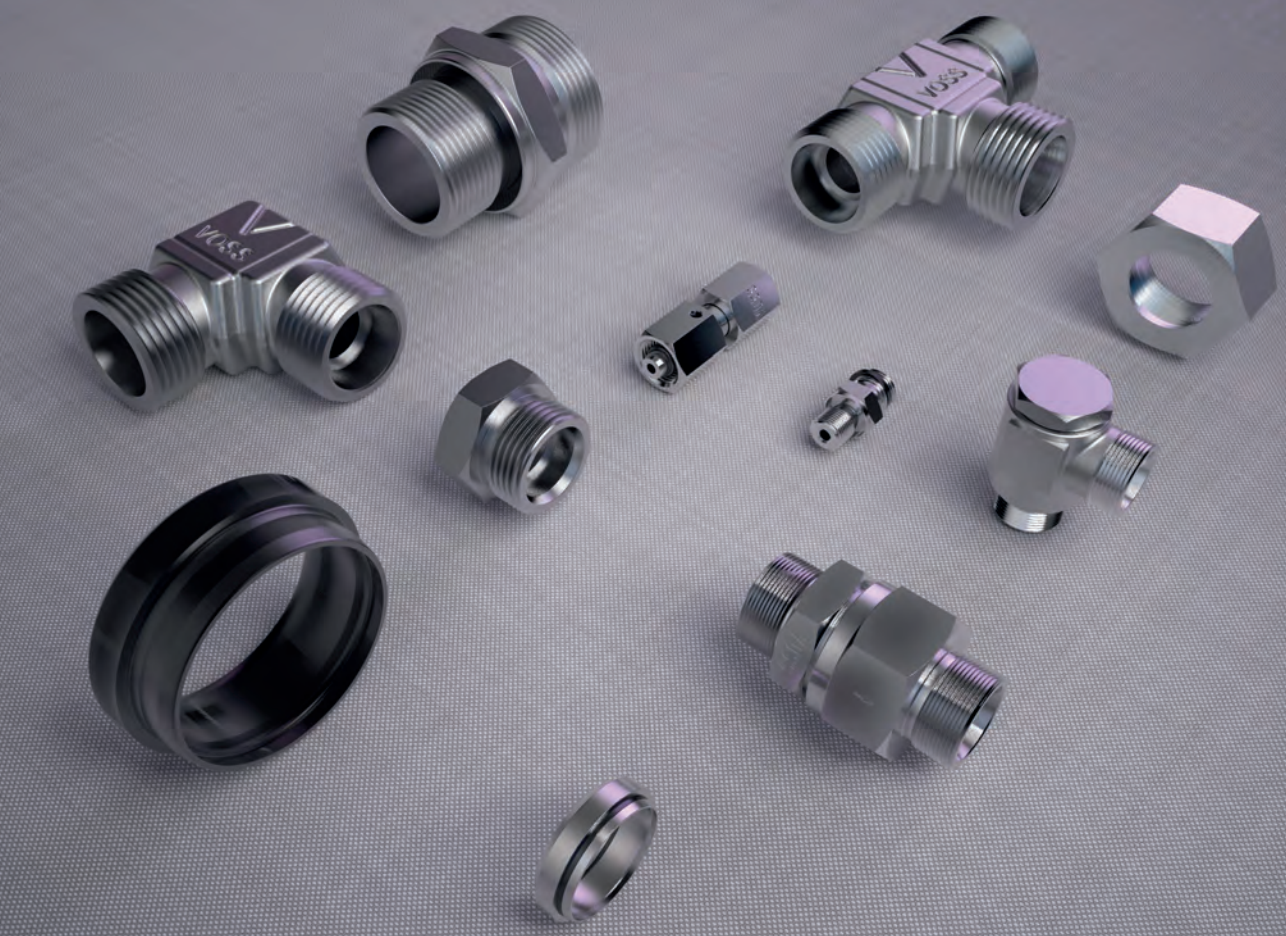
VOSS

Hydraulic Connection Technology



www.voss.net

Important notes

For the reliable performance of the VOSS products, compliance with the respective assembly instructions (Chapter 8), compliance with the general technical instructions (Chapter 9) and the consideration of the current standardization and regulations of the general mechanical engineering is a basic requirement. Please always use the latest version.

This catalogue edition replaces all previously published technical documents (catalogues, assembly instructions etc.). Consequently, all previous documents lose their validity with immediate effect!

Subject to technical modifications; misprints and errors excepted.

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Retailer directory

To find the addresses of our worldwide retailers, please visit www.voss.net/en/find-a-sales-partner.

Content

	Chapter
General information	1
Overview of 24° tube connecting systems	2
Tube connecting parts, 24° connecting pieces and single parts/accessories	3
VOSS *Point* ^{DC} measurement couplings M16x2	4
Flange couplings/ZAKO	5
Hydraulic valves	6
Pre-assembly devices and tools	7
Assembly instructions	8
General technical notes	9
Services	10
List of designations	11



VOSS

1

Your system partner for fluid management

We are VOSS

As a leading system partner for fluid management, VOSS develops and produces innovative line and connection systems for mobile and stationary applications.

Our solutions set standards in the fields of hydraulics, pneumatics, fuel supply, thermal management and exhaust technology - with the highest quality and lasting reliability.

With over 90 years of experience and a deep-rooted spirit of innovation, we are shaping the technologies of tomorrow. Our developments pave the way for sustainable future solutions, including battery energy storage systems, battery management in vehicles, hydrogen lines for fuel cell systems and lines for the production and distribution of green hydrogen.

As a medium-sized group with 23 companies in 13 countries, we are there for you worldwide and together form the VOSS Holding with its headquarters in Wipperfürth, North Rhine-Westphalia. Our global network is complemented by sales partners in more than 50 countries.

VOSS is wholly owned by the non-profit Hans Hermann Voss Foundation, which for more than 30 years has supported projects in the natural sciences and research, education and training, youth and the elderly, as well as charitable causes.

The headquarters: Factory and administration Wipperfürth



Responsibility and sustainability

For VOSS, sustainability is not a trend, but a deep rooted principle that governs our daily actions. Inspired by the guiding idea of the founder's son Hans Hermann Voss, who always focused on the welfare of our employees, society and the environment, we have been committed to sustainable solutions for decades.

Many measures that we have already implemented successfully now meet the requirements of the EU's Corporate Sustainability Reporting Directive (CSRD). Our annual sustainability report provides a transparent insight into our progress and initiatives.

Protection of the environment
In order to consistently reduce our environmental footprint, we pursue ambitious environmental goals. We rely on energy-efficient and resource-efficient production processes and the increased use of renewable energies in our worldwide plants. With clearly defined measures, we work towards CO_2 neutrality and make an active contribution to promoting climate-friendly technologies with our innovative product solutions.

Human welfare
Our employees are our most valuable asset. Their commitment, talents and achievements are the key to our success. Therefore, we strive to provide them not only with a secure workplace, but also with a motivating and appreciative working environment.

Occupational safety and health are our top priority. We implement targeted measures to protect our employees in the best possible way and to ensure optimal working conditions. On the basis of our values, we stand for tolerance, diversity and equality and show social commitment.

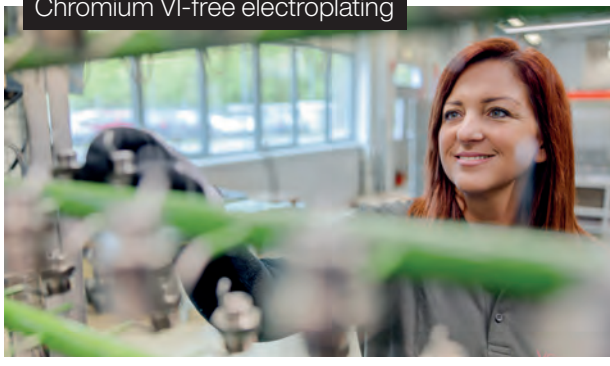
Responsible action
Our daily activities are geared towards the sustainable and long-term future of VOSS. In doing so, we act responsibly, fairly and transparently – always in accordance with basic democratic principles and all applicable regulations and laws. This obligation is firmly anchored in our core guidelines: the Compliance Policy, the Code of Ethics and the Code of Conduct. These are open to our employees, suppliers and customers and form the basis for a trusting cooperation.

Certificates according to ISO 14001, ISO 50001, ISO 45001, IATF 16949 and ISO 9001 underline our systematic approach to the highest quality and continuous improvement in all areas.

Photovoltaic system at the Wipperfürth plant



Chromium VI-free electroplating



Certificates for the VOSS sites



Competences of the VOSS Group

From the individual design of your fluid system to the development of innovative products, prototype construction and series production, to intelligent logistics concepts and practice-oriented training – VOSS offers you holistic solutions from a single source.

Our cooperation is as individual as our customers: whether global players with worldwide locations, specialized niche providers, long-term business partners with constant demand or innovators looking for customized solutions – VOSS develops tailor-made concepts for sustainable success.

Product range

Ready-to-install lines and components from VOSS set standards in functional reliability, tightness, ease of assembly and durability of fluid systems. A wide range of system solutions, materials and variants is available for tubes and hoses, connecting elements, valves and sensors, for measuring and control technology, pre-assembly devices and tools.

This is the basis on which the unique VOSS specialty is created: individual developments matched exactly to the requirements of our customers – from individual components to complete tube systems.



Tube connections



Measuring couplings



Pre-assembly devices and tools



Ready-to-install lines



Plug-in systems



Manifolds and in-line connectors



Modules



Valves



Sensors

Industry solutions



Mobile machinery



Agricultural engineering



Stationary systems



Rail technology



Energy generation and storage



Marine and offshore



Trucks and buses



Cars and vans



Energy infrastructure

VOSS products are used in a wide range of industries. For their highly different conditions of use and corresponding requirements of the fluid systems, our solutions shape the state of the art:

- For stationary and mobile applications with different material demands and environmental influences
- For various application media, which require special material compatibility and reliable sealing at the connection points
- For system requirements from low pressure to high pressure and from lowest to highest temperatures
- For delicate and heavy-duty line systems
- For different installation conditions on site

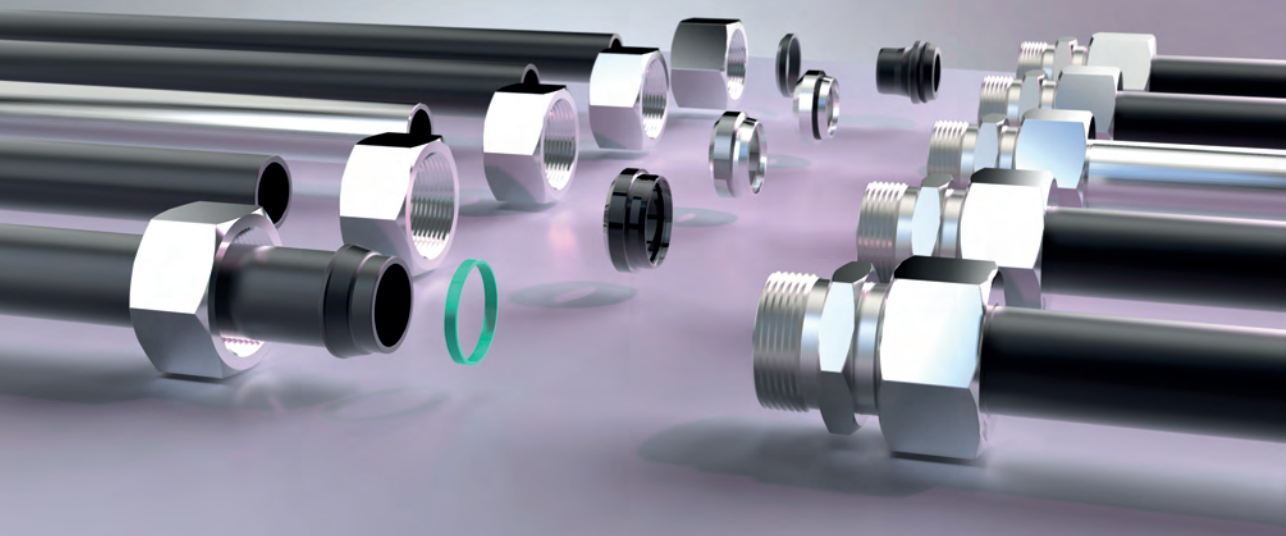
With our system expertise, we offer our customers holistic solutions from a single source – individual, reliable and pioneering.

Media competence

- Hydraulic oil
- CNG & LNG
- Compressed air
- AdBlue®
- Liquid fuels
- Hydrogen
- Coolant
- Cleaning fluids
- Water
- ...

Overview
VOSS Tube connection systems

The right connections for all applications



Content	Type/Page
Couplings program with a wide range of system solutions	P.12
Key benefits of the 24° couplings	P.13
The right connections for all application	P.14
Characteristics and requirements of connection systems	P.15
The path to permanently leak-free connections	P.16
Cutting ring system VOSS *Ring M*	P.17
Cutting ring system ES-4	P.21

VOSS

Content	Type/Page
Cutting ring systems 2SVA/ES-4VA	P.25
Tube forming systems VOSS *Form* ^{SQR} and VOSS *Form* ^{SQR} VA	P.27
Flanging system BV-10	P.31
Taper coupling VOSS DKO	P.35
Customized solutions	P.39
The complete catalogue range	P.40
Certification and approvals	P.44

Couplings program

with a wide range of system solutions

Full offer in premium quality

According to this principle, VOSS Fluid produces one of the most extensive product ranges of tube connection systems. The entire product range is available as a catalog program.

The product range includes cutting ring, soft-seal and flared couplings, tube forming systems, flange couplings and supplementary accessories. A further particular emphasis is placed on the development of customer-specific system solutions. VOSS Fluid handles the entire package, from project planning, engineering, production and assembly to special logistics services.

VOSS Fluid offers convincing economic concepts and improvement approaches that take into account the procurement costs, the assembly effort, the sustainability of coupling tightness and long-term corrosion protection.

The complete product range is optimally protected against corrosion by the high-quality chromium (VI)-free surface coating VOSS coat as standard. Extensive salt spray tests in accordance with DIN EN ISO 9227 have shown that no basic metal corrosion occurs even at 1,000 hours under practical conditions, i.e. after handling and assembly.

The company's consistent quality policy and the defined quality objectives – all of which are reflected in the necessary certifications and approvals of the relevant associations and specialist bodies – have ensured VOSS Fluid a leading position in all established markets for many years.

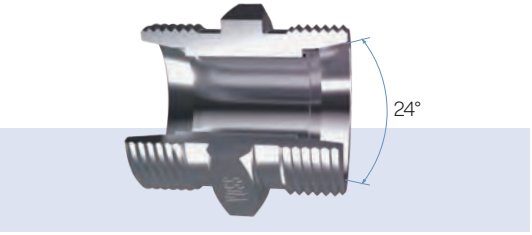


VOSS 24° couplings

VOSS 24° tube couplings to ISO 8434-1 are among the most widely used connection systems in hydraulics worldwide. Especially in Europe, Asia and South America, this type of tube connection has become established through a variety of advantages.

The product line comprises a light and heavy series (L and S), which differ in terms of different pressure levels and dimensions. All nominal pressure data (PN) is designed with quadruple safety.

Depending on the specific application, various connection systems can be adapted on the tube connection side. The 24° inner cone serves here as a sealing surface.



Through worldwide depots with a wide range of systems and a global network of authorized dealers, VOSS Fluid stands for the very highest availability of products and offers particularly economical delivery systems. These range from a KANBAN Full Service to the complete optimization of the customer's supply chain.

With regular training courses and application-related information, VOSS Fluid offers a wide range of special services. The internal and inter-company logistics of the entire VOSS Group provide considerable cost advantages, which make it possible for customers to plan their production precisely in time and in line with capacity without having to build up their own inventories.

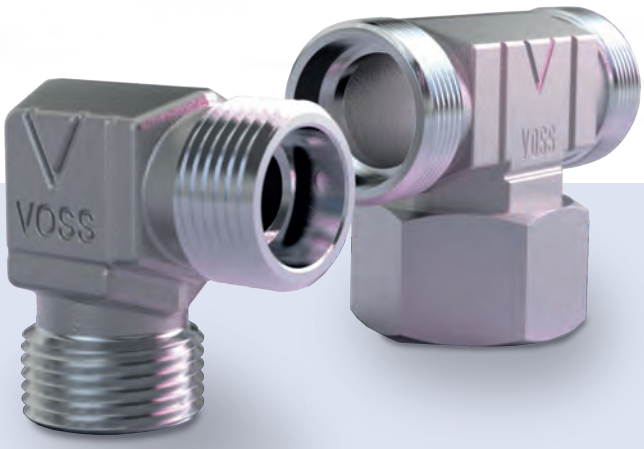
The wide range of couplings from VOSS Fluid includes a wide variety of designs, such as angled, T or L couplings. These are available in different designs, as a connecting or bulkhead coupling, as a male stud connector or adjustable coupling. In addition, VOSS Fluid also offers a variety of special types, such as blanking plugs, reducers, gauge couplings or non-return valves.

On the screw-in side, a variety of threads and types of seals according to international standards are available.

Key benefits

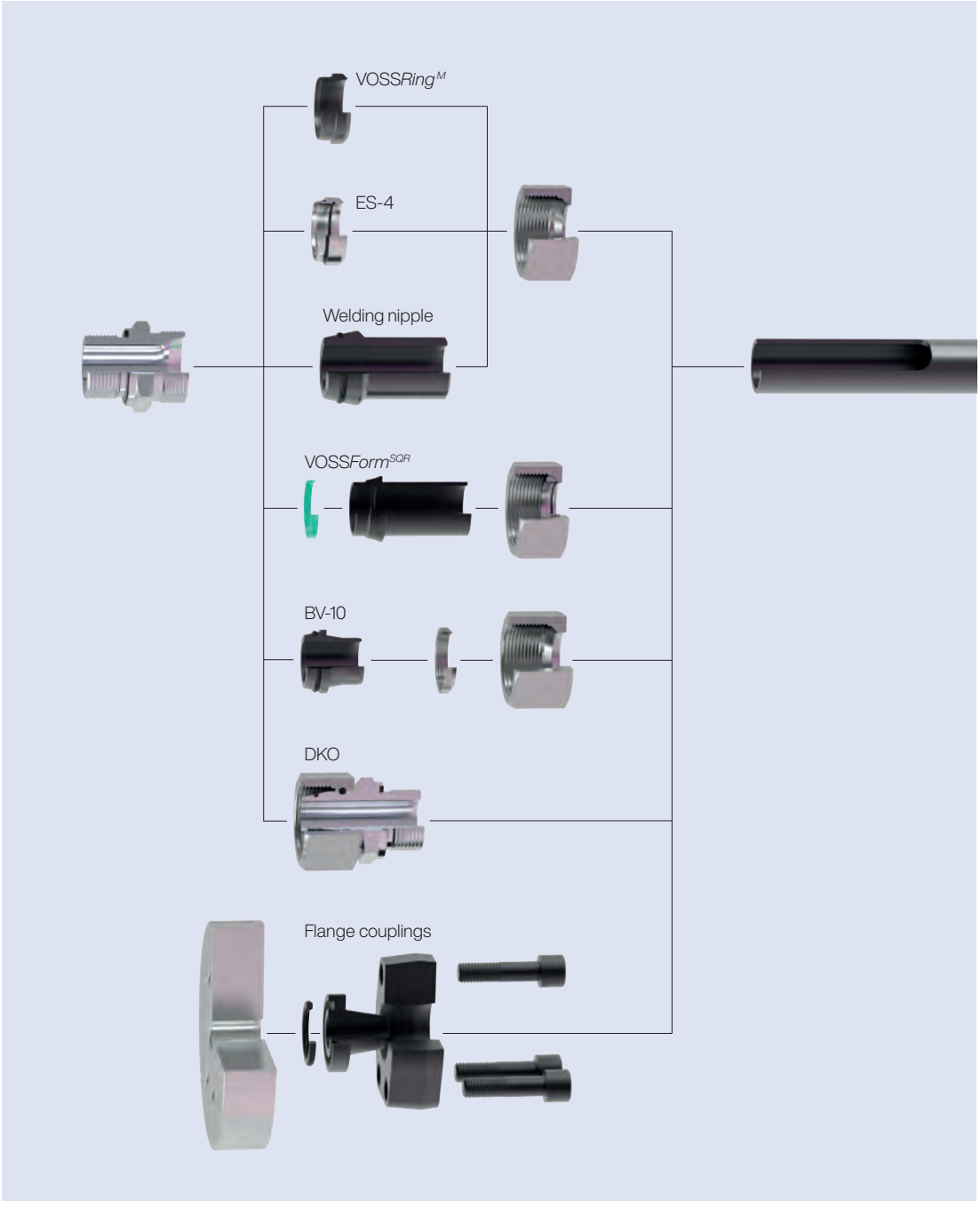
of the 24° couplings

- The connection type with 24° inner cone is leaktight and resistant to alternating bending loads, pressure pulses and tearing of the tube.
- The tube connections can be easily produced.
- The tube connection can be detached as often as required. This is especially important in the case of maintenance and servicing.
- Depending on the intended use, various tube connection systems can be combined with the 24° coupling bodies. This opens up the possibility of producing an additional soft-sealing system from a purely metallic sealing system.
- The tube coupling offers maximum leak tightness even at very high system pressures (up to 800 bar), very small external dimensions and low assembly costs.
- The permitted system pressures of the connections have a safety factor of 4. This ensures sufficient reserves in the event of overloading of the connection.
- There is a large variety of types from which it is possible to select according to the modular principle. Special couplings or unnecessary tube bends and installation space can thus be saved. In the screw-in variants, too, a wide variety of metric and inch threads and types of seals can be selected.
- The 24° system is a worldwide standard and is therefore very widespread, especially in Europe, Asia and South America. Hose fittings can also be connected without any problems.
- In the case of the 24° connection system, as a rule, no retightening of the coupling is necessary.
- For lower system pressures up to 500 bar, a "light" series is available. These components are cheaper, save weight, require even smaller installation space and have a higher flow rate.
- Due to the optimal tube clamping in the 24° coupling system, the tube connection remains flexible enough to cushion vibrations of the tube system. On the other hand, captive connections remain rigid and frequently tend to tear off the tube connection.
- All VOSS couplings are provided with VOSS coat surface protection as standard. This offers the highest level of protection against corrosion.
- The function of the entire connection system has been confirmed by many independent certification companies.
- VOSS 24° couplings can also be used in other applications, e.g. in the stationary gas and hydrogen industry. Contact us about our solutions for these areas of application!



The right connections

for all application



Characteristics and requirements

of connection systems

Type of connection	24° cutting ring system		24° tube forming system	24° flanging system	Taper coupling	Flange connection
VOSS Fluid range	VOSS*Ring*^{M}	ES-4	VOSS*Form*^{SQR}	BV-10	DKO	ZAKO
Standard	DIN EN ISO 8434-1	DIN EN ISO 8434-1	DIN EN ISO 8434-1	DIN EN ISO 8434-1	DIN EN ISO 8434-1	
Type of sealing	Metallic	Metallic + soft-sealing	Metallic + soft-sealing	Metallic + soft-sealing	Metallic + soft-sealing	Metallic + soft-sealing
Material	Steel	Steel/stainless steel	Steel/stainless steel	Steel	Steel	Steel
Series	L/S	L/S	L/S	L/S	L/S	
Tube OD	6–42	6–42	6–42	6–42	6–42	16–114.3
Pressure resistance	●●●	●●●	●●●●	●●●	●●●	●●●●
Temperature stability	●●●	●●●	●●●	●●●	●●●	●●●
Corrosion resistance	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●
Media resistance	●●●	●●●	●●●	●●●	●●●	●●●
Ease of assembly	●●●●	●●●●	●●●●	●●●	●●●●	●●●
On-site assembly	●●●●	●●●●	●	●●●	●●●●	●●●
Maintenance effort	●●●	●●●●	●●●●	●●●●	●●●●	●●●●
Flow behavior	●●	●●	●●	●	●●	●
System security	●●●	●●●	●●●●	●●●●	●●●●	●●●●

●●●● outstanding ●●● very good ●● good ● average

Criteria for assessing the requirements

Pressure resistance	Static/dynamic compressive strength, absorption of external forces
Ease of assembly	Pre- and final assembly, sources of error, inspection possibilities
On-site assembly	Assembly without special tools, possible repair solutions
Maintenance effort	Setting behavior under continuous load, permanent fine seal
Flow behavior	Cross-sectional constriction, dead spaces, pressure loss, noise
System security	Tearing, tube rupture, assembly safety

The path to permanently leak-free connections

Permanently leak-free joints increase the efficiency of your products and enhance your product image. The variety of VOSS connection systems and the wide range of variants offer the right alternative for almost every application.

Taking the respective application into account, we recommend the following for the design and selection of the correct connecting system:

1 Pay attention to the basics!

Before selecting the connection system, important parameters such as pressure, volume flow, ambient temperature, external influences, standardization and/or legislation and the type of load should be known. One important additional decision criterion should be the cost-effectiveness of the connection. In addition to the incurred purchase price, the procurement costs, the installation effort, the sustainability of the sealing function and the long-term corrosion protection must also be included in the total cost consideration.

2 Assemble exclusively according to the VOSS assembly instructions!

Leaky connections are mainly caused by assembly errors. That is why it is necessary to follow the assembly and operating instructions carefully. VOSS Fluid offers comprehensive training material as well as practical seminars on all aspects of tube connections. On request, we will also be happy to conduct these at your company and provide valuable tips, specially designed for your production processes.

3 If possible, use a continuous soft-sealing system!

Soft-sealing systems prevent even the smallest leakage paths, which can be caused by setting of the connection, temperature fluctuations and vibrations. The VOSS Fluid product range enables the consistent use of elastomers on the tube connection and threaded side of the connection. Please note the different material properties of the sealing materials.

4 Rely consistently on VOSS products!

In general, it is possible to use different coupling components from different manufacturers, however, we recommend using only VOSS components. The VOSS products are perfectly matched to each other, guaranteeing the best function and quality.

5 Profit from our broad application competence!

VOSS Fluid and our authorized specialist dealers have a wide range of knowledge for almost every application. Take advantage of our experience and get customized advice before selecting a system.

6 Have yourself regularly audited by VOSS Fluid!

Check at regular intervals whether changes have resulted in your internal production processes, for example due to new assembly personnel or worn machines and tools. We offer auditing as a service, during which we check your assembly on site.

7 Check your tube and hose installation!

Make sure that your tube and hose assemblies are professionally laid and supported at regular intervals. Excessively rigid constructions cannot absorb vibrations, while carelessly supported tube systems tend to vibrate.

Cutting ring system VOSS*Ring*^{M}

Highest leak-protection thanks to optimized tube cuts



Product information VOSS*Ring*^{M}

VOSS*Ring*^{M} offers you all the advantages of previous 24° cutting ring systems and raises them to a new level of quality and safety. The special focus during development was on the easy and process-safe assembly, reliable protection against leakage and the use of extremely durable materials. The result is a cutting ring system that is secure all-round, both in assembly and in usage, made by VOSS.

We have perfectly matched all properties of the VOSS*Ring*^{M} cutting ring system to each other for full system performance.

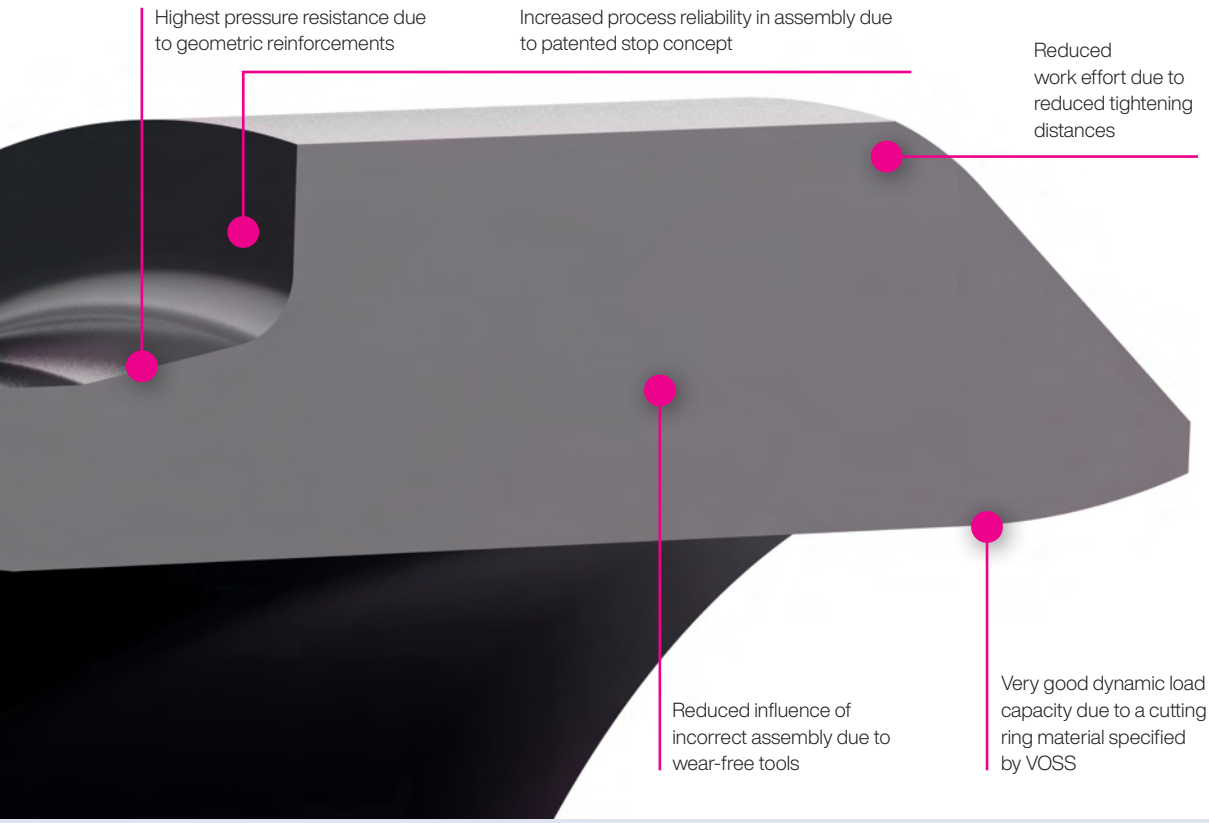


VOSS coat BLACK

Since 2007, VOSS has been setting standards with VOSS coat, the zinc-nickel-based surface, now also used with the VOSS*Ring*^{M} cutting ring system. To avoid confusion and to make the assembly process safe, the new VOSS*Ring*^{M} is coated with a BLACK coating. VOSS coat BLACK guarantees maximum service life.

- 1,000 hours corrosion resistance in salt spray test under realistic conditions
- More than 2,000 hours of corrosion resistance during the salt spray test under laboratory conditions in the unmounted state
- Much more resistant to damage to the base layer
- Sustainable production by using the latest in-house galvanizing

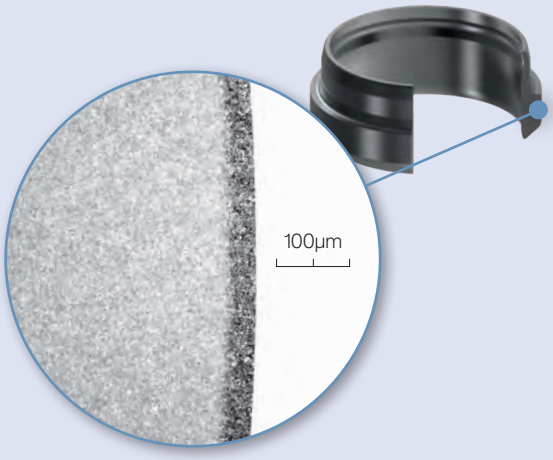




High-tech materials

For our VOSS*Ring*^{M} cutting rings we use a specially developed material with very narrow tolerances for the alloying components. This guarantees high strength of the extremely homogeneous, fine-grained structure with high toughness and fracture resistance.

Our further improved hardening process produces a very thin and extremely hard surface layer. This ensures a precise and optimal cut in steel and stainless steel tubes and only a slight spring-back after assembly.



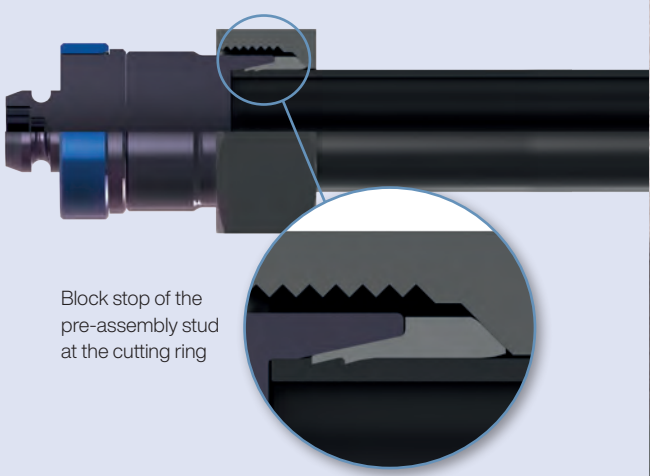
Optimization of pre- and final assembly

Precise pre-assembly through the patented stop concept

For the VOSS*Ring*^{M} cutting ring system, both machines and manual assembly studs are available for pre-assembly. Both are made of wear-free high-performance steel and offer up to 20 times longer tool life.

With a specially developed material, we prevent the expansion of the cone contour. Regular tests for suitability for function therefore become unnecessary. When the limit of use is reached, the stud breaks. Assembly errors due to tool wear are thus effectively prevented.

Due to the integrated stop function, the pre-assembly path is exactly maintained due to the design. The pre-assembly stud comes into contact with the cutting ring with a defined stop surface at the end point of pre-assembly. The pre-assembly path is terminated at the optimum point. When using the manual assembly stud, a significant increase in force is noticeable. Overassembly is effectively prevented. The tube connection is permanently leak-free.



Block stop of the pre-assembly stud at the cutting ring

Reliable final assembly

through geometric optimizations

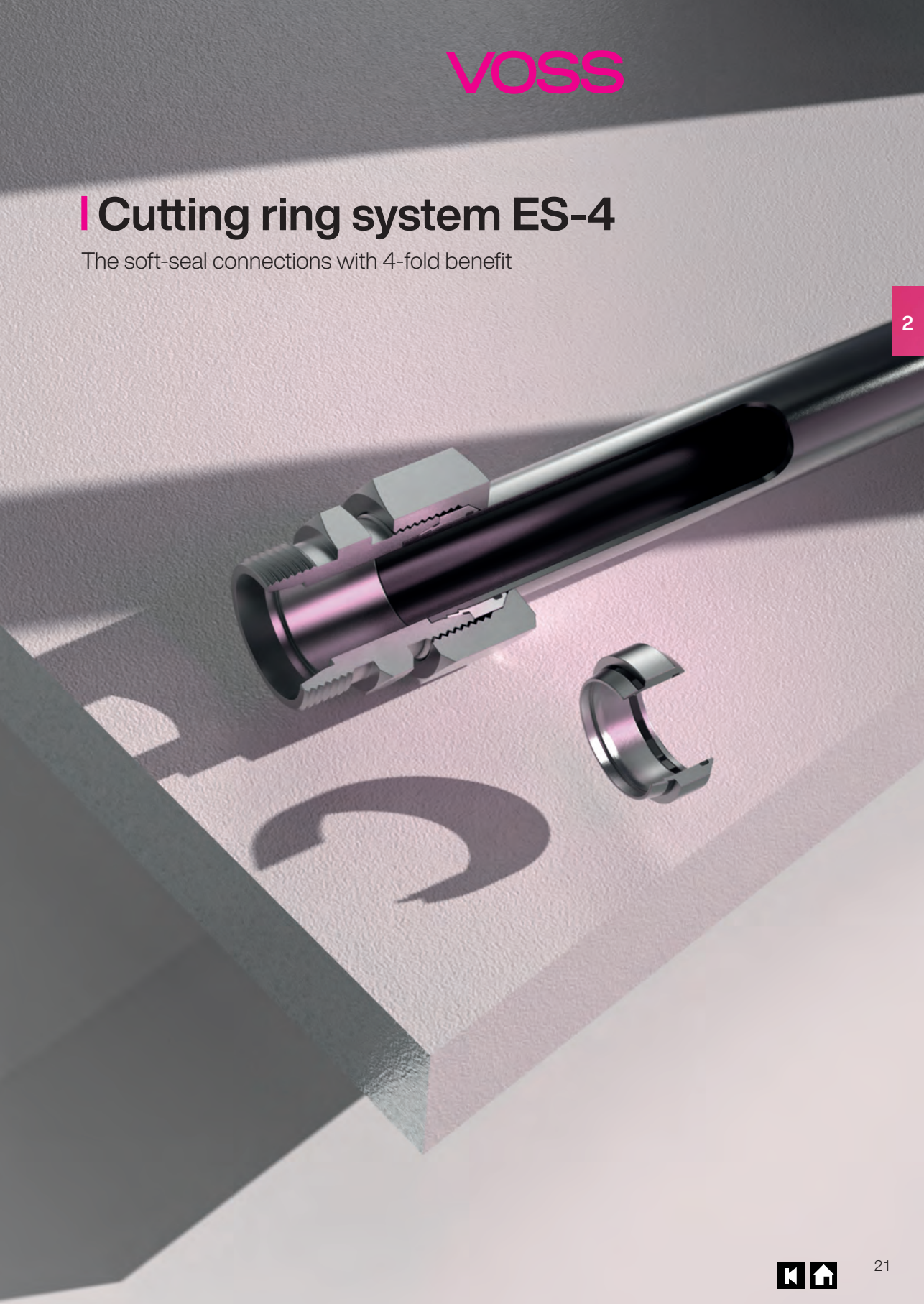
The quality of the VOSS*Ring*^{M} cutting ring system is also evident in efficient final assembly. The geometric optimization in the tube stop area gives the installer a number of advantages:

- Final assembly distance reduced from 90° to 30°
- Significantly reduced work effort
- Simplified final assembly in tight installation situations

In addition, an additional free space is defined by the extended end face of the pre-assembly tool, which permits a re-cutting of the cutting ring during the later final assembly. In this way, an optimum incision and seating of the cutting ring is achieved even in the course of a problem-free, process-reliable and standard-compliant repeated assembly.

Cutting ring system ES-4

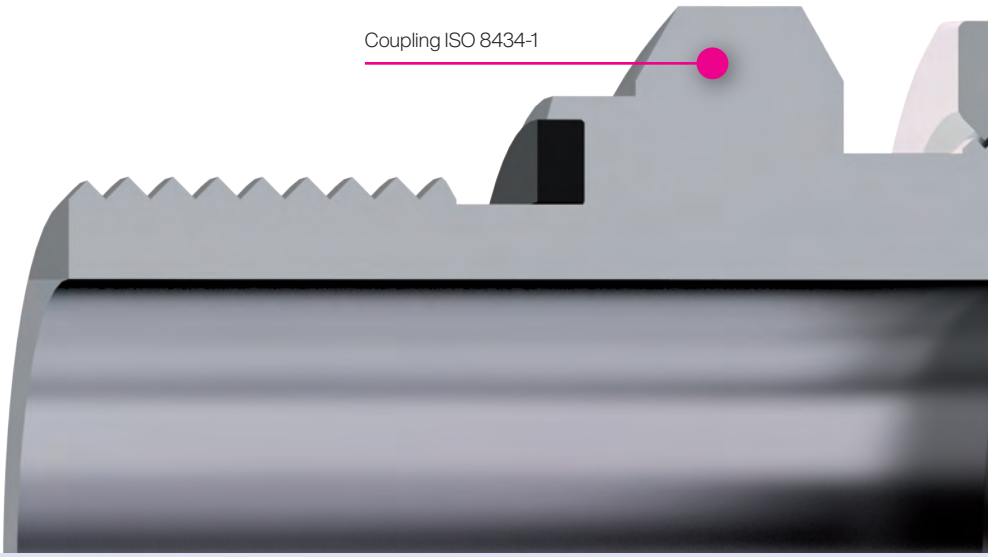
The soft-seal connections with 4-fold benefit



Product information VOSS ES-4

The VOSS ES-4 soft-seal coupling covers the area of application between the proven cutting ring coupling for normal applications and the 10° flanging system for high loads.

As a coupling according to ISO 8434-1, VOSS ES-4 offers additional potential for reliability and cost-effectiveness.



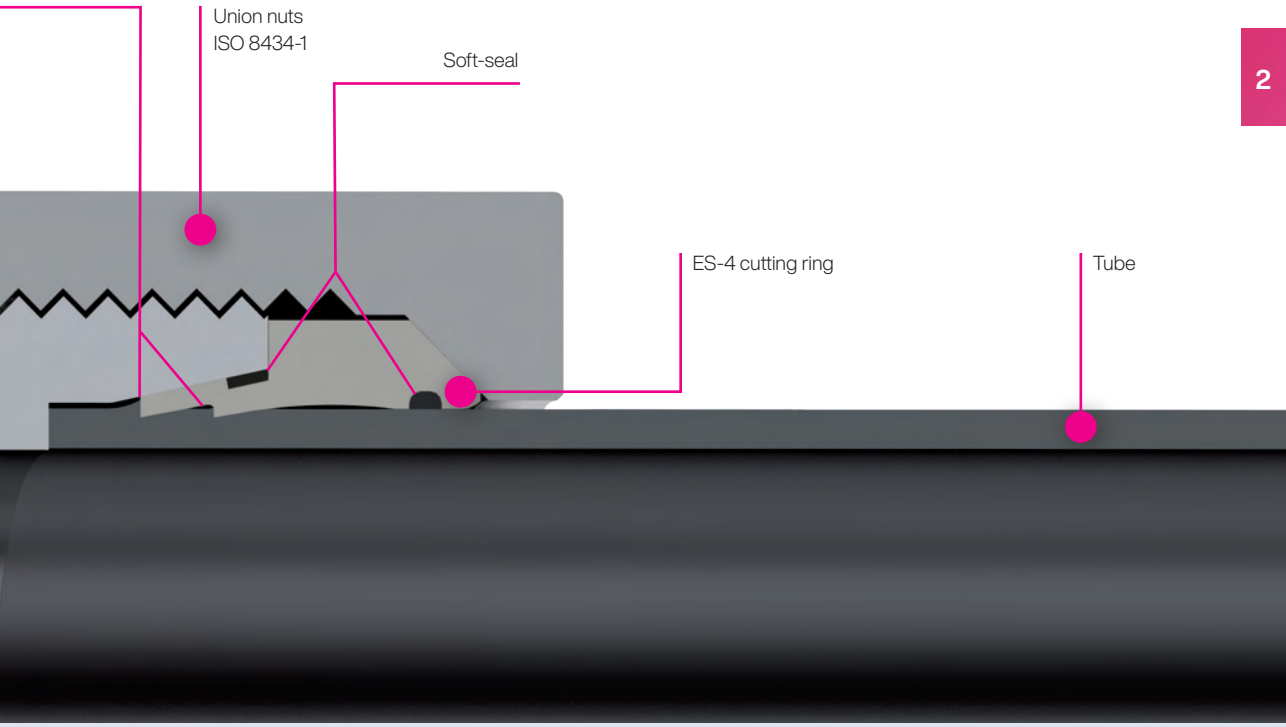
It offers four benefits:

1. VOSS cutting ring as a proven base
2. Additional fine sealing by soft-seal elements from FKM
3. Reliable tightness due to gap-free chambering of soft-seals
4. Guided assembly up to the tightening limit

VOSS Ring as the basis

The soft-seal coupling is based on the proven VOSS tube connection according to ISO 8434-1. The cutting ring is supplemented by soft-seals applied on the secondary side. The reliable functional properties of the cutting ring are fully preserved.

In the final assembly state, sufficient resistance to the bending moments acting on it is counteracted due to the broad support and due to the closed force flow. In addition, the first strong cutting edge and the additional second cutting edge ensure a stable hold in the event of pressure impacts and therefore tear-out protection.



Fine seal with clear chambering

The fine seals prevent the known sweating effects of purely metallic seals. The special shaped seal of the ES-4 cutting ring, which is captively integrated in a groove on the cutting ring cone, seals the possible leakage between the cutting ring and the coupling. An additional O-ring prevents possible leakage between the cutting ring and tube.

Both soft-seals thus lie behind the tried-and-tested metallic seal. By these arrangements, dynamic and static loads are intercepted at the primary zones, i.e. at the metallic sealing points. and only reach the soft-seals approximately statically.

A further advantage is that the soft-seals are chambered in stable, gap-free installation spaces after the cutting ring assembly. This prevents extrusion of the soft-seal even at full system pressure.



Technical and economic benefits

Safety through block assembly

The stable, gap-free chamber of the fine seal is achieved by the block assembly of the ES-4 cutting ring – specifically by an increased pressing of the shaped seal against the coupling cone and by a gap-free, radial contact of the cutting ring against the tube outer diameter in the region of the O-ring seal.

For this purpose, the cutting ring geometry is designed in such a way that a maximum degree of elasticity is obtained despite the block effect.

The block assembly also ensures a cut-away boundary which counteracts a tube constriction in the case of thin-walled tubes. An overassembly of the connection is thereby made difficult.

The same mounting forces apply to the block assembly as for cutting rings. The check of the correct cutting ring incision required by the standard can also be carried out unchanged. The installer does not have to change, the existing tools can still be used.

The economic benefits:

ES-4 fittings offer not only maximum leak tightness, but also additional economic benefits:

- Cost- and time-consuming improvements are no longer necessary, production losses are avoided.
- Dry connections contribute to the image enhancement of the final product. The end customers gain a competitive advantage over their competitors.
- With the ES-4 couplings, VOSS offers a continuous soft-sealing system. The user can reduce the number of his suppliers and significantly minimize the number of ordering processes.
- Since the ES-4 couplings consist of DIN/ISO fittings and DIN/ISO nuts, the user does not have to set up a storage with special parts.
- Since the user does not have to change his assembly habits or his tools, additional training and tools costs are eliminated.

Conclusion: In view of the advantages that ES-4 couplings offer in terms of maximum leak safety, they also represent a very interesting solution in terms of cost-benefit comparison.

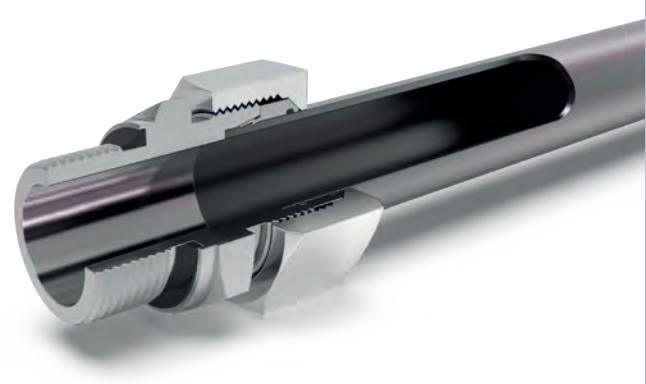
Avoid leaks
The special form seal in the groove on the cutting ring cone and the additional O-ring between the cutting ring and the tube eliminate leakage which results from a decrease in the metallic seal, for example due to creep processes.

Dynamic load
If the medium succeeds in overcoming the metallic sealing zones in the event of pressure changes, it is absorbed by the soft-seals arranged behind it.

The arrangement of the elastomer seals behind the metal sealing zone means that the alternating pressure load only reaches the soft-seal in a highly damped state.

This quasi-static load at a level which is lower than the operating pressure ensures excellent long-term stability of the elastomers.

Static load
In the case of static pressure application and an assumed leak of the metallic sealing zone, the full operating pressure nevertheless builds up before the soft-seal – with a considerable delay in time. In this case, the complete gap-free chamber of the soft-sealing elements ensures reliable sealing.



Cutting ring systems 2SVA/ES-4VA

Cutting ring couplings made of stainless steel



Product information VOSS 2SVA and VOSS ES-4VA

VOSS 2SVA

The VOSS 2SVA cutting ring with its two cutting edges and the proven spring effect offers a secure connection of stainless steel tubes. As a standard cutting ring made of stainless steel, it is characterized by a high functional stability and a practical assembly behavior for applications in stainless steel.

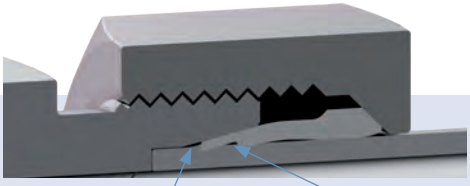
The first cutting edge produces stable material accumulation for firm hold, the second cutting ring provides additional security under higher dynamic oscillation and bending fatigue loads. This ensures an even distribution of force over the entire cone and thus the additional safety you have come to expect from VOSS. The elastic behavior of the ring maintains the prestress of the mounting forces and prevents leaks due to setting effects or critical pressure peaks.

VOSS ES-4VA

Especially when it comes to the use of tube lines for the transport of sensitive media, the use of stainless steel in conjunction with a complete sealing is absolutely essential.

By transferring the known advantages of the VOSS ES-4 cutting ring to the material stainless steel, the soft-sealing cutting ring VOSS ES-4VA ensures maximum leaktightness with precision accuracy.

A labyrinth sealing effect functions instead of the FKM soft-seal as a fine seal in the secondary area between the cutting ring and the tube.



2SVA cutting ring



ES-4VA cutting ring

Tube forming systems VOSS*Form*^{SQR} and VOSS*Form*^{SQR} VA

A maximum of safety, pressure resistance and quality



Product information VOSS*Form*^{SQR}

The essential requirements for hydraulic connections can be summarized in three terms:

The most important aspect of a hydraulic connection is its	**S**afety
A permanent freedom from leakage can only be achieved with consistently high	**Q**uality
To be successful on the market, a connection needs high	**R**entability



Dynamic load absorption by integrated clamping ring

The VOSS*Form*^{SQR} tube forming system meets these requirements with its innovative design based on the proven VOSS design principles.

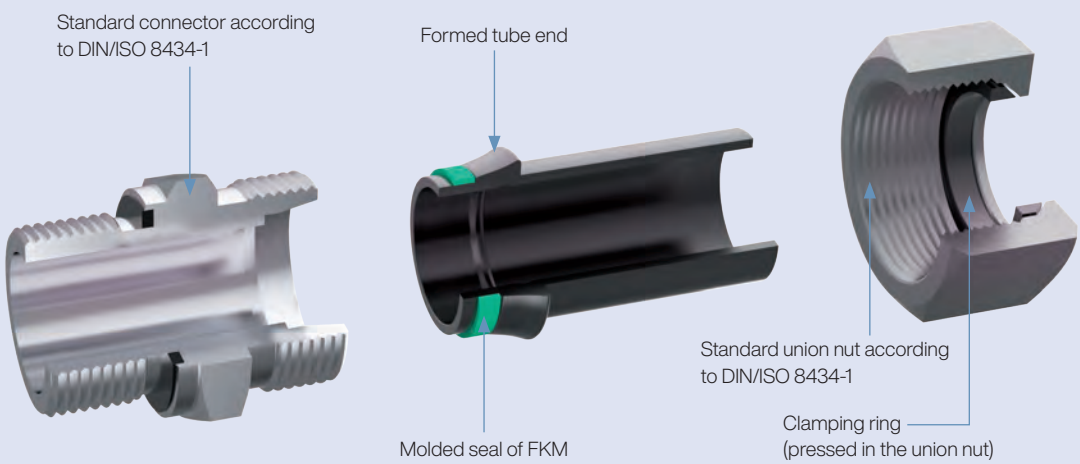
A contour is formed on the end of a commercially available hydraulic tube in the VOSS*Form* 100 forming machine. A simple and high-quality connection is created, supplemented by a soft-seal and the special SQR functional nut.

Maximum durability and safety

The critical area is the transition from the deformed contour to the tube. Here, material embrittlement can occur as a result of the forming process. With the VOSS*Form*^{SQR} system, this weakpoint is effectively eliminated. On the one hand, the rounded transition minimizes the notch effect. On the other hand, the SQR functional nut with the integrated clamping ring radially clamps the tube on the circumference and thus absorbs dynamic loads in front of the critical region and increases the compressive loading capacity and fracture resistance.

Assembly safety due to safe stop

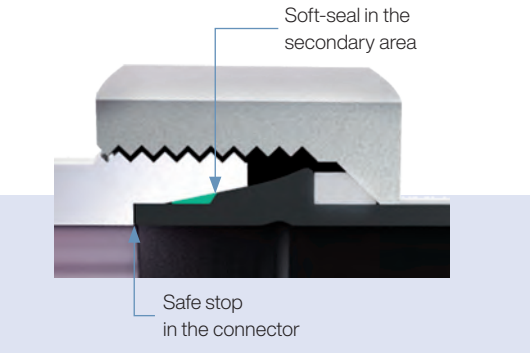
Safe assembly means safe connections. With the VOSS*Form*^{SQR} system, the end face of the tube strikes against the bottom of the standard DIN/ISO connector. When tightening the union nut, the end of assembly becomes clear due to a noticeable increase in force. Underassembly or overassembly is practically excluded. In addition, the mounting distance and, accordingly, the mounting time are reduced. At the connector, the shaped contour dips deep into the 24° cone and ensures a stable fit.



Process-safe tube forming

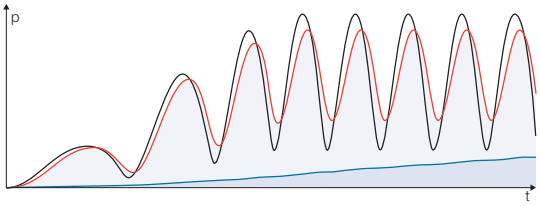
Forming with the VOSS*Form* 100 forming machine is conceivably simple. The simple insertion of the tube end against the stop plate and the monitored forming process do not allow for any errors. The inner mandrel on the upsetting head prevents constriction of the tube in the formed area. The inner diameter of the tube is completely retained – there can be no pressure losses due to bulges. Cycle times of 7 to 15 seconds significantly reduce assembly times, especially in series production.

Tightness thanks to soft-seal



Compared to a purely metallic seal, a soft-seal offers clear advantages. Leaks caused by setting the components under mechanical stress are compensated. The sweating of the connection is effectively prevented. A connection which is completely sealed even in the fine range is more economical, protects the environment and underlines the quality of the connection as well as of the entire product.

The concept of arranging the soft-seal in the secondary area – as in the case of the ES-4 cutting ring – minimizes both the static and the dynamic loading of the seal. The metallic primary restriction – on the end face of the tube – brings about a damping of the load in the event of a pressure alternating stress. In the case of static load, there is a considerable time delay in the application of pressure. The long-term stability of the elastomer is ensured by this form of arrangement.



VOSS soft-seal in the secondary area

Economic efficiency

With the avoidance of leaks, the minimization of the assembly time and the elimination of the maintenance effort, efficiency is already basically established. Low material costs and easy handling of the parts make VOSS*Form*^{SQR} an advantageous solution, also and especially for series production.

Full range

A wide range of products is a prerequisite for the successful use of connection systems. VOSS*Form*^{SQR} is based on standard components. Therefore, the complete VOSS DIN/ISO range is available for the VOSS*Form*^{SQR} system.

VOSS*Form*^{SQR}VA

The VOSS*Form*^{SQR}VA forming system is available for applications in stainless steel. All individual parts are made of stainless steel.

The same product properties and advantages apply as with VOSS*Form*^{SQR} for applications in steel

- Dynamic pressure curve in the tube
- Conventional connection system with soft-seal in the primary area
- VOSS system with soft-seal in the secondary area

VOSS*Form* 100 forming machine

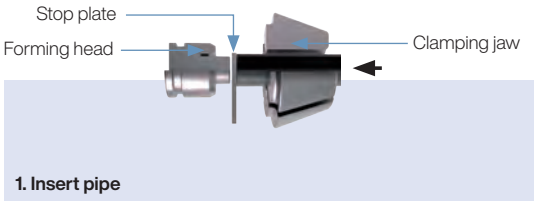
The VOSS*Form* 100 forming machine ensures a time-saving, process-safe production of the contour of VOSS*Form*^{SQR}. The monitored process in conjunction with optimum guidance of the tube makes faulty deformations practically impossible as a result of incorrect operation.

Simple tool changes make a significant contribution to reducing processing times. Clamping jaws and forming heads can be exchanged without tools. The unique identification of both tools prevents assembly errors due to an incorrect combination of tools and tube dimensions.

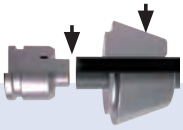
The forming process

Forming starts with the tube being pushed into the forming machine against the stop plate. Pressing the start button triggers the process (1.). The clamping jaws close and clamp the tube. The stop plate pivots out of the forming area (2.). The forming head moves forward and forms the contour of VOSS*Form*^{SQR} plastically on the tube (3.). The forming head moves back and the clamping jaws open (4.).

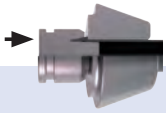
The removal of the tube is monitored. This enables the machine to automatically move back into the initial position and the next tube forming can begin without a manual resetting being necessary (5.).



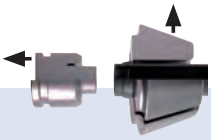
1. Insert pipe



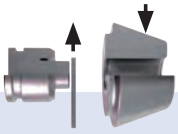
2. Clamp



3. Forming



4. Open



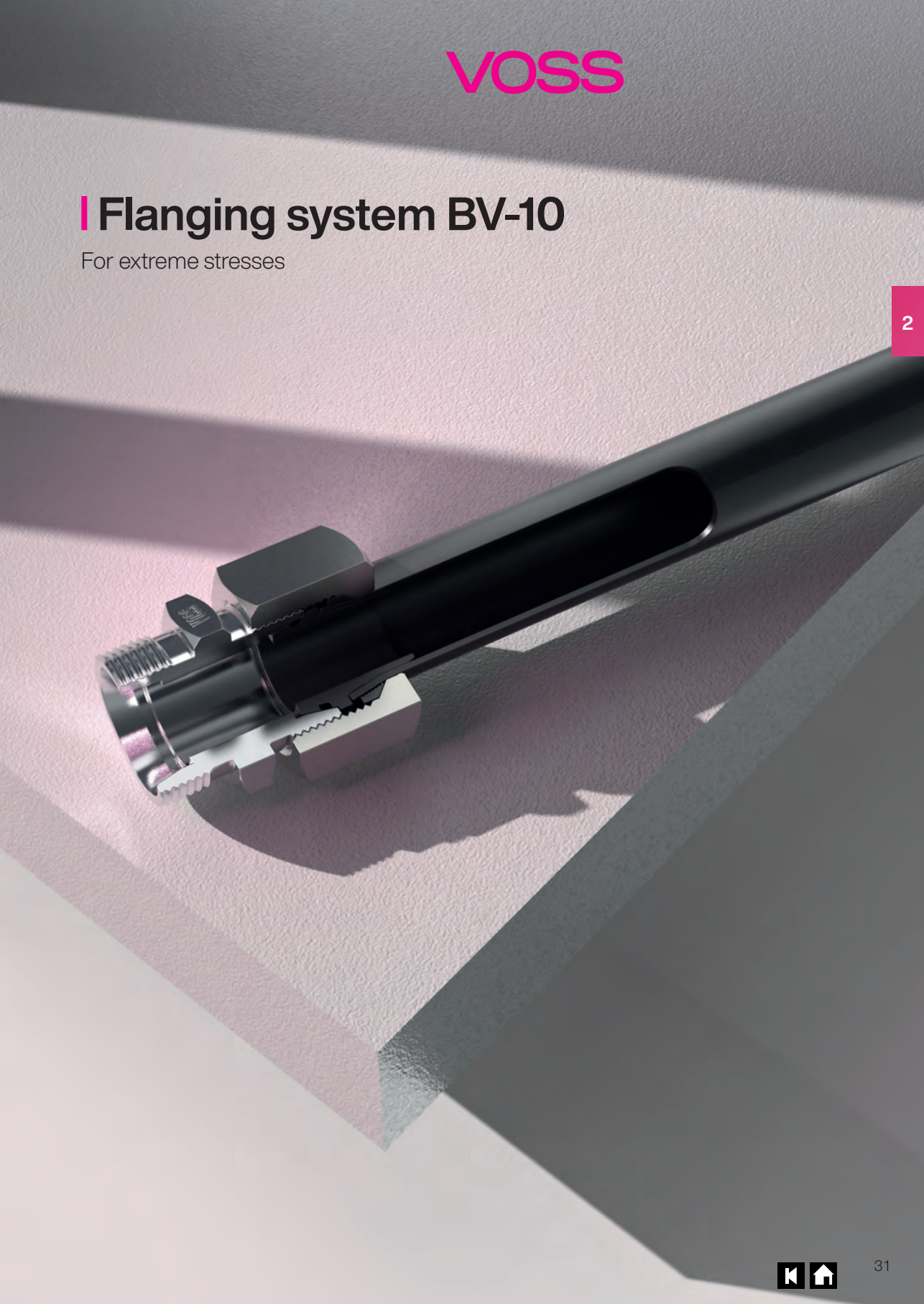
5. Tube withdrawal and approaching the home position

Forming machine in detail

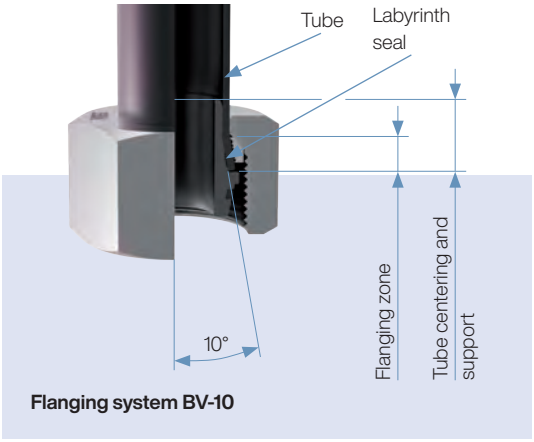


Flanging system BV-10

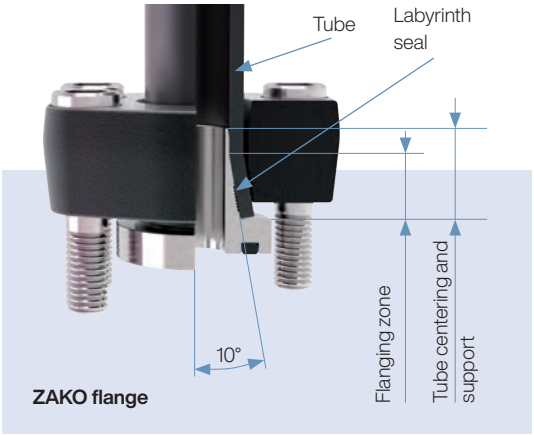
For extreme stresses



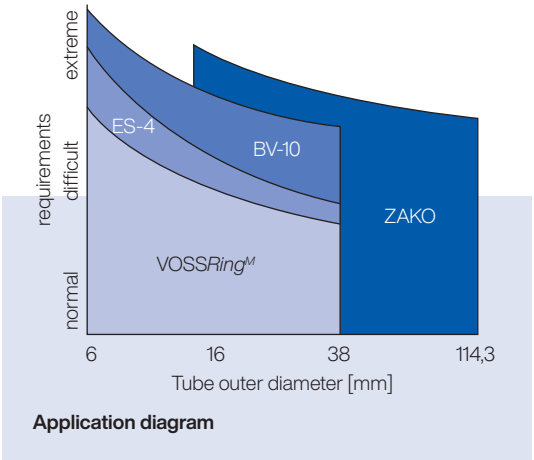
Product information 10° flanging systems



Flanging system BV-10



ZAKO flange



Application diagram

The VOSS 10° flanging system complements the proven VOSS cutting ring program for the area of highest loads (see application diagram).

Where cutting ring connections reach the limits of their load capacity, the 10° flanging system offers permanent control of alternating bending moments, pressure strokes, pressure peaks, vibrations and temperature fluctuations.

On the tube side, this system operates with a flanging angle of 10°, in contrast to the standard systems.

The connection side to the unit – directly or via a connector coupling – is designed for the commercially available or standardized connection sides. The combination of flared cone and clamping ring or collar ring and flange ensures particularly high holding forces in their design and thus a maximum of functional reliability under the highest loads.

Basically, two types of connection are based on the 10° flanging principle: the BV-10 coupling and the ZAKO flange.

The user has a complete range of couplings available in the light and heavy series. The BV-10 flanged coupling is based on the use of DIN/ISO standard couplings with 24° cone. This ensures easy interchangeability with cutting ring and welding nipple systems.

As shown in the following figure of flanging system BV-10, the clamping ring in conjunction with the 10° flared cone ensures the holding of the tube and the necessary pre-stressing. The tried-and-tested DKO head of the flared cone secures the sealing effect on the connector by means of a metallic sealing function and completely chambered soft-seal.

The sealing effect on the tube connection side is achieved by surface pressure in the flaring zone and the labyrinth sealing effect of the "saw teeth" on the conical surface. The clamping ring clamps the tube end over a wide area on the flared cone, thus ensuring particularly high holding forces. As a result, vibrations and alternating bending moments can be largely controlled.

The nominal pressures for the VOSS BV-10 flanged coupling correspond to those of the 24° sealing cone or 24° cutting ring couplings.

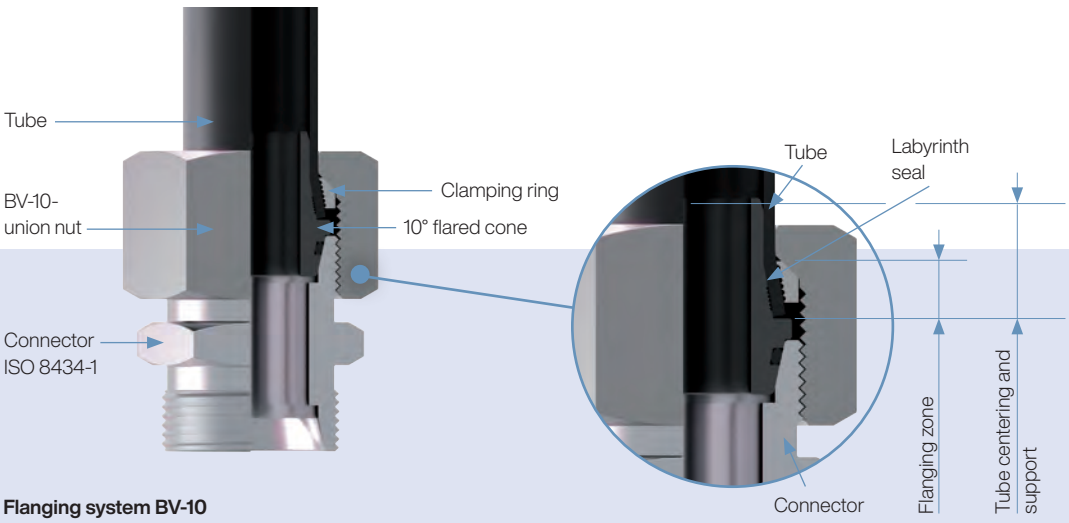
Benefits of the BV-10 flanging system

- Especially suited for extreme demands
- Cut-free tube holding by the 10° flanging principle
- Use of commercially available connection holes and couplings
- Easy installation even with thick-walled tubes
- Elimination of assembly errors, since the flared cone must always be pre-assembled in a device
- Suitable for stainless steel tubes with tolerances according to DIN EN 10305-1
- Complete coupling assortment in the L and S series

Safety note:

Different operating conditions often cause stresses in tube connections whose parameters cannot be predicted. In order not to impair functional safety, the following must be observed:

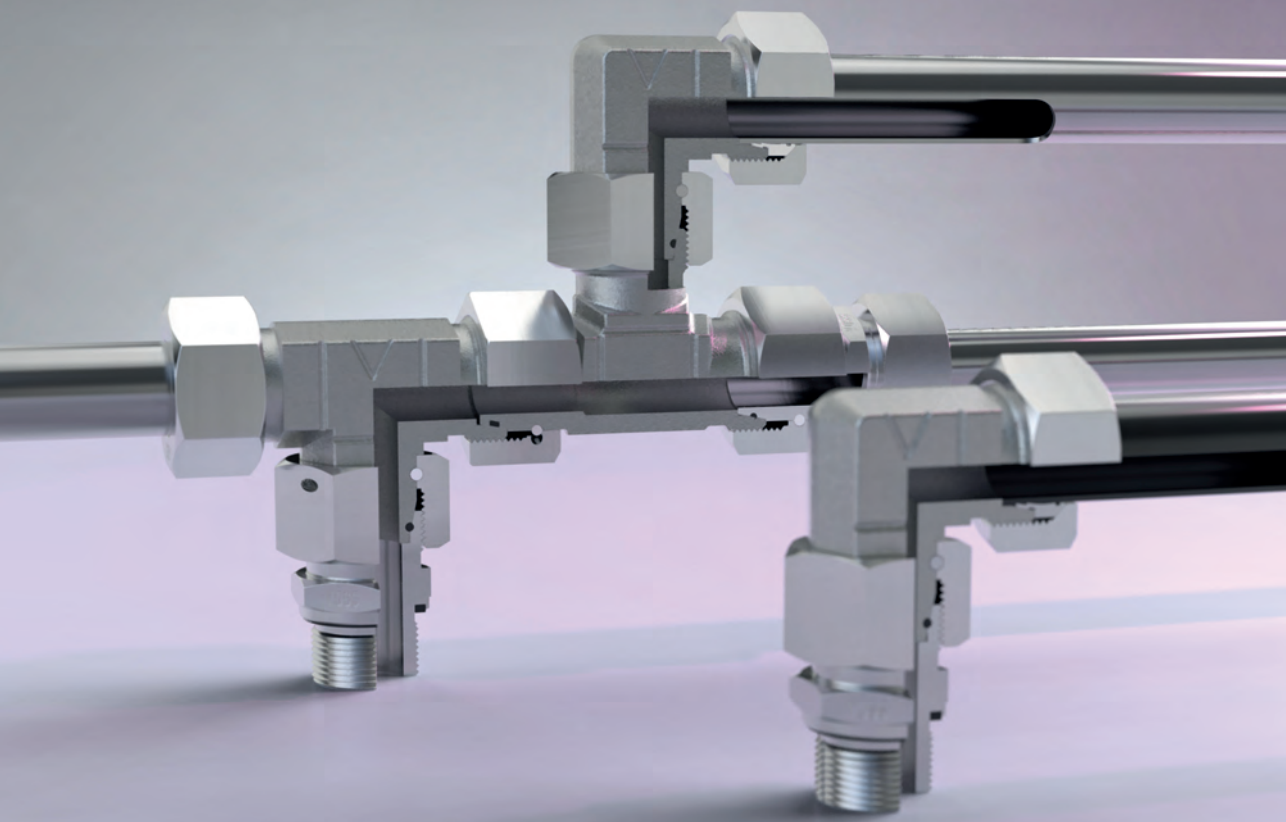
- In addition to the tube outer diameter, always take the tube wall thickness into account additionally!
- VOSS 10° flanging systems may only be pre-assembled with the pre-assembly devices specially designed for this purpose.
- The assembly instructions for the device used must be noted.



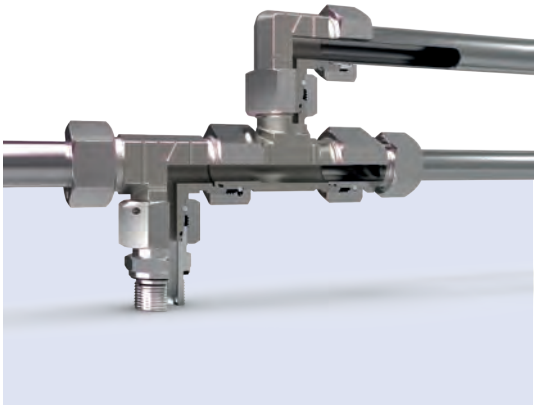
Flanging system BV-10

Taper coupling VOSS DKO

The complete product spectrum of direction adjustable couplings



Product information
Taper coupling VOSS DKO



The 24° taper coupling is a logical further development of the adjustable coupling with tube extension and pre-assembled cutting ring. The sealing cone attached to the fitting body ensures a particularly secure and permanently stable connection.

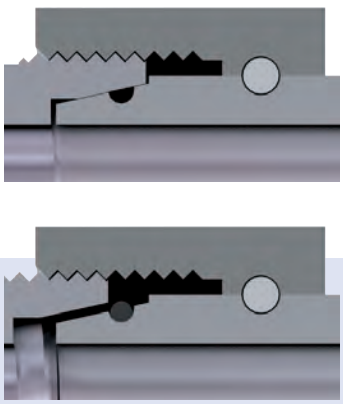
The retaining function is performed by a special union nut with a wire pin located in a groove. Following final assembly the interlocked union nut ensures a coupling that is resistant to tearing out.

Sealing is provided by the embedded O-ring. This way a fine seal is achieved.

With a wide spectrum of various types, all standard combinations of adjustable couplings can be produced. The connection dimensions correspond exactly to ISO 8434-1. This provides interchangeability with the traditional adjustable spigot version.

Special features:

- With its precisely chambered O-ring seal, the VOSS DKO taper coupling ensures improvement when it comes to leak-proofing and precision sealing.
- It also remains functionally reliable and permanently tight under extreme operating conditions, such as pressure surges, reverse bending moments and vibrations.
- The VOSS DKO taper coupling can be easily and reliably installed. An optimum final function is produced with a short tightening distance and practice-oriented final tightening force.
- Repeated installation is possible – frequently and without any issues.



High material compaction

General note

For the functional performance of the taper coupling, exact compliance with the assembly instructions and the instructions in the technical notes is of paramount importance.

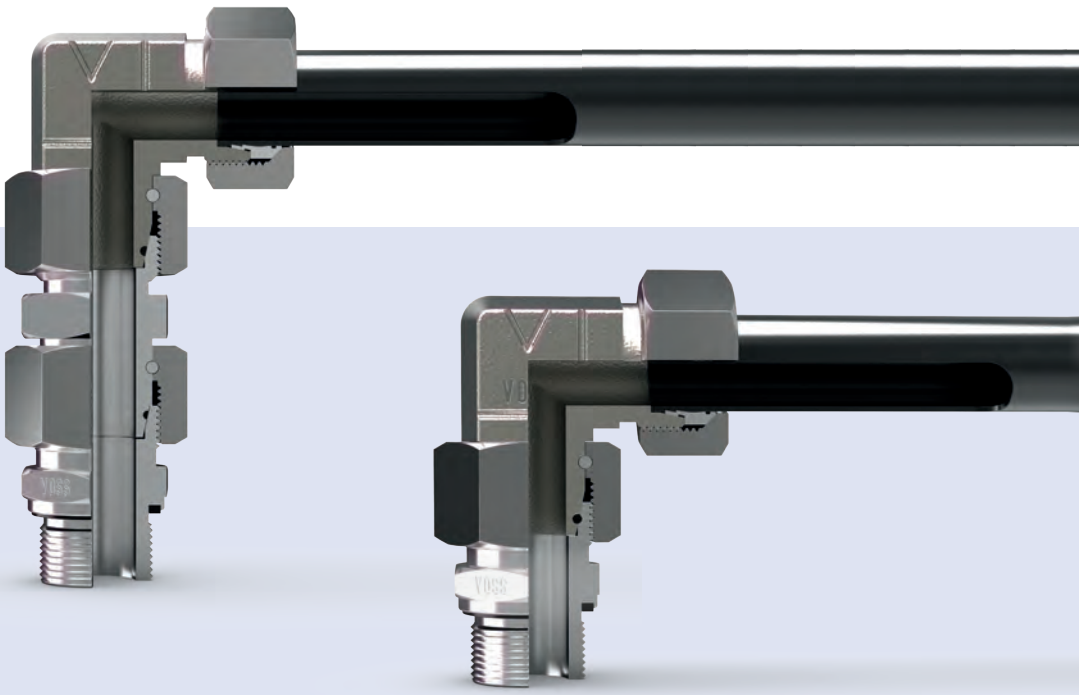
Distance adapters with taper and O-ring

The distance adapter, fitting hole shape W according to ISO 8434-1, is mainly used for extending over-built couplings.

In addition, existing cutting ring connections can be replaced without major effort, for example during maintenance work. Existing tubes can be used further in this case.

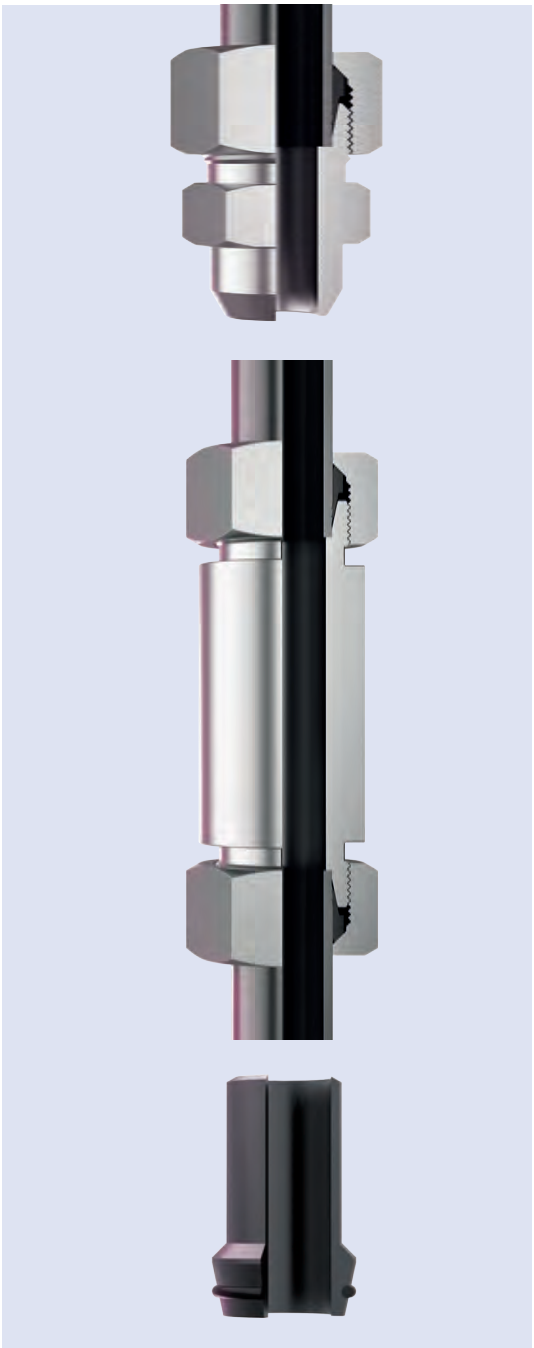


Distance adapters with taper and O-ring



Connection system with and without distance adapters

Product information
Welding couplings



VOSS welding couplings and welding cones are a program supplement to the usual cutting ring, tube forming and flanging systems.

The VOSS welding cone with 24° taper and O-ring can be combined with all tube couplings according to ISO 8434-1 and their studs.

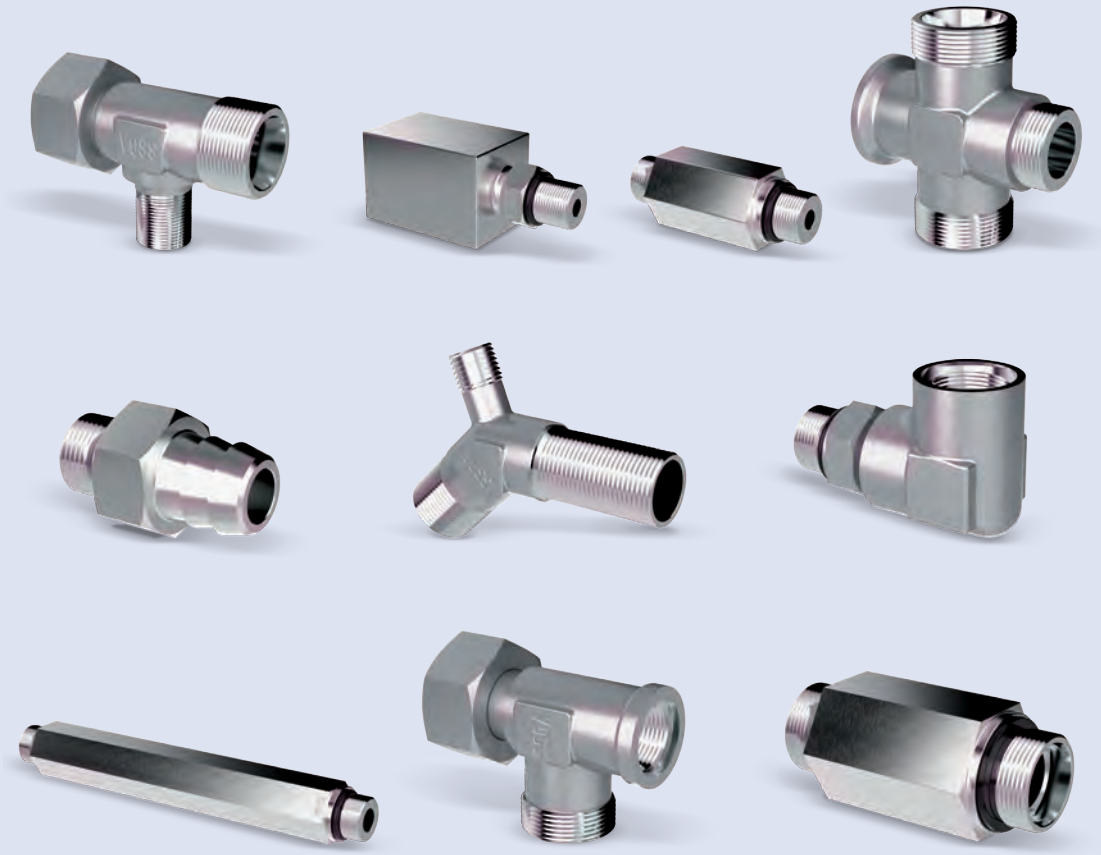
Welding couplings are increasingly becoming a special niche solution. Reasons for this are the limited usability, the high costs, the need for pretreatment of the tube, the use of the welding method, the work involved with aftertreatment and testing as well as the required qualification of the welding specialists.

Customized solutions

As a competent system partner with a broad portfolio of normed and standard parts, VOSS Fluid also offers individual special solutions for drawing parts according to customer specifications.

Through experience, creativity and state-of-the-art manufacturing technologies, convincing individual solutions can be developed.

The special items range, for example, from couplings for use as length adapters, chokes, diameter adapters or special designs, to non-return valves with special opening pressures.



The complete catalogue range

Tube connecting parts

VOSS *Ring*™



P. 58
24-VRM-...

Cutting rings ES-4



P. 60
24-ES4-...

Cutting rings 2SVA



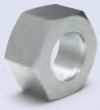
P. 59
24-2S-...-SST

Cutting rings ES-4VA



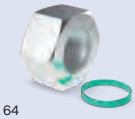
P. 60
24-ES4-...-SST

Union nuts



P. 62
24-N-...

SQR union nuts and sealing rings



P. 64
24-SQRNMS-...

Flared cone BV-10



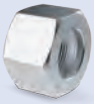
P. 66
24-VRM-...

Clamping rings BV-10



P. 68
24-VRM-...

Union nuts BV-10



P. 69
24-VRM-...

Adapter rings 24°/37°



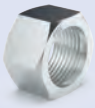
P. 74
24-VRM-...

Support sleeves 24°/37°



P. 75
24-VRM-...

Union nuts 24°/37°



P. 76
24-VRM-...

Male stud connectors

Metric/Inch,
Cylinder sealing ring



P. 80
24-SDS-...

Metric/Inch,
Cylindrical sealing edge



P. 84
24-SDS-...

Metric/Inch/NPT
Tapered



P. 93
24-SDS-...

Metric/Inch,
Cylindrical, PEFLEX



P. 95
24-SDS-...

UN/UNF,
O-ring



P. 101
24-SDS-...

Metric, cylindrical,
ISO 6149, O-ring



P. 104
24-SDS-...

Elbow, metric/inch,
Tapered



P. 106
24-SDE-...

L, metric/inch,
Tapered



P. 110
24-SDL-...

T, metric/inch,
Tapered



P. 112
24-SDT-...

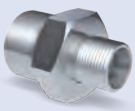
Unions

Straight



P. 116
24-S-...

Reductions



P. 117
24-S-...-...

Elbow



P. 119
24-E-...

T



P. 120
24-T-...

T-reductions



P. 121
24-T-...-...-...

Cross



P. 124
24-K-...

Bulkhead unions

Straight



P. 126
24-BHSLN-...

Elbow



P. 127
24-BHELN-...

Inch, cylin., PEFLEX



P. 128
24-BHSDSLN-...

Banjo and rotary couplings

Metric/inch, cylindrical, Standard design



P. 130
24-BSE-...

Metric/inch, cylindrical, Non-restrictive design



P. 134
24-BEE-...

Metric/inch, cylindrical, High pressure



P. 138
24-BCE-...

Metric/inch, cylindrical, High pressure



P. 142
24-BCT-...

Metric/inch, cylindrical, Rotary coupling



P. 144
24-RCE-...

Adjustable couplings with tube socket

Elbow



P. 148
24-SWE-...

T



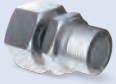
P. 149
24-SWT-...

L



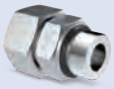
P. 150
24-SWL-...

Stud standpipe adapters, metric/inch, Cylindrical sealing edge



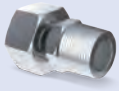
P. 151
24-SWSDS-...

Stud stabdpipe adapters, metric/inch, Cylindrical, PEFLEX



P. 154
24-SWSDS-...

Stud standpipe adapters NPT



P. 153
24-SWSDS-...

Reducing inserts



P. 156
24-SWS-...-...

Adjustable stud connectors with locknut

Elbow, metric/inch, Cylin.



P. 182
24-SDAE-...

Elbow, metric, cylindrical, ISO 6149, O-ring



P. 184
24-SDAE-...

L, metric, cylindrical, ISO 6149, O-ring



P. 185
24-SDAL-...

T, metric, cylindrical, ISO 6149, O-ring



P. 186
24-SDAT-...

The complete catalogue range

24° taper couplings DKO

Straight, DKO



P. 162
24-SW2OS-...

Elbow, DKO



P. 168
24-SWOE-...

45°, DKO



P. 169
24-SWOE45-...

T, DKO



P. 170
24-SWOT-...

L, DKO



P. 171
24-SWOL-...

Cross, DKO



P. 167
24-SWDK-...

Stud standpipe adapters, DKO, metric/inch, Cylin., PEFLEX



P. 172
24-SWOSDS-...

Stud standpipe adapters, DKO, metric, Cylin., ISO 6149, O-ring



P. 175
24-SWOSDS-...

Reducing couplings, DKO



P. 176
24-SWOS-...-...

Weld connectors

Straight welding bosses



P. 188
24-WDS-...

Welding bulkhead couplings



P. 189
24-WDBHS-...

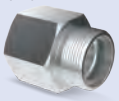
Welding nipple with O-ring seal



P. 190
24-WDNPSO-...

Female and gauge connectors

Straight female stud couplings, Metric/inch



P. 194
24-S-...

Gauge couplings, standard couplings



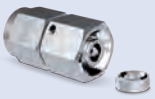
P. 197
24-PGS-...

Gauge couplings, male version



P. 198
24-SWPGS-...

Gauge couplings, DKO



P. 199
24-SWOPGS-...

Double nipple

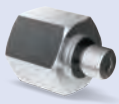
Inch, cylin., PEFLEX



P. 200
GP-SD2S-...

Component parts and accessories for couplings

Thread reducing couplings Straight adapters



P. 202
GP-SDS-...

Blanking screws



P. 207
GP-PLIH-...

Blanking plugs



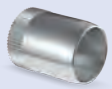
P. 210
24-PLOC-...

Tube blanking screws



P. 213
24-TBS-...

Reinforcing sleeves



P. 215
24-RS-...

Sealing rings



P. 220
GP-...

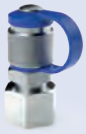
VOSS *Point*^{DC} measuring couplings M 16x2

Measuring couplings

P. 248
DC-SDS-...

Union tees

P. 249
DC/24-T-...

24° taper connectors DKO

P. 250
DC/24-SWOS-...

Bulkhead unions

P. 252
DC/24-BHS-...

Gauge connectors

P. 255
DC/24-PGBHSLN-...

Hose connectors

P. 256
DC-S-...

Measuring equipment hoses

P. 257
DC-TH6-...

Threaded studs

P. 258
DC-SDS-...

Weld connectors

P. 259
DC-WDS-...

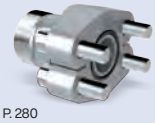
Flange couplings

Straight, square

P. 276
F/24-QFFSO-...

Elbow, square

P. 277
F/24-QFFEO-...

Straight, SAE

P. 280
F/24-FASO-...

Elbow, SAE

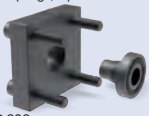
P. 282
F/24-FAEO-...

ZAKO tube-to-port flange couplings, SAE, 3000/6000 psi

P. 300
Z-TPO-...

ZAKO tube-to-tube flange couplings, SAE, 3000/6000 psi

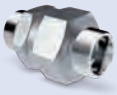
P. 304
Z-TTO-...

ZAKO tube-to-port flange couplings, square

P. 308
Z-TPO-...-HC...-...-...

ZAKO tube-to-tube flange couplings, square

P. 310
Z-TTO-...-HC...-...-...

Hydraulic valves

Non-return valves
Tube coupling on both ends

P. 336
24-VNRO-...

Non-return valves
Female thread

P. 337
GP-VNROI-...

Non-return valves
Male thread

P. 339
24-VNROPT-...

Non-return valves
Male thread

P. 341
24-VNROTP-...

Non-return valves
Plug-in cartridges

P. 348
GP-VNRCO-...

Shuttle valves
Ball seat/soft-sealing

P. 350
24-VST-...

Certification and approvals

VOSS Fluid is certified according to ISO 9001, ISO 14001 and ISO 50001 by TÜV Rheinland.

The standard VOSS tube connections are approved by all major inspection agencies.

- DNV
- Lloyds Register of Shipping
- Bureau Veritas
- American Bureau of Shipping
- US Coast Guard
- DVGW
- German Bundeswehr
- Technical Committee "Mechanical Engineering, Lifting Equipment, Smelting and Rolling Plants" (MHHW) of the HVBG-BGZ

Other approvals on request.

Attention!

Our approvals relate to specific products and designs, applications and operating conditions. As the validity of the authorizations by the authorizing body is limited in time, they are renewed before the respective expiry date. Detailed information is provided in the marketing authorization.

Please request the latest version of the approvals from us. We are also happy to advise you extensively on the topic of approvals and applications.

Approvals for applications in the field of gas according to DVGW

The following VOSS Fluid tube coupling systems are approved by DVGW for the gas field of application (gas transport, plant construction, natural gas filling stations, gas vehicles, liquefied gas plants):

- Cutting ring system VOSS*Ring*^{M}
- Cutting ring system VOSS ES-4
- Tube forming system VOSS*Form*^{SQR}
- Taper coupling VOSS DKO

Contact us on our H2ready solutions!

Authorized gases according to DVGW worksheet G 260:

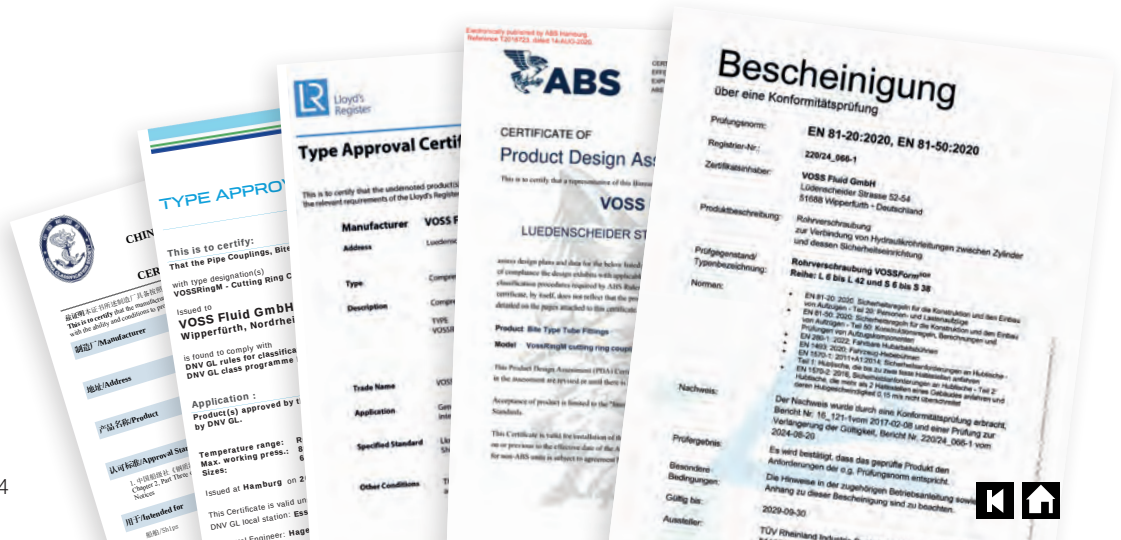
- Compressed air
- Natural gas
- LPG

Working pressure:

- A MOP is required for heavy series connections (max. operating pressure) of up to 250 bar.
- In the light series, a MOP of 250 bar is permitted up to tube OD 18; from tube OD 22, a restriction of 160 bar is imposed.

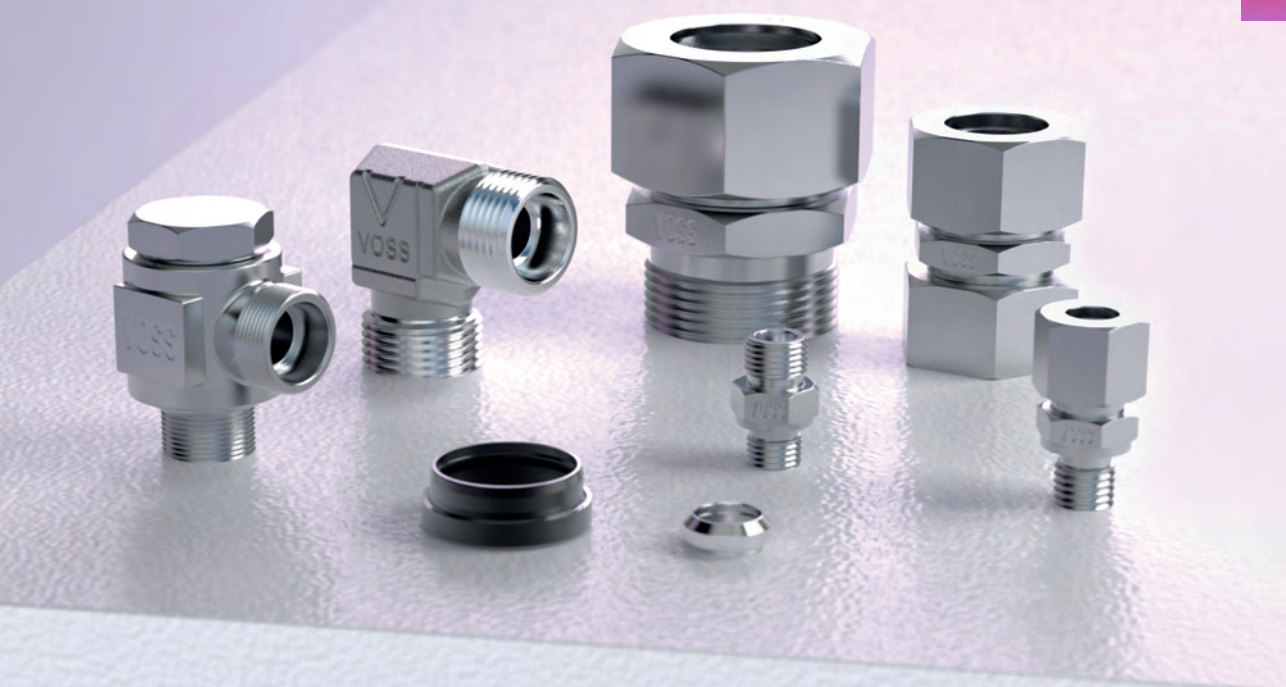
Operating temperature:

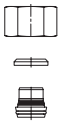
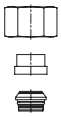
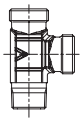
- Between -20 °C and +60 °C



Tube connecting parts, 24° connecting pieces and single parts/accessories

The complete program acc. to ISO 8434

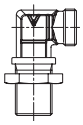
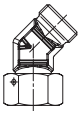
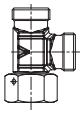


Content	Type/Page			
The VOSS product designation	P.50			
Cutting rings	VRM	2SVA	ES4	
				
	P.58	P.59	P.60	
DIN union nuts	N			
				
	P.62			
VOSS *Form* ^{SQR} function nuts	SQRNMS			
				
	P.64			
BV-10 tube connecting parts	BV10CO	BV10R	BV10N	BV10SO
				
	P.66	P.68	P.69	P.70
Flared connecting parts	24/37AO	24/37R	24/37N	24/37SO
				
	P.74	P.75	P.76	P.77
Male stud connectors	SDS	SDE	SDL	SDT
				
	P.80	P.106	P.110	P.112

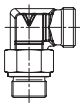
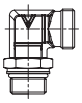
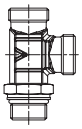
VOSS

Content

Type/Page

Unions	S	S	E	T	T
					
	P.116	P.117	P.119	P.120	P.121
	K				
					
	P.124				
Bulkhead unions	BHSLN	BHELN	BHSDSLN		
					
	P.126	P.127	P.128		
Banjo and rotary couplings	BSE	BEE	BCE	BCT	RCE
					
	P.130	P.134	P.138	P.142	P.144
Adjustable couplings with tube socket	SWE	SWT	SWL	SWSDS	SWS
					
	P.148	P.149	P.150	P.151	P.156
24° taper couplings (DKO)	SW2OS	SW2OS	SWOK	SWOE	SWOE45
					
	P.162	P.164	P.167	P.168	P.169
	SWOT	SWOL	SWOSDS	SWOS	SWOS
					
	P.170	P.171	P.172	P.176	P.180

3

Content	Type/Page			
Adjustable stud connectors with locknut	SDAE	SDAE	SDAL	SDAT
				
	P.182	P.184	P.185	P.186
Weld connectors	WDS	WDBHS	WDNPSO	
				
	P.188	P.189	P.190	
Female and gauge connectors	S	PGS	SWPGS	SWOPGS
				
	P.194	P.197	P.198	P.199
Double nipple	SD2S			
				
	P.200			
Thread reducing couplings	SDS			
				
	P.202			
Straight adapters ISO 6149/DIN 3852	SDS			
				
	P.206			
Blanking plugs for ports	PLIH / PLEH			
				
	P.207			

VOSS

Content

Type/Page

Blanking plugs / tube blanking screws	PLB	PLO / PLOC	TBS		
					
	P.210	P.211	P.213		
Hexagonal nuts	LN				
					
	P.214				
Reinforcing sleeves	RS				
					
	P.215				
Sealing rings	ES4MS	SR	OR (banjo c.)	PEFLEX	SR
	P.220	P.221	P.222	P.224	P.229
	OR (DKO/BV-10)	OR (flange c.)	SQRMS	OR (24/37°)	
	P.230	P.233	P.234	P.235	

The designations of VOSS products

System	Function/ Component	Form	Completion	Series/ Thread

This catalog contains an alphanumerical product designation system based to a large extent on ISO 8434. This makes the designation self-explanatory and facilitates identification of the products. Since the structure is based on English, the designation is understood internationally.

Furthermore, the product designations make it possible to generate customized special solutions by combining variations of the existing VOSS product program.

Example: 24-SDSC-L18-M22E-ES4

24	SD	S	C	L

System

24° DIN program

The "system" characteristic describes the product line.

Function/Component

Stud coupling

The “function/component” characteristic describes the product type.

Form

Straight

Details on component shape

Completion

Complete connection
(with tube connecting system)

This characteristic identifies the components (e. g. hexagonal nut, union nut and cutting ring, O-ring ...) that can be used to complete the product type. Complete couplings are supplied with VOSS*Ring*^{M} cutting rings by default, other connection systems are listed in the “Suffix” characteristics.

Series/Thread

Light series

Determines the series.

Straight male stud coupling; size L18 with metric fine thread M22x1.5, cylindrical; completed with “PEFLEX” profile ring seal and ES-4 cutting ring and union nut.

Tube OD/ Diameter	Thread	Diameter	Sealing type/ Threaded bore	Suffix

Examples of how to order items, as well as additional explanations and variation options are given in the respective chapters and in the following pages for the individual product groups.

18	M	22	E	ES4

Suffix 5

ES-4 cutting ring

Deviations from the default characteristics (e. g. seal materials, completion using different cutting-ring systems, flared coupling parts, special dimensions ...)

Sealing type/Threaded bore

Elastomeric sealing

Type of seal for the connecting thread.

Diameter

22 mm

States the nominal thread size (pitch is not stated for metric and imperial thread sizes).

Thread

Metric

Identifies the type of thread.

Tube OD/Diameter

OD in L series

States the outer diameter of the tube.

	System
24	24° DIN program
GP	General program (components and accessories, applicable in different connecting systems)

	Function
	Component 37°
24/37A	24/37° adapter
24/37N	24/37° nuts
24/37R	24/37° rings
24/37S	24/37° sets
	Cutting rings
1S	1S Cutting rings
VRM	VOSS*Ring*[M] Cutting rings
ES4	ES-4 Cutting rings
ES4MS	ES-4 Moulded seals
ES4OR	ES-4 O-rings
	BV-10
BV10C	BV-10 Cones
BV10N	BV-10 Union nuts
BV10R	BV-10 Clamping rings
BV10S	BV-10 Sets
	Plugs
PLB	Plugs, metal-to-metal sealing
PLO	Plugs with O-rings
	Sealings
OR	O-rings
PEFLEX	PEFLEX sealing rings
SR	Sealing rings
	Sleeves
RS	Reinforcing sleeves
	Screws
PLEH	Plug screws with external hex
PLIH	Plug screws with internal hex
TBS	Tube blanking screws
	VOSS*Form*[SQR]
SQRMS	SQR moulded seals
SQRN	SQR function nut without moulded seal
	Banjo couplings
BE	Banjo couplings, eccentric design
BC	Banjo couplings, compact design
BS	Banjo couplings, standard design

System	Function/ Component	Form	Completion	Series/ Thread	Tube OD/ Diameter	Thread	Diameter	Sealing type/ Threaded bore	Suffix

	Diagnostic couplings
PG	Pressure gauges
	Swivel couplings
SW	Swivel couplings with cutting ring and nut
SWO	Swivel with O-ring
SWOPG	Swivel with O-ring with pressure gauges
SWOSD	Swivel studs with O-ring
SWPG	Swivel pressure gauges
SWSD	Swivel stud with cutting ring and nut
SW2O	2-sided swivels with O-ring
	Weld-on/weld-in couplings
WDBH	Weld-in bulkhead couplings
WDNP	Welded nipples
WD	Weld-on couplings
	Others
BH	Bulkhead couplings
BHSD	Bulkhead stud couplings
LN	Locknuts
N	Union nuts
RC	Rotary couplings
SD	Stud couplings
SD2	Both sides
SDA	Stud couplings adjustable

	Form
E	Elbow
E45	45° elbow
K	Cross
L	L
S	Straight
T	Tee

	Completion
C	Complete connection (with tube connecting system)
LN	Locknut
LNC	Complete connection with locknuts
MS	Moulded sealing SQR
O	O-ring enclosed
X	Tube socket not pre-assembled / only body
XC	Complete connection at tube side, tube socket not pre-assembled

	Series/Thread
	Series
LL	Extra light series
L	Light series
S	Heavy series
L/S	Light and heavy series are identical
	Thread
M	Metric
G	Whitworth parallel
R	Whitworth tapered
U	UNF
N	NPT
IM	Internal thread, metric
IG	Internal thread, Whitworth parallel

	Tube OD/Diameter
6	6 mm
8	8 mm
10	10 mm
12	12 mm
14	14 mm
15	15 mm
16	16 mm
18	18 mm
20	20 mm
22	22 mm
25	25 mm
28	28 mm
30	30 mm
35	35 mm
38	38 mm
42	42 mm

	Sealing type/Threaded bore
A	Metal-to-metal flat face sealing (Type A)
B	Metal-to-metal sealing shoulder (Type B)
E	Elastomeric sealing (Type E)
F	O-ring sealing (Type F)
T	Tapered (Type C)

	Suffix overview
Suffix 4	Sealing material
Suffix 5	Completion
Suffix 6	Differing dimension
Suffix 7	Material/strength
Suffix 8	Coating
Suffix 11	Customized product

Suffixes not referred to here are not relevant to this chapter.
Note: For articles having more than one relevant suffix, these are listed in numerical order in the sales designation.

Suffix 4	Sealing material
EPDM80	EPDM 70-80
EPDM85	EPDM 85
FKM70	FKM 70
FKM80	FKM 80
FKM90	FKM 90
NBR80	NBR 70-80
NBR85	NBR 85
NBR90	NBR 90

Suffix 5	Completion
1S	1S Cutting ring
ES4	ES-4 Cutting ring
BV10	BV-10 Set
24/37	24/37° Set

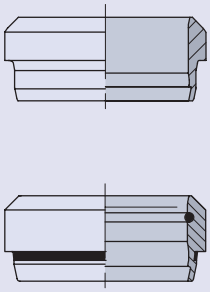
Suffix 6	Differing dimension
	Height
H2,5	Height 2.5 mm
...	...
	Length
LG17	Length 17 mm
...	...
	Wrench size
WS19	Wrench size 19 mm
...	...
	Others
P	Profile material

Suffix 7	Material/Strength
ST	Steel (standard is not listed)
SST	Stainless Steel
BS	Brass

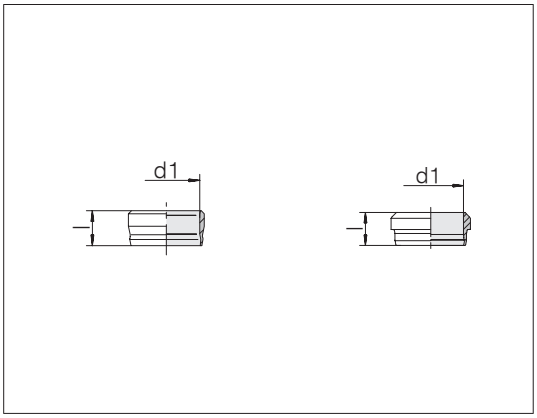
Suffix 8	Coating
C00	Steel, blank, washed and oiled, production stage
C10	Steel, phosphated and oiled
C21	Zinc-nickel transparent passivated, sealed and lubricated
C62	Stainless steel, hardened

Suffix 11	Customized product
CP1	Differing to VOSS standard
CP2	Differing to VOSS standard
CP12	Differing to VOSS standard

Cutting rings



1S and VOSS *Ring M* cutting rings



Series Tube OD d1	Pressure	l	Order-No.	Designation
LL 4	PN 100	6.8	0006002000	24-1S-LL4
LL 5	PN 100	7.8	0006052000	24-1S-LL5
LL 6	PN 100	7.8	0006102000	24-1S-LL6
LL 8	PN 100	7.8	0006152000	24-1S-LL8
L/S 6	PN 500/800	9.2	0019002100	24-VRM-L/S6
L/S 8	PN 500/800	9.2	0019052100	24-VRM-L/S8
L/S 10	PN 500/800	10	0019102100	24-VRM-L/S10
L/S 12	PN 400/630	10	0019152100	24-VRM-L/S12
L 15	PN 400	10.2	0019202100	24-VRM-L15
L 18	PN 400	10.5	0019252100	24-VRM-L18
L 22	PN 250	11.2	0019302100	24-VRM-L22
L 28	PN 250	11.2	0019352100	24-VRM-L28
L 35	PN 250	13.4	0019402100	24-VRM-L35
L 42	PN 250	13.4	0019452100	24-VRM-L42
S 14	PN 630	10.2	0019702100	24-VRM-S14
S 16	PN 630	10.2	0019752100	24-VRM-S16
S 20	PN 420	13	0019802100	24-VRM-S20
S 25	PN 420	13	0019852100	24-VRM-S25
S 30	PN 420	13.6	0019902100	24-VRM-S30
S 38	PN 420	13.5	0019952100	24-VRM-S38

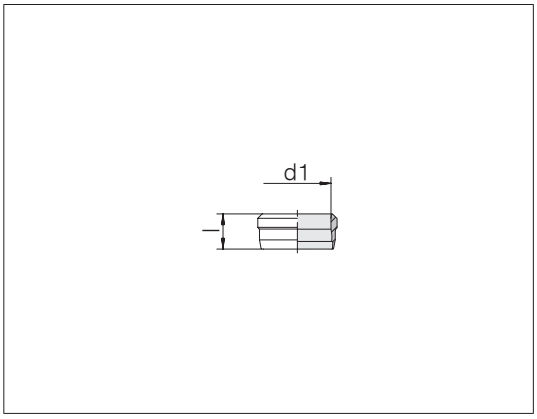
Cutting-rings for tube OD
6 - 12 mm are identical for
series L + S .

Series LL = 1S
Series L + S = VOSS *Ring M*

Example for comp. :
D04LLX
DIN 3861-ALL4-St

PSR06LX
ISO 8434-1-CR-L6-St

2SVA cutting rings



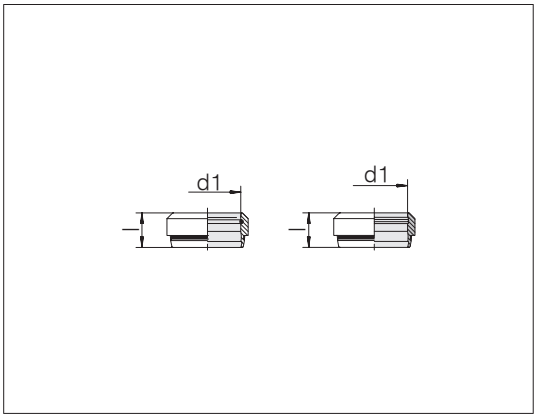
Series Tube OD d1	Pressure	l	Order-No.	Designation
L/S 6	PN 500/800	8.8	0010006200	24-2S-L/S6-SST-C62
L/S 8	PN 500/800	8.8	0010056200	24-2S-L/S8-SST-C62
L/S 10	PN 500/800	9.8	0010106200	24-2S-L/S10-SST-C62
L/S 12	PN 400/630	9.8	0010156200	24-2S-L/S12-SST-C62
L 15	PN 400	10.2	0010206200	24-2S-L15-SST-C62
L 18	PN 400	10.2	0010256200	24-2S-L18-SST-C62
L 22	PN 250	11.5	0010306200	24-2S-L22-SST-C62
L 28	PN 250	11.5	0010356200	24-2S-L28-SST-C62
L 35	PN 250	13.5	0010406200	24-2S-L35-SST-C62
L 42	PN 250	13.5	0010456200	24-2S-L42-SST-C62
S 14	PN 630	10.2	0010706200	24-2S-S14-SST-C62
S 16	PN 630	10.2	0010756200	24-2S-S16-SST-C62
S 20	PN 420	12.5	0010806200	24-2S-S20-SST-C62
S 25	PN 420	12.5	0010856200	24-2S-S25-SST-C62
S 30	PN 420	13.5	0010906200	24-2S-S30-SST-C62
S 38	PN 420	13.5	0010956200	24-2S-S38-SST-C62

Cutting-rings for tube OD 6 - 12 mm are identical for series L + S .

Example for comp. :
DPR06L71X

ES-4 / ES-4VA cutting rings

Standard material of moulded seals and
O-rings is FKM

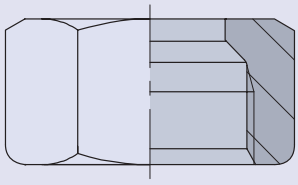


Series Tube OD d1	Pressure	l	Order-No.	Designation steel	Order-No.	Designation stainless steel
L/S 6	PN 500/800	8.8	0011002039	24-ES4-L/S6	0011006039	24-ES4-L/S6-SST
L/S 8	PN 500/800	8.8	0011052039	24-ES4-L/S8	0011056039	24-ES4-L/S8-SST
L/S 10	PN 500/800	9.8	0011102039	24-ES4-L/S10	0011106039	24-ES4-L/S10-SST
L/S 12	PN 400/630	9.8	0011152039	24-ES4-L/S12	0011156039	24-ES4-L/S12-SST
L 15	PN 400	10.2	0011202039	24-ES4-L15	0011206039	24-ES4-L15-SST
L 18	PN 400	10.2	0011252039	24-ES4-L18	0011256039	24-ES4-L18-SST
L 22	PN 250	11.5	0011302039	24-ES4-L22	0011306039	24-ES4-L22-SST
L 28	PN 250	11.5	0011352039	24-ES4-L28	0011356039	24-ES4-L28-SST
L 35	PN 250	13.5	0011402039	24-ES4-L35	0011406039	24-ES4-L35-SST
L 42	PN 250	13.5	0011452039	24-ES4-L42	0011456039	24-ES4-L42-SST
S 14	PN 630	10.2	0011702039	24-ES4-S14	0011706039	24-ES4-S14-SST
S 16	PN 630	10.2	0011752039	24-ES4-S16	0011756039	24-ES4-S16-SST
S 20	PN 420	12.5	0011802039	24-ES4-S20	0011806039	24-ES4-S20-SST
S 25	PN 420	12.5	0011852039	24-ES4-S25	0011856039	24-ES4-S25-SST
S 30	PN 420	13.5	0011902039	24-ES4-S30	0011906039	24-ES4-S30-SST
S 38	PN 420	13.5	0011952039	24-ES4-S38	0011956039	24-ES4-S38-SST

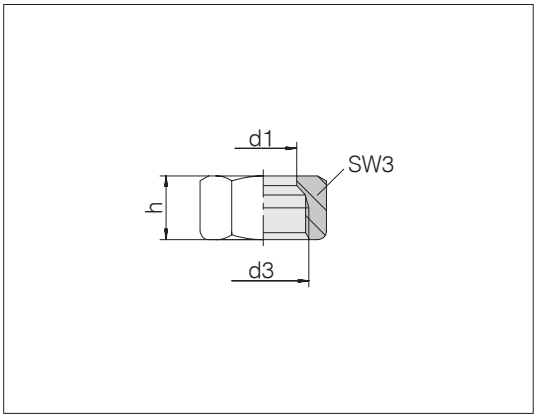
Cutting-rings for tube OD
6 - 12 mm are identical for
series L + S .

Example for comp. :
ISO 8434-1-CR-L6-St

DIN union nuts



Union nuts



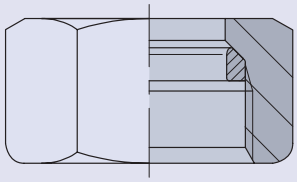
Series Tube OD d1	d3	Pressure	SW3	h	Order-No.	Designation steel	Order-No.	Designation stainless steel
LL 4	M 8 x 1	PN 100	10	11	0003002100	24-N-LL4	0003006000	24-N-LL4-SST
LL 5	M 10 x 1	PN 100	12	11.5	0003052100	24-N-LL5	0003056000	24-N-LL5-SST
LL 6	M 10 x 1	PN 100	12	11.5	0003102100	24-N-LL6	0003106000	24-N-LL6-SST
LL 8	M 12 x 1	PN 100	14	12	0003152100	24-N-LL8	0003156000	24-N-LL8-SST
L 6	M 12 x 1.5	PN 500	14	15.5	0004002100	24-N-L6	0004006000	24-N-L6-SST
L 8	M 14 x 1.5	PN 500	17	15.5	0004052100	24-N-L8	0004056000	24-N-L8-SST
L 10	M 16 x 1.5	PN 500	19	16.5	0004102100	24-N-L10	0004106000	24-N-L10-SST
L 12	M 18 x 1.5	PN 400	22	16.5	0004152100	24-N-L12	0004156000	24-N-L12-SST
L 15	M 22 x 1.5	PN 400	27	18	0004202100	24-N-L15	0004206000	24-N-L15-SST
L 18	M 26 x 1.5	PN 400	32	19	0004252100	24-N-L18	0004256000	24-N-L18-SST
L 22	M 30 x 2	PN 250	36	21	0004302100	24-N-L22	0004306000	24-N-L22-SST
L 28	M 36 x 2	PN 250	41	21	0004352100	24-N-L28	0004356000	24-N-L28-SST
L 35	M 45 x 2	PN 250	50	24	0004402100	24-N-L35	0004406000	24-N-L35-SST
L 42	M 52 x 2	PN 250	60	24	0004452100	24-N-L42	0004456000	24-N-L42-SST
S 6	M 14 x 1.5	PN 800	17	17.5	0004502100	24-N-S6	0004506000	24-N-S6-SST
S 8	M 16 x 1.5	PN 800	19	17.5	0004552100	24-N-S8	0004556000	24-N-S8-SST
S 10	M 18 x 1.5	PN 800	22	18.5	0004602100	24-N-S10	0004606000	24-N-S10-SST
S 12	M 20 x 1.5	PN 630	24	18.5	0004652100	24-N-S12	0004656000	24-N-S12-SST
S 14	M 22 x 1.5	PN 630	27	21.5	0004702100	24-N-S14	0004706000	24-N-S14-SST
S 16	M 24 x 1.5	PN 630	30	21.5	0004752100	24-N-S16	0004756000	24-N-S16-SST
S 20	M 30 x 2	PN 420	36	25	0004802100	24-N-S20	0004806000	24-N-S20-SST
S 25	M 36 x 2	PN 420	46	27	0004852100	24-N-S25	0004856000	24-N-S25-SST
S 30	M 42 x 2	PN 420	50	29	0004902100	24-N-S30	0004906000	24-N-S30-SST
S 38	M 52 x 2	PN 420	60	32.5	0004952100	24-N-S38	0004956000	24-N-S38-SST

To reduce the assembly forces, the union nuts are coated with wax lubricant.

Example for comp. :
M04LLX
DIN 3870-ALL4

M06LX
ISO 8434-1-N-L6-St

VOSS *Form* SQR function nuts

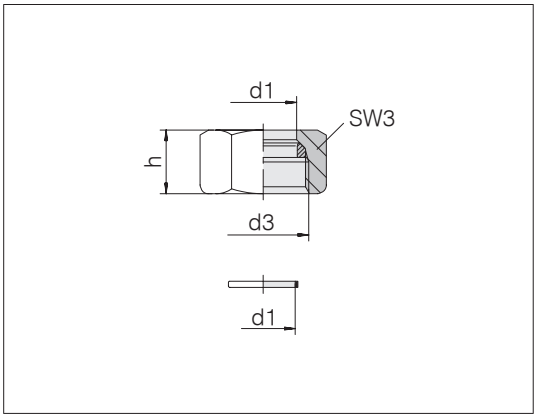


VOSS *Form SQR*

Steel / stainless-steel set comprising

- SQR-function nuts
- moulded seals

Standard moulded-seal material is FKM

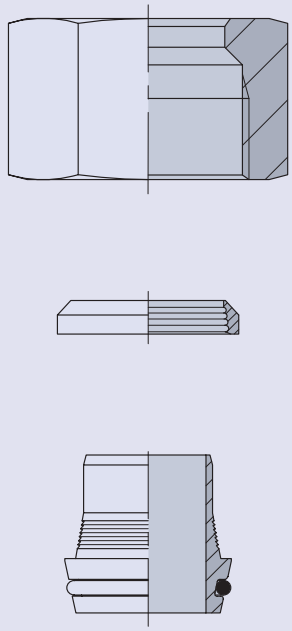


Series Tube OD d1	d3	Pressure	SW3	h	kg/100 ca.	Order-No.	Designation steel	Order-No.	Designation stainless steel
L 6	M 12 x 1.5	PN 500	14	14.5	1.1	0015502167	24-SQRNMS-L6-PU300	0015506067	24-SQRNMS-L6-SST-PU100
L 8	M 14 x 1.5	PN 500	17	14.5	1.7	0015512167	24-SQRNMS-L8-PU250	0015516067	24-SQRNMS-L8-SST-PU100
L 10	M 16 x 1.5	PN 500	19	15.5	2.0	0015522167	24-SQRNMS-L10-PU150	0015526067	24-SQRNMS-L10-SST-PU100
L 12	M 18 x 1.5	PN 400	22	15.5	2.8	0015532167	24-SQRNMS-L12-PU100	0015536067	24-SQRNMS-L12-SST-PU100
L 15	M 22 x 1.5	PN 400	27	17	4.7	0015542167	24-SQRNMS-L15-PU60	0015546067	24-SQRNMS-L15-SST-PU50
L 18	M 26 x 1.5	PN 400	32	18	6.9	0015552167	24-SQRNMS-L18-PU45	0015556067	24-SQRNMS-L18-SST-PU45
L 22	M 30 x 2	PN 250	36	20	8.9	0015562167	24-SQRNMS-L22-PU30	0015566067	24-SQRNMS-L22-SST-PU30
L 28	M 36 x 2	PN 250	41	21	9.4	0015572167	24-SQRNMS-L28-PU25	0015576067	24-SQRNMS-L28-SST-PU25
L 35	M 45 x 2	PN 250	50	24	15.0	0015582167	24-SQRNMS-L35-PU15	0015586067	24-SQRNMS-L35-SST-PU15
L 42	M 52 x 2	PN 250	60	24	23.0	0015592167	24-SQRNMS-L42-PU10	0015596067	24-SQRNMS-L42-SST-PU10
S 6	M 14 x 1.5	PN 800	17	16.5	2.0	0015602167	24-SQRNMS-S6-PU200	0015606067	24-SQRNMS-S6-SST-PU100
S 8	M 16 x 1.5	PN 800	19	16.5	2.3	0015612167	24-SQRNMS-S8-PU150	0015616067	24-SQRNMS-S8-SST-PU100
S 10	M 18 x 1.5	PN 800	22	17.5	3.5	0015622167	24-SQRNMS-S10-PU100	0015626067	24-SQRNMS-S10-SST-PU100
S 12	M 20 x 1.5	PN 630	24	17.5	3.9	0015632167	24-SQRNMS-S12-PU90	0015636067	24-SQRNMS-S12-SST-PU50
S 14	M 22 x 1.5	PN 630	27	20.5	5.8	0015642167	24-SQRNMS-S14-PU60	0015646067	24-SQRNMS-S14-SST-PU50
S 16	M 24 x 1.5	PN 630	30	20.5	7.1	0015652167	24-SQRNMS-S16-PU50	0015656067	24-SQRNMS-S16-SST-PU50
S 20	M 30 x 2	PN 420	36	24	11.3	0015662167	24-SQRNMS-S20-PU25	0015666067	24-SQRNMS-S20-SST-PU25
S 25	M 36 x 2	PN 420	46	27	21.2	0015672167	24-SQRNMS-S25-PU15	0015676067	24-SQRNMS-S25-SST-PU15
S 30	M 42 x 2	PN 420	50	29	23.3	0015682167	24-SQRNMS-S30-PU10	0015686067	24-SQRNMS-S30-SST-PU10
S 38	M 52 x 2	PN 420	60	32.5	34.4	0015692167	24-SQRNMS-S38-PU6	0015696067	24-SQRNMS-S38-SST-PU6

To reduce the assembly forces, the union nuts are coated with wax lubricant.

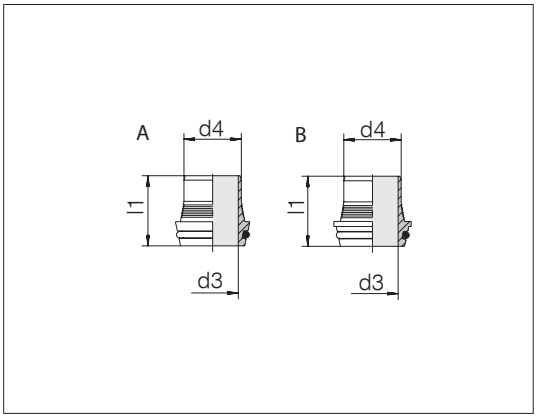
The order is placed in packaging units, for example PU100=packing unit 100 pieces.

BV-10 tube connecting parts



Flared cones

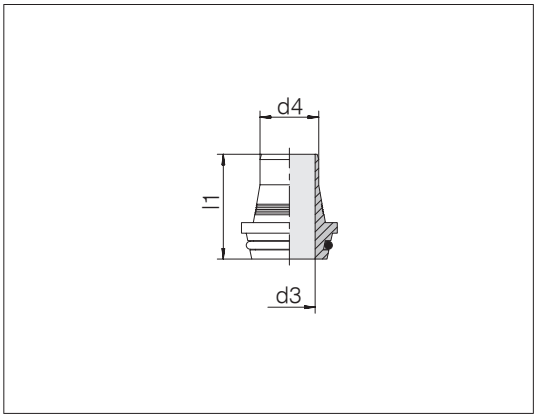
Standard O-ring material is NBR



Series Tube d1 x s	Pressure	d3	d4	l1	Style	kg/100 ca.	Order-No.	Designation
L 6 x 1	PN 500	2.9	4.2	16.5	A	0.3	0034009900	24-BV10CO-L6x1-C19
L 8 x 1	PN 500	4.9	6.2	18.6	A	0.4	0034059900	24-BV10CO-L8x1-C19
L 10 x 1	PN 500	6.3	8.2	19	A	0.6	0034109900	24-BV10CO-L10x1-C19
L 10 x 1.5	PN 500	5.5	7.2	19	A	0.6	0034119900	24-BV10CO-L10x1,5-C19
L 12 x 1	PN 400	8	10.2	21.5	A	0.9	0034159900	24-BV10CO-L12x1-C19
L 12 x 1.5	PN 400	7.5	9.2	21.5	A	0.8	0034169900	24-BV10CO-L12x1,5-C19
L 15 x 1.5	PN 400	10.2	12.2	21.5	A	1.1	0034219900	24-BV10CO-L15x1,5-C19
L 15 x 2	PN 400	9.1	11.3	21.5	A	1.2	0034229900	24-BV10CO-L15x2-C19
L 18 x 1.5	PN 400	13	15.2	22	B	1.5	0034269900	24-BV10CO-L18x1,5-C19
L 18 x 2	PN 400	12	14.3	22	B	1.6	0034279900	24-BV10CO-L18x2-C19
L 22 x 1.5	PN 250	16.2	19.2	23.5	B	2.0	0034319900	24-BV10CO-L22x1,5-C19
L 22 x 2	PN 250	16.2	18.3	23.5	B	2.0	0034329900	24-BV10CO-L22x2-C19
L 28 x 2	PN 250	21	24.3	27	B	3.8	0034379900	24-BV10CO-L28x2-C19
L 28 x 3	PN 250	19.5	22.3	27	B	3.6	0034399900	24-BV10CO-L28x3-C19
L 35 x 2	PN 250	28.5	31.3	31	B	5.3	0034419900	24-BV10CO-L35x2-C19
L 35 x 3	PN 250	26.5	29.3	31	B	6.1	0034439900	24-BV10CO-L35x3-C19
L 42 x 3	PN 250	33.5	36.3	31	B	7.7	0034479900	24-BV10CO-L42x3-C19

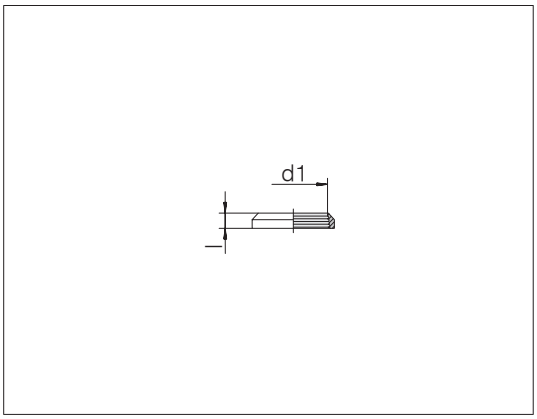
Flared cones

Standard O-ring material is NBR



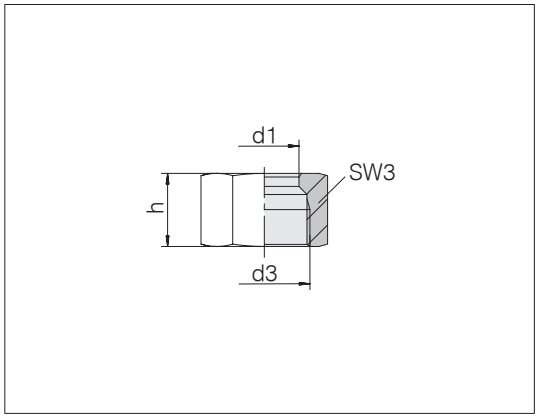
Series Tube d1 x s	Pressure	d3	d4	l1	kg/100 ca.	Order-No.	Designation
S 8 x 1.5	PN 800	4	5.2	20	0.5	0034569900	24-BV10CO-S8x1,5-C19
S 8 x 2	PN 800	3	4.2	20	0.5	0034579900	24-BV10CO-S8x2-C19
S 10 x 1.5	PN 800	5.5	7.2	21	0.8	0034619900	24-BV10CO-S10x1,5-C19
S 10 x 2	PN 800	4.5	6.2	21	0.8	0034629900	24-BV10CO-S10x2-C19
S 12 x 1.5	PN 630	7.5	9.2	22.5	1.0	0034669900	24-BV10CO-S12x1,5-C19
S 12 x 2	PN 630	6.5	8.2	22.5	1.1	0034679900	24-BV10CO-S12x2-C19
S 12 x 3	PN 630	4.5	6.2	22.5	1.1	0034699900	24-BV10CO-S12x3-C19
S 14 x 2	PN 630	8.5	10.3	26	1.5	0034719900	24-BV10CO-S14x2-C19
S 16 x 2	PN 630	10.5	12.3	26.5	1.8	0034779900	24-BV10CO-S16x2-C19
S 16 x 2.5	PN 630	9.5	11.3	26.5	1.6	0034789900	24-BV10CO-S16x2,5-C19
S 16 x 3	PN 630	8.5	10.3	26.5	1.8	0034799900	24-BV10CO-S16x3-C19
S 20 x 2	PN 420	13.5	16.3	32	3.4	0034819900	24-BV10CO-S20x2-C19
S 20 x 2.5	PN 420	13.5	15.3	32	3.3	0034829900	24-BV10CO-S20x2,5-C19
S 20 x 3	PN 420	12.5	14.3	32	3.5	0034839900	24-BV10CO-S20x3-C19
S 20 x 3.5	PN 420	11	13.3	32	3.1	0034849900	24-BV10CO-S20x3,5-C19
S 20 x 4	PN 420	10	12.3	32	3.1	0040049900	24-BV10CO-S20x4-C19
S 25 x 2.5	PN 420	18	20.3	34.5	5.9	0034869900	24-BV10CO-S25x2,5-C19
S 25 x 3	PN 420	17	19.3	34.5	6.1	0034879900	24-BV10CO-S25x3-C19
S 25 x 4	PN 420	15	17.3	34.5	6.5	0034889900	24-BV10CO-S25x4-C19
S 30 x 3	PN 420	22	24.3	34.5	6.8	0034929900	24-BV10CO-S30x3-C19
S 30 x 4	PN 420	20	22.3	34.5	7.4	0034939900	24-BV10CO-S30x4-C19
S 30 x 5	PN 420	17	20.3	34.5	8.5	0034949900	24-BV10CO-S30x5-C19
S 38 x 3	PN 420	30	32.3	38	8.9	0034969900	24-BV10CO-S38x3-C19
S 38 x 4	PN 420	27	30.3	38	12.8	0034979900	24-BV10CO-S38x4-C19
S 38 x 5	PN 420	26	28.3	38	12.0	0034989900	24-BV10CO-S38x5-C19
S 38 x 6	PN 420	23	26.3	38	11.8	0034999900	24-BV10CO-S38x6-C19

Clamping rings



Series Tube OD d1	Pressure	l	kg/100 ca.	Order-No.	Designation
L 6	PN 500	3.8	0.1	0031001900	24-BV10R-L6-C19
L 8	PN 500	3.8	0.1	0031051900	24-BV10R-L8-C19
L 10	PN 500	3.8	0.1	0031101900	24-BV10R-L10-C19
L 12	PN 400	3.8	0.2	0031151900	24-BV10R-L12-C19
L 15	PN 400	4.5	0.3	0031201900	24-BV10R-L15-C19
L 18	PN 400	4.5	0.4	0031251900	24-BV10R-L18-C19
L 22	PN 250	5	0.5	0031301900	24-BV10R-L22-C19
L 28	PN 250	5.5	0.5	0031351900	24-BV10R-L28-C19
L 35	PN 250	7	1.4	0031401900	24-BV10R-L35-C19
L 42	PN 250	7	1.6	0031451900	24-BV10R-L42-C19
S 8	PN 800	4.5	0.3	0031551900	24-BV10R-S8-C19
S 10	PN 800	4.5	0.3	0031601900	24-BV10R-S10-C19
S 12	PN 630	4.5	0.3	0031651900	24-BV10R-S12-C19
S 14	PN 630	6.5	0.5	0031701900	24-BV10R-S14-C19
S 16	PN 630	6.5	0.6	0031751900	24-BV10R-S16-C19
S 20	PN 420	9	1.1	0031801900	24-BV10R-S20-C19
S 25	PN 420	10	2.3	0031851900	24-BV10R-S25-C19
S 30	PN 420	10	2.6	0031901900	24-BV10R-S30-C19
S 38	PN 420	13.5	5.7	0031951900	24-BV10R-S38-C19

BV-10 union nuts

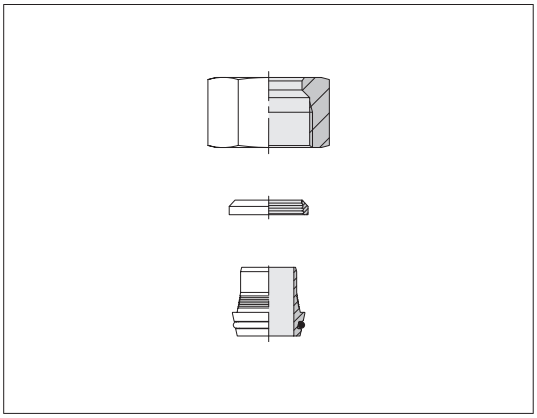


Series Tube OD d1	d3	Pressure	h	SW3	kg/100 ca.	Order-No.	Designation
L 6	M 12 x 1.5	PN 500	17.8	14	1.2	0032002100	24-BV10N-L6
L 8	M 14 x 1.5	PN 500	17.8	17	1.8	0032052100	24-BV10N-L8
L 10	M 16 x 1.5	PN 500	18.8	19	2.2	0032102100	24-BV10N-L10
L 12	M 18 x 1.5	PN 400	18.8	22	3.1	0032152100	24-BV10N-L12
L 15	M 22 x 1.5	PN 400	20.3	27	5.0	0032202100	24-BV10N-L15
L 18	M 26 x 1.5	PN 400	21.3	32	7.5	0032252100	24-BV10N-L18
L 22	M 30 x 2	PN 250	24	36	9.9	0032302100	24-BV10N-L22
L 28	M 36 x 2	PN 250	25	41	11.2	0032352100	24-BV10N-L28
L 35	M 45 x 2	PN 250	28	50	17.2	0032402100	24-BV10N-L35
L 42	M 52 x 2	PN 250	28	60	26.7	0032452100	24-BV10N-L42
S 8	M 16 x 1.5	PN 800	20	19	2.5	0032552100	24-BV10N-S8
S 10	M 18 x 1.5	PN 800	21.5	22	3.7	0032602100	24-BV10N-S10
S 12	M 20 x 1.5	PN 630	21.5	24	4.1	0032652100	24-BV10N-S12
S 14	M 22 x 1.5	PN 630	26	27	6.5	0032702100	24-BV10N-S14
S 16	M 24 x 1.5	PN 630	26	30	8.1	0032752100	24-BV10N-S16
S 20	M 30 x 2	PN 420	30.5	36	12.6	0032802100	24-BV10N-S20
S 25	M 36 x 2	PN 420	38	46	28.4	0032852100	24-BV10N-S25
S 30	M 42 x 2	PN 420	39	50	29.5	0032902100	24-BV10N-S30
S 38	M 52 x 2	PN 420	46	60	45.2	0032952100	24-BV10N-S38

Flared connecting parts

Standard O-ring material is NBR

L series, complete

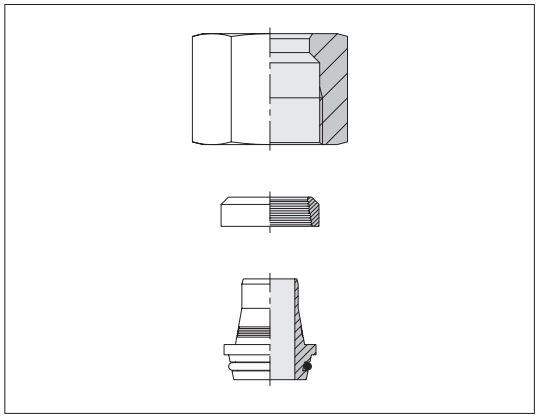


Series Tube d1 x s	Pressure	kg/100 ca.	Order-No.	Designation
L 6 x 1	PN 500	1.6	0033009900	24-BV10SO-L6x1-C19
L 8 x 1	PN 500	2.3	0033059900	24-BV10SO-L8x1-C19
L 10 x 1	PN 500	2.9	0033109900	24-BV10SO-L10x1-C19
L 10 x 1.5	PN 500	2.9	0033119900	24-BV10SO-L10x1,5-C19
L 12 x 1	PN 400	4.2	0033159900	24-BV10SO-L12x1-C19
L 12 x 1.5	PN 400	4.2	0033169900	24-BV10SO-L12x1,5-C19
L 15 x 1.5	PN 400	6.4	0033219900	24-BV10SO-L15x1,5-C19
L 15 x 2	PN 400	6.4	0033229900	24-BV10SO-L15x2-C19
L 18 x 1.5	PN 400	9.4	0033269900	24-BV10SO-L18x1,5-C19
L 18 x 2	PN 400	9.5	0033279900	24-BV10SO-L18x2-C19
L 22 x 1.5	PN 250	12.4	0033319900	24-BV10SO-L22x1,5-C19
L 22 x 2	PN 250	12.4	0033329900	24-BV10SO-L22x2-C19
L 28 x 2	PN 250	15.5	0033379900	24-BV10SO-L28x2-C19
L 28 x 3	PN 250	15.3	0033399900	24-BV10SO-L28x3-C19
L 35 x 2	PN 250	23.9	0033419900	24-BV10SO-L35x2-C19
L 35 x 3	PN 250	24.7	0033439900	24-BV10SO-L35x3-C19
L 42 x 3	PN 250	36.0	0033479900	24-BV10SO-L42x3-C19

Flared connecting parts

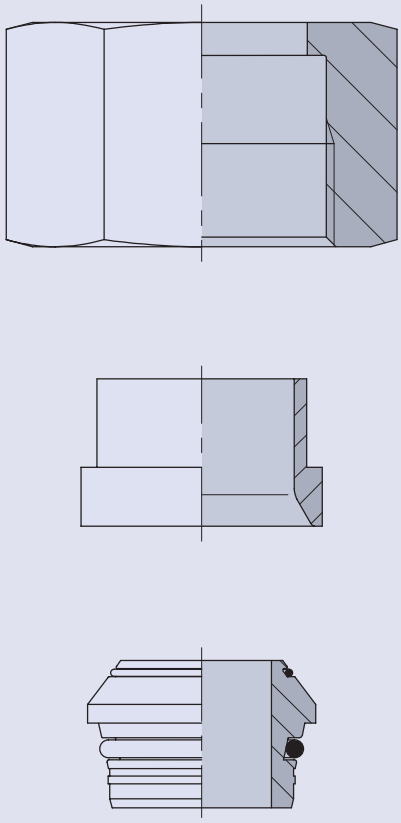
Standard O-ring material is NBR

S series, complete



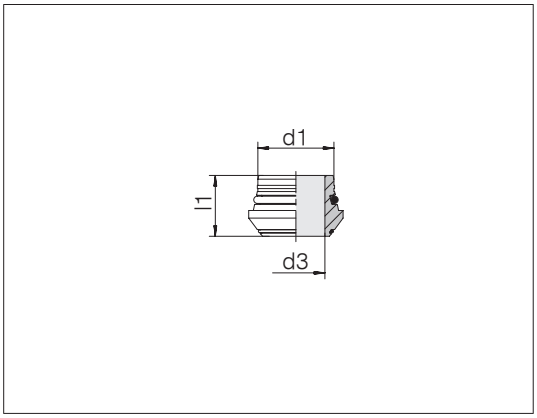
Series Tube d1 x s	Pressure	kg/100 ca.	Order-No.	Designation
S 8 x 1.5	PN 800	4.8	0033569900	24-BV10SO-S8x1,5-C19
S 8 x 2	PN 800	5.0	0033579900	24-BV10SO-S8x2-C19
S 10 x 1.5	PN 800	5.6	0033619900	24-BV10SO-S10x1,5-C19
S 10 x 2	PN 800	5.6	0033629900	24-BV10SO-S10x2-C19
S 12 x 1.5	PN 630	6.5	0033669900	24-BV10SO-S12x1,5-C19
S 12 x 2	PN 630	6.6	0033679900	24-BV10SO-S12x2-C19
S 12 x 3	PN 630	6.7	0033699900	24-BV10SO-S12x3-C19
S 14 x 2	PN 630	10.3	0033719900	24-BV10SO-S14x2-C19
S 16 x 2	PN 630	11.0	0033779900	24-BV10SO-S16x2-C19
S 16 x 2.5	PN 630	11.0	0033789900	24-BV10SO-S16x2,5-C19
S 16 x 3	PN 630	11.4	0033799900	24-BV10SO-S16x3-C19
S 20 x 2	PN 420	15.7	0033819900	24-BV10SO-S20x2-C19
S 20 x 2.5	PN 420	15.7	0033829900	24-BV10SO-S20x2,5-C19
S 20 x 3	PN 420	15.7	0033839900	24-BV10SO-S20x3-C19
S 20 x 3.5	PN 420	15.7	0033849900	24-BV10SO-S20x3,5-C19
S 20 x 4	PN 420	15.5	0033859900	24-BV10SO-S20x4-C19
S 25 x 2.5	PN 420	25.3	0033869900	24-BV10SO-S25x2,5-C19
S 25 x 3	PN 420	25.3	0033879900	24-BV10SO-S25x3-C19
S 25 x 4	PN 420	25.5	0033889900	24-BV10SO-S25x4-C19
S 30 x 3	PN 420	37.5	0033929900	24-BV10SO-S30x3-C19
S 30 x 4	PN 420	38.0	0033939900	24-BV10SO-S30x4-C19
S 30 x 5	PN 420	39.2	0033949900	24-BV10SO-S30x5-C19
S 38 x 3	PN 420	60.0	0033969900	24-BV10SO-S38x3-C19
S 38 x 4	PN 420	61.7	0033979900	24-BV10SO-S38x4-C19
S 38 x 5	PN 420	62.2	0033989900	24-BV10SO-S38x5-C19
S 38 x 6	PN 420	62.3	0033999900	24-BV10SO-S38x6-C19

Flared connecting parts



24/37° adapter rings

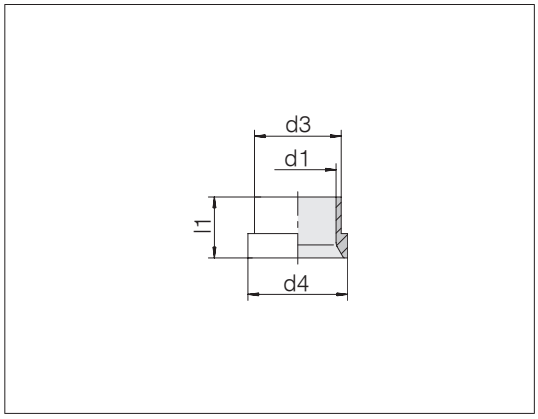
Standard O-ring material is FKM



Series Tube OD d1	Pressure	d3	l1	kg/100 ca.	Order-No.	Designation
L/S 6	PN 500/630	3	11.5	0.3	0041002158	24-24/37AO-L/S6-C21
L/S 8	PN 500/630	5	12	0.4	0041012158	24-24/37AO-L/S8-C21
L/S 10	PN 500/630	6	12.5	0.6	0041022158	24-24/37AO-L/S10-C21
L/S 12	PN 400/630	8	12.5	0.8	0041032158	24-24/37AO-L/S12-C21
L 15	PN 400	11	12.5	1.0	0041042158	24-24/37AO-L15-C21
L 18	PN 400	14	13	1.3	0041052158	24-24/37AO-L18-C21
L 22	PN 250	17	14.2	2.1	0041062158	24-24/37AO-L22-C21
L 28	PN 250	23	14.7	2.9	0041072158	24-24/37AO-L28-C21
L 35	PN 250	28	18.5	6.1	0041082158	24-24/37AO-L35-C21
L 42	PN 250	35	20.5	8.1	0041092158	24-24/37AO-L42-C21
S 14	PN 630	9	14	1.2	0041102158	24-24/37AO-S14-C21
S 16	PN 630	11	15	1.5	0041112158	24-24/37AO-S16-C21
S 20	PN 400	14	18.5	2.8	0041122158	24-24/37AO-S20-C21
S 25	PN 400	19	20	4.0	0041132158	24-24/37AO-S25-C21
S 30	PN 400	23	22	6.0	0041142158	24-24/37AO-S30-C21
S 38	PN 400	30	26	9.3	0041152158	24-24/37AO-S38-C21

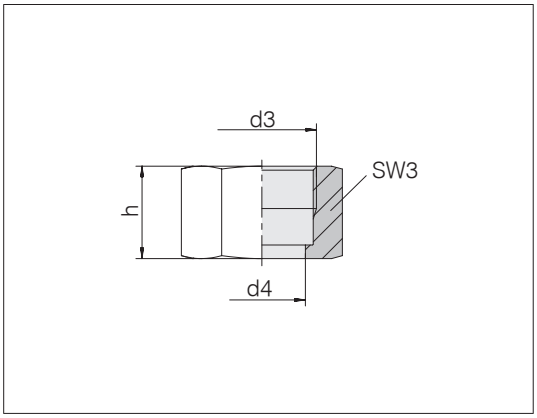
Weight without O-ring.

24/37° support sleeves



Series Tube OD d1	Pressure	d3	d4	l1	kg/100 ca.	Order-No.	Designation
L/S 6	PN 500/630	7.6	10.2	10.5	0.2	0041202000	24-24/37R-L/S6
L/S 8	PN 500/630	9.3	12.2	11	0.3	0041212000	24-24/37R-L/S8
L/S 10	PN 500/630	11.5	14.2	12.5	0.4	0041222000	24-24/37R-L/S10
L/S 12	PN 400/630	13.6	16.2	13	0.5	0041232000	24-24/37R-L/S12
L 15	PN 400	17.5	20.2	14	1.0	0041242000	24-24/37R-L15
L 18	PN 400	21	24.2	14.5	1.5	0041252000	24-24/37R-L18
L 22	PN 250	24.2	27.8	18	1.7	0041262000	24-24/37R-L22
L 28	PN 250	30.2	33.8	17	2.0	0041272000	24-24/37R-L28
L 35	PN 250	38	42.7	19	3.8	0041282000	24-24/37R-L35
L 42	PN 250	45	49.7	21	5.2	0041292000	24-24/37R-L42
S 14	PN 630	17.5	20.2	14.5	1.2	0041302000	24-24/37R-S14
S 16	PN 630	18.5	22	17	1.3	0041312000	24-24/37R-S16
S 20	PN 400	24.2	27.8	17.5	2.5	0041322000	24-24/37R-S20
S 25	PN 400	28.5	32.8	20	3.2	0041332000	24-24/37R-S25
S 30	PN 400	34	39	21.5	4.9	0041342000	24-24/37R-S30
S 38	PN 400	42	48.5	26.5	7.7	0041352000	24-24/37R-S38

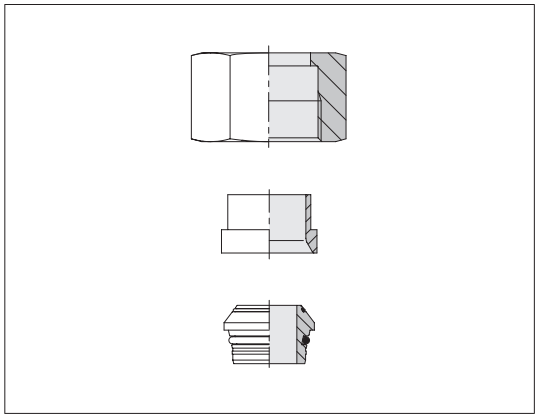
24/37° union nuts



Series Tube OD	d3	Pressure	d4	h	SW3	kg/100 ca.	Order-No.	Designation
L 6	M 12 x 1.5	PN 500	7.8	17	14	1.2	0041402100	24-24/37N-L6
L 8	M 14 x 1.5	PN 500	9.5	18	17	1.9	0041412100	24-24/37N-L8
L 10	M 16 x 1.5	PN 500	11.7	19.5	19	2.4	0041422100	24-24/37N-L10
L 12	M 18 x 1.5	PN 400	13.8	20.5	22	3.5	0041432100	24-24/37N-L12
L 15	M 22 x 1.5	PN 630	17.7	23	27	5.7	0041442100	24-24/37N-L15-S14
L 18	M 26 x 1.5	PN 400	21.2	23	32	7.9	0041452100	24-24/37N-L18
L 22	M 30 x 2	PN 400	24.4	27.5	36	11.5	0041462100	24-24/37N-L22-S20
L 28	M 36 x 2	PN 250	30.4	27.5	41	12.5	0041472100	24-24/37N-L28
L 35	M 45 x 2	PN 250	38.3	30	50	17.9	0041482100	24-24/37N-L35
L 42	M 52 x 2	PN 250	45.3	34	60	32.4	0041492100	24-24/37N-L42
S 6	M 14 x 1.5	PN 630	7.8	18	17	2.0	0041502100	24-24/37N-S6
S 8	M 16 x 1.5	PN 630	9.5	19	19	2.4	0041512100	24-24/37N-S8
S 10	M 18 x 1.5	PN 630	11.7	20.5	22	3.6	0041522100	24-24/37N-S10
S 12	M 20 x 1.5	PN 630	13.8	21	24	4.1	0041532100	24-24/37N-S12
S 14	M 22 x 1.5	PN 630	17.7	23	27	5.7	0041442100	24-24/37N-L15-S14
S 16	M 24 x 1.5	PN 630	18.7	26.5	30	8.4	0041542100	24-24/37N-S16
S 20	M 30 x 2	PN 400	24.4	27.5	36	11.5	0041462100	24-24/37N-L22-S20
S 25	M 36 x 2	PN 400	28.7	30.5	46	23.1	0041552100	24-24/37N-S25
S 30	M 42 x 2	PN 400	34.2	32	50	24.1	0041562100	24-24/37N-S30
S 38	M 52 x 2	PN 400	42.3	38	60	37.0	0041572100	24-24/37N-S38

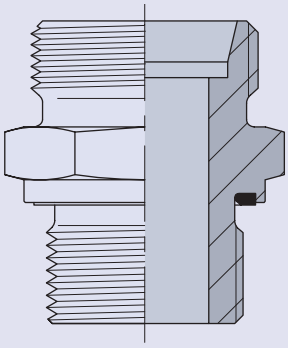
24/37° flared connecting parts

Standard O-ring material is FKM



Series Tube OD	Pressure	kg/100 ca.	Order-No.	Designation
L 6	PN 500	1.7	0041602058	24-24/37SO-L6
L 8	PN 500	2.6	0041612058	24-24/37SO-L8
L 10	PN 500	3.4	0041622058	24-24/37SO-L10
L 12	PN 400	4.8	0041632058	24-24/37SO-L12
L 15	PN 400	7.7	0041642058	24-24/37SO-L15
L 18	PN 400	10.7	0041652058	24-24/37SO-L18
L 22	PN 250	15.3	0041662058	24-24/37SO-L22
L 28	PN 250	17.4	0041672058	24-24/37SO-L28
L 35	PN 250	27.8	0041682058	24-24/37SO-L35
L 42	PN 250	45.7	0041692058	24-24/37SO-L42
S 6	PN 630	2.5	0041702058	24-24/37SO-S6
S 8	PN 630	3.1	0041712058	24-24/37SO-S8
S 10	PN 630	4.6	0041722058	24-24/37SO-S10
S 12	PN 630	5.4	0041732058	24-24/37SO-S12
S 14	PN 630	8.1	0041742058	24-24/37SO-S14
S 16	PN 630	11.2	0041752058	24-24/37SO-S16
S 20	PN 400	16.8	0041762058	24-24/37SO-S20
S 25	PN 400	30.3	0041772058	24-24/37SO-S25
S 30	PN 400	35.0	0041782058	24-24/37SO-S30
S 38	PN 400	54.0	0041792058	24-24/37SO-S38

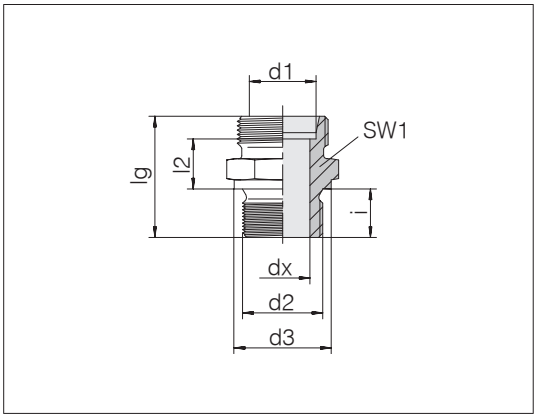
Male stud connectors



Male stud connectors

Male thread: Metric fine thread, cylindrical
Threaded stud: DIN 3852-1 Form A
Sealing type: Sealing ring
Sealing material: e.g. copper sealing ring

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d3	dx	lg	l2	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	M 10 x 1	PN 250	14	4	23.5	8.5	14	8	20	1.4	0707002000	24-SDS-L6-M10A	1)
L 6	M 12 x 1.5	PN 250	17	4	27	10	17	12	30	2.4	0785172000	24-SDS-L6-M12A	
L 8	M 10 x 1	PN 250	14	4	24.5	9.5	17	8	20	1.9	0707062000	24-SDS-L8-M10A	
L 8	M 12 x 1.5	PN 250	17	6	29	10	17	12	30	2.2	0707052000	24-SDS-L8-M12A	1)
L 8	M 16 x 1.5	PN 250	21	6	30.5	11.5	22	12	90	4.3	0707082000	24-SDS-L8-M16A	
L 8	M 18 x 1.5	PN 250	23	6	30.5	11.5	24	12	100	5.2	0707092000	24-SDS-L8-M18A	
L 10	M 14 x 1.5	PN 250	19	7	30	11	19	12	50	3.0	0707102000	24-SDS-L10-M14A	1)
L 10	M 16 x 1.5	PN 250	21	7	31.5	12.5	22	12	90	4.3	0707122000	24-SDS-L10-M16A	
L 10	M 18 x 1.5	PN 250	23	8	31.5	12.5	24	12	100	5.0	0707132000	24-SDS-L10-M18A	
L 12	M 12 x 1.5	PN 250	17	5	31.5	12.5	19	12	30	3.1	0707192000	24-SDS-L12-M12A	
L 12	M 14 x 1.5	PN 250	19	7	31.5	12.5	19	12	50	3.4	0707162000	24-SDS-L12-M14A	
L 12	M 16 x 1.5	PN 250	21	9	31.5	12.5	22	12	90	4.0	0707152000	24-SDS-L12-M16A	1)
L 12	M 18 x 1.5	PN 250	23	10	31.5	12.5	24	12	100	4.7	0707172000	24-SDS-L12-M18A	
L 12	M 22 x 1.5	PN 200	27	9	35	14	27	14	110	8.1	0707182000	24-SDS-L12-M22A	
L 15	M 14 x 1.5	PN 250	19	7	32	13	24	12	50	4.7	0707242000	24-SDS-L15-M14A	
L 15	M 16 x 1.5	PN 250	21	9	32.5	13.5	22	12	90	4.7	0707212000	24-SDS-L15-M16A	
L 15	M 18 x 1.5	PN 250	23	11	32.5	13.5	24	12	100	5.2	0707202000	24-SDS-L15-M18A	1)
L 15	M 22 x 1.5	PN 200	27	12	36	15	27	14	110	7.7	0707222000	24-SDS-L15-M22A	
L 15	M 26 x 1.5	PN 125	31	12	38	15	32	16	130	11.7	0799922000	24-SDS-L15-M26A	
L 18	M 18 x 1.5	PN 250	23	11	32.5	13	27	12	100	6.3	0707262000	24-SDS-L18-M18A	
L 18	M 22 x 1.5	PN 200	27	14	36	14.5	27	14	110	7.6	0707252000	24-SDS-L18-M22A	1)
L 18	M 26 x 1.5	PN 125	31	15	38	14.5	32	16	130	11.0	0707272000	24-SDS-L18-M26A	
L 22	M 18 x 1.5	PN 250	23	11	36	16.5	32	12	100	8.7	0707332000	24-SDS-L22-M18A	
L 22	M 22 x 1.5	PN 200	27	14	38.5	17	32	14	110	9.7	0707312000	24-SDS-L22-M22A	
L 22	M 26 x 1.5	PN 125	31	18	40	16.5	32	16	130	10.3	0707302000	24-SDS-L22-M26A	1)
L 22	M 27 x 2	PN 125	32	18	45	21.5	32	16	150	12.9	0707342000	24-SDS-L22-M27A	
L 28	M 22 x 1.5	PN 200	27	14	39	17.5	41	14	110	13.5	0707382000	24-SDS-L28-M22A	
L 28	M 26 x 1.5	PN 125	31	18	43	19.5	41	16	130	16.1	0707362000	24-SDS-L28-M26A	
L 28	M 33 x 2	PN 125	39	23	43	17.5	41	18	350	16.9	0707352000	24-SDS-L28-M33A	1)
L 35	M 42 x 2	PN 125	49	30	48	17.5	50	20	550	28.4	0707402000	24-SDS-L35-M42A	1)

1) Standard size

Threaded stud in acc. with DIN 3852-1 Form A are approved for use for gas supply in accordance with DIN 3387-1.

