KOSTYRKA

Cylindrical Clamping Sleeves

Flange Type Clamping Sleeves

Expanding Sleeves

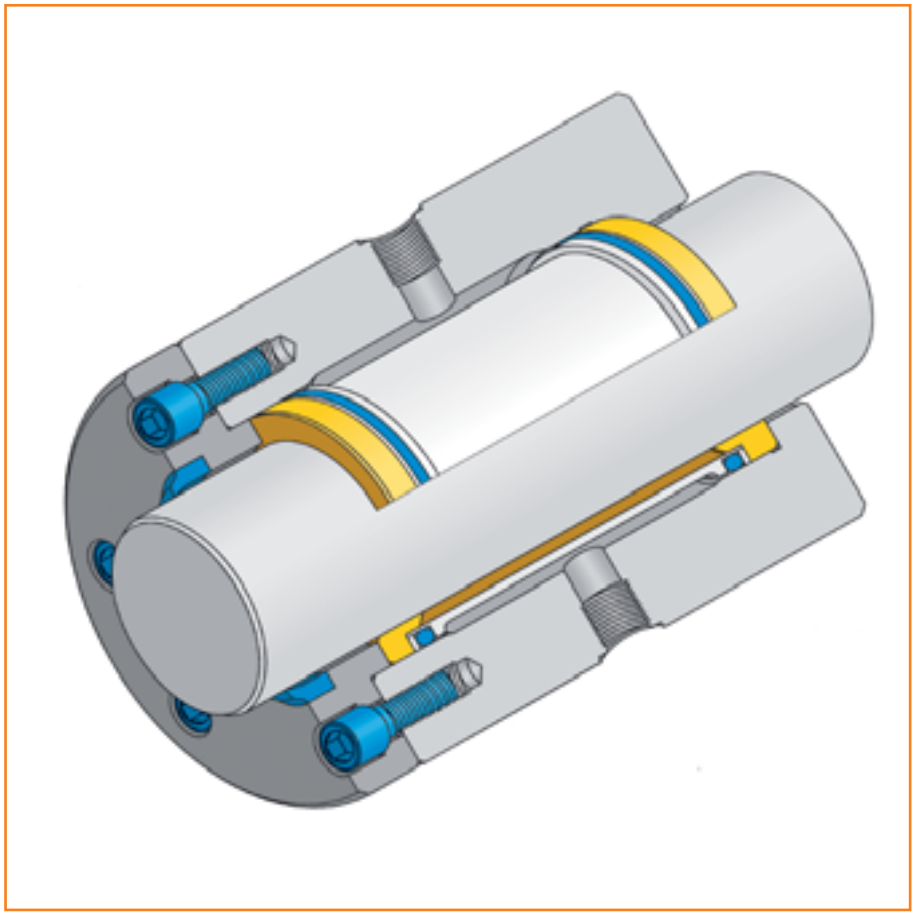
Product Information

The story of an amazing idea

The KOSTYRKA® clamping sleeves are based on the idea of creating a shaft-hub joint actuated by adherence, thus supporting very efficiently the function of modern machine tools. The clamping elements should be able to transmit great forces, to open and to close with lightning speed and be program-controlled as well as to have a space-saving overall size.

Hydraulic oil presented itself as the ideal pressure medium. A flexible metallic cylinder should be the load transmission element. Unfortunately a solid metal construction turned out to be to inflexible and a plastic jacket by itself as not resistant enough. Only the combination of a suitable synthetic material and a slitted metal cylinder resulted in the wanted success.

35 Years KOSTYRKA® Clamping Sleeves:
An amazing idea is now standard practice.



Principle of function

Flexible sleeves made from a compound of metal and plastic are axially held in housings.

The sleeves surround the part and clamp it by applying hydraulic pressure to the sleeve jacket.

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1 Basics for KOSTYRKA® Clamping Sleeves

KOSTYRKA® System slotted clamping sleeves are proven elements in the construction of machines and fixtures, and been used in more than 200,000 applications since 1969. Clamping at great speed, they prevent the slipping or turning of supporting elements, bolts, spindles, sleeves, collar plates, press stands, piston rods, turntables...

1.1 Method of Operation

An oil pressure is applied between seals at the sleeve jacket, and this is converted, without loss, into radial clamping force.

KOSTYRKA® clamping sleeves work with no part influences: the part to be clamped is neither axially pushed nor twisted as the clamping occurs.

When the oil pressure is completely removed the sleeves spring back elastically to their starting position, releasing the part once again. It is essential to avoid residual pressure. Although frictional force transmission is involved: the surfaces of the parts to be clamped are not damaged.

In spite of high wall strength, the KOSTYRKA® clamping sleeves are very elastic. This is due to the fact that individual blades are bent, rather than a closed cylinder jacket having to be compressed.

Clamping sleeves without flange rings can only transmit forces in a longitudinal direction. Rotational forces, such as occur with turntables, require clamping sleeves with integrated flange rings.

1.2 Sleeve Materials

The clamping sleeve's **main body** consists of copper/tin, copper/tin/zinc or copper/aluminium alloy. Highly stressed sleeves may make use of case hardened steel or spring steel.

The **plastic jacket** with double-sided O-ring / back-up ring combination is manufactured from PA or POM.

1.3 Operating Conditions

All forms of KOSTYRKA® clamping sleeves are, without exception,designed for operation by pressurized oil. Although the sleeves are activated by quite low hydraulic pressures, compressed air actuation is to be avoided. KOSTYRKA® clamping sleeves can be operated by any liquid medium against which the main body of the sleeve, plastic jacket and seals are chemically and thermally resistant.

The **plastic jackets** of the standard versions of KOSTYRKA® clamping sleeves are resistant to mineral oils, brake fluid and low-flammability hydraulic fluids, up to a temperature of 100°C (212°F). Special versions are fitted with plastic jackets of suitable materials for higher operating temperatures.

The **seals** of the sleeves are resistant to hydraulic fluids and to petroleum based lubricants, transmission oils, and animal or vegetable fats in the temperature range from -30°C to +110°C (-22°F up to +230°F). Higher operating temperatures are made possible by VITON® O-rings, which can be supplied if required.

The **working pressure** of KOSTYRKA® clamping sleeves is in general between 50 - 450 bar (700 - 6,500 psi.). For working pressures outside this range, we ask you to contact us.

1.4 General Tolerances

All forms and sizes of KOSTYRKA® clamping sleeves are, in general, toleranced as follows: outer diameter D = g6, inner diameter d = H7, Length L* = -0,1 mm (-0.004 in.).

Special tolerances are possible.

Abstract from the DIN / ISO Tolerance Zone Table for clamping sleeve diameters.

Tolerances with LARGE characters, like "H", apply to INNER diameters, those with small characters, like "g" were used for outer diameters. They vary with increased nominal size.

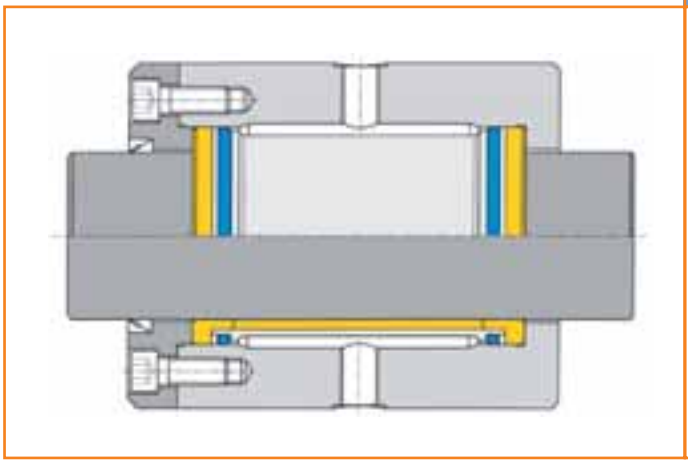
Nominal Diameter [mm]	H7 Minimun Deviation to Nominal Diameter [mm]	H7 Maximum Deviation to Nominal Diameter [mm]	g6 Minimum Deviation to Nominal Diameter [mm]	g6 Maximum Deviation to Nominal Diameter [mm]
006 to 010	0.000	+0.015	-0.005	-0.014
010 to 018	0.000	+0.018	-0.006	-0.017
018 to 030	0.000	+0.021	-0.007	-0.020
030 to 050	0.000	+0.025	-0.009	-0.025
050 to 080	0.000	+0.030	-0.010	-0.029
080 to 120	0.000	+0.035	-0.012	-0.034
120 to 180	0.000	+0.040	-0.014	-0.039
180 to 250	0.000	+0.046	-0.015	-0.044
250 to 315	0.000	+0.052	-0.017	-0.049
315 to 400	0.000	+0.057	-0.018	-0.054
400 to 500	0.000	+0.063	-0.020	-0.060

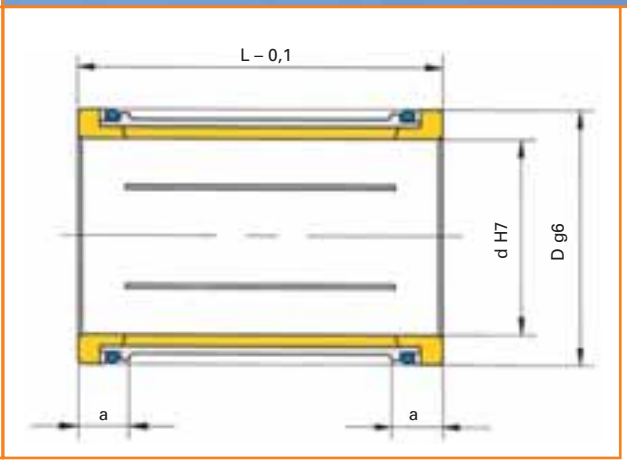
* The length "L" refers only to the fitting length, i.e. for cylindrical sleeves the full length, for flange type clamping sleeves the length excluding the flange ring.

