



LONG-LIFE
CLAMPING
TECHNOLOGY
I N S I D E

AUTOMATIC CLAMPING

Complete systems and components

OTT

Spanntechnik

JAKOB





INTRODUCTION

ABOUT OTT-JAKOB

OTT-JAKOB is one of the most significant manufacturers of clamping systems for machine tools in the world. Our leading position in the market is due to our distinguished development skills. We have set numerous standards and even milestones in the field of clamping technology over the past few decades with our new technical innovations.

OTT-JAKOB has pursued a holistic strategy since the outset, focusing on realising customer-specific complete systems. With our state-of-the-art machinery we are able to manufacture large volumes and even highly customised special solutions cost-effectively. A full range of products from clamping units to rotary unions combined with the high degree of customisation of our modular portfolio makes it possible to overcome challenging clamping problems.



THIS CATALOGUE

This catalogue presents a selection from our wide range of technologies for automatic machine tools and serves as a reference for consultations with our sales team. This catalogue is a tool you can use to plan your projects and configure a clamping system.

As an expert in special solutions, we present the components for the most common applications. Additionally, the tables in the catalogue provide an extensive, albeit non-exhaustive, overview of our wide range of products. With selected reference clamping systems, you can gain an impression of our expertise in solutions. Finally, the catalogue contains information about our accessories and after-sales service.

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Subject to errors and modification due to technical advances.
Technical drawings are not to scale.

2nd edition (2019)

▲ FIVE REASONS TO CHOOSE OTT-JAKOB



HIGHLY SPECIALISED EXPERTISE

We know the requirements of the sector like no other due to our decades of experience in working with leading spindle and machine manufacturers and specialising exclusively in the manufacturing of tool clamping systems. As a systems provider, we rely on an in-house value chain encompassing all of the stages of the engineering process, from development to construction to production.

INTENSIVE KNOWLEDGE TRANSFER

Our research and development department works to improve and develop our clamping systems on a daily basis. In order to generate new ideas, our engineers are in regular contact with prestigious universities and research institutions. This constant transfer of knowledge enables us to keep pace with the state of the art and to turn technological challenges into innovative product solutions.

CONSTANT QUALITY MANAGEMENT

The recognised quality of our clamping systems is the result of stringent quality management. Every employee and supplier is obliged to adhere to clearly defined objectives. Standardised work processes and weekly internal quality meetings maintain a high level of quality and ensure a continuous improvement process.



OTT-JAKOB clamping systems are known by the industry to be exceptionally reliable; a characteristic resulting from our seamless quality control system. We carry out extensive performance and endurance tests in our in-house testing area with the latest testing technology. A full final inspection of the assembly units guarantees high quality straight out of the box. We have a range of calibrated measuring machines and equipment for the purposes of general quality assurance.

COMPREHENSIVE QUALITY TESTS



Our research partners (a selection)

EXPERT SUPPORT

With an extensive range of services, we can guarantee smooth operation and by extension maximum availability for our clamping systems. Our experienced service technicians know the ins and outs of our products and provide skilled support across all stages of the product life cycle. More detailed information on our after-sales service is available in the Service section on page 164.



PROJECT SCHEDULE



ENQUIRY AND CONSULTATION

After having received your enquiry, our technical sales staff will contact you. In the initial consultation, our representative will align your specific requirements with the technical possibilities and advise you on alternative design forms or on technical developments by OTT-JAKOB.

QUOTATION

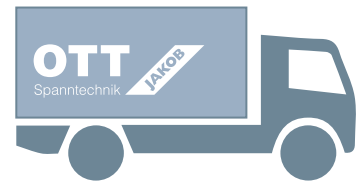
We will provide you with a reference quotation on the basis of the consultation. Subject to availability, we will also provide you with a relevant sample drawing.

DRAFT AND APPROVAL

Following a feasibility analysis, we will coordinate with you to produce a detailed draft drawing that you can examine and approve. If necessary, we will provide you with a revised quotation.

AFTER-SALES SERVICE

Once the clamping system has been delivered, you can make use of our after-sales service for training, briefings, repairs and spare parts. Find out more in the Service section on page 164.



PRODUCTION AND DOCUMENTATION

As soon as we receive your order, we will start to produce the individual component drawings and work plans. We will then start to produce the clamping system. At this point we will also provide you with an order confirmation, the technical drawing of your clamping system, the underlying calculation documents and a set of operating instructions.

PERFORMANCE TESTING AND TRACEABILITY

Once built, all clamping systems undergo extensive standardised performance tests and only leave our factory once they have passed every test in full. We store the results of each test and assign them to the serial number of the clamping system. The serial number remains unique throughout the life cycle of the product, making it possible to trace the manufacturing and the components used at all times.

DELIVERY AND INSTALLATION

Your clamping system will arrive ready to install. As an optional service, we can provide a specific manufacturer's briefing featuring an installation demonstration by an OTT-JAKOB service technician.

OUR RANGE OF PRODUCTS

MODULAR CLAMPING SYSTEMS

The modular structure of OTT-JAKOB clamping systems makes it possible to combine standard components with customer-specific elements.

ROTARY UNIONS

In recent years, we have set new standards for rotary unions. Our range of products features single- and multi-passage rotary unions for numerous media such as hydraulic, air, coolants, MQL and even cryogenic machining.

UNCLAMPING UNITS

We have a wide range of hydraulic, pneumatic and electric unclamping units. Spindle-bearing relief, holders for our rotary unions and cleaning air connections are optionally available.

PULLING HEADS AND GRIPPERS

Complete clamping systems always require the right pulling heads – whether SK, HSK, PSC or KM4X™. These are adapted based on the specific spindle. The spindle length, available space, pull force and life span specifications are all coordinated with one another in the design process. We also apply our full experience in spring design for each pulling head. The large number of types of clamping unit guarantees the right solution for every application. The result is complete clamping systems for all automatic applications.

ASSISTANCE SYSTEMS

With our portfolio of electronic monitoring systems, we offer innovative monitoring technologies that can be integrated into a networked production environment and provide up-to-date status information during the machining process.

ROTARY UNIONS

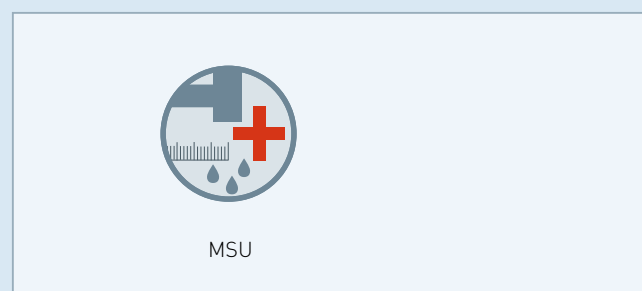


MEDIA TRANSFER + UNCLAMPING

ROTARY UNION



MEDIA TRANSFER



ROTARY UNIONS

MEDIA TRANSFER



Integrated seal-kit



Single-passage rotary unions



CO₂



Cleaning air

ROTARY UNION



Single-passage oil

UNCLAMPING UNITS

UNCLAMPING



Hydraulic



Pneumatic



Electric

PULLING HEADS

CLAMPING



HSK/PSC/KM4X™ (IF)

CLAMPING UNITS



K



B



C



D



Short



PB



KM4X™

ASSISTANCE SYSTEMS

MONITORING



Condition monitoring



PLANKO



GAUS

OUR RANGE OF PRODUCTS

POWER-CHECK 2 & POWER-CHECK MAGAZINE

POWER-CHECK 2

The pull force measurement device Power-Check 2 guarantees rapid and precise monitoring of the force with which the tool is pulled into the spindle taper. See page 151.



POWER-CHECK MAGAZINE

The Power-Check Magazine is used for fully automatic measurement of the pull force and can remain in the tool magazine permanently. The measurement results are transmitted wirelessly. See page 153.



ASSISTANCE SYSTEMS

OVERVIEW



GAUS

GAUS monitors spring force, temperature and vibration on rotating clamping system components. See page 136.



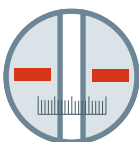
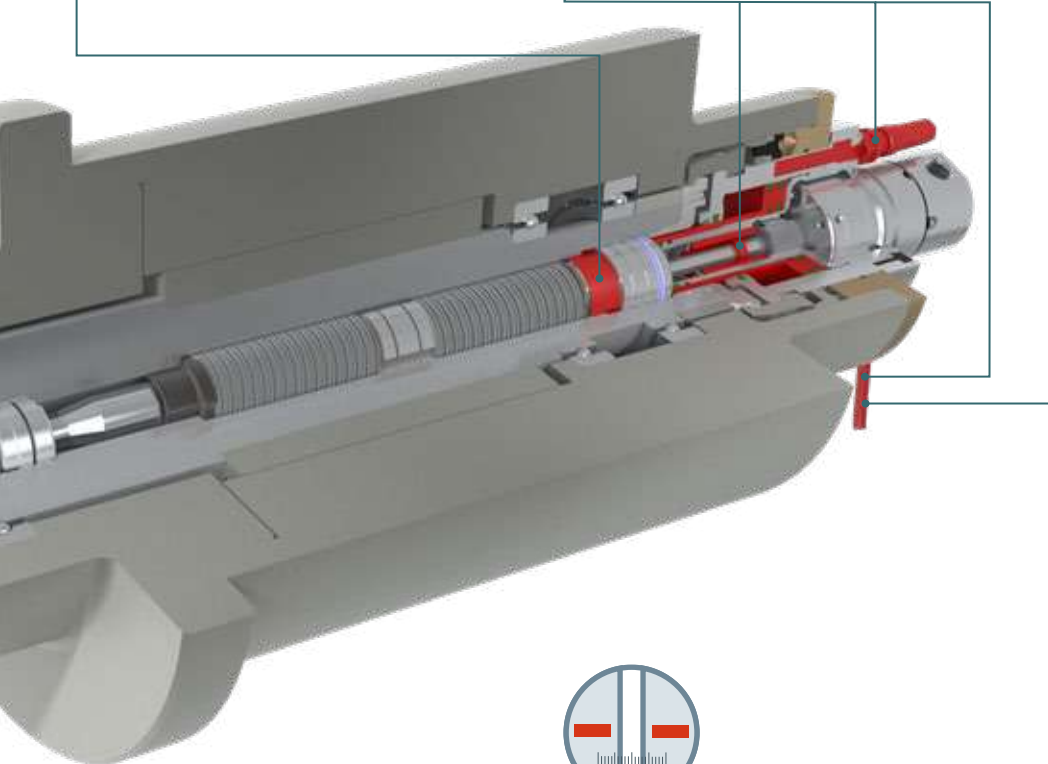
MSU

The MSU multi-sensor system monitors the drawbar shaft position, piston position and optionally also leakage. See page 130.



CONDITION MONITORING

Condition monitoring systems reliably detect leaks in rotary unions, and monitor the degree of wear to seals. See page 134.



PLANKO

PLANKO monitors the tool clamping quality within HSK machine tool spindles. See page 132.

GRIPPERS

SK gripper with holder



HSK clamping unit



PSC clamping unit



KM4X™ clamping unit



PULLING HEADS

SK (IS)

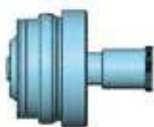


HSK / PSC / KM4X™ (IF)



UNCLAMPING UNITS AND ROTARY UNIONS

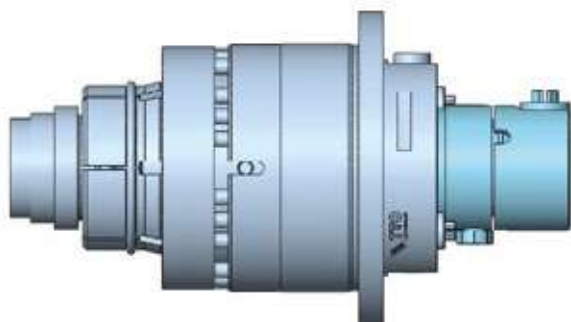
Single-passage oil rotary union



Dual-passage rotary union



Unclamping unit and single-passage GD rotary union



GRIPPERS

PAGE 17

SK GRIPPERS WITH HOLDER

HSK CLAMPING UNITS

PSC CLAMPING UNITS

KM4X™ CLAMPING UNITS

PULLING HEADS

PAGE 49

SK

HSK, PSC, KM4X™

POSITION-MONITORING
OPTIONS

UNCLAMPING UNITS

PAGE 63

HYDRAULIC

PNEUMATIC

ELECTRIC (PAGE 146)

ROTARY UNIONS

PAGE 93

SINGLE-PASSAGE OIL

DUAL-PASSAGE

SINGLE-PASSAGE GD

INTEGRATED SEAL-KITS

SINGLE-PASSAGE
SELF-SUPPORTED

ENQUIRY FORM

Company:		Department:	
Mr. / Ms. / Name:		Phone:	
Address:		Email:	
ZIP-code / City:			

Length of spindle ☐ Fix ☐ Range (please specify)

Max. length

Unclamping unit/rotary union

Bearing Ø at front

Bearing Ø at rear

Max. Ø of unclamping unit

RPM

INTERFACE:

☐ SK ☐ HSK ☐ PSC ☐ KM4X™

Tool (size, standard, form):

Type (for HSK):

- ☐ K (silver)
☐ B (black)
☐ C (self-holding)

Pull force ☐ per standard ☐ _____ [N]

Expected load cycle per hour:

Shift operation ☐ 1 ☐ 2 ☐ 3

MEDIA AND PRESSURE:

☐ Coolant [bar]

☐ Cleaning air [bar]

☐ Air / rotation [bar]

☐ MQL [bar]

☐ _____ [bar]

ORIENTATION:

☐ Horizontal ☐ vertical ☐ Rotary head

Comments (e.g. material to be machined, lubricant):

UNCLAMPING:

☐ Own unclamping unit

☐ Hydraulic ☐ Pneumatics ☐ Electric

Unclamping pressure [bar] ☐ Spindle bearing release

ASSISTANCE SYSTEMS:

☐ Position monitoring

☐ Unclamping unit piston monitoring

☐ Contact face sensing system

☐ Leakage detector

PLEASE CONTACT US:

Contact me ☐ by phone ☐ by email ☐ by appointment

☐ Quotation – scale

☐ Draft ☐ dxf ☐ 3D Format

INFORMATION REGARDING THE ENQUIRY FORM

In order for us to be able to advise you personally, please be as specific as possible when describing your requirements. Use our enquiry form to send us the relevant data quickly and easily.

Please fill in the form and send it to your representative or info@ott-jakob.de.

The enquiry form is also available online at www.ott-jakob.de under 'Products' in the menu.

INFORMATION ON THE PRODUCT PAGES

STRUCTURE

Corresponding to the modular structure of our clamping systems, the main part of the catalogue is divided into five sections: Grippers, Pulling heads, Unclamping units, Rotary unions and Assistance systems.

COLOUR CODING SYSTEM

To make it easier to navigate, we have assigned each section its own colour that appears in the register, the order code and the tables.

THE OTT-JAKOB ORDER CODE

Use our order code to configure a clamping system. The order code consists of a 24-digit combination of numbers and letters and describes the clamping system and its specifications.

A compact overview of the order code is available on the following double page. More detailed descriptions of the short codes are available on each product page.

Use the order code to familiarise yourself with our modular system. It is also helpful during the consultation when configuring your desired clamping system, and subsequently also helps you to keep track of our products. Please note that the order code overview in this catalogue contains only products described in the catalogue. You can download the full order code from our Infothek. More about the OTT-JAKOB Infothek is available on page 166. Your OTT-JAKOB representative will finalise your order code for you.

THE ORDER CODE IN DETAIL

Pulling heads			Grippers							Pulling heads		Unclamping units			Rotary unions			Length of spindle [mm]						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
						A	I															,		
						Standard	Form																	

Our order code will accompany you through the entire product section and is always visible at the top of the catalogue.

The fields follow the same predefined colour scheme for the individual sections. This shows you at a glance where to find the necessary short codes in the catalogue. On the product pages, these are always marked with a key symbol .

If there are short codes on a product page, there will be coloured marking beneath the respective fields of the order code.

The length of spindle is shown in fields 19 – 24. This always contains four digits (19–22) with a decimal place (24). For a length of spindle under 1,000 mm, a "0" is prefixed.

ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
---	---	---	---	---	---	---	---	---	----	----	----

SK

1	2	CONFIGURATIONS OF THE SK POWER DRAWBAR
E	S	Inside spindle drawbar
I	S	Built-in power drawbar
F	S	Spring drawbar

NOMINAL SIZE OF THE SK INTERFACE					
4	5	6	ES	IS	
2	0	-		x	
2	5	-		x	
3	0	-	x	x	
4	0	-	x	x	
4	5	-	x	x	
5	0	-	x	x	
6	0	-	x	x	

7	8	9	INTERFACE STANDARD
A	1	-	DIN 69871/72; ISO 7388/1/2 Type A
C	1	-	ANSI B 5.50-78; ISO 7388/1/2 Type B
E	1	-	MAS 403-1982 BT/PT 2 (30°)
F	1	-	MAS 403-1982 BT/PT 1 (45°)
G	1	-	MAS 403-1982 [0°]
-	2	-	Internal thread (short design)
-	3	-	External thread (short design)
-	-	V	Force-amplifying gripper
-	-	W	Less pull force

10	SK MEDIA TRANSFER
1	Without transfer
2	Axial transfer
3	Radial transfer
4	Radial/axial transfer

HSK / PSC / KM4X™

1	2	CONFIGURATIONS OF THE HSK POWER DRAWBAR
I	F	Built-in inside spindle drawbar with spring

NOMINAL SIZE OF THE HSK/PSC/KM4X™ INTERFACE					
4	5	6	Interface		
2	0	-	HSK		
2	5	-	HSK		
3	2	-	HSK/PSC		
4	0	-	HSK/PSC		
5	0	-	HSK/PSC		
6	3	-	HSK / PSC / KM4X™		
8	0	-	HSK/PSC		
8	0	X	PSC		
1	0	0	HSK / PSC / KM4X™		
1	2	5	HSK / KM4X™		
1	6	0	HSK		

7	8	9	INTERFACE STANDARD
A	-	-	HSK: ISO 12164-1/DIN 69893-1/Form A
B	-	-	HSK: DIN 69893-2/Form B
D	-	-	HSK: DIN 69893-2/Form D
E	-	-	HSK: DIN 69893-5/Form E
F	-	-	HSK: DIN 69893-6/Form F
K	M	-	Kennametal KM4X™
P	-	-	PSC: ISO 26623
T	-	-	HSK: DIN 69893-7/Form T
-	K	-	Type K (silver)
-	B	-	Type B (black)
-	C	-	Type C/2S
-	D	-	Type D/high transmission ratio
-	-	K	Short clamping unit
-	-	M	More pull force
-	-	W	Less pull force
-	-	S	Special configuration

10	HSK MEDIA TRANSFER
1	Without transfer
2	Axial transfer
3	Radial transfer
4	Radial/axial transfer
5	Air transfer through spring chamber

This overview only contains short codes for the products in this catalogue. You can download the full order code from our Infothek. More about the OTT-JAKOB Infothek is available on page 166.

13	14	15	16	17	18	19	20	21	22	23	24
----	----	----	----	----	----	----	----	----	----	----	----

12	POSITION MONITORING
B	Unclamping or indication through bolts
G	Thread in pulling head/drawbar shaft
H	Signal ring
K	Piston detection
M	MSU sensor system without leakage monitoring
L	MSU sensor system with leakage monitoring
O	Without thread/slot

13	14	15	UNCLAMPING UNIT
-	0	0	Without unclamping unit
-	0	1	LE 92 without single-passage modular system
-	0	2	LE 60 without single-passage modular system
-	0	3	LE 102 air blast
-	0	4	LE 95 flange-mounted
-	1	0	LE 115 flange-mounted air blast
-	1	1	LE 124-F-KURZ
-	1	9	LE 99-P 2A
-	2	0	LE 99-P 3A
-	2	1	LE 119-P 1
-	2	2	LE 119-P 2
-	2	3	LE 119-P 3
-	3	1	LE 150-P 1
-	3	2	LE 150-P 2
-	3	3	LE 150-P 3
-	3	7	LE 150-P 1FA (flange-mounted/holder)
-	3	8	LE 150-P 2FA (flange-mounted/holder)
-	3	9	LE 150-P 3FA (flange-mounted/holder)
-	5	4	LE 123-B
-	5	5	LE 156
-	5	8	LE95
-	5	9	LE 60-B
-	6	0	LE 165-P 2FA (flange-mounted/holder)
-	6	1	LE 83-F (flange-mounted)
-	6	9	LE120
-	7	4	LE 74-P2FA
-	7	5	LE 74-P1FA
-	7	7	LE 140-F-B
F	-	-	GAUS telemetry system

19/20/21/22/23/24	Length of spindle
- Measurements in mm - less than 1,000 mm: with prefix "0" - See the chapter "pulling heads" on page 49 for the minimum length of spindle	

16	17	18	ROTARY UNION
0	0	-	Without rotary union
1	1	-	Single-passage oil (Euro) M12 × 1.5
1	2	-	Single-passage oil (US-Norm) 1/16" 20 UNF
1	4	-	2KL Dual-passage air M42 × 1.5/M52 × 1.5
1	4	-	2KL-ME Additionally "M" for multisensor must be selected in field 12
2	1	-	1K-GD
2	1	K	1K-GD-K
2	1	S	1K-GD-44
2	2	-	1K-GD-A
2	2	K	1K-GD-K
2	2	S	1K-GD-44
2	3	-	1K-GDR
2	4	-	1K-GDR-A
2	5	-	2KA M42 × 1.5/M52 × 1.5
2	5	-	2KA-ME Additionally "M" for multisensor must be selected in field 12
2	6	-	2KA-SR Signal ring version M42 × 1.5/M52 × 1.5
2	7	-	2KA UNIVERSAL M42 × 1.5/M52 × 1.5
2	8	-	2KL-X M42 × 1.5/M52 × 1.5
2	9	-	2KA-SR UNIVERSAL M52 × 1.5; signal ring
3	2	-	1K-GD-HD 150 bar
3	3	-	1K-GD-SL
3	4	-	1K-GD-RA-08 Min. capacity ø 8
3	5	-	2KA-A
3	6	-	2KA-SR axial
3	7	-	1K-GDR-LC-2L
3	9	I	1K-GD-HS-IK
4	0	-	Seal-kit IDS-A-Ø8 Integrated seal-kit
4	0	S	Seal-kit IDS-R-Ø8 Integrated seal-kit
4	2	-	1K-SDR-A-B Medium air, air gap seal
4	7	-	2KL-SR Signal ring (M42 × 1.5)
4	9	-	1K-SDR-B Medium air, air gap seal
5	0	I	1K-GD-A-HS-IK 42,000 RPM
6	1	-	1K-GD-CM Including internal leakage monitor
6	3	-	1K-GDR-CM
6	5	-	1K-GDR-LC-2L
6	8	-	1K-GDP-LC ø 32, 36,000 rpm
7	0	-	1K-GDK-44-IN Short version, integrated
7	1	-	1K-GDP-A-LC ø 32, 36,000 rpm
7	5	-	1K-GD-A-HD 150 bar
8	3	-	2KAU-48
8	8	-	1KR Self-supported
A	6	-	1K-GDV
B	9	-	1K-GDR-CM axial
C	2	-	2K-GDSD-C02-KSM Liquefied CO ₂
E	2	-	1K-GDP
E	7	-	1K-GDP-A
-	-	S	Special configuration
-	-	A	Application of CO ₂
-	-	C	Wear monitor

1K = Single-passage
 # A = Axial connection
 # R = Reduced speed
 # HD = High pressure
 # SK = For rotary head
 # SR = Signal ring

GD = Closed sealing surfaces
 # RA = Radial and axial connection
 # HS = High speed
 # SL = Passive sealing air
 # 2KA = Dual-passage



GRIPPERS

SK grippers with holder	page 18
HSK clamping units	page 30
PSC clamping units	page 44
KM4X™ clamping units	page 46

ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
						Standard			Media transfer		



STEEP TAPER

The steep taper is the original tool interface and continues to see frequent use in the machine tool industry. Steep taper technology has proven itself for decades and, in spite of the increasingly widespread use of HSK interfaces, remains a practical solution for standard machine tools.

TOOL STANDARD

DIN 69871/69872		ISO 7388/1/3 TYPE A		ANSI B5.50-1978		ISO 7388/1/3 TYPE U		MAS 403-1982 BT/PT 2 (30°)		ISO 7388/2/3 Type J (30°)		MAS 403-1982 BT/PT 1 (45°)		ISO 7388/2/3 Type J (45°)	
	G	$l_1 \pm 0.25$	$l_2 \pm 0.25$		G	$l_1 \pm 0.30$	$l_2 \pm 0.30$		G	$l_1 \pm 0.25$	$l_2 \pm 0.25$		G	$l_1 \pm 0.25$	$l_2 \pm 0.25$
SK 30	31.75	71.65	66.65	SK 30	31.75	59.30	55.65	SK 30	31.75	71.35	66.35	SK 30	31.75	71.35	66.35
SK 40	44.45	94.25	88.25	SK 40	44.45	84.50	79.25	SK 40	44.45	100.35	93.35	SK 40	44.45	100.35	93.35
SK 50	69.85	135.60	126.60	SK 50	69.85	127.00	119.40	SK 50	69.85	146.75	136.75	SK 50	69.85	146.75	136.75
SK 60	107.95	201.65	191.65	SK 60	107.95	199.95	189.45								

INTERFACE STANDARD

A

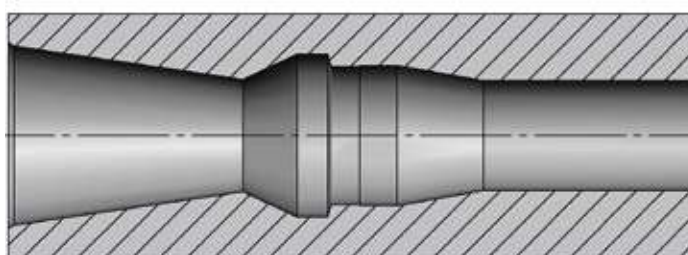
C

E

F

UNIVERSAL SPINDLE CONTOUR

Thanks to the spindle inside contour developed by OTT-JAKOB, various standards of tool can be used in the same spindle. The universal spindle contour is compatible with all conventional tool standards.



- ▲ DIN 69871/69872 // ISO 7388/1/2 Type A
- ▲ ANSI B5.50-1978 // ISO 7388/1/2 Type B
- ▲ MAS 403-1982 BT/PT2 (30°) // ISO 7388/2/3 (30°)
- ▲ MAS 403-1982 BT/PT1 (45°) // ISO 7388/2/3 (45°)

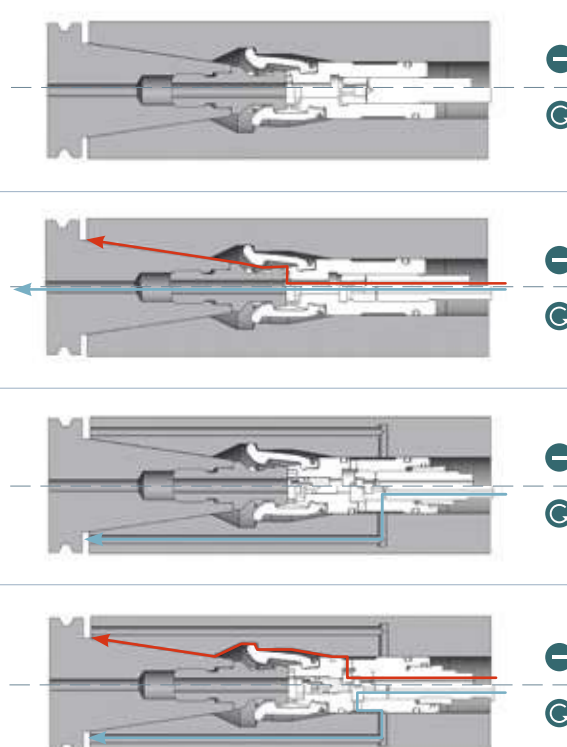
MEDIA TRANSFER TYPES

CODE	COOLANT	CLEANING AIR
1 	Without	Without
2 	Axial	Axial (with closed tools)
3 	Radial	Without
4 	Radial	Axial

 Coolant

 Cleaning air

 Tool changing

 Rotation


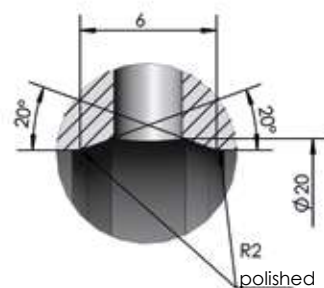
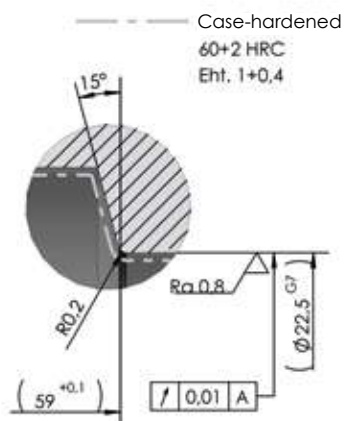
1	2	3	4	5	6	7	8	9	10	11	12	
			Nominal size			Standard	Form					

NOMINAL SIZE 3 0 -

Technical drawing of a probe tip assembly. The drawing shows a cross-section of the assembly with various dimensions and tolerances.

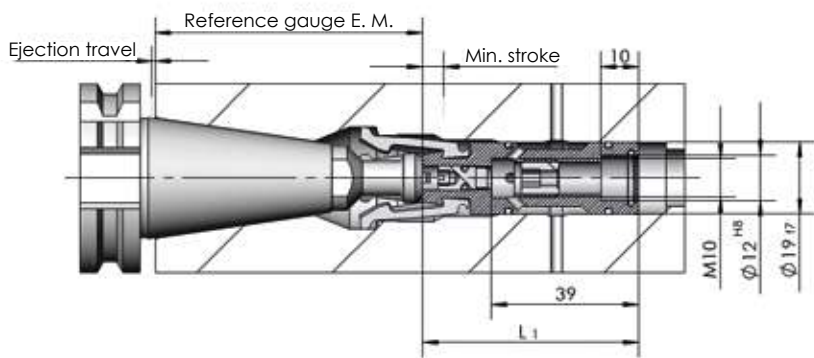
- Overall Length:** 135
- Tip Section Dimensions:**
 - Length from tip to start of first step: 91^{+0.5}
 - Length of first step: 76^{+0.2}
 - Length of second step: 59^{+0.1}
 - Radius of third step: R0.5
 - Angle of fourth step: 22°
 - Angle of fifth step: 5°
- Diameters and Tolerances:**
 - Tip diameter: Ø 31.75
 - First step diameter: Ø 19.5^{+0.1}
 - Second step diameter: Ø 27^{+0.2}
 - Third step diameter: Ø 22.5 G7
 - Fourth step diameter: Ø 23
 - Fifth step diameter: Ø 20.2^{+0.2}
 - Sleeve inner diameter: Ø 3
 - Sleeve outer diameter: Ø 19 H8
- Surface Finish:** Ra 0.4
- Material Properties:** A
- Other Features:**
 - Feature X: Tip point
 - Feature Y: First step edge
 - Feature Z: Polished surface
 - Note: "Number specified by customer" points to the sleeve diameter Ø 3.