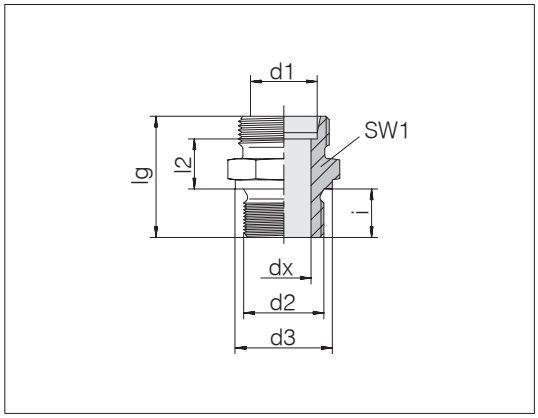
Example for comp.: GE06LMAX

Continued on following page

Male stud connectors

Male thread: Metric fine thread, cylindrical
Threaded stud: DIN 3852-1 Form A
Sealing type: Sealing ring
Sealing material: e.g. copper sealing ring

Tube coupling: 24° in acc. with ISO 8434-1



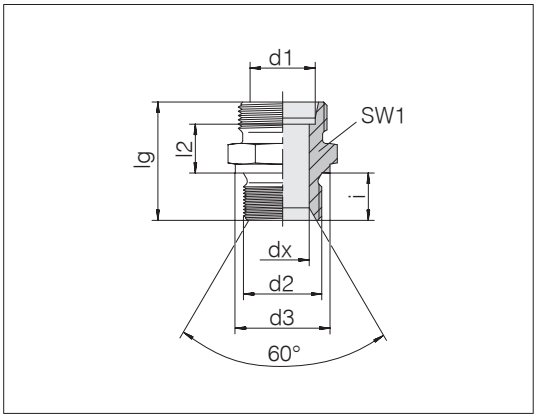
Series Tube OD d1	d2	Pressure	d3	dx	lg	l2	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
S 6	M 12 x 1.5	PN 250	17	4	32	13	17	12	30	3.0	0707502000	24-SDS-S6-M12A	1)
S 8	M 14 x 1.5	PN 250	19	5	34	15	19	12	50	4.3	0707552000	24-SDS-S8-M14A	1)
S 12	M 18 x 1.5	PN 250	23	8	36.5	17	24	12	100	7.2	0707652000	24-SDS-S12-M18A	1)
S 16	M 18 x 1.5	PN 250	23	9	38.5	18	24	12	100	7.6	0707782000	24-SDS-S16-M18A-ID9	

1) Standard size

Male stud connectors

Male thread: BSPP thread, cylindrical
Threaded stud: DIN 3852-2 Form A
Sealing type: Sealing ring
Sealing material: e.g. copper sealing ring

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d3	dx	lg	l2	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	G 1/8 A	PN 250	14	4	23.5	8.5	14	8	20	1.4	0708002000	24-SDS-L6-G1/8A-CH60	1)
L 6	G 1/4 A	PN 250	18	4	28	9	19	12	45	2.5	0708022000	24-SDS-L6-G1/4A-CH60	
L 6	G 3/8 A	PN 250	22	4	30.5	11.5	22	12	80	4.2	0708032000	24-SDS-L6-G3/8A-CH60	
L 8	G 1/8 A	PN 250	14	4	24.5	9.5	17	8	20	1.8	0708062000	24-SDS-L8-G1/8A-CH60	
L 8	G 1/4 A	PN 250	18	6	29	10	19	12	45	2.7	0708052000	24-SDS-L8-G1/4A-CH60	1)
L 8	G 3/8 A	PN 250	22	6	30.5	11.5	22	12	80	4.2	0708072000	24-SDS-L8-G3/8A-CH60	
L 10	G 1/4 A	PN 250	18	7	30	11	19	12	45	2.7	0708102000	24-SDS-L10-G1/4A-CH60	1)
L 10	G 3/8 A	PN 250	22	7	31.5	12.5	22	12	80	4.3	0708122000	24-SDS-L10-G3/8A-CH60	
L 10	G 1/2 A	PN 160	26	7	34	13	27	14	90	6.8	0708132000	24-SDS-L10-G1/2A-CH60	
L 12	G 1/4 A	PN 250	18	7	31	12	19	12	45	3.1	0708162000	24-SDS-L12-G1/4A-CH60	
L 12	G 3/8 A	PN 250	22	9	31.5	12.5	22	12	80	4.6	0708152000	24-SDS-L12-G3/8A-CH60	1)
L 12	G 1/2 A	PN 160	26	9	34	13	27	14	90	6.7	0708172000	24-SDS-L12-G1/2A-CH60	
L 15	G 3/8 A	PN 250	22	9	32.5	13.5	24	12	80	5.1	0708212000	24-SDS-L15-G3/8A-CH60	
L 15	G 1/2 A	PN 160	26	11	35	14	27	14	90	7.7	0708202000	24-SDS-L15-G1/2A-CH60	1)
L 15	G 3/4 A	PN 160	32	12	38	15	32	16	220	11.2	0708222000	24-SDS-L15-G3/4A-CH60	
L 18	G 3/8 A	PN 250	22	9	33.5	14	27	12	80	6.6	0708262000	24-SDS-L18-G3/8A-CH60	
L 18	G 1/2 A	PN 160	26	14	36	14.5	27	14	90	7.1	0708252000	24-SDS-L18-G1/2A-CH60	1)
L 18	G 3/4 A	PN 160	32	15	38	14.5	32	16	220	10.6	0708272000	24-SDS-L18-G3/4A-CH60	
L 22	G 1/2 A	PN 160	26	14	38	16.5	32	14	90	8.8	0708312000	24-SDS-L22-G1/2A-CH60	
L 22	G 3/4 A	PN 160	32	18	40	16.5	32	16	220	10.2	0708302000	24-SDS-L22-G3/4A-CH60	1)
L 22	G 1 A	PN 160	39	19	42	16.5	41	18	350	16.7	0708322000	24-SDS-L22-G1A-CH60	
L 28	G 1/2 A	PN 160	26	14	39	17.5	41	14	90	13.2	0708382000	24-SDS-L28-G1/2A-CH60	
L 28	G 3/4 A	PN 160	32	18	43	19.5	41	16	220	16.2	0708362000	24-SDS-L28-G3/4A-CH60	
L 28	G 1 A	PN 160	39	23	43	17.5	41	18	350	16.7	0708352000	24-SDS-L28-G1A-CH60	1)
L 35	G 1 1/4 A	PN 125	49	30	48	17.5	50	20	400	27.2	0708402000	24-SDS-L35-G11/4A-CH60	1)
L 42	G 1 1/4 A	PN 125	49	30	50	19	55	20	400	33.4	0708462000	24-SDS-L42-G11/4A-CH60	
L 42	G 1 1/2 A	PN 125	55	36	52	19	55	22	700	34.5	0708452000	24-SDS-L42-G11/2A-CH60	1)

1) Standard size

Threaded stud in acc. with DIN 3852-2 Form A are approved for use for gas supply in accordance with DIN 3387-1.

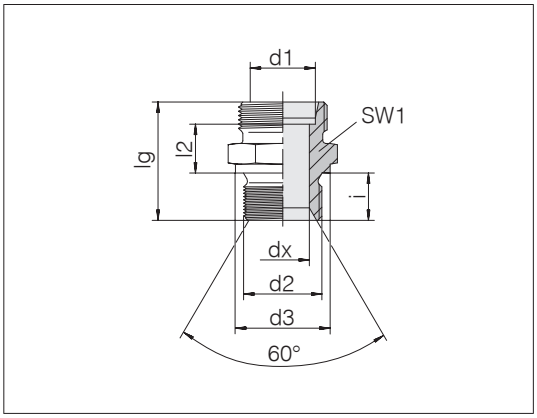
Example for comp.: GE06LRA

Continued on following page

Male stud connectors

Male thread: BSPP thread, cylindrical
Threaded stud: DIN 3852-2 Form A
Sealing type: Sealing ring
Sealing material: e.g. copper sealing ring

Tube coupling: 24° in acc. with ISO 8434-1



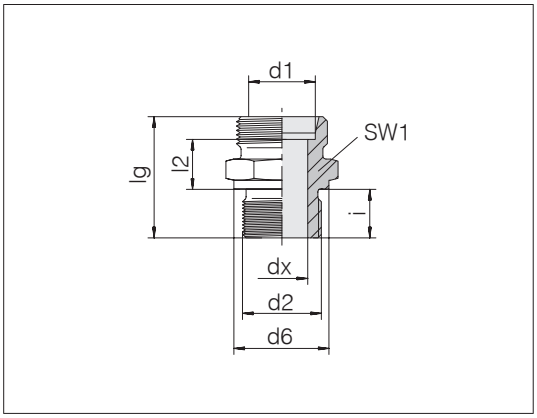
Series Tube OD d1	d2	Pressure	d3	dx	lg	l2	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation
S 6	G 1/8 A	PN 250	14	4	27.5	12.5	17	8	20	2.4	0708512000	24-SDS-S6-G1/8A-ID4/CH60
S 6	G 1/4 A	PN 250	18	4	32	13	19	12	45	3.4	0708502000	24-SDS-S6-G1/4A-CH60 [1]
S 8	G 1/8 A	PN 250	14	4	29.5	14.5	17	8	20	3.0	0708562000	24-SDS-S8-G1/8A-ID4/CH60
S 8	G 1/4 A	PN 250	18	5	34	15	19	12	45	4.1	0708552000	24-SDS-S8-G1/4A-CH60 [1]
S 8	G 3/8 A	PN 250	22	5	34.5	15.5	22	12	80	5.5	0708572000	24-SDS-S8-G3/8A-CH60
S 10	G 1/4 A	PN 250	18	5	34	14.5	19	12	45	4.1	0708612000	24-SDS-S10-G1/4A-CH60
S 10	G 3/8 A	PN 250	22	7	34.5	15	22	12	80	5.5	0708602000	24-SDS-S10-G3/8A-CH60 [1]
S 10	G 1/2 A	PN 160	26	7	39	17.5	27	14	90	9.2	0708622000	24-SDS-S10-G1/2A-CH60
S 12	G 1/4 A	PN 250	18	5	36	16.5	22	12	45	5.7	0708662000	24-SDS-S12-G1/4A-CH60
S 12	G 3/8 A	PN 250	22	8	36.5	17	22	12	80	6.1	0708652000	24-SDS-S12-G3/8A-CH60 [1]
S 12	G 1/2 A	PN 160	26	8	39	17.5	27	14	90	9.3	0708672000	24-SDS-S12-G1/2A-CH60
S 14	G 1/2 A	PN 160	26	10	41	19	27	14	90	9.4	0708702000	24-SDS-S14-G1/2A-CH60 [1]
S 16	G 3/8 A	PN 250	22	9	39	18.5	24	12	80	7.4	0708762000	24-SDS-S16-G3/8A-CH60
S 16	G 1/2 A	PN 160	26	12	41	18.5	27	14	90	9.0	0708752000	24-SDS-S16-G1/2A-CH60 [1]
S 16	G 3/4 A	PN 160	32	12	45	20.5	32	16	220	14.9	0708772000	24-SDS-S16-G3/4A-CH60
S 16	G 1 A	PN 160	39	12	49	22.5	41	18	350	23.1	0708782000	24-SDS-S16-G1A-CH60
S 20	G 1/2 A	PN 160	26	12	45	20.5	32	14	90	13.3	0708812000	24-SDS-S20-G1/2A-CH60
S 20	G 3/4 A	PN 160	32	16	47	20.5	32	16	220	16.3	0708802000	24-SDS-S20-G3/4A-CH60 [1]
S 20	G 1 A	PN 160	39	16	51	22.5	41	18	350	24.3	0708822000	24-SDS-S20-G1A-CH60
S 25	G 3/4 A	PN 160	32	16	51	23	41	16	220	23.6	0708862000	24-SDS-S25-G3/4A-CH60
S 25	G 1 A	PN 160	39	20	53	23	41	18	350	25.7	0708852000	24-SDS-S25-G1A-CH60 [1]
S 30	G 3/4 A	PN 160	32	16	53	23.5	46	16	220	29.6	0708932000	24-SDS-S30-G3/4A-CH60
S 30	G 1 A	PN 160	39	20	55	23.5	46	18	350	31.9	0708912000	24-SDS-S30-G1A-CH60
S 30	G 1 1/4 A	PN 125	49	25	57	23.5	50	20	400	40.3	0708902000	24-SDS-S30-G11/4A-CH60 [1]
S 38	G 1 A	PN 160	39	20	60	26	55	18	350	49.4	0708982000	24-SDS-S38-G1A-CH60
S 38	G 1 1/4 A	PN 125	49	25	62	26	55	20	400	53.9	0708962000	24-SDS-S38-G11/4A-CH60
S 38	G 1 1/2 A	PN 125	55	32	64	26	55	22	700	55.0	0708952000	24-SDS-S38-G11/2A-CH60 [1]

[1] Standard size

Male stud connectors

Male thread: Metric fine thread, cylindrical
Threaded stud: DIN 3852-1/ISO 9974-3 Form B
Sealing type: Sealing edge

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d6	dx	lg	l2	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	M 8 x 1	PN 100	12	3	23.5	8.5	12	8	14	1.1	0709012000	24-SDS-L6-M8B	
L 6	M 10 x 1	PN 400	14	4	23.5	8.5	14	8	25	1.4	0709002000	24-SDS-L6-M10B	1)
L 6	M 12 x 1.5	PN 400	17	4	27	10	17	10	35	2.2	709022000	24-SDS-L6-M12B-TL10	
L 6	M 14 x 1.5	PN 400	19	4	29	11	19	11	55	3.2	0709032000	24-SDS-L6-M14B	
L 6	M 16 x 1.5	PN 400	21	4	30.5	11.5	22	12	80	3.6	0709042000	24-SDS-L6-M16B	
L 8	M 10 x 1	PN 400	14	4	24.5	9.5	17	8	25	1.9	0709062000	24-SDS-L8-M10B	
L 8	M 12 x 1.5	PN 400	17	6	29	10	17	12	35	2.2	0709052000	24-SDS-L8-M12B	1)
L 8	M 14 x 1.5	PN 400	19	6	29	10	19	12	55	2.9	0709072000	24-SDS-L8-M14B	
L 8	M 16 x 1.5	PN 400	21	6	30.5	11.5	22	12	80	4.2	0709082000	24-SDS-L8-M16B	
L 8	M 18 x 1.5	PN 400	23	6	30.5	11.5	24	12	100	5.2	0709092000	24-SDS-L8-M18B	
L 8	M 22 x 1.5	PN 400	27	6	31	10	27	14	170	6.9	1709132000	24-SDS-L8-M22B	
L 10	M 10 x 1	PN 400	14	4	25.5	10.5	17	8	25	2.1	0709142000	24-SDS-L10-M10B	
L 10	M 12 x 1.5	PN 400	17	6	30	11	17	12	35	2.5	0709112000	24-SDS-L10-M12B	
L 10	M 14 x 1.5	PN 400	19	7	30	11	19	12	55	3.0	0709102000	24-SDS-L10-M14B	1)
L 10	M 16 x 1.5	PN 400	21	7	31.5	12.5	22	12	80	4.2	0709122000	24-SDS-L10-M16B	
L 10	M 18 x 1.5	PN 400	23	7	31.5	12.5	24	12	100	5.2	0709132000	24-SDS-L10-M18B	
L 10	M 22 x 1.5	PN 400	27	8	35	14	27	14	170	8.1	1709142000	24-SDS-L10-M22B	
L 12	M 12 x 1.5	PN 400	17	6	31.5	12.5	19	12	35	3.0	1709162000	24-SDS-L12-M12B	
L 12	M 14 x 1.5	PN 400	19	7	31.5	12.5	19	12	55	3.4	0709162000	24-SDS-L12-M14B	
L 12	M 16 x 1.5	PN 400	21	9	31.5	12.5	22	12	80	4.0	0709152000	24-SDS-L12-M16B	1)
L 12	M 18 x 1.5	PN 400	23	9	31.5	12.5	24	12	100	4.5	0709172000	24-SDS-L12-M18B	
L 12	M 22 x 1.5	PN 400	27	10	35	14	27	14	170	7.8	0709182000	24-SDS-L12-M22B	
L 15	M 16 x 1.5	PN 400	21	9	32	13	24	12	80	4.8	0709212000	24-SDS-L15-M16B	
L 15	M 18 x 1.5	PN 400	23	11	32.5	13.5	24	12	100	5.1	0709202000	24-SDS-L15-M18B	1)
L 15	M 22 x 1.5	PN 400	27	12	36	15	27	14	170	7.8	0709222000	24-SDS-L15-M22B	
L 15	M 26 x 1.5	PN 200	31	12	38	15	32	16	230	11.6	0785622000	24-SDS-L15-M26B	
L 15	M 33 x 2	PN 200	39	12	41	16	41	18	400	16.5	0709242000	24-SDS-L15-M33B	

1) Standard size

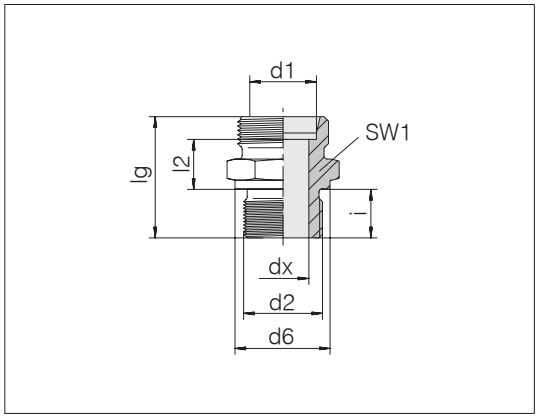
Example for comp. :
GE06LM8x1X
ISO 8434-1-SDS-L6xM8x1-B-St

Continued on following page

Male stud connectors

Male thread: Metric fine thread, cylindrical
Threaded stud: DIN 3852-1/ISO 9974-3 Form B
Sealing type: Sealing edge

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d6	dx	lg	l2	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 18	M 16 x 1.5	PN 400	21	9	33	13.5	27	12	80	6.2	1709112000	24-SDS-L18-M16B	
L 18	M 18 x 1.5	PN 400	23	11	33.5	14	27	12	100	6.6	0709262000	24-SDS-L18-M18B	
L 18	M 22 x 1.5	PN 400	27	14	36	14.5	27	14	170	7.7	0709252000	24-SDS-L18-M22B	1)
L 18	M 26 x 1.5	PN 200	31	15	38	14.5	32	16	230	10.8	0709272000	24-SDS-L18-M26B	
L 18	M 33 x 2	PN 200	39	14	41	15.5	41	18	400	20.9	0709282000	24-SDS-L18-M33B	
L 22	M 18 x 1.5	PN 200	23	11	36	16.5	32	12	100	8.7	0709332000	24-SDS-L22-M18B	
L 22	M 22 x 1.5	PN 200	27	14	38	16.5	32	14	170	9.3	0709312000	24-SDS-L22-M22B	
L 22	M 26 x 1.5	PN 200	31	18	40	16.5	32	16	230	10.1	0709302000	24-SDS-L22-M26B	1)
L 22	M 33 x 2	PN 200	39	19	43	17.5	41	18	400	18.5	0709322000	24-SDS-L22-M33B	
L 22	M 42 x 2	PN 200	49	18	51	23.5	50	20	700	43.0	1709122000	24-SDS-L22-M42B	
L 28	M 26 x 1.5	PN 200	31	18	43	19.5	41	16	230	16.4	0709362000	24-SDS-L28-M26B	
L 28	M 33 x 2	PN 200	39	23	43	17.5	41	18	400	16.7	0709352000	24-SDS-L28-M33B	1)
L 35	M 26 x 1.5	PN 200	31	18	44	17.5	46	16	230	20.5	0709412000	24-SDS-L35-M26B	
L 35	M 42 x 2	PN 200	49	30	48	17.5	50	20	700	27.8	0709402000	24-SDS-L35-M42B	1)
L 42	M 42 x 2	PN 200	49	30	50	19	55	20	700	33.4	0709462000	24-SDS-L42-M42B	
L 42	M 48 x 2	PN 200	55	36	52	19	55	22	900	35.4	0709452000	24-SDS-L42-M48B	1)

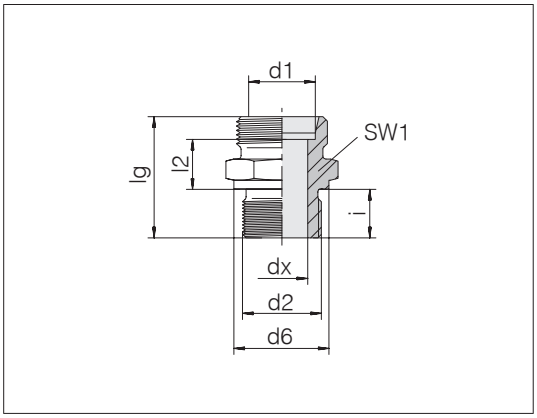
1) Standard size

Continued on following page

Male stud connectors

Male thread: Metric fine thread, cylindrical
Threaded stud: DIN 3852-1/ISO 9974-3 Form B
Sealing type: Sealing edge

Tube coupling: 24° in acc. with ISO 8434-1



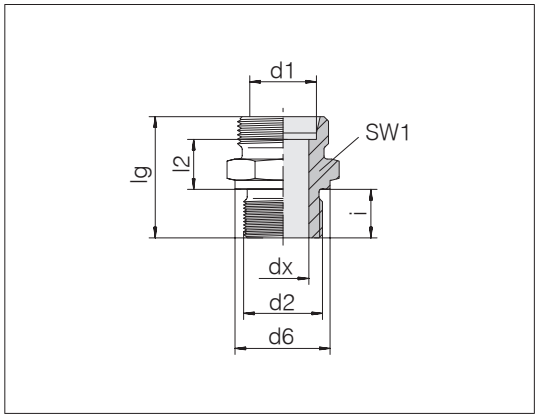
Series Tube OD d1	d2	Pressure	d6	dx	lg	l2	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
S 6	M 12 x 1.5	PN 630	17	4	32	13	17	12	60	3.1	0709502000	24-SDS-S6-M12B	1)
S 8	M 12 x 1.5	PN 630	17	4	34	15	17	12	60	3.6	0709562000	24-SDS-S8-M12B	
S 8	M 14 x 1.5	PN 630	19	5	34	15	19	12	90	4.3	0709552000	24-SDS-S8-M14B	1)
S 8	M 18 x 1.5	PN 630	23	5	36.5	17.5	24	12	190	6.9	0709592000	24-SDS-S8-M18B	
S 8	M 22 x 1.5	PN 630	27	5	39	18	27	14	300	11.0	0709572000	24-SDS-S8-M22B	
S 10	M 14 x 1.5	PN 630	19	5	34	14.5	19	12	90	4.4	0709612000	24-SDS-S10-M14B	
S 10	M 16 x 1.5	PN 630	21	7	34.5	15	22	12	120	5.4	0709602000	24-SDS-S10-M16B	1)
S 10	M 18 x 1.5	PN 630	23	7	36.5	17	24	12	190	7.1	0709622000	24-SDS-S10-M18B	
S 10	M 22 x 1.5	PN 630	27	7	39	17.5	27	14	300	11.0	0709632000	24-SDS-S10-M22B	
S 12	M 14 x 1.5	PN 630	19	5	36	16.5	22	12	90	5.9	1709102000	24-SDS-S12-M14B	
S 12	M 16 x 1.5	PN 630	21	8	36.5	17	22	12	120	6.0	0709662000	24-SDS-S12-M16B	
S 12	M 18 x 1.5	PN 630	23	8	36.5	17	24	12	190	7.1	0709652000	24-SDS-S12-M18B	1)
S 12	M 22 x 1.5	PN 630	27	8	39	17.5	27	14	300	10.3	0709682000	24-SDS-S12-M22B	
S 12	M 27 x 2	PN 630	32	8	43	19.5	32	16	420	13.6	0785532000	24-SDS-S12-M27B	
S 14	M 18 x 1.5	PN 630	23	8	39	19	24	12	190	7.9	0709712000	24-SDS-S14-M18B	
S 14	M 20 x 1.5	PN 630	25	10	41	19	27	14	280	9.2	0709702000	24-SDS-S14-M20B	1)
S 16	M 18 x 1.5	PN 630	23	8	38.5	18	24	12	190	7.8	0709792000	24-SDS-S16-M18B	
S 16	M 22 x 1.5	PN 630	27	12	41	18.5	27	14	300	9.7	0709752000	24-SDS-S16-M22B	1)
S 16	M 27 x 2	PN 400	32	12	45	20.5	32	16	420	15.8	0709772000	24-SDS-S16-M27B	
S 20	M 18 x 1.5	PN 400	23	8	40.5	18	32	12	190	11.8	0709842000	24-SDS-S20-M18B	
S 20	M 22 x 1.5	PN 400	27	12	45	20.5	32	14	300	14.2	0709812000	24-SDS-S20-M22B	
S 20	M 27 x 2	PN 400	32	16	47	20.5	32	16	420	15.3	0709802000	24-SDS-S20-M27B	1)
S 20	M 33 x 2	PN 400	39	16	51	22.5	41	18	600	25.0	0709822000	24-SDS-S20-M33B	
S 25	M 27 x 2	PN 400	32	16	51	23	41	16	420	24.1	0709862000	24-SDS-S25-M27B	
S 25	M 33 x 2	PN 400	39	20	53	23	41	18	600	26.6	0709852000	24-SDS-S25-M33B	1)
S 30	M 33 x 2	PN 200	39	20	55	23.5	46	18	600	32.5	0709912000	24-SDS-S30-M33B	
S 30	M 42 x 2	PN 200	49	25	57	23.5	50	20	700	42.8	0709902000	24-SDS-S30-M42B	1)
S 38	M 48 x 2	PN 200	55	32	64	26	55	22	900	57.3	0709952000	24-SDS-S38-M48B	1)

1) Standard size

Male stud connectors

Male thread: BSPP thread, cylindrical
Threaded stud: DIN ISO 1179-4 Form B
Sealing type: Sealing edge

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d6	dx	lg	l2	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	G 1/8 A	PN 400	14	4	23.5	8.5	14	8	25	1.4	0710002000	24-SDS-L6-G1/8B	1)
L 6	G 1/4 A	PN 400	18	4	28	9	19	12	55	2.4	0710022000	24-SDS-L6-G1/4B	
L 6	G 3/8 A	PN 400	22	4	30.5	11.5	22	12	95	4.0	0710032000	24-SDS-L6-G3/8B	
L 6	G 1/2 A	PN 400	26	4	33	12	27	14	185	7.4	0710042000	24-SDS-L6-G1/2B	
L 8	G 1/8 A	PN 400	14	4	24.5	9.5	17	8	25	1.8	0710062000	24-SDS-L8-G1/8B	
L 8	G 1/4 A	PN 400	18	6	29	10	19	12	55	2.7	0710052000	24-SDS-L8-G1/4B	1)
L 8	G 3/8 A	PN 400	22	6	30.5	11.5	22	12	95	4.4	0710072000	24-SDS-L8-G3/8B	
L 8	G 1/2 A	PN 400	26	6	33	12	27	14	185	7.4	0710082000	24-SDS-L8-G1/2B	
L 10	G 1/8 A	PN 400	14	4	25.5	10.5	17	8	25	2.1	0710112000	24-SDS-L10-G1/8B	
L 10	G 1/4 A	PN 400	18	6	30	11	19	12	55	3.0	0710102000	24-SDS-L10-G1/4B	1)
L 10	G 3/8 A	PN 400	22	7	31.5	12.5	22	12	95	4.5	0710122000	24-SDS-L10-G3/8B	
L 10	G 1/2 A	PN 400	26	7	34	13	27	14	185	7.2	0710132000	24-SDS-L10-G1/2B	
L 10	G 3/4 A	PN 400	32	8	37	14	32	16	230	10.4	1710152000	24-SDS-L10-G3/4B	
L 12	G 1/4 A	PN 400	18	6	31	12	19	12	55	3.2	0710162000	24-SDS-L12-G1/4B	
L 12	G 3/8 A	PN 400	22	9	31.5	12.5	22	12	95	4.2	0710152000	24-SDS-L12-G3/8B	1)
L 12	G 1/2 A	PN 400	26	9	34	13	27	14	185	7.1	0710172000	24-SDS-L12-G1/2B	
L 12	G 3/4 A	PN 400	32	9	37	14	32	16	250	9.0	0710182000	24-SDS-L12-G3/4B	
L 15	G 1/4 A	PN 400	18	6	32	13	24	12	55	4.6	0710232000	24-SDS-L15-G1/4B	
L 15	G 3/8 A	PN 400	22	9	32.5	13.5	24	12	95	5.2	0710212000	24-SDS-L15-G3/8B	
L 15	G 1/2 A	PN 400	26	11	35	14	27	14	185	7.1	0710202000	24-SDS-L15-G1/2B	1)
L 15	G 3/4 A	PN 400	32	12	38	15	32	16	250	11.7	0710222000	24-SDS-L15-G3/4B	
L 18	G 3/8 A	PN 400	22	9	33.5	14	27	12	95	6.7	0710262000	24-SDS-L18-G3/8B	
L 18	G 1/2 A	PN 400	26	14	36	14.5	27	14	185	7.0	0710252000	24-SDS-L18-G1/2B	1)
L 18	G 3/4 A	PN 400	32	15	38	14.5	32	16	250	11.0	0710272000	24-SDS-L18-G3/4B	
L 18	G 1 A	PN 200	39	15	41	15.5	41	18	400	20.3	0710282000	24-SDS-L18-G1B	
L 22	G 1/2 A	PN 200	26	14	38	16.5	32	14	185	8.8	0710312000	24-SDS-L22-G1/2B	
L 22	G 3/4 A	PN 200	32	18	40	16.5	32	16	250	10.3	0710302000	24-SDS-L22-G3/4B	1)
L 22	G 1 A	PN 200	39	19	43	17.5	41	18	400	18.5	0710322000	24-SDS-L22-G1B	

1) Standard size

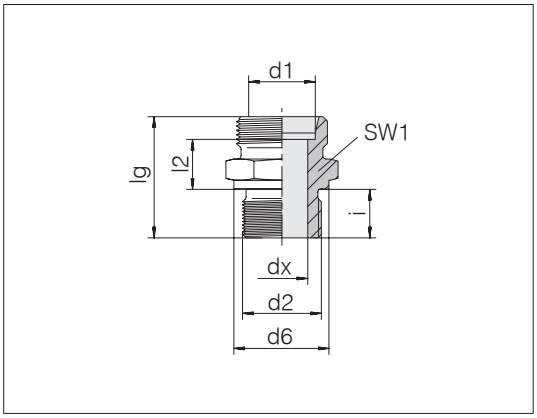
Example for comp. :
GE06LRX
ISO 8434-1-SDS-L6xG1/8A-B-St

Continued on following page

Male stud connectors

Male thread: BSPP thread, cylindrical
Threaded stud: DIN ISO 1179-4 Form B
Sealing type: Sealing edge

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d6	dx	lg	l2	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 28	G 1/2 A	PN 200	26	14	39	17.5	41	14	185	14.3	1710362000	24-SDS-L28-G1/2B	
L 28	G 3/4 A	PN 200	32	18	41	17.5	41	16	250	14.3	0710362000	24-SDS-L28-G3/4B	
L 28	G 1 A	PN 200	39	23	43	17.5	41	18	400	16.9	0710352000	24-SDS-L28-G1B	1)
L 28	G 1 1/4 A	PN 200	49	23	46	18.5	50	20	670	25.8	0710372000	24-SDS-L28-G11/4B	
L 28	G 1 1/2 A	PN 200	55	24	50	20.5	55	22	800	34.6	1710242000	24-SDS-L28-G11/2B	
L 35	G 3/4 A	PN 200	32	18	44	17.5	50	16	250	26.0	1710162000	24-SDS-L35-G3/4B	
L 35	G 1 A	PN 200	39	23	46	17.5	50	18	400	24.1	0710412000	24-SDS-L35-G1B	
L 35	G 1 1/4 A	PN 200	49	30	48	17.5	50	20	670	27.4	0710402000	24-SDS-L35-G11/4B	1)
L 35	G 1 1/2 A	PN 200	55	30	52	19.5	55	22	800	47.2	0710422000	24-SDS-L35-G11/2B	
L 42	G 1 A	PN 200	39	23	48	19	55	18	400	31.2	1710182000	24-SDS-L42-G1B	
L 42	G 1 1/4 A	PN 200	49	30	50	19	55	20	670	33.1	0710462000	24-SDS-L42-G11/4B	
L 42	G 1 1/2 A	PN 200	55	36	52	19	55	22	800	34.9	0710452000	24-SDS-L42-G11/2B	1)
S 6	G 1/4 A	PN 500	18	4	32	13	19	12	95	3.5	0710502000	24-SDS-S6-G1/4B	1)
S 6	G 3/8 A	PN 500	22	4	34.5	15.5	22	12	180	5.3	0710522000	24-SDS-S6-G3/8B	
S 6	G 1/2 A	PN 500	26	4	35	14	27	14	160	6.7	0710532000	24-SDS-S6-G1/2B	
S 8	G 1/4 A	PN 500	18	5	34	15	19	12	95	4.1	0710552000	24-SDS-S8-G1/4B	1)
S 8	G 3/8 A	PN 500	22	5	34.5	15.5	22	12	180	5.5	0710572000	24-SDS-S8-G3/8B	
S 8	G 1/2 A	PN 500	26	5	39	18	27	14	160	8.9	0710582000	24-SDS-S8-G1/2B	
S 10	G 1/4 A	PN 500	18	5	34	14.5	19	12	95	4.2	0710612000	24-SDS-S10-G1/4B	
S 10	G 3/8 A	PN 400	22	7	34.5	15	22	12	180	5.6	0710602000	24-SDS-S10-G3/8B	1)
S 10	G 1/2 A	PN 400	26	7	35	13.5	27	14	160	7.8	0710622000	24-SDS-S10-G1/2B	
S 12	G 1/4 A	PN 400	18	5	36	16.5	22	12	95	5.7	0710662000	24-SDS-S12-G1/4B	
S 12	G 3/8 A	PN 400	22	8	36.5	17	22	12	180	6.2	0710652000	24-SDS-S12-G3/8B	1)
S 12	G 1/2 A	PN 400	26	8	39	17.5	27	14	160	9.7	0710672000	24-SDS-S12-G1/2B	
S 12	G 3/4 A	PN 400	32	8	43	19.5	32	16	350	14.9	0710682000	24-SDS-S12-G3/4B	
S 14	G 3/8 A	PN 400	22	8	39	19	24	12	180	7.5	0710712000	24-SDS-S14-G3/8B	
S 14	G 1/2 A	PN 400	26	10	41	19	27	14	160	9.8	0710702000	24-SDS-S14-G1/2B	1)
S 14	G 3/4 A	PN 400	32	10	45	21	32	16	350	16.4	0710722000	24-SDS-S14-G3/4B	

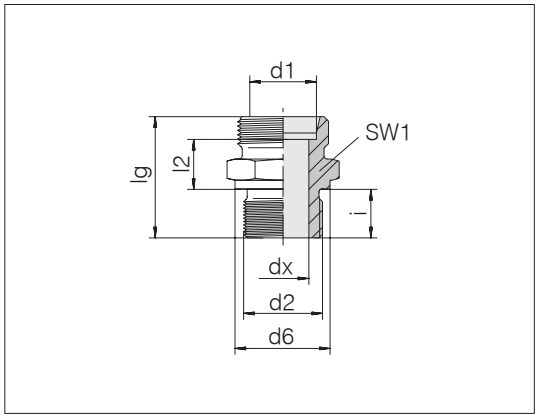
1) Standard size

Continued on following page

Male stud connectors

Male thread: BSPP thread, cylindrical
Threaded stud: DIN ISO 1179-4 Form B
Sealing type: Sealing edge

Tube coupling: 24° in acc. with ISO 8434-1



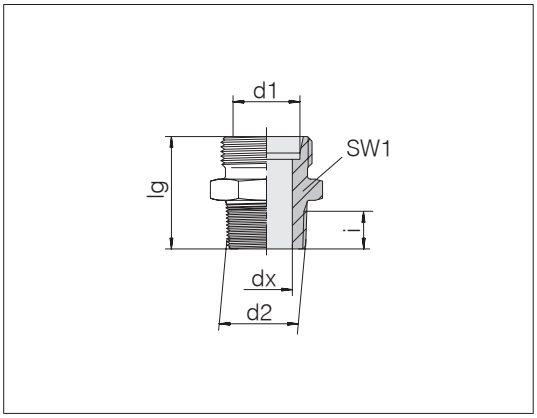
Series Tube OD d1	d2	Pressure	d6	dx	lg	l2	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
S 16	G 3/8 A	PN 400	22	8	38.5	18	27	12	180	8.4	0710762000	24-SDS-S16-G3/8B	
S 16	G 1/2 A	PN 400	26	12	41	18.5	27	14	160	9.1	0710752000	24-SDS-S16-G1/2B	1)
S 16	G 3/4 A	PN 400	32	12	45	20.5	32	16	350	15.5	0710772000	24-SDS-S16-G3/4B	
S 16	G 1 A	PN 400	39	12	49	22.5	41	18	700	25.4	1710322000	24-SDS-S16-G1B	
S 20	G 1/2 A	PN 400	26	12	45	20.5	32	14	160	13.3	0710812000	24-SDS-S20-G1/2B	
S 20	G 3/4 A	PN 400	32	16	47	20.5	32	16	350	15.1	0710802000	24-SDS-S20-G3/4B	1)
S 20	G 1 A	PN 400	39	16	51	22.5	41	18	700	27.5	0710822000	24-SDS-S20-G1B	
S 25	G 3/4 A	PN 400	32	16	51	23	41	16	350	24.1	0710862000	24-SDS-S25-G3/4B	
S 25	G 1 A	PN 400	39	20	53	23	41	18	700	26.6	0710852000	24-SDS-S25-G1B	1)
S 25	G 1 1/4 A	PN 400	49	20	55	23	50	20	850	44.0	0710872000	24-SDS-S25-G11/4B	
S 25	G 1 1/2 A	PN 400	55	20	60	26	55	22	1000	53.9	1710312000	24-SDS-S25-G11/2B	
S 30	G 3/4 A	PN 200	32	16	53	23.5	46	16	350	29.9	0710932000	24-SDS-S30-G3/4B	
S 30	G 1 A	PN 200	39	20	55	23.5	46	18	700	32.8	0710912000	24-SDS-S30-G1B	
S 30	G 1 1/4 A	PN 200	49	25	57	23.5	50	20	850	41.7	0710902000	24-SDS-S30-G11/4B	1)
S 30	G 1 1/2 A	PN 200	55	25	62	26.5	55	22	1000	64.5	1710332000	24-SDS-S30-G11/2B	
S 38	G 1 A	PN 200	39	20	60	26	55	18	700	49.2	0710982000	24-SDS-S38-G1B	
S 38	G 1 1/4 A	PN 200	49	25	62	26	55	20	850	55.0	0710962000	24-SDS-S38-G11/4B	
S 38	G 1 1/2 A	PN 200	55	32	64	26	55	22	1000	56.6	0710952000	24-SDS-S38-G11/2B	1)

1) Standard size

Male stud connectors

Male thread: Metric fine thread, tapered
Threaded stud: DIN 3852-1 Form C
Sealing type: Tapered thread
Sealing material: e.g. PTFE sealing tape

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	dx	lg	SW1	i	kg/100 ca.	Order-No.	Designation	
LL 4	M 6 x 1 keg	PN 100	2	20	9	6	0.6	0701012000	24-SDS-LL4-M6T	
LL 4	M 8 x 1 keg	PN 100	3	20	10	6	0.6	0701002000	24-SDS-LL4-M8T	1)
LL 4	M 10 x 1 keg	PN 100	3	20	11	6	0.8	0701022000	24-SDS-LL4-M10T	
LL 5	M 8 x 1 keg	PN 100	3.5	20	11	6	0.6	0701052000	24-SDS-LL5-M8T	1)
LL 6	M 6 x 1 keg	PN 100	2.5	20	11	6	0.6	0701982000	24-SDS-LL6-M6T	
LL 6	M 8 x 1 keg	PN 100	4.5	20	11	6	0.6	0701112000	24-SDS-LL6-M8T	
LL 6	M 10 x 1 keg	PN 100	4.5	20	11	6	0.8	0701102000	24-SDS-LL6-M10T	1)
LL 8	M 10 x 1 keg	PN 100	6	22	12	6	1.0	0701152000	24-SDS-LL8-M10T	1)
L 6	M 10 x 1 keg	PN 315	4	22	14	6	1.3	0702002000	24-SDS-L6-M10T	1)
L 8	M 10 x 1 keg	PN 315	4	23	17	6	2.0	0702072000	24-SDS-L8-M10T	
L 8	M 12 x 1.5 keg	PN 315	6	27	17	9	2.1	0702052000	24-SDS-L8-M12T	1)
L 10	M 14 x 1.5 keg	PN 315	7	28	17	9	2.5	0702102000	24-SDS-L10-M14T	1)
L 12	M 16 x 1.5 keg	PN 315	9	29	19	9	3.2	0702152000	24-SDS-L12-M16T	1)
L 15	M 18 x 1.5 keg	PN 315	11	30	24	9	4.7	0702202000	24-SDS-L15-M18T	1)
L 18	M 22 x 1.5 keg	PN 315	14	33	27	11	6.8	0702252000	24-SDS-L18-M22T	1)
S 6	M 12 x 1.5 keg	PB 630	4	30	17	9	2.8	0702502000	24-SDS-S6-M12T	1)
S 8	M 14 x 1.5 keg	PB 630	5	32	17	9	3.7	0702552000	24-SDS-S8-M14T	1)
S 10	M 16 x 1.5 keg	PB 630	7	32	19	9	4.3	0702602000	24-SDS-S10-M16T	1)
S 12	M 18 x 1.5 keg	PB 630	8	34	22	9	6.0	0702652000	24-SDS-S12-M18T	1)
S 14	M 20 x 1.5 keg	PB 630	10	38	27	11	8.7	0702702000	24-SDS-S14-M20T	1)
S 16	M 22 x 1.5 keg	PB 400	12	38	27	11	9.0	0702752000	24-SDS-S16-M22T	1)

1) Standard size

Threaded stud in acc. with DIN 3852-1 Form C are approved for use for gas supply in accordance with DIN 3387-1.

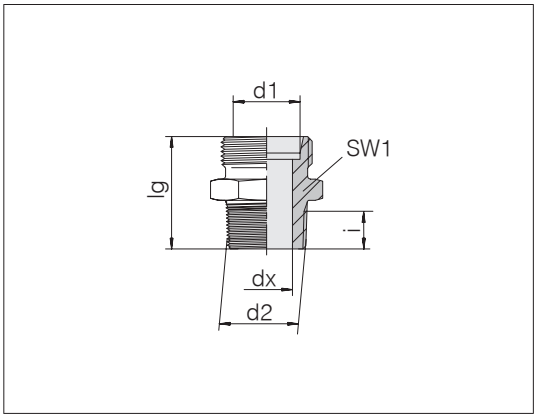
Operating pressure PB 630 only applies if holes with female conical threads are available.

Example for comp. :
GE06LMkegX
DIN 2353-AL6-St

Male stud connectors

Male thread: BSPT thread, tapered
Threaded stud: DIN 3852-2 Form C
Sealing type: Tapered thread
Sealing material: e.g. PTFE sealing tape

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	dx	lg	SW1	i	kg/100 ca.	Order-No.	Designation	
LL 4	R 1/8	PN 100	3	20	11	6.2	0.8	0703002000	24-SDS-LL4-R1/8T	1)
LL 5	R 1/8	PN 100	3.5	20	11	6.2	0.9	0703052000	24-SDS-LL5-R1/8T	1)
LL 6	R 1/8	PN 100	4.5	20	11	6.2	0.8	0703102000	24-SDS-LL6-R1/8T	1)
LL 6	R 1/4	PN 100	4.5	25	14	9.3	2.0	0703112000	24-SDS-LL6-R1/4T	
LL 8	R 1/8	PN 100	6	22	12	6.2	0.9	0703152000	24-SDS-LL8-R1/8T	1)
LL 8	R 1/4	PN 100	6	26	14	9.3	1.7	0703172000	24-SDS-LL8-R1/4T	
L 6	R 1/8	PN 315	4	22	14	6.2	1.2	0704002000	24-SDS-L6-R1/8T	1)
L 6	R 1/4	PN 315	4	26	14	9.3	1.9	0704022000	24-SDS-L6-R1/4T	
L 6	R 3/8	PN 315	4	28	19	9.3	3.6	0704032000	24-SDS-L6-R3/8T	
L 8	R 1/8	PN 315	4	23	14	6.2	1.5	0704062000	24-SDS-L8-R1/8T	
L 8	R 1/4	PN 315	6	27	17	9.3	2.2	0704052000	24-SDS-L8-R1/4T	1)
L 8	R 3/8	PN 315	6	28	19	9.3	3.4	0704072000	24-SDS-L8-R3/8T	
L 8	R 1/2	PN 315	6	30	24	10.4	5.9	0704082000	24-SDS-L8-R1/2T	
L 10	R 1/4	PN 315	7	28	17	9.3	2.3	0704102000	24-SDS-L10-R1/4T	1)
L 10	R 3/8	PN 315	8	28	19	9.3	3.1	0704122000	24-SDS-L10-R3/8T	
L 10	R 1/2	PN 315	8	31	24	10.4	5.6	0704132000	24-SDS-L10-R1/2T	
L 12	R 1/4	PN 315	7	29	19	9.3	2.8	0704162000	24-SDS-L12-R1/4T	
L 12	R 3/8	PN 315	9	29	19	9.3	3.3	0704152000	24-SDS-L12-R3/8T	1)
L 12	R 1/2	PN 315	9	31	24	10.4	5.5	0704172000	24-SDS-L12-R1/2T	
L 12	R 3/4	PN 315	9	34	30	12.4	8.2	0704182000	24-SDS-L12-R3/4T	
L 15	R 1/4	PN 315	7	30	24	9.3	4.4	0704232000	24-SDS-L15-R1/4T	
L 15	R 3/8	PN 315	11	30	24	9.3	4.4	0704212000	24-SDS-L15-R3/8T	
L 15	R 1/2	PN 315	11	32	24	10.4	5.8	0704202000	24-SDS-L15-R1/2T	1)
L 18	R 1/2	PN 315	14	33	27	10.4	6.4	0704252000	24-SDS-L18-R1/2T	1)
L 18	R 3/4	PN 315	14	35	30	12.4	10.9	0704272000	24-SDS-L18-R3/4T	
L 22	R 1/2	PB 160	14	35	32	10.4	8.1	0704312000	24-SDS-L22-R1/2T	
L 22	R 3/4	PB 160	18	37	32	12.4	9.6	0704302000	24-SDS-L22-R3/4T	1)
L 28	R 3/4	PB 160	18	38	41	12.4	13.9	0704362000	24-SDS-L28-R3/4T	
L 28	R 1	PB 160	23	40	41	13.4	15.6	0704352000	24-SDS-L28-R1T	1)
L 42	R 1 1/4	PB 160	30	47	55	15.4	34.5	7006496200	24-SDS-L42-R11/4T	

1) Standard size

Threaded stud in acc. with DIN 3852-2 Form C are approved for use for gas supply in accordance with DIN 3387-1.

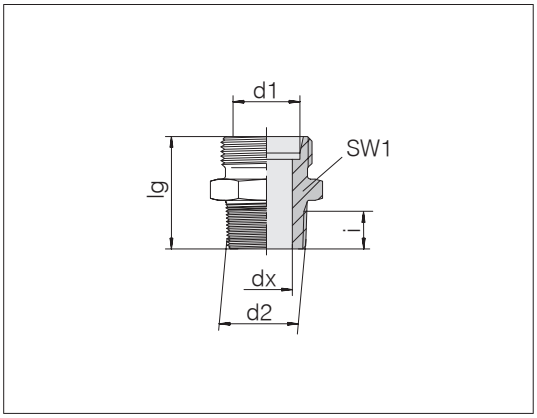
Example for comp.:
GE06LRkegX
DIN 2353-BL6-St

Continued on following page

Male stud connectors

Male thread: BSPT thread, tapered
Threaded stud: DIN 3852-2 Form C
Sealing type: Tapered thread
Sealing material: e.g. PTFE sealing tape

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	dx	lg	SW1	i	kg/100 ca.	Order-No.	Designation	
S 6	R 1/4	PB 630	4	30	17	9.3	3.0	0704502000	24-SDS-S6-R1/4T	1)
S 8	R 1/4	PB 630	5	32	17	9.3	3.4	0704552000	24-SDS-S8-R1/4T	1)
S 10	R 3/8	PB 630	7	32	19	9.3	4.4	0704602000	24-SDS-S10-R3/8T	1)
S 12	R 1/4	PB 630	6	34	22	9.3	5.4	0704662000	24-SDS-S12-R1/4T	
S 12	R 3/8	PB 630	8	34	22	9.3	5.8	0704652000	24-SDS-S12-R3/8T	1)
S 14	R 3/8	PB 630	8	36	24	9.3	6.8	0704712000	24-SDS-S14-R3/8T	
S 14	R 1/2	PB 630	10	38	27	10.4	8.9	0704702000	24-SDS-S14-R1/2T	1)
S 16	R 3/8	PB 400	9	36	27	9.3	7.9	0704762000	24-SDS-S16-R3/8T	
S 16	R 1/2	PB 400	12	38	27	10.4	8.5	0704752000	24-SDS-S16-R1/2T	1)
S 20	R 1/2	PB 400	14	42	32	10.4	12.2	0704812000	24-SDS-S20-R1/2T	
S 20	R 3/4	PB 400	16	44	32	12.4	14.1	0704802000	24-SDS-S20-R3/4T	1)

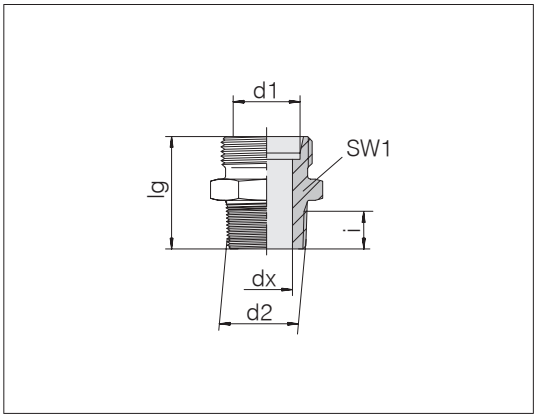
1) Standard size

Operating pressure PB 630 only
applies if holes with
female conical threads are available.

Male stud connectors

Male thread: NPT thread, tapered
Threaded stud: ASME B1.20.1
Sealing type: Tapered thread
Sealing material: e.g. PTFE sealing tape

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	dx	lg	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
LL 4	1/8 NPT	PN 100	3	21.9	11	6.7	15	0.9	0705002000	24-SDS-LL4-N1/8T	1)
LL 6	1/8 NPT	PN 100	4.5	21.9	11	6.7	15	0.9	0705102000	24-SDS-LL6-N1/8T	1)
LL 8	1/8 NPT	PN 100	6	23.9	12	6.7	15	1.0	0705152000	24-SDS-LL8-N1/8T	1)
L 6	1/8 NPT	PN 315	4	23.9	12	6.7	15	1.2	0706002000	24-SDS-L6-N1/8T	1)
L 6	1/4 NPT	PN 315	4	30	17	10.2	35	2.6	0706022000	24-SDS-L6-N1/4T	
L 8	1/8 NPT	PN 315	5	24.9	14	6.7	15	1.5	0706062000	24-SDS-L8-N1/8T	
L 8	1/4 NPT	PN 315	6	30.1	17	10.2	35	2.5	0706052000	24-SDS-L8-N1/4T	1)
L 8	3/8 NPT	PN 315	6	31.2	19	10.4	55	3.9	0706072000	24-SDS-L8-N3/8T	
L 8	1/2 NPT	PN 315	6	35.8	24	13.6	110	7.1	0706082000	24-SDS-L8-N1/2T	
L 10	1/8 NPT	PN 315	4	27	17	6.7	15	2.3	0706112000	24-SDS-L10-N1/8T	
L 10	1/4 NPT	PN 315	7	31.1	17	10.2	35	2.5	0706102000	24-SDS-L10-N1/4T	1)
L 10	3/8 NPT	PN 315	8	32.2	19	10.4	55	3.7	0706122000	24-SDS-L10-N3/8T	
L 10	1/2 NPT	PN 315	8	37.8	24	13.6	110	7.2	0706132000	24-SDS-L10-N1/2T	
L 12	1/4 NPT	PN 315	7	32	19	10.2	35	3.2	0706162000	24-SDS-L12-N1/4T	
L 12	3/8 NPT	PN 315	9	32.2	19	10.4	55	3.6	0706152000	24-SDS-L12-N3/8T	1)
L 12	1/2 NPT	PN 315	10	36.8	24	13.6	110	6.4	0706172000	24-SDS-L12-N1/2T	
L 15	3/8 NPT	PN 315	9	33.2	24	10.4	55	5.2	0706212000	24-SDS-L15-N3/8T	
L 15	1/2 NPT	PN 315	11	37.8	24	13.6	110	6.8	0706202000	24-SDS-L15-N1/2T	1)
L 18	3/8 NPT	PN 315	9	34.2	27	10.4	55	8.0	0706262000	24-SDS-L18-N3/8T	
L 18	1/2 NPT	PN 315	14	38.8	27	13.6	110	7.2	0706252000	24-SDS-L18-N1/2T	1)
L 18	3/4 NPT	PN 160	14	39.1	30	13.9	175	9.1	0706272000	24-SDS-L18-N3/4T	
L 22	1/2 NPT	PN 160	14	40.8	32	13.6	110	9.9	0706312000	24-SDS-L22-N1/2T	
L 22	3/4 NPT	PN 160	18	41.1	32	13.9	175	10.1	0706302000	24-SDS-L22-N3/4T	1)
L 28	1 NPT	PN 160	23	47	41	17.3	265	17.2	0706352000	24-SDS-L28-N1T	1)
L 35	1 1/4 NPT	PN 160	30	50.6	46	18	315	25.6	0706402000	24-SDS-L35-N11/4T	1)
L 42	1 1/4 NPT	PN 160	30	52.6	55	25.6	315	37.4	7011121800	24-SDS-L42-N11/4T	
L 42	1 1/2 NPT	PN 160	36	53	55	18.4	385	35.2	0706452000	24-SDS-L42-N11/2T	1)

1) Standard size

Threaded stud NPT in acc. with ASME are approved for use for gas supply in acc. with DIN 3387-1.

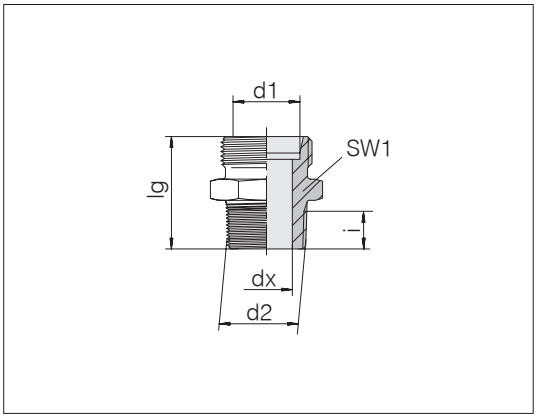
Example for comp.: GE06L1/8NPTX

Continued on following page

Male stud connectors

Male thread: NPT thread, tapered
Threaded stud: ASME B1.20.1
Sealing type: Tapered thread
Sealing material: e.g. PTFE sealing tape

Tube coupling: 24° in acc. with ISO 8434-1



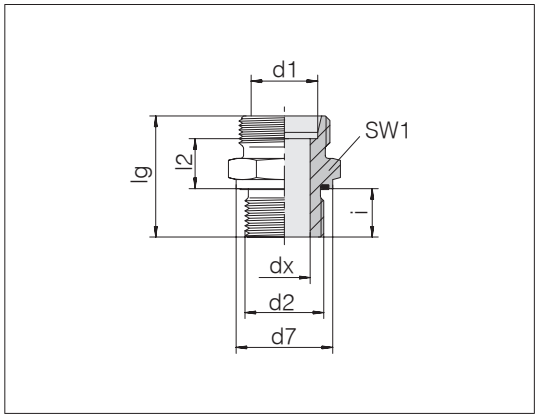
Series Tube OD d1	d2	Pressure	dx	lg	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
S 6	1/4 NPT	PN 630	4	33.1	17	10.2	35	3.3	0706502000	24-SDS-S6-N1/4T	1)
S 8	1/4 NPT	PN 630	5	35.1	17	10.2	35	3.8	0706552000	24-SDS-S8-N1/4T	1)
S 8	3/8 NPT	PN 630	8	35	19	10.4	55	4.5	0706572000	24-SDS-S8-N3/8T	
S 10	1/8 NPT	PN 630	4	30.9	19	6.7	15	4.0	0706632000	24-SDS-S10-N1/8T	
S 10	1/4 NPT	PN 630	5	35.1	19	10.2	35	4.3	0706612000	24-SDS-S10-N1/4T	
S 10	3/8 NPT	PN 630	7	35.2	19	10.4	55	4.8	0706602000	24-SDS-S10-N3/8T	1)
S 10	1/2 NPT	PN 630	7	41.8	24	13.6	110	9.0	0706622000	24-SDS-S10-N1/2T	
S 12	1/4 NPT	PN 630	5	37.1	22	10.2	35	5.8	0706662000	24-SDS-S12-N1/4T	
S 12	3/8 NPT	PN 630	8	37.2	22	10.4	55	6.2	0706652000	24-SDS-S12-N3/8T	1)
S 12	1/2 NPT	PN 630	8	41.8	24	13.6	110	9.0	0706672000	24-SDS-S12-N1/2T	
S 14	3/8 NPT	PN 630	8	39	24	10.4	55	7.2	0706712000	24-SDS-S14-N3/8T	
S 14	1/2 NPT	PN 630	10	43.8	27	13.6	110	9.9	0706702000	24-SDS-S14-N1/2T	1)
S 16	3/8 NPT	PN 400	8	39.2	27	10.4	55	8.4	0706762000	24-SDS-S16-N3/8T	
S 16	1/2 NPT	PN 400	12	43.8	27	13.6	110	9.4	0706752000	24-SDS-S16-N1/2T	1)
S 16	3/4 NPT	PN 400	12	44	30	13.9	175	13.5	0706772000	24-SDS-S16-N3/4T	
S 20	1/2 NPT	PN 400	14	47.8	32	13.6	110	12.7	0706812000	24-SDS-S20-N1/2T	
S 20	3/4 NPT	PN 400	16	48.1	32	13.9	175	14.9	0706802000	24-SDS-S20-N3/4T	1)
S 20	1 NPT	PN 400	16	55	36	17.3	265	25.0	0706822000	24-SDS-S20-N1T	
S 25	3/4 NPT	PN 400	18	52.1	41	13.9	175	22.7	0706862000	24-SDS-S25-N3/4T	
S 25	1 NPT	PN 400	20	57	41	17.3	265	28.1	0706852000	24-SDS-S25-N1T	1)
S 30	1 NPT	PN 400	22	59	46	17.3	265	32.2	0706912000	24-SDS-S30-N1T	
S 30	1 1/4 NPT	PN 400	23	59.6	46	18	315	39.3	0706902000	24-SDS-S30-N11/4T	1)
S 38	1 1/2 NPT	PN 315	32	65	55	18.4	385	57.2	0706952000	24-SDS-S38-N11/2T	1)

1) Standard size

Male stud connectors

Male thread: Metric fine thread, cylindrical
Threaded stud: ISO 9974-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d7	dx	lg	l2	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	M 10 x 1	PN 500	13.9	4	23.5	8.5	14	8	15	1.4	0784392000	24-SDS-L6-M10E	1)
L 6	M 12 x 1	PN 500	16.9	4	27	10	17	10	25	2.8	1785662000	24-SDS-L6-M12x1E	
L 6	M 12 x 1.5	PN 500	16.9	4	29	10	17	12	25	2.3	1784612000	24-SDS-L6-M12E	
L 6	M 14 x 1.5	PN 500	18.9	4	29	10	19	12	50	3.4	1785682000	24-SDS-L6-M14E	
L 6	M 16 x 1.5	PN 400	21.9	4	30.5	11.5	22	12	70	3.4	1785442000	24-SDS-L6-M16E	
L 6	M 18 x 1.5	PN 400	23.9	4	30.5	11.5	24	12	90	3.6	1785462000	24-SDS-L6-M18E	
L 8	M 10 x 1	PN 500	13.9	4	24.5	9.5	14	8	15	1.6	1784442000	24-SDS-L8-M10E	
L 8	M 12 x 1.5	PN 500	16.9	6	29	10	17	12	25	2.1	0784402000	24-SDS-L8-M12E	1)
L 8	M 14 x 1.5	PN 500	18.9	6	29	10	19	12	50	2.8	0784112000	24-SDS-L8-M14E	
L 8	M 16 x 1.5	PN 400	21.9	6	30.5	11.5	22	12	70	4.1	1784862000	24-SDS-L8-M16E	
L 8	M 18 x 1.5	PN 400	23.9	6	30.5	11.5	24	12	90	5.0	1798492000	24-SDS-L8-M18E	
L 8	M 20 x 1.5	PN 400	25.9	6	33.5	12.5	27	14	130	7.7	1784532000	24-SDS-L8-M20E	
L 8	M 22 x 1.5	PN 400	26.9	6	34	13	27	14	130	5.5	1785552000	24-SDS-L8-M22E	
L 10	M 10 x 1	PN 500	13.9	4	25.5	10.5	17	8	15	2.3	1785982000	24-SDS-L10-M10E	
L 10	M 12 x 1	PN 500	16.9	6	28	11	17	10	25	2.6	1795042000	24-SDS-L10-M12x1E	
L 10	M 12 x 1.5	PN 500	16.9	6	30	11	17	12	25	2.4	1784622000	24-SDS-L10-M12E	2)
L 10	M 14 x 1.5	PN 500	18.9	7	30	11	19	12	50	2.9	0784412000	24-SDS-L10-M14E	1)
L 10	M 16 x 1.5	PN 400	21.9	7	31.5	12.5	22	12	70	4.2	1784602000	24-SDS-L10-M16E	
L 10	M 18 x 1.5	PN 400	23.9	8	31.5	12.5	24	12	90	4.9	0784042000	24-SDS-L10-M18E	
L 10	M 22 x 1.5	PN 400	26.9	8	35	14	27	14	130	8.0	1784872000	24-SDS-L10-M22E	
L 12	M 10 x 1	PN 400	13.9	4	27	12	19	8	15	2.7	1784892000	24-SDS-L12-M10E	
L 12	M 12 x 1.5	PN 400	16.9	6	31.5	12.5	19	12	25	3.0	1784852000	24-SDS-L12-M12E	
L 12	M 14 x 1.5	PN 400	18.9	7	30	11	19	12	50	2.9	1784402000	24-SDS-L12-M14E	
L 12	M 16 x 1.5	PN 400	21.9	9	31.5	12.5	22	12	70	3.9	0784422000	24-SDS-L12-M16E	1)
L 12	M 18 x 1.5	PN 400	23.9	9	31.5	12.5	24	12	90	4.4	1784482000	24-SDS-L12-M18E	
L 12	M 22 x 1.5	PN 400	26.9	9	35	14	27	14	130	6.4	1784492000	24-SDS-L12-M22E	
L 12	M 26 x 1.5	PN 250	31.9	10	37	14	32	16	180	10.0	1785532000	24-SDS-L12-M26E	
L 15	M 12 x 1.5	PN 400	16.9	6	32	13	24	12	25	4.8	1796032000	24-SDS-L15-M12E	
L 15	M 16 x 1.5	PN 400	21.9	9	32	13	24	12	70	4.8	1784562000	24-SDS-L15-M16E	
L 15	M 18 x 1.5	PN 400	23.9	11	32.5	13.5	24	12	90	5.1	0784432000	24-SDS-L15-M18E	1)
L 15	M 22 x 1.5	PN 400	26.9	12	36	15	27	14	130	7.1	1784502000	24-SDS-L15-M22E	
L 15	M 26 x 1.5	PN 250	31.9	12	38	15	32	16	180	11.3	1784542000	24-SDS-L15-M26E	

1) Standard size

2) Special sizes only on request

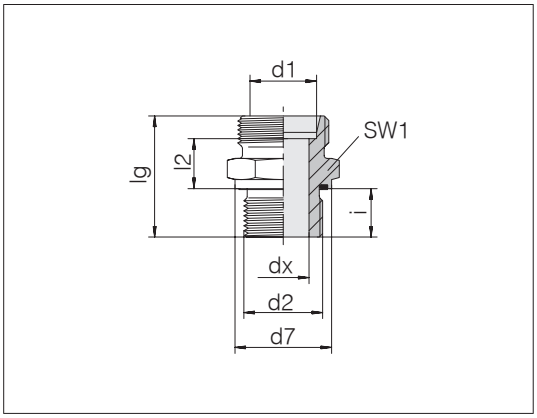
Example for comp.:
GE06LMEDOMD
ISO 8434-1-SDS-L6xM10x1-E-St

Continued on following page

Male stud connectors

Male thread: Metric fine thread, cylindrical
Threaded stud: ISO 9974-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d7	dx	lg	l2	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 18	M 18 x 1.5	PN 400	23.9	11	33.5	14	27	12	90	6.5	1784452000	24-SDS-L18-M18E	
L 18	M 22 x 1.5	PN 400	26.9	14	36	14.5	27	14	130	7.4	0784442000	24-SDS-L18-M22E	1)
L 18	M 26 x 1.5	PN 250	31.9	15	38	14.5	32	16	180	9.4	1784472000	24-SDS-L18-M26E	
L 18	M 27 x 2	PN 250	31.9	15	43	19.5	32	16	180	14.8	1796872000	24-SDS-L18-M27E	
L 18	M 33 x 2	PN 250	39.9	15	41	15.5	41	18	230	16.0	1798222000	24-SDS-L18-M33E	
L 22	M 18 x 1.5	PN 250	23.9	11	35.5	16	32	12	90	9.0	1785252000	24-SDS-L22-M18E	
L 22	M 22 x 1.5	PN 250	26.9	14	38	16.5	32	14	130	9.0	1784462000	24-SDS-L22-M22E	
L 22	M 26 x 1.5	PN 250	31.9	18	40	16.5	32	16	180	10.1	0784452000	24-SDS-L22-M26E	1)
L 22	M 27 x 2	PN 250	31.9	18	40	16.5	32	16	180	10.8	1798422000	24-SDS-L22-M27E	
L 22	M 33 x 2	PN 250	39.9	19	43	17.5	41	18	230	18.6	1784732000	24-SDS-L22-M33E	
L 28	M 18 x 1.5	PN 250	23.9	11	36.5	17	41	12	90	12.9	1785452000	24-SDS-L28-M18E	
L 28	M 22 x 1.5	PN 250	26.9	14	39	17.5	41	14	130	13.7	1784802000	24-SDS-L28-M22E	
L 28	M 26 x 1.5	PN 250	31.9	18	43	19.5	41	16	180	16.2	1784592000	24-SDS-L28-M26E	
L 28	M 33 x 2	PN 250	39.9	23	43	17.5	41	18	230	16.4	0784462000	24-SDS-L28-M33E	1)
L 28	M 42 x 2	PN 250	49.9	23	46	18.5	50	20	330	32.2	1784512000	24-SDS-L28-M42E	
L 35	M 33 x 2	PN 250	39.9	23	46	17.5	46	18	230	21.7	1784392000	24-SDS-L35-M33E	
L 35	M 42 x 2	PN 250	49.9	30	48	17.5	50	20	330	27.3	0784472000	24-SDS-L35-M42E	1)
L 42	M 42 x 2	PN 250	49.9	30	50	19	55	20	330	33.6	1784782000	24-SDS-L42-M42E	
L 42	M 48 x 2	PN 250	54.9	36	52	19	55	22	500	34.6	0784482000	24-SDS-L42-M48E	1)

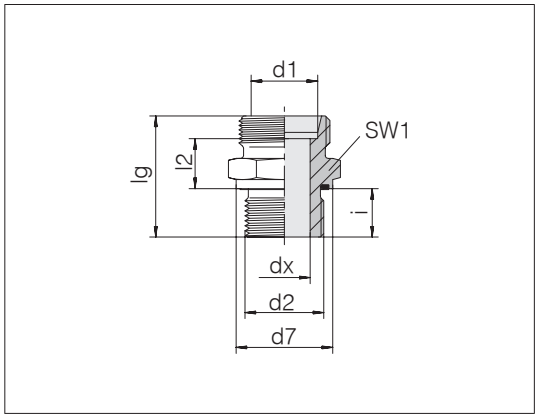
1) Standard size

Continued on following page

Male stud connectors

Male thread: Metric fine thread, cylindrical
Threaded stud: ISO 9974-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



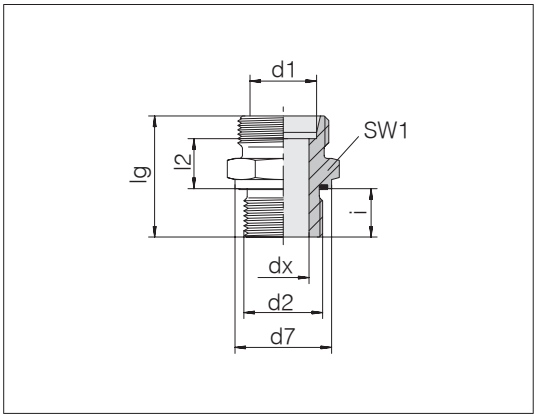
Series Tube OD d1	d2	Pressure	d7	dx	lg	l2	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
S 6	M 12 x 1.5	PN 800	16.9	4	32	13	17	12	50	2.9	0784492000	24-SDS-S6-M12E	1)
S 8	M 12 x 1.5	PN 800	16.9	4	34	15	17	12	50	3.8	1785602000	24-SDS-S8-M12E	
S 8	M 14 x 1.5	PN 800	18.9	5	34	15	19	12	60	4.1	0784502000	24-SDS-S8-M14E	1)
S 8	M 18 x 1.5	PN 630	23.9	5	36.5	17.5	24	12	90	6.5	1785432000	24-SDS-S8-M18E	
S 8	M 22 x 1.5	PN 630	26.9	5	41	20	27	14	130	10.4	1785342000	24-SDS-S8-M22E	
S 10	M 12 x 1.5	PN 800	16.9	4	34.5	15	19	12	50	4.5	1796512000	24-SDS-S10-M12E	
S 10	M 16 x 1.5	PN 800	21.9	7	34.5	15	22	12	80	5.3	0784512000	24-SDS-S10-M16E	1)
S 10	M 18 x 1.5	PN 630	23.9	7	36.5	17	24	12	90	7.6	1785672000	24-SDS-S10-M18E	
S 12	M 12 x 1.5	PN 630	16.9	4	36	16.5	22	12	50	5.2	1785592000	24-SDS-S12-M12E	
S 12	M 14 x 1.5	PN 630	18.9	5	36	16.5	22	12	60	6.2	1796332000	24-SDS-S12-M14E	
S 12	M 16 x 1.5	PN 630	21.9	7	36	16.5	22	12	80	6.9	1785172000	24-SDS-S12-M16E	
S 12	M 18 x 1.5	PN 630	23.9	8	36.5	17	24	12	90	7.1	0784522000	24-SDS-S12-M18E	1)
S 12	M 20 x 1.5	PN 630	25.9	8	39	17.5	27	14	130	10.0	1795192000	24-SDS-S12-M20E	
S 12	M 22 x 1.5	PN 630	26.9	8	39	17.5	27	14	130	10.2	1784832000	24-SDS-S12-M22E	
S 14	M 18 x 1.5	PN 630	23.9	8	39	19	24	12	90	7.7	1784672000	24-SDS-S14-M18E	
S 14	M 20 x 1.5	PN 630	25.9	10	41	19	27	14	130	9.4	0784532000	24-SDS-S14-M20E	1)
S 16	M 16 x 1.5	PN 630	21.9	7	39	18.5	27	12	80	8.4	1785372000	24-SDS-S16-M16E	
S 16	M 18 x 1.5	PN 630	23.9	10	38.5	18	27	12	90	8.1	0784062000	24-SDS-S16-M18E-ID10	
S 16	M 22 x 1.5	PN 630	26.9	12	41	18.5	27	14	130	9.6	0784542000	24-SDS-S16-M22E	1)
S 16	M 27 x 2	PN 420	31.9	12	45	20.5	32	16	200	15.7	1784682000	24-SDS-S16-M27E	
S 20	M 22 x 1.5	PN 420	26.9	12	45	20.5	32	14	130	13.9	0784022000	24-SDS-S20-M22E	
S 20	M 26 x 1.5	PN 420	31.9	16	47	20.5	32	16	190	16.3	1785782000	24-SDS-S20-M26E	
S 20	M 27 x 2	PN 420	31.9	16	47	20.5	32	16	200	15.1	0784552000	24-SDS-S20-M27E	1)
S 25	M 26 x 1.5	PN 420	31.9	16	51	23	41	16	190	25.0	1798432000	24-SDS-S25-M26E	
S 25	M 27 x 2	PN 420	31.9	16	51	23	41	16	200	23.7	1784792000	24-SDS-S25-M27E	
S 25	M 33 x 2	PN 420	39.9	20	53	23	41	18	250	26.5	0784562000	24-SDS-S25-M33E	1)
S 30	M 33 x 2	PN 420	39.9	20	55	23.5	46	18	250	34.9	1796342000	24-SDS-S30-M33E	
S 30	M 42 x 2	PN 420	49.9	25	57	23.5	50	20	500	41.7	0784572000	24-SDS-S30-M42E	1)
S 38	M 48 x 2	PN 420	54.9	32	64	26	55	22	600	56.4	0784582000	24-SDS-S38-M48E	1)

1) Standard size

Male stud connectors

Male thread: BSPP thread, cylindrical
Threaded stud: ISO 1179-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d7	dx	lg	l2	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	G 1/8 A	PN 500	13.9	4	23.5	8.5	14	8	20	1.3	0784192000	24-SDS-L6-G1/8E	1)
L 6	G 1/4 A	PN 500	18.9	4	29	10	19	12	50	2.7	1784082000	24-SDS-L6-G1/4E	
L 6	G 3/8 A	PN 400	21.9	4	30.5	11.5	22	12	80	3.8	1784942000	24-SDS-L6-G3/8E	
L 8	G 1/8 A	PN 500	13.9	4	24.5	9.5	14	8	20	1.5	1784222000	24-SDS-L8-G1/8E	
L 8	G 1/4 A	PN 500	18.9	6	29	10	19	12	50	2.7	0784202000	24-SDS-L8-G1/4E	1)
L 8	G 3/8 A	PN 400	21.9	6	30.5	11.5	22	12	80	4.4	1784232000	24-SDS-L8-G3/8E	
L 8	G 1/2 A	PN 400	26.9	6	33	12	27	14	100	7.2	1784912000	24-SDS-L8-G1/2E	
L 8	G 3/4 A	PN 250	31.9	6	36	13	32	16	180	10.0	1785762000	24-SDS-L8-G3/4E	
L 10	G 1/8 A	PN 500	13.9	4	25.5	10.5	17	8	20	2.0	1784932000	24-SDS-L10-G1/8E	
L 10	G 1/4 A	PN 500	18.9	6	30	11	19	12	50	2.9	0784212000	24-SDS-L10-G1/4E	1)
L 10	G 3/8 A	PN 400	21.9	8	31.5	12.5	22	12	80	4.2	1784172000	24-SDS-L10-G3/8E	
L 10	G 1/2 A	PN 400	26.9	8	34	13	27	14	100	6.3	1784182000	24-SDS-L10-G1/2E	
L 12	G 1/4 A	PN 400	18.9	6	31.5	12.5	19	12	50	3.2	0784102000	24-SDS-L12-G1/4E	
L 12	G 3/8 A	PN 400	21.9	9	31.5	12.5	22	12	80	4.2	0784222000	24-SDS-L12-G3/8E	1)
L 12	G 1/2 A	PN 400	26.9	10	34	13	27	14	100	6.7	0784122000	24-SDS-L12-G1/2E	
L 12	G 3/4 A	PN 250	31.9	10	37	14	32	16	180	11.7	1784212000	24-SDS-L12-G3/4E	
L 15	G 1/4 A	PN 400	18.9	6	32	13	24	12	50	3.9	1785642000	24-SDS-L15-G1/4E	
L 15	G 3/8 A	PN 400	21.9	9	32.5	13.5	24	12	80	5.1	1784072000	24-SDS-L15-G3/8E	
L 15	G 1/2 A	PN 400	26.9	11	35	14	27	14	100	7.1	0784232000	24-SDS-L15-G1/2E	1)
L 15	G 3/4 A	PN 250	31.9	12	38	15	32	16	180	11.7	1784192000	24-SDS-L15-G3/4E	
L 15	G 1 A	PN 250	39.9	11	41	16	41	18	230	22.8	1796972000	24-SDS-L15-G1E	
L 18	G 3/8 A	PN 400	21.9	9	33.5	14	27	12	80	6.6	1784922000	24-SDS-L18-G3/8E	
L 18	G 1/2 A	PN 400	26.9	14	36	14.5	27	14	100	7.0	0784242000	24-SDS-L18-G1/2E	1)
L 18	G 3/4 A	PN 250	31.9	15	38	14.5	32	16	180	10.9	1784282000	24-SDS-L18-G3/4E	
L 18	G 1 A	PN 250	39.9	15	41	15.5	41	18	230	16.7	1785972000	24-SDS-L18-G1E	
L 18	G 1 1/4 A	PN 250	49.9	15	44	16.5	50	20	330	37.9	1796842000	24-SDS-L18-G11/4E	
L 22	G 3/8 A	PN 250	21.9	9	35.5	16	32	12	80	9.2	1794562000	24-SDS-L22-G3/8E	
L 22	G 1/2 A	PN 250	26.9	14	38	16.5	32	14	100	8.7	1784162000	24-SDS-L22-G1/2E	
L 22	G 3/4 A	PN 250	31.9	18	40	16.5	32	16	180	10.2	0784252000	24-SDS-L22-G3/4E	1)
L 22	G 1 A	PN 250	39.9	19	43	17.5	41	18	230	18.4	1784712000	24-SDS-L22-G1E	
L 22	G 1 1/4 A	PN 250	49.9	19	46	18.5	50	20	330	37.5	1785132000	24-SDS-L22-G11/4E	

1) Standard size

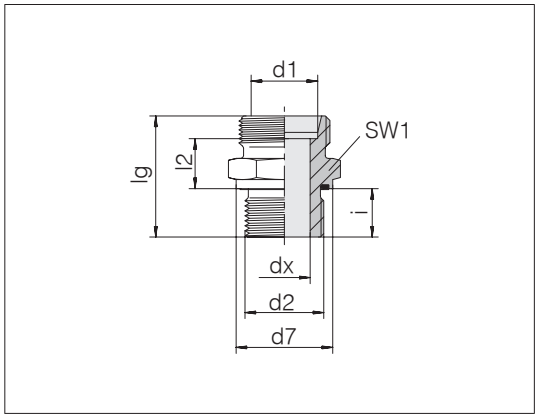
Example for comp. :
GE06LREDOMD
ISO 8434-1-SDS-L6xG1/8A-E-St

Continued on following page

Male stud connectors

Male thread: BSPP thread, cylindrical
Threaded stud: ISO 1179-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d7	dx	lg	l2	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 28	G 3/4 A	PN 250	31.9	18	41	17.5	41	16	180	14.6	1784122000	24-SDS-L28-G3/4E	
L 28	G 1 A	PN 250	39.9	23	43	17.5	41	18	230	16.5	0784262000	24-SDS-L28-G1E	1)
L 28	G 1 1/4 A	PN 250	49.9	23	46	18.5	50	20	330	25.2	1784902000	24-SDS-L28-G11/4E	
L 35	G 1 A	PN 250	39.9	23	46	17.5	46	18	230	23.8	1784362000	24-SDS-L35-G1E	
L 35	G 1 1/4 A	PN 250	49.9	30	48	17.5	50	20	330	27.1	0784272000	24-SDS-L35-G11/4E	1)
L 35	G 1 1/2 A	PN 250	54.9	30	52	19.5	55	22	500	37.4	1785612000	24-SDS-L35-G11/2E	
L 42	G 1 1/4 A	PN 250	49.9	30	50	19	55	20	330	33.6	1785652000	24-SDS-L42-G11/4E	
L 42	G 1 1/2 A	PN 250	54.9	36	52	19	55	22	500	34.3	0784282000	24-SDS-L42-G11/2E	1)
S 6	G 1/4 A	PN 800	18.9	4	32	13	19	12	60	3.5	0784292000	24-SDS-S6-G1/4E	1)
S 6	G 3/8 A	PN 800	21.9	4	34.5	15.5	22	12	90	6.0	1784052000	24-SDS-S6-G3/8E	
S 6	G 1/2 A	PN 630	26.9	4	39	18	27	14	150	8.6	1784252000	24-SDS-S6-G1/2E	
S 8	G 1/4 A	PN 800	18.9	5	34	15	19	12	60	4.1	0784302000	24-SDS-S8-G1/4E	1)
S 8	G 3/8 A	PN 800	21.9	5	34.5	15.5	22	12	90	5.7	1784132000	24-SDS-S8-G3/8E	
S 8	G 1/2 A	PN 630	26.9	5	39	18	27	14	150	9.5	1785942000	24-SDS-S8-G1/2E	
S 10	G 1/4 A	PN 800	18.9	5	34	14.5	19	12	60	4.2	0784152000	24-SDS-S10-G1/4E	
S 10	G 3/8 A	PN 800	21.9	7	34.5	15	22	12	90	5.5	0784312000	24-SDS-S10-G3/8E	1)
S 10	G 1/2 A	PN 630	26.9	7	39	17.5	27	14	150	8.9	1784242000	24-SDS-S10-G1/2E	
S 12	G 1/4 A	PN 630	18.9	5	36	16.5	22	12	60	5.6	1784142000	24-SDS-S12-G1/4E	
S 12	G 3/8 A	PN 630	21.9	8	36.5	17	22	12	90	6.2	0784322000	24-SDS-S12-G3/8E	1)
S 12	G 1/2 A	PN 630	26.9	8	39	17.5	27	14	150	9.1	0784172000	24-SDS-S12-G1/2E	
S 12	G 3/4 A	PN 420	31.9	8	43	19.5	32	16	200	13.4	1784152000	24-SDS-S12-G3/4E	
S 14	G 3/8 A	PN 630	21.9	8	39	19	24	12	90	8.3	1785922000	24-SDS-S14-G3/8E	
S 14	G 1/2 A	PN 630	26.9	10	41	19	27	14	150	9.6	0784332000	24-SDS-S14-G1/2E	1)
S 14	G 3/4 A	PN 630	31.9	16	45	21	32	16	200	14.7	7009362400	24-SDS-S14-G3/4E	
S 16	G 1/4 A	PN 630	18.9	5	38	17.5	27	12	60	8.4	1785302000	24-SDS-S16-G1/4E	
S 16	G 3/8 A	PN 630	21.9	8	38.5	18	27	12	90	8.1	1784092000	24-SDS-S16-G3/8E	
S 16	G 1/2 A	PN 630	26.9	12	41	18.5	27	14	150	9.2	0784342000	24-SDS-S16-G1/2E	1)
S 16	G 3/4 A	PN 420	31.9	12	45	20.5	32	16	200	13.8	1784262000	24-SDS-S16-G3/4E	
S 16	G 1 A	PN 420	39.9	12	49	22.5	41	18	250	23.7	1784722000	24-SDS-S16-G1E	

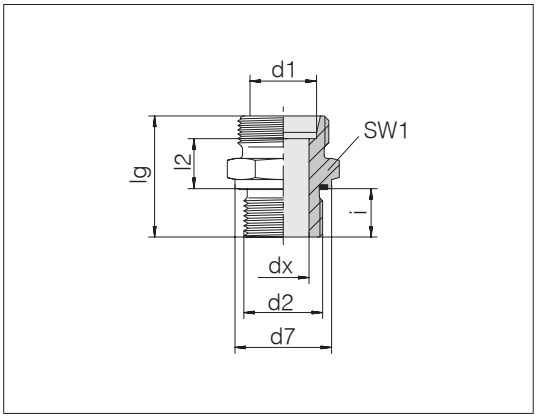
1) Standard size

Continued on following page

Male stud connectors

Male thread: BSPP thread, cylindrical
Threaded stud: ISO 1179-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



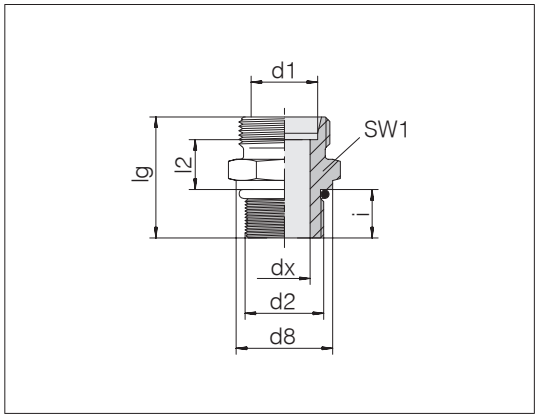
Series Tube OD d1	d2	Pressure	d7	dx	lg	l2	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
S 20	G 1/2 A	PN 420	26.9	12	45	20.5	32	14	150	13.5	1784062000	24-SDS-S20-G1/2E	
S 20	G 3/4 A	PN 420	31.9	16	47	20.5	32	16	200	14.9	0784352000	24-SDS-S20-G3/4E	1)
S 20	G 1 A	PN 420	39.9	16	51	22.5	41	18	250	25.0	1784382000	24-SDS-S20-G1E	
S 25	G 1/2 A	PN 420	26.9	12	49	23	41	14	150	23.9	1785632000	24-SDS-S25-G1/2E	
S 25	G 3/4 A	PN 420	31.9	16	51	23	41	16	200	23.7	0784032000	24-SDS-S25-G3/4E	
S 25	G 1 A	PN 420	39.9	20	53	23	41	18	250	26.3	0784362000	24-SDS-S25-G1E	1)
S 25	G 1 1/4 A	PN 420	49.9	20	55	23	50	20	500	46.7	1785772000	24-SDS-S25-G11/4E	
S 30	G 3/4 A	PN 420	31.9	16	53	23.5	46	16	200	31.7	1785712000	24-SDS-S30-G3/4E	
S 30	G 1 A	PN 420	39.9	20	55	23.5	46	18	250	33.0	1784112000	24-SDS-S30-G1E	
S 30	G 1 1/4 A	PN 420	49.9	25	57	23.5	50	20	500	41.9	0784372000	24-SDS-S30-G11/4E	1)
S 30	G 1 1/2 A	PN 420	54.9	25	62	26.5	55	22	600	64.0	1785962000	24-SDS-S30-G11/2E	
S 38	G 3/4 A	PN 420	31.9	16	58	26	55	16	200	50.1	1785902000	24-SDS-S38-G3/4E	
S 38	G 1 A	PN 420	39.9	20	60	26	55	18	250	44.9	1785702000	24-SDS-S38-G1E	
S 38	G 1 1/4 A	PN 420	49.9	25	62	26	55	20	500	55.5	1785212000	24-SDS-S38-G11/4E	
S 38	G 1 1/2 A	PN 420	54.9	32	64	26	55	22	600	55.9	0784382000	24-SDS-S38-G11/2E	1)

1) Standard size

Male stud connectors

Male thread: UN/UNF, cylindrical
Threaded stud: ISO 11926-2/3
Sealing type: O-Ring (Form F)
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d8	dx	lg	l2	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation
L 6	7/16-20 UNF-2A	PN 500	15.8	4	25	8.8	17	9.2	25	1.9	0782402000	24-SDS-L6-U7/16-20F
L 6	9/16-18 UNF-2A	PN 500	17.7	4	27	10	19	10	30	2.5	1782572000	24-SDS-L6-U9/16-18F
L 8	7/16-20 UNF-2A	PN 500	15.8	5	26.5	10.3	17	9.2	25	2.1	0782412000	24-SDS-L8-U7/16-20F
L 8	1/2-20 UNF-2A	PN 500	16.2	6	26.5	10.3	17	9.2	28	2.2	0782422000	24-SDS-L8-U1/2-20F
L 8	9/16-18 UNF-2A	PN 500	17.7	6	27	10	19	10	30	2.8	0782432000	24-SDS-L8-U9/16-18F
L 8	3/4-16 UNF-2A	PN 400	23	6	30	11.8	24	11.2	55	4.3	1782502000	24-SDS-L8-U3/4-16F
L 10	7/16-20 UNF-2A	PN 500	15.8	5	28	11.8	17	9.2	25	2.4	0782962000	24-SDS-L10-U7/16-20F
L 10	9/16-18 UNF-2A	PN 500	17.7	7	28	11	19	10	30	2.8	0782442000	24-SDS-L10-U9/16-18F
L 10	3/4-16 UNF-2A	PN 400	23	8	31	12.8	24	11.2	55	4.4	1782512000	24-SDS-L10-U3/4-16F
L 10	7/8-14 UNF-2A	PN 400	27	7	32.5	12.8	27	12.7	60	7.6	0782452000	24-SDS-L10-U7/8-14F
L 12	7/16-20 UNF-2A	PN 400	15.8	5	28.5	12.3	19	9.2	25	2.6	0782492000	24-SDS-L12-U7/16-20F
L 12	1/2-20 UNF-2A	PN 400	16.8	6	28.5	12.4	19	9.2	28	3.0	1782562000	24-SDS-L12-U1/2-20F
L 12	9/16-18 UNF-2A	PN 400	17.7	7	29.5	12.5	19	10	30	3.2	0782462000	24-SDS-L12-U9/16-18F
L 12	3/4-16 UNF-2A	PN 400	23	9	31	12.8	24	11.2	55	4.5	0782482000	24-SDS-L12-U3/4-16F
L 12	7/8-14 UNF-2A	PN 400	27	10	32.5	12.8	27	12.7	60	7.0	0782502000	24-SDS-L12-U7/8-14F
L 15	9/16-18 UNF-2A	PN 400	17.7	7	31	14	24	10	30	4.8	0782512000	24-SDS-L15-U9/16-18F
L 15	3/4-16 UNF-2A	PN 400	23	11	32	13.8	24	11.2	55	5.4	0782522000	24-SDS-L15-U3/4-16F
L 15	7/8-14 UNF-2A	PN 400	27	11	33.7	14	27	12.7	60	7.5	0782532000	24-SDS-L15-U7/8-14F
L 15	1 1/16-12 UN-2A	PN 400	32	12	37	15	32	15	110	11.7	1782482000	24-SDS-L15-U11/16-12F
L 15	1 5/16-12 UN-2A	PN 250	38.1	12	37	15	41	15	165	18.7	1782452000	24-SDS-L15-U15/16-12F
L 18	3/4-16 UNF-2A	PN 400	23	12	33	14.3	27	11.2	55	6.6	0782542000	24-SDS-L18-U3/4-16F
L 18	7/8-14 UNF-2A	PN 400	27	14	34.7	14.5	27	12.7	60	7.4	0782552000	24-SDS-L18-U7/8-14F
L 18	1 1/16-12 UN-2A	PN 400	32	15	37	14.5	32	15	110	9.6	0782902000	24-SDS-L18-U11/16-12F
L 18	1 5/16-12 UN-2A	PN 250	38.1	15	37	14.5	41	15	165	18.3	1782472000	24-SDS-L18-U15/16-12F
L 22	7/8-14 UNF-2A	PN 250	27	12	36.7	16.5	32	12.7	60	9.8	0782562000	24-SDS-L22-U7/8-14F
L 22	1 1/16-12 UN-2A	PN 250	32	18	39	16.5	32	15	110	10.2	0782572000	24-SDS-L22-U11/16-12F
L 22	1 5/16-12 UN-2A	PN 250	38.1	18	39	16.5	41	15	165	17.3	0782582000	24-SDS-L22-U15/16-12F
L 22	1 5/8-12 UN-2A	PN 250	48	19	40	17.5	50	15	220	28.7	1782462000	24-SDS-L22-U15/8-12F

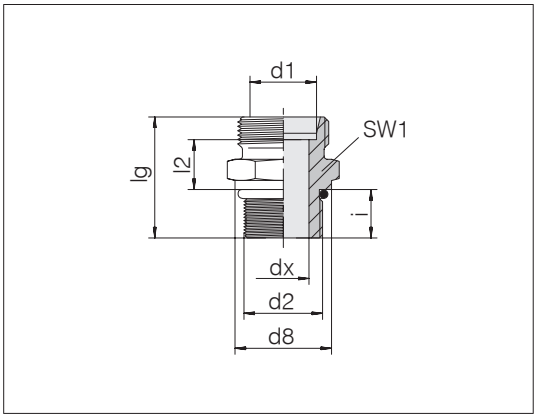
Example for comp. :
GE06L7/16UNFOMD

Continued on following page

Male stud connectors

Male thread: UN/UNF, cylindrical
Threaded stud: ISO 11926-2/3
Sealing type: O-Ring (Form F)
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



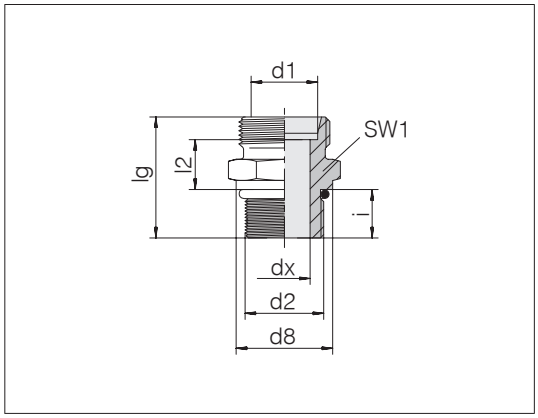
Series Tube OD d1	d2	Pressure	d8	dx	lg	l2	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation
L 28	7/8-14 UNF-2A	PN 250	27	12	38	17.8	41	12.7	60	13.7	0782872000	24-SDS-L28-U7/8-14F
L 28	1 1/16-12 UN-2A	PN 250	32	18	40	17.5	41	15	110	14.3	0782592000	24-SDS-L28-U11/16-12F
L 28	1 5/16-12 UN-2A	PN 250	38.1	23	40	17.5	41	15	165	16.2	0782602000	24-SDS-L28-U15/16-12F
L 28	1 5/8-12 UN-2A	PN 250	48	24	40	17.5	50	15	220	26.4	0782922000	24-SDS-L28-U15/8-12F
L 35	1 3/16-12 UN-2A	PN 250	35	20	43	17.5	46	15	140	20.3	0782912000	24-SDS-L35-U13/16-12F
L 35	1 5/16-12 UN-2A	PN 250	39	23	43	17.5	46	15	165	21.1	0782612000	24-SDS-L35-U15/16-12F
L 35	1 5/8-12 UN-2A	PN 250	48	30	43	17.5	50	15	220	24.9	0782842000	24-SDS-L35-U15/8-12F
L 35	1 7/8-12 UN-2A	PN 250	54	30	45	19.5	55	15	260	31.2	0782972000	24-SDS-L35-U17/8-12F
L 42	1 5/8-12 UN-2A	PN 250	48	30	45	19	55	15	220	30.8	0782932000	24-SDS-L42-U15/8-12F
L 42	1 7/8-12 UN-2A	PN 250	54	36	45	19	55	15	260	31.6	0782622000	24-SDS-L42-U17/8-12F
S 6	7/16-20 UNF-2A	PN 800	15.8	4	29	12.8	17	9.2	30	2.7	0782642000	24-SDS-S6-U7/16-20F
S 8	7/16-20 UNF-2A	PN 800	15.8	4	31	14.8	17	9.2	30	3.2	0782882000	24-SDS-S8-U7/16-20F
S 8	1/2-20 UNF-2A	PN 800	16.2	5	31	14.8	17	9.2	45	3.4	0782652000	24-SDS-S8-U1/2-20F
S 8	9/16-18 UNF-2A	PN 800	17.7	5	32	15	19	10	75	4.5	0782632000	24-SDS-S8-U9/16-18F
S 10	9/16-18 UNF-2A	PN 800	17.7	7	32.5	15	19	10	75	4.1	0782662000	24-SDS-S10-U9/16-18F
S 10	3/4-16 UNF-2A	PN 800	23	7	33.7	15	24	11.2	100	6.6	0782672000	24-SDS-S10-U3/4-16F
S 12	9/16-18 UNF-2A	PN 800	17.7	7	34.5	17	22	10	75	5.5	1782422000	24-SDS-S12-U9/16-18F
S 12	3/4-16 UNF-2A	PN 630	23	8	36	17.3	24	11.2	100	7.4	0782692000	24-SDS-S12-U3/4-16F
S 12	7/8-14 UNF-2A	PN 630	27	8	37	16.8	27	12.7	160	9.7	0782702000	24-SDS-S12-U7/8-14F
S 14	9/16-18 UNF-2A	PN 630	17.7	7	37	19	24	10	75	6.8	0782712000	24-SDS-S14-U9/16-18F
S 14	3/4-16 UNF-2A	PN 630	23	10	38	18.8	24	11.2	100	7.6	0782722000	24-SDS-S14-U3/4-16F
S 16	3/4-16 UNF-2A	PN 630	23	12	38	18.3	27	11.2	100	8.1	0782732000	24-SDS-S16-U3/4-16F
S 16	7/8-14 UNF-2A	PN 630	27	12	37.5	16.3	27	12.7	160	8.7	0782742000	24-SDS-S16-U7/8-14F
S 16	1 1/16-12 UN-2A	PN 630	32	12	42	18.5	32	15	270	14.4	0782752000	24-SDS-S16-U11/16-12F
S 20	3/4-16 UNF-2A	PN 420	23	10	42	20.3	32	11.2	100	12.7	0782772000	24-SDS-S20-U3/4-16F
S 20	7/8-14 UNF-2A	PN 420	27	12	43.5	20.3	32	12.7	160	13.8	0782782000	24-SDS-S20-U7/8-14F
S 20	1 1/16-12 UN-2A	PN 420	32	16	46	20.5	32	15	430	15.0	0782792000	24-SDS-S20-U11/16-12F
S 20	1 5/16-12 UN-2A	PN 420	38.1	16	48	22.5	41	15	270	25.0	1782552000	24-SDS-S20-U15/16-12F
S 20	1 5/8-12 UN-2A	PN 420	48	16	48	22.5	50	15	450	36.5	1782412000	24-SDS-S20-U15/8-12F

Continued on following page

Male stud connectors

Male thread: UN/UNF, cylindrical
Threaded stud: ISO 11926-2/3
Sealing type: O-Ring (Form F)
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1

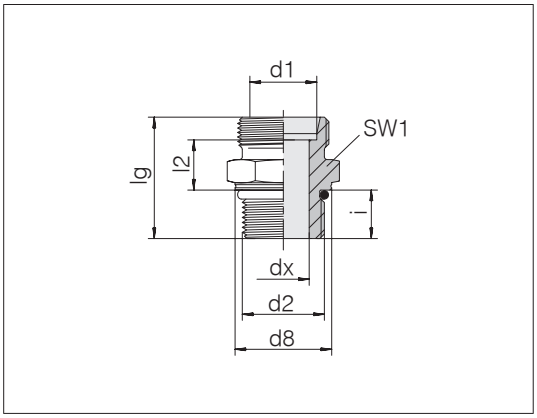


Series Tube OD d1	d2	Pressure	d8	dx	lg	l2	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation
S 25	1 1/16-12 UN-2A	PN 420	32	16	50	23	41	15	270	23.5	0782942000	24-SDS-S25-U11/16-12F
S 25	1 5/16-12 UN-2A	PN 420	38.1	20	50	23	41	15	430	25.7	0782802000	24-SDS-S25-U15/16-12F
S 30	1 1/16-12 UN-2A	PN 420	32	16	52	23.5	46	15	270	30.1	0782812000	24-SDS-S30-U11/16-12F
S 30	1 5/16-12 UN-2A	PN 420	38.1	22	52	23.5	46	15	430	30.7	0782822000	24-SDS-S30-U15/16-12F
S 30	1 5/8-12 UN-2A	PN 420	48	25	52	23.5	50	15	450	38.1	0782852000	24-SDS-S30-U15/8-12F
S 38	1 5/8-12 UN-2A	PN 315	48	25	57	26	55	15	450	51.6	0782952000	24-SDS-S38-U15/8-12F
S 38	1 7/8-12 UN-2A	PN 315	54	32	57	26	55	15	520	51.9	0782832000	24-SDS-S38-U17/8-12F

Male stud connectors

Male thread: Metric fine thread, cylindrical
Threaded stud: ISO 6149-2/3
Sealing type: O-Ring (Form F)
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d8	dx	lg	l2	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	M 10 x 1	PN 500	13.8	4	25	9.5	14	8.5	15	1.5	0746002000	24-SDS-L6-M10F	1)
L 6	M 14 x 1.5	PN 500	18.8	4	28	10	19	11	35	2.6	0746012000	24-SDS-L6-M14F	
L 8	M 10 x 1	PN 500	13.8	4	25.5	10	17	8.5	15	2.1	0746092000	24-SDS-L8-M10F	
L 8	M 12 x 1.5	PN 500	16.8	6	28	10	17	11	25	2.2	0746052000	24-SDS-L8-M12F	1)
L 8	M 14 x 1.5	PN 500	18.8	6	28	10	19	11	35	3.1	0746072000	24-SDS-L8-M14F	
L 8	M 18 x 1.5	PN 400	23.8	6	31	11.5	24	12.5	45	5.1	0746062000	24-SDS-L8-M18F	
L 10	M 10 x 1	PN 500	13.8	4	26.5	11	17	8.5	15	2.3	0746082000	24-SDS-L10-M10F	
L 10	M 12 x 1.5	PN 500	16.8	6	29	11	17	11	25	2.4	0746122000	24-SDS-L10-M12F	
L 10	M 14 x 1.5	PN 500	18.8	7	29	11	19	11	35	2.9	0746102000	24-SDS-L10-M14F	1)
L 10	M 16 x 1.5	PN 400	21.8	8	31	12.5	22	11.5	40	4.0	0746132000	24-SDS-L10-M16F	
L 10	M 18 x 1.5	PN 400	23.8	8	32	12.5	24	12.5	45	5.2	0746142000	24-SDS-L10-M18F	
L 10	M 22 x 1.5	PN 400	26.8	7	34	14	27	13	60	6.6	0746112000	24-SDS-L10-M22F	
L 12	M 12 x 1.5	PN 400	16.8	6	30.5	12.5	19	11	25	3.0	0746162000	24-SDS-L12-M12F	
L 12	M 14 x 1.5	PN 400	18.8	7	31	13	19	11	35	3.2	0746172000	24-SDS-L12-M14F	
L 12	M 16 x 1.5	PN 400	21.8	9	31	12.5	22	11.5	40	4.0	0746152000	24-SDS-L12-M16F	1)
L 12	M 18 x 1.5	PN 400	23.8	9	32	12.5	24	12.5	45	5.1	0746192000	24-SDS-L12-M18F	
L 12	M 22 x 1.5	PN 400	26.8	10	34	14	27	13	60	7.6	0746182000	24-SDS-L12-M22F	
L 12	M 27 x 2	PN 250	31.8	18	37	14	32	16	100	9.8	7007716100	24-SDS-L12-M27F	
L 15	M 14 x 1.5	PN 400	18.8	7	31.5	13.5	24	11	35	4.8	0746212000	24-SDS-L15-M14F	
L 15	M 16 x 1.5	PN 400	21.8	9	32.5	14	22	11.5	40	5.4	0746242000	24-SDS-L15-M16F	
L 15	M 18 x 1.5	PN 400	23.8	11	33	13.5	24	12.5	45	5.2	0746202000	24-SDS-L15-M18F	1)
L 15	M 22 x 1.5	PN 400	26.8	12	35	15	27	13	60	7.7	0746222000	24-SDS-L15-M22F	
L 18	M 18 x 1.5	PN 400	23.8	11	34.5	14.5	27	12.5	45	7.6	0746262000	24-SDS-L18-M18F	
L 18	M 22 x 1.5	PN 400	26.8	14	35	14.5	27	13	60	7.5	0746252000	24-SDS-L18-M22F	1)
L 18	M 30 x 2	PN 400	35.8	21	38	14.5	36	16	130	12.8	7008822600	24-SDS-L18-M30F	
L 22	M 22 x 1.5	PN 400	26.8	14	37	16.5	32	13	60	11.3	0746312000	24-SDS-L22-M22F	
L 22	M 27 x 2	PN 250	31.8	18	40	16.5	32	16	100	10.5	0746302000	24-SDS-L22-M27F	1)
L 22	M 33 x 2	PN 250	40.8	19	41	17.5	41	16	160	18.4	0746322000	24-SDS-L22-M33F	
L 22	M 42 x 2	PN 250	49.8	19	42	18.5	50	16	210	25.7	0746332000	24-SDS-L22-M42F	
L 28	M 22 x 1.5	PN 250	26.8	14	37.5	17	41	13	60	14.8	7009327900	24-SDS-L28-M22F	
L 28	M 27 x 2	PN 250	31.8	18	40	16.5	36	16	100	13.6	0746372000	24-SDS-L28-M27F	
L 28	M 33 x 2	PN 250	40.8	23	41	17.5	41	16	160	16.4	0746352000	24-SDS-L28-M33F	1)

1) Standard size

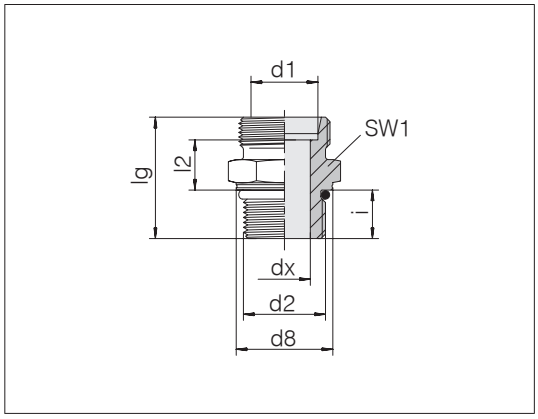
Example for comp. :
GEO06LMOMD
ISO 8434-1-SDS-L6xM10x1-F-St

Continued on following page

Male stud connectors

Male thread: Metric fine thread, cylindrical
Threaded stud: ISO 6149-2/3
Sealing type: O-Ring (Form F)
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



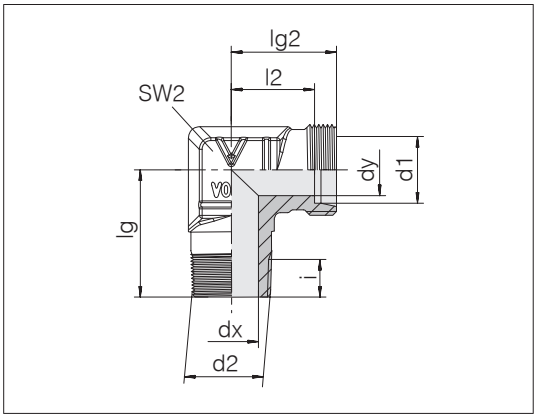
Series Tube OD d1	d2	Pressure	d8	dx	lg	l2	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 35	M 33 x 2	PN 250	40.8	23	44	17.5	46	16	160	25.9	0746422000	24-SDS-L35-M33F	
L 35	M 42 x 2	PN 250	49.8	30	44	17.5	50	16	210	26.5	0746402000	24-SDS-L35-M42F	1)
L 35	M 48 x 2	PN 250	54.8	30	47.5	19.5	55	17.5	260	36.1	0746432000	24-SDS-L35-M48F	
L 42	M 42 x 2	PN 250	49.8	30	46	19	55	16	210	37.4	0746412000	24-SDS-L42-M42F	
L 42	M 48 x 2	PN 250	54.8	36	47.5	19	55	17.5	260	33.0	0746452000	24-SDS-L42-M48F	1)
S 6	M 12 x 1.5	PN 800	16.8	4	31	13	17	11	35	2.9	0746502000	24-SDS-S6-M12F	1)
S 8	M 10 x 1	PN 800	13.8	3	29.5	13	17	9.5	15	3.2	0746572000	24-SDS-S8-M10F	
S 8	M 12 x 1.5	PN 800	16.8	4	33	15	17	11	35	3.9	0746562000	24-SDS-S8-M12F	
S 8	M 14 x 1.5	PN 800	18.8	5	33	15	19	11	40	4.1	0746552000	24-SDS-S8-M14F	1)
S 10	M 16 x 1.5	PN 800	21.8	7	35	15	22	12.5	55	5.5	0746602000	24-SDS-S10-M16F	1)
S 12	M 14 x 1.5	PN 630	18.8	5	35.5	17	22	11	40	5.9	0746672000	24-SDS-S12-M14F	
S 12	M 16 x 1.5	PN 630	21.8	7	35.5	15.5	22	12.5	55	6.0	0746662000	24-SDS-S12-M16F	
S 12	M 18 x 1.5	PN 630	23.8	8	38.5	17	24	14	70	7.5	0746652000	24-SDS-S12-M18F	1)
S 12	M 22 x 1.5	PN 630	26.8	8	40	17.5	27	15	100	11.3	0746682000	24-SDS-S12-M22F	
S 16	M 22 x 1.5	PN 630	26.8	12	42	18.5	27	15	100	9.9	0746752000	24-SDS-S16-M22F	1)
S 16	M 27 x 2	PN 420	31.8	12	47.5	20.5	32	18.5	170	17.1	0746772000	24-SDS-S16-M27F	
S 20	M 22 x 1.5	PN 630	26.8	12	46	20.5	32	15	100	19.0	0746812000	24-SDS-S20-M22F	
S 20	M 27 x 2	PN 420	31.8	15	49.5	20.5	32	18.5	170	16.4	0746802000	24-SDS-S20-M27F	1)
S 20	M 33 x 2	PN 420	40.8	16	51.5	22.5	41	18.5	310	27.4	0746832000	24-SDS-S20-M33F	
S 25	M 27 x 2	PN 420	31.8	15	53	22.5	41	18.5	170	25.7	0746842000	24-SDS-S25-M27F	
S 25	M 33 x 2	PN 420	40.8	20	53.5	23	41	18.5	310	26.9	0746852000	24-SDS-S25-M33F	1)
S 30	M 33 x 2	PN 420	40.8	20	55.5	23.5	46	18.5	310	33.7	0746912000	24-SDS-S30-M33F	
S 30	M 42 x 2	PN 420	49.8	25	56	23.5	50	19	330	49.3	0746902000	24-SDS-S30-M42F	1)
S 38	M 48 x 2	PN 420	54.8	32	63.5	26	55	21.5	420	57.1	0746952000	24-SDS-S38-M48F	1)

1) Standard size

Male stud elbows

Male thread: Metric fine thread, tapered
Threaded stud: DIN 3852-1 Form C
Sealing type: Tapered thread
Sealing material: e.g. PTFE sealing tape

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	dx	dy	lg	lg2	l2	SW2	i	kg/100 ca.	Order-No.	Designation	
LL 4	M 6 x 1 keg	PN 100	2.5	3	17	15	11	9	6	1.0	0713012000	24-SDE-LL4-M6T	
LL 4	M 8 x 1 keg	PN 100	3.5	3	17	15	11	9	6	0.9	0713002000	24-SDE-LL4-M8T	1)
LL 5	M 8 x 1 keg	PN 100	3.5	3.5	17	15	9.5	11	6	1.7	0713052000	24-SDE-LL5-M8T-P	
LL 6	M 6 x 1 keg	PN 100	2.3	4.5	17	15	9.5	11	6	1.5	0713962000	24-SDE-LL6-M6T-P	
LL 6	M 8 x 1 keg	PN 100	3.5	4.5	17	15	9.5	11	6	1.6	0713112000	24-SDE-LL6-M8T-P	
LL 6	M 10 x 1 keg	PN 100	4.5	4.5	17	15	9.5	11	6	1.7	0713102000	24-SDE-LL6-M10T-P	1)
LL 8	M 10 x 1 keg	PN 100	6	6	20	17	11.5	12	6	2.2	0713152000	24-SDE-LL8-M10T-P	1)
L 6	M 10 x 1 keg	PN 315	4	4	20	19	12	12	9	2.9	0714002000	24-SDE-L6-M10T-P	1)
L 8	M 12 x 1.5 keg	PN 315	6	6	26	21	14	14	9	4.3	0714052000	24-SDE-L8-M12T-P	1)
L 10	M 14 x 1.5 keg	PN 315	7	8	27	22	15	17	12	6.2	0714102000	24-SDE-L10-M14T-P	1)
L 12	M 16 x 1.5 keg	PN 315	9	10	28	24	17	19	12	8.5	0714152000	24-SDE-L12-M16T	1)
L 12	M 18 x 1.5 keg	PN 315	11	10	32	28	21	19	9	8.2	0714172000	24-SDE-L12-M18T	
L 15	M 18 x 1.5 keg	PN 315	11	12	32	28	21	19	12	8.3	0714202000	24-SDE-L15-M18T	1)
L 18	M 22 x 1.5 keg	PN 315	14	15	36	31	23.5	24	11	13.0	0714252000	24-SDE-L18-M22T	1)
S 6	M 12 x 1.5 keg	PB 630	4	4	26	23	16	12	12	5.2	0714502000	24-SDE-S6-M12T	1)
S 8	M 14 x 1.5 keg	PB 630	5	5	27	24	17	17	9	7.4	0714552000	24-SDE-S8-M14T-P	1)
S 10	M 16 x 1.5 keg	PB 630	7	7	28	25	17.5	19	9	10.1	0714602000	24-SDE-S10-M16T-P	1)
S 12	M 18 x 1.5 keg	PB 630	8	8	28	29	21.5	22	9	12.9	0714652000	24-SDE-S12-M18T-P	1)
S 14	M 20 x 1.5 keg	PB 630	10	10	32	30	22	19	11	10.4	0714702000	24-SDE-S14-M20T	1)
S 16	M 22 x 1.5 keg	PB 400	12	12	32	33	24.5	24	11	14.5	0714752000	24-SDE-S16-M22T	1)

1) Standard size

Threaded stud in acc. with DIN 3852-1 Form C are approved for use for gas supply in accordance with DIN 3387-1.

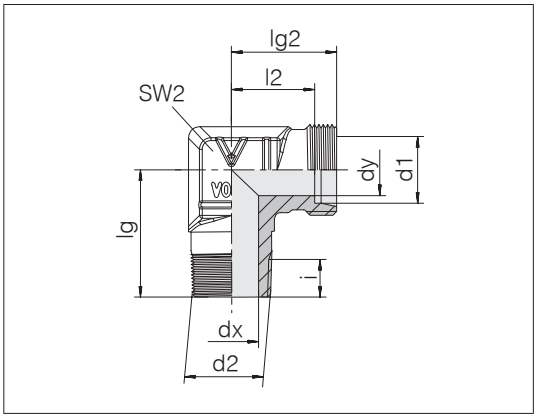
Operating pressure PB 630 only applies if holes with female conical threads are available.

Example for comp. :
WE06LMX
DIN 2353-FL6-St

Male stud elbows

Male thread: BSPT thread, tapered
Threaded stud: DIN 3852-2 Form C
Sealing type: Tapered thread
Sealing material: e.g. PTFE sealing tape

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	dx	dy	lg	lg2	l2	SW2	i	kg/100 ca.	Order-No.	Designation	
LL 4	R 1/8	PN 100	4	3	17	15	11	9	6.2	1.0	0715002000	24-SDE-LL4-R1/8T	1)
LL 5	R 1/8	PN 100	4	3.5	17	15	9.5	11	6.2	1.8	0715052000	24-SDE-LL5-R1/8T-P	1)
LL 6	R 1/8	PN 100	4.5	4.5	17	15	9.5	11	6.2	1.6	0715102000	24-SDE-LL6-R1/8T-P	1)
LL 8	R 1/8	PN 100	6	6	20	17	11.5	12	6.2	2.2	0715152000	24-SDE-LL8-R1/8T-P	1)
L 6	R 1/8	PN 315	4	4	20	19	12	12	6.2	2.7	0716002000	24-SDE-L6-R1/8T-P	1)
L 6	R 1/4	PN 315	7	4	26	21	14	14	9.3	4.5	0716022000	24-SDE-L6-R1/4T-P	
L 6	R 3/8	PN 315	9	4	27	24	17	17	9.3	6.8	0716032000	24-SDE-L6-R3/8T-P	
L 8	R 1/8	PN 315	4	6	26	21	14	14	6.2	4.6	0716062000	24-SDE-L8-R1/8T-P	
L 8	R 1/4	PN 315	6	6	26	21	14	14	9.3	4.8	0716052000	24-SDE-L8-R1/4T-P	1)
L 8	R 3/8	PN 315	8	6	28	22	15	19	9.3	8.8	0716072000	24-SDE-L8-R3/8T-P	
L 10	R 1/8	PN 315	4	7	25	22	15	17	6.2	6.7	0716112000	24-SDE-L10-R1/8T-P	
L 10	R 1/4	PN 315	7	8	27	22	15	17	9.3	5.9	0716102000	24-SDE-L10-R1/4T-P	1)
L 10	R 3/8	PN 315	7	7	28	24	17	19	9.3	9.3	0716122000	24-SDE-L10-R3/8T-P	
L 10	R 1/2	PN 315	11	7	34	27	20	19	10.4	9.6	0716132000	24-SDE-L10-R1/2T	
L 12	R 1/4	PN 315	7	9	28	24	17	19	9.3	8.5	0716162000	24-SDE-L12-R1/4T-P	
L 12	R 3/8	PN 315	9	10	28	24	17	19	9.3	9.1	0716152000	24-SDE-L12-R3/8T-P	1)
L 12	R 1/2	PN 315	11	9	34	27	20	19	10.4	9.7	0716172000	24-SDE-L12-R1/2T	
L 15	R 3/8	PN 315	9	11	32	28	21	19	9.3	9.0	0716212000	24-SDE-L15-R3/8T	
L 15	R 1/2	PN 315	11	12	34	28	21	19	10.4	9.5	0716202000	24-SDE-L15-R1/2T	1)
L 15	R 3/4	PN 160	16	12	42	28.5	21.5	27	12.4	18.6	0716222000	24-SDE-L15-R3/4T	
L 18	R 1/2	PN 315	14	15	36	31	23.5	24	14	12.6	0716252000	24-SDE-L18-R1/2T	1)
L 18	R 3/4	PN 160	18	15	42	35	27.5	27	12.4	20.2	0716272000	24-SDE-L18-R3/4T	
L 22	R 3/4	PN 160	18	19	42	35	27.5	27	12.4	17.3	0716342000	24-SDE-L22-R3/4T	

1) Standard size

Threaded stud in acc. with DIN 3852-2 Form C are approved for use for gas supply in accordance with DIN 3387-1.

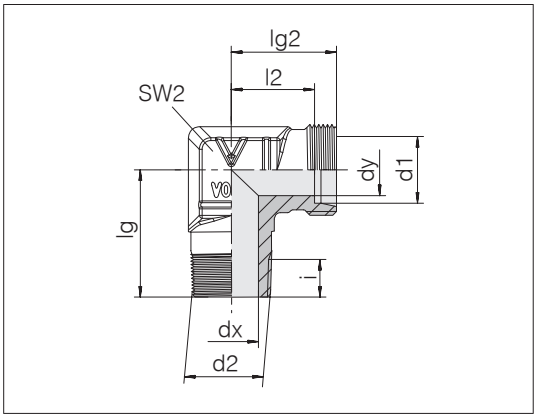
Example for comp. : WE06LRX DIN 2353-GL6-St

Continued on following page

Male stud elbows

Male thread: BSPT thread, tapered
Threaded stud: DIN 3852-2 Form C
Sealing type: Tapered thread
Sealing material: e.g. PTFE sealing tape

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	dx	dy	lg	lg2	l2	SW2	i	kg/100 ca.	Order-No.	Designation	
S 6	R 1/4	PB 630	4	4	26	23	16	14	9.3	5.4	0716502000	24-SDE-S6-R1/4T-P	1)
S 8	R 1/4	PB 630	5	5	27	24	17	17	6.2	7.0	0716552000	24-SDE-S8-R1/4T-P	1)
S 10	R 1/4	PB 630	5	7	27	25	17.5	19	6.2	9.3	0716612000	24-SDE-S10-R1/4T-P	
S 10	R 3/8	PB 630	7	7	28	25	17.5	19	9.3	10.2	0716602000	24-SDE-S10-R3/8T-P	1)
S 10	R 1/2	PB 630	10	7	34	27	19.5	19	14	11.5	0716622000	24-SDE-S10-R1/2T	
S 12	R 3/8	PB 630	8	8	28	29	21.5	22	9.3	12.7	0716652000	24-SDE-S12-R3/8T-P	1)
S 12	R 1/2	PB 630	11	8	34	29	21.5	19	10.4	10.3	0716672000	24-SDE-S12-R1/2T	
S 14	R 1/4	PB 630	7	10	30	30	22	19	9.3	9.3	0716732000	24-SDE-S14-R1/4T	
S 14	R 3/8	PB 630	8	10	30	30	22	19	9.3	9.7	0716712000	24-SDE-S14-R3/8T	
S 14	R 1/2	PB 630	10	10	32	30	22	19	10.4	10.5	0716702000	24-SDE-S14-R1/2T	1)
S 16	R 1/2	PB 400	12	12	32	33	24.5	24	14	13.9	0716752000	24-SDE-S16-R1/2T	1)
S 16	R 3/4	PB 400	16	12	42	33	24.5	27	12.4	18.9	0716772000	24-SDE-S16-R3/4T	
S 20	R 1/2	PB 400	12	16	40	37	26.5	27	10.4	21.6	0716812000	24-SDE-S20-R1/2T	
S 20	R 3/4	PB 400	16	16	42	37	26.5	27	12.4	21.7	0716842000	24-SDE-S20-R3/4T	1)

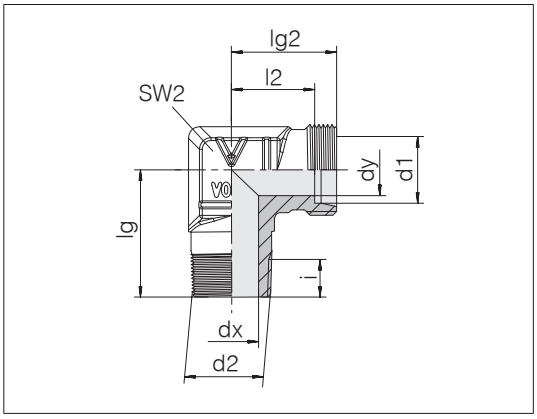
1) Standard size

Operating pressure PB 630 only applies if holes with female conical threads are available.

Male stud elbows

Male thread: NPT thread, tapered
Threaded stud: ASME B1.20.1
Sealing type: Tapered thread
Sealing material: e.g. PTFE sealing tape

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	dx	dy	lg	lg2	l2	SW2	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
LL 4	1/8 NPT	PN 100	3	3	17	15	11	11	6.7	15	1.8	0717002000	24-SDE-LL4-N1/8T-P	1)
LL 6	1/8 NPT	PN 100	4.5	4.5	17	15	9.5	11	6.7	15	1.7	0717102000	24-SDE-LL6-N1/8T-P	1)
LL 8	1/8 NPT	PN 100	6	6	20	17	11.5	12	6.7	15	2.4	0717152000	24-SDE-LL8-N1/8T-P	1)
L 6	1/8 NPT	PN 315	4	4	20	19	12	12	6.7	15	3.0	0718002000	24-SDE-L6-N1/8T-P	1)
L 6	1/4 NPT	PN 315	4	4	26	21	14	14	10.2	35	4.9	0718022000	24-SDE-L6-N1/4T-P	
L 8	1/4 NPT	PN 315	6	6	26	21	14	14	10.2	35	4.7	0718052000	24-SDE-L8-N1/4T-P	1)
L 10	1/4 NPT	PN 315	7	7	27	22	15	17	10.2	35	6.2	0718102000	24-SDE-L10-N1/4T-P	1)
L 10	3/8 NPT	PN 315	9	8	28	24	17	19	10.4	55	9.1	0718122000	24-SDE-L10-N3/8T-P	
L 12	1/4 NPT	PN 315	7	9	28	24	17	19	10.2	35	8.6	0718162000	24-SDE-L12-N1/4T-P	
L 12	3/8 NPT	PN 315	9	9	28	24	17	19	10.4	55	9.0	0718152000	24-SDE-L12-N3/8T-P	1)
L 12	1/2 NPT	PN 315	12	9	33	28	21	24	13.6	110	12.3	0718172000	24-SDE-L12-N1/2T	
L 15	1/2 NPT	PN 315	11	11	36	31	24	24	13.6	110	14.2	0718202000	24-SDE-L15-N1/2T	1)
L 18	1/2 NPT	PN 315	14	14	37	31	23.5	24	13.6	110	12.9	0718252000	24-SDE-L18-N1/2T	1)
L 22	3/4 NPT	PN 160	18	19	42	35	27.5	27	13.9	175	17.4	0718302000	24-SDE-L22-N3/4T	1)
L 28	1 NPT	PN 160	23	24	48	38	30.5	36	20.6	265	28.5	0718352000	24-SDE-L28-N1T	1)
L 35	1 1/4 NPT	PN 160	30	30	54	45	34.5	41	21.2	315	47.7	0718402000	24-SDE-L35-N11/4T	1)
L 42	1 1/2 NPT	PN 160	36	36	61	51	40	50	18.4	385	72.3	0718452000	24-SDE-L42-N11/2T	1)
S 6	1/4 NPT	PN 630	4	4	26	23	16	14	10.2	35	5.6	0718502000	24-SDE-S6-N1/4T-P	1)
S 8	1/4 NPT	PN 630	5	5	27	24	17	17	10.2	35	7.3	0718552000	24-SDE-S8-N1/4T-P	1)
S 10	3/8 NPT	PN 630	7	7	28	25	17.5	19	10.4	55	10.4	0718602000	24-SDE-S10-N3/8T-P	1)
S 12	3/8 NPT	PN 630	8	8	29	29	21.5	22	10.4	55	12.6	0718652000	24-SDE-S12-N3/8T-P	1)
S 14	1/2 NPT	PN 630	10	10	33	33	25	24	13.6	110	14.9	0718702000	24-SDE-S14-N1/2T	1)
S 16	1/2 NPT	PN 400	12	12	36	33	24.5	24	16.2	110	14.6	0718752000	24-SDE-S16-N1/2T	1)
S 16	3/4 NPT	PN 400	16	12	42	33	24.5	27	13.9	175	24.2	7006788500	24-SDE-S16-N3/4T	
S 20	3/4 NPT	PN 400	16	16	42	37	26.5	27	13.9	175	21.5	0718802000	24-SDE-S20-N3/4T	1)
S 25	1 NPT	PN 400	20	20	49	42	30	36	20.6	265	37.6	0718852000	24-SDE-S25-N1T	1)
S 30	1 1/4 NPT	PN 400	25	25	54	49	35.5	41	18	315	64.8	0718902000	24-SDE-S30-N11/4T	1)
S 38	1 1/2 NPT	PN 315	32	32	61	57	41	50	18.4	385	97.1	0718952000	24-SDE-S38-N11/2T	1)

1) Standard size

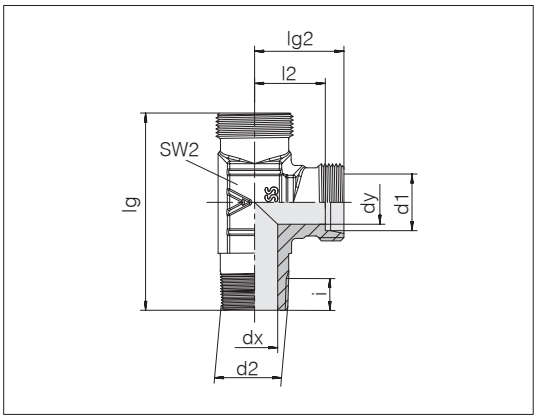
Threaded stud NPT in acc. with ASME are approved for use for gas supply in acc. with DIN 3387-1.

Example for comp. : WE06L1/8NPTX

Male stud run tees

Male thread: Metric fine thread, tapered
Threaded stud: DIN 3852-1 Form C
Sealing type: Tapered thread
Sealing material: e.g. PTFE sealing tape

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	dx	dy	lg	lg2	l2	SW2	i	kg/100 ca.	Order-No.	Designation
LL 4	M 8 x 1 keg	PN 100	3.5	3	32	15	11	9	6	1.2	0721002000	24-SDL-LL4-M8T
LL 6	M 10 x 1 keg	PN 100	4.5	4.5	32	15	9.5	9	6	1.2	0721102000	24-SDL-LL6-M10T
LL 8	M 10 x 1 keg	PN 100	6	6	37	17	11.5	12	6	2.8	0721152000	24-SDL-LL8-M10T-P
L 6	M 10 x 1 keg	PN 315	4	4	39	19	12	12	6	3.8	0722002000	24-SDL-L6-M10T-P
L 8	M 12 x 1.5 keg	PN 315	6	6	47	21	14	14	9	5.4	0722052000	24-SDL-L8-M12T-P
L 10	M 14 x 1.5 keg	PN 315	7	8	49	22	15	17	12	7.2	0722102000	24-SDL-L10-M14T-P
L 12	M 16 x 1.5 keg	PN 315	9	10	52	24	17	19	9	10.1	0722152000	24-SDL-L12-M16T-P
L 15	M 18 x 1.5 keg	PN 315	11	12	60	28	21	19	9	10.4	0722202000	24-SDL-L15-M18T
L 18	M 22 x 1.5 keg	PN 315	14	15	67	31	23.5	24	11	16.5	0722252000	24-SDL-L18-M22T
S 6	M 12 x 1.5 keg	PB 630	4	4	49	23	16	14	9	7.0	0722502000	24-SDL-S6-M12T-P
S 8	M 14 x 1.5 keg	PB 630	5	5	51	24	17	17	9	9.3	0722552000	24-SDL-S8-M14T-P
S 10	M 16 x 1.5 keg	PB 630	7	7	53	25	17.5	19	9	11.8	0722602000	24-SDL-S10-M16T-P
S 12	M 18 x 1.5 keg	PB 630	8	8	57	29	21.5	22	9	16.8	0722652000	24-SDL-S12-M18T-P
S 14	M 20 x 1.5 keg	PB 630	10	10	62	30	22	19	11	13.2	0722702000	24-SDL-S14-M20T
S 16	M 22 x 1.5 keg	PB 400	12	12	65	33	24.5	24	11	16.5	0722752000	24-SDL-S16-M22T

Operating pressure PB 630 only applies if holes with female conical threads are available.

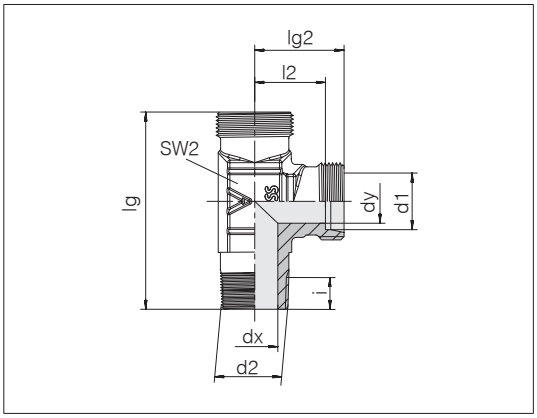
Threaded stud in acc. with DIN 3852-1 Form C are approved for use for gas supply in accordance with DIN 3387-1.

Example for comp. :
LE06LMX
DIN 2353-AAL6-St

Male stud run tees

Male thread: BSPT thread, tapered
Threaded stud: DIN 3852-2 Form C
Sealing type: Tapered thread
Sealing material: e.g. PTFE sealing tape

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	dx	dy	lg	lg2	l2	SW2	i	kg/100 ca.	Order-No.	Designation
LL 4	R 1/8	PN 100	4	3	32	15	11	9	6.2	1.3	0723002000	24-SDL-LL4-R1/8T
LL 6	R 1/8	PN 100	4.5	4.5	32	15	9.5	9	6.2	1.2	0723102000	24-SDL-LL6-R1/8T
LL 8	R 1/8	PN 100	6	6	37	17	11.5	12	6.2	2.8	0723152000	24-SDL-LL8-R1/8T-P
L 6	R 1/8	PN 315	4	4	39	19	12	12	6.2	3.7	0724002000	24-SDL-L6-R1/8T-P
L 8	R 1/4	PN 315	6	6	47	21	14	14	9.3	5.6	0724052000	24-SDL-L8-R1/4T-P
L 10	R 1/4	PN 315	7	8	49	22	15	17	9.3	7.3	0724102000	24-SDL-L10-R1/4T-P
L 12	R 3/8	PN 315	9	10	52	24	17	19	9.3	9.8	0724152000	24-SDL-L12-R3/8T-P
L 15	R 1/2	PN 315	11	12	62	28	21	19	14	11.7	0724202000	24-SDL-L15-R1/2T
L 18	R 1/2	PN 315	14	15	67	31	23.5	24	10.4	15.7	0724252000	24-SDL-L18-R1/2T
S 6	R 1/4	PB 630	4	4	49	23	16	14	9.3	12.1	0724502000	24-SDL-S6-R1/4T-P
S 8	R 1/4	PB 630	5	5	51	24	17	17	9.3	9.0	0724552000	24-SDL-S8-R1/4T-P
S 10	R 3/8	PB 630	7	7	53	25	17.5	19	9.3	11.9	0724602000	24-SDL-S10-R3/8T-P
S 12	R 3/8	PB 630	8	8	57	29	21.5	22	9.3	16.2	0724652000	24-SDL-S12-R3/8T-P
S 14	R 1/2	PB 630	10	10	62	30	22	19	10.4	13.7	0724702000	24-SDL-S14-R1/2T
S 16	R 1/2	PB 400	12	12	65	33	24.5	24	10.4	16.5	0724752000	24-SDL-S16-R1/2T

Operating pressure PB 630 only applies if holes with female conical threads are available.

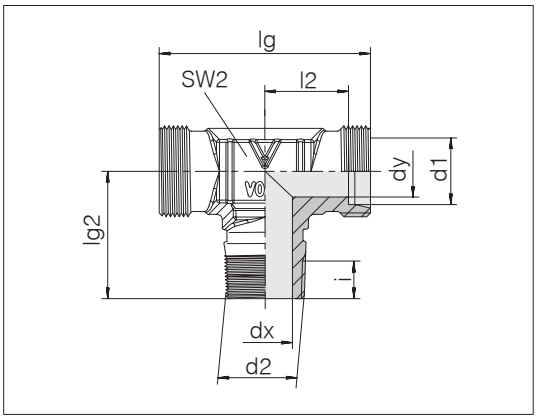
Threaded stud in acc. with DIN 3852-2 Form C are approved for use for gas supply in accordance with DIN 3387-1.

Example for comp. :
LE06LRX
DIN 2353-ABL6-St

Male stud branch tees

Male thread: Metric fine thread, tapered
Threaded stud: DIN 3852-1 Form C
Sealing type: Tapered thread
Sealing material: e.g. PTFE sealing tape

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	dx	dy	lg	lg2	l2	SW2	i	kg/100 ca.	Order-No.	Designation
LL 4	M 8 x 1 keg	PN 100	3.5	3	30	17	11	9	6	1.2	0727002000	24-SDT-LL4-M8T
LL 6	M 10 x 1 keg	PN 100	4.5	4.5	30	17	9.5	9	6	1.2	0727102000	24-SDT-LL6-M10T
LL 8	M 10 x 1 keg	PN 100	6	6	34	20	11.5	12	6	2.8	0727152000	24-SDT-LL8-M10T-P
L 6	M 10 x 1 keg	PN 315	4	4	38	20	12	12	6	3.6	0728002000	24-SDT-L6-M10T-P
L 8	M 12 x 1.5 keg	PN 315	6	6	42	26	14	12	9	4.3	0728052000	24-SDT-L8-M12T
L 10	M 14 x 1.5 keg	PN 315	7	8	44	27	15	17	9	7.2	0728102000	24-SDT-L10-M14T-P
L 12	M 16 x 1.5 keg	PN 315	9	10	48	28	17	19	9	9.8	0728152000	24-SDT-L12-M16T-P
L 15	M 18 x 1.5 keg	PN 315	11	12	56	32	21	19	12	10.2	0728202000	24-SDT-L15-M18T
L 18	M 22 x 1.5 keg	PN 315	14	15	62	36	23.5	24	11	14.1	0728252000	24-SDT-L18-M22T
S 6	M 12 x 1.5 keg	PB 630	4	4	46	26	16	14	9	6.6	0728502000	24-SDT-S6-M12T-P
S 8	M 14 x 1.5 keg	PB 630	5	5	48	27	17	17	9	9.2	0728552000	24-SDT-S8-M14T-P
S 10	M 16 x 1.5 keg	PB 630	7	7	50	28	17.5	19	9	12.1	0728602000	24-SDT-S10-M16T-P
S 12	M 18 x 1.5 keg	PB 630	8	8	58	28	21.5	17	12.5	12.0	0728652000	24-SDT-S12-M18T
S 14	M 20 x 1.5 keg	PB 630	10	10	60	32	22	19	14	13.2	0728702000	24-SDT-S14-M20T
S 16	M 22 x 1.5 keg	PB 400	12	12	66	32	24.5	24	14	16.1	0728752000	24-SDT-S16-M22T

Operating pressure PB 630 only applies if holes with female conical threads are available.

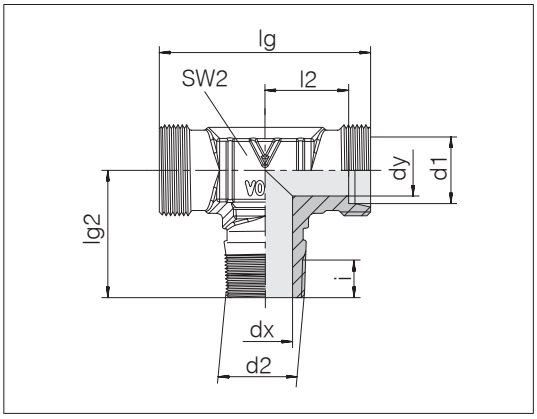
Threaded stud in acc. with DIN 3852-1 Form C are approved for use for gas supply in accordance with DIN 3387-1.

Example for comp. : TE06LMX DIN 2353-ML6-St

Male stud branch tees

Male thread: BSPT thread, tapered
Threaded stud: DIN 3852-2 Form C
Sealing type: Tapered thread
Sealing material: e.g. PTFE sealing tape

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	dx	dy	lg	lg2	l2	SW2	i	kg/100 ca.	Order-No.	Designation	
LL 4	R 1/8	PN 100	4	3	30	17	11	9	6.2	1.3	0729002000	24-SDT-LL4-R1/8T	1)
LL 6	R 1/8	PN 100	4.5	4.5	30	17	9.5	9	6.2	1.2	0729102000	24-SDT-LL6-R1/8T	1)
LL 8	R 1/8	PN 100	6	6	34	20	11.5	12	6.2	2.7	0729152000	24-SDT-LL8-R1/8T-P	1)
L 6	R 1/8	PN 315	4	4	38	20	12	12	6.2	3.6	0730002000	24-SDT-L6-R1/8T-P	1)
L 8	R 1/4	PN 315	6	6	42	26	14	14	9.3	5.8	0730052000	24-SDT-L8-R1/4T-P	1)
L 10	R 1/4	PN 315	7	8	44	27	15	17	9.3	7.2	0730102000	24-SDT-L10-R1/4T-P	1)
L 12	R 1/4	PN 315	7	9	48	28	17	19	9.3	10.2	0730162000	24-SDT-L12-R1/4T-P	
L 12	R 3/8	PN 315	9	10	48	28	17	19	9.3	10.0	0730152000	24-SDT-L12-R3/8T-P	1)
L 15	R 1/2	PN 315	11	12	56	34	21	19	10.4	11.6	0730202000	24-SDT-L15-R1/2T	1)
L 18	R 1/2	PN 315	14	15	62	36	23.5	24	10.4	15.7	0730252000	24-SDT-L18-R1/2T	1)
S 6	R 1/4	PB 630	4	4	46	26	16	14	9.3	7.1	0730502000	24-SDT-S6-R1/4T-P	1)
S 8	R 1/4	PB 630	5	5	48	27	17	17	9.3	9.2	0730552000	24-SDT-S8-R1/4T-P	1)
S 10	R 3/8	PB 630	7	7	50	28	17.5	19	9.3	12.1	0730602000	24-SDT-S10-R3/8T-P	1)
S 12	R 3/8	PB 630	8	8	58	28	21.5	22	9.3	16.3	0730652000	24-SDT-S12-R3/8T-P	1)
S 14	R 1/2	PB 630	10	10	60	32	22	19	10.4	13.8	0730702000	24-SDT-S14-R1/2T	1)
S 16	R 1/2	PB 400	12	12	66	32	24.5	24	10.4	18.5	0730752000	24-SDT-S16-R1/2T	1)

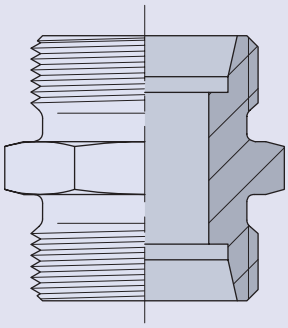
1) Standard size

Threaded stud in acc. with DIN 3852-2 Form C are approved for use for gas supply in accordance with DIN 3387-1.

Operating pressure PB 630 only applies if holes with female conical threads are available.

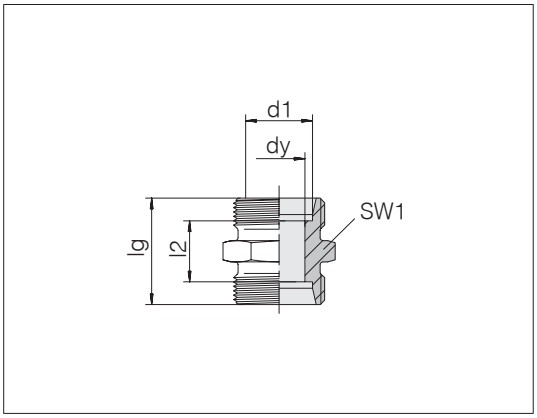
Example for comp. : TE06LRX DIN 2353-NL6-St

Unions



Unions

Tube coupling: 24° in acc. with ISO 8434-1

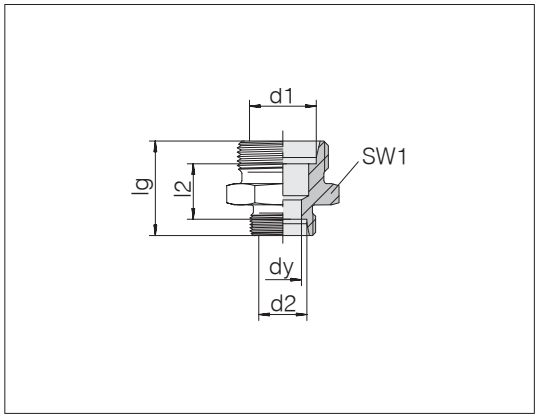


Series Tube OD d1	Pressure	dy	lg	l2	SW1	kg/100 ca.	Order-No.	Designation
LL 4	PN 100	3	20	12	9	0.5	0711002000	24-S-LL4
LL 5	PN 100	3.5	20	9	11	0.8	0711052000	24-S-LL5
LL 6	PN 100	4.5	20	9	11	0.7	0711102000	24-S-LL6
LL 8	PN 100	6	23	12	12	1.0	0711152000	24-S-LL8
L 6	PN 500	4	24	10	12	1.2	0712002000	24-S-L6
L 8	PN 500	6	25	11	14	1.6	0712052000	24-S-L8
L 10	PN 500	8	27	13	17	2.2	0712102000	24-S-L10
L 12	PN 400	10	28	14	19	2.8	0712152000	24-S-L12
L 15	PN 400	12	30	16	24	4.9	0712202000	24-S-L15
L 18	PN 400	15	31	16	27	6.7	0712252000	24-S-L18
L 22	PN 250	19	35	20	32	8.8	0712302000	24-S-L22
L 28	PN 250	24	36	21	41	13.6	0712352000	24-S-L28
L 35	PN 250	30	41	20	46	21.0	0712402000	24-S-L35
L 42	PN 250	36	43	21	55	29.4	0712452000	24-S-L42
S 6	PN 800	4	30	16	14	2.5	0712502000	24-S-S6
S 8	PN 800	5	32	18	17	3.7	0712552000	24-S-S8
S 10	PN 800	7	32	17	19	4.3	0712602000	24-S-S10
S 12	PN 630	8	34	19	22	5.9	0712652000	24-S-S12
S 14	PN 630	10	38	22	24	7.5	0712702000	24-S-S14
S 16	PN 630	12	38	21	27	8.7	0712752000	24-S-S16
S 20	PN 420	16	44	23	32	14.2	0712802000	24-S-S20
S 25	PN 420	20	50	26	41	25.0	0712852000	24-S-S25
S 30	PN 420	25	54	27	46	32.3	0712902000	24-S-S30
S 38	PN 420	32	61	29	55	53.8	0712952000	24-S-S38

Example for comp. :
G06LX
ISO 8434-1-S-L6-St

Straight reducers

Tube coupling: 24° in acc. with ISO 8434-1



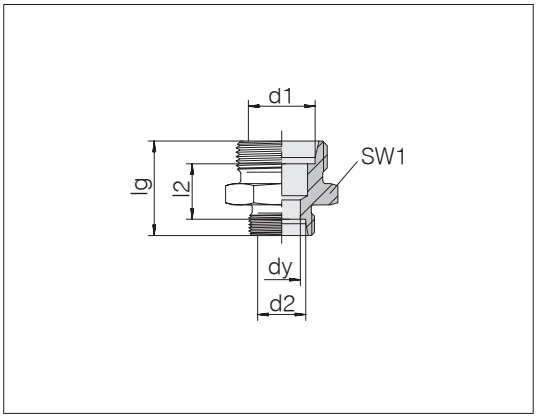
Series Tube OD d1	Series Tube OD d2	Pressure	dy	lg	l2	SW1	kg/100 ca.	Order-No.	Designation
LL 6	LL 4	PN 100	3	20	10.5	11	0.7	0711122000	24-S-LL6-LL4
LL 8	LL 4	PN 100	3	22	12.5	12	0.9	0711182000	24-S-LL8-LL4
LL 8	LL 6	PN 100	4.5	22	11	12	1.1	0711192000	24-S-LL8-LL6
L 8	L 6	PN 500	4	25	11	14	1.5	0712062000	24-S-L8-L6
L 10	L 6	PN 500	4	26	12	17	2.0	0712122000	24-S-L10-L6
L 10	L 8	PN 500	6	26	12	17	2.1	0712112000	24-S-L10-L8
L 12	L 10	PN 400	8	28	14	19	2.7	0712162000	24-S-L12-L10
L 12	L 6	PN 400	4	27	13	19	2.5	0712182000	24-S-L12-L6
L 12	L 8	PN 400	6	27	13	19	2.6	0712172000	24-S-L12-L8
L 15	L 10	PN 400	8	29	15	24	4.1	0712222000	24-S-L15-L10
L 15	L 12	PN 400	10	29	15	24	4.2	0712212000	24-S-L15-L12
L 15	L 6	PN 400	4	28	14	24	3.8	0712242000	24-S-L15-L6
L 15	L 8	PN 400	6	28	14	24	4.0	0712232000	24-S-L15-L8
L 18	L 10	PN 400	8	30	15.5	27	5.6	0712282000	24-S-L18-L10
L 18	L 12	PN 400	10	30	15.5	27	5.7	0712272000	24-S-L18-L12
L 18	L 15	PN 400	12	31	16.5	27	6.1	0712262000	24-S-L18-L15
L 18	L 8	PN 400	6	29	14.5	27	6.0	0712292000	24-S-L18-L8
L 22	L 10	PN 250	8	32	17.5	32	7.5	0712342000	24-S-L22-L10
L 22	L 12	PN 250	10	32	17.5	32	7.6	0712332000	24-S-L22-L12
L 22	L 15	PN 250	12	33	18.5	32	8.1	0712322000	24-S-L22-L15
L 22	L 18	PN 250	15	33	18	32	8.6	0712312000	24-S-L22-L18
L 28	L 10	PN 250	8	33	18.5	41	12.2	0711822000	24-S-L28-L10
L 28	L 12	PN 250	10	33	18.5	41	12.2	0712392000	24-S-L28-L12
L 28	L 15	PN 250	12	34	19.5	41	12.2	0712382000	24-S-L28-L15
L 28	L 18	PN 250	15	34	19	41	12.3	0712372000	24-S-L28-L18
L 28	L 22	PN 250	19	36	21	41	13.2	0712362000	24-S-L28-L22
L 35	L 22	PN 250	19	39	21	46	19.0	0712422000	24-S-L35-L22
L 35	L 28	PN 250	24	39	21	46	19.0	0712412000	24-S-L35-L28
L 42	L 28	PN 250	24	41	22.5	55	26.8	0712472000	24-S-L42-L28
L 42	L 35	PN 250	30	43	21.5	55	29.3	0712462000	24-S-L42-L35

Example for comp. :
GR08/06LX
ISO 8434-1-RDS-L8xL6-St

Continued on following page

Straight reducers

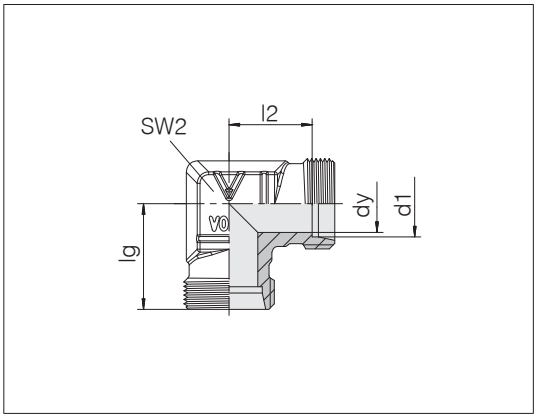
Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	Series Tube OD d2	Pressure	dy	lg	l2	SW1	kg/100 ca.	Order-No.	Designation
S 8	S 6	PN 800	4	32	18	17	3.4	0712562000	24-S-S8-S6
S 10	S 6	PN 800	4	32	17.5	19	4.0	0712622000	24-S-S10-S6
S 10	S 8	PN 800	5	32	17.5	19	4.2	0712612000	24-S-S10-S8
S 12	S 10	PN 630	7	34	19	22	5.8	0712662000	24-S-S12-S10
S 12	S 6	PN 630	4	34	19.5	22	5.4	0712682000	24-S-S12-S6
S 12	S 8	PN 630	5	34	19.5	22	5.6	0712672000	24-S-S12-S8
S 14	S 10	PN 630	7	36	20.5	24	6.9	0712722000	24-S-S14-S10
S 14	S 12	PN 630	8	36	20.5	24	7.0	0712712000	24-S-S14-S12
S 16	L 12	PN 400	10	35	19.5	27	7.7	0711982000	24-S-S16-L12
S 16	L 15	PN 400	12	36	20.5	27	7.9	0799632000	24-S-S16-L15
S 16	S 10	PN 630	7	36	20	27	7.9	0712782000	24-S-S16-S10
S 16	S 12	PN 630	8	36	20	27	8.0	0712772000	24-S-S16-S12
S 16	S 14	PN 630	10	38	21.5	27	8.7	0712762000	24-S-S16-S14
S 16	S 8	PN 630	5	36	20.5	27	7.8	0712792000	24-S-S16-S8
S 20	L 15	PN 400	12	40	22.5	32	13.9	0796222000	24-S-S20-L15
S 20	S 10	PN 420	7	40	22	32	12.2	0712842000	24-S-S20-S10
S 20	S 12	PN 420	8	40	22	32	12.5	0712832000	24-S-S20-S12
S 20	S 14	PN 420	10	42	23.5	32	12.9	0712822000	24-S-S20-S14
S 20	S 16	PN 420	12	42	23	32	12.9	0712812000	24-S-S20-S16
S 25	S 16	PN 420	12	46	25.5	41	22.0	0712872000	24-S-S25-S16
S 25	S 20	PN 420	16	48	25.5	41	23.2	0712862000	24-S-S25-S20
S 30	S 20	PN 420	16	50	26	46	29.4	0712922000	24-S-S30-S20
S 30	S 25	PN 420	20	52	26.5	46	31.1	0712912000	24-S-S30-S25
S 38	S 25	PN 420	20	57	29	55	48.2	0712972000	24-S-S38-S25
S 38	S 30	PN 420	25	59	29.5	55	48.8	0712962000	24-S-S38-S30

Union elbows

Tube coupling: 24° in acc. with ISO 8434-1

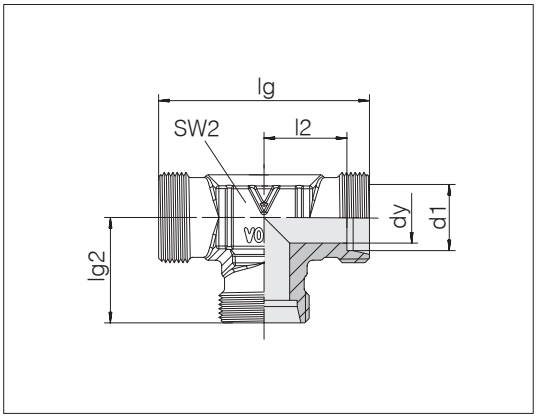


Series Tube OD d1	Pressure	dy	lg	l2	SW2	kg/100 ca.	Order-No.	Designation
LL 4	PN 100	3	15	11	9	1.3	0719002000	24-E-LL4-P
LL 6	PN 100	4.5	15	9.5	11	1.5	0719102000	24-E-LL6-P
LL 8	PN 100	6	17	11.5	12	2.3	0719152000	24-E-LL8-P
L 6	PN 500	4	19	12	12	2.8	0720002000	24-E-L6-P
L 8	PN 500	6	21	14	14	4.1	0720052000	24-E-L8-P
L 10	PN 500	8	22	15	17	5.6	0720102000	24-E-L10-P
L 12	PN 400	10	24	17	19	7.7	0720152000	24-E-L12-P
L 15	PN 400	12	28	21	19	7.4	0720202000	24-E-L15
L 18	PN 400	15	31	23.5	24	11.9	0720252000	24-E-L18
L 22	PN 250	19	35	27.5	27	15.2	0720302000	24-E-L22
L 28	PN 250	24	38	30.5	36	25.1	0720352000	24-E-L28
L 35	PN 250	30	45	34.5	41	43.1	0720402000	24-E-L35
L 42	PN 250	36	51	40	50	78.2	0720452000	24-E-L42
S 6	PN 800	4	23	16	14	5.1	0720502000	24-E-S6-P
S 8	PN 800	5	24	17	17	7.2	0720552000	24-E-S8-P
S 10	PN 800	7	25	17.5	19	9.8	0720602000	24-E-S10-P
S 12	PN 630	8	29	21.5	22	14.4	0720652000	24-E-S12-P
S 14	PN 630	10	30	22	19	10.4	0720702000	24-E-S14
S 16	PN 630	12	33	24.5	24	12.7	0720752000	24-E-S16
S 20	PN 420	16	37	26.5	27	20.5	0720802000	24-E-S20
S 25	PN 420	20	42	30	36	34.9	0720852000	24-E-S25
S 30	PN 420	25	49	35.5	41	58.8	0720902000	24-E-S30
S 38	PN 420	32	57	41	50	103.1	0720952000	24-E-S38

Example for comp. :
W06LX
ISO 8434-1-E-L6-St

Union tees

Tube coupling: 24° in acc. with ISO 8434-1

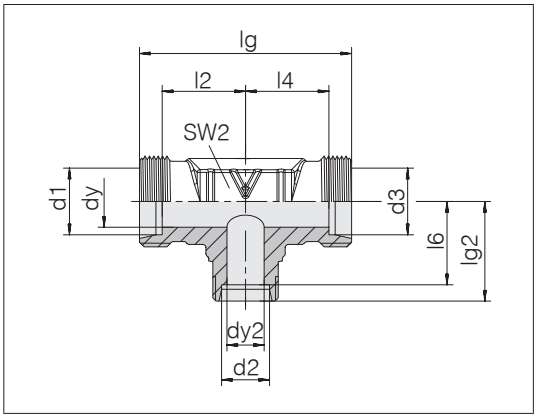


Series Tube OD d1	Pressure	dy	lg	lg2	l2	SW2	kg/100 ca.	Order-No.	Designation
LL 4	PN 100	3	30	15	11	9	1.1	0733002000	24-T-LL4
LL 5	PN 100	3.5	30	15	9.5	9	1.2	0733052000	24-T-LL5
LL 6	PN 100	4.5	30	15	9.5	9	1.0	0733102000	24-T-LL6
LL 8	PN 100	6	34	17	11.5	12	2.8	0733152000	24-T-LL8-P
L 6	PN 500	4	38	19	12	12	3.5	0734002000	24-T-L6-P
L 8	PN 500	6	42	21	14	14	5.1	0734052000	24-T-L8-P
L 10	PN 500	8	44	22	15	17	6.7	0734102000	24-T-L10-P
L 12	PN 400	10	48	24	17	19	9.1	0734152000	24-T-L12-P
L 15	PN 400	12	56	28	21	19	10.0	0734202000	24-T-L15
L 18	PN 400	15	62	31	23.5	24	15.0	0734252000	24-T-L18
L 22	PN 250	19	70	35	27.5	27	18.6	0734302000	24-T-L22
L 28	PN 250	24	76	38	30.5	36	29.9	0734352000	24-T-L28
L 35	PN 250	30	90	45	34.5	41	52.3	0734402000	24-T-L35
L 42	PN 250	36	102	51	40	50	91.5	0734452000	24-T-L42
S 6	PN 800	4	46	23	16	14	6.7	0734502000	24-T-S6-P
S 8	PN 800	5	48	24	17	17	9.1	0734552000	24-T-S8-P
S 10	PN 800	7	50	25	17.5	19	11.5	0734602000	24-T-S10-P
S 12	PN 630	8	58	29	21.5	22	17.3	0734652000	24-T-S12-P
S 14	PN 630	10	60	30	22	19	13.1	0734702000	24-T-S14
S 16	PN 630	12	66	33	24.5	24	16.5	0734752000	24-T-S16
S 20	PN 420	16	74	37	26.5	27	26.0	0734802000	24-T-S20
S 25	PN 420	20	84	42	30	36	43.6	0734852000	24-T-S25
S 30	PN 420	25	98	49	35.5	41	71.5	0734902000	24-T-S30
S 38	PN 420	32	114	57	41	50	125.8	0734952000	24-T-S38

Example for comp. :
T06LX
ISO 8434-1-T-L6-St

Tee reducers

Tube coupling: 24° in acc. with ISO 8434-1



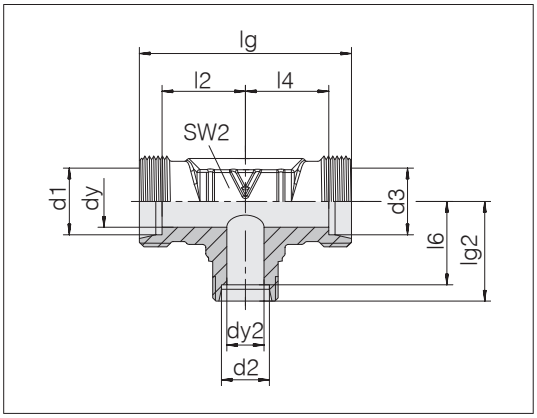
Series Tube OD d1	d2	d3	Pressure	dy	dy2	lg	lg2	l2	l4	l6	SW2	kg/100 ca.	Order-No.	Designation
L 6	8	6	PN 500	4	6	42	21	14	14	14	14	5.1	0799772000	24-T-L6-L8-L6-P
L 6	10	6	PN 500	4	8	44	22	15	15	15	17	6.6	0799562000	24-T-L6-L10-L6-P
L 8	6	8	PN 500	6	4	42	21	14	14	14	14	5.2	0734062000	24-T-L8-L6-L8-P
L 8	8	6	PN 500	4	6	42	21	14	14	14	14	5.0	0799592000	24-T-L8-L8-L6-P
L 8	10	8	PN 500	6	8	44	22	15	15	15	17	6.9	0799762000	24-T-L8-L10-L8-P
L 8	12	8	PN 400	6	10	48	24	17	17	17	19	9.7	0799512000	24-T-L8-L12-L8-P
L 10	6	10	PN 500	8	4	44	22	15	15	15	17	6.6	0734122000	24-T-L10-L6-L10-P
L 10	6	6	PN 500	4	4	44	22	15	15	15	17	6.5	0799572000	24-T-L10-L6-L6-P
L 10	8	10	PN 500	8	6	44	22	15	15	15	17	6.7	0734112000	24-T-L10-L8-L10-P
L 10	10	6	PN 500	4	8	44	22	15	15	15	17	6.5	0733542000	24-T-L10-L10-L6-P
L 10	12	10	PN 400	8	10	48	24	17	17	17	19	8.9	0799522000	24-T-L10-L12-L10-P
L 10	15	10	PN 400	8	11	56	28	21	21	21	19	10.5	0799462000	24-T-L10-L15-L10
L 12	6	12	PN 400	10	4	48	24	17	17	17	19	9.4	1794292000	24-T-L12-L6-L12
L 12	8	12	PN 400	10	6	48	24	17	17	17	19	9.3	0734172000	24-T-L12-L8-L12-P
L 12	8	8	PN 400	6	6	48	24	17	17	17	17	9.3	1794262000	24-T-L12-L8-L8
L 12	10	10	PN 400	8	8	48	24	17	17	17	19	9.2	0797322000	24-T-L12-L10-L10-P
L 12	10	12	PN 400	10	8	48	24	17	17	17	19	9.0	0734162000	24-T-L12-L10-L12-P
L 12	12	10	PN 400	8	10	48	24	17	17	17	19	9.1	0799552000	24-T-L12-L12-L10-P
L 12	12	8	PN 400	6	10	48	24	17	17	17	19	9.2	0799542000	24-T-L12-L12-L8-P
L 12	15	12	PN 400	10	12	56	28	21	21	21	19	9.9	0799472000	24-T-L12-L15-L12
L 12	18	12	PN 400	10	15	62	31	24	24	23.5	24	15.5	0799382000	24-T-L12-L18-L12
L 12	22	12	PN 250	10	19	70	35	28	28	27.5	27	23.5	0796532000	24-T-L12-L22-L12
L 15	6	15	PN 400	12	4	56	28	21	21	21	19	10.2	0734242000	24-T-L15-L6-L15
L 15	8	15	PN 400	12	6	56	28	21	21	21	19	10.2	0734232000	24-T-L15-L8-L15
L 15	10	10	PN 400	8	8	56	28	21	21	21	19	9.9	0799492000	24-T-L15-L10-L10
L 15	10	15	PN 400	12	8	56	28	21	21	21	19	9.8	0734222000	24-T-L15-L10-L15
L 15	12	12	PN 400	10	10	56	28	21	21	21	19	9.9	0797612000	24-T-L15-L12-L12
L 15	12	15	PN 400	12	10	56	28	21	21	21	19	9.9	0734212000	24-T-L15-L12-L15
L 15	15	10	PN 400	8	12	56	28	21	21	21	19	10.0	0799942000	24-T-L15-L15-L10
L 15	15	12	PN 400	10	12	56	28	21	21	21	19	9.9	0797732000	24-T-L15-L15-L12
L 15	18	15	PN 400	12	15	62	31	24	24	23.5	24	19.3	0799952000	24-T-L15-L18-L15

Example for comp. :
TR06/08/06LX

Continued on following page

Tee reducers

Tube coupling: 24° in acc. with ISO 8434-1

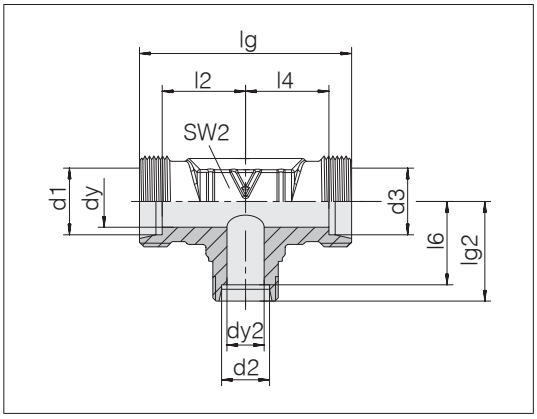


Series Tube OD d1	d2	d3	Pressure	dy	dy2	lg	lg2	l2	l4	l6	SW2	kg/100 ca.	Order-No.	Designation
L 15	22	15	PN 250	12	19	70	35	28	28	27.5	27	22.6	0799972000	24-T-L15-L22-L15
L 18	8	18	PN 400	15	6	62	31	23.5	23.5	24	24	19.0	0734292000	24-T-L18-L8-L18
L 18	10	10	PN 400	8	8	62	31	23.5	24	24	24	15.2	0799402000	24-T-L18-L10-L10
L 18	10	18	PN 400	15	8	62	31	23.5	23.5	24	24	15.4	0734282000	24-T-L18-L10-L18
L 18	12	18	PN 400	15	10	62	31	23.5	23.5	24	24	15.1	0734272000	24-T-L18-L12-L18
L 18	15	15	PN 400	12	12	62	31	23.5	24	24	24	18.9	0799412000	24-T-L18-L15-L15
L 18	15	18	PN 400	15	12	62	31	23.5	23.5	24	24	15.4	0734262000	24-T-L18-L15-L18
L 18	18	10	PN 400	8	15	62	31	23.5	24	23.5	24	15.1	0799422000	24-T-L18-L18-L10
L 18	18	15	PN 400	12	15	62	31	23.5	24	23.5	24	18.9	0799442000	24-T-L18-L18-L15
L 18	22	15	PN 250	12	19	70	35	27.5	28	27.5	27	23.3	0799742000	24-T-L18-L22-L15
L 18	22	18	PN 250	15	19	70	35	27.5	27.5	27.5	27	22.2	0799962000	24-T-L18-L22-L18
L 22	10	22	PN 250	19	8	70	35	27.5	27.5	28	27	20.4	0734342000	24-T-L22-L10-L22
L 22	12	22	PN 250	19	10	70	35	27.5	27.5	28	27	19.7	0734332000	24-T-L22-L12-L22
L 22	15	15	PN 250	12	12	70	35	28	27.5	28	27	21.2	0799362000	24-T-L22-L15-L15
L 22	15	22	PN 250	19	12	70	35	27.5	27.5	28	27	19.9	0734322000	24-T-L22-L15-L22
L 22	18	18	PN 250	15	15	70	35	27.5	27.5	27.5	27	21.2	0733562000	24-T-L22-L18-L18
L 22	18	22	PN 250	19	15	70	35	27.5	27.5	27.5	27	20.5	0734312000	24-T-L22-L18-L22
L 22	22	18	PN 250	15	19	70	35	27.5	27.5	27.5	27	19.8	0733652000	24-T-L22-L22-L18
L 22	28	22	PN 250	19	24	76	38	30.5	30.5	30.5	36	36.4	0796512000	24-T-L22-L28-L22
L 28	10	28	PN 250	24	8	76	38	30.5	30.5	31	36	31.8	0799312000	24-T-L28-L10-L28
L 28	12	28	PN 250	24	10	76	38	30.5	30.5	31	36	32.1	0734392000	24-T-L28-L12-L28
L 28	15	28	PN 250	24	12	76	38	30.5	30.5	31	36	32.3	0734382000	24-T-L28-L15-L28
L 28	18	28	PN 250	24	15	76	38	30.5	30.5	30.5	36	31.7	0734372000	24-T-L28-L18-L28
L 28	22	22	PN 250	19	19	76	38	30.5	30.5	30.5	36	32.3	0796352000	24-T-L28-L22-L22
L 28	22	28	PN 250	24	19	76	38	30.5	30.5	30.5	36	30.0	0734362000	24-T-L28-L22-L28
L 28	35	28	PN 250	24	30	90	45	37.5	37.5	34.5	41	61.8	1734082000	24-T-L28-L35-L28
L 28	42	28	PN 250	24	36	102	51	43.5	43.5	40	50	112.0	1734102000	24-T-L28-L42-L28
L 35	18	35	PN 250	30	15	90	45	34.5	34.5	37.5	41	60.0	0734432000	24-T-L35-L18-L35
L 35	28	28	PN 250	24	24	90	45	34.5	37.5	37.5	41	59.0	1734042000	24-T-L35-L28-L28
L 35	28	35	PN 250	30	24	90	45	34.5	34.5	37.5	41	54.0	0734412000	24-T-L35-L28-L35
L 35	42	35	PN 250	30	36	102	51	40.5	40.5	40	50	106.0	1734092000	24-T-L35-L42-L35

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Tee reducers

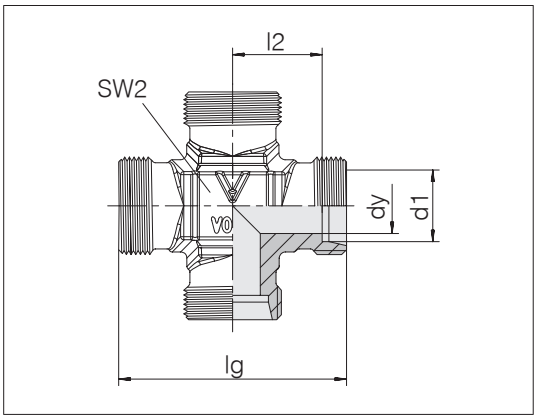
Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	d3	Pressure	dy	dy2	lg	lg2	l2	l4	l6	SW2	kg/100 ca.	Order-No.	Designation
L 42	18	42	PN 250	36	15	102	51	40	40	43.5	50	92.2	0734492000	24-T-L42-L18-L42
L 42	22	42	PN 250	36	19	102	51	40	40	43.5	50	101.6	0734482000	24-T-L42-L22-L42
L 42	28	42	PN 250	36	24	102	51	40	40	43.5	50	97.4	0734472000	24-T-L42-L28-L42
L 42	35	42	PN 250	36	30	102	51	40	40	40.5	50	93.5	0734462000	24-T-L42-L35-L42
S 10	6	10	PN 800	7	4	50	25	17.5	17.5	18	19	11.7	0734622000	24-T-S10-S6-S10-P
S 12	8	12	PN 630	8	5	58	29	21.5	21.5	22	22	17.5	0734672000	24-T-S12-S8-S12-P
S 12	8	8	PN 630	5	5	58	29	21.5	22	22	22	16.9	0799302000	24-T-S12-S8-S8-P
S 12	10	12	PN 630	8	7	58	29	21.5	21.5	21.5	22	17.6	0734662000	24-T-S12-S10-S12-P
S 12	16	12	PN 630	8	12	66	33	25.5	25.5	24.5	24	17.7	0797822000	24-T-S12-S16-S12
S 16	6	16	PN 630	12	4	66	33	24.5	24.5	26	24	16.8	0799292000	24-T-S16-S6-S16
S 16	8	16	PN 630	12	5	66	33	24.5	24.5	26	24	17.1	0734792000	24-T-S16-S8-S16
S 16	10	16	PN 630	12	7	66	33	24.5	24.5	25.5	24	17.1	0734782000	24-T-S16-S10-S16
S 16	12	16	PN 630	12	8	66	33	24.5	24.5	25.5	24	16.9	0734772000	24-T-S16-S12-S16
S 16	16	10	PN 630	12	12	66	33	24.5	25.5	24.5	24	21.1	7009071100	24-T-S16-S16-S10
S 16	20	16	PN 420	12	16	74	37	28.5	28.5	26.5	27	26.7	0799222000	24-T-S16-S20-S16
S 20	10	20	PN 420	16	7	74	37	26.5	26.5	29.5	27	26.4	0734842000	24-T-S20-S10-S20
S 20	12	20	PN 420	16	8	74	37	26.5	26.5	29.5	27	26.5	0734832000	24-T-S20-S12-S20
S 20	16	16	PN 420	12	12	74	37	26.5	28.5	28.5	27	25.3	0795972000	24-T-S20-S16-S16
S 20	16	20	PN 420	16	12	74	37	26.5	26.5	28.5	27	25.9	0734812000	24-T-S20-S16-S20
S 20	25	20	PN 420	16	20	84	42	31.5	31.5	30	36	45.3	0797452000	24-T-S20-S25-S20
S 25	12	25	PN 420	20	8	84	42	30	30	34.5	36	44.8	0734892000	24-T-S25-S12-S25
S 25	16	25	PN 420	20	12	84	42	30	30	33.5	36	44.5	0734872000	24-T-S25-S16-S25
S 25	18	25	PN 420	20	15	84	42	30	30	34.5	36	46.6	1796912000	24-T-S25-L18-S25
S 25	20	25	PN 420	20	16	84	42	30	30	31.5	36	43.4	0734862000	24-T-S25-S20-S25
S 25	25	20	PN 420	16	20	84	42	30	31.5	30	36	47.4	0733572000	24-T-S25-S25-S20
S 25	30	25	PN 420	20	25	98	49	37	37	35.5	41	77.8	0733982000	24-T-S25-S30-S25
S 30	16	30	PN 420	25	12	98	49	35.5	35.5	40.5	41	79.0	0734932000	24-T-S30-S16-S30
S 30	20	30	PN 420	25	16	98	49	35.5	35.5	38.5	41	71.0	0734922000	24-T-S30-S20-S30
S 30	38	30	PN 420	25	32	114	57	43.5	43.5	41	50	138.6	0733622000	24-T-S30-S38-S30
S 38	16	38	PN 420	32	12	114	57	41	41	48.5	50	120.4	0734992000	24-T-S38-S16-S38
S 38	25	38	PN 420	32	20	114	57	41	41	45	50	118.3	0734972000	24-T-S38-S25-S38
S 38	38	25	PN 420	20	32	114	57	41	45	41	50	134.1	0733482000	24-T-S38-S38-S25

Union crosses

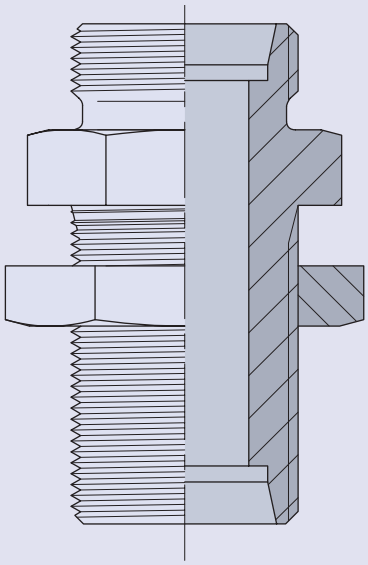
Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	Pressure	dy	lg	l2	SW2	kg/100 ca.	Order-No.	Designation
LL 4	PN 100	3	30	11	12	2.1	0735002000	24-K-LL4
LL 6	PN 100	4.5	34	11.5	12	2.3	0735102000	24-K-LL6
LL 8	PN 100	6	34	11.5	12	2.7	0735152000	24-K-LL8
L 6	PN 315	4	38	12	12	3.9	0736002000	24-K-L6
L 8	PN 315	6	42	14	12	4.6	0736052000	24-K-L8
L 10	PN 315	8	44	15	14	5.2	0736102000	24-K-L10
L 12	PN 315	10	48	17	17	8.2	0736152000	24-K-L12
L 15	PN 315	12	56	21	19	12.7	0736202000	24-K-L15
L 18	PN 315	15	62	23.5	24	18.8	0736252000	24-K-L18
L 22	PN 160	19	70	27.5	27	21.0	0736302000	24-K-L22
L 28	PN 160	24	76	30.5	36	34.6	0736352000	24-K-L28
L 35	PN 160	30	90	34.5	41	62.3	0736402000	24-K-L35
L 42	PN 160	36	102	40	50	94.5	0736452000	24-K-L42
S 6	PN 630	4	46	16	12	6.6	0736502000	24-K-S6
S 8	PN 630	5	48	17	14	8.1	0736552000	24-K-S8
S 10	PN 630	7	50	17.5	17	10.7	0736602000	24-K-S10
S 12	PN 630	8	58	21.5	17	14.9	0736652000	24-K-S12
S 14	PN 630	10	60	22	19	15.8	0736702000	24-K-S14
S 16	PN 400	12	66	24.5	24	23.3	0736752000	24-K-S16
S 20	PN 400	16	74	26.5	27	29.4	0736802000	24-K-S20
S 25	PN 400	20	84	30	36	51.9	0736852000	24-K-S25
S 30	PN 400	25	98	35.5	41	89.0	0736902000	24-K-S30
S 38	PN 315	32	114	41	50	140.3	0736952000	24-K-S38

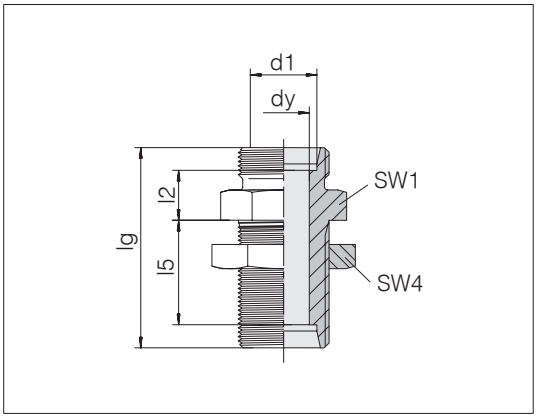
Example for comp. :
K06LX
ISO 8434-1-K-L6-St

Bulkhead unions



Bulkhead unions

Tube coupling: 24° in acc. with ISO 8434-1



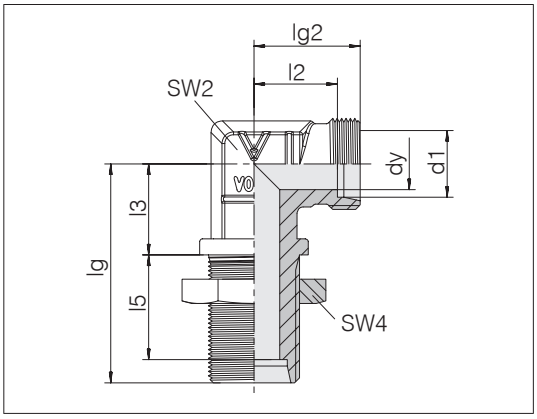
Series Tube OD d1	Pressure	dy	lg	l2	l5	SW1	SW4	kg/100 ca.	Order-No.	Designation
L 6	PN 500	4	48	7	27	17	17	3.8	0137002066	24-BHSLN-L6
L 8	PN 500	6	49	8	27	19	19	4.9	0137052066	24-BHSLN-L8
L 10	PN 500	8	52	10	28	22	22	6.6	0137102066	24-BHSLN-L10
L 12	PN 400	10	53	10	29	24	24	7.6	0137152066	24-BHSLN-L12
L 15	PN 400	12	57	12	31	27	30	12.8	0137202066	24-BHSLN-L15
L 18	PN 400	15	61	13.5	32.5	32	36	19.9	0137252066	24-BHSLN-L18
L 22	PN 250	19	66	16.5	34.5	36	41	24.8	0137302066	24-BHSLN-L22
L 28	PN 250	24	69	18.5	35.5	41	46	33.8	0137352066	24-BHSLN-L28
L 35	PN 250	30	76	18.5	36.5	50	55	53.9	0137402066	24-BHSLN-L35
L 42	PN 250	36	77	19	36	60	65	75.6	0137452066	24-BHSLN-L42
S 6	PN 800	4	55	12	29	19	19	6.5	0137502066	24-BHSLN-S6
S 8	PN 800	5	56	13	29	22	22	8.7	0137552066	24-BHSLN-S8
S 10	PN 800	7	59	14.5	29.5	24	24	11.0	0137602066	24-BHSLN-S10
S 12	PN 630	8	60	14.5	30.5	27	27	13.9	0137652066	24-BHSLN-S12
S 14	PN 630	10	65	17	32	30	30	17.8	0137702066	24-BHSLN-S14
S 16	PN 630	12	65	16.5	31.5	32	32	19.7	0137752066	24-BHSLN-S16
S 20	PN 420	16	72	17.5	33.5	41	41	34.5	0137802066	24-BHSLN-S20
S 25	PN 420	20	79	20	35	46	46	49.2	0137852066	24-BHSLN-S25
S 30	PN 420	25	86	21.5	37.5	50	50	61.7	0137902066	24-BHSLN-S30
S 38	PN 420	32	91	22	37	65	65	108.0	0137952066	24-BHSLN-S38

Bulkhead material thickness
max. 16 mm.