2 KOSTYRKA®
Cylindrical Clamping Sleeves

2.1 Standard Dimensions

The table below gives the dimensions of the 20 sizes which are supplied in the standard range.

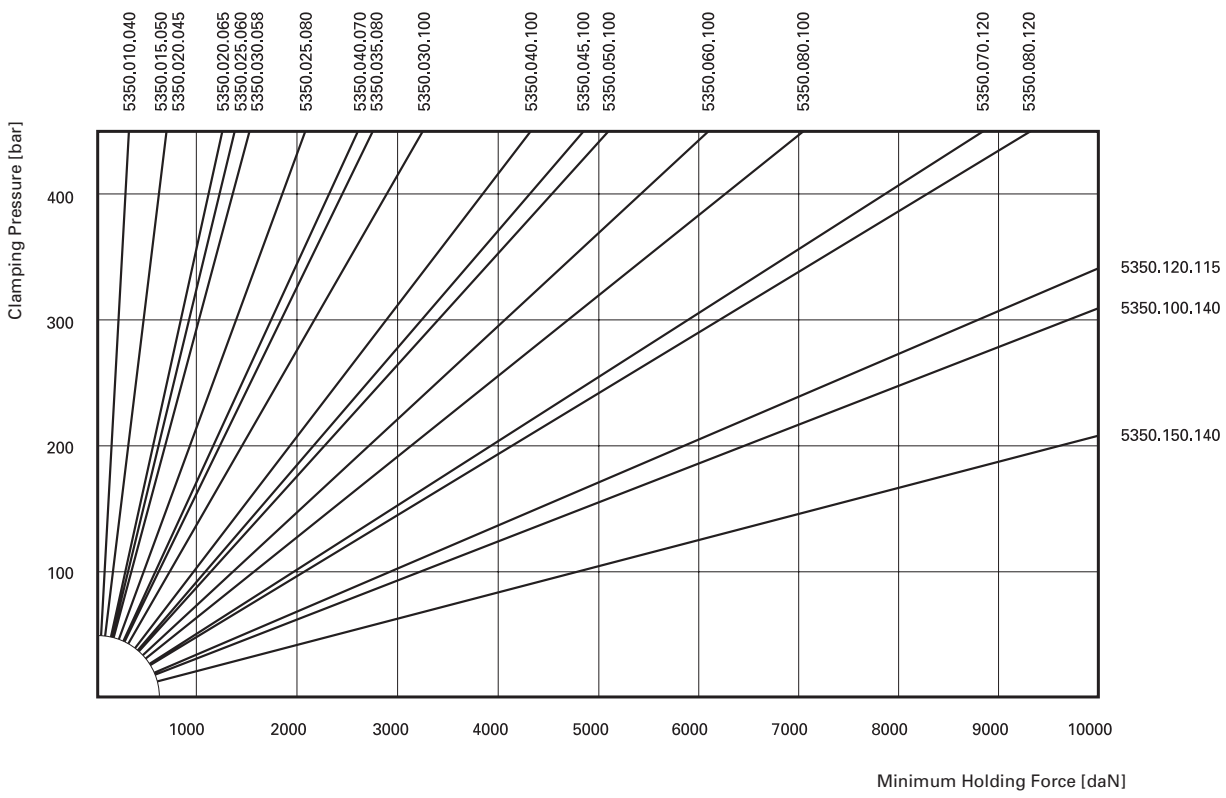




Type	d	D	L	a	O-rings	Back-up rings
5350.010.040	10	20	40	9,5	114 / 15,54 x 2,62	SG – 15,5 x 020 x 1,4 – P
5350.015.050	15	25	50	9,5	117 / 20,29 x 2,62	SG – 20,5 x 025 x 1,4 – P
5350.020.045	20	30	45	10,0	120 / 25,07 x 2,62	SG – 25,5 x 030 x 1,4 – P
5350.020.065	20	30	65	10,0	120 / 25,07 x 2,62	SG – 25,5 x 030 x 1,4 – P
5350.025.060	25	35	60	11,0	123 / 29,82 x 2,62	SG – 30,5 x 035 x 1,4 – P
5350.025.080	25	35	80	11,0	123 / 29,82 x 2,62	SG – 30,5 x 035 x 1,4 – P
5350.030.058	30	40	58	11,5	126 / 34,59 x 2,62	SG – 35,5 x 040 x 1,4 – P
5350.030.100	30	40	100	11,5	126 / 34,59 x 2,62	SG – 35,5 x 040 x 1,4 – P
5350.035.080	35	45	80	12,0	129 / 39,34 x 2,62	SG – 40,5 x 045 x 1,4 – P
5350.040.070	40	50	70	12,0	132 / 44,12 x 2,62	SG – 45,5 x 050 x 1,4 – P
5350.040.100	40	50	100	12,0	132 / 44,12 x 2,62	SG – 45,5 x 050 x 1,4 – P
5350.045.100	45	55	100	12,0	136 / 50,47 x 2,62	SG – 50,5 x 055 x 1,4 – P
5350.050.100	50	65	100	14,0	228 / 56,74 x 3,53	SU – 58,8 x 065 x 1,4 – P
5350.060.100	60	75	100	14,0	231 / 66,27 x 3,53	SU – 68,8 x 075 x 1,4 – P
5350.070.120	70	85	120	15,0	234 / 75,79 x 3,53	SU – 78,8 x 085 x 1,4 – P
5350.080.100	80	100	100	18,5	341 / 88,27 x 5,33	SU – 90,6 x 100 x 1,7 – P
5350.080.120	80	100	120	18,5	341 / 88,27 x 5,33	SU – 90,6 x 100 x 1,7 – P
5350.100.140	100	125	140	18,5	349 / 113,67 x 5,33	SU – 115,6 x 125 x 1,7 – P
5350.120.115	120	140	115	18,5	354 / 129,54 x 5,33	SU – 130,6 x 140 x 1,7 – P
5350.150.140	150	175	140	18,5	363 / 164,47 x 5,33	SU – 165,6 x 175 x 1,7 – P

2.1.1 Holding Force of Standard Sleeves (Diagram)

Minimum slippage resistances of round parts clamped with standard range KOSTYRKA® clamping sleeves as a function of clamping force. A constant coefficient of friction of μ = 0.1 is assumed for all operating pressures.



2.2 Special Dimensions

Application conditions and available space often call for the use of special clamping sleeves with unusual dimensions which are not listed in the above table. Our copyable inquiry data sheet (Para. 9) gives you the opportunity to precisely specify the necessary dimensions and the working and application conditions when you make your inquiry.

KOSTYRKA® clamping sleeves can currently be used to clamp parts with diameters of 8 - 1.600 mm (0.315 - 63 in.). The maximum clamping length depends on the production method, and is about 1.500 mm (59 in.).

2.2.1 Calculating the Holding Force "F" of Special Sleeves

The following fomulas apply to any KOSTYRKA® cylindrical clamping sleeve with a clamp diameter "d" and a length "L", fed by a hydraulic pressure "p":

$$F = d \cdot (L - 2a) \cdot \pi \cdot p \cdot \mu$$

The coefficient of friction "μ" varies from 0.07 to 0.12 depending on the properties of the clamped surfaces, the lubricant and the operating pressure.

Important: KOSTYRKA® cylindrical clamping sleeves can only transmit force in the longitudinal direction. Clamping sleeves with flange rings are needed to transmit torque!