Largest axial movement of the dimension from the face $\pm 0,1$



GRIPPER HOLDER FORM
UNCLAMPED POSITION

FORM 1 



	STANDARD			
	A	C	E	F
Gripper holder form	1			
Media transfer	1/2/3	1/2	1/2/3	
Max. F _E pull force [N]	6,000			
Min. stroke [mm]	5.5			
Ejection path [mm]	0.95	1.6	0.95	
Reference gauge E.M. [mm]	70.7	57.7	70.4	
l ₁	57.1	69.8	57.8	
ORDER NUMBERS				
Gripper with holder	9510145232	9510145032	9510145332	9510145132
Lock screw	Included in delivery			
Mounting tool	9510128092			

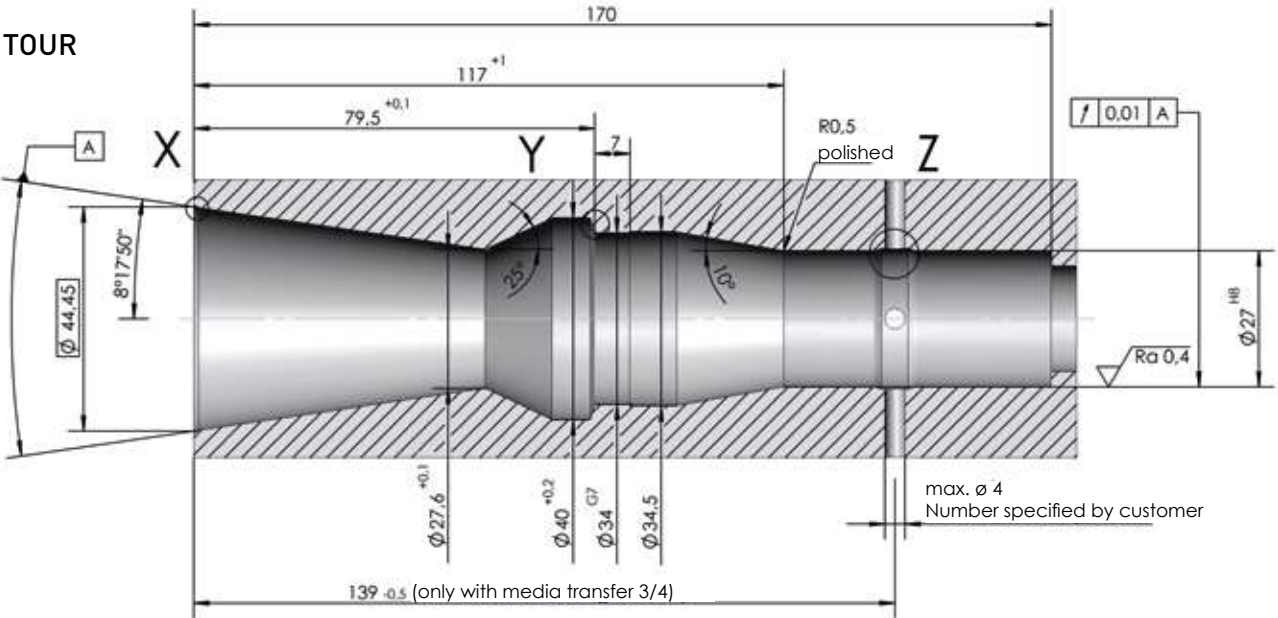
ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
			Nominal size			Standard		Form			

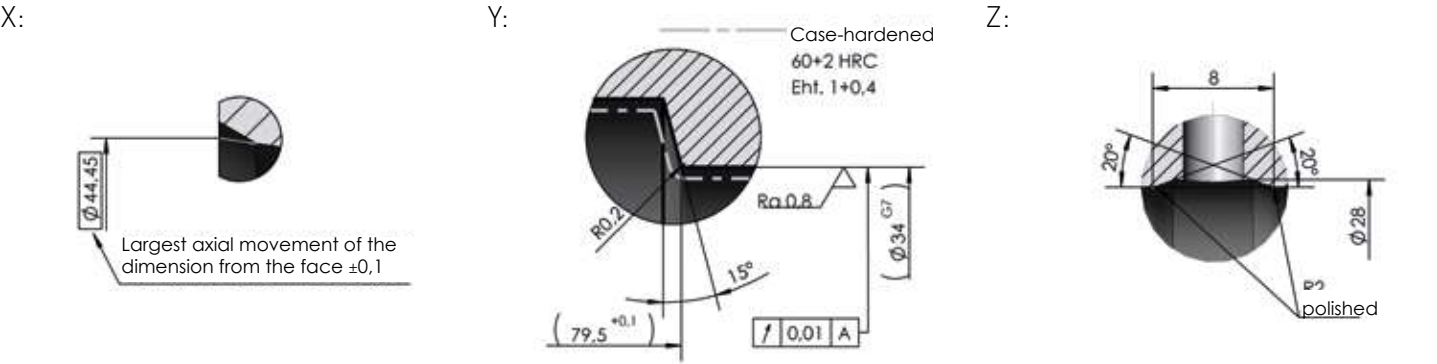
SK40

NOMINAL SIZE 4 0 - 🔑

INSIDE CONTOUR



DETAILS



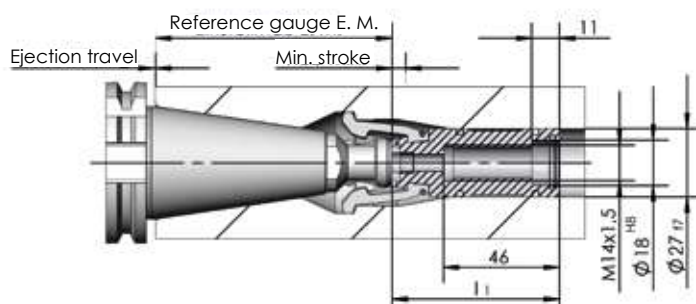
	STANDARD								
	A						C		
Gripper holder form	1				2	3	1		
Media transfer	1	2	3	4	1/2		1	2	
Max. FE pull force [N]	15,000								
Min. stroke [mm]	5.5								
Ejection path [mm]	0.65						1.6		
Reference gauge E.M. [mm]	93.6						82.9		
l ₁	67.1	66.4	67.4	67.4	41.4	56.4	77.9	77.5	
ORDER NUMBERS									
Gripper with holder	9510128832	9510121632	9510120232	9510122332	9510168432	9510157032	9510128732	9510123332	
Lock screw	9510137251						9510137251		
Mounting tool	9510128192				9510097542		9510128192		

GRIPPER HOLDER FORM

UNCLAMPED POSITION

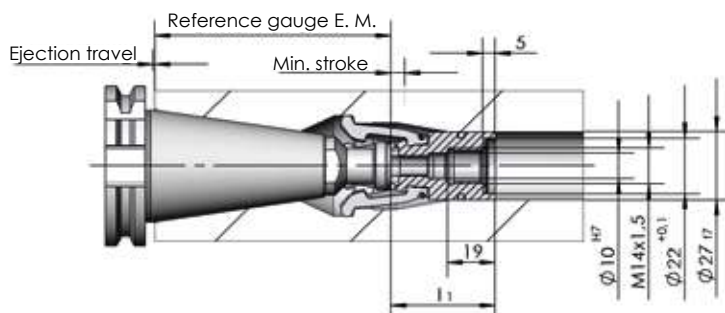
FORM

1



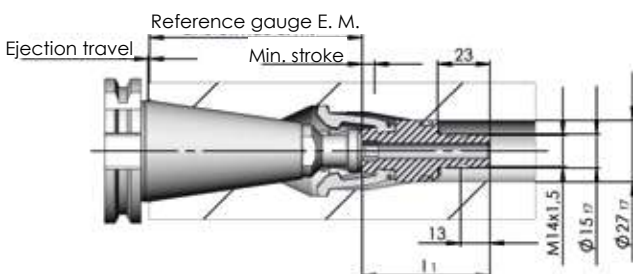
FORM

2



FORM

3



STANDARD

C				E		F	
1	2	3	4	1	2	1	2
3	4	1/2					
15,000							
5.5							
1.6				0.65			
82.9				99.7			
77.9	78.2	51.6	67.3	60.3	35.3	60.3	35.3
9510129032	9510129532	9510168532	9510156932	9510148532	9510168732	9510148632	9510168632
9510137251				9510137251		9510137251	
9510128192		9510097542		9510128192	9510097542	9510128192	9510097542

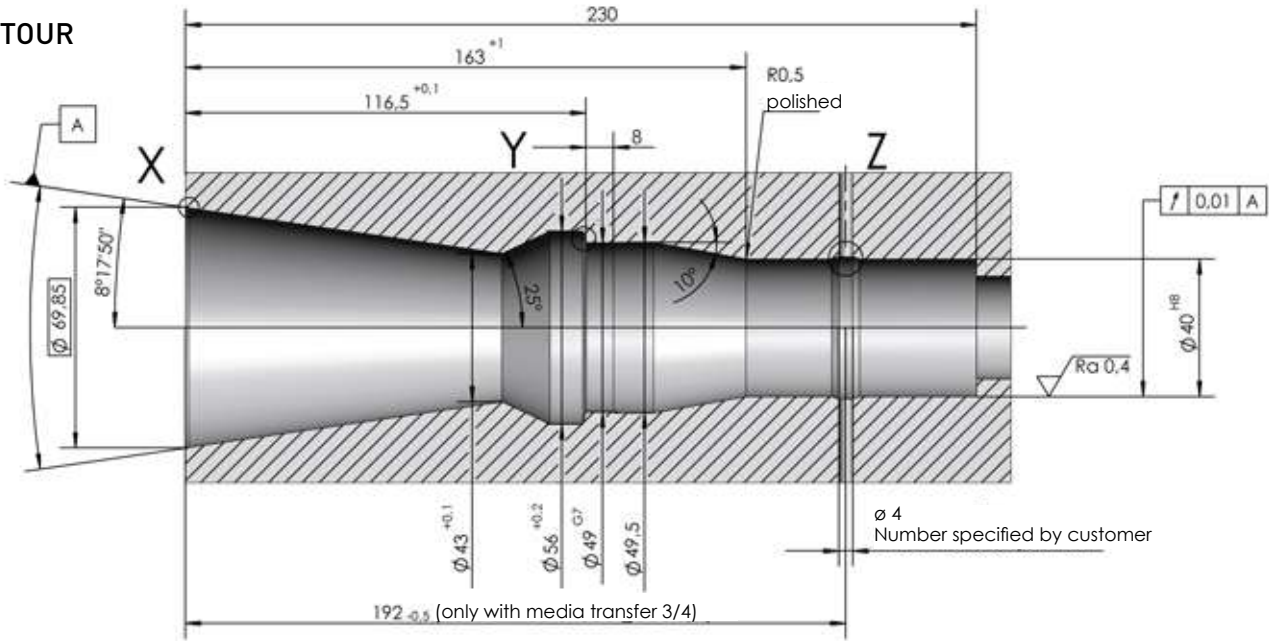
ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
			Nominal size			Standard		Form			

SK50

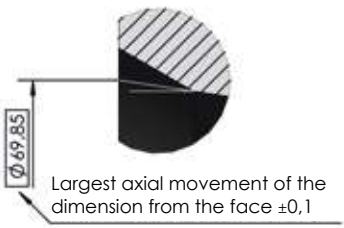
NOMINAL SIZE 5 0 - 🔑

INSIDE CONTOUR

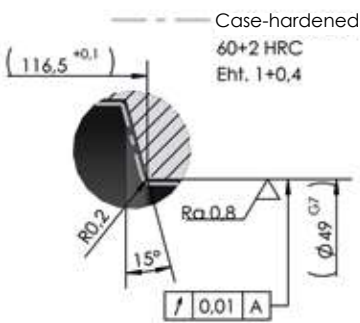


DETAILS

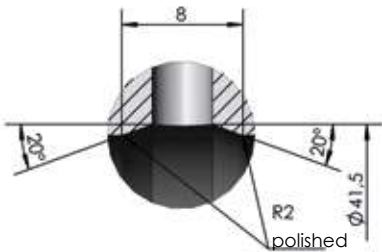
X:



Y:



Z:

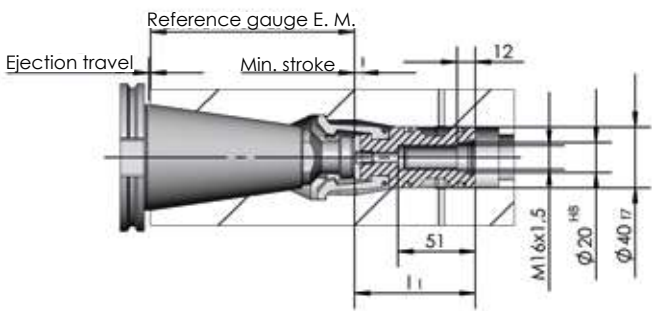


	STANDARD				
	A				
Gripper holder form	1		2	3	
Media transfer	1/2	3	4	1/2	
Max. FE pull force [N]	25,000				
Min. stroke [mm]	6				
Ejection path [mm]	1				
Reference gauge E.M. [mm]	134.6				
l ₁	79.7		46.2	66.8	
ORDER NUMBERS					
Gripper with holder	9510129732	9510129832	9510135632	9510154032	9510138632
Lock screw	9510363651				
Mounting tool	9510133792			9510042142	

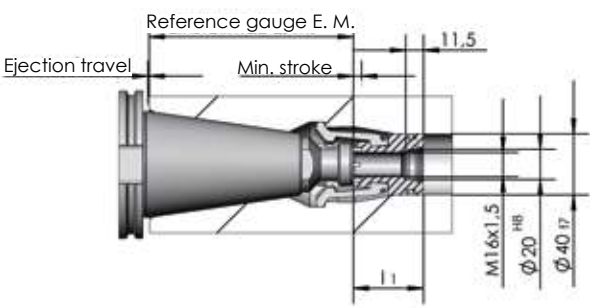
GRIPPER HOLDER FORM

UNCLAMPED POSITION

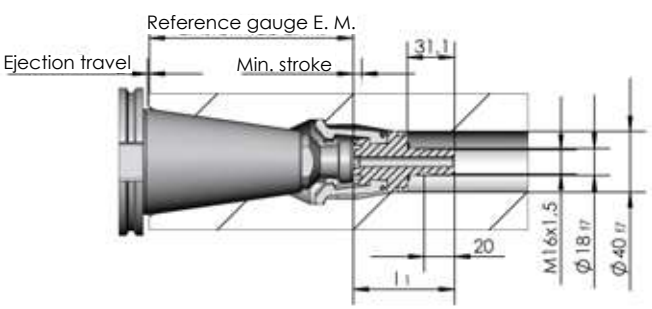
FORM 1



FORM 2



FORM 3



STANDARD					
C				E	F
1		2	3	1	
1/2	4	1/2			
25,000					
6					
1					
126				145.75	
87.9		55	75.9	68.8	
9510130632	9510152232	9510166832	9510138532	9510147632	9510150632
9510363651				9510363651	
9510133792			9510042142	9510133792	

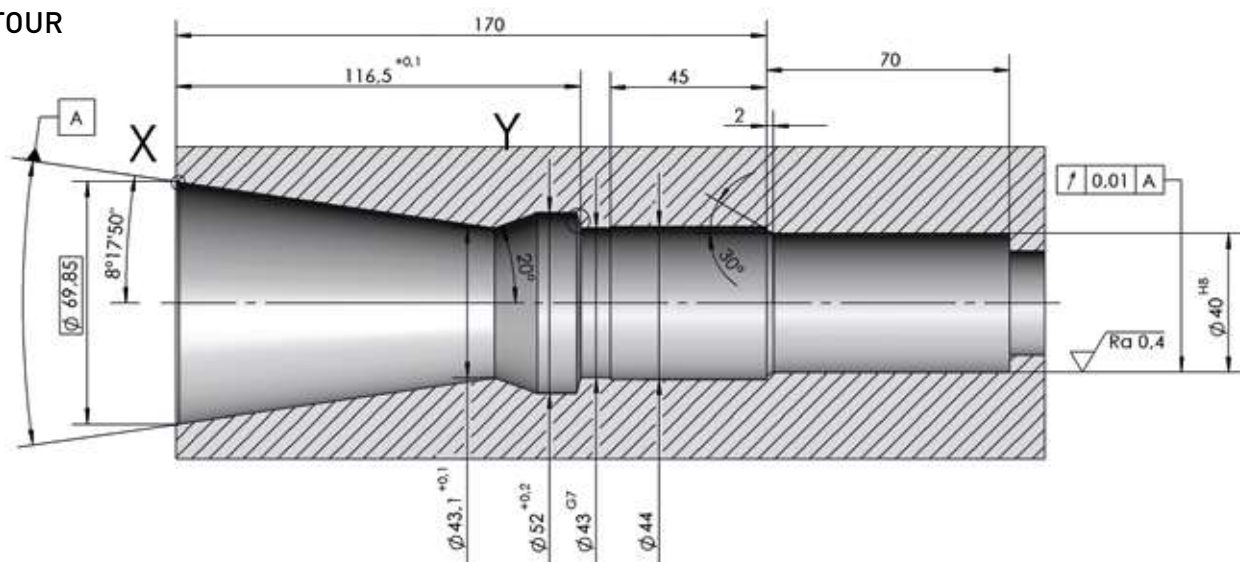
ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
			Nominal size			Standard		Form	Reinforced gripper		

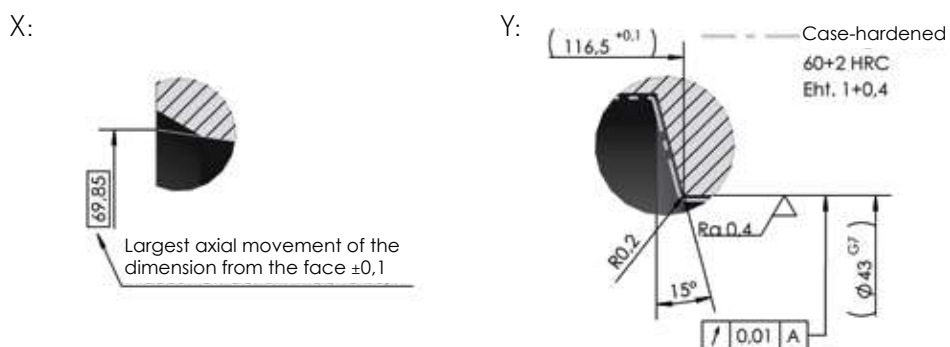
SK50V REINFORCED GRIPPER

NOMINAL SIZE **5 0 -**  Reinforced gripper **V** 

INSIDE CONTOUR

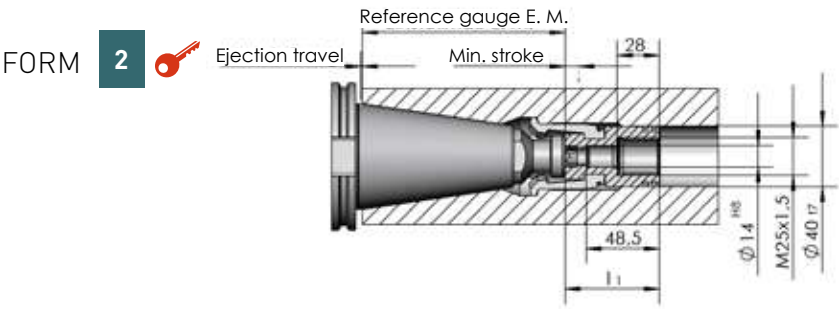
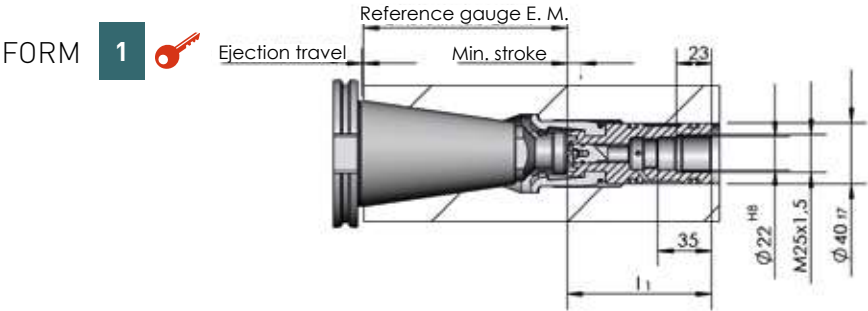