Example for comp. :
SV06LOMD
ISO 8434-1-BHSLN-L6-St

Bulkhead elbows

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	Pressure	dy	lg	lg2	l2	l3	l5	SW2	SW4	kg/100 ca.	Order-No.	Designation
L 6	PN 315	4	48	19	12	14	27	12	17	4.9	0138002066	24-BHELN-L6
L 8	PN 315	6	51	21	14	17	27	12	19	6.1	0138052066	24-BHELN-L8
L 10	PN 315	8	38	22	15	18	31	14	22	7.6	7011216000	24-BHELN-L10-LG38/TL20
L 10	PN 315	8	53	22	15	18	28	14	22	7.9	0138102066	24-BHELN-L10
L 12	PN 315	10	56	24	17	20	29	17	24	9.6	0138152066	24-BHELN-L12
L 15	PN 315	12	61	28	21	23	31	19	30	16.9	0138202066	24-BHELN-L15
L 18	PN 315	15	64	31	23.5	24	32.5	24	36	25.5	0138252066	24-BHELN-L18
L 22	PN 160	19	72	35	27.5	30	34.5	27	41	31.8	0138302066	24-BHELN-L22
L 28	PN 160	24	77	38	30.5	34	35.5	36	46	46.2	0138352066	24-BHELN-L28
L 35	PN 160	30	86	45	34.5	39	36.5	41	55	76.9	0138402066	24-BHELN-L35
L 42	PN 160	36	90	51	40	43	36	50	65	112.3	0138452066	24-BHELN-L42
S 6	PN 630	4	53	23	16	17	29	12	19	7.6	0138502066	24-BHELN-S6
S 8	PN 630	5	54	24	17	18	29	14	22	10.2	0138552066	24-BHELN-S8
S 10	PN 630	7	57	25	17.5	20	29.5	17	24	12.4	0138602066	24-BHELN-S10
S 12	PN 630	8	59	29	21.5	21	30.5	17	27	16.0	0138652066	24-BHELN-S12
S 14	PN 630	10	63	30	22	23	32	19	30	19.6	0138702066	24-BHELN-S14
S 16	PN 400	12	64	33	24.5	24	31.5	24	32	23.8	0138752066	24-BHELN-S16
S 20	PN 400	16	74	37	26.5	30	33.5	27	41	39.9	0138802066	24-BHELN-S20
S 25	PN 400	20	81	42	30	34	35	36	46	60.9	0138852066	24-BHELN-S25
S 30	PN 400	25	90	49	35.5	39	37.5	41	50	93.2	0138902066	24-BHELN-S30
S 38	PN 315	32	96	57	41	43	37	50	65	144.9	0138952066	24-BHELN-S38

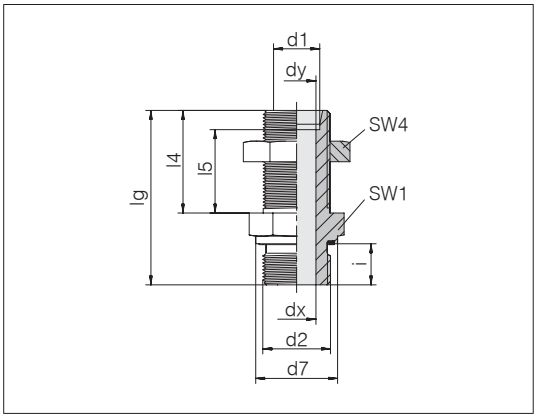
Bulkhead material thickness
max. 16 mm.

Example for comp. :
WSV06LOMD
ISO 8434-1-BHELN-L6-St

Male stud bulkhead unions

Male thread: BSPP thread, cylindrical
Threaded stud: ISO 1179-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1

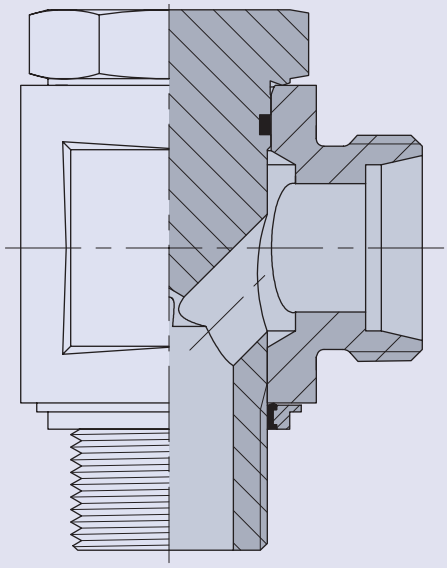


Series Tube OD d1	d2	Pressure	d7	dx	dy	lg	l4	l5	SW1	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	G 1/4 A	PN 500	18.9	4	4	54	34	27	19	17	12	50	6.0	7007913600	24-BHSDSLN-L6-G1/4E	
L 8	G 1/4 A	PN 500	18.9	6	6	54	34	27	19	19	12	50	6.5	1137052066	24-BHSDSLN-L8-G1/4E	1)
L 8	G 3/8 A	PN 400	21.9	9	6	54.5	34	27	22	19	12	80	7.5	1137062066	24-BHSDSLN-L8-G3/8E	
L 8	G 1/2 A	PN 400	26.9	11	6	58	34	27	27	19	14	100	10.1	1137072066	24-BHSDSLN-L8-G1/2E	
L 10	G 1/4 A	PN 500	18.9	6	6	57	35	28	22	22	12	50	9.2	0255722066	24-BHSDSLN-L10-G1/4E	1)
L 10	G 1/2 A	PN 400	26.9	11	8	59	35	28	27	22	14	100	11.0	1137122066	24-BHSDSLN-L10-G1/2E	
L 12	G 3/8 A	PN 400	21.9	9	9	56.5	36	29	24	24	12	80	10.1	1137152066	24-BHSDSLN-L12-G3/8E	1)
L 12	G 1/2 A	PN 400	26.9	11	9	60	36	29	27	24	14	100	12.7	0255732066	24-BHSDSLN-L12-G1/2E	
L 15	G 3/8 A	PN 400	21.9	9	12	59.5	38	31	27	30	12	80	14.6	1137192066	24-BHSDSLN-L15-G3/8E	
L 15	G 1/2 A	PN 400	26.9	11	11	62	38	31	27	30	14	100	16.2	1137202066	24-BHSDSLN-L15-G1/2E	1)
L 15	G 3/4 A	PN 250	31.9	15	12	66	38	31	32	30	16	180	20.6	0265992066	24-BHSDSLN-L15-G3/4E	
L 18	G 1/2 A	PN 400	26.9	14	14	66	40	32.5	32	36	14	100	22.8	0255602066	24-BHSDSLN-L18-G1/2E	1)
L 18	G 3/4 A	PN 250	31.9	15	15	68	40	32.5	32	36	16	180	24.9	0265922066	24-BHSDSLN-L18-G3/4E	
L 22	G 3/4 A	PN 250	31.9	18	18	71	42	34.5	36	41	16	180	30.2	7007666100	24-BHSDSLN-L22-G3/4E	1)

1) Standard size

Bulkhead material thickness
max. 16 mm.

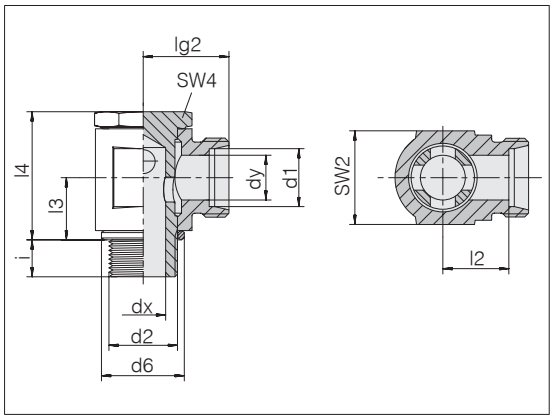
Banjo and rotary couplings



Banjo couplings standard design

Male thread: metric fine thread, parallel
For threaded bores: ISO 9974-1 (Form N - narrow)
Sealing type: Seal-edge ring (Form B)

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d6	dx	dy	lg2	l2	l3	l4	SW2	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
LL 4	M 8 x 1	PB 100	12	3	3	14.5	10.5	8	18.5	12	12	6	10	2.0	1150002081	24-BSE-LL4-M8B	1)
LL 6	M 10 x 1	PB 100	14	4	4.5	15.5	10	9	20.5	14	14	6	15	2.7	1150102081	24-BSE-LL6-M10B	1)
LL 8	M 10 x 1	PB 100	14	4.5	6	16.5	11	10	22.5	14	14	6	15	3.1	1150152081	24-BSE-LL8-M10B	1)
L 6	M 10 x 1	PB 250	14	4	4	17.5	10.5	10	23.5	14	14	6	20	3.6	1151002081	24-BSE-L6-M10B	1)
L 8	M 12 x 1.5	PB 250	17	5.8	6	20	13	12	27	17	17	9	30	5.5	1151052081	24-BSE-L8-M12B	1)
L 10	M 14 x 1.5	PB 250	19	6.5	8	21	14	13	28	19	19	9	45	6.8	1151102081	24-BSE-L10-M14B	1)
L 12	M 16 x 1.5	PB 250	21	8.5	10	22.5	15.5	15	33	22	22	9	65	10.1	1151152081	24-BSE-L12-M16B	1)
L 12	M 18 x 1.5	PB 250	23	10.5	10	23.5	16.5	18.5	38	24	24	9	90	13.0	1151172081	24-BSE-L12-M18B	
L 15	M 18 x 1.5	PB 250	23	10.5	12	24.5	17.5	18.5	38	24	24	9	90	13.4	1151202081	24-BSE-L15-M18B	1)
L 18	M 22 x 1.5	PB 160	27	13	15	27.5	20	22	44	30	27	11	100	21.1	1151252081	24-BSE-L18-M22B	1)
L 22	M 26 x 1.5	PB 160	31	17	19	32.5	25	24.5	48	36	32	13	150	31.3	1151302081	24-BSE-L22-M26B	1)
S 6	M 12 x 1.5	PB 250	17	4	4	21	14	12	27	17	17	9	30	6.0	1151502081	24-BSE-S6-M12B	1)
S 8	M 14 x 1.5	PB 250	19	5	5	22	15	13	28	19	19	9	45	7.7	1151552081	24-BSE-S8-M14B	1)
S 10	M 16 x 1.5	PB 250	21	7	7	23.5	16	15	33	22	22	9	70	11.2	1151602081	24-BSE-S10-M16B	1)
S 12	M 18 x 1.5	PB 250	23	8	8	24.5	17	16.5	35	24	24	9	90	14.0	1151652081	24-BSE-S12-M18B	1)
S 14	M 18 x 1.5	PB 250	23	8	10	28	20	18.5	38	27	24	9	90	18.5	1151712081	24-BSE-S14-M18B	
S 14	M 20 x 1.5	PB 250	25	10	10	28	20	18.5	39	27	27	11	110	18.6	1151702081	24-BSE-S14-M20B	1)
S 16	M 22 x 1.5	PB 160	27	11	12	29.5	21	20.5	42	30	27	11	100	21.9	1151752081	24-BSE-S16-M22B	1)
S 20	M 27 x 2	PB 160	32	16	16	34.5	24	23.5	48	36	32	13	150	35.1	1151802081	24-BSE-S20-M27B	1)

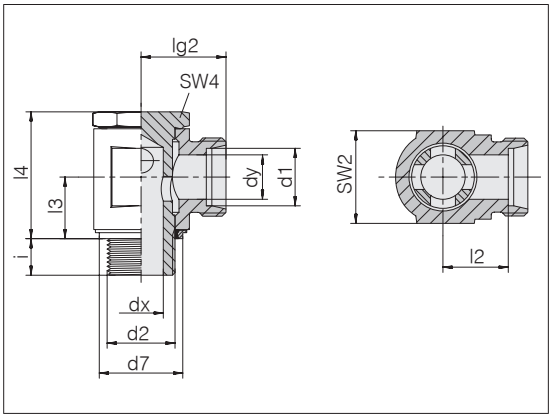
1) Standard size

Example for comp. :
SWVE06LMOMD

Banjo couplings standard design

Male thread: Metric fine thread, cylindrical
For threaded bores: ISO 9974-1 (Form N - narrow)
Sealing type: Soft sealing ring (Form E)
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d7	dx	dy	lg2	l2	l3	l4	SW2	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
LL 6	M 10 x 1	PB 100	14.9	4	4.5	15.5	10	9	20.5	14	14	6	15	2.7	1150112081	24-BSE-LL6-M10E	1)
LL 8	M 10 x 1	PB 100	14.9	4.5	6	16.5	11	10	22.5	14	14	6	15	3.1	1150162081	24-BSE-LL8-M10E	1)
L 6	M 10 x 1	PB 250	14.9	4	4	17.5	10.5	10	23.5	14	14	6	20	3.6	1151012081	24-BSE-L6-M10E	1)
L 8	M 12 x 1.5	PB 250	17	5.8	6	20	13	12	27	17	17	9	30	5.5	1151072081	24-BSE-L8-M12E	1)
L 10	M 14 x 1.5	PB 250	18.9	6.5	8	21	14	13	28	19	19	9	45	6.8	1151112081	24-BSE-L10-M14E	1)
L 12	M 16 x 1.5	PB 250	21.9	8.5	10	22.5	15.5	15	33	22	22	9	65	10.1	1151162081	24-BSE-L12-M16E	1)
L 12	M 18 x 1.5	PB 250	23.9	10.5	10	23.5	16.5	18.5	38	24	24	9	90	13.0	1151182081	24-BSE-L12-M18E	
L 15	M 18 x 1.5	PB 250	23.9	10.5	12	24.5	17.5	18.5	38	24	24	9	90	13.4	1151212081	24-BSE-L15-M18E	1)
L 18	M 22 x 1.5	PB 160	26.9	13	15	27.5	20	22	44	30	27	11	100	21.1	1151262081	24-BSE-L18-M22E	1)
L 22	M 26 x 1.5	PB 160	31.9	17	19	32.5	25	24.5	48	36	32	13	150	31.3	1151312081	24-BSE-L22-M26E	1)
S 6	M 12 x 1.5	PB 250	17	4	4	21	14	12	27	17	17	9	30	6.0	1151512081	24-BSE-S6-M12E	1)
S 8	M 14 x 1.5	PB 250	18.9	5	5	22	15	13	28	19	19	9	45	7.7	1151562081	24-BSE-S8-M14E	1)
S 10	M 16 x 1.5	PB 250	21.9	7	7	23.5	16	15	33	22	22	9	70	11.2	1151612081	24-BSE-S10-M16E	1)
S 12	M 18 x 1.5	PB 250	23.9	8	8	24.5	17	16.5	35	24	24	9	90	14.0	1151662081	24-BSE-S12-M18E	1)
S 16	M 22 x 1.5	PB 160	26.9	11	12	29.5	21	20.5	42	30	27	11	100	21.9	1151762081	24-BSE-S16-M22E	1)
S 20	M 27 x 2	PB 160	32.9	16	16	34.5	24	23.5	48	36	32	13	150	35.1	1151812081	24-BSE-S20-M27E	1)

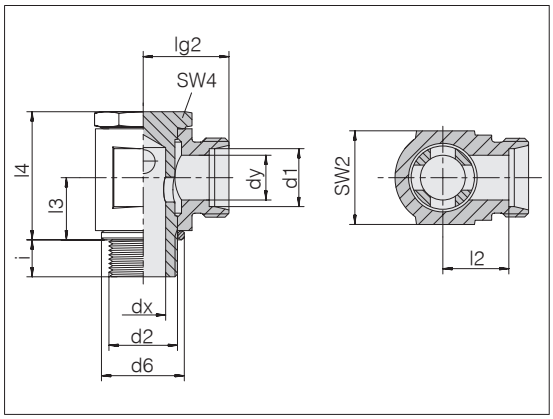
1) Standard size

Example for comp. :
SWVE06LMKDSOMD

Banjo couplings standard design

Male thread: BSPP thread, parallel
For threaded bores: ISO 1179-1 (Form N - narrow)
Sealing type: Seal-edge ring (Form B)

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d6	dx	dy	lg2	l2	l3	l4	SW2	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
LL 4	G 1/8 A	PB 100	14	3	3	15.5	11.5	8	18.5	14	14	6	15	2.5	1152002081	24-BSE-LL4-G1/8B	1)
LL 6	G 1/8 A	PB 100	14	4	4.5	15.5	10	9	20.5	14	14	6	15	2.7	1152102081	24-BSE-LL6-G1/8B	1)
LL 8	G 1/8 A	PB 100	14	4.5	6	16.5	11	10	22.5	14	14	6	15	3.1	1152152081	24-BSE-LL8-G1/8B	1)
L 6	G 1/8 A	PB 250	14	4	4	17.5	10.5	10	23.5	14	14	6	20	3.5	1153002081	24-BSE-L6-G1/8B	1)
L 6	G 1/4 A	PB 250	18	5.8	4	20	13	12	27	19	19	9	45	6.5	1153012081	24-BSE-L6-G1/4B	
L 8	G 1/4 A	PB 250	18	5.8	6	20	13	12	27	19	19	9	45	6.5	1153052081	24-BSE-L8-G1/4B	1)
L 10	G 1/4 A	PB 250	18	6.5	8	21	14	13	28	19	19	9	50	6.8	1153102081	24-BSE-L10-G1/4B	1)
L 12	G 3/8 A	PB 250	22	8.5	10	22.5	15.5	15.5	33	22	22	9	75	10.3	1153152081	24-BSE-L12-G3/8B	1)
L 12	G 1/2 A	PB 250	26	10.5	10	25	18	19	38	27	27	11	110	16.8	1153172081	24-BSE-L12-G1/2B	
L 15	G 3/8 A	PB 250	22	9	12	24.5	17.5	18.5	38	24	24	9	75	14.4	1152982081	24-BSE-L15-G3/8B	
L 15	G 1/2 A	PB 250	26	10.5	12	26	19	19	38	27	27	11	110	17.6	1153202081	24-BSE-L15-G1/2B	1)
L 18	G 1/2 A	PB 160	26	13	15	27.5	20	22	44	30	27	11	100	20.2	1153252081	24-BSE-L18-G1/2B	1)
L 22	G 3/4 A	PB 160	32	17	19	32.5	25	24	48	36	32	13	150	31.8	1153302081	24-BSE-L22-G3/4B	1)
S 6	G 1/4 A	PB 250	18	4	4	22	15	12	27	19	19	9	45	7.3	1153502081	24-BSE-S6-G1/4B	1)
S 8	G 1/4 A	PB 250	18	5	5	22	15	13	28	19	19	9	50	7.4	1153552081	24-BSE-S8-G1/4B	1)
S 10	G 3/8 A	PB 250	22	7	7	23.5	16	15.5	33	22	22	9	70	11.1	1153602081	24-BSE-S10-G3/8B	1)
S 12	G 3/8 A	PB 250	22	8	8	23.5	16	16.5	36	24	22	9	70	14.0	1153652081	24-BSE-S12-G3/8B	1)
S 14	G 1/2 A	PB 250	26	10	10	28	20	19	38.5	27	27	11	115	18.4	1153702081	24-BSE-S14-G1/2B	1)
S 16	G 1/2 A	PB 160	26	11	12	29.5	21	20.5	42	30	27	11	100	22.0	1153752081	24-BSE-S16-G1/2B	1)
S 20	G 3/4 A	PB 160	32	16	16	34.5	24	24	48	36	32	13	150	34.6	1153802081	24-BSE-S20-G3/4B	1)

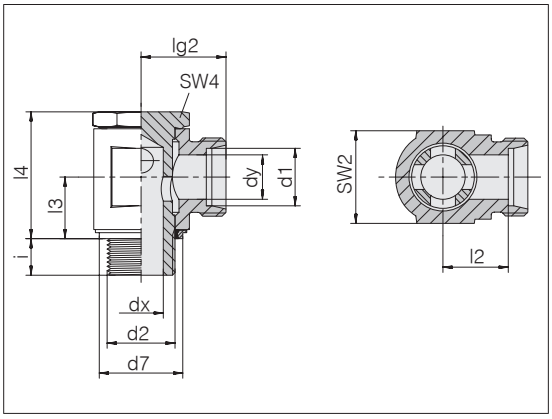
1) Standard size

Example for comp. :
SWVE06LROMD

Banjo couplings standard design

Male thread: BSPP thread, cylindrical
For threaded bores: ISO 1179-1 (Form N - narrow)
Sealing type: Soft sealing ring (Form E)
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d7	dx	dy	lg2	l2	l3	l4	SW2	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
LL 4	G 1/8 A	PB 100	14.9	3	3	15.5	11.5	8	18.5	14	14	6	15	2.5	1152012081	24-BSE-LL4-G1/8E	1)
LL 6	G 1/8 A	PB 100	14.9	4	4.5	15.5	10	9	20.5	14	14	6	15	2.7	1152112081	24-BSE-LL6-G1/8E	1)
LL 8	G 1/8 A	PB 100	14.9	4.5	6	16.5	11	10	22.5	14	14	6	15	3.1	1152162081	24-BSE-LL8-G1/8E	1)
L 6	G 1/8 A	PB 250	14.9	4	4	17.5	10.5	10	23.5	14	14	6	20	3.5	1153022081	24-BSE-L6-G1/8E	1)
L 6	G 1/4 A	PB 250	18.9	5.8	4	20	13	12	27	19	19	9	45	6.5	1153032081	24-BSE-L6-G1/4E	
L 8	G 1/4 A	PB 250	18.9	5.8	6	20	13	12	27	19	19	9	45	6.5	1153062081	24-BSE-L8-G1/4E	1)
L 10	G 1/4 A	PB 250	18.9	6.5	8	21	14	13	28	19	19	9	50	6.8	1153122081	24-BSE-L10-G1/4E	1)
L 10	G 3/8 A	PB 250	21.9	8.5	8	22.5	15.5	15.5	33	22	22	9	75	10.4	1153132081	24-BSE-L10-G3/8E	
L 12	G 1/4 A	PB 250	18.9	6.5	10	22.5	15.5	15.5	32	22	19	9	50	9.5	1153972081	24-BSE-L12-G1/4E	
L 12	G 3/8 A	PB 250	21.9	8.5	10	22.5	15.5	15.5	33	22	22	9	75	10.3	1153992081	24-BSE-L12-G3/8E	1)
L 12	G 1/2 A	PB 250	26.9	10.5	10	25	18	19	38	27	27	11	110	16.8	1153982081	24-BSE-L12-G1/2E	
L 15	G 3/8 A	PB 250	21.9	9	12	24.5	17.5	18.5	38	24	24	9	75	14.7	1152992081	24-BSE-L15-G3/8E	
L 15	G 1/2 A	PB 250	26.9	10.5	12	26	19	19	38	27	27	11	110	17.6	1153212081	24-BSE-L15-G1/2E	1)
L 18	G 1/2 A	PB 160	26.9	13	15	27.5	20	22	44	30	27	11	100	20.2	1153262081	24-BSE-L18-G1/2E	1)
L 22	G 3/4 A	PB 160	39.9	17	19	32.5	25	24	48	36	32	13	150	31.8	1153312081	24-BSE-L22-G3/4E	1)
S 6	G 1/4 A	PB 250	18.9	4	4	22	15	12	27	19	19	9	45	7.3	1153512081	24-BSE-S6-G1/4E	1)
S 8	G 1/4 A	PB 250	18.9	5	5	22	15	13	28	19	19	9	50	7.4	1153562081	24-BSE-S8-G1/4E	1)
S 10	G 3/8 A	PB 250	21.9	7	7	23.5	16	15.5	33	22	22	9	70	11.1	1153612081	24-BSE-S10-G3/8E	1)
S 12	G 3/8 A	PB 250	21.9	8	8	23.5	16	16.5	36	24	22	9	70	14.0	1153662081	24-BSE-S12-G3/8E	1)
S 14	G 1/2 A	PB 250	26.9	10	10	28	20	19	38.5	27	27	11	115	18.4	1153712081	24-BSE-S14-G1/2E	1)
S 16	G 1/2 A	PB 160	26.9	11	12	29.5	21	20.5	42	30	27	11	100	22.0	1153762081	24-BSE-S16-G1/2E	1)
S 20	G 3/4 A	PB 160	32.9	16	16	34.5	24	24	48	36	32	13	150	34.6	1153812081	24-BSE-S20-G3/4E	1)

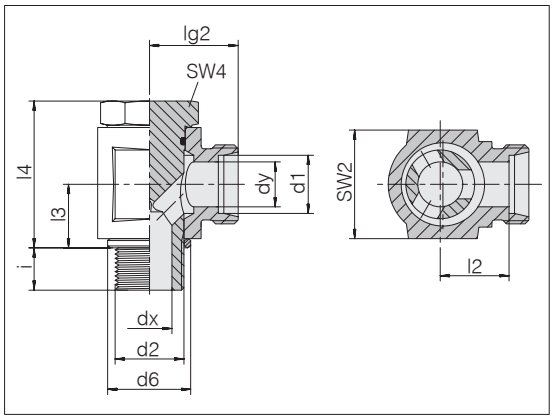
1) Standard size

Example for comp. :
SWVE06LRKDSOMD

Banjo couplings unrestricted flow design with eccentric flow channel

Male thread: metric fine thread, parallel
For threaded bores: ISO 9974-1 (Form N - narrow)
Sealing type: Seal-edge ring (Form B)
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d6	dx	dy	lg2	l2	l3	l4	SW2	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	M 10 x 1	PB 500	14	4	4	19	12	10.5	25.3	19	14	8	30	5.1	1155002081	24-BEE-L6-M10B	1)
L 8	M 12 x 1.5	PB 400	17	6	6	21.5	14.5	14	31.5	22	17	12	42	9.5	1155052081	24-BEE-L8-M12B	1)
L 10	M 14 x 1.5	PB 350	19	8	8	22.5	15.5	14	33	22	19	12	42	9.9	1155102081	24-BEE-L10-M14B	1)
L 10	M 18 x 1.5	PB 315	23	12	8	22.5	20	18.5	42.5	30	24	12	70	20.6	1154952081	24-BEE-L10-M18B	
L 12	M 16 x 1.5	PB 350	21	10	10	25	18	16.5	38.5	27	22	12	60	16.3	1155152081	24-BEE-L12-M16B	1)
L 12	M 18 x 1.5	PB 315	23	12	10	27	20	18.5	42.5	30	24	12	70	20.7	1155172081	24-BEE-L12-M18B	
L 15	M 18 x 1.5	PB 315	23	12	12	28	21	18.5	42.5	30	24	12	70	21.6	1155202081	24-BEE-L15-M18B	1)
L 15	M 22 x 1.5	PB 315	27	15	12	29	22	21.5	47.5	36	27	14	160	29.8	1155222081	24-BEE-L15-M22B	
L 18	M 22 x 1.5	PB 315	27	15	15	29	21.5	21.5	47.5	36	27	14	160	29.8	1155252081	24-BEE-L18-M22B	1)
L 22	M 26 x 1.5	PB 200	31	19	19	33.5	26	24	55.5	41	32	16	140	46.4	1155302081	24-BEE-L22-M26B	1)
L 28	M 33 x 2	PB 200	39	24	24	39	31.5	30.5	68	50	41	18	350	88.3	1155352081	24-BEE-L28-M33B	1)
L 35	M 42 x 2	PB 200	49	30	30	46	35.5	35.5	78	60	50	20	500	145.6	1155402081	24-BEE-L35-M42B	1)
L 42	M 48 x 2	PB 200	55	36	36	51	40	40.5	88.5	70	60	22	600	215.4	1155452081	24-BEE-L42-M48B	1)
S 6	M 12 x 1.5	PB 500	17	4	4	23.5	16.5	14	30.5	22	17	12	57	9.9	1155502081	24-BEE-S6-M12B	1)
S 8	M 14 x 1.5	PB 450	19	5	5	23.5	16.5	14	31	22	19	12	90	10.9	1155552081	24-BEE-S8-M14B	1)
S 10	M 16 x 1.5	PB 400	21	7	7	26	18.5	16.5	37	27	22	12	100	17.0	1155602081	24-BEE-S10-M16B	1)
S 12	M 18 x 1.5	PB 400	23	8	8	28	20.5	18.5	40	30	24	12	130	22.9	1155652081	24-BEE-S12-M18B	1)
S 14	M 20 x 1.5	PB 400	25	10	10	31	23	20	43	32	27	14	160	28.5	1155702081	24-BEE-S14-M20B	1)
S 16	M 22 x 1.5	PB 400	27	12	12	31	22.5	21.5	47	36	27	14	180	32.0	1155752081	24-BEE-S16-M22B	1)
S 20	M 22 x 1.5	PB 400	27	12	16	38	27.5	25	55	46	27	14	180	58.5	1154942081	24-BEE-S20-M22B	
S 20	M 27 x 2	PB 400	32	16	16	38	27.5	24	55	46	36	16	300	59.6	1155802081	24-BEE-S20-M27B	1)
S 25	M 33 x 2	PB 250	39	20	20	43	31	30.5	66.5	50	41	18	380	94.8	1155852081	24-BEE-S25-M33B	1)
S 30	M 42 x 2	PB 250	49	25	25	50	36.5	35.5	75.5	60	50	20	600	154.0	1155902081	24-BEE-S30-M42B	1)
S 38	M 48 x 2	PB 250	55	32	32	57	41	40.5	86.5	70	60	22	750	231.7	1155952081	24-BEE-S38-M48B	1)

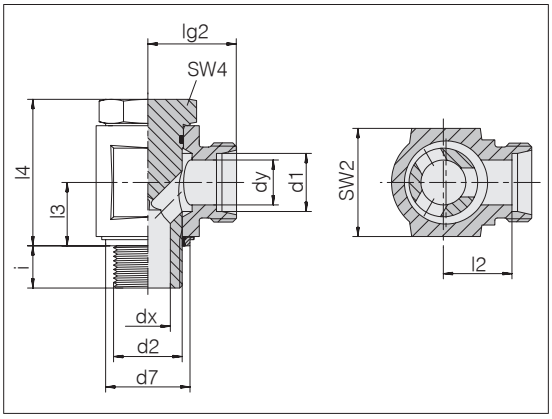
1) Standard size

Example for comp. :
WH06LMOMD

Banjo couplings unrestricted flow design with eccentric flow channel

Male thread: Metric fine thread, cylindrical
For threaded bores: ISO 9974-1 (Form N - narrow)
Sealing type: Soft sealing ring (Form E)
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d7	dx	dy	lg2	l2	l3	l4	SW2	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	M 10 x 1	PB 500	14.9	4	4	19	12	10.5	25.3	19	14	8	30	5.1	1155012081	24-BEE-L6-M10E	1)
L 8	M 12 x 1.5	PB 400	17	6	6	21.5	14.5	14	31.5	22	17	12	42	9.4	1155062081	24-BEE-L8-M12E	1)
L 8	M 14 x 1.5	PB 350	18.9	8	6	22.5	15.5	14	33	22	19	12	42	10.3	1155072081	24-BEE-L8-M14E	
L 10	M 14 x 1.5	PB 350	18.9	8	8	22.5	15.5	14	33	22	19	12	42	7.9	1155112081	24-BEE-L10-M14E	1)
L 12	M 16 x 1.5	PB 350	21.9	10	10	25	18	16.5	38.5	27	22	12	60	16.3	1155162081	24-BEE-L12-M16E	1)
L 12	M 18 x 1.5	PB 315	23.9	12	10	27	20	18.5	42.5	30	24	12	70	20.5	1156802081	24-BEE-L12-M18E	
L 15	M 18 x 1.5	PB 315	23.9	12	12	28	21	18.5	42.5	30	24	12	70	21.6	1155212081	24-BEE-L15-M18E	1)
L 15	M 22 x 1.5	PB 315	26.9	15	12	29	22	21.5	47.5	36	27	14	160	29.7	1156822081	24-BEE-L15-M22E	
L 18	M 22 x 1.5	PB 315	26.9	15	15	29	21.5	21.5	47.5	36	27	14	160	29.9	1155262081	24-BEE-L18-M22E	1)
L 22	M 26 x 1.5	PB 200	31.9	19	19	33.5	26	24	55.5	41	32	16	140	46.5	1155312081	24-BEE-L22-M26E	1)
L 28	M 33 x 2	PB 200	39.9	24	24	39	31.5	30.5	68	50	41	18	350	87.8	1155362081	24-BEE-L28-M33E	1)
L 35	M 42 x 2	PB 200	49.9	30	30	46	35.5	35.5	78	60	50	20	500	147.4	1155412081	24-BEE-L35-M42E	1)
L 42	M 48 x 2	PB 200	55.9	36	36	51	40	40.5	88.5	70	60	22	600	216.9	1155462081	24-BEE-L42-M48E	1)
S 6	M 12 x 1.5	PB 500	17	4	4	23.5	16.5	14	30.5	22	17	12	57	9.9	1155512081	24-BEE-S6-M12E	1)
S 8	M 12 x 1.5	PB 450	17	4	5	23.5	16.5	14	30.5	22	17	12	57	10.7	7007559600	24-BEE-S8-M12E	
S 8	M 14 x 1.5	PB 450	18.9	5	5	23.5	16.5	14	31	22	19	12	90	10.9	1155562081	24-BEE-S8-M14E	1)
S 10	M 16 x 1.5	PB 400	21.9	7	7	26	18.5	16.5	37	27	22	12	100	17.4	1155612081	24-BEE-S10-M16E	1)
S 12	M 18 x 1.5	PB 400	23.9	8	8	28	20.5	18.5	40	30	24	12	130	22.9	1155662081	24-BEE-S12-M18E	1)
S 16	M 22 x 1.5	PB 400	26.9	12	12	31	22.5	21.5	47	36	27	14	180	32.0	1155762081	24-BEE-S16-M22E	1)
S 20	M 22 x 1.5	PB 400	26.9	12	16	38	27.5	25	55	46	27	14	180	48.0	1154832081	24-BEE-S20-M22E	
S 20	M 27 x 2	PB 400	32.9	16	16	38	27.5	24	55	46	36	16	300	59.7	1155812081	24-BEE-S20-M27E	1)
S 25	M 33 x 2	PB 250	39.9	20	20	43	31	30.5	66.5	50	41	18	380	93.4	1155862081	24-BEE-S25-M33E	1)
S 30	M 42 x 2	PB 250	49.9	25	25	50	36.5	35.5	75.5	60	50	20	600	157.3	1155912081	24-BEE-S30-M42E	1)
S 38	M 48 x 2	PB 250	55.9	32	32	57	41	40.5	86.5	70	60	22	750	232.8	1155962081	24-BEE-S38-M48E	1)

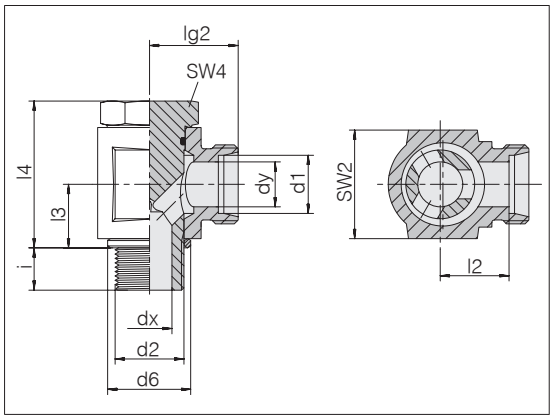
1) Standard size

Example for comp. :
WH06LMKDSOMD

Banjo couplings unrestricted flow design with eccentric flow channel

Male thread: BSPP thread, parallel
For threaded bores: ISO 1179-1 (Form N - narrow)
Sealing type: Seal-edge ring (Form B)
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d6	dx	dy	lg2	l2	l3	l4	SW2	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	G 1/8 A	PB 500	14	4	4	19	12	10.5	25.3	19	14	8	25	5.0	1157002081	24-BEE-L6-G1/8B	1)
L 6	G 1/4 A	PB 400	18	6	4	21.5	14.5	14	29.5	22	19	12	40	9.8	1156832081	24-BEE-L6-G1/4B	
L 8	G 1/4 A	PB 400	18	6	6	21.5	14.5	14	31.5	22	19	12	40	10.0	1157052081	24-BEE-L8-G1/4B	1)
L 10	G 1/4 A	PB 350	18	8	8	22.5	15.5	14	33	22	19	12	38	10.4	1157102081	24-BEE-L10-G1/4B	1)
L 12	G 3/8 A	PB 350	22	10	10	25	18	16.5	38.5	27	22	12	75	16.5	1157152081	24-BEE-L12-G3/8B	1)
L 12	G 1/2 A	PB 315	26	12	10	29	22	21.5	45.5	32	27	14	110	28.4	1157192081	24-BEE-L12-G1/2B	
L 15	G 1/2 A	PB 315	26	12	12	29	22	21.5	45.5	32	27	14	110	28.7	1157202081	24-BEE-L15-G1/2B	1)
L 18	G 1/2 A	PB 315	26	15	15	29	21.5	21.5	47.5	36	27	14	110	29.3	1157252081	24-BEE-L18-G1/2B	1)
L 22	G 3/4 A	PB 200	32	19	19	36	28.5	24	56.5	46	36	16	160	56.3	1157302081	24-BEE-L22-G3/4B	1)
L 28	G 1 A	PB 200	39	24	24	39	31.5	30.5	68	50	41	18	270	88.1	1157352081	24-BEE-L28-G1B	1)
L 35	G 1 1/4 A	PB 200	49	30	30	46	35.5	35.5	78	60	50	20	500	147.9	1157402081	24-BEE-L35-G11/4B	1)
L 42	G 1 1/2 A	PB 200	55	36	36	51	40	40.5	88.5	70	60	22	600	218.6	1157452081	24-BEE-L42-G11/2B	1)
S 6	G 1/4 A	PB 500	18	4	4	23.5	16.5	14	30.5	22	19	12	53	10.3	1157502081	24-BEE-S6-G1/4B	1)
S 8	G 1/4 A	PB 450	18	5	5	23.5	16.5	14	31	22	19	12	53	10.6	1157552081	24-BEE-S8-G1/4B	1)
S 10	G 3/8 A	PB 400	22	7	7	26	18.5	16.5	37	27	22	12	120	17.3	1157602081	24-BEE-S10-G3/8B	1)
S 12	G 3/8 A	PB 400	22	8	8	26	18.5	16.5	37.5	27	22	12	120	17.8	1157652081	24-BEE-S12-G3/8B	1)
S 14	G 1/2 A	PB 400	26	10	10	31	23	21.5	43	32	27	14	160	29.1	1157702081	24-BEE-S14-G1/2B	1)
S 16	G 1/2 A	PB 400	26	12	12	31	22.5	21.5	47	36	27	14	160	31.5	1157752081	24-BEE-S16-G1/2B	1)
S 20	G 3/4 A	PB 400	32	16	16	38	27.5	24	55	46	36	16	330	59.4	1157802081	24-BEE-S20-G3/4B	1)
S 25	G 1 A	PB 250	39	20	20	43	31	30.5	66.5	50	41	18	380	93.2	1157852081	24-BEE-S25-G1B	1)
S 30	G 1 1/4 A	PB 250	49	25	25	50	36.5	35.5	75.5	60	50	20	600	156.7	1157902081	24-BEE-S30-G11/4B	1)
S 38	G 1 1/2 A	PB 250	55	32	32	57	41	40.5	86.5	70	60	22	800	232.3	1157952081	24-BEE-S38-G11/2B	1)

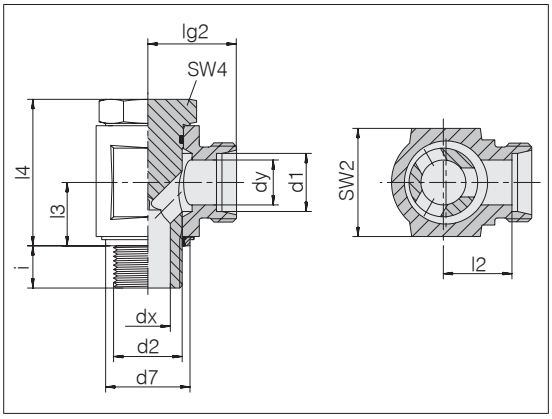
1) Standard size

Example for comp. :
WH06LROMD

Banjo couplings unrestricted flow design with eccentric flow channel

Male thread: BSPP thread, cylindrical
For threaded bores: ISO 1179-1 (Form N - narrow)
Sealing type: Soft sealing ring (Form E)
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d7	dx	dy	lg2	l2	l3	l4	SW2	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	G 1/8 A	PB 500	14.9	4	4	19	12	10.5	25.3	19	14	8	25	5.0	1157012081	24-BEE-L6-G1/8E	1)
L 6	G 1/4 A	PB 400	18.9	6	4	21.5	14.5	14	31.5	22	19	12	40	9.7	1154812081	24-BEE-L6-G1/4E	
L 8	G 1/4 A	PB 400	18.9	6	6	21.5	14.5	14	31.5	22	19	12	40	9.8	1157062081	24-BEE-L8-G1/4E	1)
L 10	G 1/4 A	PB 350	18.9	8	8	22.5	15.5	14	33	22	19	12	38	10.1	1157112081	24-BEE-L10-G1/4E	1)
L 10	G 3/8 A	PB 350	21.9	10	8	22.5	18	16.5	38.5	27	22	12	75	16.4	1154732081	24-BEE-L10-G3/8E	
L 12	G 1/4 A	PB 350	18.9	8	10	25	18	16.5	37	27	22	12	75	14.6	1154822081	24-BEE-L12-G1/4E	
L 12	G 3/8 A	PB 350	21.9	10	10	25	18	16.5	38.5	27	22	12	75	16.2	1157162081	24-BEE-L12-G3/8E	1)
L 12	G 1/2 A	PB 315	30	12	10	29	22	21.5	45.5	32	27	14	110	27.7	1156812081	24-BEE-L12-G1/2E	
L 15	G 1/2 A	PB 315	26.9	12	12	29	22	21.5	45.5	32	27	14	110	28.4	1157212081	24-BEE-L15-G1/2E	1)
L 18	G 1/2 A	PB 315	26.9	15	15	29	21.5	21.5	47.5	36	27	14	110	29.6	1157262081	24-BEE-L18-G1/2E	1)
L 22	G 3/4 A	PB 200	32.9	19	19	36	28.5	24	56.5	46	36	16	160	56.8	1157312081	24-BEE-L22-G3/4E	1)
L 28	G 1 A	PB 200	39.9	24	24	39	31.5	30.5	68	50	41	18	270	86.6	1157362081	24-BEE-L28-G1E	1)
L 35	G 1 1/4 A	PB 200	49.9	30	30	46	35.5	35.5	78	60	50	20	500	146.6	1157412081	24-BEE-L35-G11/4E	1)
L 42	G 1 1/2 A	PB 200	55.9	36	36	51	40	40.5	88.5	70	60	22	600	214.5	1157462081	24-BEE-L42-G11/2E	1)
S 6	G 1/4 A	PB 500	18.9	4	4	23.5	16.5	14	30.5	22	19	12	53	10.4	1157512081	24-BEE-S6-G1/4E	1)
S 8	G 1/4 A	PB 450	18.9	5	5	23.5	16.5	14	31	22	19	12	53	10.5	1157562081	24-BEE-S8-G1/4E	1)
S 10	G 3/8 A	PB 400	21.9	7	7	26	18.5	16.5	37	27	22	12	120	17.3	1157612081	24-BEE-S10-G3/8E	1)
S 12	G 3/8 A	PB 400	21.9	8	8	26	18.5	16.5	37.5	27	22	12	120	17.5	1157662081	24-BEE-S12-G3/8E	1)
S 14	G 1/2 A	PB 400	26.9	10	10	31	23	21.5	44	32	27	14	160	29.5	1157712081	24-BEE-S14-G1/2E	1)
S 16	G 1/2 A	PB 400	26.9	12	12	31	22.5	21.5	47	36	27	14	160	31.2	1157762081	24-BEE-S16-G1/2E	1)
S 20	G 3/4 A	PB 400	32.9	16	16	38	27.5	24	55	46	36	16	330	59.4	1157812081	24-BEE-S20-G3/4E	1)
S 25	G 1 A	PB 250	39.9	20	20	43	31	30.5	66.5	50	41	18	380	93.8	1157862081	24-BEE-S25-G1E	1)
S 30	G 1 1/4 A	PB 250	49.9	25	25	50	36.5	35.5	75.5	60	50	20	600	155.2	1157912081	24-BEE-S30-G11/4E	1)
S 38	G 1 1/2 A	PB 250	55.9	32	32	57	41	40.5	86.5	70	60	22	800	231.1	1157962081	24-BEE-S38-G11/2E	1)

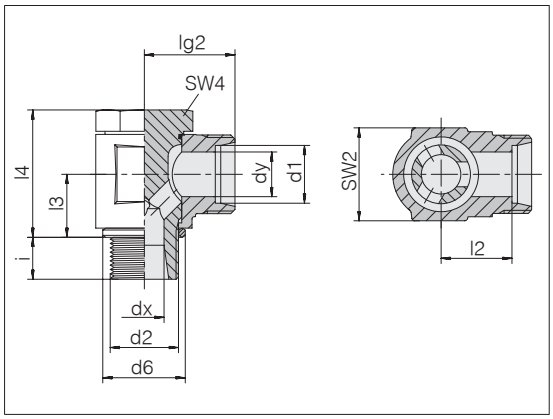
1) Standard size

Example for comp. :
WH06LRKDSOMD

Banjo couplings compact design - high pressure

Male thread: metric fine thread, parallel
For threaded bores: ISO 9974-1 (Form N - narrow)
Sealing type: Seal-edge ring (Form B)
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



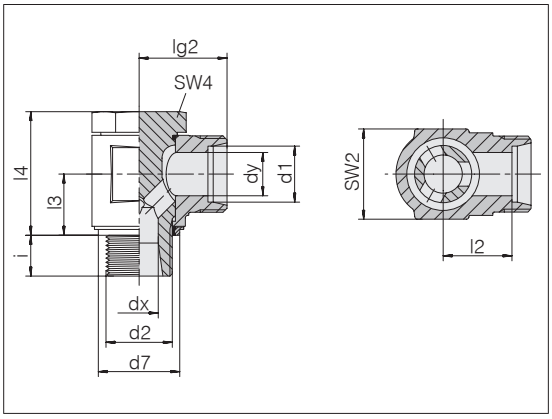
Series Tube OD d1	d2	Pressure	d6	dx	dy	lg2	l2	l3	l4	SW2	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	M 10 x 1	PB 500	14	4	4	20	13	10	21	14	14	8	25	3.6	1152202081	24-BCE-L6-M10B	1)
L 8	M 12 x 1.5	PB 500	17	5	6	21	14	13.5	27	19	19	10	50	7.5	1152212081	24-BCE-L8-M12B	1)
L 10	M 14 x 1.5	PB 500	19	5	8	22	15	13.5	27	19	19	10	60	8.2	1152222081	24-BCE-L10-M14B	1)
L 12	M 16 x 1.5	PB 400	21	8	10	24.5	17.5	16	32.5	24	22	10	80	12.4	1152232081	24-BCE-L12-M16B	1)
L 12	M 18 x 1.5	PB 315	23	8	10	27	20	18.5	36	24	22	10	100	14.2	1152242081	24-BCE-L12-M18B	
L 15	M 18 x 1.5	PB 400	23	9.5	12	27	20	18.5	37	27	24	10	100	19.2	1152252081	24-BCE-L15-M18B	1)
L 18	M 22 x 1.5	PB 400	27	11	15	28	20.5	21.5	43	30	27	12	140	27.9	1152262081	24-BCE-L18-M22B	1)
L 22	M 26 x 1.5	PB 250	31	15	19	34.5	27	24	48	36	32	16	180	42.0	1152272081	24-BCE-L22-M26B	1)
L 28	M 33 x 2	PB 250	39	19	24	39	31.5	30.5	59	46	41	18	380	86.0	1152282081	24-BCE-L28-M33B	1)
L 35	M 42 x 2	PB 250	49	24	30	46	35.5	35.5	70	55	50	20	500	145.7	1152292081	24-BCE-L35-M42B	1)
L 42	M 48 x 2	PB 250	55	31	36	51	40	40.5	80	65	55	22	600	219.2	1152302081	24-BCE-L42-M48B	1)
S 6	M 12 x 1.5	PB 500	17	5	4	23	16	13.5	27	19	19	10	50	7.9	1152312081	24-BCE-S6-M12B	1)
S 8	M 14 x 1.5	PB 500	19	5	5	23	16	13.5	27	19	19	10	60	8.9	1152322081	24-BCE-S8-M14B	1)
S 10	M 16 x 1.5	PB 500	21	8	7	25.5	18	16	32.5	24	22	10	80	13.1	1152332081	24-BCE-S10-M16B	1)
S 12	M 18 x 1.5	PB 400	23	9.5	8	27	19.5	18.5	37	27	24	10	110	19.5	1152342081	24-BCE-S12-M18B	1)
S 16	M 22 x 1.5	PB 400	27	11	12	30	21.5	21.5	43	30	27	12	140	28.2	1152362081	24-BCE-S16-M22B	1)
S 20	M 27 x 2	PB 315	32	15	16	36.5	26	24	48	36	32	16	300	45.4	1152372081	24-BCE-S20-M27B	1)
S 25	M 33 x 2	PB 250	39	19	20	43	31	30.5	59	46	41	18	380	85.9	1152382081	24-BCE-S25-M33B	1)
S 30	M 42 x 2	PB 250	49	24	25	50	36.5	35.5	70	55	50	20	600	144.7	1152392081	24-BCE-S30-M42B	1)
S 38	M 48 x 2	PB 250	55	31	32	57	41	40.5	80	65	55	22	700	232.0	1152402081	24-BCE-S38-M48B	1)

1) Standard size

Banjo couplings compact design - high pressure

Male thread: metric fine thread, cylindrical
For threaded bores: ISO 9974-1 (Form N - narrow)
Sealing type: Soft sealing ring (Form E)
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



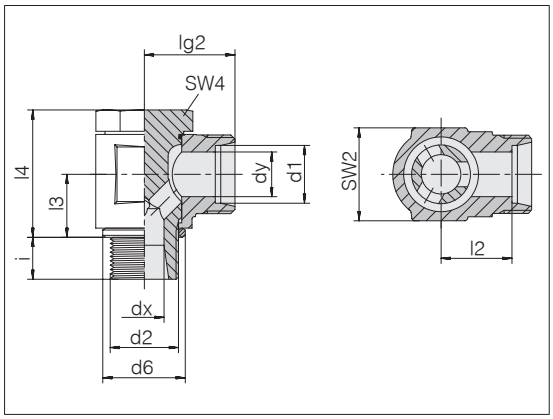
Series Tube OD d1	d2	Pressure	d7	dx	dy	lg2	l2	l3	l4	SW2	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	M 10 x 1	PB 500	14.9	4	4	20	13	10	21	14	14	8	25	3.6	1150202081	24-BCE-L6-M10E	1)
L 8	M 12 x 1.5	PB 500	17.9	5	6	21	14	13.5	27	19	19	10	50	7.5	1150212081	24-BCE-L8-M12E	1)
L 10	M 14 x 1.5	PB 500	18.9	5	8	22	15	13.5	27	19	19	10	60	8.2	1150222081	24-BCE-L10-M14E	1)
L 12	M 16 x 1.5	PB 400	21.9	8	10	24.5	17.5	16	32.5	24	22	10	80	12.4	1150232081	24-BCE-L12-M16E	1)
L 12	M 18 x 1.5	PB 315	23.9	8	10	27	20	18.5	36	24	22	10	100	14.2	1150242081	24-BCE-L12-M18E	
L 15	M 18 x 1.5	PB 400	23.9	9.5	12	27	20	18.5	37	27	24	10	100	19.2	1150252081	24-BCE-L15-M18E	1)
L 18	M 22 x 1.5	PB 400	26.9	11	15	28	20.5	21.5	43	30	27	12	140	27.9	1150262081	24-BCE-L18-M22E	1)
L 22	M 26 x 1.5	PB 250	31.9	15	19	34.5	27	24	48	36	32	16	180	42.0	1150272081	24-BCE-L22-M26E	1)
L 28	M 33 x 2	PB 250	39.9	19	24	39	31.5	30.5	59	46	41	18	380	86.0	1150282081	24-BCE-L28-M33E	1)
L 35	M 42 x 2	PB 250	49.9	24	30	46	35.5	35.5	70	55	50	20	500	145.7	1150292081	24-BCE-L35-M42E	1)
L 42	M 48 x 2	PB 250	55.9	31	36	51	40	40.5	80	65	55	22	600	219.2	1150302081	24-BCE-L42-M48E	1)
S 6	M 12 x 1.5	PB 500	17.9	5	4	23	16	13.5	27	19	19	10	50	7.9	1150312081	24-BCE-S6-M12E	1)
S 8	M 14 x 1.5	PB 500	18.9	5	5	23	16	13.5	27	19	19	10	60	8.9	1150322081	24-BCE-S8-M14E	1)
S 10	M 16 x 1.5	PB 500	21.9	8	7	25.5	18	16	32.5	24	22	10	80	13.1	1150332081	24-BCE-S10-M16E	1)
S 12	M 18 x 1.5	PB 400	23.9	9.5	8	27	19.5	18.5	37	27	24	10	110	19.5	1150342081	24-BCE-S12-M18E	1)
S 16	M 22 x 1.5	PB 400	27.9	11	12	30	21.5	21.5	43	30	27	12	140	28.2	1150362081	24-BCE-S16-M22E	1)
S 20	M 27 x 2	PB 315	32.9	15	16	36.5	26	24	48	36	32	16	300	45.4	1150372081	24-BCE-S20-M27E	1)
S 25	M 33 x 2	PB 250	39.9	19	20	43	31	30.5	59	46	41	18	380	85.9	1150382081	24-BCE-S25-M33E	1)
S 30	M 42 x 2	PB 250	49.9	24	25	50	36.5	35.5	70	55	50	20	600	144.7	1150392081	24-BCE-S30-M42E	1)
S 38	M 48 x 2	PB 250	55.9	31	32	57	41	40.5	80	65	55	22	700	232.0	1150402081	24-BCE-S38-M48E	1)

1) Standard size

Banjo couplings compact design - high pressure

Male thread: BSPP thread, parallel
For threaded bores: ISO 1179-1 (Form N - narrow)
Sealing type: Seal-edge ring (Form B)
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



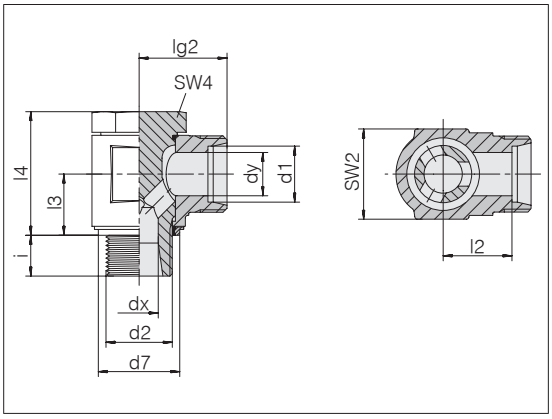
Series Tube OD d1	d2	Pressure	d6	dx	dy	lg2	l2	l3	l4	SW2	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	G 1/8 A	PB 500	14	4	4	20	13	10	21	14	14	8	25	5.9	1152412081	24-BCE-L6-G1/8B	1)
L 6	G 1/4 A	PB 500	18	5	4	22	15	13.5	27	19	19	10	45	5.9	1152422081	24-BCE-L6-G1/4B	
L 8	G 1/4 A	PB 500	18	5	6	21	14	13.5	27	19	19	10	45	9.3	1152432081	24-BCE-L8-G1/4B	1)
L 10	G 1/4 A	PB 500	18	5	8	22	15	13.5	27	19	19	10	45	10.2	1152442081	24-BCE-L10-G1/4B	1)
L 12	G 1/4 A	PB 400	18	5	10	22	15	15.5	30	22	19	10	45	15.8	1152452081	24-BCE-L12-G1/4B	
L 12	G 3/8 A	PB 400	22	8	10	24.5	17.5	16	32.5	24	22	10	75	15.9	1152462081	24-BCE-L12-G3/8B	1)
L 15	G 1/2 A	PB 400	26	11	12	28	21	21.5	43	30	27	12	110	28.4	1152472081	24-BCE-L15-G1/2B	1)
L 18	G 1/2 A	PB 400	26	11	15	28	20.5	21.5	43	30	27	12	110	32.0	1152482081	24-BCE-L18-G1/2B	1)
L 22	G 3/4 A	PB 250	32	15	19	34.5	27	24	48	36	32	16	210	48.5	1152492081	24-BCE-L22-G3/4B	1)
L 28	G 1 A	PB 250	39	19	24	39	31.5	30.5	59	46	41	18	380	88.2	1152502081	24-BCE-L28-G1B	1)
L 35	G 1 1/4 A	PB 250	49	24	30	46	35.5	35.5	70	55	50	20	500	150.8	1152512081	24-BCE-L35-G11/4B	1)
L 42	G 1 1/2 A	PB 250	55	31	36	51	40	40.5	80	65	55	22	650	234.1	1152522081	24-BCE-L42-G11/2B	1)
S 6	G 1/4 A	PB 500	18	5	4	23	16	13.5	27	19	19	10	50	8.7	1152532081	24-BCE-S6-G1/4B	1)
S 8	G 1/4 A	PB 500	18	5	5	23	16	13.5	27	19	19	10	50	10.3	1152542081	24-BCE-S8-G1/4B	1)
S 10	G 3/8 A	PB 500	22	8	7	25.5	18	16	32.5	24	22	10	80	17.0	1152552081	24-BCE-S10-G3/8B	1)
S 12	G 3/8 A	PB 400	22	8	8	25.5	18	16	32.5	24	22	10	80	17.9	1152562081	24-BCE-S12-G3/8B	1)
S 14	G 1/2 A	PB 400	26	11	10	30	22	19.5	41	30	27	12	160	30.3	1152572081	24-BCE-S14-G1/2B	1)
S 16	G 1/2 A	PB 400	26	11	12	30	21.5	21.5	43	30	27	12	160	31.6	1152582081	24-BCE-S16-G1/2B	1)
S 20	G 3/4 A	PB 315	32	15	16	36.5	26	24	48	36	32	16	250	51.8	1152592081	24-BCE-S20-G3/4B	1)
S 25	G 1 A	PB 250	39	19	20	43	31	30.5	59	46	41	18	380	103.0	1152602081	24-BCE-S25-G1B	1)
S 30	G 1 1/4 A	PB 250	49	24	25	50	36.5	35.5	70	55	50	20	600	163.7	1152612081	24-BCE-S30-G11/4B	1)
S 38	G 1 1/2 A	PB 250	55	31	32	57	41	40.5	80	65	55	22	700	262.7	1152622081	24-BCE-S38-G11/2B	1)

1) Standard size

Banjo couplings compact design - high pressure

Male thread: BSPP thread, cylindrical
For threaded bores: ISO 1179-1 (Form N - narrow)
Sealing type: Soft sealing ring (Form E)
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



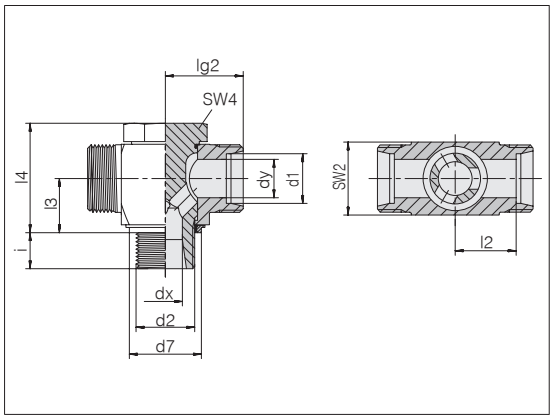
Series Tube OD d1	d2	Pressure	d7	dx	dy	lg2	l2	l3	l4	SW2	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	G 1/8 A	PB 500	14.9	4	4	20	13	10	21	14	14	8	25	5.9	1150412081	24-BCE-L6-G1/8E	1)
L 6	G 1/4 A	PB 500	18.9	5	4	22	15	13.5	27	19	19	10	45	5.9	1150422081	24-BCE-L6-G1/4E	
L 8	G 1/4 A	PB 500	18.9	5	6	21	14	13.5	27	19	19	10	45	9.3	1150432081	24-BCE-L8-G1/4E	1)
L 10	G 1/4 A	PB 500	18.9	5	8	22	15	13.5	27	19	19	10	45	10.2	1150442081	24-BCE-L10-G1/4E	1)
L 12	G 1/4 A	PB 400	18.9	5	10	22	15	15.5	30	22	19	10	45	15.8	1150452081	24-BCE-L12-G1/4E	
L 12	G 3/8 A	PB 400	21.9	8	10	24.5	17.5	16	32.5	24	22	10	75	15.9	1150462081	24-BCE-L12-G3/8E	1)
L 15	G 1/2 A	PB 400	26.9	11	12	28	21	21.5	43	30	27	12	110	28.4	1150472081	24-BCE-L15-G1/2E	1)
L 18	G 1/2 A	PB 400	26.9	11	15	28	20.5	21.5	43	30	27	12	110	32.0	1150482081	24-BCE-L18-G1/2E	1)
L 22	G 3/4 A	PB 250	32.9	15	19	35.5	27	24	48	36	32	16	210	48.5	1150492081	24-BCE-L22-G3/4E	1)
L 28	G 1 A	PB 250	39.9	19	24	39	31.5	30.5	59	46	41	18	380	88.2	1150502081	24-BCE-L28-G1E	1)
L 35	G 1 1/4 A	PB 250	49.9	24	30	46	35.5	35.5	70	55	50	20	500	150.8	1150512081	24-BCE-L35-G11/4E	1)
L 42	G 1 1/2 A	PB 250	55.9	31	36	51	40	40.5	80	65	55	22	650	234.1	1150522081	24-BCE-L42-G11/2E	1)
S 6	G 1/4 A	PB 500	18.9	5	4	23	16	13.5	27	19	19	10	50	8.7	1150532081	24-BCE-S6-G1/4E	1)
S 8	G 1/4 A	PB 500	18.9	5	5	23	16	13.5	27	19	19	10	50	10.3	1150542081	24-BCE-S8-G1/4E	1)
S 10	G 3/8 A	PB 500	21.9	8	7	25.5	18	16	32.5	24	22	10	80	17.0	1150552081	24-BCE-S10-G3/8E	1)
S 12	G 3/8 A	PB 400	21.9	8	8	25.5	18	16	32.5	24	22	10	80	17.9	1150562081	24-BCE-S12-G3/8E	1)
S 14	G 1/2 A	PB 400	26.9	11	10	30	22	19.5	41	30	27	12	160	30.3	1150572081	24-BCE-S14-G1/2E	1)
S 16	G 1/2 A	PB 400	26.9	11	12	30	21.5	21.5	43	30	27	12	160	31.6	1150582081	24-BCE-S16-G1/2E	1)
S 20	G 3/4 A	PB 400	32.9	15	16	36.5	26	24	48	36	32	16	250	51.8	1150592081	24-BCE-S20-G3/4E	1)
S 25	G 1 A	PB 250	39.9	19	20	43	31	30.5	59	46	41	18	380	103.0	1150602081	24-BCE-S25-G1E	1)
S 30	G 1 1/4 A	PB 250	49.9	24	25	50	36.5	35.5	70	55	50	20	600	163.7	1150612081	24-BCE-S30-G11/4E	1)
S 38	G 1 1/2 A	PB 250	55.9	31	32	57	41	40.5	80	65	55	22	700	262.7	1150622081	24-BCE-S38-G11/2E	1)

1) Standard size

T banjo couplings compact design - high pressure

Male thread: metric fine thread, cylindrical
For threaded bores: ISO 9974-1 (Form N - narrow)
Sealing type: Soft sealing ring (Form E)
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



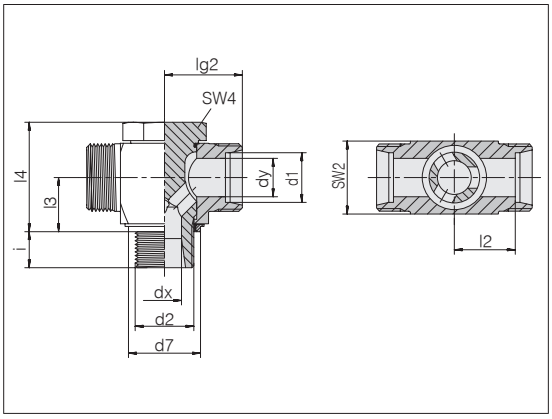
Series Tube OD d1	d2	Pressure	d7	dx	dy	lg2	l2	l3	l4	SW2	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	M 10 x 1	PB 500	14.9	4	4	20	13	10	21	14	14	8	25	4.9	1154202081	24-BCT-L6-M10E-P	1)
L 8	M 12 x 1.5	PB 500	17.9	5	6	21	14	13.5	27	19	19	10	50	8.7	1154212081	24-BCT-L8-M12E-P	1)
L 10	M 14 x 1.5	PB 500	19.9	5	8	22	15	13.5	27	19	19	10	60	9.5	1150972081	24-BCT-L10-M14E-P	1)
L 12	M 16 x 1.5	PB 400	21.9	8	10	24.5	17.5	16	32.5	24	22	10	80	15.6	1154232081	24-BCT-L12-M16E-P	1)
L 12	M 18 x 1.5	PB 315	23.9	8	10	27	20	18.5	36	24	22	10	100	24.1	1154242081	24-BCT-L12-M18E-P	
L 15	M 18 x 1.5	PB 400	23.9	9.5	12	27	20	18.5	37	27	24	10	100	21.7	1154252081	24-BCT-L15-M18E-P	1)
L 18	M 22 x 1.5	PB 400	27.9	11	15	28	20.5	21.5	43	30	27	12	140	30.3	1154262081	24-BCT-L18-M22E-P	1)
L 22	M 26 x 1.5	PB 250	31.9	15	19	34.5	27	24	48	36	32	16	180	47.2	1154272081	24-BCT-L22-M26E-P	1)
L 28	M 33 x 2	PB 250	39.9	19	24	39	31.5	30.5	59	46	41	18	380	90.1	1154282081	24-BCT-L28-M33E-P	1)
L 35	M 42 x 2	PB 250	49.9	24	30	46	35.5	35.5	70	55	50	20	500	153.5	1154292081	24-BCT-L35-M42E-P	1)
L 42	M 48 x 2	PB 250	55.9	31	36	51	40	40.5	80	65	55	22	600	218.8	1154302081	24-BCT-L42-M48E-P	1)
S 6	M 12 x 1.5	PB 500	17.9	5	4	23	16	13.5	27	19	19	10	50	9.8	1154312081	24-BCT-S6-M12E-P	1)
S 8	M 14 x 1.5	PB 500	19.9	5	5	23	16	13.5	27	19	19	10	60	10.8	1154322081	24-BCT-S8-M14E-P	1)
S 10	M 16 x 1.5	PB 500	21.9	8	7	25.5	18	16	32.5	24	22	10	80	16.9	1154332081	24-BCT-S10-M16E-P	1)
S 12	M 18 x 1.5	PB 400	23.9	9.5	8	27	19.5	18.5	37	27	24	10	110	22.2	1154342081	24-BCT-S12-M18E-P	1)
S 16	M 22 x 1.5	PB 400	27.9	11	12	30	21.5	21.5	43	30	27	12	140	31.2	1154362081	24-BCT-S16-M22E-P	1)
S 20	M 27 x 2	PB 315	32.9	15	16	36.5	26	24	48	36	32	16	300	51.2	1154372081	24-BCT-S20-M27E-P	1)
S 25	M 33 x 2	PB 250	39.9	19	20	43	31	30.5	59	46	41	18	380	95.2	1154382081	24-BCT-S25-M33E-P	1)
S 30	M 42 x 2	PB 250	49.9	24	25	50	36.5	35.5	70	55	50	20	600	157.8	1154392081	24-BCT-S30-M42E-P	1)
S 38	M 48 x 2	PB 250	55.9	31	32	57	41	40.5	80	65	55	22	700	239.0	1154402081	24-BCT-S38-M48E-P	1)

1) Standard size

T banjo couplings compact design - high pressure

Male thread: BSPP thread, cylindrical
For threaded bores: ISO 1179-1 (Form N - narrow)
Sealing type: Soft sealing ring (Form E)
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d7	dx	dy	lg2	l2	l3	l4	SW2	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	G 1/8 A	PB 500	14.9	4	4	20	13	10	21	14	14	8	25	4.8	1154412081	24-BCT-L6-G1/8E-P	1)
L 8	G 1/4 A	PB 500	18.9	5	6	21	14	13.5	27	19	19	10	45	9.0	1154432081	24-BCT-L8-G1/4E-P	1)
L 10	G 1/4 A	PB 500	18.9	5	8	22	15	13.5	27	19	19	10	45	9.2	1154442081	24-BCT-L10-G1/4E-P	1)
L 12	G 3/8 A	PB 400	21.9	8	10	24.5	17.5	16	32.5	24	22	10	75	15.4	1154462081	24-BCT-L12-G3/8E-P	1)
L 15	G 1/2 A	PB 400	26.9	11	12	28	21	21.5	43	30	27	12	110	28.7	1154472081	24-BCT-L15-G1/2E-P	1)
L 18	G 1/2 A	PB 400	26.9	11	15	28	20.5	21.5	43	30	27	12	110	29.4	1154482081	24-BCT-L18-G1/2E-P	1)
L 22	G 3/4 A	PB 250	32.9	15	19	35.5	28	24	48	36	32	16	210	49.2	1154492081	24-BCT-L22-G3/4E-P	1)
L 28	G 1 A	PB 250	39.9	19	24	39	31.5	30.5	59	46	41	18	380	89.9	1154502081	24-BCT-L28-G1E-P	1)
L 35	G 1 1/4 A	PB 250	49.9	24	30	46	35.5	35.5	70	55	50	20	500	152.9	1154512081	24-BCT-L35-G11/4E-P	1)
L 42	G 1 1/2 A	PB 250	55.9	31	36	51	40	40.5	80	65	55	22	650	218.8	1154522081	24-BCT-L42-G11/2E-P	1)
S 6	G 1/4 A	PB 500	18.9	5	4	23	16	13.5	27	19	19	10	50	10.0	1154532081	24-BCT-S6-G1/4E-P	1)
S 8	G 1/4 A	PB 500	18.9	5	5	23	16	13.5	27	19	19	10	50	10.5	1154542081	24-BCT-S8-G1/4E-P	1)
S 10	G 3/8 A	PB 500	21.9	8	7	25.5	18	16	32.5	24	22	10	80	16.7	1154552081	24-BCT-S10-G3/8E-P	1)
S 12	G 3/8 A	PB 400	21.9	8	8	25.5	18	16	32.5	24	22	10	80	17.2	1154562081	24-BCT-S12-G3/8E-P	1)
S 14	G 1/2 A	PB 400	26.9	11	10	30	22	19.5	41	30	27	12	160	29.4	1154572081	24-BCT-S14-G1/2E-P	1)
S 16	G 1/2 A	PB 400	26.9	11	12	30	21.5	21.5	43	30	27	12	160	30.3	1154582081	24-BCT-S16-G1/2E-P	1)
S 20	G 3/4 A	PB 315	32.9	15	16	36.5	26	24	48	36	32	16	250	51.1	1154592081	24-BCT-S20-G3/4E-P	1)
S 25	G 1 A	PB 250	39.9	19	20	43	31	30.5	59	46	41	18	380	95.0	1154602081	24-BCT-S25-G1E-P	1)
S 30	G 1 1/4 A	PB 250	49.9	24	25	50	36.5	35.5	70	55	50	20	600	157.3	1154612081	24-BCT-S30-G11/4E-P	1)
S 38	G 1 1/2 A	PB 250	55.9	31	32	57	41	40.5	80	65	55	22	700	239.0	1154622081	24-BCT-S38-G11/2E-P	1)

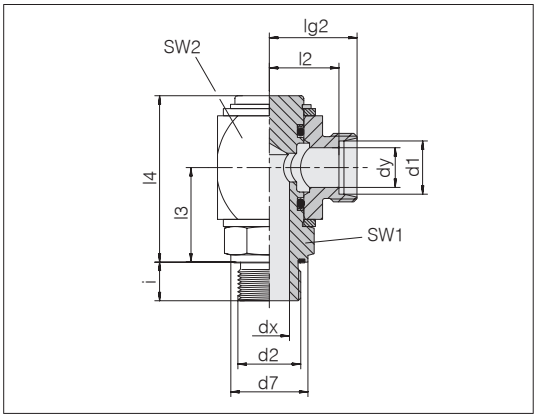
1) Standard size

Rotary couplings

Male thread: Metric fine thread, cylindrical
Threaded stud: ISO 9974-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1

Model: made of square section



Series Tube OD d1	d2	Pressure	d7	dx	dy	lg2	l2	l3	l4	SW1	SW2	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	M 10 x 1	PB 100	14.9	4	4	23.5	16.5	26.5	47	22	27	8	25	18.1	1175001081	24-RCE-L6-M10E-C10	1)
L 8	M 12 x 1.5	PB 100	16.9	6	6	23.5	16.5	26.5	47	22	27	12	35	18.4	1175051081	24-RCE-L8-M12E-C10	1)
L 10	M 14 x 1.5	PB 100	18.9	7	8	24.5	17.5	26.5	47	22	27	12	50	19.3	1175101081	24-RCE-L10-M14E-C10	1)
L 12	M 16 x 1.5	PB 100	21.9	9	8	24.5	17.5	26.5	47	22	27	12	80	18.9	1175151081	24-RCE-L12-M16E-C10	1)
L 15	M 18 x 1.5	PB 100	23.9	11	12	30.5	23.5	33.5	58.5	27	36	12	100	40.8	1175201081	24-RCE-L15-M18E-C10	1)
L 15	M 22 x 1.5	PB 100	26.9	14	12	30.5	23.5	33.5	58.5	27	36	14	160	41.3	1175221081	24-RCE-L15-M22E-C10	
L 18	M 22 x 1.5	PB 100	26.9	14	13	30.5	23	33.5	58.5	27	36	14	160	41.0	1175251081	24-RCE-L18-M22E-C10	1)
L 22	M 26 x 1.5	PB 100	31.9	17	18	34.5	27	38	65.5	32	41	16	220	54.3	1175301081	24-RCE-L22-M26E-C10	1)
L 28	M 33 x 2	PB 100	39.9	22	22	37	29.5	42.5	72	41	46	18	300	78.4	1175351081	24-RCE-L28-M33E-C10	1)
S 6	M 12 x 1.5	PB 400	16.9	4	4	25.5	18.5	26.5	47	22	27	12	50	20.0	1175501081	24-RCE-S6-M12E-C10	1)
S 8	M 14 x 1.5	PB 400	18.9	5	5	26	18.5	26.5	47	22	27	12	60	20.3	1175551081	24-RCE-S8-M14E-C10	1)
S 10	M 16 x 1.5	PB 400	21.9	7	7	25.5	18	26.5	47	22	27	12	100	20.3	1175601081	24-RCE-S10-M16E-C10	1)
S 12	M 18 x 1.5	PB 400	23.9	8	8	30.5	23	33.5	58.5	27	36	12	120	42.7	1175651081	24-RCE-S12-M18E-C10	1)
S 14	M 20 x 1.5	PB 400	25.9	10	10	33	25	33.5	58.5	27	36	14	170	43.2	1175701081	24-RCE-S14-M20E-C10	1)
S 16	M 22 x 1.5	PB 400	26.9	12	12	33	24.5	33.5	58.5	27	36	14	190	42.9	1175751081	24-RCE-S16-M22E-C10	1)
S 20	M 27 x 2	PB 400	32.9	16	16	36.5	26	38	65.5	32	41	16	300	56.8	1175801081	24-RCE-S20-M27E-C10	1)
S 25	M 33 x 2	PB 250	39.9	20	20	41	29	42.5	72	41	46	18	450	79.0	1175851081	24-RCE-S25-M33E-C10	1)

1) Standard size

These couplings are designed for slow rotary and swivelling motions of angles up to 360° and temperatures of up to 70 °C.

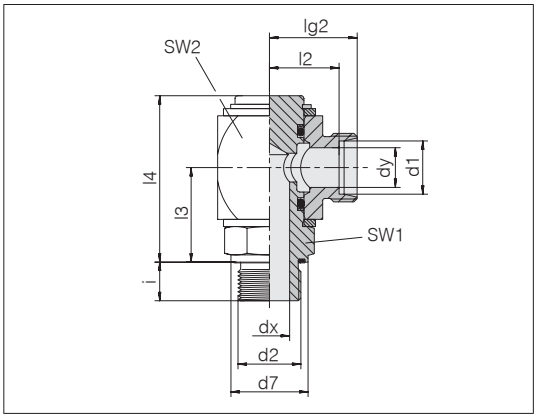
Example for comp. : DVWE06LMOMD

Rotary couplings

Male thread: BSPP thread, cylindrical
Threaded stud: ISO 1179-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1

Model: made of square section

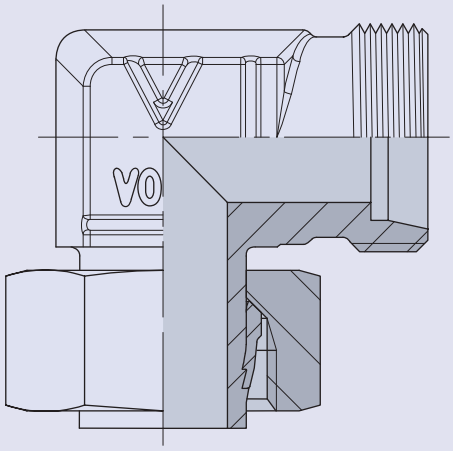


Series Tube OD d1	d2	Pressure	d7	dx	dy	lg2	l2	l3	l4	SW1	SW2	i	Nm -10 %	kg/100 ca.	Order-No.	Designation
L 6	G 1/8 A	PB 100	13.9	4	4	23.5	16.5	26.5	47	22	27	8	25	18.9	1176001081	24-RCE-L6-G1/8E-C10
L 8	G 1/4 A	PB 100	18.9	6	6	23.5	16.5	26.5	47	22	27	12	50	19.4	1176051081	24-RCE-L8-G1/4E-C10
L 10	G 1/4 A	PB 100	18.9	7	8	24.5	17.5	26.5	47	22	27	12	50	18.9	1176101081	24-RCE-L10-G1/4E-C10
L 12	G 3/8 A	PB 100	21.9	9	8	24.5	17.5	26.5	47	22	27	12	80	18.9	1176151081	24-RCE-L12-G3/8E-C10
L 15	G 1/2 A	PB 100	26.9	11	12	30.5	23.5	33.5	58.5	27	36	14	170	41.8	1176201081	24-RCE-L15-G1/2E-C10
L 18	G 1/2 A	PB 100	26.9	14	13	30.5	23	33.5	58.5	27	36	14	170	40.4	1176251081	24-RCE-L18-G1/2E-C10
L 22	G 3/4 A	PB 100	31.9	17	18	34.5	27	38	65.5	32	41	16	240	55.1	1176301081	24-RCE-L22-G3/4E-C10
L 28	G 1 A	PB 100	39.9	22	22	37	29.5	42.5	72	41	46	18	370	77.3	1176351081	24-RCE-L28-G1E-C10
S 6	G 1/4 A	PB 400	18.9	4	4	25.5	18.5	26.5	47	22	27	12	60	20.0	1176501081	24-RCE-S6-G1/4E-C10
S 8	G 1/4 A	PB 400	18.9	5	5	26	18.5	26.5	47	22	27	12	60	20.3	1176551081	24-RCE-S8-G1/4E-C10
S 10	G 3/8 A	PB 400	21.9	7	7	25.5	18	26.5	47	22	27	12	110	20.7	1176601081	24-RCE-S10-G3/8E-C10
S 12	G 3/8 A	PB 400	21.9	8	8	30.5	23	33.5	58.5	27	36	12	110	42.4	1176651081	24-RCE-S12-G3/8E-C10
S 14	G 1/2 A	PB 400	26.9	10	10	33	25	33.5	58.5	27	36	14	200	43.7	1176701081	24-RCE-S14-G1/2E-C10
S 16	G 1/2 A	PB 400	26.9	12	12	33	24.5	33.5	58.5	27	36	14	200	42.4	1176751081	24-RCE-S16-G1/2E-C10
S 20	G 3/4 A	PB 400	31.9	16	16	36.5	26	38	65.5	32	41	16	320	57.4	1176801081	24-RCE-S20-G3/4E-C10
S 25	G 1 A	PB 250	39.9	20	20	41	29	42.5	72	41	46	18	500	98.0	1176851081	24-RCE-S25-G1E-C10

These couplings are designed for slow rotary and swivelling motions of angles up to 360° and temperatures of up to 70 °C.

Example for comp. :
DVWE06LROMD

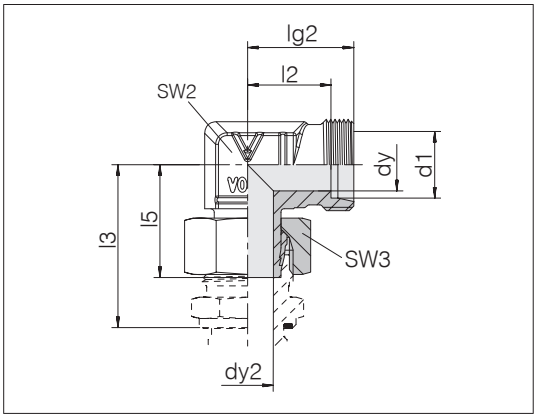
Adjustable couplings with tube socket



Swivel elbows

Tube socket pre-assembled

Tube coupling: 24° in acc. with ISO 8434-1



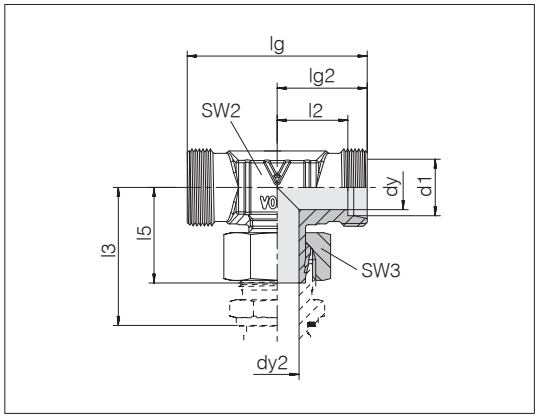
Series Tube OD d1	Pressure	dy	dy2	lg2	l2	l3	l5	SW2	SW3	kg/100 ca.	Order-No.	Designation
L 6	PN 315	4	3.5	19	12	34.5	26	12	14	2.8	0158032007	24-SWE-L6
L 8	PN 315	6	5	21	14	37.5	27.5	12	17	3.8	0158082007	24-SWE-L8
L 10	PN 315	8	7	22	15	40	29	14	19	5.0	0158132007	24-SWE-L10
L 12	PN 315	10	9	24	17	42	29.5	17	22	6.6	0158182007	24-SWE-L12
L 15	PN 315	12	11	28	21	46	32.5	19	27	11.5	0158232007	24-SWE-L15
L 18	PN 315	15	14	31	23.5	50	35.5	24	32	17.8	0158282007	24-SWE-L18
L 22	PN 160	19	17	35	27.5	55	38.5	27	36	23.5	0158332007	24-SWE-L22
L 28	PN 160	24	22.5	38	30.5	59	41.5	36	41	34.1	0158382007	24-SWE-L28
L 35	PN 160	30	28.5	45	34.5	68.5	51	41	50	57.7	0158432007	24-SWE-L35
L 42	PN 160	36	35	51	40	75	56	50	60	87.2	0158482007	24-SWE-L42
S 6	PN 630	4	3.5	23	16	40	27	12	17	4.4	0158532007	24-SWE-S6
S 8	PN 630	5	4.5	24	17	42.5	27.5	14	19	5.9	0158582007	24-SWE-S8
S 10	PN 630	7	6	25	17.5	45	30	17	22	8.3	0158632007	24-SWE-S10
S 12	PN 630	8	7	29	21.5	48	31	17	24	10.5	0158682007	24-SWE-S12
S 14	PN 630	10	9	30	22	54	35	19	27	14.6	0158732007	24-SWE-S14
S 16	PN 400	12	11	33	24.5	55	36.5	24	30	19.9	0158782007	24-SWE-S16
S 20	PN 400	16	15	37	26.5	65	44.5	27	36	29.4	0158832007	24-SWE-S20
S 25	PN 400	20	18	42	30	73	50	36	46	54.1	0158882007	24-SWE-S25
S 30	PN 400	25	23	49	35.5	78.5	55	41	50	76.2	0158932007	24-SWE-S30
S 38	PN 315	32	29	57	41	89	63	50	60	118.9	0158982007	24-SWE-S38

Example for comp. :
EVW06LOMD

Swivel branch tees

Tube socket pre-assembled

Tube coupling: 24° in acc. with ISO 8434-1



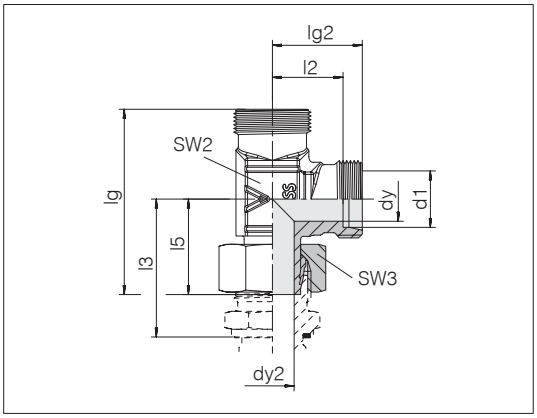
Series Tube OD d1	Pressure	dy	dy2	lg	lg2	l2	l3	l5	SW2	SW3	kg/100 ca.	Order-No.	Designation
L 6	PN 315	4	3.5	38	19	12	34.5	26	12	14	3.8	0160032007	24-SWT-L6
L 8	PN 315	6	5	42	21	14	37.5	27.5	12	17	4.8	0160082007	24-SWT-L8
L 10	PN 315	8	7	44	22	15	40	29	14	19	6.0	0160132007	24-SWT-L10
L 12	PN 315	10	9	48	24	17	42	29.5	17	22	7.9	0160182007	24-SWT-L12
L 15	PN 315	12	11	56	28	21	46	32.5	19	27	14.2	0160232007	24-SWT-L15
L 18	PN 315	15	14	62	31	23.5	50	35.5	24	32	21.1	0160282007	24-SWT-L18
L 22	PN 160	19	17	70	35	27.5	55	38.5	27	36	27.8	0160332007	24-SWT-L22
L 28	PN 160	24	22.5	76	38	30.5	59	41.5	36	41	38.6	0160382007	24-SWT-L28
L 35	PN 160	30	28.5	90	45	34.5	68.5	51	41	50	66.0	0160432007	24-SWT-L35
L 42	PN 160	36	35	102	51	40	75	56	50	60	101.8	0160482007	24-SWT-L42
S 6	PN 630	4	3.5	46	23	16	40	27	12	17	5.8	0160532007	24-SWT-S6
S 8	PN 630	5	4.5	48	24	17	42.5	27.5	14	19	7.6	0160582007	24-SWT-S8
S 10	PN 630	7	6	50	25	17.5	45	30	17	22	10.3	0160632007	24-SWT-S10
S 12	PN 630	8	7	58	29	21.5	48	31	17	24	13.5	0160682007	24-SWT-S12
S 14	PN 630	10	9	60	30	22	54	35	19	27	17.9	0160732007	24-SWT-S14
S 16	PN 400	12	11	66	33	24.5	55	36.5	24	30	24.1	0160782007	24-SWT-S16
S 20	PN 400	16	15	74	37	26.5	65	44.5	27	36	34.8	0160832007	24-SWT-S20
S 25	PN 400	20	18	84	42	30	73	50	36	46	63.0	0160882007	24-SWT-S25
S 30	PN 400	25	23	98	49	35.5	78.5	55	41	50	90.8	0160932007	24-SWT-S30
S 38	PN 315	32	29	114	57	41	89	63	50	60	141.7	0160982007	24-SWT-S38

Example for comp. :
EVT06LOMD

Swivel run tees

Tube socket pre-assembled

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	Pressure	dy	dy2	lg	lg2	l2	l3	l5	SW2	SW3	kg/100 ca.	Order-No.	Designation
L 6	PN 315	4	3.5	45	19	12	34.5	26	12	14	3.4	0162032007	24-SWL-L6
L 8	PN 315	6	5	48.5	21	14	37.5	27.5	12	17	4.7	0162082007	24-SWL-L8
L 10	PN 315	8	7	51	22	15	40	29	14	19	6.0	0162132007	24-SWL-L10
L 12	PN 315	10	9	53.5	24	17	42	29.5	17	22	7.9	0162182007	24-SWL-L12
L 15	PN 315	12	11	60.5	28	21	46	32.5	19	27	13.7	0162232007	24-SWL-L15
L 18	PN 315	15	14	66.5	31	23.5	50	35.5	24	32	20.8	0162282007	24-SWL-L18
L 22	PN 160	19	17	73.5	35	27.5	55	38.5	27	36	27.2	0162332007	24-SWL-L22
L 28	PN 160	24	22.5	79.5	38	30.5	59	41.5	36	41	39.1	0162382007	24-SWL-L28
L 35	PN 160	30	28.5	96	45	34.5	68.5	51	41	50	66.1	0162432007	24-SWL-L35
L 42	PN 160	36	35	107	51	40	75	56	50	60	100.6	0162482007	24-SWL-L42
S 6	PN 630	4	3.5	50	23	16	40	27	12	17	5.6	0162532007	24-SWL-S6
S 8	PN 630	5	4.5	51.5	24	17	42.5	27.5	14	19	7.8	0162582007	24-SWL-S8
S 10	PN 630	7	6	55	25	17.5	45	30	17	22	10.3	0162632007	24-SWL-S10
S 12	PN 630	8	7	60	29	21.5	48	31	17	24	13.4	0162682007	24-SWL-S12
S 14	PN 630	10	9	65	30	22	54	35	19	27	17.7	0162732007	24-SWL-S14
S 16	PN 400	12	11	69.5	33	24.5	55	36.5	24	30	22.5	0162782007	24-SWL-S16
S 20	PN 400	16	15	81.5	37	26.5	65	44.5	27	36	34.8	0162832007	24-SWL-S20
S 25	PN 400	20	18	92	42	30	73	50	36	46	63.5	0162882007	24-SWL-S25
S 30	PN 400	25	23	104	49	35.5	78.5	55	41	50	91.4	0162932007	24-SWL-S30
S 38	PN 315	32	29	120	57	41	89	63	50	60	141.7	0162982007	24-SWL-S38

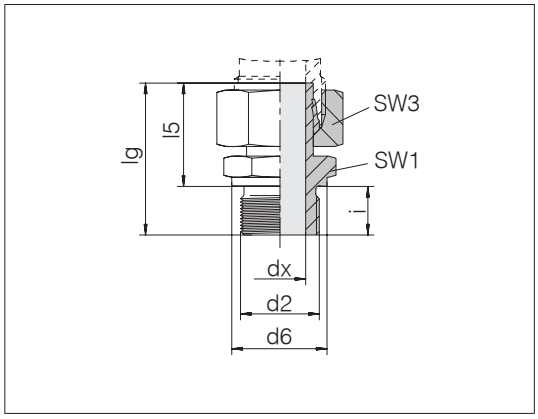
Example for comp. :
EVL06LOMD

Swivel connectors

Male thread: Metric fine thread, cylindrical
Threaded stud: DIN 3852-1/ISO 9974-3 Form B
Sealing type: Sealing edge

Tube coupling: 24° in acc. with ISO 8434-1

Tube socket pre-assembled



Series Tube OD	d2	Pressure	d6	dx	lg	l5	SW1	SW3	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	M 10 x 1	PN 315	14	3.5	32.5	24.5	14	14	8	20	2.4	0164032007	24-SWSDS-L6-M10B	1)
L 8	M 12 x 1.5	PN 315	17	5	38.5	26.5	17	17	12	30	4.0	0164082007	24-SWSDS-L8-M12B	1)
L 10	M 14 x 1.5	PN 315	19	7	39.5	27.5	19	19	12	50	4.9	0164132007	24-SWSDS-L10-M14B	1)
L 12	M 16 x 1.5	PN 315	21	9	42.5	30.5	22	22	12	70	6.8	0164182007	24-SWSDS-L12-M16B	1)
L 12	M 18 x 1.5	PN 315	23	8.8	42.5	30.5	24	22	12	90	7.8	1199172007	24-SWSDS-L12-M18B	
L 12	M 22 x 1.5	PN 315	27	9	46	32	27	22	14	140	10.8	0185712007	24-SWSDS-L12-M22B	
L 15	M 18 x 1.5	PN 315	23	11	43.5	31.5	24	27	12	90	9.8	0164232007	24-SWSDS-L15-M18B	1)
L 18	M 22 x 1.5	PN 315	27	14	45.5	31.5	27	32	14	140	14.0	0164282007	24-SWSDS-L18-M22B	1)
L 22	M 26 x 1.5	PN 160	31	17	48.5	32.5	32	36	16	190	19.6	0164332007	24-SWSDS-L22-M26B	1)
L 28	M 33 x 2	PN 160	39	22.5	53	35	41	41	18	300	26.9	0164382007	24-SWSDS-L28-M33B	1)
L 35	M 42 x 2	PN 160	49	28.5	62.5	42.5	50	50	20	500	45.7	0164432007	24-SWSDS-L35-M42B	1)
L 42	M 48 x 2	PN 160	55	35	68.5	46.5	55	60	22	600	60.7	0164482007	24-SWSDS-L42-M48B	1)
S 6	M 12 x 1.5	PB 630	17	3.5	39	27	17	17	12	45	4.4	0164532007	24-SWSDS-S6-M12B	1)
S 8	M 14 x 1.5	PB 630	19	4.5	41.5	29.5	19	19	12	60	6.0	0164582007	24-SWSDS-S8-M14B	1)
S 10	M 16 x 1.5	PB 630	21	6	44	32	22	22	12	80	8.3	0164632007	24-SWSDS-S10-M16B	1)
S 12	M 18 x 1.5	PB 630	23	7	46	34	24	24	12	120	11.0	0164682007	24-SWSDS-S12-M18B	1)
S 14	M 20 x 1.5	PB 630	25	9	50.5	36.5	27	27	14	160	14.7	0164732007	24-SWSDS-S14-M20B	1)
S 16	M 22 x 1.5	PB 400	27	11	51	37	27	30	14	170	17.0	0164782007	24-SWSDS-S16-M22B	1)
S 20	M 27 x 2	PB 400	32	15	59	43	32	36	16	280	25.3	0164832007	24-SWSDS-S20-M27B	1)
S 25	M 33 x 2	PB 400	39	18	66	48	41	46	18	450	48.8	0164882007	24-SWSDS-S25-M33B	1)
S 30	M 42 x 2	PB 250	49	23	71	51	50	50	20	540	65.9	0164932007	24-SWSDS-S30-M42B	1)
S 38	M 48 x 2	PB 250	55	29	82	60	55	60	22	700	95.2	0164982007	24-SWSDS-S38-M48B	1)

1) Standard size

At PB 630, the safety is 2.

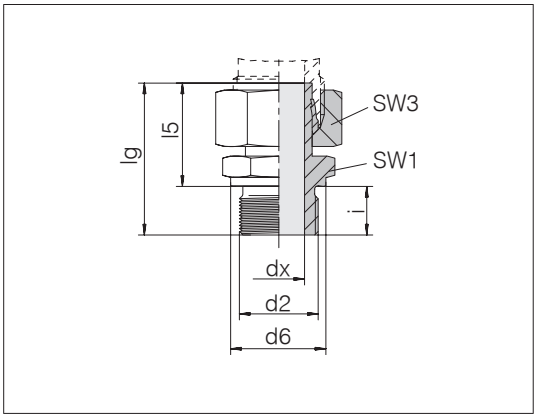
Example for comp. : EVGE06LM

Swivel connectors

Male thread: BSPP thread, cylindrical
Threaded stud: DIN ISO 1179-4 Form B
Sealing type: Sealing edge

Tube coupling: 24° in acc. with ISO 8434-1

Tube socket pre-assembled



Series Tube OD	d2	Pressure	d6	dx	lg	l5	SW1	SW3	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	G 1/8 A	PN 315	14	3.5	32.5	24.5	14	14	8	20	2.4	0165032007	24-SWSDS-L6-G1/8B	1)
L 8	G 1/4 A	PN 315	18	4.5	41.5	29.5	19	17	12	50	4.6	0165082007	24-SWSDS-L8-G1/4B	1)
L 10	G 1/4 A	PN 315	18	6	39.5	27.5	19	19	12	50	5.1	0165132007	24-SWSDS-L10-G1/4B	1)
L 12	G 1/4 A	PN 315	18	6	45.5	33.5	19	22	12	50	7.0	0197372007	24-SWSDS-L12-G1/4B	
L 12	G 3/8 A	PN 315	22	7	46	34	22	22	12	80	8.2	0165182007	24-SWSDS-L12-G3/8B	1)
L 12	G 1/2 A	PN 315	26	7	48.5	34.5	27	22	14	140	9.8	0197382007	24-SWSDS-L12-G1/2B	
L 15	G 3/8 A	PN 315	22	9	43.5	31.5	22	27	12	80	9.6	0186042007	24-SWSDS-L15-G3/8B	
L 15	G 1/2 A	PN 315	26	11	46	32	27	27	14	140	11.9	0165232007	24-SWSDS-L15-G1/2B	1)
L 18	G 1/2 A	PN 315	26	14	45.5	31.5	27	32	14	140	13.6	0165282007	24-SWSDS-L18-G1/2B	1)
L 22	G 3/4 A	PN 160	32	18	48.5	32.5	32	36	16	190	18.7	0165332007	24-SWSDS-L22-G3/4B	1)
L 28	G 1 A	PN 160	39	22.5	53	35	41	41	18	330	27.1	0165382007	24-SWSDS-L28-G1B	1)
L 35	G 1 1/4 A	PN 160	49	29	62.5	42.5	50	50	20	540	44.8	0165432007	24-SWSDS-L35-G11/4B	1)
L 42	G 1 1/2 A	PN 160	55	35	68.5	46.5	55	60	22	630	60.7	0165482007	24-SWSDS-L42-G11/2B	1)
S 6	G 1/4 A	PB 630	18	3.5	39	27	19	17	12	60	4.9	0165532007	24-SWSDS-S6-G1/4B	1)
S 8	G 1/4 A	PB 630	18	4.5	41.5	29.5	19	19	12	60	5.8	0165582007	24-SWSDS-S8-G1/4B	1)
S 10	G 3/8 A	PB 630	22	6	44	32	22	22	12	100	8.7	0165632007	24-SWSDS-S10-G3/8B	1)
S 12	G 1/4 A	PB 630	18	5	45.5	33.5	19	24	12	60	8.4	0194242007	24-SWSDS-S12-G1/4B	
S 12	G 3/8 A	PB 630	22	7	46	34	22	24	12	100	10.0	0165682007	24-SWSDS-S12-G3/8B	1)
S 12	G 1/2 A	PB 400	26	7	48.5	34.5	27	24	14	160	14.9	0189612007	24-SWSDS-S12-G1/2B	
S 14	G 1/2 A	PB 630	26	9	50.5	36.5	27	27	14	160	15.4	0165732007	24-SWSDS-S14-G1/2B	1)
S 16	G 1/2 A	PB 400	26	11	51	37	27	30	14	160	16.3	0165782007	24-SWSDS-S16-G1/2B	1)
S 20	G 3/4 A	PB 400	32	15	59	43	32	36	16	280	26.0	0165832007	24-SWSDS-S20-G3/4B	1)
S 25	G 1 A	PB 400	39	18	66	48	41	46	18	440	48.5	0165882007	24-SWSDS-S25-G1B	1)
S 30	G 1 1/4 A	PB 250	49	22.5	71	51	50	50	20	580	67.2	0165932007	24-SWSDS-S30-G11/4B	1)
S 38	G 1 1/2 A	PB 250	55	28.5	82	60	55	60	22	700	96.9	0165982007	24-SWSDS-S38-G11/2B	1)

1) Standard size

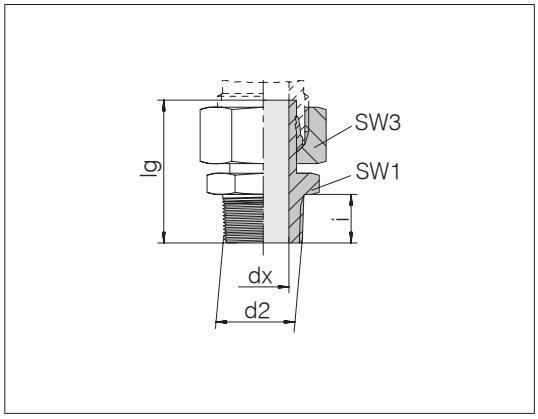
Example for comp. :
EVGE06LR

Swivel connectors

Male thread: NPT thread, tapered
Threaded stud: ASME B1.20.1
Sealing type: Tapered thread
Sealing material: e.g. PTFE sealing tape

Tube coupling: 24° in acc. with ISO 8434-1

Tube socket pre-assembled



Series Tube OD	d2	Pressure	dx	lg	SW1	SW3	i	Nm -10 %	kg/100 ca.	Order-No.	Designation
L 6	1/8 NPT	PN 315	3.5	33	11	14	9.9	15	2.2	0172802007	24-SWSDS-L6-N1/8T
L 8	1/4 NPT	PN 315	5	39.6	14	17	15.1	35	3.5	0172812007	24-SWSDS-L8-N1/4T
L 10	1/4 NPT	PN 315	7	40.6	14	19	15.1	35	4.2	0172822007	24-SWSDS-L10-N1/4T
L 12	3/8 NPT	PN 315	7	43	19	22	15.2	55	7.2	0172832007	24-SWSDS-L12-N3/8T
L 15	1/2 NPT	PN 315	11	48.5	22	27	19.8	110	11.0	0172842007	24-SWSDS-L15-N1/2T
L 18	1/2 NPT	PN 315	13	48	22	32	19.8	110	13.0	0172852007	24-SWSDS-L18-N1/2T
L 22	3/4 NPT	PN 160	17	50	27	36	20.1	175	18.2	0172862007	24-SWSDS-L22-N3/4T
L 28	1 NPT	PN 160	22.5	57	36	41	25	265	25.9	0172872007	24-SWSDS-L28-N1T
L 35	1 1/4 NPT	PN 160	29	65	46	50	25.6	315	42.8	0172882007	24-SWSDS-L35-N11/4T
L 42	1 1/2 NPT	PN 160	35	69	50	60	26	385	57.5	0172892007	24-SWSDS-L42-N11/2T
S 6	1/4 NPT	PN 630	3.5	40	14	17	15.1	35	4.3	0172902007	24-SWSDS-S6-N1/4T
S 8	1/4 NPT	PN 630	4.5	42	14	19	15.1	35	4.9	0172912007	24-SWSDS-S8-N1/4T
S 10	3/8 NPT	PN 630	6	44	19	22	15.2	55	8.0	0172922007	24-SWSDS-S10-N3/8T
S 12	3/8 NPT	PN 630	7	46	19	24	15.2	55	8.6	0172932007	24-SWSDS-S12-N3/8T
S 14	1/2 NPT	PN 630	9	53	22	27	19.8	110	13.8	0172942007	24-SWSDS-S14-N1/2T
S 16	1/2 NPT	PN 400	11	52.8	22	30	19.8	110	14.7	0172952007	24-SWSDS-S16-N1/2T
S 20	3/4 NPT	PN 400	15	60	27	36	20.1	175	23.9	0172962007	24-SWSDS-S20-N3/4T
S 25	1 NPT	PN 400	18	69	36	46	25	265	46.0	0172972007	24-SWSDS-S25-N1T
S 30	1 1/4 NPT	PN 400	22.5	72.6	46	50	25.6	315	65.2	0172982007	24-SWSDS-S30-N11/4T
S 38	1 1/2 NPT	PN 315	28.5	83	50	60	26	385	86.3	0172992007	24-SWSDS-S38-N11/2T

Threaded stud NPT in acc. with ASME B 1 - 20.01 are approved for use for gas supply in acc. with DIN 3387-1.

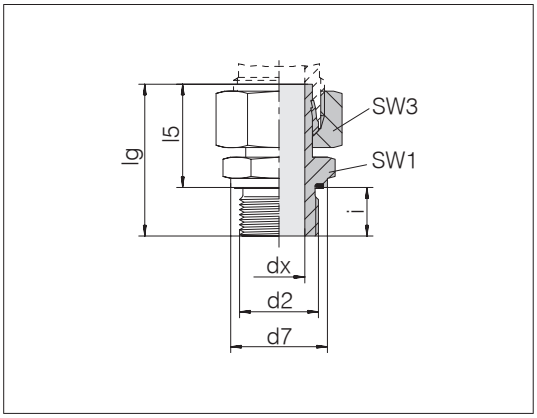
Example for comp. :
EVGE06L1/8NPT

Swivel connectors

Male thread: Metric fine thread, cylindrical
Threaded stud: ISO 9974-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1

Tube socket pre-assembled



Series Tube OD	d2	Pressure	d7	dx	lg	l5	SW1	SW3	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	M 10 x 1	PN 315	13.9	3.5	32.5	24.5	14	14	8	15	2.3	0174802007	24-SWSDS-L6-M10E	1)
L 8	M 12 x 1.5	PN 315	16.9	5	38.5	26.5	17	17	12	25	3.9	0174812007	24-SWSDS-L8-M12E	1)
L 10	M 14 x 1.5	PN 315	18.9	7	39.5	27.5	19	19	12	50	4.9	0174822007	24-SWSDS-L10-M14E	1)
L 12	M 16 x 1.5	PN 315	21.9	9	42.5	30.5	22	22	12	70	6.8	0174832007	24-SWSDS-L12-M16E	1)
L 15	M 18 x 1.5	PN 315	23.9	11	43.5	31.5	24	27	12	90	9.8	0174842007	24-SWSDS-L15-M18E	1)
L 18	M 22 x 1.5	PN 315	26.9	14	45.5	31.5	27	32	14	130	14.0	0174852007	24-SWSDS-L18-M22E	1)
L 22	M 26 x 1.5	PN 160	31.9	17	48.5	32.5	32	36	16	180	19.4	0174862007	24-SWSDS-L22-M26E	1)
L 28	M 33 x 2	PN 160	39.9	22.5	53	35	41	41	18	230	27.0	0174872007	24-SWSDS-L28-M33E	1)
L 35	M 42 x 2	PN 160	49.9	28.5	62.5	42.5	50	50	20	330	45.3	0174882007	24-SWSDS-L35-M42E	1)
L 42	M 48 x 2	PN 160	54.9	35	68.5	46.5	55	60	22	500	62.7	0174892007	24-SWSDS-L42-M48E	1)
S 6	M 12 x 1.5	PN 630	16.9	3.5	39	27	17	17	12	50	4.3	0174902007	24-SWSDS-S6-M12E	1)
S 8	M 14 x 1.5	PN 630	18.9	4.5	41.5	29.5	19	19	12	60	6.0	0174912007	24-SWSDS-S8-M14E	1)
S 10	M 16 x 1.5	PN 630	21.9	6	44	32	22	22	12	80	8.6	0174922007	24-SWSDS-S10-M16E	1)
S 12	M 18 x 1.5	PN 630	23.9	7	46	34	24	24	12	90	10.9	0174932007	24-SWSDS-S12-M18E	1)
S 14	M 20 x 1.5	PN 630	25.9	9	50.5	36.5	27	27	14	130	14.6	0174942007	24-SWSDS-S14-M20E	1)
S 16	M 22 x 1.5	PN 400	26.9	11	51	37	27	30	14	130	16.7	0174952007	24-SWSDS-S16-M22E	1)
S 20	M 27 x 2	PN 400	31.9	15	59	43	32	36	16	200	25.4	0174962007	24-SWSDS-S20-M27E	1)
S 25	M 33 x 2	PN 400	39.9	18	66	48	41	46	18	250	48.6	0174972007	24-SWSDS-S25-M33E	1)
S 30	M 42 x 2	PN 400	49.9	23	71	51	50	50	20	500	66.2	0174982007	24-SWSDS-S30-M42E	1)
S 38	M 48 x 2	PN 315	54.9	29	82	60	55	60	22	600	93.3	0174992007	24-SWSDS-S38-M48E	1)

[1] Standard size

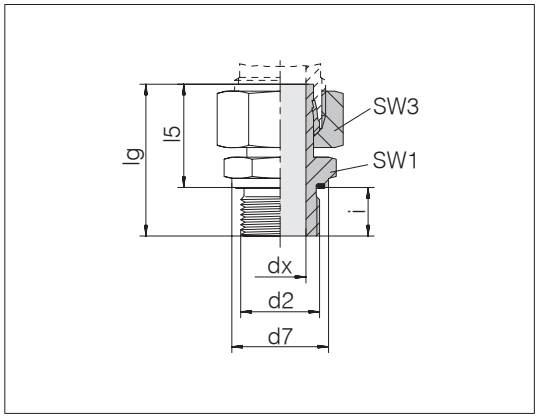
Example for comp. :
EVGE06LMED

Swivel connectors

Male thread: BSPP thread, cylindrical
Threaded stud: ISO 1179-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1

Tube socket pre-assembled



Series Tube OD	d2	Pressure	d7	dx	lg	l5	SW1	SW3	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	G 1/8 A	PN 315	13.9	3.5	32.5	24.5	14	14	8	20	2.3	0177802007	24-SWSDS-L6-G1/8E	1)
L 6	G 1/4 A	PN 315	18.9	3.5	38	26	19	14	12	50	3.9	0177172007	24-SWSDS-L6-G1/4E	
L 8	G 1/4 A	PN 315	18.9	4.5	41.5	29.5	19	17	12	50	4.6	0177812007	24-SWSDS-L8-G1/4E	1)
L 8	G 3/8 A	PN 315	21.9	4.5	43	31	22	17	14	80	6.0	1177072007	24-SWSDS-L8-G3/8E	
L 10	G 1/4 A	PN 315	18.9	6	39.5	27.5	19	19	12	50	5.0	0177822007	24-SWSDS-L10-G1/4E	1)
L 10	G 3/8 A	PN 315	21.9	7	41	29	22	19	12	80	6.4	1177042007	24-SWSDS-L10-G3/8E	
L 12	G 1/4 A	PN 315	18.9	6	45.5	33.5	19	22	12	50	7.0	1177032007	24-SWSDS-L12-G1/4E	
L 12	G 3/8 A	PN 315	21.9	7	46	34	22	22	12	80	8.0	0177832007	24-SWSDS-L12-G3/8E	1)
L 12	G 1/2 A	PN 315	26.9	7	48.5	34.5	27	22	14	100	10.1	1177012007	24-SWSDS-L12-G1/2E	
L 15	G 3/8 A	PN 315	21.9	9	43.5	31.5	22	27	12	80	9.4	1177052007	24-SWSDS-L15-G3/8E	
L 15	G 1/2 A	PN 315	26.9	11	46	32	27	27	14	100	11.7	0177842007	24-SWSDS-L15-G1/2E	1)
L 18	G 1/2 A	PN 315	26.9	14	45.5	31.5	27	32	14	100	13.4	0177852007	24-SWSDS-L18-G1/2E	1)
L 22	G 1/2 A	PN 160	26.9	14	46.5	32.5	27	36	14	100	15.4	0177742007	24-SWSDS-L22-G1/2E	
L 22	G 3/4 A	PN 160	31.9	18	48.5	32.5	32	36	16	180	18.4	0177862007	24-SWSDS-L22-G3/4E	1)
L 28	G 1 A	PN 160	39.9	22.5	53	35	41	41	18	230	26.8	0177872007	24-SWSDS-L28-G1E	1)
L 35	G 1 1/4 A	PN 160	49.9	29	62.5	42.5	50	50	20	330	43.9	0177882007	24-SWSDS-L35-G11/4E	1)
L 42	G 1 1/2 A	PN 160	54.9	35	68.5	46.5	55	60	22	500	62.3	0177892007	24-SWSDS-L42-G11/2E	1)
S 6	G 1/4 A	PN 630	18.9	3.5	39	27	19	17	12	60	4.9	0177902007	24-SWSDS-S6-G1/4E	1)
S 8	G 1/4 A	PN 630	18.9	4.5	41.5	29.5	19	19	12	60	5.8	0177912007	24-SWSDS-S8-G1/4E	1)
S 10	G 1/4 A	PN 630	18.9	5	43.5	31.5	19	22	12	60	7.2	0177762007	24-SWSDS-S10-G1/4E	
S 10	G 3/8 A	PN 630	21.9	6	44	32	22	22	12	90	8.7	0177922007	24-SWSDS-S10-G3/8E	1)
S 12	G 3/8 A	PN 630	21.9	7	46	34	22	24	12	90	9.9	0177932007	24-SWSDS-S12-G3/8E	1)
S 12	G 1/2 A	PN 630	26.9	7	48.5	34.5	27	24	14	150	12.8	0177792007	24-SWSDS-S12-G1/2E	
S 14	G 1/2 A	PN 630	26.9	9	50.5	36.5	27	27	14	150	15.4	0177942007	24-SWSDS-S14-G1/2E	1)
S 16	G 1/2 A	PN 400	26.9	11	51	37	27	30	14	150	16.2	0177952007	24-SWSDS-S16-G1/2E	1)
S 16	G 3/4 A	PN 400	31.9	11	55	39	32	30	16	200	22.7	1177062007	24-SWSDS-S16-G3/4E	
S 20	G 1/2 A	PN 400	26.9	12	55	41	27	36	14	150	24.2	7006948000	24-SWSDS-S20-G1/2E	
S 20	G 3/4 A	PN 400	31.9	15	59	43	32	36	16	200	25.5	0177962007	24-SWSDS-S20-G3/4E	1)
S 25	G 1 A	PN 400	39.9	18	66	48	41	46	18	250	48.8	0177972007	24-SWSDS-S25-G1E	1)
S 30	G 1 1/4 A	PN 400	49.9	22.5	71	51	50	50	20	500	66.7	0177982007	24-SWSDS-S30-G11/4E	1)
S 38	G 1 1/2 A	PN 315	54.9	28.5	82	60	55	60	22	600	95.3	0177992007	24-SWSDS-S38-G11/2E	1)

1) Standard size

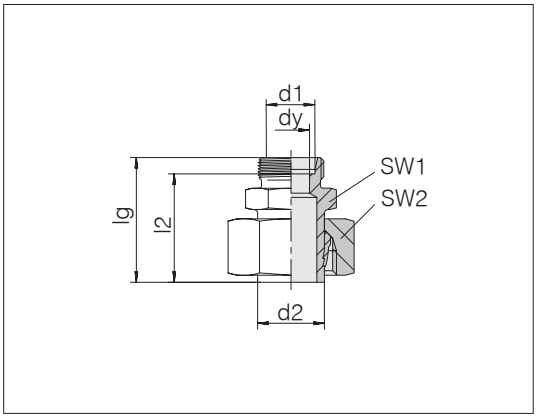
Example for comp. :
EVGE06LRED

Tube end reducers

with hexagon for locking

Tube socket pre-assembled

Tube coupling: 24° in acc. with ISO 8434-1



Tube socket d2	Series Tube OD d1	Pressure	dy	lg	l2	SW1	SW2	kg/100 ca.	Order-No.	Designation
L 6	LL 4	PN 100	3	31	27	11	14	2.1	0188462074	24-SWS-L6-LL4
L 8	L 6	PN 315	4	33	26	12	17	2.9	0148052074	24-SWS-L8-L6
L 10	L 6	PN 315	4	34	27	12	19	3.4	0148112074	24-SWS-L10-L6
L 10	L 8	PN 315	6	35	28	14	19	3.8	0148102074	24-SWS-L10-L8
L 12	L 10	PN 315	8	38	31	17	22	5.2	0148152074	24-SWS-L12-L10
L 12	L 6	PN 315	4	37	30	14	22	4.7	0148172074	24-SWS-L12-L6
L 12	L 8	PN 315	6	37	30	14	22	4.8	0148162074	24-SWS-L12-L8
L 12	S 8	PN 315	5	39	32	17	22	5.7	0186092074	24-SWS-L12-S8
L 15	L 10	PN 315	8	39	32	17	27	7.7	0148212074	24-SWS-L15-L10
L 15	L 12	PN 315	10	40	33	19	27	8.2	0148202074	24-SWS-L15-L12
L 15	L 6	PN 315	4	38	31	17	27	7.4	0148232074	24-SWS-L15-L6
L 15	L 8	PN 315	6	38	31	17	27	7.5	0148222074	24-SWS-L15-L8
L 18	L 10	PN 315	8	38.5	31.5	19	32	10.2	0148272074	24-SWS-L18-L10
L 18	L 12	PN 315	10	38.5	31.5	19	32	10.3	0148262074	24-SWS-L18-L12
L 18	L 15	PN 315	12	39.5	32.5	24	32	11.9	0148252074	24-SWS-L18-L15
L 18	L 6	PN 315	4	37.5	30.5	19	32	11.0	0148292074	24-SWS-L18-L6
L 18	L 8	PN 315	6	37.5	30.5	19	32	10.2	0148282074	24-SWS-L18-L8
L 18	S 16	PN 315	12	50	41.5	30	32	19.2	0196612074	24-SWS-L18-S16
L 22	L 10	PN 160	8	39.5	32.5	24	36	14.1	0148332074	24-SWS-L22-L10
L 22	L 12	PN 160	10	39.5	32.5	24	36	14.1	0148322074	24-SWS-L22-L12
L 22	L 15	PN 160	12	40.5	33.5	24	36	14.7	0148312074	24-SWS-L22-L15
L 22	L 18	PN 160	15	41.5	34	27	36	16.2	0148302074	24-SWS-L22-L18
L 22	L 6	PN 160	4	41	34	24	36	14.8	0199032074	24-SWS-L22-L6
L 22	L 8	PN 160	6	38.5	31.5	24	36	14.5	0148342074	24-SWS-L22-L8
L 22	S 20	PN 160	16	50.5	40	32	36	21.5	0198362074	24-SWS-L22-S20
L 28	L 10	PN 160	8	41	34	30	41	17.8	0148392074	24-SWS-L28-L10
L 28	L 12	PN 160	10	41	34	30	41	18.3	0148382074	24-SWS-L28-L12
L 28	L 15	PN 160	12	42	35	30	41	18.4	0148372074	24-SWS-L28-L15
L 28	L 18	PN 160	15	43	35.5	30	41	19.1	0148362074	24-SWS-L28-L18

Other diameter combinations available upon request.