3 KOSTYRKA® Flange Type Clamping Sleeves

If KOSTYRKA® clamping sleeves are to be used not only to transmit axial forces but also to transmit torque, they must be provided with a flange ring. The method of operation, materials, operating conditions and general tolerances of the flange type clamping sleeves correspond to those of the cylindrical clamping sleeves.

3.1 Dimensions

KOSTYRKA® flange type clamping sleeves are only made to meet particular requirements, and are not produced as standard series. Our copyable inquiry data sheet (Para. 9) gives you the opportunity to precisely specify the necessary dimensions and the working and application conditions when you make your inquiry.

KOSTYRKA® flange type clamping sleeves are currently made in over 2.000 different versions, having clamping diameters up to 1.600 mm (63 in.) and total lengths of up to 750 mm (29 in.).

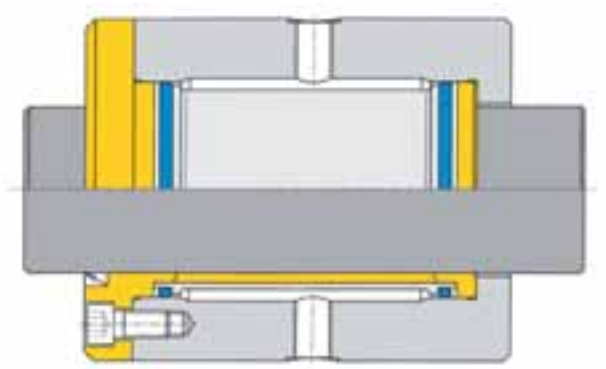
3.2 Calculation of the Transmissible Torque "Md"

The transmissible torque "Md" for any given flange type clamping sleeve can be obtained by multiplying the holding force "F" by the interior sleeve radius "d/2":

$$Md = d \cdot (L - 2a) \cdot \pi \cdot p \cdot \mu \cdot d/2$$

The coefficient of friction "μ" varies from 0.07 to 0.12 depending on the properties of the clamped surfaces, the lubricant and the operating pressure.

Note: the length "L" is the flange type clamping sleeve's fitting length, i.e. the full length excluding the flange thickness.



3.3 Torsional Stiffness

A formula for calculation of the torsional stiffness can not be given. Essentially, the rotational stiffness of a system using KOSTYRKA® flange type clamping sleeves becomes larger as the fitting length is reduced and the operating pressure is increased.

The following experimental result can serve as a guide:
A KOSTYRKA® flange type clamping sleeve with a clamp diameter of 280 mm (11 in.) and a fitting length of 75 mm (3 in.) was subjected to a torque of 6.000 Nm (4,500 lb.ft) with a clamping pressure of 210 bar (3,000 psi.). The clamped part, a turntable, was displaced by 0° 0' 9" (9 angular seconds). When the torque was maintained, no "creeping" could be observed. With the torque removal, the turntable sprang elastically back to its initial position.

4 KOSTYRKA® Expanding Sleeves and Table Clamps

KOSTYRKA® expanding sleeves were developed specially for clamping turntables and dividing units.
Based on the inverse of the clamping sleeves' functional principle, the expanding sleeve's slotted jacket is expanded by oil pressure. Thus the surrounding table, for example, is gripped from inside.

As with all the KOSTYRKA® clamping sleeves, an important feature here is that the table has no rotational movement as clamping is applied.

4.1 Dimensions

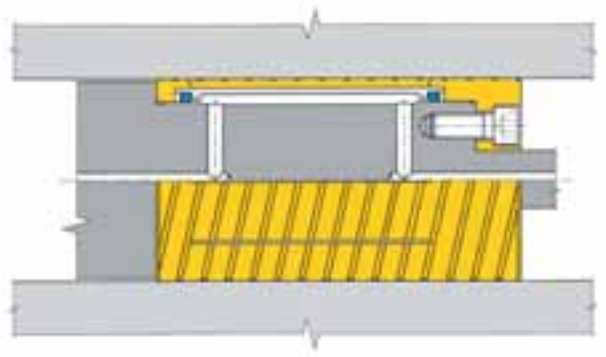
As KOSTYRKA® expanding sleeves are designed with dimensions derived from the required loads and various application conditions, it is not possible to keep standard sizes in stock. Please make an inquiry.

4.2 Calculating the Holding Force "F" of Expanding Sleeves

KOSTYRKA® expanding sleeves clamp on their **outer circumference**, in contrast to the versions described so far. Therefore, in the formula already known from paragraph 2.2.1, "Calculating the Holding Force of Special Sleeves"

$$F = d \cdot (L - 2a) \cdot \pi \cdot p \cdot \mu$$

the **outer diameter** must be substituted for d!
The coefficient of friction, μ, again varies here from 0.07-0.12, depending on the properties of the clamping surfaces, lubricant and operating pressure.



5 The Item to be Clamped...

KOSTYRKA® clamping sleeves can be used to clamp all hardened or unhardened ferrous and non-ferrous metals. When using material of low strength, the maximum permissible surface pressure should be considered when selecting the operating pressure.

When clamping pipes, their wall strength should be considered to avoid deformation. If necessary, please ask us.

5.1 ...in KOSTYRKA® Cylindrical Clamping or Flange Type Clamping Sleeves

The outer diameter of the part to be clamped should be made to tolerance g6 (see Abstract 1.4).
If round parts with wider tolerances are to be clamped, the bore of the KOSTYRKA® clamping sleeve must be appropriately adapted. Please make an inquiry.

5.2 ...in KOSTYRKA® Expanding Sleeves

The inner diameter of the part to be clamped should be made to tolerance H7 (see Abstract 1.4).
If round parts with wider tolerances are to be clamped, the outer diameter of the KOSTYRKA® expanding sleeve must be appropriately adapted. Please make an inquiry.

6 Space Requirements and Adjacent Parts

The thickness of the housing wall must be particularly considered in the design. The same oil pressure which generates the clamping effect also expands the housing which contains the clamping sleeve. This may result in unacceptably large seal gaps, and can interfere with the function of adjacent parts. For this reason bearings of all types must be located away from the clamping area of the KOSTYRKA® sleeve.

7 Fitting Regulations for KOSTYRKA® Clamping Sleeves

7.1 The most important rule

KOSTYRKA® clamping sleeves must NEVER be supplied with pressure when they are empty, i.e. without the part to be clamped. Otherwise they will immediately and irreparably be damaged!

7.2 Fitting Combinations: Sleeve (d) / Locating Hole (e) / Part to be Clamped (a)

An effective sliding clearance fit has in practice been found to be provided by the pairing of shaft diameter to g6 with a bore hole to H7. The inner and outer diameters of all forms and sizes of KOSTYRKA® clamping sleeves are therefore adapted to this pairing fit.

If tolerances differ from these we ask you to contact us, since the sleeves must then be appropriately altered.

7.2.1 Fitting Combination: Clamping Sleeve (d) / Locating Hole (e)

Outer diameter of sleeve:
g6 (see Abstract 1.4)
Inner diameter of locating hole:
H7 (see Abstract 1.4)

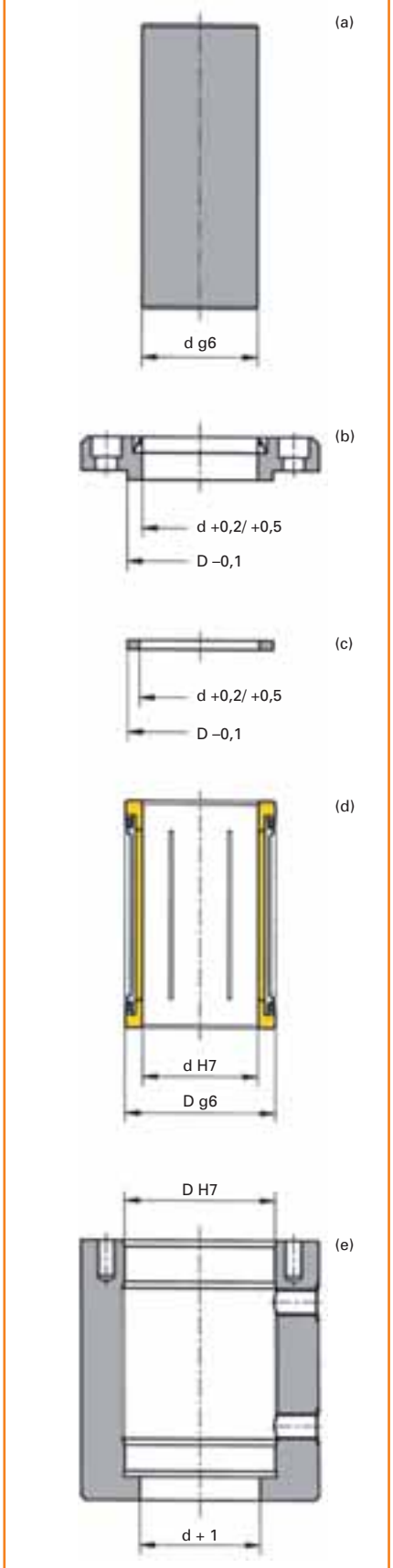
7.2.2 Fitting Combination: Clamping Sleeve (d) / Part to be Clamped (a)

Inner diameter of sleeve:
H7 (see Abstract 1.4)
Outer diameter of part to be clamped: g6 (see Abstract 1.4)

7.3 Axial Pre-Tensioning of Sleeves

KOSTYRKA® clamping sleeves can not transmit forces through their seals. An axial load would displace them, together with the clamped part, by any axial play which might be present in their locating hole. For this reason KOSTYRKA® clamping sleeves must be pre-tensioned by about 0,03 % of their axial length.
Example: sleeve length L = 100 mm (3.937 in.) correspond to an axial pre-tensioning of 0,03 mm (0.0011 in.). Greater pre-tensioning can lead to an unacceptable narrowing of the sleeve diameter.