DETAILS



GRIPPER HOLDER FORM

UNCLAMPED POSITION



	STANDARD			
	A	C	A	C
Gripper holder form	1		2	
Media transfer	1/2/3			
Max. FE pull force [N]	35,000			
Min. stroke [mm]	9			
Ejection path [mm]	1			
Reference gauge E.M. [mm]	134.6	126	134.6	126
l ₁	95	103.6	62.5	71.5
ORDER NUMBERS				
Gripper with holder	9510178132	9510178232	9510216132	9510223732
Lock screw	9510127341			
Mounting tool	9510133692			

1	2	3	4	5	6	7	8	9	10	11	12
			Nominal size			Standard	Form				

NOMINAL SIZE 6 0 -

Technical drawing of a shaft assembly. The drawing shows a shaft with a conical section on the left, a central section with a keyway, and a right section with a keyway. The shaft is mounted in a housing. Dimensions and tolerances are as follows:

- Overall length: 255^{+0.5}
- Distance from left face to start of conical section: 235.9^{-0.1}
- Distance from left face to start of keyway: 230
- Distance from left face to end of keyway: 181.3^{+0.1}
- Distance from end of keyway to start of right keyway: 39
- Distance from start of right keyway to right face: 90
- Conical section angle: 8°17'50"
- Conical section diameter at left face: $\Phi 107.95$
- Conical section diameter at start of keyway: $\Phi 65$ (tolerance ± 0.1)
- Keyway diameter: $\Phi 78$ (tolerance ± 0.2)
- Keyway width: $\Phi 65$ (tolerance ± 0.1)
- Keyway depth: $\Phi 62.5$ (tolerance ± 0.2)
- Keyway width at right keyway: $\Phi 66.2$ (tolerance ± 0.2)
- Right keyway diameter: $\Phi 52$ (tolerance ± 0.1)
- Right keyway width: $\Phi 52$ (tolerance ± 0.1)
- Surface finish: Ra 0.4
- Surface texture: $\sqrt{0.01}$ A

Largest axial movement of the dimension from the face $\pm 0,1$

Technical drawing of a ball bearing cross-section. The drawing includes the following specifications:

- Case-hardened** (indicated by a dashed line and text)
- 60+2 HRC** (Rockwell C hardness)
- Eht. 1+0,4** (Hardness tolerance)
- 181,3 ± 0,1** (Dimension in mm)
- R0,2** (Radius dimension)
- 15°** (Angle dimension)
- Ra 0,4** (Surface roughness)
- 0,01 A** (Surface texture symbol)
- Ø 65 C7** (Bore diameter and fit)

HSK

(HOLLOW-SHAFT TAPER)



As an advancement of the steep taper, HSK was created as part of a research project carried out by RWTH Aachen University in close collaboration with well-known industrial partners. From the outset, OTT-JAKOB played a leading role in the creation of the HSK interface. Since its standardisation, HSK has become a standard interface in machine tool technology. With the redundancy of the flange and taper contact surfaces, the HSK clamping system is ideal for highly precise machining results and a repeat accuracy on the micro scale.

The hollow-shaft taper (HSK) has a shorter, lighter structure than the steep taper, which allows tools to be changed more quickly and higher RPMs to be reached. By virtue of its high pull-in forces, excellent stiffness and optimal torque transmission, HSK is also ideal for use in heavy machining.

ADVANTAGES OF THE HSK INTERFACE

- ▲ High repeat accuracy on the micro scale during tool changing
- ▲ Rapid tool changing due to low weight and compact design
- ▲ Transfer of high torques through redundancy of taper and flange contact surfaces
- ▲ Ideal for high-speed machining as the end face prevents axial displacement

ADVANTAGES OF HSK CLAMPING UNITS FROM OTT-JAKOB

- ▲ The geometry of our HSK clamping units ensures parallel movement of the gripper segments. As a result, the tool is clamped evenly between two surfaces; this guarantees optimal power and torque transmission
- ▲ The geometric construction of the gripper segments and clamping cone allows for a reliable and multiple intensification of the spring force
- ▲ Additional dynamic clamping force intensification through the centrifugal force acting on the gripper segments
- ▲ To afford them the best possible protection against wear, the surfaces of the gripper segments and clamping cone are coated with a high-end coating which also guarantees low coefficients of friction
- ▲ Precisely manufactured gripper segments supplied in sets
- ▲ The reasonable transmission ratio minimises wear on the tool holders
- ▲ The bronze assembly ring preserves the coolant tube of the tool
- ▲ With the exception of Type K, forced guidance of the gripper segments, even in critical situations

Faster tool changing for a shorter chip-to-chip time has become enormously important, especially due to high-speed machining. OTT-JAKOB is facing the challenges of the sector by consistently optimising its HSK clamping units for automatic clamping systems.

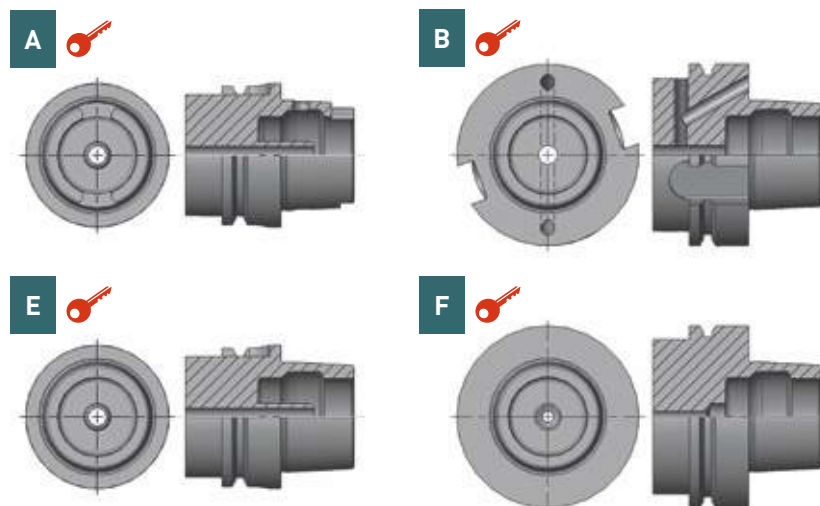
THE OTT-JAKOB HSK CLAMPING UNIT IN DETAIL:



ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
						Form	Type		Media transfer		

HSK TOOL FORMS:



▲ FORM A

The most frequently used tool standard with keyways at the taper end.

▲ FORM B

Has an enlarged flange with keyways and is most commonly used for heavy machining.

▲ FORM E

Is most commonly used for high-speed machining and has no keyways.

▲ FORM F

Has no coolant seal for use in the woodworking and plastics industries.

You will find the inner contours on page 36.

TYPES OF HSK CLAMPING UNITS:

TYPE K

Type K is the most economical solution in the range of OTT-JAKOB HSK clamping units. A solid basic variant, it is particularly suited for standard applications. Its high-quality coating gives it a long life span.

TYPE B

Type B was developed to meet the specific requirements of the automotive industry. This high-performance clamping unit was designed for frequent, rapid tool changing. The forced guidance ensures that the grippers move in parallel even in the most difficult conditions. The optimised DLC coating gives it the longest possible life span. At the same time, the reduced friction leads to a higher transmission ratio.

TYPE C

Type C generates extremely short tool-changing times. The built-in holding function minimises waiting time during the tool-changing process. Our high-quality, optimised DLC coating also gives it a long life span.

TYPE D

Based on Type B, this clamping unit provides an even higher transmission ratio with an identical inside contour.

TYPE BK

For the shortest possible lengths of spindles, shorter variations of many Type B clamping units are also available.

TYPE **K**



TYPE **B**



TYPE **C**



TYPE **D**



TYPE **B K***



* Enter this short code in field 9

TYPES OF MEDIA TRANSFER:

CODE	COOLANT	CLEANING AIR
1 	Without	Without
2 	Axial	Axial (with closed tool)
3 	Without	Radial
4 	Axial	Radial
5 	Axial	Radial (through the spring chamber)

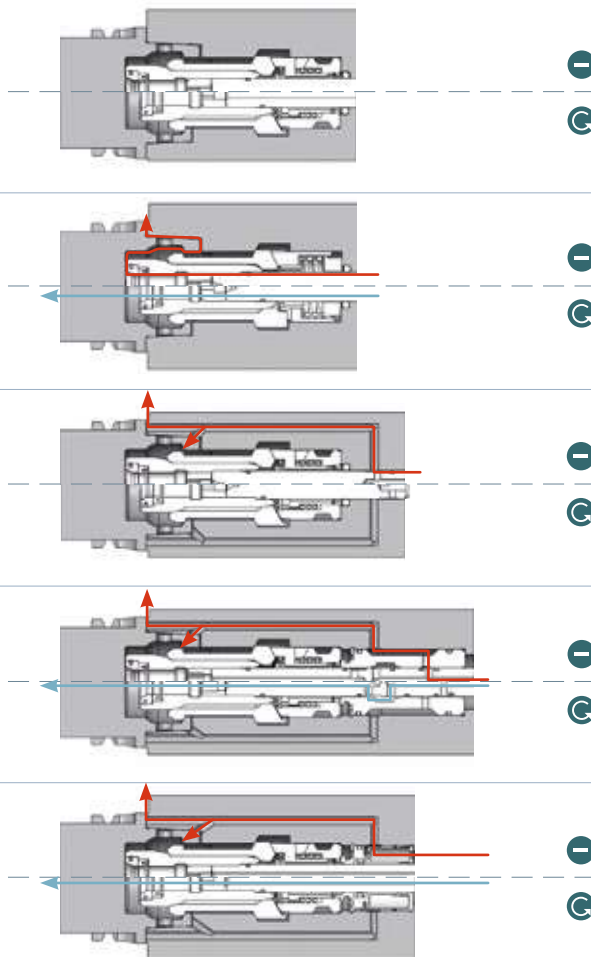
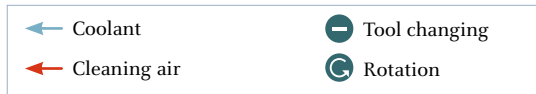
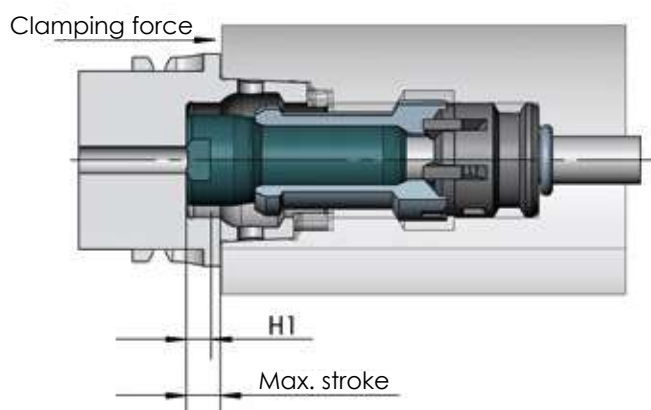
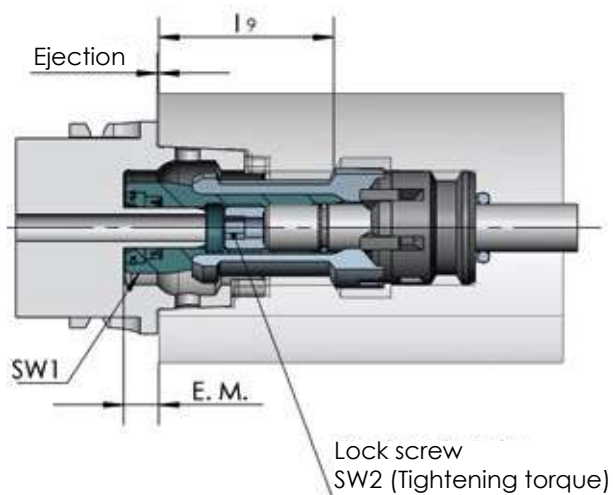


TABLE SKETCHES

TECHNICAL DATA FOR HSK CLAMPING UNITS



ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
			Nominal size								

TECHNICAL DATA FOR HSK CLAMPING UNITS

See the previous page for a drawing; for the mounting tool, see page 162.

		FORM	NOMINAL SIZES 						
		A		25-	32-	40-	50-		
		B			40-	50-	63-		
		E	20-	25-	32-	40-	50-		
		F				50-	63-		
Clamping force (standard)		[kN]	1.2	2.8	5.0	6.8	11.0		
OTT-JAKOB plus		[kN]				8.0	14.0		
Pressure (medium)		[bar]	80.0	80.0	80.0	80.0	80.0		
Ejection		[mm]	0.5	0.5	0.5	0.5	0.5		
Reference gauge E.M.	±0.1	[mm]	5.5	6.5	8.5	8.5	10.5		
Max. stroke		[mm]	6.5	7.0	7.5	8.0	9.0		
H ₁ clamped with tool		[mm]	3.8	4.6	5.1	5.6	6.4		
SW ₁		[mm]	8	10	12	15	18		
SW ₂		[mm]	2	3	3	4	4		
Tightening torque		[Nm]	1.5	7	10	15	20		
RPM limit	A	[rpm]		94,278	67,493	48,188	37,331		
	B	[rpm]			48,349	34,561	26,451		
	E	[rpm]	93567	72,207	70,924	54,667	44,160		
	F	[rpm]				39,171	31,263		
Transferable torque (without driver)	A	[Nm]		7	14	24	48		
	B	[Nm]			16.9	28	57		
	E	[Nm]	2.34	5.3	16.4	28	59		
	F	[Nm]				32	68		

ORDER NUMBERS	E20	A25/E25	A32/B40/E32	A40/B50/E40/F50	A50/B63/E50/F63					
Type K		No coolant	9560001136		9560000836		9560000736		9560000436	
Type B	9560014936	No coolant	9560003836		9560011336		9560003436		9560003536	
		Coolant: 80 bar	9560006336			150 bar	9560003436V04	150 bar	9560003536V02	
		Coolant: 150 bar	9560006336V01					250 bar	9560003536V03	
Type B-K				l _y : 25 mm	9560004536	l _y : 25.5mm	9560017326	l _y : 31.5mm	9560011836	
								150 bar	9560011836V02	
								250 bar	9560011836V03	
Type C F _z : Holding power in unclamped position				F _z : 100 N	9560015526	F _z : 150 N	9560006526	F _z : 250 N	9560015026	
						F _z : 230 N	9560006526V01			
Type D (higher transmission ratio)							9560020026		9560020426	
Type C-D (higher transmission ratio) F _z : Holding power in unclamped position										
Type D-K (higher transmission ratio)								l _y : 31.5mm	9560013536	
Lock screw	9560318541		9560027141		9560012141		9560012241		9510159751	