Example for comp. : KOR08/06LOMD

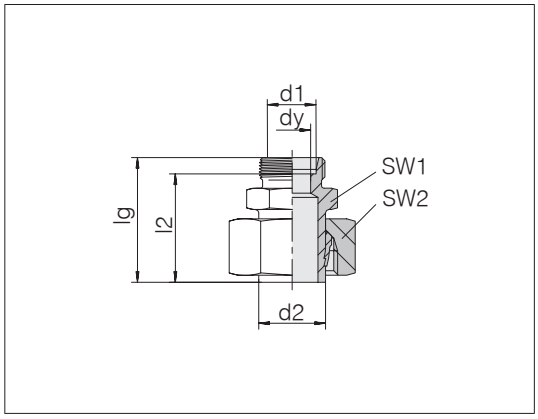
Continued on following page

Tube end reducers

with hexagon for locking

Tube socket pre-assembled

Tube coupling: 24° in acc. with ISO 8434-1



Tube socket d2	Series Tube OD d1	Pressure	dy	lg	l2	SW1	SW2	kg/100 ca.	Order-No.	Designation
L 28	L 22	PN 160	19	45	37.5	32	41	20.2	0148352074	24-SWS-L28-L22
L 28	L 6	PN 160	4	42	35	30	41	19.1	0198652074	24-SWS-L28-L6
L 28	L 8	PN 160	6	42	35	30	41	17.5	0199022074	24-SWS-L28-L8
L 28	S 25	PN 160	20	58	46	41	41	38.7	0197632074	24-SWS-L28-S25
L 35	L 10	PN 160	8	49	42	36	50	28.8	0198892074	24-SWS-L35-L10
L 35	L 12	PN 160	10	47.5	40.5	36	50	28.6	0148442074	24-SWS-L35-L12
L 35	L 15	PN 160	12	48.5	41.5	36	50	29.1	0148432074	24-SWS-L35-L15
L 35	L 18	PN 160	15	49.5	42	36	50	28.7	0148422074	24-SWS-L35-L18
L 35	L 22	PN 160	19	51.5	44	36	50	28.8	0148412074	24-SWS-L35-L22
L 35	L 28	PN 160	24	52.5	45	41	50	31.8	0148402074	24-SWS-L35-L28
L 35	L 8	PN 160	6	48	41	36	50	27.9	0198712074	24-SWS-L35-L8
L 42	L 10	PN 160	8	51	44	46	60	44.2	0199802074	24-SWS-L42-L10
L 42	L 12	PN 160	10	51	44	46	60	45.2	0199812074	24-SWS-L42-L12
L 42	L 15	PN 160	12	52	45	46	60	45.0	0148492074	24-SWS-L42-L15
L 42	L 18	PN 160	15	52	44.5	46	60	46.2	0148482074	24-SWS-L42-L18
L 42	L 22	PN 160	19	54	46.5	46	60	44.9	0148472074	24-SWS-L42-L22
L 42	L 28	PN 160	24	55	47.5	46	60	45.1	0148462074	24-SWS-L42-L28
L 42	L 35	PN 160	30	58	47.5	46	60	47.8	0148452074	24-SWS-L42-L35

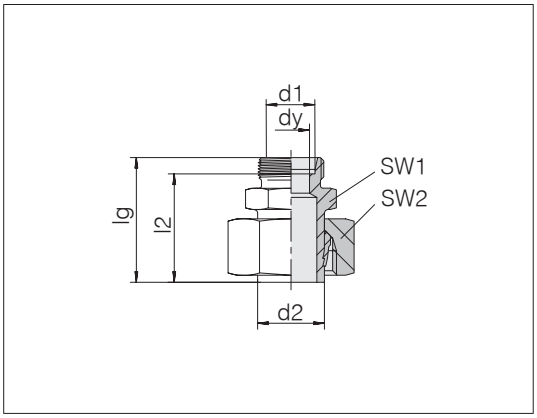
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Tube end reducers

with hexagon for locking

Tube socket pre-assembled

Tube coupling: 24° in acc. with ISO 8434-1



Tube socket d2	Series Tube OD d1	Pressure	dy	lg	l2	SW1	SW2	kg/100 ca.	Order-No.	Designation
S 8	S 6	PN 630	4	37	30	14	19	4.4	0148552074	24-SWS-S8-S6
S 10	S 6	PN 630	4	39	32	14	22	5.9	0148612074	24-SWS-S10-S6
S 10	S 8	PN 630	5	41	34	17	22	6.7	0148602074	24-SWS-S10-S8
S 12	L 12	PN 315	7	38	31	19	24	6.9	0198922074	24-SWS-S12-L12
S 12	S 10	PN 630	7	41	33.5	19	24	7.8	0148652074	24-SWS-S12-S10
S 12	S 6	PN 630	4	39	32	14	24	6.6	0148672074	24-SWS-S12-S6
S 12	S 8	PN 630	5	41	34	17	24	7.4	0148662074	24-SWS-S12-S8
S 14	S 10	PN 630	7	44	36.5	19	27	10.6	0148712074	24-SWS-S14-S10
S 14	S 12	PN 630	8	46	38.5	22	27	12.0	0148702074	24-SWS-S14-S12
S 14	S 6	PN 630	4	42	35	17	27	9.6	0148732074	24-SWS-S14-S6
S 14	S 8	PN 630	5	44	37	17	27	10.0	0148722074	24-SWS-S14-S8
S 16	L 12	PN 315	10	43	36	19	30	11.6	1148022074	24-SWS-S16-L12
S 16	L 15	PN 315	12	46	39	24	30	13.4	0197872074	24-SWS-S16-L15
S 16	S 10	PN 400	7	44	36.5	19	30	11.9	0148772074	24-SWS-S16-S10
S 16	S 12	PN 400	8	46	38.5	22	30	13.3	0148762074	24-SWS-S16-S12
S 16	S 14	PN 400	10	48	40	24	30	14.7	0148752074	24-SWS-S16-S14
S 16	S 6	PN 400	4	42	35	17	30	11.1	0148792074	24-SWS-S16-S6
S 16	S 8	PN 400	5	44	37	17	30	11.6	0148782074	24-SWS-S16-S8
S 20	L 15	PN 315	12	51	44	24	36	18.6	0198902074	24-SWS-S20-L15
S 20	L 18	PN 315	14	51	43.5	27	36	20.6	0198912074	24-SWS-S20-L18
S 20	S 10	PN 400	7	48	40.5	22	36	16.8	0148832074	24-SWS-S20-S10
S 20	S 12	PN 400	8	50	42.5	22	36	17.9	0148822074	24-SWS-S20-S12
S 20	S 14	PN 400	10	52	44	24	36	19.1	0148812074	24-SWS-S20-S14
S 20	S 16	PN 400	12	52	43.5	27	36	20.3	0148802074	24-SWS-S20-S16
S 20	S 6	PN 400	4	47	40	22	36	7.4	0199012074	24-SWS-S20-S6
S 20	S 8	PN 400	5	48	41	22	36	17.2	0148842074	24-SWS-S20-S8
S 25	L 18	PN 315	15	51	43.5	27	46	31.7	0198622074	24-SWS-S25-L18
S 25	L 22	PN 160	18	55	47.5	32	46	36.0	0198372074	24-SWS-S25-L22
S 25	S 10	PN 400	7	51	43.5	27	46	31.9	0148892074	24-SWS-S25-S10
S 25	S 12	PN 400	8	53	45.5	27	46	32.6	0148882074	24-SWS-S25-S12
S 25	S 14	PN 400	10	55	47	27	46	33.1	0148872074	24-SWS-S25-S14
S 25	S 16	PN 400	12	55	46.5	27	46	33.2	0148862074	24-SWS-S25-S16
S 25	S 20	PN 400	16	59	48.5	32	46	37.0	0148852074	24-SWS-S25-S20

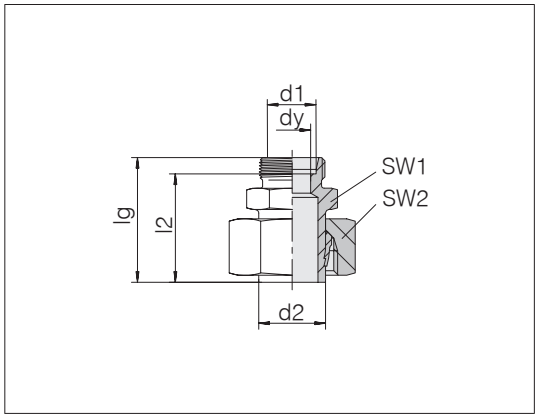
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Tube end reducers

with hexagon for locking

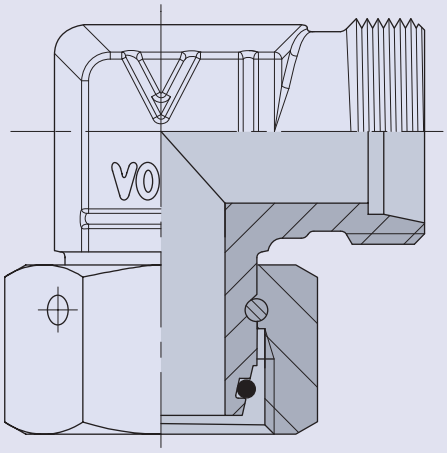
Tube socket pre-assembled

Tube coupling: 24° in acc. with ISO 8434-1



Tube socket d2	Series Tube OD d1	Pressure	dy	lg	l2	SW1	SW2	kg/100 ca.	Order-No.	Designation
S 25	S 6	PN 400	4	51	44	27	46	31.2	0198992074	24-SWS-S25-S6
S 25	S 8	PN 400	5	51	44	27	46	31.5	0199002074	24-SWS-S25-S8
S 30	S 12	PN 400	8	56	48.5	32	50	37.5	0148942074	24-SWS-S30-S12
S 30	S 14	PN 400	10	58	50	32	50	18.1	0148932074	24-SWS-S30-S14
S 30	S 16	PN 400	12	58	49.5	32	50	37.9	0148922074	24-SWS-S30-S16
S 30	S 20	PN 400	16	62	51.5	32	50	39.9	0148912074	24-SWS-S30-S20
S 30	S 25	PN 400	20	66	54	41	50	49.4	0148902074	24-SWS-S30-S25
S 30	S 8	PN 400	5	59	52	32	50	40.9	0198972074	24-SWS-S30-S8
S 38	S 10	PN 315	7	62	54.5	41	60	28.2	0199872074	24-SWS-S38-S10
S 38	S 12	PN 315	8	62	54.5	41	60	60.9	0199882074	24-SWS-S38-S12
S 38	S 16	PN 315	12	64	55.5	41	60	58.9	0148982074	24-SWS-S38-S16
S 38	S 20	PN 315	16	68	57.5	41	60	60.5	0148972074	24-SWS-S38-S20
S 38	S 25	PN 315	20	72	60	41	60	64.5	0148962074	24-SWS-S38-S25
S 38	S 30	PN 315	25	74	60.5	46	60	71.4	0148952074	24-SWS-S38-S30

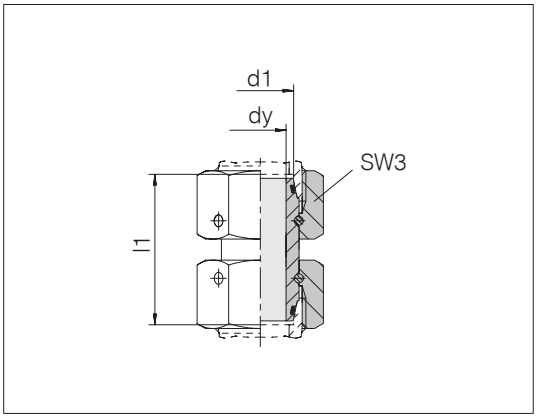
24° taper couplings (DKO)



Swivel unions

With taper and O-ring
fit in bore type
W DIN 3861/ISO 8434-1

Standard O-ring material is FKM



Series Tube OD d1	Pressure	dy	l1	SW3	kg/100 ca.	Order-No.	Designation	
L 6	PN 500	2.5	33.5	14	2.9	1178342058	24-SW2OS-L6-CP1	
L 6	PN 500	2.5	36	14	3.0	1178352058	24-SW2OS-L6-CP2	
L 6	PN 500	2.5	38	14	3.1	1178002058	24-SW2OS-L6	1)
L 8	PN 500	4	33.5	17	4.4	1178852058	24-SW2OS-L8-CP1	
L 8	PN 500	4	36	17	4.6	1178372058	24-SW2OS-L8-CP2	
L 8	PN 500	4	39.5	17	4.6	1178012058	24-SW2OS-L8	1)
L 10	PN 500	6	34	19	5.5	1178472058	24-SW2OS-L10-CP1	
L 10	PN 500	6	37	19	5.9	1178382058	24-SW2OS-L10-CP2	
L 10	PN 500	6	39.5	19	6.0	1178022058	24-SW2OS-L10	1)
L 12	PN 400	8	34	22	7.4	1178752058	24-SW2OS-L12-CP1	
L 12	PN 400	8	37	22	7.7	1178392058	24-SW2OS-L12-CP2	
L 12	PN 400	8	39.5	22	7.9	1178032058	24-SW2OS-L12	1)
L 15	PN 400	10	40	27	14.3	1178442058	24-SW2OS-L15-CP12	
L 15	PN 400	10	42.5	27	14.8	1178042058	24-SW2OS-L15	1)
L 18	PN 400	13	39	32	17.6	1178452058	24-SW2OS-L18-CP1	
L 18	PN 400	13	42.5	32	18.3	1178802058	24-SW2OS-L18-CP2	
L 18	PN 400	13	45	32	18.8	1178052058	24-SW2OS-L18	1)
L 22	PN 250	17	44	36	24.4	1178652058	24-SW2OS-L22-CP1	
L 22	PN 250	17	46.5	36	25.1	1178812058	24-SW2OS-L22-CP2	
L 22	PN 250	17	49.5	36	25.6	1178062058	24-SW2OS-L22	1)
L 28	PN 250	22	48	41	31.2	1178482058	24-SW2OS-L28-CP12	
L 28	PN 250	22	51.5	41	31.7	1178072058	24-SW2OS-L28	1)
L 35	PN 250	28	52	50	45.1	1178822058	24-SW2OS-L35-CP1	
L 35	PN 250	28	57.5	50	48.3	1178832058	24-SW2OS-L35-CP2	
L 35	PN 250	28	61	50	49.8	1178082058	24-SW2OS-L35	1)
L 42	PN 250	34	57.5	60	74.6	1178842058	24-SW2OS-L42-CP12	
L 42	PN 250	34	62.5	60	78.1	1178092058	24-SW2OS-L42	1)

1) Standard size

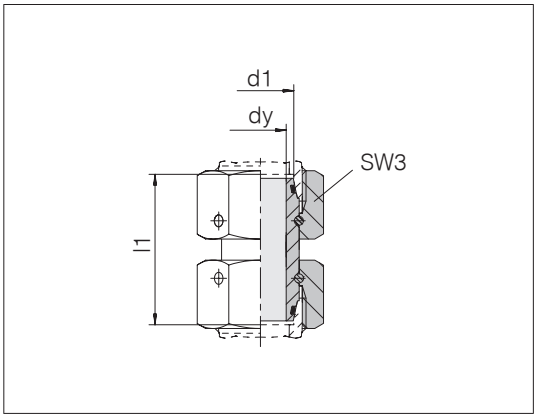
Example for comp. :
GZ06LVIT

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Swivel unions

With taper and O-ring
fit in bore type
W DIN 3861/ISO 8434-1

Standard O-ring material is FKM



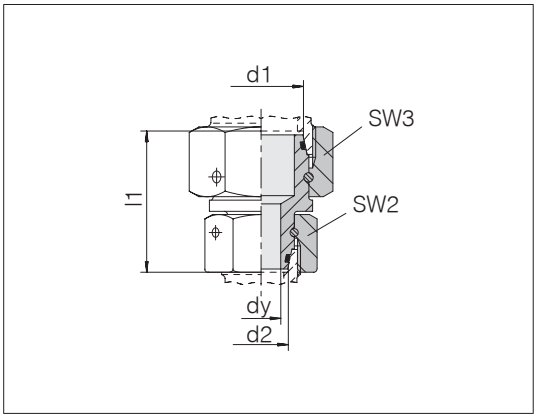
Series Tube OD d1	Pressure	dy	l1	SW3	kg/100 ca.	Order-No.	Designation
S 6	PN 800	2.5	33	17	4.2	1178862058	24-SW2OS-S6-CP1
S 6	PN 800	2.5	39	17	4.6	1178872058	24-SW2OS-S6-CP2
S 6	PN 800	2.5	40.5	17	4.7	1178102058	24-SW2OS-S6 [1]
S 8	PN 800	4	34	19	5.6	1178882058	24-SW2OS-S8-CP1
S 8	PN 800	4	39	19	6.0	1178892058	24-SW2OS-S8-CP2
S 8	PN 800	4	40.5	19	6.1	1178112058	24-SW2OS-S8 [1]
S 10	PN 800	6	35	22	7.7	1178902058	24-SW2OS-S10-CP1
S 10	PN 800	6	43.5	22	8.5	1178122058	24-SW2OS-S10-CP2 [1]
S 12	PN 630	8	38	24	9.7	1178912058	24-SW2OS-S12-CP1
S 12	PN 630	8	44	24	10.4	1178132058	24-SW2OS-S12-CP2 [1]
S 14	PN 630	9	41	27	14.4	1178922058	24-SW2OS-S14-CP1
S 14	PN 630	9	48.5	27	15.6	1178142058	24-SW2OS-S14-CP2 [1]
S 16	PN 630	11	42	30	17.5	1178932058	24-SW2OS-S16-CP1
S 16	PN 630	11	49	30	18.6	1178152058	24-SW2OS-S16-CP2 [1]
S 20	PN 420	14	48	36	26.1	1178942058	24-SW2OS-S20-CP1
S 20	PN 420	14	60.5	36	29.6	1178162058	24-SW2OS-S20-CP2 [1]
S 25	PN 420	16	73	46	63.1	1178712058	24-SW2OS-S25-LG73
S 25	PN 420	16	107	46	80.4	1178722058	24-SW2OS-S25-LG107
S 25	PN 420	18	54.5	46	51.7	1178952058	24-SW2OS-S25-CP1
S 25	PN 420	18	65.5	46	56.4	1178962058	24-SW2OS-S25-CP2
S 25	PN 420	18	67.5	46	56.9	1178172058	24-SW2OS-S25 [1]
S 30	PN 420	23	62	50	63.1	1178702058	24-SW2OS-S30-CP1
S 30	PN 420	23	72.5	50	68.6	1178182058	24-SW2OS-S30-CP2 [1]
S 38	PN 420	30	67	60	86.7	1178692058	24-SW2OS-S38-CP1
S 38	PN 420	30	83	60	99.6	1178192058	24-SW2OS-S38-CP2 [1]

[1] Standard size

Swivel reducers

With taper and O-ring
fit in bore type
W DIN 3861/ISO 8434-1

Standard O-ring material is FKM



Series Tube OD d1	Series Tube OD d2	Pressure	dy	l1	SW2	SW3	kg/100 ca.	Order-No.	Designation
L 6	S 6	PN 500	2.5	34	17	14	3.7	1180262058	24-SW2OS-L6-S6-CP1
L 6	S 6	PN 500	2.5	37.5	17	14	3.9	1178232058	24-SW2OS-L6-S6-CP2
L 8	L 6	PN 500	2.5	34	14	17	3.8	1180002058	24-SW2OS-L8-L6-CP1
L 8	S 8	PN 500	4	34.5	19	17	5.3	1180272058	24-SW2OS-L8-S8-CP1
L 10	L 6	PN 500	2.5	34	14	19	4.4	1178662058	24-SW2OS-L10-L6-CP1
L 10	L 8	PN 500	4	34.5	17	19	5.2	1180012058	24-SW2OS-L10-L8-CP1
L 10	S 10	PN 500	6	35	22	19	6.8	1180282058	24-SW2OS-L10-S10-CP1
L 10	S 10	PN 500	6	40	22	19	7.2	1178242058	24-SW2OS-L10-S10-CP2
L 12	L 10	PN 400	6	34.5	19	22	6.8	1180042058	24-SW2OS-L12-L10-CP1
L 12	L 10	PN 400	6	37.5	19	22	7.1	1178682058	24-SW2OS-L12-L10-CP2
L 12	L 6	PN 400	2.5	34.5	14	22	5.4	1180022058	24-SW2OS-L12-L6-CP1
L 12	L 8	PN 400	4	34.5	17	22	6.2	1180032058	24-SW2OS-L12-L8-CP1
L 12	S 12	PN 400	8	37.5	24	22	8.9	1180292058	24-SW2OS-L12-S12-CP1
L 12	S 12	PN 400	8	40.5	24	22	9.3	1178252058	24-SW2OS-L12-S12-CP2
L 15	L 10	PN 400	6	38	19	27	10.5	1178222058	24-SW2OS-L15-L10-CP12
L 15	L 12	PN 400	8	39	22	27	11.4	1178432058	24-SW2OS-L15-L12-CP1
L 15	L 8	PN 400	4	38	17	27	9.6	1178612058	24-SW2OS-L15-L8-CP12
L 18	L 10	PN 400	6	37.5	19	32	12.2	1180062058	24-SW2OS-L18-L10-CP1
L 18	L 12	PN 400	8	37.5	22	32	13.1	1180072058	24-SW2OS-L18-L12-CP1
L 18	L 15	PN 400	10	40.5	27	32	16.5	1180082058	24-SW2OS-L18-L15-CP1
L 18	L 15	PN 400	10	45	27	32	17.3	1178202058	24-SW2OS-L18-L15
L 18	S 16	PN 400	11	41.5	30	32	18.2	1180302058	24-SW2OS-L18-S16-CP1
L 22	L 12	PN 250	8	43.5	22	36	18.1	1180092058	24-SW2OS-L22-L12-CP1
L 22	L 15	PN 250	10	43.5	27	36	20.2	1180102058	24-SW2OS-L22-L15-CP12
L 22	L 18	PN 250	13	44	32	36	22.1	1178212058	24-SW2OS-L22-L18-CP1
L 22	S 20	PN 250	14	47	36	36	25.9	1180312058	24-SW2OS-L22-S20-CP1
L 22	S 20	PN 250	14	53.5	36	36	27.5	1178262058	24-SW2OS-L22-S20-CP2
L 28	L 15	PN 250	10	46	27	41	24.8	1180112058	24-SW2OS-L28-L15
L 28	L 18	PN 250	13	46	32	41	26.0	1178622058	24-SW2OS-L28-L18-CP2
L 28	L 22	PN 250	17	46	36	41	28.2	1178302058	24-SW2OS-L28-L22-CP1
L 28	S 25	PN 250	18	50.5	46	41	40.8	1180322058	24-SW2OS-L28-S25-CP1

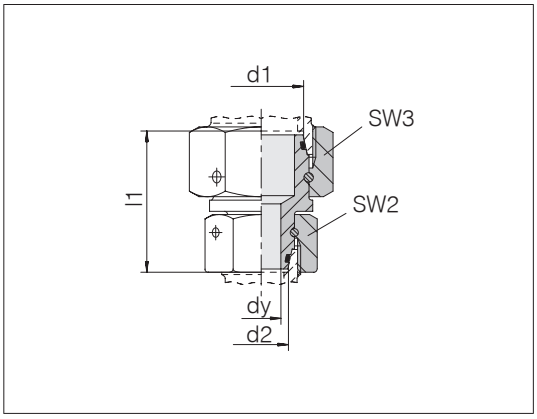
Example for comp. :
GZR08/06LVIT

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Swivel reducers

With taper and O-ring
fit in bore type
W DIN 3861/ISO 8434-1

Standard O-ring material is FKM



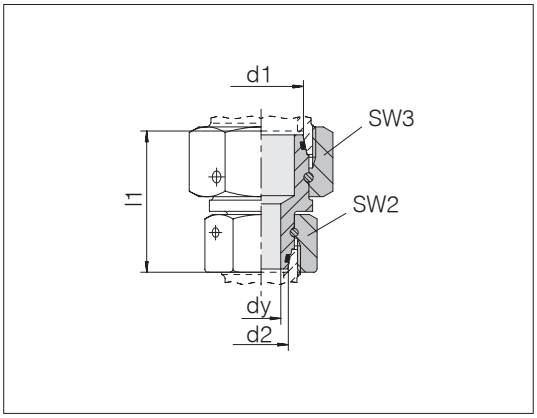
Series Tube OD d1	Series Tube OD d2	Pressure	dy	l1	SW2	SW3	kg/100 ca.	Order-No.	Designation
L 35	L 18	PN 250	13	51	32	50	37.5	1180122058	24-SW2OS-L35-L18-CP12
L 35	L 22	PN 250	17	51	36	50	38.4	1180132058	24-SW2OS-L35-L22-CP1
L 35	L 28	PN 250	22	51	41	50	40.3	1180142058	24-SW2OS-L35-L28-CP1
L 35	L 28	PN 250	22	52.5	41	50	41.0	1178672058	24-SW2OS-L35-L28-CP2
L 35	S 30	PN 250	23	59	50	50	55.8	1180332058	24-SW2OS-L35-S30-CP1
L 42	L 22	PN 250	17	54	36	60	55.7	1180152058	24-SW2OS-L42-L22
L 42	L 28	PN 250	22	54	41	60	57.5	1178632058	24-SW2OS-L42-L28-CP2
L 42	L 35	PN 250	28	56.5	50	60	62.5	1178642058	24-SW2OS-L42-L35-CP1
L 42	S 38	PN 250	30	62	60	60	78.3	1180342058	24-SW2OS-L42-S38-CP1
L 42	S 38	PN 250	30	66	60	60	84.1	1178282058	24-SW2OS-L42-S38-CP2
S 8	S 6	PN 800	2.5	34	17	19	5.2	1180162058	24-SW2OS-S8-S6-CP1
S 10	S 6	PN 800	2.5	34.5	17	22	6.2	1180172058	24-SW2OS-S10-S6-CP1
S 10	S 8	PN 800	4	34.5	19	22	6.8	1180182058	24-SW2OS-S10-S8-CP1
S 10	S 8	PN 800	4	41	19	22	7.7	1178492058	24-SW2OS-S10-S8-CP2
S 12	S 10	PN 630	6	38	22	24	9.0	1178502058	24-SW2OS-S12-S10-CP1
S 12	S 6	PN 630	2.5	37.5	17	24	7.6	1180192058	24-SW2OS-S12-S6-CP1
S 12	S 8	PN 630	4	37.5	19	24	8.0	1178742058	24-SW2OS-S12-S8-CP1
S 16	L 15	PN 400	10	41	27	30	16.1	1180352058	24-SW2OS-S16-L15-CP1
S 16	L 15	PN 400	10	45	27	30	16.8	1178292058	24-SW2OS-S16-L15-CP2
S 16	S 10	PN 630	6	41.5	22	30	13.5	1178522058	24-SW2OS-S16-S10-CP1
S 16	S 12	PN 630	8	41.5	24	30	14.1	1178532058	24-SW2OS-S16-S12-CP1
S 20	L 18	PN 400	13	47	32	36	23.9	1180362058	24-SW2OS-S20-L18-CP1
S 20	S 12	PN 420	8	47	24	36	19.8	1180202058	24-SW2OS-S20-S12-CP1
S 20	S 12	PN 420	8	52	24	36	21.4	1178542058	24-SW2OS-S20-S12-CP2
S 20	S 16	PN 420	11	47.5	30	36	23.0	1178552058	24-SW2OS-S20-S16-CP1
S 25	L 18	PN 400	13	47.5	32	46	35.4	1178762058	24-SW2OS-S25-L18-CP1
S 25	L 22	PN 250	17	50.5	36	46	38.9	1180372058	24-SW2OS-S25-L22-CP1
S 25	S 16	PN 420	11	51	30	46	36.2	1178562058	24-SW2OS-S25-S16-CP1
S 25	S 20	PN 420	14	53	36	46	40.2	1178572058	24-SW2OS-S25-S20

Continued on following page

Swivel reducers

With taper and O-ring
fit in bore type
W DIN 3861/ISO 8434-1

Standard O-ring material is FKM



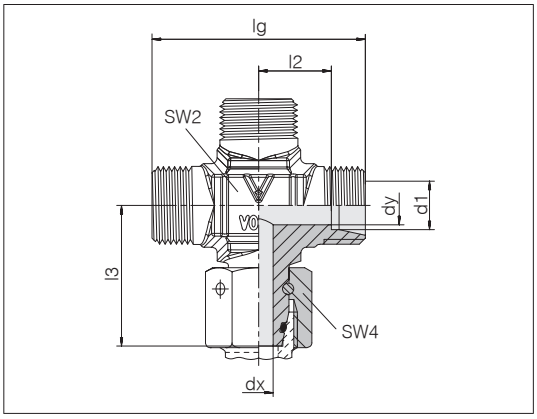
Series Tube OD d1	Series Tube OD d2	Pressure	dy	l1	SW2	SW3	kg/100 ca.	Order-No.	Designation
S 30	L 28	PN 250	22	58	41	50	51.9	1178272058	24-SW2OS-S30-L28-CP1
S 30	S 16	PN 420	11	58	30	50	44.9	1180212058	24-SW2OS-S30-S16-CP1
S 30	S 20	PN 420	14	59	36	50	47.9	1180222058	24-SW2OS-S30-S20-CP1
S 30	S 25	PN 420	18	60.5	46	50	58.9	1180232058	24-SW2OS-S30-S25-CP1
S 30	S 25	PN 420	18	69.5	46	50	65.2	1178582058	24-SW2OS-S30-S25
S 38	L 35	PN 250	28	61.5	50	60	70.3	1178732058	24-SW2OS-S38-L35-CP1
S 38	S 20	PN 420	14	61.5	36	60	62.5	1180242058	24-SW2OS-S38-S20-CP1
S 38	S 25	PN 420	18	63	46	60	72.7	1178592058	24-SW2OS-S38-S25-CP1
S 38	S 30	PN 420	23	66.5	50	60	77.2	1180252058	24-SW2OS-S38-S30
S 38	S 30	PN 420	23	78	50	60	89.1	1178602058	24-SW2OS-S38-S30-CP2

Union crosses

With taper and O-ring

Standard material of O-rings is FKM

Tube coupling: 24° in acc. with ISO 8434-1



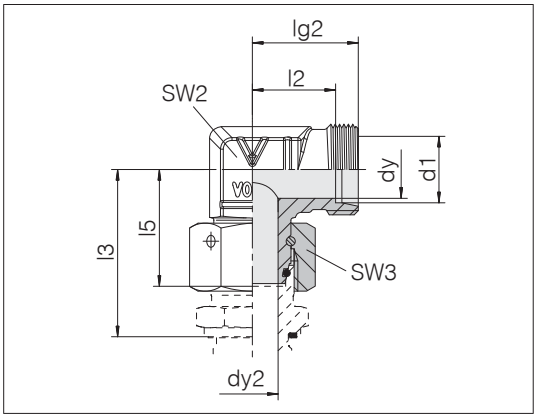
Series Tube OD d1	Pressure	dx	dy	lg	l2	l3	SW2	SW4	Order-No.	Designation
L 6	PN 315	2.5	4	38	12	24	12	14	1190412058	24-SWOK-L6
L 8	PN 315	4	6	42	14	27.5	17	17	1196702058	24-SWOK-L8
L 10	PN 315	6	8	44	15	29	17	19	1196962058	24-SWOK-L10
L 12	PN 315	8	10	48	17	29.5	17	22	1196952058	24-SWOK-L12
L 15	PN 315	10	12	56	21	32.5	24	27	1196262058	24-SWOK-L15
L 18	PN 315	13	15	68	26.5	38.5	27	32	1196792058	24-SWOK-L18
L 35	PN 250	28	30	90	34.5	51	41	50	1190662058	24-SWOK-L35
L 42	PN 250	34	36	102	40	56	50	60	1194942058	24-SWOK-L42

Swivel elbows

With taper and O-ring

Standard material of O-rings is FKM

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	Pressure	dy	dy2	lg2	l2	l3	l5	SW2	SW3	kg/100 ca.	Order-No.	Designation
L 6	PN 500	4	2.5	19	12	34.5	26	12	14	4.1	1158032058	24-SWOE-L6-P
L 8	PN 500	6	4	21	14	37.5	27.5	14	17	6.2	1158082058	24-SWOE-L8-P
L 10	PN 500	8	6	22	15	40	29	14	19	5.3	1158132058	24-SWOE-L10
L 12	PN 400	10	8	24	17	42	29.5	17	22	10.1	1158182058	24-SWOE-L12
L 15	PN 400	12	10	28	21	46	32.5	19	27	12.9	1158232058	24-SWOE-L15
L 18	PN 400	15	13	31	23.5	50	35.5	24	32	18.6	1158282058	24-SWOE-L18
L 22	PN 250	19	17	35	27.5	55	38.5	27	36	25.3	1158332058	24-SWOE-L22
L 28	PN 250	24	22	38	30.5	59	41.5	36	41	34.2	1158382058	24-SWOE-L28
L 35	PN 250	30	28	45	34.5	68.5	51	41	50	57.4	1158432058	24-SWOE-L35
L 42	PN 250	36	34	51	40	75	56	50	60	103.0	1158482058	24-SWOE-L42
S 6	PN 800	4	2.5	23	16	40	27	14	17	6.2	1158532058	24-SWOE-S6-P
S 8	PN 800	5	4	24	17	42.5	27.5	17	19	8.5	1158582058	24-SWOE-S8-P
S 10	PN 800	7	6	25	17.5	45	30	19	22	12.2	1158632058	24-SWOE-S10-P
S 12	PN 630	8	8	29	21.5	48	31	17	24	10.8	1158682058	24-SWOE-S12
S 14	PN 630	10	9	30	22	54	35	19	27	14.9	1158732058	24-SWOE-S14
S 16	PN 630	12	11	33	24.5	55	36.5	24	30	20.1	1158782058	24-SWOE-S16
S 20	PN 420	16	14	37	26.5	65	44.5	27	36	30.5	1158832058	24-SWOE-S20
S 25	PN 420	20	18	42	30	73	50	36	46	55.4	1158882058	24-SWOE-S25
S 30	PN 420	25	23	49	35.5	78.5	55	41	50	77.9	1158932058	24-SWOE-S30
S 38	PN 420	32	30	57	41	89	63	50	60	118.6	1158982058	24-SWOE-S38

Example for comp. :
EW06LVITOMD
ISO 8434-1-SWOE-L6-St

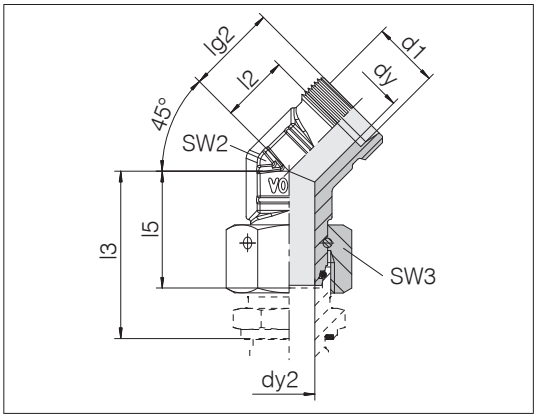
VOSS

Swivel 45° elbows

With taper and O-ring

Standard material of O-rings is FKM

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	Pressure	dy	dy2	lg2	l2	l3	l5	SW2	SW3	kg/100 ca.	Order-No.	Designation
L 6	PN 315	4	2.5	21	14	34.5	26	19	14	6.9	1170032058	24-SWOE45-L6
L 8	PN 315	6	4	22	15	37.5	27.5	19	17	7.0	1170082058	24-SWOE45-L8
L 10	PN 315	8	6	23	16	40	29	19	19	7.8	1170132058	24-SWOE45-L10
L 12	PN 315	10	8	24	17	42	29.5	19	22	8.6	1170182058	24-SWOE45-L12
L 15	PN 315	12	10	24	17	46	32.5	19	27	12.6	1170232058	24-SWOE45-L15
L 18	PN 315	15	13	26.5	19	50	35.5	24	32	17.8	1170282058	24-SWOE45-L18
L 22	PN 160	19	17	30	22.5	55	38.5	27	36	23.6	1170332058	24-SWOE45-L22
L 28	PN 160	24	22	32	24.5	59	41.5	36	41	33.6	1170382058	24-SWOE45-L28
L 35	PN 160	30	28	37.5	27	68.5	51	41	50	54.6	1170432058	24-SWOE45-L35
L 42	PN 160	36	34	38	27	75	56	50	60	83.6	1170482058	24-SWOE45-L42
S 6	PN 630	4	2.5	23	16	40	27	19	17	7.3	1170532058	24-SWOE45-S6
S 8	PN 630	5	4	23	16	42.5	27.5	19	19	8.2	1170582058	24-SWOE45-S8
S 10	PN 630	7	6	24	16.5	45	30	19	22	9.5	1170632058	24-SWOE45-S10
S 12	PN 630	8	8	24.5	17	48	31	19	24	11.2	1170682058	24-SWOE45-S12
S 14	PN 630	10	9	25	17	54	35	19	27	13.6	1170732058	24-SWOE45-S14
S 16	PN 400	12	11	27.5	19	55	36.5	24	30	18.8	1170782058	24-SWOE45-S16
S 20	PN 400	16	14	32	21.5	65	44.5	27	36	28.6	1170832058	24-SWOE45-S20
S 25	PN 400	20	18	35	23	73	50	36	46	52.3	1170882058	24-SWOE45-S25
S 30	PN 400	25	23	37.5	24	78.5	55	41	50	69.7	1170932058	24-SWOE45-S30
S 38	PN 315	32	30	44	28	89	63	50	60	106.8	1170982058	24-SWOE45-S38

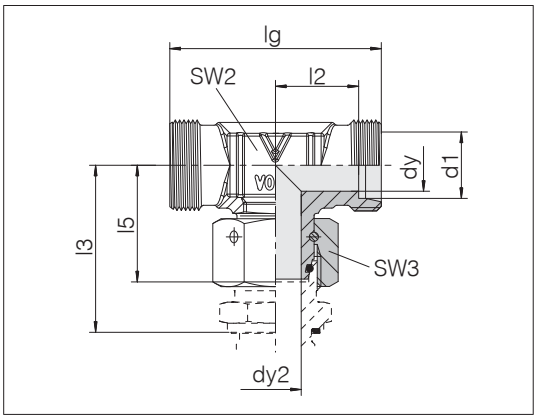
Example for comp. :
EV06LVITOMD
ISO 8434-1-SWOE45-L6-St

Swivel branch tees

With taper and O-ring

Standard material of O-rings is FKM

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	Pressure	dy	dy2	lg	l2	l3	l5	SW2	SW3	kg/100 ca.	Order-No.	Designation
L 6	PN 500	4	2.5	38	12	34.5	26	12	14	4.9	1160032058	24-SWOT-L6-P
L 8	PN 500	6	4	42	14	37.5	27.5	14	17	6.9	1160082058	24-SWOT-L8-P
L 10	PN 500	8	6	44	15	40	29	14	19	9.2	1160132058	24-SWOT-L10
L 12	PN 400	10	8	48	17	42	29.5	19	22	12.0	1160182058	24-SWOT-L12-P
L 15	PN 400	12	10	56	21	46	32.5	19	27	15.4	1160232058	24-SWOT-L15
L 18	PN 400	15	13	62	23.5	50	35.5	24	32	21.5	1160282058	24-SWOT-L18
L 22	PN 250	19	17	70	27.5	55	38.5	27	36	27.7	1160332058	24-SWOT-L22
L 28	PN 250	24	22	76	30.5	59	41.5	36	41	39.7	1160382058	24-SWOT-L28
L 35	PN 250	30	28	90	34.5	68.5	51	41	50	68.0	1160432058	24-SWOT-L35
L 42	PN 250	36	34	102	40	75	56	50	60	113.8	1160482058	24-SWOT-L42
S 6	PN 800	4	2.5	46	16	40	27	14	17	7.7	1160532058	24-SWOT-S6-P
S 8	PN 800	5	4	48	17	42.5	27.5	17	19	10.5	1160582058	24-SWOT-S8-P
S 10	PN 800	7	6	50	17.5	45	30	19	22	14.0	1160632058	24-SWOT-S10-P
S 12	PN 630	8	8	58	21.5	48	31	17	24	13.5	1160682058	24-SWOT-S12
S 14	PN 630	10	9	60	22	54	35	19	27	18.1	1160732058	24-SWOT-S14
S 16	PN 630	12	11	66	24.5	55	36.5	24	30	24.6	1160782058	24-SWOT-S16
S 20	PN 420	16	14	74	26.5	65	44.5	27	36	35.6	1160832058	24-SWOT-S20
S 25	PN 420	20	18	84	30	73	50	36	46	63.7	1160882058	24-SWOT-S25
S 30	PN 420	25	23	98	35.5	78.5	55	41	50	91.6	1160932058	24-SWOT-S30
S 38	PN 420	32	30	114	41	89	63	50	60	147.8	1160982058	24-SWOT-S38

Example for comp. :
ET06LVITOMD
ISO 8434-1-SWOBT-L6-St

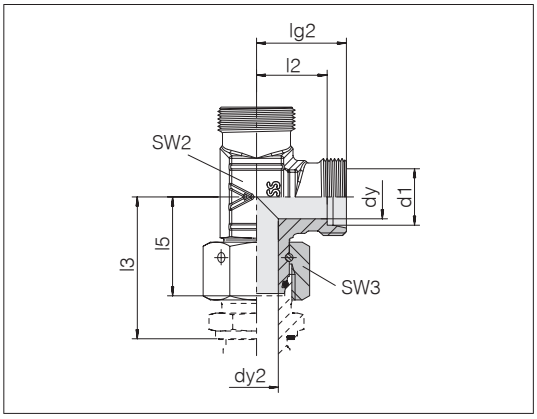
VOSS

Swivel run tees

With taper and O-ring

Standard material of O-rings is FKM

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	Pressure	dy	dy2	lg2	l2	l3	l5	SW2	SW3	kg/100 ca.	Order-No.	Designation
L 6	PN 500	4	2.5	19	12	34.5	26	12	14	4.8	1162032058	24-SWOL-L6-P
L 8	PN 500	6	4	21	14	37.5	27.5	14	17	7.0	1162082058	24-SWOL-L8-P
L 10	PN 500	8	6	22	15	40	29	14	19	9.6	1162132058	24-SWOL-L10
L 12	PN 400	10	8	24	17	42	29.5	19	22	12.0	1162182058	24-SWOL-L12-P
L 15	PN 400	12	10	28	21	46	32.5	19	27	15.4	1162232058	24-SWOL-L15
L 18	PN 400	15	13	31	23.5	50	35.5	24	32	21.3	1162282058	24-SWOL-L18
L 22	PN 250	19	17	35	27.5	55	38.5	27	36	28.1	1162332058	24-SWOL-L22
L 28	PN 250	24	22	38	30.5	59	41.5	36	41	39.2	1162382058	24-SWOL-L28
L 35	PN 250	30	28	45	34.5	68.5	51	41	50	67.7	1162432058	24-SWOL-L35
L 42	PN 250	36	34	51	40	75	56	50	60	112.4	1162482058	24-SWOL-L42
S 6	PN 800	4	2.5	23	16	40	27	12	17	7.8	1162532058	24-SWOL-S6
S 8	PN 800	5	4	24	17	42.5	27.5	17	19	10.2	1162582058	24-SWOL-S8-P
S 10	PN 800	7	6	25	17.5	45	30	19	22	14.0	1162632058	24-SWOL-S10-P
S 12	PN 630	8	8	29	21.5	48	31	17	24	13.3	1162682058	24-SWOL-S12
S 14	PN 630	10	9	30	22	54	35	19	27	18.0	1162732058	24-SWOL-S14
S 16	PN 630	12	11	33	24.5	55	36.5	24	30	22.6	1162782058	24-SWOL-S16
S 20	PN 420	16	14	37	26.5	65	44.5	27	36	35.3	1162832058	24-SWOL-S20
S 25	PN 420	20	18	42	30	73	50	36	46	62.8	1162882058	24-SWOL-S25
S 30	PN 420	25	23	49	35.5	78.5	55	41	50	91.7	1162932058	24-SWOL-S30
S 38	PN 420	32	30	57	41	89	63	50	60	149.3	1162982058	24-SWOL-S38

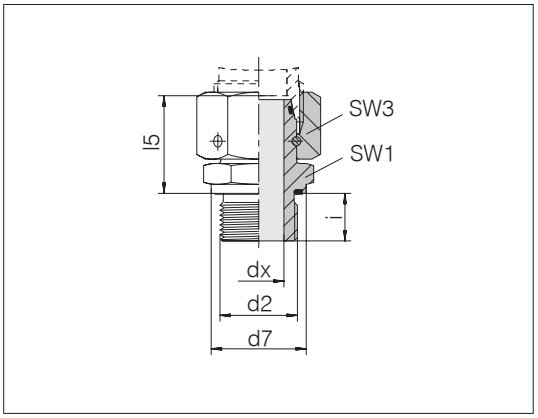
Example for comp. :
EL06LVITOMD
ISO 8434-1-SWORT-L6-St

Swivel connectors

With taper and O-ring
fit in bore type W DIN 3861/ISO 8434-1

Male thread: Metric fine thread, cylindrical
Threaded stud: ISO 9974-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Standard O-ring material (DKO) is FKM



Series Tube OD	d2	Pressure	d7	dx	l5	SW1	SW3	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	M 8 x 1	PN 500	11.9	2.5	24.5	12	14	8	12	2.2	1198052000	24-SWOSDS-L6-M8E	
L 6	M 10 x 1	PN 500	13.9	2.5	24.5	14	14	8	15	2.6	1164032000	24-SWOSDS-L6-M10E	1)
L 8	M 14 x 1.5	PN 500	18.9	4	27.5	19	17	12	50	6.0	7008029600	24-SWOSDS-L8-M14E	
L 8	M 16 x 1.5	PN 500	16.9	4	26.5	17	17	12	25	4.4	1164082000	24-SWOSDS-L8-M12E	1)
L 10	M 14 x 1.5	PN 500	18.9	6	27.5	19	19	12	50	5.7	1164132000	24-SWOSDS-L10-M14E	1)
L 10	M 16 x 1.5	PN 400	21.9	6	30.5	22	19	12	70	4.0	1197002000	24-SWOSDS-L10-M16E	
L 10	M 16 x 1.5	PN 500	16.9	6	26.5	17	19	12	25	4.8	1196012000	24-SWOSDS-L10-M12E	
L 12	M 16 x 1.5	PN 400	21.9	8	30.5	22	22	12	70	8.3	1164182000	24-SWOSDS-L12-M16E	1)
L 12	M 18 x 1.5	PN 400	23.9	8	30.5	24	22	12	90	10.3	1198202000	24-SWOSDS-L12-M18E	
L 12	M 22 x 1.5	PN 400	26.9	8	30.5	27	22	14	130	11.1	1198712000	24-SWOSDS-L12-M22E	
L 15	M 18 x 1.5	PN 400	23.9	10	31.5	24	27	12	90	11.9	1164232000	24-SWOSDS-L15-M18E	1)
L 15	M 22 x 1.5	PN 400	26.9	10	32	27	27	14	130	13.2	1198702000	24-SWOSDS-L15-M22E	
L 18	M 22 x 1.5	PN 400	26.9	13	31.5	27	32	14	130	15.3	1164282000	24-SWOSDS-L18-M22E	1)
L 18	M 26 x 1.5	PN 250	31.9	13	31.5	32	32	16	180	19.5	1197502000	24-SWOSDS-L18-M26E	
L 22	M 26 x 1.5	PN 250	31.9	17	32.5	32	36	16	180	20.2	1164332000	24-SWOSDS-L22-M26E	1)
L 28	M 33 x 2	PN 250	39.9	22	35	41	41	18	230	28.6	1164382000	24-SWOSDS-L28-M33E	1)
L 35	M 42 x 2	PN 250	49.9	28	42.5	50	50	20	330	50.0	1164432000	24-SWOSDS-L35-M42E	1)
L 42	M 48 x 2	PN 250	54.9	34	46.5	55	60	22	500	71.6	1164482000	24-SWOSDS-L42-M48E	1)
S 6	M 16 x 1.5	PN 800	16.9	2.5	27	17	17	12	50	4.7	1164532000	24-SWOSDS-S6-M12E	1)
S 6	M 16 x 1.5	PN 800	21.9	2.5	32	22	17	12	80	8.1	1196282000	24-SWOSDS-S6-M16E	
S 8	M 14 x 1.5	PN 800	18.9	4	29.5	19	19	12	60	6.4	1164582000	24-SWOSDS-S8-M14E	1)
S 8	M 16 x 1.5	PN 800	21.9	4	32	22	19	12	80	8.6	1196292000	24-SWOSDS-S8-M16E	
S 10	M 16 x 1.5	PN 800	21.9	6	32	22	22	12	80	9.0	1164632000	24-SWOSDS-S10-M16E	1)
S 12	M 16 x 1.5	PN 800	21.9	6	33	22	24	12	80	10.1	1196222000	24-SWOSDS-S12-M16E	
S 12	M 18 x 1.5	PN 630	23.9	8	34	24	24	12	90	11.1	1164682000	24-SWOSDS-S12-M18E	1)
S 14	M 20 x 1.5	PN 630	25.9	9	36.5	27	27	14	130	15.7	1164732000	24-SWOSDS-S14-M20E	1)
S 16	M 22 x 1.5	PN 630	26.9	11	37	27	30	14	130	17.6	1164782000	24-SWOSDS-S16-M22E	1)
S 20	M 22 x 1.5	PN 420	26.9	12	40.5	27	36	14	200	23.5	1192912000	24-SWOSDS-S20-M22E	
S 20	M 27 x 2	PN 420	31.9	14	43	32	36	16	200	27.6	1164832000	24-SWOSDS-S20-M27E	1)
S 25	M 33 x 2	PN 420	39.9	18	48	41	46	18	250	50.5	1164882000	24-SWOSDS-S25-M33E	1)
S 30	M 42 x 2	PN 420	49.9	23	51	50	50	20	500	69.7	1164932000	24-SWOSDS-S30-M42E	1)
S 38	M 48 x 2	PN 420	54.9	30	60	55	60	22	600	76.4	1164982000	24-SWOSDS-S38-M48E	1)

1) Standard size

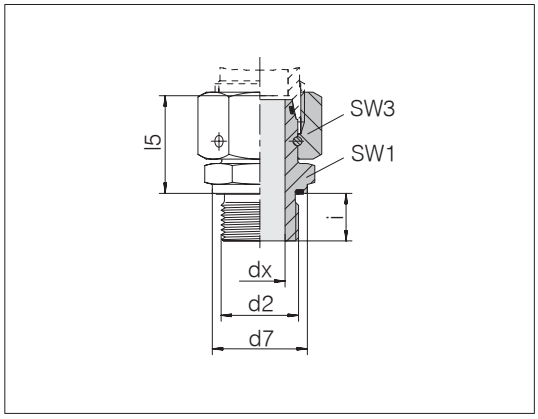
Example for comp. :
EGE06LMED
ISO 8434-1-SWOSDS-L6xM10x1-E-St

Swivel connectors

With taper and O-ring
suitable in bore form W DIN 3861/ISO 8434-1

Male thread: BSPP thread, cylindrical
Screw-in stud: ISO 1179-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Standard O-ring material (DKO) is FKM



Series Tube OD	d2	Pressure	d7	dx	l5	SW1	SW3	i	Nm -10 %	kg/100 ca.	Order-No.	Designation
L 6	G 1/8 A	PN 500	13.9	2.5	24.5	14	14	8	20	2.6	1165032000	24-SWOSDS-L6-G1/8E [1]
L 8	G 1/8 A	PN 500	13.9	4	24	14	17	8	20	3.3	1197392000	24-SWOSDS-L8-G1/8E
L 8	G 1/4 A	PN 500	18.9	4	29.5	19	17	12	50	5.7	1165082000	24-SWOSDS-L8-G1/4E [1]
L 10	G 1/4 A	PN 500	18.9	6	27.5	19	19	12	50	5.6	1165132000	24-SWOSDS-L10-G1/4E [1]
L 10	G 3/8 A	PN 400	21.9	6	28	22	19	12	80	7.3	1197212000	24-SWOSDS-L10-G3/8E
L 10	G 1/2 A	PN 400	26.9	6	28.5	27	19	14	100	9.8	1198302000	24-SWOSDS-L10-G1/2E
L 12	G 1/4 A	PN 400	18.9	6	27.5	19	22	12	50	6.9	1197572000	24-SWOSDS-L12-G1/4E
L 12	G 3/8 A	PN 400	21.9	8	34	22	22	12	80	9.6	1165182000	24-SWOSDS-L12-G3/8E [1]
L 12	G 1/2 A	PN 400	26.9	8	31.5	27	22	14	100	11.8	1198402000	24-SWOSDS-L12-G1/2E
L 15	G 3/8 A	PN 400	21.9	9	32	22	27	12	80	11.6	1198562000	24-SWOSDS-L15-G3/8E
L 15	G 1/2 A	PN 400	26.9	10	32	27	27	14	100	14.1	1165232000	24-SWOSDS-L15-G1/2E [1]
L 15	G 3/4 A	PN 250	31.9	10	30.5	32	27	16	180	15.4	1197032000	24-SWOSDS-L15-G3/4E
L 18	G 1/2 A	PN 400	26.9	13	31.5	27	32	14	100	14.4	1165282000	24-SWOSDS-L18-G1/2E [1]
L 18	G 3/4 A	PN 250	31.9	13	31.5	32	32	16	180	17.2	1198652000	24-SWOSDS-L18-G3/4E
L 22	G 1/2 A	PN 250	26.9	14	32.5	27	36	14	100	17.1	1198662000	24-SWOSDS-L22-G1/2E
L 22	G 3/4 A	PN 250	31.9	17	32.5	32	36	16	180	20.1	1165332000	24-SWOSDS-L22-G3/4E [1]
L 28	G 3/4 A	PN 250	31.9	17	35	32	41	16	180	23.5	1197012000	24-SWOSDS-L28-G3/4E
L 28	G 1 A	PN 250	39.9	22	35	41	41	18	230	29.3	1165382000	24-SWOSDS-L28-G1E [1]
L 35	G 1 1/4 A	PN 250	49.9	28	42.5	50	50	20	330	50.9	1165432000	24-SWOSDS-L35-G11/4E [1]
L 42	G 1 1/2 A	PN 250	54.9	34	46.5	55	60	22	500	72.2	1165482000	24-SWOSDS-L42-G11/2E [1]

[1] Standard size

Example for comp. :
EGE06LRED
ISO 8434-1-SWOSDS-L6x1/8A-E-St

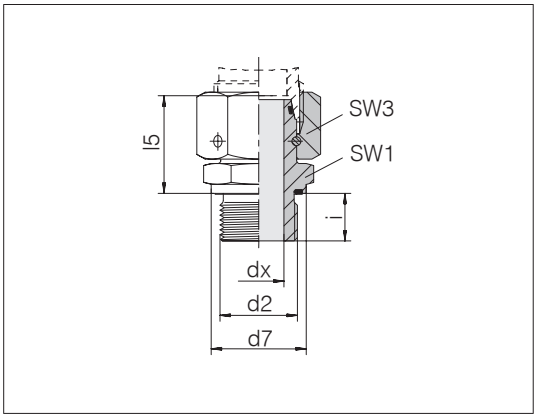
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Swivel connectors

With taper and O-ring
suitable in bore form W DIN 3861/ISO 8434-1

Male thread: BSPP thread, cylindrical
Screw-in stud: ISO 1179-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Standard O-ring material (DKO) is FKM



Series Tube OD	d2	Pressure	d7	dx	l5	SW1	SW3	i	Nm -10 %	kg/100 ca.	Order-No.	Designation
S 6	G 1/4 A	PN 800	18.9	2.5	27	19	17	12	60	5.4	1165532000	24-SWOSDS-S6-G1/4E [1]
S 8	G 1/4 A	PN 800	18.9	4	29.5	19	19	12	60	6.4	1165582000	24-SWOSDS-S8-G1/4E [1]
S 10	G 1/4 A	PN 800	18.9	5	32	22	22	12	60	8.7	1197512000	24-SWOSDS-S10-G1/4E
S 10	G 3/8 A	PN 800	21.9	6	32	22	22	12	90	9.4	1165632000	24-SWOSDS-S10-G3/8E [1]
S 12	G 1/4 A	PN 630	18.9	5	30.5	19	24	12	60	7.9	1198582000	24-SWOSDS-S12-G1/4E
S 12	G 3/8 A	PN 630	21.9	8	34	22	24	12	90	10.0	1165682000	24-SWOSDS-S12-G3/8E [1]
S 12	G 1/2 A	PN 630	26.9	8	36	27	24	14	150	14.4	1198572000	24-SWOSDS-S12-G1/2E
S 14	G 1/2 A	PN 630	26.9	9	36.5	27	27	14	150	16.4	1165732000	24-SWOSDS-S14-G1/2E [1]
S 16	G 1/2 A	PN 630	26.9	11	37	27	30	14	150	17.1	1165782000	24-SWOSDS-S16-G1/2E [1]
S 16	G 3/4 A	PN 420	31.9	11	39.5	32	30	16	200	24.4	1197772000	24-SWOSDS-S16-G3/4E
S 20	G 1/2 A	PN 420	26.9	12	43	27	36	14	150	21.2	1198312000	24-SWOSDS-S20-G1/2E
S 20	G 3/4 A	PN 420	31.9	14	43	32	36	16	200	27.2	1165832000	24-SWOSDS-S20-G3/4E [1]
S 25	G 3/4 A	PN 420	31.9	16	48	32	46	16	200	39.7	1196482000	24-SWOSDS-S25-G3/4E
S 25	G 1 A	PN 420	39.9	18	48	41	46	18	250	50.6	1165882000	24-SWOSDS-S25-G1E [1]
S 30	G 1 A	PN 420	39.9	18	51.5	41	50	18	250	54.4	1197412000	24-SWOSDS-S30-G1E
S 30	G 1 1/4 A	PN 420	49.9	23	51	50	50	20	500	68.5	1165932000	24-SWOSDS-S30-G11/4E [1]
S 38	G 1 1/4 A	PN 420	49.9	25	54.5	50	60	20	500	78.9	1197362000	24-SWOSDS-S38-G11/4E
S 38	G 1 1/2 A	PN 420	54.9	30	60	55	60	22	600	95.5	1165982000	24-SWOSDS-S38-G11/2E [1]

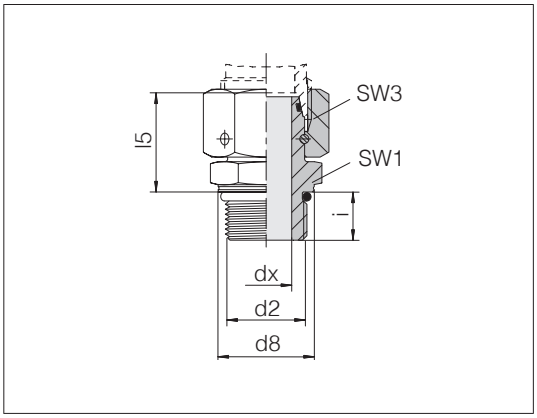
[1] Standard size

Swivel connectors

With taper and O-Ring
fit in bore type W DIN 3861/ISO 8434-1

Male thread: Metric fine thread, cylindrical
Threaded stud: ISO 6149-2/3
Sealing type: O-Ring (Form F)
Sealing material: Standard NBR

Standard O-ring material (DKO) is FKM



Series Tube OD	d2	Pressure	d8	dx	l5	SW1	SW3	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	M 10 x 1	PN 500	13.8	2.5	24.5	14	14	8.5	15	3.1	7000197100	24-SWOSDS-L6-M10F	1)
L 8	M 12 x 1.5	PN 500	16.8	4	26.5	17	17	11	25	4.9	1171082000	24-SWOSDS-L8-M12F	1)
L 8	M 14 x 1.5	PN 500	18.8	4	26.5	19	17	11	35	5.7	1171092000	24-SWOSDS-L8-M14F	
L 10	M 12 x 1.5	PN 500	16.8	6	27.5	17	19	11	25	5.4	1171112000	24-SWOSDS-L10-M12F	1)
L 10	M 14 x 1.5	PN 500	18.8	6	27.5	19	19	11	35	6.2	1171102000	24-SWOSDS-L10-M14F	
L 10	M 18 x 1.5	PN 400	23.8	6	28	24	19	12.5	45	8.9	1171142000	24-SWOSDS-L10-M18F	
L 12	M 16 x 1.5	PN 400	21.8	8	30.5	22	22	11.5	40	9.2	1171152000	24-SWOSDS-L12-M16F	1)
L 15	M 18 x 1.5	PN 400	23.8	10	31.5	24	27	12.5	45	12.1	1171202000	24-SWOSDS-L15-M18F	1)
L 15	M 22 x 1.5	PN 400	26.8	10	31.5	27	27	13	60	13.9	1171212000	24-SWOSDS-L15-M22F	
L 15	M 27 x 2	PN 400	31.8	10	30.5	32	27	16	100	18.7	1171222000	24-SWOSDS-L15-M27F	
L 18	M 22 x 1.5	PN 400	26.8	13	31.5	27	32	13	60	16.2	1171252000	24-SWOSDS-L18-M22F	1)
L 22	M 27 x 2	PN 250	31.8	17	32.5	32	36	16	100	19.6	1171332000	24-SWOSDS-L22-M27F	1)
L 28	M 33 x 2	PN 250	40.8	22	35	41	41	16	160	31.4	1171382000	24-SWOSDS-L28-M33F	1)
L 28	M 42 x 2	PN 250	49.8	22	38	50	41	16	210	40.6	1171392000	24-SWOSDS-L28-M42F	
L 35	M 42 x 2	PN 250	49.8	28	44.5	50	50	16	210	54.6	7000197200	24-SWOSDS-L35-M42F	1)
L 42	M 48 x 2	PN 250	54.8	34	49	55	60	17.5	260	91.7	7000197300	24-SWOSDS-L42-M48F	1)
S 6	M 12 x 1.5	PN 800	16.8	2.5	27.5	17	17	11	35	5.2	7000197800	24-SWOSDS-S6-M12F	1)
S 8	M 14 x 1.5	PN 800	18.8	4	29.5	19	19	11	40	7.0	1171582000	24-SWOSDS-S8-M14F	1)
S 10	M 16 x 1.5	PN 800	21.8	6	32	22	22	12.5	55	10.0	1171632000	24-SWOSDS-S10-M16F	1)
S 12	M 18 x 1.5	PN 630	23.8	8	35	24	24	14	70	12.3	7000197400	24-SWOSDS-S12-M18F	1)
S 16	M 22 x 1.5	PN 630	26.8	11	39	27	30	15	100	20.7	7000197500	24-SWOSDS-S16-M22F	1)
S 20	M 22 x 1.5	PN 630	26.8	12	43	27	36	15	100	25.3	1171812000	24-SWOSDS-S20-M22F	
S 20	M 27 x 2	PN 420	31.8	14	43	32	36	16	170	29.5	1171832000	24-SWOSDS-S20-M27F	1)
S 25	M 33 x 2	PN 420	40.8	18	48	41	46	18.5	310	53.5	1171882000	24-SWOSDS-S25-M33F	1)
S 30	M 42 x 2	PN 420	49.8	23	56	50	50	19	330	79.7	7000197600	24-SWOSDS-S30-M42F	1)
S 38	M 48 x 2	PN 420	54.8	30	67.5	55	60	21.5	420	115.2	7000197700	24-SWOSDS-S38-M48F	1)

1) Standard size

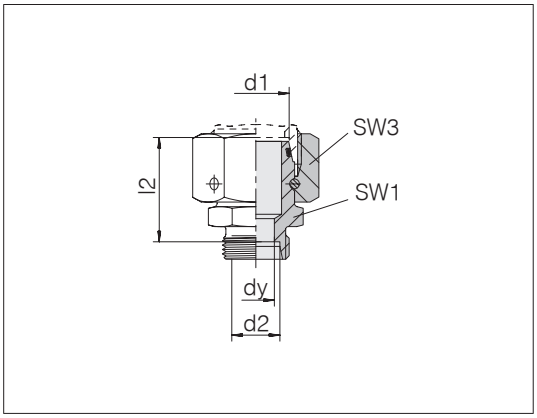
Example for comp. :
EGEO06LM
ISO 8434-1-SWOSDS-L6xM10x1-F-St

Tube end reducers

With taper and O-ring
fit in bore type W DIN 3861/ISO 8434-1

Standard material of O-rings is FKM

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	Series Tube OD d2	Pressure	dy	l2	SW1	SW3	kg/100 ca.	Order-No.	Designation
L 8	L 6	PN 500	4	23.5	12	17	2.9	1181002058	24-SWOS-L8-L6
L 10	L 6	PN 500	4	25	14	19	3.8	1181012058	24-SWOS-L10-L6
L 10	L 8	PN 500	6	25	14	19	3.8	1181022058	24-SWOS-L10-L8
L 10	S 8	PN 500	5	28	17	19	4.9	1181962058	24-SWOS-L10-S8
L 12	L 10	PN 400	8	26	17	22	5.2	1181052058	24-SWOS-L12-L10
L 12	L 6	PN 400	4	25	17	22	5.0	1181032058	24-SWOS-L12-L6
L 12	L 8	PN 400	6	25	17	22	5.1	1181042058	24-SWOS-L12-L8
L 12	S 6	PN 400	4	28	17	22	5.6	1181952058	24-SWOS-L12-S6
L 12	S 8	PN 400	5	28	17	22	6.0	1181982058	24-SWOS-L12-S8
L 15	L 10	PN 400	8	29	19	27	8.9	1181082058	24-SWOS-L15-L10
L 15	L 12	PN 400	10	29	19	27	9.0	1181092058	24-SWOS-L15-L12
L 15	L 18	PN 400	10	31	27	27	11.8	1181942058	24-SWOS-L15-L18
L 15	L 6	PN 400	4	28	19	27	8.7	1181062058	24-SWOS-L15-L6
L 15	L 8	PN 400	6	28	19	27	8.8	1181072058	24-SWOS-L15-L8
L 15	S 8	PN 400	5	30	19	27	9.4	1181992058	24-SWOS-L15-S8
L 18	L 10	PN 400	8	29	24	32	11.2	1181122058	24-SWOS-L18-L10
L 18	L 12	PN 400	10	29	24	32	11.3	1181132058	24-SWOS-L18-L12
L 18	L 15	PN 400	12	30	24	32	11.8	1181142058	24-SWOS-L18-L15
L 18	L 6	PN 400	4	28	24	32	11.1	1181102058	24-SWOS-L18-L6
L 18	L 8	PN 400	6	28	24	32	11.1	1181112058	24-SWOS-L18-L8
L 18	S 8	PN 400	5	30	24	32	11.6	1181972058	24-SWOS-L18-S8
L 22	L 10	PN 250	8	33	27	36	15.7	1181172058	24-SWOS-L22-L10
L 22	L 12	PN 250	10	33	27	36	16.1	1181182058	24-SWOS-L22-L12
L 22	L 15	PN 250	12	34	27	36	16.2	1181192058	24-SWOS-L22-L15
L 22	L 18	PN 250	15	33.5	27	36	16.6	1181202058	24-SWOS-L22-L18
L 22	L 6	PN 250	4	32	27	36	15.4	1181152058	24-SWOS-L22-L6
L 22	L 8	PN 250	6	32	27	36	15.5	1181162058	24-SWOS-L22-L8
L 28	L 10	PN 250	8	35	32	41	20.1	1181232058	24-SWOS-L28-L10
L 28	L 12	PN 250	10	35	32	41	20.1	1181242058	24-SWOS-L28-L12
L 28	L 15	PN 250	12	36	32	41	20.6	1181252058	24-SWOS-L28-L15

Example for comp. :
RED08/06LOMDVIT

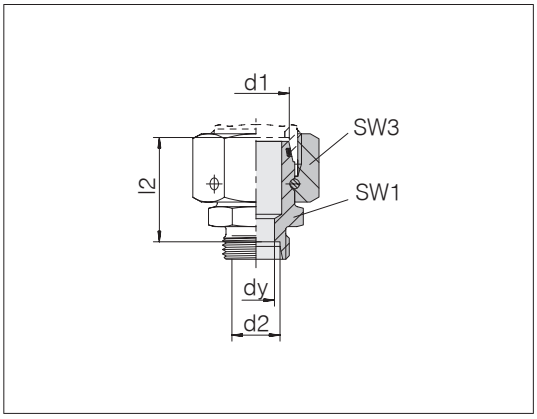
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Tube end reducers

With taper and O-ring
fit in bore type W DIN 3861/ISO 8434-1

Standard material of O-rings is FKM

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	Series Tube OD d2	Pressure	dy	l2	SW1	SW3	kg/100 ca.	Order-No.	Designation
L 28	L 18	PN 250	15	35.5	32	41	21.0	1181262058	24-SWOS-L28-L18
L 28	L 22	PN 250	19	37.5	32	41	21.0	1181272058	24-SWOS-L28-L22
L 28	L 8	PN 250	6	34	32	41	20.1	1181222058	24-SWOS-L28-L8
L 28	S 16	PN 250	12	36.5	32	41	21.5	1181922058	24-SWOS-L28-S16
L 28	S 20	PN 250	16	36.5	32	41	23.2	1181912058	24-SWOS-L28-S20
L 35	L 10	PN 250	8	38	41	50	32.3	1181302058	24-SWOS-L35-L10
L 35	L 12	PN 250	10	38	41	50	31.3	1181312058	24-SWOS-L35-L12
L 35	L 15	PN 250	12	39	41	50	31.6	1181322058	24-SWOS-L35-L15
L 35	L 18	PN 250	15	38.5	41	50	31.9	1181332058	24-SWOS-L35-L18
L 35	L 22	PN 250	19	40.5	41	50	32.1	1181342058	24-SWOS-L35-L22
L 35	L 28	PN 250	24	40.5	41	50	32.3	1181352058	24-SWOS-L35-L28
L 35	L 6	PN 250	4	37	41	50	31.9	1181282058	24-SWOS-L35-L6
L 35	L 8	PN 250	6	37	41	50	30.6	1181292058	24-SWOS-L35-L8
L 42	L 10	PN 250	8	41.5	50	60	52.8	1181372058	24-SWOS-L42-L10
L 42	L 12	PN 250	10	41.5	50	60	51.8	1181382058	24-SWOS-L42-L12
L 42	L 15	PN 250	12	42.5	50	60	53.4	1181392058	24-SWOS-L42-L15
L 42	L 18	PN 250	15	42	50	60	52.7	1181412058	24-SWOS-L42-L18
L 42	L 22	PN 250	19	44	50	60	51.5	1181422058	24-SWOS-L42-L22
L 42	L 28	PN 250	24	44	50	60	51.5	1181432058	24-SWOS-L42-L28
L 42	L 35	PN 250	30	43	50	60	53.1	1181442058	24-SWOS-L42-L35
L 42	L 6	PN 250	4	40.5	50	60	52.5	1181812058	24-SWOS-L42-L6
L 42	L 8	PN 250	6	40.5	50	60	51.9	1181362058	24-SWOS-L42-L8

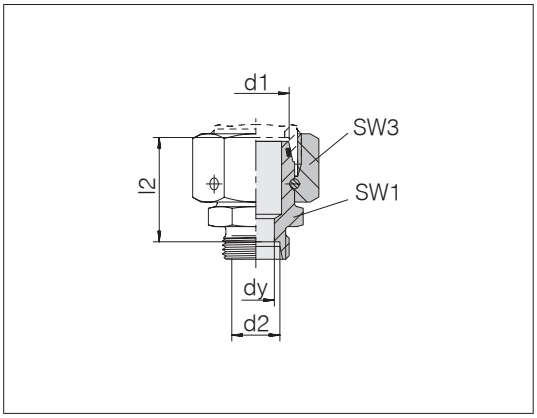
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Tube end reducers

With taper and O-ring
fit in bore type W DIN 3861/ISO 8434-1

Standard material of O-rings is FKM

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	Series Tube OD d2	Pressure	dy	l2	SW1	SW3	kg/100 ca.	Order-No.	Designation
S 8	S 6	PN 800	4	27	14	19	4.3	1181452058	24-SWOS-S8-S6
S 10	S 6	PN 800	4	27.5	17	22	5.5	1181462058	24-SWOS-S10-S6
S 10	S 8	PN 800	5	27.5	17	22	5.7	1181472058	24-SWOS-S10-S8
S 12	S 10	PN 630	7	29.5	19	24	7.3	1181502058	24-SWOS-S12-S10
S 12	S 6	PN 630	4	30	19	24	7.0	1181482058	24-SWOS-S12-S6
S 12	S 8	PN 630	5	30	19	24	7.1	1181492058	24-SWOS-S12-S8
S 14	S 10	PN 630	7	31	22	27	10.2	1181532058	24-SWOS-S14-S10
S 14	S 12	PN 630	8	31	22	27	10.4	1181542058	24-SWOS-S14-S12
S 14	S 6	PN 630	4	31	19	27	9.4	1181512058	24-SWOS-S14-S6
S 14	S 8	PN 630	5	31.5	19	27	9.5	1181522058	24-SWOS-S14-S8
S 16	L 12	PN 400	10	32	22	30	11.6	1181932058	24-SWOS-S16-L12
S 16	L 15	PN 400	11	38.8	24	30	14.4	1198602058	24-SWOS-S16-L15
S 16	S 10	PN 630	7	31.5	22	30	11.7	1181572058	24-SWOS-S16-S10
S 16	S 12	PN 630	8	31.5	22	30	12.0	1181582058	24-SWOS-S16-S12
S 16	S 14	PN 630	10	33	24	30	12.8	1181592058	24-SWOS-S16-S14
S 16	S 6	PN 630	4	32	22	30	11.4	1181552058	24-SWOS-S16-S6
S 16	S 8	PN 630	5	32	22	30	11.6	1181562058	24-SWOS-S16-S8
S 20	L 15	PN 400	12	36	27	36	16.6	1197582058	24-SWOS-S20-L15
S 20	L 22	PN 250	19	35.5	32	36	21.2	1191252058	24-SWOS-S20-L22
S 20	S 10	PN 420	7	35.5	27	36	17.0	1181622058	24-SWOS-S20-S10
S 20	S 12	PN 420	8	35.5	27	36	17.3	1181632058	24-SWOS-S20-S12
S 20	S 16	PN 420	12	36.5	27	36	17.9	1181652058	24-SWOS-S20-S16
S 20	S 6	PN 420	4	36	27	36	17.0	1181602058	24-SWOS-S20-S6
S 20	S 8	PN 420	5	36	27	36	17.2	1181612058	24-SWOS-S20-S8
S 25	L 18	PN 400	15	38	32	46	31.5	1198612058	24-SWOS-S25-L18
S 25	S 10	PN 420	7	38	32	46	31.2	1181682058	24-SWOS-S25-S10
S 25	S 12	PN 420	8	38	32	46	31.3	1181692058	24-SWOS-S25-S12
S 25	S 16	PN 420	12	39	32	46	31.7	1181712058	24-SWOS-S25-S16
S 25	S 20	PN 420	16	39	32	46	32.8	1181722058	24-SWOS-S25-S20
S 25	S 6	PN 420	4	38.5	32	46	30.9	1181662058	24-SWOS-S25-S6
S 25	S 8	PN 420	5	38.5	32	46	30.9	1181672058	24-SWOS-S25-S8
S 30	L 22	PN 250	19	45.5	41	50	40.9	1198072058	24-SWOS-S30-L22
S 30	S 10	PN 420	7	43.5	41	50	40.4	1181752058	24-SWOS-S30-S10

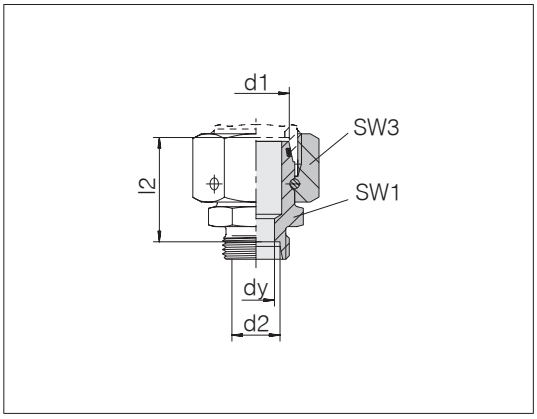
Continued on following page

Tube end reducers

With taper and O-ring
fit in bore type W DIN 3861/ISO 8434-1

Standard material of O-rings is FKM

Tube coupling: 24° in acc. with ISO 8434-1



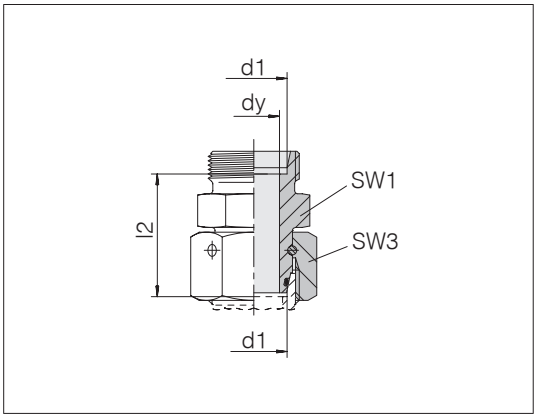
Series Tube OD d1	Series Tube OD d2	Pressure	dy	l2	SW1	SW3	kg/100 ca.	Order-No.	Designation
S 30	S 12	PN 420	8	43.5	41	50	40.5	1181762058	24-SWOS-S30-S12
S 30	S 16	PN 420	12	44.5	41	50	40.6	1181782058	24-SWOS-S30-S16
S 30	S 20	PN 420	16	44.5	41	50	42.2	1181792058	24-SWOS-S30-S20
S 30	S 25	PN 420	20	45	41	50	44.8	1181802058	24-SWOS-S30-S25
S 30	S 6	PN 420	4	44	41	50	40.4	1181732058	24-SWOS-S30-S6
S 30	S 8	PN 420	5	44	41	50	39.9	1181742058	24-SWOS-S30-S8
S 38	S 10	PN 420	7	47	50	60	58.4	1181842058	24-SWOS-S38-S10
S 38	S 12	PN 420	8	47	50	60	59.2	1181852058	24-SWOS-S38-S12
S 38	S 16	PN 420	12	48	50	60	59.2	1181862058	24-SWOS-S38-S16
S 38	S 20	PN 420	16	48	50	60	59.7	1181872058	24-SWOS-S38-S20
S 38	S 25	PN 420	20	48.5	50	60	62.3	1181882058	24-SWOS-S38-S25
S 38	S 30	PN 420	25	49	50	60	63.6	1181892058	24-SWOS-S38-S30
S 38	S 6	PN 420	4	47.5	50	60	57.6	1181822058	24-SWOS-S38-S6
S 38	S 8	PN 420	5	47.5	50	60	57.8	1181832058	24-SWOS-S38-S8

Distance adapters

With taper and O-ring

Standard material of O-rings is FKM

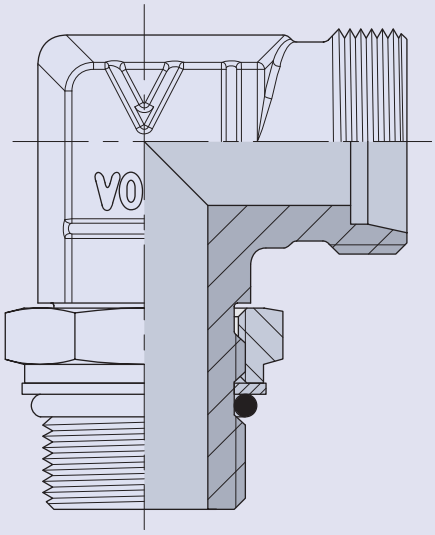
Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	Pressure	dy	l2	SW1	SW3	Nm -5 %	kg/100 ca.	Order-No.	Designation
L 6	PN 500	2.5	36	12	14	20	3.7	1191402058	24-SWOS-L6
L 8	PN 500	4	36	14	17	30	5.0	1191412058	24-SWOS-L8
L 10	PN 500	6	36	17	19	40	6.6	1191422058	24-SWOS-L10
L 12	PN 400	8	36	19	22	50	8.7	1191862058	24-SWOS-L12
L 15	PN 400	10	36	24	27	70	13.2	1191432058	24-SWOS-L15
L 18	PN 400	13	36	27	32	90	16.8	1191882058	24-SWOS-L18
L 22	PN 250	17	40	32	36	120	23.0	1191872058	24-SWOS-L22
L 28	PN 250	22	40	41	41	160	29.7	1191892058	24-SWOS-L28
L 35	PN 250	28	50	46	50	250	49.0	1191902058	24-SWOS-L35
L 42	PN 250	34	60	55	60	380	85.0	1191912058	24-SWOS-L42
S 6	PN 800	2.5	36	14	17	25	5.3	1191442058	24-SWOS-S6
S 8	PN 800	4	36	17	19	40	7.0	1191492058	24-SWOS-S8
S 10	PN 800	6	36	19	22	50	8.7	1191522058	24-SWOS-S10
S 12	PN 630	8	36	22	24	60	10.4	1191482058	24-SWOS-S12
S 14	PN 630	9	40	24	27	75	14.7	1191532058	24-SWOS-S14
S 16	PN 630	11	40	27	30	85	17.8	1191542058	24-SWOS-S16
S 20	PN 420	14	46	32	36	140	28.0	1191512058	24-SWOS-S20
S 25	PN 420	18	50	41	46	190	50.3	1191502058	24-SWOS-S25
S 30	PN 420	23	56	46	50	270	65.6	1191342058	24-SWOS-S30
S 38	PN 420	30	60	55	60	400	93.6	1191692058	24-SWOS-S38

Example for comp. :
DA06LOMD

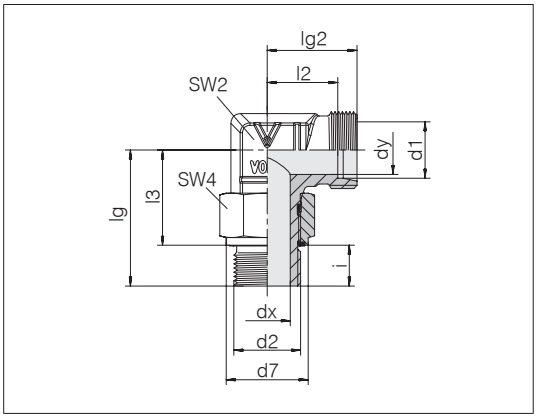
Adjustable stud connectors with locknut



Adjustable locknut elbows

Male thread: Metric fine thread, cylindrical
Threaded stud: ISO 9974-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



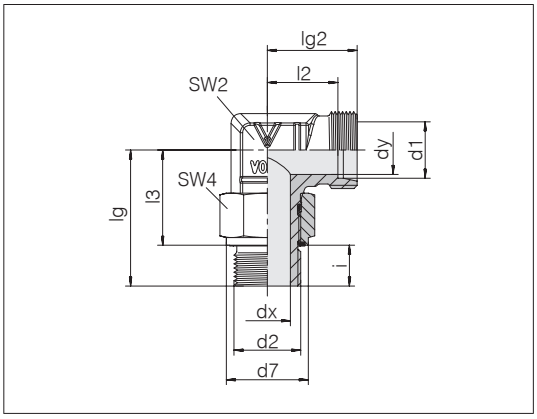
Series Tube OD d1	d2	Pressure	d7	dx	dy	lg	lg2	l2	l3	SW2	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	M 10 x 1	PN 315	13.9	4.5	4	29.5	21	14	21.5	14	14	8	18	4.4	1113002081	24-SDAE-L6-M10E	1)
L 6	M 12 x 1.5	PN 315	16.9	6	4	36.5	21	14	24.5	14	17	12	35	5.8	1113012081	24-SDAE-L6-M12E	
L 6	M 14 x 1.5	PN 315	18.9	7	4	39	23	16	27	17	19	12	55	8.1	1113022081	24-SDAE-L6-M14E	
L 8	M 12 x 1.5	PN 315	16.9	6	6	36.5	23	16	24.5	14	17	12	35	6.1	1113052081	24-SDAE-L8-M12E	1)
L 10	M 14 x 1.5	PN 315	18.9	7.5	8	39	24	17	27	17	19	12	55	7.4	1113102081	24-SDAE-L10-M14E	1)
L 10	M 18 x 1.5	PN 315	23.9	11	8	42	28	21	30	22	19	11.9	90	13.6	1113112081	24-SDAE-L10-M18E	
L 12	M 16 x 1.5	PN 315	21.9	9	10	40	24	17	28	17	22	12	80	9.6	1113152081	24-SDAE-L12-M16E	1)
L 12	M 18 x 1.5	PN 315	23.9	11	10	32	28	21	30	22	24	12	90	14.6	1113162081	24-SDAE-L12-M18E	
L 15	M 18 x 1.5	PN 315	23.9	11	12	32	28	21	30	22	24	12	90	13.7	1113202081	24-SDAE-L15-M18E	1)
L 15	M 22 x 1.5	PN 315	26.9	14	12	46	29	22	32	22	27	14	130	16.4	1113212081	24-SDAE-L15-M22E	
L 18	M 18 x 1.5	PN 315	23.9	11	15	46	31	23.5	34	24	24	12	90	16.1	1113262081	24-SDAE-L18-M18E	
L 18	M 22 x 1.5	PN 315	26.9	14	15	49.5	33	25.5	35.5	27	27	14	130	24.6	1113252081	24-SDAE-L18-M22E	1)
L 18	M 26 x 1.5	PN 160	31.9	18	15	53	33	25.5	37	27	32	16	180	27.0	1113272081	24-SDAE-L18-M26E	
L 22	M 26 x 1.5	PN 160	31.9	18	19	53	35	27.5	37	27	32	16	180	24.2	1113312081	24-SDAE-L22-M26E	1)
L 22	M 27 x 2	PN 160	31.9	18	19	56	35	27.5	40	27	32	16	190	27.9	1113302081	24-SDAE-L22-M27E	
L 28	M 26 x 1.5	PN 160	31.9	18	24	59	38	30.5	43	36	32	16	180	36.3	1113362081	24-SDAE-L28-M26E	
L 28	M 33 x 2	PN 160	40.9	23	24	68.5	40	32.5	50.5	41	41	18	250	65.9	1113352081	24-SDAE-L28-M33E	1)
L 35	M 42 x 2	PN 160	49.9	30	30	75.5	46.5	36	55.5	50	50	20	350	103.9	1113402081	24-SDAE-L35-M42E	1)
L 42	M 48 x 2	PN 160	54.9	36	36	79.5	51	40	57.5	50	55	22	500	106.4	1113452081	24-SDAE-L42-M48E	1)
S 6	M 12 x 1.5	PN 315	16.9	4	4	36.5	23.5	16.5	24.5	14	17	12	35	6.9	1113502081	24-SDAE-S6-M12E	1)
S 8	M 14 x 1.5	PN 315	18.9	6	5	39	25	18	27	17	19	12	55	9.2	1113552081	24-SDAE-S8-M14E	1)
S 10	M 12 x 1.5	PN 315	16.9	6	7	38.5	25	17.5	26.5	17	17	12	35	7.9	1113612081	24-SDAE-S10-M12E	
S 10	M 16 x 1.5	PN 315	21.9	7	7	40	25	17.5	28	17	22	12	80	12.2	1113602081	24-SDAE-S10-M16E	1)
S 12	M 18 x 1.5	PN 315	23.9	9	8	42	29	21.5	30	22	24	12	90	17.1	1113652081	24-SDAE-S12-M18E	1)
S 16	M 22 x 1.5	PN 315	26.9	12	12	49.5	35	26.5	35.5	27	27	14	130	27.4	1113752081	24-SDAE-S16-M22E	1)
S 20	M 27 x 2	PN 250	31.9	15	16	56	38	27.5	40	27	32	16	220	34.3	1113802081	24-SDAE-S20-M27E	1)
S 25	M 33 x 2	PN 160	40.9	20	20	68.5	44	32	50.5	41	41	18	250	76.9	1113852081	24-SDAE-S25-M33E	1)
S 30	M 42 x 2	PN 160	49.9	26	25	75.5	50	36.5	55.5	50	50	20	350	121.4	1113902081	24-SDAE-S30-M42E	1)
S 38	M 48 x 2	PN 160	54.9	32	32	79.5	57	41	57.5	50	55	22	500	133.1	1113952081	24-SDAE-S38-M48E	1)

1) Standard size

Adjustable locknut elbows

Male thread: BSPP thread, cylindrical
Threaded stud: ISO 1179-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



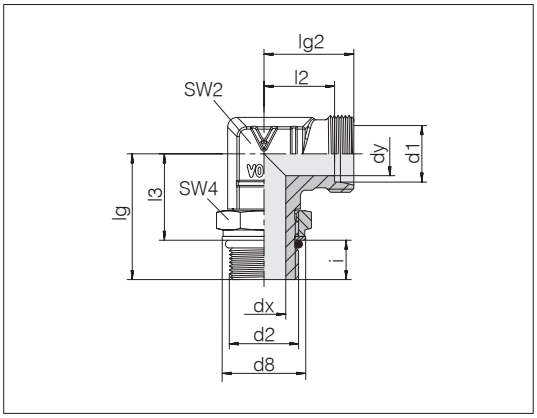
Series Tube OD d1	d2	Pressure	d7	dx	dy	lg	lg2	l2	l3	SW2	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	G 1/8 A	PN 315	13.9	4	4	29	21	14	21	14	14	8	20	4.1	1144002081	24-SDAE-L6-G1/8E	1)
L 6	G 1/4 A	PN 315	18.9	7	4	38	23	16	26	17	19	12	50	7.8	1144012081	24-SDAE-L6-G1/4E	
L 8	G 1/4 A	PN 315	18.9	7	6	38	23	16	26	17	19	12	50	7.9	1144052081	24-SDAE-L8-G1/4E	1)
L 8	G 3/8 A	PN 315	21.9	9	6	41	25	18	29	19	22	12	80	11.0	1144062081	24-SDAE-L8-G3/8E	
L 10	G 1/4 A	PN 315	18.9	7	8	38	24	17	26	17	19	12	50	7.9	1144102081	24-SDAE-L10-G1/4E	1)
L 12	G 1/4 A	PN 315	18.9	7	10	48	24	17	26	17	19	12	50	7.6	1144162081	24-SDAE-L12-G1/4E	
L 12	G 3/8 A	PN 315	21.9	10	10	41	26	19	29	19	22	12	80	11.2	1144152081	24-SDAE-L12-G3/8E	1)
L 12	G 1/2 A	PN 250	26.9	12.5	10	44	28	21	30	22	27	14	105	15.4	1144172081	24-SDAE-L12-G1/2E	
L 15	G 1/2 A	PN 250	26.9	12.5	12	44	28	21	30	22	27	14	105	15.3	1144202081	24-SDAE-L15-G1/2E	1)
L 15	G 3/4 A	PN 160	32.9	15.5	12	55	33	26	39.1	27	36	15.9	190	35.9	7006947600	24-SDAE-L15-G3/4E	
L 18	G 1/2 A	PN 250	26.9	12.5	15	51	33	25.5	37	27	27	14	105	25.9	1144252081	24-SDAE-L18-G1/2E	1)
L 18	G 3/4 A	PN 160	32.9	15.5	15	55	33	25.5	39	27	36	16	190	32.6	1144262081	24-SDAE-L18-G3/4E	
L 22	G 1/2 A	PN 160	26.9	12.5	19	51	35	27.5	37	27	27	14	105	24.5	1144312081	24-SDAE-L22-G1/2E	
L 22	G 3/4 A	PN 160	35.9	15.5	19	55	35	27.5	39	27	36	16	190	33.6	1144302081	24-SDAE-L22-G3/4E	1)
L 28	G 3/4 A	PN 160	35.9	15.5	24	60.5	38	30.5	44.5	36	36	16	190	43.7	1144362081	24-SDAE-L28-G3/4E	
L 28	G 1 A	PN 160	40.9	21.5	24	68.5	40	32.5	50.5	41	41	18	250	70.5	1144352081	24-SDAE-L28-G1E	1)
L 35	G 1 1/4 A	PN 160	49.9	27.5	30	76	46.5	36	56	50	50	20	400	111.5	1144402081	24-SDAE-L35-G11/4E	1)
L 42	G 1 1/2 A	PN 160	54.9	33	36	79.5	51	40	57.5	50	55	22	500	115.4	1144452081	24-SDAE-L42-G11/2E	1)
S 6	G 1/4 A	PN 315	18.9	6	4	38	25	18	26	17	19	12	50	8.7	1144502081	24-SDAE-S6-G1/4E	1)
S 8	G 1/4 A	PN 315	18.9	7	5	38	25	18	26	17	19	12	50	8.5	1144552081	24-SDAE-S8-G1/4E	1)
S 10	G 3/8 A	PN 315	21.9	10	7	41	27	19.5	29	19	22	12	80	12.1	1144602081	24-SDAE-S10-G3/8E	1)
S 12	G 3/8 A	PN 315	21.9	10	8	41	29	21.5	29	19	22	12	80	12.1	1144652081	24-SDAE-S12-G3/8E	1)
S 14	G 1/2 A	PN 315	26.9	10	10	44	30	22	30	24	27	14	110	19.3	1144702081	24-SDAE-S14-G1/2E	1)
S 16	G 1/2 A	PN 315	26.9	10	12	51	35	26.5	37	27	27	14	110	27.3	1144752081	24-SDAE-S16-G1/2E	1)
S 16	G 3/4 A	PN 250	35.9	15.5	12	55	35	26.5	39	27	36	16	220	35.3	1144762081	24-SDAE-S16-G3/4E	
S 20	G 3/4 A	PN 250	35.9	15.5	16	55	38	27.5	39	27	36	16	220	36.2	1144802081	24-SDAE-S20-G3/4E	1)
S 25	G 3/4 A	PN 250	35.9	15.5	20	60.5	42	30	44.5	36	36	16	220	46.5	1144862081	24-SDAE-S25-G3/4E	
S 25	G 1 A	PN 250	40.9	21.5	20	68.5	44	32	50.5	41	41	18	280	75.0	1144852081	24-SDAE-S25-G1E	1)
S 30	G 1 1/4 A	PN 160	49.9	27.5	25	76	50	36.5	56	50	50	20	400	118.7	1144902081	24-SDAE-S30-G11/4E	1)
S 38	G 1 1/2 A	PN 160	54.9	33	32	79.5	57	41	57.5	50	55	22	500	129.5	1144952081	24-SDAE-S38-G11/2E	1)

1) Standard size

Adjustable locknut elbows

Male thread: Metric fine thread, cylindrical
Threaded stud: ISO 6149-2/3
Sealing type: O-Ring (Form F)
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d8	dx	dy	lg	lg2	l2	l3	SW2	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation	
L 6	M 10 x 1	PN 315	14.5	4.5	4	27	19	12	20	12	14	7	15	2.6	0147002081	24-SDAE-L6-M10F	1)
L 8	M 12 x 1.5	PN 315	17.5	6	6	32	21	14	22	12	17	10	25	3.7	0147052081	24-SDAE-L8-M12F	1)
L 10	M 12 x 1.5	PN 315	17.5	6	8	35	22	15	25	14	17	10	25	4.6	0147112081	24-SDAE-L10-M12F	
L 10	M 14 x 1.5	PN 315	19.5	7.5	8	35	22	15	25	14	19	10	35	4.8	0147102081	24-SDAE-L10-M14F	1)
L 10	M 18 x 1.5	PN 315	24.5	11	8	41	24	17	30	19	24	11	45	9.7	0147122081	24-SDAE-L10-M18F	
L 12	M 12 x 1.5	PN 315	17.5	6	10	36	24.5	17.5	26	17	17	10	25	5.4	0147172081	24-SDAE-L12-M12F	
L 12	M 16 x 1.5	PN 315	22.5	9	10	36	24	17	26	17	22	10	40	6.5	0147152081	24-SDAE-L12-M16F	1)
L 12	M 18 x 1.5	PN 315	24.5	11	26	41	26	19	30	19	24	11	45	10.0	0147182081	24-SDAE-L12-M18F	
L 15	M 18 x 1.5	PN 315	24.5	11	12	41	28	21	30	19	24	11	45	10.4	0147202081	24-SDAE-L15-M18F	1)
L 18	M 22 x 1.5	PN 315	27.5	14	15	45	31	23.5	33	24	27	12	60	15.7	0147252081	24-SDAE-L18-M22F	1)
L 22	M 27 x 2	PN 160	32.5	18	19	49	35	27.5	35	27	32	14	100	20.7	0147302081	24-SDAE-L22-M27F	1)
L 28	M 33 x 2	PN 160	41.5	23	24	52	38	30.5	38	36	41	14	160	34.5	0147352081	24-SDAE-L28-M33F	1)
L 35	M 42 x 2	PN 160	50.5	30	30	62	45	34.5	48	41	50	14	210	52.7	0147402081	24-SDAE-L35-M42F	1)
L 42	M 48 x 2	PN 160	55.5	36	36	65	51	40	49	50	55	16	260	81.3	0147452081	24-SDAE-L42-M48F	1)
S 6	M 12 x 1.5	PN 400	17.5	4	4	32	23	16	22	12	17	10	35	4.6	0147502081	24-SDAE-S6-M12F	1)
S 8	M 14 x 1.5	PN 400	19.5	6	5	36	24	17	26	14	19	10	45	6.4	0147552081	24-SDAE-S8-M14F	1)
S 10	M 16 x 1.5	PN 400	22.5	7	7	38	25	17.5	27	17	22	11	55	8.6	0147602081	24-SDAE-S10-M16F	1)
S 12	M 18 x 1.5	PN 400	24.5	9	8	43	29	21.5	31	17	24	12	70	11.6	0147652081	24-SDAE-S12-M18F	1)
S 16	M 22 x 1.5	PN 400	27.5	12	12	49	33	24.5	35	24	27	14	100	17.9	0147752081	24-SDAE-S16-M22F	1)
S 20	M 27 x 2	PN 400	32.5	15	16	55	37	26.5	39	27	32	16	170	28.7	0147802081	24-SDAE-S20-M27F	1)
S 25	M 33 x 2	PN 315	41.5	20	20	60	42	30	44	36	41	16	310	48.0	0147852081	24-SDAE-S25-M33F	1)
S 30	M 42 x 2	PN 250	50.5	26	25	68	49	35.5	51	41	50	17	330	76.5	0147902081	24-SDAE-S30-M42F	1)
S 38	M 48 x 2	PN 200	55.5	32	32	73	57	41	54	50	55	19	420	114.5	0147952081	24-SDAE-S38-M48F	1)

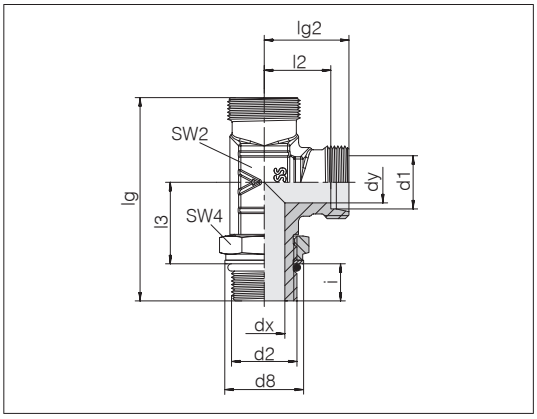
1) Standard size

Example for comp. :
WEE06LMOROMD

Adjustable locknut run tees

Male thread: Metric fine thread, cylindrical
Threaded stud: ISO 6149-2/3
Sealing type: O-Ring (Form F)
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1



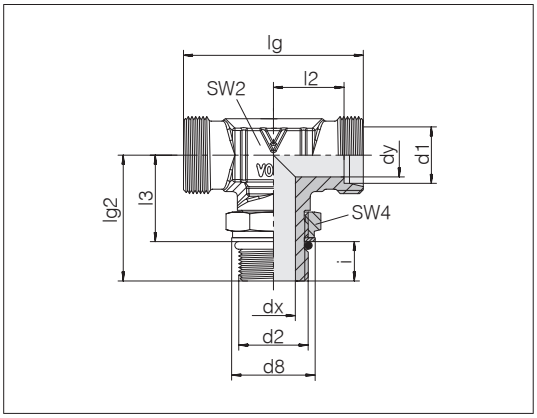
Series Tube OD d1	d2	Pressure	d8	dx	dy	lg	lg2	l2	l3	SW2	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation
L 6	M 10 x 1	PN 315	14.5	4.5	4	48	21	14	20	14	14	7	15	4.8	1146002081	24-SDAL-L6-M10F
L 8	M 12 x 1.5	PN 315	17.5	6	6	55	23	16	22	17	17	10	25	6.9	1146052081	24-SDAL-L8-M12F
L 10	M 14 x 1.5	PN 315	19.5	7.5	8	59	24	17	25	17	19	10	35	7.0	1146102081	24-SDAL-L10-M14F
L 12	M 16 x 1.5	PN 315	22.5	9	10	62	26	19	26	19	22	10	40	10.6	1146152081	24-SDAL-L12-M16F
L 15	M 18 x 1.5	PN 315	24.5	11	12	69	28	21	30	19	24	11	45	12.2	1146202081	24-SDAL-L15-M18F
L 18	M 22 x 1.5	PN 315	27.5	14	15	79	34	26.5	33	27	27	12	60	25.4	1146252081	24-SDAL-L18-M22F
L 22	M 27 x 2	PN 160	32.5	18	19	84	35	27.5	35	27	32	14	100	28.2	1146302081	24-SDAL-L22-M27F
L 28	M 33 x 2	PN 160	41.5	23	24	90	38	30.5	38	36	41	14	160	46.8	1146352081	24-SDAL-L28-M33F
L 35	M 42 x 2	PN 160	50.5	30	30	107	45	34.5	48	41	50	14	210	90.1	1146402081	24-SDAL-L35-M42F
L 42	M 48 x 2	PN 160	55.5	36	36	116	51	40	49	50	55	16	260	102.8	1146452081	24-SDAL-L42-M48F
S 6	M 12 x 1.5	PN 400	17.5	4	4	55	23	16	22	17	17	10	35	7.5	1146502081	24-SDAL-S6-M12F
S 8	M 14 x 1.5	PN 400	19.5	6	5	60	24	17	26	17	19	10	45	8.9	1146552081	24-SDAL-S8-M14F
S 10	M 16 x 1.5	PN 400	22.5	7	7	65	27	19.5	27	19	22	11	55	13.4	1146602081	24-SDAL-S10-M16F
S 12	M 18 x 1.5	PN 400	24.5	9	8	75	32	24.5	31	27	24	12	70	26.7	1146652081	24-SDAL-S12-M18F
S 16	M 22 x 1.5	PN 400	27.5	12	12	82	33	24.5	35	22	27	14	100	30.2	1146752081	24-SDAL-S16-M22F
S 20	M 27 x 2	PN 400	32.5	15	16	92	37	26.5	39	27	32	16	170	37.7	1146802081	24-SDAL-S20-M27F
S 25	M 33 x 2	PN 315	41.5	20	20	102	42	30	44	36	41	16	310	66.7	1146852081	24-SDAL-S25-M33F
S 30	M 42 x 2	PN 250	50.5	26	25	117	49	35.5	51	41	50	17	330	116.4	1146902081	24-SDAL-S30-M42F
S 38	M 48 x 2	PN 200	55.5	32	32	130	57	41	54	50	55	19	420	151.4	1146952081	24-SDAL-S38-M48F

Example for comp. :
LEE06LMOROMD

Adjustable locknut branch tees

Male thread: Metric fine thread, cylindrical
Threaded stud: ISO 6149-2/3
Sealing type: O-Ring (Form F)
Sealing material: Standard NBR

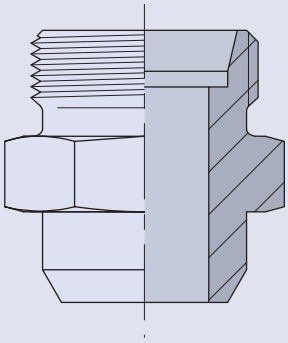
Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	d8	dx	dy	lg	lg2	l2	l3	SW2	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation
L 6	M 10 x 1	PN 315	14.5	4.5	4	44	27	15	20	14	14	7	15	4.7	1147002081	24-SDAT-L6-M10F
L 8	M 12 x 1.5	PN 315	17.5	6	6	44	32	15	22	14	17	10	25	5.5	1147052081	24-SDAT-L8-M12F
L 10	M 14 x 1.5	PN 315	19.5	7.5	8	49	35	17.5	25	17	19	10	35	7.3	1147102081	24-SDAT-L10-M14F
L 12	M 16 x 1.5	PN 315	22.5	9	10	54	36	20	26	19	22	10	40	10.8	1147152081	24-SDAT-L12-M16F
L 15	M 18 x 1.5	PN 315	24.5	11	12	56	41	21	30	22	24	11	45	15.4	1147202081	24-SDAT-L15-M18F
L 18	M 22 x 1.5	PN 315	27.5	14	15	66	45	25.5	33	27	27	12	60	81.3	1147252081	24-SDAT-L18-M22F
L 22	M 27 x 2	PN 160	32.5	18	19	70	49	27.5	35	27	32	14	100	28.2	1147302081	24-SDAT-L22-M27F
L 28	M 33 x 2	PN 160	41.5	23	24	76	52	30.5	38	36	41	14	160	47.3	1147352081	24-SDAT-L28-M33F
L 35	M 42 x 2	PN 160	50.5	30	30	90	62	34.5	48	41	50	14	210	90.1	1147402081	24-SDAT-L35-M42F
L 42	M 48 x 2	PN 160	55.5	36	36	102	65	40	49	50	55	16	260	102.8	1147452081	24-SDAT-L42-M48F
S 6	M 12 x 1.5	PN 400	17.5	4	4	44	32	15	22	17	17	10	35	7.3	1147502081	24-SDAT-S6-M12F
S 8	M 14 x 1.5	PN 400	19.5	6	5	54	36	20	26	19	19	10	45	12.4	1147552081	24-SDAT-S8-M14F
S 10	M 16 x 1.5	PN 400	22.5	7	7	55	38	20	27	19	22	11	55	13.5	1147602081	24-SDAT-S10-M16F
S 12	M 18 x 1.5	PN 400	24.5	9	8	58	43	21.5	31	22	24	12	70	18.7	1147652081	24-SDAT-S12-M18F
S 16	M 22 x 1.5	PN 400	27.5	12	12	66	49	24.5	35	22	27	14	100	21.8	1147752081	24-SDAT-S16-M22F
S 20	M 27 x 2	PN 400	32.5	15	16	74	55	26.5	39	27	32	16	170	37.7	1147802081	24-SDAT-S20-M27F
S 25	M 33 x 2	PN 315	41.5	20	20	84	60	30	44	36	41	16	310	66.8	1147852081	24-SDAT-S25-M33F
S 30	M 42 x 2	PN 250	50.5	26	25	98	68	35.5	51	41	50	17	330	116.8	1147902081	24-SDAT-S30-M42F
S 38	M 48 x 2	PN 200	55.5	32	32	114	73	41	54	50	55	19	420	151.5	1147952081	24-SDAT-S38-M48F

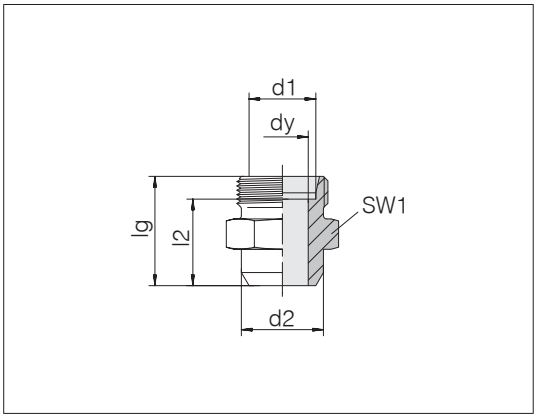
Example for comp. :
TEE06LMOROMD

Weld connectors



Weld connectors

Tube coupling: 24° in acc. with ISO 8434-1

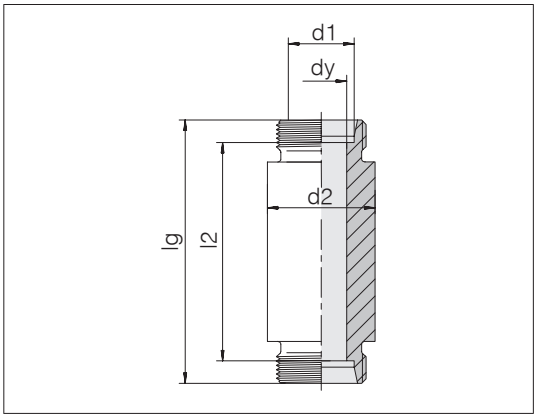


Series Tube OD d1	Pressure	d2	dy	lg	l2	SW1	kg/100 ca.	Order-No.	Designation
L 6	PN 315	10	4	21	14	12	1.0	0739000000	24-WDS-L6-C00
L 8	PN 315	12	6	23	16	14	1.5	0739050000	24-WDS-L8-C00
L 10	PN 315	14	8	25	18	17	2.1	0739100000	24-WDS-L10-C00
L 12	PN 315	16	10	25	18	19	2.6	0739150000	24-WDS-L12-C00
L 15	PN 315	19	12	29	22	22	4.3	0739200000	24-WDS-L15-C00
L 18	PN 315	22	15	31	23.5	27	6.6	0739250000	24-WDS-L18-C00
L 22	PN 160	27	19	36	28.5	32	9.7	0739300000	24-WDS-L22-C00
L 28	PN 160	32	24	38	30.5	41	15.9	0739350000	24-WDS-L28-C00
L 35	PN 160	40	30	43	32.5	46	22.8	0739400000	24-WDS-L35-C00
L 42	PN 160	46	36	46	35	55	32.8	0739450000	24-WDS-L42-C00
S 6	PN 630	11	4	26	19	14	2.1	0739500000	24-WDS-S6-C00
S 8	PN 630	13	5	28	21	17	3.0	0739550000	24-WDS-S8-C00
S 10	PN 630	15	7	30	22.5	19	4.0	0739600000	24-WDS-S10-C00
S 12	PN 630	17	8	32	24.5	22	5.5	0739650000	24-WDS-S12-C00
S 14	PN 630	19	10	35	27	24	7.0	0739700000	24-WDS-S14-C00
S 16	PN 400	21	12	35	26.5	27	8.3	0739750000	24-WDS-S16-C00
S 20	PN 400	26	16	40	29.5	32	12.9	0739800000	24-WDS-S20-C00
S 25	PN 400	31	20	44	32	41	22.2	0739850000	24-WDS-S25-C00
S 30	PN 400	36	25	49	35.5	46	29.5	0739900000	24-WDS-S30-C00
S 38	PN 315	44	32	54	38	55	45.5	0739950000	24-WDS-S38-C00

Example for comp. :
AS06LX
ISO 8434-1-WDS-L6-St

Weld bulkhead connectors

Tube coupling: 24° in acc. with ISO 8434-1



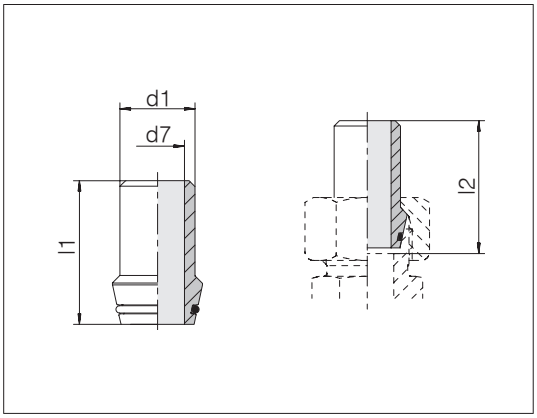
Series Tube OD d1	Pressure	d2	dy	lg	l2	kg/100 ca.	Order-No.	Designation
L 6	PN 315	18	4	70	56	10.3	0741000000	24-WDBHS-L6-C00
L 8	PN 315	20	6	70	56	12.1	0741050000	24-WDBHS-L8-C00
L 10	PN 315	22	8	72	58	14.3	0741100000	24-WDBHS-L10-C00
L 12	PN 315	25	10	72	58	17.7	0741150000	24-WDBHS-L12-C00
L 15	PN 315	28	12	84	70	25.9	0741200000	24-WDBHS-L15-C00
L 18	PN 315	32	15	84	69	33.4	0741250000	24-WDBHS-L18-C00
L 22	PN 160	36	19	88	73	40.0	0741300000	24-WDBHS-L22-C00
L 28	PN 160	40	24	88	73	44.5	0741350000	24-WDBHS-L28-C00
L 35	PN 160	50	30	92	71	72.3	0741400000	24-WDBHS-L35-C00
L 42	PN 160	60	36	92	70	100.5	0741450000	24-WDBHS-L42-C00
S 6	PN 630	20	4	74	60	13.5	0741500000	24-WDBHS-S6-C00
S 8	PN 630	22	5	74	60	16.2	0741550000	24-WDBHS-S8-C00
S 10	PN 630	25	7	74	59	20.0	0741600000	24-WDBHS-S10-C00
S 12	PN 630	28	8	74	59	25.0	0741650000	24-WDBHS-S12-C00
S 14	PN 630	30	10	88	72	33.7	0741700000	24-WDBHS-S14-C00
S 16	PN 400	35	12	88	71	44.4	0741750000	24-WDBHS-S16-C00
S 20	PN 400	38	16	92	71	51.5	0741800000	24-WDBHS-S20-C00
S 25	PN 400	45	20	96	72	72.3	0741850000	24-WDBHS-S25-C00
S 30	PN 400	50	25	100	73	87.3	0741900000	24-WDBHS-S30-C00
S 38	PN 315	60	32	104	72	125.1	0741950000	24-WDBHS-S38-C00

Example for comp. :
ESV06LX
ISO 8434-1-WDBHS-L6-St

Welding nipples with O-ring seal

With taper and O-ring
fit in bore type
W DIN 3861/ISO 8434-1

Standard material of O-rings is NBR



Series Tube OD d1	for tube	Pressure	d7	l1	l2	kg/100 ca.	O-ring dimensions	Order-No.	Designation
L/S 6	6 x 1.5	PN 500	3	31	31.5	0.7	4 x 1.5	0070519967	24-WDNPSO-6x1,5-C10
L/S 8	8 x 1.5	PN 400	4.5	31	31.5	1.1	6 x 1.5	0070569967	24-WDNPSO-8x1,5-C10
L/S 8	8 x 2	PN 500	4	31	31.5	1.1	6 x 1.5	0070579967	24-WDNPSO-8x2-C10
L/S 10	10 x 1	PN 250	6.5	32.5	33.5	1.3	7.5 x 1.5	0070609967	24-WDNPSO-10x1-C10
L/S 10	10 x 1.5	PN 315	6.5	32.5	33.5	1.5	7.5 x 1.5	0070619967	24-WDNPSO-10x1,5-C10
L/S 10	10 x 2	PN 400	6	32.5	33.5	1.6	7.5 x 1.5	0070629967	24-WDNPSO-10x2-C10
L/S 10	10 x 2.5	PN 500	5	32.5	33.5	1.8	7.5 x 1.5	0070639967	24-WDNPSO-10x2,5-C10
L/S 12	12 x 1.5	PN 315	8	32.5	33.5	1.9	9 x 1.5	0070669967	24-WDNPSO-12x1,5-C10
L/S 12	12 x 2	PN 400	8	32.5	33.5	1.9	9 x 1.5	0070679967	24-WDNPSO-12x2-C10
L/S 12	12 x 2.5	PN 400	7	32.5	33.5	2.2	9 x 1.5	0070689967	24-WDNPSO-12x2,5-C10
L 15	15 x 2	PN 315	10	34.5	34.5	2.4	12 x 2	0069009967	24-WDNPSO-15x2-C10
L 15	15 x 2.5	PN 315	10	34.5	34.5	2.9	12 x 2	0069019967	24-WDNPSO-15x2,5-C10
L 18	18 x 2.5	PN 315	13	36	37	3.9	15 x 2	0069029967	24-WDNPSO-18x2,5-C10
L 22	22 x 2.5	PN 160	17	38.5	39.5	5.2	20 x 2	0069079967	24-WDNPSO-22x2,5-C10
L 28	28 x 2.5	PN 160	23	41.5	42.5	7.3	26 x 2	0069039967	24-WDNPSO-28x2,5-C10
L 28	28 x 3	PN 160	22	41.5	42.5	8.4	26 x 2	0070039967	24-WDNPSO-28x3-C10
L 35	35 x 3.5	PN 160	28	47.5	49.5	14.4	32 x 2.5	0069049967	24-WDNPSO-35x3,5-C10
L 35	35 x 4	PN 160	27	47.5	49.5	16.0	32 x 2.5	0069059967	24-WDNPSO-35x4-C10
L 42	42 x 3	PN 160	35	47.5	50	15.4	38 x 2.5	0070009967	24-WDNPSO-42x3-C10
L 42	42 x 4	PN 160	34	47.5	50	19.5	38 x 2.5	0070049967	24-WDNPSO-42x4-C10

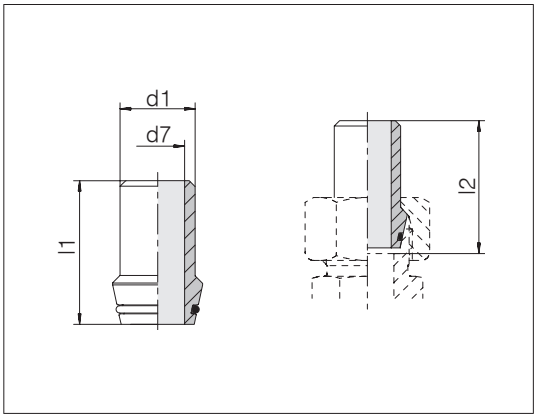
Example for comp. :
SKA06X1.5

Continued on following page

Welding nipples with O-ring seal

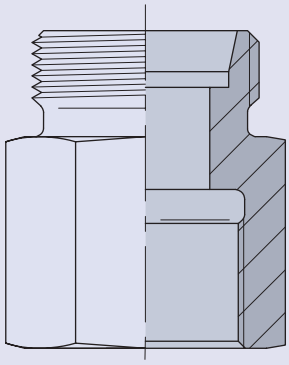
With taper and O-ring
fit in bore type
W DIN 3861/ISO 8434-1

Standard material of O-rings is NBR



Series Tube OD d1	for tube	Pressure	d7	l1	l2	kg/100 ca.	O-ring dimensions	Order-No.	Designation
S 14	14 x 2	PN 315	9	38.5	39.5	3.0	10 x 2	0070729967	24-WDNPSO-14x2-C10
S 14	14 x 2.5	PN 400	9	38.5	39.5	3.1	10 x 2	0070739967	24-WDNPSO-14x2,5-C10
S 14	14 x 3	PN 400	8	38.5	39.5	3.5	10 x 2	0070749967	24-WDNPSO-14x3-C10
S 16	16 x 1.5	PN 250	11.5	39	41	3.1	12 x 2	0070769967	24-WDNPSO-16x1,5-C10
S 16	16 x 2	PN 315	11	39	41	3.6	12 x 2	0070779967	24-WDNPSO-16x2-C10
S 16	16 x 2.5	PN 400	11	39	41	3.6	12 x 2	0070789967	24-WDNPSO-16x2,5-C10
S 16	16 x 3	PN 400	10	39	41	4.4	12 x 2	0070799967	24-WDNPSO-16x3-C10
S 20	20 x 2	PN 250	14.5	45	47	6.0	16.3 x 2.4	0070819967	24-WDNPSO-20x2-C10
S 20	20 x 2.5	PN 315	14	45	47	6.4	16.3 x 2.4	0070829967	24-WDNPSO-20x2,5-C10
S 20	20 x 3	PN 400	14	45	47	6.4	16.3 x 2.4	0070839967	24-WDNPSO-20x3-C10
S 20	20 x 4	PN 400	12	45	47	7.8	16.3 x 2.4	0070849967	24-WDNPSO-20x4-C10
S 25	25 x 2.5	PN 250	18	50	53.5	10.1	20.3 x 2.4	0070869967	24-WDNPSO-25x2,5-C10
S 25	25 x 3	PN 315	18	50	53.5	10.2	20.3 x 2.4	0070879967	24-WDNPSO-25x3-C10
S 25	25 x 3.5	PN 315	18	50	53.5	10.0	20.3 x 2.4	0070909967	24-WDNPSO-25x3,5-C10
S 25	25 x 4	PN 400	17	50	53.5	11.2	20.3 x 2.4	0070889967	24-WDNPSO-25x4-C10
S 25	25 x 5	PN 400	15	50	53.5	13.1	20.3 x 2.4	0070899967	24-WDNPSO-25x5-C10
S 30	30 x 3	PN 250	23	52	57	10.8	25.3 x 2.4	0070929967	24-WDNPSO-30x3-C10
S 30	30 x 4	PN 315	22	52	57	14.5	25.3 x 2.4	0070939967	24-WDNPSO-30x4-C10
S 30	30 x 5	PN 400	20	52	57	17.1	25.3 x 2.4	0070949967	24-WDNPSO-30x5-C10
S 30	30 x 6	PN 400	18	52	57	19.5	25.3 x 2.4	0070959967	24-WDNPSO-30x6-C10
S 38	38 x 3	PN 160	30	56.5	64	16.4	33.3 x 2.4	0070509967	24-WDNPSO-38x3-C10
S 38	38 x 4	PN 315	30	56.5	64	20.6	33.3 x 2.4	0070979967	24-WDNPSO-38x4-C10
S 38	38 x 5	PN 315	28	56.5	64	24.5	33.3 x 2.4	0070989967	24-WDNPSO-38x5-C10
S 38	38 x 6	PN 315	26	56.5	64	28.1	33.3 x 2.4	0070999967	24-WDNPSO-38x6-C10
S 38	38 x 7	PN 315	24	56.5	64	31.6	33.3 x 2.4	0070969967	24-WDNPSO-38x7-C10

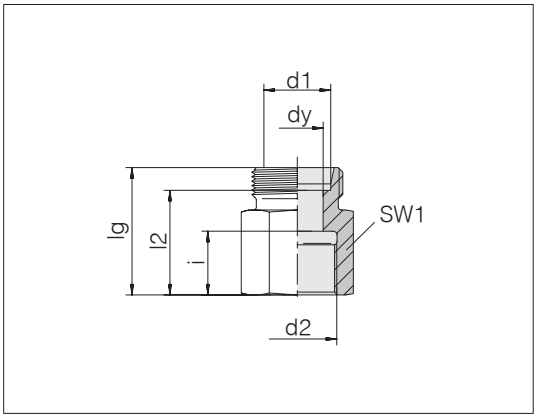
Female and gauge connectors



Female connectors

Female thread: metric fine thread, parallel
Threaded bores: ISO 9974-1

Tube coupling: 24° in acc. with ISO 8434-1



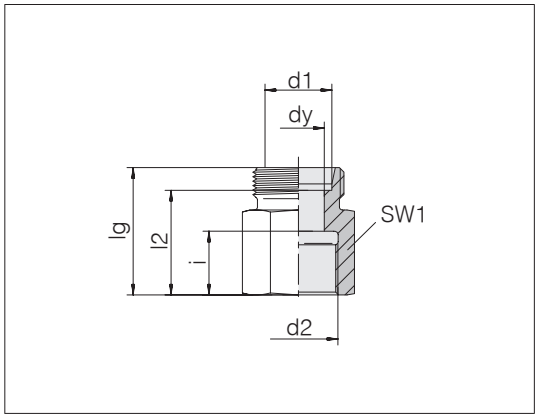
Series Tube OD d1	d2	Pressure	dy	lg	l2	SW1	i	kg/100 ca.	Order-No.	Designation
L 6	M 10 x 1	PN 315	4	26.5	19.5	14	12.5	1.8	0743002000	24-S-L6-IM10
L 8	M 10 x 1	PN 315	6	26.5	19.5	14	12.5	1.8	0743062000	24-S-L8-IM10
L 8	M 12 x 1.5	PN 315	6	31	24	17	17	3.1	0743052000	24-S-L8-IM12
L 10	M 14 x 1.5	PN 315	8	32	25	19	17	3.7	0743102000	24-S-L10-IM14
L 12	M 16 x 1.5	PN 315	10	33	26	22	17	5.1	0743152000	24-S-L12-IM16
L 15	M 18 x 1.5	PN 315	12	35	28	24	17	6.5	0743202000	24-S-L15-IM18
L 18	M 22 x 1.5	PN 315	15	37	29.5	30	19	10.9	0743252000	24-S-L18-IM22
L 22	M 26 x 1.5	PN 160	19	42	34.5	32	21	12.1	0743302000	24-S-L22-IM26
L 28	M 33 x 2	PN 160	24	45	37.5	41	24	20.8	0743352000	24-S-L28-IM33
L 35	M 42 x 2	PN 160	30	51	40.5	55	26	45.2	0743402000	24-S-L35-IM42
L 42	M 48 x 2	PN 160	36	53	42	60	28	51.5	0743452000	24-S-L42-IM48
S 6	M 10 x 1	PB 630	4	32.5	25.5	19	16.5	4.8	0743512000	24-S-S6-IM10
S 6	M 12 x 1.5	PB 630	4	33	26	17	17	3.0	0743502000	24-S-S6-IM12
S 8	M 14 x 1.5	PB 630	5	33	26	19	17	4.2	0743552000	24-S-S8-IM14
S 10	M 16 x 1.5	PB 630	7	34	26.5	22	17	5.8	0743602000	24-S-S10-IM16
S 12	M 18 x 1.5	PB 630	8	35	27.5	24	17	6.9	0743652000	24-S-S12-IM18
S 14	M 20 x 1.5	PB 630	10	39	31	27	19	9.6	0743702000	24-S-S14-IM20
S 16	M 22 x 1.5	PB 400	12	39	30.5	30	19	11.5	0743752000	24-S-S16-IM22
S 20	M 27 x 2	PB 400	16	45	34.5	36	22	18.6	0743802000	24-S-S20-IM27
S 25	M 33 x 2	PB 400	20	49	37	41	24	24.1	0743852000	24-S-S25-IM33
S 30	M 42 x 2	PB 400	25	55	41.5	55	26	49.3	0743902000	24-S-S30-IM42
S 38	M 48 x 2	PB 315	32	59	43	60	28	60.5	0743952000	24-S-S38-IM48

Example for comp. :
GAI06LMX

Female connectors

Female thread: BSPP thread, cylindrical
Threaded hole: ISO 1179-1

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	d2	Pressure	dy	lg	l2	SW1	i	kg/100 ca.	Order-No.	Designation
L 6	G 1/8	PN 315	4	26	19	14	12	1.8	0744002000	24-S-L6-IG1/8
L 6	G 1/4	PN 315	4	31	24	19	17	3.7	0744022000	24-S-L6-IG1/4
L 6	G 3/8	PN 315	4	33	26	24	17	6.4	0744032000	24-S-L6-IG3/8
L 8	G 1/4	PN 315	6	31	24	19	17	3.8	0744052000	24-S-L8-IG1/4
L 8	G 3/8	PN 315	6	32	25	24	17	6.2	0744072000	24-S-L8-IG3/8
L 8	G 1/2	PN 315	6	36	29	27	20	7.9	0744082000	24-S-L8-IG1/2
L 10	G 1/4	PN 315	8	32	25	19	17	3.9	0744102000	24-S-L10-IG1/4
L 10	G 3/8	PN 315	8	33	26	24	17	6.2	0744122000	24-S-L10-IG3/8
L 10	G 1/2	PN 315	8	37	30	27	20	8.1	0744132000	24-S-L10-IG1/2
L 12	G 1/4	PN 315	9	32	25	19	17	4.0	0744162000	24-S-L12-IG1/4
L 12	G 3/8	PN 315	10	33	26	24	17	6.2	0744152000	24-S-L12-IG3/8
L 12	G 1/2	PN 315	10	38	31	27	20	8.4	0744172000	24-S-L12-IG1/2
L 15	G 3/8	PN 315	12	34	27	24	17	6.8	0744212000	24-S-L15-IG3/8
L 15	G 1/2	PN 315	12	38	31	27	20	8.6	0744202000	24-S-L15-IG1/2
L 18	G 1/2	PN 315	15	38	30.5	27	20	8.9	0744252000	24-S-L18-IG1/2
L 22	G 3/4	PN 160	19	43	35.5	36	22	17.3	0744302000	24-S-L22-IG3/4
L 28	G 1	PN 160	24	45.5	38	41	24.5	20.9	0744352000	24-S-L28-IG1
L 35	G 1	PN 160	30.5	47.5	37	46	18	32.4	0744412000	24-S-L35-IG1
L 35	G 1 1/4	PN 160	30	51.5	41	55	26.5	45.7	0744402000	24-S-L35-IG11/4
L 42	G 1 1/2	PN 160	36	53.5	42.5	60	28.5	52.8	0744452000	24-S-L42-IG11/2

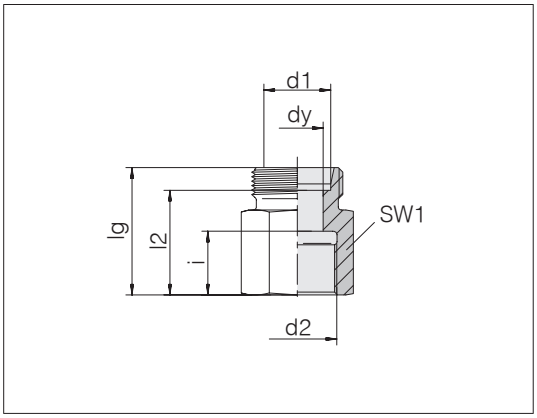
Example for comp. :
GAI06LRX

Continued on following page

Female connectors

Female thread: BSPP thread, cylindrical
Threaded hole: ISO 1179-1

Tube coupling: 24° in acc. with ISO 8434-1

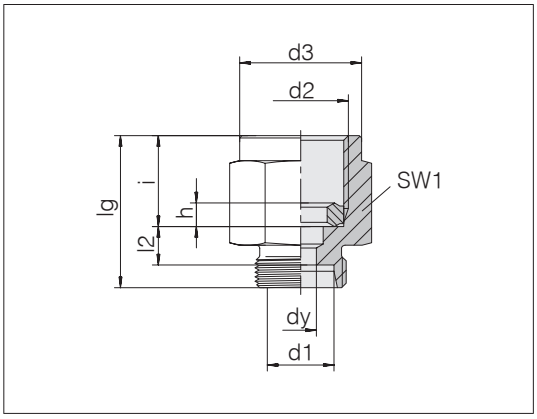


Series Tube OD d1	d2	Pressure	dy	lg	l2	SW1	i	kg/100 ca.	Order-No.	Designation
S 6	G 1/4	PB 630	4	33	26	19	17	4.2	0744502000	24-S-S6-IG1/4
S 8	G 1/4	PB 630	5	33	26	19	17	4.4	0744552000	24-S-S8-IG1/4
S 10	G 3/8	PB 630	7	34	26.5	24	17	6.9	0744602000	24-S-S10-IG3/8
S 12	G 1/4	PB 630	8	34	26.5	22	17	6.8	0744662000	24-S-S12-IG1/4
S 12	G 3/8	PB 630	8	34	26.5	24	17	7.1	0744652000	24-S-S12-IG3/8
S 12	G 1/2	PB 630	8	38	30.5	27	20	8.8	0744672000	24-S-S12-IG1/2
S 14	G 1/2	PB 630	10	40	32	27	20	9.4	0744702000	24-S-S14-IG1/2
S 16	G 1/2	PB 400	12	40	31.5	27	20	9.3	0744752000	24-S-S16-IG1/2
S 20	G 3/4	PB 400	16	45	34.5	36	22	18.9	0744802000	24-S-S20-IG3/4
S 25	G 1	PB 400	20	49.5	37.5	41	24.5	24.0	0744852000	24-S-S25-IG1
S 30	G 1 1/4	PB 400	25	55.5	42	55	26.5	50.3	0744902000	24-S-S30-IG11/4
S 38	G 1 1/2	PB 315	32	59.5	43.5	60	28.5	61.5	0744952000	24-S-S38-IG11/2

Gauge connectors

Female thread: BSPP thread, cylindrical
Sealing type: Seal-edge ring (Form B)

Tube coupling: 24° in acc. with ISO 8434-1



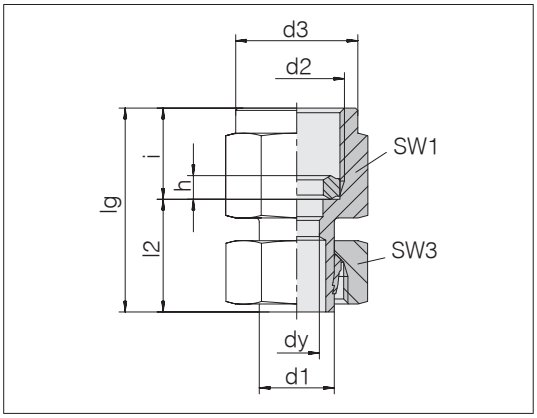
Series Tube OD d1	d2	Pressure	d3	dy	lg	l2	SW1	h	i	kg/100 ca.	Order-No.	Designation
L 6	G 1/4	PN 315	18.8	4	29	7.5	19	4.6	14.5	3.4	0142002081	24-PGS-L6-IG1/4B
L 8	G 1/4	PN 315	18.8	4	29	7.5	19	4.6	14.5	3.6	0142052081	24-PGS-L8-IG1/4B
L 10	G 1/4	PN 315	18.8	4	30	8.5	19	4.6	14.5	3.9	0142102081	24-PGS-L10-IG1/4B
L 12	G 1/4	PN 315	18.8	4	30	8.5	19	4.6	14.5	4.0	0142152081	24-PGS-L12-IG1/4B
S 6	G 1/4	PN 630	18.8	4	31	9	19	4.6	14.5	6.7	0142512081	24-PGS-S6-IG1/4B
S 6	G 1/2	PN 630	26.8	4	38	11	27	5.2	20	8.2	0142502081	24-PGS-S6-IG1/2B
S 8	G 1/4	PN 630	18.8	4	31	9.5	19	4.6	14.5	4.2	0142562081	24-PGS-S8-IG1/4B
S 8	G 1/2	PN 630	26.8	5	38	11	27	5.2	20	8.5	0142552081	24-PGS-S8-IG1/2B
S 10	G 1/2	PN 630	26.8	5	38	10.5	27	5.2	20	8.8	0142602081	24-PGS-S10-IG1/2B
S 12	G 1/4	PN 630	21.8	4	31	9	22	4.6	14.5	6.2	0142662081	24-PGS-S12-IG1/4B
S 12	G 1/2	PN 630	26.8	5	38	10.5	27	5.2	20	9.0	0142652081	24-PGS-S12-IG1/2B

Example for comp. :
MAV06LROMD

Gauge connectors

Female thread: BSPP thread, cylindrical
Sealing type: Seal-edge ring (Form B)

Tube socket pre-assembled
fits into bore form W DIN 3861/ISO 8434-1



Series Tube OD d1	d2	Pressure	d3	dy	lg	l2	SW1	SW3	h	i	kg/100 ca.	Order-No.	Designation
L 6	G 1/4	PN 315	18.8	2.5	38	23.5	19	14	4.6	14.5	4.8	0142042007	24-SWPGS-L6-IG1/4B
L 8	G 1/4	PN 315	18.8	2.5	38	23.5	19	17	4.6	14.5	5.5	0142092007	24-SWPGS-L8-IG1/4B
L 10	G 1/4	PN 315	18.8	2.5	39.5	25	19	19	4.6	14.5	6.2	0142132007	24-SWPGS-L10-IG1/4B
L 12	G 1/4	PN 315	18.8	2.5	40.5	26	19	22	4.6	14.5	7.4	0142182007	24-SWPGS-L12-IG1/4B
S 6	G 1/2	PN 630	26.8	2.5	45	25	27	17	5.2	20	9.9	0142542007	24-SWPGS-S6-IG1/2B
S 8	G 1/2	PN 630	26.8	3.5	45	25	27	19	5.2	20	10.4	0142592007	24-SWPGS-S8-IG1/2B
S 10	G 1/2	PN 630	26.8	3.5	47	27	27	22	5.2	20	12.0	0142612007	24-SWPGS-S10-IG1/2B
S 12	G 1/2	PN 630	26.8	3.5	47.5	27.5	27	24	5.2	20	12.9	0142692007	24-SWPGS-S12-IG1/2B

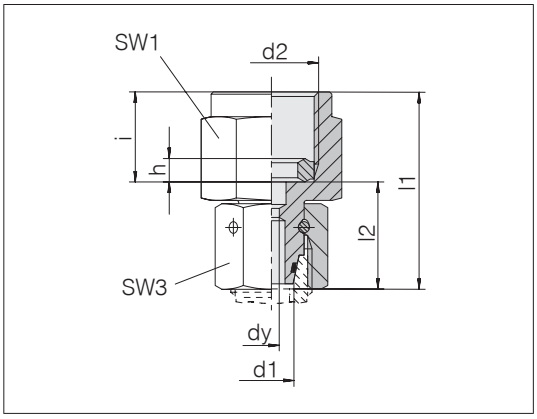
Example for comp. :
MAVEV06LR

Gauge connectors

Female thread: BSPP thread, cylindrical
Sealing type: Seal-edge ring (Form B)

Plug-in version with taper and O-ring
fits into bore form W DIN 3861/ISO 8434-1

Standard material of O-rings is FKM

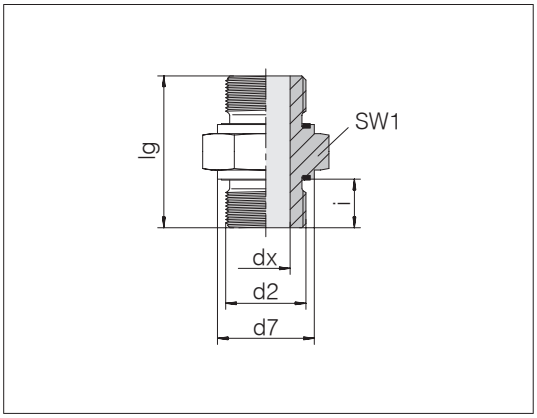


Series Tube OD d1	d2	Pressure	dy	l1	l2	SW1	SW3	h	i	kg/100 ca.	Order-No.	Designation
L 6	G 1/4	PN 315	2.5	37.5	23	19	14	4.6	14.5	4.8	1142002058	24-SWOPGS-L6-IG1/4B
L 8	G 1/4	PN 315	2.5	37.5	23	19	17	4.6	14.5	5.5	1142052058	24-SWOPGS-L8-IG1/4B
L 10	G 1/4	PN 315	2.5	36	21.5	19	19	4.6	14.5	5.8	1142102058	24-SWOPGS-L10-IG1/4B
L 12	G 1/4	PN 315	2.5	36	21.5	19	22	4.6	14.5	6.9	1142152058	24-SWOPGS-L12-IG1/4B
L 12	G 1/2	PN 315	3.5	42	22	27	22	5.2	20	11.4	1142672058	24-SWOPGS-L12-IG1/2B
L 15	G 1/2	PN 315	3.5	44.5	24.5	27	27	5.2	20	14.2	1142202058	24-SWOPGS-L15-IG1/2B
S 6	G 1/4	PN 630	2.5	35.5	21	19	17	4.6	14.5	5.4	1142522058	24-SWOPGS-S6-IG1/4B
S 6	G 1/2	PN 630	2.5	44.5	24.5	27	17	5.2	20	10.3	1142502058	24-SWOPGS-S6-IG1/2B
S 8	G 1/4	PN 630	2.5	35.5	21	19	19	4.6	14.5	5.7	1142572058	24-SWOPGS-S8-IG1/4B
S 8	G 1/2	PN 630	4	44.5	24.5	27	19	5.2	20	11.7	1142552058	24-SWOPGS-S8-IG1/2B
S 10	G 1/4	PN 630	2.5	39	24.5	19	22	4.6	14.5	7.8	1142622058	24-SWOPGS-S10-IG1/4B
S 10	G 1/2	PN 630	3.5	43.5	23.5	27	22	5.2	20	11.3	1142602058	24-SWOPGS-S10-IG1/2B
S 12	G 1/4	PN 630	2.5	39	24.5	19	24	4.6	14.5	8.2	1142662058	24-SWOPGS-S12-IG1/4B
S 12	G 1/2	PN 630	3.5	45	25	27	24	5.2	20	12.2	1142652058	24-SWOPGS-S12-IG1/2B

Example for comp. :
MAVE06LRVIT

Double nipple

Male thread tube-to-tube: BSPP thread, cylindrical
Threaded stud: ISO 1179-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

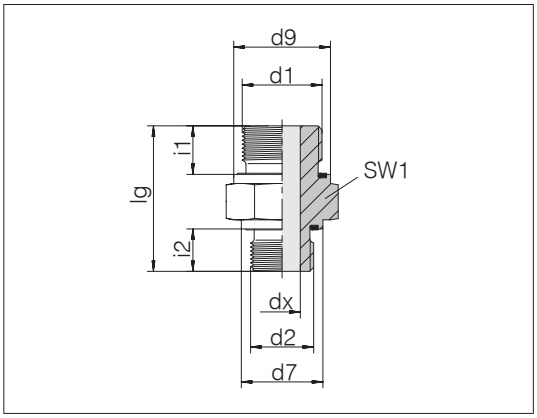


d2	Pressure	d7	dx	lg	SW1	i	Nm -10 %	kg/100 ca.	Order-No.	Designation
G 1/8 A	PN 500	13.9	4	23	14	8	20	1.5	1794682000	GP-SD2S-G1/8E-G1/8E-ID4
G 1/4 A	PN 630	18.9	5	34	19	12	60	4.0	1794672000	GP-SD2S-G1/4E-G1/4E
G 3/8 A	PN 630	21.9	8	38.5	22	12	90	6.5	1798262000	GP-SD2S-G3/8E-G3/8E
G 1/2 A	PN 630	26.9	12	45	30	14	150	12.2	1798232000	GP-SD2S-G1/2E-G1/2E-LG45
G 3/4 A	PN 420	31.9	16	50	36	16	200	17.6	1796692000	GP-SD2S-G3/4E-G3/4E
G 1 A	PN 420	39.9	20	56	41	18	250	29.8	1794662000	GP-SD2S-G1E-G1E
G 1 1/4 A	PN 420	49.9	25	60	50	20	500	49.7	1794652000	GP-SD2S-G11/4E-G11/4E
G 1 1/2 A	PN 420	54.9	32	67	55	22	600	62.0	1794642000	GP-SD2S-G11/2E-G11/2E
G 2 A	PN 160	74.9	40	73	75	24	700	117.4	1794632000	GP-SD2S-G2E-G2E

Double nipple

Male thread tube-to-tube: BSPP thread, cylindrical
Threaded stud: ISO 1179-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

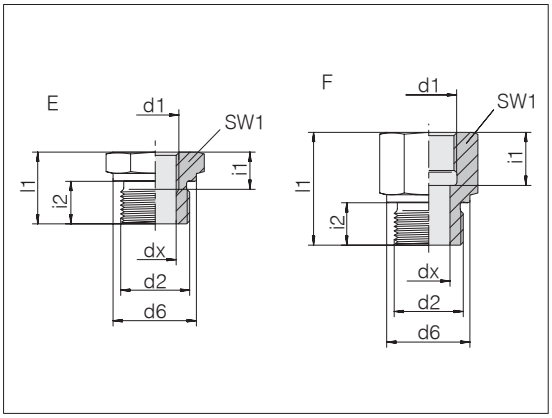
Reduction



d1	d2	Pressure	Nm -10 % (d1)	d7		d9	dx	lg	SW1	i1	i2	kg/100 ca.	Order-No.	Designation
G 1/4 A	G 1/8 A	PN 500	60	13.9	20	18.9	4	29.5	19	12	8	3.2	1794302000	GP-SD2S-G1/4E-G1/8E-ID4
G 3/8 A	G 1/4 A	PN 630	90	18.9	60	21.9	5	36.5	22	12	12	6.1	1794312000	GP-SD2S-G3/8E-G1/4E
G 1/2 A	G 1/4 A	PN 630	150	18.5	60	26.9	5	41	27	14	12	8.9	1790852000	GP-SD2S-G1/2E-G1/4E
G 1/2 A	G 3/8 A	PN 630	150	21.9	90	26.9	8	41.5	27	14	12	10.5	1798882000	GP-SD2S-G1/2E-G3/8E
G 3/4 A	G 3/8 A	PN 420	200	21.9	90	31.9	8	46	32	16	12	15.0	1790842000	GP-SD2S-G3/4E-G3/8E
G 3/4 A	G 1/2 A	PN 420	200	26.9	150	31.9	12	48	32	16	14	16.8	1794322000	GP-SD2S-G3/4E-G1/2E
G 1 A	G 1/2 A	PN 420	250	26.9	150	39.9	12	52	41	18	14	25.7	1790862000	GP-SD2S-G1E-G1/2E
G 1 A	G 3/4 A	PN 420	250	31.9	200	39.9	16	54	41	18	16	29.4	1794332000	GP-SD2S-G1E-G3/4E
G 1 1/4 A	G 1/2 A	PN 420	500	26.9	150	49.9	12	54	50	20	14	40.2	1790822000	GP-SD2S-G11/4E-G1/2E
G 1 1/4 A	G 3/4 A	PN 420	500	31.9	200	49.9	16	56	50	20	16	41.6	1790872000	GP-SD2S-G11/4E-G3/4E
G 1 1/4 A	G 1 A	PN 420	500	39.9	250	49.9	20	58	50	20	18	47.8	1794342000	GP-SD2S-G11/4E-G1E
G 1 1/2 A	G 1 A	PN 420	600	39.9	250	54.9	20	63	55	22	18	55.7	1790832000	GP-SD2S-G11/2E-G1Ê
G 1 1/2 A	G 1 1/4 A	PN 420	600	49.9	500	54.9	25	65	55	22	20	69.5	1794352000	GP-SD2S-G11/2E-G11/4E
G 2 A	G 1 1/2 A	PN 160	700	54.9	600	74.9	32	70	75	24	22	117.6	1794362000	GP-SD2S-G2E-G11/2E

Thread reducing couplings

Male thread: BSPP thread, cylindrical
Threaded stud: DIN ISO 1179-4 Form B
Sealing type: Sealing edge



Male thread d2	Female thread d1	Pressure	d6	dx	l1	SW1	i1	i2	Style	Nm -10 %	kg/100 ca.	Order-No.	Designation
G 1/8 A	G 1/4	PB 630	14	4	31	19	17	8	F	25	3.7	0149012000	GP-SDS-G1/8B-IG1/4
G 1/8 A	G 3/8	PB 630	14	4	32	24	17	8	F	25	6.3	0149002000	GP-SDS-G1/8B-IG3/8
G 1/4 A	G 1/8	PB 630	18	7	30	19	13	12	F	60	4.0	0149052000	GP-SDS-G1/4B-IG1/8-ID7
G 1/4 A	G 3/8	PB 630	18	6	36	24	17	12	F	60	6.6	0149042000	GP-SDS-G1/4B-IG3/8-ID6
G 1/4 A	G 1/2	PB 630	18	5	40	27	20	12	F	60	8.6	0149032000	GP-SDS-G1/4B-IG1/2
G 1/4 A	G 3/4	PB 630	18	5	43	36	22	12	F	60	17.0	0149022000	GP-SDS-G1/4B-IG3/4
G 3/8 A	G 1/8	PB 400	22	8.5	22.5	22	8	12	E	110	3.9	0149092000	GP-SDS-G3/8B-IG1/8
G 3/8 A	G 1/4	PB 400	22	8	36	22	17	12	F	110	7.0	0149082000	GP-SDS-G3/8B-IG1/4
G 3/8 A	G 1/2	PB 400	22	8	41	27	20	12	F	110	9.6	0149072000	GP-SDS-G3/8B-IG1/2
G 3/8 A	G 3/4	PB 400	22	8	44	36	22	12	F	110	17.7	0149062000	GP-SDS-G3/8B-IG3/4
G 1/2 A	G 1/8	PB 400	26	8.5	24	27	8	14	E	200	6.6	0149152000	GP-SDS-G1/2B-IG1/8
G 1/2 A	G 1/4	PB 400	26	11.5	24	27	12	14	E	200	5.5	0149142000	GP-SDS-G1/2B-IG1/4
G 1/2 A	G 3/8	PB 400	26	12	36	27	17	14	F	200	9.1	0149132000	GP-SDS-G1/2B-IG3/8
G 1/2 A	G 3/4	PB 400	26	12	46	36	22	14	F	200	18.2	0149122000	GP-SDS-G1/2B-IG3/4
G 1/2 A	G 1	PB 400	26	12	49	41	24.5	14	F	200	22.1	0149112000	GP-SDS-G1/2B-IG1
G 1/2 A	G 1 1/4	PB 250	26	10	53	55	26.5	14	F	200	48.0	0149102000	GP-SDS-G1/2B-IG11/4
G 3/4 A	G 1/4	PB 400	32	11.5	26	32	12	16	E	320	10.2	0149212000	GP-SDS-G3/4B-IG1/4
G 3/4 A	G 3/8	PB 400	32	15	26	32	12	16	E	320	8.7	0149202000	GP-SDS-G3/4B-IG3/8
G 3/4 A	G 1/2	PB 400	32	16	41	32	20	16	F	320	14.4	0149192000	GP-SDS-G3/4B-IG1/2
G 3/4 A	G 1	PB 400	32	16	51	41	24.5	16	F	320	23.7	0149182000	GP-SDS-G3/4B-IG1
G 3/4 A	G 1 1/4	PB 250	32	16	55	55	26.5	16	F	320	48.7	0149172000	GP-SDS-G3/4B-IG11/4
G 3/4 A	G 1 1/2	PB 250	32	16	57	60	28.5	16	F	320	56.5	0149162000	GP-SDS-G3/4B-IG11/2
G 1 A	G 1/4	PB 400	39	11.5	29	41	12	18	E	500	19.5	0149272000	GP-SDS-G1B-IG1/4
G 1 A	G 3/8	PB 400	39	15	29	41	12	18	E	500	17.9	0149262000	GP-SDS-G1B-IG3/8
G 1 A	G 1/2	PB 400	39	19	29	41	14	18	E	500	15.4	0149252000	GP-SDS-G1B-IG1/2
G 1 A	G 3/4	PB 400	39	20	47	41	22	18	F	500	27.3	0149242000	GP-SDS-G1B-IG3/4
G 1 A	G 1 1/4	PB 250	39	20	57	55	26.5	18	F	500	50.9	0149232000	GP-SDS-G1B-IG11/4
G 1 A	G 1 1/2	PB 250	39	20	59	60	28.5	18	F	500	58.6	0149222000	GP-SDS-G1B-IG11/2

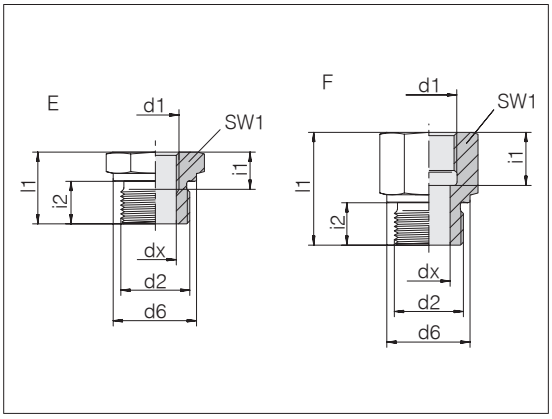
Thread reducing adapters with metric threads available upon request.

Example for comp. : RI1/8X1/4X

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Thread reducing couplings

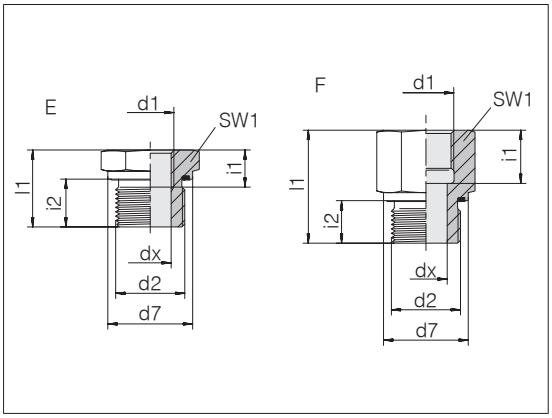
Male thread: BSPP thread, cylindrical
Threaded stud: DIN ISO 1179-4 Form B
Sealing type: Sealing edge



Male thread d2	Female thread d1	Pressure	d6	dx	l1	SW1	i1	i2	Style	Nm -10 %	kg/100 ca.	Order-No.	Designation
G 1 1/4 A	G 1/2	PB 250	49	19	32	50	14	20	E	600	31.0	0149312000	GP-SDS-G11/4B-IG1/2
G 1 1/4 A	G 3/4	PB 250	49	24	32	50	16	20	E	600	26.4	0149302000	GP-SDS-G11/4B-IG3/4
G 1 1/4 A	G 1	PB 250	49	25	52	50	24.5	20	F	600	45.8	0149292000	GP-SDS-G11/4B-IG1
G 1 1/4 A	G 1 1/2	PB 250	49	25	60	60	28.5	20	F	600	62.1	0149282000	GP-SDS-G11/4B-IG11/2
G 1 1/2 A	G 1/2	PB 250	55	19	36	55	14	22	E	800	47.8	0149352000	GP-SDS-G11/2B-IG1/2
G 1 1/2 A	G 3/4	PB 250	55	24	36	55	16	22	E	800	42.2	0149342000	GP-SDS-G11/2B-IG3/4
G 1 1/2 A	G 1	PB 250	55	30.5	36	55	18	22	E	800	34.0	0149332000	GP-SDS-G11/2B-IG1
G 1 1/2 A	G 1 1/4	PB 250	55	32	58	55	26.5	22	F	800	52.7	0149322000	GP-SDS-G11/2B-IG11/4

Thread reducing couplings

Male thread: BSPP thread, cylindrical
Threaded stud: ISO 1179-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR



Male thread d2	Female thread d1	Pressure	d7	dx	l1	SW1	i1	i2	Style	Nm -10 %	kg/100 ca.	Order-No.	Designation
G 1/8 A	G 1/8	PB 630	13.9	4	22.5	17	8.5	8	E	20	2.5	7012668100	GP-SDS-G1/8E-IG1/8-ID4
G 1/8 A	G 1/4	PN 630	13.9	4	32.5	19	17	8	F	20	4.2	1149012000	GP-SDS-G1/8E-IG1/4
G 1/8 A	G 3/8	PN 630	13.9	4	33.5	24	17	8	F	20	6.8	1149002000	GP-SDS-G1/8E-IG3/8
G 1/4 A	G 1/8	PN 630	18.9	5	31.5	19	12	12	F	60	4.6	1149052000	GP-SDS-G1/4E-IG1/8
G 1/4 A	G 3/8	PN 630	18.9	5	37.5	24	17	12	F	60	7.3	1149042000	GP-SDS-G1/4E-IG3/8
G 1/4 A	G 1/2	PN 630	18.9	5	41.5	30	20	12	F	60	12.4	1149032000	GP-SDS-G1/4E-IG1/2
G 1/4 A	G 3/4	PN 630	18.9	5	44.5	36	22	12	F	60	18.5	1149022000	GP-SDS-G1/4E-IG3/4
G 3/8 A	G 1/8	PN 630	21.9	8.5	22.5	22	8	12	E	90	3.8	1149092000	GP-SDS-G3/8E-IG1/8
G 3/8 A	G 1/4	PN 630	21.9	8	37.5	22	17	12	F	90	7.2	1149082000	GP-SDS-G3/8E-IG1/4
G 3/8 A	G 1/2	PN 630	21.9	8	42.5	30	20	12	F	90	13.2	1149072000	GP-SDS-G3/8E-IG1/2
G 3/8 A	G 3/4	PN 400	21.9	8	45.5	36	22	12	F	90	19.1	1149062000	GP-SDS-G3/8E-IG3/4
G 1/2 A	G 1/8	PN 630	26.9	8.5	24	27	8	14	E	150	6.5	1149152000	GP-SDS-G1/2E-IG1/8
G 1/2 A	G 1/4	PN 630	26.9	11.5	24	27	12	14	E	150	5.6	1149142000	GP-SDS-G1/2E-IG1/4
G 1/2 A	G 3/8	PN 630	26.9	12	37.5	27	17	14	F	150	9.7	1149132000	GP-SDS-G1/2E-IG3/8
G 1/2 A	G 1/2	PN 630	26.9	12	42	30	20	14	F	150	12.3	1149402000	GP-SDS-G1/2E-IG1/2
G 1/2 A	G 3/4	PN 400	26.9	12	47.5	36	22	14	F	150	19.4	1149122000	GP-SDS-G1/2E-IG3/4
G 1/2 A	G 1	PN 400	26.9	12	50.5	41	24.5	14	F	150	23.7	1149112000	GP-SDS-G1/2E-IG1
G 1/2 A	G 1 1/4	PN 400	26.9	12	54.5	55	26.5	14	F	150	50.3	1149102000	GP-SDS-G1/2E-IG11/4
G 3/4 A	G 1/4	PN 400	31.9	11.5	26	32	12	16	E	200	10.1	1149212000	GP-SDS-G3/4E-IG1/4
G 3/4 A	G 3/8	PN 400	31.9	15	26	32	12	16	E	200	8.5	1149202000	GP-SDS-G3/4E-IG3/8
G 3/4 A	G 1/2	PN 400	31.9	16	42.5	32	20	16	F	200	15.0	1149192000	GP-SDS-G3/4E-IG1/2
G 3/4 A	G 3/4	PB 400	31.9	16	44	36	16	16	E	200	18.9	7012942500	GP-SDS-G3/4E-IG3/4
G 3/4 A	G 1	PN 400	31.9	16	52.5	41	24.5	16	F	200	24.7	1149182000	GP-SDS-G3/4E-IG1
G 3/4 A	G 1 1/4	PN 400	31.9	16	56.5	55	26.5	16	F	200	51.4	1149172000	GP-SDS-G3/4E-IG11/4
G 3/4 A	G 1 1/2	PN 315	31.9	16	58.5	60	28.5	16	F	200	59.6	1149162000	GP-SDS-G3/4E-IG11/2

Other sizes on request.

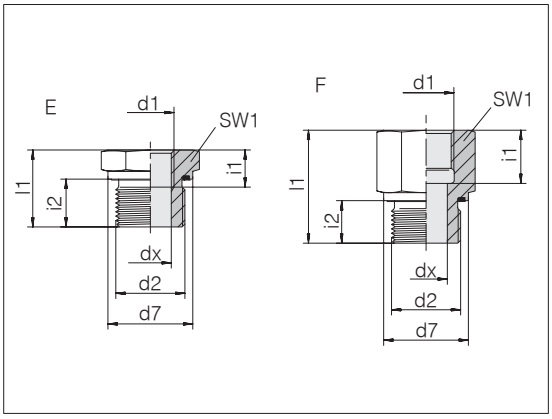
Thread reducing adapters with metric threads available upon request.

Example for comp. : RI1/8EDX1/4

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Thread reducing couplings

Male thread: BSPP thread, cylindrical
Threaded stud: ISO 1179-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

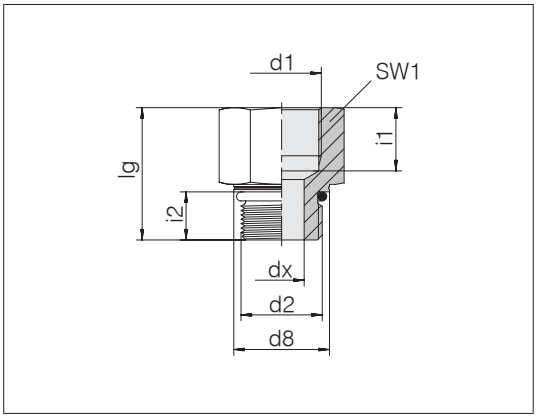


Male thread d2	Female thread d1	Pressure	d7	dx	l1	SW1	i1	i2	Style	Nm -10 %	kg/100 ca.	Order-No.	Designation
G 1 A	G 1/4	PN 400	39.9	11.5	29	41	12	18	E	250	19.3	1149272000	GP-SDS-G1E-IG1/4
G 1 A	G 3/8	PN 400	39.9	15	29	41	12	18	E	250	17.8	1149262000	GP-SDS-G1E-IG3/8
G 1 A	G 1/2	PN 400	39.9	19	29	41	14	18	E	250	15.2	1149252000	GP-SDS-G1E-IG1/2
G 1 A	G 3/4	PN 400	39.9	20	49	41	22	18	F	250	28.6	1149242000	GP-SDS-G1E-IG3/4
G 1 A	G 1 1/4	PN 400	39.9	20	59	55	26.5	18	F	250	54.9	1149232000	GP-SDS-G1E-IG11/4
G 1 A	G 1 1/2	PN 315	39.9	20	61	60	28.5	18	F	250	62.6	1149222000	GP-SDS-G1E-IG11/2
G 1 1/4 A	G 1/2	PN 400	49.9	19	32	50	14	20	E	500	30.9	1149312000	GP-SDS-G11/4E-IG1/2
G 1 1/4 A	G 3/4	PN 400	49.9	24	32	50	16	20	E	500	26.0	1149302000	GP-SDS-G11/4E-IG3/4
G 1 1/4 A	G 1	PN 400	49.9	25	54	50	24.5	20	F	500	48.2	1149292000	GP-SDS-G11/4E-IG1
G 1 1/4 A	G 1 1/2	PN 315	49.9	25	62	60	28.5	20	F	500	65.9	1149282000	GP-SDS-G11/4E-IG11/2
G 1 1/2 A	G 1/2	PN 315	54.9	19	36	55	14	22	E	600	46.7	1149352000	GP-SDS-G11/2E-IG1/2
G 1 1/2 A	G 3/4	PN 315	54.9	24	36	55	16	22	E	600	41.6	1149342000	GP-SDS-G11/2E-IG3/4
G 1 1/2 A	G 1	PN 315	54.9	30.5	36	55	18	22	E	600	33.6	1149332000	GP-SDS-G11/2E-IG1
G 1 1/2 A	G 1 1/4	PN 315	54.9	32	60	55	26.5	22	F	600	55.3	1149322000	GP-SDS-G11/2E-IG11/4
G 2 A	G 1/2	PN 160	74.9	19	45	75	14	24	E	700	117.1	1149682000	GP-SDS-G2E-IG1/2
G 2 A	G 1	PN 160	74.9	30.5	45	75	18	24	E	700	101.9	1149692000	GP-SDS-G2E-IG1
G 2 A	G 1 1/4	PN 160	74.9	39	45	75	26.5	24	E	700	85.2	1149702000	GP-SDS-G2E-IG11/4
G 2 A	G 1 1/2	PN 160	74.9	40	65	75	28.5	24	F	700	131.0	1149672000	GP-SDS-G2E-IG11/2

Other sizes on request.

Straight adapter ISO 6149 / DIN 3852

Male thread: Metric fine thread, cylindrical
Threaded stud: ISO 6149-2/3
Sealing type: O-Ring (Form F)
Sealing material: Standard NBR

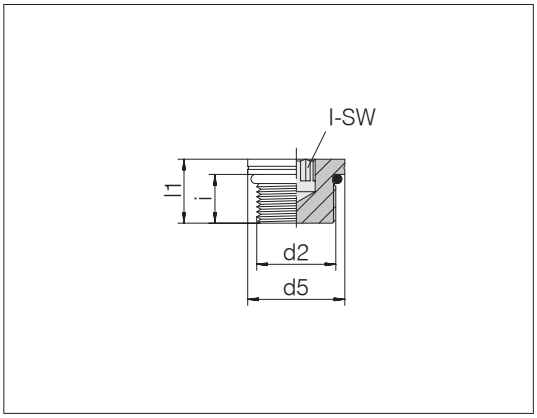


Male thread d2	Female thread d1	Pressure	d8	dx	lg	SW1	i1	i2	Nm -10 %	kg/100 ca.	Order-No.	Designation
M 10 x 1	M 10 x 1	PB 630	13.8	3	24	17	11	8.5	15	2.6	1149542000	GP-SDS-M10F-IM10
M 12 x 1.5	M 10 x 1	PB 630	16.8	4	26	17	10	11	25	3.1	7008993100	GP-SDS-M12F-IM20
M 12 x 1.5	M 12 x 1.5	PB 630	16.8	4	31.5	19	16	11	25	4.4	1149552000	GP-SDS-M12F-IM12
M 14 x 1.5	M 14 x 1.5	PB 630	18.8	6	31.5	22	16	11	35	5.6	1149562000	GP-SDS-M14F-IM14
M 16 x 1.5	M 16 x 1.5	PB 630	21.8	7	33	24	16	11.5	40	7.1	1149572000	GP-SDS-M16F-IM16
M 18 x 1.5	M 18 x 1.5	PB 630	23.8	9	34	27	16	12.5	45	8.8	1149582000	GP-SDS-M18F-IM18
M 22 x 1.5	M 22 x 1.5	PB 630	26.8	12	37	32	18	13	60	13.0	1149592000	GP-SDS-M22F-IM22
M 27 x 2	M 26 x 1.5	PB 400	31.8	15	44	36	21	16	100	19.4	1149602000	GP-SDS-M27F-IM26
M 27 x 2	M 27 x 2	PB 400	31.8	15	44	36	21	16	100	19.0	1149612000	GP-SDS-M27F-IM27
M 33 x 2	M 33 x 2	PB 400	40.8	20	46	46	23	16	160	32.0	1149622000	GP-SDS-M33F-IM33
M 42 x 2	M 42 x 2	PB 250	49.8	26	49	55	25	16	210	46.7	1149632000	GP-SDS-M42F-IM42
M 48 x 2	M 48 x 2	PB 250	54.8	32	53.5	60	27	17.5	260	56.5	1149642000	GP-SDS-M48F-IM48

Other sizes on request.

Blanking plugs for ports

Male thread: Metric fine thread, cylindrical
Threaded stud: ISO 6149-2/3
Sealing type: O-Ring (Form F)
Sealing material: Standard NBR



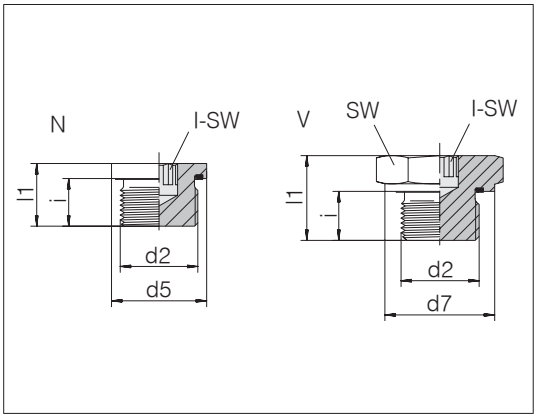
d2	Pressure	d5	l1	l-SW	i	Nm -10 %	kg/100 ca.	Order-No.	Designation
M 10 x 1	PN 630	14	13	5	9.5	18	0.8	0190012100	GP-PLIH-M10F-C21
M 12 x 1.5	PN 630	17	15.5	6	11	40	1.4	0190022100	GP-PLIH-M12F-C21
M 14 x 1.5	PN 630	19	16	6	11	55	2.0	0190032100	GP-PLIH-M14F-C21
M 16 x 1.5	PN 630	22	17.5	8	12.5	70	2.8	0190042100	GP-PLIH-M16F-C21
M 18 x 1.5	PN 630	24	19	8	14	90	3.9	0190052100	GP-PLIH-M18F-C21
M 22 x 1.5	PN 630	27	20	10	15	130	5.7	0190072100	GP-PLIH-M22F-C21
M 26 x 1.5	PN 400	31	21	12	16	150	8.0	0190102100	GP-PLIH-M26F-C21
M 27 x 2	PN 400	32	23.5	12	18.5	180	9.6	0190202100	GP-PLIH-M27F-C21
M 33 x 2	PN 400	41	24.5	17	18.5	310	15.1	0190182100	GP-PLIH-M33F-C21
M 42 x 2	PN 400	50	25	17	19	400	26.2	0190132100	GP-PLIH-M42F-C21
M 48 x 2	PN 400	55	27.5	17	21.5	500	37.9	0190142100	GP-PLIH-M48F-C21

Other sizes on request.

Example for comp. :
VSTI10X1OR

Blanking plugs for ports

Male thread: Metric fine thread, cylindrical
Threaded stud: ISO 9974-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR



d2	Pressure	d5	d7	l1	SW	l-SW	i	Style	Nm -10 %	kg/100 ca.	Order-No.	Designation
M 8 x 1	PN 400	12		12.3		4	8	N	10	0.5	0189142100	GP-PLIH-M8E-C21
M 10 x 1	PN 400	14		12.3		5	8	N	12	0.7	0189202100	GP-PLIH-M10E-C21
M 10 x 1	PN 400		13.9	18	14		8	V	12	1.6	1189202100	GP-PLEH-M10E-C21
M 12 x 1.5	PN 400	17		17.3		6	12	N	23	1.4	0189212100	GP-PLIH-M12E-C21
M 14 x 1.5	PN 400	19		17.3		6	12	N	30	1.9	0189222100	GP-PLIH-M14E-C21
M 14 x 1.5	PN 400		18.9	22	19		12	V	30	3.4	1189222100	GP-PLEH-M14E-C21
M 16 x 1.5	PN 400	21.9		17.3		8	12	N	50	2.4	0189232100	GP-PLIH-M16E-C21
M 18 x 1.5	PN 400	23.9		17.3		8	12	N	65	3.2	0189242100	GP-PLIH-M18E-C21
M 18 x 1.5	PN 400		23.9	22	24		12	V	65	5.6	1189242100	GP-PLEH-M18E-C21
M 20 x 1.5	PN 400	25.9		19.3		10	14	N	75	4.0	0189252100	GP-PLIH-M20E-C21
M 22 x 1.5	PN 400	27		19.3		10	14	N	90	5.0	0189262100	GP-PLIH-M22E-C21
M 24 x 1.5	PN 400	29.9		19.3		12	14	N	90	5.8	0189272100	GP-PLIH-M24E-C21
M 26 x 1.5	PN 400	31.9		21.3		12	16	N	110	7.4	0189282100	GP-PLIH-M26E-C21
M 27 x 2	PN 400	32		21.3		12	16	N	130	7.7	0189292100	GP-PLIH-M27E-C21
M 33 x 2	PN 400	39.9		22.8		17	16	N	225	12.4	0189302100	GP-PLIH-M33E-C21
M 33 x 2	PN 400		46	33	46	17	18	V	250	27.4	1189302100	GP-PLEH-M33E-C21
M 42 x 2	PN 315	49.9		22.8		22	16	N	310	18.6	0189312100	GP-PLIH-M42E-C21
M 42 x 2	PN 400		57	38	60	22	20	V	400	53.4	1189312100	GP-PLEH-M42E-C21
M 48 x 2	PN 315	55		22.8		24	16	N	380	24.4	0189322100	GP-PLIH-M48E-C21
M 48 x 2	PN 400		64	40	65	24	22	V	500	69.2	1189322100	GP-PLEH-M48E-C21

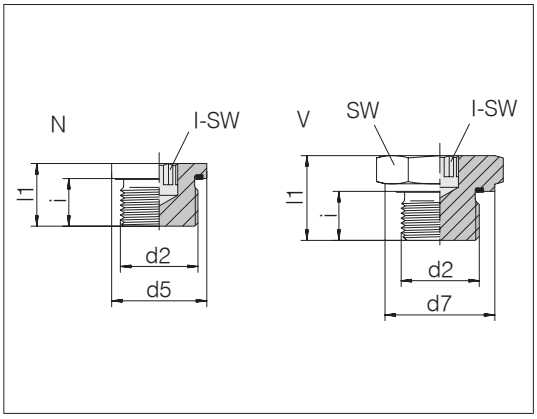
Other sizes on request.

Example for comp. : VSTI8X1ED

Threaded ports as per ISO 9974-1/ DIN 3852. form X. d5 = d4 narrow

Blanking plugs for ports

Male thread: BSPP thread, cylindrical
Threaded stud: ISO 1179-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR



d2	Pressure	d5	d7	l1	SW	l-SW	i	Style	Nm -10 %	kg/100 ca.	Order-No.	Designation
G 1/8 A	PN 400	14		12.3		5	8	N	12	0.7	0189332100	GP-PLIH-G1/8E-C21
G 1/4 A	PN 400	18.9		17.3		6	12	N	25	1.8	0189342100	GP-PLIH-G1/4E-C21
G 3/8 A	PN 400	22		17.3		8	12	N	50	2.7	0189352100	GP-PLIH-G3/8E-C21
G 1/2 A	PN 400	26.9		19.3		10	14	N	70	4.4	0189362100	GP-PLIH-G1/2E-C21
G 3/4 A	PN 400	32		21.3		12	16	N	120	7.5	0189372100	GP-PLIH-G3/4E-C21
G 1 A	PN 400	39.9		22.8		17	16	N	200	12.3	0189382100	GP-PLIH-G1E-C21
G 1 A	PN 400		46	33	46	17	18	V	250	27.2	1189382100	GP-PLEH-G1E-C21
G 1 1/4 A	PN 315	49.9		22.8		22	16	N	320	19.4	0189392100	GP-PLIH-G11/4E-C21
G 1 1/4 A	PN 400	49.9		28		22	20	N	450	27.2	1189412100	GP-PLIH-G11/4E-PN400-C21
G 1 1/4 A	PN 400		57	38	60	22	20	V	400	54.3	1189392100	GP-PLEH-G11/4E-C21
G 1 1/2 A	PN 315	55		22.8		24	16	N	400	25.2	0189402100	GP-PLIH-G11/2E-C21
G 1 1/2 A	PN 400	55		30		24	22	N	600	37.5	1189422100	GP-PLIH-G11/2E-PN400-C21
G 1 1/2 A	PN 400		64	40	65	24	22	V	500	69.3	1189402100	GP-PLEH-G11/2E-C21
G 2 A	PN 250	75		34		32	24	N	650	68.7	1189572100	GP-PLIH-G2E-C21

Other sizes on request.