The pre-tensioning can be effected through precise preparation of the depth of the location hole (e), by an adapting washer (c) or by adjusting the bore cover (b).



7.4 Form of the Location Holes

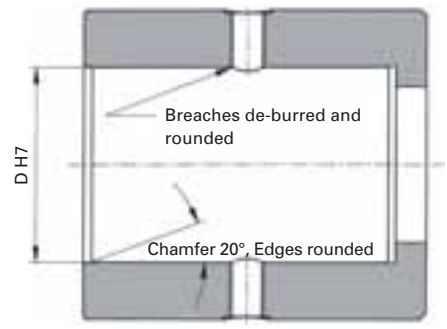
This section should be given particular attention to avoid damaging the seals when KOSTYRKA® sleeves are installed into the system.

At the start of the location hole and in the area of the depression, adequately dimensioned, rounded, 20° glide chamfers must be provided. The openings of the oil feed holes and of any venting holes are also to be carefully de-burred and rounded.

The surface roughness of the location hole in the area of the sleeve seals may have a maximum value of R_{max} = 6 -10 µm ($R_a \leq$ 1,6 µm).
For explanation: “µm” = “microns“.

7.4.1 Cylindrical Location Hole

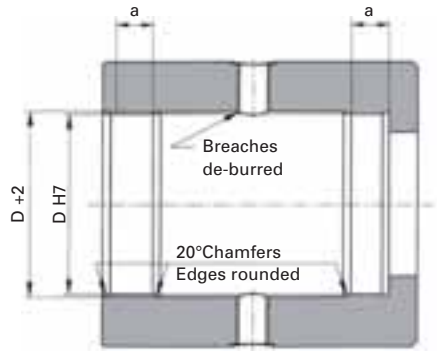
This form of location hole is the easiest to machine. It has, however, the disadvantage, that during installation the seals of the KOSTYRKA® sleeve rub on their jacket surfaces for the full length of the location hole.
If the surface finish or the de-burring and rounding of the oil feed and venting holes have not been prepared with sufficient care, the seals can be damaged as they are fitted, or may even be sheared right off.Leaks are the inevitable result.



Housing with Cylindrical Location Hole

7.4.2 Sunken Location Hole

Although the sunken form of location hole is slightly more complicated, when properly formed and executed, it provides the best possible protection of the seals when KOSTYRKA® sleeves are installed. The de-burred oil feed and venting holes are located in the area of the depression, so that the seals only have to be pushed through a short fitting area of the jacket surface.



Housing with Sunken Location Hole

7.5 Fitting and Removing KOSTYRKA® Clamping Sleeves

The glide chamfers, the contact area of the location hole and the sleeve seals should be lubricated with a little grease, and the sleeve then pushed into the hole, without bending it or using excessive force.

Flange type clamping sleeves and heavy cylindrical clamping sleeves have at least two pulling threads to assist removal. These aids are not present in the smaller versions. For this reason, the area where they are installed should be designed in such a way (holes, offsets) that straightforward dismantling is possible. Pulling threads are only provided on smaller sleeves at the particular request of the customer, if they are indeed technically possible.

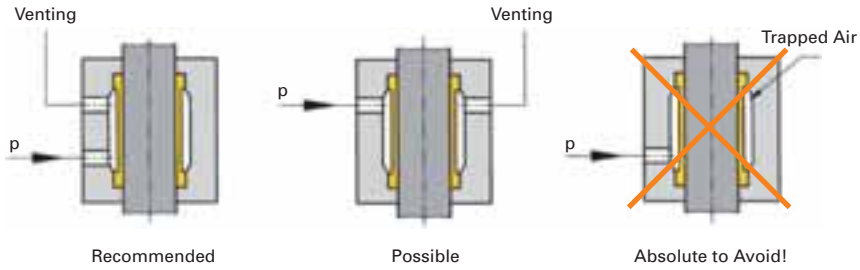
7.6 Venting KOSTYRKA® Clamping Sleeves

It is essential that no air pockets can develop either in the feed lines or in the sleeve’s fitting area. The compression would heat air to such a degree that the sleeve jacket and seals would be thermally damaged (see illustrations).

7.7 Position of Pressurized Oil and Venting Connections...

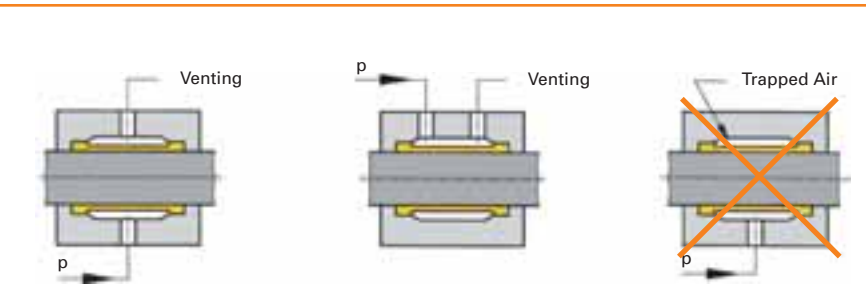
7.7.1 ...when Mounting the KOSTYRKA® Clamping Sleeve Vertically

It is recommended to feed the pressurized oil in at the lowest point of the sleeve contact area, and to provide a venting facility at the highest point (see figure on the left). The solution shown in the middle picture is also possible. The construction indicated in the right hand picture will inevitably result in damage (see Para. 7.6).



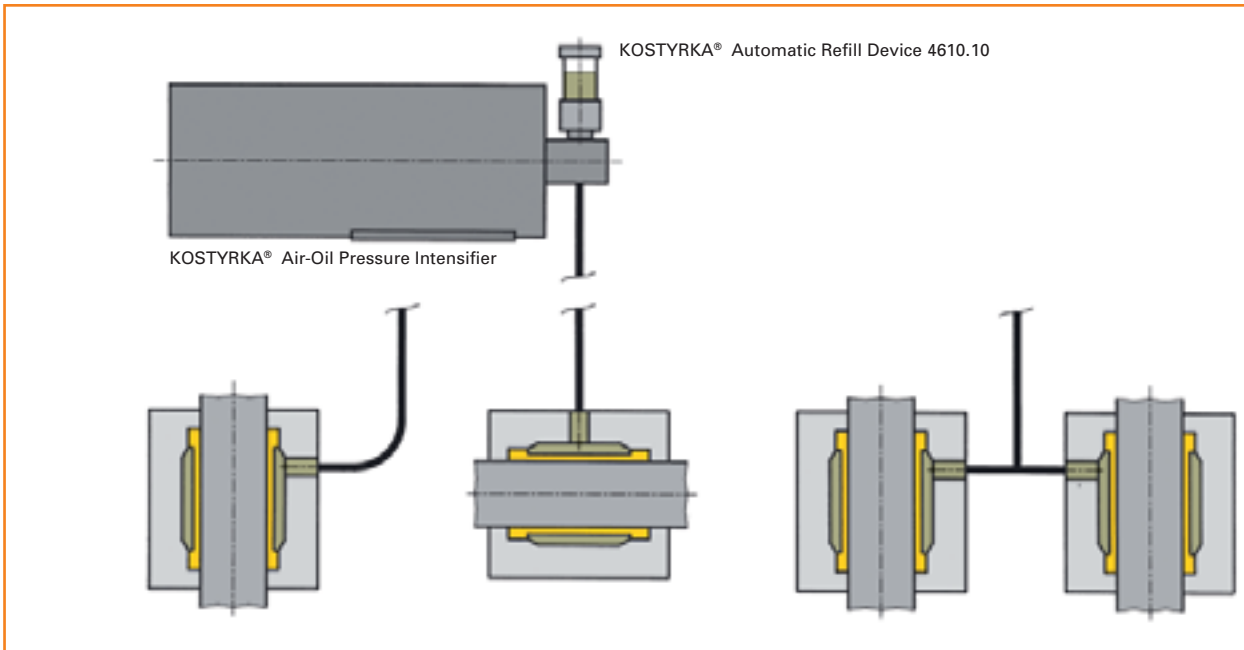
7.7.2 ...when Mounting the KOSTYRKA® Clamping Sleeve Horizontally

The general sense of the fitting recommendations for vertically applied sleeves also applies to those with a horizontal orientation. The following picture should clarify this.