13	14	15	16	17	18	19	20	21	22	23	24
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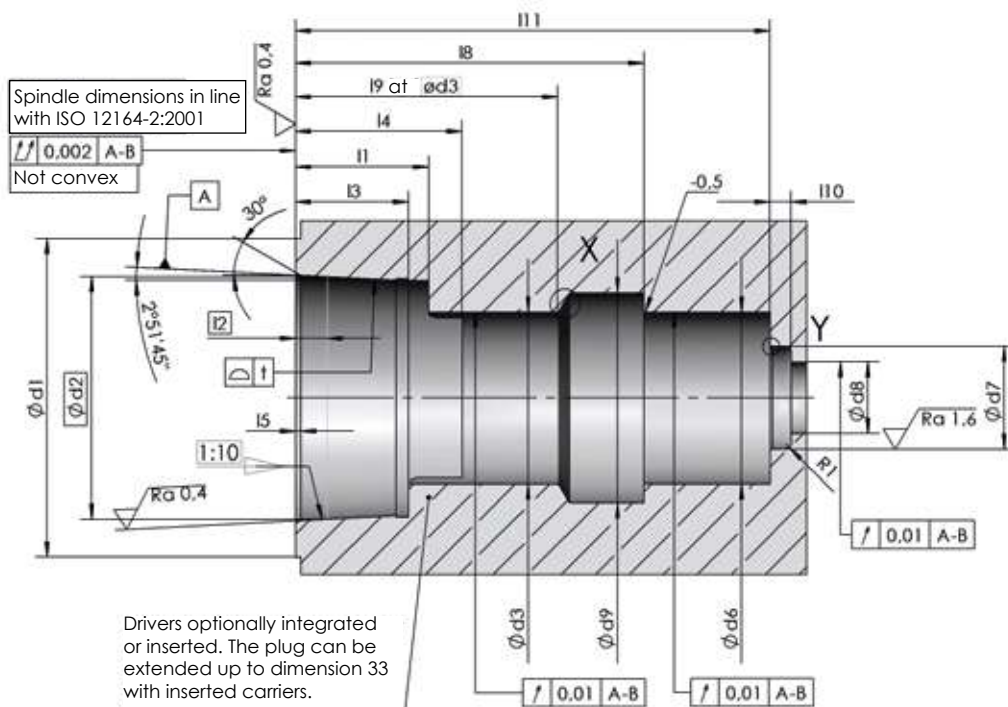
NOMINAL SIZES 									
63-		80		100		125		160	
80-		100		125		160			
63-									
80-									
18.0		28.0		45.0		70.0		115.0	
24.0		37.0		55.0		86.0		150.0	
80.0		80.0		80.0		80.0		80.0	
0.5		0.5		0.5		0.5		1.0	
10.5		13.0		13.0		16.5		17.0	
10.0		11.0		12.5		15.8		24.5	
7.4		8.3		9.15		10.8		17.5	
24		27		36		46		55	
6		6		6		14		16	
30		30		50		100		150	
27,198		20,895		15,465		12,560		8,962	
19,125		15,082		11,133		8,714			
32,693									
22,967									
96		188		364		710		1,460	
114		221		425		843			
117									
136									
A63/B80/E63/F80		A80/B100		A100/B125		A125/B160		A160	
	9560000136		9560000236		9560000336		9560000936	9560001036	
250 bar	9560000136V01								
	9560003326		9560003626		9560003726		9560018216	9560020516	
150 bar	9560003326V04			150 bar	9560003726V02	150 bar	9560018216V01		
250 bar	9560003326V03			250 bar	9560003726V01				
l _y : 38 mm	9560017226	l _y : 45 mm	9560015216	l _y : 55 mm	9560015616	l _y : 70 mm	9560015916		
F _z : 100 N	9560005226V03	F _z : 200 N	9560005326V01	F _z : 300 N	9560005726				
F _z : 200 N	9560005226V01	F _z : 300 N	9560005326	F _z : 500 N	9560005726V01				
F _z : 270 N	9560005226V02			F _z : 700 N	9560005726V02				
F _z : 340 N	9560005226V05								
F _z : 400 N	9560005226								
F _z : 550 N	9560005226V04								
	9560018926				9560018726		9560019916		
F _z : 100 N	9560019626V02			F _z : 300 N	9560018426V01				
F _z : 200 N	9560019626V01			F _z : 400 N	9560018426				
F _z : 300 N	95600019626								
				l _y : 55 mm	9560017816				
	9560147541		9510363651		9510363651		9560010141	9560037241	

ORDER CODE

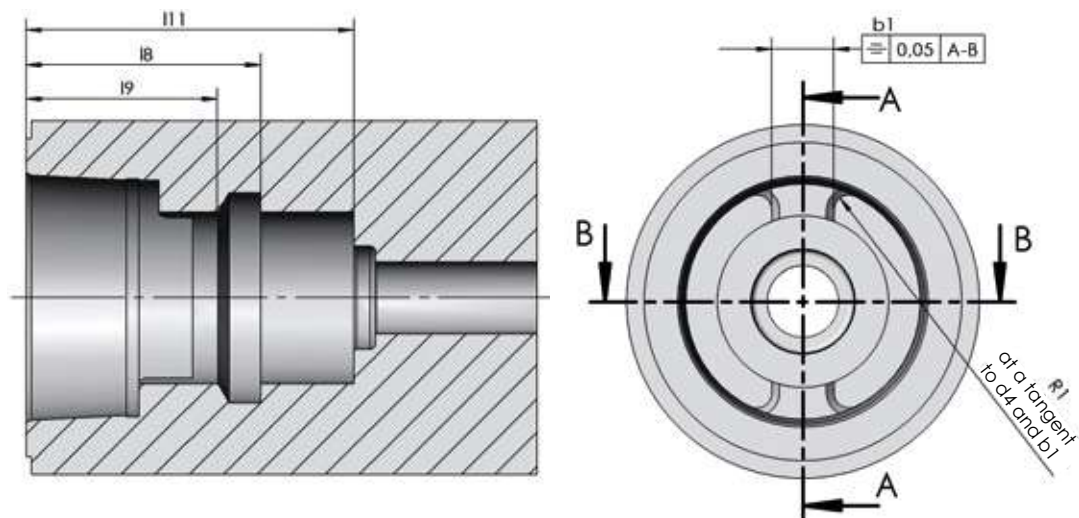
1	2	3	4	5	6	7	8	9	10	11	12
						Form					

HSK SPINDLE INSIDE CONTOUR

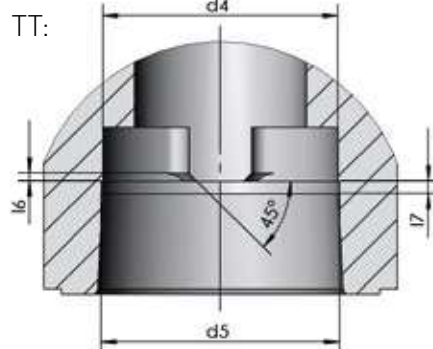
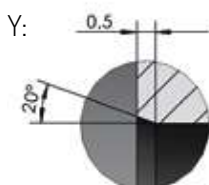
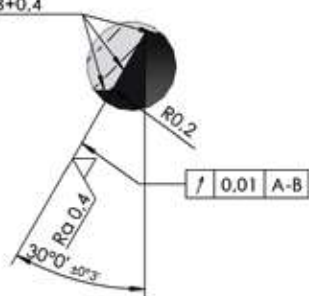
FORM **A** 



SHORT VERSION:



X: Case-hardened
700+100 HV100
Eht. 0.8+0.4



		TOLERANCE	NOMINAL SIZE															
DIN69063-1: 2008-03*	d ₁		A25	32	32 Short	40	40 Short	50	50 Short	63	63 Short	80	80 Short	100	100 Short	125	125 Short	160
	b ₁	±0.05	5.8	6.8		7.8		10.3		12.3		15.8		19.78		24.78		29.78
	d ₂		18.998	23.998		29.998		37.998		47.998		59.997		74.997		94.996		119.995
	d ₃	H ₁₀	14	17		21		26		34		42		53		67		85
	d ₄	+0.1	18.46	23.28		29.06		36.85		46.53		58.1		72.6		92.05		116.1
	d ₅	+0.2	18.8	23.8		29.6		37.5		47.2		58.8		73.4		93		118
	l ₁	+0.2	11.4	13.4		16.9		20.9		26.4		32.4		40.4		51.4		64.4
	l ₂		2.5	3.2		4		5		6.3		8		10		12.5		16
	l ₃	+0.2	9.4	11.4		14.4		17.9		22.4		28.4		35.4		44.4		57.4
	l ₄	+0.2	13.5	16.5		20.5		25.5		33		41		51		64		81
	l ₅		0.6	0.8		0.8		1		1		1.5		1.5		2		2
	l ₆	+0.1	0.6	1		1		1.5		1.5		2		2		2.5		2.5
	l ₇	±0.1	1.5	2		2		2		2.5		3		3		4		4
	r ₁	-0.05	1.25	1.5		2		2.5		3		4		5		6		8
	t**		0.0010	0.0015		0.0015		0.0020		0.0020		0.0025		0.0030		0.0035		0.0035
CLAMPING UNIT	d ₆	H6	14	17		21		26		34		42		53		67		85
	d ₇	+0.1	10.3	10.3		13.2		15.2		20.4		22.4		24.2		32		37.2
	d ₈	+0.1	6.2	6.6		8.6		10.6		14.6		16.6		18.4		25.4		32.4
	d ₉	+0.2	18	22.5		26.5		33		41.6		50		63		79		104
	l ₈	±0.1	25.5	43	38	58	35	61	45	69	46.5	72	59	93	73.5	112.5	88	148
	l ₉	js ₈ with d ₃	18.5	30	25	44	25.5	45	31.5	52	38	56	45	70	55	86	70	113
	l ₁₀	+0.2		3		3.6		3.6		4.2		4.2		4.2		4.7		4
	l ₁₁	-0.2	40	62.5	57.5	78	50	84	64	94	65	98	77	124	92	149	107	188

The dimensions in the clamping unit section are for speeds of up to 10,000 rpm. For higher RPMs, we recommend limiting the dimension d₆ as well as the concentricity. Please do not hesitate to contact us for more information.

* See current standards

** See ISO 1101 and ISO 3040

For accessories such as mounting tools, see the accessories section on page 159.

13	14	15	16	17	18	19	20	21	22	23	24
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			TOLERANCE	NOMINAL SIZE												
DIN69063-2: 2003-05*	CLAMPING UNIT [mm]	d ₁		40	40 Short	50	50 Short	63	63 Short	80	80 Short	100	100 Short	125	125 Short	160
		b ₁	±0.05	9.9		11.9		15.9		17.9		19.9		24.9		31.9
		b ₂		1		1		1		1		2		2		2
		d ₂	Depending on size	23.998		29.998		37.998		47.998		59.997		74.997		94.996
		d ₃	H ₁₀	17		21		26		34		42		53		67
		e ₁	+0.2 0	16.2		20.2		25.2		31.7		40.2		50.2		62.7
		f ₁	Max.	19.5		25.5		25.5		25.5		28.5		28.5		30.5
		l ₁	+0.3 0	16.5		20.5		25.5		33		41		51		67
		l ₂		3.2		4		5		6.3		8		10		12.5
		l ₅		0.8		0.8		1		1		1.5		1.5		2
		t		0.015				0.002				0.025		0.003		0.035
		d ₆	H ₆	17		21		26		34		42		53		67
		d ₇	+0.1	10.3		13.2		15.2		20.4		22.4		24.2		34
		d ₈	+0.1	6.6		8.6		10.6		14.6		16.6		18.4		25.4
		d ₉	+0.2	22.5		26.5		33		41.6		50		63		79
		l ₈	±0.1	43	38	58	35	61	45	69	46.5	72	59	93	73.5	112.5
		l ₉	js ₈ with d ₃	30	25	44	25.5	45	31.5	52	38	56	45	70	55	86
		l ₁₀	+0.2	3		3.6		3.6		4.2		4.2		4.2		4.7
		l ₁₁	-0.2	62.5	57.5	78	50	84	64	94	65	98	77	124	92	149

The dimensions in the clamping unit section are for speeds of up to 10,000 rpm. For higher RPMs, we recommend limiting the dimension d₈ as well as the concentricity. Please do not hesitate to contact us for more information.

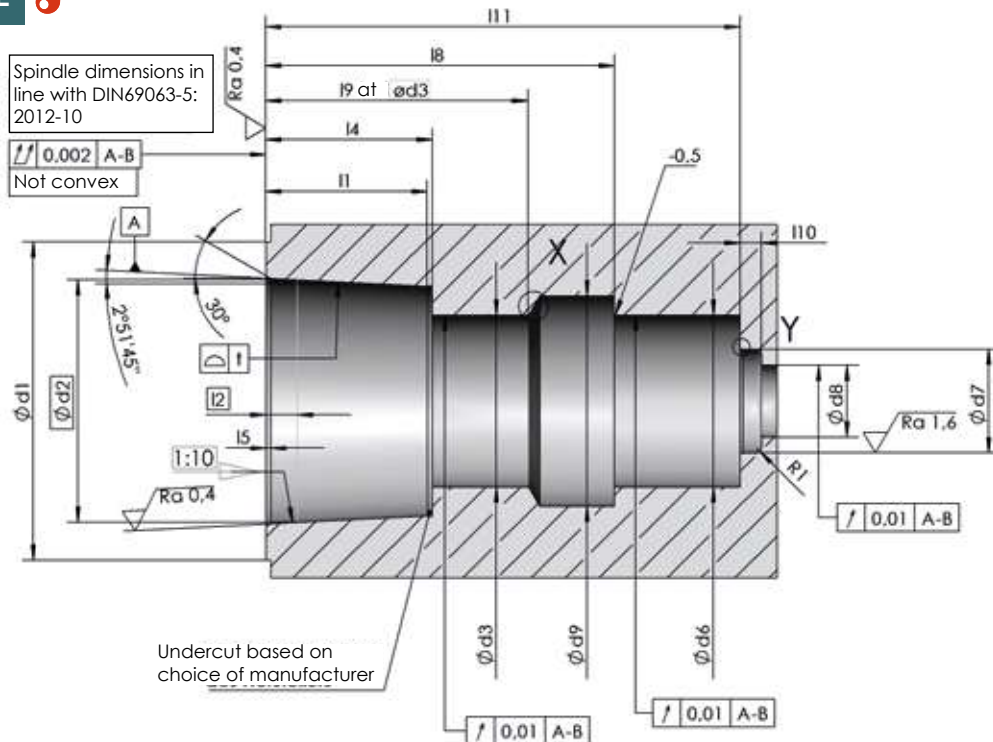
* See current standards

ORDER CODE

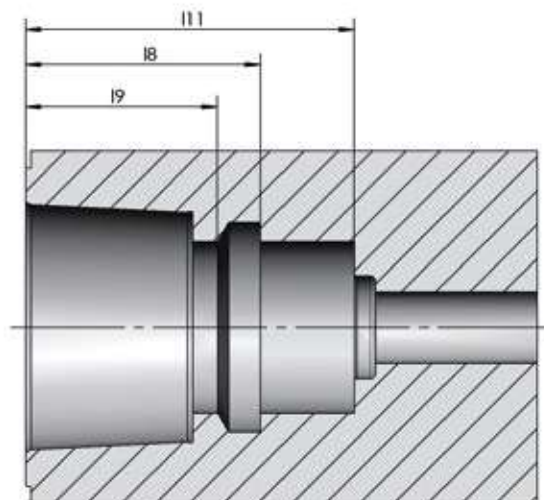
1	2	3	4	5	6	7	8	9	10	11	12
						Form					

HSK SPINDLE INSIDE CONTOUR

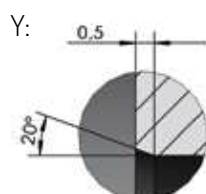
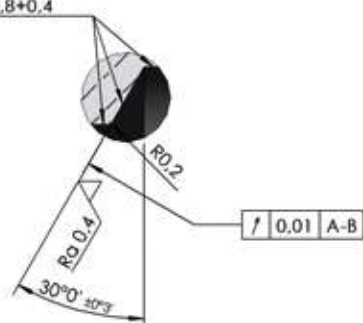
FORM **E** 



SHORT VERSION:



X: Case-hardened
700+100 HV100
Eht. 0.8+0.4



			TOLERANCE	NOMINAL SIZE									
DIN 69063-5 2012-10*		d ₁		20	25	32	40	40 Short	50	50 Short	63	63 Short	
		d ₂		15.198	18.998	23.998	29.997		37.996		47.995		
		l ₁	Depending on size		13	16	20		25		32		
		l ₂			2.5	3.2	4		5		6.3		
		l ₄			13.5	16.5	20.5		25.5		33		
		l ₅			0.5	0.8	0.85		1		1		
		t		0.0010						0.0015		0.0020	
	CLAMPING UNIT	[mm]	d ₃	H ₁₀		14	17	21		26		34	
			d ₆	H ₆		14	17	21		26		34	
			d ₇	-0.1		-	10.3	13.2		15.2		20.4	
			d ₈	+0.1		6.4	6.6	8.6		10.6		14.6	
			d ₉	+0.2		18	22.5	26.5		33		41.6	
			l ₈	±0.1		25.5	43	58	35	61	45	69	46.5
			l ₉	js ₈ with d ₃		18.5	30	44	25.5	45	31.5	52	38
			l ₁₀	+0.2		-	3	3.6		3.6		4.2	
			l ₁₁	-0.2		40	62.5	78	50	84	64	94	65

The dimensions in the clamping unit section are for speeds of up to 10,000 rpm. For higher RPMs, we recommend limiting the dimension d₈ as well as the concentricity. Please do not hesitate to contact us for more information.