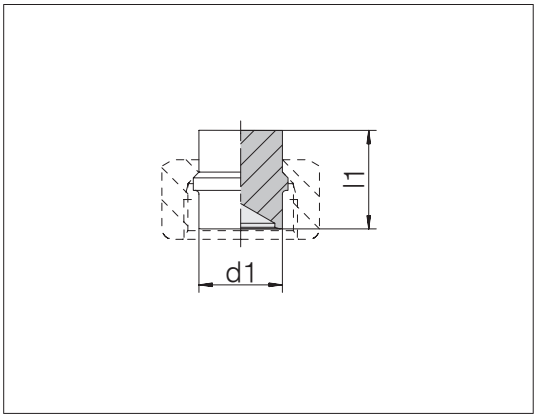
Example for comp. :
VSTI1/8ED

Threaded ports as per ISO 9974-1/ DIN 3852. form X.
d5 = d4 narrow

Caps

With sealing edge
fit in bore type W DIN 3861/ISO 8434-1

For blind connections of tube couplings



Series Tube OD d1	Pressure	l1	kg/100 ca.	Order-No.	Designation
LL 16	PN 100	22	3.5	0793642000	24-PLB-LL16
L/S 6	PN 315/630	19.5	0.5	0793652000	24-PLB-L/S6
L/S 8	PN 315/630	19.5	0.8	0793662000	24-PLB-L/S8
L/S 10	PN 315/630	21	1.3	0793672000	24-PLB-L/S10
L/S 12	PN 315/630	21.8	2.0	0793682000	24-PLB-L/S12
L 15	PN 315	22	3.0	0793692000	24-PLB-L15
L 18	PN 315	24	4.6	0793702000	24-PLB-L18
L 22	PN 160	26	7.4	0793712000	24-PLB-L22
L 28	PN 160	26.5	11.5	0793722000	24-PLB-L28
L 35	PN 160	32	22.1	0793732000	24-PLB-L35
L 42	PN 160	32.5	31.5	0793742000	24-PLB-L42
S 14	PN 630	23.5	2.9	0793792000	24-PLB-S14
S 16	PN 400	25.5	4.0	0793802000	24-PLB-S16
S 20	PN 400	30.5	7.4	0793812000	24-PLB-S20
S 25	PN 400	32.5	11.8	0793822000	24-PLB-S25
S 30	PN 400	35.5	18.3	0793832000	24-PLB-S30
S 38	PN 315	40	33.1	0793842000	24-PLB-S38

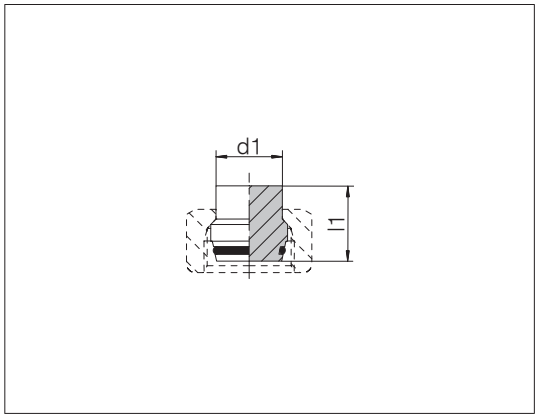
Example for comp. :
BUZ06LX

Caps

With taper and O-ring
fit in bore type W DIN 3861/ISO 8434-1

For blind connections of tube couplings

Standard O-ring material is FKM



Series Tube OD d1	Pressure	l1	kg/100 ca.	Order-No.	Designation
L/S 6	PN 500/800	18.5	0.6	1793142058	24-PLO-L/S6
L/S 8	PN 500/800	19	1.0	1793152058	24-PLO-L/S8
L/S 10	PN 500/800	20	1.6	1793162058	24-PLO-L/S10
L/S 12	PN 400/630	20.5	2.2	1793172058	24-PLO-L/S12
L 15	PN 400	20.5	3.2	1793082058	24-PLO-L15
L 18	PN 400	22.5	5.1	1793092058	24-PLO-L18
L 22	PN 250	25	8.1	1793102058	24-PLO-L22
L 28	PN 250	25.5	13.0	1793112058	24-PLO-L28
L 35	PN 250	30	24.0	1793122058	24-PLO-L35
L 42	PN 250	30	34.6	1793132058	24-PLO-L42
S 14	PN 630	22.5	3.2	1793182058	24-PLO-S14
S 16	PN 630	23	4.1	1793192058	24-PLO-S16
S 20	PN 420	28.5	8.0	1793202058	24-PLO-S20
S 25	PN 420	29	12.4	1793212058	24-PLO-S25
S 30	PN 420	30.5	18.2	1793222058	24-PLO-S30
S 38	PN 420	33	31.5	1793232058	24-PLO-S38

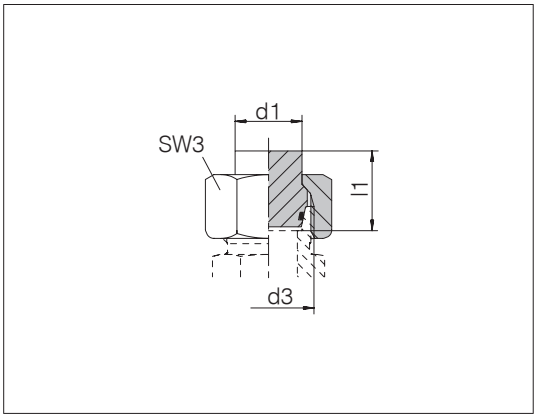
Example for comp. :
VKA06VIT

Caps

With taper and O-ring
fit in bore type W DIN 3861/ISO 8434-1

For blind connections of tube couplings

Standard O-ring material is FKM

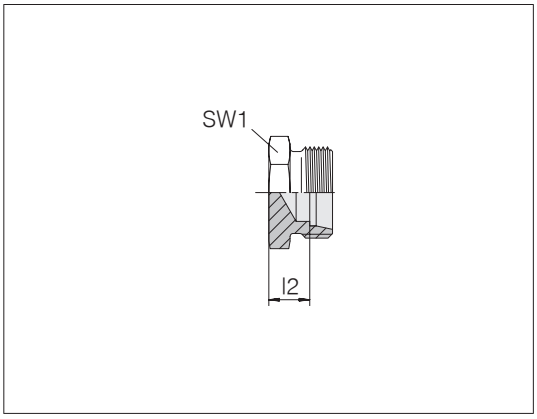


Series Tube OD d1	d3	Pressure	l1	SW3	kg/100 ca.	Order-No.	Designation
L 6	M 12 x 1.5	PN 500	18.5	14	1.6	1193042058	24-PLOC-L/S6
L 8	M 14 x 1.5	PN 500	19	17	2.5	1193052058	24-PLOC-L8
L 10	M 16 x 1.5	PN 500	20	19	3.4	1193062058	24-PLOC-L/S10
L 12	M 18 x 1.5	PN 400	20.5	22	4.8	1193072058	24-PLOC-L/S12
L 15	M 22 x 1.5	PN 400	20.5	27	7.5	1193082058	24-PLOC-L15
L 18	M 26 x 1.5	PN 400	23.4	32	11.4	1193092058	24-PLOC-L18
L 22	M 30 x 2	PN 250	25.9	36	16.3	1193102058	24-PLOC-L22
L 28	M 36 x 2	PN 250	26.4	41	21.7	1193112058	24-PLOC-L28
L 35	M 45 x 2	PN 250	32	50	37.4	1193122058	24-PLOC-L35
L 42	M 52 x 2	PN 250	32.5	60	55.9	1193132058	24-PLOC-L42
S 6	M 14 x 1.5	PN 800	18.9	17	2.4	1193142058	24-PLOC-S6
S 8	M 16 x 1.5	PN 800	19.4	19	3.1	1193152058	24-PLOC-S8
S 10	M 18 x 1.5	PN 800	20.9	22	4.7	1193162058	24-PLOC-S10
S 12	M 20 x 1.5	PN 630	21.4	24	5.7	1193172058	24-PLOC-S12
S 14	M 22 x 1.5	PN 630	23.9	27	8.5	1193182058	24-PLOC-S14
S 16	M 24 x 1.5	PN 630	24.9	30	10.7	1193192058	24-PLOC-S16
S 20	M 30 x 2	PN 420	30.5	36	18.3	1193202058	24-PLOC-S20
S 25	M 36 x 2	PN 420	32.5	46	33.0	1193212058	24-PLOC-S25
S 30	M 42 x 2	PN 420	35.5	50	39.8	1193222058	24-PLOC-S30
S 38	M 52 x 2	PN 420	40.5	60	62.8	1193232058	24-PLOC-S38

Example for comp. :
VKAM06LVIT

Plugs

Tube coupling: 24° in acc. with ISO 8434-1

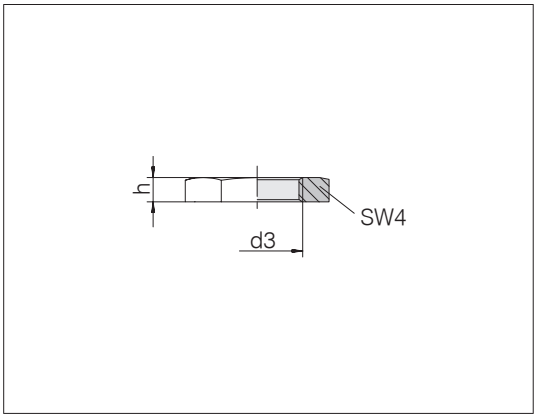


Series Tube OD	Pressure	l2	SW1	kg/100 ca.	Order-No.	Designation
L 6	PN 315	7	12	0.8	0793342000	24-TBS-L6
L 8	PN 315	8	14	1.2	0793352000	24-TBS-L8
L 10	PN 315	9	17	1.6	0793362000	24-TBS-L10
L 12	PN 315	10	19	2.2	0793372000	24-TBS-L12
L 15	PN 315	11	24	3.8	0793382000	24-TBS-L15
L 18	PN 315	11.5	27	5.4	0793392000	24-TBS-L18
L 22	PN 160	13.5	32	7.7	0793402000	24-TBS-L22
L 28	PN 160	14.5	41	13.3	0793412000	24-TBS-L28
L 35	PN 160	14.5	46	20.1	0793422000	24-TBS-L35
L 42	PN 160	18.5	55	34.0	0793432000	24-TBS-L42
S 6	PN 630	11	14	1.6	0793442000	24-TBS-S6
S 8	PN 630	13	17	2.6	0793452000	24-TBS-S8
S 10	PN 630	12.5	19	3.1	0793462000	24-TBS-S10
S 12	PN 630	14.5	22	4.5	0793472000	24-TBS-S12
S 14	PN 630	16	24	5.9	0793482000	24-TBS-S14
S 16	PN 400	15.5	27	6.8	0793492000	24-TBS-S16
S 20	PN 400	17.5	32	12.0	0793502000	24-TBS-S20
S 25	PN 400	20	41	21.3	0793512000	24-TBS-S25
S 30	PN 400	20.5	46	28.1	0793522000	24-TBS-S30
S 38	PN 315	23	55	49.8	0793532000	24-TBS-S38

Example for comp. :
ROV06LX

Hexagonal nuts

For bulkhead couplings



d3	SW4	h	kg/100 ca.	Order-No.	Designation
M 12 x 1.5	17	6	0.7	0081002100	24-LN-L6-IM12
M 14 x 1.5	19	6	0.8	0081022100	24-LN-L8-S6-IM14
M 16 x 1.5	22	6	1.0	0081042100	24-LN-L10-S8-IM16
M 18 x 1.5	24	6	1.2	0081062100	24-LN-L12-S10-IM18
M 20 x 1.5	27	6	1.5	0081082100	24-LN-S12-IM20
M 22 x 1.5	30	7	2.2	0081102100	24-LN-L15-S14-IM22
M 24 x 1.5	32	7	2.4	0081122100	24-LN-S16-IM24
M 26 x 1.5	36	8	3.8	0081142100	24-LN-L18-IM26
M 30 x 2	41	8	4.9	0081162100	24-LN-L22-S20-IM30
M 36 x 2	46	9	5.9	0081182100	24-LN-L28-S25-IM36
M 42 x 2	50	9	5.8	0081202100	24-LN-S30-IM42
M 45 x 2	55	9	7.5	0081222100	24-LN-L35-IM45
M 52 x 2	65	10	12.1	0081262100	24-LN-L42-S38-IM52

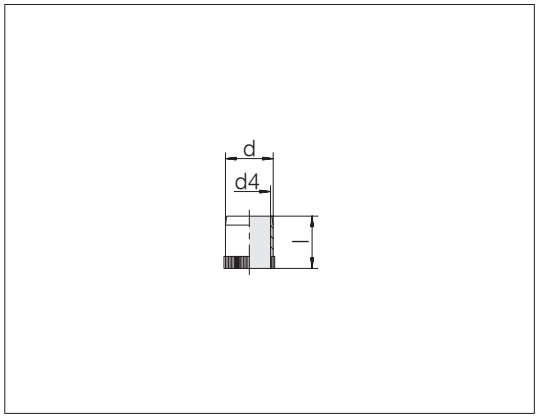
Example for comp. :
GM06LX
ISO 8434-1-LN-L6-St

VOSS

Reinforcing sleeves

For thin-walled steel tubes

Material: brass



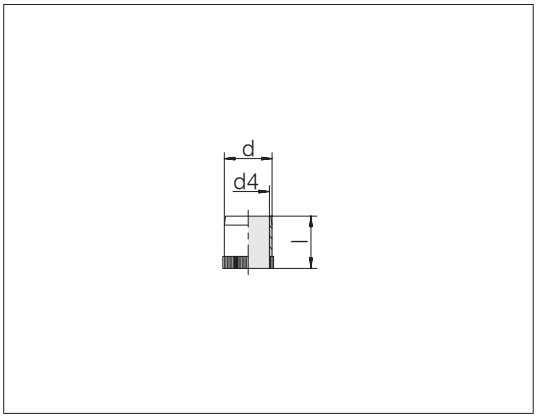
for tube OD x wall thickness	d	d4	l	kg/100 ca.	Order-No.	Designation
6 x 1	4	2.6	15.5	0.1	0020005000	24-RS-4-BS
8 x 1	6	4.6	15.5	0.2	0020085000	24-RS-6-BS
10 x 1	8	6.6	16.5	0.2	0020165000	24-RS-8-BS
12 x 1	10	8.6	16.5	0.3	0020285000	24-RS-10-BS
18 x 1 / 20 x 2	16	14.2	17.5	0.6	0020405000	24-RS-16-BS
20 x 1 / 22 x 2	18	16.2	22	0.9	0020425000	24-RS-18-BS
22 x 1	20	18.2	18	0.8	0020465000	24-RS-20-BS
25 x 1	23	21.2	23.5	1.2	0020505000	24-RS-23-BS
28 x 1 / 30 x 2	26	24.2	18	1.0	0020565000	24-RS-26-BS
28 x 2	24	22.2	18	1.4	0020525000	24-RS-24-BS
35 x 2	31	28.8	22.5	1.9	0020585000	24-RS-31-BS
42 x 2	38	35.8	23.5	2.4	0020645000	24-RS-38-BS
12 x 0.75	10.5	9.3	16.5	0.3	0020305000	24-RS-10,5-BS
14 x 1 / 15 x 1.5	12	10.2	17	0.5	0020345000	24-RS-12-BS
15 x 1 / 16 x 1.5	13	11.2	17	0.5	0020365000	24-RS-13-BS
18 x 1.5	15	13.2	17.5	0.6	0020385000	24-RS-15-BS
22 x 1.5	19	17.2	18	0.8	0020445000	24-RS-19-BS
25 x 1.5	22	20.2	23.5	1.1	0020485000	24-RS-22-BS
28 x 1.5 / 30 x 2.5	25	23.2	18	0.9	0020545000	24-RS-25-BS
35 x 1.5 / 38 x 3	32	29.8	22.5	1.9	0020605000	24-RS-32-BS
42 x 1.5	39	36.8	23.5	2.5	0020665000	24-RS-39-BS
6 x 0.75	4.5	3.1	12.5	0.1	0020025000	24-RS-4,5-BS
6 x 0.5	5	3.6	12.5	0.1	0020045000	24-RS-5-BS
8 x 0.75	6.5	5.1	12.5	0.1	0020125000	24-RS-6,5-BS
10 x 1.5	7	5.6	17	0.2	0020145000	24-RS-7-BS
10 x 0.75	8.5	7.1	16.5	0.2	0020185000	24-RS-8,5-BS
12 x 1.5	9	7.6	16.5	0.3	0020245000	24-RS-9-BS

Example for comp. :
VH04MSX

Reinforcing sleeves

For thin-walled steel tubes

Material: Steel



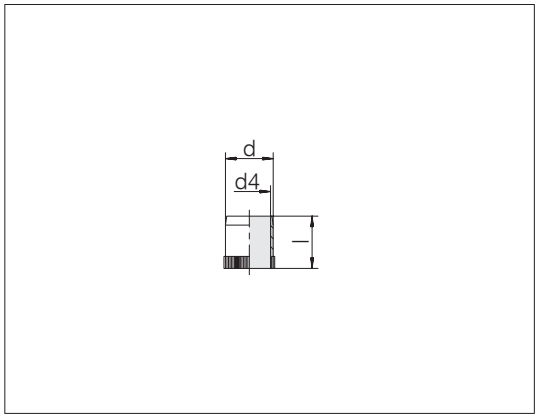
for tube OD x wall thickness	d	d4	l	kg/100 ca.	Order-No.	Designation
6 x 1	4	2.6	14	0.1	0020732000	24-RS-4-ST
8 x 1	6	4.6	14	0.1	0020752000	24-RS-6-ST
10 x 1	8	6.6	16.5	0.2	0020772000	24-RS-8-ST
12 x 1	10	8.6	16.5	0.2	0020792000	24-RS-10-ST
14 x 1	12	10.1	17	0.4	0020812000	24-RS-12-ST
16 x 1	14	12.1	17	0.4	0020832000	24-RS-14-ST
18 x 1 / 20 x 2	16	14.1	19	0.6	0020852000	24-RS-16-ST
22 x 1	20	18.1	20	0.8	0020882000	24-RS-20-ST
22 x 2	18	16.1	20	0.6	0020872000	24-RS-18-ST
25 x 2	21	19.1	21.5	0.8	0020892000	24-RS-21-ST
28 x 1 / 30 x 2	26	24.3	23.5	1.3	0020922000	24-RS-26-ST
28 x 2	24	22.3	23.5	1.1	0020912000	24-RS-24-ST
35 x 2	31	28.6	26.5	2.0	0020592000	24-RS-31-ST
38 x 2	34	31.6	26.5	2.6	0020962000	24-RS-34-ST
42 x 2	38	35.6	21	2.0	0020982000	24-RS-38-ST
15 x 1 / 16 x 1.5	13	11.1	17	0.4	0020822000	24-RS-13-ST
18 x 1.5	15	13.1	19	0.6	0020842000	24-RS-15-ST
22 x 1.5	19	17.1	16	0.6	0020452000	24-RS-19-ST
25 x 1.5	22	20.1	23.5	1.0	0020902000	24-RS-22-ST
35 x 1.5 / 38 x 3	32	29.6	26.5	1.9	0020942000	24-RS-32-ST
42 x 1.5	39	36.6	21	2.0	0020992000	24-RS-39-ST
6 x 0.75	4.5	3.1	14	0.1	0020742000	24-RS-4,5-ST
20 x 1.5	17	15.1	20	0.6	0020862000	24-RS-17-ST
28 x 1.5 / 30 x 2.5	25	23.3	23.5	0.9	0020532000	24-RS-25-ST
35 x 2.5	30	27.6	26.5	1.9	0020932000	24-RS-30-ST
38 x 2.5	33	30.6	26.5	2.0	0020952000	24-RS-33-ST
42 x 2.5	37	34.6	21	2.0	0020972000	24-RS-37-ST

Example for comp. :
VH04CFX

Reinforcing sleeves

For thin-walled stainless steel tubes

Material: Stainless steel



for tube OD x wall thickness	d	d4	l	kg/100 ca.	Order-No.	Designation
6 x 1	4	2.5	17	0.1	1020006000	24-RS-4-SST
8 x 1	6	4.5	14	0.1	1020016000	24-RS-6-SST
10 x 1	8	6.5	15.5	0.2	1020026000	24-RS-8-SST
12 x 1	10	8.5	15.5	0.2	1020036000	24-RS-10-SST
14 x 1	12	10.5	17	0.4	1020046000	24-RS-12-SST
16 x 1	14	12	17	0.4	1020066000	24-RS-14-SST
18 x 1 / 20 x 2	16	14	18	0.6	1020086000	24-RS-16-SST
22 x 1	20	18	20	0.8	1020126000	24-RS-20-SST
22 x 2	18	16	20	0.6	1020106000	24-RS-18-SST
25 x 2	21	19	21.5	0.8	1020136000	24-RS-21-SST
28 x 1 / 30 x 2	26	24	23.5	1.3	1020176000	24-RS-26-SST
28 x 2	24	22	23.5	1.1	1020156000	24-RS-24-SST
35 x 2	31	28	26.5	2.0	1020196000	24-RS-31-SST
42 x 2	38	35	26.5	2.0	1020226000	24-RS-38-SST
15 x 1 / 16 x 1.5	13	11.5	17	0.4	1020056000	24-RS-13-SST
18 x 1.5	15	13	18	0.6	1020076000	24-RS-15-SST
22 x 1.5	19	17	20	0.6	1020116000	24-RS-19-SST
25 x 1.5	22	20	24	1.0	1020146000	24-RS-22-SST
35 x 1.5 / 38 x 3	32	29.5	26.5	1.9	1020206000	24-RS-32-SST
20 x 1.5	17	15	20	0.6	1020096000	24-RS-17-SST
28 x 1.5 / 30 x 2.5	25	23	23.5	1.0	1020166000	24-RS-25-SST
35 x 2.5	30	27.8	26.5	1.9	1020186000	24-RS-30-SST
38 x 2.5	33	30	26.5	2.0	1020216000	24-RS-33-SST

Example for comp. :
VH0471X

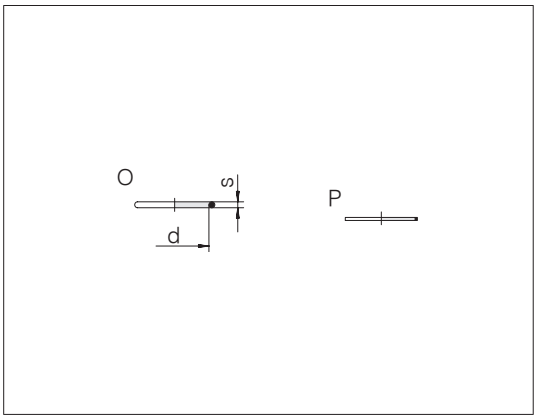
Sealing rings



Sealing rings for ES-4 cutting rings

- O-Ring for inner sector
- Moulded seal for the outer cone

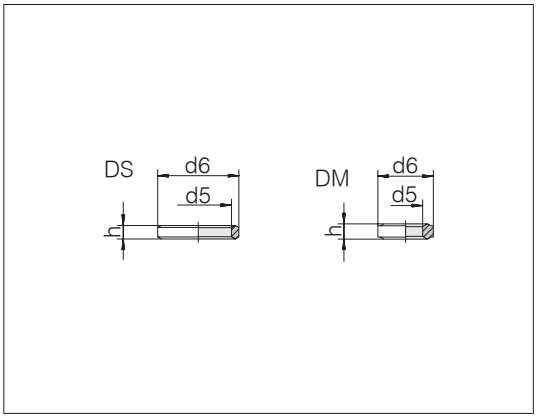
Standard material for moulded seals and O-rings is FKM



Series Tube OD	d	s	Order-No.	Designation O	Order-No.	Designation P
L 6	6	1	0907329783	GP-ES4OR-6x1-FKM80	0912009783	GP-ES4MS-6-FKM80
L 8	8	1	0907609783	GP-ES4OR-8x1-FKM80	0912019783	GP-ES4MS-8-FKM80
L 10	10	1	0908909783	GP-ES4OR-10x1-FKM80	0912029783	GP-ES4MS-10-FKM80
L 12	12	1	0908919783	GP-ES4OR-12x1-FKM80	0912039783	GP-ES4MS-12-FKM80
L 15	15	1	0908889783	GP-ES4OR-15x1-FKM80	0912059783	GP-ES4MS-15-FKM80
L 18	18	1	0908989783	GP-ES4OR-18x1-FKM80	0912079783	GP-ES4MS-18-FKM80
L 22	22	1	0908999783	GP-ES4OR-22x1-FKM80	0912099783	GP-ES4MS-22-FKM80
L 28	28	1	0908879783	GP-ES4OR-28x1-FKM80	0912119783	GP-ES4MS-28-FKM80
L 35	35	1	0908869783	GP-ES4OR-35x1-FKM80	0912139783	GP-ES4MS-35-FKM80
L 42	42	1	0908859783	GP-ES4OR-42x1-FKM80	0912159783	GP-ES4MS-42-FKM80
S 6	6	1	0907329783	GP-ES4OR-6x1-FKM80	0912009783	GP-ES4MS-6-FKM80
S 8	8	1	0907609783	GP-ES4OR-8x1-FKM80	0912019783	GP-ES4MS-8-FKM80
S 10	10	1	0908909783	GP-ES4OR-10x1-FKM80	0912029783	GP-ES4MS-10-FKM80
S 12	12	1	0908919783	GP-ES4OR-12x1-FKM80	0912039783	GP-ES4MS-12-FKM80
S 14	14	1	0908929783	GP-ES4OR-14x1-FKM80	0912049783	GP-ES4MS-14-FKM80
S 16	16	1	0908939783	GP-ES4OR-16x1-FKM80	0912069783	GP-ES4MS-16-FKM80
S 20	20	1	0908949783	GP-ES4OR-20x1-FKM80	0912089783	GP-ES4MS-20-FKM80
S 25	25	1	0908959783	GP-ES4OR-25x1-FKM80	0912109783	GP-ES4MS-25-FKM80
S 30	30	1	0908969783	GP-ES4OR-30x1-FKM80	0912129783	GP-ES4MS-30-FKM80
S 38	38	1	0908979783	GP-ES4OR-38x1-FKM80	0912149783	GP-ES4MS-38-FKM80

Sealing rings (seal-edge rings for banjo and gauge couplings)

- Sealing-edge ring for banjo couplings for external thread (DS)
- Sealing-edge ring for gauge couplings for internal thread (DM)



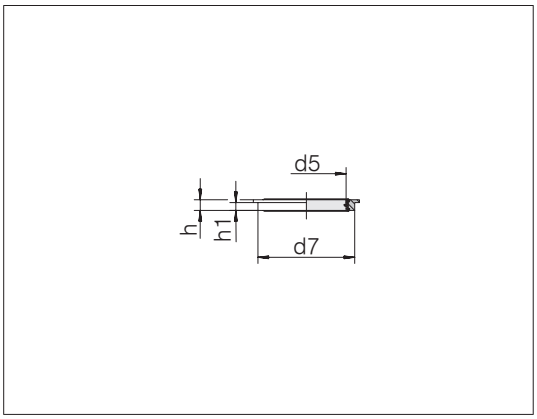
d2	d5	d6	h	Style	kg/100 ca.	Order-No.	Designation
M 8 x 1	8.1	12	2.5	DS	0.1	0080692100	GP-SR-M8B-H2,5-C21
M 10 x 1	10.1	14	2.5	DS	0.1	0080702100	GP-SR-M10B-H2,5-C21
M 12 x 1.5	12.1	17	3	DS	0.2	0080712100	GP-SR-M12B-H3-C21
M 14 x 1.5	14.1	19	3	DS	0.2	0080722100	GP-SR-M14B-H3-C21
M 16 x 1.5	16.1	21	3	DS	0.3	0080732100	GP-SR-M16B-H3-C21
M 18 x 1.5	18.1	23	3	DS	0.3	0080742100	GP-SR-M18B-H3-C21
M 20 x 1.5	20.1	25	3	DS	0.3	0080752100	GP-SR-M20B-H3-C21
M 22 x 1.5	22.1	27	4.5	DS	0.6	0080142100	GP-SR-M22B-H4,5-C21
M 26 x 1.5	26.15	31	3.5	DS	0.5	0080772100	GP-SR-M26B-H3,5-C21
M 27 x 2	27.15	32	3.5	DS	0.5	0080782100	GP-SR-M27B-H3,5-C21
M 33 x 2	33.15	39	3.5	DS	0.7	0080792100	GP-SR-M33B-H3,5-C21
M 42 x 2	42.05	49	3.5	DS	1.0	0080882100	GP-SR-G11/4B-H3,5-C21
M 48 x 2	48	55	3.5	DS	1.2	0080892100	GP-SR-G11/2B-H3,5-C21
G 1/8 A	9.8	14	2.5	DS	0.1	0080822100	GP-SR-G1/8B-H2,5-C21
G 1/4 A	5.8	11.2	4.6	DM	0.2	0080562100	GP-SR-IG1/4B-H4,6-C21
G 1/4 A	13.25	18	3	DS	0.2	0080832100	GP-SR-G1/4B-H3-C21
G 3/8 A	16.75	22	3	DS	0.3	0080842100	GP-SR-G3/8B-H3-C21
G 1/2 A	11	18.3	5.2	DM	0.6	0080582100	GP-SR-IG1/2B-H5,2-C21
G 1/2 A	21.1	26	4.5	DS	0.5	0080852100	GP-SR-G1/2B-H4,5-C21
G 3/4 A	26.6	32	3.5	DS	0.6	0080862100	GP-SR-G3/4B-H3,5-C21
G 1 A	33.4	39	3.5	DS	0.7	0080872100	GP-SR-G1B-H3,5-C21
G 1 1/4 A	42.05	49	3.5	DS	1.0	0080882100	GP-SR-G11/4B-H3,5-C21
G 1 1/2 A	48	55	3.5	DS	1.2	0080892100	GP-SR-G11/2B-H3,5-C21

Example for comp. :
DKA10X

Sealing rings for banjo couplings

Soft seal ring for eccentric banjo couplings for external thread

Standard soft seal ring material is NBR



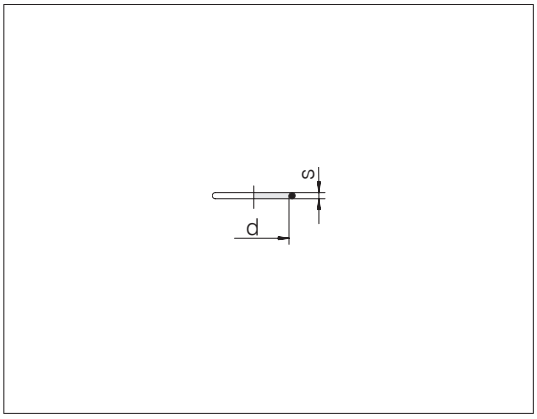
d2	d5	d7	h	h1	kg/100 ca.	Order-No.	Designation
M 10 x 1	10.2	14.9	2.5	1.1	0.2	0090509900	GP-SR-M10-G1/8E
M 12 x 1.5	12.2	17	3	1.6	0.2	0090519900	GP-SR-M12E
M 14 x 1.5	14.2	18.9	3	1.6	0.2	0090529900	GP-SR-M14E
M 16 x 1.5	16.9	21.9	3	2.1	0.3	0090539900	GP-SR-M16-G3/8E
M 18 x 1.5	18.2	23.9	3		0.4	0090549900	GP-SR-M18E
M 22 x 1.5	22.2	26.9	4.5	2.6	0.7	0090569900	GP-SR-M22-G1/2E
M 26 x 1.5	26.2	31.9	3.5	2.6	0.6	0090579900	GP-SR-M26E
M 27 x 2	27.2	32.9	3.5	2.6	0.7	0090589900	GP-SR-M27-G3/4E
M 33 x 2	33.5	39.9	3.5	2.6	0.9	0090599900	GP-SR-M33-G1E
M 42 x 2	42.3	49.9	3.5		1.2	0090609900	GP-SR-M42-G11/4E
M 48 x 2	48.3	55.9	3.5	2.6	1.6	0090619900	GP-SR-M48-G11/2E
G 1/8 A	10.2	14.9	2.5	1.1	0.2	0090509900	GP-SR-M10-G1/8E
G 1/4 A	14.2	18.9	3	1.6	0.2	0090489900	GP-SR-G1/4E
G 3/8 A	16.9	21.9	3	2.1	0.3	0090539900	GP-SR-M16-G3/8E
G 1/2 A	22.2	26.9	4.5	2.6	0.7	0090569900	GP-SR-M22-G1/2E
G 3/4 A	27.2	32.9	3.5	2.6	0.7	0090589900	GP-SR-M27-G3/4E
G 1 A	33.5	39.9	3.5	2.6	0.9	0090599900	GP-SR-M33-G1E
G 1 1/4 A	42.3	49.9	3.5		1.2	0090609900	GP-SR-M42-G11/4E
G 1 1/2 A	48.3	55.9	3.5	2.6	1.6	0090619900	GP-SR-M48-G11/2E

Example for comp. :
KDS10X

Sealing rings for banjo couplings

O-ring for hollow screws on eccentric banjo couplings

standard O-ring material is NBR

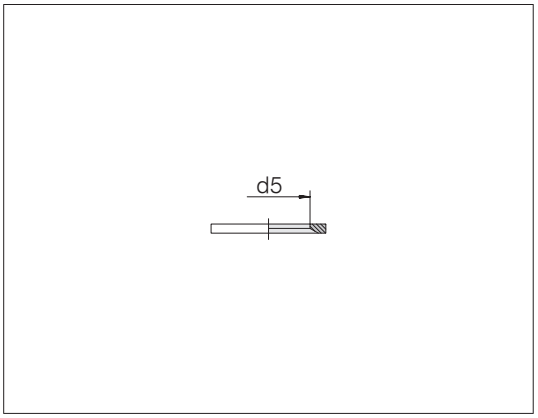


d2	O-ring d x s	Order-No.	Designation
M 10 x 1	8 x 1.5	0900049990	GP-OR-8x1,5-NBR90
M 12 x 1.5	10.5 x 1.5	0907529990	GP-OR-10,5x1,5-NBR90
M 14 x 1.5	12.5 x 1.5	0907649990	GP-OR-12,5x1,5-NBR90
M 16 x 1.5	14 x 1.5	0906029990	GP-OR-14x1,5-NBR90
M 18 x 1.5	16 x 1.5	0906629990	GP-OR-16x1,5-NBR90
M 22 x 1.5	20 x 1.5	0907659990	GP-OR-20x1,5-NBR90
M 26 x 1.5	23 x 2	0900909990	GP-OR-23x2-NBR90
M 27 x 2	24 x 2	0907539990	GP-OR-24x2-NBR90
M 33 x 2	29 x 2.5	0906639990	GP-OR-29x2,5-NBR90
M 42 x 2	38 x 2.5	0900949990	GP-OR-38x2,5-NBR90
M 48 x 2	43 x 3	0900789990	GP-OR-43x3-NBR90
G 1/8 A	8 x 1.5	0900049990	GP-OR-8x1,5-NBR90
G 1/4 A	12.5 x 1.5	0907649990	GP-OR-12,5x1,5-NBR90
G 3/8 A	15 x 1.5	0900889990	GP-OR-15x1,5-NBR90
G 1/2 A	19 x 1.5	0900899990	GP-OR-19x1,5-NBR90
G 3/4 A	24 x 2	0907539990	GP-OR-24x2-NBR90
G 1 A	29 x 2.5	0906639990	GP-OR-29x2,5-NBR90
G 1 1/4 A	38 x 2.5	0900949990	GP-OR-38x2,5-NBR90
G 1 1/2 A	43 x 3	0900789990	GP-OR-43x3-NBR90

Sealing rings for threaded studs according to

ISO 9974-2 Form E (metric)
ISO 1179-2 Form E (BSPP)

The standard material of the profile sealing rings PEFLEX is NBR



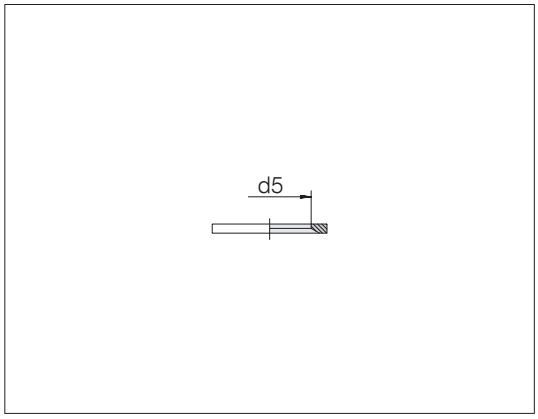
Male thread d2	PEFLEX d5	Order-No.	Designation
M 10 x 1	8.4	0905229900	GP-PEFLEX-M10-G1/8-NBR85
M 12 x 1.5	9.8	0905019900	GP-PEFLEX-M12-NBR85
M 14 x 1.5	11.6	0905029900	GP-PEFLEX-M14-G1/4-NBR85
M 16 x 1.5	13.8	0905039900	GP-PEFLEX-M16-NBR85
M 18 x 1.5	15.7	0905059900	GP-PEFLEX-M18-NBR85
M 20 x 1.5	17.8	0905069900	GP-PEFLEX-M20-NBR85
M 22 x 1.5	19.6	0905089900	GP-PEFLEX-M22-NBR85
M 26 x 1.5	23.9	0905109900	GP-PEFLEX-M26-M27-G3/4-NBR85
M 27 x 2	23.9	0905109900	GP-PEFLEX-M26-M27-G3/4-NBR85
M 33 x 2	29.7	0905119900	GP-PEFLEX-M33-G1-NBR85
M 42 x 2	38.8	0905129900	GP-PEFLEX-M42-G11/4-NBR85
M 48 x 2	44.7	0905139900	GP-PEFLEX-M48-G11/2-NBR85
G 1/8 A	8.4	0905229900	GP-PEFLEX-M10-G1/8-NBR85
G 1/4 A	11.6	0905029900	GP-PEFLEX-M14-G1/4-NBR85
G 3/8 A	14.7	0905049900	GP-PEFLEX-G3/8-NBR85
G 1/2 A	18.5	0905079900	GP-PEFLEX-G1/2-NBR85
G 3/4 A	23.9	0905109900	GP-PEFLEX-M26-M27-G3/4-NBR85
G 1 A	29.7	0905119900	GP-PEFLEX-M33-G1-NBR85
G 1 1/4 A	38.8	0905129900	GP-PEFLEX-M42-G11/4-NBR85
G 1 1/2 A	44.7	0905139900	GP-PEFLEX-M48-G11/2-NBR85
G 2 A	56.7	0905149900	GP-PEFLEX-M60-G2-NBR85

Example for comp. :
ED10X1X

Sealing rings for threaded studs according to

ISO 9974-2 Form E (metric)
ISO 1179-2 Form E (BSPP)

The alternative material of the profile sealing rings PEFLEX is FKM



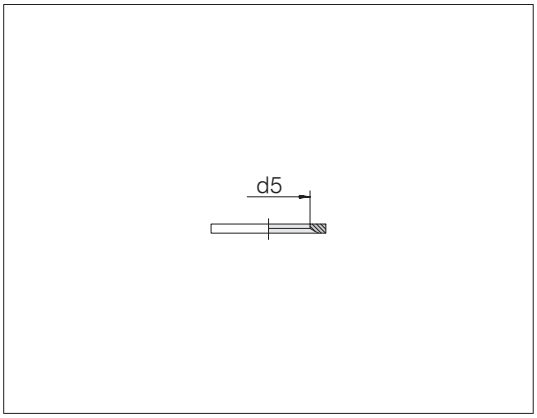
Male thread d2	PEFLEX d5	Order-No.	Designation
M 10 x 1	8.4	0905229700	GP-PEFLEX-M10-G1/8-FKM80
M 12 x 1.5	9.8	0905019700	GP-PEFLEX-M12-FKM80
M 14 x 1.5	11.6	0905029700	GP-PEFLEX-M14-G1/4-FKM80
M 16 x 1.5	13.8	0905039700	GP-PEFLEX-M16-FKM80
M 18 x 1.5	15.7	0905059700	GP-PEFLEX-M18-FKM80
M 20 x 1.5	17.8	0905069700	GP-PEFLEX-M20-FKM80
M 22 x 1.5	19.6	0905089700	GP-PEFLEX-M22-FKM80
M 26 x 1.5	23.9	0905109700	GP-PEFLEX-M26-M27-G3/4-FKM80
M 27 x 2	23.9	0905109700	GP-PEFLEX-M26-M27-G3/4-FKM80
M 33 x 2	29.7	0905119700	GP-PEFLEX-M33-G1-FKM80
M 42 x 2	38.8	0905129700	GP-PEFLEX-M42-G11/4-FKM80
M 48 x 2	44.7	0905139700	GP-PEFLEX-M48-G11/2-FKM80
G 1/8 A	8.4	0905229700	GP-PEFLEX-M10-G1/8-FKM80
G 1/4 A	11.6	0905029700	GP-PEFLEX-M14-G1/4-FKM80
G 3/8 A	14.7	0905049700	GP-PEFLEX-G3/8-FKM80
G 1/2 A	18.5	0905079700	GP-PEFLEX-G1/2-FKM80
G 3/4 A	23.9	0905109700	GP-PEFLEX-M26-M27-G3/4-FKM80
G 1 A	29.7	0905119700	GP-PEFLEX-M33-G1-FKM80
G 1 1/4 A	38.8	0905129700	GP-PEFLEX-M42-G11/4-FKM80
G 1 1/2 A	44.7	0905139700	GP-PEFLEX-M48-G11/2-FKM80
G 2 A	56.7	0905149700	GP-PEFLEX-M60-G2-FKM80

Example for comp. :
ED10X1X

Sealing rings for threaded studs according to

ISO 9974-2 Form E (metric)
ISO 1179-2 Form E (BSPP)

The alternative material of the profile sealing rings PEFLEX is EPDM



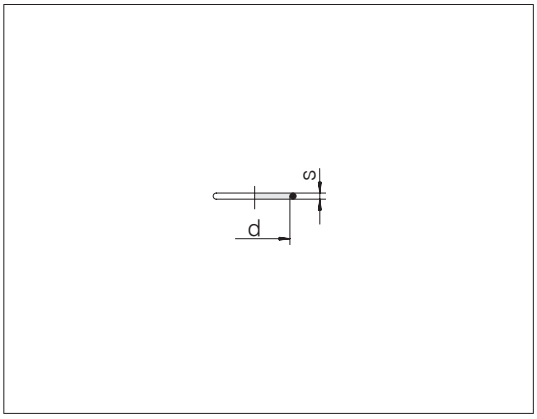
Male thread d2	PEFLEX d5	Order-No.	Designation
M 10 x 1	8.4	0905229676	GP-PEFLEX-M10-G1/8-EPDM85
M 12 x 1.5	9.8	0905019676	GP-PEFLEX-M12-EPDM85
M 14 x 1.5	11.6	0905029676	GP-PEFLEX-M14-G1/4-EPDM85
M 16 x 1.5	13.8	0905039676	GP-PEFLEX-M16-EPDM85
M 18 x 1.5	15.7	0905059676	GP-PEFLEX-M18-EPDM85
M 20 x 1.5	17.8	0905069676	GP-PEFLEX-M20-EPDM85
M 22 x 1.5	19.6	0905089676	GP-PEFLEX-M22-EPDM85
M 26 x 1.5	23.9	0905109676	GP-PEFLEX-M26-M27-G3/4-EPDM85
M 27 x 2	23.9	0905109676	GP-PEFLEX-M26-M27-G3/4-EPDM85
M 33 x 2	29.7	0905119676	GP-PEFLEX-M33-G1-EPDM85
M 42 x 2	38.8	0905129676	GP-PEFLEX-M42-G11/4-EPDM85
M 48 x 2	44.7	0905139676	GP-PEFLEX-M48-G11/2-EPDM85
G 1/8 A	8.4	0905229676	GP-PEFLEX-M10-G1/8-EPDM85
G 1/4 A	11.6	0905029676	GP-PEFLEX-M14-G1/4-EPDM85
G 3/8 A	14.7	0905049676	GP-PEFLEX-G3/8-EPDM85
G 1/2 A	18.5	0905079676	GP-PEFLEX-G1/2-EPDM85
G 3/4 A	23.9	0905109676	GP-PEFLEX-M26-M27-G3/4-EPDM85
G 1 A	29.7	0905119676	GP-PEFLEX-M33-G1-EPDM85
G 1 1/4 A	38.8	0905129676	GP-PEFLEX-M42-G11/4-EPDM85
G 1 1/2 A	44.7	0905139676	GP-PEFLEX-M48-G11/2-EPDM85

Example for comp. :
ED10X1X

Sealing rings for threaded studs according to

I SO 6149-2 / -3 Form E (metric)
ISO 11926-2 / -3 Form F (UN/UNF)

The standard material of the O-rings is NBR

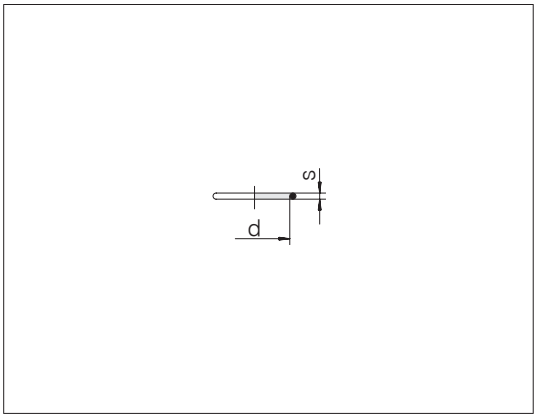


Male thread d2	O-ring d x s	Order-No.	Designation
M 10 x 1	8.1 x 1.6	0908289990	GP-OR-8,1x1,6-NBR90
M 12 x 1.5	9.3 x 2.2	0908299990	GP-OR-9,3x2,2-NBR90
M 14 x 1.5	11.3 x 2.2	0908309990	GP-OR-11,3x2,2-NBR90
M 16 x 1.5	13.3 x 2.2	0908319990	GP-OR-13,3x2,2-NBR90
M 18 x 1.5	15.3 x 2.2	0908329990	GP-OR-15,3x2,2-NBR90
M 22 x 1.5	19.3 x 2.2	0908339990	GP-OR-19,3x2,2-NBR90
M 26 x 1.5	22.7 x 2.8	0907799990	GP-OR-22,7x2,8-NBR90
M 27 x 2	23.6 x 2.9	0908349990	GP-OR-23,6x2,9-NBR90
M 33 x 2	29.6 x 2.9	0908359990	GP-OR-29,6x2,9-NBR90
M 42 x 2	38.6 x 2.9	0908369990	GP-OR-38,6x2,9-NBR90
M 48 x 2	44.6 x 2.9	0908379990	GP-OR-44,6x2,9-NBR90
7/16-20 UNF-2A	9.17 x 1.83	0900239990	GP-OR-9,17x1,83-NBR90
1/2-20 UNF-2A	10.52 x 1.83	0900259990	GP-OR-10,52x1,83-NBR90
9/16-18 UNF-2A	11.89 x 1.98	0900269990	GP-OR-11,89x1,98-NBR90
3/4-16 UNF-2A	16.36 x 2.21	0900279990	GP-OR-16,36x2,21-NBR90
7/8-14 UNF-2A	19.18 x 2.46	0900289990	GP-OR-19,18x2,46-NBR90
1 1/16-12 UN-2A	23.47 x 2.95	0900299990	GP-OR-23,47x2,95-NBR90
1 3/16-12 UN-2A	26.62 x 2.95	0900309990	GP-OR-26,62x2,95-NBR90
1 5/16-12 UN-2A	29.74 x 2.95	0900319990	GP-OR-29,74x2,95-NBR90
1 5/8-12 UN-2A	37.47 x 3	0900329990	GP-OR-37,47x3-NBR90
1 7/8-12 UN-2A	43.69 x 3	0900339990	GP-OR-43,69x3-NBR90

Sealing rings for threaded studs according to

ISO 6149-2 / -3 Form F (metric)
ISO 11926-2 / -3 Form F (UN/UNF)

The standard material of the O-rings is FKM

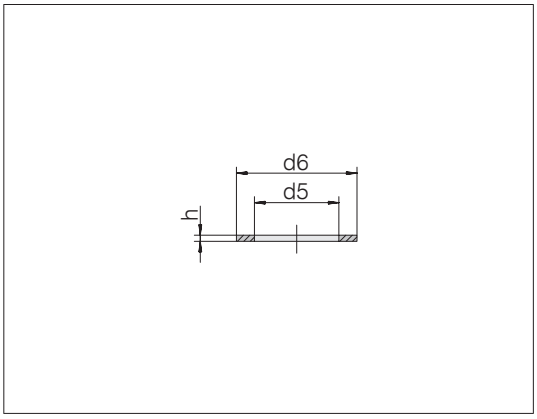


Male thread d2	O-ring d x s	Order-No.	Designation
M 10 x 1	8.1 x 1.6	0908289780	GP-OR-8,1x1,6-FKM80
M 12 x 1.5	9.3 x 2.2	0908299780	GP-OR-9,3x2,2-FKM80
M 14 x 1.5	11.3 x 2.2	0908309780	GP-OR-11,3x2,2-FKM80
M 16 x 1.5	13.3 x 2.2	0908319780	GP-OR-13,3x2,2-FKM80
M 18 x 1.5	15.3 x 2.2	0908329780	GP-OR-15,3x2,2-FKM80
M 22 x 1.5	19.3 x 2.2	0908339780	GP-OR-19,3x2,2-FKM80
M 27 x 2	23.6 x 2.9	0908349780	GP-OR-23,6x2,9-FKM80
M 33 x 2	29.6 x 2.9	0908359780	GP-OR-29,6x2,9-FKM80
M 42 x 2	38.6 x 2.9	0908369780	GP-OR-38,6x2,9-FKM80
M 48 x 2	44.6 x 2.9	0908379780	GP-OR-44,6x2,9-FKM80
7/16-20 UNF-2A	9.17 x 1.83	0900239700	GP-OR-9,17x1,83-FKM80
1/2-20 UNF-2A	10.52 x 1.83	0900259700	GP-OR-10,52x1,83-FKM80
9/16-18 UNF-2A	11.89 x 1.98	0900269700	GP-OR-11,89x1,98-FKM80
3/4-16 UNF-2A	16.36 x 2.21	0900279700	GP-OR-16,36x2,21-FKM80
7/8-14 UNF-2A	19.18 x 2.46	0900289700	GP-OR-19,18x2,46-FKM80
1 1/16-12 UN-2A	23.47 x 2.95	0900299700	GP-OR-23,47x2,95-FKM80
1 3/16-12 UN-2A	26.62 x 2.95	0900309700	GP-OR-26,62x2,95-FKM80
1 5/16-12 UN-2A	29.74 x 2.95	0900319700	GP-OR-29,74x2,95-FKM80
1 5/8-12 UN-2A	37.47 x 3	0900329700	GP-OR-37,47x3-FKM80
1 7/8-12 UN-2A	43.69 x 3	0900339700	GP-OR-43,69x3-FKM80

Sealing rings for threaded studs according to

DIN 3852-1 Form A (metric)
DIN 3852-2 Form A (BSPP)

The standard material of the sealing rings is copper



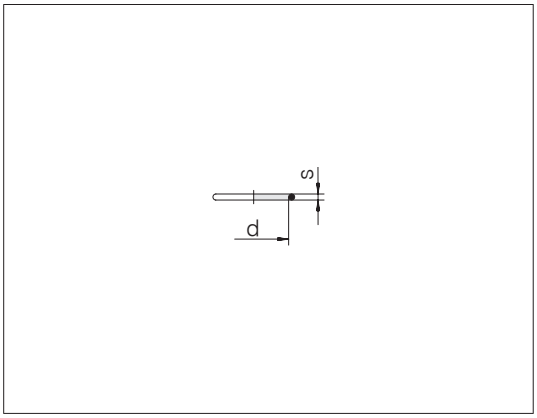
Male connector	d5	d6	h	kg/100 ca.	Order-No.	Designation
M 10 x 1 / G 1/8 A	10.2	13.9	1	0.1	0082115900	GP-SR-A10x14-CO-7603-PU100
M 12 x 1.5	12.2	16.9	1.5	0.1	7004600100	GP-SR-A12x17-CO-7603-PU100
M 14 x 1.5	14.2	17.9	1.5	0.1	7004600200	GP-SR-A14x18-CO-7603-PU100
M 16 x 1.5	16.2	19.9	1.5	0.1	7004600300	GP-SR-A16x20-CO-7603-PU100
M 18 x 1.5	18.2	21.9	1.5	0.2	7004600400	GP-SR-A18x22-CO-7603-PU50
M 22 x 1.5	22.2	26.9	1.5	0.2	7004600500	GP-SR-A22x27-CO-7603-PU50
M 26 x 1.5	26.3	30.9	2	0.4	7004600600	GP-SR-A26x31-CO-7603-PU25
M 27 x 2	27.3	31.9	2	0.4	7004600800	GP-SR-A27x32-CO-7603-PU25
M 33 x 2 / G 1 A	33.3	38.9	2	0.5	0082585900	GP-SR-A33x39-CO-7603-PU25
M 42 x 2 / G 1 1/4 A	42.3	48.9	2	0.8	0082665900	GP-SR-A42x49-CO-7603-PU25
M 48 x 2 / G 1 1/2 A	48.3	54.9	2	0.9	0082705900	GP-SR-A48x55-CO-7603-PU25
G 1/4 A	13.3	17.9	1.5	0.1	7001613800	GP-SR-A13,3x17,9x1,5-CO-PU100
G 3/8 A	17.2	20.9	1.5	0.1	7003166000	GP-SR-A17x21-CO-7603-PU50
G 1/2 A	21.2	25.9	1.5	0.2	0082385900	GP-SR-A21x26-CO-7603-PU50
G 3/4 A	26.6	31.9	2	0.4	7001613900	GP-SR-A26,6x31,9x2-CO-PU25

The order is placed in packaging units, for example PU100=packing unit 100 pieces.

Sealing rings for conical seals (DKO), flared cone and welded cone couplings

Standard material for O-rings for flared cone and welded cone couplings is NBR

Alternative material for O rings for DKO couplings is NBR

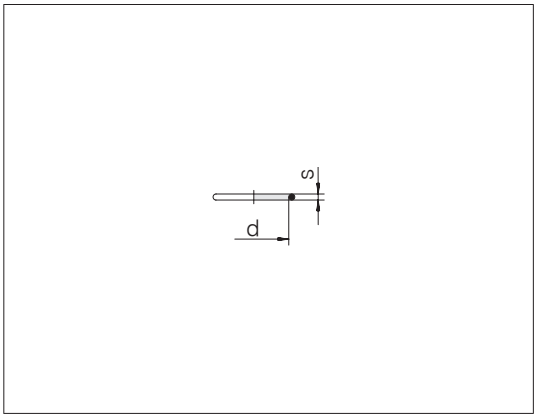


Series Tube OD	d x s	Order-No.	Designation
L 6	4 x 1.5	0900009900	GP-OR-4x1,5-NBR80
L 8	6 x 1.5	0900029900	GP-OR-6x1,5-NBR80
L 10	7.5 x 1.5	0900419900	GP-OR-7,5x1,5-NBR80
L 12	9 x 1.5	0900429900	GP-OR-9x1,5-NBR80
L 15	12 x 2	0900449900	GP-OR-12x2-NBR80
L 18	15 x 2	0900389900	GP-OR-15x2-NBR80
L 22	20 x 2	0906199900	GP-OR-20x2-NBR80
L 28	26 x 2	0906589900	GP-OR-26x2-NBR80
L 35	32 x 2.5	0900929900	GP-OR-32x2,5-NBR80
L 42	38 x 2.5	0900949900	GP-OR-38x2,5-NBR80
S 6	4 x 1.5	0900009900	GP-OR-4x1,5-NBR80
S 8	6 x 1.5	0900029900	GP-OR-6x1,5-NBR80
S 10	7.5 x 1.5	0900419900	GP-OR-7,5x1,5-NBR80
S 12	9 x 1.5	0900429900	GP-OR-9x1,5-NBR80
S 14	10 x 2	0900439900	GP-OR-10x2-NBR80
S 16	12 x 2	0900449900	GP-OR-12x2-NBR80
S 20	16.3 x 2.4	0900459900	GP-OR-16,3x2,4-NBR80
S 25	20.3 x 2.4	0900469900	GP-OR-20,3x2,4-NBR80
S 30	25.3 x 2.4	0900479900	GP-OR-25,3x2,4-NBR80
S 38	33.3 x 2.4	0900489900	GP-OR-33,3x2,4-NBR80

Sealing rings for conical seals (DKO), flared cone and welded cone couplings

Standard material for O-rings for DKO couplings is FKM

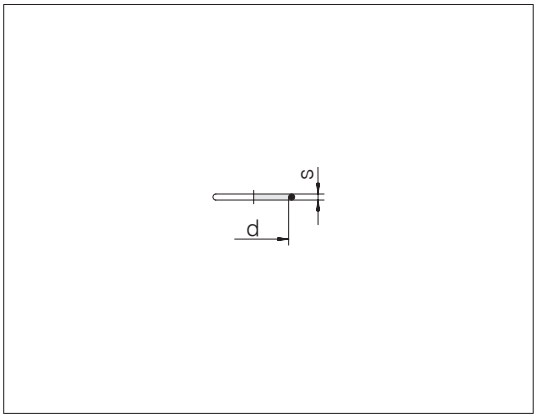
Alternative material for O-rings for flared cone and welded cone couplings is FKM



Series Tube OD	d x s	Order-No.	Designation
L 6	4 x 1.5	0900009700	GP-OR-4x1,5-FKM80
L 8	6 x 1.5	0900029700	GP-OR-6x1,5-FKM80
L 10	7.5 x 1.5	0900419700	GP-OR-7,5x1,5-FKM80
L 12	9 x 1.5	0900429700	GP-OR-9x1,5-FKM80
L 15	12 x 2	0900449700	GP-OR-12x2-FKM80
L 18	15 x 2	0900389700	GP-OR-15x2-FKM80
L 22	20 x 2	0906199700	GP-OR-20x2-FKM80
L 28	26 x 2	0906589700	GP-OR-26x2-FKM80
L 35	32 x 2.5	0900929700	GP-OR-32x2,5-FKM80
L 42	38 x 2.5	0900949700	GP-OR-38x2,5-FKM80
S 6	4 x 1.5	0900009700	GP-OR-4x1,5-FKM80
S 8	6 x 1.5	0900029700	GP-OR-6x1,5-FKM80
S 10	7.5 x 1.5	0900419700	GP-OR-7,5x1,5-FKM80
S 12	9 x 1.5	0900429700	GP-OR-9x1,5-FKM80
S 14	10 x 2	0900439700	GP-OR-10x2-FKM80
S 16	12 x 2	0900449700	GP-OR-12x2-FKM80
S 20	16.3 x 2.4	0900459700	GP-OR-16,3x2,4-FKM70
S 25	20.3 x 2.4	0900469700	GP-OR-20,3x2,4-FKM80
S 30	25.3 x 2.4	0900479700	GP-OR-25,3x2,4-FKM80
S 38	33.3 x 2.4	0900489700	GP-OR-33,3x2,4-FKM80

Sealing rings for conical seals (DKO), flared cone and welded cone couplings

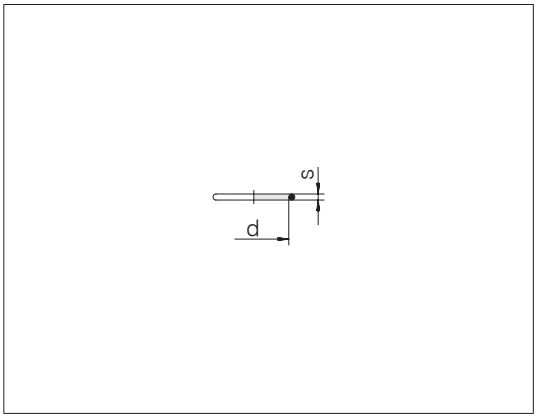
Alternative O-ring material is EPDM



Series Tube OD	d x s	Order-No.	Designation
L 6	4 x 1.5	0900009676	GP-OR-4x1,5-EPDM80
L 8	6 x 1.5	0900029676	GP-OR-6x1,5-EPDM80
L 10	7.5 x 1.5	0900419676	GP-OR-7,5x1,5-EPDM80
L 12	9 x 1.5	0900429676	GP-OR-9x1,5-EPDM80
L 15	12 x 2	0900449676	GP-OR-12x2-EPDM80
L 18	15 x 2	0900389676	GP-OR-15x2-EPDM80
L 22	20 x 2	0906199676	GP-OR-20x2-EPDM80
L 28	26 x 2	0906589676	GP-OR-26x2-EPDM80
L 35	32 x 2.5	0900929676	GP-OR-32x2,5-EPDM80
L 42	38 x 2.5	0900949676	GP-OR-38x2,5-EPDM80
S 6	4 x 1.5	0900009676	GP-OR-4x1,5-EPDM80
S 8	6 x 1.5	0900029676	GP-OR-6x1,5-EPDM80
S 10	7.5 x 1.5	0900419676	GP-OR-7,5x1,5-EPDM80
S 12	9 x 1.5	0900429676	GP-OR-9x1,5-EPDM80
S 14	10 x 2	0900439676	GP-OR-10x2-EPDM80
S 16	12 x 2	0900449676	GP-OR-12x2-EPDM80
S 20	16.3 x 2.4	0900459676	GP-OR-16,3x2,4-EPDM80
S 25	20.3 x 2.4	0900469676	GP-OR-20,3x2,4-EPDM80
S 30	25.3 x 2.4	0900479676	GP-OR-25,3x2,4-EPDM80
S 38	33.3 x 2.4	0900489676	GP-OR-33,3x2,4-EPDM80

Sealing rings for flange couplings

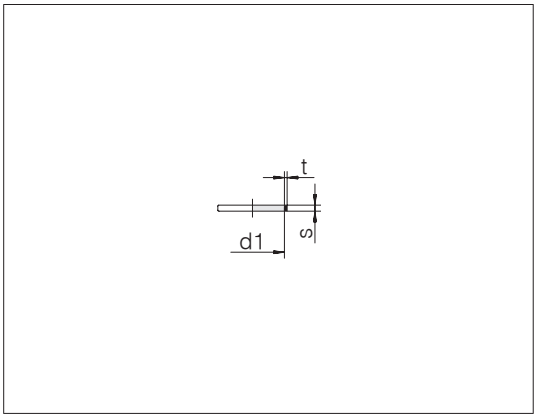
Standard material of O-rings is NBR



Series Tube OD	Hole circle diameter	Fl. size	d x s	Order-No.	Designation
L 10	35		20 x 2.5	0906599990	GP-OR-20x2,5-NBR90
L 12	35		20 x 2.5	0906599990	GP-OR-20x2,5-NBR90
L 15	35		20 x 2.5	0906599990	GP-OR-20x2,5-NBR90
L 15	40		26 x 2.5	0900189990	GP-OR-26x2,5-NBR90
L 18	40		26 x 2.5	0900189990	GP-OR-26x2,5-NBR90
L 18		3/4	24.99 x 3.53	0906719990	GP-OR-24,99x3,53-NBR90
L 22	40		26 x 2.5	0900189990	GP-OR-26x2,5-NBR90
L 22		3/4	24.99 x 3.53	0906719990	GP-OR-24,99x3,53-NBR90
L 28		1	32.92 x 3.53	0906729990	GP-OR-32,92x3,53-NBR90
L 28	40		26 x 2.5	0900189990	GP-OR-26x2,5-NBR90
L 28	55		32 x 2.5	0900929990	GP-OR-32x2,5-NBR90
L 35	55		32 x 2.5	0900929990	GP-OR-32x2,5-NBR90
L 42		1 1/2	47.22 x 3.53	0906549990	GP-OR-47,22x3,53-NBR90
S 12	35		20 x 2.5	0906599990	GP-OR-20x2,5-NBR90
S 16	35		20 x 2.5	0906599990	GP-OR-20x2,5-NBR90
S 16		1/2	18.64 x 3.53	0906749990	GP-OR-18,64x3,53-NBR90
S 16		3/4	24.99 x 3.53	0906719990	GP-OR-24,99x3,53-NBR90
S 20		3/4	24.99 x 3.53	0906719990	GP-OR-24,99x3,53-NBR90
S 20	35		20 x 2.5	0906599990	GP-OR-20x2,5-NBR90
S 20	40		26 x 2.5	0900189990	GP-OR-26x2,5-NBR90
S 20	55		32 x 2.5	0900929990	GP-OR-32x2,5-NBR90
S 25	55		32 x 2.5	0900929990	GP-OR-32x2,5-NBR90
S 25		3/4	24.99 x 3.53	0906719990	GP-OR-24,99x3,53-NBR90
S 30	55		32 x 2.5	0900929990	GP-OR-32x2,5-NBR90
S 30		1	32.92 x 3.53	0906729990	GP-OR-32,92x3,53-NBR90
S 38		1 1/2	47.22 x 3.53	0906549990	GP-OR-47,22x3,53-NBR90

Sealing rings for VOSS*Form*^{SQR} tube couplings

Standard moulded seal material is FKM

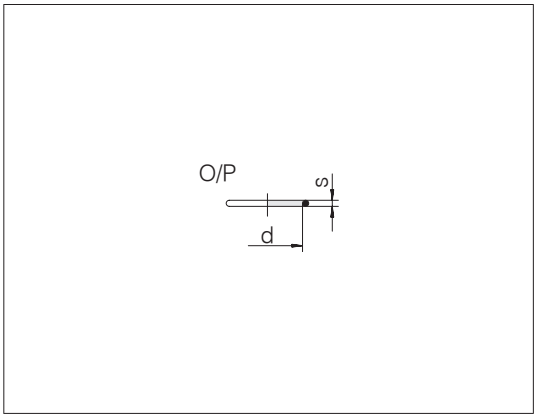


Series Tube OD	d1 x s	t	Order-No.	Designation
L/S 6	6 x 1.8	0.7	0912309790	24-SQRMS-L/S6-FKM90
L/S 8	8 x 1.8	0.7	0912319790	24-SQRMS-L/S8-FKM90
L/S 10	10 x 2	0.7	0912329790	24-SQRMS-L/S10-FKM90
L/S 12	12 x 2	0.7	0912339790	24-SQRMS-L/S12-FKM90
L 15	15 x 2	0.7	0912349790	24-SQRMS-L15-FKM90
L 18	18 x 2	0.7	0912359790	24-SQRMS-L18-FKM90
L 22	22 x 2	0.7	0912369790	24-SQRMS-L22-FKM90
L 28	28 x 2	0.7	0912379790	24-SQRMS-L28-FKM90
L 35	35 x 2.6	0.9	0912389790	24-SQRMS-L35-FKM90
L 42	42 x 2.6	0.9	0912399790	24-SQRMS-L42-FKM90
S 14	14 x 2	0.7	0912409790	24-SQRMS-S14-FKM90
S 16	16 x 2	0.7	0912419790	24-SQRMS-S16-FKM90
S 20	20 x 2.5	0.9	0912429790	24-SQRMS-S20-FKM90
S 25	25 x 2.5	0.9	0912439790	24-SQRMS-S25-FKM90
S 30	30 x 2.6	0.9	0912449790	24-SQRMS-S30-FKM90
S 38	38 x 2.6	0.9	0912459790	24-SQRMS-S38-FKM90

Sealing rings for 24/37° flare adapters

- O-ring (O) for the 24° taper
- O-ring (P) for the 37° taper

Alternative O-ring material is FKM

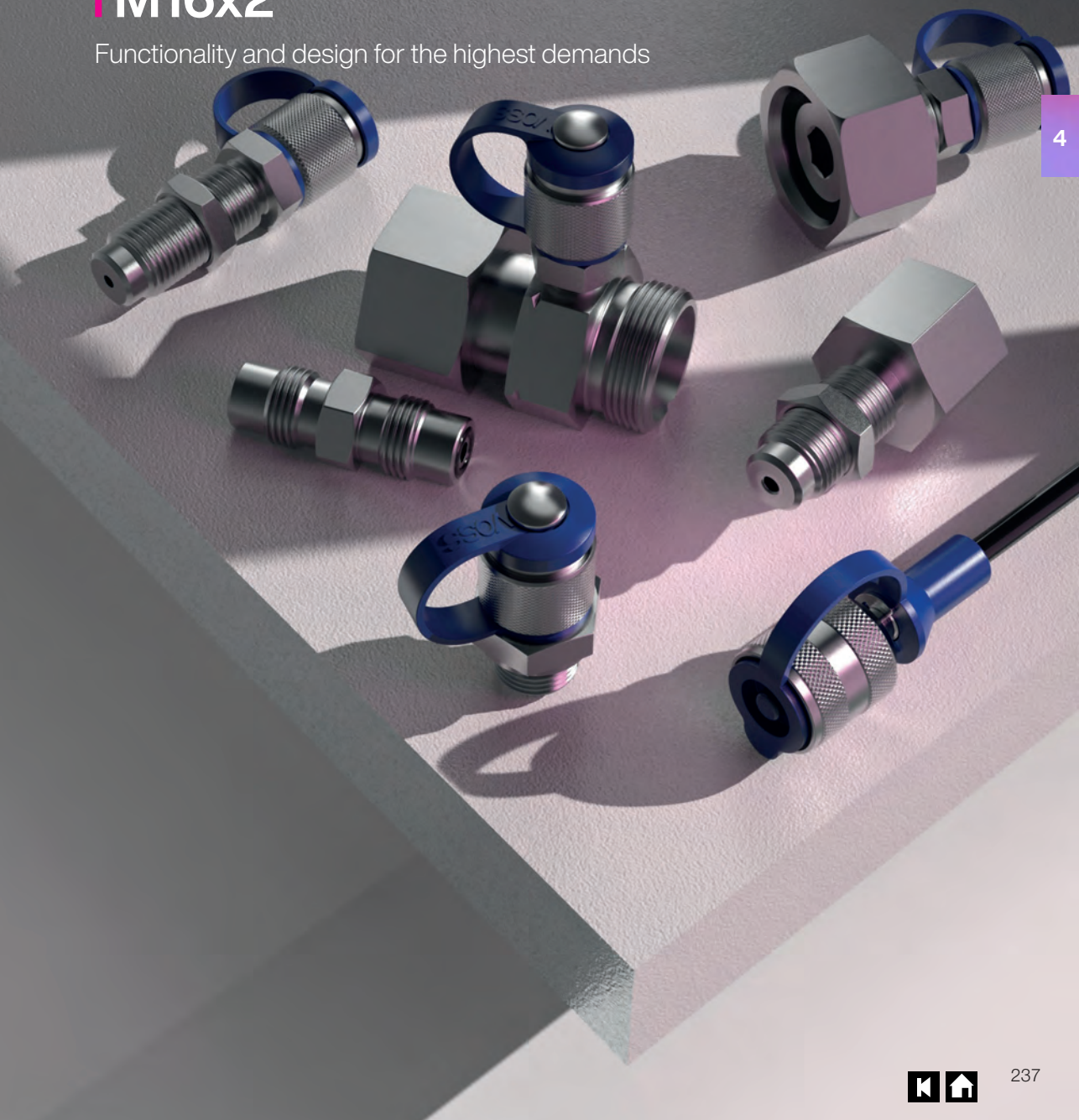


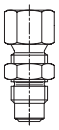
Series Tube OD	d x s	Order-No.	Designation O	d x s	Order-No.	Designation P
L 6	4 x 1.5	0900009700	GP-OR-4x1,5-FKM80	4.4 x 0.8	0901559700	GP-OR-4,4x0,8-FKM80
L 8	6 x 1.5	0900029700	GP-OR-6x1,5-FKM80	6 x 0.8	0901569700	GP-OR-6x0,8-FKM80
L 10	7.5 x 1.5	0900419700	GP-OR-7,5x1,5-FKM80	7.5 x 0.8	0901579700	GP-OR-7,5x0,8-FKM80
L 12	9 x 1.5	0900429700	GP-OR-9x1,5-FKM80	9.5 x 0.8	0901589700	GP-OR-9,5x0,8-FKM80
L 15	12 x 2	0900449700	GP-OR-12x2-FKM80	12.5 x 0.8	0901599700	GP-OR-12,5x0,8-FKM80
L 18	15 x 2	0900389700	GP-OR-15x2-FKM80	15 x 1	0908889700	GP-OR-15x1-FKM80
L 22	20 x 2	0906199700	GP-OR-20x2-FKM80	18 x 1	0908989700	GP-OR-18x1-FKM80
L 28	26 x 2	0906589700	GP-OR-26x2-FKM80	23 x 1	0901629700	GP-OR-23x1-FKM80
L 35	32 x 2.5	0900929700	GP-OR-32x2,5-FKM80	30 x 1	0908969700	GP-OR-30x1-FKM80
L 42	38 x 2.5	0900949700	GP-OR-38x2,5-FKM80	37 x 1	0901639700	GP-OR-37x1-FKM80
S 6	4 x 1.5	0900009700	GP-OR-4x1,5-FKM80	4.4 x 0.8	0901559700	GP-OR-4,4x0,8-FKM80
S 8	6 x 1.5	0900029700	GP-OR-6x1,5-FKM80	6 x 0.8	0901569700	GP-OR-6x0,8-FKM80
S 10	7.5 x 1.5	0900419700	GP-OR-7,5x1,5-FKM80	7.5 x 0.8	0901579700	GP-OR-7,5x0,8-FKM80
S 12	9 x 1.5	0900429700	GP-OR-9x1,5-FKM80	9.5 x 0.8	0901589700	GP-OR-9,5x0,8-FKM80
S 14	10 x 2	0900439700	GP-OR-10x2-FKM80	11 x 1	0901609700	GP-OR-11x1-FKM80
S 16	12 x 2	0900449700	GP-OR-12x2-FKM80	12.5 x 1	0901619700	GP-OR-12,5x1-FKM80
S 20	16.3 x 2.4	0900459700	GP-OR-16,3x2,4-FKM70	16 x 1	0908939700	GP-OR-16x1-FKM80
S 25	20.3 x 2.4	0900469700	GP-OR-20,3x2,4-FKM80	20 x 1	0908949700	GP-OR-20x1-FKM80
S 30	25.3 x 2.4	0900479700	GP-OR-25,3x2,4-FKM80	25 x 1	0908959700	GP-OR-25x1-FKM80
S 38	33.3 x 2.4	0900489700	GP-OR-33,3x2,4-FKM80	32 x 1.78	0901649700	GP-OR-32x1,78-FKM80

VOSS

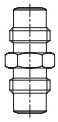
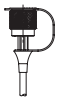
VOSS*Point*^{DC} measuring couplings M16x2

Functionality and design for the highest demands



Content	Type/Page	
The VOSS product designation	P.240	
Product information, measurement technology	P.242	
Technical notes	P.247	
Measuring couplings with male thread	SDS  P.248	
Measuring couplings with 24° tube connection	T  P.249	
Measuring couplings with 24° taper connection (DKO)	SWOS  P.250	SWOL  P.251
Bulkhead unions	BHSLN  P.252	PGBHSLN  P.254

VOSS

Content	Type/Page	
Gauge connections	PGS	
		
	P.255	
Hose connectors	S	
		
	P.256	
Measuring equipment hoses	TH	
		
	P.257	
Accessories	SDS	WDS
		
	P.258	P.259

The VOSS product name for measuring couplings and measuring equipment hoses

System	Function/ Component	Form	Completion	Size

This brochure contains an alphanumeric product designation, which is modeled strongly on ISO 8434. This makes the designation speak for itself and the product is easy to identify.

Due to the English structure this can be understood internationally. Also through the product designation customer-specific solutions can be generated from variations of existing VOSS product

Examples:

DC/24-TC-L8-TPC1-L8-SCV	**5680271107**
DC-TH6-A1-A1-LG1000	**5681005100va**

	DC/24 DC	TH6	T	C	L8 A1
System					
Diagnostic couplings	DC				
Diagnostic couplings/ 24° DIN	DC/24				
Diagnostic couplings/further connections	DC/...				
Function/Component					
Stud couplings		SD			
Swivel with O-ring		SWO			
Bulkhead couplings		BH			
Pressure gauges		PG			
Weld-on couplings		WD			
Test hose		TH6			
Further more see DIN program		...			
Form					
Elbows			E		
45° Elbows			E45		
Cross			K		
L-types			L		
T-types			T		
Straights			S		
Completion					
Complete connections				C	
Not pre-assembled				X	
With locknut				LN	
Series					
Light series					L
Heavy series					S
Tube diameter					6, 8, 10, 12, 14, 15, 16, 18, 20, 22, 25, 28, 30, 35, 38, 42
Standard test point cap M16 x 2					A1

Measuring coupling as T-screw joint; size L 8; measuring connection with taper seal; version M16 x 2; metal cap; VOSS*Ring*^{M} and union nut completed.

Use/ Allocation	Size 2/ Connection	Seal material	Material	Design cap	Special part

ranges automatically. Order example, further explanations and variation options are found in the respective chapters or following pages of the individual product groups.

TPC1 - L8 - A1 - LG1000 - SVC

	Special parts
CP	Customer product
	Execution cap
SCV	Steel cap
PC	Plastic cap
	Material
ST	Steel ZnNi – standard
SST	Stainless steel
	Length
LG1000	Length test hose 1,000 mm
	Sealing type
NBR	NBR – standard is not mentioned
FKM	FKM
EPDM	EPDM – on request
	Series 2/Connection
L8...	Series
PM	Push in male
FM	Female
U	UNF
N	NPT
G/R	Whitworth
M	metric
B	Seal edge
E	PEFLEX profile seal ring
F	Sealing with O-ring
A1	Standard test point cap M16 x 2
...	Further more see DIN program
	Application/Classification Measurement system
TP	Test point
C	Test point with cone
B	Test point with ball
1	Style M16 x 2
2	Style M16 x 1,5
3	Style S12,65 x 1,5
4	Style push-in system

Functionality and design for the highest demands



Coupling and measuring under high pressure

Pressure testing in hydraulic systems is extremely important for smooth, reliable plant operation. Measuring couplings are now standard in hydraulic systems and are widely used. They facilitate nearly completely leak-proof coupling and uncoupling of measuring and test equipment during plant operation or the connection of appliances for filling or venting.

VOSS measuring couplings redefine security and handling. To accomplish this, we revamped the best design concept on the market, providing it with the superior VOSS coat zinc-nickel coating. The ingenious twist: To improve handling in practice, the end cap is connected to the coupler body by a colored plastic element.

Innovative and high-quality – our product design

A revolutionary design with impressive details. Corroded and torn chains are passé. Our integrated plastic element imparts measuring couplings a high-quality look, ensures a permanently secure attachment, and prevents the end cap from loosening due to vibrations.

- Color differentiation between different hydraulic circuits
- Clearly visible diagnosis access
- Individual color design possible
- Integrated vibration protection



Measuring couplings in the closed position



Measuring couplings in the opened position

All leakage paths secured with additional soft seal

To achieve 100% secure sealing, we use a combination of metallic and elastomer seals on the primary seal. To increase the leakage security even further and minimize wear, the seal point is designed in such a way that any unnecessary flexing of the O-ring seal is prevented when the coupling is opened and closed.

In the secondary seal, an additional stabilization of the O-ring increases the long-term sealing effect of the VOSS measuring couplings by up to ten times. The compact construction of the VOSS*Point*^{DC} couplings is accomplished by using a one-piece housing. This prevents the formation of additional leakage paths.

High leakage protection

- Elastomer seal for 100% secure sealing
- Up to ten times greater long-term sealing of the secondary seal through additional support ring
- One-piece housing design prevents the formation of unnecessary leakage paths
- Structural minimization of O-ring wear

The VOSS*Point*^{DC} measuring coupling in detail:



Tested for reliable, superior performance

Nothing is left to coincidence

Starting right with development, we put our new measuring couplings through comprehensive trials to achieve an especially application-oriented product design. VOSS*Point*^{DC} has been put to the test many times to ensure its superior durability, functionality, and simple handling. Our most important test criteria were:

- Static leak tightness for 160 hours
- Burst pressure greater than 4 times the nominal pressure
- Impulse test to determine the service life (more than 2 million impulses)
- Coupling test under pressure
- Flow volume in both directions at 250 bar
- Resistance to environmental influences (UV resistance, salt spray test, tensile test)
- IPX9K = Protection against water under high pressure and steam cleaning, specifically for road vehicles

Every measuring coupling is checked for functional reliability and leak-tightness, even during series production.



Blue (standard)



Yellow



Orange



Green



Red



Black



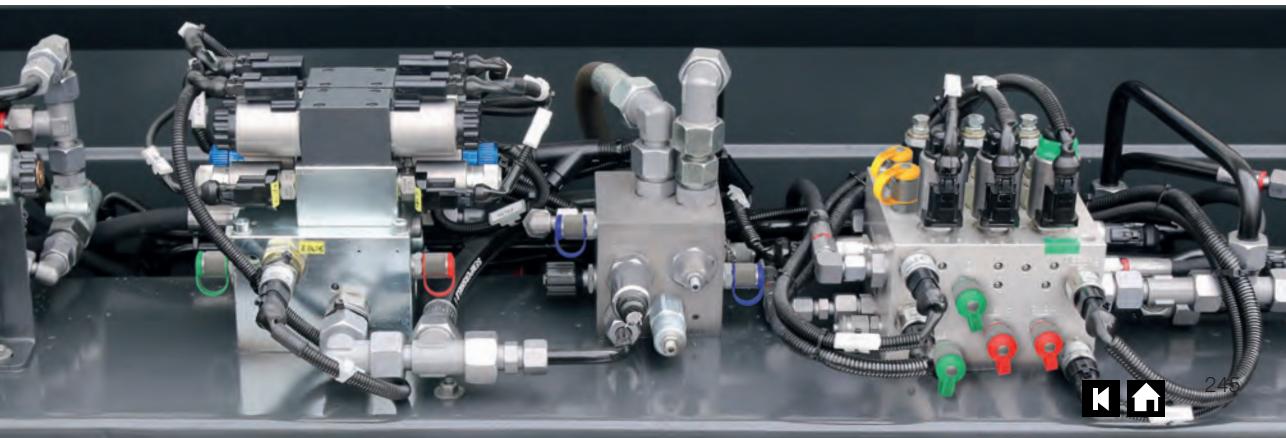
Individual

Colorful variety

Clear orientation thanks to individual color scheme

In delivery standard, the plastic cylinder is dyed blue, which makes the connection facilities clearly recognizable for the user in complex hydraulics systems.

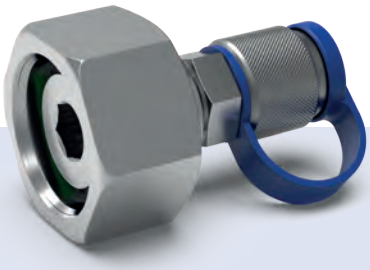
- Additional basic colors for visual differentiation of multiple hydraulic circuits
- Individual coloration to match your own branding and product design also possible on request



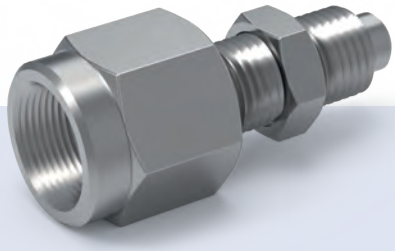
The VOSS*Point*^{DC} range



Male threads in metric and inch dimensions



Easy-to-assemble and process-reliable conical seal connections



Large range of adapters and special couplings



Manometer connections with additional soft seal



High-pressure-proof measuring equipment hoses



24° connecting couplings with measuring coupling already integrated

Technical notes

Specifications

- Design as per DIN ISO 15171-2
- Approved for up to 630 bar maximum operating pressure
- High number of variants
- With integrated vibration protection
- Primary and secondary sealing
- Secondary sealing with additional Teflon support ring

Main body material

- Steel

Cap fastening material

- TPE-E

Soft seal components

- NBR (optional FKM)

Media and temperature resistance

- Commercially available mineral oil based hydraulic oil up to +100 °C

Corrosion protection

- Zink-nickel based corrosion protection according to VOSS specifications
- Corrosion resistance > 1000 hours, test as per DIN 50021-SS

Coupling body color

- Metallic, gray-matte

Mounting lug cap designs color

- Blue (standard color) – other colors on request

IP-protection type testing IPX9K

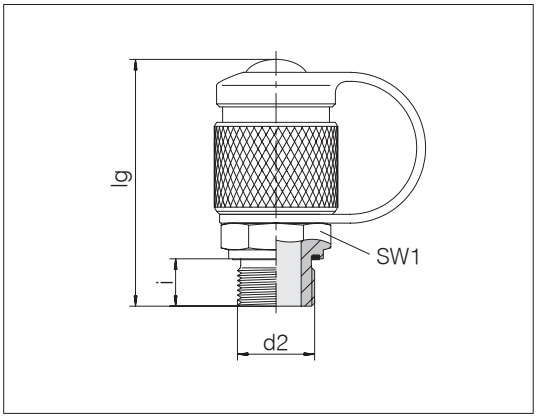
- Acc. to ISO 20653:2013-02. Protection class IPX9K



Measuring couplings M16x2 with male threads

The type of sealing is determined by the sealing form

Sealing material: Standard NBR



d2	Pressure	lg ca.	SW1	i	Style	Nm	Order-No.	Designation
M 8 x 1	PN 250	48	17	8.5	CS	6	7007572700	DC-SDS-TPC1-M8CS-SCV-SP51
M 10 x 1	PN 630	46	17	8.5	CS	15	7007572100	DC-SDS-TPC1-M10CS-SCV-SP51
M 10 x 1	PN 630	47.5	17	8	E	15	7007582700	DC-SDS-TPC1-M10E-SCV-SP51
M 12 x 1.5	PN 630	48.5	17	12	E	30	7007573600	DC-SDS-TPC1-M12E-SCV-SP51
M 14 x 1.5	PN 630	47.5	19	11	F	45	7007574700	DC-SDS-TPC1-M14F-SCV-SP51
M 14 x 1.5	PN 630	48.5	19	12	E	40	7007574000	DC-SDS-TPC1-M14E-SCV-SP51
M 16 x 1.5	PN 630	48.5	22	12	E	60	7007574500	DC-SDS-TPC1-M16E-SCV-SP51
G 1/8	PN 630	47.5	17	8	E	18	7007575100	DC-SDS-TPC1-G1/8E-SCV-SP51
G 1/4	PN 630	48.5	19	12	E	40	7007571500	DC-SDS-TPC1-G1/4E-SCV-SP51
G 3/8	PN 630	49.5	22	12	E	60	7007576800	DC-SDS-TPC1-G3/8E-SCV-SP51
G 1/2	PN 630	52.5	27	14	E	60	7007583200	DC-SDS-TPC1-G1/2E-SCV-SP51
R 1/8	PN 400	47.5	17	10	T		7007579400	DC-SDS-TPC1-R1/8T-SCV-SP51
1/8 NPTF	PN 400	47.5	17	10	T		7007577800	DC-SDS-TPC1-N1/8T-SCV-SP51
1/4 NPTF	PN 630	48.5	17	14	T		7007578000	DC-SDS-TPC1-N1/4T-SCV-SP51
7/16-20 UNF-2A	PN 630	45.5	17	9	F	20	7007578300	DC-SDS-TPC1-U7/16-20F-SCV-SP51
9/16-18 UNF-2A	PN 630	46.5	19	10	F	35	7007578900	DC-SDS-TPC1-U9/16-18F-SCV-SP51

Metal cap with vibration protection.

Other materials, additional versions, seals and male threads on request.

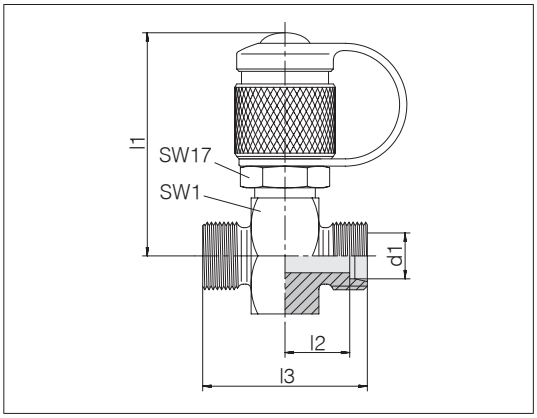
Form CS (O-ring)
Form E (PEFLEX)
Form T (tapered)
Form F (O-ring)

Example for comp.:
EMA3/1/4ED
SKK20G1/4-PC

Measuring couplings M16x2 as T couplings

Tube coupling: 24° in acc. with ISO 8434-1

Sealing material: Standard NBR



Series Tube OD d1	Pressure	l1 ca.	l2	l3	SW1	Order-No.	Designation
L 6	PN 315	49.5	10.25	34.5	24	7007607200	DC/24-T-L6-TPC1-L6-SCV-SP51
L 8	PN 315	49.5	10.25	34.5	24	7007600000	DC/24-T-L8-TPC1-L8-SCV-SP51
L 10	PN 315	49.5	11.25	36.5	24	7007607500	DC/24-T-L10-TPC1-L10-SCV-SP51
L 12	PN 315	49.5	11.25	36.5	24	7007607700	DC/24-T-L12-TPC1-L12-SCV-SP51
L 15	PN 315	52.5	12.25	38.5	30	7007608000	DC/24-T-L15-TPC1-L15-SCV-SP51
L 18	PN 315	53.5	11.75	38.5	32	7007608200	DC/24-T-L18-TPC1-L18-SCV-SP51
L 22	PN 160	55.5	13.75	42.5	36	7007608400	DC/24-T-L22-TPC1-L22-SCV-SP51
L 28	PN 160	58	13.75	42.5	41	7007608600	DC/24-T-L28-TPC1-L28-SCV-SP51
L 35	PN 160	60.5	12.75	46.5	46	7007608800	DC/24-T-L35-TPC1-L35-SCV-SP51
L 42	PN 160	65	12.25	46.5	55	7007609000	DC/24-T-L42-TPC1-L42-SCV-SP51
S 6	PN 630	49.5	12.25	38.5	24	7007609200	DC/24-T-S6-TPC1-S6-SCV-SP51
S 8	PN 630	49.5	12.25	38.5	24	7007609400	DC/24-T-S8-TPC1-S8-SCV-SP51
S 10	PN 630	49.5	11.75	38.5	24	7007609600	DC/24-T-S10-TPC1-S10-SCV-SP51
S 12	PN 630	49.5	11.75	38.5	24	7007609800	DC/24-T-S12-TPC1-S12-SCV-SP51
S 14	PN 630	51	13.25	42.5	27	7007610000	DC/24-T-S14-TPC1-S14-SCV-SP51
S 16	PN 400	52.5	12.75	42.5	30	7007610200	DC/24-T-S16-TPC1-S16-SCV-SP51
S 20	PN 400	55.5	12.75	46.5	36	7007610400	DC/24-T-S20-TPC1-S20-SCV-SP51
S 25	PN 400	58	13.25	50.5	41	7007610600	DC/24-T-S25-TPC1-S25-SCV-SP51
S 30	PN 400	60.5	13.75	54.5	46	7007610800	DC/24-T-S30-TPC1-S30-SCV-SP51
S 38	PN 315	65	14.5	61.0	55	7007611000	DC/24-T-S38-TPC1-S38-SCV-SP51

Other materials,
additional versions
and seals on request.

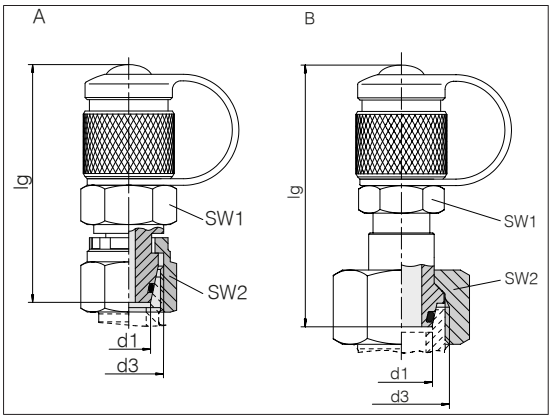
Example for comp.:
GMA3/12LOMD
SKK20-12L-PG

Measuring couplings M16x2 with 24° taper couplings

With taper and O-ring
fit in bore type
W DIN 3861/ISO 8434-1

Standard material of the seals is NBR

Standard material of the DKO O-Rings is FKM



Series Tube OD d1	Pressure	d3	lg ca.	SW1	SW2	Style	Order-No.	Designation
L 6	PN 315	M 12 x 1,5	51.5	17	14	A	7007590100	DC/24-SWOS-L6-TPC1-SCV-SP51
L 8	PN 315	M 14 x 1,5	54.5	17	17	A	7007590400	DC/24-SWOS-L8-TPC1-SCV-SP51
L 10	PN 315	M 16 x 1,5	54.5	19	19	A	7007591700	DC/24-SWOS-L10-TPC1-SCV-SP51
L 12	PN 315	M 18 x 1,5	55	19	22	A	7007592000	DC/24-SWOS-L12-TPC1-SCV-SP51
L 15	PN 315	M 22 x 1,5	60	17	27	B	7007615800	DC/24-SWOS-L15-TPC1-SCV-SP51
L 18	PN 315	M 26 x 1,5	60	17	32	B	7007616100	DC/24-SWOS-L18-TPC1-SCV-SP51
L 22	PN 160	M 30 x 2	60	17	36	B	7007616300	DC/24-SWOS-L22-TPC1-SCV-SP51
L 28	PN 160	M 36 x 2	61	17	41	B	7007616400	DC/24-SWOS-L28-TPC1-SCV-SP51
L 35	PN 160	M 45 x 2	63	17	50	B	7007616500	DC/24-SWOS-L35-TPC1-SCV-SP51
L 42	PN 160	M 52 x 2	63	17	60	B	7007616600	DC/24-SWOS-L42-TPC1-SCV-SP51
S 6	PN 630	M 14 x 1,5	51.5	17	17	A	7007592700	DC/24-SWOS-S6-TPC1-SCV-SP51
S 8	PN 630	M 16 x 1,5	54.5	17	19	A	7007592900	DC/24-SWOS-S8-TPC1-SCV-SP51
S 10	PN 630	M 18 x 1,5	54.5	19	22	A	7007593300	DC/24-SWOS-S10-TPC1-SCV-SP51
S 12	PN 630	M 20 x 1,5	55	19	24	A	7007593600	DC/24-SWOS-S12-TPC1-SCV-SP51
S 14	PN 630	M 22 x 1,5	63	17	27	B	7007617000	DC/24-SWOS-S14-TPC1-SCV-SP51
S 16	PN 400	M 24 x 1,5	63	17	30	B	7007617100	DC/24-SWOS-S16-TPC1-SCV-SP51
S 20	PN 400	M 30 x 2	63	17	36	B	7007617300	DC/24-SWOS-S20-TPC1-SCV-SP51
S 25	PN 400	M 36 x 2	64.5	17	46	B	7007617400	DC/24-SWOS-S25-TPC1-SCV-SP51
S 30	PN 400	M 42 x 2	66	17	50	B	7007617500	DC/24-SWOS-S30-TPC1-SCV-SP51
S 38	PN 315	M 52 x 2	69	17	60	B	7007617600	DC/24-SWOS-S38-TPC1-SCV-SP51

Other materials,
additional versions
and seals on request.

Example for comp.:
VKA3/06L
SKK20-06L-PK

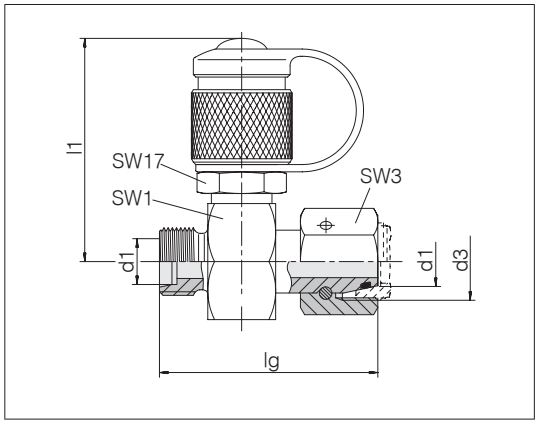
Measuring couplings M16x2 with 24° taper couplings in combination with 24° tube connection

With taper and O-ring
fit in bore type
W DIN 3861/ISO 8434-1

Tube coupling: 24° in acc. with ISO 8434-1

Standard material of sealings is NBR

Standard material of DKO O-rings is FKM



Series Tube OD d1	Pressure	d3	lg ca.	l1 ca.	SW1		Order-No.	Designation
L 6	PN 315	M 12 x 1,5	44.5	49.5	24	14	7007614100	DC/24-SWOL-L6-TPC1-L6-SCV-SP51
L 8	PN 315	M 14 x 1,5	44.5	49.5	24	17	7007600200	DC/24-SWOL-L8-TPC1-L8-SCV-SP51
L 10	PN 315	M 16 x 1,5	47.5	49.5	24	19	7007614200	DC/24-SWOL-L10-TPC1-L10-SCV-SP51
L 12	PN 315	M 18 x 1,5	48.5	49.5	24	22	7007614300	DC/24-SWOL-L12-TPC1-L12-SCV-SP51
L 15	PN 315	M 22 x 1,5	51.5	52.5	30	27	7007614400	DC/24-SWOL-L15-TPC1-L15-SCV-SP51
L 18	PN 315	M 26 x 1,5	55.5	53.5	32	32	7007614500	DC/24-SWOL-L18-TPC1-L18-SCV-SP51
L 22	PN 160	M 30 x 2	58.5	55.5	36	36	7007614600	DC/24-SWOL-L22-TPC1-L22-SCV-SP51
L 28	PN 160	M 36 x 2	59	58	41	41	7007614700	DC/24-SWOL-L28-TPC1-L28-SCV-SP51
L 35	PN 160	M 45 x 2	68	60.5	46	50	7007614800	DC/24-SWOL-L35-TPC1-L35-SCV-SP51
L 42	PN 160	M 52 x 2	68	65	55	60	7007614900	DC/24-SWOL-L42-TPC1-L42-SCV-SP51
S 6	PN 630	M 14 x 1,5	46.5	49.5	24	17	7007615000	DC/24-SWOL-S6-TPC1-S6-SCV-SP51
S 8	PN 630	M 16 x 1,5	48.5	49.5	24	19	7007615100	DC/24-SWOL-S8-TPC1-S8-SCV-SP51
S 10	PN 630	M 18 x 1,5	49.5	49.5	24	22	7007615200	DC/24-SWOL-S10-TPC1-S10-SCV-SP51
S 12	PN 630	M 20 x 1,5	50	49.5	24	24	7007615300	DC/24-SWOL-S12-TPC1-S12-SCV-SP51
S 14	PN 630	M 22 x 1,5	53.5	51	27	27	7007615400	DC/24-SWOL-S14-TPC1-S14-SCV-SP51
S 16	PN 400	M 24 x 1,5	56.5	52.5	30	30	7007615500	DC/24-SWOL-S16-TPC1-S16-SCV-SP51
S 20	PN 400	M 30 x 2	64.5	55.5	36	36	7007615600	DC/24-SWOL-S20-TPC1-S20-SCV-SP51
S 25	PN 400	M 36 x 2	66	58	41	46	7007615700	DC/24-SWOL-S25-TPC1-S25-SCV-SP51

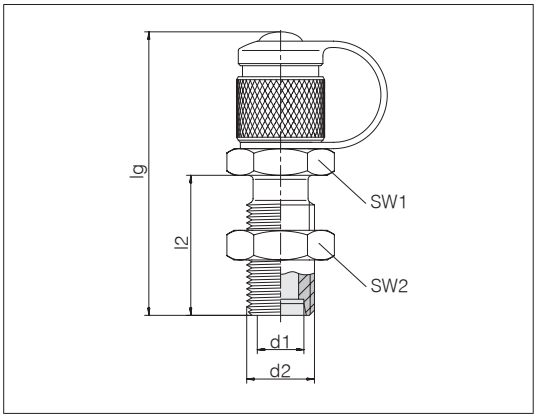
Other materials,
additional versions
and seals on request.

Example for comp.:
Z103-KL-06.00

Measuring couplings M16x2 Bulkhead version

Tube coupling: 24° in acc. with ISO 8434-1

Sealing material: Standard NBR



Series Tube OD d1	d2	Pressure	lg ca.	l2	SW1	SW2	Order-No.	Designation
L 6	M 12 x 1.5	PN 315	68.5	34	17	17	7009470600	DC/24-BHSLN-L6-TPC1-SCV-SP51
S 6	M 14 x 1.5	PN 630	70.5	36	19	19	7009484900	DC/24-BHSLN-S6-TPC1-SCV-SP51
S 8	M 16 x 1.5	PN 630	73	36.5	19	19	7007596600	DC/24-BHSLN-S8-TPC1-SCV-SP51
S 10	M 18 x 1.5	PN 630	70.5	36.5	22	24	7007596900	DC/24-BHSLN-S10-TPC1-SCV-SP51

Other materials, additional versions and seals on request.

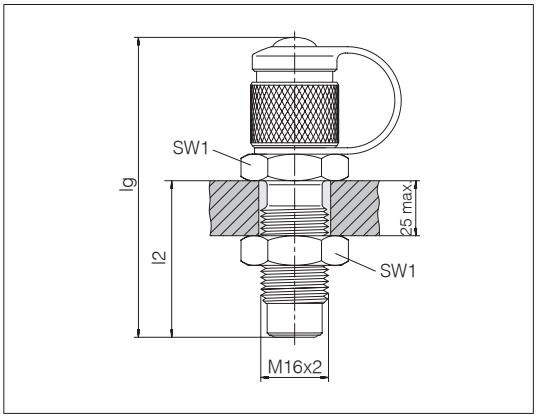
Example for comp.: SSK20/08L-P

Measuring couplings M16x2 Bulkhead version

Measuring tube

Measuring couplings on both sides
M 16 x 2

Sealing material: Standard NBR



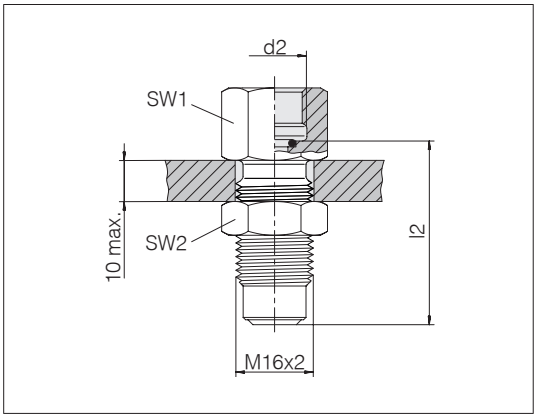
Pressure	lg ca.	l2	SW1	Order-No.	Designation
PN 630	73	39	19	7007596100	DC-BHSLN-TPC1-FM1-SCV-SP51

Other materials,
additional versions
and seals on request.

Example for comp.:
SSK20/08L-P

Manometer connections for bulkheadwalls and measurement equipment hoses M16x2

Sealing material: Standard NBR



d2	Pressure	l2	SW1	SW2	Order-No.	Designation
G 1/4	PN 630	35.5	19	19	7007597000	DC-PGBHSLN-FM1-IG1/4F-SP51
G 1/2	PN 630	40	27	19	7007597100	DC-PGBHSLN-FM1-IG1/2F-SP51

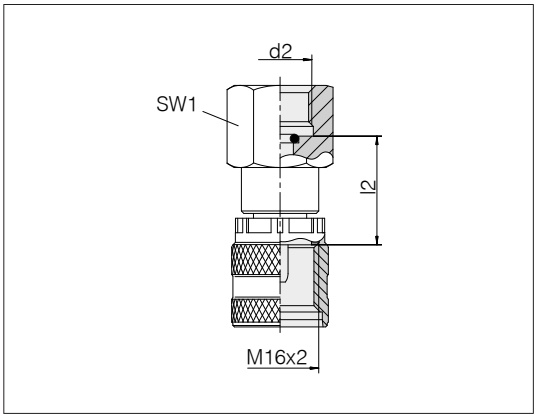
Other materials,
additional versions,
seals and male threads
on request.

Example for comp.:
SMA20-G1/4-OR
MAV1/4MA3

Gauge couplings M16x2

Direct connection

Sealing material: Standard NBR



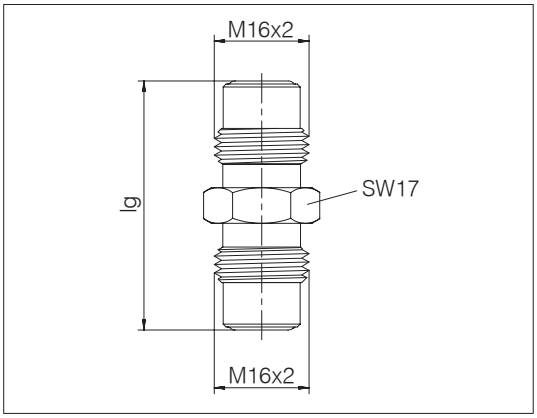
d2	Pressure	l2	SW1	Order-No.	Designation
G 1/4	PN 630	22.5	19	7007597200	DC-PGS-PM1-IG1/4F-SP51
G 1/2	PN 630	24	27	7007597300	DC-PGS-PM1-IG1/2F-SP51

Other materials,
additional versions,
seals and male threads
on request.

Example for comp.:
MAVMD1/4Ma3
SMD20-G1/4-P-OR

Hose connectors M16x2

Sealing material: Standard NBR



Pressure	lg	Order-No.	Designation
PN 630	48	7007597400	DC-S-TPC1-SP51

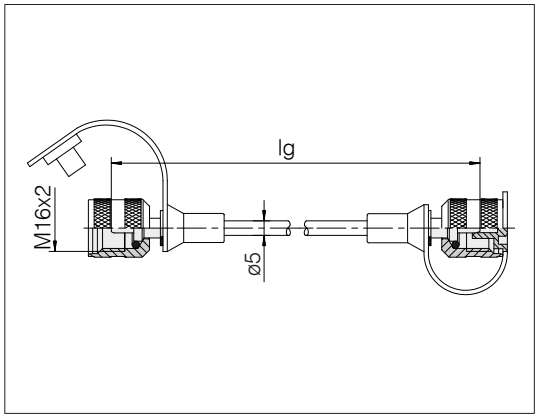
Other materials,
additional versions,
seals and male threads
on request.

Example for comp.:
SSV20

Measuring equipment hoses DN 2 with measuring couplings

For screw series M16x2

- For hydraulic and other mineral-based oils
- Fittings same on both ends



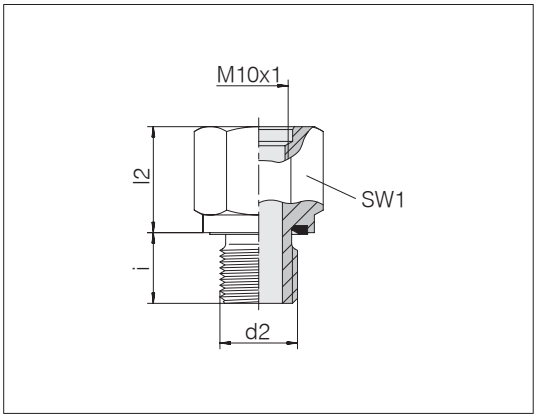
Pressure	lg	Order-No.	Designation
PN 630	200	7007583300	DC-TH6-A1-A1-LG200-SP51
PN 630	300	7007583400	DC-TH6-A1-A1-LG300-SP51
PN 630	400	7007583500	DC-TH6-A1-A1-LG400-SP51
PN 630	500	7007583600	DC-TH6-A1-A1-LG500-SP51
PN 630	630	7007583700	DC-TH6-A1-A1-LG630-SP51
PN 630	800	7007583800	DC-TH6-A1-A1-LG800-SP51
PN 630	1,000	7007583900	DC-TH6-A1-A1-LG1000-SP51
PN 630	1,250	7007584000	DC-TH6-A1-A1-LG1250-SP51
PN 630	1,500	7007584100	DC-TH6-A1-A1-LG1500-SP51
PN 630	2,000	7007584200	DC-TH6-A1-A1-LG2000-SP51
PN 630	2,500	7007584300	DC-TH6-A1-A1-LG2500-SP51
PN 630	3,200	7007584400	DC-TH6-A1-A1-LG3200-SP51
PN 630	4,000	7007584500	DC-TH6-A1-A1-LG4000-SP51
PN 630	5,000	7007584600	DC-TH6-A1-A1-LG5000-SP51

Example for comp.:
SMQA3-630
SMS20-630-B

Threaded studs for measuring couplings

The type of sealing is determined by the sealing form

Sealing material: Standard NBR



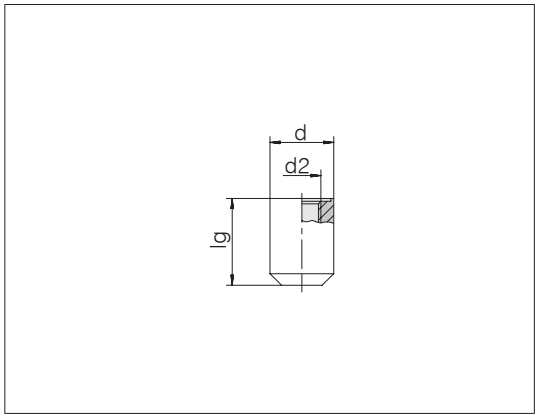
d2	Pressure	l2	SW1	i	Style	Order-No.	Designation
M 12 x 1.5	PN 630	19	17	10	E	5680900800	DC-SDS-M12E-IM10CS
G 1/8	PN 630	19	17	8	E	5680901200	DC-SDS-G1/8E-IM10CS
G 1/2	PN 630	10	27	14	E	5680901600	DC-SDS-G1/2E-IM10CS
G 3/4	PN 630	13	32	12	E	5680901400	DC-SDS-G3/4E-IM10CS
1/2 NPTF	PN 630	10	24	18	T	5680901000	DC-SDS-N1/2T-IM10CS

Other materials,
additional versions,
seals and male threads
on request.

Form CS (O-ring)
Form E (PEFLEX)
Form T (tapered)
Form F (O-ring)

Example for comp..:
SRS20-G1/4-PC

Weld connectors



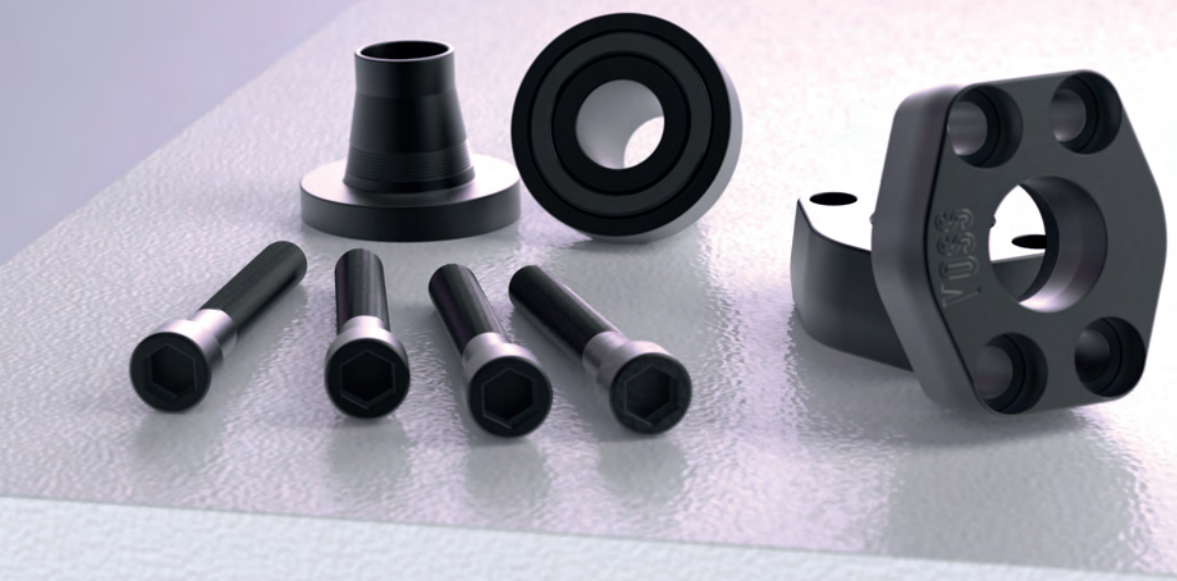
d2	Pressure	d	lg	Style	Order-No.	Designation
M 10 x 1	PN 630	20	25	CS	5680902000	DC-WDS-IM10CS-D20-C10
G 1/4	PN 630	22	30	E	5680902400	DC-WDS-IG1/4-D22-C10

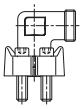
Other materials,
additional versions
and seals on request.

Example for comp.:
SAS-G1/4

Flange couplings/ZAKO

Flange connections with cutting ring connection · ZAKO flared flange



Content	Type/Page			
The VOSS designation	P.264			
Product information, flange couplings	P.270			
Product information, ZAKO flange couplings	P.271			
Flange couplings with cutting ring and square flange connection	QFFSO  P.276	QFFEO  P.277		
Flange couplings with cutting ring connection and devided SAE flange	FASO  P.280	FAEO  P.282		
Flange couplings with cutting ring and square flange connection, Individual parts	QFFSX  P.286	QFFEX  P.287		
Flange couplings with cutting ring connection and split SAE flange, individual parts	FASX  P.290	FAEX  P.292	SF  P.294	SFPO  P.296

VOSS

Content

Content	Type/Page				
ZAKO flared flanges with SAE flange connection	TPO (standard)	TPO (high pressure)	TTO (standard)	TTO (high pressure)	
	 P.300	 P.302	 P.304	 P.305	
ZAKO flared flanges with square flange connection	TPO	TTO			
	 P.308	 P.310			
ZAKO, individual parts	RGO	R	FPH	FPT	FPH
	 P.314	 P.316	 P.318	 P.319	 P.320

The designations of VOSS products

System	Function/ Component	Form	Completion	Series/ Thread

This catalog contains an alphanumerical product designation system based to a large extent on ISO 8434. This makes the designation self-explanatory and facilitates identification of the products. Since the structure is based on English, the designation is understood internationally.

Furthermore, the product designations make it possible to generate customized special solutions by combining variations of the existing VOSS product program.

Example: Z-TPO-30x4-HC62-M12-C19

Z - TP - O -

System

ZAKO flange program

The "system" characteristic describes the product line.

Function/Component

ZAKO Flange tube-to-port, set

The "Function/component" describes the product type.

Form

Completion

O-ring enclosed

This characteristic identifies the components (e. g. hexagonal nut, union nut and cutting ring, O-ring ...) that can be used to complete the product type. Complete couplings are supplied with VOSS*Ring*^{M} cutting rings by default, other connection systems are listed in the "Suffix" characteristics.

Series/Thread

ZAKO connecting flange coupling set, square flange for 30x4 mm tube, hole circle 62 mm, screw size M12, blackened, oiled or burnished steel

Tube OD/ Diameter	Thread	Diameter	Sealing type/ Threaded bore	Suffix

Examples of how to order items, as well as additional explanations and variation options are given in the respective chapters and in the following pages for the individual product groups.

30x4 - - - HC62 - M12 - C19

Suffix 8

Steel, blackened, oiled or burnished

Deviations from the default characteristics (e. g. seal materials, completion using different cutting ring systems, flared coupling parts, special dimensions ...)

Suffix 2

Screw size M12 mm

Deviations from the default characteristics (e. g. seal materials, completion using different cutting ring systems, flared coupling parts, special dimensions ...)

Suffix 1

Hole circle 62 mm

Deviations from the default characteristics (e. g. seal materials, completion using different cutting ring systems, flared coupling parts, special dimensions ...)

Sealing type/Threaded bore

Not relevant for chapter 5

Diameter

Not relevant for chapter 5

Thread

Not relevant for chapter 5

Tube OD/Diameter

Tube size 30x4 mm

States the outer diameter or the nominal diameter of the tube. Where required, the tube wall thickness is also stated.

	System
F/24	Flange program with 24° DIN connection
F	Flange program
F/SET	Integration kit
Z	ZAKO flange program

	Function
	Flanges
SF	Split flange clamps
	ZAKO flanges
FPH	ZAKO flange plates with hole
FPT	ZAKO flange plates with thread
PT	ZAKO flanges port-to-tube, set
TP	ZAKO flanges tube-to-port, set
TT	ZAKO flanges tube-to-tube, set
RG	ZAKO rings with groove
R	ZAKO rings without groove

	Form
E	Elbow
S	Straight
T	Tee

	Completion
C	Complete connection (with tube connecting system)
O	O-ring enclosed
X	Without split flange clamps and O-ring

	Series/Thread
	Series
L	Light series
S	Heavy series

	Tube OD/Diameter
10	10 mm
12	12 mm
15	15 mm
16	16 mm
18	18 mm
20	20 mm
22	22 mm
25	25 mm
28	28 mm
30	30 mm
35	35 mm
38	38 mm
42	42 mm
43,3	43.3 mm
48,3	48.3 mm
50	50 mm
60,3	60.3 mm
65	65 mm
76,1	76.1 mm
80	80 mm
88,9	88.9 mm
101,6	101.6 mm
114,3	114.3 mm

	Suffix overview
Suffix 1	Flange hole pattern
Suffix 2	Flange screw diameter
Suffix 5	Completion
Suffix 6	Differing dimension
Suffix 7	Material/strength
Suffix 8	Coating

Suffixes not referred to here are not relevant to this chapter.
Note: For articles having more than one relevant suffix, these are listed in numerical order in the sales designation.

Suffix 1	Flange hole pattern
	SAE pattern
3S1/2	3000 psi SAE 1/2 "
3S3/4	3000 psi SAE 3/4 "
3S1	3000 psi SAE 1 "
3S11/4	3000 psi SAE 1 1/4 "
3S11/2	3000 psi SAE 1 1/2 "
3S2	3000 psi SAE 2 "
3S21/2	3000 psi SAE 2 1/2 "
3S3	3000 psi SAE 3 "

6S1/2	6000 psi SAE 1/2 "
6S3/4	6000 psi SAE 3/4 "
6S1	6000 psi SAE 1 "
6S11/4	6000 psi SAE 1 1/4 "
6S11/2	6000 psi SAE 1 1/2 "
6S2	6000 psi SAE 2 "

	Hole circle
HC35	Hole circle 35 mm
HC40	Hole circle 40 mm
HC42	Hole circle 42 mm
HC45	Hole circle 45 mm
HC50	Hole circle 50 mm
HC55	Hole circle 55 mm
HC62	Hole circle 62 mm
HC72	Hole circle 72 mm
HC85	Hole circle 85 mm
HC98	Hole circle 98 mm
HC118	Hole circle 118 mm
HC145	Hole circle 145 mm
HC175	Hole circle 175 mm

Suffix 2	Flange screw diameter
	Flange screw hole diameter
D10,75	Diameter 10.75 mm
...	...
	Flange screw size
M10x35	Metric 10 x 35 mm
IM16	Internal thread, metric 16 mm
...	...

Suffix 5	Completion
ES4	ES-4 Cutting ring

Suffix 6	Differing dimension
	Dimension
HD75	Hub diameter 75 mm
...	...

Suffix 7	Material/Strength
	Screw strength
8.8	8.8
10.9	10.9 (standard is not listed)

Suffix 8	Coating
C19	Steel, blackened, oiled or burnished
C20	Steel zinc-nickel (standard is not listed)

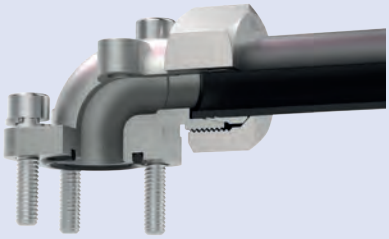
Product information flange couplings

In addition to screwed tube couplings for the various installation criteria, flanges are also frequently used in hydraulic systems, preferably for medium-range and large coupling dimensions. Various flange versions are provided in order to meet different requirements.

Flange couplings with square flanges and cutting ring connection

These flange couplings with a square flange connection are characterized by very compact external dimensions. Both straight and elbow versions are available. The product range covers tube outer diameters ranging from 10 mm to 42 mm. The flange connections are sealed with a circular elastic sealing ring (O-ring), and the physical connection is made using cheese-head screws. The flange connections are designed to match the connection hole patterns of leading pump manufacturers.







SAE flange couplings with cutting ring connection

SAE flange couplings are supplied both as standard and as high-pressure designs with hole patterns in accordance with SAE J 518 or ISO 6162.

The device-side connection is made with 2 flange halves secured with 4 cheese-head screws. In contrast to normal threaded studs, the screws can be fastened in the couplings using smaller tools and lower forces. The tube connections can be made using cutting rings or BV-10 flared couplings, for instance.

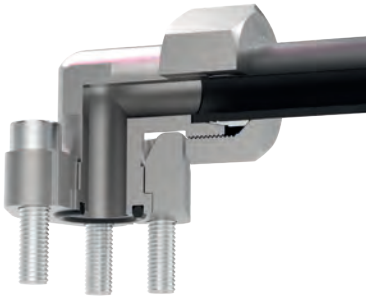
One special advantage of the SAE flange elbow couplings is that the connection direction is adjustable. Nevertheless, accessibility of the mounting screws must be ensured when installing the tubes.

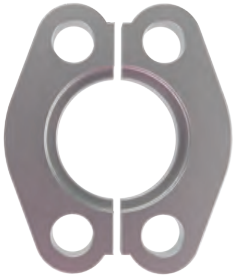
The VOSS ZAKO system with the 10° flare connection is provided for especially high stresses, such as are caused by vibration and pressure jolts or high pressures in tubes with larger diameters.

General note

In order for the flange couplings listed in this catalogue to fulfil their function, the installation instructions and the note in the technical remarks must be followed exactly.







Product information ZAKO flange couplings



In hydraulic engineering, the ZAKO range of flanges is a synonym for reliability on a large scale, as this unique design not only stands up to the hardest stresses without any problems, it is also conceived for use with large-diameter tubes. With the 10° flare system and the exclusive finish providing optimum corrosion protection, ZAKO flanges set the absolute standard in all fields of hydraulics, proving their worth e. g. in strip-mining equipment, hydraulic presses and injection-moulding machinery.

ZAKO – creates confidence right from the start

For tubes with outer diameters ranging from 16 mm to 114.3 mm and wall thicknesses up to 17.5 mm.

- Standard series for up to 250 bar and high-pressure series for up to 400 bar, with four-fold safety
- For standard hole patterns in accordance with SAE (3000 psi/6000 psi) and square flanges
- Superior 10° flare system

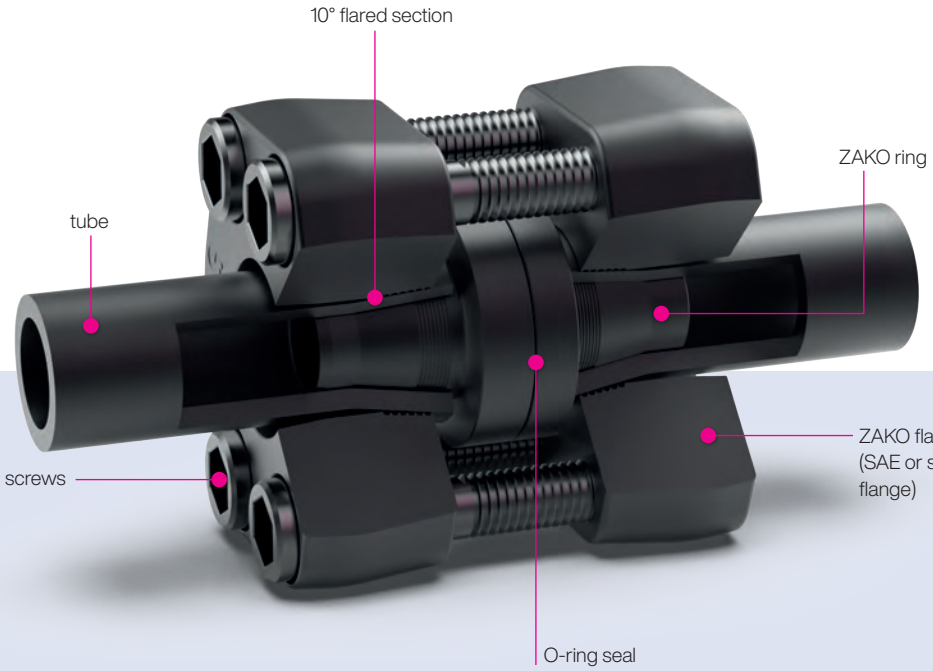
This removable flange system eliminates complicated welding work

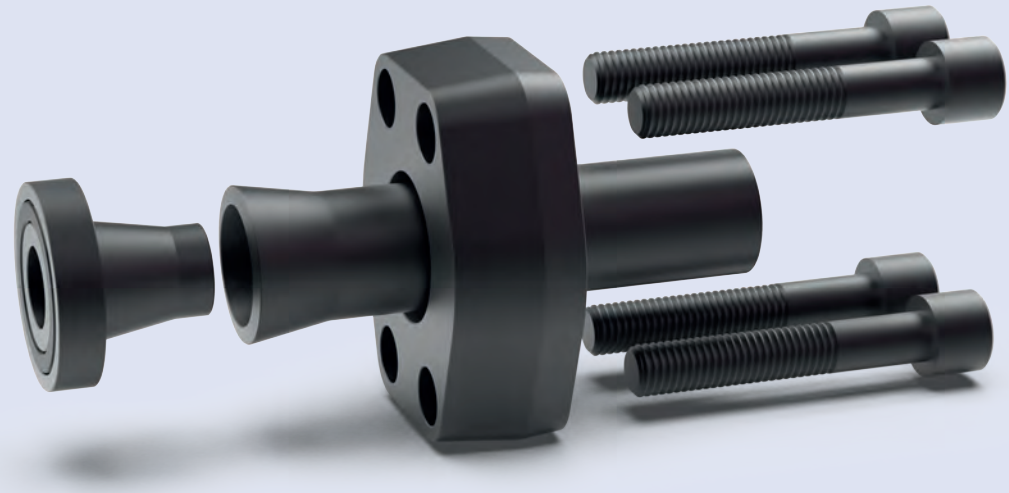
Compared to conventional welded joints, the ZAKO system is also convincing from the economical and technical aspects.

- Removable connections are ideal for servicing and maintenance
- Fast assembly, saving time and money
- Lower component process costs
- Can be installed in high fire hazard environments
- No complex process steps (tack-welds, setting up, sealwelding, cleaning, flame-tempering and straightening)

The perfect design for efficient installation

ZAKO system tube couplings consist of four perfectly matching elements: a ZAKO ring, an O-ring, a flange, and the connecting screws or bolts. The tried and tested 10° flare principle in conjunction with the ZAKO ring ensures a notch-effect-free and incision-free preliminary assembly. To achieve this, the ZAKO ring is pressed accurately into the tube at a very high pressure applied by special pre-assembly equipment. This, in conjunction with an additional labyrinth seal, ensures that the system is strong and leak-tight.





As opposed to systems with conventional flare angles of 37°, ZAKO flange systems have a 10° taper angle and small "saw teeth" on the flared section. Many years of experience using this system combined with extensive force measurement tests have shown the considerable advantages of the system in terms of stability and safety. As the tube is only flared by 10°, the material is not expanded too far and thus retains suffcient elasticity to withstand strong alternating bending stresses.

10° means ...

- **greater function reserves**
  The low expansion of the tube end achieves unimpaired material strength.

- **higher compression force**
  The compression force achieved using the equivalent bolt tension is approximately 3.5 times greater than with comparable 37° systems.

- **optimized assembly without tool wear**
  The ZAKO ring is a tool and component in one and is press-fitted into the tube during the pre-assembly process.

- **easy utilization**
  No special assembly limit couplings (stops) required.

- **better support**
  A long flared section supports the coupling system better and greatly increases its stability under dynamic loads.

- **better sealing**
  The saw-tooth surface of the flared section achieves an additional labyrinth-seal effect.

ZAKO flange systems are available for tubes with outer diameters of 16 – 114.3 mm and various wall thicknesses. All sizes are available as standard, high-pressure versions (for up to 400 bar).

Overview of the 10° flange system

ZAKO

tube OD [mm]	wall thickness [mm]				
16	2	2.5	3		
20	2.5	3	3.5		
25	3	4			
30	4	5			
38	4	5	6		
42	2				
50	2.5	5	6	8	9
60	3	5	10		
65	3	4	5	8	
75	12.5				
80	3	8	10		
88	14				
101.6	16				
114.3	17.5				

The ZAKO principle

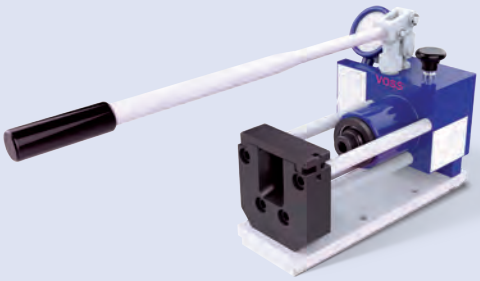
ZAKO flange couplings are easily and safely assembled. A pre-assembly device is used to press the ZAKO ring into the tube which is to be connected by the system. In this process, the ZAKO collar ring serves both as a flaring tool and a component that remains in the flared tube. This means that possible process faults due to worn tools are eliminated. After this, the two tubes are joined together using the flanges and connecting bolts or screws. An O-ring integrated into the ZAKO collar ring is used to seal the coupling. The 10° flare angle of this system provides a very long contact area that supports the connection, ensuring that the connection's stability is maintained even under high dynamic loads. Flange connections are easily taken apart to permit service and maintenance work.

Pre-assembly devices

Depending on where and how you intend to pre-assemble the ZAKO rings, we offer you a wide range of pre-assembly devices, ranging from manually operated tools for occasional use right up to high-performance equipment for mass production.

Type 80 N3

Tube OD 16 – 38 mm



Type 90 Basic II

Tube OD 16 – 38 mm



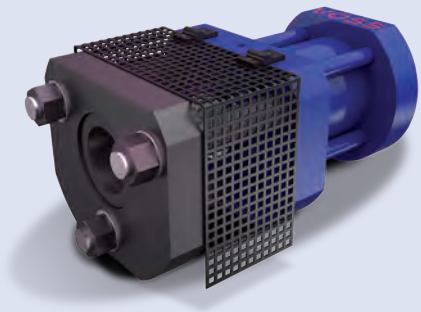
Type 90 Comfort

Tube OD 16 – 38 mm

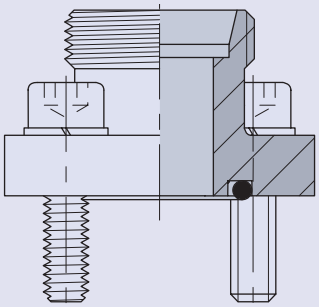


Type 85

Tube OD 38 – 114.3 mm



Flange couplings with cutting ring and square flange connection

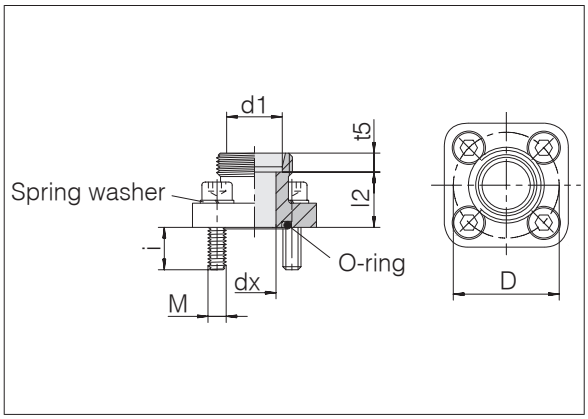


Straight flange couplings

With cutting ring and square flange connection

Standard material of O-rings is NBR

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	PB	Hole circle Ø D	dx	l2	t5	i	4 x cyl. screws	O-ring	Nm	kg/100 ca.	Order-No.	Designation
L 10	315	35	8	23	7	12.5	M 6 x 22	20 x 2,5	10	13.4	0195362081	F/24-QFFSO-L10-HC35-M6-8.8
L 12	315	35	10	23	7	12.5	M 6 x 22	20 x 2,5	10	12.7	0195372081	F/24-QFFSO-L12-HC35-M6-8.8
L 15	100	40	12	27.5	7	12.5	M 6 x 22	26 x 2,5	10	15.8	0195392081	F/24-QFFSO-L15-HC40-M6-8.8
L 15	250	35	12	23	7	12.5	M 6 x 22	20 x 2,5	10	13.1	0195382081	F/24-QFFSO-L15-HC35-M6-8.8
L 18	100	40	19	27.5	7.5	12.5	M 6 x 22	26 x 2,5	10	16.3	0195402081	F/24-QFFSO-L18-HC40-M6-8.8
L 18	250	35	12	22.5	7.5	12.5	M 6 x 22	20 x 2,5	10	14.8	0196102081	F/24-QFFSO-L18-HC35-M6-8.8
L 22	100	40	19	27.5	7.5	12.5	M 6 x 22	26 x 2,5	10	15.6	0195412081	F/24-QFFSO-L22-HC40-M6-8.8
L 28	100	40	20	34.5	7.5	12.5	M 6 x 22	26 x 2,5	10	19.4	0195142081	F/24-QFFSO-L28-HC40-M6-8.8
L 28	100	40	20	47.5	7.5	12.5	M 6 x 22	26 x 2,5	10	21.5	0195842081	F/24-QFFSO-L28-HC40-M6-LG55-8.8
L 28	100	55	20	32.5	7.5	11.5	M 8 x 25	32 x 2,5	25	38.4	0195902081	F/24-QFFSO-L28-HC55-M8-8.8
L 35	100	55	28	39.5	10.5	11.5	M 8 x 25	32 x 2,5	25	40.9	0195872081	F/24-QFFSO-L35-HC55-M8-8.8
S 16	315	35	12	21.5	8.5	12.5	M 6 x 22	20 x 2,5	10	12.8	0195102081	F/24-QFFSO-S16-HC35-M6-8.8
S 20	315	55	16	29.5	10.5	11.5	M 8 x 25	33 x 2,5	25	37.1	0195232081	F/24-QFFSO-S20-HC55-M8-8.8

Nm = recommended tightening torques (Nm max.) for cylindrical bolts as spec. in DIN 912 (10.9) for friction coefficient μ tot. 0.14.

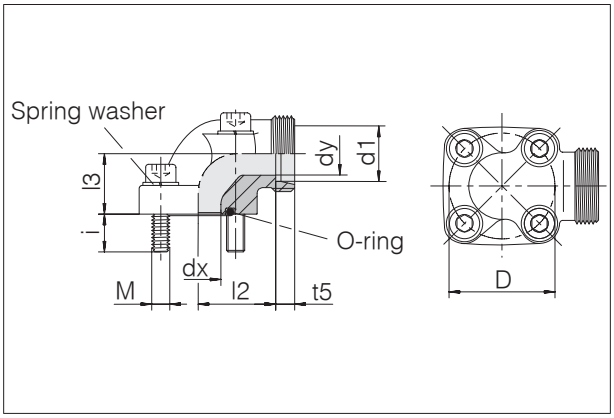
Example for comp. : BFG10L/LK35OMDCF

Elbow flange couplings

With cutting ring and square flange connection

Standard material of O-rings is NBR

Tube coupling: 24° in acc. with ISO 8434-1

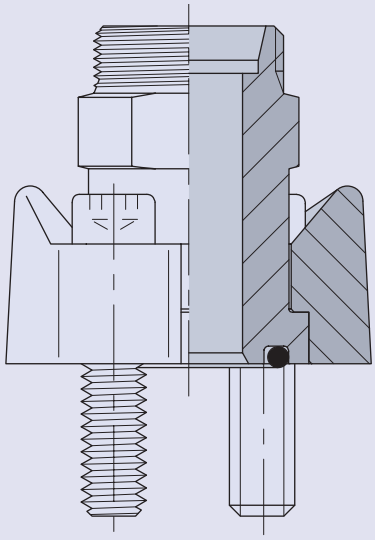


Series Tube OD d1	PB	Hole circle Ø D	dx	dy	l2	l3	t5	i	4 x cyl. screws	O-ring	Nm	kg/100 ca.	Order-No.	Designation
L 10	315	35	14	8	31	16.5	7	12.5	2 x M 6 x 22 2 x M 6 x 35	20 x 2,5	10	18.6	0195422081	F/24-QFFEO-L10-HC35-M6-8.8
L 12	315	35	14	10	31	16.5	7	12.5	2 x M 6 x 22 2 x M 6 x 35	20 x 2,5	10	16.8	0195622081	F/24-QFFEO-L12-HC35-M6-8.8
L 15	100	40	20	12	31	22.5	7	12.5	4 x M 6 x 22	26 x 2,5	10	20.4	0195642081	F/24-QFFEO-L15-HC40-M6-8.8
L 15	250	35	14	12	31	16.5	7	12.5	2 x M 6 x 22 2 x M 6 x 40	20 x 2,5	10	22.8	7004709600	F/24-QFFEO-L15-HC35-M6-8.8
L 18	100	40	20	15	30.5	22.5	7.5	12.5	4 x M 6 x 22	26 x 2,5	10	20.6	0195432081	F/24-QFFEO-L18-HC40-M6-8.8
L 18	250	35	15	15	30.5	20	7.5	12.5	2 x M 6 x 22 2 x M 6 x 40	20 x 2,5	10	22.8	0195452081	F/24-QFFEO-L18-HC35-M6-8.8
L 22	100	40	20	19	30.5	22.5	7.5	12.5	4 x M 6 x 22	26 x 2,5	10	20.9	0195442081	F/24-QFFEO-L22-HC40-M6-8.8
L 28	100	40	20	25	32.5	28	7.5	12.5	2 x M 6 x 22 2 x M 6 x 50	26 x 2,5	10	29.9	0195152081	F/24-QFFEO-L28-HC40-M6-8.8
L 35	100	40	20	31	30.5	34	10.5	12.5	2 x M 6 x 22 2 x M 6 x 60	26 x 2,5	10	39.5	0195272081	F/24-QFFEO-L35-HC40-M6-8.8
L 35	100	55	26	31	38.5	32	10.5	11.5	2 x M 8 x 25 2 x M 8 x 60	32 x 2,5	25	57.9	0195172081	F/24-QFFEO-L35-HC55-M8-8.8
L 42	100	55	26	38	38	40	8.5	11	2 x M 8 x 25 2 x M 8 x 70	32 x 2,5	25	61.0	0195192081	F/24-QFFEO-L42-HC55-M8-8.8
S 12	315	35	14	10	30.5	16.5	7.5	12.5	2 x M 6 x 22 2 x M 6 x 35	20 x 2,5	10	21.2	0195882081	F/24-QFFEO-S12-HC35-M6-8.8
S 16	315	35	15	12.5	29.5	20	8.5	12.5	2 x M 6 x 22 2 x M 6 x 40	20 x 2,5	10	22.1	0195252081	F/24-QFFEO-S16-HC35-M6-8.8
S 20	250	40	20	16	29.5	22	10.5	12.5	2 x M 6 x 22 2 x M 6 x 45	26 x 2,5	10	25.5	0195132081	F/24-QFFEO-S20-HC40-M6-8.8
S 20	250	55	20	16	34.5	24	10.5	11	2 x M 8 x 25 2 x M 8 x 50	32 x 2,5	25	52.9	0195182081	F/24-QFFEO-S20-HC55-M8-8.8
S 20	315	35	15	16	34.5	25	10.5	11	2 x M 6 x 22 2 x M 6 x 45	20 x 2,5	10	29.1	0195112081	F/24-QFFEO-S20-HC35-M6-8.8
S 25	250	55	20	20	37	30	12	11.5	2 x M 8 x 25 2 x M 8 x 55	32 x 2,5	25	61.3	0195892081	F/24-QFFEO-S25-HC55-M8-8.8
S 30	250	55	26	26	35.5	32	13.5	11	2 x M 8 x 25 2 x M 8 x 50	32 x 2,5	25	58.4	0195242081	F/24-QFFEO-S30-HC55-M8-8.8

Nm = recommended tightening torques (Nm max.) for cylindrical bolts as spec. in ISO 4762 (10.9) for friction coefficient μ tot. 0.14.

Example for comp. : BFW10L/LK35OMDCF

Flange couplings with cutting ring connection and devided SAE flange

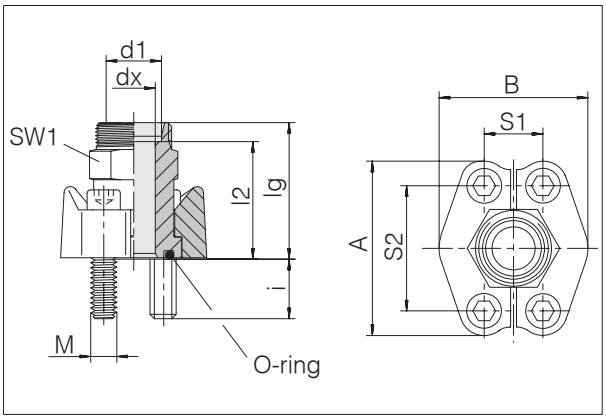


Straight flange couplings

With cutting ring connection and split SAE flange
Hole pattern according to SAE J 518 C/ISO 6162
Standard series (3000 psi)

Standard material of O-rings is NBR

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	Fl. size	PB	dx	lg	l2	SW1	S1	S2	A	B	i	4 x cyl. screws	O-ring	Nm	Order-No.	Designation
L 18	3/4“	315	15	53	45.5	30	22.2	47.6	65	52	16	M 10 x 30	25 x 3,53	50	0305002081	F/24-FASO-L18-3S3/4-M10x30
L 22	3/4“	160	19	53	45.5	30	22.2	47.6	65	52	16	M 10 x 30	25 x 3,53	50	0305012081	F/24-FASO-L22-3S3/4-M10x30
L 28	1“	160	24	54	46.5	36	26.2	52.4	70	59	14	M 10 x 30	32,92 x 3,53	50	0305022081	F/24-FASO-L28-3S1-M10x30
L 35	1 1/4“	160	30	58	47.5	41	30.2	58.7	79	73	24	M 12 x 35	37,7 x 3,53	85	0305032081	F/24-FASO-L35-3S11/4-M12x35
L 42	1 1/2“	160	36	64	53	46	35.7	69.9	94	83	14	M 12 x 35	47,22 x 3,53	85	0305042081	F/24-FASO-L42-3S11/2-M12x35
S 16	1/2	350	12	50.2	40.7	24	17.5	38.1	46	54	11	M 8 x 25	18,66 x 3,53	50	0305632081	F/24-FASO-S16-3S1/2-M8x25
S 20	3/4“	350	16	57	46.5	30	22.2	47.6	65	52	16	M 10 x 30	25 x 3,53	50	0305052081	F/24-FASO-S20-3S3/4-M10x30
S 25	3/4“	350	17	57	45	30	22.2	47.6	65	52	16	M 10 x 30	25 x 3,53	50	0305062081	F/24-FASO-S25-3S3/4-M10x30
S 25	1	350	20	58.2	46.1	36	26.2	52.4	70	59	14	M 10 x 30	32,92 x 3,53	50	0305292081	F/24-FASO-S25-3S1-M10x30
S 25	1 1/4“	280	20	60	48	41	30.2	58.7	79	73	24	M 12 x 35	37,7 x 3,53	85	0305072081	F/24-FASO-S25-3S11/4-M12x35
S 30	1“	320	24	63	49.5	36	26.2	52.4	70	59	14	M 10 x 30	32,92 x 3,53	50	0305082081	F/24-FASO-S30-3S1-M10x30
S 30	1 1/4“	280	25	62	48.5	41	30.2	58.7	79	73	24	M 12 x 35	37,7 x 3,53	85	0305092081	F/24-FASO-S30-3S11/4-M12x35
S 38	1 1/4“	280	28	66	50.5	46	30.2	58.7	79	73	24	M 12 x 35	37,7 x 3,53	85	0305102081	F/24-FASO-S38-3S11/4-M12x35
S 38	1 1/2“	210	32	70	54	46	35.7	69.9	94	83	19	M 12 x 35	47,22 x 3,53	85	0305112081	F/24-FASO-S38-3S11/2-M12x35

Nm = recommended tightening torques (Nm max.) for cylindrical bolts as spec. in ISO 4762 (10.9) for friction coefficient μ tot. 0.14.

Example for comp. : GFS33/18LOMDCF

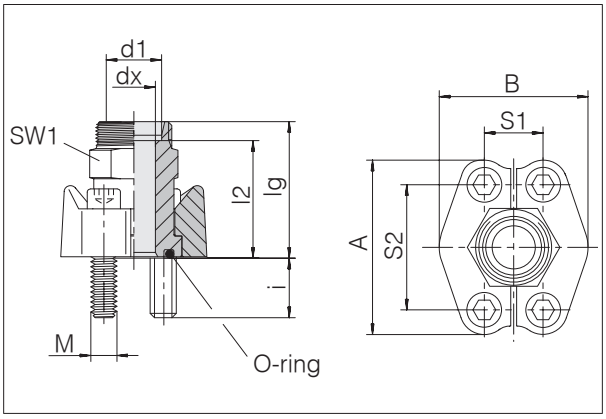
VOSS

Straight flange couplings

With cutting ring connection and split SAE flange
Hole pattern according to SAE J 518 C/ISO 6162
High-pressure series (6000 psi)

Standard material of O-rings is NBR

Tube coupling: 24° in acc. with ISO 8434-1



5

Series Tube OD d1	Fl. size	PB	dx	lg	l2	SW1	S1	S2	A	B	i	4 x cyl. screws	O-ring	Nm	Order-No.	Designation
S 16	1/2	400	12	53	44.5	24	18.2	40.5	48	56	13	M 8 x 30	18,46 x 3,53	50	0305722081	F/24-FASOLW-S16-6S1/2-M8x30-8.8
S 16	3/4"	400	12	59	50.5	30	23.8	50.8	71	60	16	M 10 x 35	25 x 3,53	50	0305242081	F/24-FASO-S16-6S3/4-M10x35
S 20	3/4"	400	16	61	50.5	30	23.8	50.8	71	60	16	M 10 x 35	25 x 3,53	50	0305252081	F/24-FASO-S20-6S3/4-M10x35
S 25	3/4"	400	17	63	51	30	23.8	50.8	71	60	16	M 10 x 35	25 x 3,53	50	0305262081	F/24-FASO-S25-6S3/4-M10x35
S 25	1"	400	20	72	60	36	27.8	57.2	81	70	21	M 12 x 45	32,92 x 3,53	85	0305272081	F/24-FASO-S25-6S1-M12x45
S 30	3/4	400	18	64	50.5	36	23.8	50.8	71	60	24	M 10 x 35	25 x 3,53	85	0306612081	F/24-FASO-S30-6S3/4-M10x35
S 30	1"	400	24	74	60.5	36	27.8	57.2	81	70	21	M 12 x 45	32,92 x 3,53	85	0305282081	F/24-FASO-S30-6S1-M12x45
S 30	1 1/4"	400	25	79	65.5	41	31.8	66.7	95	78	23	M 14 x 50	37,7 x 3,53	135	0305302081	F/24-FASO-S30-6S11/4-M14x45
S 38	1 1/4"	315	30	83	67	46	31.8	66.7	95	78	23	M 14 x 50	37,7 x 3,53	135	0305322081	F/24-FASO-S38-6S11/4-M14x45
S 38	1 1/2"	315	30	89	73	46	36.5	79.4	113	95	25	M 16 x 55	47,22 x 3,53	210	0305342081	F/24-FASO-S38-6S11/2-M16x55

Nm = recommended tightening torques (Nm max.) for cylindrical bolts as spec. in ISO 4762 (10.9) for friction coefficient μ tot. 0.14.

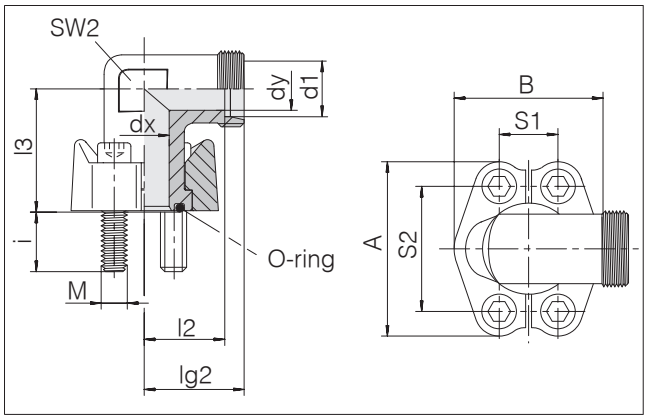
Example for comp. : GFS63/16SOMDCF

Elbow flange couplings

With cutting ring connection and split SAE flange
Hole pattern according to SAE J 518 C/ISO 6162
Standard series (3000 psi)

Standard material of O-rings is NBR

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD d1	Fl. size	PB	dx	dy	lg2	l2	l3	SW2	S1	S2	A	B	i	4 x cyl. screws	O-ring	Nm	Order-No.	Designation
L 18	3/4“	315	19	15	39	31.5	42	30	22.2	47.6	65	52	16	M 10 x 30	25 x 3,53	50	0305122081	F/24-FAEO-L18-3S3/4-M10x30
L 22	3/4“	160	19	19	41	33.5	42	30	22.2	47.6	65	52	16	M 10 x 30	25 x 3,53	50	0305132081	F/24-FAEO-L22-3S3/4-M10x30
L 28	1“	160	25	24	44	36.5	45	36	26.2	52.4	70	59	14	M 10 x 30	32,92 x 3,53	50	0305142081	F/24-FAEO-L28-3S1-M10x30
L 35	1 1/4“	160	27	30	57	46.5	50	41	30.2	58.7	79	59	14	M 10 x 30	37,7 x 3,53	85	0305692081	F/24-FAEO-L35-3S11/4-M10x30
L 35	1 1/4“	160	27	30	57	46.5	50	41	30.2	58.7	79	73	24	M 12 x 35	37,7 x 3,53	85	0305152081	F/24-FAEO-L35-3S11/4-M12x35
L 42	1 1/2“	160	36	36	58	47	55	50	35.7	69.9	94	83	19	M 12 x 35	47,22 x 3,53	85	0305162081	F/24-FAEO-L42-3S11/2-M12x35
S 20	3/4“	350	19	16	43	32.5	42	30	22.2	47.6	65	52	16	M 10 x 30	25 x 3,53	50	0305172081	F/24-FAEO-S20-3S3/4-M10x30
S 25	3/4“	350	19	19	45	33	42	30	22.2	47.6	65	52	16	M 10 x 30	25 x 3,53	50	0305182081	F/24-FAEO-S25-3S3/4-M10x30
S 25	1 1/4“	280	27	20	55	43	50	41	30.2	58.7	79	73	16	M 10 x 30	37,7 x 3,53	85	0305782081	F/24-FAEO-S25-3S11/4-M10x30
S 25	1 1/4“	280	27	20	55	43	50	41	30.2	58.7	79	73	24	M 12 x 35	37,7 x 3,53	85	0305192081	F/24-FAEO-S25-3S11/4-M12x35
S 30	1“	320	25	25	47	33.5	45	36	26.2	52.4	70	59	14	M 10 x 30	32,92 x 3,53	50	0305202081	F/24-FAEO-S30-3S1-M10x30
S 30	1 1/4“	280	27	25	57	43.5	50	41	30.2	58.7	79	73	14	M 10 x 30	37,7 x 3,53	85	0305682081	F/24-FAEO-S30-3S11/4-M10x30
S 30	1 1/4“	280	27	25	57	43.5	50	41	30.2	58.7	79	73	24	M 12 x 35	37,7 x 3,53	85	0305212081	F/24-FAEO-S30-3S11/4-M12x35
S 38	1 1/4“	280	27	28	59	43	50	41	30.2	58.7	79	73	24	M 12 x 35	37,7 x 3,53	85	0305222081	F/24-FAEO-S38-3S11/4-D13,5
S 38	1 1/2“	210	32	32	64	48	55	50	35.7	69.9	94	83	19	M 12 x 35	47,22 x 3,53	85	0305232081	F/24-FAEO-S38-3S11/2-M12x35

Nm = recommended tightening torques (Nm max.) for cylindrical bolts as spec. in ISO 4762 (10.9) for friction coefficient μ tot. 0.14.

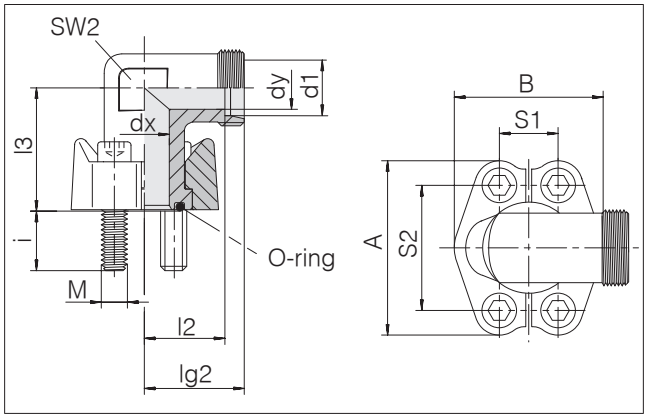
Example for comp. : WFS33/18LOMDCF

Elbow flange couplings

With cutting ring connection and split SAE flange
Hole pattern according to SAE J 518 C/ISO 6162
High-pressure series (6000 psi)

Standard material of O-rings is NBR

Tube coupling: 24° in acc. with ISO 8434-1

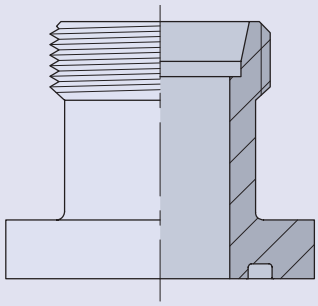


Series Tube OD d1	Fl. size	PB	dx	dy	lg2	l2	l3	SW2	S1	S2	A	B	i	4 x cyl. screws	O-ring	Nm	Order-No.	Designation
S 16	1/2"	400	12	12	38	29.5	39	24	18.3	40.5	56	47	14	M 8 x 30	18,66 x 3,53	25	0305352081	F/24-FAEO-S16-6S1/2-M8x30
S 16	3/4"	400	17	12	45	36.5	48	32	23.8	50.8	71	60	16	M 10 x 35	25 x 3,53	50	0305362081	F/24-FAEO-S16-6S3/4-M10x35
S 20	3/4"	400	17	16	46	35.5	48	32	23.8	50.8	71	60	16	M 10 x 35	25 x 3,53	50	0305372081	F/24-FAEO-S20-6S3/4-M10x35
S 25	3/4"	400	17	18	48	36	48	32	23.8	50.8	71	60	16	M 10 x 35	25 x 3,53	50	0305382081	F/24-FAEO-S25-6S3/4-M10x35
S 25	1"	400	24	20	53	41	60	41	27.8	57.2	81	70	21	M 12 x 45	32,92 x 3,53	85	0305392081	F/24-FAEO-S25-6S1-M12x45
S 25	1 1/4"	400	24	24	58	46	68	46	31.8	66.7	95	78	23	M 14 x 50	37,7 x 3,53	135	0305412081	F/24-FAEO-S25-6S11/4-M14x50
S 30	1"	400	24	24	55	41.5	60	41	27.8	57.2	81	70	21	M 12 x 45	32,92 x 3,53	85	0305402081	F/24-FAEO-S30-6S1-M12x45
S 30	1 1/4"	400	31	25	58	44.5	68	46	31.8	66.7	95	78	23	M 14 x 50	37,7 x 3,53	135	0305422081	F/24-FAEO-S30-6S11/4-M14x50
S 38	1 1/4"	315	31	30	61	45	68	46	31.8	66.7	95	78	21	M 12 x 45	37,7 x 3,53	135	0306492081	F/24-FAEO-S38-6S11/4-M12x45
S 38	1 1/4"	315	31	30	61	45	68	46	31.8	66.7	95	78	23	M 14 x 50	37,7 x 3,53	135	0305442081	F/24-FAEO-S38-6S11/4-M14x50
S 38	1 1/2"	315	36	32	72	56	76	50	36.5	79.4	113	95	25	M 16 x 55	47,22 x 3,53	210	0305462081	F/24-FAEO-S38-6S11/2-M16x55

Nm = recommended tightening torques (Nm max.) for cylindrical bolts as spec. in ISO 4762 (10.9) for friction coefficient μ tot. 0.14.

Example for comp. : WFS62/16SOMDCF

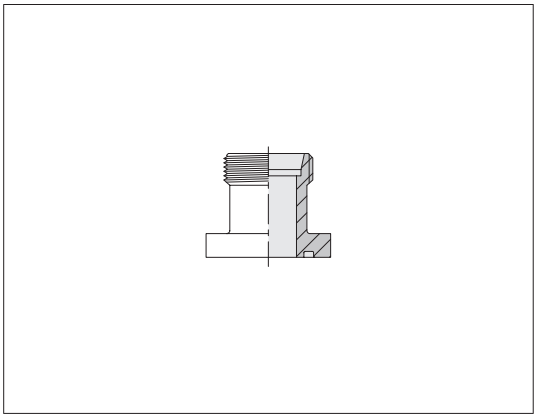
Flange couplings with cutting ring and square flange connection, Individual parts



Straight flange stud connector

With cutting ring and square flange connection

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD	PB	Hole circle Ø	kg/100 ca.	Order-No.	Designation
L 10	315	35	9.5	0795362000	F/24-QFFSX-L10-HC35-D6,4
L 12	315	35	9.7	0795372000	F/24-QFFSX-L12-HC35-D6,4
L 15	100	40	12.4	0795392000	F/24-QFFSX-L15-HC40-D6,4
L 15	250	35	10.2	0795382000	F/24-QFFSX-L15-HC35-D6,4
L 18	100	35	12.0	0796102000	F/24-QFFSX-L18-HC35-D6,4
L 18	100	40	12.2	0795402000	F/24-QFFSX-L18-HC40-D6,4
L 22	100	40	12.3	0795412000	F/24-QFFSX-L22-HC40-D6,4
L 28	100	40	15.9	0795142000	F/24-QFFSX-L28-HC40-D6,4
L 28	100	40	16.0	0795842000	F/24-QFFSX-L28-HC40-D6,4-LG55
L 28	100	55	30.4	0795902000	F/24-QFFSX-L28-HC55-D8,4
L 35	100	55	39.8	0795872000	F/24-QFFSX-L35-HC55-D8,4
S 16	315	35	16.4	0795102000	F/24-QFFSX-S16-HC35-D6,4
S 20	315	55	30.0	0795232000	F/24-QFFSX-S20-HC55-D8,4

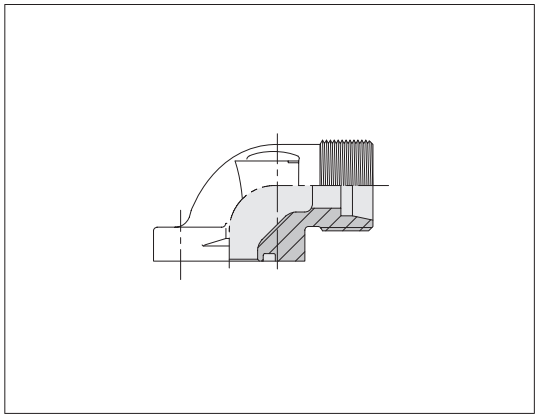
For O-rings, see chapter 3.

Example for comp. :
BFG10L/LK35CFX

Elbow flange stud connector

With cutting ring and square flange connection

Tube coupling: 24° in acc. with ISO 8434-1

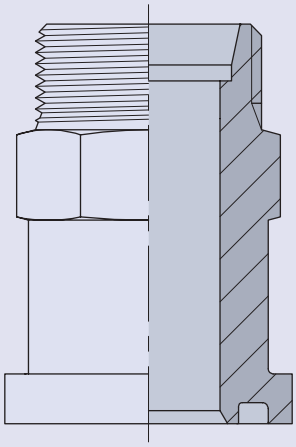


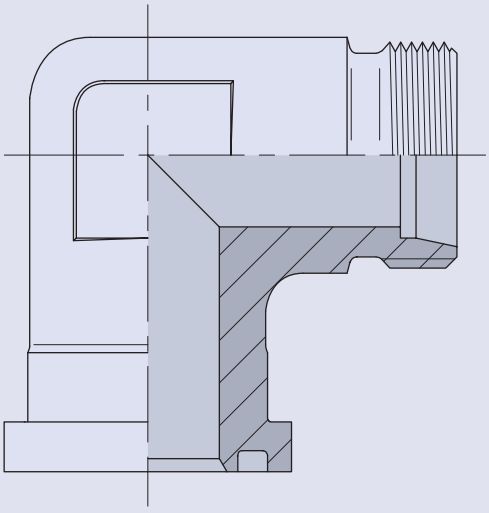
Series Tube OD	PB	Hole circle Ø	kg/100 ca.	Order-No.	Designation
L 10	315	35	14.2	0795422000	F/24-QFFEX-L10-HC35-D6,4
L 12	315	35	15.7	0795622000	F/24-QFFEX-L12-HC35-D6,4
L 15	100	40	20.1	0795642000	F/24-QFFEX-L15-HC40-D6,4
L 15	250	35	19.0	7004709400	F/24-QFFEX-L15-HC35-D6,4
L 18	100	35	17.9	0795452000	F/24-QFFEX-L18-HC35-D6,4
L 18	100	40	16.9	0795432000	F/24-QFFEX-L18-HC40-D6,4
L 22	100	40	17.7	0795442000	F/24-QFFEX-L22-HC40-D6,4
L 28	100	40	26.0	0795152000	F/24-QFFEX-L28-HC40-D6,4
L 35	100	40	32.2	0795272000	F/24-QFFEX-L35-HC40-D6,4
L 35	100	55	46.6	0795172000	F/24-QFFEX-L35-HC55-D8,4
L 42	100	55	61.0	0795192000	F/24-QFFEX-L42-HC55-D8,4
S 12	315	35	27.1	0795882000	F/24-QFFEX-S12-HC35-D6,4
S 16	315	35	17.3	0795252000	F/24-QFFEX-S16-HC35-D6,4
S 20	250	40	20.2	0795132000	F/24-QFFEX-S20-HC40-D6,4
S 20	250	55	44.9	0795182000	F/24-QFFEX-S20-HC55-D8,4
S 20	315	35	22.3	0795112000	F/24-QFFEX-S20-HC35-D6,4
S 25	250	55	49.1	0795892000	F/24-QFFEX-S25-HC55-D8,4
S 30	250	55	49.8	0795242000	F/24-QFFEX-S30-HC55-D8,4

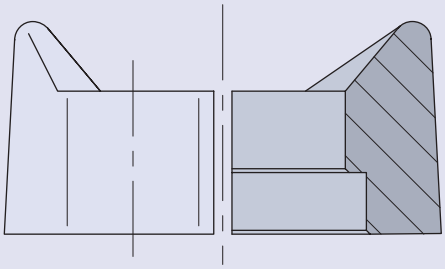
For O-rings, see chapter 3.

Example for comp. :
BFW10L/LK35CFX

Flange couplings with cutting ring connection and split SAE flange, individual parts



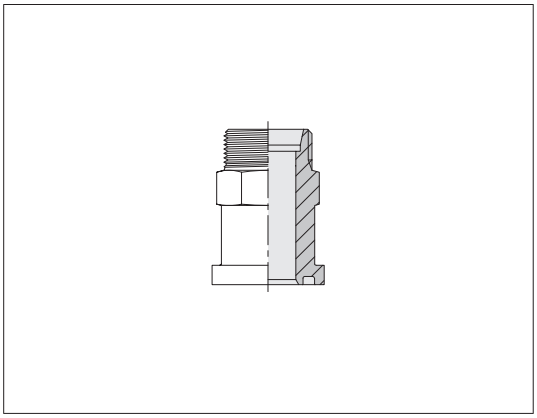




Straight flange stud connector

With cutting ring coupling for divided SAE flange
Hole pattern according to SAE J 518 C / ISO 6162
Standard series (3000 psi)

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD	Fl. size	kg/100 ca.	Order-No.	Designation
L 18	3/4"	21.3	0396002000	F/24-FASX-L18-3S3/4
L 22	3/4"	20.2	0396012000	F/24-FASX-L22-3S3/4
L 28	1"	28.2	0396022000	F/24-FASX-L28-3S1
L 35	1 1/4"	36.3	0396032000	F/24-FASX-L35-3S11/4
L 42	1 1/2"	48.2	0396042000	F/24-FASX-L42-3S11/2
S 20	3/4"	23.8	0396052000	F/24-FASX-S20-3S3/4
S 25	3/4"	24.1	0396062000	F/24-FASX-S25-3S3/4
S 25	1 1/4"	43.3	0396072000	F/24-FASX-S25-3S11/4
S 30	1"	36.4	0396082000	F/24-FASX-S30-3S1
S 30	1 1/4"	43.8	0396092000	F/24-FASX-S30-3S11/4
S 38	1 1/4"	53.2	0396102000	F/24-FASX-S38-3S11/4
S 38	1 1/2"	63.2	0396112000	F/24-FASX-S38-3S11/2

For O-rings, see chapter 3.

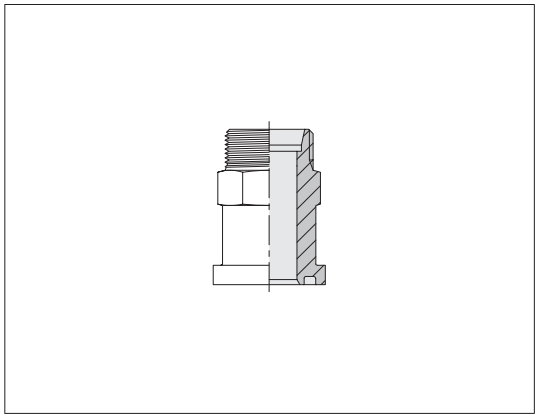
Order code depends on screw size.

Example for comp. :
GFS33/18LCFX

Straight flange stud connector

With cutting ring coupling for divided SAE flange
Hole pattern according to SAE J 518 C / ISO 6162
Standard series (6000 psi)

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD	Fl. size	kg/100 ca.	Order-No.	Designation
S 16	3/4“	27.2	0396242000	F/24-FASX-S16-6S3/4
S 20	3/4“	27.9	0396252000	F/24-FASX-S20-6S3/4
S 25	3/4“	30.0	0396262000	F/24-FASX-S25-6S3/4
S 25	1“	46.1	0396272000	F/24-FASX-S25-6S1
S 30	1“	43.4	0396282000	F/24-FASX-S30-6S1
S 30	1 1/4“	57.4	0396302000	F/24-FASX-S30-6S11/4
S 38	1 1/4“	64.8	0396322000	F/24-FASX-S38-6S11/4
S 38	1 1/2“	82.0	0396342000	F/24-FASX-S38-6S11/2

For O-rings, see chapter 3.

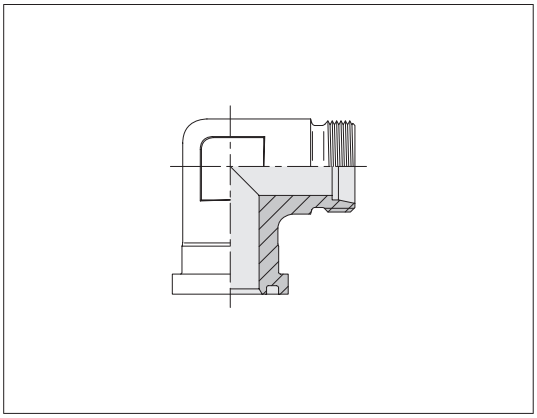
Order code depends on screw size.

Example for comp.: GFS63/16SCFX

Elbow flange stud connector

With cutting ring coupling for divided SAE flange
Hole pattern according to SAE J 518 C / ISO 6162
Standard series (3000 psi)

Tube coupling: 24° in acc. with ISO 8434-1



Series Tube OD	Fl. size	kg/100 ca.	Order-No.	Designation
L 18	3/4"	31.4	0396122000	F/24-FAEX-L18-3S3/4
L 22	3/4"	29.6	0396132000	F/24-FAEX-L22-3S3/4
L 28	1"	40.4	0396142000	F/24-FAEX-L28-3S1
L 35	1 1/4"	67.0	0396152000	F/24-FAEX-L35-3S11/4
L 42	1 1/2"	110.9	0396162000	F/24-FAEX-L42-3S11/2
S 20	3/4"	31.9	0396172000	F/24-FAEX-S20-3S3/4
S 25	3/4"	33.3	0396182000	F/24-FAEX-S25-3S3/4
S 25	1 1/4"	62.2	0396192000	F/24-FAEX-S25-3S11/4
S 30	1"	45.2	0396202000	F/24-FAEX-S30-3S1
S 30	1 1/4"	69.4	0396212000	F/24-FAEX-S30-3S11/4
S 38	1 1/4"	76.5	0396222000	F/24-FAEX-S38-3S11/4
S 38	1 1/2"	98.3	0396232000	F/24-FAEX-S38-3S11/2

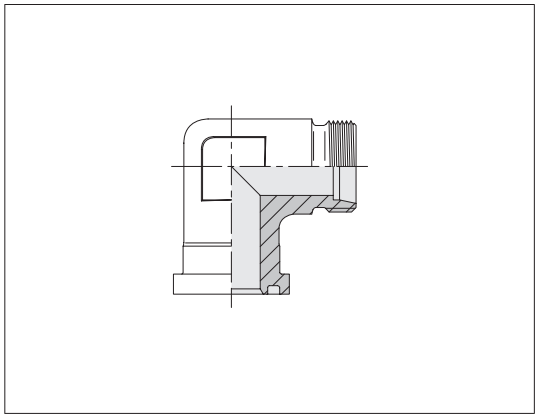
For O-rings, see chapter 3.