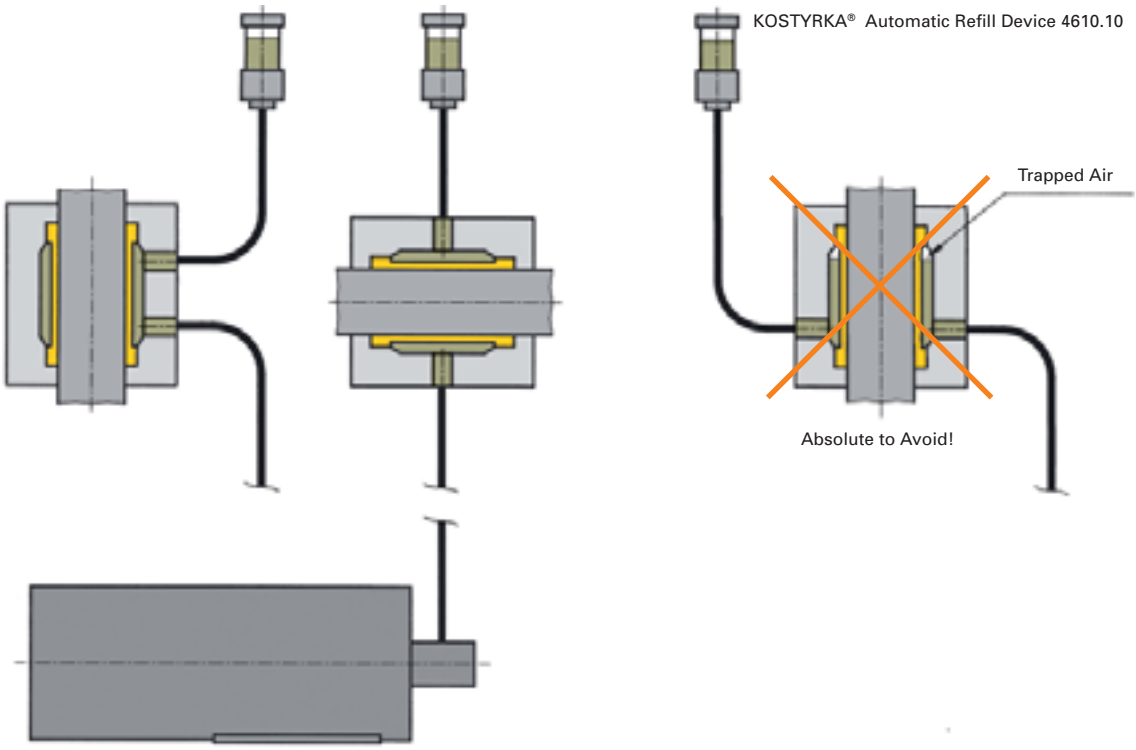
7.7.3 ...when using KOSTYRKA® Air-Oil Pressure Intensifier

If the pressure intensifier is situated **over** the clamping sleeve, the pressurized oil connection must **always** enter at the highest point of the sleeve installation space. The KOSTYRKA® 4610.10 automatic refill device can remain on the pressure intensifier. This is shown in the following sketch.



KOSTYRKA® Air-Oil Pressure Intensifier situated over the KOSTYRKA® Clamping Sleeve

If the pressure intensifier is fitted **under** the clamping sleeve, the automatic refill device must be separated from the intensifier. The pressure line is best taken to the lowest point of the installation space and on from its uppermost point to the remotely located automatic refill device. This is shown in the following sketch.



KOSTYRKA® Air-Oil Pressure Intensifier fitted under the KOSTYRKA® Clamping Sleeve

Paragraphs 7.7.1 and 7.7.2 apply when using KOSTYRKA® **Oil-Oil pressure intensifiers**.

7.8 Nature of the Clamping Surfaces

The clamping surfaces must be kept free from preservatives, rust converter, solid lubricant based on graphite or molybdenum disulphide, cooling lubricant, abraded seal or metal material, and from dirt of any kind. Scrapers in the cover of the location holes reduce the infiltration of dirt.

If piston guide rings are provided, care must be taken to ensure that graphite or carbon filled base material is not used. Material worn away from this can reach the clamping surfaces and result in unacceptable reduction of the holding force. Bronze-filled guide rings are permitted.

7.9 Lubrication of KOSTYRKA® Sleeves

KOSTYRKA® sleeves should be regularly lubricated with a little mineral oil. Neither the viscosity nor the quantity of the oil is critical, provided the oil is clean and can flow freely. Greases or oils containing solid lubricant additives are absolutely unsuitable for lubrication.

For clamping presses, or when there is a long travel distance to the part to be clamped, forced lubrication must be provided in order to be able to wash abraded materials off.

8 Application Examples

8.1 Clamping Presses

KOSTYRKA® clamping sleeves which are used to hold a crosshead or the closer of a plastics press or of a test press operate under particularly unfavourable conditions: high lift frequency, continuous running, elevated temperatures, very high loads and exposure to dirt.

The picture here shows a clamping system for one of the four column of a plastics press. It consists of two clamping sleeves in sequence, (5 and 10), which together transmit an axial force of 6 MN (1.320.000 lb.). The column has a diameter of 325 mm (12.78 in.), the clamping pressure is 450 bar (6.500 psi.).

The sleeves are held in their receptacles with slight pre-tension by the two covers (4). When operating, the bolts of the lower cover must bear 3 MN (660.000 lb.). The upper sleeve supports itself against the housing floor with the other half of the axial force. Fitting the sleeve is made easier by shallow glide chamfers (11), rounded at their corners.

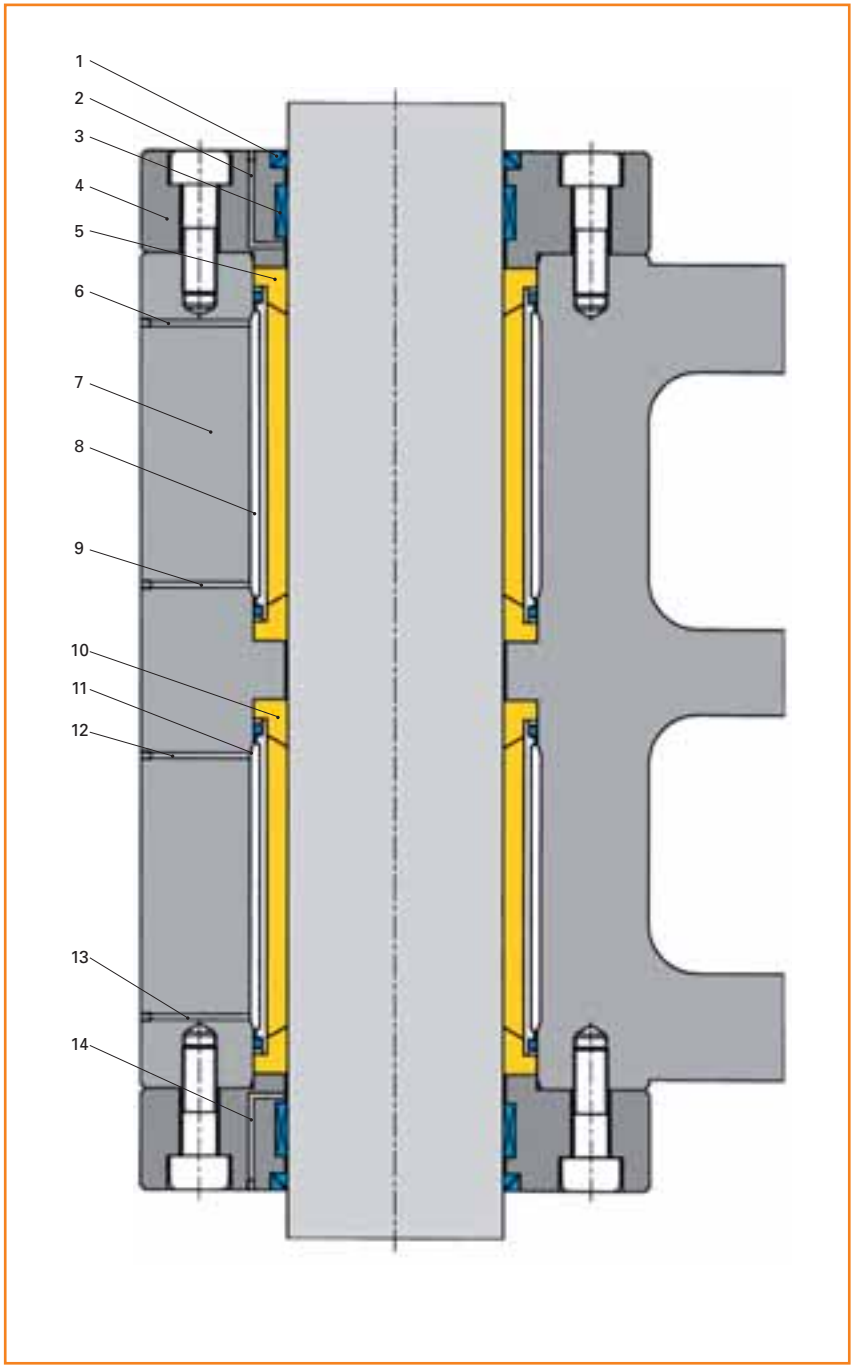
Scrapers (1) in the cover prevent the infiltration of dirt. Flexible bellows may be preferable to the scraper under conditions of heavy contamination.