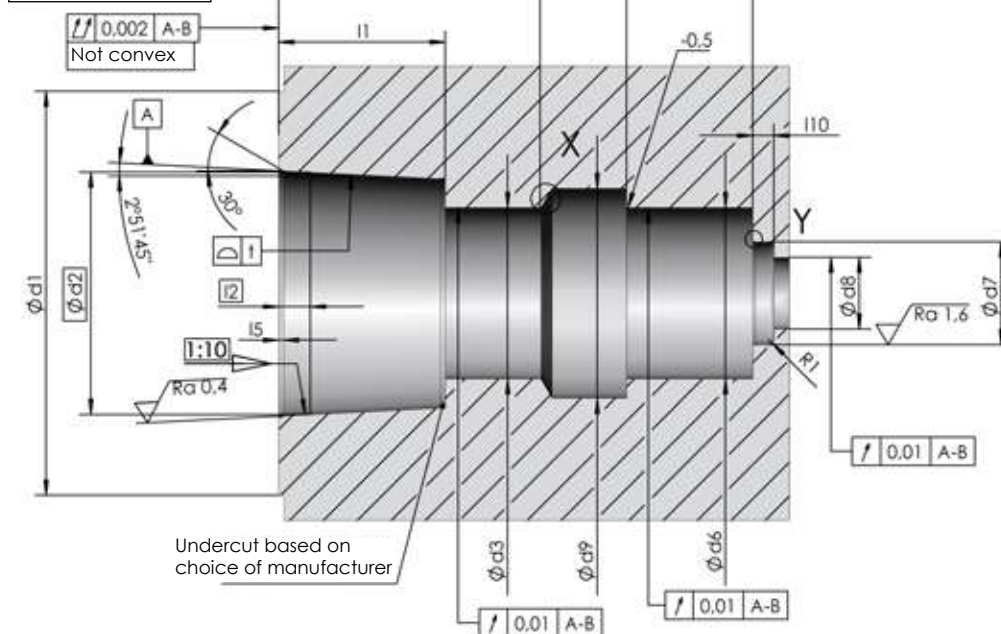
* See current standards

1	2	3	4	5	6	7	8	9	10	11	12
---	---	---	---	---	---	---	---	---	----	----	----

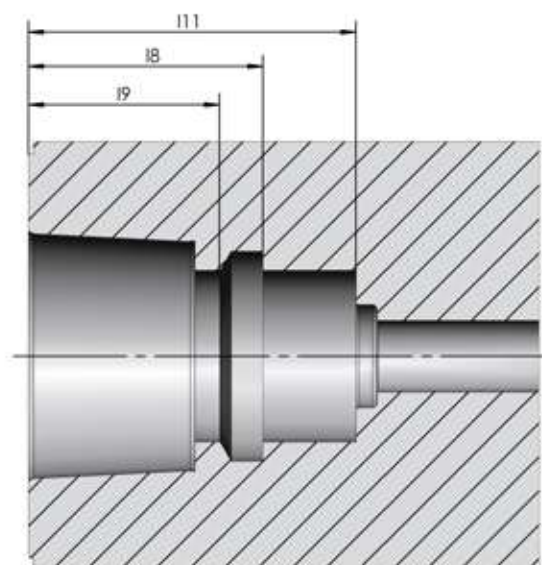
Form

FORM **F** 

Spindle dimensions in line with DIN69063-6: 2003-05

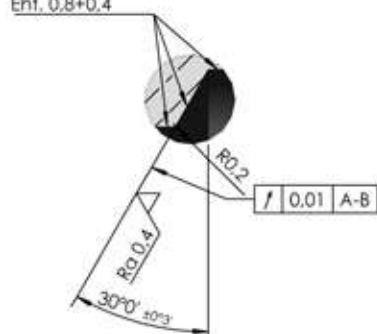


SHORT VERSION:

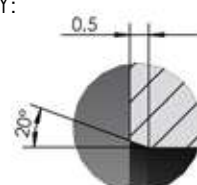


X:

Case-hardened
700+100 HV100
Eht. 0.8+0.4



Y:



		TOLERANCE		NOMINAL SIZE						
DIN69063-6: 2003-05*	CLAMPING UNIT	[mm]	d ₁		50	50 short	63	63 short	80	80 short
			d ₂	Depending on size	29.997		37.996		47.995	
			d ₃	H ₁₀	21		26		34	
			l ₁	+0.2	20.5		25.5		33	
			l ₂		4		5		6.3	
			l ₅	+0.2	0.8		1		1	
			t		0.0010		0.0015		0.0020	
			d ₉	+0.2	26.5		33		41.6	
			d ₆	H ₆	21		26		34	
			d ₇	+0.1	13.2		15.2		20.4	
			d ₈	+0.1	8.6		10.6		14.6	
			l ₁₁	-0.2	78	50	84	64	94	65
			l ₈	±0.1	58	35	61	45	69	46.5
			l ₉	js ₈ with d ₃	44	25.5	45	31.5	52	38
			l ₁₀	+0.2	3.6		3.6		4.2	

The dimensions in the clamping unit section are for speeds of up to 10,000 rpm. For higher RPMs, we recommend limiting the dimension d₈ as well as the concentricity. Please do not hesitate to contact us for more information.

* See current standards

ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
			Nominal size			Form					



PSC

POLYGONAL TAPER

The polygon taper is a powerful interface that has proven its effectiveness especially in multitask machines. Launched on the market in 1990 under the name Coromant CAPTO™, it was internationally standardised under ISO 26623 after the patent expired.

The main feature of the polygon taper is its unique tapered polygonal shape which, due to its self-centring properties, effectively prevents axial and radial play. The face contact accurately defines the position of the tool in the holder and produces high repeat accuracy.

The PSC interface features excellent rigidity due to the large taper diameter. Additionally, the balanced distribution of torque over the polygon surface generates maximum stability.

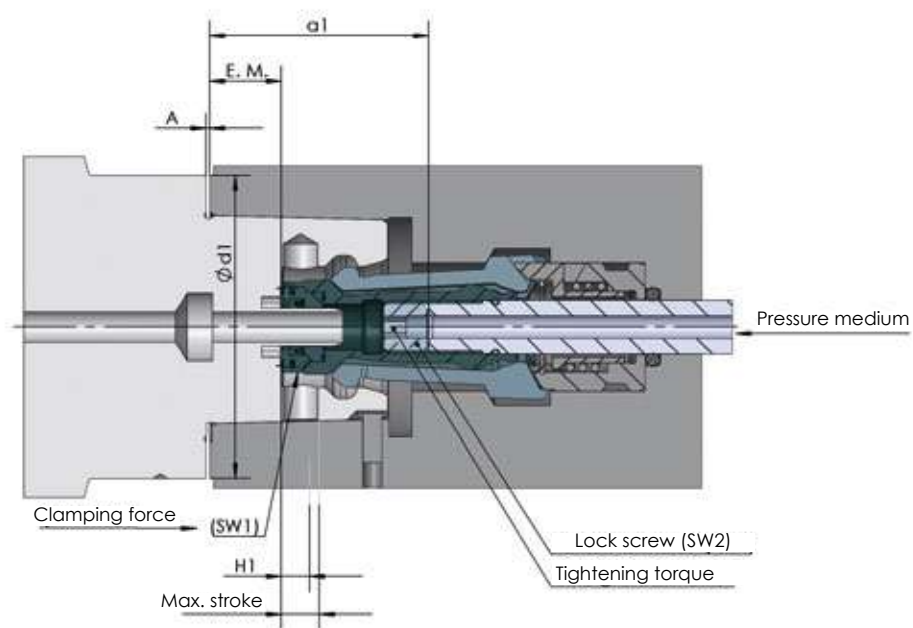
PSC SIZE	TOLERANCE		63- 🔑	80- 🔑	100 🔑
Clamping force (standard)		[kN]	30.0	40.0	60.0
Pressure (medium)		[bar]	80.0	80.0	80.0
Ejection A		[mm]	0.8	1.0	1.0
Reference gauge E.M.	±0.1	[mm]	10.2	19.0	19.0
Max. stroke		[mm]	10.0	10.0	11.5
Clamping stroke H _i		[mm]	7.4	7.4	8.3
a ₁		[mm]	41.5	58	64.5
SW ₁		[mm]	22	24	32
SW ₂		[mm]	5	5	8
Tightening torque		[Nm]	20	30	50

ORDER NUMBERS			
Clamping unit	9560021326	9560017926	9560018826
Lock screw	Included in delivery	9510066741	9560446041
Mounting tool	9560238492	9560235992	9560243392

FORM

P

B



ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
			Nominal size			Form					

KM4X™

KENNAMETAL



The high-performance KM4X™ interface was developed to meet the specific requirements of working with hard-to-machine materials such as titanium alloys. KM4X™ allows a machine tool to utilise its full power potential in challenging turning and milling projects.

Tools are clamped by four balls which are forced radially outwards during the clamping process. The contact surfaces of the tool holder deliver maximum stability and optimally distribute the clamping force.

The clamping units for the KM4X™ interface are the product of an exclusive development partnership between OTT-JAKOB and Kennametal.

KM4X™ SIZE		63- 🔑	100 🔑	125 🔑
Clamping force (standard)	[kN]	36–58	90–110	135–165
Pressure (medium)	[bar]	250.0	250.0	250.0
Ejection	[mm]	1.0	1.2	1.5
Reference gauge E.M.	[mm]	1.0 +0.2 / -0.1	1.2 ±0.15	1.5 ±0.2
Max. stroke	[mm]	9.5	13.0	16.3
H ₁	[mm]	5.8	8.5	11.5
a ₁ (standard)	[mm]	45.9	65.5	81
SW ₁	[mm]	19	27	38
Tightening torque of threaded ring	[Nm]	75	200	350
SW ₂	[mm]	5	8	8
Tightening torque of lock screw	[Nm]	20	50	50
RPM limit	[rpm]	30,000	21,400	16,700
Transferable torque*	[Nm]	352	1,179	2,480

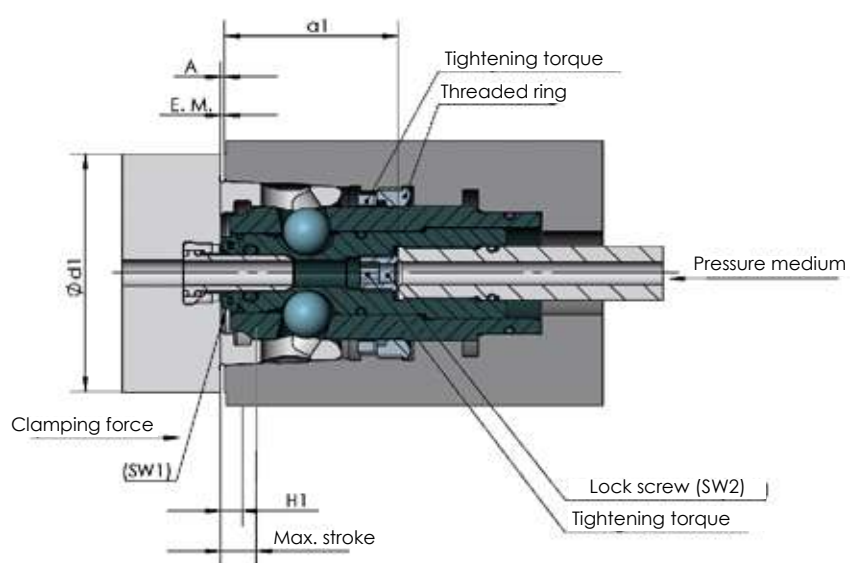
ORDER NUMBERS			
Clamping unit	9560019326	9560019226	9560021126
Lock screw	Included in delivery		
Mounting tool	9560506531	9560483731	9560021126

* Only frictional connection taken into consideration. The actual transferable torque is significantly higher due to the form fit on the balls.

FORM

K

M





PULLING HEADS

SK	page 50
HSK, PSC, KM4X™	page 58
Position monitoring options	page 60

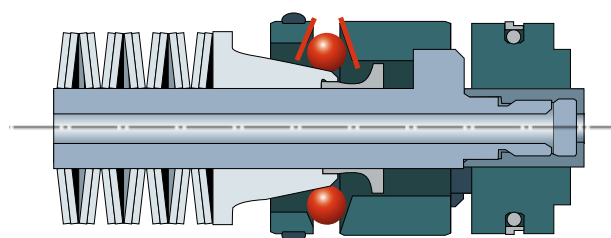
ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
Design form											

SK PULLING HEADS

OTT-JAKOB STEEP TAPER – THE ADVANTAGES

OTT-JAKOB steep taper clamping systems feature a multiple intensification of the spring force. The protected, maintenance-free position of the force intensifying mechanism at the back of the spindle shaft ensures reliable functionality over the entire life span of the clamping system.



Power drawbars have the following advantages over spring drawbars:

- ▲ High pull-in forces and compact dimensions
- ▲ Lower release forces, which results in less spindle bearing load and the opportunity to use smaller unclamping units
- ▲ Easier to balance due to smaller masses
- ▲ Self-locking effectively prevents frictional corrosion and vibration damage to the spindle taper

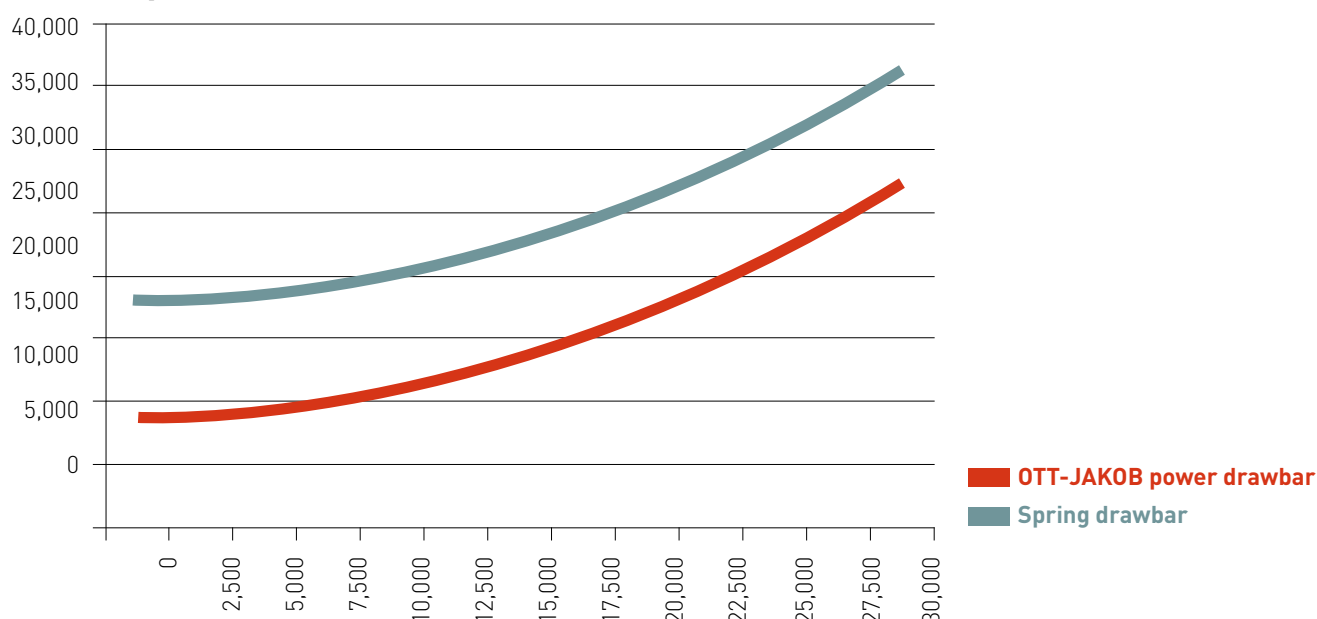
Unclamp force as a function of RPM

Parameters

Interface: SK40 DIN

Bearing Ø at front: 65 mm

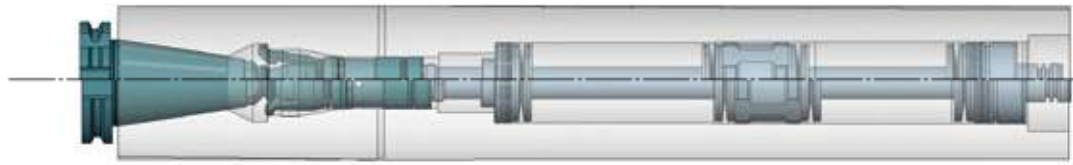
Unclamp force



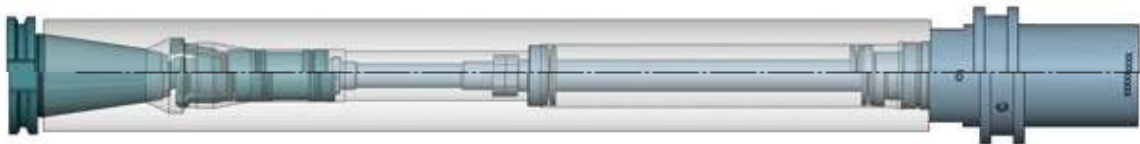
DESIGN FORMS



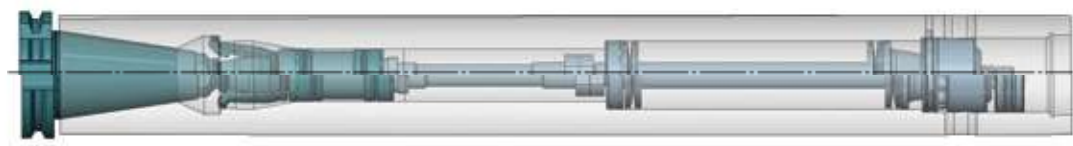
With our spring drawbar, there is no intensification of the spring force; i.e. there is a direct connection between the spring and the clamped tool. If the tool is subjected to higher pull-out forces during the machining process, the quality can be impaired. Compared to OTT-JAKOB power drawbar systems (ES/IS), stronger springs are required to reach the nominal force. The resulting disadvantages are higher space requirements and, depending on the system, a higher unclamping force. On the positive side, there is the lower unclamping stroke compared to power drawbar systems.