Example for comp.:
WFS336/18LCFX

Elbow flange stud connector

With cutting ring coupling for divided SAE flange
Hole pattern according to SAE J 518 C / ISO 6162
Standard series (6000 psi)

Tube coupling: 24° in acc. with ISO 8434-1



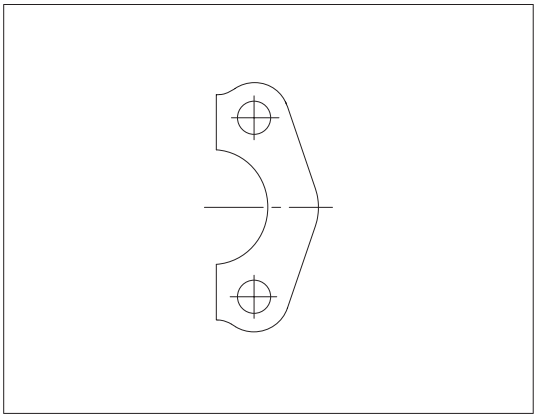
Series Tube OD	Fl. size	kg/100 ca.	Order-No.	Designation
S 16	1/2“	15.7	0396352000	F/24-FAEX-S16-6S1/2
S 16	3/4“	43.0	0396362000	F/24-FAEX-S16-6S3/4
S 20	3/4“	42.5	0396372000	F/24-FAEX-S20-6S3/4
S 25	3/4“	45.8	0396382000	F/24-FAEX-S25-6S3/4
S 25	1“	59.3	0396392000	F/24-FAEX-S25-6S1
S 30	1“	61.2	0396402000	F/24-FAEX-S30-6S1
S 30	1 1/4“	82.9	0396422000	F/24-FAEX-S30-6S11/4
S 38	1 1/4“	96.5	0396442000	F/24-FAEX-S38-6S11/4
S 38	1 1/2“	131.7	0396462000	F/24-FAEX-S38-6S11/2

For O-rings, see chapter 3.

Example for comp.:
WFS63/16SCFX

Flange halves

Hole pattern according to SAE J 518 C / ISO 6162
Standard series (3000 psi)

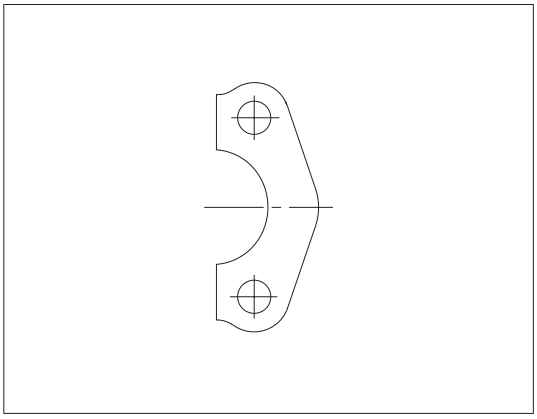


Fl. size	kg/100 ca.	Order-No.	Designation
1/2“		0396992000	F-SF-3S1/2-D8,75
3/4“	8.9	0397792000	F-SF-3S3/4-D10,75
1“	11.1	0397802000	F-SF-3S1-D10,75
1 1/4“	14.6	0397812000	F-SF-3S11/4-D12,75
1 1/4“	15.0	0397672000	F-SF-3S11/4-D12
1 1/4“	15.8	0396972000	F-SF-3S11/4-D10,75
1 1/2“	23.0	0397822000	F-SF-3S11/2-D13,5
2“	26.5	0397832000	F-SF-3S2-D13,5
2 1/2"	41.1	0396962000	F-SF-3S21/2-D13,5
3“	65.2	0396952000	F-SF-3S3-D17
3 1/2"	59.9	0396942000	F-SF-3S31/2-D17
4"	81.0	0396932000	F-SF-3S4-D17

Example for comp.:
FHS33CFX

Flange halves

Hole pattern according to SAE J 518 C / ISO 6162
Standard series (6000 psi)



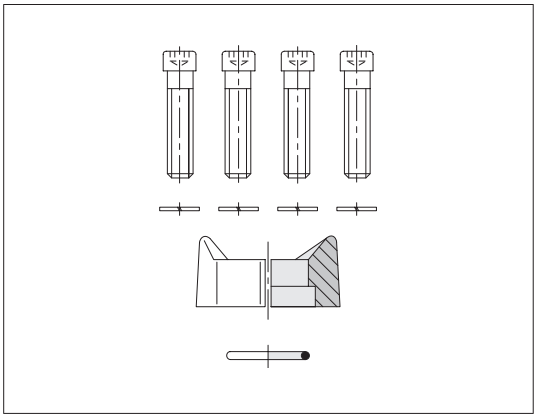
Fl. size	kg/100 ca.	Order-No.	Designation
1/2“	25.0	0397862000	F-SF-6S1/2-D8,75
3/4“	33.2	0397872000	F-SF-6S3/4-D10,75
1“	25.0	0397882000	F-SF-6S1-D13
1“	27.0	0396912000	F-SF-6S1-D12
1 1/4“	39.0	0397892000	F-SF-6S11/4-D14,75
1 1/4“	40.0	0396902000	F-SF-6S11/4-D13,5
1 1/2“	68.3	0397902000	F-SF-6S11/2-D17
2“	105.0	0396892000	F-SF-6S2-D21

Example for comp.:
FHS63CFX

Installation kits

Hole pattern according to SAE J 518 C / ISO 6162
Standard series (3000 psi)

Flange halves pair
Metric screws with spring washer
Standard material of O-rings is NBR



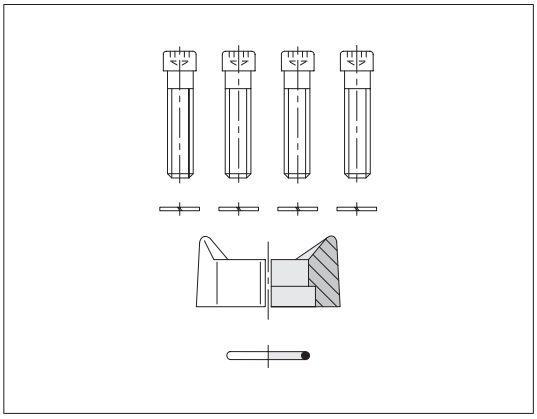
Fl. size	4 x cyl. screws	Order-No.	Designation
1/2“	M 8 x 25	7004707800	F/SET-SFPO-3S1/2-M8x25
3/4“	M 10 x 30	7004707700	F/SET-SFPO-3S3/4-M10x30
1“	M 10 x 30	7004707600	F/SET-SFPO-3S1-M10x30
1 1/4“	M 10 x 30	7004707500	F/SET-SFPO-3S11/4-M10x30
1 1/4“	M 12 x 35	7004707400	F/SET-SFPO-3S11/4-M12x35
1 1/2“	M 12 x 35	7004707300	F/SET-SFPO-3S11/2-M12x35
2“	M 12 x 35	7004707200	F/SET-SFPO-3S2-M12x35
2 1/2"	M 12 x 40	7004707100	F/SET-SFPO-3S21/2-M12x40

Example for comp. :
FHS63CFX
GFS63/16SCFX
WFS63/16SCFX

Installation kits

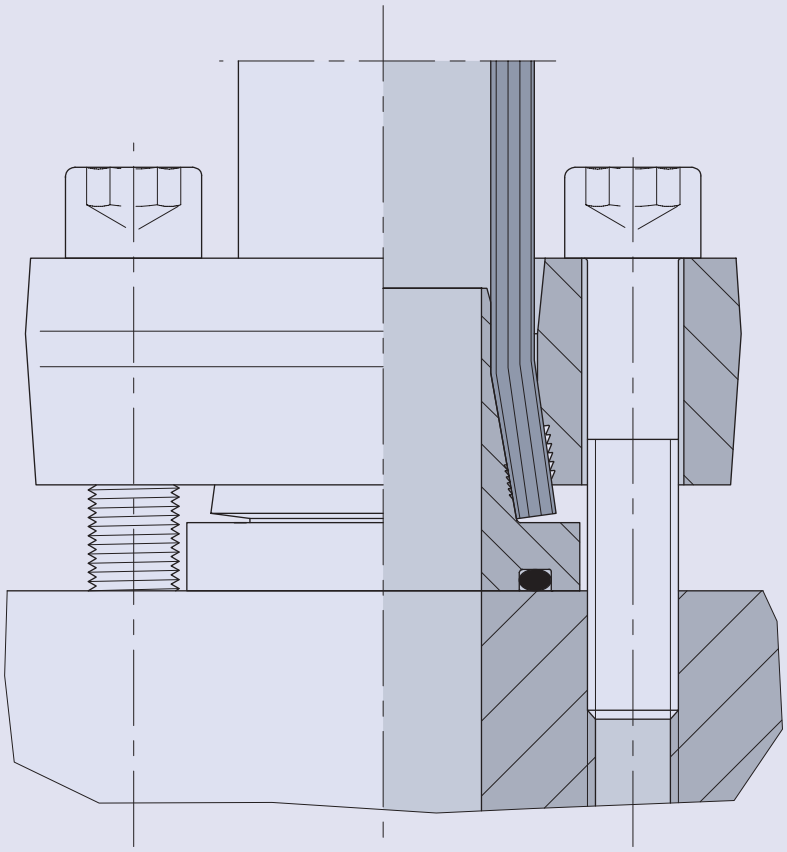
Hole pattern according to SAE J 518 C / ISO 6162
Standard series (6000 psi)

Flange halves pair
Metric screws with spring washer
Standard material of O-rings is NBR



Fl. size	4 x cyl. screws	Order-No.	Designation
1/2“	M 8 x 30	7004707000	F/SET-SFPO-6S1/2-M8x30
3/4“	M 10 x 35	7004706900	F/SET-SFPO-6S3/4-M10x35
1“	M 12 x 45	7004706800	F/SET-SFPO-6S1-M12x45
1 1/4“	M 14 x 50	7004706700	F/SET-SFPO-6S11/4-M14x50
1 1/2“	M 16 x 55	7004706600	F/SET-SFPO-6S11/2-M16x55
2“	M 20 x 70	7004706500	F/SET-SFPO-6S2-M20x70

ZAKO flared flanges with SAE flange connection

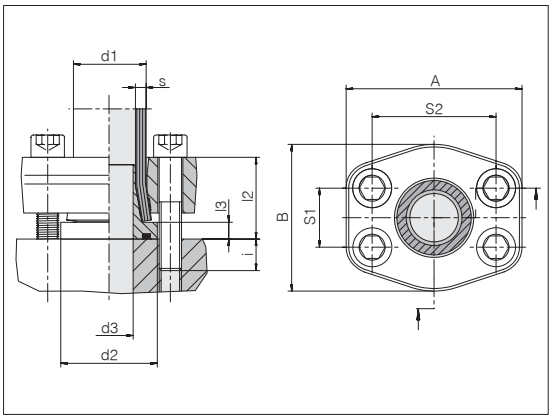


Connecting flange couplings ZAKO system

Hole pattern according to
SAE J 518 C/ISO 6162
Standard series (3000 psi)

Standard O-ring material is NBR

Permitted operating pressure (PB) 250 bar



Tube d1 x s	Fl. size	d2	d3	l2	l3	S1	S2	A	B	i	4 x cyl. screws	Nm	kg/100 ca.	Order-No.	Designation
16 x 2	1/2“	30	10.5	32	8	17.5	38.1	56	48	13	M 8 x 45	35	43.9	0513001900	Z-TPO-16x2-3S1/2-M8-C19
16 x 2,5	1/2“	30	9.5	32	8	17.5	38.1	56	48	13	M 8 x 45	35	43.9	0513011900	Z-TPO-16x2,5-3S1/2-M8-C19
16 x 3	1/2“	30	8.5	32	8	17.5	38.1	56	48	13	M 8 x 45	35	43.9	0513291900	Z-TPO-16x3-3S1/2-M8-C19
20 x 2,5	3/4“	38	13.5	32	8	22.2	47.6	65	52	13	M 10 x 45	69	54.7	0513021900	Z-TPO-20x2,5-3S3/4-M10-C19
20 x 3	3/4“	38	12.5	32	8	22.2	47.6	65	52	13	M 10 x 45	69	54.8	0513031900	Z-TPO-20x3-3S3/4-M10-C19
25 x 3	3/4“	38	17	32.5	8.5	22.2	47.6	65	52	12.5	M 10 x 45	69	66.9	0513041900	Z-TPO-25x3-3S3/4-M10-C19
25 x 4	3/4“	38	15	32.5	8.5	22.2	47.6	65	50	12.5	M 10 x 45	69	67.3	0513221900	Z-TPO-25x4-3S3/4-M10-C19
30 x 4	1“	46	20	42.5	8.5	26.2	52.4	72	60	12.5	M 10 x 55	69	80.1	0513051900	Z-TPO-30x4-3S1-M10-C19
30 x 5	1“	46	17	42.5	8.5	26.2	52.4	72	60	12.5	M 10 x 55	69	81.3	0513251900	Z-TPO-30x5-3S1-M10-C19
38 x 4	1 1/4“	52	28	44	9	30.2	58.7	79	73	16	M 12 x 60	120	106.7	0513061900	Z-TPO-38x4-3S11/4-M12-C19
38 x 5	1 1/4“	52	56	44	9	30.2	58.7	79	73	16	M 12 x 60	120	107.2	0513071900	Z-TPO-38x5-3S11/4-M12-C19
38 x 6	1 1/4“	52	23	44	9	30.2	58.7	79	73	16	M 12 x 60	120	107.3	0513281900	Z-TPO-38x6-3S11/4-M12-C19
42 x 2	1 1/4“	52	34	44	9	30.2	58.7	79	73	16	M 10 x 60	69	80.1	0513161900	Z-TPO-42x2-3S11/4-M10-C19
50 x 2,5	1 1/2“	63	42	46	10	35.7	69.9	94	83	14	M 12 x 60	120	136.3	0513081900	Z-TPO-50x2,5-3S11/2-M12-C19
50 x 5	1 1/2“	63	37	46	10	35.7	69.9	94	83	14	M 12 x 60	120	136.9	0513091900	Z-TPO-50x5-3S11/2-M12-C19
50 x 6	1 1/2“	63	35	46	10	35.7	69.9	94	83	14	M 12 x 60	120	136.8	0513101900	Z-TPO-50x6-3S11/2-M12-C19
50 x 8	1 1/2“	63	31	46	10	35.7	69.9	94	83	14	M 12 x 60	120	140.0	0513201900	Z-TPO-50x8-3S11/2-M12-C19
65 x 3	2“	75	55	60	11	42.9	77.8	102	97	15	M 12 x 75	120	189.0	0513111900	Z-TPO-65x3-3S2-M12-C19
65 x 4	2“	75	54	60	11	42.9	77.8	102	97	15	M 12 x 75	120	183.0	0513121900	Z-TPO-65x4-3S2-M12-C19
65 x 5	2“	75	52	60	11	42.9	77.8	102	97	15	M 12 x 75	120	186.3	0513131900	Z-TPO-65x5-3S2-M12-C19
80 x 3	3“	100	71	66	16	61.9	106.4	135	131	24	M 16 x 90	295	405.6	0513141900	Z-TPO-80x3-3S3-M16-C19

The pressure ratings stated by the tube manufacturers are the criteria for selecting tube dimensions.

ASME code states that a reduced operating pressure applies to flange sizes 2" and 3".

Nm = recommended tightening torques (Nm max.) for cylindrical bolts as spec. in DIN 912 (10.9) for friction coefficient μ tot. 0.14.

Example for comp. : FE-1620-8/3

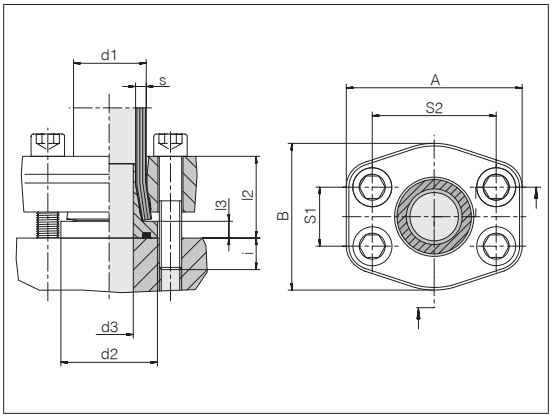
Connecting flange couplings ZAKO system

Hole pattern according to
SAE J 518 C/ISO 6162
Standard series (3000 psi)

Standard O-ring material is NBR

Permitted operating pressure (PB) 250 bar

Reducers



Tube d1 x s	Fl. size	d2	d3	l2	l3	S1	S2	A	B	i	4 x cyl. screws	Nm	kg/100 ca.	Order-No.	Designation
25 x 4	1“	38	15	38.5	8.5	26.2	52.4	72	60	16.5	M 10 x 55	69	64.6	0513241900	Z-TPO-25x4-3S1-M10-C19
30 x 4	1 1/4“	46	20	42	8.5	30.2	58.7	79	73	18	M 12 x 60	120	105.5	0513261900	Z-TPO-30x4-3S11/4-M12-C19
30 x 5	1 1/4“	46	17	43.5	8.5	30.2	58.7	79	73	16.5	M 12 x 60	120	105.7	0513271900	Z-TPO-30x5-3S11/4-M12-C19
50 x 2,5	2“	63	42	52.5	10	42.9	77.8	102	97	22.5	M 12 x 75	120	193.0	0513751900	Z-TPO-50x2,5-3S2-M12-C19
50 x 5	2“	63	37	53	10	42.9	77.8	102	97	22	M 12 x 75	120	193.2	0513761900	Z-TPO-50x5-3S2-M12-C19
50 x 6	2“	63	35	55	10	42.9	77.8	102	97	20	M 12 x 75	120	193.1	0513771900	Z-TPO-50x6-3S2-M12-C19
50 x 8	2“	63	31	56	10	42.9	77.8	102	97	19	M 12 x 75	120	197.4	0513781900	Z-TPO-50x8-3S2-M12-C19

The pressure ratings stated by the tube manufacturers are the criteria for selecting tube dimensions.

ASME code states that a reduced operating pressure applies to flange size 2".

Nm = recommended tightening torques (Nm max.) for cylindrical bolts as spec. in DIN 912 (10.9) for friction coefficient μ tot. 0.14.

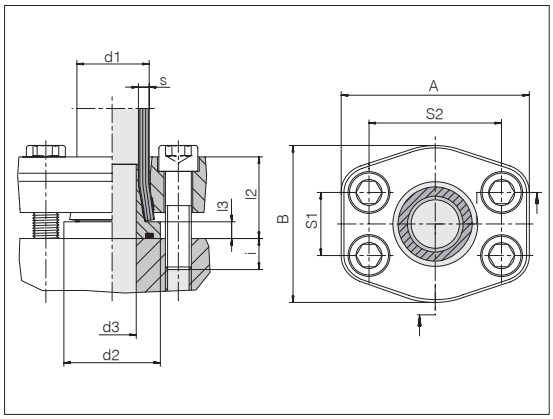
Example for comp. : FE-2530-16/3

Connecting flange couplings ZAKO system

Hole pattern according to
SAE J 518 C/ISO 6162
High pressure series (6000 psi)

Standard O-ring material is NBR

Permitted operating pressure (PB) 400 bar



Tube d1 x s	Fl. size	d2	d3	l2	l3	S1	S2	A	B	i	4 x cyl. screws	Nm	kg/100 ca.	Order-No.	Designation
16 x 2	1/2"	30	10.5	32	8	18.3	40.5	56	48	12	M 8 x 40	35	38.6	0513521900	Z-TPO-16x2-6S1/2-M8-C19
16 x 2,5	1/2"	30	9.5	32	8	18.3	40.5	56	48	12	M 8 x 40	35	38.6	0513301900	Z-TPO-16x2,5-6S1/2-M8-C19
16 x 3	1/2"	30	8.5	32	8	18.3	40.5	56	48	12	M 8 x 40	35	38.6	0513311900	Z-TPO-16x3-6S1/2-M8-C19
20 x 2,5	3/4"	38	13.5	37	8	23.9	50.8	71	60	13	M 10 x 40	69	69.2	0513531900	Z-TPO-20x2,5-6S3/4-M10-C19
20 x 3	3/4"	38	12.5	37	8	23.9	50.8	71	60	13	M 10 x 40	69	69.3	0513321900	Z-TPO-20x3-6S3/4-M10-C19
20 x 3,5	3/4"	38	11	37	8	23.9	50.8	71	60	13	M 10 x 40	69	69.6	0513331900	Z-TPO-20x3,5-6S3/4-M10-C19
25 x 3	3/4"	38	17	37.5	8.5	23.9	50.8	71	60	14.5	M 10 x 40	69	65.6	0513341900	Z-TPO-25x3-6S3/4-M10-C19
25 x 4	3/4"	38	15	37.5	8.5	23.9	50.8	71	60	14.5	M 10 x 40	69	66.0	0513351900	Z-TPO-25x4-6S3/4-M10-C19
30 x 4	1"	46	20	42.5	8.5	27.8	57.2	81	70	14.5	M 12 x 40	120	97.6	0513361900	Z-TPO-30x4-6S1-M12-C19
30 x 5	1"	46	17	42.5	8.5	27.8	57.2	81	70	14.5	M 12 x 40	120	98.7	0513371900	Z-TPO-30x5-6S1-M12-C19
38 x 4	1 1/4"	52	28	44	9	31.7	66.7	95	78	17.1	M 14 x 45	190	127.2	0513551900	Z-TPO-38x4-6S11/4-M14-C19
38 x 5	1 1/4"	52	26	44	9	31.7	66.7	95	78	17.1	M 14 x 45	190	127.0	0513381900	Z-TPO-38x5-6S11/4-M14-C19
38 x 6	1 1/4"	52	23	44	9	31.7	66.7	95	78	17.1	M 14 x 45	190	140.3	0513391900	Z-TPO-38x6-6S11/4-M14-C19
50 x 5	1 1/2"	63	37	56.5	10	36.5	79.4	113	95	22	M 16 x 60	295	230.8	0513561900	Z-TPO-50x5-6S11/2-M16-C19
50 x 6	1 1/2"	63	35	56.5	10	36.5	79.4	113	95	22	M 16 x 60	295	230.7	0513401900	Z-TPO-50x6-6S11/2-M16-C19
50 x 8	1 1/2"	63	31	56.5	10	36.5	79.4	113	95	22	M 16 x 60	295	233.1	0513411900	Z-TPO-50x8-6S11/2-M16-C19
65 x 8	2"	75	46	65	11	44.5	96.8	133	114	30	M 20 x 90	580	383.5	0513421900	Z-TPO-65x8-6S2-M20-C19

The pressure ratings stated by the tube manufacturers are the criteria for selecting tube dimensions.

Nm = recommended tightening torques (Nm max.) for cylindrical bolts as spec. in DIN 912 (10.9) for friction coefficient μ tot. 0.14.

Example for comp. : FE-1620-8/6

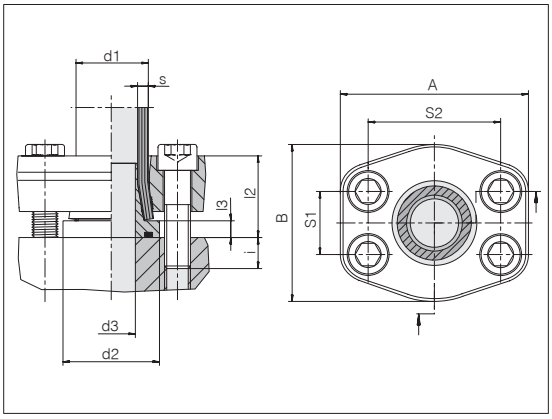
Connecting flange couplings ZAKO system

Hole pattern according to
SAE J 518 C/ISO 6162
High pressure series (6000 psi)

Standard O-ring material is NBR

Permitted operating pressure (PB) 400 bar

Reducers



Tube d1 x s	Fl. size	d2	d3	l2	l3	S1	S2	A	B	i	4 x cyl. screws	Nm	kg/100 ca.	Order-No.	Designation
38 x 5	1“	46	26	43	9	27.8	57.2	81	70	14	M 12 x 40	120	89.9	0513541900	Z-TPO-38x5-6S1-M12-C19
50 x 5	2“	63	37	58	10	44.5	96.8	133	114	32	M 20 x 90	580	438.5	0513571900	Z-TPO-50x5-6S2-M20-C19
50 x 8	2“	63	31	61	10	44.5	96.8	133	114	34	M 20 x 90	580	440.7	0513431900	Z-TPO-50x8-6S2-M20-C19

The pressure ratings stated by the tube manufacturers are the criteria for selecting tube dimensions.

Nm = recommended tightening torques (Nm max.) for cylindrical bolts as spec. in DIN 912 (10.9) for friction coefficient μ tot. 0.14.

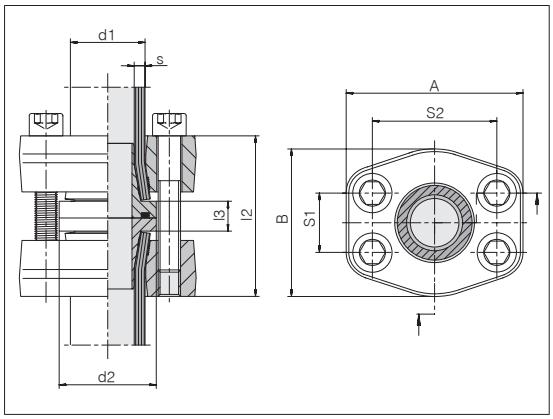
Example for comp. :
FE-3850-16/6

Tube connection flange couplings ZAKO system

Hole pattern according to
SAE J 518 C/ISO 6162
Standard series (3000 psi)

Standard O-ring material is NBR

Permitted operating pressure (PB) 250 bar



Tube d1 x s	Fl. size	d2	l2	l3	S1	S2	A	B	4 x cyl. screws	Nm	kg/100 ca.	Order-No.	Designation
16 x 2	1/2“	30	61.5	13.5	17.5	38.1	55	45	M 8 x 55	35	77.5	0514001900	Z-TTO-16x2-3S1/2-M8-C19
16 x 2,5	1/2“	30	61.5	13.5	17.5	38.1	55	45	M 8 x 55	35	77.5	0514011900	Z-TTO-16x2,5-3S1/2-M8-C19
16 x 3	1/2“	30	61.5	13.5	17.5	38.1	55	45	M 8 x 55	35	77.5	0514801900	Z-TTO-16x3-3S1/2-M8-C19
20 x 2,5	3/4“	38	61.5	13.5	22.2	47.6	65	50	M 10 x 55	69	96.6	0514021900	Z-TTO-20x2,5-3S3/4-M10-C19
20 x 3	3/4“	38	61.5	13.5	22.2	47.6	65	50	M 10 x 55	69	97.0	0514031900	Z-TTO-20x3-3S3/4-M10-C19
20 x 3,5	3/4“	38	61.5	13.5	22.2	47.6	65	50	M 10 x 55	69	97.4	0514811900	Z-TTO-20x3,5-3S3/4-M10-C19
25 x 3	3/4“	38	62	14	22.2	47.6	65	50	M 10 x 55	69	106.0	0514041900	Z-TTO-25x3-3S3/4-M10-C19
25 x 4	3/4“	38	62	14	22.2	47.6	65	50	M 10 x 55	69	106.4	0514821900	Z-TTO-25x4-3S3/4-M10-C19
30 x 4	1“	46	82.5	14.5	26.2	52.4	72	60	M 10 x 60	69	149.0	0514051900	Z-TTO-30x4-3S1-M10-C19
30 x 5	1“	46	82.5	14.5	26.2	52.4	72	60	M 10 x 60	69	151.2	0514851900	Z-TTO-30x5-3S1-M10-C19
38 x 4	1 1/4“	52	86	16	30.2	58.7	79	73	M 12 x 75	120	198.6	0514061900	Z-TTO-38x4-3S11/4-M12-C19
38 x 5	1 1/4“	52	86	16	30.2	58.7	79	73	M 12 x 75	120	197.1	0514071900	Z-TTO-38x5-3S11/4-M12-C19
38 x 6	1 1/4“	52	86	16	30.2	58.7	79	73	M 12 x 75	120	197.0	0514891900	Z-TTO-38x6-3S11/4-M12-C19
50 x 2,5	1 1/2“	63	89	17	35.7	69.9	94	83	M 12 x 75	120	255.8	0514081900	Z-TTO-50x2,5-3S11/2-M12-C19
50 x 5	1 1/2“	63	89	17	35.7	69.9	94	83	M 12 x 75	120	256.3	0514091900	Z-TTO-50x5-3S11/2-M12-C19
50 x 6	1 1/2“	63	89	17	35.7	69.9	94	83	M 12 x 75	120	255.8	0514101900	Z-TTO-50x6-3S11/2-M12-C19
50 x 8	1 1/2“	63	89	17	35.7	69.9	94	83	M 12 x 75	120	256.8	0514901900	Z-TTO-50x8-3S11/2-M12-C19
50 x 9	1 1/2“	63	89	17	35.7	69.9	94	83	M 12 x 75	120	257.1	0514911900	Z-TTO-50x9-3S11/2-M12-C19
65 x 3	2“	75	117	19	42.9	77.8	102	97	M 12 x 100	120	359.6	0514111900	Z-TTO-65x3-3S2-M12-C19
65 x 4	2“	75	117	19	42.9	77.8	102	97	M 12 x 100	120	353.2	0514121900	Z-TTO-65x4-3S2-M12-C19
65 x 5	2“	75	117	19	42.9	77.8	102	97	M 12 x 100	120	357.1	0514131900	Z-TTO-65x5-3S2-M12-C19
80 x 3	3“	100	129	29	61.9	106.4	135	131	M 16 x 110	295	756.0	0514141900	Z-TTO-80x3-3S3-M16-C19

The pressure ratings stated by the tube manufacturers are the criteria for selecting tube dimensions.

ASME code states that a reduced operating pressure applies to flange sizes 2" and 3".

Nm = recommended tightening torques (Nm max.) for cylindrical bolts as spec. in DIN 912 (10.9) for friction coefficient μ tot. 0.14.

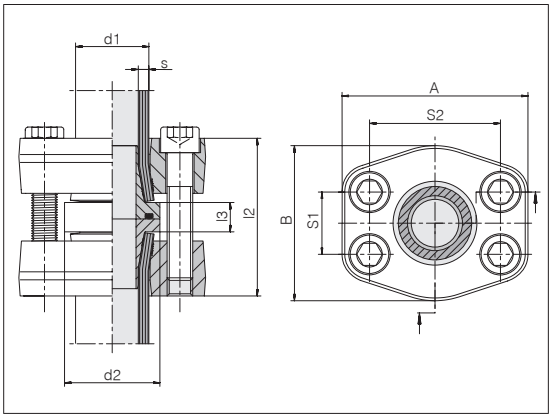
Example for comp. :
FG-1620-8/3

Tube connection flange couplings ZAKO system

Hole pattern according to
SAE J 518 C/ISO 6162
High pressure series (6000 psi)

Standard O-ring material is NBR

Permitted operating pressure (PB) 400 bar



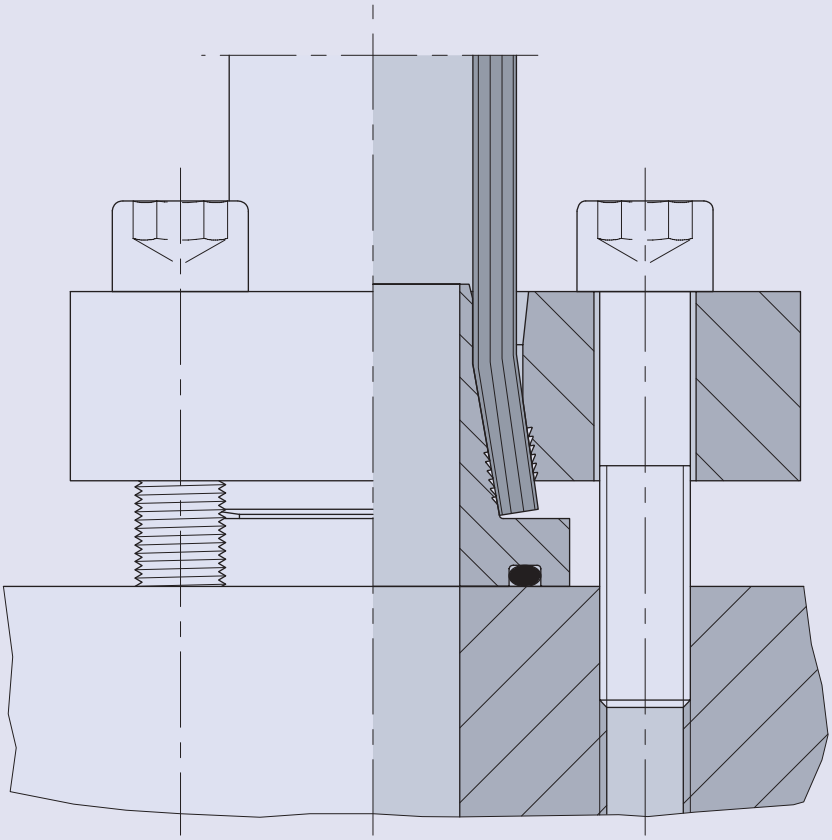
Tube d1 x s	Fl. size	d2	l2	l3	S1	S2	A	B	4 x cyl. screws	Nm	kg/100 ca.	Order-No.	Designation
16 x 2	1/2"	30	61.5	13.5	18.3	40.5	56	48	M 8 x 50	35	72.0	0514501900	Z-TTO-16x2-6S1/2-M8-C19
16 x 2,5	1/2"	30	61.5	13.5	18.3	40.5	56	48	M 8 x 50	35	72.0	0514301900	Z-TTO-16x2,5-6S1/2-M8-C19
16 x 3	1/2"	30	61.5	13.5	18.3	40.5	56	48	M 8 x 50	35	72.0	0514311900	Z-TTO-16x3-6S1/2-M8-C19
20 x 2,5	3/4"	38	71.5	13.5	23.9	50.8	71	60	M 10 x 50	69	132.5	0514511900	Z-TTO-20x2,5-6S3/4-M10-C19
20 x 3	3/4"	38	71.5	13.5	23.9	50.8	71	60	M 10 x 50	69	132.9	0514321900	Z-TTO-20x3-6S3/4-M10-C19
20 x 3,5	3/4"	38	71.5	13.5	23.9	50.8	71	60	M 10 x 50	69	133.2	0514331900	Z-TTO-20x3,5-6S3/4-M10-C19
25 x 3	3/4"	38	72	14	23.9	50.8	71	60	M 10 x 50	69	128.2	0514341900	Z-TTO-25x3-6S3/4-M10-C19
25 x 4	3/4"	38	72	14	23.9	50.8	71	60	M 10 x 50	69	128.9	0514351900	Z-TTO-25x4-6S3/4-M10-C19
30 x 4	1"	46	82.5	14.5	27.8	57.2	81	70	M 12 x 50	120	193.6	0514361900	Z-TTO-30x4-6S1-M12-C19
30 x 5	1"	46	82.5	14.5	27.8	57.2	81	70	M 12 x 50	120	195.8	0514371900	Z-TTO-30x5-6S1-M12-C19
38 x 4	1 1/4"	52	86	16	31.7	66.7	95	78	M 14 x 60	190	248.6	0514531900	Z-TTO-38x4-6S11/4-M14-C19
38 x 5	1 1/4"	52	86	16	31.7	66.7	95	78	M 14 x 60	190	248.9	0514381900	Z-TTO-38x5-6S11/4-M14-C19
38 x 6	1 1/4"	52	86	16	31.7	66.7	95	78	M 14 x 60	190	262.7	0514391900	Z-TTO-38x6-6S11/4-M14-C19
50 x 5	1 1/2"	63	110	17	36.5	79.4	113	95	M 16 x 75	295	442.6	0514541900	Z-TTO-50x5-6S11/2-M16-C19
50 x 6	1 1/2"	63	110	17	36.5	79.4	113	95	M 16 x 75	295	442.2	0514401900	Z-TTO-50x6-6S11/2-M16-C19
50 x 8	1 1/2"	63	110	17	36.5	79.4	113	95	M 16 x 75	295	444.7	0514411900	Z-TTO-50x8-6S11/2-M16-C19
50 x 9	1 1/2"	63	110	17	36.5	79.4	113	95	M 16 x 75	295	446.0	0514551900	Z-TTO-50x9-6S11/2-M16-C19
65 x 8	2"	75	127	19	44.5	96.8	133	114	M 20 x 110	580	699.0	0514421900	Z-TTO-65x8-6S2-M20-C19

The pressure ratings stated by the tube manufacturers are the criteria for selecting tube dimensions.

Nm = recommended tightening torques (Nm max.) for cylindrical bolts as spec. in DIN 912 (10.9) for friction coefficient μ tot. 0.14.

Example for comp. :
FG-1620-8/6

ZAKO flared flanges with square flange connection

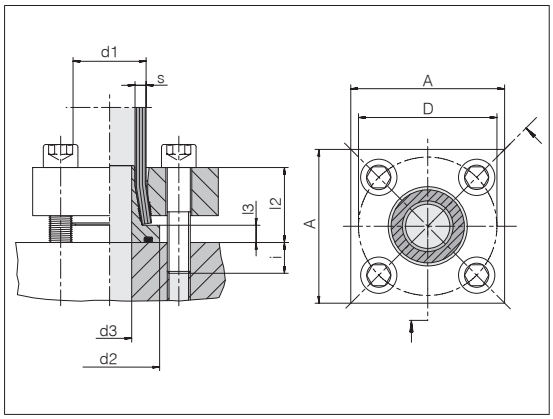


Connecting flange couplings ZAKO system

Hole pattern VOSS square flange high pressure series

Standard O-ring material is NBR

Permitted operating pressure (PB) 400 bar



Tube d1 x s	NW	d2	d3	l2	l3	A	D	i	4 x cyl. screws	Nm	kg/100 ca.	Order-No.	Designation
16 x 2	12	30	10.5	28	8	50	42	12	M 8 x 40	35	42.2	0515151900	Z-TPO-16x2-HC42-M8-C19
16 x 2,5	11	30	9.5	28	8	50	42	12	M 8 x 40	35	42.2	0513601900	Z-TPO-16x2,5-HC42-M8-C19
16 x 3	10	30	8.5	28	8	50	42	12	M 8 x 40	35	42.2	0513611900	Z-TPO-16x3-HC42-M8-C19
20 x 2,5	15	38	13.5	32	8	55	50	13	M 10 x 45	69	55.2	0515161900	Z-TPO-20x2,5-HC50-M10-C19
20 x 3	14	38	12.5	32	8	55	50	13	M 10 x 45	69	55.3	0513621900	Z-TPO-20x3-HC50-M10-C19
20 x 3,5	13	38	11	32	8	55	50	13	M 10 x 45	69	55.6	0513631900	Z-TPO-20x3,5-HC50-M10-C19
25 x 3	19	38	17	32.5	8.5	55	50	12.5	M 10 x 45	69	65.4	0513641900	Z-TPO-25x3-HC50-M10-C19
25 x 4	17	38	15	32.5	8.5	55	50	12.5	M 10 x 45	69	65.8	0513651900	Z-TPO-25x4-HC50-M10-C19
30 x 4	22	46	20	37.5	8.5	65	62	17.5	M 12 x 55	120	87.3	0513661900	Z-TPO-30x4-HC62-M12-C19
30 x 5	20	46	17	37.5	8.5	65	62	17.5	M 12 x 55	120	88.1	0513671900	Z-TPO-30x5-HC62-M12-C19
38 x 4	30	52	28	39	9	80	72	16	M 12 x 55	120	124.4	0515171900	Z-TPO-38x4-HC72-M12-C19
38 x 5	28	52	26	39	9	80	72	16	M 12 x 55	120	124.9	0513681900	Z-TPO-38x5-HC72-M12-C19
38 x 6	26	52	23	39	9	80	72	16	M 12 x 55	120	125.1	0513691900	Z-TPO-38x6-HC72-M12-C19
50 x 2,5	45	63	42	56	10	85	85	19	M 14 x 75	190	197.4	0515001900	Z-TPO-50x2,5-HC85-M14-C19
50 x 2,5	45	63	42	56	10	100	98	19	M 16 x 75	295	290.1	0515181900	Z-TPO-50x2,5-HC98-M16-C19
50 x 5	40	63	37	56	10	85	85	19	M 14 x 75	190	197.9	0515231900	Z-TPO-50x5-HC85-M14-C19
50 x 5	40	63	37	56	10	100	98	19	M 16 x 75	295	290.5	0515191900	Z-TPO-50x5-HC98-M16-C19
50 x 6	38	63	35	56	10	85	85	19	M 14 x 75	190	197.9	0515241900	Z-TPO-50x6-HC85-M14-C19
50 x 6	38	63	35	56	10	100	98	19	M 16 x 75	295	290.5	0513701900	Z-TPO-50x6-HC98-M16-C19
50 x 8	34	63	31	56	10	85	85	19	M 14 x 75	190	201.1	0515011900	Z-TPO-50x8-HC85-M14-C19
50 x 8	34	63	31	56	10	100	98	19	M 16 x 75	295	294.0	0513711900	Z-TPO-50x8-HC98-M16-C19
50 x 9	32	63	29	56	10	85	85	19	M 14 x 75	190	201.1	0515251900	Z-TPO-50x9-HC85-M14-C19
50 x 9	32	63	29	56	10	100	98	19	M 16 x 75	295	294.0	0515201900	Z-TPO-50x9-HC98-M16-C19

The pressure ratings stated by the tube manufacturers are the criteria for selecting tube dimensions.

Nm = recommended tightening torques (Nm max.) for cylindrical bolts as spec. in DIN 912 (10.9) for friction coefficient μ tot. 0.14.

Example for comp. : FE-1620

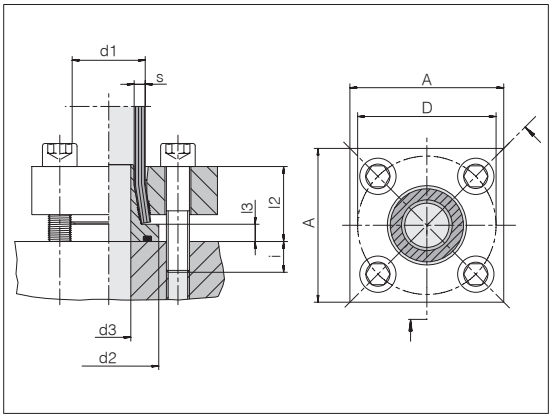
Continued on following page

Connecting flange couplings ZAKO system

Hole pattern VOSS square flange high pressure series

Standard O-ring material is NBR

Permitted operating pressure (PB) 400 bar



Tube d1 x s	NW	d2	d3	l2	l3	A	D	i	4 x cyl. screws	Nm	kg/100 ca.	Order-No.	Designation
60 x 3	54	75	51	64	15	100	98	26	M 16 x 90	295	289.0	0515021900	Z-TPO-60x3-HC98-M16-C19
60 x 5	50	75	47	64	15	100	98	26	M 16 x 90	295	295.0	0515211900	Z-TPO-60x5-HC98-M16-C19
60 x 10	40	75	35	64	15	100	98	26	M 16 x 90	295	292.0	0515031900	Z-TPO-60x10-HC98-M16-C19
65 x 8	49	75	46	60	11	120	118	30	M 20 x 90	580	430.5	0513721900	Z-TPO-65x8-HC118-M20-C19
75 x 12,5	50	95	45	72	16	120	118	28	M 20 x 100	580	522.0	0513801900	Z-TPO-75x12,5-HC118-M20-C19
80 x 3	74	100	71	76	16	150	145	34	M 24 x 110	800	820.0	0515041900	Z-TPO-80x3-HC145-M24-C19
80 x 8	64	100	60	80	20	150	145	30	M 24 x 110	800	861.0	0515221900	Z-TPO-80x8-HC145-M24-C19
80 x 10	60	100	55	80	16	150	145	30	M 24 x 110	800	859.0	0513731900	Z-TPO-80x10-HC145-M24-C19
88 x 14	60	110	54	84	20	150	145	36	M 24 x 120	800	951.0	0513811900	Z-TPO-88x14-HC145-M24-C19
101,6 x 16	70	114	63.6	88.5	20	150	145	32	M 24 x 120	800	1132.0	0513831900	Z-TPO-101,6x16-HC145-M24-C19
114,3 x 17,5	80	140	73	92	20	180	175	38	M 30 x 130	1500	1400.0	0515641900	Z-TPO-114,3x17,5-HC175-M30-C19

The pressure ratings stated by the tube manufacturers are the criteria for selecting tube dimensions.

Nm = recommended tightening torques (Nm max.) for cylindrical bolts as spec. in DIN 912 (10.9) for friction coefficient μ tot. 0.14.

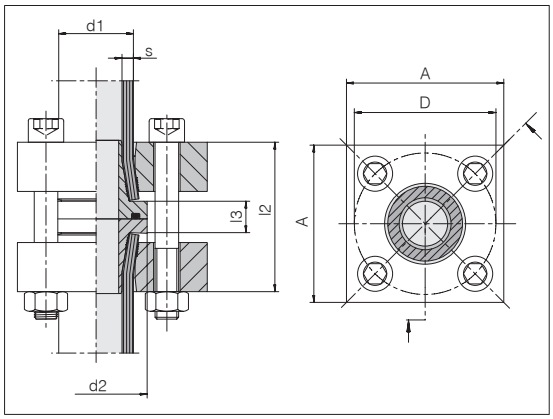
Example for comp. : FE-6030

Tube connection flange couplings ZAKO system

Hole pattern VOSS square flange high pressure series

Standard O-ring material is NBR

Permitted operating pressure (PB) 400 bar



Tube d1 x s	NW	d2	l2	l3	A	D	4 x cyl. screws	Nm	kg/100 ca.	Order-No.	Designation
16 x 2	12	30	53.5	13.5	50	42	M 8 x 65	35	81.2	0515301900	Z-TTO-16x2-HC42-M8-C19
16 x 2,5	11	30	53.5	13.5	50	42	M 8 x 65	35	81.3	0514601900	Z-TTO-16x2,5-HC42-M8-C19
16 x 3	10	30	53.5	13.5	50	42	M 8 x 65	35	81.4	0514611900	Z-TTO-16x3-HC42-M8-C19
20 x 2,5	15	38	61.5	13.5	55	50	M 10 x 75	69	106.3	0515311900	Z-TTO-20x2,5-HC50-M10-C19
20 x 3	14	38	61.5	13.5	55	50	M 10 x 75	69	106.8	0514621900	Z-TTO-20x3-HC50-M10-C19
20 x 3,5	13	38	61.5	13.5	55	50	M 10 x 75	69	107.1	0514631900	Z-TTO-20x3,5-HC50-M10-C19
25 x 3	19	38	62	14	55	50	M 10 x 75	69	126.6	0514641900	Z-TTO-25x3-HC50-M10-C19
25 x 4	17	38	62	14	55	50	M 10 x 75	69	127.3	0514651900	Z-TTO-25x4-HC50-M10-C19
30 x 4	22	46	72.5	14.5	65	62	M 12 x 90	120	168.0	0514661900	Z-TTO-30x4-HC62-M12-C19
30 x 5	20	46	72.5	14.5	65	62	M 12 x 90	120	170.4	0514671900	Z-TTO-30x5-HC62-M12-C19
38 x 4	30	52	76	16	80	72	M 12 x 90	120	243.1	0515321900	Z-TTO-38x4-HC72-M12-C19
38 x 5	28	52	76	16	80	72	M 12 x 90	120	243.4	0514681900	Z-TTO-38x5-HC72-M12-C19
38 x 6	26	52	76	16	80	72	M 12 x 90	120	243.5	0514691900	Z-TTO-38x6-HC72-M12-C19
50 x 2,5	45	63	109	17	85	85	M 14 x 130	190	379.3	0515101900	Z-TTO-50x2,5-HC85-M14-C19
50 x 2,5	45	63	109	17	100	98	M 16 x 130	295	565.2	0515331900	Z-TTO-50x2,5-HC98-M16-C19
50 x 5	40	63	109	17	85	85	M 14 x 130	190	379.8	0515381900	Z-TTO-50x5-HC85-M14-C19
50 x 5	40	63	109	17	100	98	M 16 x 130	295	565.7	0515341900	Z-TTO-50x5-HC98-M16-C19
50 x 6	38	63	109	17	85	85	M 14 x 130	190	379.3	0515391900	Z-TTO-50x6-HC85-M14-C19
50 x 6	38	63	109	17	100	98	M 16 x 130	295	565.2	0514701900	Z-TTO-50x6-HC98-M16-C19
50 x 8	34	63	109	17	85	85	M 14 x 130	190	385.5	0515111900	Z-TTO-50x8-HC85-M14-C19
50 x 8	34	63	109	17	100	98	M 16 x 130	295	571.4	0514711900	Z-TTO-50x8-HC98-M16-C19

The pressure ratings stated by the tube manufacturers are the criteria for selecting tube dimensions.

Nm = recommended tightening torques (Nm max.) for cylindrical bolts as spec. in DIN 912 (10.9) for friction coefficient μ tot. 0.14.

Example for comp. : FG-1620

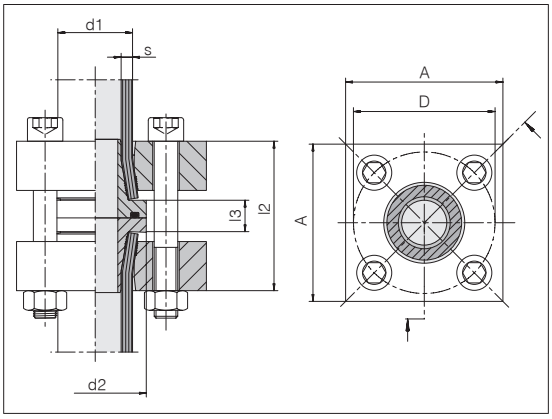
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Tube connection flange couplings ZAKO system

Hole pattern VOSS square flange high pressure series

Standard O-ring material is NBR

Permitted operating pressure (PB) 400 bar



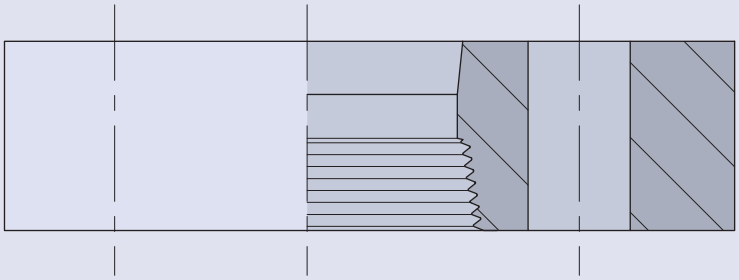
Tube d1 x s	NW	d2	l2	l3	A	D	4 x cyl. screws	Nm	kg/100 ca.	Order-No.	Designation
50 x 9	32	63	109	17	85	85	M 14 x 130	190	385.9	0515401900	Z-TTO-50x9-HC85-M14-C19
50 x 9	32	63	109	17	100	98	M 16 x 130	295	571.8	0515351900	Z-TTO-50x9-HC98-M16-C19
60 x 3	54	75	125	27	100	98	M 16 x 150	295	551.0	0515121900	Z-TTO-60x3-HC98-M16-C19
60 x 5	50	75	125	27	100	98	M 16 x 150	295	568.3	0515361900	Z-TTO-60x5-HC98-M16-C19
60 x 10	40	75	125	27	100	98	M 16 x 150	295	554.8	0515131900	Z-TTO-60x10-HC98-M16-C19
65 x 8	49	75	117	19	120	118	M 20 x 140	580	820.0	0514721900	Z-TTO-65x8-HC118-M20-C19
75 x 12,5	50	95	150	28	120	118	M 20 x 180	580	1003.0	0515411900	Z-TTO-75x12,5-HC118-M20-C19
80 x 3	74	100	134	29	150	145	M 24 x 180	800	1580.0	0515141900	Z-TTO-80x3-HC145-M24-C19
80 x 8	64	100	141	36	150	145	M 24 x 180	800	1658.0	0515371900	Z-TTO-80x8-HC145-M24-C19
80 x 10	60	100	141	36	150	145	M 24 x 180	800	1654.0	0514731900	Z-TTO-80x10-HC145-M24-C19
88 x 14	60	110	172	36	150	145	M 24 x 200	800	1796.0	0515421900	Z-TTO-88x14-HC145-M24-C19
101,6 x 16	70	114	174	36	150	145	M 24 x 200	800	1708.5	0514751900	Z-TTO-101,6x16-HC145-M24-C19
114,3 x 17,5	80	140	194	36	180	175	M 30 x 230	1500	2724.2	0515651900	Z-TTO-114,3x17,5-HC175-M30-C19

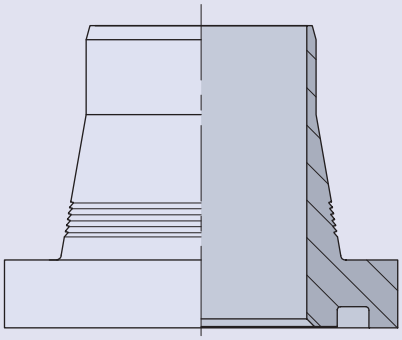
The pressure ratings stated by the tube manufacturers are the criteria for selecting tube dimensions.

Nm = recommended tightening torques (Nm max.) for cylindrical bolts as spec. in DIN 912 (10.9) for friction coefficient μ tot. 0.14.

Example for comp. : FG-5090

ZAKO, individual parts



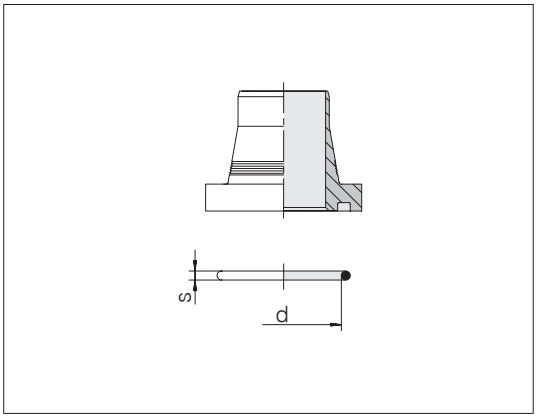




ZAKO ring with O-ring

O-ring is supplied in package, but not installed

Standard material of O-rings is NBR



Tube d1 x s	Fl. size (SAE 3000 psi)	Fl. size (SAE 6000 psi)	Fl. size NW (square fl.)	O-ring d x s	kg/100 ca.	Order-No.	Designation
16 x 2	1/2“	1/2“	12	18.6 x 3.5	4.1	0036009900	Z-RGO-16x2-C19
16 x 2,5	1/2“	1/2“	11	18.6 x 3.5	4.1	0036029900	Z-RGO-16x2,5-C19
16 x 3	1/2“	1/2“	10	18.6 x 3.5	4.1	0036049900	Z-RGO-16x3-C19
20 x 2,5	3/4“	3/4“	15	25 x 3.5	6.5	0036069900	Z-RGO-20x2,5-C19
20 x 3	3/4“	3/4“	14	25 x 3.5	6.6	0036089900	Z-RGO-20x3-C19
20 x 3,5	3/4“	3/4“	13	25 x 3.5	6.9	0036109900	Z-RGO-20x3,5-C19
25 x 3	3/4“, 1"	3/4“	19	25 x 3.5	6.9	0036129900	Z-RGO-25x3-C19
25 x 4	3/4“, 1"	3/4“	17	25 x 3.5	7.2	0036149900	Z-RGO-25x4-C19
30 x 4	1“, 1 1/4"	1“	22	32.9 x 3.5	10.3	0036169900	Z-RGO-30x4-C19
30 x 5	1“, 1 1/4"	1“	20	32.9 x 3.5	11.5	0036189900	Z-RGO-30x5-C19
38 x 4	1 1/4“	1 1/4“	30	37.7 x 3.5	14.5	0036229900	Z-RGO-38x4-C19
38 x 5	1 1/4“	1 1/4“	28	37.7 x 3.5	15.0	0036249900	Z-RGO-38x5-C19
38 x 5	1“	1“		32.9 x 3.5	11.6	0036209900	Z-RGO-38x5-HD46-C19
38 x 6	1 1/4“	1 1/4“	26	37.7 x 3.5	15.2	0036269900	Z-RGO-38x6-C19
42 x 2	1 1/4“			37.7 x 3.5	15.9	0036609900	Z-RGO-42x2-C19
50 x 2,5	1 1/2“, 2"		45	47.2 x 3.5	27.6	0036289900	Z-RGO-50x2,5-C19
50 x 5	1 1/2“, 2"	1 1/2“	40	47.2 x 3.5	28.1	0036309900	Z-RGO-50x5
50 x 6	1 1/2“, 2"	1 1/2“	38	47.2 x 3.5	28.0	0036329900	Z-RGO-50x6-C19
50 x 8	1 1/2“, 2"	1 1/2“	34	47.2 x 3.5	31.3	0036349900	Z-RGO-50x8-C19
50 x 9	1 1/2“, 2"	1 1/2“	32	47.2 x 3.5	31.0	0036369900	Z-RGO-50x9-C19
60 x 3			54	56.7 x 3.5	43.9	0036529900	Z-RGO-60x3-C19
60 x 5			50	56.7 x 3.5	50.0	0036589900	Z-RGO-60x5-C19
60 x 10			40	56.7 x 3.5	47.1	0036549900	Z-RGO-60x10-C19
60 x 10			50	60 x 5	88.7	0036819900	Z-RGO-60x10-HD95-C19

The pressure ratings stated by the tube manufacturers are the criteria for selecting tube dimensions.

ASME code states that a reduced operating pressure applies to flange size 2".

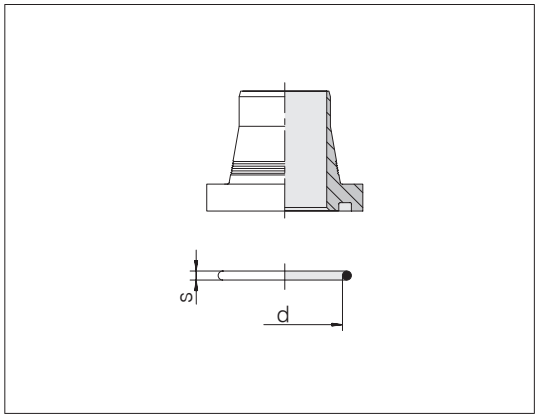
Example for comp. : K-1620-8

Continued on following page

ZAKO ring with O-ring

O-ring is supplied in package, but not installed

Standard material of O-rings is NBR



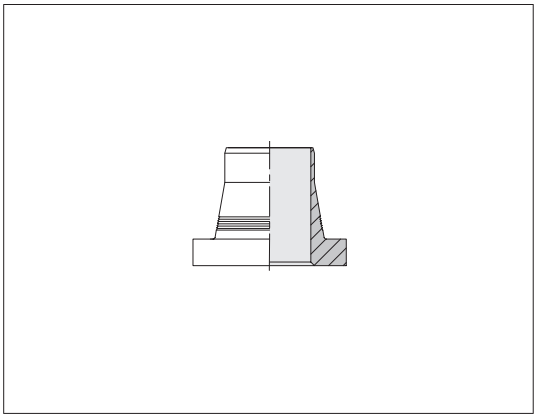
Tube d1 x s	Fl. size (SAE 3000 psi)	Fl. size (SAE 6000 psi)	Fl. size NW (square fl.)	O-ring d x s	kg/100 ca.	Order-No.	Designation
65 x 3	2“			60 x 3.5	35.2	0036389900	Z-RGO-65x3-C19
65 x 4	2“			60 x 3.5	28.8	0036409900	Z-RGO-65x4-C19
65 x 5	2“			56.7 x 3.5	32.6	0036429900	Z-RGO-65x5-C19
65 x 8		2“	49	56.7 x 3.5	47.1	0036449900	Z-RGO-65x8-C19
75 x 12,5			50	60 x 5	99.0	0036629900	Z-RGO-75x12,5-C19
75 x 12,5			60	75 x 5	150.0	0036809900	Z-RGO-75x12,5-HD110-C19
80 x 3	3“		74	85.3 x 3.5	86.9	0036489900	Z-RGO-80x3-C19
80 x 8			64	75 x 5	128.1	0036569900	Z-RGO-80x8-C19
80 x 10			60	75 x 5	126.3	0036509900	Z-RGO-80x10-C19
88 x 14			60	75 x 5	158.0	0036649900	Z-RGO-88x14-C19
101,6 x 16			70	80 x 5	172.0	0036869900	Z-RGO-101,6x16-C19
114,3 x 17,5			80	95 x 5	260.0	0036989900	Z-RGO-114,3x17,5-C19

The pressure ratings stated by the tube manufacturers are the criteria for selecting tube dimensions.

ASME code states that a reduced operating pressure applies to flange sizes 2" and 3".

Example for comp. : K-6530-8

ZAKO ring



Tube d1 x s	Fl. size (SAE 3000 psi)	Fl. size (SAE 6000 psi)	Fl. size NW (square fl.)	kg/100 ca.	Order-No.	Designation
16 x 2	1/2“	1/2“	12	3.3	0036011900	Z-R-16x2-C19
16 x 2,5	1/2“	1/2“	11	3.4	0036031900	Z-R-16x2,5-C19
16 x 3	1/2“	1/2“	10	3.5	0036051900	Z-R-16x3-C19
20 x 2,5	3/4“	3/4“	15	5.3	0036071900	Z-R-20x2,5-C19
20 x 3	3/4“	3/4“	14	5.7	0036091900	Z-R-20x3-C19
20 x 3,5	3/4“	3/4“	13	5.7	0036111900	Z-R-20x3,5-C19
25 x 3	3/4“	3/4“	19	5.6	0036131900	Z-R-25x3-C19
25 x 4	3/4“	3/4“	17	5.9	0036151900	Z-R-25x4-C19
30 x 4	1“	1“	22	8.8	0036171900	Z-R-30x4-C19
30 x 5	1“	1“	20	9.9	0036191900	Z-R-30x5-C19
38 x 4	1 1/4“	1 1/4“	30	13.9	0036231900	Z-R-38x4-C19
38 x 5		1“		11.0	0036211900	Z-R-38x5-HD46-C19
38 x 5	1 1/4“	1 1/4“		13.7	0036251900	Z-R-38x5-C19
38 x 6	1 1/4“	1 1/4“	26	13.6	0036271900	Z-R-38x6-C19
42 x 2	1 1/4“			15.0	0036611900	Z-R-42x2-C19
50 x 2,5	1 1/2“		45	24.9	0036291900	Z-R-50x2,5-C19
50 x 5	1 1/2“	1 1/2“	40	24.9	0036311900	Z-R-50x5-C19
50 x 6	1 1/2“	1 1/2“	38	24.4	0036331900	Z-R-50x6-C19
50 x 8	1 1/2“	1 1/2“	34	27.4	0036351900	Z-R-50x8-C19
50 x 9	1 1/2“	1 1/2“	32	27.1	0036371900	Z-R-50x9-C19
60 x 3			54	40.0	0036531900	Z-R-60x3-C19
60 x 5			50	51.0	0036591900	Z-R-60x5-C19
60 x 10			40	40.0	0036551900	Z-R-60x10-C19
65 x 3	2“			32.4	0036391900	Z-R-65x3-C19
65 x 4	2“			26.9	0036411900	Z-R-65x4-C19
65 x 5	2“			32.0	0036431900	Z-R-65x5-C19
65 x 8		2“	49	42.6	0036451900	Z-R-65x8-C19

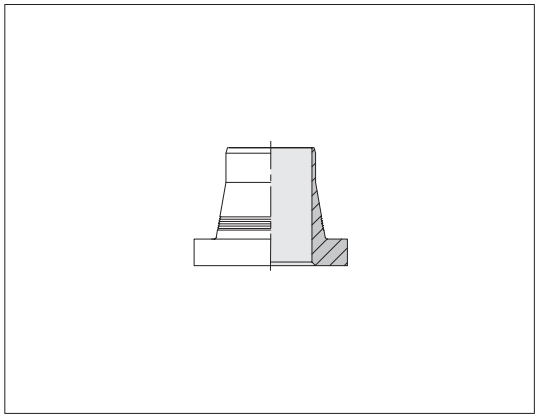
The pressure ratings stated by the tube manufacturers are the criteria for selecting tube dimensions.

ASME code states that a reduced operating pressure applies to flange size 2".

Example for comp.: KO-1620-8

Continued on following page

ZAKO ring



Tube d1 x s	Fl. size (SAE 3000 psi)	Fl. size (SAE 6000 psi)	Fl. size NW (square fl.)	kg/100 ca.	Order-No.	Designation
75 x 12,5			50	94.0	0036631900	Z-R-75x12,5-C19
80 x 3	3“			79.8	0036491900	Z-R-80x3-C19
80 x 8			64	122.3	0036571900	Z-R-80x8-C19
80 x 10			60	120.1	0036511900	Z-R-80x10-C19
88 x 14			60	154.0	0036651900	Z-R-88x14-C19
101,6 x 16			70	154.0	0036871900	Z-R-101,6x16-C19
114,3 x 17,5			80	230.0	0036991900	Z-R-114,3x17,5-C19

The pressure ratings stated by the tube manufacturers are the criteria for selecting tube dimensions.

ASME code states that a reduced operating pressure applies to flange size 3".

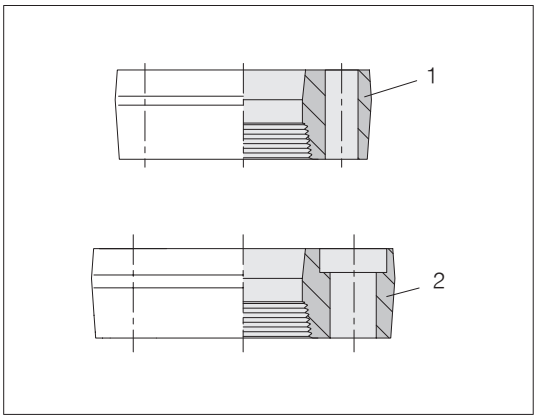
Example for comp. : KO-75125-8

SAE flange ZAKO

Hole pattern according to SAE J 518 C/ISO 6162

Part 1: standard series (3000 psi)
Permitted operating pressure (PB) 250 bar

Part 2: high-pressure series (6000 psi)
Permitted operating pressure (PB) 400 bar



Tube OD	Fl. size (SAE 3000 psi)	Fl. size (SAE 6000 psi)	kg/100 ca.	Order-No.	Designation
16		1/2“	26.1	0510201900	Z-FPH-16-6S1/2-D9-C19
16	1/2“		30.6	0510001900	Z-FPH-16-3S1/2-D9-C19
20		3/4“	49.4	0510211900	Z-FPH-20-6S3/4-D11-C19
20	3/4“		33.7	0510011900	Z-FPH-20-3S3/4-D11-C19
25	1“		45.5	0510041900	Z-FPH-30/25-3S1-D11-C19
25		3/4“	45.5	0510221900	Z-FPH-25-6S3/4-D11-C19
25	3/4“		45.5	0510021900	Z-FPH-25-3S3/4-D11-C19
30		1“	68.7	0510231900	Z-FPH-30-6S1-D13,5-C19
30	1 1/4“		69.8	0510081900	Z-FPH-30-3S11/4-D13,5-C19
30	1“		54.1	0510051900	Z-FPH-30-3S1-D11-C19
38		1 1/4“	86.1	0510251900	Z-FPH-38-6S11/4-D15,5-C19
38		1“	59.6	0510241900	Z-FPH-38-6S1-D13,5-C19
38	1 1/4“		66.8	0510101900	Z-FPH-38-3S11/4-D13,5-C19
38	1“		54.1	0510061900	Z-FPH-38-3S1-D10,5-C19
42	1 1/4“		65.8	0510161900	Z-FPH-42-3S11/4-D11-C19
50		1 1/2“	154.0	0510281900	Z-FPH-50-6S11/2-D17,5-C19
50		2“	304.0	0510321900	Z-FPH-50-6S2-D22-C19
50	1 1/2“		83.3	0510111900	Z-FPH-50-3S11/2-D13,5-C19
50	2“		136.1	0510151900	Z-FPH-50-3S2-D13,5-C19
65		2“	248.3	0510301900	Z-FPH-65-6S2-D22-C19
65	2“		123.4	0510121900	Z-FPH-65-3S2-D13,5-C19
80	3“		250.7	0510141900	Z-FPH-80-3S3-D17,5-C19

The pressure ratings stated by the tube manufacturers are the criteria for selecting tube dimensions.

ASME code states that a reduced operating pressure applies to flange sizes 2" and 3" (3000 psi).

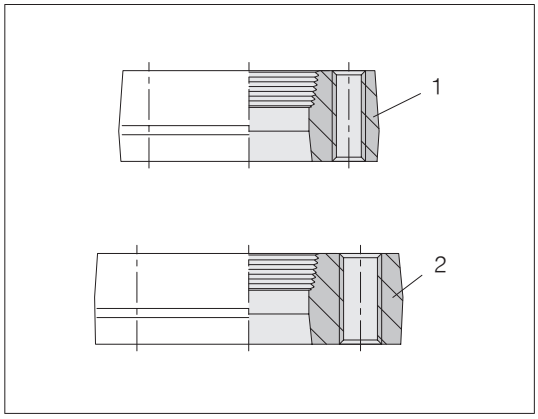
Example for comp. :
FE-1600-8/3
FE-1600-8/6

SAE counterflange ZAKO

Hole pattern according to SAE J 518 C/ISO 6162

Part 1: standard series (3000 psi)
Permitted operating pressure (PB) 250 bar

Part 2: high-pressure series (6000 psi)
Permitted operating pressure (PB) 400 bar



Tube OD	Fl. size (SAE 3000 psi)	Fl. size (SAE 6000 psi)	kg/100 ca.	Order-No.	Designation
16		1/2“	28.5	0510701900	Z-FPT-16-6S1/2-IM8-C19
16	1/2“		28.6	0510501900	Z-FPT-16-3S1/2-IM8-C19
20		3/4“	55.7	0510711900	Z-FPT-20-6S3/4-IM10-C19
20	3/4“		34.0	0510511900	Z-FPT-20-3S3/4-IM10-C19
25		3/4“	52.6	0510721900	Z-FPT-25-6S3/4-IM10-C19
25	3/4“		30.8	0510521900	Z-FPT-25-3S3/4-IM10-C19
30		1“	82.0	0510731900	Z-FPT-30-6S1-IM12-C19
30	1 1/4“		75.5	0510621900	Z-FPT-30-3S11/4-IM10-C19
30	1“		57.7	0510551900	Z-FPT-30-3S1-IM10-C19
38		1 1/4“	100.5	0510751900	Z-FPT-38-6S11/4-IM14-C19
38		1“	70.1	0510741900	Z-FPT-38-6S1-IM12-C19
38	1 1/4“		73.4	0510571900	Z-FPT-38-3S11/4-IM12-C19
42	1 1/4“		48.0	0510631900	Z-FPT-42-3S11/4-IM10-C19
50		1 1/2“	177.2	0510761900	Z-FPT-50-6S11/2-IM16-C19
50	1 1/2“		90.0	0510581900	Z-FPT-50-3S11/2-IM12-C19
65		2“	253.1	0510771900	Z-FPT-65-6S2-IM20-C19
65	2“		129.4	0510591900	Z-FPT-65-3S2-IM12-C19
80	3“		257.9	0510611900	Z-FPT-80-3S3-IM16-C19

The pressure ratings stated by the tube manufacturers are the criteria for selecting tube dimensions.

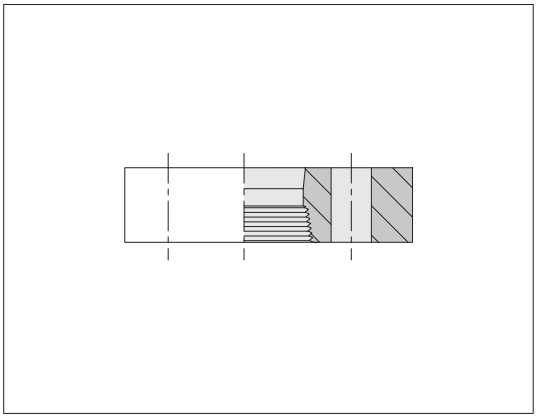
ASME code states that a reduced operating pressure applies to flange sizes 2" and 3" (3000 psi).

Example for comp. :
FV-1600-8/3
FV-1600-8/6

Square flange ZAKO

Hole pattern VOSS square flange high pressure series

Permitted operating pressure (PB) 400 bar



Tube OD	NW	kg/100 ca.	Order-No.	Designation
16	10, 11, 12	30.6	0511001900	Z-FPH-16-HC42-D9-C19
20	13, 14, 15	35.2	0511011900	Z-FPH-20-HC50-D11-C19
25	17, 19	45.0	0511021900	Z-FPH-25-HC50-D11-C19
30	20, 22	54.8	0511031900	Z-FPH-30-HC62-D13,5-C19
38	26, 28, 30	87.7	0511041900	Z-FPH-38-HC72-D13,5-C19
50	32, 34, 38, 40, 45	129.0	0511221900	Z-FPH-50-HC85-D15,5-C19
50	32, 34, 38, 40, 45	207.7	0511051900	Z-FPH-50-HC98-D17,5-C19
60	40	383.7	0511251900	Z-FPH-75/60-HC118-D22-C19
60	40, 50, 54	182.2	0511231900	Z-FPH-60-HC98-D17,5-C19
65	49	280.2	0511061900	Z-FPH-65-HC118-D22-C19
75	50	307.0	0511081900	Z-FPH-75-HC118-D22-C19
75	50	584.0	0511241900	Z-FPH-88/75-HC145-D26-C19
80	60, 64, 74	552.0	0511071900	Z-FPH-80-HC145-D26-C19
88	60	576.0	0511091900	Z-FPH-88-HC145-D26-C19
101.6	70	648.0	0511131900	Z-FPH-101,6-HC145-D26-C19
114.3	80	760.0	0511411900	Z-FPH-114,3-HC175-D33-C19

The pressure ratings stated by the tube manufacturers are the criteria for selecting tube dimensions.

ASME code states that a reduced operating pressure applies to flange size NW 40 Z-FPH-75/60-HC118-D22-C19

Example for comp. : FE-1600

Hydraulic valves

For simple functional processes in hydraulic control circuits



Content	Type/Page			
The VOSS designation	P.324			
Product information hydraulic valves	P.328			
Function description non-return valves	P.329			
Function description non-return valve cartridge inserts	P.331			
Function description internal valve part installation kits standard	P.332			
Function description shuttle valves	P.334			
Standard non-return valves	VNRO	VNROI	VNROPT	VNROTP
				
	P.336	P.337	P.339	P.341

Content	Type/Page		
High-pressure non-return valves	VNROHP	VNROPTHP	VNROTPHP
			
	P.343	P.344	P.346
Non-return valve plug-in cartridges	VNRCO		
			
	P.348		
Internal valve part installation kits	VNRIO		
			
	P.349		
Shuttle valves with ball seat	VST		
			
	P.350		
Shuttle valves with soft seals	VSOT		
			
	P.352		

The designations of VOSS products

System	Function/ Component	Form	Completion	Series/ Thread

This catalog contains an alphanumerical product designation system based to a large extent on ISO 8434. This makes the designation self-explanatory and facilitates identification of the products. Since the structure is based on English, the designation is understood internationally.

Furthermore, the product designations make it possible to generate customized special solutions by combining variations of the existing VOSS product program.

Example: 24-VNROTPC-S16-G1/2E-3B-ES4

24	VNROTP		C	S

System

24° DIN program

The "system" characteristic describes the product line.

Function/Component

Non-return valve with O-ring, tube-to-port

The "Function/component" describes the product type.

Form

Completion

Complete connection (with tube connecting system)

This characteristic identifies the components (e. g. hexagonal nut, union nut and cutting ring, O-ring ...) that can be used to complete the product type. Complete couplings are supplied with VOSS*Ring*^{M} cutting rings by default. Other connection systems are listed in the "Suffix" characteristics.

Series/Thread

Heavy series

Determines the series

Non-return valve with O-ring, direction of flow towards threaded stud, fully assembled with nut and ES-4 cutting ring, AD S16 tube. G1/2 inch thread with "PEFLEX" profile ring seal, special 3 bar opening pressure

Tube OD/ Diameter	Thread	Diameter	Sealing type/ Threaded bore	Suffix

Examples of how to order items, as well as additional explanations and variation options are given in the respective chapters and in the following pages for the individual product groups.

16	G	1/2	E	3B	ES4

Suffix 5

ES-4 cutting ring

Deviations from the default characteristics (e. g. seal materials, completion using different cutting ring systems, flared coupling parts, special dimensions, special opening pressures ...)

Suffix 3

3 bar

Deviations from the default characteristics (e. g. seal materials, completion using different cutting ring systems, flared coupling parts, special dimensions, special opening pressures ...)

Sealing type/Threaded bore

Elastomeric sealing

Type of seal for the connecting thread

Diameter

1/2 inch

States the nominal thread size (pitch is not stated for metric and imperial thread sizes).

Thread

Whitworth

Identifies the type of thread.

Tube OD/Diameter

OD 16 mm

States the outer diameter of the tube.

	System
24	24° DIN program
GP	General program (components and accessories, applicable in different connecting systems)

	Function
VNRCO	Non-return valve cartridges with O-ring
VNRIO	Non-return valve inner parts with O-ring
VNRO	Non-return valves with O-ring
VNROHP	Non-return valves with O-ring, high-pressure
VNROI	Non-return valves with internal thread
VNROPT	Non-return valves with O-ring, port-to-tube
VNROPTHP	Non-return valves with O-ring, port-to-tube, high-pressure
VNROTP	Non-return valves with O-ring, tube-to-port
VNROTPHP	Non-return valves with O-ring, tube-to-port, high-pressure
VS	Shuttle valves
VSO	Shuttle valves with O-ring
VSSWO	Shuttle valves swivel with O-ring

	Form
T	Tee

	Completion
C	Complete connection (with tube connecting system)

	Series/Thread
	Series
L	Light series
S	Heavy series
L/S	Light and heavy series are identical
	Thread
M	Metric
G	Whitworth parallel
IG	Internal thread, Whitworth parallel
IU	Internal thread, UNF

	Tube OD/Diameter
6	6 mm
8	8 mm
10	10 mm
12	12 mm
14	14 mm
15	15 mm
16	16 mm
18	18 mm
20	20 mm
22	22 mm
25	25 mm
28	28 mm
30	30 mm
35	35 mm
38	38 mm
42	42 mm

	Sealing type/Threaded bore
E	Elastomeric sealing
F	O-ring sealing

	Suffix overview
Suffix 3	Opening pressure
Suffix 5	Completion
Suffix 6	Differing dimension

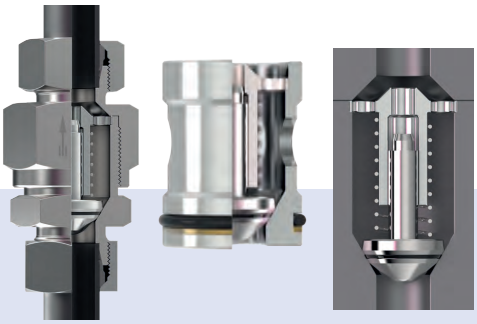
Suffixes not referred to here are not relevant to this chapter.
Note: For articles having more than one relevant suffix. These are listed in numerical order in the sales designation.

Suffix 3	Opening pressure
0,2B	0.2 bar
0,5B	0.5 bar
3B	3 bar
...	...

Suffix 5	Completion
1S	1S Cutting ring
ES4	ES-4 Cutting ring
BV10	BV-10 Set
24/37	24/37° Set

Suffix 6	Differing dimension
P	Profile material

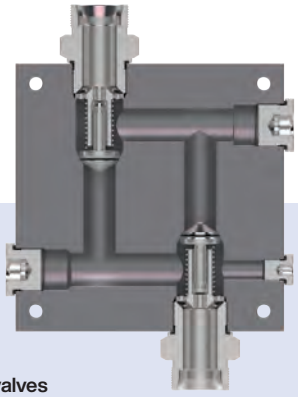
Product information hydraulic valves



Non-return valves



Shuttle valves



Special valves

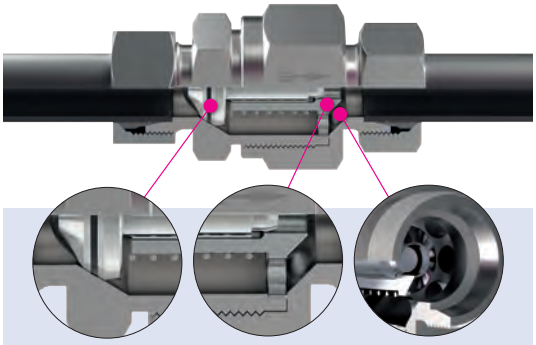
VOSS hydraulic valves for simple function processes in hydraulic control circuits are a logical addition to our wide range of tube couplings.

- Non-return valves for in-line and block installation
- Intelligent couplings with throttle functions
- Shuttle valves with ball seats and soft-seals
- Special valves

The valves described in the following section provide an overview of the common valve types and sizes held on stock for your convenience.

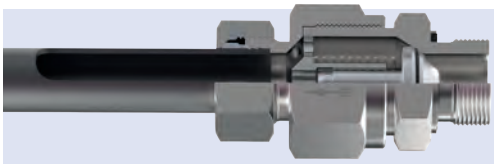
We are only too happy to advise you on modifications. Additional functional details or special customer-specific development work.

Function description non-return valves

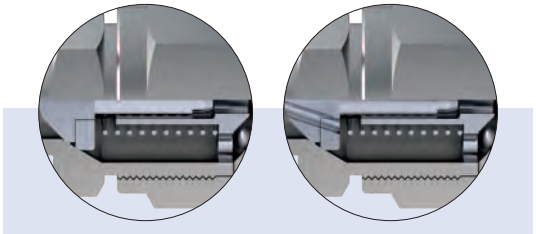


Optimum design





Screw-in types



Valve plunger for different variants

VOSS non-return valves are available in the following design variants:

- Line non-return valves with tube coupling at both ends
- Screw-in non-return valves with metric fine thread or Whitworth tube thread and sealed with profile seals
- High-pressure non-return valves
- Non-return valve cartridge inserts
- Internal valve part installation kits

Non-return valves are also used as suction valves or preloading valves, depending on the opening pressure

- Sealing is effected by a spring-loaded cone with an integrated soft-seal.
- Stroke limitation and damping pin on the seal cone reduce wear.
- Flow direction from or to the threaded end of screw-in non-return valves
- Specially low flow resistance thanks to the shape of the internal parts

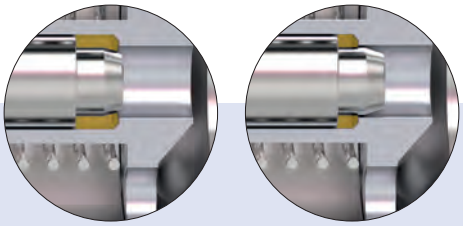
Opening pressures

- Opening pressure of standard designs is 1 bar
- For special opening pressures, see the following table on VOSS non-return valves for standard and high-pressure applications.

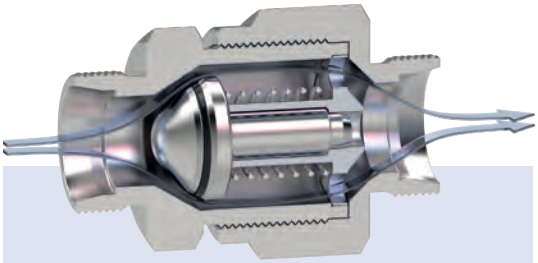
Special opening pressures

Special opening pressures	Standard	High-pressure
0.2	•	•
0.5	•	•
1.5	•	
2	•	•
2.5	•	•
3	•	•
4	•	
4.5	•	
5	•	
6	•	

Other opening pressures upon request



Hydraulic end-position damping



Flow-optimized geometry

In principle, suction inlet valves with low opening pressures (e. g. 0.1 bar), or even without spring loading, can be implemented. Vertical installation with an upward flow direction is recommended for opening pressures of less than 0.5 bar in order to avoid friction effects and ensure that the disc seal is centred. However, in this case the weight of the plunger and disc affects the opening pressure.

Opening pressure tolerance: ±20 %

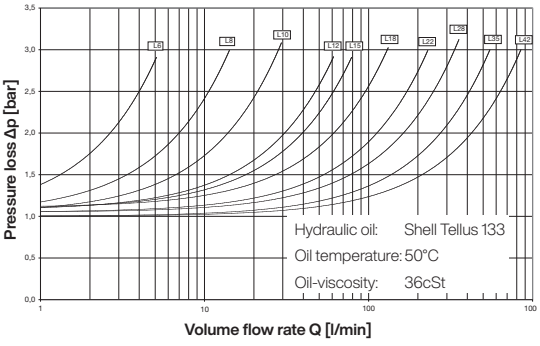
Valves for less than 0.2 bar:
Tolerance cannot be specified
(too many undefined influencing factors)

Maximum opening pressure

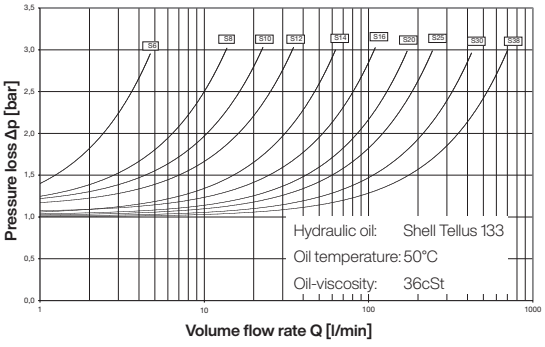
Standard Tube OD	Max. opening pressure bar
L 6 – L 28	6
L 35	5
L 42	2
S 6 – S 30	6
S 38	5

High-pressure Tube OD	Max. opening pressure bar
L 6 – L 42	3
S 6 – S 38	3

Pressure loss graphs: Non-return valves, 1 bar opening pressure, L series

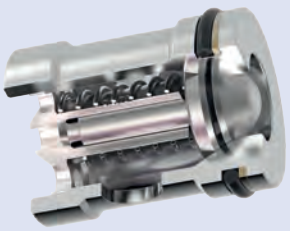


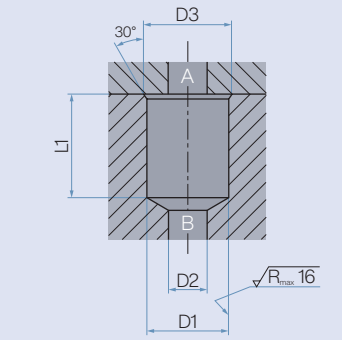
Pressure loss graphs: Non-return valves, 1 bar opening pressure, S series

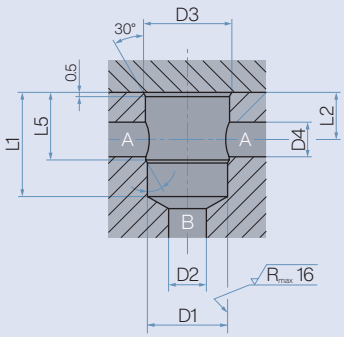


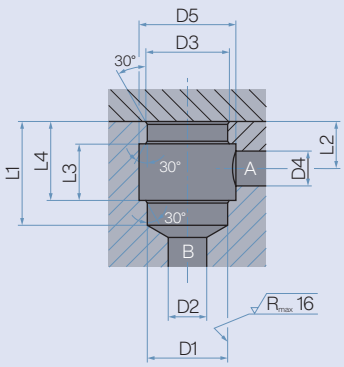
Flow resistances

Function description non-return valve cartridge inserts







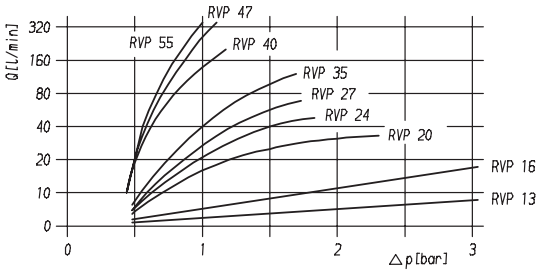


As insert elements for mounting in plate structures of hydraulic devices or for direct installation in machine housings, VOSS non-return valve cartridge inserts permit flow in one direction and prevent flow in the opposite direction.

Non-return valve cartridge inserts are also used as suction valves or pre-loading valves, depending on the opening pressure.

- The compact design of VOSS non-return valve cartridge inserts makes them suitable for tight installation situations.
- Sealing is effected by a spring-loaded cone with an integrated soft-seal.
- Stroke limitation and damping pin on the seal cone keep wear to a minimum.
- VOSS non-return valve cartridge inserts achieve especially low flow resistance thanks to the shape of the internal parts.
- The crosswise holes through the VOSS non-return valve cartridge inserts allow them to be used with different inflow and outlet flow directions. The valve cartridges can also be supplied without crosswise holes upon request.

Flow resistance

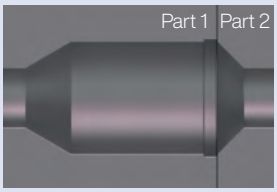


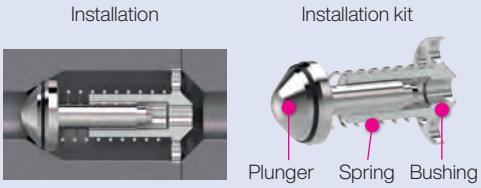
Pressure loss Δp as a function of the volume flow rate Q

Mounting holes

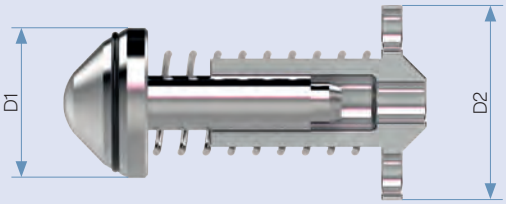
Typ	D1 (D10)	D2	D3 (+0.2)	D4	D5	L1 min.	L2	L3	L4	L5
RVP	13	4	13.7	4	14	23.3	12	9	15	14.5
RVP	16	6	16.7	6	18.5	26.8	14.5	11.5	18.5	18
RVP	20	8	20.7	8	23.5	30.3	16	14	21	20.5
RVP	24	10	25	10	27.5	35.3	18	16	24	23.5
RVP	27	12	28	12	31.5	38.3	20	19	27	26.5
RVP	35	15	36	15	40.5	44.8	19.5	23	32.5	27.5
RVP	40	19	41	19	47.5	50.8	23	27.5	38.5	33
RVP	47	24	48	24	56	60.3	28	35	48	40.5
RVP	55	30	56.2	30	70	70.3	28	43	56	43.5

Function description internal valve part installation kits standard





Internal valve parts



Series	Tube OD	Pressure	D1 [mm]	D2 [mm]	Order no. Compl. internal parts kit (1 bar, NBR seal)
L	6	PB 250	7.5	9.3	GP-VNRIO-L/S6
L	8	PB 250	8.5	11.3	GP-VNRIO-L8
L	10	PB 250	11.7	15.3	GP-VNRIO-L10-S12
L	12	PB 250	14.8	18.8	GP-VNRIO-L12-S14
L	15	PB 250	15.8	20.8	GP-VNRIO-L15
L	18	PB 160	19.8	25.8	GP-VNRIO-L18
L	22	PB 160	24.5	31.8	GP-VNRIO-L22
L	28	PB 100	30	39.8	GP-VNRIO-L28
L	35	PB 100	38	49.8	GP-VNRIO-L35
L	42	PB 100	41	55.8	GP-VNRIO-L42
S	6	PB 630	7.5	9.3	GP-VNRIO-L/S6
S	8	PB 630	8.5	10.8	GP-VNRIO-S8
S	10	PB 630	9.6	12.8	GP-VNRIO-S10
S	12	PB 630	11.7	15.3	GP-VNRIO-L10-S12
S	14	PB 630	14.8	18.8	GP-VNRIO-L12-S14
S	16	PB 400	17	22.3	GP-VNRIO-S16
S	20	PB 400	21.7	27.8	GP-VNRIO-S20
S	25	PB 400	27	34.8	GP-VNRIO-S25
S	30	PB 250	30	40.8	GP-VNRIO-S30
S	38	PB 250	38	50.8	GP-VNRIO-S38

Identification dimensions

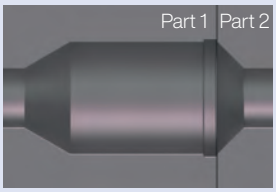
VOSS internal parts are available as kits that can be directly installed into other assemblies, such as valve blocks, manifolds and hydraulic units, which already have the specified mounting holes.

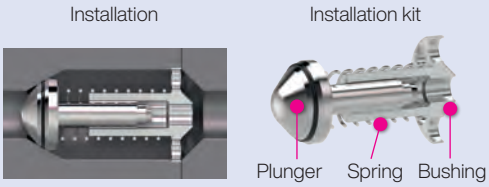
The advantages of the kits are their compact design, comprising a plunger/plate with integrated soft-seal, a spring and a bushing, as well as the same low-flow resistance characteristics as the other non-return valves.

General technical data of all non-return valves standard

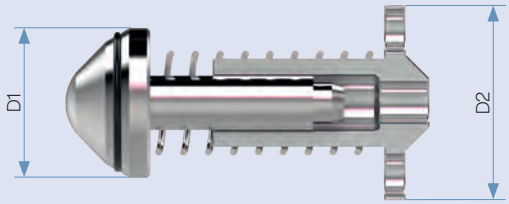
- Materials and surface protection: steel bodies, VOSS coat surface finish, NBR seals, other materials available upon request
- Installation orientation: any
- Operating pressure: 100 / 160 / 250 / 400 / 630 bar
- Temperature range: -35 °C to +100 °C (other temperature ranges available upon request)
- Pressure fluids: mineral-oil-based liquids (valves for other media available upon request)

Function description internal valve part installation kits high pressure





Internal valve parts



Series	Tube OD	Pressure	D1 [mm]	D2 [mm]	Order no. Compl. internal parts kit (1 bar, NBR seal)
L	6	PN 420	7.5	9.3	GP-VNRIOHP-L/S6
L	8	PN 400	8.5	11.3	GP-VNRIOHP-L8
L	10	PN 420	11.7	15.3	GP-VNRIOHP-L10-S12
L	12	PN 420	14.8	18.8	GP-VNRIOHP-L12-S14
L	15	PN 400	15.8	20.4	GP-VNRIOHP-L15
L	18	PN 400	19.8	25.4	GP-VNRIOHP-L18
L	22	PN 250	24.5	31.8	GP-VNRIOHP-L22
L	28	PN 250	30	39.8	GP-VNRIOHP-L28
L	35	PN 250	36.2	51.3	GP-VNRIOHP-L35
L	42	PN 250	41	56.8	GP-VNRIOHP-L42
S	6	PN 420	7.5	9.3	GP-VNRIOHP-L/S6
S	8	PN 420	8.5	10.8	GP-VNRIOHP-S8
S	10	PN 420	9.6	12.8	GP-VNRIOHP-S10
S	12	PN 420	11.7	15.3	GP-VNRIOHP-L10-S12
S	16	PN 420	17	22.3	GP-VNRIOHP-S16
S	20	PN 420	19.8	27.8	GP-VNRIOHP-S20
S	25	PN 420	26	34.8	GP-VNRIOHP-S25
S	30	PN 250	30	41.3	GP-VNRIOHP-S30
S	38	PN 250	36.2	51.3	GP-VNRIOHP-S38

Identification dimensions

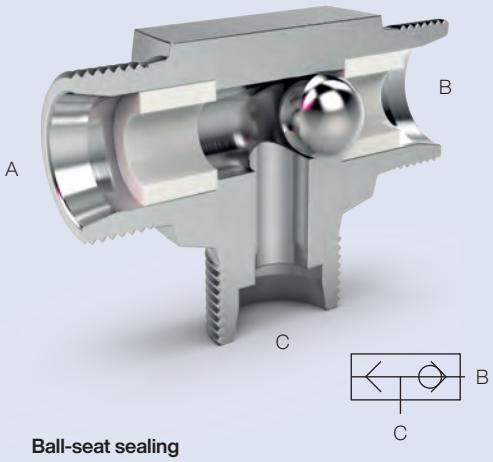
VOSS internal parts are available as kits that can be directly installed into other assemblies, such as valve blocks, manifolds and hydraulic units, which already have the specified mounting holes.

The advantages of the kits are their compact design, comprising a plunger/plate with integrated soft-seal, a spring and a bushing, as well as the same low-flow resistance characteristics as the other non-return valves.

General technical data of all non-return valves high pressure

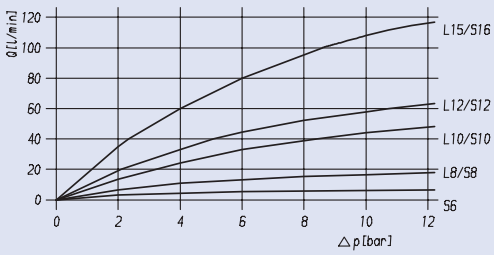
- Materials and surface protection: steel bodies, VOSS coat surface finish, NBR seals, other materials available upon request
- Installation orientation: any
- Nominal pressure 250/420 bar
- Temperature range: -35 °C to +100 °C (other temperature ranges available upon request)
- Pressure fluids: mineral-oil-based liquids (valves for other media available upon request)

Function description shuttle valves



Ball-seat sealing

Pressure loss Δp as a function of the volume flow rate



Flow resistance

Ball seat

VOSS shuttle valves (designation “WV”) are self-actuated gate valves for closed hydraulic circuits.

With two inlet openings that can be blocked and one outlet opening, a VOSS shuttle valve will connect either port A or port B to the outlet port C, depending on the pressure applied by the hydraulic fluid feed, whereby the lower pressure inlet is blocked by a movable ball.

This simple and sturdy valve design provides a maintenance-free solution for many applications.

The valves operate automatically.

VOSS shuttle valves are part of the one-way valve product range.

- Valve type: ball-seat valve
- Available for tube in-line installation and as special designs also with tapered seal connections
- Installation orientation: any

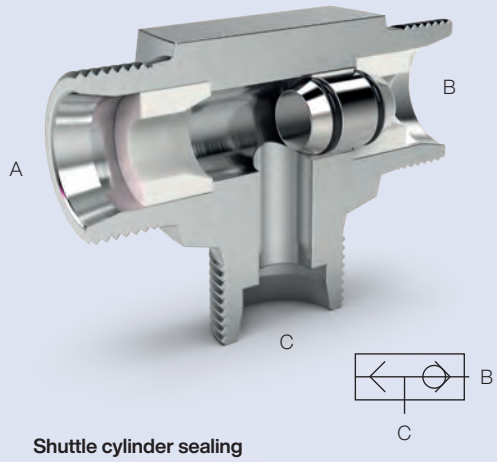
Materials and surface protection:
Steel valve body, VOSS coat surface protection

Pressure fluids: mineral-oil-based
(valves for other media upon request)

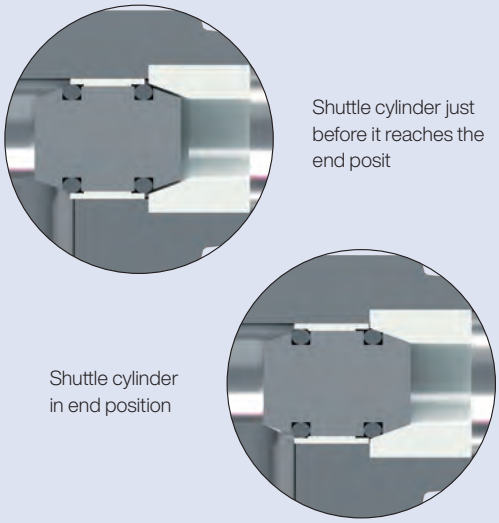
Temperature range: -40 °C to 120 °C
Permitted leakage: 1 cm^3/min

Caution!
Not suitable for compressed air or gases, and not suitable for use with 24° sealing cones/welding cones! For quasi-static applications only.

Function description shuttle valves



Shuttle cylinder sealing



Sealing principle

Soft-sealing

In a hydraulic circuit, VOSS soft-sealing shuttle valves have the same function as ball-seat shuttle valves.

- Type: soft-sealing valve with conical seat
- For installation in-line in tubing systems (other designs available upon request)
- Installation orientation: any

Materials and surface protection:
Steel valve body, VOSS coat surface protection
Seals made of NBR (FKM seals available upon request)

Pressure fluids: mineral-oil-based
(valves for other media upon request)

Leak-tightness: absolutely leak-tight at pressures from 3 bar up (medium: hydraulic fluid)

Sealing principle:

The sliding sleeve on the shuttle cylinder

- exposes the seal area when it strikes the bushing
- prevents the O-ring facing the flow from being flushed out.

Temperature range:
-35 °C to +100 °C for valves with NBR seals
-25 °C to +200 °C for valves with FKM seals
(available upon request)

Caution!
Not suitable for compressed air or gases, and not suitable for use with 24° sealing cones/welding cones! For quasi-static applications only.

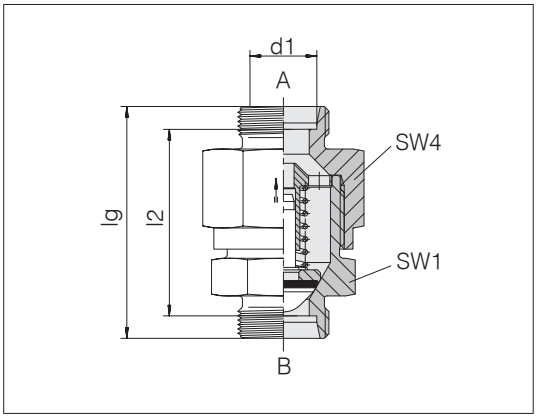
Standard non-return valves

Tube coupling: 24° in acc. with ISO 8434-1

Opening pressure 1 bar

Standard O-ring material is NBR





Series Tube OD d1	Pressure	lg	l2	SW1	SW4	kg/100 ca.	Order-No.	Designation
L 6	PB 250	43	29	17	17	4.4	0600012081	24-VNRO-L6
L 8	PB 250	44	30	19	19	5.5	0600022081	24-VNRO-L8
L 10	PB 250	54.5	40.5	22	24	9.8	0600032081	24-VNRO-L10
L 12	PB 250	57.5	43.5	27	30	16.5	0600042081	24-VNRO-L12
L 15	PB 250	61.5	47.5	30	32	20.5	0600052081	24-VNRO-L15
L 18	PB 160	66.5	51.5	36	36	29.0	0600062081	24-VNRO-L18
L 22	PB 160	76.5	61.5	41	46	49.5	0600072081	24-VNRO-L22
L 28	PB 100	85	70	50	55	78.4	0600082081	24-VNRO-L28
L 35	PB 100	95.5	74.5	60	65	122.7	0600092081	24-VNRO-L35
L 42	PB 100	99.5	77.5	65	75	162.6	0600102081	24-VNRO-L42
S 6	PB 630	48.5	34.5	19	19	6.6	0600112081	24-VNRO-S6
S 8	PB 630	48.5	34.5	19	19	6.8	0600122081	24-VNRO-S8
S 10	PB 630	55.5	40.5	22	24	11.5	0600132081	24-VNRO-S10
S 12	PB 630	57.5	42.5	24	27	14.5	0600142081	24-VNRO-S12
S 14	PB 630	63.5	47.5	27	32	20.9	0600152081	24-VNRO-S14
S 16	PB 400	67.5	50.5	32	36	27.8	0600162081	24-VNRO-S16
S 20	PB 400	75.5	54.5	41	46	49.5	0600172081	24-VNRO-S20
S 25	PB 400	82.5	58.5	46	50	62.7	0600182081	24-VNRO-S25
S 30	PB 250	96	69	55	60	107.8	0600192081	24-VNRO-S30
S 38	PB 250	107.5	75.5	65	70	161.3	0600202081	24-VNRO-S38

Test pressure PP = 1.5 times value in table

Example for comp. : RHD06LOMD

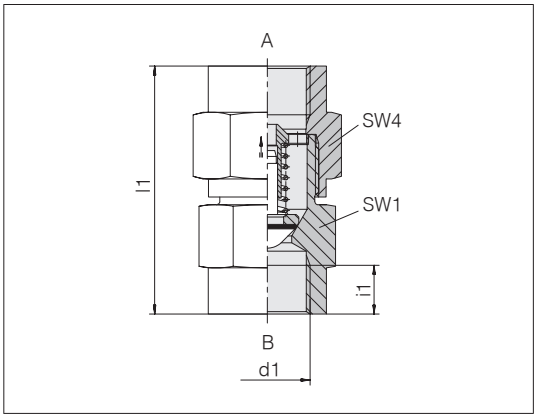
Non-return valves

Double-sided internal BSPP thread, parallel ISO 1179

Opening pressure 1 bar (standard version)

Standard O-ring material is NBR





Series Tube OD	d1	Pressure	l1	SW1	SW4	i1	kg/100 ca.	Order-No.	Designation
L 6	G 1/8 A	PB 250	50.5	19	19	8	10.4	0670252000	GP-VNROI-IG1/8
L 6	G 1/4 A	PB 250	55	19	19	12	11.7	0670262000	GP-VNROI-IG1/4
L 10	G 3/8 A	PB 250	68.5	24	27	12	21.0	0670272000	GP-VNROI-IG3/8
L 15	G 1/2 A	PB 250	74	32	36	14	35.5	0670282000	GP-VNROI-IG1/2
L 18	G 3/4 A	PB 160	84	41	46	16	80.7	0670292000	GP-VNROI-IG3/4
L 22	G 1 A	PB 160	96.5	46	50	18	89.2	0670302000	GP-VNROI-IG1
L 28	G 1 1/4 A	PB 100	110	60	60	20	189.0	0670312000	GP-VNROI-IG11/4
L 35	G 1 1/2 A	PB 100	119	65	70	22	237.6	0670322000	GP-VNROI-IG11/2

Test pressure PP = 1.5-fold value in table

Other sizes on request.

Example for comparison: RHDI1/8

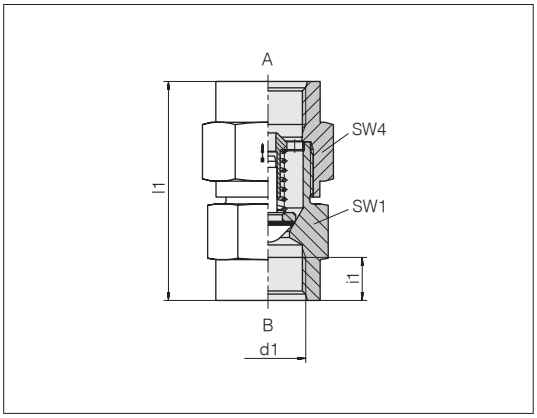
Non-return valves

Double-sided internal UN/UNF thread
ISO 11926-2/SAE J 1962-2

Opening pressure 1 bar
(standard version)

Standard O-ring material is NBR





Series Tube OD	d1	Pressure	l1	SW1	SW4	i1	kg/100 ca.	Order-No.	Designation
S 6	7/16-20 UNF	PB 630	57.5	19	19	11.5	11.5	0670352000	GP-VNROI-IU7/16-20F
S 8	1/2-20 UNF	PB 630	57.5	19	19	11.5	10.1	0670362000	GP-VNROI-IU1/2-20F
S 10	9/16-18 UNF	PB 630	68	22	24	12.7	17.4	0670372000	GP-VNROI-IU9/16-18F
S 12	3/4-16 UNF	PB 630	74.5	27	27	14.3	25.6	0670382000	GP-VNROI-IU3/4-16F
S 16	7/8-14 UNF	PB 400	80	32	36	16.7	44.0	0670392000	GP-VNROI-IU7/8-14F
S 20	1 1/16-12 UN	PB 400	91.5	41	46	19	79.8	0670402000	GP-VNROI-IU11/16-12F
S 25	1 5/16-12 UN	PB 400	98	46	50	19	93.0	0670412000	GP-VNROI-IU15/16-12F
S 30	1 5/ 8-12 UN	PB 250	104	55	60	19	153.8	0670422000	GP-VNROI-IU15/8-12F
S 38	1 7/ 8-12 UN	PB 250	117	65	70	19	221.4	0670442000	GP-VNROI-IU17/8-12F

Test pressure PP = 1.5-fold value in table

Other sizes on request.

Standard non-return valves

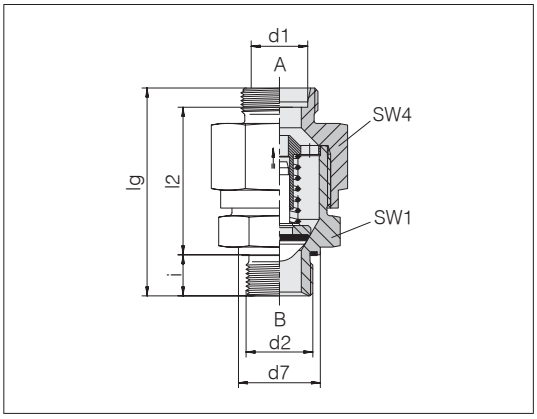
Flow direction from threaded stud

Male thread: metric fine thread, cylindrical
Threaded stud: ISO 9974-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1

Opening pressure 1 bar





Series Tube OD d1	d2	d7	lg	Pressure	l2	SW1	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation
L 6	M 10 x 1	13.9	44	PB 250	29	17	17	8	15	4.6	0601302081	24-VNROPT-L6-M10E
L 8	M 12 x 1.5	16.9	48	PB 250	29	19	19	12	25	7.5	0601312081	24-VNROPT-L8-M12E
L 10	M 14 x 1.5	18.9	59	PB 250	40	22	24	12	50	10.6	0601322081	24-VNROPT-L10-M14E
L 12	M 16 x 1.5	21.9	61.5	PB 250	42.5	27	30	12	70	17.3	0601332081	24-VNROPT-L12-M16E
L 15	M 18 x 1.5	23.9	64.5	PB 250	45.5	30	32	12	90	20.8	0601342081	24-VNROPT-L15-M18E
L 18	M 22 x 1.5	26.9	71.5	PB 160	50	36	36	14	130	36.6	0601352081	24-VNROPT-L18-M22E
L 22	M 26 x 1.5	31.9	81	PB 160	57.5	41	46	16	180	49.9	0601362081	24-VNROPT-L22-M26E
L 28	M 33 x 2	39.9	92	PB 100	66.5	50	55	18	230	81.5	0601372081	24-VNROPT-L28-M33E
L 35	M 42 x 2	49.9	101.5	PB 100	71	60	65	20	330	124.8	0601382081	24-VNROPT-L35-M42E
L 42	M 48 x 2	54.9	109.5	PB 100	76.5	65	75	22	500	169.6	0601392081	24-VNROPT-L42-M48E
S 6	M 12 x 1.5	16.9	50.5	PB 630	31.5	19	19	12	50	9.0	0601402081	24-VNROPT-S6-M12E
S 8	M 14 x 1.5	18.9	50.5	PB 630	31.5	19	19	12	60	7.0	0601412081	24-VNROPT-S8-M14E
S 8	M 27 x 2	31.9	76.5	PB 400	53.5	32	36	16	200	37.8	7008436600	24-VNROPT-S8-M27E-22,3
S 10	M 16 x 1.5	21.9	57.5	PB 630	38	22	24	12	80	15.6	0601422081	24-VNROPT-S10-M16E
S 12	M 18 x 1.5	23.9	60.5	PB 630	41	24	27	12	90	15.4	0601432081	24-VNROPT-S12-M18E
S 14	M 20 x 1.5	25.9	66.5	PB 630	44.5	27	32	14	130	27.2	0601442081	24-VNROPT-S14-M20E
S 16	M 22 x 1.5	26.9	70.5	PB 400	48	32	36	14	130	36.0	0601452081	24-VNROPT-S16-M22E
S 20	M 22 x 1.5	26.9	80.5	PB 400	56	41	46	14	130	56.1	7009078300	24-VNROPT-S20-M22E
S 20	M 27 x 2	31.9	78.5	PB 400	52	41	46	16	200	50.3	0601462081	24-VNROPT-S20-M27E
S 25	M 33 x 2	39.9	87	PB 400	57	46	50	18	250	87.3	0601472081	24-VNROPT-S25-M33E
S 30	M 42 x 2	49.9	99.5	PB 250	66	55	60	20	500	113.2	0601482081	24-VNROPT-S30-M42E
S 38	M 48 x 2	54.9	110	PB 250	72	65	70	22	600	197.3	0601492081	24-VNROPT-S38-M48E

Test pressure PP = 1.5-fold value in table

Example for comp. : RHV06LMEDOMD

Standard non-return valves

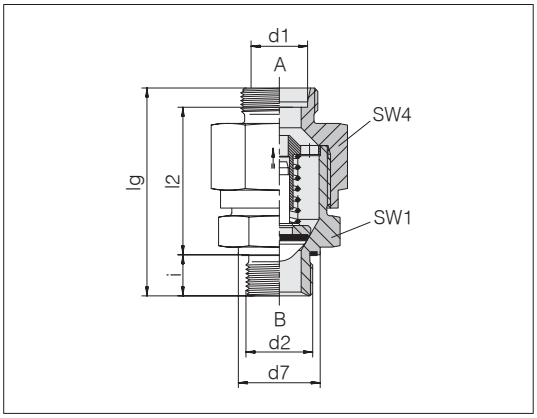
Flow direction from threaded stud

Male thread: BSPP thread, cylindrical
Threaded stud: ISO 1179-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1

Opening pressure 1 bar





Series Tube OD d1	d2	d7	lg	Pressure	l2	SW1	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation
L 6	G 1/8 A	13.9	44	PB 250	29	17	17	8	20	5.7	0602302081	24-VNROPT-L6-G1/8E
L 8	G 1/4 A	18.9	49	PB 250	30	19	19	12	50	6.2	0602312081	24-VNROPT-L8-G1/4E
L 10	G 1/4 A	18.9	59.5	PB 250	40.5	22	24	12	50	10.6	0602322081	24-VNROPT-L10-G1/4E
L 12	G 3/8 A	21.9	61.5	PB 250	42.5	27	30	12	80	17.2	0602332081	24-VNROPT-L12-G3/8E
L 15	G 1/2 A	26.9	66.5	PB 250	45.5	30	32	14	100	21.9	0602342081	24-VNROPT-L15-G1/2E
L 18	G 1/2 A	26.9	72.5	PB 160	51	36	36	14	100	30.1	0602352081	24-VNROPT-L18-G1/2E
L 22	G 3/4 A	31.9	80	PB 160	56.5	41	46	16	180	48.8	0602362081	24-VNROPT-L22-G3/4E
L 28	G 1 A	39.9	92	PB 100	66.5	50	55	18	230	81.0	0602372081	24-VNROPT-L28-G1E
L 35	G 1 1/4 A	49.9	102.5	PB 100	72	60	65	20	330	126.6	0602382081	24-VNROPT-L35-G11/4E
L 42	G 1 1/2 A	54.9	109.5	PB 100	76.5	65	75	22	500	170.1	0602392081	24-VNROPT-L42-G11/2E
S 6	G 1/4 A	18.9	50.5	PB 630	31.5	19	19	12	60	7.0	0602402081	24-VNROPT-S6-G1/4E
S 8	G 1/4 A	18.9	50.5	PB 630	31.5	19	19	12	60	6.8	0602412081	24-VNROPT-S8-G1/4E
S 10	G 3/8 A	21.9	57.5	PB 630	38	22	24	12	90	12.0	0602422081	24-VNROPT-S10-G3/8E
S 12	G 3/8 A	21.9	60.5	PB 630	41	24	27	12	90	14.9	0602432081	24-VNROPT-S12-G3/8E
S 14	G 1/2 A	26.9	66.5	PB 630	44.5	27	32	14	150	22.2	0602442081	24-VNROPT-S14-G1/2E
S 16	G 1/2 A	26.9	70.5	PB 400	48	32	36	14	150	28.1	0602452081	24-VNROPT-S16-G1/2E
S 20	G 3/4 A	31.9	78.5	PB 400	52	41	46	16	200	50.2	0602462081	24-VNROPT-S20-G3/4E
S 25	G 1 A	39.9	87.5	PB 400	57.5	46	50	18	250	65.7	0602472081	24-VNROPT-S25-G1E
S 30	G 1 1/4 A	49.9	97.5	PB 250	64	55	60	20	500	108.2	0602482081	24-VNROPT-S30-G11/4E
S 38	G 1 1/2 A	54.9	109.5	PB 250	71.5	65	70	22	600	162.1	0602492081	24-VNROPT-S38-G11/2E

Test pressure PP = 1.5-fold value in table

Example for comp. : RRHV06LREDOMD

Standard non-return valves

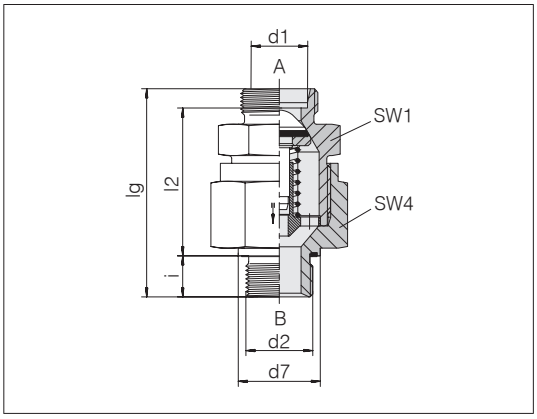
Flow direction to threaded stud

Male thread: metric fine thread, cylindrical
Threaded stud: ISO 9974-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1

Opening pressure 1 bar





Series Tube OD d1	d2	lg	Pressure	d7	l2	SW1	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation
L 6	M 10 x 1	43	PB 250	13.9	28	17	17	8	15	5.7	0603302081	24-VNROTP-L6-M10E
L 8	M 12 x 1.5	47.5	PB 250	16.9	28.5	19	19	12	25	5.5	0603312081	24-VNROTP-L8-M12E
L 10	M 14 x 1.5	57.5	PB 250	18.9	38.5	22	24	12	50	10.3	0603322081	24-VNROTP-L10-M14E
L 12	M 16 x 1.5	60	PB 250	21.9	41	27	30	12	70	16.5	0603332081	24-VNROTP-L12-M16E
L 15	M 18 x 1.5	63	PB 250	23.9	44	30	32	12	90	19.9	0603342081	24-VNROTP-L15-M18E
L 18	M 22 x 1.5	69.5	PB 160	26.9	48	36	36	14	130	28.3	0603352081	24-VNROTP-L18-M22E
L 22	M 26 x 1.5	79.5	PB 160	31.9	56	41	46	16	180	47.9	0603362081	24-VNROTP-L22-M26E
L 28	M 33 x 2	91	PB 100	39.9	65.5	50	55	18	230	79.4	0603372081	24-VNROTP-L28-M33E
L 35	M 42 x 2	102	PB 100	49.9	71.5	60	65	20	330	125.8	0603382081	24-VNROTP-L35-M42E
L 42	M 48 x 2	108.5	PB 100	54.9	75.5	65	75	22	500	194.0	0603392081	24-VNROTP-L42-M48E
S 6	M 12 x 1.5	50.5	PB 630	16.9	31.5	19	19	12	50	9.3	0603402081	24-VNROTP-S6-M12E
S 8	M 14 x 1.5	50.5	PB 630	18.9	31.5	19	19	12	60	9.2	0603412081	24-VNROTP-S8-M14E
S 10	M 16 x 1.5	57.5	PB 630	21.9	38	22	24	12	80	11.8	0603422081	24-VNROTP-S10-M16E
S 12	M 18 x 1.5	60.5	PB 630	23.9	41	24	27	12	90	18.9	0603432081	24-VNROTP-S12-M18E
S 14	M 20 x 1.5	65.5	PB 630	25.9	43.5	27	32	14	130	27.9	0603442081	24-VNROTP-S14-M20E
S 16	M 22 x 1.5	69	PB 400	26.9	46.5	32	36	14	130	27.5	0603452081	24-VNROTP-S16-M22E
S 20	M 27 x 2	78.5	PB 400	31.9	52	41	46	16	200	50.3	0603462081	24-VNROTP-S20-M27E
S 25	M 33 x 2	87	PB 400	39.9	57	46	50	18	250	65.5	0603472081	24-VNROTP-S25-M33E
S 30	M 42 x 2	99.5	PB 250	49.9	66	55	60	20	500	133.8	0603482081	24-VNROTP-S30-M42E
S 38	M 48 x 2	110.5	PB 250	54.9	72.5	65	70	22	600	196.9	0603492081	24-VNROTP-S38-M48E

Test pressure PP = 1.5-fold value in table

Example for comp. : RHZ06LMEDOMD

Standard non-return valves

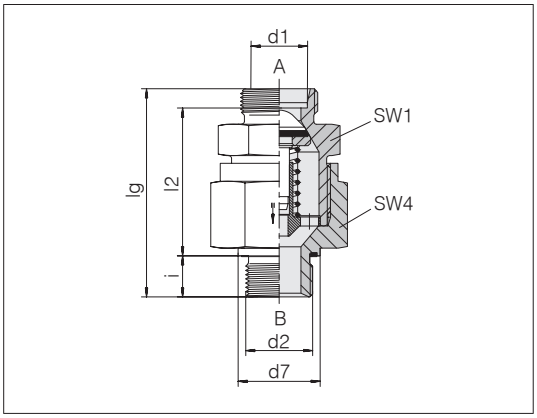
Flow direction to threaded stud

Male thread: BSPP thread, cylindrical
Threaded studs: ISO 1179-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1

Opening pressure 1 bar





Series Tube OD d1	d2	lg	Pressure	d7	l2	SW1	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation
L 6	G 1/8 A	43	PB 250	13.9	28	17	17	8	20	4.5	0604302081	24-VNROTP-L6-G1/8E
L 8	G 1/4 A	47.5	PB 250	18.9	28.5	19	19	12	50	5.8	0604312081	24-VNROTP-L8-G1/4E
L 10	G 1/4 A	59	PB 250	18.9	40	22	24	12	50	10.6	0604322081	24-VNROTP-L10-G1/4E
L 12	G 3/8 A	60.5	PB 250	21.9	41.5	27	30	12	80	16.8	0604332081	24-VNROTP-L12-G3/8E
L 15	G 1/2 A	65	PB 250	26.9	44	30	32	14	100	20.8	0604342081	24-VNROTP-L15-G1/2E
L 18	G 1/2 A	69.5	PB 160	26.9	48	36	36	14	100	28.0	0604352081	24-VNROTP-L18-G1/2E
L 22	G 3/4 A	80.5	PB 160	31.9	57	41	46	16	180	49.4	0604362081	24-VNROTP-L22-G3/4E
L 28	G 1 A	92.5	PB 100	39.9	67	50	55	18	230	81.9	0604372081	24-VNROTP-L28-G1E
L 35	G 1 1/4 A	102	PB 100	49.9	71.5	60	65	20	330	121.7	0604382081	24-VNROTP-L35-G11/4E
L 42	G 1 1/2 A	108.5	PB 100	54.9	75.5	65	75	22	500	167.2	0604392081	24-VNROTP-L42-G11/2E
S 6	G 1/4 A	50.5	PB 630	18.9	31.5	19	19	12	60	7.0	0604402081	24-VNROTP-S6-G1/4E
S 8	G 1/4 A	50.5	PB 630	18.9	31.5	19	19	12	60	6.9	0604412081	24-VNROTP-S8-G1/4E
S 10	G 3/8 A	57.5	PB 630	21.9	38	22	24	12	90	12.0	0604422081	24-VNROTP-S10-G3/8E
S 12	G 3/8 A	60.5	PB 630	21.9	41	24	27	12	90	15.0	0604432081	24-VNROTP-S12-G3/8E
S 14	G 1/2 A	65.5	PB 630	26.9	43.5	27	32	14	150	21.6	0604442081	24-VNROTP-S14-G1/2E
S 16	G 1/2 A	70.5	PB 400	26.9	48	32	36	14	150	28.0	0604452081	24-VNROTP-S16-G1/2E
S 20	G 3/4 A	78.5	PB 400	31.9	52	41	46	16	200	50.7	0604462081	24-VNROTP-S20-G3/4E
S 25	G 1 A	87	PB 400	39.9	57	46	50	18	250	65.6	0604472081	24-VNROTP-S25-G1E
S 30	G 1 1/4 A	99.5	PB 250	49.9	66	55	60	20	500	108.5	0604482081	24-VNROTP-S30-G11/4E
S 38	G 1 1/2 A	110.5	PB 250	54.9	72.5	65	70	22	600	161.8	0604492081	24-VNROTP-S38-G11/2E

Test pressure PP = 1.5-fold value in table

Example for comp. : RHZ06LREDOMD

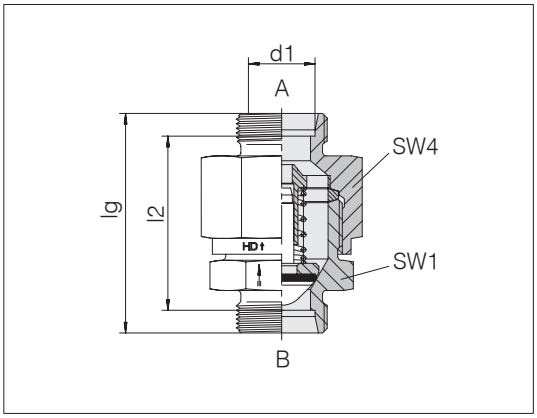
High-pressure non-return valves

Tube coupling: 24° in acc. with ISO 8434-1

Opening pressure 1 bar

Standard O-ring material is NBR





Series Tube OD d1	Pressure	lg	l2	SW1	SW4	kg/100 ca.	Order-No.	Designation
L 6	PN 400	45.5	31.5	17	19	6.3	1600012081	24-VNROHP-L6
L 8	PN 400	49	35	19	22	8.2	1600022081	24-VNROHP-L8
L 10	PN 400	52	38	22	24	10.8	1600032081	24-VNROHP-L10
L 12	PN 400	53	39	27	30	16.3	1600042081	24-VNROHP-L12
L 15	PN 400	58	44	30	32	21.0	1600052081	24-VNROHP-L15
L 18	PN 400	63	48	36	36	31.7	1600062081	24-VNROHP-L18
L 22	PN 250	72.5	57.5	41	46	51.2	1600072081	24-VNROHP-L22
L 28	PN 250	75.5	60.5	50	55	76.4	1600082081	24-VNROHP-L28
L 35	PN 250	90	69	60	65	121.3	1600092081	24-VNROHP-L35
L 42	PN 250	88	66	65	70	134.9	1600102081	24-VNROHP-L42
S 6	PN 420	49	35	19	19	7.6	1600112081	24-VNROHP-S6
S 8	PN 420	49	35	19	19	7.8	1600122081	24-VNROHP-S8
S 10	PN 420	53	38	22	24	12.3	1600132081	24-VNROHP-S10
S 12	PN 420	55	40	24	27	15.7	1600142081	24-VNROHP-S12
S 14	PN 420	59	43	27	32	21.0	1600152081	24-VNROHP-S14
S 16	PN 420	65	48	32	36	25.1	1600162081	24-VNROHP-S16
S 20	PN 420	73	52	41	41	45.3	1600172081	24-VNROHP-S20
S 25	PN 420	86	62	46	50	75.2	1600182081	24-VNROHP-S25
S 30	PN 250	91	64	55	60	109.6	1600192081	24-VNROHP-S30
S 38	PN 250	99	67	65	70	155.5	1600202081	24-VNROHP-S38

High-pressure non-return valves

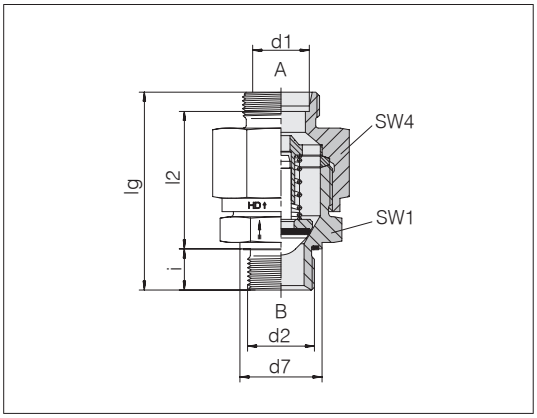
Flow direction from threaded stud

Male thread: metric fine thread, cylindrical
Threaded stud: ISO 9974-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1

Opening pressure 1 bar





Series Tube OD d1	d2	d7	lg	Pressure	l2	SW1	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation
L 6	M 10 x 1	13.9	45	PN 400	30	17	19	8	15	6.2	1601302081	24-VNROPTHP-L6-M10E
L 8	M 12 x 1.5	16.9	51	PN 400	32	19	22	12	25	8.2	1601312081	24-VNROPTHP-L8-M12E
L 10	M 14 x 1.5	18.9	53	PN 400	34	22	24	12	50	10.7	1601322081	24-VNROPTHP-L10-M14E
L 12	M 16 x 1.5	21.9	58	PN 400	39	27	30	12	70	17.6	1601332081	24-VNROPTHP-L12-M16E
L 15	M 18 x 1.5	23.9	60	PN 400	41	30	32	12	90	20.8	1601342081	24-VNROPTHP-L15-M18E
L 18	M 22 x 1.5	26.9	67	PN 400	45.5	36	36	14	130	33.2	1601352081	24-VNROPTHP-L18-M22E
L 22	M 26 x 1.5	31.9	77	PN 250	53.5	41	46	16	180	51.9	1601362081	24-VNROPTHP-L22-M26E
L 28	M 33 x 2	39.9	85.5	PN 250	60	50	55	18	230	83.1	1601372081	24-VNROPTHP-L28-M33E
L 35	M 42 x 2	49.9	97.5	PN 250	67	60	65	20	330	126.6	1601382081	24-VNROPTHP-L35-M42E
L 42	M 48 x 2	54.9	98.5	PN 250	65.5	65	70	22	500	144.1	1601392081	24-VNROPTHP-L42-M48E
S 6	M 12 x 1.5	16.9	51	PN 420	32	19	19	12	50	7.6	1601402081	24-VNROPTHP-S6-M12E
S 8	M 14 x 1.5	18.9	51	PN 420	32	19	19	12	60	7.9	1601412081	24-VNROPTHP-S8-M14E
S 10	M 16 x 1.5	21.9	56.5	PN 420	37	22	24	12	80	12.3	1601422081	24-VNROPTHP-S10-M16E
S 12	M 18 x 1.5	23.9	58	PN 420	38.5	24	27	12	90	16.4	1601432081	24-VNROPTHP-S12-M18E
S 16	M 22 x 1.5	26.9	67	PN 420	44.5	32	36	14	130	29.3	1601452081	24-VNROPTHP-S16-M22E
S 20	M 27 x 2	31.9	77	PN 420	50.5	41	41	16	200	46.9	1601462081	24-VNROPTHP-S20-M27E
S 25	M 33 x 2	39.9	88.5	PN 420	58.5	46	50	18	250	75.9	1601472081	24-VNROPTHP-S25-M33E
S 30	M 42 x 2	49.9	94	PN 250	60.5	55	60	20	500	114.9	1601482081	24-VNROPTHP-S30-M42E
S 38	M 48 x 2	54.9	103.5	PN 250	65.5	65	70	22	600	161.0	1601492081	24-VNROPTHP-S38-M48E

High-pressure non-return valves

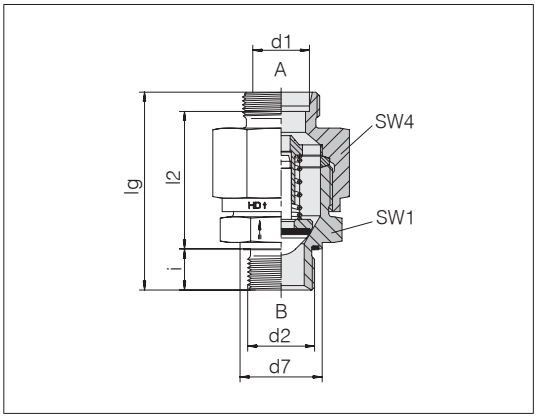
Flow direction from threaded stud

Male thread: BSPP thread, cylindrical
Threaded stud: ISO 1179-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1

Opening pressure 1 bar





Series Tube OD d1	d2	d7	lg	Pressure	l2	SW1	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation
L 6	G 1/8 A	13.9	45	PN 400	30	17	19	8	20	6.2	1602302081	24-VNROPTHP-L6-G1/8E
L 8	G 1/4 A	18.9	51	PN 400	32	19	22	12	50	8.5	1602312081	24-VNROPTHP-L8-G1/4E
L 10	G 1/4 A	18.9	53	PN 400	34	22	24	12	50	10.4	1602322081	24-VNROPTHP-L10-G1/4E
L 12	G 3/8 A	21.9	58	PN 400	39	27	30	12	80	17.2	1602332081	24-VNROPTHP-L12-G3/8E
L 15	G 1/2 A	26.9	62	PN 400	41	30	32	14	100	22.1	1602342081	24-VNROPTHP-L15-G1/2E
L 18	G 1/2 A	26.9	67	PN 400	45.5	36	36	14	100	29.4	1602352081	24-VNROPTHP-L18-G1/2E
L 22	G 3/4 A	31.9	77	PN 250	53.5	41	46	16	180	51.9	1602362081	24-VNROPTHP-L22-G3/4E
L 28	G 1 A	39.9	85.5	PN 250	60	50	55	18	230	83.3	1602372081	24-VNROPTHP-L28-G1E
L 35	G 1 1/4 A	49.9	97.5	PN 250	67	60	65	20	330	126.3	1602382081	24-VNROPTHP-L35-G11/4E
L 42	G 1 1/2 A	54.9	98.5	PN 250	65.5	65	70	22	500	143.5	1602392081	24-VNROPTHP-L42-G11/2E
S 6	G 1/4 A	18.9	51	PN 420	32	19	19	12	60	7.8	1602402081	24-VNROPTHP-S6-G1/4E
S 8	G 1/4 A	18.9	51	PN 420	32	19	19	12	60	7.7	1602412081	24-VNROPTHP-S8-G1/4E
S 10	G 3/8 A	21.9	56.5	PN 420	37	22	24	12	90	13.1	1602422081	24-VNROPTHP-S10-G3/8E
S 12	G 3/8 A	21.9	58	PN 420	38.5	24	27	12	90	15.9	1602432081	24-VNROPTHP-S12-G3/8E
S 16	G 1/2 A	26.9	67	PN 420	44.5	32	36	14	150	28.9	1602452081	24-VNROPTHP-S16-G1/2E
S 20	G 3/4 A	31.9	77	PN 420	50.5	41	41	16	200	46.6	1602462081	24-VNROPTHP-S20-G3/4E
S 25	G 1 A	39.9	88.5	PN 420	58.5	46	50	18	250	76.1	1602472081	24-VNROPTHP-S25-G1E
S 30	G 1 1/4 A	49.9	94	PN 250	60.5	55	60	20	500	114.7	1602482081	24-VNROPTHP-S30-G11/4E
S 38	G 1 1/2 A	54.9	103.5	PN 250	65.5	65	70	22	600	160.5	1602492081	24-VNROPTHP-S38-G11/2E

High-pressure non-return valves

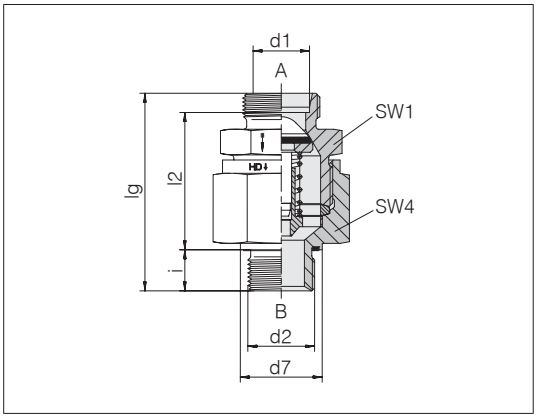
Flow direction to threaded stud

Male thread: metric fine thread, cylindrical
Threaded stud: ISO 9974-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1

Opening pressure 1 bar





Series Tube OD d1	d2	d7	lg	Pressure	l2	SW1	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation
L 6	M 10 x 1	13.9	44	PN 400	29	17	19	8	15	6.0	1603302081	24-VNROTPHP-L6-M10E
L 8	M 12 x 1.5	16.9	51	PN 400	32	19	22	12	25	8.2	1603312081	24-VNROTPHP-L8-M12E
L 10	M 14 x 1.5	18.9	53	PN 400	34	22	24	12	50	10.6	1603322081	24-VNROTPHP-L10-M14E
L 12	M 16 x 1.5	21.9	58	PN 400	39	27	30	12	70	17.8	1603332081	24-VNROTPHP-L12-M16E
L 15	M 18 x 1.5	23.9	60	PN 400	41	30	32	12	90	20.8	1603342081	24-VNROTPHP-L15-M18E
L 18	M 22 x 1.5	26.9	67	PN 400	45.5	36	36	14	130	29.5	1603352081	24-VNROTPHP-L18-M22E
L 22	M 26 x 1.5	31.9	77	PN 250	53.5	41	46	16	180	51.4	1603362081	24-VNROTPHP-L22-M26E
L 28	M 33 x 2	39.9	80	PN 250	54.5	50	55	18	230	74.7	1603372081	24-VNROTPHP-L28-M33E
L 35	M 42 x 2	49.9	97.5	PN 250	67	60	65	20	330	126.8	1603382081	24-VNROTPHP-L35-M42E
L 42	M 48 x 2	54.9	98	PN 250	65	65	70	22	500	143.5	1603392081	24-VNROTPHP-L42-M48E
S 6	M 12 x 1.5	16.9	51	PN 420	32	19	19	12	50	7.6	1603402081	24-VNROTPHP-S6-M12E
S 8	M 14 x 1.5	18.9	51	PN 420	32	19	19	12	60	7.9	1603412081	24-VNROTPHP-S8-M14E
S 10	M 16 x 1.5	21.9	56.5	PN 420	37	22	24	12	80	13.1	1603422081	24-VNROTPHP-S10-M16E
S 12	M 18 x 1.5	23.9	56.5	PN 420	37	24	27	12	90	15.7	1603432081	24-VNROTPHP-S12-M18E
S 16	M 22 x 1.5	26.9	67	PN 420	44.5	32	36	14	130	29.5	1603452081	24-VNROTPHP-S16-M22E
S 20	M 27 x 2	31.9	77	PN 420	50.5	41	41	16	200	46.9	1603462081	24-VNROTPHP-S20-M27E
S 25	M 33 x 2	39.9	86.5	PN 420	56.5	46	50	18	250	72.3	1603472081	24-VNROTPHP-S25-M33E
S 30	M 42 x 2	49.9	94	PN 250	60.5	55	60	20	500	114.9	1603482081	24-VNROTPHP-S30-M42E
S 38	M 48 x 2	54.9	103.5	PN 250	65.5	65	70	22	600	162.9	1603492081	24-VNROTPHP-S38-M48E

High-pressure non-return valves

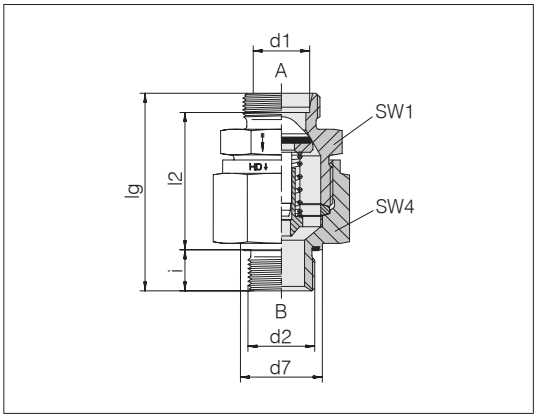
Flow direction to threaded stud

Male thread: BSPP thread, cylindrical
Threaded studs: ISO 1179-2 Form E
Sealing type: Profile sealing ring PEFLEX
Sealing material: Standard NBR

Tube coupling: 24° in acc. with ISO 8434-1

Opening pressure 1 bar





Series Tube OD d1	d2	d7	lg	Pressure	l2	SW1	SW4	i	Nm -10 %	kg/100 ca.	Order-No.	Designation
L 6	G 1/8 A	13.9	44	PN 400	29	17	17	8	20	6.0	1604302081	24-VNROTPHP-L6-G1/8E
L 8	G 1/4 A	18.9	51	PN 400	32	19	19	12	50	8.5	1604312081	24-VNROTPHP-L8-G1/4E
L 10	G 1/4 A	18.9	53	PN 400	34	22	24	12	50	10.4	1604322081	24-VNROTPHP-L10-G1/4E
L 12	G 3/8 A	21.9	58	PN 400	39	27	30	12	80	17.8	1604332081	24-VNROTPHP-L12-G3/8E
L 15	G 1/2 A	26.9	62	PN 400	41	30	32	14	100	21.9	1604342081	24-VNROTPHP-L15-G1/2E
L 18	G 1/2 A	26.9	67	PN 400	45.5	36	36	14	100	31.7	1604352081	24-VNROTPHP-L18-G1/2E
L 22	G 3/4 A	31.9	77	PN 250	53.5	41	46	16	180	51.4	1604362081	24-VNROTPHP-L22-G3/4E
L 28	G 1 A	39.9	80	PN 250	54.5	50	55	18	230	71.8	1604372081	24-VNROTPHP-L28-G1E
L 35	G 1 1/4 A	49.9	97.5	PN 250	67	60	65	20	330	126.6	1604382081	24-VNROTPHP-L35-G11/4E
L 42	G 1 1/2 A	54.9	98	PN 250	65	65	70	22	500	142.9	1604392081	24-VNROTPHP-L42-G11/2E
S 6	G 1/4 A	18.9	51	PN 420	32	19	19	12	60	7.8	1604402081	24-VNROTPHP-S6-G1/4E
S 8	G 1/4 A	18.9	51	PN 420	32	19	19	12	60	7.8	1604412081	24-VNROTPHP-S8-G1/4E
S 10	G 3/8 A	21.9	56.5	PN 420	37	22	24	12	90	13.2	1604422081	24-VNROTPHP-S10-G3/8E
S 12	G 3/8 A	21.9	56.5	PN 420	37	24	27	12	90	19.5	1604432081	24-VNROTPHP-S12-G3/8E
S 16	G 1/2 A	26.9	67	PN 420	44.5	32	36	14	150	28.7	1604452081	24-VNROTPHP-S16-G1/2E
S 20	G 3/4 A	31.9	77	PN 420	50.5	41	46	16	200	46.6	1604462081	24-VNROTPHP-S20-G3/4E
S 25	G 1 A	39.9	86.5	PN 420	56.5	46	50	18	250	72.2	1604472081	24-VNROTPHP-S25-G1E
S 30	G 1 1/4 A	49.9	94	PN 250	60.5	55	60	20	500	114.7	1604482081	24-VNROTPHP-S30-G11/4E
S 38	G 1 1/2 A	54.9	103.5	PN 250	65.5	65	70	22	600	161.4	1604492081	24-VNROTPHP-S38-G11/2E

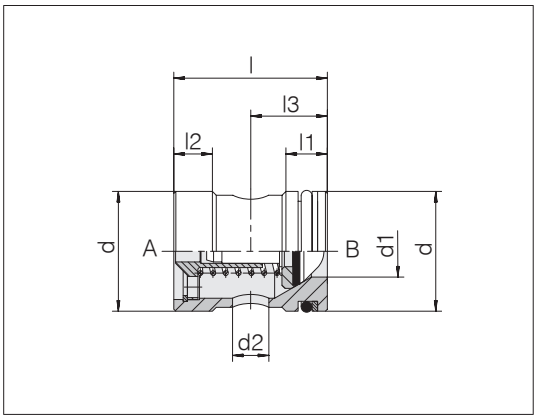
Non-return valve plug-in cartridges

Flow direction B-A

Opening pressure 1 bar
(standard version)

Standard O-ring material is NBR





Type	Pressure	d	d1	d2	l	l1	l2	l3	kg/100 ca.	Order-No.	Designation
RVP 13	PB 400	13	4	3	23	8	6	11	1.6	0605002000	GP-VNRCO-NW13
RVP 16	PB 400	16	6	4.5	26.5	8	7	12	2.7	0605012000	GP-VNRCO-NW16
RVP 20	PB 400	20	8	6	30	9	7	14	4.3	0605022000	GP-VNRCO-NW20
RVP 24	PB 400	24	10	7	35	11	8	17	6.4	0605032000	GP-VNRCO-NW24
RVP 27	PB 400	27	12	8.5	38	11	8	18	8.9	0605042000	GP-VNRCO-NW27
RVP 35	PB 400	35	15	11	44.5	12	9.5	25	18.5	0605052000	GP-VNRCO-NW35
RVP 40	PB 250	40	19	13.5	50.5	12	11	27.5	25.2	0605062000	GP-VNRCO-NW40
RVP 47	PB 250	47	24	17	60	12	13	32	40.4	0605072000	GP-VNRCO-NW47
RVP 55	PB 250	55	30	21.5	70	14	13	42	62.6	0605082000	GP-VNRCO-NW55

Example for comp. :
RVP13

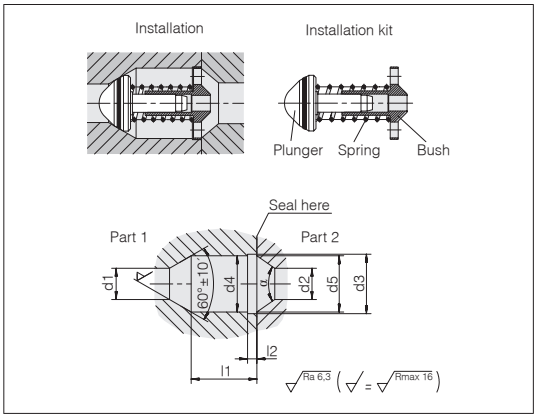
Internal valve part installation kits

Flow direction B-A

Opening pressure 1 bar
(standard version)

Standard O-ring material is NBR





Series Tube OD	d1	d2	d3 + 0.1	d4 + 0.1	d5 ± 0.1	l1 ± 0.1	l2 + 0.2	α °	Order-No.	Designation
L 6	4	4	9.6	8.6	8.6	16.5	2.5	70	0669032000	GP-VNRIO-L/S6
L 8	6	6	11.5	10.5	10.5	16	2.5	70	0669042000	GP-VNRIO-L8
L 10	8	8	15.5	14.5	14.5	21.8	2.5	70	0669052000	GP-VNRIO-L10-S12
L 12	10	10	19	18	18	21	3	70	0669062000	GP-VNRIO-L12-S14
L 15	12	12	21	20	20	23	3	70	0669072000	GP-VNRIO-L15
L 18	15	15	26	25	25	24.5	3.5	70	0669082000	GP-VNRIO-L18
L 22	19	19	32	31	30.6	29.2	4	80	0669092000	GP-VNRIO-L22
L 28	24	24	40	39	38.5	34.5	4.5	90	0669102000	GP-VNRIO-L28
L 35	30	30	50	49	48.6	32.2	4.5	70	0669112000	GP-VNRIO-L35
L 42	36	36	56	55	54.2	31.7	5.5	70	0669122000	GP-VNRIO-L42
S 6	4	4	9.6	8.6	8.6	16.5	2.5	70	0669032000	GP-VNRIO-L/S6
S 8	5	5	11	10	10	15	2.5	70	0669132000	GP-VNRIO-S8
S 10	7	7	13	12	12	22	2.5	70	0669142000	GP-VNRIO-S10
S 12	8	8	15.5	14.5	14.5	21.8	2.5	70	0669052000	GP-VNRIO-L10-S12
S 14	10	10	19	18	18	21	3	70	0669062000	GP-VNRIO-L12-S14
S 16	12	12	22.5	21.5	21.5	24	3	70	0669152000	GP-VNRIO-S16
S 20	16	16	28	27	27	28	3.5	70	0669162000	GP-VNRIO-S20
S 25	20	20	35	34	33.6	28.7	4	70	0669172000	GP-VNRIO-S25
S 30	25	25	41	40	39.6	32.3	4.5	70	0669182000	GP-VNRIO-S30
S 38	32	32	51	50	49.2	34.7	4.5	70	0669192000	GP-VNRIO-S38

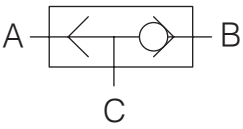
Example for comp. :
ITL06L

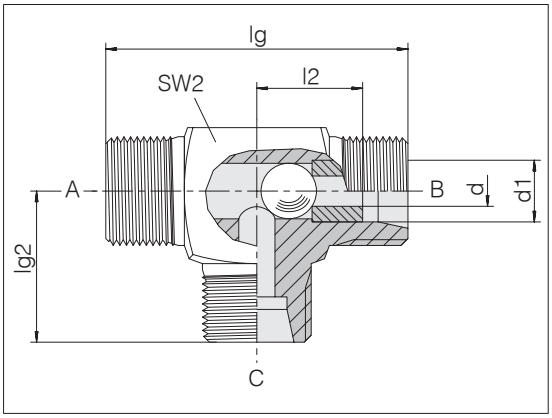
Shuttle valves

Ball seat

Tube installation

Tube coupling: 24° in acc. with ISO 8434-1





Series Tube OD d1	Pressure	d	lg	l2	lg2	SW2	kg/100 ca.	Order-No.	Designation
L 8	PB 250	4.5	42	14	21	14	5.7	5690992281	24-VST-L8-P
L 10	PB 250	6	44	15	22	17	7.4	5690998281	24-VST-L10-P
L 12	PB 250	7.5	48	17	24	19	10.8	5690997081	24-VST-L12-P
L 15	PB 250	10	56	21	28	19	12.4	5690996281	24-VST-L15
S 6	PB 630	3	46	16	23	14	6.9	5690993281	24-VST-S6-P
S 8	PB 630	4.5	48	17	24	17	9.5	5690999281	24-VST-S8-P
S 10	PB 630	6	50	17.5	25	19	12.4	5690990281	24-VST-S10-P
S 12	PB 630	7.5	58	21.5	29	22	17.7	5690995281	24-VST-S12-P
S 16	PB 400	10	66	24.5	33	24	18.8	5690994281	24-VST-S16

Example for comp. :
WV08LOMD

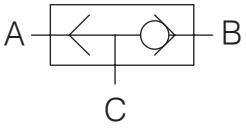
Shuttle valves

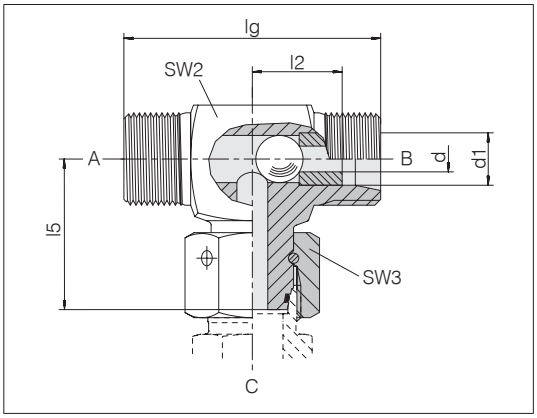
Ball seat

with taper coupling

Standard O-ring material is FKM

Tube coupling: 24° in acc. with ISO 8434-1





Series Tube OD d1	Pressure	d	lg	l2	l5	SW2	SW3	kg/100 ca.	Order-No.	Designation
L 12	PB 250	7.5	48	17	29.5	19	22	13.4	5690991181	24-VSSWOT-L12-P

Example for comp. :
WV-ET12LOMD

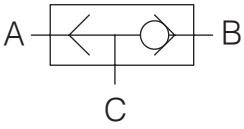
Shuttle valves

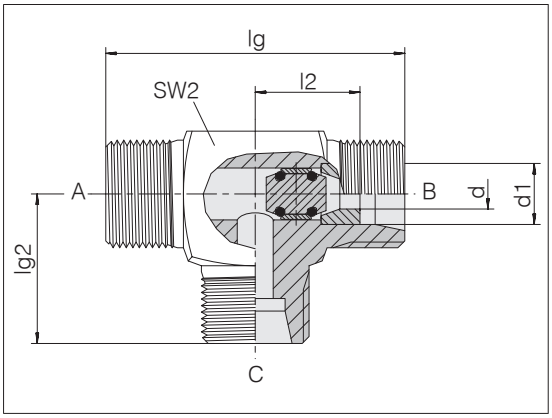
Soft-sealing

Tube installation

Standard O-ring material is NBR

Tube coupling: 24° in acc. with ISO 8434-1





Series Tube OD d1	Pressure	lg	d	lg2	l2	SW2	kg/100 ca.	Order-No.	Designation
L 8	PB 250	44	4.5	22	15	17	5.8	5690980281	24-VSOT-L8-P
L 10	PB 250	44	5.6	22	15	17	7.4	5690981281	24-VSOT-L10-P
L 12	PB 250	48	6.6	24	17	19	11.1	5690982281	24-VSOT-L12-P
L 15	PB 250	56	8.5	28	21	19	26.0	5690983281	24-VSOT-L15
S 6	PB 630	46	2.7	23	16	14	12.6	5690984281	24-VSOT-S6-P
S 8	PB 630	48	4.5	24	17	17	12.1	5690985281	24-VSOT-S8-P
S 10	PB 630	50	5.6	25	17.5	19	22.1	5690985381	24-VSOT-S10-P
S 12	PB 630	58	6.6	29	21.5	22	17.9	5690985481	24-VSOT-S12-P
S 16	PB 400	66	8.5	33	24.5	24	19.7	5690985581	24-VSOT-S16

Example for comp. :
WV08LOMD

Pre-assembly devices and tools

For every application, whether single or series assembly



Content	Type/Page				
The VOSS product designation	P.356				
Product information VOSS pre-assembly devices and tools	P.361				
Pre-assembly devices	TYPE80N3	TYPE90B2	TYPE90C2	CRARPAC	TYPE85
	P.370	P.371	P.372	P.373	P.374
Forming machines	TYPE100				
	P.375				
Accessories	FOOT-SWITCH1, TBM1	TIB, TM	AFHS6, MTD	VOSSLUBE, FCO	
	P.376	P.377	P.378	P.379	
Cone gauges	CG				
	P.380				
Inspections gauges	TGCR				
	P.381				

VOSS

Content	Type/Page				
Pre-assembly tools cutting ring assemblies	VRPT	CRPT-M	CRCB-TYPE80	CRPT-MT	CRPT-MT-RFID
	P.382	P.383	P.384	P.385	P.386
	CRCB				
	P.387				
Pre-assembly tools BV-10	BV10PT/ BV10CJ				
	P.388				
Pre-assembly tools ZAKO	ZAKOPP/ ZAKOCJ				
	P.390				
Pre-assembly tools VOSSForm	SQRFH/ SQRCJ				
	P.392				

The designations of VOSS products

System	Function/ Component	Form	Completion	Series/ Thread

This catalog contains an alphanumerical product designation system based to a large extent on ISO 8434-1. This makes the designation self-explanatory and facilitates identification of the products. Since the structure is based on English, the designation is understood internationally.

Furthermore, the product designations make it possible to generate customized special solutions by combining variations of the existing VOSS product program.

Example: TD-CRPT-L35-M-PM

TD - **CRPT** - **L**

System

Tools and devices

The "system" characteristic describes the product line.

Function/Component

Cutting ring pre-assembly tool

The "Function/component" describes the product type.

Form

Not relevant for chapter 7

Completion

Not relevant for chapter 7

Series/Thread

Light series

Determines the series

Manual pre-assembly studs made of heavy-duty steel, for tube OD L35

Tube OD/ Diameter	Thread	Diameter	Sealing type/ Threaded bore	Suffix

Examples of how to order items, as well as additional explanations and variation options are given in the respective chapters and in the following pages for the individual product groups.

35 - **ES4**

Suffix 10

Manual pre-assembly mandrel heavy-duty steel

Deviations from the default characteristics (e. g. seal materials, completion using different cutting ring systems, flared coupling parts, special dimensions ...)

Sealing type/Threaded bore

Not relevant for chapter 7

Diameter

Thread

Not relevant for chapter 7

Tube OD/Diameter

OD 35 mm

States the outer diameter of the tube.

	System
TD	Tools and devices

	Function
	Tools
	BV-10
BV10CJ	BV-10 Clamping jaws
BV10PT	BV-10 Pre-assembly tools
	Cutting rings
CRCB	Cutting ring counter brackets
CRPT	Cutting ring pre-assembly tools
	SQR
SQRCJ	SQR Clamping jaws
SQRFH	SQR Forming heads
	ZAKO
ZAKOCJ	ZAKO Clamping jaws
ZAKOPP	ZAKO Pressure plates
ZAKOSR	ZAKO Spacer rings
	Gauges
CG	Cone gauges
TGCR	Cutting ring testing gauges
TIB	Thread identification board
	Devices
TBM1	Tube bending manual no. 1
TYPE80N3	Pre-assembly device TYPE 80N3
TYPE85	Pre-assembly device TYPE 85
TYPE90B2	Pre-assembly device TYPE 90B2
TYPE90C2	Pre-assembly device TYPE 90 Comfort
TYPE100	Pre-assembly device TYPE 100
TYPE100C	Pre-assembly device TYPE 100 Compact
DUHY1	Drive unit 1, hydraulic (number consecutively) YALE PY-07
FOOTSWITCH1	Footswitch 1 with protection cover (number consecutively) Wire Plug CA 3 LS
BV10A	BV-10 Attachments

	Series/Thread
	Series
LL	Extra light series
L	Light series
S	Heavy series
L/S	Light and heavy series are identical

	Tube OD/Diameter
6	6 mm
8	8 mm
10	10 mm
12	12 mm
14	14 mm
15	15 mm
16	16 mm
18	18 mm
20	20 mm
22	22 mm
25	25 mm
28	28 mm
30	30 mm
35	35 mm
38	38 mm
42	42 mm
48.3	48.3 mm
50	50 mm
60	60 mm
60.3	60.3 mm
65	65 mm
75	75 mm
76.1	76.1 mm
80	80 mm
88	88 mm
89.9	89.9 mm
101.6	101.6 mm
114.3	114.3 mm
1/2	1/2 inch
3/4	3/4 inch
1	1 inch
1 1/4	1 1/4 inch

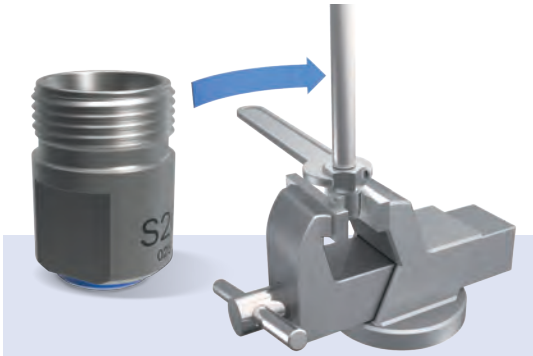
	Suffix overview
Suffix 6	Differing dimension
Suffix 10	Tool

Suffixes not referred to here are not relevant to this chapter.
Note: For articles having more than one relevant suffix, these are listed in numerical order in the sales designation.

Suffix 6	Differing dimension
	Inner diameter
ID3	Inner diameter 3 mm
...	...

Suffix 10	Tool
BV10A	BV-10 Attachments
DUHY1	Drive unit 1, hydraulic (number consecutively) YALE PY-07
M	Manual pre-assembly mandrel
M-PM	Manual pre-assembly mandrel heavy-duty steel
MT	Mop-top
MT-RFID	Mop-top with RFID
MT-PM-RFID	Mop-top heavy-duty steel with RFID
PA	Pin adapter
PA-PM	Pin adapter heavy-duty steel
RR8	Reserve roll 8 mm
RR10	Reserve roll 10 mm
RR12	Reserve roll 12 mm
RR14	Reserve roll 14 mm
RR15	Reserve roll 15 mm
RR16	Reserve roll 16 mm
RR18	Reserve roll 18 mm
RR20	Reserve roll 20 mm
RR22	Reserve roll 22 mm
SST	Stainless steel applications
TYPE82	Pre-assembly device TYPE82
TYPE80	Pre-assembly device TYPE80 (all generations)
TYPE85	Pre-assembly device TYPE85
TYPE90B2	Pre-assembly device TYPE90B2
TYPE90C2	Pre-assembly device TYPE90C2 Comfort

Product information VOSS pre-assembly devices and tools



One-off assembly

VOSS pre-assembly devices and tools are specially designed for assembling tube couplings.