If piston guide rings (3) are provided, care must be taken to ensure that graphite or carbon filled base material is not used. Material worn away from this can reach the clamping surfaces and result in unacceptable reduction of the holding force. Bronze-filled guide rings are permitted.

The wall of the housing (7) is kept very thick to avoid expansion. On the other hand, the recesses cut (8) into this housing are very shallow. This keeps the volume of the ring-shaped oil chambers in the sleeve's clamping area small. This is particularly important in the light of the compressibility of oil (clamping time, energy consumption).

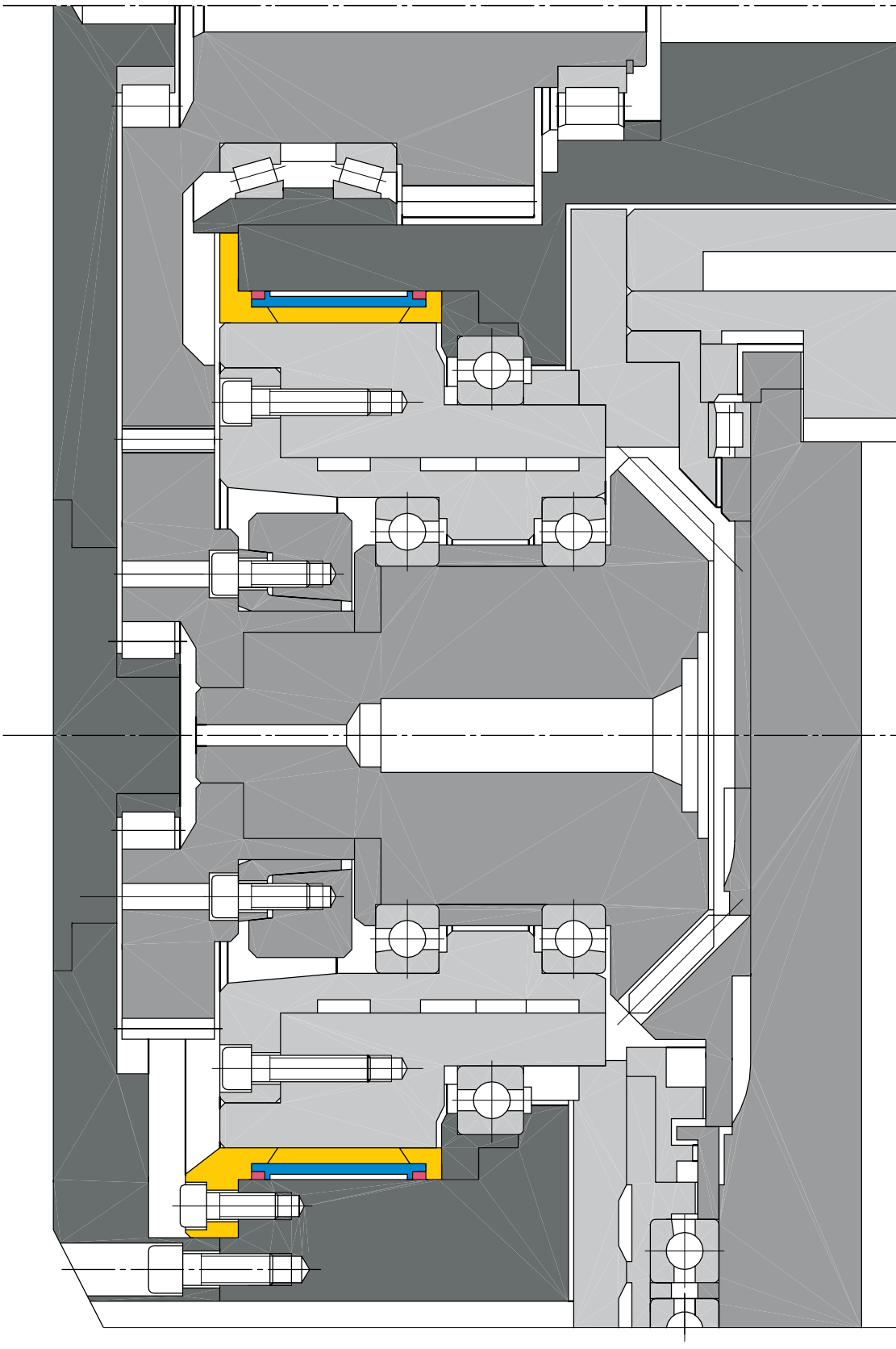
Connections (6) and (12) enter at the highest point of these oil chambers. In reality they are even higher on the part than shown, being directly under the seals. Other connections (9) and (13) are made underneath. By continuous circulation from (9) to (6) and from (13) to (12) both chambers can be effectively kept free of air. In continuous operation the pressure around the sleeves is developed through connections (9) and (13). It is released via (6) and (12). Thus, with each working cycle, a small quantity of fresh oil is introduced, thus avoiding excessive heating.

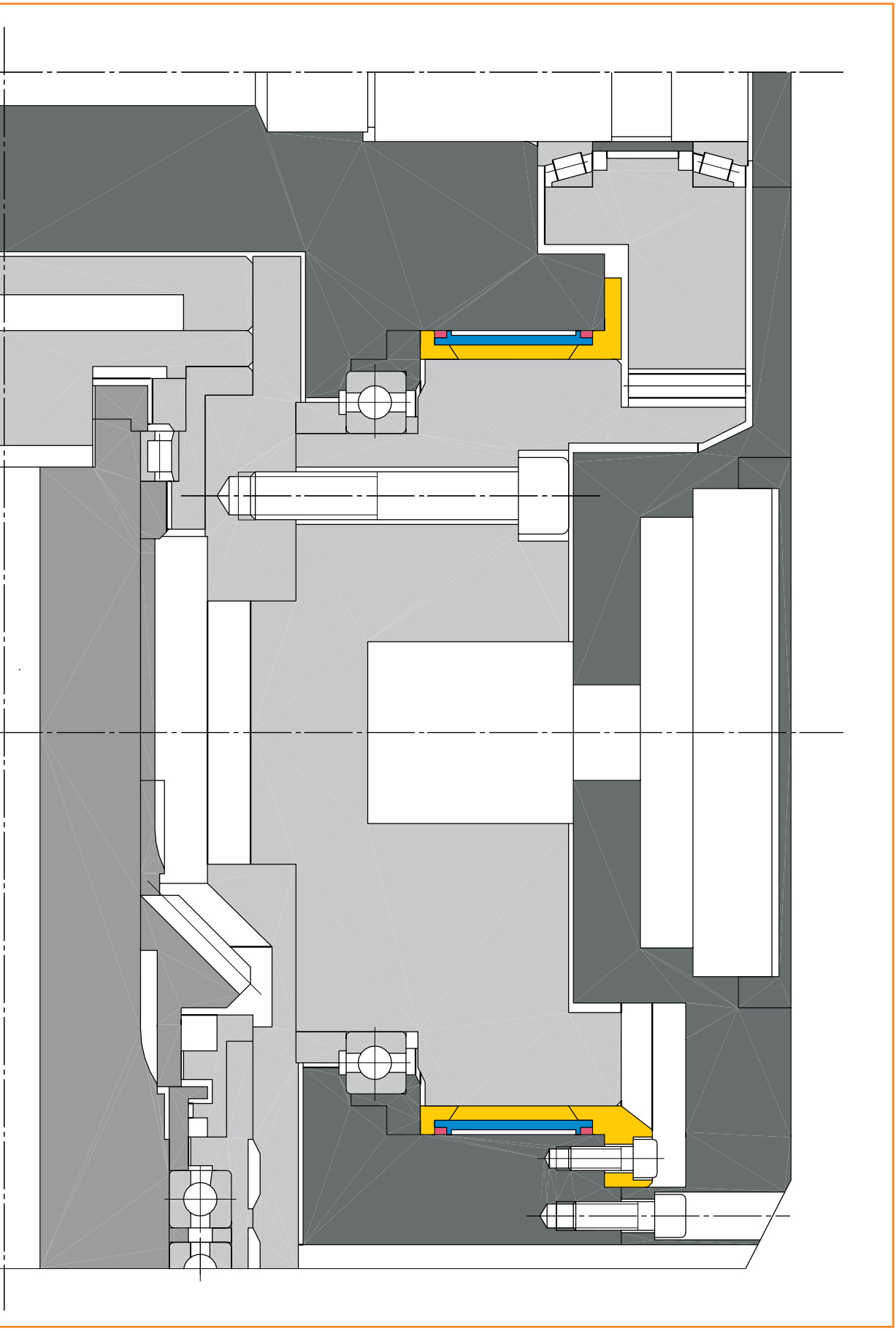
Lubricating oil is fed via channel (2), and this can flow away without pressure through (14).