With the inside spindle drawbar (ES), the gears are located in a cylinder behind the spindle shaft. Due to the position of the gears, a simple and uncomplicated position monitoring of the clamping system is possible (different types of signal ring are available). The ES design is suitable for applications involving spindle speeds of up to 10,000 rpm.



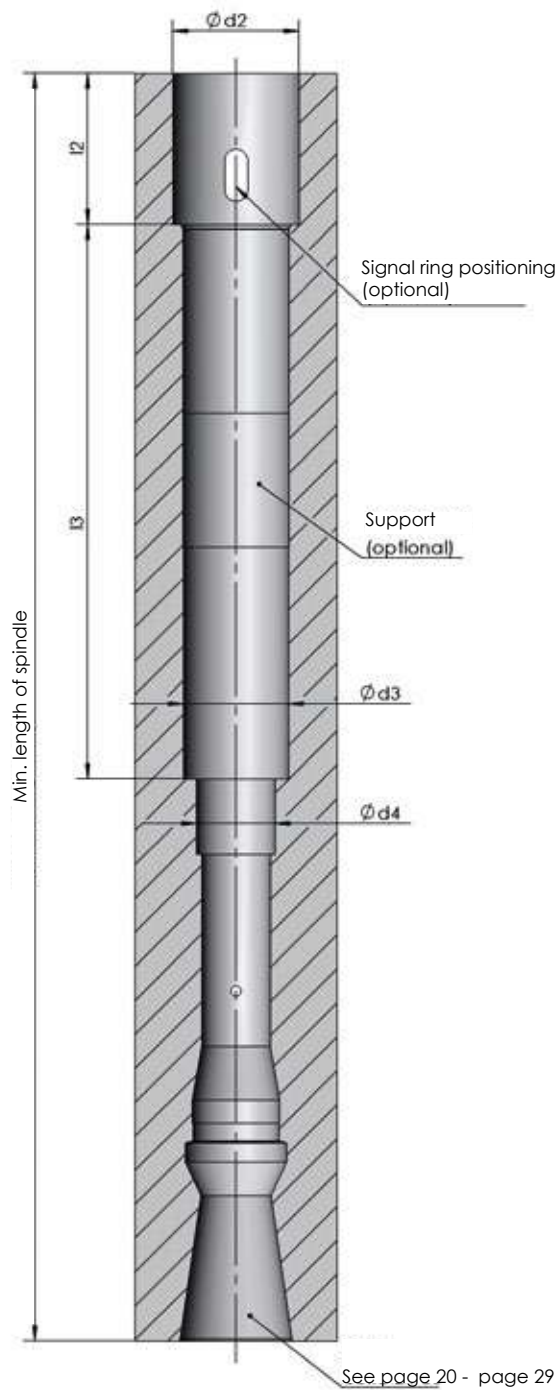
In order to ensure that our steep taper clamping systems can also be used at higher RPMs, the structure of the spindle integrated spring power drawbar was kept as compact as possible by the force intensifying mechanism built into the spindle shaft. This allows for rotation speeds far higher than 10,000 rpm.



ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
Design form											

INSIDE CONTOUR OF FS PULLING HEADS



DESIGN FORM

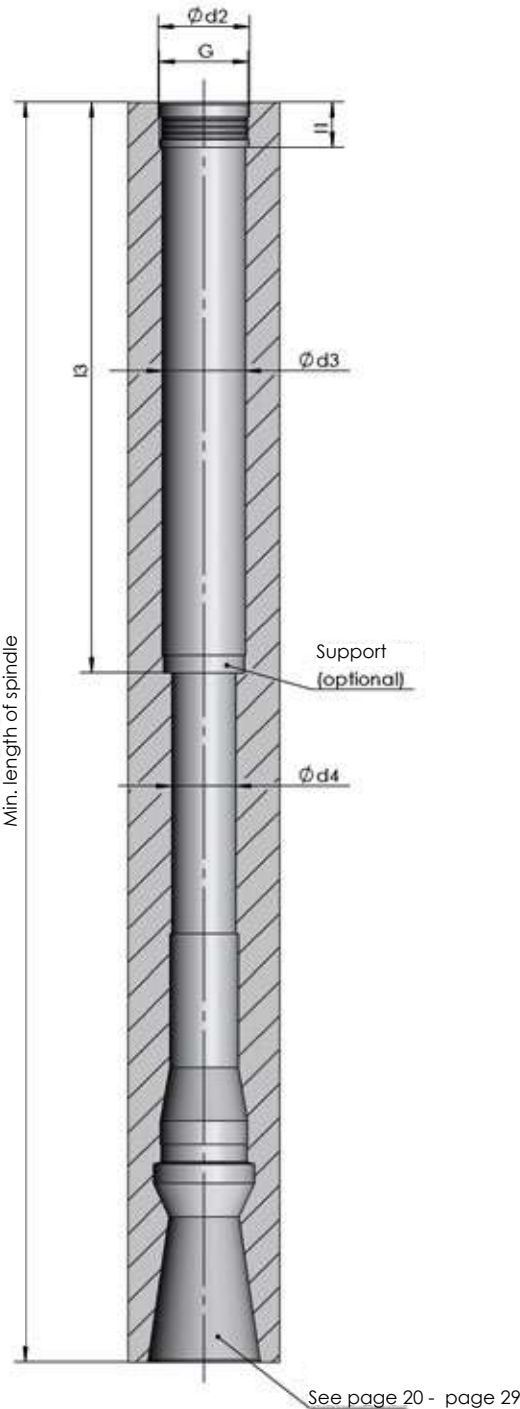


	Nominal size	30	40	50	60
	$\varnothing d_2$	36	38	38	38
	$\varnothing d_3$	32.2	32	32	35
	$\varnothing d_4$	24	20	20	27
	l_2	59.6	65.5	65.5	65.5
	l_3	86.5	100	100	158
	Min. length of spindle	300			

The dimensions above are standard values. They can be adjusted for very long or short clamping systems or changed to meet your requirements if you have extremely narrow spindle shafts.

1	2	3	4	5	6	7	8	9	10	11	12
Design form											

INSIDE CONTOUR OF ES PULLING HEADS



DESIGN FORM



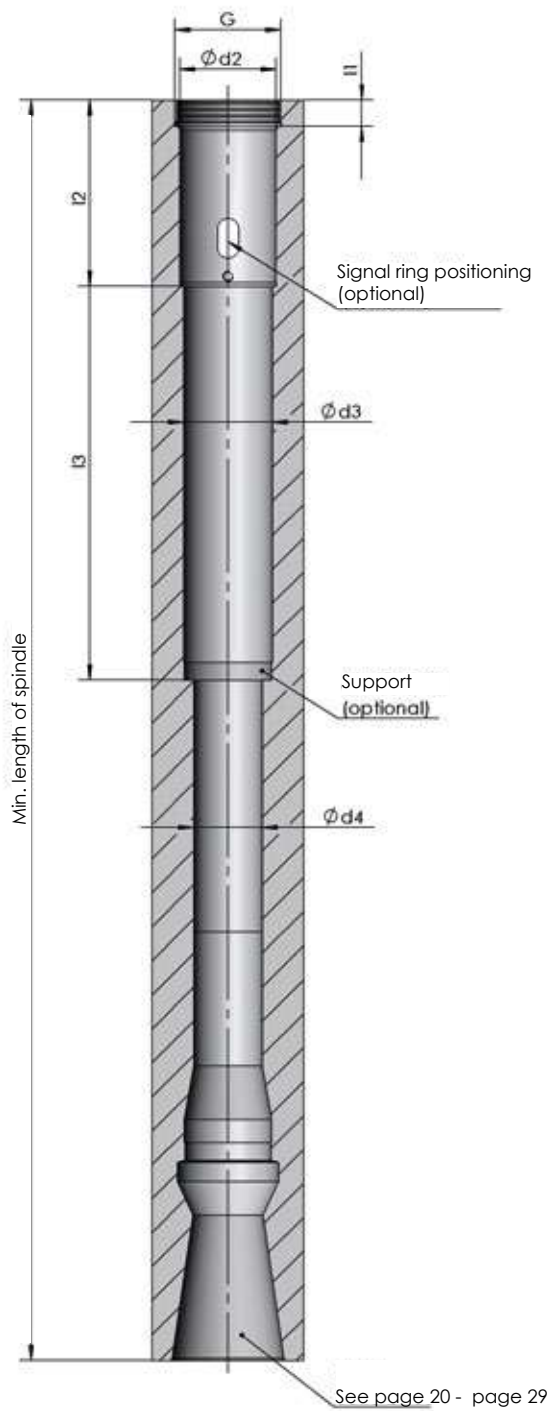
PULLING HEAD	Nominal size	30	40	50	60
	G	M35 × 1.5	M35 × 1.5	M45 × 1.5	M75 × 1.5
	ød ₂	36	36	48	76
	ød ₃	30	33	41.5	73
	ød ₄	19	27	30	56
	l ₁	17	18	20	26
	l ₃	118.2	226.5	257	396
	Min. length of spindle	260	415	500	780

The dimensions above are standard values. They can be adjusted for very long or short clamping systems or changed to meet your requirements if you have extremely narrow spindle shafts.

ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
Design form											

INSIDE CONTOUR OF IS PULLING HEADS



DESIGN FORM



PULLING HEAD	Nominal size	30	40	50	60
	G	M42 × 1.5	M42 × 1.5	M52 × 1.5	M85 × 1.5
	ød ₂	38	38	48	80
	ød ₃	35	35	41.5	73
	ød ₄	19	27	30	52
	l ₁	10.5	10.5	14	17
	l ₂	74	74	100.5	135
	l ₃	145	156.1	271	On request
	Min. length of spindle	360	420	610	On request

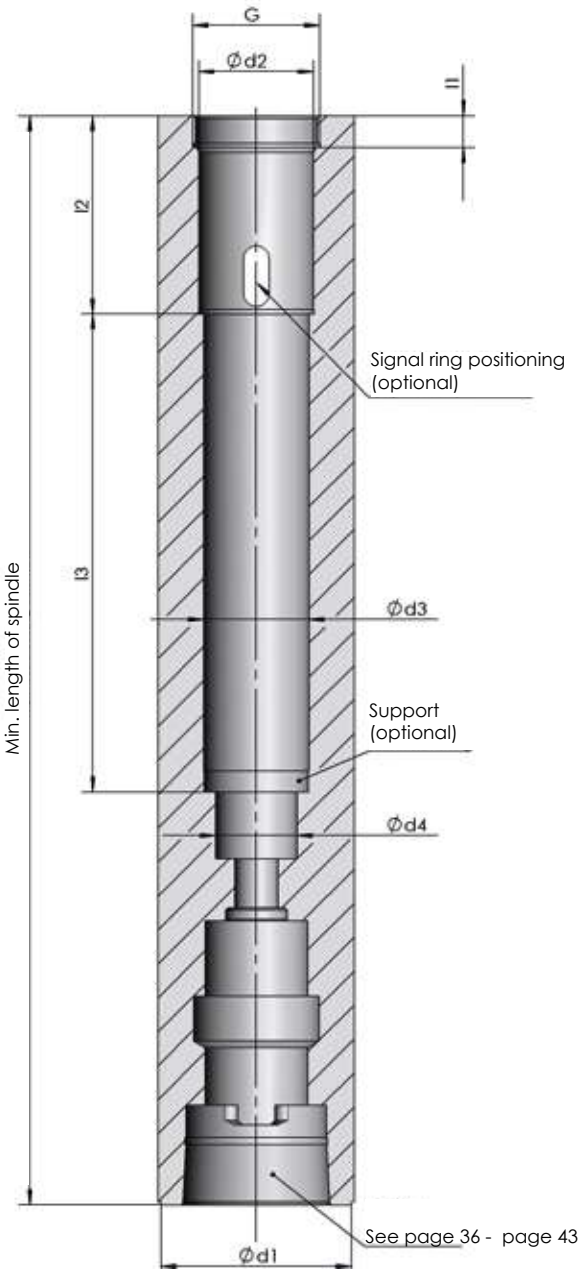
The dimensions above are standard values. They can be adjusted for very long or short clamping systems or changed to meet your requirements if you have extremely narrow spindle shafts.

1	2	3	4	5	6	7	8	9	10	11	12
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Design form

HSK, PSC, KM4X™ PULLING HEADS

INSIDE CONTOUR OF HSK PULLING HEAD



PSC holder



KM4X™ holder



The adjacent table does not apply to PSC and KM4X™; values available on request.

DESIGN FORM



	d ₁ Nominal size	20	25	32	40	50	63	80	100	125	160
	Form	E20	A25 E25	A32 B40 E32	A40 B50 E40 F50	A50 B63 E50 F63	A63 B80 E63 F80	A80 B100	A100 B125	A125 B160	A160
PULLING HEAD	G	on request			M42 × 1.5	M42 × 1.5	M42 × 1.5	M52 × 1.5	M52 × 1.5	M85 × 1.5	on request
	ød ₂				38	38	38	48	48	80	
	ød ₃				32	32	35	41.5	44	72	
	ød ₄				20	20	25	27	36	58.5	
	l ₁				10.5	10.5	10.5	14	14	17	
	l ₂				65.5	65.5	65.5	86.5	86.5	118	
	l ₃				100	121	158	167	298	331	
	Min. length of spindle				350			450	530	700	

The dimensions above are standard values. They can be adjusted for very long or short clamping systems or changed to meet your requirements if you have extremely narrow spindle shafts.

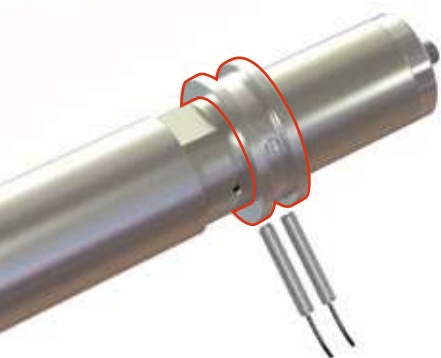
1	2	3	4	5	6	7	8	9	10	11	12
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OPTIONS FOR POSITION MONITORING



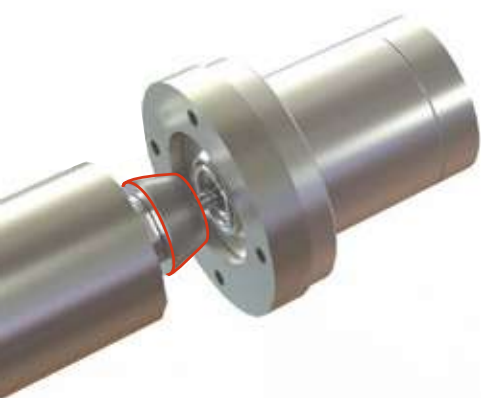
THREAD IN PULLING HEAD/DRAWBAR SHAFT

Position monitoring through a thread in the pulling head is a cost-effective, straightforward solution for detecting the position of the tool. The pulling head features threaded holes that you can use to attach a signal ring. The clamping position is determined by sensors or proximity switches.



SIGNAL RING

In principle, position monitoring H is identical to variation G, except in this case the signal ring is supplied with the OTT-JAKOB clamping system. The signal rings available for digital or analogue sensors are attached directly to the clamping system (e.g. steep taper clamping systems in ES design) or connected to the drawbar connection (e.g. dual-passage SR rotary unions).