For every application, whether for one-off or series-production assembly of cutting rings, VOSS*Form*^{SQR}, BV-10 flared cone rings or ZAKO rings, a variety of tools are available – from simple aids to automatically assembly-force-controlled devices and the associated tool inserts.

The manual pre-assembly stud is a simple but necessary tool for manual pre-assembly of cutting rings.

The hardened pre-assembly stud guarantees that the taper cuts into the tube reliably without damaging the cone of the actual coupling connecting piece.

For series-production assembly of cutting rings, BV-10 flared cones and ZAKO rings, a wide range of devices ranging from portable hand-pump devices to permanently installed, electrically operated pre-assembly devices for outer tube diameters of 6 – 114.3 mm is available.



Series assembly

Reliability right down to the last detail



We at VOSS, see ourselves not only as manufacturers and suppliers of high-quality connecting components, but also as system partners who guide and support you in the entire field of hydraulic tube connecting technology and help your products to be a success – all around the world. We manufacture our own systems, operate our own in-house electroplating plant, and can supply pre-assembly devices, tools and auxiliary equipment for your operations.

We also offer training courses and audits to our customers. Logistics is another important aspect for us – only products that are delivered to you reliably and on time can be used dependably in your processes. Our aim: all tube couplings must be absolutely reliable and safe. The use of VOSS pre-assembly devices which are perfectly matched to the applications and their outstanding, well-conceived features play an essential role towards achieving this aim.

Safe and reliable pre-assembly and final assembly processes

Device designation	Type 80 N3	Type 90 Basic II	Type 90 Comfort	VOSS*Form* 100	VOSS*Form* 100 Compact	Type 85
One-off assembly	•	•				
Series assembly		•	•	•		•
Small volume assembly		•			•	
Automatic tool recognition			•			
Reverse stroke optimization		•	•	•	•	
Semi-automatic tooling			•	•	•	
Touch screen			•			
Error detection			•			
Error prevention				•	•	
Including calibration service			•			
Free parameter definition acc. to customer requirements			•			
"Countdown" workpiece counter		•	•			
Freely programmable workpiece counter			•			
Optional pedal switch		•	•	•	•	
Tube OD	6–42 mm	6–42 mm	6–42 mm	6–42 mm	6–42 mm	38–114.3 mm
Bench-top device	•	•	•		•	•
Floor-mounted device				•		
Systems:						
Cutting ring systems	•	•	•			
BV-10 flared cone system	•	•	•			
ZAKO flange system	•	•	•			•
VOSS*Form*^{SQR} / VOSS*Form*^{SQR}VA				•	•	
Electrical connection	–	400 V	400 V	400 V	400 V	400 V
Dimensions (wxhxd) in mm	185x267x590	540x280x480	800x308x615	900x1122x943	800x951x480	340x320x650
Weight	15 kg	66 kg	90 kg	630 kg	440 kg	160 kg

Our pre-assembly devices and tools have been specially designed for one-off and for series production and match our entire coupling system right down to the last detail. We offer appropriate solutions for all requirements – safe and economical pre-assembly for initial production and for maintenance work.

From simple manual assembly tools right up to automatic devices with tool recognition, VOSS offers a wide range of tools for tubes diameters between 6 and 114.3 mm.

Always prepared

Manual pre-assembly studs



For individual cutting ring assembly using a vise

If a cutting ring has to be replaced on-site or during servicing, a manual pre-assembly stud should be used. This allows a connection to be made without subjecting the actual coupling connecting piece to wear.

- for individual manual pre-assembly work
- wear-resistant

Systems
Cutting rings VOSS*Ring*^{M}, 2SVA, ES-4, ES-4VA:
tube OD 6 mm–42 mm

Applications
On-site service work requiring a vise

The star of the construction site

VOSS Type 80 N3



Also suitable for 10° flared coupling systems

Lots of tubing at a lot of different, difficult-to-access places? The handy VOSS Type 80 N3 tool takes on any service work challenge. Its extending side surfaces allow it to be securely gripped in a vise or be bolted directly onto the workbench. Tool sets are easily exchanged and the pressure gauge, in conjunction with the settings printed on the device, ensure precision assembly results. This is THE portable field service device for pre-assembly work if no electric mains power is available.

- pressure gauge, table of settings
- new: operating lever and mounting can be removed to facilitate transportation

Systems
Cutting rings VOSS*Ring*^{M}, 2SVA, ES-4, ES-4VA:
tube OD 6 mm–42 mm

BV-10: tube OD 6 mm–42 mm

ZAKO: tube OD up to 38 mm

Applications
Mobile device for maintenance and service work, easy assembly, with mounting options

Serial reproducibility

VOSS Type 90 Basic II



With automatic pre-assembly and workpiece counter

One shop floor, but multiple workplaces? The easily transported VOSS Type 90 Basic II ensures reliable series pre-assembly of cutting ring couplings everywhere with reproducible results. The automated pre-assembly process ensures consistently good results and the adjustable working pressure allows the pre-assembly process to be adjusted to match varying assembly parameters. One especially practical feature: system-related setting values are printed directly on the device casing. These can be adjusted individually and are shown clearly on a large display. The built-in count-down workpiece counter makes sure that not a single tube too many or too few is pre-assembled.

- Weighs just 66 kg
- Easy to operate, integrated workpiece counter, easy tool change
- Intelligent controls lead to short cycle times
- Pedal switch available as an option

Systems
Cutting rings VOSS*Ring*^{M}, 2SVA, ES-4, ES-4VA:
tube OD 6 mm–42 mm

BV-10 (machine conversion by VOSS service)
tube OD 6 mm–42 mm

ZAKO (machine conversion by VOSS service)
tube OD up to 38 mm

Applications
Bench-top device for shop-floor use, larger production runs

Maximum process reliability

VOSS Type 90 Comfort



Automatic RFID tool recognition prevents errors and lowers production costs

Pre-assembly work for large series production has its own special requirements. Tools have to be exchanged quickly, cycle times must be extremely short but not a single fault is permitted since this might render an entire lot unusable. The answer to such demands is the VOSS Type 90 Comfort. This device reads the RFID chips integrated in the VOSS tools and then adjusts parameters automatically to suit the tool. In this way, the shortest tooling times possible can be achieved, while effectively preventing operator errors – even when tools have to be exchanged often and fast. Simple, precise, safe and reliable – especially suitable for tight tube bends.

- Automatic pressure settings
- Tool recognition via RFID chip
- Programmable workpiece counter
- Pre-assembly controlled in relation to tool travel
- Touch-panel, intuitive menu guidance
- Including on-site calibration service
- Pedal switch available as an option
- Error detection

Systems
Cutting rings VOSS*Ring*^{M}, 2SVA, ES-4, ES-4VA:
tube OD 6 mm–42 mm

BV-10 (machine conversion by VOSS service)
tube OD 6 mm–42 mm

ZAKO (machine conversion by VOSS service)
tube OD up to 38 mm

Applications
For series production on shop floors, offering maximum process safety and reliability

Fast, perfect tube forming

VOSS*Form* 100



Large-series assembly of VOSS*Form*^{SQR} couplings, safe operation thanks to a stop plate

Flaring tubes to obtain the VOSS*Form*^{SQR} contour can be carried out easily and reliably using the VOSS*Form* 100. The unmistakable markings on both tools minimize assembly errors, and the stop plate for the tube end prevents insertion errors. This ensures that there is always enough tube material for shaping the contour and avoids rejects right from the start. Operating errors are prevented by automatic shaping pressure adjustment and by optical indication of the next operating step. Once the tube has been formed, the device returns to the start position under optical gate control – an ideal solution for fast-cycle mass production. Another feature which helps to achieve this is the design of the VOSS*Form* 100 as a complete workplace with an integrated magazine for easy-to-change tools and an additional 230 V mains outlet on the back.

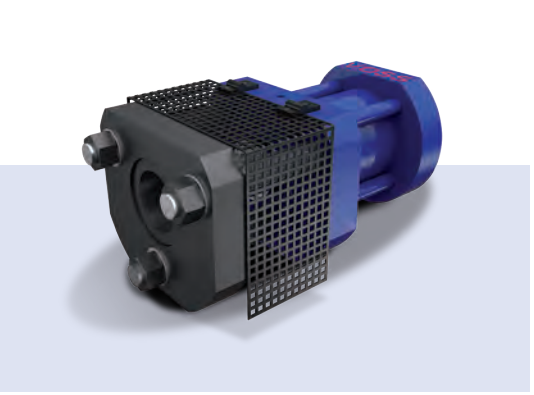
- Automatic set-up to match tube size
- Cycle times from 7 (6–10 mm OD) to 15 seconds (25–42 mm OD)
- Optical gate detects end of work step and causes machine to return to start position
- Ergonomical: tool magazine lock with single-handed operation, extremely simple operation thanks to intuitive concept
- Pedal switch available as an option

Systems
VOSS*Form*^{SQR} and VOSS*Form*^{SQR}VA:
tube OD 6 mm–42 mm

Applications
Stationary device, series production, maximum process safety and reliability

Optimum results that can be seen – with ZAKO

VOSS Type 85



No wear and tear; protection against excessive flaring

Type 85 – a compact electro-hydraulic machine is available for pre-assembly mounting of rings for ZAKO flange couplings on tubes with outer diameters up to 114.3 mm. Easy transportation is ensured by the two-part design: separate pre-assembly cylinder plus assembly head, and external hydraulic unit. Another advantage of this construction: the forming process can be visually monitored. The actual ZAKO ring is used directly to flare the tube – there is no "tool" wear as the "tool" is turned into part of the tube coupling by the process. This means that the tube does not have to be flared in advance. As the system is so extremely simple, pre-assembly is very easy and great accuracy is obtained.

- Tool remains in the tube so that there is no tool wear
- Simple operation
- Complete assembly process can be monitored visually

Systems
ZAKO: tube OD 38 mm–114.3 mm

Applications
Can be transported, one-off and series production

100 % fault-free cutting ring assembly

Pre-assembly studs made of high performance steel



Tool service life extended by more than 20 times plus built-in wear indicator

Two versions of the VOSS pre-assembly tools for cutting rings are available: a basic version and a more sophisticated version made of high performance steel. Normal pre-assembly studs wear faster so that they have to be checked using a gauge after every 50 pre-assembly operations. This is time-consuming, is a potential source of faults and therefore means adhering to a tool test plan. Our solution: durable tools made of high performance steel. Typical tool wear no longer occurs, there are no test and inspection intervals and the service life is very long – up to 20 times that of conventional tools. When the stud reaches the usable tolerance limits, its front end breaks off, forcing the user to replace it. This ensures fault-free processes in your company.

- Basic version: accuracy has to be checked using a gauge after every 50 pre-assembly processes
- High performance steel version: no inspection/checking required, service life up to 20 times longer, clear indication when service tolerance limit is reached
- Also available as manual pre-assembly studs for use in a vise
- Version for Type 90 Comfort: contains an integrated RFID chip as well
- All tools have the same mounting and can be used in any corresponding pre-assembly device

Precise checking of gauge accuracy

VOSS Fluid taper gauges for pre-assembly studs



Hardened pre-assembly studs for cutting ring pre-assembly are wear-resistant, thus achieving consistent pre-assembly results. To maintain these results, the tools must be checked at regular intervals, since they are nevertheless subject to a certain degree of wear.

In addition to a visual inspection for damage or cracks, the checks must also include verification of the stud dimensions using a gauge. This involves checking the internal conical bore of the pre-assembly stud after every 50 applications.

VOSS taper gauges are available individually or as a complete set containing all sizes of the light-weight and heavy-duty versions in a practical plastic case.

Cutting ring geometry at a glance

VOSS Fluid test gauges for cutting ring pre-assembly



VOSS supplies inspection gauges to check the results of cutting ring pre-assembly and which can be used to evaluate pre-assembly in conjunction with visual inspection of the pushed-up tube material. To establish a permanently leak-tight cutting ring coupling, the pre-assembled end of the tube must have contact in the coupling and the cutting ring must be inserted securely into the 24° conical recess. A closed force transmission path and the resulting safe connection can only be achieved by the interaction of this geometry with a strong ring of raised tube material. The VOSS taper gauge is used as an auxiliary device for evaluating cutting ring pre-assemblies and summarizing the geometry situation in the form of legible values.

Operating principle:
The results are checked by measuring the pre-assembled tube end. This is done by pushing the tube end into the conical opening of the taper gauge and screwing on the union nut manually, hand-tight, without a spanner. The pointer of the dial will move until the cutting ring cone is in contact with the tapered hole in the gauge. The indicated value must be within specified limits. If the value is below the specified range, the assembly is probably faulty and the cutting ring is too near the end of the tube. If the value is higher than the specified range, it must be assumed that the cutting ring is too far from the end of the tube.

Applications:
- Series production of tubings
- Inspection of pre-configured tubings

Caution!
The inspection gauge does not eliminate the need to visually check for excessive or too little pre-assembly pressures (by checking the height of tube material pushed up by the first cutting ring edge)

Prevent size confusion

VOSS thread gauge board to determine threaded stud sizes



The VOSS thread gauge board facilitates the determination of metric and imperial threaded stud sizes and prevents mistakes during assembly.

The similarity of some metric and imperial threads makes it hard to distinguish between them. Furthermore, some threads can even be screwed into tapped holes which have been mistakenly assumed to have the correct thread. As such mistakes can endanger workers and the environment, we recommend that the cautionary notes in the respective standards be observed.

The VOSS thread gauge board allows the threads to be verified once more before the studs are used.

Reliable radii

VOSS tube-bending equipment



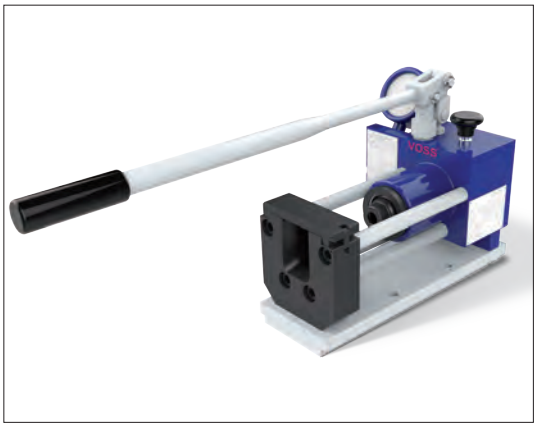
Light-weight manual bending device, vise-mounting, for accurate bending of tubes with ODs of 8 mm–22 mm.

- For tubes with outer diameters of 8, 10,12, 14, 16, 18, 20 and 22 mm
- Including a sturdy metal case
- Degree graduation marks on the bending templates make accurate bending of tubes easier
- Highly suitable for on-site use as the device can be simply held in a vise.

Pre-assembly devices

Type 80 N3

Manual pump pre-assembly device



Type	Order-No.	Designation
For manual pre-assembly of cutting rings on tubes with OD 6–42 mm, and for manual pre-assembly of flared cones and ZAKO rings up to 1 1/4"	5991080400	TD-TYPE80N3

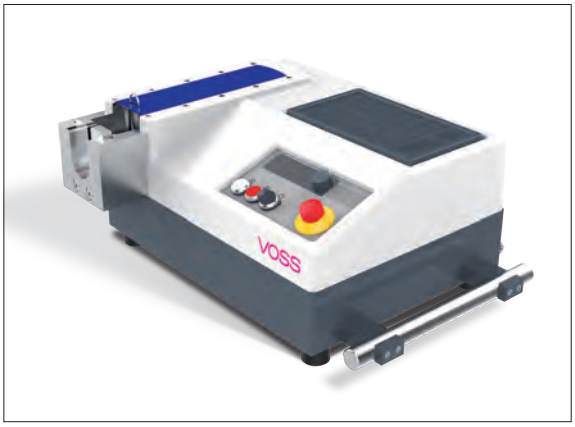
Dimensions
Width: 190 mm
Height: 267 mm
Depth: 590 mm

Weight: 15 kg

Pre-assembly devices

Type 90 Basic II

Device for electrical mains power
400 V / 50 Hz / 3 Ph



Type	Order-No.	Designation
For machine-assisted pre-assembly of cutting rings on tubes with OD 6–42 mm, and for machine-assisted pre-assembly of flared cones and ZAKO rings, by means of a conversion kit (not part of standard delivery package)	5992892000	TD-TYPE90B2
Dimensions Width: 681 mm Height: 260 mm Depth: 520 mm		
Weight: 66 kg Noise level: 60 dBA		
Conversion kit	7000267300	TD-BV10AL-TYPE90B2

Other power supply ratings upon request

Pre-assembly devices

Type 90 Comfort

Device for electrical mains power
400 V / 50 Hz / 3 Ph

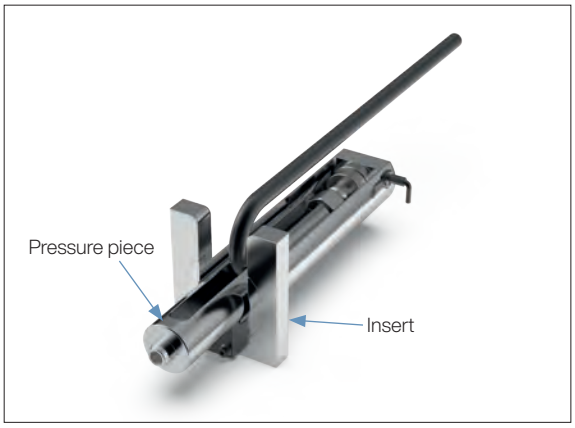


Type	Order-No.	Designation
For machine-assisted pre-assembly of cutting rings on tubes with OD 6–42 mm, and for machine-assisted pre-assembly of flared cones and ZAKO rings, by means of a conversion kit (not part of standard delivery package)	5992893000	TD-TYPE90C2
Dimensions		
Width: 800 mm		
Height: 308 mm		
Depth: 615 mm		
Depth (with conversion kit): 636 mm		
Weight: 90 kg		
Noise level: 70 dBA		
Conversion kit	7000268200	TD-BV10AL-TYPE90C2

Other power supply ratings upon request

Device for reversed cutting ring assembly

The device is suitable for mounting a cutting ring on bent tubes with a bending angle of between 90° and 180° and consists of an insert and a pressure piece.

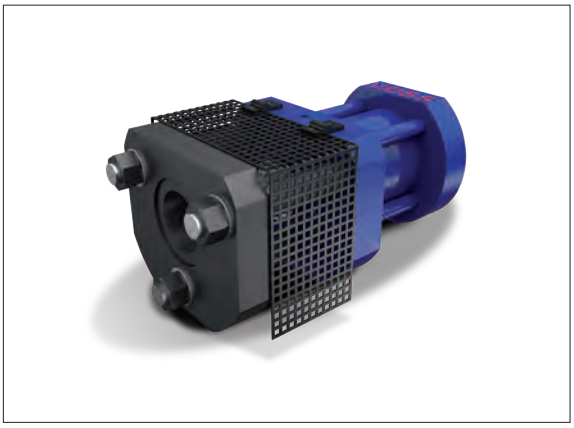


Type/size	Order-No.	Designation
Insert		
L/S 6 to L 18	7005412200	TD-CRARPAC-6-18-TYPE90
Pressure piece for type 90 Basic II		
L/S 6	7005410200	TD-CRTP-L/S6-TYPE90
L/S 8	7005410100	TD-CRTP-L/S8-TYPE90
L/S 10	7005410000	TD-CRTP-L/S10-TYPE90
L/S 12	7005409900	TD-CRTP-L/S12-TYPE90
S 14	7005409800	TD-CRTP-S14-TYPE90
L 15	7005409700	TD-CRTP-L15-TYPE90
S 16	7005409600	TD-CRTP-S16-TYPE90
L 18	7005409500	TD-CRTP-L18-TYPE90
Pressure piece for Type 90 Comfort with RFID		
L 6	7005411400	TD-CRPT-L6-RFID-TYPE90C2
S 6	7005411300	TD-CRPT-S6-RFID-TYPE90C2
L 8	7005411200	TD-CRPT-L8-RFID-TYPE90C2
S 8	7005411100	TD-CRPT-S8-RFID-TYPE90C2
L 10	7005411000	TD-CRPT-L10-RFID-TYPE90C2
S 10	7005410900	TD-CRPT-S10-RFID-TYPE90C2
L 12	7005410800	TD-CRPT-L12-RFID-TYPE90C2
S 12	7005410700	TD-CRPT-L12-RFID-TYPE90C2
S 14	7005410600	TD-CRPT-S14-RFID-TYPE90C2
L 15	7005410500	TD-CRPT-L15-RFID-TYPE90C2
S 16	7005410400	TD-CRPT-S16-RFID-TYPE90C2
L 18	7005410300	TD-CRPT-L18-RFID-TYPE90C2

Pre-assembly devices

Type 85

Device for electrical mains power
400 V 16 A AC
3 Ph / N / PE / 50 Hz / 0.75 kW



Type	Order-No.	Designation
For machine-assisted pre-assembly of ZAKO rings for tubes with outer diameters 38 mm–114.3 mm incl. drive unit and high-pressure hose	5991085000	TD-TYPE85-DUHY1
Pre-assembly cylinder Type 85 without drive unit Device for connection to a drive unit P_A = max. 700 bar V = min 3 l with hydraulic plug coupling (NW 10 coupling sleeve YALE CFY-10-10). Dimensions Width: 340 mm Height: 320 mm Depth: 650 mm Weight: 160 kg	5991085100	TD-TYPE85
Drive unit (Electric hydraulic power pack YALE PY-07).	5992361000	TD-DUHY1

Other power supply ratings upon request

Forming machines

VOSS*Form* 100

Forming machine for electrical mains power supply
400 V 16 A AC
3Ph / N / PE 50 Hz / 4 kW



Type	Order-No.	Designation
For machine-assisted forming of the VOSS*Form*^{SQR} contour on steel and stainless steel tubes with OD 6–42 mm	5991008000	TD-TYPE100

5-pin CEE plug

Dimensions
Width: 900 mm
Height: 1122 mm
Depth: 943 mm

Weight: 630 kg
Noise level: < 74 dBA

Other power supply ratings upon request

Foot switch for pre-assembly devices

Connector: CA 3 LS
Protection class: IP65



Type	Order-No.	Designation
Safety foot switch with accident-prevention hood and safety interlock	9799600139	TD-FOOTSWITCH1
For operating pre-assembly devices: Type 90 Basic II Type 90 Comfort VOSS*Form* 100 VOSS*Form* 100 Compact Min. cable length 3 m	Dimensions Width: 156 mm Height: 146 mm Depth: 250 mm	

Tube bending device

Mobile manual unit for producing precision tube bends



Type	Order-No.	Designation
Tube bending device for manual precision bending of tubes. Can be used to bend tubes with OD of 8 to 22 mm The scope of delivery includes 8 bending rolls in the sizes 8, 10, 12, 15, 16, 18, 20, 22	5994060000	TD-TBM1

Thread gauge board

For determining thread sizes of threaded studs



Type	Order-No.	Designation
Metric fine thread, parallel M 10 x 1 – M 48 x 2	5993571149	TD-TIB
Inch-size BSSP thread, parallel G 1/8" – G 1 1/2"		
UN/UNF, parallel 7/16-20 UNF-2 – 1 7/8-12 UN-2A	7004123800	TD-TIB2
NPT thread, conical 1/8 NPT – 1 1/2 NPT		

Tool holder

For the pre-assembly tools
Type 90 Basic II
Type 90 Comfort



Type	Order-No.	Designation
This tool holder is designed for device assembly supports and pressure plates	5994030300	TD-TM

Saw device

This sturdy and handy saw device is particularly suitable for preparing steel or stainless steel tubes quickly for cutting ring assembly. All common tube sizes from 6–42 mm tube outer diameter can be worked with the aid of this device.

A guide rail ensures a parallel saw cut.



Type	Order-No.	Designation
Device	5994050000	TD-AFHS6-42
Spare parts kit comprising two-part saw blade guide and spacer	7005382900	TD-SPSET-AFHS

Manual deburring tool

The manual deburring tool is ideal for inner and outer deburring of steel or stainless steel tubes.

The range of application is from tube inner diameter or tube outer diameter 8–35 mm.



Type	Order-No.	Designation
Tool	5994049900	TD-MTD-8-35

VOSS*Lube*^{MP}

Assembly paste for the correct assembly of stainless steel couplings



Type	Order-No.	Designation
Assembly paste Quantity: 250 g	7005253600	TD-VOSSLUBE-250G

VOSS forming oil

For perfect mechanical forming of tube contours with VOSS forming systems on stainless steel tubes from 6–42 mm tube outer diameter



Type	Order-No.	Designation
Precise cutting oil Quantity: 1 l	9499300069	TD-FCO-HADOL-1455-1L

Cone gauges for pre-assembly studs

For checking the 24° cone of a stud



Series Tube OD	Order-No.	Designation
L 6	5991001000	TD-CG-L/S6
L 8	5991001100	TD-CG-L/S8
L 10	5991001200	TD-CG-L/S10
L 12	5991001300	TD-CG-L/S12
L 15	5991001400	TD-CG-L15
L 18	5991001500	TD-CG-L18
L 22	5991001600	TD-CG-L22
L 28	5991001700	TD-CG-L28
L 35	5991001800	TD-CG-L35
L 42	5991001900	TD-CG-L42
S 6	5991001000	TD-CG-L/S6
S 8	5991001100	TD-CG-L/S8
S 10	5991001200	TD-CG-L/S10
S 12	5991001300	TD-CG-L/S12
S 14	5991002000	TD-CG-S14
S 16	5991002100	TD-CG-S16
S 20	5991002200	TD-CG-S20
S 25	5991002300	TD-CG-S25
S 30	5991002400	TD-CG-S30
S 38	5991002500	TD-CG-S38
Cone gauges complete in handy case	5994090049	TD-CG

Inspection gauges

For inspection of cutting ring pre-assemblies

Including union nut and test pin in a handy suitcase

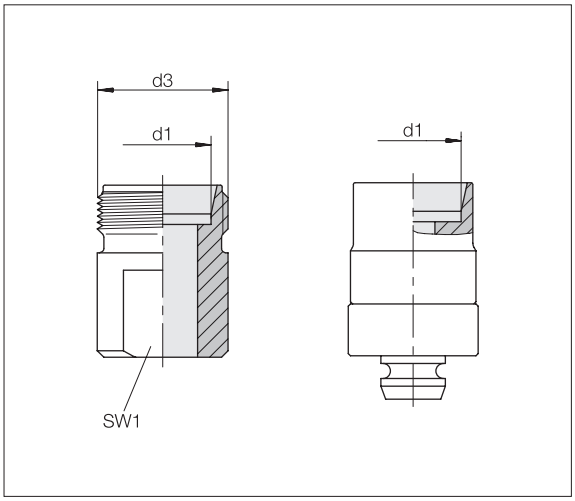


Series Tube OD	Order-No.	Designation
LL 16	5994503649	TD-TGCR-LL16
LL 18	7005991100	TD-TGCR-LL18
L 6	5994502249	TD-TGCR-L6
L 8	5994502349	TD-TGCR-L8
L 10	5994502449	TD-TGCR-L10
L 12	5994502549	TD-TGCR-L12
L 15	5994502649	TD-TGCR-L15
L 18	5994502749	TD-TGCR-L18
L 22	5994502849	TD-TGCR-L22
L 28	5994503749	TD-TGCR-L28
L 35	5994503849	TD-TGCR-L35
L 42	5994503949	TD-TGCR-L42
S 6	5994502949	TD-TGCR-S6
S 8	5994503049	TD-TGCR-S8
S 10	5994503149	TD-TGCR-S10
S 12	5994503249	TD-TGCR-S12
S 14	5994503349	TD-TGCR-S14
S 16	5994503449	TD-TGCR-S16
S 20	5994503549	TD-TGCR-S20
S 25	5994504049	TD-TGCR-S25
S 30	5994504149	TD-TGCR-S30
S 38	5994504249	TD-TGCR-S38

Pre-assembly tools for cutting ring assemblies

VOSS*Ring* manual pre-assembly stud

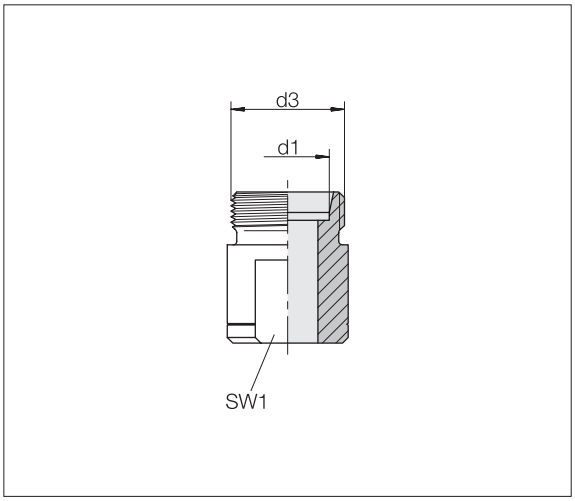
VOSS*Ring* pre-assembly stud
Type 80 N3
Type 90 Basic II
Type 90 Comfort



Series Tube OD d1	d3	SW1	Order-No.	Designation Manual pre-assembly stud **High-performance steel**	Order-No.	Designation Pre-assembly stud **High-performance steel**	Order-No.	Designation Pre-assembly stud **High-performance steel with RFID (Type 90 Comfort)**
L 6	M 12 x 1.5	10	5993234100	TD-VRPT-L6-M-PM	5993230300	TD-VRPT-L6-MT-PM	5993230349	TD-VRPT-L6-MT-PM-RFID
L 8	M 14 x 1.5	12	5993234200	TD-VRPT-L8-M-PM	5993230400	TD-VRPT-L8-MT-PM	5993230449	TD-VRPT-L8-MT-PM-RFID
L 10	M 16 x 1.5	13	5993234300	TD-VRPT-L10-M-PM	5993230500	TD-VRPT-L10-MT-PM	5993230549	TD-VRPT-L10-MT-PM-RFID
L 12	M 18 x 1.5	14	5993234400	TD-VRPT-L12-M-PM	5993230600	TD-VRPT-L12-MT-PM	5993230649	TD-VRPT-L12-MT-PM-RFID
L 15	M 22 x 1.5	19	5993234500	TD-VRPT-L15-M-PM	5993230700	TD-VRPT-L15-MT-PM	5993230749	TD-VRPT-L15-MT-PM-RFID
L 18	M 26 x 1.5	22	5993234600	TD-VRPT-L18-M-PM	5993230800	TD-VRPT-L18-MT-PM	5993230849	TD-VRPT-L18-MT-PM-RFID
L 22	M 30 x 2	24	5993234700	TD-VRPT-L22-M-PM	5993230900	TD-VRPT-L22-MT-PM	5993230949	TD-VRPT-L22-MT-PM-RFID
L 28	M 36 x 2	30	5993234800	TD-VRPT-L28-M-PM	5993231000	TD-VRPT-L28-MT-PM	5993231049	TD-VRPT-L28-MT-PM-RFID
L 35	M 45 x 2	36	5993234900	TD-VRPT-L35-M-PM	5993231100	TD-VRPT-L35-MT-PM	5993231149	TD-VRPT-L35-MT-PM-RFID
L 42	M 52 x 2	41	5993235000	TD-VRPT-L42-M-PM	5993231200	TD-VRPT-L42-MT-PM	5993231249	TD-VRPT-L42-MT-PM-RFID
S 6	M 14 x 1.5	12	5993235100	TD-VRPT-S6-M-PM	5993231300	TD-VRPT-S6-MT-PM	5993231349	TD-VRPT-S6-MT-PM-RFID
S 8	M 16 x 1.5	13	5993235200	TD-VRPT-S8-M-PM	5993231400	TD-VRPT-S8-MT-PM	5993231449	TD-VRPT-S8-MT-PM-RFID
S 10	M 18 x 1.5	14	5993235300	TD-VRPT-S10-M-PM	5993231500	TD-VRPT-S10-MT-PM	5993231549	TD-VRPT-S10-MT-PM-RFID
S 12	M 20 x 1.5	17	5993235400	TD-VRPT-S12-M-PM	5993231600	TD-VRPT-S12-MT-PM	5993231649	TD-VRPT-S12-MT-PM-RFID
S 14	M 22 x 1.5	19	5993235500	TD-VRPT-S14-M-PM	5993231700	TD-VRPT-S14-MT-PM	5993231749	TD-VRPT-S14-MT-PM-RFID
S 16	M 24 x 1.5	19	5993235600	TD-VRPT-S16-M-PM	5993231800	TD-VRPT-S16-MT-PM	5993231849	TD-VRPT-S16-MT-PM-RFID
S 20	M 30 x 2	24	5993235700	TD-VRPT-S20-M-PM	5993231900	TD-VRPT-S20-MT-PM	5993231949	TD-VRPT-S20-MT-PM-RFID
S 25	M 36 x 2	30	5993235800	TD-VRPT-S25-M-PM	5993232000	TD-VRPT-S25-MT-PM	5993232049	TD-VRPT-S25-MT-PM-RFID
S 30	M 42 x 2	36	5993235900	TD-VRPT-S30-M-PM	5993232100	TD-VRPT-S30-MT-PM	5993232149	TD-VRPT-S30-MT-PM-RFID
S 38	M 52 x 2	41	5993236000	TD-VRPT-S38-M-PM	5993232200	TD-VRPT-S38-MT-PM	5993232249	TD-VRPT-S38-MT-PM-RFID

Pre-assembly tools for cutting ring assemblies

Universal manual pre-assembly stud

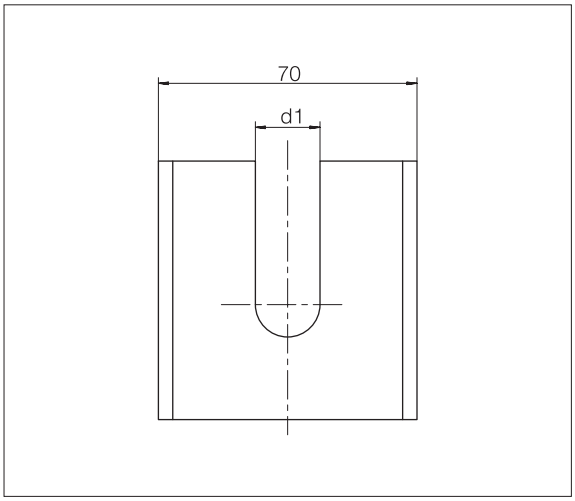


Series Tube OD d1	d3	SW1	Order-No.	Designation Pre-assembly stud **Standard**	Order-No.	Designation Pre-assembly stud **High-performance steel**
LL 4	M 8 x 1	7	5993950000	TD-CRPT-LL4-M	5993993000	TD-CRPT-LL4-M-PM
LL 6	M 10 x 1	9	5993952000	TD-CRPT-LL6-M	5993993200	TD-CRPT-LL6-M-PM
LL 8	M 12 x 1	11	5993953000	TD-CRPT-LL8-M	5993993300	TD-CRPT-LL8-M-PM
L 6	M 12 x 1.5	11	5993954000	TD-CRPT-L6-M	5993993400	TD-CRPT-L6-M-PM
L 8	M 14 x 1.5	12	5993955000	TD-CRPT-L8-M	5993993500	TD-CRPT-L8-M-PM
L 10	M 16 x 1.5	14	5993956000	TD-CRPT-L10-M	5993993600	TD-CRPT-L10-M-PM
L 12	M 18 x 1.5	17	5993957000	TD-CRPT-L12-M	5993993700	TD-CRPT-L12-M-PM
L 15	M 22 x 1.5	19	5993958000	TD-CRPT-L15-M	5993993800	TD-CRPT-L15-M-PM
L 18	M 26 x 1.5	24	5993959000	TD-CRPT-L18-M	5993993900	TD-CRPT-L18-M-PM
L 22	M 30 x 2	27	5993960000	TD-CRPT-L22-M	5993994000	TD-CRPT-L22-M-PM
L 28	M 36 x 2	32	5993961000	TD-CRPT-L28-M	5993994100	TD-CRPT-L28-M-PM
L 35	M 45 x 2	41	5993962000	TD-CRPT-L35-M	5993994200	TD-CRPT-L35-M-PM
L 42	M 52 x 2	46	5993963000	TD-CRPT-L42-M	5993994300	TD-CRPT-L42-M-PM
S 6	M 14 x 1.5	12	5993964000	TD-CRPT-S6-M	5993994400	TD-CRPT-S6-M-PM
S 8	M 16 x 1.5	14	5993965000	TD-CRPT-S8-M	5993994500	TD-CRPT-S8-M-PM
S 10	M 18 x 1.5	17	5993966000	TD-CRPT-S10-M	5993994600	TD-CRPT-S10-M-PM
S 12	M 20 x 1.5	17	5993967000	TD-CRPT-S12-M	5993994700	TD-CRPT-S12-M-PM
S 14	M 22 x 1.5	19	5993968000	TD-CRPT-S14-M	5993994800	TD-CRPT-S14-M-PM
S 16	M 24 x 1.5	22	5993969000	TD-CRPT-S16-M	5993994900	TD-CRPT-S16-M-PM
S 20	M 30 x 2	27	5993970000	TD-CRPT-S20-M	5993995000	TD-CRPT-S20-M-PM
S 25	M 36 x 2	32	5993971000	TD-CRPT-S25-M	5993995100	TD-CRPT-S25-M-PM
S 30	M 42 x 2	36	5993972000	TD-CRPT-S30-M	5993995200	TD-CRPT-S30-M-PM
S 38	M 52 x 2	46	5993973000	TD-CRPT-S38-M	5993995300	TD-CRPT-S38-M-PM

Pre-assembly tools for cutting ring assemblies

Type 80 N3

Support plate

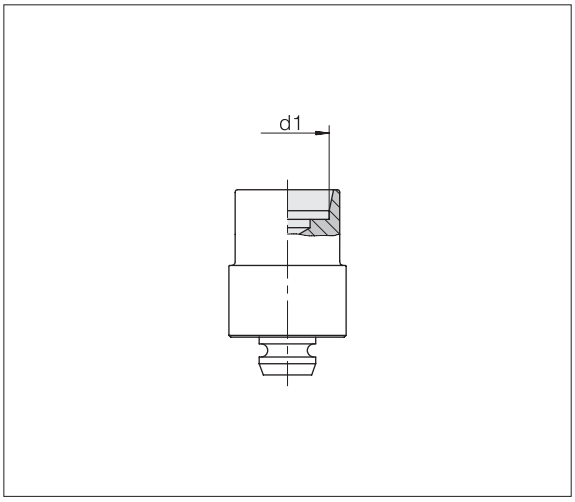


Series Tube OD d1	Order-No.	Designation Support plate **Type 80 N3**
LL 6	5991327100	TD-CRCB-L/S6-TYPE80
LL 8	5991328100	TD-CRCB-L/S8-TYPE80
L 6	5991327100	TD-CRCB-L/S6-TYPE80
L 8	5991328100	TD-CRCB-L/S8-TYPE80
L 10	5991329100	TD-CRCB-L/S10-TYPE80
L 12	5991330100	TD-CRCB-L/S12-TYPE80
L 15	5991331100	TD-CRCB-L15-TYPE80
L 18	5991332100	TD-CRCB-L18-TYPE80
L 22	5991333100	TD-CRCB-L22-TYPE80
L 28	5991334100	TD-CRCB-L28-TYPE80
L 35	5991335100	TD-CRCB-L35-TYPE80
L 42	5991336100	TD-CRCB-L42-TYPE80
S 6	5991327100	TD-CRCB-L/S6-TYPE80
S 8	5991328100	TD-CRCB-L/S8-TYPE80
S 10	5991329100	TD-CRCB-L/S10-TYPE80
S 12	5991330100	TD-CRCB-L/S12-TYPE80
S 14	5991337100	TD-CRCB-S14-TYPE80
S 16	5991338100	TD-CRCB-S16-TYPE80
S 20	5991339100	TD-CRCB-S20-TYPE80
S 25	5991340100	TD-CRCB-S25-TYPE80
S 30	5991341100	TD-CRCB-S30-TYPE80
S 38	5991342100	TD-CRCB-S38-TYPE80

Pre-assembly tools for cutting ring assemblies

Type 80 N3
Type 90 Basic II

Universal pre-assembly stud

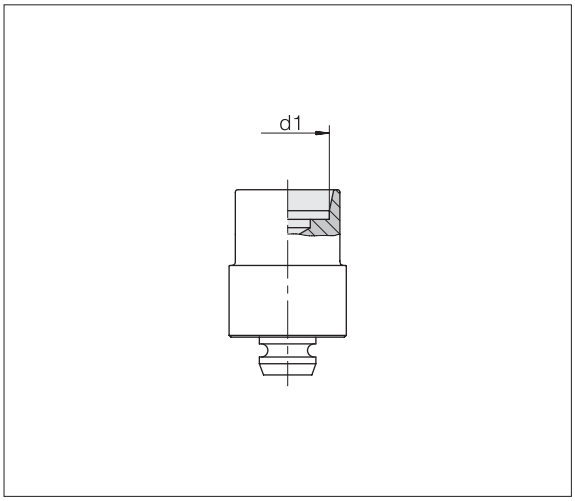


Series Tube OD d1	Order-No.	Designation Pre-assembly stud **Standard**	Order-No.	Designation Pre-assembly stud **High-performance steel**
L 6	5991207300	TD-CRPT-L6-MT	5993861400	TD-CRPT-L6-MT-PM
L 8	5991208300	TD-CRPT-L8-MT	5993861600	TD-CRPT-L8-MT-PM
L 10	5991209300	TD-CRPT-L10-MT	5993861800	TD-CRPT-L10-MT-PM
L 12	5991210300	TD-CRPT-L12-MT	5993862000	TD-CRPT-L12-MT-PM
L 15	5991211300	TD-CRPT-L15-MT	5993862300	TD-CRPT-L15-MT-PM
L 18	5991212300	TD-CRPT-L18-MT	5993862500	TD-CRPT-L18-MT-PM
L 22	5991213300	TD-CRPT-L22-MT	5993862700	TD-CRPT-L22-MT-PM
L 28	5991214300	TD-CRPT-L28-MT	5993862900	TD-CRPT-L28-MT-PM
L 35	5991215300	TD-CRPT-L35-MT	5993863100	TD-CRPT-L35-MT-PM
L 42	5991216300	TD-CRPT-L42-MT	5993863300	TD-CRPT-L42-MT-PM
S 6	5991217300	TD-CRPT-S6-MT	5993861500	TD-CRPT-S6-MT-PM
S 8	5991218300	TD-CRPT-S8-MT	5993861700	TD-CRPT-S8-MT-PM
S 10	5991219300	TD-CRPT-S10-MT	5993861900	TD-CRPT-S10-MT-PM
S 12	5991220300	TD-CRPT-S12-MT	5993862100	TD-CRPT-S12-MT-PM
S 14	5991221300	TD-CRPT-S14-MT	5993862200	TD-CRPT-S14-MT-PM
S 16	5991222300	TD-CRPT-S16-MT	5993862400	TD-CRPT-S16-MT-PM
S 20	5991223300	TD-CRPT-S20-MT	5993862600	TD-CRPT-S20-MT-PM
S 25	5991224300	TD-CRPT-S25-MT	5993862800	TD-CRPT-S25-MT-PM
S 30	5991225300	TD-CRPT-S30-MT	5993863000	TD-CRPT-S30-MT-PM
S 38	5991226300	TD-CRPT-S38-MT	5993863200	TD-CRPT-S38-MT-PM

Pre-assembly tools for cutting ring assemblies

Type 90 Comfort

Universal pre-assembly stud

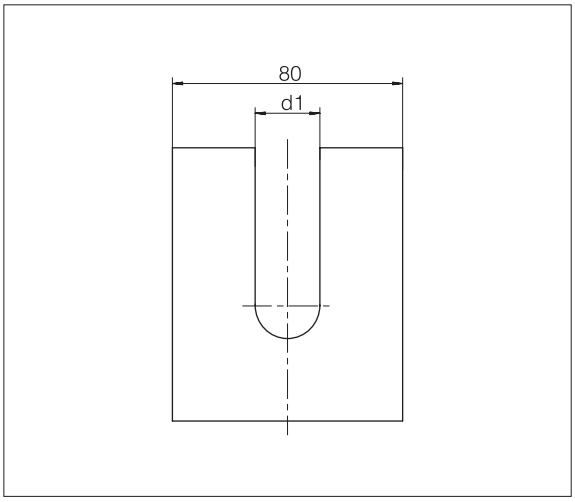


Series Tube OD d1	Order-No.	Designation Pre-assembly stud **Standard** **with RFID** **(Type 90 Comfort)**	Order-No.	Designation Pre-assembly stud **High-performance steel** **with RFID** **(Type 90 Comfort)**
L 6	5993975449	TD-CRPT-L6-LG45,5-MT-RFID	5993974149	TD-CRPT-L6-LG45,5-MT-PM-RFID
L 8	5993975549	TD-CRPT-L8-LG45,5-MT-RFID	5993974249	TD-CRPT-L8-LG45,5-MT-PM-RFID
L 10	5993975649	TD-CRPT-L10-LG45,5-MT-RFID	5993974349	TD-CRPT-L10-LG45,5-MT-PM-RFID
L 12	5993975749	TD-CRPT-L12-LG45,5-MT-RFID	5993974449	TD-CRPT-L12-LG45,5-MT-PM-RFID
L 15	5993975849	TD-CRPT-L15-LG43,5-MT-RFID	5993879549	TD-CRPT-L15-LG43-MT-PM-RFID
L 18	5993851800	TD-CRPT-L18-MT-RFID	5993871800	TD-CRPT-L18-MT-PM-RFID
L 22	5993852000	TD-CRPT-L22-MT-RFID	5993872000	TD-CRPT-L22-MT-PM-RFID
L 28	5993975949	TD-CRPT-L28-LG41-MT-RFID	5993879649	TD-CRPT-L28-LG41-MT-PM-RFID
L 35	5993852400	TD-CRPT-L35-MT-RFID	5993872400	TD-CRPT-L35-MT-PM-RFID
L 42	5993976049	TD-CRPT-L42-LG36-MT-RFID	5993974549	TD-CRPT-L42-LG36-MT-PM-RFID
S 6	5993878849	TD-CRPT-S6-LG43,5-MT-RFID	5993976149	TD-CRPT-S6-LG43,5-MT-PM-RFID
S 8	5993878949	TD-CRPT-S8-LG43,5-MT-RFID	5993975049	TD-CRPT-S8-LG43,5-MT-PM-RFID
S 10	5993879049	TD-CRPT-S10-LG43,5-MT-RFID	5993975149	TD-CRPT-S10-LG43,5-MT-PM-RFID
S 12	5993879149	TD-CRPT-S12-LG43,5-MT-RFID	5993975249	TD-CRPT-S12-LG43,5-MT-PM-RFID
S 14	5993851500	TD-CRPT-S14-MT-RFID	5993871500	TD-CRPT-S14-MT-PM-RFID
S 16	5993851700	TD-CRPT-S16-MT-RFID	5993871700	TD-CRPT-S16-MT-PM-RFID
S 20	5993851900	TD-CRPT-S20-MT-RFID	5993871900	TD-CRPT-S20-MT-PM-RFID
S 25	5993852100	TD-CRPT-S25-MT-RFID	5993872100	TD-CRPT-S25-MT-PM-RFID
S 30	5993879249	TD-CRPT-S30-LG31-MT-RFID	5993975349	TD-CRPT-S30-LG31-MT-PM-RFID
S 38	5993852500	TD-CRPT-S38-MT-RFID	5993872500	TD-CRPT-S38-MT-PM-RFID

Pre-assembly tools for cutting ring assemblies

Type 90 Basic II
Type 90 Comfort

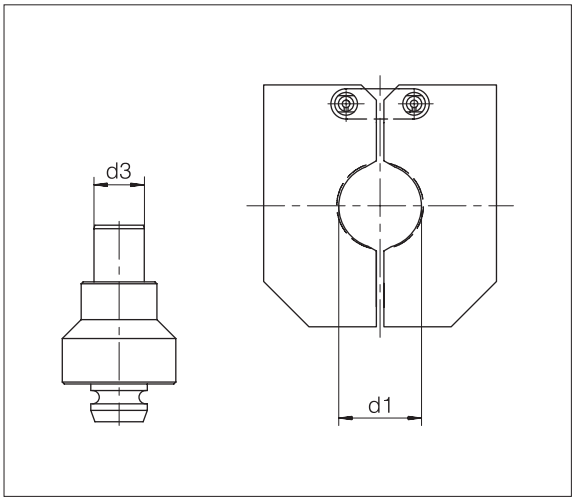
Support plate



Series Tube OD d1	Order-No.	Designation Support plate
LL 6	5991327300	TD-CRCB-L/S6
LL 8	5991328300	TD-CRCB-L/S8
L 6	5991327300	TD-CRCB-L/S6
L 8	5991328300	TD-CRCB-L/S8
L 10	5991329300	TD-CRCB-L/S10
L 12	5991330300	TD-CRCB-L/S12
L 15	5991331300	TD-CRCB-L15
L 18	5991332300	TD-CRCB-L18
L 22	5991333300	TD-CRCB-L22
L 28	5991334300	TD-CRCB-L28
L 35	5991335300	TD-CRCB-L35
L 42	5991336300	TD-CRCB-L42
S 6	5991327300	TD-CRCB-L/S6
S 8	5991328300	TD-CRCB-L/S8
S 10	5991329300	TD-CRCB-L/S10
S 12	5991330300	TD-CRCB-L/S12
S 14	5991337300	TD-CRCB-S14
S 16	5991338300	TD-CRCB-S16
S 20	5991339300	TD-CRCB-S20
S 25	5991340300	TD-CRCB-S25
S 30	5991341300	TD-CRCB-S30
S 38	5991342300	TD-CRCB-S38

Pre-assembly tools for BV-10 flared cone assembly

Type 80 N3
Type 90 Basic II

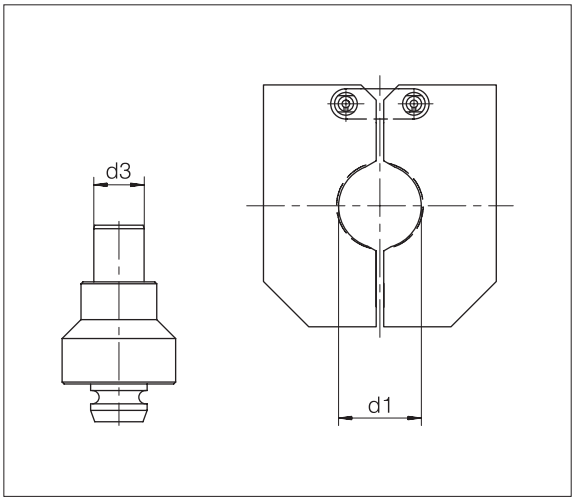


Series Tube OD d1 x s	d3	Order-No.	Designation **Pre-assembly stud**	Order-No.	Designation **Clamping jaws**
L 6 x 1	2.9	5993020100	TD-BV10PT-L6x1-MT	5993000000	TD-BV10CJ-L/S6
L 8 x 1	4.9	5993020200	TD-BV10PT-L8x1-MT	5993001000	TD-BV10CJ-L/S8
L 10 x 1	6.3	5993020300	TD-BV10PT-L10x1-MT	5993002000	TD-BV10CJ-L/S10
L 10 x 1.5	5.5	5993020400	TD-BV10PT-L/S10x1,5-MT	5993002000	TD-BV10CJ-L/S10
L 12 x 1	8.0	5993020500	TD-BV10PT-L12x1-MT	5993003000	TD-BV10CJ-L/S12
L 12 x 1.5	7.5	5993020600	TD-BV10PT-L/S12x1,5-MT	5993003000	TD-BV10CJ-L/S12
L 15 x 1.5	10.2	5993020700	TD-BV10PT-L15x1,5-MT	5993004000	TD-BV10CJ-L15
L 15 x 2	9.1	5993020800	TD-BV10PT-L15x2-MT	5993004000	TD-BV10CJ-L15
L 18 x 1.5	13.0	5993020900	TD-BV10PT-L18x1,5-MT	5993005000	TD-BV10CJ-L18
L 18 x 2	12.0	5993021000	TD-BV10PT-L18x2-MT	5993005000	TD-BV10CJ-L18
L 22 x 1.5	16.2	5993021100	TD-BV10PT-L22x1,5/22x2-MT	5993006000	TD-BV10CJ-L22
L 22 x 2	16.2	5993021100	TD-BV10PT-L22x1,5/22x2-MT	5993006000	TD-BV10CJ-L22
L 28 x 2	21.0	5993021200	TD-BV10PT-L28x2/28x2,5-MT	5993007000	TD-BV10CJ-L28
L 28 x 2.5	21.0	5993021200	TD-BV10PT-L28x2/28x2,5-MT	5993007000	TD-BV10CJ-L28
L 28 x 3	19.5	5993021300	TD-BV10PT-L28x3-MT	5993007000	TD-BV10CJ-L28
L 35 x 2	28.5	5993021400	TD-BV10PT-L35x2-MT	5993008000	TD-BV10CJ-L35
L 35 x 3	26.5	5993021500	TD-BV10PT-L35x3/35x3,5-MT	5993008000	TD-BV10CJ-L35
L 35 x 3.5	26.5	5993021500	TD-BV10PT-L35x3/35x3,5-MT	5993008000	TD-BV10CJ-L35
L 42 x 3	33.5	5993021700	TD-BV10PT-L42x3-MT	5993009000	TD-BV10CJ-L42

Locking plate available upon request

Pre-assembly tools for BV-10 flared cone assembly

Type 80 N3
Type 90 Basic II

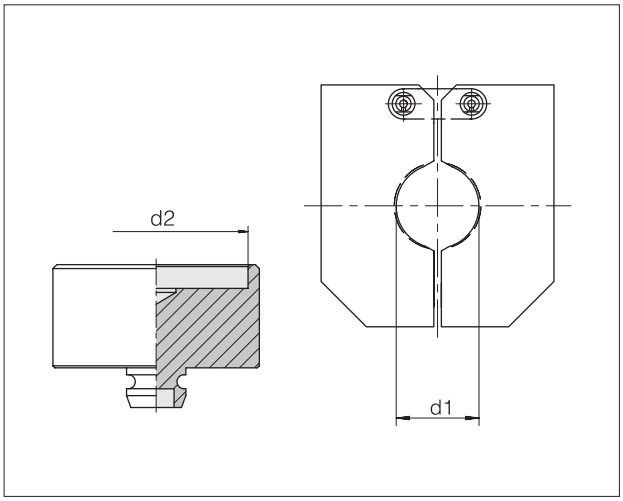


Series Tube OD d1 x s	d3	Order-No.	Designation **Pre-assembly stud**	Order-No.	Designation **Clamping jaws**
S 8 x 1.5	4	5993021800	TD-BV10PT-S8x1,5-MT	5993001000	TD-BV10CJ-L/S8
S 8 x 2	3	5993021900	TD-BV10PT-S8x2-MT	5993001000	TD-BV10CJ-L/S8
S 10 x 1.5	5.5	5993020400	TD-BV10PT-L/S10x1,5-MT	5993002000	TD-BV10CJ-L/S10
S 10 x 2	4.5	5993022000	TD-BV10PT-S10x2/12x3-MT	5993002000	TD-BV10CJ-L/S10
S 12 x 1.5	7.5	5993020600	TD-BV10PT-L/S12x1,5-MT	5993003000	TD-BV10CJ-L/S12
S 12 x 2	6.5	5993022100	TD-BV10PT-S12x2-MT	5993003000	TD-BV10CJ-L/S12
S 12 x 3	4.5	5993022000	TD-BV10PT-S10x2/12x3-MT	5993003000	TD-BV10CJ-L/S12
S 14 x 2	8.5	5993022200	TD-BV10PT-S14x2/16x3-MT	5993014000	TD-BV10CJ-S14
S 14 x 3	6	5993022300	TD-BV10PT-S14x3-MT	5993014000	TD-BV10CJ-S14
S 16 x 2	10.5	5993022400	TD-BV10PT-S16x2-MT	5993015000	TD-BV10CJ-S16
S 16 x 2.5	9.5	5993022500	TD-BV10PT-S16x2,5-MT	5993015000	TD-BV10CJ-S16
S 16 x 3	8.5	5993022200	TD-BV10PT-S14x2/16x3-MT	5993015000	TD-BV10CJ-S16
S 20 x 2	13.5	5993022600	TD-BV10PT-S20x2/20x2,5-MT	5993016000	TD-BV10CJ-S20
S 20 x 2.5	13.5	5993022600	TD-BV10PT-S20x2/20x2,5-MT	5993016000	TD-BV10CJ-S20
S 20 x 3	12.5	5993022700	TD-BV10PT-S20x3-MT	5993016000	TD-BV10CJ-S20
S 20 x 3.5	11	5993022800	TD-BV10PT-S20x3,5-MT	5993016000	TD-BV10CJ-S20
S 20 x 4	10	5993023900	TD-BV10PT-S20x4-MT	5993016000	TD-BV10CJ-S20
S 25 x 2.5	18	5993023000	TD-BV10PT-S25x2,5-MT	5993017000	TD-BV10CJ-S25
S 25 x 3	17	5993023100	TD-BV10PT-S25x3/30x5-MT	5993017000	TD-BV10CJ-S25
S 25 x 4	15	5993023200	TD-BV10PT-S25x4-MT	5993017000	TD-BV10CJ-S25
S 30 x 3	22	5993023300	TD-BV10PT-S30x3-MT	5993018000	TD-BV10CJ-S30
S 30 x 4	20	5993023400	TD-BV10PT-S30x4-MT	5993018000	TD-BV10CJ-S30
S 30 x 5	17	5993023100	TD-BV10PT-S25x3/30x5-MT	5993018000	TD-BV10CJ-S30
S 38 x 3	30	5993023500	TD-BV10PT-S38x3-MT	5993019000	TD-BV10CJ-S38
S 38 x 4	27	5993023600	TD-BV10PT-S38x4-MT	5993019000	TD-BV10CJ-S38
S 38 x 5	26	5993023700	TD-BV10PT-S38x5-MT	5993019000	TD-BV10CJ-S38
S 38 x 6	23	5993023800	TD-BV10PT-S38x6-MT	5993019000	TD-BV10CJ-S38

Locking plate available upon request

Pre-assembly tools for ZAKO ring assembly

Type 80 N3
Type 90 Basic II
Type 90 Comfort

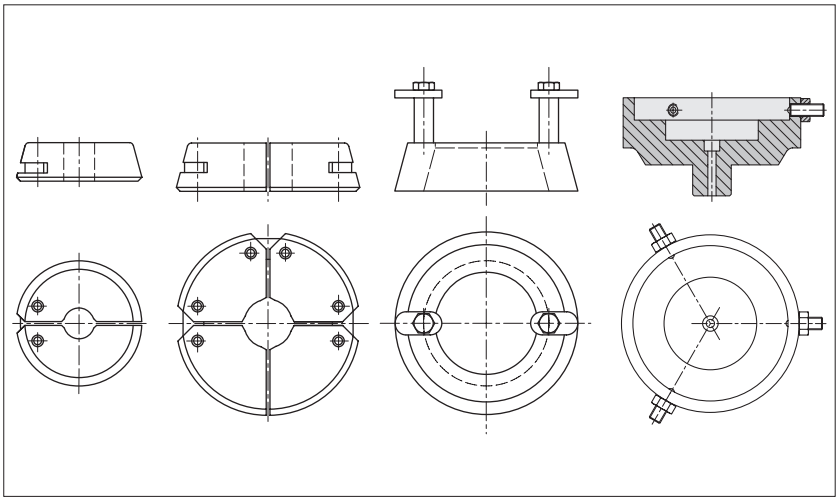


Flange size	d2	Order-No.	Designation **Pre-assembly stud**	Tube OD d1	Order-No.	Designation **Clamping jaws**
1/2"	30.3	5993065300	TD-ZAKOPP-1/2-MT	16	5993015000	TD-BV10CJ-S16
3/4"	38.3	5993066300	TD-ZAKOPP-3/4-MT	20	5993016000	TD-BV10CJ-S20
3/4"	38.3	5993066300	TD-ZAKOPP-3/4-MT	25	5993017000	TD-BV10CJ-S25
1"	38.3	5993066300	TD-ZAKOPP-3/4-MT	25	5993017000	TD-BV10CJ-S25
1"	46.3	5993067300	TD-ZAKOPP-1-MT	30	5993018000	TD-BV10CJ-S30
1"	46.3	5993067300	TD-ZAKOPP-1-MT	38	5993019000	TD-BV10CJ-S38
1 1/4"	46.3	5993067300	TD-ZAKOPP-1-MT	30	5993018000	TD-BV10CJ-S30
1 1/4"	52.3	5993068400	TD-ZAKOPP-1 1/4-MT	38	5993019000	TD-BV10CJ-S38
1 1/4"	52.3	5993068400	TD-ZAKOPP-1 1/4-MT	42	5993009000	TD-BV10CJ-S42

Locking plate available upon request

Pre-assembly tools for ZAKO ring assembly

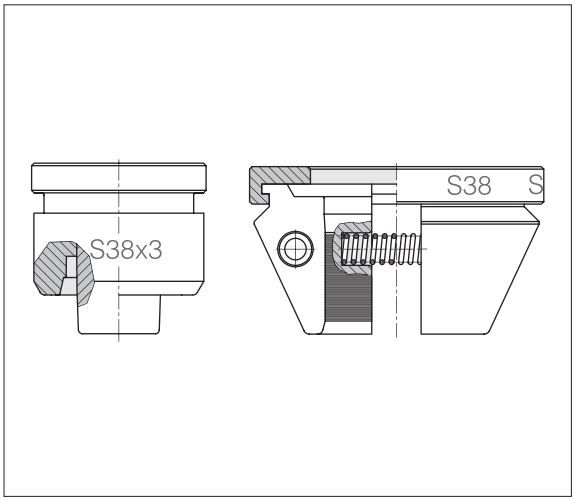
Type 85



Tube OD	Order-No.	Designation **Clamping jaws**	Order-No.	Designation **Clamping jaws**	Order-No.	Designation **Spacer ring**	Order-No.	Designation **Pressure plate**
38	5514940049	TD-ZAKOCJ-38-TYPE85			5514978100	TD-ZAKOSR-TYPE85	5993802749	TD-ZAKOPP-38-TYPE85
50	5514940149	TD-ZAKOCJ-50-TYPE85			5514978100	TD-ZAKOSR-TYPE85	5993801849	TD-ZAKOPP-48,3/50-TYPE85
60	5514940249	TD-ZAKOCJ-60-TYPE85			5514978100	TD-ZAKOSR-TYPE85	5993801949	TD-ZAKOPP-60-TYPE85
65	5514940349	TD-ZAKOCJ-65-TYPE85			5514978100	TD-ZAKOSR-TYPE85	5993802049	TD-ZAKOPP-65-TYPE85
75			5514940949	TD-ZAKOCJ-75-TYPE85			5993802149	TD-ZAKOPP-75-TYPE85
80			5514940449	TD-ZAKOCJ-80-TYPE85			5993802249	TD-ZAKOPP-76,1/80-TYPE85
88			5514940549	TD-ZAKOCJ-88-TYPE85			5993802349	TD-ZAKOPP-88-TYPE85
101.6			5514940649	TD-ZAKOCJ-101,6-TYPE85			5993802449	TD-ZAKOPP-88,9/101,6-TYPE85
114.3			5514940749	TD-ZAKOCJ-114,3-TYPE85			5993802549	TD-ZAKOPP-114,3-TYPE85

Pre-assembly tools VOSS*Form* SQR (steel)

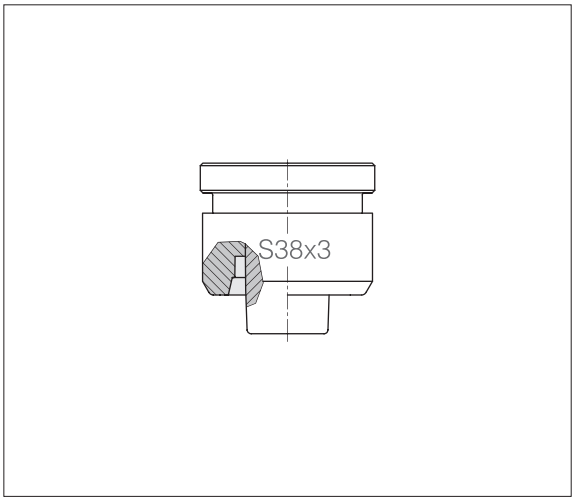
Type 100 / Type 100 Compact



Tube OD	Order-No.	Designation **Forming head**	Tube OD	Order-No.	Designation **Clamping jaws**
L/S 6 x 1	5993290690	TD-SQRFH-L/S6x1	L/S 6	5993090149	TD-SQRCJ-L/S6
L/S 6 x 1.5	5993290691	TD-SQRFH-L/S6x1,5	L/S 8	5993092949	TD-SQRCJ-L/S8
L/S 6 x 2	5993290692	TD-SQRFH-L/S6x2	L/S 10	5993093649	TD-SQRCJ-L/S10
L/S 8 x 1	5993293490	TD-SQRFH-L/S8x1	L/S 12	5993094349	TD-SQRCJ-L/S12
L/S 8 x 1.5	5993293491	TD-SQRFH-L/S8x1,5	L 15	5993096049	TD-SQRCJ-L15
L/S 8 x 2	5993293492	TD-SQRFH-L/S8x2	L 18	5993096749	TD-SQRCJ-L18
L/S 8 x 2.5	5993293493	TD-SQRFH-L/S8x2,5	L 22	5993097449	TD-SQRCJ-L22
L 10 x 1	5993294190	TD-SQRFH-L10x1	L 28	5993098149	TD-SQRCJ-L28
L 10 x 1.5	5993294191	TD-SQRFH-L10x1,5	L 35	5993098849	TD-SQRCJ-L35
L 10 x 2	5993294192	TD-SQRFH-L10x2	L 42	5993092249	TD-SQRCJ-L42
L 12 x 1	5993294890	TD-SQRFH-L12x1	S 14	5993099549	TD-SQRCJ-S14
L 12 x 1.5	5993294891	TD-SQRFH-L12x1,5	S 16	5993090849	TD-SQRCJ-S16
L 12 x 2	5993294892	TD-SQRFH-L12x2	S 20	5993091549	TD-SQRCJ-S20
L 15 x 1.5	5993296591	TD-SQRFH-L15x1,5	S 25	5993100349	TD-SQRCJ-S25
L 15 x 2	5993296592	TD-SQRFH-L15x2	S 30	5993101049	TD-SQRCJ-S30
L 15 x 2.5	5993296593	TD-SQRFH-L15x2,5	S 38	5993101749	TD-SQRCJ-S38
L 18 x 1.5	5993297291	TD-SQRFH-L18x1,5			
L 18 x 2	5993297292	TD-SQRFH-L18x2			
L 18 x 2.5	5993297293	TD-SQRFH-L18x2,5			
L 18 x 3	5993297294	TD-SQRFH-L18x3			
L 22 x 1.5	5993297991	TD-SQRFH-L22x1,5			
L 22 x 2	5993297992	TD-SQRFH-L22x2			
L 22 x 2.5	5993297993	TD-SQRFH-L22x2,5			
L 22 x 3	5993297994	TD-SQRFH-L22x3			
L 28 x 2	5993298692	TD-SQRFH-L28x2			
L 28 x 2.5	5993298693	TD-SQRFH-L28x2,5			
L 28 x 3	5993298694	TD-SQRFH-L28x3			
L 35 x 2	5993299392	TD-SQRFH-L35x2			
L 35 x 2.5	5993299393	TD-SQRFH-L35x2,5			
L 35 x 3	5993299394	TD-SQRFH-L35x3			
L 35 x 4	5993299396	TD-SQRFH-L35x4			
L 42 x 2	5993292792	TD-SQRFH-L42x2			

Pre-assembly tools VOSS*Form* SQR (steel)

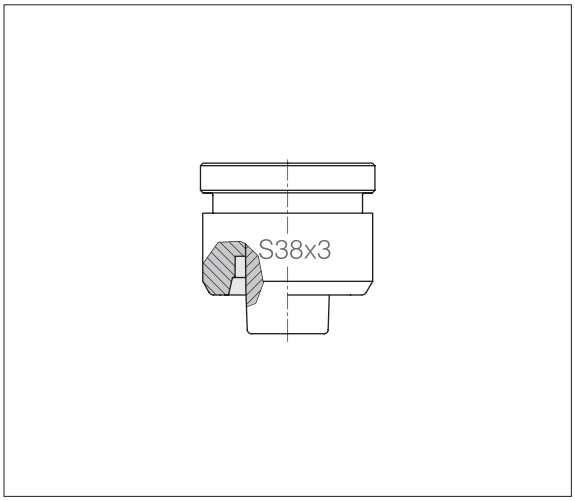
Type 100 / Type 100 Compact



Tube OD	Order-No.	Designation **Forming head**
L 42 x 2.5	5993292793	TD-SQRFH-L42x2,5
L 42 x 3	5993292794	TD-SQRFH-L42x3
L 42 x 4	5993292796	TD-SQRFH-L42x4
S 10 x 1.5	5993295391	TD-SQRFH-S10x1,5
S 10 x 2	5993295392	TD-SQRFH-S10x2
S 10 x 2.5	5993295393	TD-SQRFH-S10x2,5
S 12 x 1.5	5993295891	TD-SQRFH-S12x1,5
S 12 x 2	5993295892	TD-SQRFH-S12x2
S 12 x 2.5	5993295893	TD-SQRFH-S12x2,5
S 12 x 3	5993295894	TD-SQRFH-S12x3
S 14 x 1.5	5993300191	TD-SQRFH-S14x1,5
S 14 x 2	5993300192	TD-SQRFH-S14x2
S 14 x 2.5	5993300193	TD-SQRFH-S14x2,5
S 14 x 3	5993300194	TD-SQRFH-S14x3
S 16 x 1.5	5993291391	TD-SQRFH-S16x1,5
S 16 x 2	5993291392	TD-SQRFH-S16x2
S 16 x 2.5	5993291393	TD-SQRFH-S16x2,5
S 16 x 3	5993291394	TD-SQRFH-S16x3
S 16 x 4	5993291396	TD-SQRFH-S16x4
S 20 x 2	5993292092	TD-SQRFH-S20x2
S 20 x 2.5	5993292093	TD-SQRFH-S20x2,5
S 20 x 3	5993292094	TD-SQRFH-S20x3
S 20 x 3.5	5993292095	TD-SQRFH-S20x3,5
S 20 x 4	5993292096	TD-SQRFH-S20x4
S 25 x 2	5993300892	TD-SQRFH-S25x2
S 25 x 2.5	5993300893	TD-SQRFH-S25x2,5
S 25 x 3	5993300894	TD-SQRFH-S25x3
S 25 x 4	5993300896	TD-SQRFH-S25x4
S 30 x 2	5993301592	TD-SQRFH-S30x2
S 30 x 2.5	5993301593	TD-SQRFH-S30x2,5
S 30 x 3	5993301594	TD-SQRFH-S30x3
S 30 x 4	5993301596	TD-SQRFH-S30x4

Pre-assembly tools VOSS*Form* SQR (steel)

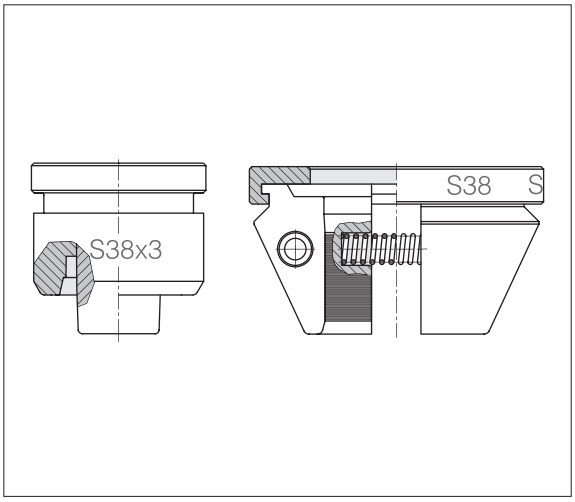
Type 100 / Type 100 Compact



Tube OD	Order-No.	Designation **Forming head**
S 30 x 5	5993301597	TD-SQRFH-S30x5
S 30 x 6	5993301598	TD-SQRFH-S30x6
S 38 x 2.5	5993302293	TD-SQRFH-S38x2,5
S 38 x 3	5993302294	TD-SQRFH-S38x3
S 38 x 4	5993302296	TD-SQRFH-S38x4
S 38 x 5	5993302297	TD-SQRFH-S38x5
S 38 x 6	5993302298	TD-SQRFH-S38x6
S 38 x 7	5993302299	TD-SQRFH-S38x7

Pre-assembly tools VOSS*Form* ^{SQR}VA (stainless steel)

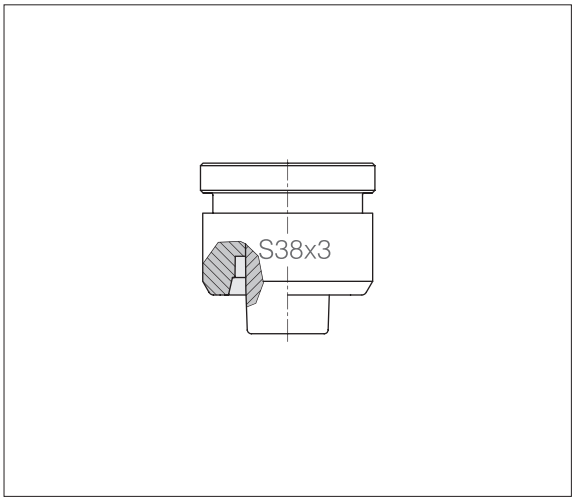
Type 100 / Type 100 Compact



Tube OD	Order-No.	Designation **Forming head**	Tube OD	Order-No.	Designation **Clamping jaws**
L/S 6 x 1	5993145000	TD-SQRFH-L/S6x1-SST	L/S 6	5993090149	TD-SQRCJ-L/S6
L/S 6 x 1.5	5993145100	TD-SQRFH-L/S6x1,5-SST	L/S 8	5993092949	TD-SQRCJ-L/S8
L/S 6 x 2	5993145200	TD-SQRFH-L/S6x2-SST	L/S 10	5993093649	TD-SQRCJ-L/S10
L/S 8 x 1	5993145300	TD-SQRFH-L/S8x1-SST	L/S 12	5993094349	TD-SQRCJ-L/S12
L/S 8 x 1.5	5993145400	TD-SQRFH-L/S8x1,5-SST	L 15	5993096049	TD-SQRCJ-L15
L/S 8 x 2	5993145500	TD-SQRFH-L/S8x2-SST	L 18	5993096749	TD-SQRCJ-L18
L/S 8 x 2.5	5993145600	TD-SQRFH-L/S8x2,5-SST	L 22	5993097449	TD-SQRCJ-L22
L 10 x 1	5993145700	TD-SQRFH-L10x1-SST	L 28	5993098149	TD-SQRCJ-L28
L 10 x 1.5	5993145800	TD-SQRFH-L10x1,5-SST	L 35	5993098849	TD-SQRCJ-L35
L 10 x 2	5993145900	TD-SQRFH-L10x2-SST	L 42	5993092249	TD-SQRCJ-L42
L 12 x 1	5993146000	TD-SQRFH-L12x1-SST	S 14	5993099549	TD-SQRCJ-S14
L 12 x 1.5	5993146100	TD-SQRFH-L12x1,5-SST	S 16	5993090849	TD-SQRCJ-S16
L 12 x 2	5993146200	TD-SQRFH-L12x2-SST	S 20	5993091549	TD-SQRCJ-S20
L 15 x 1.5	5993146300	TD-SQRFH-L15x1,5-SST	S 25	5993100349	TD-SQRCJ-S25
L 15 x 2	5993146400	TD-SQRFH-L15x2-SST	S 30	5993101049	TD-SQRCJ-S30
L 15 x 2.5	5993146500	TD-SQRFH-L15x2,5-SST	S 38	5993101749	TD-SQRCJ-S38
L 18 x 1.5	5993146600	TD-SQRFH-L18x1,5-SST			
L 18 x 2	5993146700	TD-SQRFH-L18x2-SST			
L 18 x 2.5	5993146800	TD-SQRFH-L18x2,5-SST			
L 18 x 3	5993146900	TD-SQRFH-L18x3-SST			
L 22 x 1.5	5993147000	TD-SQRFH-L22x1,5-SST			
L 22 x 2	5993147100	TD-SQRFH-L22x2-SST			
L 28 x 2	5993147200	TD-SQRFH-L28x2-SST			
L 28 x 2.5	5993147300	D-SQRFH-L28x2,5-SST			
L 28 x 3	5993147400	TD-SQRFH-L28x3-SST			
L 35 x 2	5993147500	TD-SQRFH-L35x2-SST			
L 35 x 2.5	5993147600	TD-SQRFH-L35x2,5-SST			
L 35 x 3	5993147700	TD-SQRFH-L35x3-SST			
L 42 x 2	5993147800	TD-SQRFH-L42x2-SST			
L 42 x 3	5993147900	TD-SQRFH-L42x3-SST			

Pre-assembly tools VOSS*Form* ^{SQR} VA (stainless steel)

Type 100 / Type 100 Compact



Tube OD	Order-No.	Designation **Forming head**
S 10 x 1.5	5993148000	TD-SQRFH-S10x1,5-SST
S 10 x 2	5993148100	TD-SQRFH-S10x2-SST
S 10 x 2.5	5993148200	TD-SQRFH-S10x2,5-SST
S 12 x 1.5	5993148300	TD-SQRFH-S12x1,5-SST
S 12 x 2	5993148400	TD-SQRFH-S12x2-SST
S 12 x 2.5	5993148500	TD-SQRFH-S12x2,5-SST
S 12 x 3	5993148600	TD-SQRFH-S12x3-SST
S 14 x 1.5	5993148700	TD-SQRFH-S14x1,5-SST
S 14 x 2	5993148800	TD-SQRFH-S14x2-SST
S 14 x 2.5	5993148900	TD-SQRFH-S14x2,5-SST
S 14 x 3	5993149000	TD-SQRFH-S14x3-SST
S 16 x 1.5	5993149100	TD-SQRFH-S16x1,5-SST
S 16 x 2	5993149200	TD-SQRFH-S16x2-SST
S 16 x 2.5	5993149300	TD-SQRFH-S16x2,5-SST
S 16 x 3	5993149400	TD-SQRFH-S16x3-SST
S 20 x 2	5993149500	TD-SQRFH-S20x2-SST
S 20 x 2.5	5993149600	TD-SQRFH-S20x2,5-SST
S 20 x 3	5993149700	TD-SQRFH-S20x3-SST
S 25 x 1.5	7007658900	TD-SQRFH-S25x1,5-SST
S 25 x 2	5993149800	TD-SQRFH-S25x2-SST
S 25 x 2.5	5993149900	TD-SQRFH-S25x2,5-SST
S 25 x 3	5993150000	TD-SQRFH-S25x3-SST
S 25 x 4	5993150100	TD-SQRFH-S25x4-SST
S 30 x 2.5	5993150200	TD-SQRFH-S30x2,5-SST
S 30 x 3	5993150300	TD-SQRFH-S30x3-SST
S 30 x 4	5993150400	TD-SQRFH-S30x4-SST
S 30 x 5	7007770100	TD-SQRFH-S30x5-SST
S 38 x 3	5993150500	TD-SQRFH-S38x3-SST
S 38 x 4	5993150600	TD-SQRFH-S38x4-SST
S 38 x 5	5993150700	TD-SQRFH-S38x5-SST

Assembly instructions

For process-safe and correct pre-assembly
and final assembly



Content	Type/Page
Important notes on VOSS assembly instructions	P.402
Assembly instructions VOSS *Ring M* tube couplings in conjunction with universal pre-assembly stud	P.404
Assembly instructions VOSS *Ring M* tube couplings in conjunction with VOSS*Ring* pre-assembly stud	P.408
Assembly instructions 2SVA tube couplings	P.413
Assembly instructions ES-4 tube couplings	P.418
Assembly instructions ES-4VA tube couplings	P.423
Assembly instructions VOSS *Form SQR* tube couplings	P.428

VOSS

Content	Type/Page
Assembly instructions VOSS *Form* ^{SQR} VA tube couplings	P.434
Assembly instructions BV-10 flared couplings	P.440
Assembly instructions Tapper (DKO) and weld nipple	P.445
Assembly instructions Flange couplings/ZAKO	P.449
Assembly instructions Flange couplings with cutting ring	P.456
Assembly instructions Male stud connectors Form A, B and E	P.459
Assembly instructions Male stud connectors UN/UNF and ISO 6149 (Form F)	P.461

Content	Type/Page
Assembly instructions Adjustable couplings as specified in ISO 6149 / 11926-1	P.463
Assembly instructions Adjustable elbow couplings with lock nut	P.465
Assembly instructions 37° flared adapters	P.467
Assembly instructions Tube blanking screws sealed with PEFLEX moulded seal rings	P.473

Important notes on VOSS assembly instructions

In order to ensure maximum performance and functional reliability of VOSS products, the respective assembly instructions, operating conditions and tube recommendations have to be adhered to.

We recommend that you use VOSS pre-assembly devices at all times. The use of pre-assembly devices is a strict requirement from tube sizes L18/S16 and larger! It is absolutely essential to follow the operating instructions for the respective pre-assembly device used.

Do not start with assembly until you are absolutely sure that you have understood the operating and assembly instructions for each VOSS pre-assembly device or machine, tool and product. Incorrect handling leads to risks regarding safety and leak-tightness and can result in failure of the entire connection.

It is impossible for the manufacturer to monitor whether the user is adhering to the operating and assembly instructions for individual pre-assembly devices or machines, tools and products, as well as what conditions prevail and what methods are used for installation, operation, application and maintenance of the individual products. Improper workmanship can lead to material damage, which in turn may pose a danger to life and limb. This means that VOSS Fluid GmbH can accept no responsibility or liability for loss, damage or costs incurred due to faulty installation, improper operation or incorrect application and maintenance or from any related issue. Failure to heed this warning will lead to loss of guarantee.

VOSS Fluid GmbH reserves the right to make changes or additions to the information provided without prior notification. Customers can obtain the latest version of the operating and assembly instructions upon request, or from our download area at: **www.voss.net**

VOSS

General notes on VOSS assembly instructions

Make sure that all components, including the tubes, are clean before assembly is started and that they remain clean during the entire assembly process. Soiled components may lead to failure of the system.

Before starting assembly, make sure that you have carried out all preparatory work in accordance with the respective instructions.

Specifications concerning permissible steel tubes:
Seamless, cold-drawn and normalized precision steel tubes as specified in DIN EN 10305-4, material E235+N, mat. no. 1.0308+N or E355, mat. no. 1.0580. The tubes must be ordered by specifying the outer diameter and the inner diameter.

Specifications concerning permissible stainless steel tubes:
Seamless, cold-drawn and solution-annealed, scale-free stainless steel tubes in CFA or CFD delivery condition of dimensions and tolerances according to DIN EN 10305-1 and all other delivery conditions as specified in DIN EN 10216-5, material X6CrNiMoTi17-12-2, mat. no. 1.4571. The tubes must be ordered by specifying the outer diameter and the inner diameter.

The tubes should be prepared with the same thoroughness as pre-assembly and final assembly of the connection. Especially when using long tubes, check the end sections for damage or distortion.

We recommend that pre-assembled tubes which are not to be finally assembled yet should be fitted with protective caps.

Marking a stroke on the union nut and the tube makes it easier to achieve the correct number of turns when tightening the coupling.

Before starting to assemble VOSS components with elastomer seals, always check that:

- the nut and the seal surfaces are clean and undamaged and/or
- the elastomer sealing is clean and undamaged.

Determining the tightening torque for screw couplings

The tightening torques specified in the catalogue apply under the following conditions:

- Steel fittings with VOSS coat surface coating
- The specified nominal pressure ranges assume that the mating material has a tensile strength of ≥ 600 N/mm^2
- Our recommendations on lubrication of the threaded studs are observed

If other values for strength, modulus of elasticity and friction-surface combinations are used, the user has to adapt the tightening torque empirically.

The recommended tightening torques have to be adhered to if the pressure range is to be fully utilized and the appropriate safety level is to be maintained.

The recommended tightening torques for the threads are given in the tables for the respective type of thread.

Explanation of symbols and other notes


Visual inspection


Turn until hand-tight or carry out another manual activity


Use the tool to tighten the coupling according to the instructions


Oil and lubricate at the point marked with an arrow

All dimensions in millimetres [mm]

Assembly instructions VOSS*Ring*^{M} tube couplings

in conjunction with universal pre-assembly stud

1 Notes

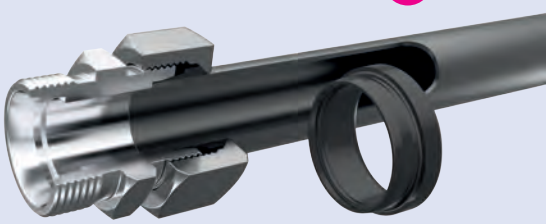
These assembly instructions describe the pre-assembly of the VOSS*Ring*^{M} in conjunction with the universal pre-assembly stud in steel or heavy duty steel.

However, to use the VOSS*Ring*^{M}, the use of the specially developed VOSS*Ring* pre-assembly stud is nevertheless recommended. Only in this way can the patented stop function and the shortened 30° final assembly route be used.

Before starting assembly work please consider the general notes in the latest VOSS catalog and check that your assembly instructions are up to date!

These assembly instructions describe the manual mounting options provided in DIN 3859-2.

However, we always recommend assembly using VOSS pre-assembly devices and tools. Here the respective operating instructions must be observed.



For use with steel and stainless steel tubes according to VOSS specification (see introduction assembly instructions).

Attention!

Please note the recommendation on the use of support sleeves for thin-walled steel tubes and soft tubes of non-ferrous metals and support sleeves of material 1.4571 for thin-walled stainless steel tubes.

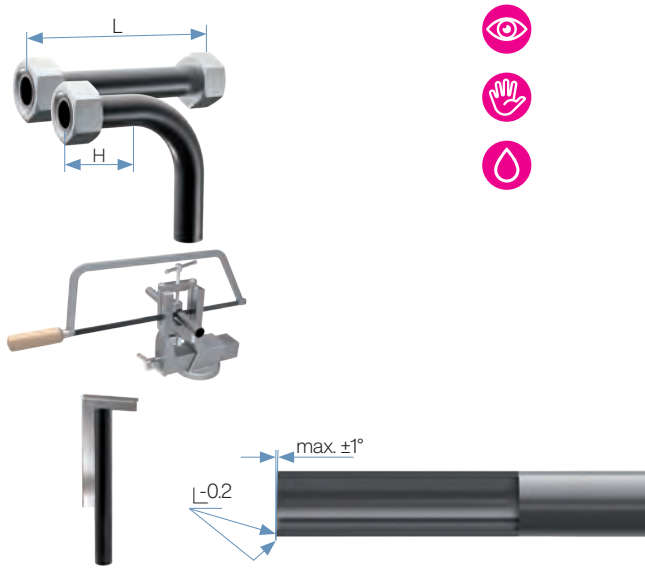
2 Tube preparation

2.1 Minimum dimensions of the straight tube ends must be taken into account for determining the tube lengths.

Series	Tube OD [mm]	H [mm]	L [mm]
L	6/8	31	39
L	10/12	33	42
L	15	36	45
L	18	38	48
L	22/28	42	53
L	35/42	48	60

Series	Tube OD [mm]	H [mm]	L [mm]
S	6/8	35	44
S	10/12	37	47
S	14/16	43	54
S	20	50	63
S	25	54	68
S	30	58	72
S	38	65	82

With machine pre-assembly, the minimum lengths are contained in the respective operating instructions of the pre-assembly devices.



2.2 Cut the tube at a right angle and at least 10 mm away from the manufacturer's or supplier's cut. An angular tolerance of ±1° is permissible. Do not use tube cutters or abrasive cutting machines.

2.3 Slightly deburr tube ends inside and outside.
Clean tube.

Attention!
Tubes cut crookedly or improperly deburred reduce service life and the tightness of the connection.

2.4 Assembly of VOSS reinforcement sleeves

1a. Lightly coat the outer circumference of the steel sleeve with lubricant (e.g. mineral-oil based hydraulic oil HLP32). Then insert the sleeve into the tube up to the knurled section.

1b. Lightly coat the outer circumference of the stainless steel sleeve with assembly paste (e.g. assembly paste MPE). Then insert the sleeve into the tube up to the knurled section.

2. Use a hammer (plastic or hard rubber) to drive in the sleeve totally. In doing so, the knurled section is pressed against the inner wall of the tube and prevents the sleeve from being displaced or falling out.



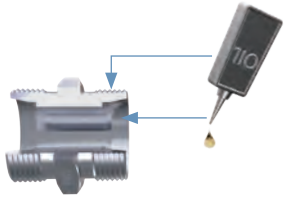
Sleeve inserted


Sleeve driven in

Series	Tube-OD [mm]	Wall thickness [mm]						
		0.5	0.75	1	1.5	2	2.5	3
L	6	•	•					
L	8	•	•					
L	10	•	•					
L	12	•	•	•				
L	15	•	•	•				
L	18	•	•	•	•			
L	22	•	•	•	•	•		
L	28	•	•	•	•	•		
L	35	•	•	•	•	•	•	
L	42	•	•	•	•	•	•	
S	6	•	•					
S	8	•	•					
S	10	•	•					
S	12	•	•	•				
S	14	•	•	•				
S	16	•	•	•	•			
S	20	•	•	•	•	•		
S	25	•	•	•	•	•		
S	30	•	•	•	•	•	•	
S	38	•	•	•	•	•	•	•

3 Assembly preparation

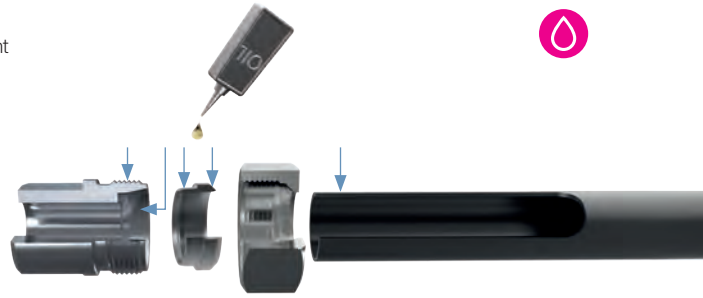
3.1 Lightly lubricate the thread, the cutting ring, the tube end and the taper of the coupling connecting piece and/or the manual pre-assembly mandrel (e.g. using mineral-oil based hydraulic oil HLP32 or, with stainless steel, assembly paste MPE).



VOSS*Ring*^{M} in conjunction with universal pre-assembly stud

3.2 Put the union nut and the VOSS*Ring*^{M} on the tube end one after the other. The cutting edges of the VOSS*Ring*^{M} point towards the tube end.

Attention!
Make sure that the VOSS*Ring*^{M} is in the right position!



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4 Pre-assembly

VOSS*Ring*^{M} can be pre-assembled directly in the coupling connecting piece or with a hardened universal pre-assembly stud.

Hardened pre-assembly studs in steel are low-wear and enable uniform assembly results. Approximately every 50 pre-assemblies, accuracy to gauge must be checked.

Pre-assembly studs in heavy duty steel have up to 20x longer service life and a "wear inspection". If the usage limit is reached, the front end of the stud breaks off.

Attention!
Universal pre-assembly studs that are not true to gauge or damaged in the cone area must be replaced!

When mounting these directly in the coupling connecting piece, this may be used only once for pre-assembly!

All given assembly instructions must be strictly adhered to! Otherwise the coupling could leak or the tube may be torn out of the coupling!

4.1 Insert the tube end into the 24° taper as far as it will go and press on it. The tube must be held in as far as it can go during the assembly process in order to avoid faulty assembly.

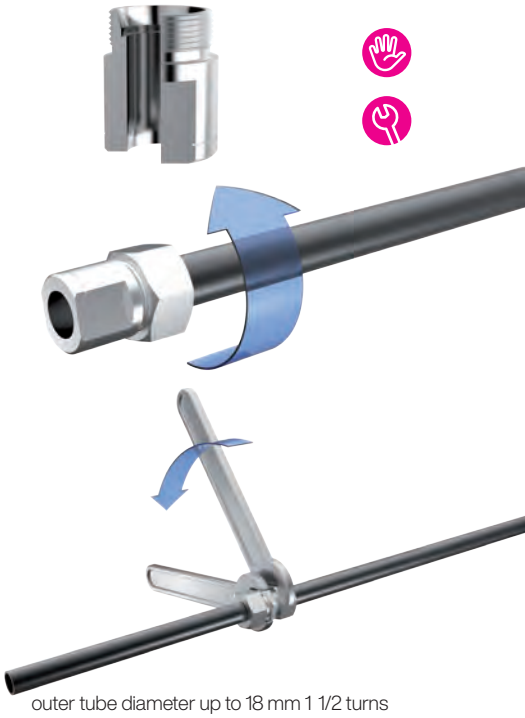
4.2 Tighten the union nut until it is hand tight.

4.3 Tighten the union nut with a wrench to an outer tube.

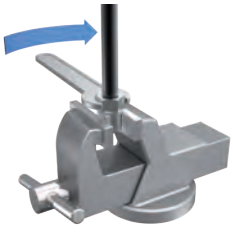
- tube OD up to 18 mm
  1 1/2 turns

- tube OD from 20 mm
  1 1/4 turns

For assembly into the tube hold the coupling connecting piece in place with a wrench. For compliance with the specified number of turns, marking lines are recommended on the union nut and tube.



outer tube diameter up to 18 mm 1 1/2 turns
to tube outer diameter from 20 mm, 1 1/4 turns



outer tube diameter up to 18 mm 1 1/2 turns
to tube outer diameter from 20 mm, 1 1/4 turns

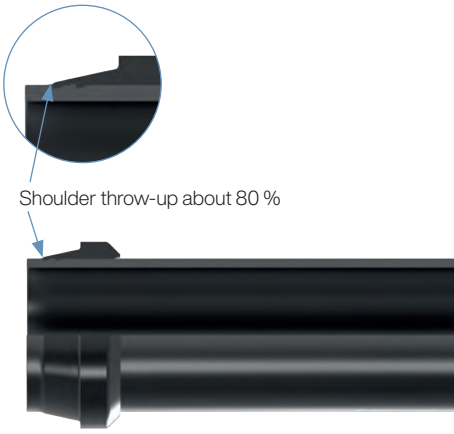
5 Assembly inspection

Loosen the nut and check the shoulder throw-up. The shoulder throw-up should cover approximately 80 % of the cutting-edge front face. With thin-walled tubes and stainless steel tubes the shoulder throw-up has shown to be as markedly less.

In this position, it is still permissible for the cutting ring to turn on the tube. Any dirt must be removed.

Attention!
If not enough tube material has been raised, the procedure must be repeated using more force. The result must be rechecked.

Note:
We recommend the use of the VOSS gauge to check the correct axial position of the cutting ring.



6 Final assembly

6.1 Lightly lubricate the thread, the pre-assembled tube end and the taper of the coupling connecting piece easily with lubricant (e.g. using mineral-oil based hydraulic oil HLP32 or, with stainless steel, assembly paste MPE).

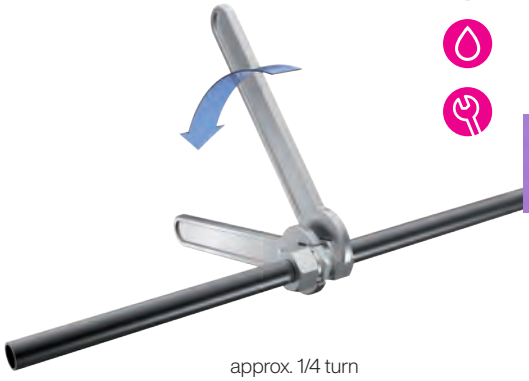
6.2 Carefully insert the pre-assembled tube end into the coupling connecting piece. Then tighten the union nut until it is hand tight.

Attention!
If the VOSS*Ring*^{M} was pre-assembled in the coupling connecting piece, the same coupling connecting piece used for the direct assembly must be used again for the final assembly.

6.3 Tighten the nut with a wrench until there is a noticeable force increase. As a result, the coupling components are elastically stressed.

Then tighten another **1/4 turn.**

Attention!
When tightening up the coupling connecting piece for the final time, always hold it in wrench or clamp it in a vise.



7 Repeat assembly

For repeated assembly, the union nut is tightened with the same force as during the initial assembly.

Assembly instructions VOSS*Ring*^{M} tube couplings

in conjunction with VOSS*Ring* pre-assembly stud

1 Notes

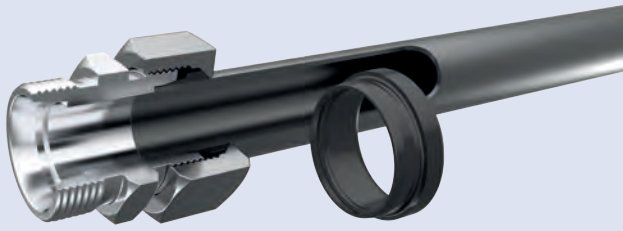
Before starting assembly work please consider the general notes in the latest VOSS catalog and check that your assembly instructions are up to date!

These assembly instructions describe the manual mounting options provided in DIN 3859-2.

However, we always recommend assembly using VOSS pre-assembly devices and tools. Here the respective operating instructions must be observed.

To use the VOSS*Ring*^{M} the use of specially developed VOSS*Ring* pre-assembly mandrel is recommended. Only in this way can the patented stop function and the shortened 30° final assembly route be used.

Conventional VOSS pre-assembly mandrels can also be used. However, in this case separate installation instructions must be observed.



For use with steel and stainless steel tubes according to VOSS specification (see introduction assembly instructions).

Attention!

Please note the recommendation on the use of support sleeves for thin-walled steel pipes and soft tubes of non-ferrous metals and support sleeves of material 1.4571 for thin-walled stainless steel tubes.

2 Tube preparation

2.1 Minimum dimensions of the straight tube ends must be taken into account for determining the tube lengths.

Series	Tube OD [mm]	H [mm]	L [mm]
L	6/8	31	39
L	10/12	33	42
L	15	36	45
L	18	38	48
L	22/28	42	53
L	35/42	48	60

Series	Tube OD [mm]	H [mm]	L [mm]
S	6/8	35	44
S	10/12	37	47
S	14/16	43	54
S	20	50	63
S	25	54	68
S	30	58	72
S	38	65	82

With machine pre-assembly, the minimum lengths are contained in the respective operating instructions of the pre-assembly devices.



2.2 Cut the tube at a right angle and at least 10 mm away from the manufacturer's or supplier's cut. An angular tolerance of ±1° is permissible. Do not use tube cutters or abrasive cutting machines.

2.3 Slightly deburr tube ends inside and outside. Clean tube.

Attention!
Tubes cut crookedly or improperly deburred reduce service life and the tightness of the connection.

2.4 Assembly of VOSS reinforcement sleeves.

1a. Lightly coat the outer circumference of the steel sleeve with lubricant (e.g. mineral-oil based hydraulic oil HLP32). Then insert the sleeve into the tube up to the knurled section.

1b. Lightly coat the outer circumference of the stainless steel sleeve with assembly paste (e.g. assembly paste MPE). Then insert the sleeve into the tube up to the knurled section.

2. Use a hammer (plastic or hard rubber) to drive in the sleeve totally. In doing so, the knurled section is pressed against the inner wall of the tube and prevents the sleeve from being displaced or falling out.





Sleeve inserted



Sleeve driven in

Series	Tube OD [mm]	Wall thickness [mm]						
		0.5	0.75	1	1.5	2	2.5	3
L	6	•	•					
L	8	•	•					
L	10	•	•					
L	12	•	•	•				
L	15	•	•	•				
L	18	•	•	•	•			
L	22	•	•	•	•	•		
L	28	•	•	•	•	•		
L	35	•	•	•	•	•	•	
L	42	•	•	•	•	•	•	
S	6	•	•					
S	8	•	•					
S	10	•	•					
S	12	•	•	•				
S	14	•	•	•				
S	16	•	•	•	•			
S	20	•	•	•	•	•		
S	25	•	•	•	•	•		
S	30	•	•	•	•	•	•	
S	38	•	•	•	•	•	•	•

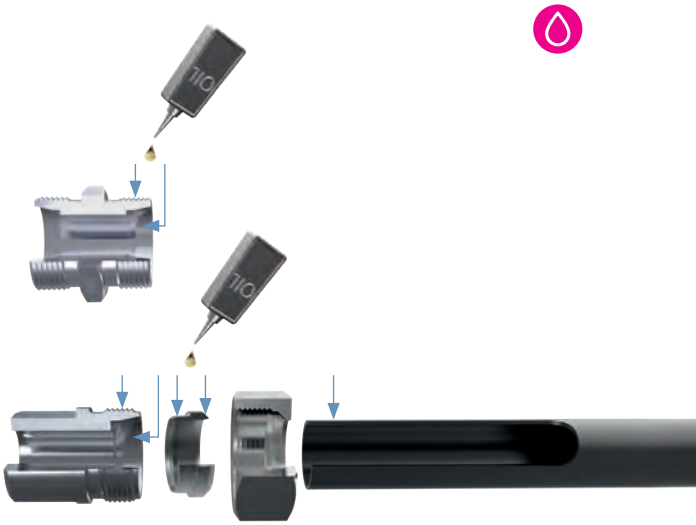
VOSS*Ring*^{M} in conjunction with VOSS*Ring* pre-assembly stud

3 Assembly preparation

3.1 Lightly lubricate the thread, the cutting ring, the tube end and the taper of the coupling connecting piece and/or the manual pre-assembly mandrel (e.g. using mineral-oil based hydraulic oil HLP32 or, with stainless steel, assembly paste MPE).

3.2 Put the union nut and the VOSS*Ring*^{M} on the tube end one after the other. The cutting edges of the VOSS*Ring*^{M} point towards the tube end.

Attention!
Make sure that the VOSS*Ring*^{M} is in the right position!



4 Pre-assembly

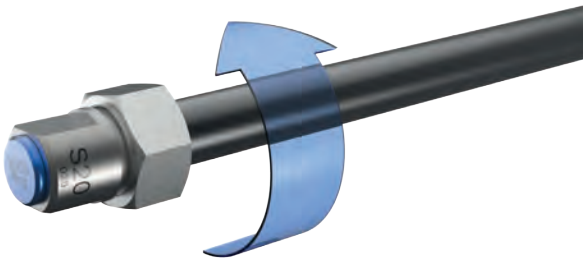
The VOSS*Ring*^{M} can be pre-assembled directly in the coupling connecting piece or using the hardened VOSS*Ring* pre-assembly mandrel.

VOSS*Ring* pre-assembly mandrels for heavy-duty steel show no typical wear and have no inspection intervals. When the usage limits of the pre-assembly mandrel are reached, the front end breaks off, so that a replacement must be made.



Attention!
When mounting these directly in the coupling connecting piece, this may be used only once for pre-assembly!

All given assembly instructions must be strictly adhered to! Otherwise the coupling could leak or the tube may be torn out of the coupling!



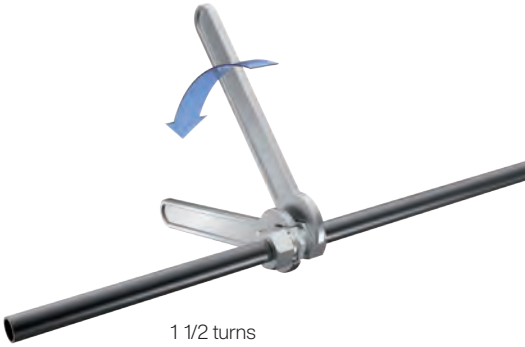
4.1 Insert the tube end into the 24° taper as far as it will go and press on it. The tube must be held in as far as it can go during the assembly process in order to avoid faulty assembly.

4.2 Tighten the union nut until it is hand tight.

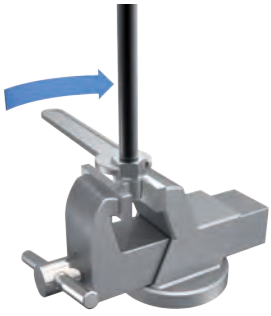
4.3 Tighten the nut
1 1/2 turns with the wrench.

Notes:
In pre-assembly in the patented VOSS*Ring* pre-assembly mandrel, the end of assembly is easily recognizable after about 1 1/2 turns thanks to the block stop installation or a noticeable force increase.

For assembly into the tube hold the coupling connecting piece in place with a wrench. For compliance with the specified number of turns marking lines are recommended on the union nut and tube.



1 1/2 turns



1 1/2 turns

5 Assembly inspection

Loosen the nut and check the shoulder throw-up. The shoulder throw-up should cover the cutting-edge front face completely, i.e. cover approximately 100%. With thin-walled tubes and stainless steel tubes the shoulder throw-up has shown to be as markedly less.

In this position, it is still permissible for the cutting ring to turn on the tube. Any dirt must be removed.

Attention!
If not enough tube material has been raised, the procedure must be repeated using more force. The result must be rechecked.

Note:
We recommend the use of the VOSS gauge to check the correct axial position of the cutting ring.



Shoulder throw-up about 100%

VOSS*Ring*^{M} in conjunction with VOSS*Ring* pre-assembly stud

6 Final assembly

6.1 Lightly lubricate the thread, the pre-assembled tube end and the taper of the coupling connecting piece easily with lubricant (e.g. using mineral-oil based hydraulic oil HLP32 or, with stainless steel, assembly paste MPE).

6.2 Carefully insert the pre-assembled tube end into the coupling connecting piece. Then tighten the union nut until it is hand tight.

Attention!
If the VOSS*Ring*^{M} was pre-assembled in the coupling connecting piece, the same coupling connecting piece used for the direct assembly must be used again for the final assembly.

6.3 Tighten the union nut with a wrench until there is a noticeable force increase. As a result, the coupling components are elastically stressed and the state of assembly after pre-assembly is once again achieved.

6.4 Then tighten a further **30° final assembly route**. As a result of this, a lower final cut of the cutting ring is achieved and an absolute tightness guaranteed.

Attention!
When tightening up the coupling connecting piece for the final time, always hold it in wrench or clamp it in a vise.



clearly noticeable force increase
+ 30° final assembly route

7 Repeat assembly

The repeated assembly is carried out identically to the final assembly.

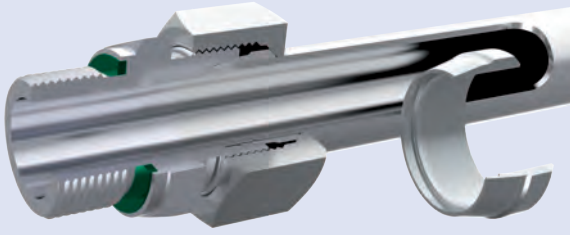
7.1 Tighten the nut with a wrench until there is a noticeable force increase.

7.2 Then tighten a further 30° final assembly route.

Assembly instructions 2SVA tube couplings

1 Notes

Before starting the assembly work, read the general notes in the latest VOSS catalogue and check that your assembly instructions are up to date.



VOSS 2SVA cutting rings have to be pre-assembled in hardened tools.

These assembly instructions describe the pre-assembly in hardened pre-assembly studs.

We recommend that VOSS pre-assembly devices and tools are used for assembly at all times.

For use with stainless steel tubes in accordance with VOSS specifications (see introduction to assembly instructions).

Attention!
Please note the recommendation on the use of tube supports made of material 1.4571 for thin-walled stainless steel tubes.

2 Tube preparation

2.1 The minimum dimensions of the straight tube ends must be taken into account for determining the tube lengths.

Series	Tube OD [mm]	H [mm]	L [mm]
L	6/8	31	39
L	10/12	33	42
L	15	36	45
L	18	38	48
L	22/28	42	53
L	35/42	48	60

Series	Tube OD [mm]	H [mm]	L [mm]
S	6/8	35	44
S	10/12	37	47
S	14/16	43	54
S	20	50	63
S	25	54	68
S	30	58	72
S	38	65	82

With machine pre-assembly, the minimum lengths are contained in the respective operating instructions of the pre-assembly devices.



2SVA

2.2 Cut the tube at a right angle and at least 10 mm away from the manufacturer's or supplier's cut. An angle tolerance of ±1° is permissible. Do not use a rotary grinder or tube cutter.

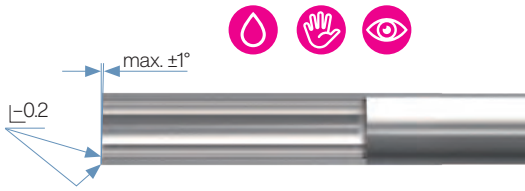
2.3 Slightly deburr tube ends inside and outside.
Clean the tube.

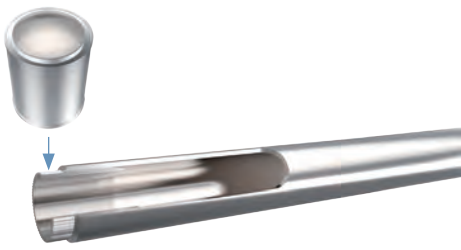
Attention!
If tubes are not cut off squarely or are not properly deburred, this may reduce the service life and leak-tightness of the couplings.

2.4 Assembly of VOSS reinforcing sleeves

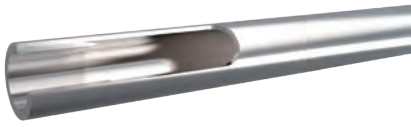
1. Lubricate the outside surface of the sleeve lightly using assembly paste (e.g. MPE assembly paste). Then insert the sleeve into the tube up to the knurled section.

2. Use a hammer (plastic or hard rubber) to drive the sleeve in totally. In doing so, the knurled section is pressed against the inner wall of the tube and prevents the sleeve from being displayed or falling out.





Sleeve inserted



Sleeve driven in firmly

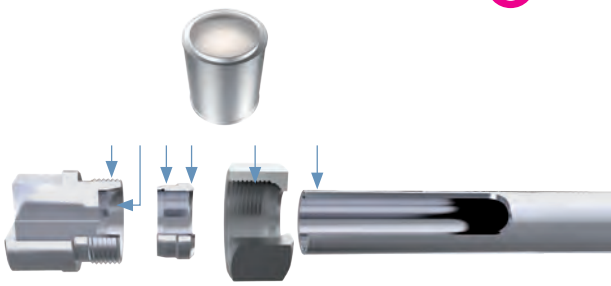
Series	Tube OD [mm]	Wall thickness [mm]						
		0.5	0.75	1	1.5	2	2.5	3
L	6	•	•					
L	8	•	•					
L	10	•	•					
L	12	•	•	•				
L	15	•	•	•				
L	18	•	•	•	•			
L	22	•	•	•	•	•		
L	28	•	•	•	•	•		
L	35	•	•	•	•	•	•	
L	42	•	•	•	•	•	•	
S	6	•	•					
S	8	•	•					
S	10	•	•					
S	12	•	•	•				
S	14	•	•	•				
S	16	•	•	•	•			
S	20	•	•	•	•	•		
S	25	•	•	•	•	•		
S	30	•	•	•	•	•	•	
S	38	•	•	•	•	•	•	•

3 Assembly preparation

3.1 In order to carry out pre-assembly correctly, the thread of the coupling connecting piece, the tube end, the cutting ring, the union nut and the taper surfaces have to be lubricated with assembly paste (e.g. MPE assembly paste).

3.2 Put the union nut and the 2SVA cutting ring on the tube end.

Attention!
Make sure that the 2SVA cutting ring is in the right position.



4 Assembly instructions

Hardened pre-assembly studs are wear-resistant, thus achieving consistent pre-assembly results. They have to be checked after approx. every 50 pre-assemblies for trueness of gauge.

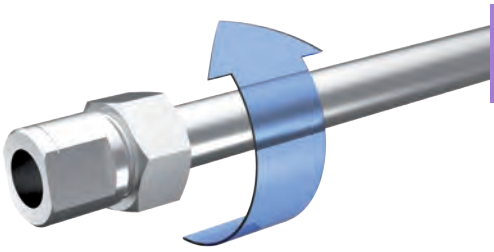
Attention!
Pre-assembly studs that are not true to gauge or that are damaged in the taper section must be replaced immediately.

All specified assembly distances (number of turns) must be adhered to. Otherwise there is a danger that the coupling will leak or that the tube will tear out of the coupling.

4.1 Insert the tube end into the 24° taper as far as it will go and press on it. The tube must be held in as far as it will go during the entire assembly process in order to avoid faulty assembly.

4.2 Turn union nut until it is hand-tight.

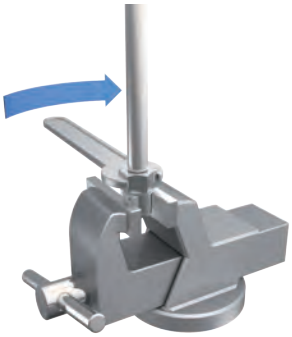




2SVA

4.3 Tighten union nut with approx. **1 1/4 – 1 1/2 turns.**

Note:
Marking a stroke on the union nut and the tube makes it easier to achieve the correct number of turns.



approx. 1 1/4 – 1 1/2 turns

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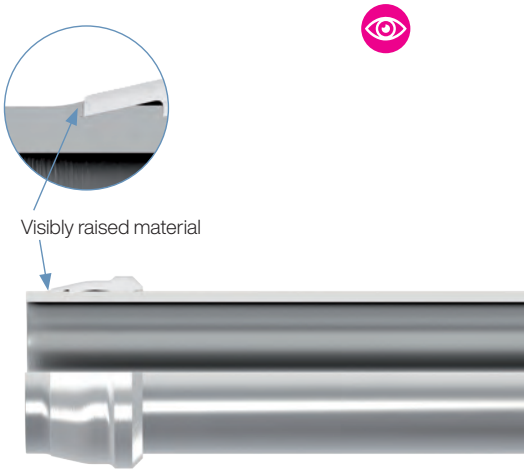
5 Check results

Unscrew the union nut, check how much material has been pushed up. It is not possible to cut and raise as much material of stainless steel tubes as on normal steel tubes. However, a certain amount of raised material must be visible.

On this position, it is still permissible for the cutting ring to turn on the tube.

Attention!
If not enough tube material has been raised, the procedure must be repeated using more force. The result must be rechecked.

Note:
We recommend the use of the VOSS gauge to check the correct axial position of the cutting ring.



6 Final assembly

6.1 Lubricate the thread, the pre-assembled tube end, the union nut and the taper lightly with assembly paste (e.g. MPE assembly paste).

6.2 Insert the pre-assembled tube end carefully into the coupling connecting piece. Then turn the union nut until it is hand-tight.

6.3 Use a spanner to tighten the union nut until there is a noticeable force increase.

6.4 Tighten up further by approximately **1/2 turn.**

Attention!
When finally tightening up the coupling connecting piece, always hold it in a spanner or clamp it in a vise.



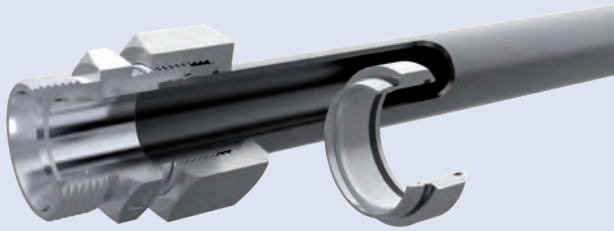
7 Repeat assembly

For repeat assembly, the union nut must be tightened by using the same force as for the original assembly.

Assembly instructions ES-4 tube couplings

1 Notes

Before starting the assembly work, read the general notes in the latest VOSS catalogue and check that your assembly instructions are up to date.



These assembly instructions describe the possible assembly options provided for in the German standard DIN 3859 Part 2.

We recommend that VOSS pre-assembly devices and tools are used for assembly at all times.

For use with steel tubes in accordance with VOSS specifications (see introduction to assembly instructions).

Attention!

Please note the recommendation on the use of tube supports for thin-walled steel tubes and soft tubes made of non-ferrous metals.

This cutting ring is not suitable for stainless steel tube assemblies. For these, cutting rings of types VOSS*Ring*^{M}, 2SVA or ES-4VA must be used!

2 Tube preparation

2.1 The minimum dimensions of the straight tube ends must be taken into account for determining the tube lengths.

Series	Tube OD [mm]	H [mm]	L [mm]
L	6/8	31	39
L	10/12	33	42
L	15	36	45
L	18	38	48
L	22/28	42	53
L	35/42	48	60

Series	Tube OD [mm]	H [mm]	L [mm]
S	6/8	35	44
S	10/12	37	47
S	14/16	43	54
S	20	50	63
S	25	54	68
S	30	58	72
S	38	65	82

With machine pre-assembly, the minimum lengths are contained in the respective operating instructions of the pre-assembly devices.



2.2 Cut the tube at a right angle and at least 10 mm away from the manufacturer's or supplier's cut. An angle tolerance of ±1° is permissible. Do not use a rotary grinder or tube cutter.

2.3 Slightly deburr tube ends inside and outside.
Clean the tube.

Attention!
If tubes are not cut off squarely or are not properly deburred, this may reduce the service life and leak-tightness of the couplings. Burrs on the tube outer diameter can damage the inner O-ring.

2.4 Assembly of VOSS reinforcing sleeves

1. Lubricate the outside surface of the sleeve lightly (e.g. using mineral-oil based hydraulic fluid HLP32). Then insert the sleeve into the tube up to the knurled section.

2. Use a hammer (plastic or hard rubber) to drive the sleeve in totally. In doing so, the knurled section is pressed against the inner wall of the tube and prevents the sleeve from being displaced or from falling out.





Sleeve inserted



Sleeve driven in firmly

Series	Tube OD [mm]	Wall thickness [mm]						
		0.5	0.75	1	1.5	2	2.5	3
L	6	•	•					
L	8	•	•					
L	10	•	•					
L	12	•	•	•				
L	15	•	•	•				
L	18	•	•	•	•			
L	22	•	•	•	•	•		
L	28	•	•	•	•	•		
L	35	•	•	•	•	•	•	
L	42	•	•	•	•	•	•	
S	6	•	•					
S	8	•	•					
S	10	•	•					
S	12	•	•	•				
S	14	•	•	•				
S	16	•	•	•	•			
S	20	•	•	•	•	•		
S	25	•	•	•	•	•		
S	30	•	•	•	•	•	•	
S	38	•	•	•	•	•	•	•

ES-4

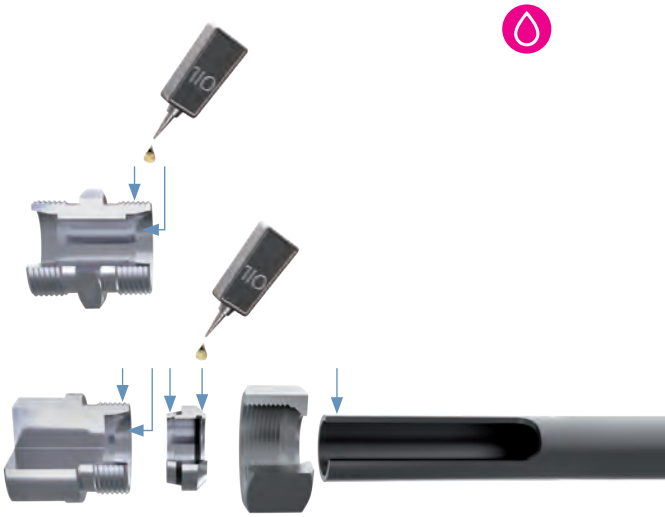
3 Assembly preparation

3.1 Lubricate the thread, the cutting ring, the tube end and the taper of the coupling connecting piece and/or of the manual pre-assembly stud lightly (e.g. using mineral-oil based hydraulic fluid HLP32).

Wetting the tube end with lubricant makes it easier to push the ES-4 cutting ring onto the tube.

3.2 Put the union nut and the ES-4 cutting ring on the tube end, one after the other. The cutting edges of the ES-4 cutting ring point towards the tube end.

Attention!
Make sure that the ES-4 cutting ring is in the right position.



4 Assembly instructions

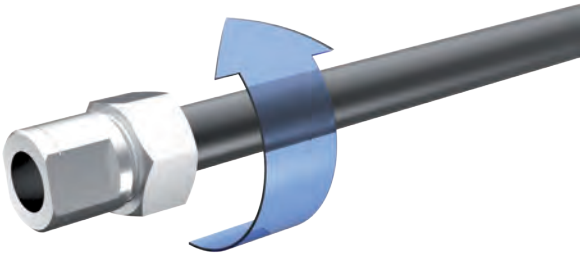
VOSS ES-4 cutting rings can be pre-assembled directly in the coupling connecting piece or using a hardened pre-assembly stud.



Hardened pre-assembly stud are wear-resistant, thus achieving consistent pre-assembly results. They have to be checked after approx. every 50 pre-assemblies for trueness of gauge.

Attention!
Pre-assembly studs that are not true to gauge or that are damaged in the tapered section must be replaced on all accounts. When mounting them directly in the coupling connecting piece, this may be used only once for pre-assembly.

All specified assembly distances must be adhered to. Otherwise there is a danger that the coupling will leak or that the tube will tear out of the coupling.

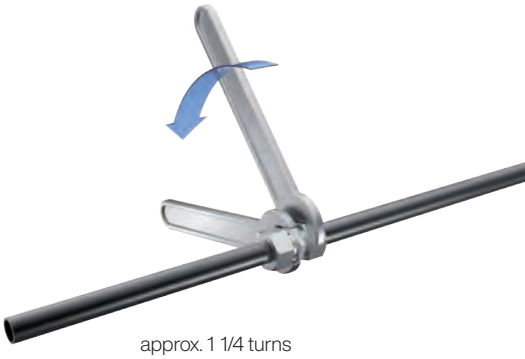


4.1 Insert the tube end into the 24° taper as far as it will go and press on it. The tube must be held in as far as it will go during the entire assembly process in order to avoid faulty assembly.

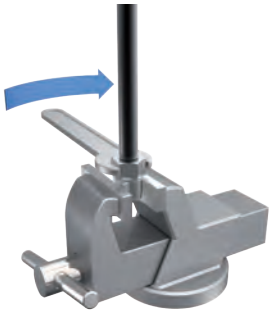
4.2 Turn the union nut until it is hand-tight.

4.3 Tighten the union nut by approx. **1 1/4 turns** (min. 1 to max. 1 1/2 turns). This pushes the ES-4 cutting ring against the end face of the stud.

Notes:
When installing couplings in tubing systems, always hold the coupling connecting piece in a spanner. Marking a stroke on the union nut and the tube makes it easier to achieve the correct number of turns.



approx. 1 1/4 turns



approx. 1 1/4 turns

5 Check results

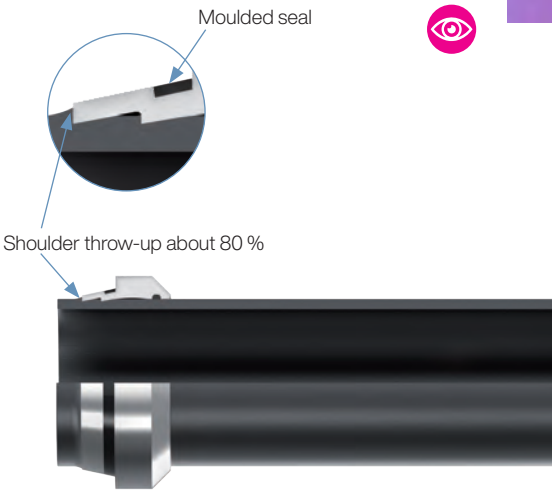
5.1 Loosen the nut and check the shoulder throw-up and the moulded seal. The shoulder throw-up should cover approximate 80 % of the cutting-edge front face.

In this position, it is still permissible for the cutting ring to turn on the tube.

Attention!
The moulded seal must be undamaged. Remove possible soiling and replace the moulded seal if necessary.

If an inadequate amount of material is raised, repeat assembly with a higher torque. The results must be re-checked!

Note:
We recommend the use of the VOSS gauge to check the correct axial position of the cutting ring.



ES-4

6 Final assembly

6.1 Lubricate the thread, the pre-assembled tube end and the taper of the coupling connecting piece lightly (e.g. using mineral-oil based hydraulic fluid HLP32).

6.2 Insert the pre-assembled tube end carefully into the coupling connecting piece, making sure that the moulded seal is not damaged and is seated in the seal groove correctly. Then turn the union nut until it is hand-tight.

Attention!
If the cutting ring was pre-assembled in the coupling connecting piece, the same coupling connecting piece used to pre-assemble the tube and cutting ring must be used again for final assembly.

6.3 Use a spanner to tighten the union nut until there is a noticeable force increase.

6.4 Tighten up further by approximately **1/4 turn.**

Attention!
When finally tightening up the coupling connecting piece, always hold it in a spanner or clamp it in a vise.



7 Repeat assembly

7.1 Each time the tube coupling is unscrewed, the moulded seal must be checked for damage and replaced if necessary.

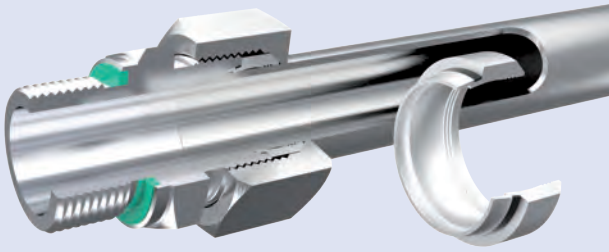
7.2 For repeat assembly, the union nut must be tightened again with the same amount of force as during inital assembly.



Assembly instructions ES-4VA tube couplings

1 Notes

Before starting the assembly work, read the general notes in the latest VOSS catalogue and check that your assembly instructions are up to date.



Toughened tools must be used to pre-assemble ES-4VA cutting rings.

These assembly instructions describe the pre-assembly in hardened pre-assembly studs.

We recommend that VOSS pre-assembly devices and tools are used for assembly at all times.

For use with stainless steel tubes in accordance with VOSS specifications (see introduction to assembly instructions).

Attention!
Please note the recommendation on the use of tube supports made of material 1.4571 for thin-walled stainless steel tubes.

2 Tube preparation

2.1 The minimum dimensions of the straight tube ends must be taken into account for determining the tube lengths.

Series	Tube OD [mm]	H [mm]	L [mm]
L	6/8	31	39
L	10/12	33	42
L	15	36	45
L	18	38	48
L	22/28	42	53
L	35/42	48	60

Series	Tube OD [mm]	H [mm]	L [mm]
S	6/8	35	44
S	10/12	37	47
S	14/16	43	54
S	20	50	63
S	25	54	68
S	30	58	72
S	38	65	82

With machine pre-assembly, the minimum lengths are contained in the respective operating instructions of the pre-assembly devices.



ES-4VA

2.2 Cut the tube at a right angle and at least 10 mm away from the manufacturer's or supplier's cut. An angle tolerance of ±1° is permissible. Do not use a rotary grinder or tube.

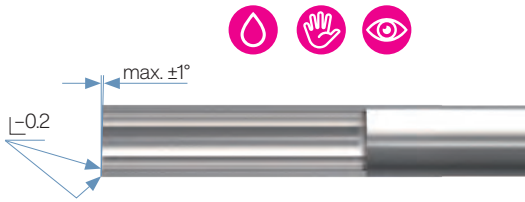
2.3 Slightly deburr tube ends inside and outside.
Clean the tube.

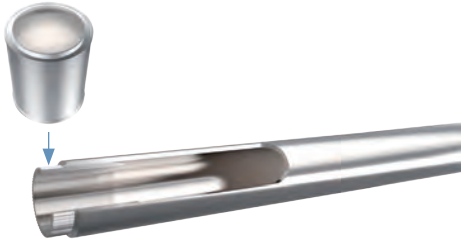
Attention!
If tubes are not cut off squarely or are not properly deburred, this may reduce the service life and leak-tightness of the couplings.

2.4 Assembly of VOSS reinforcing sleeves

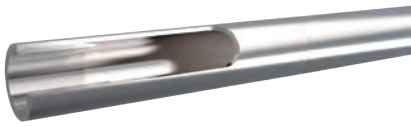
1. Lubricate the outside surface of the sleeve lightly using assembly paste (e.g. MPE assembly paste). Then insert the sleeve into the tube up to the knurled section.

2. Use a hammer (plastic or hard rubber) to drive the sleeve in totally. In doing so, the knurled section is pressed against the inner wall of the tube and prevents the sleeve from being displaced or falling out.





Sleeve inserted



Sleeve driven in firmly

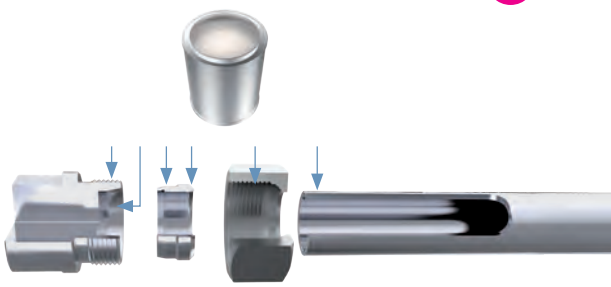
Series	Tube OD [mm]	Wall thickness [mm]						
		0.5	0.75	1	1.5	2	2.5	3
L	6	•	•					
L	8	•	•					
L	10	•	•					
L	12	•	•	•				
L	15	•	•	•				
L	18	•	•	•	•			
L	22	•	•	•	•	•		
L	28	•	•	•	•	•		
L	35	•	•	•	•	•	•	
L	42	•	•	•	•	•	•	
S	6	•	•					
S	8	•	•					
S	10	•	•					
S	12	•	•	•				
S	14	•	•	•				
S	16	•	•	•	•			
S	20	•	•	•	•	•		
S	25	•	•	•	•	•		
S	30	•	•	•	•	•	•	
S	38	•	•	•	•	•	•	•

3 Assembly preparation

3.1 To ensure correct pre-assembly, lubricate the pre-assembly stud, tube end, cutting ring, union nut and the cone surface with assembly paste (e.g. MPE assembly paste).

3.2 Push the union nut and the ES-4VA cutting ring onto the tube end.

Attention!
Make sure that the ES-4VA cutting ring is in the right position.



4 Assembly instructions

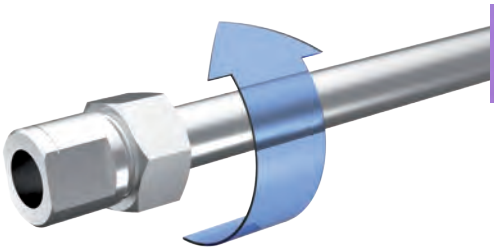
Hardened pre-assembly studs are wear-resistant, thus achieving consistent pre-assembly results. They have to be checked after approx. every 50 pre-assemblies for trueness of gauge.

Attention!
Pre-assembly studs that are not true to gauge or that are damaged in the taper section must be replaced immediately. All specified assembly distances must be adhered to. Otherwise there is a danger that the coupling will leak or that the tube will tear out of the coupling.



4.1 Insert the tube end into the 24° taper as far as it will go and press on it. The tube must be held in as far as it will go during the entire assembly process in order to avoid faulty assembly.

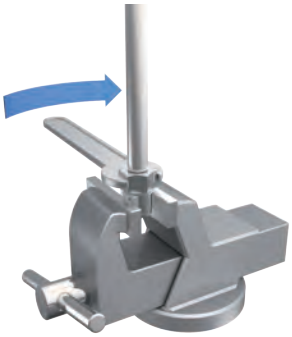
4.2 Push the pre-assembled tube end into the taper of the hardened manual pre-assembly stud and turn the union nut until it is hand-tight.



ES-4VA

4.3 Tighten union nut with approx. **1 1/4 turns** (min. 1 to max. 1 1/2 turns). This pushes the ES-4VA cutting ring against the end face of the stud.

Note:
Marking a stroke on the union nut and the tube makes it easier to achieve the correct number of turns.



approx. 1 1/4 turns

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5 Check results

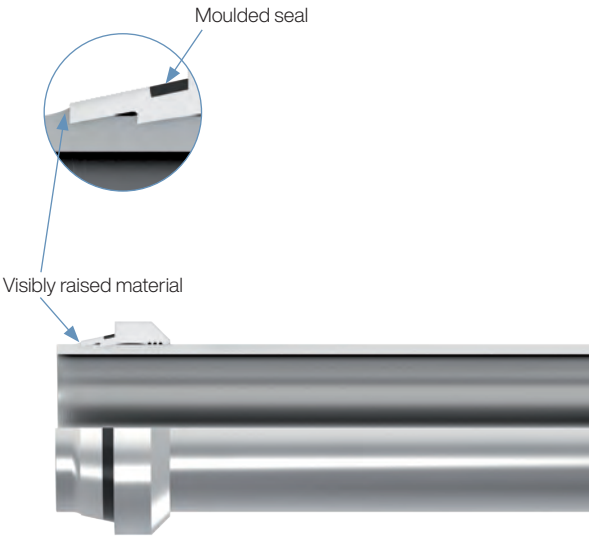
5.1 Unscrew the union nut, check the moulded seal, gap width and how much material has been pushed up. It is not possible to cut and raise as much material of stainless steel tubes as on normal steel tubes. However, a certain amount of raised material must be visible.

In this position, it is still permissible for the cutting ring to turn on the tube.

Attention!
The moulded seal must be undamaged. Remove possible soiling and replace the moulded seal if necessary.

If an inadequate amount of material is raised, repeat assembly with a higher torque. The results must be re-checked!

Note:
We recommend the use of the VOSS gauge to check the correct axial position of the cutting ring.



6 Final assembly

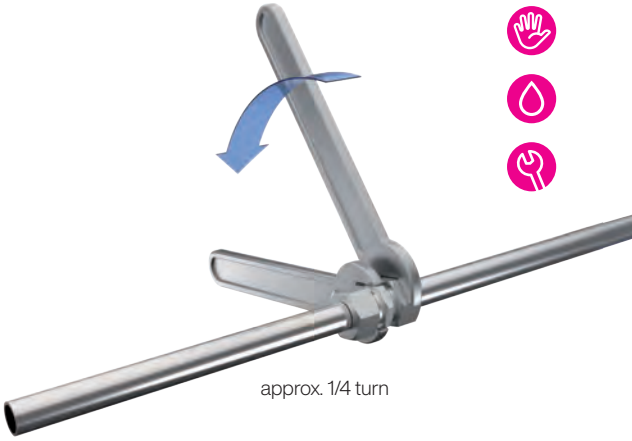
6.1 Lubricate the thread, the pre-assembled tube end, the union nut and the taper lightly with assembly paste (e.g. MPE assembly paste).

6.2 Insert the pre-assembled tube end carefully into the coupling connecting piece. When fitting the parts together, take care not to damage the moulded seal and ensure that it is seated in the seal groove correctly. Then turn the union nut until it is hand-tight.

6.3 Use a spanner to tighten the union nut until there is a noticeable force increase.

6.4 Tighten up further by approximately **1/4 turn.**

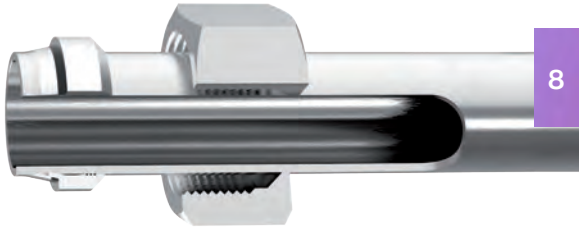
Attention!
When finally tightening up the coupling connecting piece, always hold it in a spanner or clamp it in a vise.



7 Repeat assembly

7.1 Each time the tube coupling is unscrewed, the moulded seal must be checked for damage and replaced if necessary.

7.2 For repeat assembly, the union nut must be tightened using the same force as for the original assembly.



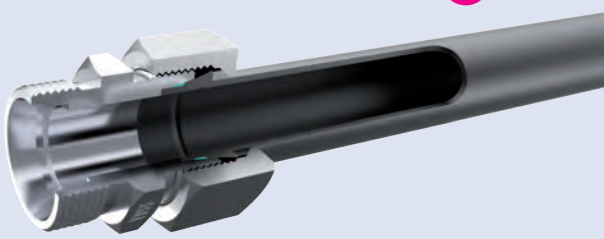
Assembly instructions VOSS*Form*^{SQR} tube couplings

1 Notes

Before starting the assembly work, read and observe the general notes in the latest VOSS catalogue and check that your assembly instructions are up to date.

These assembly instructions describe the tube forming and the final assembly of VOSS*Form*^{SQR}.

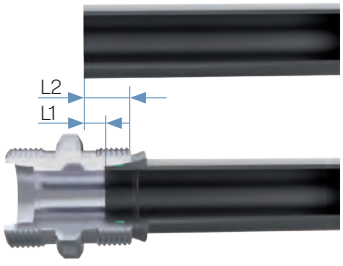
These assembly instructions are not a substitute for the detailed operating instructions of the forming device used. They only describe the basic tube preparation, forming and final assembly steps.



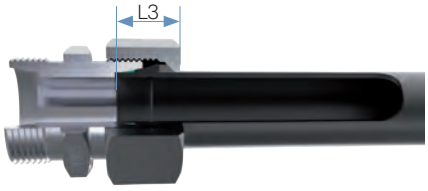
2 Tube preparation

2.1 When determining the tube lengths to be used, dimensions L1 and L2 have to be taken into consideration. The forming process compresses the tube and shortens it by the length L1.

In addition, the minimum lengths A1, A2 and B1, B2 required for clamping the tube ends have to be taken into consideration.

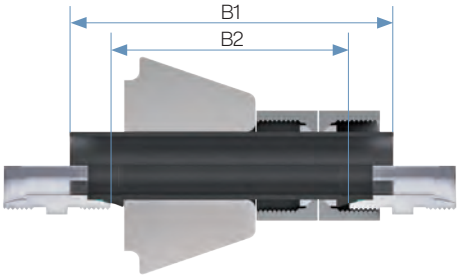


Height of the completely assembled VOSS*Form*^{SQR} connection

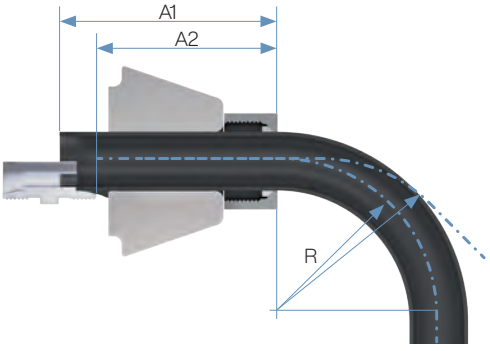


Series	Tube OD [mm]	s [mm]	L1 [mm]	L2 [mm]	L3 approx. [mm]	A1 [mm] R≥3xDN		A2 [mm] R≥3xDN		B1 [mm]	B2 [mm]
						α≤45°	α≤90°	α≤45°	α≤90°		
L	6	1	5.6	12.6	15.5	60	69	47	56	82	56
		1.5	6.0	13.0	16.0						
		2	5.3	12.3	16.0						
L	8	1	5.0	12.0	15.5	60	64	47	51	82	56
		1.5	5.7	12.7	16.0						
		2	5.2	12.2	16.0						
		2.5	4.4	11.4	16.0						
L	10	1	5.2	12.2	15.5	60	60	47	47	83	57
		1.5	5.8	12.8	16.0						
		2	5.1	12.1	16.0						
L	12	1	5.1	12.1	15.5	60	60	47	47	83	57
		1.5	5.8	12.8	16.0						
		2	4.9	11.9	16.0						
L	15	1.5	6.0	13.0	17.5	70	70	56	56	96	68
		2	5.6	12.6	17.5						
		2.5	5.3	12.3	17.5						
L	18	1.5	5.9	13.4	18.5	75	75	61	61	101	73
		2	5.3	12.8	18.5						
		2.5	5.1	12.6	18.5						
		3	5.1	12.6	18.5						
L	22	1.5	6.5	14.0	20.0	85	85	70	70	113	83
		2	5.6	13.1	20.0						
		2.5	5.4	12.9	20.0						
		3	5.3	12.8	20.0						
L	28	2	5.6	13.1	20.0	93	93	79	79	120	92
		2.5	5.4	12.9	20.0						
		3	5.5	13.0	20.0						
L	35	2	7.6	18.1	24.0	107	107	87	87	142	102
		2.5	7.0	17.5	24.0						
		3	7.5	18.0	25.0						
		4	7.2	17.7	25.0						
L	42	2	7.6	18.6	24.5	117	117	97	97	152	112
		2.5	7.0	18.0	24.5						
		3	7.4	18.4	25.5						
		4	7.0	18.0	25.5						

Minimum lengths for clamping in straight tubes



Minimum lengths for clamping in curved tubes
(R ≥ 3x Tube OD)



2.2 Cut the tube at a right angle and at least 10 mm away from the manufacturer's or supplier's cut. An angle tolerance of ±1° is permissible. Do not use tube cutters or angle grinders to cut tubes.





Series	Tube OD [mm]	s [mm]	L1 [mm]	L2 [mm]	L3 approx. [mm]	A1 [mm] R≥3xDN		A2 [mm] R≥3xDN		B1 [mm]	B2 [mm]
						α≤45°	α≤90°	α≤45°	α≤90°		
S	6	1	5.6	12.6	16.0	62	69	49	56	85	59
		1.5	6.0	13.0	16.5						
		2	5.3	12.3	16.5						
S	8	1	5.0	12.0	16.0	62	64	49	51	85	59
		1.5	5.7	12.7	16.5						
		2	5.2	12.2	16.5						
		2.5	4.4	11.4	16.5						
S	10	1.5	6.5	14.0	18.5	64	64	50	50	90	62
		2	5.9	13.4	18.5						
		2.5	5.2	12.7	18.5						
S	12	1.5	6.4	13.9	18.5	64	64	50	50	90	62
		2	5.7	13.2	18.5						
		2.5	5.2	12.7	18.5						
		3	4.9	12.4	18.5						
S	14	1.5	6.7	14.7	20.5	72	72	57	57	101	71
		2	6.3	14.3	20.5						
		2.5	5.8	13.8	20.5						
		3	5.7	13.7	20.5						
S	16	1.5	6.9	15.4	21.0	77	77	61	61	107	75
		2	6.1	14.6	21.0						
		2.5	5.7	14.2	21.0						
		3	5.5	14.0	21.0						
		4	5.2	13.7	21.5						
S	20	2	8.1	18.6	25.0	88	88	69	69	122	84
		2.5	7.2	17.7	25.0						
		3	6.8	17.3	25.0						
		3.5	6.6	17.1	25.0						
		4	6.4	16.9	25.0						
S	25	2	7.7	19.7	28.0	103	103	82	82	140	98
		2.5	7.3	19.3	28.0						
		3	7.0	19.0	28.0						
		4	6.6	18.6	28.0						
S	30	2	7.9	21.4	30.5	114	114	92	92	155	111
		2.5	7.3	20.8	30.5						
		3	8.1	21.6	31.5						
		4	7.6	21.1	31.5						
		5	7.3	20.8	31.5						
		6	7.0	20.5	32.0						
S	38	2.5	10.4	26.4	34.5	134	134	108	108	180	128
		3	9.1	25.1	34.5						
		4	9.2	25.2	35.5						
		5	9.1	25.1	35.5						
		6	9.0	25.0	35.5						
		7	9.0	25.0	36.0						

2.3 Slightly deburr tube ends inside and outside.
Clean the tube.

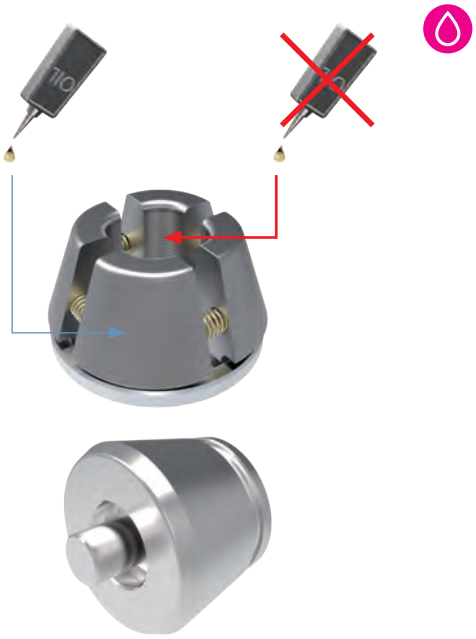


Attention!
Burrs on the outer and inner edges of the tube end can impair the forming process. Tubes which are not cut off squarely and correctly deburred reduce the service life and leak-tightness of the couplings.

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3 Lubricating tools and steel tubes

After every tool change and after roughly 100 forming procedures, the outer surfaces of the clamping jaws at the tapered section should be lightly lubricated using hydraulic fluid or a non-resinous lubricant containing MoS_2.

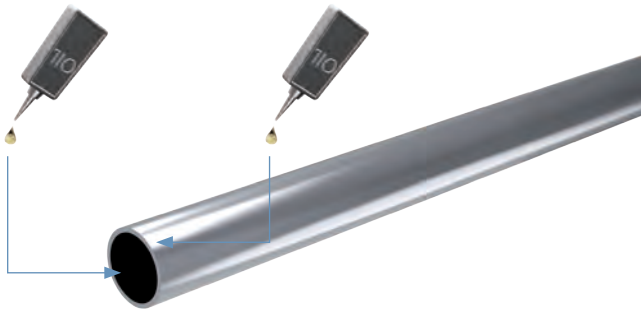


Attention!
Ensure that no oil is applied to the teeth of the clamping jaw, otherwise the gripping function may be impaired.

Lubricating phosphate-treated steel tubes:
In order to reduce tool wear, on approximately every tenth tube being processed, apply a thin film of hydraulic fluid to the internal and external surfaces of the tube section to be formed.

Lubricating zinc-plated steel tubes:
In order to reduce tool wear, on every tube being processed, apply a thin film of hydraulic fluid to the internal and external surfaces of the tube section to be formed.

Attention!
If the lubricant film on the outer perimeter of the tubing is too thick, it will be trapped by the forming process and lead to inaccurate contours.



4 Notes on tube forming

4.1 Prepare the tube forming device as described in the operating instructions and insert the tools.

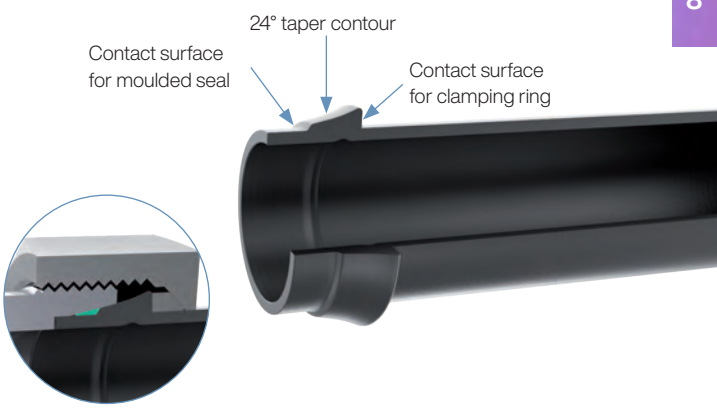
4.2 Push the SQR function nut onto the prepared tube end.

4.3 Form the tube as described in the operating instructions.



5 Check the results

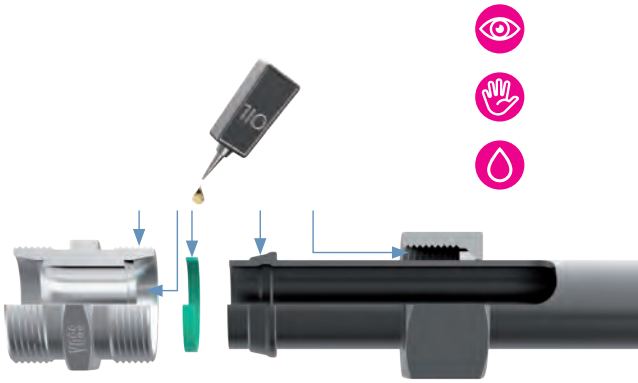
It is adequate to visually inspect the quality of the three characteristic VOSS*Form*^{SQR} features.



6 Final assembly

6.1 Install the moulded seal, ensuring that it is not twisted or damaged.

Push the pre-assembled tube end straight into the taper of the coupling connecting piece.



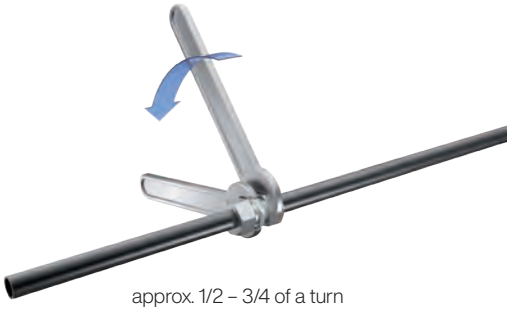
6.2 Lubricate the threads, the formed tube end and the moulded seal lightly (e.g. using mineral-oil based hydraulic fluid HLP32).

6.3 Turn union nut until it is hand-tight.

To achieve the final tightening torque, turn the SQR special function nut by approx. **1/2 to 3/4 of a turn.**

If the coupling is being installed on an already-installed tubing system, hold the coupling connecting piece with a spanner when tightening the coupling.

Marking a stroke on the SQR special function nut and the tube makes it easier to achieve the correct number of turns when tightening the coupling.



approx. 1/2 – 3/4 of a turn

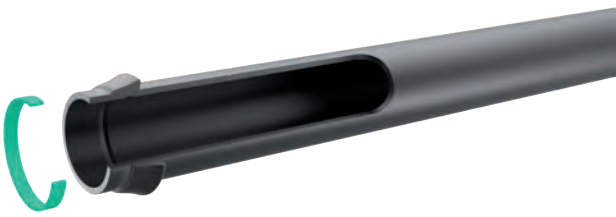
7 Re-assembly

7.1 Every time the tube connection is taken apart, the moulded seal must be checked for damage and, if necessary, replaced.

7.2 For re-assembly processes, the SQR function nut must be tightened by only **1/4 to 1/2 turn** after it has been hand-tightened.

Attention!

For re-assembling, the 24° taper contour, the moulded seal contact surfaces and the clamping ring must be checked for damage (see 5: Checking results).



8 Tightening torques

8.1 As an alternative to achieving pre-assembly and final assembly states by distance dependent assembly, the tightening torques can be applied directly. The stated tightening torques are guideline values which have been determined under the following conditions:

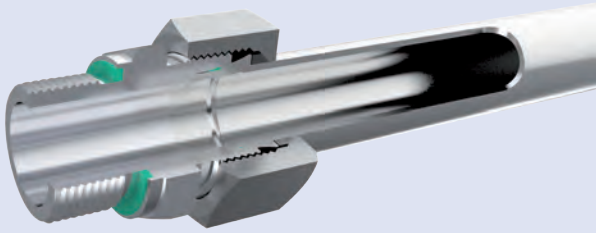
- Tube specifications as given in the general notes
- VOSS coat surface finish on all coupling components, additional wax coating on the SQR function nut.

Series	Tube OD [mm]	Tightening torque in Nm ±5 %
L	6	20
L	8	30
L	10	40
L	12	50
L	15	70
L	18	90
L	22	120
L	28	160
L	35	250
L	42	380
S	6	25
S	8	40
S	10	50
S	12	60
S	14	75
S	16	85
S	20	140
S	25	190
S	30	270
S	38	400

Assembly instructions VOSS*Form*^{SQR} VA tube couplings

1 Notes

Before starting the assembly work, read and observe the general notes in the latest VOSS catalogue and check that your assembly instructions are up to date.



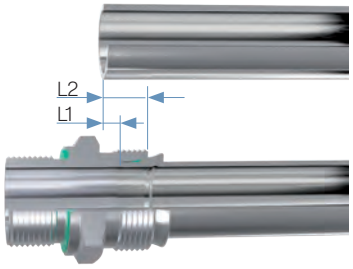
These assembly instructions describe the tube forming and the final assembly of VOSS*Form*^{SQR} VA.

These assembly instructions are not a substitute for the detailed operating instructions of the forming device used. They only describe the basic tube preparation, forming and final assembly steps.

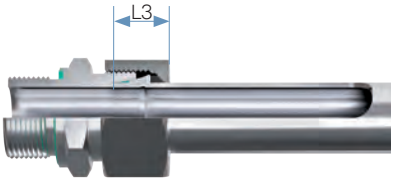
2 Tube preparation

2.1 When determining the tube lengths to be used, dimensions L1 and L2 have to be taken into consideration. The forming process compresses the tube and shortens it by the length L1.

In addition, the minimum lengths A1, A2 and B1, B2 required for clamping the tube ends have to be taken into consideration.

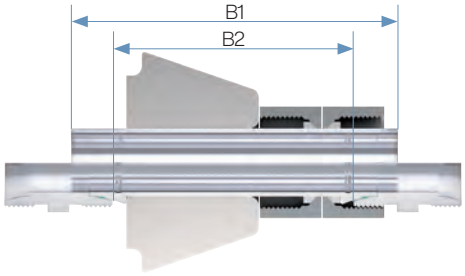


Height of the completely assembled VOSS*Form*^{SQR} VA connection

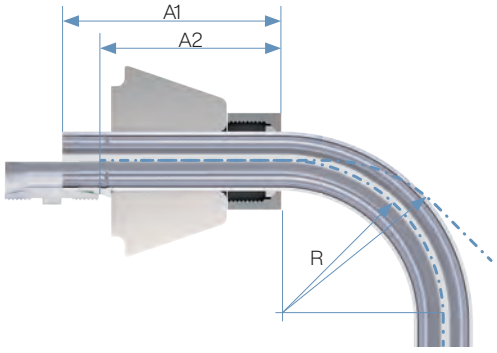


Series	Tube OD [mm]	s [mm]	L1 [mm]	L2 [mm]	L3 approx. [mm]	A1 [mm] R≥3xDN		A2 [mm] R≥3xDN		B1 [mm]	B2 [mm]
						α≤45°	α≤90°	α≤45°	α≤90°		
L	6	1	5.6	12.6	15.5	60	69	47	56	82	56
		1.5	6.1	13.1	16.0						
		2	5.5	12.5	16.0						
L	8	1	5.5	12.5	15.5	60	64	47	51	82	56
		1.5	5.7	12.7	16.0						
		2	5.2	12.2	16.0						
		2.5	4.7	11.7	16.0						
L	10	1	5.8	12.8	15.5	60	60	47	47	83	57
		1.5	6.0	13.0	16.0						
		2	5.2	12.2	16.0						
L	12	1	5.9	12.9	15.5	60	60	47	47	83	57
		1.5	5.7	12.7	16.0						
		2	5.1	12.1	16.0						
L	15	1.5	6.5	13.5	17.5	70	70	56	56	96	68
		2	5.8	12.8	17.5						
		2.5	5.6	12.6	17.5						
L	18	1.5	6.7	14.2	18.5	75	75	61	61	101	73
		2	5.8	13.3	18.5						
		2.5	5.5	13.0	18.5						
		3	5.8	13.3	18.5						
L	22	1.5	7.1	14.6	20.0	85	85	70	70	113	83
		2	6.6	14.1	20.0						
L	28	2	6.7	14.2	19.5	93	93	79	79	120	92
		2.5	6.2	13.7	19.5						
		3	6.3	13.8	19.5						
L	35	2	9.0	19.5	24.0	107	107	87	87	142	102
		2.5	8.1	18.6	24.0						
		3	8.6	19.1	25.0						
L	42	2	8.4	19.4	24.5	117	117	97	97	152	112
		3	8.6	19.6	25.5						
		4	7.2	17.7	25.0						

Minimum lengths for clamping in straight tubes

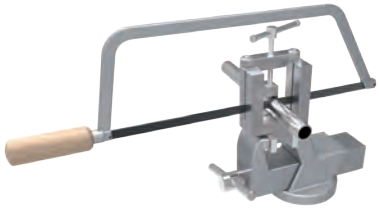


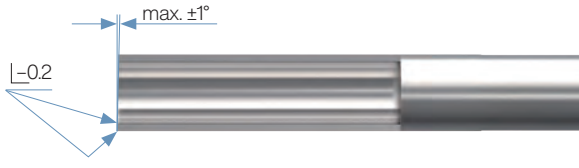
Minimum lengths for clamping in curved tubes
(R ≥ 3x tube OD)



Series	Tube OD [mm]	s [mm]	L1 [mm]	L2 [mm]	L3 approx. [mm]	A1 [mm] R≥3xDN		A2 [mm] R≥3xDN		B1 [mm]	B2 [mm]
						α≤45°	α≤90°	α≤45°	α≤90°		
S	6	1	5.6	12.6	16.0	62	69	49	56	85	59
		1.5	6.1	13.1	16.5						
		2	5.5	12.5	16.5						
S	8	1	5.5	12.5	16.0	62	64	49	51	85	59
		1.5	5.7	12.7	16.5						
		2	5.2	12.2	16.5						
		2.5	4.7	11.7	16.5						
S	10	1.5	6.7	14.2	18.5	64	64	50	50	90	62
		2	5.9	13.4	18.5						
		2.5	5.5	13.0	18.5						
S	12	1.5	6.3	13.8	18.5	64	64	50	50	90	62
		2	5.7	13.2	18.5						
		2.5	5.3	12.8	18.5						
		3	5.0	12.5	18.5						
S	14	1.5	6.7	14.7	20.5	72	72	57	57	101	71
		2	6.3	14.3	20.5						
		2.5	5.7	13.7	20.5						
		3	5.7	13.7	20.5						
S	16	1.5	7.2	15.7	21.0	77	77	61	61	107	75
		2	6.2	14.7	21.0						
		2.5	6.0	14.5	21.0						
		3	5.8	14.3	21.0						
S	20	2	8.5	19.0	25.0	88	88	69	69	122	84
		2.5	7.7	18.2	25.0						
		3	7.3	17.8	25.0						
S	25	2	8.7	20.7	28.0	103	103	82	82	140	98
		2.5	8.0	20.0	28.0						
		3	7.6	19.6	28.0						
		4	7.6	19.6	28.0						
S	30	2.5	8.1	21.6	30.5	114	114	92	92	155	111
		3	8.7	22.2	31.5						
		4	8.4	21.9	31.5						
S	38	3	10.3	26.3	34.5	134	134	108	108	180	128
		4	10.2	26.2	35.5						
		5	9.8	25.8	35.5						

2.2 Cut the tube at a right angle and at least 10 mm away from the manufacturer's or supplier's cut. An angle tolerance of ±1° is permissible. Do not use tube cutters or angle grinders to cut tubes.





2.3 Slightly deburr tube ends inside and outside.
Clean the tube.



Attention!
Burrs on the outer and inner edges of the tube end can impair the forming process. Tubes which are not cut off squarely and correctly deburred may reduce the service life and leak-tightness of the couplings.

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3 Lubricating tools and stainless steel tubes

3.1 Lubricating the tools



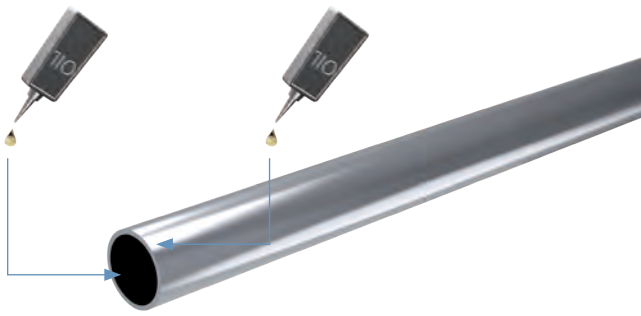
Clamping jaws:
After every tool change and after roughly 100 forming procedures, the outer part of the clamping jaw taper must be lightly lubricated using hydraulic fluid or a non-resinous lubricant containing MoS_2. VOSS recommends to use separate sets of clamping jaws if steel and stainless steel tubes are being used both at the same time.

Attention!
Ensure that no oil is applied to the teeth of the clamping jaw, otherwise the gripping function may be impaired.

3.2 Lubricating the stainless steel tubes

To ensure fault-free forming, each tube must be lubricated on the inside and outside in the forming area with a thin film of oil. (VOSS forming oil FOE).

Attention!
If the lubricant film on the outer tubing surface is too thick, it will be trapped between the forming tool and the tube, thus leading to inaccurate contours. Always use VOSS forming oil FOE. (The use of normal hydraulic oil is not allowed).