8.2 Cutting Head

Clamp in a universal angular milling head. Two KOSTYRKA® flange type clamping sleeves lock the milling spindle receptacle, without any float, at any angle between 0° and 90°.



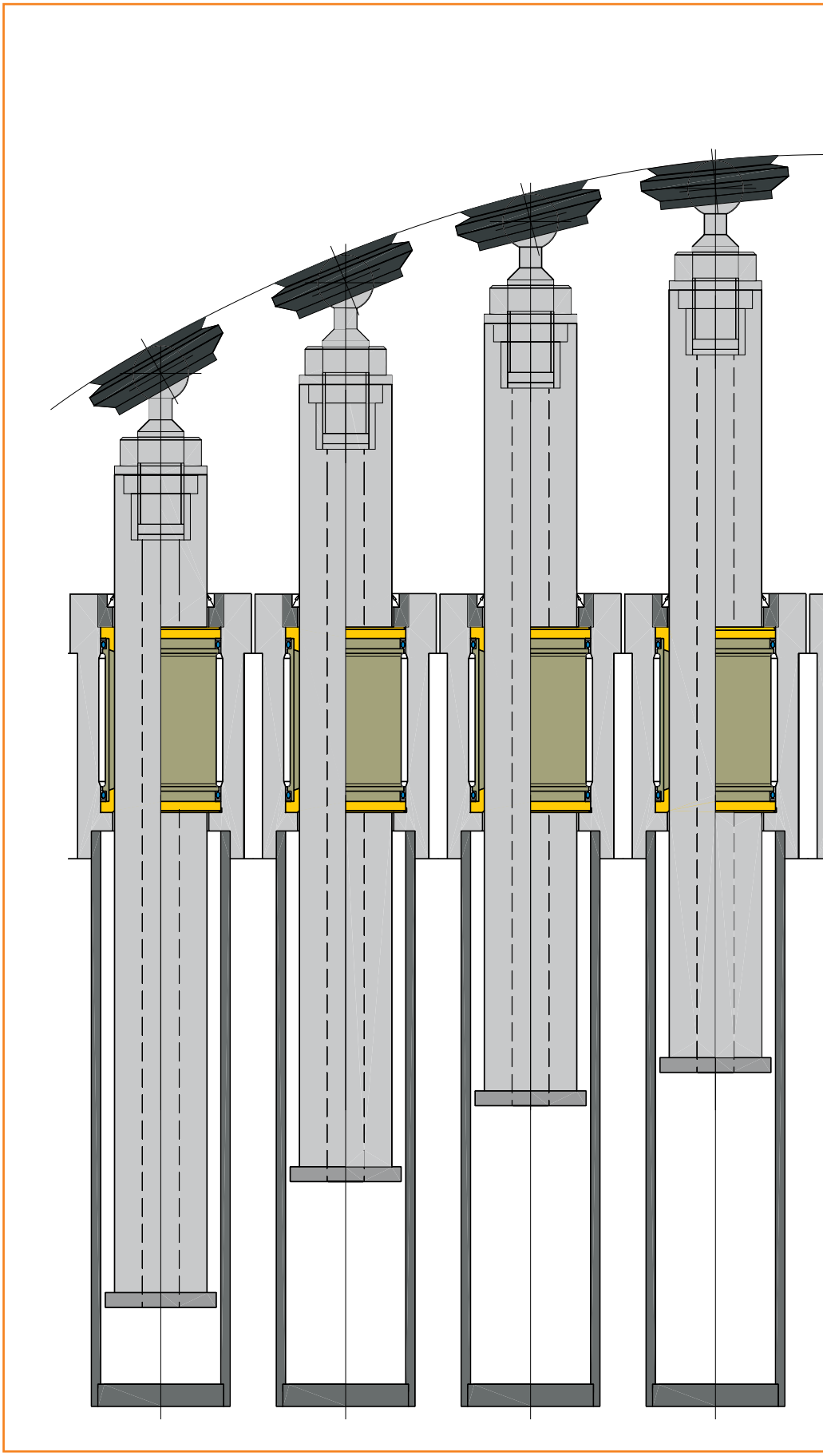


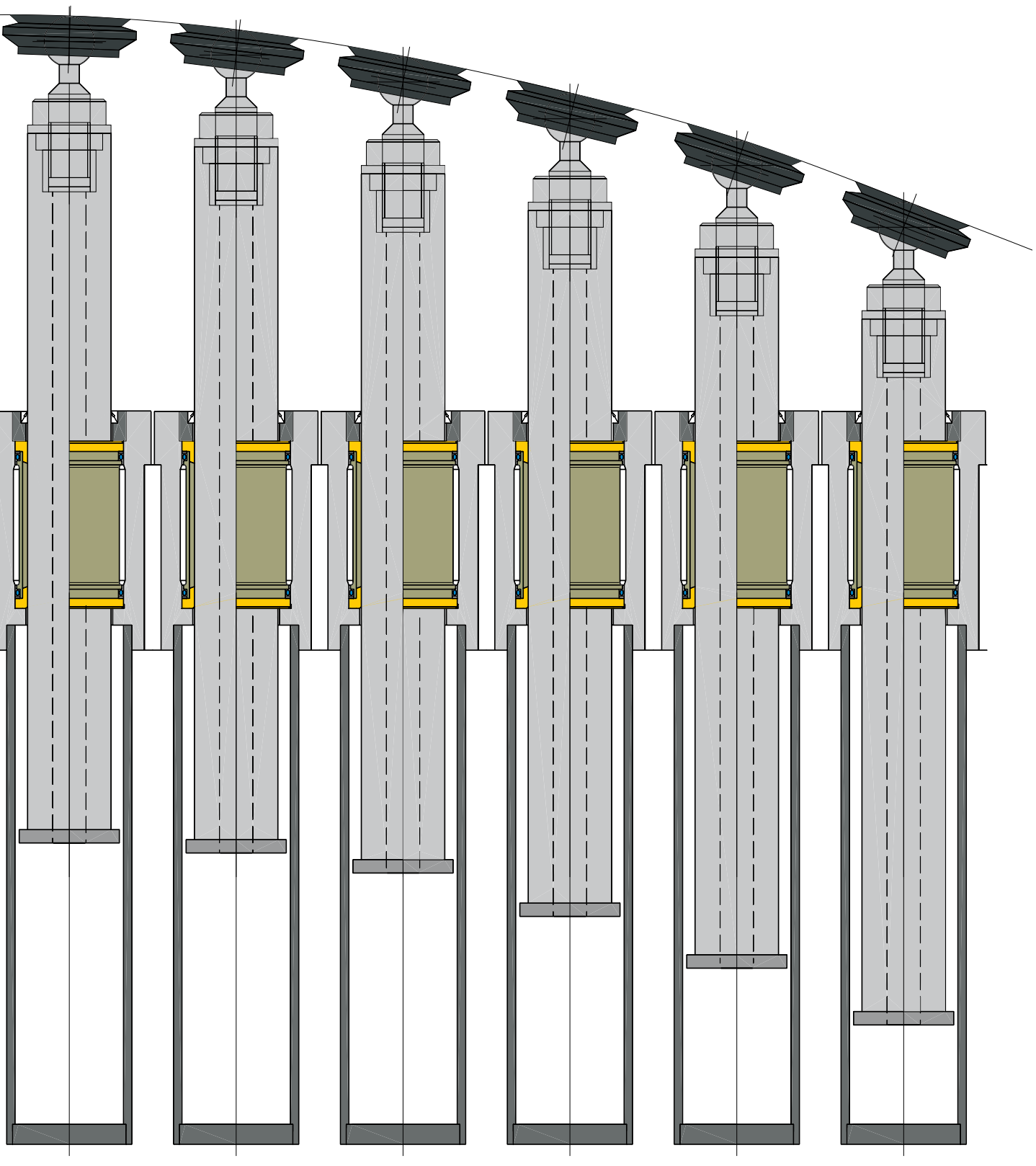
8.3 Pogo

Part of a universal holding fixture for the aircraft industry. Supporting elements are individually positioned and fixed into a defined position. As a whole they determine the surface form of thin-walled plates of metal or of bonded materials. Vacuum suction cups at the ends of the supporting pins pull the workpieces onto rigid stops, and hold them firm during processing.

A typical fixture set-up of this type possesses several hundred supporting units, whose height is individually adjustable over a wide range. A large number of differently shaped parts can be accepted in the same set of equipment, with very short change-over times being required.

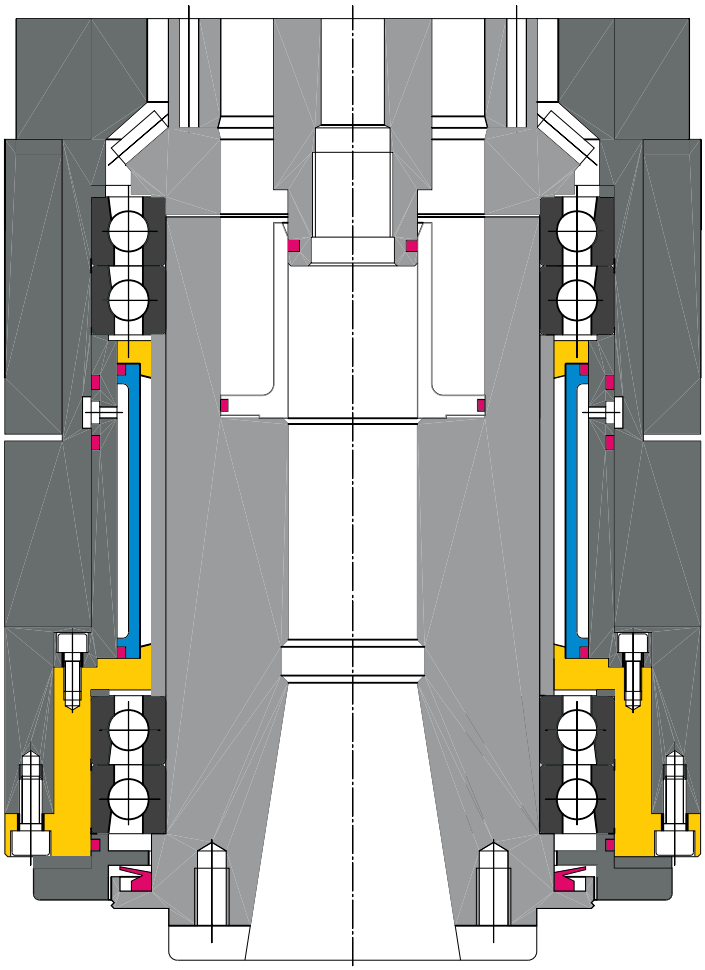
These fixtures are particularly suitable for contour milling, laser or water jet cutting, for riveting work and for drilling, as well as for inspection and measurement procedures on easily distorted large-area parts.





8.4 Centre Sleeve Lock

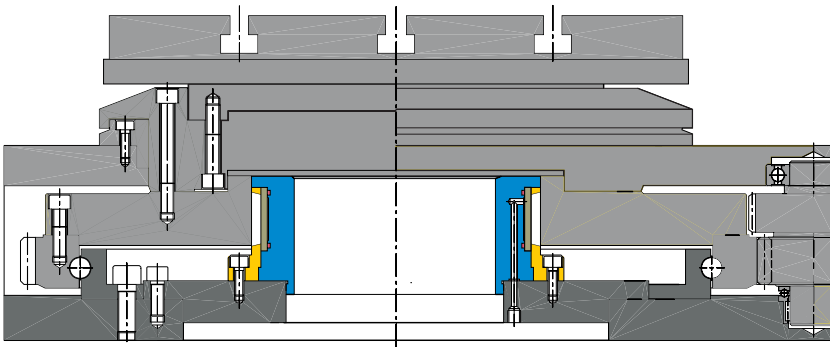
A KOSTYRKA® clamping unit, consisting of the clamping sleeve itself, with an integrated over-sleeve and with a specially formed flange ring, is used for holding a milling spindle sleeve without rotary play. When unclamped, the clamping sleeve permits high speed rotation of the milling spindle. In the clamped state the spindle and its sleeve form a rigid unit.



8.5 Turntable

Turntables of all kinds are securely fixed at any orientation by means of externally acting clamping units. KOSTYRKA® table clamps

- do not twist the table during the clamping procedure by even a tiny amount,
- are therefore exceptionally suitable for clamping high-precision measuring and parts tables,
- transmit unusually high torques,
- can therefore also be used for clamping milling tables for heavy cutting,
- have very good damping properties and
- are supplied as compact units ready for fitting.



9. Appendix

9.1 Inquiry Data Sheet

Please copy, fill in, and send in a windowed envelope to :

KOSTYRKA GmbH
Technical Sales
Postfach 311404

D-70474 Stuttgart

Sender

Company name

Street/Postbox-number

Postcode/City

Phone

Fax

Contact person

or by fax (07 11) 8 87 10-30
or e-mail: kostyrka@kostyrka.com

What part is to be clamped?

☐ There are only axial forces.

Maximum axial force?

Traversing speed?

Distance of travel?

☐ Torque is transmitted.

Maximum torque?

r.p.m.

General information:

What clamping pressure is available, and how is it produced?

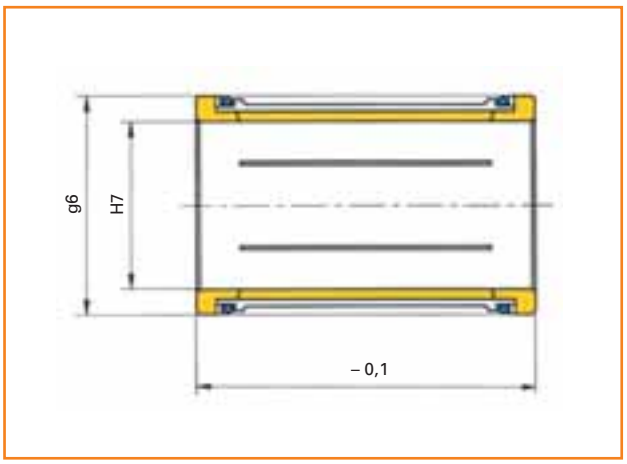
Frequency and duration of clamping?

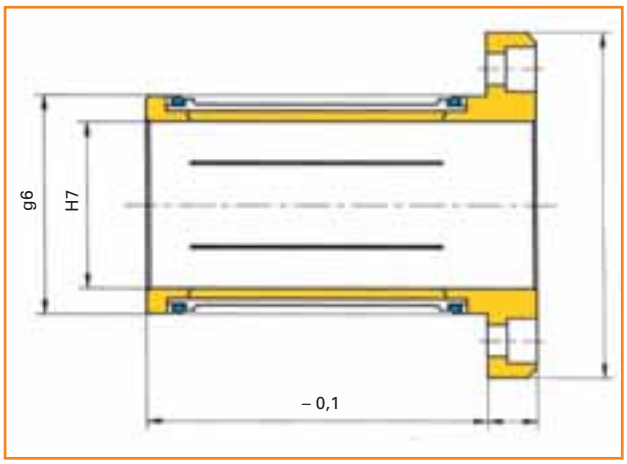
Minimum and maximum operation temperature?

Is lubrication provided? If so, of what type?

What pressure medium is used?

Please add the desired base sizes to the sketch.





Is a drawing of the fitting location available? If so, please include it!

We are available for you

KOSTYRKA GmbH
Motorstraße 41 · D-70499 Stuttgart
P.O.B. 31 14 04 · 70474 Stuttgart
Germany

Phone +49 (0) 7 11 / 88 71 0-0
Fax +49 (0) 7 11 / 88 71 0-30

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www.kostyrka.com

KOSTYRKA

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