4 Notes on tube forming

4.1 Prepare the tube forming device as described in the operating instructions and insert the tools.

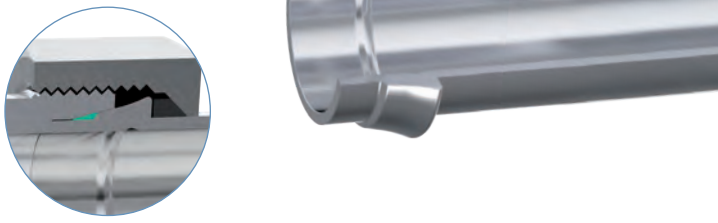
4.2 Push the SQR function nut onto the prepared tube end.

4.3 Form the tube as described in the operating instructions.



5 Checking the results

It is adequate to visually inspect the quality of the three characteristic VOSS*Form*^{SQR} features.



6 Final assembly

6.1 Install the moulded seal, ensuring that it is not twisted or damaged.

Push the pre-assembled tube end straight into the taper of the coupling connecting piece.

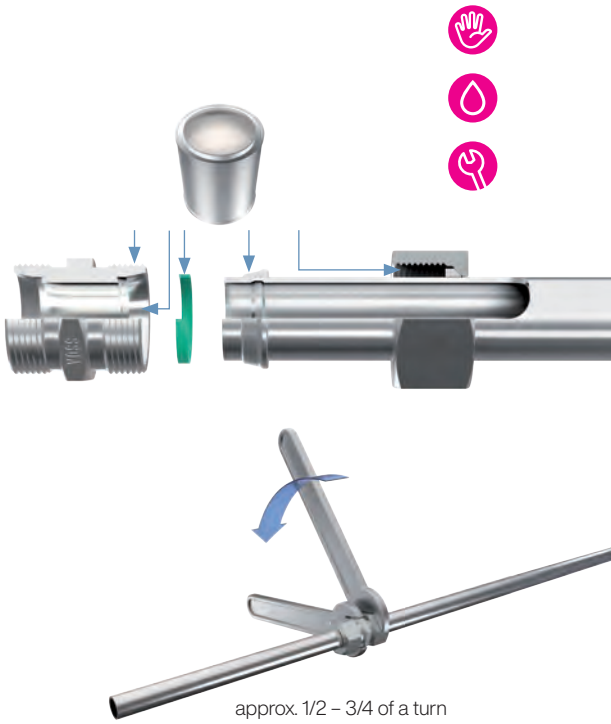
6.2 Apply a light film of assembly paste (e.g. MPE assembly paste) to the threads, the formed tube end, the SQR special function nut and the moulded seal.

6.3 Turn the SQR special function nut until it is hand-tight.

To achieve the final tightening torque, turn the SQR special function nut by approx. **1/2 to 3/4 of a turn.**

If the coupling is being installed on an already-installed tubing system, hold the coupling connecting piece with a spanner when tightening the coupling.

Marking a stroke on the SQR function nut and the tube makes it easier to achieve the correct number of turns when tightening the coupling.



approx. 1/2 – 3/4 of a turn

7 Re-assembly

7.1 Every time the tube connection is taken apart, the moulded seal must be checked for damage and, if necessary, replaced.

7.2 For re-assembly processes, the SQR function nut must be tightened by only **1/4 to 1/2 turn** after it has been hand-tightened.

Attention!
Before re-assembling, the 24° taper contour, the moulded seal contact surfaces and the clamping ring must be checked for damage (see 5: Checking results).



8 Tightening torques

8.1 As an alternative to achieving pre-assembly and final assembly states by distance dependent assembly, the tightening torques are guideline values which have been determined using MPE assembly paste.

Tube specifications as given in the general notes.

Series	Tube OD [mm]	Tightening torque Nm ±5 %
L	6	25
L	8	35
L	10	55
L	12	65
L	15	90
L	18	125
L	22	150
L	28	220
L	35	380
L	42	580
S	6	30
S	8	50
S	10	65
S	12	85
S	14	115
S	16	125
S	20	220
S	25	300
S	30	430
S	38	640

Assembly instructions BV-10 flared couplings

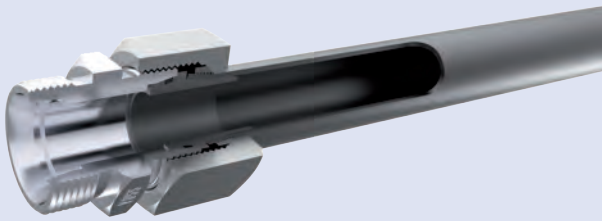
1 Notes

Before starting the assembly work, read and observe the general notes in the latest VOSS catalogue and check that your assembly instructions are up to date.

These assembly instructions describe pre-assembly and final assembly of BV-10 flared couplings.

Attention!

Various VOSS pre-assembly devices are available for pre-assembly of the flared cone. The specifications in the respective operating instructions apply to the assembly procedures here.

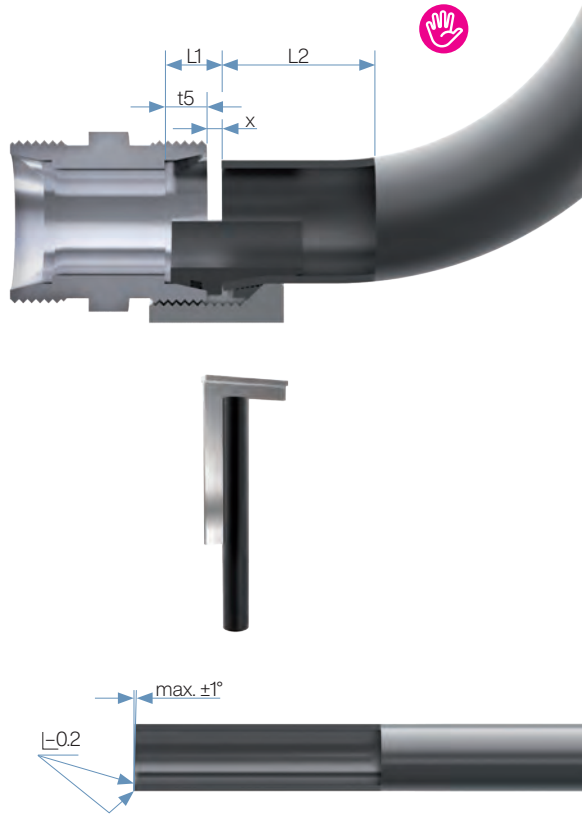


2 Tube preparation

2.1 Determine the tubing dimensions using the following table of dimensions.

Series	Tube OD[mm]	t5 [mm]	x approx. [mm]	L1 approx. [mm]	L2 approx. [mm]
L	6	7	0.8	7.8	55
L	8	7	1.1	8.1	55
L	10	7	0.5	7.5	60
L	12	7	0.5	7.5	62
L	15	7	0.5	7.5	62
L	18	7.5	1.5	9	63
L	22	7.5	1.5	9	65
L	28	7.5	1.5	9	72
L	35	10.5	2.8	13.3	75
L	42	11	3	14	75
S	8	7	2.4	9.4	55
S	10	7.5	2.4	9.9	60
S	12	7.5	2.4	9.9	60
S	14	8	3.4	11.4	65
S	16	8.5	2.5	11	65
S	20	10.5	3.5	14	70
S	25	12	3.5	15.5	75
S	30	13.5	4.5	18	75
S	38	16	5	21	78

2.2 Cut the tube at a right angle and at least 10 mm away from the manufacturer's or supplier's cut. An angle tolerance of ±1° is permissible. Do not use tube cutters or angle grinders to cut tubes. Slightly deburr tube end inside and outside. Clean the tube.



3 Flared cone pre-assembly

3.1 Push the BV-10 union nut and the clamping ring onto the tube as shown in the diagram.



3.2 Pre-assembly principle

Only use a VOSS pre-assembly device for this process. During the pre-assembly the BV-10 flared cone is pressed into the tube.

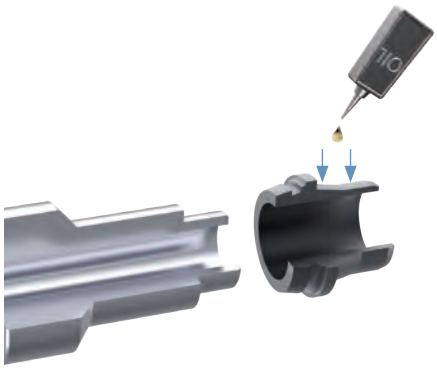
Attention!
Set up the pre-assembly device and tools as described in the corresponding operating instructions. The outer diameter and wall thickness of the tube must be observed when choosing which tools to use.

Pre-assemble the coupling as described in the operating instructions.





3.3 Apply a light film of lubricant (e.g. mineral-oil based hydraulic fluid HLP32) to the toothed section and the cylindrical collar of the BV-10 flared cone and then push this onto the assembly mandrel.

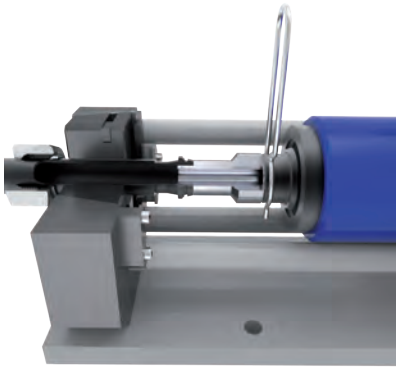


BV-10

3.4 Push the tube, with the BV-10 union nut and clamping ring on it, from the outside into the hole of the clamping jaws until it is centered on the BV-10 flared cone.

The BV-10 union nut and clamping ring must remain outside of the assembly area.

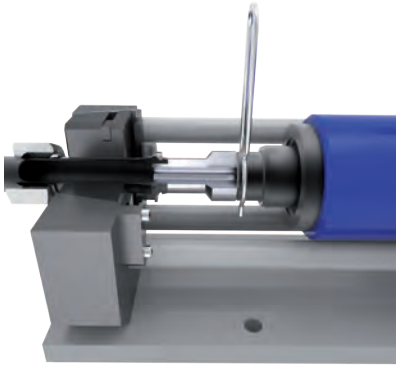
Attention!
Make sure the correct clamping jaw pressure is set. The tube must not be able to slip when the assembly process is started. Follow the relevant sections of the operating instructions for the respective pre-assembly device.



3.5 Press the BV-10 flared cone into the tube.

The optimum flared-cone assembly position is achieved when the remaining gap is ≥ 0.5 mm but not more than 1 mm.

Attention!
The BV-10 flared cone must not touch the flat surfaces of the tube end.

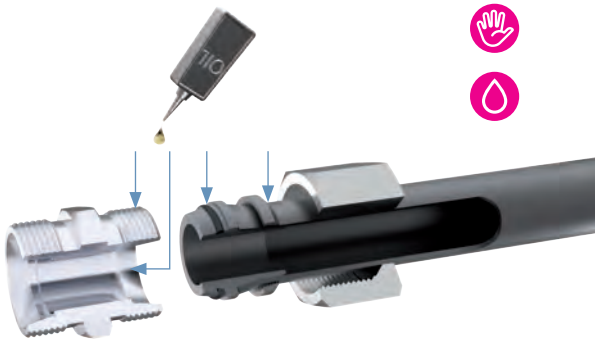


3.6 Check that the flared cone fits squarely.



4 Final assembly

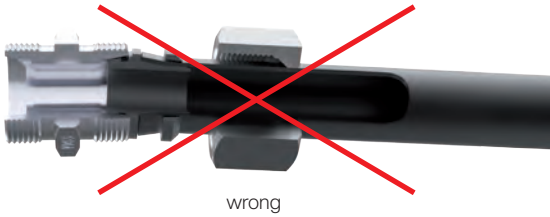
4.1 Push the O-ring on and check that it is bedded in the groove of the flared cone without being twisted. Lubricate the threads, the taper surface and the BV-10 union nut lightly (e.g. using mineral-oil based hydraulic fluid HLP32).



4.2 Insert the pre-assembled tube end into the cone of the coupling connecting piece at a straight angle.

Attention!

Make sure the O-ring is not damaged. Ensure a tensionfree connection of the pre-assembled tube and the coupling connecting piece.

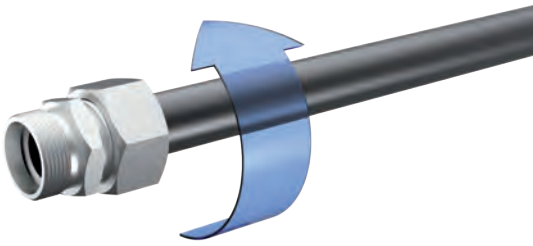


wrong



correct

4.3 Turn the BV-10 union nut until it is hand-tight.



BV-10

4.4 Tighten up the coupling by turning the BV-10 union nut by approx. **3/4 – 1 full turn.**

If the coupling is being installed on an already-installed tubing system, hold the coupling connecting piece with a spanner when tightening the coupling.



approx. 3/4 – 1 turn

---

5 Re-assembly

Each time the BV-10 flared cone is unscrewed, the O-ring must be checked for damage and replaced if necessary.

For re-assembly processes, the BV-10 union nut must be tightened by only **1/4 – 1/2 turn** after it has been hand-tightened.



approx. 1/4 – 1/2 turn

Assembly instructions Tapper (DKO) and weld nipple

1 Notes

Before starting the assembly work, read and observe the general notes in the latest VOSS catalogue and check that your assembly instructions are up to date.

These assembly instructions describe the assembly of VOSS couplings and coupling parts with taper coupling (DKO) according to ISO 8434-1.

Attention!

When the tube coupling is being connected, the DKO coupling must always be held with a spanner to counter tightening torques.



2 Assembly of the taper coupling

Assembly procedure

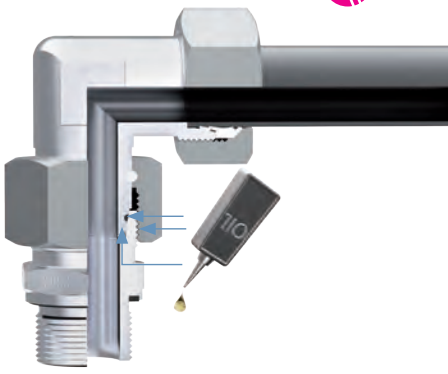
1. Check that the O-ring is not twisted and that it is bedded correctly in the groove of the taper.
2. Lubricate the threads, the cone surface and the O-ring lightly (e.g. using mineral-oil based hydraulic fluid HLP32).
3. Keeping the taper aligned, insert it into the cone and press it in firmly.

Attention!

After this step, no further alignment correction is allowed.

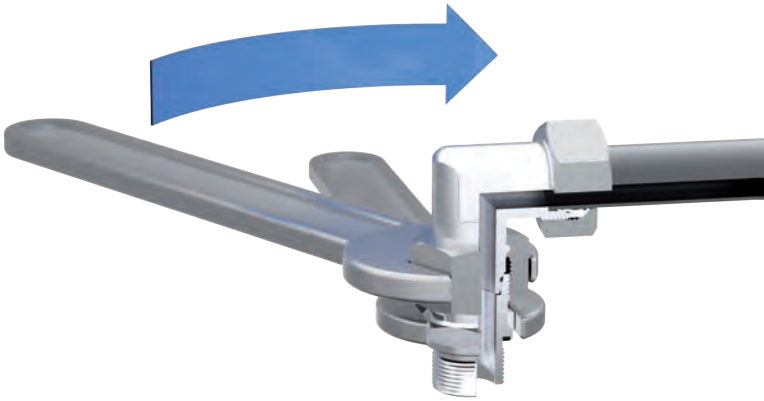
4. Turn the union nut until it is hand-tight.
5. Then use a spanner to finally tighten up the coupling by distance dependent assembly.

Marking a stroke on the DKO union nut and the coupling connecting piece makes it easier to achieve the correct number of turns when tightening the coupling.



DKO and weld nipples

Attention!
The DKO coupling must be tightened by turning the union nut, not the counter connecting piece.



3 Assembly parameters

As an alternative to achieving pre-assembly and final assembly states by distance dependent assembly, the tightening torques can be applied directly. The stated tightening torques are guideline values which have been determined under the following conditions:

Series	Tube OD [mm]	Union nut thread	Number of turns, first assembly	Number of turns, re-assembly	Tightening torque [Nm] ±5 %
L	6	M 12 x 1.5	approx. 2/3	approx. 1/3	20
L	8	M 14 x 1.5	approx. 2/3	approx. 1/3	30
L	10	M 16 x 1.5	approx. 2/3	approx. 1/3	40
L	12	M 18 x 1.5	approx. 2/3	approx. 1/3	50
L	15	M 22 x 1.5	approx. 2/3	approx. 1/3	70
L	18	M 26 x 1.5	approx. 1/2	approx. 1/3	90
L	22	M 30 x 2	approx. 1/2	approx. 1/3	120
L	28	M 36 x 2	approx. 1/3	approx. 1/3	160
L	35	M 45 x 2	approx. 1/3	approx. 1/3	250
L	42	M 52 x 2	approx. 1/3	approx. 1/4	380
S	6	M 14 x 1.5	approx. 2/3	approx. 1/3	25
S	8	M 16 x 1.5	approx. 2/3	approx. 1/3	40
S	10	M 18 x 1.5	approx. 2/3	approx. 1/3	50
S	12	M 20 x 1.5	approx. 2/3	approx. 1/3	60
S	16	M 24 x 1.5	approx. 1/2	approx. 1/3	85
S	20	M 30 x 2	approx. 1/2	approx. 1/3	140
S	25	M 36 x 2	approx. 1/3	approx. 1/4	190
S	30	M 42 x 2	approx. 1/3	approx. 1/4	270
S	38	M 52 x 2	approx. 1/3	approx. 1/4	400

4 Assembly of weld nipple couplings



4.1 General notes

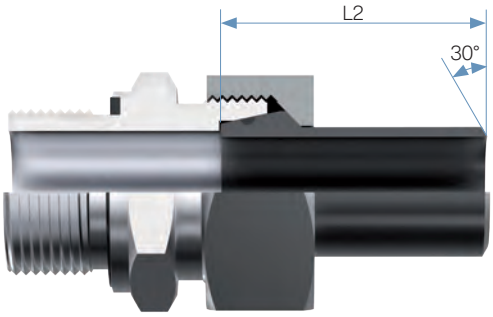
Weld nipples can be used with any tube coupling conforming to ISO 8434-1.

The weld nipples are phosphated and designed with a V-seam when delivered.

The weld nipples are welded on to the prepared tube end without the O-ring.

The user (installation company) is responsible for the welding work.

4.2 Determining the tube length



Series	Tube OD [mm]	L2
L	6	31.5
L	8	31.5
L	10	33.5
L	12	33.5
L	15	34.5
L	18	37
L	22	39.5
L	28	42.5
L	35	49.5
L	42	50
S	6	31.5
S	8	31.5
S	10	33.5
S	12	33.5
S	14	39.5
S	16	41
S	20	47
S	25	53.5
S	30	57
S	38	64

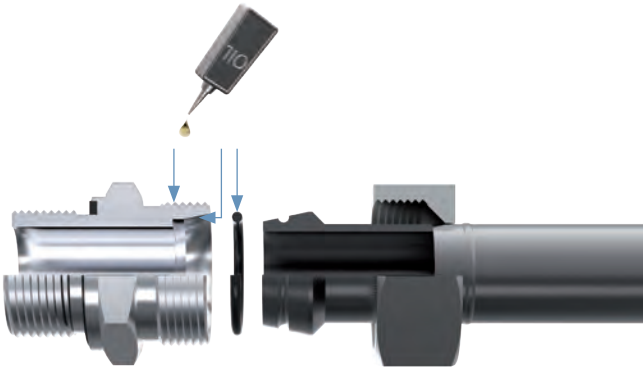


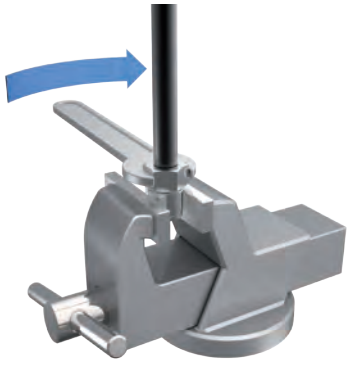
DKO and weld nipples

4.3 Assembly procedure

The principle of final assembly of weld nipple couplings is the same as for taper couplings.

1. Push the O-ring on and check that it is bedded in the groove of the taper without being twisted.
2. Lubricate the threads, the taper surface and the O-ring lightly (e.g. using mineral-oil based hydraulic fluid HLP32).
3. Insert the taper into the cone and press it in firmly. Turn the union nut until it is hand-tight.
4. To complete the assembly, turn the nut by approx. **1/4 turn.**





approx. 1/4 turn

Assembly instructions Flange couplings/ZAKO

1 Note

Before starting the assembly work, read and observe the general notes in the latest VOSS catalogue and check that your assembly instructions are up to date.



The ZAKO flange coupling product range is designed for use in tubings with outer diameters ranging from 16 mm to 114.3 mm. Flanges with a SAE hole pattern and square flanges can be used.

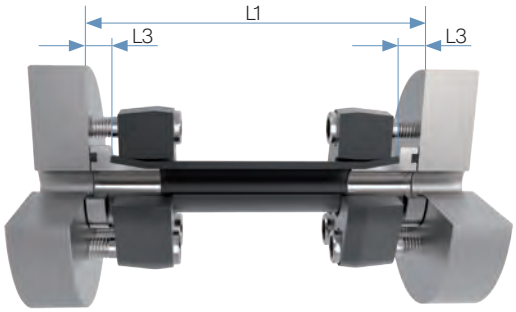
Different pre-assembly devices are available for the ZAKO ring assembly, depending on the tube dimensions. In each case, the descriptions given in the relevant individual operating instructions apply to the assembly procedures.

2 Tube preparation

2.1 Tube lengths for connecting flanges:
The first step in determining the required tube length is to calculate the theoretical total tube length L1. After this, the length L3 must be subtracted from the total tube length for each connection used (see table for length L3).

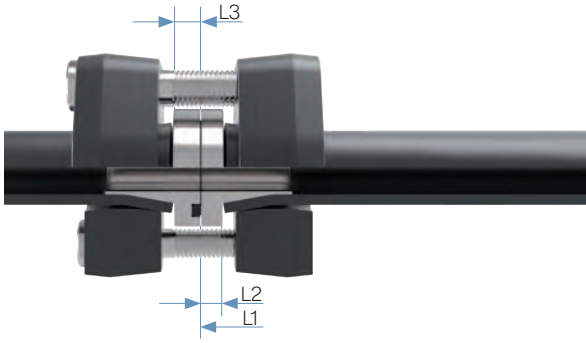
Tube OD [mm]	Connecting flange L3 approx. [mm]
ZAKO	
16	8
20	8
25	8.5
30	8.5
38/42	9
50	10
60	15
65	11
75	16
80	16
88	20
101.6	20
114.3	20

Tube OD [mm]	Coupling flange L3 approx. [mm]	L2 approx. [mm]
ZAKO		
16	8	5.5
20	8	5.5
25	8.5	5.5
30	8.5	6
38	9	7
50	10	7
60	15	12
65	11	8
75	16	12
80	16	13
88	20	16
101.6	20	16
114.3	20	16

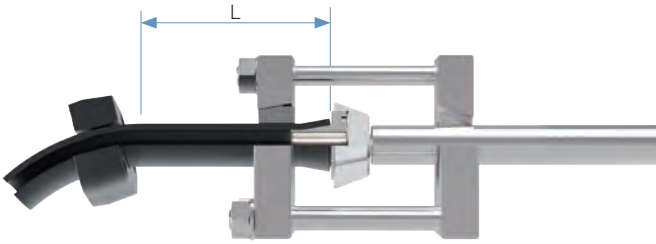


ZAKO

2.2 Tube lengths for coupling flanges:
To determine the tube lengths of coupling flanges the tube lengths L3 applies to the connecting surface of the ZAKO ring with O-ring. If the connecting surface of the ZAKO ring without O-ring is required, length L2 must be taken into account.



2.3 Compliance with straight tube length:
To assemble the ZAKO rings, a minimum tube length (L) of the straight tube end must be taken into account with curved tubing. Please observe the specifications in the operating instructions of the pre-assembly tools.



2.4 Preparing the tube ends:
Cut the tube at a right angle and at least 10 mm away from the manufacturer's or supplier's cut. An angle tolerance of ±1° is permissible.



Do not use tube cutters or angle grinders to cut tubes.

Deburr the inner and outer edges of the tube ends. For an optimal function, it is recommended that the outer edges of the tube ends are deburred only slightly and the inner edges more extensively.



The tube ends must be undamaged both internally and externally and free of metal chips, dirt, rust and other contamination.

3 Principle of the ZAKO ring pre-assembly

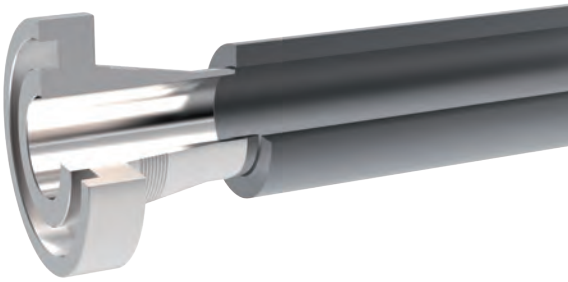
3.1 Push the ZAKO flange onto the tube with the toothed conical section of the hole pointing towards the tube end.



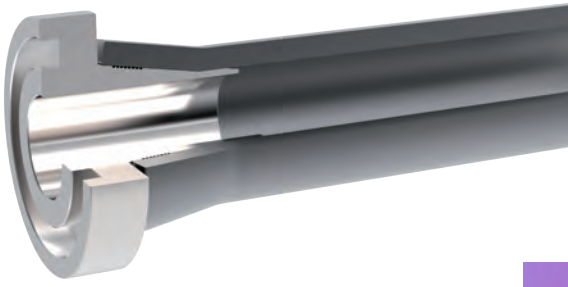
3.2 Pre-assembly principle

The pre-assembly procedure shown here is carried out using the VOSS pre-assembly device. Pre-assembly involves pressing the ZAKO ring into the tube.

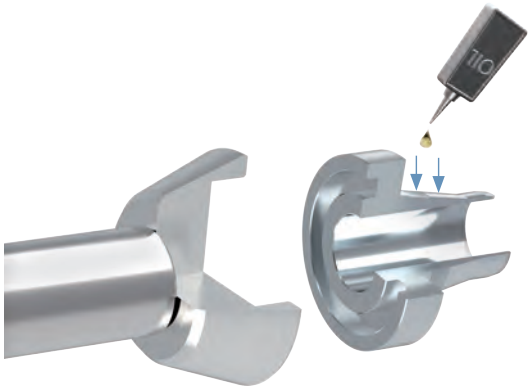
Attention!
Set up the pre-assembly device and tools as described in the corresponding operating instructions. The tube's outer diameter and wall thickness must be taken into account when choosing what tools to use.



Pre-assemble the coupling as described in the operating instructions.



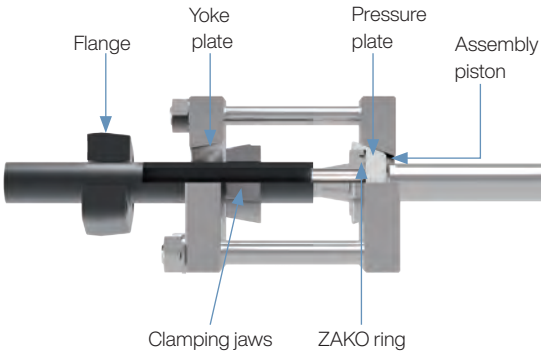
3.3 To reduce the assembly forces, lubricate the conical and cylindrical sections of the ZAKO ring generously (e.g. using mineral-oil based hydraulic fluid HLP32).



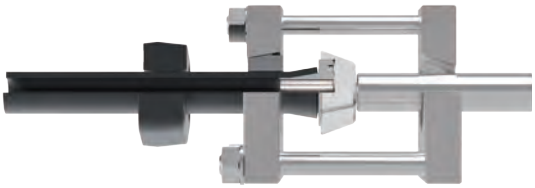
ZAKO

3.4 Push the tube through the opening of the yoke plate of the pre-assembly device and, while doing so, press the ZAKO ring against the pressure plate. Now clamp the clamping jaws around the tube. Push the clamping jaws along the tube until they are in the conical opening of the yoke plate.

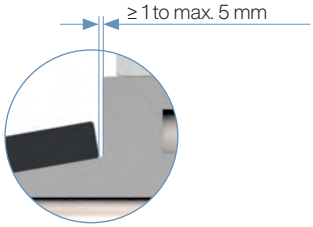
The ZAKO ring must remain outside the assembly section of the tube.



3.5 Start the assembly process as described in the pre-assembly device operating instructions. The piston stroke pushes the ZAKO ring into the tube until the remaining gap is between ≥1 mm and 5 mm wide (see table).



Attention!
During the pre-assembly process the tube end must not come into contact with the ZAKO ring. The remaining gap must adhere to the specified widths.



Tube wall thickness	Gap width
< 8 mm	≥ 1 to 1.5 mm
8 mm < 16 mm	max. 3 mm
16 mm	max. 5 mm

4 Final assembly of the flange connection

4.1 Clean the seal groove of the ZAKO ring and place the O-ring carefully into the groove, making sure it is not twisted.

4.2 Lubricate the threads of the screws (e.g. using mineral-oil based hydraulic fluid HLP32).



4.3 Press the pre-assembled flange connection onto the surface to which it is to be bolted and screw it on hand-tight. The tube must be stress-free and at right angles to the screw-on surface.

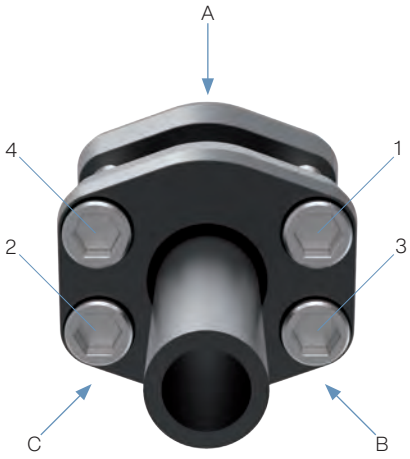
4.4 Then carefully tighten the securing screws diagonally and evenly in several steps using a wrench. The flange must be parallel to the connection surface. Should the deviation from parallel during checking (measure at all three points A, B and C) be greater than 0.5 mm, a correction must be made.

Attention!
Do not use pneumatic wrenches.

4.5 The final assembly is concluded by alternately tightening up the diagonally opposed pairs of the 4 screws.

Attention!
Do not exceed the allowed tightening torques specified for the screws (see table).

In the course of final assembly, the ZAKO ring may be pulled towards the tube end. It is possible that the gap will then be closed (see item 3.4).



Dimension [mm]	Screw tightening torque: 10.9 [Nm max.]*
ZAKO	
M 8	35
M 10	69
M 12	120
M 14	190
M 16	295
M 20	580
M 24	800
M 30	1,500

* Nm = recommended final tightening torque for cylindrical screws M 8 – M 30 for a total coefficient of friction of 0.14µ

5 Final assembly of the flange coupling

Note that one of the ZAKO rings used must be a ZAKO ring without a seal groove.

5.1 Clean the seal groove of the ZAKO ring and place the O-ring carefully into the groove, making sure it is not twisted.

5.2 Lubricate the threads of the screws (e.g. using mineral-oil based hydraulic fluid HLP32).

5.3 Align the tube ends with the pre-assembled ZAKO rings, fit them together and screw in the connecting screws by hand. The tubes must be perfectly aligned and must not be under tension.

5.4 Then tighten up the screws manually, alternating diagonally opposed pairs, in several stages. Ensure that the flanges are parallel to one another. Correct the screw tension if measurements (to be taken at all three points A, B and C) show a deviation of more than 1 mm from the parallel.

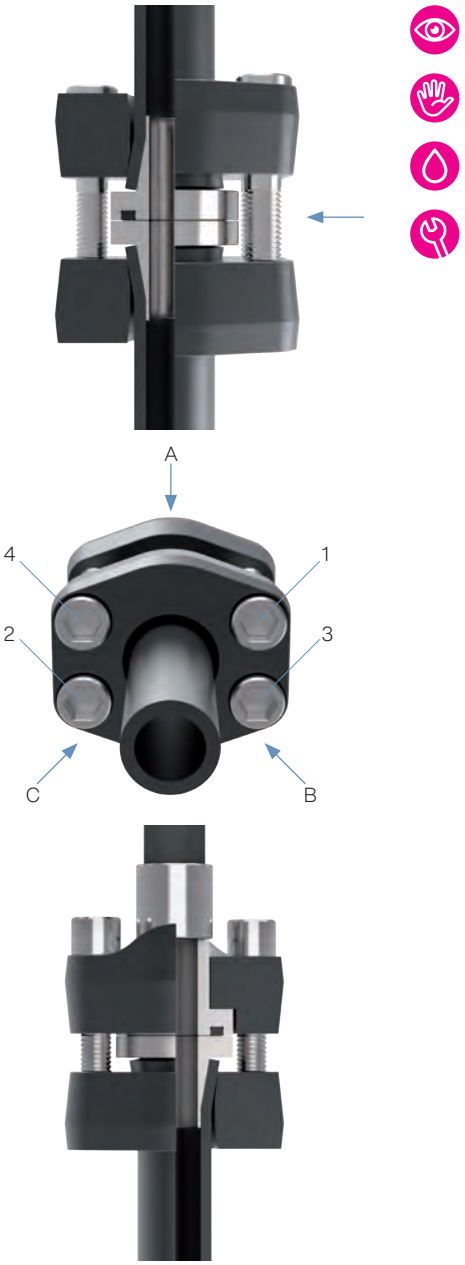
Attention!
Do not use pneumatic wrenches.

5.5 The final assembly is concluded by alternately tightening up the diagonally opposed pairs of the four screws.

Attention!
Do not exceed the allowed tightening torques specified for the screws (see table).

In the course of final assembly, the ZAKO ring may be pulled against the tube end. It is possible that the gap will be closed (see item 3.4).

5.6 The same notes also apply to the ZAKO flange couplings for SAE hose connections (see illustration).



6 Re-assembly

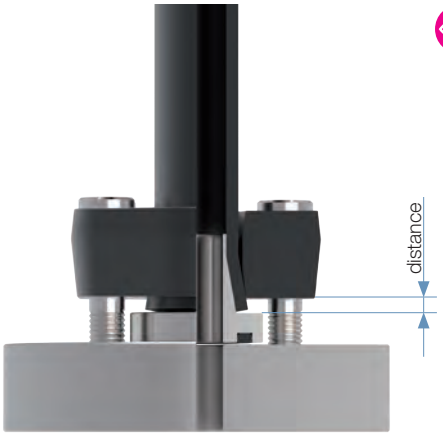
Clean the seal groove of the ZAKO ring, inspect the condition of the O-ring and then put it back into the groove carefully, making sure it is not twisted.

ZAKO flanges are easy to re-assemble. Follow all the final assembly instruction steps when re-assembling a flange connection.

---

7 Notes on subsequent inspections

Should setting make it necessary to retighten the screws, the flange plate can be pulled up to 1 mm before the ZAKO ring while taking the parallel.



Assembly instructions
Flange couplings with cutting ring

1 Notes

Before starting the assembly work, read and observe the general notes in the latest VOSS catalogue and check that your assembly instructions are up to date.

Pre-assembly and tube assembly processes for cutting ring connections are the same as described for tube couplings (see the instructions for the corresponding coupling variants).

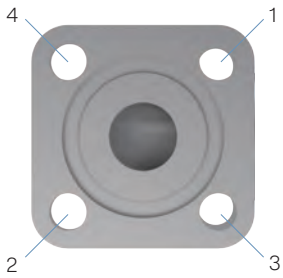


2 Assembly of square flange couplings with cutting ring or flared connection

Assembly of flange connecting pieces

Lubricate the O-ring and hexagon socket screws lightly (e.g. using mineral-oil based hydraulic fluid HLP32).

Clean the seal groove in the flange connecting piece and carefully place the O-ring into it, then use the four cylindrical screws and spring washers to join the flange by alternatingly tightening the diagonally opposed pairs of screws, taking care not to exceed the specified torque.



Tightening torques

Screw ISO 4762-8.8 [1]	Tightening torque Nm* –10 %
M 6	10
M 8	25

* Nm = recommended final tightening torque for cylindrical screws M 6 – M 8 for a total coefficient of friction of 0.14µ

Assemble the tube connection as described in the corresponding VOSS assembly instructions.

[1] ISO 4762-8.8 (formerly DIN 912-8.8)



Flanges

3 Assembly of SAE flange couplings

Assembly of flange connecting pieces
Lubricate the O-ring and hexagon socket screws lightly (e.g. using mineral-oil based hydraulic fluid HLP32).

Clean the seal groove in the flange connecting piece and carefully place the O-ring into it, then use the four screws and spring washers to join the flange halves by alternatingly tightening the diagonally opposed pairs of screws, taking care not to exceed the specified torque.

Tightening torque

Screw ISO 4762-10.9 [1]	Tightening torque Nm* –10 %
M 8	25
M 10	50
M 12	85
M 14	135
M 16	210

* Nm = recommended final tightening torque for cylindrical screws M 8 – M 16 for a total coefficient of friction of 0.14µ

[1] ISO 4762-10.9 (formerly DIN 912-10.9)





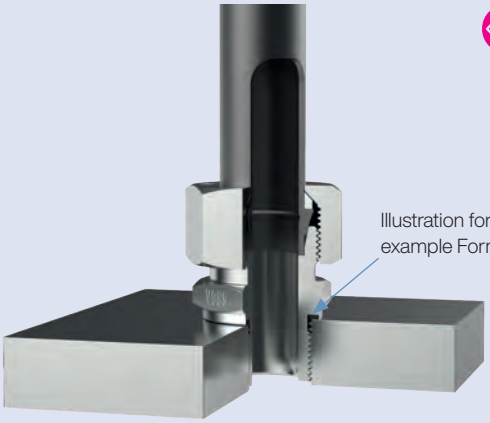
Assembly instructions Male stud connectors

Form A, B and E

1 Notes

Follow the general information in the catalogue before starting assembly and check that the assembly instructions are up to date!

These assembly instructions describe the assembly of male stud connectors Form A, B and E with cylindrical (metric/BSPP) tube thread.



2 Order of assembly

1. Check the male thread and soft-sealing for any damage. Replace components if necessary.

1.1 When using male stud connectors with flat face sealing (form A), mount the copper sealing ring.

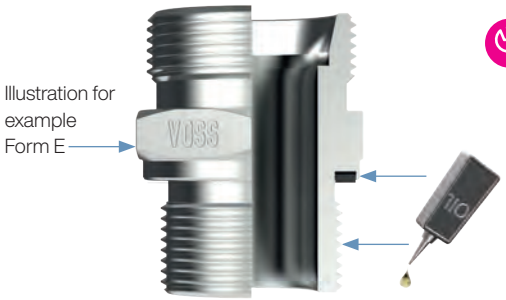
2. Lubricate the thread.

2.1 Sealing with flat-face (Form A) or with sealing edge (Form B): Lightly lubricate the male thread with mineral-oil based hydraulic oil (for example HLP32)!

2.2 Sealing via PEFLEX (Form E): Lightly lubricate the male thread and soft-sealing with mineral-oil based hydraulic oil (for example HLP32)!

3. Tighten the male stud connector in the threaded hole by hand.

4. Tighten the male stud connector according to the following table using the torque wrench.



Male stud connectors Form A, B and E

Male thread size metric	Male stud connector to					
	DIN 3852-1		DIN 3852-1 ISO 9974-3		ISO 9974-2	
	Form A Sealing ring e.g. copper sealing ring		Form B Sealing edge		Form E PEFLEX seal Standard NBR	
	Tightening torque Nm –10 %		Tightening torque Nm –10 %		Tightening torque Nm –10 %	
	Series L	Series S	Series L	Series S	Series L	Series S
M 8 x 1			14			
M 10 x 1	20		25		15	
M 12 x 1					25	
M 12 x 1.5	30	30	35	60	25	50
M 14 x 1.5	50	50	55	90	50	60
M 16 x 1.5	90		80	120	70	80
M 18 x 1.5	100	100	100	190	90	90
M 20 x 1.5				280		130
M 22 x 1.5	110		170	300	130	130
M 26 x 1.5	130		230		180	190
M 27 x 2	150			420	180	200
M 33 x 2	350		400	600	230	250
M 42 x 2	550		700	700	330	500
M 48 x 2			900	900	500	600

Male thread size BSPP	Male stud connector to					
	DIN 3852-2		ISO 1179-4		ISO 1179-2	
	Form A Sealing ring e.g. copper sealing ring		Form B Sealing edge		Form E PEFLEX seal Standard NBR	
	Tightening torque Nm –10 %		Tightening torque Nm –10 %		Tightening torque Nm –10 %	
	Series L	Series S	Series L	Series S	Series L	Series S
G 1/8 A	20	20	25		20	
G 1/4 A	45	45	55	95	50	60
G 3/8 A	80	80	95	180	80	90
G 1/2 A	90	90	185	160	100	150
G 3/4 A	220	220	250	350	180	200
G 1 A	350	350	400	700	230	250
G 1 1/4 A	400	400	670	850	330	500
G 1 1/2 A	700	700	800	1.000	500	600



Illustration for example Form E

Assembly instructions Male stud connectors

UN/UNF and ISO 6149 (Form F)



1 Notes

Follow the general information in the catalogue before starting assembly and check that the assembly instructions are up to date!

These assembly instructions describe the assembly of UN/UNF and ISO 6149 (Form F) male stud connectors with cylindrical threads.

2 Order of assembly

1. Check the male thread and soft-sealing for any damage. Exchange components if necessary.
2. Lightly lubricate the male thread and soft-sealing with mineral-oil based hydraulic oil (for example HLP32)!
3. Tighten the male stud connector in the threaded hole by hand.
4. Tighten the male stud connector according to the following table, using the torque wrench.



Male thread size UN/UNF	Male stud connector to ISO 11926-2/3 (Form F) O-ring Standard NBR Tightening torque Nm –10 %	
	Series L	Series S
7/16 - 20 UNF-2A	25	30
1/2 - 20 UNF-2A	28	45
9/16 - 18 UNF-2A	30	75
3/4 - 16 UNF-2A	55	100
7/8 - 14 UNF-2A	60	160
1 1/16 - 12 UN-2A	110	270
1 3/16 - 12 UN-2A	140	
1 5/16 - 12 UN-2A	165	430
1 5/8 - 12 UN-2A	220	450
1 7/8 - 12 UN-2A	260	520

Male stud connectors Form F

Male thread size metric	Male stud connector to ISO 6149-2/3 (Form F) O-ring Standard NBR Tightening torque Nm –10 %	
	Series L	Series S
M 10 x 1	15	15
M 12 x 1.5	25	35
M 14 x 1.5	35	40
M 16 x 1.5	40	55
M 18 x 1.5	45	70
M 22 x 1.5	60	100
M 27 x 2	100	170
M 33 x 2	160	310
M 42 x 2	210	330
M 48 x 2	260	420



VOSS

Assembly instructions Adjustable couplings

as specified in ISO 6149 / 11926-1

1 Notes

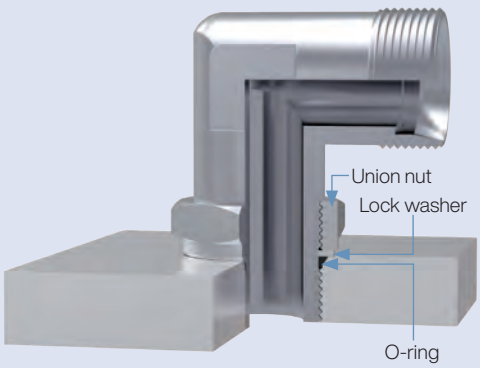
Before starting the assembly work, read and observe the general notes in the latest VOSS catalogue and check that your assembly instructions are up to date.

These assembly instructions apply to adjustable couplings with lock nuts to be screwed into threaded holes as specified in:

- ISO 6149-1 metric fine thread and
- ISO 11926-1 UN/UNF-thread

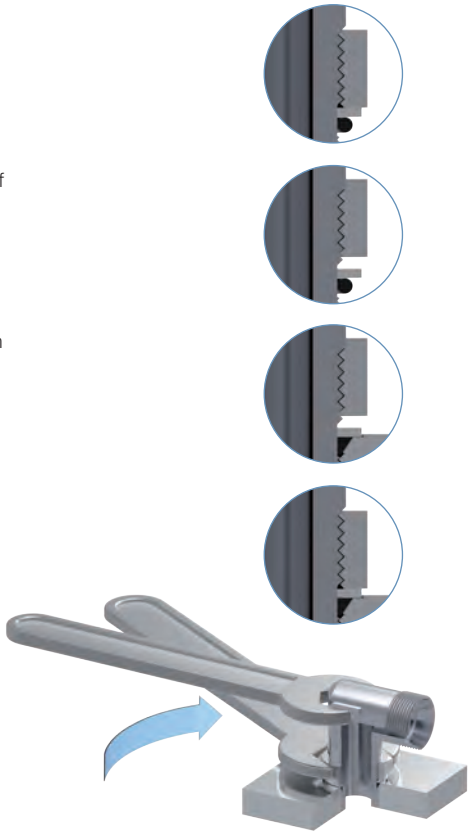
Attention!

Before installing the coupling, check the thread and the soft seal.



2 Assembly procedure

- Back off the lock nut as shown.
- Push the O-ring and the lock washer up to the top end of the relieved section.
- Lubricate the O-ring and the threads lightly (e.g. using mineral-oil based hydraulic fluid HLP32).
- Screw the fitting in manually until the lock washer rests on the mating surface.
- Hold the coupling with a spanner and tighten up the lock nut.



8

ISO 6149 / 11926-1

3 Tightening torques

Series	Thread	Tightening torque Nm –10 %
L	M 10 x 1	15
L	M 12 x 1.5	25
L	M 14 x 1.5	35
L	M 16 x 1.5	40
L	M 18 x 1.5	45
L	M 22 x 1.5	60
L	M 27 x 2	100
L	M 33 x 2	160
L	M 42 x 2	210
L	M 48 x 2	260
S	M 12 x 1.5	35
S	M 14 x 1.5	45
S	M 16 x 1.5	55
S	M 18 x 1.5	70
S	M 22 x 1.5	100
S	M 27 x 2	170
S	M 33 x 2	310
S	M 42 x 2	330
S	M 48 x 2	420

Series	Thread	Tightening torque Nm –10 %
L	7/16 - 20 UNF-2A	18
L	1/2 - 20 UNF-2A	28
L	9/16 - 18 UNF-2A	30
L	3/4 - 16 UNF-2A	50
L	7/8 - 14 UNF-2A	60
L	1 1/16 - 12 UN-2A	95
L	1 3/16 - 12 UN-2A	120
L	1 5/16 - 12 UN-2A	150
L	1 5/8 - 12 UN-2A	200
L	1 7/8 - 12 UN-2A	260
S	7/16 - 20 UNF-2A	20
S	1/2 - 20 UNF-2A	30
S	9/16 - 18 UNF-2A	35
S	3/4 - 16 UNF-2A	70
S	7/8 - 14 UNF-2A	100
S	1 1/16 - 12 UN-2A	170
S	1 5/16 - 12 UN-2A	270
S	1 5/8 - 12 UN-2A	285
S	1 7/8 - 12 UN-2A	325

Assembly instructions Adjustable elbow couplings

with lock nut

1 Notes

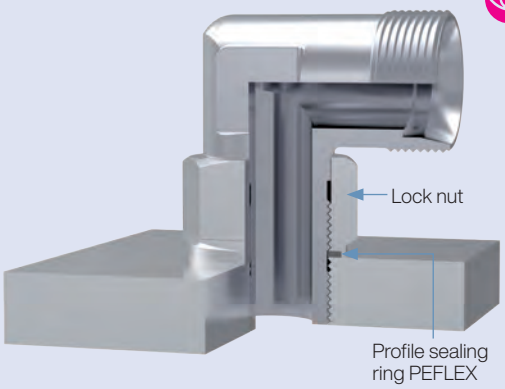
Before starting the assembly work, read and observe the general notes in the latest VOSS catalogue and check that your assembly instructions are up to date.

These assembly instructions apply to adjustable couplings with lock nuts to be screwed into threaded holes as specified in:

- ISO 9974-1 metric fine thread, cylindrical
- ISO 1179-1 Whitworth tube thread, cylindrical

Attention!

The thread and profile sealing ring PEFLEX must be checked to ensure they are clean and free of damage when beginning assembly.



2 Assembly procedure

- Lubricate the O-ring and threads lightly (e.g. using mineral-oil based hydraulic fluid HLP32).
- Screw the coupling into the threaded hole manually until the lock nut (with the profile sealing ring PEFLEX) is in contact with the mating surface.
- Turn the coupling (by not more than one turn in the opposite direction) until it points in the desired direction.
- Hold the stud with a spanner and tighten up the lock nut, taking care not to exceed the specified torque.



The lock nut has a marking groove on cylindrical Whitworth tube threads.

Elbow couplings

3 Tightening torques imperial

Series	Thread	Tightening torque Nm –10 %
L	G 1/8	20
L	G 1/4	50
L	G 3/8	80
L	G 1/2	105
L	G 3/4	190
L	G 1	250
L	G 1 1/4	400
L	G 1 1/2	500

Series	Thread	Tightening torque Nm –10 %
S	G 1/4	50
S	G 3/8	80
S	G 1/2	110
S	G 3/4	220
S	G 1	280
S	G 1 1/4	400
S	G 1 1/2	500

Tightening torques metric

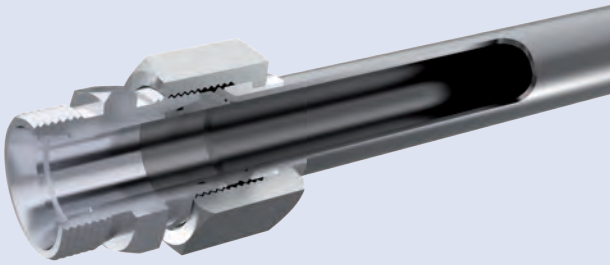
Series	Thread	Tightening torque Nm –10 %
L	M 10 x 1	18
L	M 12 x 1.2	35
L	M 14 x 1.5	55
L	M 16 x 1.5	80
L	M 18 x 1.5	90
L	M 22 x 1.5	130
L	M 26 x 1.5	180
L	M 27 x 2	190
L	M 33 x 2	250
L	M 42 x 2	350
L	M 48 x 2	500

Series	Thread	Tightening torque Nm –10 %
S	M 12 x 1.5	35
S	M 14 x 1.5	55
S	M 16 x 1.5	80
S	M 18 x 1.5	90
S	M 22 x 1.5	130
S	M 27 x 2	220
S	M 33 x 2	250
S	M 42 x 2	350
S	M 48 x 2	500

Assembly instructions 37° flared adapters

1 Notes

Before starting the assembly work, read and observe the general notes in the latest VOSS catalogue and check that your assembly instructions are up to date.



2 Assembly preparation of flared adapters

2.1 Lubricate the O-ring lightly (e.g. using mineral-oil based hydraulic fluid HLP32).

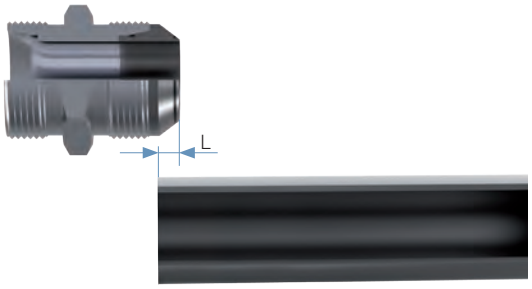
2.2 Preferably, the flared adapter should be pressed into the tube with the aid of a vice (when doing so, protect the threaded parts against damage). However, as an alternative, the flared adapter can be loosely inserted into the coupling stud.



37° flared adapters

3 Tube preparation

3.1 Determine the tube dimensions with the aid of the dimension table (also refer to item 5).



Series	Tube OD [mm]	s [mm]	L [mm]	D min. [mm]	D max. [mm]
L/S	6	1 1.5	3.5 2.5	9.1	10
L/S	8	1 1.5 2	4 3 2.5	11.3	12
L/S	10	1 1.5 2	4.5 3.5 2.5	13.1	14
L/S	12	1 1.5 2	4.5 3.5 2.5	15.3	16

Series	Tube OD [mm]	s [mm]	L [mm]	D min. [mm]	D max. [mm]
L	15	1.5 2 2.5	4.5 3.5 2.5	19.1	20
L	18	1.5 2 2.5	5.5 4.5 4	23.2	24
L	22	1.5 2 2.5 3	5.7 4.7 3.7 3.2	26.5	27.5
L	28	2 2.5 3	5.7 4.7 4.2	32.7	33.3
L	35	2 2.5 3 4	6.5 6 5 3.5	41.8	42.7
L	42	2 3 4	7 6.5 5	48.8	49.8
S	14	1.5 2 2.5 3	5.5 5 4 3	18.6	19.6
S	16	1.5 2 2.5 3	6.5 5.5 5 4	20.6	22
S	20	2 2.5 3 3.5	7 6 5 4	25.6	26.8
S	25	2 2.5 3 4	7 6.5 5.5 4	31.1	33
S	30	2 2.5 3 4 5	9 8 7.5 5.5 4	37	38.7
S	38	2.5 3 4 5 6	10 9.5 8 6 7.5	46	47.2 48

3.2 Cut the tube at a right angle and at least 10 mm away from the manufacturer's or supplier's cut. An angle tolerance of ±1° is permissible. Do not use a rotary grinder or tube cutter.



3.3 Deburr the inner and outer edges of the tube ends slightly and clean the tubing.

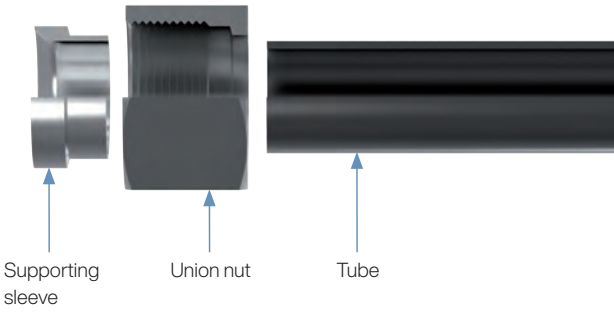
Attention!
Burrs on the outside and inside tube diameter can impair the flaring process. Tubes which are not cut off squarely and correctly deburred may reduce the service life and leak-tightness of the couplings.





4 Pre-assembly of the tube flare

Push the union nut and the supporting sleeve onto the tube. Use the standard pre-assembly devices to flare the tube end.



37° flared adapters

5 Checking the tube flare

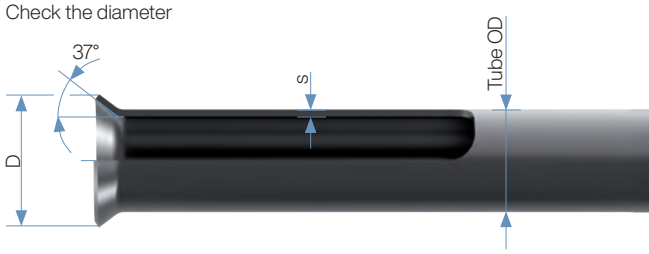
For the connection to fulfil its purpose sustainably, the tube flare must be smooth and free of fissures and scratches.

See the dimension table in item 3 for the respective outer diameter (D_{min} and D_{max}) of the flare bell.

Attention!

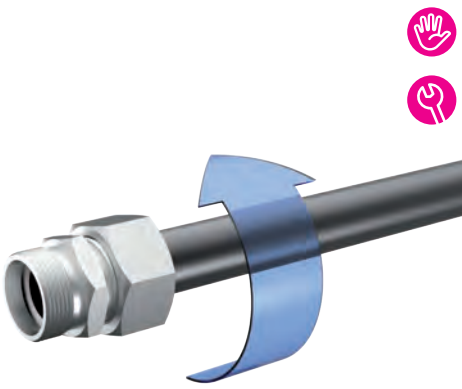
Failure to keep within the dimension tolerances will impair the connection considerably.

Check the diameter



6 Final assembly

6.1 Turn the union nut until it is hand-tight.



6.2 Final assembly with pressed-in flare adapter:

Use a spanner to tighten up the union nut until a distinctly increased torque is felt.

Continue tightening by approximately **1/2 turn** (for **L6 – L12, only approx. 1/4 turn**).



approx. 1/2 turn
approx. 1/4 turn L6 – L12

6.3 Final assembly with flare adapter inserted in connecting piece:

Use the union nut and a spanner to press the flare adapter into the connecting piece until it rests against the stop.

6.4 Unscrew the connection and check whether the flare adapter has reached the stop.

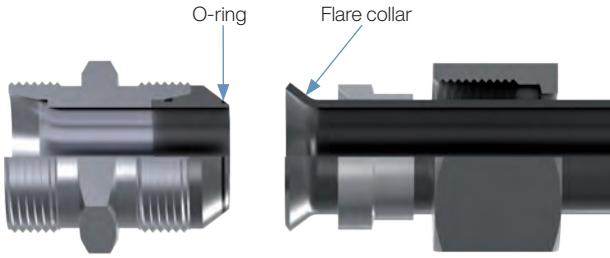
The re-tightening by approximately **1/2 turn** (for **L6 – L12, only approx. 1/4 turn**).

6.5 Turn the union nut until it is hand-tight.

Tighten the union nut with a spanner up to noticeable increase in force.

Then re-tighten by approximately **1/2 turn** (for **L6 – L12, only approx. 1/4 turn**).

Check the O-ring and the flare collar





approx. 1/2 turn
approx. 1/4 turn L6 – L12

37° flared adapters

6.6 Final assembly with tightening torque

As an alternative to achieving pre-assembly and final assembly states by distance dependent assembly, the tightening torques can be applied directly. The stated tightening torques are guideline values:

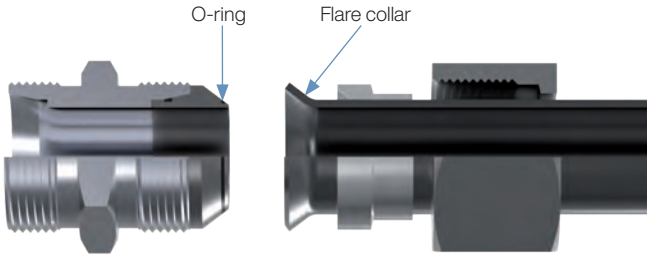
Series	Tube OD [mm]	Tightening torque Steel Nm ±5 %	Tightening torque Stainless steel 1.4571 Nm ±5 %
L	6	20	30
L	8	40	55
L	10	45	65
L	12	55	110
L	15	70	190
L	18	120	250
L	22	200	400
L	28	300	550
L	35	600	900
L	42	800	900
S	6	30	85
S	8	45	100
S	10	55	130
S	12	80	190
S	14	90	260
S	16	130	330
S	20	250	350
S	25	400	700
S	30	500	900
S	38	800	900

7 Re-assembly of connections

Every time the tube connection is taken apart, the O-ring must be carefully checked for damage and, if necessary, replaced. The tube flaring must also be cleaned and checked (see item 5).

To re-assemble the connection, tighten the union nut as described in item 6.

Check the O-ring and the flare collar



Assembly instructions Tube blanking screws

sealed with PEFLEX moulded seal rings

1 Notes

Before starting the assembly work, read and observe the general notes in the latest VOSS catalogue and check that your assembly instructions are up to date.

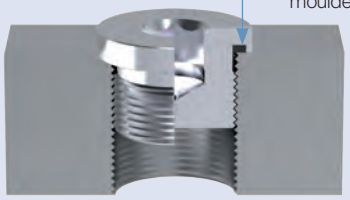
These assembly instructions apply to the use of tube blanking screws (sealing plugs) for threaded holes as specified in:

- DIN 3852-1 / ISO 9974-1 thread: Metric fine thread, cylindrical
- DIN 3852-2 / ISO 1179-1 thread: Whitworth tube thread, cylindrical
- Identification feature: Tube blanking screws (sealing plugs) of form N with Whitworth tube threads have an identification groove.

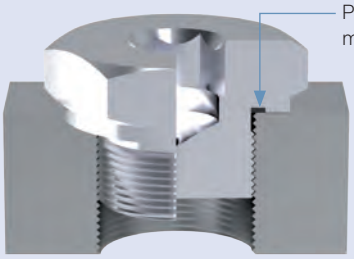
If the blanking screws or connections are to fulfil their purpose, it is important to adhere exactly to the assembly instructions. Wrong handling creates risks with regard to safety and leakages and may lead to complete failure of the connection.

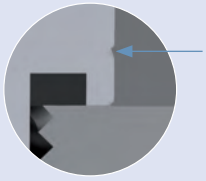
Attention!
Before application, check the thread and the soft seal.

Form N



Form V





Tube blanking screws (sealing plugs) of form N with Whitworth tube threads have an identification groove.

2 Assembly procedure



- Set the torque wrench to the torque specified for the respective component design and size in the following table.
- Lubricate the seal ring and the threads lightly (e.g. using mineral-oil based hydraulic fluid HLP32).
- Check the threads for damage.
- Screw the blanking screw (sealing plug) by hand into the threaded hole until its head is on the mating surface.
- Tighten up the blanking screw (sealing plug) to the specified final torque.

Tube blanking screws

Attention!

The recommended tightening torques relate to steel couplings with VOSS coat surface coating and which are screwed into components made of steel with a tensile strength of ≥ 350 N/mm^2. If other values for tensile strength, modulus of elasticity and friction-surface combinations are used, the user must adapt the tightening torques empirically.

3 Tightening torques

Thread	Form	Tightening torque Nm –10 %
M 8 x 1	N	10
M 10 x 1	N	12
M 10 x 1	V	12
M 12 x 1.5	N	23
M 14 x 1.5	N	30
M 14 x 1.5	V	30
M 16 x 1.5	N	50
M 18 x 1.5	N	65
M 18 x 1.5	V	65
M 20 x 1.5	N	75
M 22 x 1.5	N	90
M 24 x 1.5	N	90
M 26 x 1.5	N	110
M 27 x 2	N	130
M 33 x 2	N	225
M 33 x 2	V	250
M 42 x 2	N	310
M 42 x 2	V	400
M 48 x 2	N	380
M 48 x 2	V	500

Thread	Form	Tightening torque Nm –10 %
G 1/8	N	12
G 1/4	N	25
G 3/8	N	50
G 1/2	N	70
G 3/4	N	120
G 1	N	200
G 1	V	250
G 1 1/4	N	320
G 1 1/4	V	400
G 1 1/2	N	400
G 1 1/2	V	500

General technical notes

Technical comments · Sealing types and threaded ports



Content	Type/Page
Technical notes	P.479
Pressure calculations for hydraulic tubes of steel and stainless steel	P.481
Coupling system pressure ratings	P.485
Additional information – Resistance to media, temperatures and pressure	P.486
Pressure reduction factors and temperatures	P.487
Overview of standard threads of VOSS 24° coupling components	P.488
Seal types and threaded bores	P.489

VOSS

Content	Type/Page
Height of the completely assembled VOSS tube coupling	P.492
Additional lengths when designing tube assemblies	P.494
Calculating the equivalent straight tube length	P.495
VOSS cutting ring systems in applications using polyamide (PA) tubing	P.496
VOSS coat	P.497
Media resistance of VOSS couplings	P.503
Materials of the soft-seals (elastomers)	P.504

Content	Type/Page				
Ozone resistance of elastomer seals	P.505				
System comparison – requirements / system features	P.506				
Preventing faults and correcting malfunctions	VOSS *Ring* M	2SVA	ES-4/ES-4VA	VOSS*Form*	BV-10
	P.509	P.512	P.515	P.518	P.519
	ZAKO	DKO	24° couplings		
	P.521	P.522	P.523		

Technical notes

General safety notes

- The couplings, flanges, valves and other components listed in the catalogue are intended for fluid engineering applications only. They cover a range of operating conditions from normal to extreme.

- In order to ensure maximum performance and functional reliability of VOSS products, the respective assembly instructions, operating conditions and tube recommendations have to be adhered to. Failure to follow these instructions may impair the function and lead to loss of claims under guarantee.

- Coupling elements must not be tightened or loosened while the system is under pressure. Caution, this involves a potential risk to life and limb!

- Tubing systems are to be designed and routed in such a way that they are not under tension in the unassembled state and that all connecting elements can be easily assembled.

- Always make sure that hydraulic components are clean and are handled in a clean environment. Contamination, dirt or damage can impair the function of individual components or of the entire hydraulic system.

- When using lubricants, observe the instructions and information given by the manufacturer.

- When using VOSS pre-assembly machines/devices and tools, always observe the operating instructions. Failure to observe these instructions may endanger life and limb and/or the environment.

Standardization

In terms of design and dimensions, VOSS cutting ring tube couplings, VOSS*Form*^{SQR} tube couplings, flared couplings and flanges all conform to the latest version of standard DIN 2353/ISO 8434-1/DIN 3861/SAE J 518.

Permitted pressures

The pressure ratings stated in the VOSS catalogue are as follows:

- The nominal pressure (PN) specifies the maximum operating pressure of the coupling. This is the maximum pressure that should be applied when operating the system or the system section under stationary conditions. During load tests, the bursting pressure must be at least 4 times the nominal pressure.

- Permissible operating pressure (PB) as defined in DIN 2401 part 1. The operating pressure ("Betriebsüberdruck" - PB) data are stated for normal operating conditions (at 120 °C, static load) for a safety factor of 2.5.

For the tube-end cutting-ring connections, VOSS*Form*^{SQR} or flared connection, the safety factor is always four. Always observe the pressure information for the entire article. If tube couplings are subjected to greater loads – e. g. temperatures above +120 °C, strong pressure peaks etc. – the operating pressure must be reduced in order to retain the same safety level.

It is assumed that the tubing system is firmly installed and held by tube clamps/supports in order to achieve the required functional reliability. The recommended torque moments are to be used for articles with threaded stud connections. The specified pressure values always refer to VOSS coupling components. In the case of tubing, observe the pressure values stated by the respective tube manufacturer.

Permissible operating temperatures

For all steel coupling and flange parts listed in this catalogue, an operating temperature range of -40 °C to +120 °C is permissible (cf. DIN 3859 part 1). If the temperature limits are exceeded, the pressure has to be decreased accordingly.

Seal materials

Standard seals of NBR (e. g. Perbunan®)

- For couplings and flared cones: 70 to 80 Shore A
- For ZAKO rings 90 Shore A
- Temperature range -35 °C to +100 °C

Seals of FKM e. g. Viton® upon request

- For couplings, flared cones and ZAKO rings 75 - 85 Shore A
- Temperature range -25 °C to +200 °C

The notes given in DIN 7716 (rubber products; requirements for storage, cleaning and maintenance) must be observed when using elastomer seals.

- Dry storage at temperatures not exceeding +25 °C
- Protect against direct sunlight, ozone and strong artificial lighting

Materials

In the standard version, VOSS cutting rings, VOSS*Form*^{SQR}, flared couplings, valves and flanges are made of forged or drawn steel and, in exceptional cases, of cast steel, in accordance with the technical delivery conditions as specified in DIN 3859-1.

Surface protection

All VOSS tube connections are given a VOSS coat surface finish by default in order to protect them from corrosion. The only exceptions are articles whose function or normal market standard do not allow a VOSS coat finish (e. g. weld tube connection stubs).

VOSS coat corrosion prevention is based on a zinc-nickel base coat, a passivation layer and normally a top sealing coat.

The union nuts are also given a coating of lubricant/slip agent.

ZAKO flange connections have surfaces protected either by pickling and oiling or by a VOSS coat.

The parts intended for welding are shiny and oiled.

Upon request, versions made of other materials and with other surface finishes can be supplied.

Standards applied
Couplings

	National	International
Cutting ring couplings	DIN 2353	ISO 8434-1
Cutting rings	DIN 3861	ISO 8434-1
Conical seal couplings	–	ISO 8434-1
Flange	–	SAE J 518 / ISO 6162

Standards applied
Threaded studs/Threaded holes

		Threaded stud ends National/International	Threaded hole National/International
Metric fine thread	Sealing by DIN 7603 seal ring (form A)	DIN 3852-1	DIN 3852-1 form X ISO 9974-1
	Sealing by seal edge (form B)	DIN 3852-1 / ISO 9974-3	ISO 9974-1
	Sealing by taper thread (form C)	DIN 3852-1	DIN 3852-1 form Z
	Sealing by PEFLEX ring (form E)	ISO 9974-2	ISO 9974-1
	Sealing by O-ring	ISO 6149-2 / ISO 6149-3	ISO 6149-1
BSPP thread / UN-UNF/NPT	Sealing by DIN 7603 seal ring (form A)	DIN 3852-2	DIN 3852-2 form X ISO 1179-1
	Sealing by seal edge (form B)	ISO 1179-4	ISO 1179-1
	Sealing by taper thread (form C)	DIN 3852-2	DIN 3852-2 form Z
	Sealing by taper thread (NPT)	ASME B 1.20.1	ASME B 1.20.1
	Sealing by PEFLEX ring (form E)	ISO 1179-4	ISO 1179-1
	Sealing by O-ring (UN-UNF)	ISO 11926-2/3 / SAE J 1926-2/3	ISO 11926-1 / SAE J 1926-1

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Pressure calculations for hydraulic tubes of steel and stainless steel

The pressures stated here are based on calculations carried out in accordance with DIN 2413. These calculations were carried out assuming the following boundary conditions for straight tubes and do not take into consideration any special conditions of a real hydraulic system. They are therefore only intended to assist in preliminary selection and do not release the user from his obligation to carry out own design calculations. The scope of application of the above standard shall also be observed.

Bursting pressures were calculated by a method similar to that described in ISO 10763. The assumed tensile strength values chosen in this case lead to deviations of not more than 15 % from real applications.

Pressure calculations as described in ISO 2413

Load case I – mainly static:

$$\text{Design calculation pressure } p = \frac{20 \cdot K \cdot T \cdot C1}{S \cdot Da}$$

Load case III – pulsating

$$\text{Design calculation pressure } p = \frac{20 \cdot K \cdot T \cdot C1}{S \cdot (Da + T \cdot C1)}$$

Da = outer diameter of tube [mm]
T = tube wall thickness [mm]
p = design calculation pressure [bar]
K = strength parameter [N/mm^2]
S = safety factor
C1 = reduction factor for thinner tube walls

load case I – static			load case III – rising		
E235	E355	VA 1.4571	E235	E355	VA 1.4571
K = 235/225*	K = 355/345*	K = 245	K = 225	K = 230	K = 190
S = 1.5	S = 1.58	S = 1.5	S = 1.5	S = 1.5	S = 1.5
C1 = 0.9	C1 = 0.9	C1 = 0.9	C1 = 0.9	C1 = 0.9	C1 = 0.9

* For E235 and E355: a value of 10 N/mm^2 shall be subtracted for Da ≤ 30 and T ≤ 3mm.

Bursting pressure calculation based on ISO 10763

Calculation equation:

$$\text{burst pressure } Pb = Rm \cdot \ln\left(\frac{Da}{Di}\right) \cdot 10$$

Da = outer diameter of tube [mm]
Di = inner diameter of tube [mm]
Pb = bursting pressure [bar]
Rm = assumed tensile strength [N/mm^2]

E235	E355	VA 1.4571
Rm = 388	Rm = 530	Rm = 468

Hydraulic tubes of E235 steel (formerly St37.4) or E355 steel (formerly St52.4) and stainless steel 1.4571: pressure calculations as described in DIN 2413

Tube dimensions			VOSS nominal pressure		Design calculation pressures in accordance with DIN 2413 [bar]						Bursting pressure [bar]		
Da [mm]	Di [mm]	T [mm]	L series [bar]	S series [bar]	Load case I (idle, up to +120 °C)			Load case III (pulsating, up to +120 °C)			calculated in accordance with ISO 10763		
					E235	E355	1.4571	E235	E355	1.4571	E235	E355	1.4571
6	4.5	0.75	500	800	338	491	368	303	310	256	1116	1525	1346
6	4	1	500	800	450	655	490	391	400	330	1573	2149	1898
6	3	1.5	500	800	675	983	735	551	563	465	2689	3674	3244
6*	2	2	500	800	900	1310	980	692	708	585	4263	5823	5142
6*	1.5	2.25	500	800	1013	1474	1103	757	774	639	5379	7347	6488
8	6	1	500	800	338	491	368	303	310	256	1116	1525	1346
8	5	1.5	500	800	506	737	551	433	443	366	1824	2491	2200
8	4	2	500	800	675	983	735	551	563	465	2689	3674	3244
8*	3	2.5	500	800	844	1228	919	659	673	556	3806	5198	4590
10	8	1	500	800	270	393	294	248	253	209	866	1183	1044
10	7	1.5	500	800	405	590	441	357	365	301	1384	1890	1669
10	6	2	500	800	540	786	588	458	468	386	1982	2707	2391
10	5	2.5	500	800	675	983	735	551	563	465	2689	3674	3244
10*	4	3	500	800	810	1179	882	638	652	539	3555	4856	4288
12	10	1	400	630	225	328	245	209	214	177	707	966	853
12	9	1.5	400	630	338	491	368	303	310	256	1116	1525	1346
12	8	2	400	630	450	655	490	391	400	330	1573	2149	1898
12	7	2.5	400	630	563	819	613	474	484	400	2091	2857	2523
12	6	3	400	630	675	983	735	551	563	465	2689	3674	3244
12*	5	3.5	400	630	823	1180	858	624	638	527	3397	4640	4097
12*	4	4	400	630	940	1348	980	692	708	585	4263	5823	5142
14	12	1		630	193	281	210	181	185	153	598	817	721
14	11	1.5		630	289	421	315	264	270	223	936	1278	1129
14	10	2		630	386	561	420	342	349	289	1306	1783	1575
14	9	2.5		630	482	702	525	415	425	351	1714	2342	2068
14	8	3		630	579	842	630	485	496	410	2171	2966	2619
14	7	3.5		630	705	1011	735	551	563	465	2689	3674	3244
15	13	1	400		180	262	196	170	174	143	555	758	670
15	12	1.5	400		270	393	294	248	253	209	866	1183	1044
15	11	2	400		360	524	392	321	329	271	1203	1644	1452
15	10	2.5	400		450	655	490	391	400	330	1573	2149	1898
15	9	3	400		540	786	588	458	468	386	1982	2707	2391
16	14	1		630	169	246	184	160	163	135	518	708	625
16	13	1.5		630	253	368	276	233	239	197	806	1100	972
16	12	2		630	338	491	368	303	310	256	1116	1525	1346
16	11	2.5		630	422	614	459	370	378	312	1454	1986	1754
16	10	3		630	506	737	551	433	443	366	1824	2491	2200
16	8	4		630	705	1011	735	551	563	465	2689	3674	3244
18	16	1	400		150	218	163	143	146	121	457	624	551
18	15	1.5	400		225	328	245	209	214	177	707	966	853
18	14	2	400		300	437	327	273	279	230	975	1332	1176
18	13	2.5	400		375	546	408	333	341	281	1263	1725	1523
18	12	3	400		450	655	490	391	400	330	1573	2149	1898
18	10	4	400		627	899	653	500	511	422	2281	3115	2751

Tube dimensions			VOSS nominal pressure		Design calculation pressures in accordance with DIN 2413 [bar]						Bursting pressure [bar]		
Da [mm]	Di [mm]	T [mm]	L series [bar]	S series [bar]	Load case I (idle, up to +120°C)			Load case III (pulsating, up to +120°C)			calculated in accordance with ISO 10763		
					E235	E355	1.4571	E235	E355	1.4571	E235	E355	1.4571
20	17	1.5		420	203	295	221	190	194	160	631	861	761
20	16	2		420	270	393	294	248	253	209	866	1183	1044
20	15	2.5		420	338	491	368	303	310	256	1116	1525	1346
20	14	3		420	405	590	441	357	365	301	1384	1890	1669
20	13	3.5		420	494	708	515	408	417	345	1671	2283	2016
20	12	4		420	564	809	588	458	468	386	1982	2707	2391
20	10	5		420	705	1011	735	551	563	465	2689	3674	3244
22	20	1	250		123	179	134	118	121	100	370	505	446
22	19	1.5	250		184	268	200	173	177	146	569	777	686
22	18	2	250		245	357	267	227	232	192	779	1064	939
22	17	2.5	250		307	447	334	278	285	235	1000	1366	1207
22	16	3	250		368	536	401	328	335	277	1236	1688	1490
22	15	3.5	250		449	643	468	376	384	317	1486	2030	1792
22	14	4	250		513	735	535	422	431	356	1754	2396	2115
25	22	1.5		420	162	236	176	154	157	130	496	678	598
25	21	2		420	216	314	235	201	206	170	676	924	816
25	20	2.5		420	270	393	294	248	253	209	866	1183	1044
25	19	3		420	324	472	353	292	299	247	1065	1455	1284
25	18	3.5		420	395	566	412	336	343	283	1275	1741	1537
25	17	4		420	451	647	470	378	386	319	1496	2044	1805
25	16	4.5		420	508	728	529	418	428	353	1732	2365	2089
25	15	5		420	564	809	588	458	468	386	1982	2707	2391
28	25	1.5	250		145	211	158	138	141	117	440	601	530
28	24	2	250		193	281	210	181	185	153	598	817	721
28	23	2.5	250		241	351	263	223	228	188	763	1043	921
28	22	3	250		289	421	315	264	270	223	936	1278	1129
28	21	3.5	250		353	506	368	303	310	256	1116	1525	1346
28	20	4	250		403	578	420	342	349	289	1306	1783	1575
30	26	2		420	180	262	196	170	174	143	555	758	670
30	25	2.5		420	225	328	245	209	214	177	707	966	853
30	24	3		420	270	393	294	248	253	209	866	1183	1044
30	23	3.5		420	329	472	343	285	291	241	1031	1408	1243
30	22	4		420	376	539	392	321	329	271	1203	1644	1452
30	20	5		420	470	674	490	391	400	330	1573	2149	1898
30	18	6		420	564	809	588	458	468	386	1982	2707	2391
35	32	1.5	250		121	173	126	111	114	94	348	475	419
35	31	2	250		161	231	168	147	150	124	471	643	568
35	30	2.5	250		201	289	210	181	185	153	598	817	721
35	29	3	250		242	347	252	215	220	181	730	997	880
35	27	4	250		322	462	336	280	286	236	1007	1375	1215
35	25	5	250		403	578	420	342	349	289	1306	1783	1575
38	34	2		420	148	213	155	136	139	115	432	589	521
38	33	2.5		420	186	266	193	168	171	142	547	748	660
38	32	3		420	223	319	232	199	203	168	667	911	804
38	30	4		420	297	426	309	260	265	219	917	1253	1106
38	28	5		420	371	532	387	318	325	268	1185	1619	1429
38	26	6		420	445	639	464	373	382	315	1472	2011	1776
38	24	7		420	519	745	542	427	436	360	1783	2436	2151
38	22	8		420	594	851	619	478	488	404	2121	2897	2558
42	39	1.5	250		101	144	105	93	96	79	288	393	347
42	38	2	250		134	193	140	123	126	104	388	530	468
42	37	2.5	250		168	241	175	153	156	129	492	672	593
42	36	3	250		201	289	210	181	185	153	598	817	721
42	34	4	250		269	385	280	237	242	200	820	1120	989
42	32	5	250		336	481	350	290	297	245		1441	1273

* DIN 2413 no longer applies to these tubes (because od/id > 2.0).

Dimensions
The dimensions given in the catalogue have been adapted to currently valid standards. We reserve the right to make changes due to technical advances and developments.

Patents
We make reference here to our patents at home and abroad, as well as our registered designs, trade marks and intellectual property applications.

Approvals
For approvals, see Chapter 2.

Tightening torques for threads

The recommended tightening torques refer to steel threads with VOSS coat surface finish and a steel mating material with a breaking stress of 350 N/mm^2.

Steel threads with increased pressure level require a mating material with a breaking stress of ≥ 600 N/mm^2.

If other values for strength, modulus of elasticity and friction-surface combinations are used, the user must adapt the tightening torques empirically.

VOSS notes, operating instructions and assembly instructions are to be followed in order for the parts to fulfil their proper function.

The recommended tightening torques have to be adhered to if the pressure range is to be fully utilized and the appropriate safety level is to be maintained.

The tightening torques for the threads are given in the tables for the respective type of thread.

Recommended steel tubes

The table on the previous page contains recommendations for the tubes to be used for the connecting systems listed in this catalogue.

The values in the table refer to DIN 2413 class III dynamic loads at up to 120 °C and tube material 1.0255+N, without corrosion factor supplement.

There are a number of different German and international standards concerning calculation of the required dimensions of tubes under internal pressure.

We recommend standard DIN EN 13480-3, which explains the various load cases in great detail.

Specifications concerning permissible steel tubes:
Seamless, cold-drawn and normalized precision steel tubing as specified in DIN EN 10305-4, material E235, mat. no. 1.0308 or E355, mat. no. 1.0580. The tubes must be ordered by specifying the outer diameter and the inner diameter.

Specifications concerning permissible stainless steel tubes:
Seamless cold manufactured, solvent-annealed, scale-free stainless steel tubes in delivery condition CFA or CFD with dimensions and tolerances in accordance with DIN EN 10305-1 and all other delivery conditions in accordance with DIN EN 10216-5, material X6CrNiMoTi17-12-2, material number 1.4571, maximum tube hardness 90 HRB. The tubes must be ordered by specifying the outer diameter and the inner diameter.

To stabilize the connections, thin-walled steel tubes must be fitted with reinforcing internal sleeves.

Media resistance

VOSS cutting ring couplings, VOSS*Form*^{SQR} tube couplings, flared couplings and flanges are designed for use with normal commercially available hydraulic fluids at temperatures of up to +100 °C and compressed air at temperatures up to +80 °C.

If use with critical media such as high-flammability pressure fluids is intended, please consult our customer service department.

Orders

All articles described in this catalogue are delivered as depicted in the catalogue. Items are delivered in closed package units to facilitate warehousing and to protect them from dirt and damage.

Orders should be matched to the contents of the respective package units. The number of items in the individual package units are stated in the currently valid price list. If you require smaller quantities, i. e. less items than are contained in one package unit, we recommend that you purchase these from one of our dealers.

The general terms and conditions stated at www.voss.net apply to all business dealings.

Service for customers
Let our customer service department advise you. Simply contact our sales department or a member of our field service.

Coupling system pressure ratings

Nominal pressure (PN)

The nominal pressure specifies the maximum operating pressure of the coupling. This is the maximum envisaged pressure when the system or the system section is operated under stationary conditions. During load tests, the bursting pressure of the specimen must be at least 4 times the nominal pressure.

Series	VOSS*Ring*[M] PN	ES-4 PN	BV-10 PN	VOSS*Form*[SQR] PN
L 6	500	500	500	500
L 8				
L 10				
L 12	400	400	400	400
L 15				
L 18				
L 22	250	250	250	250
L 28				
L 35				
L 42				
S 6	800	800	800	800
S 8				
S 10				
S 12	630	630	630	630
S 14				
S 16				
S 20	420	420	420	420
S 25				
S 30				
S 38				

Additional information – Resistance to media, temperatures and pressure

Pressure reduction factors and temperatures

Pressure reduction factors within permitted operating temperatures in °C	Material			
	Steel couplings	Stainless steel (1.4571) couplings	Seals of NBR (e. g. Perbunan®)	Seals of FKM (e. g. Viton®)
-60		0 %		
-50				
-40	0 %			
-35			0 %	
-25				0 %
+20				
+50		4 %		
+100		11 %		
+120		14 %		
+150	10 %			
+175	15 %	18 %		
+200	20 %			
+250	29 %	28 %		
+300				
+400		33 %		

permitted operating temperature
permitted ambient temperature for hydraulic applications
temperature not permitted

Seal durability with hydraulic fluids

	Temperature resistance of seals	
Pressure fluids	**VOSS NBR**	**VOSS FKM**
HL, HLP, HVLP	-35 °C bis +100 °C	-25 °C up to +200 °C [4]
HTG, HETG (rapeseed oils)	up to +80 °C [1]	up to +100 °C
HEPG (Polyalkylene glycols) [5]	up to +80 °C [2]	up to +120 °C
HEES (synthetic ester oils)	up to +80 °C [3]	up to +120 °C

[1] When rapeseed oil is used, even the lowest water content (0.5 %) can destroy the usability of the seals.

[2] Depending on the quality of the oil, the seals may swell excessively and their flexibility under cold conditions may be reduced.

[3] The wide range of HEES oils available means that the swelling rates differ considerably. General compatibility cannot be guaranteed in all cases.

[4] For steel coupling components, the temperature range is -40 °C to +120 °C. Observe the operating range of the hydraulic fluid e. g. the flash point of HVLP is +125 °C.

[5] HEPG can only be used at up to +80 °C.

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Perbunan® is a registered trademark of LANXESS Deutschland GmbH.

Pressure reduction factors and temperatures

Permitted pressures

The pressure ratings stated in the VOSS catalogue are as follows:

- The nominal pressure (PN) specifies the maximum operating pressure of the coupling. This is the maximum intended pressure when operating the system or the system section under stationary conditions. During load tests, the bursting pressure of the specimen must be at least 4 times the nominal pressure.

- Permissible operating pressure (PB) as defined in DIN 2401 part 1. The operating pressure ("Betriebsüberdruck" - PB) data are stated for normal operating conditions (at +120 °C, static load) and a safety factor of 2.5.

At higher temperatures, the pressures must be reduced to below those stated in the catalogue by a factor depending on the materials used. The intended operating temperature must be taken into consideration when selecting coupling and seal materials.

Caution!
When selecting tubes, please observe the pressure reduction factors stated by the tube manufacturers.

Calculation example:

Coupling:
VOSS*Form*^{SQR} tube OD S 10 = 800 bar nominal pressure

Temperature:
+150 °C

Material:
Steel

Pressure reduction factor (see table):
10 %

Formula:
PN (coupling at +150 °C)

$$= \frac{800 \text{ bar}}{100 \%} \times (100 \% - 10 \%) = 720 \text{ bar}$$

Overview of standard threads of VOSS 24° coupling components

Imperial thread [G] **Metric thread [M]**

Series	Tube OD	Male BSSP thread	Width across flats	Metric fine thread	Width across flats	Union nut Metric fine thread	Width across flats
LL	4	G 1/8"	10	M 8 x 1	10	M 8 x 1	10
LL	5	G 1/8"	11	M 8 x 1	11	M 10 x 1	12
LL	6	G 1/8"	11	M 10 x 1	11	M 10 x 1	12
LL	8	G 1/8"	12	M 10 x 1	12	M 12 x 1	14
L	6	G 1/8"	14	M 10 x 1	14	M 12 x 1.5	14
L	8	G 1/4"	19	M 12 x 1.5	17	M 14 x 1.5	17
L	10	G 1/4"	19	M 14 x 1.5	19	M 16 x 1.5	19
L	12	G 3/8"	22	M 16 x 1.5	22	M 18 x 1.5	22
L	15	G 1/2"	27	M 18 x 1.5	24	M 22 x 1.5	27
L	18	G 1/2"	27	M 22 x 1.5	27	M 26 x 1.5	32
L	22	G 3/4"	32	M 26 x 1.5 (ISO 6149 = M 27 x 2)	32	M 30 x 2	36
L	28	G 1"	41	M 33 x 2	41	M 36 x 2	41
L	35	G 1 1/4"	50	M 42 x 2	50	M 45 x 2	50
L	42	G 1 1/2"	55	M 48 x 2	55	M 52 x 2	60
S	6	G 1/4"	19	M 12 x 1.5	17	M 14 x 1.5	17
S	8	G 1/4"	19	M 14 x 1.5	19	M 16 x 1.5	19
S	10	G 3/8"	22	M 16 x 1.5	22	M 18 x 1.5	22
S	12	G 3/8"	22	M 18 x 1.5	24	M 20 x 1.5	24
S	14 *	G 1/2"	27	M 20 x 1.5	27	M 22 x 1.5	27
S	16	G 1/2"	27	M 22 x 1.5	27	M 24 x 1.5	30
S	20	G 3/4"	32	M 27 x 2	32	M 30 x 2	36
S	25	G 1"	41	M 33 x 2	41	M 36 x 2	46
S	30	G 1 1/4"	50	M 42 x 2	50	M 42 x 2	50
S	38	G 1 1/2"	55	M 48 x 2	55	M 52 x 2	60

In addition to the standard dimensions as specified in ISO 8434-1, other male part thread sizes are available. Detailed dimension information is given on the respective pages of the catalogue.

* Tube size S14 is no longer covered by the applicable standards.

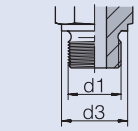
Seal types and threaded bores

for VOSS tube couplings

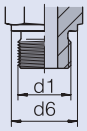
Male thread:
metric fine thread, cylindrical

Standard PEFLEX and O-ring seals are of NBR,
-35 °C to +100 °C

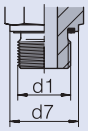
FKM seals for
-25 °C to +200 °C



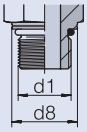
Threaded tube connection stubs DIN 3852-1 form A (sealed with DIN 7603 sealing ring)



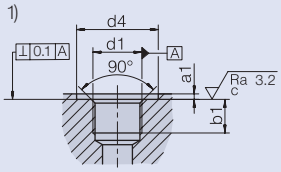
Threaded tube connection stubs DIN 3852-1 form B/ ISO 9974-3 (sealed by sealing edge)



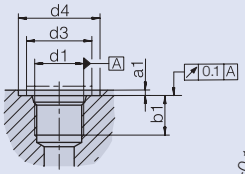
Threaded tube connection stubs form E/ISO 9974-2 (sealed with PEFLEX sealing ring)



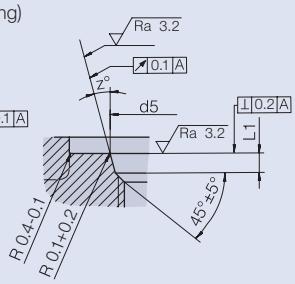
Threaded tube connection stubs form ISO 6149-2 and -3 (sealed with O-ring)



Threaded bore DIN 3852 part -1 form X/ISO 9974-1 (for cylindrical stud ends)



Threaded bore ISO 6149-1 (for cylindrical stud ends)



Tube OD LL	L	S	d1	d3/ d6	d4 +0.4	d4 min.	d5 +0.1	d7 -0.2	d8 ±0.2	a1 max.	b1 min.	L1 +0.4	Z° ±1°
DIN 3852-1 / ISO 9974													
4	-	-	M 8 x 1	12		13				1	8		
6 / 8	6	-	M 10 x 1	14		15		13.9		1	8		
-	8	6	M 12 x 1.5	17		18		16.9		1.5	12		
-	10	8	M 14 x 1.5	19		20		18.9		1.5	12		
-	12	10	M 16 x 1.5	21		23		21.9		1.5	12		
-	15	12	M 18 x 1.5	23		25		23.9		2	12		
-	-	14	M 20 x 1.5	25		27		25.9		2	14		
-	18	16	M 22 x 1.5	27		28		26.9		2.5	14		
-	22	-	M 26 x 1.5	31		33		31.9		2.5	16		
-	-	20	M 27 x 2	32		33		31.9		2.5	16		
-	28	25	M 33 x 2	39		41		39.9		2.5	18		
-	35	30	M 42 x 2	49		51		49.9		2.5	20		
-	42	38	M 48 x 2	55		56		54.9		2.5	22		
ISO 6149													
-	6	-	M 10 x 1	14.5	16		11.1		13.8	1	10	1.6	12
-	8	6	M 12 x 1.5	17.5	19		13.8		16.8	1.5	11.5	2.4	15
-	10	8	M 14 x 1.5	19.5	21		15.8		18.8	1.5	11.5	2.4	15
-	12	10	M 16 x 1.5	22.5	24		17.8		21.8	1.5	13	2.4	15
-	15	12	M 18 x 1.5	24.5	26		19.8		23.8	2	14.5	2.4	15
-	18	16	M 22 x 1.5	27.5	29		23.8		26.8	2	15.5	2.4	15
-	22	20	M 27 x 2	32.5	34		29.4		31.8	2	19	3.1	15
-	28	25	M 33 x 2	41.5	43		35.4		40.8	2.5	19	3.1	15
-	35	30	M 42 x 2	50.5	52		44.4		49.8	2.5	19.5	3.1	15
-	42	38	M 48 x 2	55.5	57		50.4		54.8	2.5	22	3.1	15

[1] 0.1 ≤ M 22 x 1.5
0.2 ≥ M 26 x 1.5

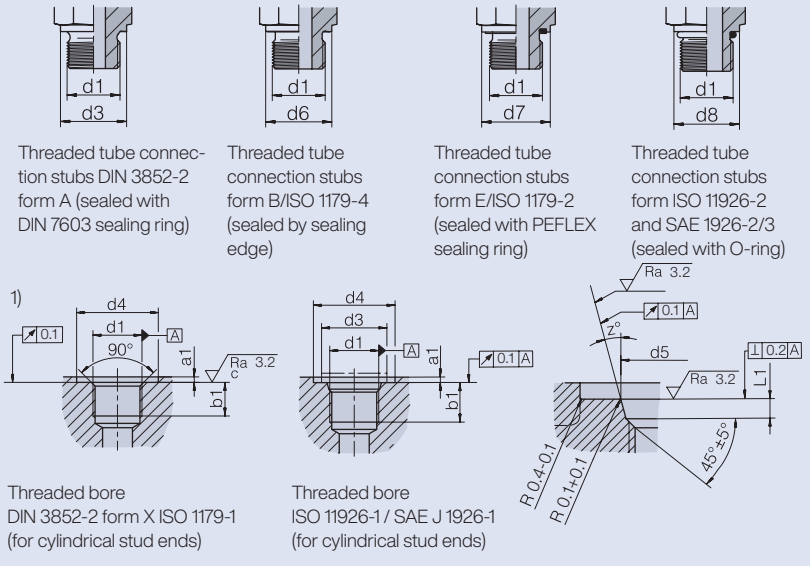
Seal types and threaded bores

for VOSS tube couplings

Male thread:
BSPP thread,
UN/UNF thread
cylindrical

Standard PEFLEX and O-ring seals are of NBR,
-35 °C to +100 °C

FKM seals for
-25 °C to +200 °C



Threaded tube connection stubs DIN 3852-2 form A (sealed with DIN 7603 sealing ring)

Threaded tube connection stubs form B/ISO 1179-4 (sealed by sealing edge)

Threaded tube connection stubs form E/ISO 1179-2 (sealed with PEFLEX sealing ring)

Threaded tube connection stubs form ISO 11926-2 and SAE 1926-2/3 (sealed with O-ring)

Threaded bore DIN 3852-2 form X ISO 1179-1 (for cylindrical stud ends)

Threaded bore ISO 11926-1 / SAE J 1926-1 (for cylindrical stud ends)

Tube-OD LL	L	S	d1	d3/ d6	d4 +0,4	d4 min.	d4 min.	d5 +0,1	d7 -0,2	d8 ±0,2	a1 max.	b1 min.	L1 +0,4	Z° ±1°
DIN 3852-2 / ISO 1179						form W	form N							
4 - 8	6	-	G 1/8 A	14		17,2	15		13,9		1	8,5		
-	8 / 10	6 / 8	G 1/4 A	18		20,7	20		18,9		1,5	12,5		
-	12	10 / 12	G 3/8 A	22		24,5	23		21,9		2	12,5		
-	15 / 18	14 / 16	G 1/2 A	26		29,6	28		26,9		2,5	15		
-	22	20	G 3/4 A	32		36,9	33		31,9		2,5	16,5		
-	28	25	G 1 A	39		46,1	41		39,9		2,5	19		
-	35	30	G 1 1/4 A	49		54	51		49,9		2,5	21,5		
-	42	38	G 1 1/2 A	55		60,5	56		54,9		2,5	22,5		
-			G 2 A	68			76		74,9		3	26		
ISO 11926 / SAE J 1926														
-	8 / 10	8	7/16-20 UNF-2A		21		15	12,40	13,8		1,6	11,5	2,4	12
-	8	8	1/ 2-20 UNF-2A		23		16	14,00	16,8		1,6	11,5	2,4	12
-	12	10 / 14	9/16-18 UNF-2A		25		18	15,65	16,8		1,6	12,7	2,5	12
-	12 - 18	12 - 20	3/ 4-16 UNF-2A		30		23	20,60	21,8		2,4	14,3	2,5	15
-	12 - 22	16 - 20	7/ 8-14 UNF-2A		34		26	23,95	26,8		2,4	16,7	2,5	15
-	22 / 28	20 / 25	1 1/16-12 UN -2A		41		32	29,15	31,8		2,4	19	3,3	15
-	35		1 3/16-12 UN -2A		45		35	32,35	35,8		2,4	19	3,3	15
-	22 - 35	25 / 30	1 5/16-12 UN -2A		49		39	35,50	40,8		3,2	19	3,3	15
-	35 - 42	30 / 38	1 5/ 8-12 UN -2A		58		48	43,50	49,8		3,2	19	3,3	15
-	42	38	1 7/ 8-12 UN -2A		65		54	49,85	54,8		3,2	19	3,3	15

[1] 0.1 ≤ G 1/2
0.2 ≥ G 3/4

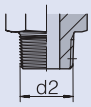
Seal types and threaded bores

for VOSS tube couplings

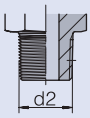
Male thread:
metric fine thread, conical

Whitworth tube thread, conical

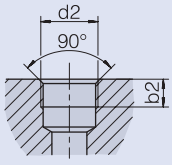
NPT thread



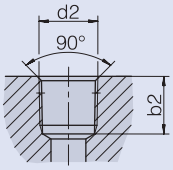
Threaded tube connection stubs
DIN 3852-1 and -2 form C
sealed by tapered thread



Threaded tube connection
stubs NPT ASME B 1.20.1
sealed by tapered thread



Threaded bore DIN 3852-1 and -2
form Z [1] (for tube connection stubs
with tapered threads)



Threaded bore NPT
ASME B 1.20.1
for tapered threads

Series	Tube OD	d2	b2 min.	d2	b2 min.	d2	b2 min.
LL	4	M 8 x 1 keg	5.5	R 1/8	5.5	1/8 NPT	11.6
LL	6	M 10 x 1 keg	5.5	R 1/8	5.5	1/8 NPT	11.6
LL	8	M 10 x 1 keg	5.5	R 1/8	5.5	1/8 NPT	11.6
L	6	M 10 x 1 keg	5.5	R 1/8	5.5	1/8 NPT	11.6
L	8	M 12 x 1.5 keg	8.5	R 1/4	8.5	1/4 NPT	16.4
L	10	M 14 x 1.5 keg	8.5	R 1/4	8.5	1/4 NPT	16.4
L	12	M 16 x 1.5 keg	8.5	R 3/8	8.5	3/8 NPT	17.4
L	15	M 18 x 1.5 keg	8.5	R 1/2	10.5	1/2 NPT	22.6
L	18	M 22 x 1.5 keg	10.5	R 1/2	10.5	1/2 NPT	22.6
L	22	M 26 x 1.5 keg	10.5	R 3/4	13	3/4 NPT	23.1
L	28	M 33 x 2 keg	12	R 1	16	1 NPT	27.8
L	35	M 42 x 2 keg	13	R 1 1/4	17	1 1/4 NPT	28.3
L	42	M 48 x 2 keg	13	R 1 1/2	17	1 1/2 NPT	28.3
S	6	M 12 x 1.5 keg	8.5	R 1/4	8.5	1/4 NPT	16.4
S	8	M 14 x 1.5 keg	8.5	R 1/4	8.5	1/4 NPT	16.4
S	10	M 16 x 1.5 keg	8.5	R 3/8	8.5	3/8 NPT	17.4
S	12	M 18 x 1.5 keg	8.5	R 3/8	8.5	3/8 NPT	17.4
S	14	M 20 x 1.5 keg	10.5	R 1/2	10.5	1/2 NPT	22.6
S	16	M 22 x 1.5 keg	10.5	R 1/2	10.5	1/2 NPT	22.6
S	20	M 27 x 2 keg	12	R 3/4	13	3/4 NPT	23.1
S	25	M 33 x 2 keg	12	R 1	16	1 NPT	27.8
S	30	M 42 x 2 keg	13	R 1 1/4	17	1 1/4 NPT	28.3
S	38	M 48 x 2 keg	13	R 1 1/2	17	1 1/2 NPT	28.3

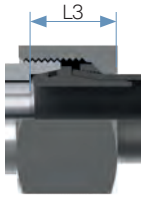
[1] Leak-tightness can only be achieved with liquid or elastic sealant.

Height of the completely assembled VOSS tube coupling

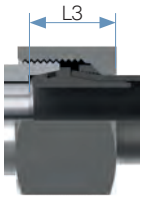
Dimension L3 describes the connection dimension of the tube connection used.







Series	s [mm]	L3 approx. [mm] Cutting rings	L3 approx. [mm] VOSS*Form*	L3 approx. [mm] BV-10
L 6	1	15.0	15.5	18.0
	1.5		16.0	–
	2			
L 8	1	15.0	15.5	18.5
	1.5		16.0	–
	2			
	2.5			
L 10	1	15.0	15.5	18.5
	1.5		16.0	–
	2			
L 12	1	15.0	15.5	18.5
	1.5		16.0	–
	2			
L 15	1	15.0	17.5	–
	1.5			19.5
	2			
L 18	1.5	16.5	18.5	20.5
	2			
	2.5			–
	3			
L 22	1.5	16.5	20.0	20.5
	2			
	2.5			–
	3			
L 28	2	16.5	20.0	21.0
	2.5			–
	3			21.0
L 35	2	21.5	24.0	26.0
	2.5			–
	3		25.0	26.0
	4			–
L 42	2	23.0	24.5	–
	2.5			
	3		25.5	28.5
	4			–

				
Series	**s [mm]**	**L3 approx. [mm] Cutting rings**	**L3 approx. [mm] VOSS*Form***	**L3 approx. [mm] BV-10**
S 6	1	15.0	16.0	–
	1.5		16.5	
	2			
S 8	1	15.0	16.0	–
	1.5		16.5	19.0
	2			–
	2.5			
S 10	1.5	16.5	18.5	20.0
	2			–
	2.5			
S 12	1.5	16.5	18.5	19.5
	2			–
	2.5			19.5
	3			
S 14	1.5	18.0	20.0	–
	2		20.5	21.5
	2.5			–
	3			
S 16	1.5	18.5	21.0	–
	2			22.0
	2.5			
	3			
	4		21.5	–
S 20	2	21.5	25.0	25.0
	2.5			
	3			
	3.5			
	4			
S 25	2	24.0	28.0	–
	2.5			27.5
	3			
	3.5			
	4			
S 30	2	26.5	30.5	–
	2.5			
	3		31.5	33.0
	4			
	5			
	6		32.0	–
S 38	2.5	31.0	34.5	–
	3			
	4		35.5	38.5
	5			
	6			
	7		36.0	–

Additional lengths when designing tube assemblies

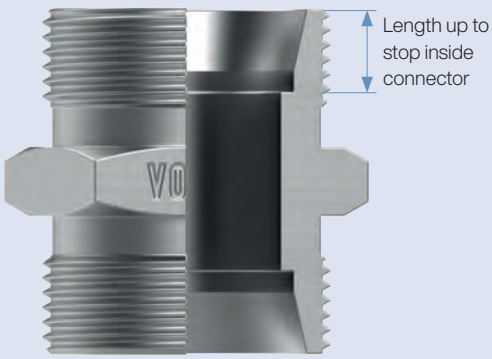
The following must be taken into consideration when calculating the length of tubing required for a given assembly length:

- minimum lengths of straight tube sections and of tube elbows*
- additional dimensions in the coupling connector
- additional tube sections (flaring, bend radii, elbow lengths, straight sections)

In addition, we recommend that in case of doubt some extra length be added when designing the ends of the tubes. This allows the tube length to be adjusted before commencing pre-assembly for the VOSS coupling system, if necessary.

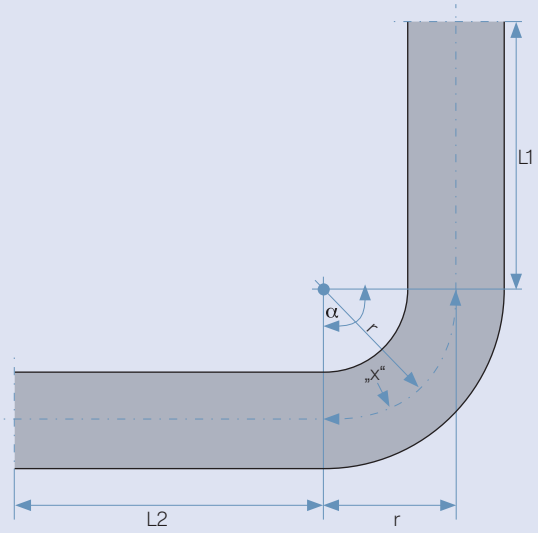
Dimension inside coupling connecting piece

Tube OD	Length up to stop inside connector [mm]
L 6	7
L 8	7
L 10	7
L 12	7
L 15	7
L 18	7.5
L 22	7.5
L 28	7.5
L 35	10.5
L 42	11
S 6	7
S 8	7
S 10	7.5
S 12	7.5
S 14	8
S 16	8.5
S 20	10.5
S 25	12
S 30	13.5
S 38	16



* Depends on the coupling system and pre-assembly system used.

Calculating the equivalent straight tube length



L = total equivalent straight tube length
x = equivalent tube length of elbow
α = bend angle
r = radius

$$x = \frac{\alpha \cdot 2 \cdot r \cdot \pi}{360°}$$

$$L = L1 + L2 + x$$

Please note that the bend radius is determined by the bend template of the device.

VOSS cutting ring systems in applications using polyamide (PA) tubing

Tubing made of organic materials is becoming increasingly popular in industrial applications. These materials have a good resistance to oil, grease and fuels as well as to high and low temperatures. They are also weather-resistant and have good mechanical characteristics such as fracture and impact resistance.

Polyamide (PA) tubes possess most of these qualities. They are manufactured to extremely tight tolerances and can be easily installed using metal or plastic coupling elements.

All VOSS Fluid cutting ring systems are suitable for use with tubes made of polyamide (PA).

Polyamide (PA) tubing applications:

- Control, measuring and monitoring technology
- Laboratory equipment
- Food processing industry
- Medical technology and electrical engineering
- Automotive industry
- Plant and equipment construction
- Pneumatics

Polyamide tube material properties

- Low weight
- Corrosion and temperature resistant
- Impact resistance at both low and high temperature ranges
- Relatively high pressure resistance with low wall thicknesses
- Temperature range from -40 °C up to +80 °C, and even up to +100 °C for short periods.

Product recommendation:

VOSS cutting pliers for plastic tubes

Plastic tubes must not be sawn apart as this leads to burrs, which endanger the leak-tightness of a coupling. VOSS Fluid recommends that the VOSS plastic tube cutting pliers be used to cut plastic tubing to length. This produces burr-free and orthogonally-cut tube ends. The surfaces of the cut do not need any additional processing.



Order designation: **TD-NTS**
Order-No.: **5994847200**

Assembly note:
Pre-assembly and final installation must always be carried out using tube support sleeves as described in the VOSS assembly instructions.

Conceived and thought through

VOSS coat

Corrosion resistance in perfection

Pioneer in zinc-nickel applications since 2007 – and still a clear leader.

EC directive 2000/53/EC on end-of-life vehicles was amended in 2007, partially banning the use of hexavalent chromium in materials and vehicles components. For us, this meant that the era of yellow chromate corrosion protection coatings had come to an end. The technological characteristics of available alternatives – using zinc as a base coat with thick-film passivation – fell a great deal short of VOSS quality requirements, and were clearly a step in the wrong direction. This move was and still is unacceptable to VOSS, since we always strive to increase the benefits for customers in our products and solutions.

Our solution: VOSS zinc-nickel surface finishes. The relevant characteristics of these coatings even surpass those of yellow-chromate finishes. Users were especially delighted by their corrosion resistance – 10 times better than before. In 2007, this was a huge leap forward in the hydraulic coupling technology market.

The steel is given three coats to provide optimum corrosion protection: a zinc-nickel base coat, a passivation layer and a sealing coat. In 2009, we set up our own electroplating competence center in which we produce and enhance our surface finishes.

Features we provide as standard are options elsewhere.

Our surface finishes have set the benchmark for corrosion resistance in all market sectors and have been used in our entire product range all around the world since 2007, at high availability levels. For you, as a customer, this means maximum process reliability for your applications, homogeneous selection of parts, no danger of confusing items. Suitable for use in hydraulic presses, plant construction, agricultural and construction machinery, conveyor engineering as well as for injection-molding machines and machine tools.



After comparative testing in a salt-spray chamber for 720 hours



VOSS Zink-Nickel



Zinc + passivation + sealing coat



The trademark for corrosion protection.

Our surface finish is much more than just a simple coating. This is why we have made it a trademark: VOSS coat. VOSS coat is synonymous with corrosion protection in perfection, focussing on technology, sustainability and human health and safety.

VOSS coat is the result of continuous improvement – for example of friction coefficients, layer thickness relationships and visual impression. These are the result of many years of experience in production processes and with customer applications furthered by our own research and development work. Only VOSS unites this comprehensive know-how under one roof – operating a proprietary VOSS coat competence center including an electroplating test line. In this way we make sure that our corrosion protection meets your strictest standards. To achieve a measurable technological lead for you.

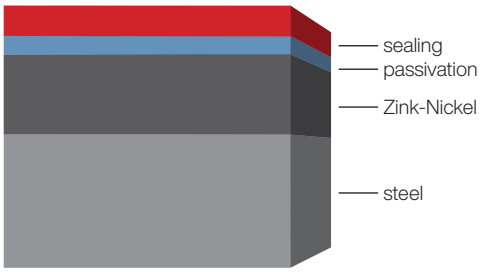
A technological lead, achieved by hard work

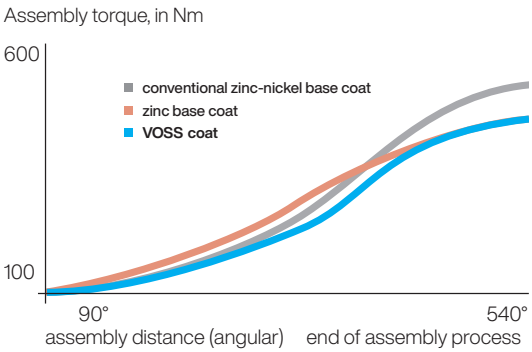
VOSS coat is the outcome of many years of in-house engineering that considers all the factors leading to increased benefits for the customers. Not only have we achieved an extremely high level of corrosion protection but also user-friendly handling in practical applications.

- **1,000 hours corrosion resistance in productive applications following shipping, handling and assembly.**
  Tested using random samples in the assembled state taken from series production. In view of the microscopic lesions which can occur during assembly, this is the only way of obtaining a reliable estimate of the service life to be expected in the customer's applications. Under laboratory conditions, the service life of unassembled parts exceeds 2,000 hours. After this, red rust starts to develop, whereas white rust only appears in the form of a light grey film. In addition, samples for our own quality assurance tests are taken from all production lots.

- **Assembly testing of cutting ring coupling (size S30)**
  VOSS coat ensures optimum assembly torques.

VOSS coat finish cross-section







Individual plant control programs: a separate program for controlling 12 parameters is compiled for each of our 6,600 articles.

- **Perfect assembly torques – not too high and not too low**
  How to avoid assemblies being too tight or too slack – thanks to our consistent quality – in all tube connections. Our own research, development and production have enabled us to continually improve the friction coefficient of VOSS coat to equal the best zinc surface finishes and have reached a value considerably lower than that of other zinc-nickel coatings.

- **Best possible process reliability thanks to a modern in-house electroplating plant with online sensors and analysis systems**
  This plant is designed exclusively for tube couplings – a unique feature. This is where we work to enhance our electroplating processes – in the electroplating test laboratory for chemical components, and in the engineering department for production procedures. In series of tests, the 12 program parameters are adjusted individually for each one of our 6,600 articles in order to optimize processes for all geometries and sizes. We have developed the racks and baskets used to move the articles through the plant ourselves and are continually improving these to achieve a degree of specialization impossible with outsourced processing. We conform without exception to the European Community Regulation on chemicals and their safe use (REACH), of course.

VOSS electroplating test laboratory: where VOSS coat is being permanently improved



Sustainability: only achievable from scratch if everything is under our control

Since 2009, we have been operating the VOSS coat competence center, with a floor area of 5,000 m^2, at our headquarters. To provide the best possible working conditions, the facility has two storeys: on the ground floor, all goods are transported and the test batches are fed to the racks and drums for the electroplating plant, then a lift system conveys them to the second floor. The actual electroplating process is carried out there and no workers are required on this floor. We can control all process steps in the plant and optimize them to suit our requirements, sustainably and without compromises.

- **Energy-efficient production:**
  Alone the sophisticated energy optimization measures (e. g. heat recovery installations) installed when the facility was built, bring annual energy savings of more than 490 MWh. This is the annual electric energy consumption of approximately 160 domestic dwellings.

- **Emission reductions (air pollution, water and noise):**
  Extract air is drawn directly from the space above the baths and is cleaned by an air scrubber. This brings pollutant levels in the exhaust air down to values exceeding the lower limits by a factor of more than 250. The same principle applies to our responsible use of water: instead of using valuable drinking-quality water, we use process water. Waste water is cleaned and its pH value neutralized by sophisticated processes at our own treatment plant. And our electroplating plant fulfils the strictest noise emission regulations for mixed-utilization urban areas as well.

- **Reduction of potential environmental hazards:**
  We use environment-friendly materials.

- **Raw-material efficiency and recycling:**
  The online analysis process optimizes the useful life of baths to achieve low resource consumption. Metal residues are reprocessed and thus returned to the raw-material cycle.



Process chemistry – the essence of VOSS coat. Thanks to automated concentration correction in baths, process parameters remain within tight tolerances.



The entire plant operation is controlled from the ground floor. All process steps and parameters are displayed and indicated in real time on control monitors.



Our plant technology is specifically designed to prevent damage to threads.



All bath parameters are continuously monitored. Chemicals are added in a fully automatic process to maintain the correct concentration.

The individual: at the focus of all our activities



Technology improves products. Sustainability ensures efficiency and conservation of resources. But only by combining these two factors do we really benefit the human beings involved. VOSS coat benefits everyone, now and in the future – staff and our customers alike.

- **Productive working conditions for our staff:**
  Employees and chemicals are separated by construction measures. Since concentration-adjustment dosing of the process baths is fully automated and requires no manual work, contact to chemicals is avoided. Ergonomical workplaces, eliminating lifting movements, for example, prevent fatigue and the errors associated with this.

- **Process stability in the interest of our customers:**
  Our good process stability, in conjunction with excellent component assembly characteristics, virtually eliminates faults which might occur due to excessively tight or slack assemblies. Coating processes specifically developed for our products ensure consistently high corrosion protection – at all times – for the entire product range.

- **Nickel release:**
  Our nickel release rate is more than 50 times lower than the limit values defined in EC regulation 1907/2006 for the release of nickel by objects coming into direct and prolonged contact with human skin.



Process optimization has led to shorter product immersion times at our facility than in other electroplating plants. This means even less stress on the material.



Our flexible plant controls allow customer-specific post-processing.



After electroplating, each production lot is subjected to quality control inspection of both the thickness and the chemical composition of the coating. The results of the inspections are documented.



Extract air is drawn directly from the space above the baths and scrubbed before being exhausted. Heat energy is recovered and recycled.

VOSS coat

Corrosion resistance in perfection

VOSS coat: in a class of its own

Corrosion protection is only as good as the weakest component. So it is best not to have any weakest component. VOSS coat sets the standard when it comes to improving corrosion protection in your entire system. Safety which improves your products and impresses your customers.

Reliability:

- 1,000 hours corrosion resistance under practical conditions.
- A technological leader among surfaces, thanks to many years of experience, research and development.
- Sustainable production in our own VOSS coat competence centre.
- More than 30 % of all users in Germany choose VOSS coat.
- High availability and delivery readiness: lean, rapid supply chains.
- Image enhancement and a high resale value for your machinery and plant, thanks to uncompromisingly high-quality components.
- Enhanced customer satisfaction due to minimum risk of complaint.
- Application engineering: customer specifications can be realized by our own employees (e.g. in the case of prototypes).
- Assuring the future through our own research and cooperation with universities and other higher education institutions.

Media resistance of VOSS couplings

The VOSS coat surface finish is compatible with all normal hydraulic fluids. However, as VOSS Fluid products are used in a wide range of applications, they will also come into contact with other media such as newly-developed synthetic hydraulic fluids, fuels, cleansing agents, lubricants, gases or corrosive alkaline or acid liquids. If you are planning to use media which cannot be described as a hydraulic oil commonly used in mechanical engineering applications, we recommend that you examine their suitability prior to use. Please note that not only their stability when used with VOSS Fluid surface coatings has to be taken into consideration, but also their compatibility with elastomers and other hydraulic components as well. An overview is given in the following table, which is only meant to serve as a guide:

Medium	Coupling material		Seal material		
	steel	Stainless steel 1.4571	NBR	FKM	EPDM
Acetone					
Ethanol (ethyl alcohol)					
Ether					
ASTM – oil No. 1–3					
ASTM – oil No. 4					
Brake fluid					
Gasolene (petrol)					
Benzene					
Steam					
Diesel fuel					
Biodiesel HVO 100					
Compressed air (dry)					
Natural gas					
Natural gas with up to 100 % hydrogen by volume					
Petroleum oil					
Liquid propane (LPG)					
Transmission oil					
Glycol (ethylene glycol)					
Fuel oil					
Hydraulic fluids (petroleum-based) HL/HLP					
Hydraulic fluids (polyglycol-based) HEPG				*	
Hydraulic oils (bio-oil based) HEES			*		
Hydraulic fluids (synthet. ester) HEES			*		
Bio-hydraulic oil (biodegradable)					
Hydraulic fluids HFC					
Carbon dioxide					
Carbon monoxide					
Methane					
Methanol (methyl alcohol)					
Mineral oils					
Unprocessed natural gas		**			
Kerosene					
Crude petroleum oil					
Shell Naturelle, HF-E-46					
Silicone oils					
Skydrol 500					
Skydrol 7000					
Sea water					

resistant resistant under certain conditions not resistant

* resistance depends on temperature ** our gas requires reduction of material hardness when stainless steel is used

Please note that any material's resistance to aggressive media depends on the temperature of the media when used.

Materials of the soft-seals (elastomers)

To ensure maximum leakage protection, different seal materials have to be used, depending on the respective application. The suitability of the elastomer to be selected depends essentially on the media being conveyed and on the temperature range.

The default elastomer material used by VOSS for 24° tube couplings, flange couplings and valves is NBR. All DKO couplings, VOSS*Form*^{SQR} and ES-4 products are supplied with elastomer seals of FKM (e. g. Viton®).

VOSS Fluid also offers other seal materials for the entire connector product range as options.

Seal material	Nitrile butadiene rubber	Hydrated NBR	Fluoroelastomer	Ethylene propylene diene-monomer rubber
Short designation (Examples: trademarks)	NBR (e. g. Perbunan®)	HNBR	FKM (e. g. Viton®)	EPDM
Temperature range	-35 °C up to +100 °C	-30 °C up to +140 °C	-25 °C up to +200 °C	-40 °C up to +150 °C
Low temperatures	++	+	+	++
Media resistance	good	good	very good	depends on conditions
Ozone resistance	limited	good	very good	very good

Please note that the effectiveness of elastomer seals will be affected by external influences, contact with media, friction and ageing.

Therefore the elastomers should be checked for the following kinds of damage when carrying out service or maintenance work, and should be replaced when necessary:

- cracking
- rough or otherwise changed surface
- deformation
- hardening or softening
- swelling
- reduced elasticity

The notes given in DIN 7716 (rubber products; requirements for storage, cleaning and maintenance) must be observed when using elastomer seals.

Viton® is a registered trademark of E. I. du Pont de Nemours and Company.
Perbunan® is a registered trademark of LANXESS Deutschland GmbH.

Ozone resistance of elastomer seals

Ozone is a gas occurring naturally in the atmosphere and which protects the environment against solar ultraviolet radiation. However, ozone is also a very strong oxidizing agent that attacks virtually all organic compounds. Elastomer seal materials, e. g. NBR, are particularly sensitive in this respect. Even a low atmospheric ozone concentration can impair product quality and service life considerably.

Ozone cracks the polymer chains of the seal material, thereby increasing the danger of tearing, even at low strain values (less than 10 %). This risk may even be increased under certain temperatures and humidity conditions.

In our production and storage processes, VOSS Fluid always ensures optimum conditions for the seal materials used. For example, all seals are protected against heat exposure, direct sunlight and soiling. Long storage times are also avoided.

To prevent damage, you should observe the following notes on storing seal materials:

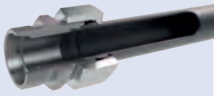
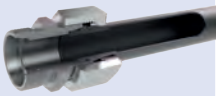
- Elastomers must be stored at a temperature between +5 °C and +25 °C.
- Deformation of the seals during storage should be avoided.
- Seal materials should be protected against direct contact with heat sources or lighting fixtures. Direct sunlight or strong artificial lighting with an ultraviolet component must also be avoided.
- Extremely damp and extremely dry conditions must be avoided. There must be no condensation, which means that the relative humidity of the storage spaces must be lower than 70 %.
- Packaging, particularly plastic bags, must be protected against UV radiation.
- Please note that ozone can also be emitted by other sources, which means that the storerooms may not contain any mercury-vapour lamps, high-voltage equipment and electric motors or other equipment which might cause arcing or electrostatic discharges. Exposure to combustion exhaust fumes and organic gases must also be avoided.
- While in storage, elastomer seals must not be allowed to come into contact with solvents, oil and grease.
- The service life of seals depends to a large extent on the type of elastomer used. Under ideal conditions, seals made of NBR and HNBR can be stored for up to 6 years and FKM seals for up to 10 years.
- Seals pre-assembled on the couplings must be inspected for damage and contamination before they are finally installed.

System comparison – requirements / system features

	VOSS*Ring*[M]	ES-4	VOSS*Form*[SQR]	BV-10
				
Technical comparison				
General				
For tube couplings as specified in standard	ISO 8434-1			
Series	L/S			
Tube OD	6 – 42			
Type of seal	metallic	metallic + soft-sealing		
Pressure load capacity	up to 500 bar (series L)			
	up to 800 bar (series S)			
Features	2-cutting-edge cutting ring with block stop	2-cutting-edge cutting ring with stop and additional soft-seals	Tube forming solution with soft-seals	10° flared coupling
Materials				
Material – version	Steel	Steel / stainless steel*	Steel / stainless steel*	Steel
Possible material pairing	Steel / stainless steel			Steel / stainless steel**
Soft-seal material	–	FKM (black)	FKM (green)	NBR (standard)
				FKM (green)
Assembly instructions				
Machine-assisted pre-assembly	possible		required	
Pre-assembly device	Type 90 Basic II / Comfort		Type 100 / Type 100 Compact	Type 90 Basic II / Comfort
	Type 80 N3			Type 80 N3
Manual pre-assembly	possible		–	–
Specifications				
Installation spaces	Minimum length of straight tube sections H > 33 mm (L12)		Minimum length of straight tube sections (A1-L1) > 53 mm (L12)	Minimum length of straight tube sections (L1+L2) > 69.5 mm (L12)
	Machine-assisted pre-assembly only possible to a limited extent if the bend radii are small		Small bend radii are only possible to a limited extent because of pre-assembly device	Small bend radii are only possible to a limited extent because of pre-assembly device
Leak-tightness in relation to influencing factors / assembly	Many influencing factors, reliability depends on correct assembly		Hardly any influencing factors, very high safety factor (process reliability)	Some influencing factors, high safety factor

* Machine-assisted pre-assembly is recommended

** Recommendation: DurNi coated connection parts

	VOSS*Ring*^{M}	ES-4	VOSS*Form*^{SQR}	BV-10
				
Specifications				
Typical application sectors	Construction machinery, wind turbines, agricultural machinery, pneumatic brakes, railway engineering	Agricultural machinery, cranes, mobile hydraulic systems	Elevators, presses	Injection-molding machines, mining vehicles
Can be used in safety areas.	No		Yes	
Fitter training requirements	Refresher training at 2-year intervals is recommended		low, single training course required	low, initial training course required, occasional refresher courses recommended
Pressure load capability - static/dyn. pressure load capability - Transmission of external forces	very good	very good	excellent	excellent
Resistance to tearing out of tubing	good	good	very good	very good
Long-term durability	good	very good	excellent	excellent
Influence of tube preparation	great	great	little	great
Conclusion	**Cutting ring for normal applications, also suitable for high pressures**	**Cutting ring for all applications, high pressures and additional safety against leakage**	**Tube-forming solution for highest requirements and process stability**	**Flaring solutions for highest requirements, also ideally suited for repairs**

Preventing faults and correcting malfunctions

All VOSS Fluid products have been carefully designed, taking into account ease of assembly, user-friendliness and the product's ability to reliably fulfil the intended purpose.

In order to ensure these qualities while the products are in use, the careful choice of hydraulic coupling systems along with their correct assembly and installation are of tremendous importance.

Almost 85 % of all failures are due to assembly or installation faults, leading to impaired sealing functions or even complete failure of the coupling or connection.

Distribution of causes of assembly faults:
- approx. 55 % too slack assembly for tube OD 20–42 mm
- approx. 40 % over-tightening for tube OD 6–18 mm
- approx. 5 % other assembly/installation faults

Faulty hydraulic lines not only lead to immense re-working costs and image loss, they can also have serious consequences such as accidents, fire hazards and environmental damage.

On the following pages, you will find system-related notes which will help you identify potential faults causes and take preventive action.

You must on all accounts observe the notes in this catalogue as well as the assembly and operating instructions for VOSS tube connection systems, tools and pre-assembly devices.

In addition, we recommend regular user training and assembly auditing by our qualified staff.



VOSS*Ring*^{M} cutting ring couplings

Problem: “leaks”

Characteristic	Preventive measures
Inadequate penetration of cutting ring / not enough tube material raised in front of first cutting edge	Observe the specified tightening paths (number of turns) when manually pre-assembling the coupling - Mark strokes on parts to allow visual control of the rotation angle - Use lubricants to reduce the assembly forces required
	Use pre-assembly devices and VOSS tools
	Observe the specified pre-assembly device parameter settings - Inspect and check the pre-assembly devices regularly
	Select tubes as specified in DIN EN 10305-4
	Do not use rotary grinder or tube cutter
	Only deburr tube edges internally and externally, do not sharpen them. Check deburring tool regularly.
	Cut tubes at right angles.
	Ensure that the area where the tube was cut is free of contamination, metal chips and paint
No visibly raised tube material in front of the first cutting edge / cutting ring is jammed on the tube	The tube must be pushed firmly against the stop in the stud - Ensure that the assembly is not subject to stress during installation
	Use pre-assembly devices and VOSS tools
Tube has been pressed away from under the cutting ring / the tube bulges	For thin-walled tubes, use suitable reinforcing supports
Constriction behind the cutting ring / damaged thread / after being slackened, the nut cannot be unscrewed any further by hand / the nut bulges / damage to the hex spanner surfaces	Observe the specified tightening paths when manually assembling the coupling - Mark strokes on parts to allow visual control of the rotation angle - Use lubricants to reduce the required assembly forces
	Use pre-assembly devices and VOSS tools
	Observe the specified pre-assembly device parameter settings - Inspect and check the pre-assembly devices regularly
	Select tubes as specified in DIN EN 10305-4
	Avoid frequent re-tightening of the coupling after assembly
	Avoid using extenders for small tubes and couplings
Cutting ring is obviously too near the tube end / stud connector has expanded	Inspect and check the pre-assembly devices regularly - Use taper gauges
	Do not re-use screw coupling parts more than once
	Use pre-assembly stud, “high-strength material” version
	Use VOSS test gauges to check cutting-ring positions

VOSS*Ring*^{M} cutting ring couplings

Problem: “leaks”

Characteristic	Preventive measures
Damage found on cutting ring after pre-assembly	Inspect and check the pre-assembly devices regularly
	- Inspect internal cone surfaces for damage and/or contamination
	Using suitable lubricants increases tool service life
Cutting ring leaks repeatedly	Select the suitable system for the respective application (depending on temperature, pressure and type of load)
	Use a soft-sealing system (ES-4 / VOSS*Form*^{SQR} / BV-10)
	Avoid duplicate dimension notations; take expansion loops into consideration to permit stress-free installation
	Use tube saddles or clamps
	Provide specified minimum length of straight tube leading to elbow
Cutting ring has penetrated unevenly	Provide specified minimum length of straight tube leading to elbow
	Select tubes as specified in DIN EN 10305-4
Slight oil film around the coupling	Only apply a small amount of lubricant to the components during assembly
	Degrease the components after assembly
Components bind at surfaces in contact with one another	Use suitable stainless steel assembly paste
	Apply sufficient lubricant to the contact surfaces
	Only use hardened pre-assembly studs for manual pre-assembly work
	Use pre-assembly devices and VOSS tools

Problem: “tube rupture”

Characteristic	Preventive measures
Tube breaks off directly behind union nut	Use tube saddles or clamps
	Ensure that components are not subject to stresses in installed condition, avoid shear loads
	Select the most suitable system for the respective application (depending on temperature, pressure and type of load)
Tube breaks off directly behind the cutting ring	Stop tightening as soon as the cutting ring has reached the block
	Avoid using extenders for small tubes and couplings

Problem “tube pulled out of coupling”

Characteristic	Preventive measures
Cutting ring peels off the tube due to too shallow incision	Before every final assembly, check the amount of tube material raised by the first cutting edge
	Re-assemble and tighten up cutting-ring couplings which were inadequately tightened
No visibly raised tube material in front of the first cutting edge / cutting ring is jammed on the tube	Before every final assembly, check the amount of tube material raised by the first cutting edge
Cutting ring has been placed on tube the wrong way around	Check that the cutting ring faces the correct direction

VOSS 2SVA cutting ring couplings

Problem: “leaks”

Characteristic	Preventive measures
Inadequate penetration of cutting ring / not enough tube material raised in front of first cutting edge	Observe the specified tightening paths (number of turns) when manually pre-assembling the coupling - Mark strokes on parts to allow visual control of the rotation angle - Use lubricants to reduce the assembly forces required
	Use pre-assembly devices and VOSS tools
	Observe the specified pre-assembly device parameter settings - Inspect and check the pre-assembly devices regularly
	Select tubes as specified in DIN EN 10305-4
	Do not use rotary grinder or tube cutter
	Only deburr tube edges internally and externally, do not sharpen them. Check deburring tool regularly
	Cut tubes at right angles
	Ensure that the area where the tube was cut is free of contamination, metal chips and paint
No visibly raised tube material in front of the first cutting edge / cutting ring is jammed on the tube	The tube must be pushed firmly against the stop in the stud - Ensure that the assembly is not subject to stress during installation
	Use pre-assembly devices and VOSS tools
Tube has been pressed away from under the cutting ring / the tube bulges	For thin-walled tubes, use suitable reinforcing supports
	Avoid frequent re-tightening of the coupling after assembly
Too much tube material has been raised	Observe the specified tightening paths when manually assembling the coupling - Mark strokes on parts to allow visual control of the rotation angle - Use lubricants to reduce the required assembly forces
	Use pre-assembly devices and VOSS tools
	Observe the specified pre-assembly device parameter settings - Inspect and check the pre-assembly devices regularly
	Select tubes as specified in DIN EN 10305-4
	Avoid using extenders for small tubes and couplings
Damaged threads / after being slackened, the nut cannot be unscrewed any further by hand	Observe the specified tightening paths when manually assembling the coupling - Mark strokes on parts to allow visual control of the rotation angle - Use lubricants to reduce the required assembly forces
	Avoid using extenders for small tubes and couplings

Characteristic	Preventive measures
The nut bulges / damage to the hex spanner surface	Observe the specified tightening paths when manually assembling the coupling - Mark strokes on parts to allow visual control of the rotation angle - Use lubricants to reduce the required assembly forces
	Avoid using extenders for small tubes and couplings
Cutting ring is obviously too near to the tube end / stud connector has expanded	Inspect and check the pre-assembly devices regularly - Use taper gauges
	Do not re-use screw coupling parts more than once
	Use pre-assembly studs, "high-strength material" version
	Use VOSS test gauges to check cutting-ring positions
Damage found on cutting ring after pre-assembly	Inspect and check the pre-assembly devices regularly - Inspect internal cone surfaces for damage and/or contamination
	Using suitable lubricants increases tool service life
Cutting ring leaks repeatedly	Select the most suitable system for the respective application (depending on temperatures, pressure and type of load and stress)
	Use a soft-sealing system (ES-4 / VOSS*Form*^{SQR} / BV-10)
	Avoid duplicate dimension notations; take expansion loops into consideration to allow stress-free installation
	Use tube saddles or clamps
	Provide specified minimum length of straight tube leading to elbow
Cutting ring has penetrated unevenly	Provide specified minimum length of straight tube leading to elbow
	Select tubes as specified in DIN EN 10305-4
Slight oil film around the coupling	Only apply a small amount of lubricant to the components during assembly
	Degrease the components after assembly
Components bind at surfaces in contact with one another	Use suitable stainless steel assembly paste
	Apply sufficient amount of lubricant to the contact surfaces
	Only use hardened pre-assembly studs for manual pre-assembly work
	Use pre-assembly devices and VOSS tools

VOSS 2SVA cutting ring couplings

Problem: “tube rupture”

Characteristic	Preventive measures
Tube breaks off directly behind union nut	Use tube saddles or clamps
	Ensure that components are not subject to stresses in installed condition, avoid shear loads
	Select the most suitable system for the respective application (depending on temperature, pressure and type of load)

Problem “tube pulled out of coupling”

Characteristic	Preventive measures
Cutting ring peels off the tube due to too shallow incision	Before each final assembly, check the amount of tube material raised by the first cutting edge
	Re-assemble and tighten up cutting-ring couplings which were inadequately tightened
No visibly raised tube material in front of the first cutting edge / cutting ring is jammed on the tube	Before each final assembly, check the amount of tube material raised by the first cutting edge
Cutting ring has been placed on tube the wrong way around	Check that the cutting ring faces the correct direction

VOSS ES-4/ES-4VA cutting ring couplings

Problem: “leaks”

Characteristic	Preventive measures
Inadequate penetration of cutting ring / not enough tube material raised in front of first cutting edge	Observe the specified tightening paths (number of turns) when manually pre-assembling the coupling - Mark strokes on parts to allow visual control of the rotation angle - Use lubricants to reduce the required assembly forces
	Use pre-assembly devices and VOSS tools
	Observe the specified pre-assembly device parameter settings - Inspect and check the pre-assembly devices regularly
	Select tubes as specified in DIN EN 10305-4
	Do not use rotary grinder or tube cutter
	Only deburr tube edges internally and externally, do not sharpen them. Check deburring tool regularly
	Cut tubes at right angles.
	Ensure that the area where the tube was cut is free of contamination, metal chips and paint
No visibly raised tube material in front of the first cutting edge / cutting ring is jammed on the tube	The tube must be pushed firmly against the stop in the stud - Ensure that the assembly is not subject to stress during installation
	Use pre-assembly devices and VOSS tools
Tube has been pressed away from under the cutting ring / the tube bulges	For thin-walled tubes, use suitable reinforcing supports
	Avoid frequent re-tightening of the coupling after assembly
Cutting ring is obviously too near to the tube end / stud connector has expanded	Inspect and check the pre-assembly devices regularly - Use taper gauges
	Do not re-use screw coupling parts repeatedly
	Use pre-assembly studs, “high-strength material” version
	Use VOSS test gauges to check cutting-ring positions
Damage found on cutting ring after pre-assembly	Inspect and check the pre-assembly devices regularly - Inspect internal cone surfaces for damage and/or contamination
	Using suitable lubricants increases tool service life
Sweating of liquid at tube end	In order to prevent the soft-seal from being damaged, it is essential to apply a lubricant to the tube before installing the cutting ring during the pre-assembly process.
	Deburr the inner and outer edges of the tube end lightly. Check deburring tool regularly.

Characteristic	Preventive measures
Sweating of liquid at stud connector end	To prevent damage to the soft-seals, lubricant must be applied to all soft-seals of the cutting ring before assembling the coupling
	Check soft-seals for damage before assembling the coupling, replace seals if necessary
Missing soft-seals	Check that all components are in place before assembling the coupling
	Replace soft-seal
Cutting ring leaks repeatedly	Select the most suitable system for the application (depending on temperatures, pressure and type of load and stress)
	Avoid duplicate dimension notations; take expansion loops into account to permit stress-free installation
	Use tube saddles or clamps
	Observe minimum lengths specified for straight tubes following elbows
Cutting ring has penetrated unevenly	Provide specified minimum length of straight tube leading to elbow
	Select tubes as specified in DIN EN 10305-4
Very little or no material raised by the first cutting edge	Stainless steel cutting rings must be used for stainless steel tubes
Components bind at surfaces in contact with one another	Use suitable stainless steel assembly paste
	Apply sufficient amount of lubricant to the contact surfaces
	Only use hardened pre-assembly studs for manual pre-assembly work
	Use pre-assembly devices and VOSS tools

VOSS ES-4/ES-4VA cutting ring couplings

Problem: “tube rupture”

Characteristic	Preventive measures
Tube breaks off directly behind union nut	Use tube saddles or clamps
	Ensure that components are not subject to stresses in installed condition, avoid shear loads
	Select the most suitable system for the application (depending on temperature, pressure and type of load)
Tube breaks off directly behind the cutting ring	Stop tightening as soon as the cutting ring has reached the block
	Avoid using extenders for small tubes and couplings

Problem “tube pulled out of coupling”

Characteristic	Preventive measures
Cutting ring peels off the tube due to too shallow incision	Before every final assembly, check the amount of tube material raised by the first cutting edge
	Re-assemble and tighten up cutting ring couplings which were inadequately tightened
No visibly raised tube material in front of the first cutting edge / cutting ring is jammed on the tube	Before every final assembly, check the amount of tube material raised by the first cutting edge
Cutting ring has been placed on tube the wrong way around	Check that the cutting ring faces in the correct direction

VOSS*Form*^{SQR}/VOSS*Form*^{SQR}VA tube couplings

Problem: “leaks”

Characteristic	Preventive measures
Nut comes loose during operation	Observe the specified tightening paths (number of turns) when finally assembling the coupling - Mark strokes on parts to allow visual control of the rotation angle - Use lubricants to reduce the required assembly forces and to reduce soft-seal wear
	Observe specified tightening torque where this is the assembly criterion
No moulded seal	Check that all components are in place before assembling the coupling
	Install the soft-seal
No clamping ring in the nut	Check that all components are in place before assembling the coupling
	Store DIN union nuts and SQR function nuts separately in order to prevent mistakes
	Only use SQR function nuts
VOSS*Form*^{SQR} contour is not created correctly	Check and inspect tools and machines regularly
	Check the contour after every forming operation
	Apply a thin film of lubricant only to the inner and outer tube surfaces, not to the end face, as oil on the end face can falsify the forming process results
	Tube must be pushed against the stop plate during the forming process
	Clean tools regularly
Slight oil film around the coupling	Only apply a small amount of lubricant to the components during assembly
	Degrease the components after assembly
Material surface binds during tube forming / tool breakage	Only stainless steel tools (marked VA for stainless steel use) may be used for forming stainless steel tubes
	Use special fine-cutting oil (Feinschneideöl FOE)
Components bind at surfaces in contact with one another	Use suitable stainless steel assembly paste
	Apply sufficient lubricant to the contact surfaces
Couplings leak repeatedly	Select the most suitable system for the application (depending on temperature, pressure and type of load and stress)

Problem: “tube rupture”

Characteristic	Preventive measures
Tube breaks off directly behind union nut	Use tube saddles or clamps
	Ensure that components are not subject to stresses in installed condition, avoid shear loads

VOSS BV-10 flared couplings

Problem: “leaks”

Characteristic	Preventive measures
Flared cone has not been driven into the tube far enough / saw-toothed surface is not completely covered	Check that the gap between the face end of the tube and the collar of the cone is correct (≥ 0.5 to max. 1 mm)
Nut comes loose during operation	Observe the specified tightening paths when manually assembling the coupling - Mark strokes on parts to allow visual control of the rotation angle - Use lubricants to reduce the assembly forces required and to reduce soft-seal wear.
Tube has bulged in the front section	Check that the gap between the face end of the tube and the collar of the cone is correct (≥ 0.5 to max. 1 mm) The end face of the tube must not come into contact with the collar of the flared cone during the pre-assembly process
Damaged thread / after being slackened, the nut cannot be unscrewed any further by hand / the nut bulges / damage to the hex spanner surfaces	Observe all specified tightening distances - Mark strokes on parts to allow visual control of the rotation angle - Use lubricants to reduce the required assembly forces Select tubes as specified in DIN EN 10305-4 Avoid frequent re-tightening of the coupling after assembly Avoid using extenders for small tubes and couplings
Missing O-ring	Check that all components are in place before assembling the coupling Install the soft-seal
Clamping ring missing	Check that all components are in place before assembling the coupling Always install clamping ring before flaring the tube
Slight oil film around the coupling	Only apply a small amount of lubricant to the components during assembly Degrease the components after assembly
Contact corrosion during operation	When using stainless steel tubing, only use Dur-Ni-coated flared cones Apply sufficient lubricant to the contact surfaces
Components bind at surfaces in contact with one another	Use suitable stainless steel assembly paste Apply sufficient lubricant to the contact surfaces
Couplings leak repeatedly	Select the most suitable system for the application (depending on temperature, pressure and type of load and stress)

Problem: “tube rupture”

Characteristic	Preventive measures
Tube breaks off directly behind union nut	Use tube saddles or clamps
	Ensure that components are not subject to stresses in installed condition, avoid shear loads

VOSS ZAKO

Problem: “leaks”

Characteristic	Preventive measures
Flared cone has not been driven into the tube far enough / saw-toothed surface is not completely covered	Observe specified gap width between face end of tube and collar of ZAKO ring, see assembly instructions for dimensions
ZAKO ring lifts off the connecting surface	Tighten all screws/bolts with the specified torques
Tube has bulged in the front section	Observe specified gap width between face end of tube and collar of ZAKO ring, see assembly instructions for dimensions The end face of the tube must not come into contact with the collar of the ZAKO ring during the pre-assembly process
Screws/bolts are difficult to screw into the threaded flange	Lubricate the screw/bolt threads
Missing O-ring	Check that all components are in place before assembling the coupling Install the soft-seal
Sealing surfaces are dirty	Keep sealing surfaces and soft-seals clean
Flange mounted crookedly on the tube	Ensure that the flange is at right angles to the connecting surface - Tighten up diagonally opposing screw/bolt pairs crosswise
Slight oil film around the coupling	During assembly, please lightly oil the components Degrease the components after assembly
Couplings leak repeatedly	Select the most suitable system for the application (depending on temperature, pressure and type of load and stress)

Problem: “tube rupture”

Characteristic	Preventive measures
Tube breaks off directly behind the flange	Use tube saddles or clamps Ensure that components are not subject to stresses in installed condition, avoid shear loads

VOSS taper seal couplings DKO

Problem: “leaks”

Characteristic	Preventive measures
Nut comes loose during operation	Observe the specified tightening paths (number of turns) when finally assembling the coupling - Mark strokes on parts to allow visual control of the rotation angle - Use lubricants to reduce the required assembly forces
	Observe specified tightening torque where this is the assembly criterion
Damaged thread / after being slackened, the nut cannot be unscrewed any further by hand / the nut bulges / damage to the hex spanner surfaces / wire pin has come out of the groove	Observe the specified tightening paths (number of turns) when finally assembling the coupling - Mark strokes on parts to allow visual control of the rotation angle - Use lubricants to reduce the required assembly forces
	Avoid using extenders for small tubes and couplings
Missing O-ring	Check that all components are in place before assembling the coupling
	Install the soft-seal
Slight oil film around the coupling	Only apply a small amount of lubricant to the components during assembly.
	Degrease the components after assembly
Damaged O-ring	Align DKO coupling properly before tightening it by hand. Hold the connecting piece body with a spanner to counter tightening torque when finally tightening up the connection
	Use lubricants to reduce the assembly forces required and to reduce soft-seal wear
	Ensure that components are not subject to stresses in installed condition, avoid shear loads
Couplings leak repeatedly	Select the most suitable system for the application depending on temperature, pressure and type of load and stress)

Problem: “tube rupture“

Characteristic	Preventive measures
DKO coupling cracks open radially along the groove for the wire pin	Install the connected tubes and hoses in such a way that no additional shear loads will act on the coupling
	Ensure that the components are not subjected to stresses in the installed state

VOSS 24° couplings

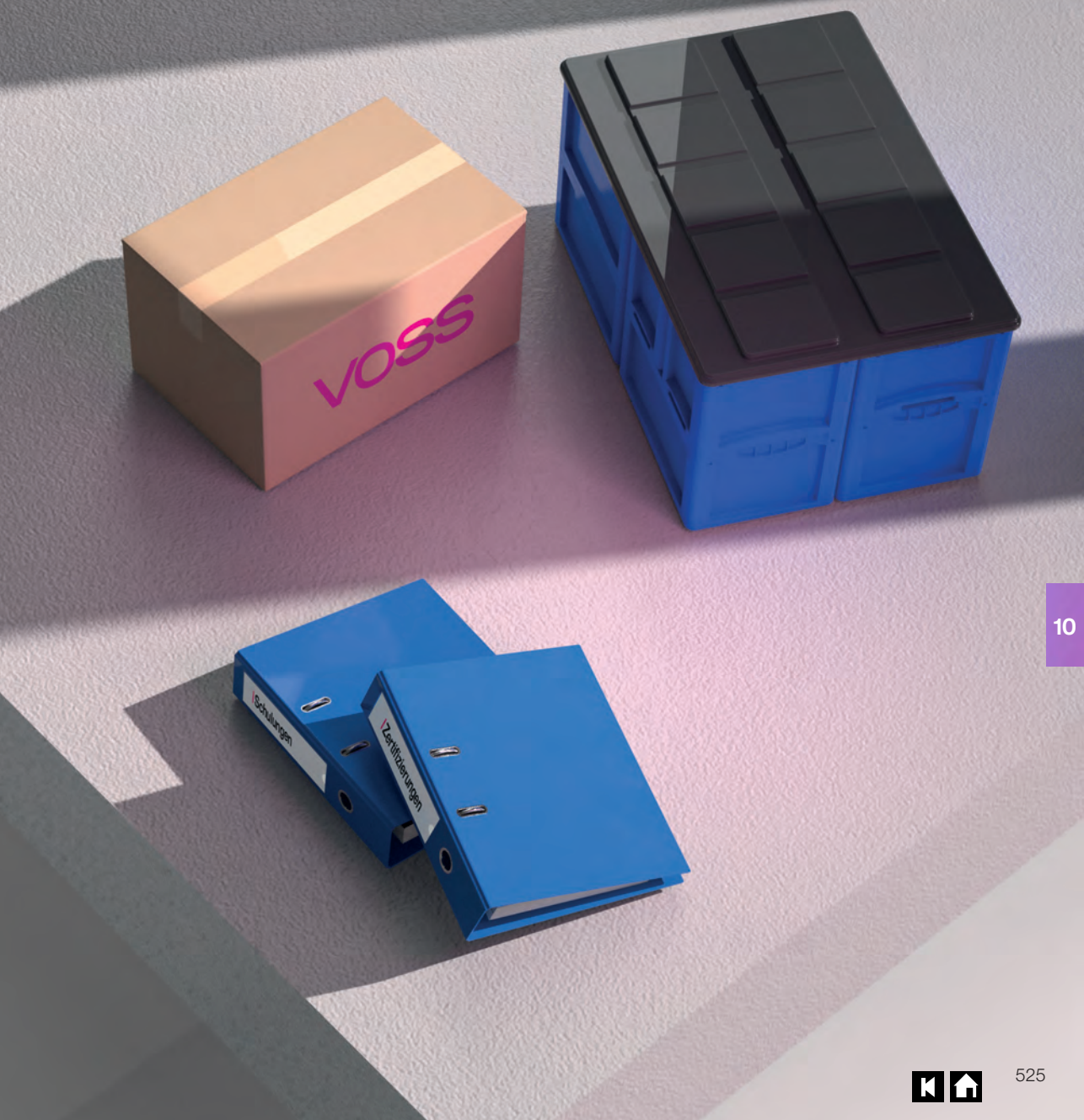
Problem: “leaks”

Characteristic	Preventive measures
Screwed connection pulls out of the threads	Observe all specified tightening torques - Use lubricants
Damaged thread / damage to the hex spanner surfaces	Observe all specified tightening torques - Use lubricants
	Avoid frequent re-tightening of the coupling after assembly
	Avoid using extenders for small tubes and couplings
Thread tears away	Observe all specified tightening torques
	Use a spanner to hold the coupling body when assembling the coupling
Missing seal (PEFLEX or O-ring)	Check that all components are in place before assembling the coupling
	Install the soft-seal
Threaded section cannot be screwed into the female part	Check whether the threads are imperial or metric (danger of confusion) - Use the VOSS thread gauge board to determine the thread type and size
Leaks in the threads	Keep sealing surfaces and soft-seals clean
	Use the correct type of seal for every threaded hole
	Avoid screwing conical male stud connectors into cylindrical threaded holes - Use components with adjustable screw connections as an alternative
Leakage at recesses	When re-assembling used components, especially male stud connectors with a sealing edge (form B), renew the recess every time
	Use the correct type of seal for every threaded bore
Damaged thread / hairline cracks in the male stud connector	Correct handling and transportation
	Inspect and check coupling components before assembly
	Check that the DKO cone has a stop to prevent over-tightening of the connection
Slight oil film around the coupling	Only apply a small amount of lubricant to the components during assembly
	Degrease the components after assembly

Characteristic	Preventive measures
Components bind at surfaces in contact with one another	Use suitable stainless steel assembly paste
	Apply sufficient lubricant to the contact surfaces
Male stud connectors cannot be unscrewed manually after being initially slackened	Observe the tightening torques specified for the respective mating materials
	Use suitable lubricants
Metal chips in the threaded hole	Clean the threads

Services

Increase process reliability, reduce lead times and save process costs through tailor-made solutions



Content	Type/Page
Our service for permanent leak-tightness and efficiency	P.527

Our service for permanent leak-tightness and efficiency

Assembly trainings and audits, with VOSS quality

Exclude all sources of error and let us advise you!

The biggest enemy of the hydraulic system is leakage. There are many possible sources of error, but most often humans are the key. Only highly qualified employees can detect and avoid potential errors at an early stage. VOSS offers regular training courses for this purpose: tailored to the customer's needs, directly on the customer's premises or in our training facilities.

Within the scope of an assembly audit, we look over your employees' shoulders, analyze processes, check assembly stations and equipment and ultimately work out a tailor-made training course that sustainably increases productivity: fewer errors, faster results and lower costs. In this way, continuous improvements to your processes and compliance with the highest safety standards can be ensured.

Our offer

- General training program in hydraulic application technology
- Optimization workshops tailored to customer processes
- Assembly training courses for the qualification of employees in theory and practice
- Assembly audits

Your added value: solutions for maximum economic efficiency

Increase the efficiency of your hydraulic applications!

The high added value by VOSS Fluid products and services provides your products and systems with lasting technical and economic advantages. This added value is defined by the three core competencies from the areas of development and production, long-term corrosion protection and availability and services.

New potential for improvement for the customer is constantly being tapped through constant critical scrutiny of the company's own processes, ongoing investments and the deployment of qualified specialist personnel.

Thanks to their high product quality and user-friendliness, VOSS Fluid product solutions always guarantee sustained leak protection without a negative influence on the overall system costs.

- High process reliability in assembly
- Short assembly times, high productivity
- Avoid rework
- Permanently leak-free connections
- Use of the optimal components/systems
- Improving the quality of your product
- Reduce the costs of your production





Sustainable surface coating by the specialist

Protect your machines and systems against corrosion during a lifetime of use!

The process-safe VOSS coat surface coating ensures best corrosion protection properties and thus ensures optimum protection of VOSS products.

The in-house galvanic plant at VOSS works without chromium VI, uses very little water and produces a coating that provides highly sustainable corrosion protection throughout its lifetime. This is another step we are taking to integrate innovative and environmentally friendly technologies into our processes.

- Highest corrosion protection in hydraulic connection technology
- Optimum design of in-house electroplating to avoid thread damage
- Continuous further development of the surface to improve corrosion protection and mountability
- Optimize your corrosion protection measures
- Increase your customers satisfaction

Intelligent logistics concepts tailored to your needs

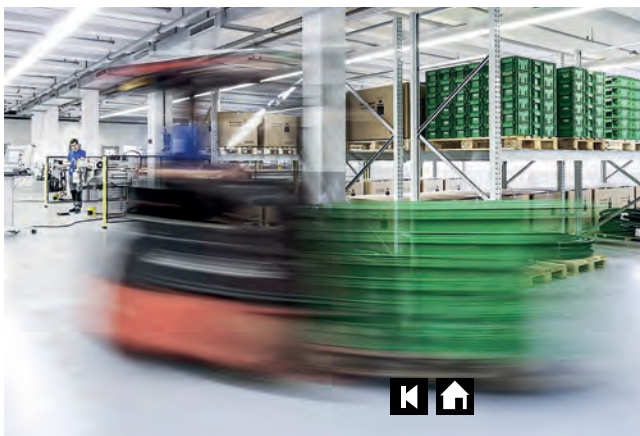
Optimize your supply chain with the highest regional availability and comprehensive services!

Only a fraction of the cost of connection components is accounted for by the actual product. The proportion of logistics costs is disproportionately high for these C parts. However, a lack of components causes the same trouble in assembly as the absence of A parts.

VOSS Fluid knows the specific needs of the customers and has corresponding logistics solutions which lead to significant savings in process costs, reduction of throughput times and high process reliability. A logistics solution based on the specific application is developed and practiced in cooperation with the customer.

- Delivery service level > 99 %
- Reduction of your inventory levels and replenishment times
- Complete support for KANBAN implementation
- Analysis and documentation of consumption
- Web-KANBAN as online monitoring of your entire coupling logistics
- Simplification/automation of your supply chain
- Reduction of your materials management costs





List of designations

Designation	Page
24-1S...	58
24-24/37AO...	74
24-24/37N...	76
24-24/37R...	75
24-24/37SO...	77
24-2S...SST	59
24-BCE...G...B	140
24-BCE...G...E	141
24-BCE...M...B	138
24-BCE...M...E	139
24-BCT...G...E	143
24-BCT...M...E	142
24-BEE...G...B	136
24-BEE...G...E	137
24-BEE...M...B	134
24-BEE...M...E	135
24-BHELN...	127
24-BHSDSLN...E	128
24-BHSLN...	126
24-BSE...G...B	132
24-BSE...G...E	133
24-BSE...M...B	130
24-BSE...M...E	131
24-BV10CO...	66
24-BV10N...	69
24-BV10R...	68
24-BV10SO...	70
24-E...	119
24-ES-4...	60
24-ES-4...SST	60
24-K...	124
24-LN...IM...	214
24-N...	62
24-N...SST	62
24-PGS...IG...B	197
24-PLB...	210
24-PLO...	211
24-PLOC...	212
24-RCE...G...E	145
24-RCE...M...E	144
24-RS...BS	215
24-RS...SST	217
24-RS...ST	216
24-S...	116
24-S...-...	117
24-S...IG...	195
24-S...IM...	194
24-SD2S...G...E...E	200
24-SDAE...G...E	183
24-SDAE...M...E	182
24-SDAE...M...F	184
24-SDAL...M...F	185
24-SDAT...M...F	186
24-SDE...M...T	106
24-SDE...N...T	109
24-SDE...R...T	107

Designation	Page
24-SDL...M...T	110
24-SDL...R...T	111
24-SDS...G...A	82
24-SDS...G...B	87
24-SDS...G...E	98
24-SDS...M...A	80
24-SDS...M...B	84
24-SDS...M...E	95
24-SDS...M...F	104
24-SDS...M...T	90
24-SDS...N...T	93
24-SDS...R...T	91
24-SDS...U...F	101
24-SDT...M...T	112
24-SDT...R...T	113
24-SQRMS...FKM	234
24-SQRNMS...	64
24-SQRNMS...SST	64
24-SW2OS...	162
24-SWE...	148
24-SWL...	150
24-SWOE...	168
24-SWOE45...	169
24-SWOK...	167
24-SWOL...	171
24-SWOPGS...IG...B	199
24-SWOS...	176, 180
24-SWOSDS...G...E	173
24-SWOSDS...M...E	172
24-SWOSDS...M...F	175
24-SWOT...	170
24-SWPGS...IG...B	198
24-SWS...	156
24-SWSDS...G...B	152
24-SWSDS...G...E	155
24-SWSDS...M...B	151
24-SWSDS...M...E	154
24-SWSDS...N...T	153
24-SWT...	149
24-T...	120
24-T...-...-...	121
24-TBS...	213
24-VNRO...	336
24-VNROHP...	343
24-VNROPT...G...E	340
24-VNROPT...M...E	339
24-VNROPTHP...G...E	345
24-VNROPTHP...M...E	344
24-VNROTP...G...E	342
24-VNROTP...M...E	341
24-VNROTPHP...G...E	347
24-VNROTPHP...M...E	346
24-VRM...	58
24-VSOT...	352
24-VSSWOT...	351
24-VST...	350
24-WDBHS...	189
24-WDNPSO...	190
24-WDS...	188
DC/24-BHSLN...TPC1-SCV-SP51	252

Designation	Page
DC/24-SWOL...TPC1...SCV-SP51	251
DC/24-SWOS...TPC1-SCV-SP51	250
DC/24-T...TPC1...SCV-SP51	249
DC-BHSLN-TPC1...SCV	253
DC-PGBHSLN-FM1-IG...F-SP51	254
DC-PGS-PM1-IG...F	255
DC-SDS-G...E-IM...	258
DC-SDS-M...E-IM...	258
DC-SDS-N...T-IM...	258
DC-SDS-TPC1-G...SCV-SP51	248
DC-SDS-TPC1-M...SCV-SP51	248
DC-SDS-TPC1-N...T-SCV-SP51	248
DC-SDS-TPC1-R...T-SCV-SP51	248
DC-SDS-TPC1-U...F-SCV-SP51	248
DC-S-TPC1	256
DC-TH6-A1-A1-LG...	257
DC-WDS-IG...D...	259
DC-WDS-IM...D...	259
F/24-FAEO...3S...	282
F/24-FAEO...6S...	283
F/24-FAEX...6S...	293
F/24-FASO...3S...	280
F/24-FASO...6S...	281
F/24-FASX...3S...	290, 292
F/24-FASX...6S...	291
F/24-QFFEO...	277
F/24-QFFEX...	287
F/24-QFFSO...	276
F/24-QFFSX...	286
F/SET-SFPO-3S...	296
F/SET-SFPO-6S...	297
F-SF-3S...	294
F-SF-6S...	295
GP_OR...EPDM	232
GP-ES4OR...	220
GP-OR...FKM	231, 235
GP-OR...FKM80	228
GP-OR...NBR	223, 230, 233
GP-OR...NBR90	227
GP-PEFLEX...EPDM	226
GP-PEFLEX...FKM	225
GP-PEFLEX...NBR	224
GP-PLIH-G...E	209
GP-PLIH-M...E	208
GP-PLIH-M...F	207
GP-SDS-G...B-IG...	202
GP-SDS-G...E-IG...	204
GP-SDS-M...F-IM...	206
GP-SR...	221, 229
GP-SR...E	222
GP-VNRCO...	348
GP-VNRIO...	349
GP-VNROI-IG...	337
GP-VNROI-IU...	338
Z-FPH...	318
Z-FPH...HC...	320
Z-FPT...	319
Z-R...	316
Z-RGO...	314
Z-TPO...3S...	300, 301

Designation	Page
Z-TPO...6S...	302, 303
Z-TPO...HC...	308
Z-TTO...3S...	304
Z-TTO...6S...	305
Z-TTO...HC...	310

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