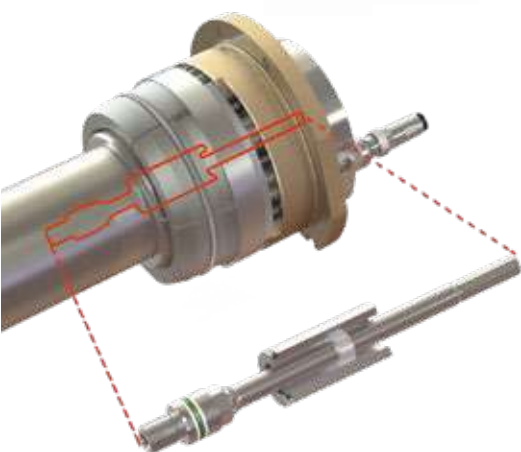


K



INQUIRY VIA PISTON

With inquiry via piston, the signal ring is on the end of the spindle in front of the unclamping unit. The unclamping unit has to be fix-mounted or fitted with extended grippers in order that the sensor can access the signal ring. Depending on the signal ring, both digital and analogue sensors can be used.



M



MSU SENSOR SYSTEM

By means of electronic distance measurement, the exact position of the drawbar shaft – and thus the current tool position – is determined. The system consists of an inductive sensor in the unclamping unit, a target ring on the drawbar shaft and the sensor electronics. The signal sent to the machine controller can be both analogue and digital. Additional monitoring options for the MSU sensor system can be found on page 130.



UNCLAMPING UNITS

Overview	page 64
Hydraulic unclamping units	page 66
Pneumatic unclamping units	page 78

ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
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OVERVIEW OF UNCLAMPING UNITS

TYPE	CODE ⁴	CATALOGUE PAGE	HOLDER Ø [MM]	UNCLAMPING				CLAMPING					
				MAX. STROKE [MM]	MAX. UNCLAMPING PRESSURE [BAR]	PISTON AREA [CM ²]	CONNECTING THREAD	HYDRAULIC	PNEUMATIC	SPRING RESET	MIN. CLAMPING PRESSURE [BAR]	PISTON AREA [CM ²]	CONNECTING THREAD
LE60	02	page 66	60	17.9	160	5.8	M10x1	●	–	–	5	5.8	M10x1
LE60-A	59	page 66	60	12.5	100	10.0	M10x1	●	–	○	5	8.5	M10x1
LE83	61	page 67	83	19.0	160	22.4	G1/8	●	–	–	5	22.4	G1/8
LE92	01	page 68	92	20.0	160	16.5	M10x1	●	–	–	5	16.5	M10x1
LE95	58	page 69	95	20.7	160	19.36	M10x1	●	○	○	5	17.0	M10x1
LE95F	04	page 69	70	23.0	160	19.36	M10x1	●	○	○	5	17.0	M10x1
LE102	03	page 70	102	21.0	160	19.36	M10x1	●	○	–	5	17.0	M10x1
LE115F	10	page 71	70	18.0	120	50.6	G1/4	●	○	○	5	42.9	G1/4
LE120	69	page 72	120	20.0	160	32.3	M10x1	●	○	–	5	29.9	M10x1
LE123	54	page 73	123	20.6	120	50.6	G3/8	●	○	–	5	48.2	G3/8
LE124F	11	page 74	85	22.8	120	32.1	G1/4	●	–	○	5	32.1	G1/4
LE140F	77	page 75	90	27.0	120	72.4	G1/4	●	○	–	5	64.7	G1/4
LE156	55	page 76	156	29.9	120	88.9	G3/8	●	○	–	5	82.5	G3/8
LE74F1	75	page 78	74	10.0	8	20.0	G1/4	–	●	–	5	20.0	G1/4
LE74F2	74	page 78	74	10.0	8	40.0	G1/4	–	●	–	5	20.0	G1/4
LE99_2	19	page 79	98	14.5	8	84.4	G3/8	–	●	–	5	42.2	G1/4
LE99_3	20	page 79	98	14.5	8	126.6	G3/8	–	●	–	5	42.2	G1/4
LE99F2	19	page 80	80	10.0	8	84.4	G3/8	–	●	–	5	42.2	G1/4
LE99F3	20	page 80	80	10.0	8	126.6	G3/8	–	●	–	5	42.2	G1/4
LE119_1	21	page 82	116	17.5	8	67.0	G3/8	–	●	–	5	67.0	G1/4
LE119_2	22	page 82	116	17.5	8	134.0	G3/8	–	●	–	5	67.0	G1/4
LE119_3	23	page 82	116	17.5	8	201.0	G3/8	–	●	–	5	67.0	G1/4
LE119F2	22	page 84	95	21.5	8	134.0	G3/8	–	●	–	5	67.0	G1/4
LE150_1	31	page 86	150	17.5	8	119.0	G3/8	–	●	○	5	119.0	G1/4
LE150_2	32	page 86	150	17.5	8	238.0	G3/8	–	●	○	5	119.0	G1/4
LE150_3	33	page 86	150	17.5	8	357.0	G3/8	–	●	○	5	119.0	G1/4
LE150F1	37	page 88	125	21.5	8	119.0	G3/8	–	●	○	5	119.0	G1/4
LE150F2	38	page 88	125	21.5	8	238.0	G3/8	–	●	○	5	119.0	G1/4
LE150F3	39	page 88	125	21.5	8	357.0	G3/8	–	●	○	5	119.0	G1/4
LE165F1	60	page 90	140	21.0	8	143.0	G3/8	–	●	–	5	143.0	G1/4
LE165F2	60	page 90	140	21.0	8	286.0	G3/8	–	●	–	5	143.0	G1/4

¹ Axial cleaning air connection

² Only GD44

³ Axial cleaning air connection for variations with no GD holder

⁴ For basic version. Equipment variants may have different abbreviations.

⁵ GDP rotary union can be used by means of reduction

● Standard equipment
○ on request

13	14	15	16	17	18	19	20	21	22	23	24
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	MEDIA					GENERAL DATA							
	GD ⁵ HOLDER	GDP HOLDER	CLEANING AIR CONNECTION	CONNECTING THREAD	LEAKAGE DRAIN	MONITORING BETWEEN GRIPPERS	ELECTRONIC POSITION MONITORING	PISTON POSITION MONITORING	LEAKAGE VOLUME MONITORING	SPINDLE BEARING RELIEF	MAX. BEARING LOAD [N] (CAN BE CHANGED)	INDEPENDENT OF RPM	EASY TO INSTALL
	-	-	● ¹	M5	-	-	-	-	-	●	300	●	●
	-	●	●	G1/8	-	-	○	○	○	●	400	●	●
	-	-	● ¹	G1/8	-	-	-	-	-	-	-	●	●
	-	-	● ¹	G1/8	-	○	-	-	-	●	300	●	●
	●	-	○	G1/8	-	○	○	○	○	●	2,100	●	●
	●	-	○	G1/8	-	-	○	○	○	-	-	●	●
	●	-	●	G1/8	-	-	○	○	○	●	2,100	●	●
	●	-	●	G1/4	-	-	○	○	○	-	-	●	●
	●	-	●	G1/8	-	-	●	○	○	○	2,100	●	●
	●	-	●	G1/8	-	○	○	○	○	●	1,600	●	●
	● ²	-	●	G1/8	●	-	○	○	○	-	-	●	●
	●	-	●	G1/4	-	-	-	-	-	-	-	●	●
	●	-	●	G1/8	-	-	●	○	○	●	1,700	●	●
	-	●	●	G1/8	-	-	○	-	-	-	-	●	●
	-	●	●	G1/8	-	-	○	-	-	-	-	●	●
	-	●	●	G1/8	-	-	○	○	○	●	350	●	●
	-	●	●	G1/8	-	-	○	○	○	●	350	●	●
	-	●	●	G1/8	-	-	○	○	○	-	-	●	●
	-	●	●	G1/8	-	-	○	○	○	-	-	●	●
	○	-	● ³	G1/8	-	-	○	○	○	●	580	●	●
	○	-	● ³	G1/8	-	-	○	○	○	●	580	●	●
	○	-	● ³	G1/8	-	-	○	○	○	●	580	●	●
	●	-	●	G1/8	-	-	○	-	-	-	-	●	●
	○	-	● ³	G1/8	-	-	○	○	○	●	580	●	●
	○	-	● ³	G1/8	-	-	○	○	○	●	580	●	●
	○	-	● ³	G1/8	-	-	○	○	○	●	580	●	●
	●	-	●	G1/8	-	-	○	○	○	-	-	●	●
	●	-	●	G1/8	-	-	○	○	○	-	-	●	●
	○	-	● ³	G1/8	-	-	○	○	○	-	-	●	●
	●	-	●	G1/8	-	-	○	○	○	-	-	●	●
	●	-	●	G1/8	-	-	○	○	○	-	-	●	●

HYDRAULIC

PNEUMATIC

UNCLAMPING UNITS

1	2	3	4	5	6	7	8	9	10	11	12
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LE60 & LE60-A – hydraulic

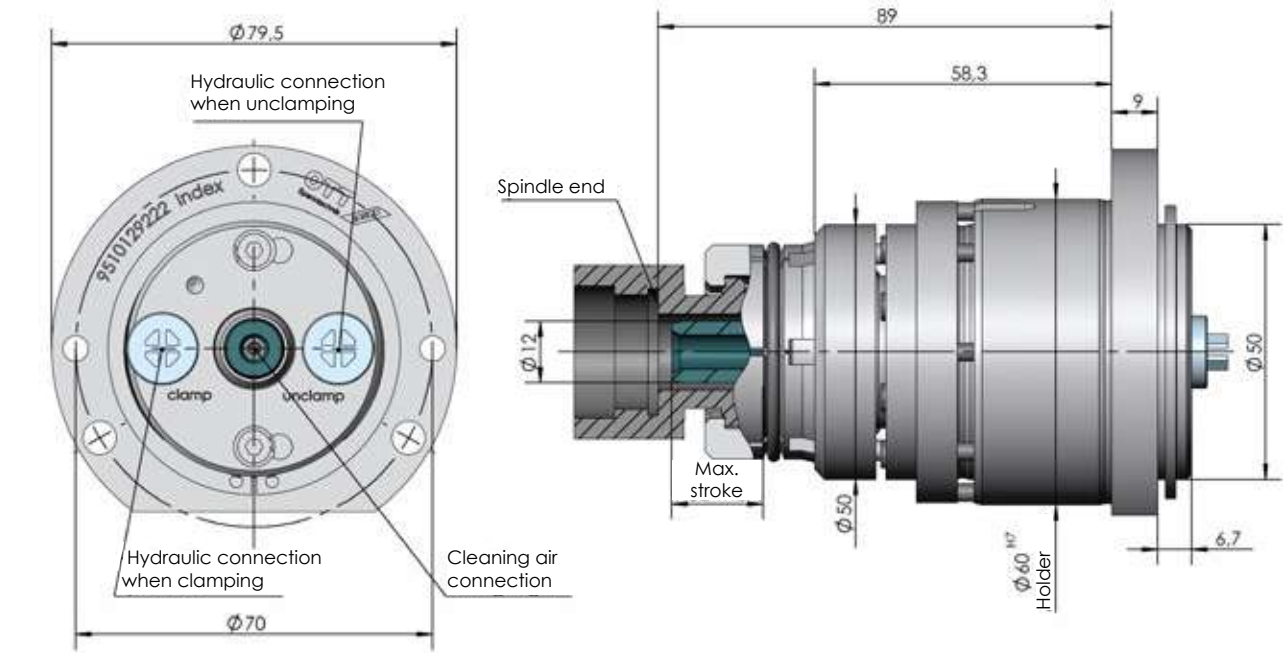
LE 60 FEATURES
• Low bearing load • Axial cleaning air connection

LE60-A FEATURES
• Low bearing load • Suitable for holding the 1K-GDP rotary union • Cleaning air connection • Optionally available with spring reset • Optional: MSU sensor system

TECHNICAL DATA	LE60	LE60A
Piston area (unclamping)	5.8 cm²	10 cm²
Piston area (clamping)	5.8 cm²	8.5 cm²
Hydraulic pressure max.	160 bar	100 bar
Min. air/hydraulic pressure	5 bar	5 bar
Max. stroke	18.5 mm	12.5 mm
Connection (clamping)	M10x1	M10x1
Connection (unclamping)	M10x1	M10x1
Cleaning air connection	M5	G1/8
Maximum effective bearing load	300 N	400 N
Mounting diameter	60 mm	60 mm

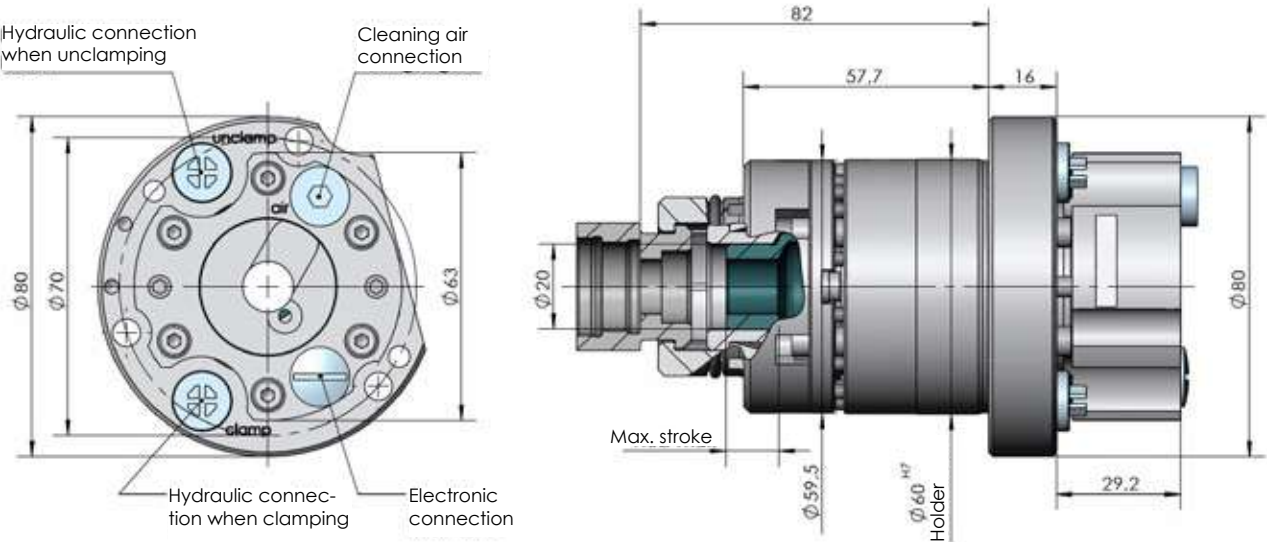
0 2 

LE 60



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LE 60-A



Unclamping unit

LE83 – hydraulic

FEATURES

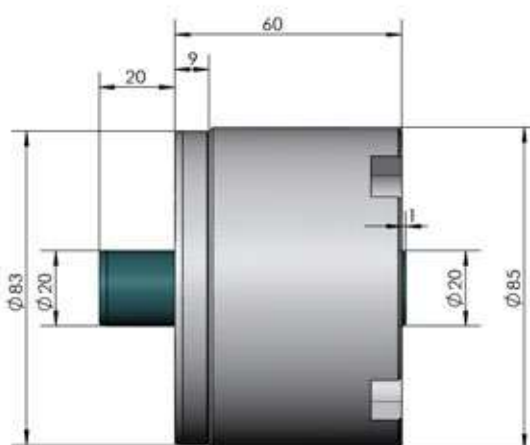
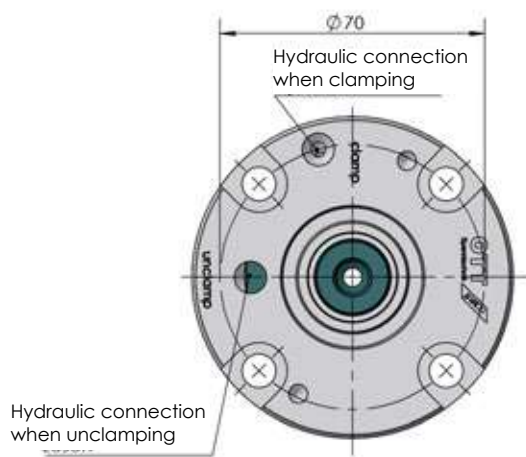
- Fix-mounted
- Short design
- Axial cleaning air connection

TECHNICAL DATA

Piston area (unclamping)	22.4 cm ²
Piston area (clamping)	22.4 cm ²
Hydraulic pressure max.	160 bar
Min. air/hydraulic pressure	5 bar
Max. stroke	19 mm
Connection (clamping)	G1/8
Connection (unclamping)	G1/8
Cleaning air connection	G1/8
Maximum effective bearing load	-
Mounting diameter	83 mm

6

1



ORDER CODE

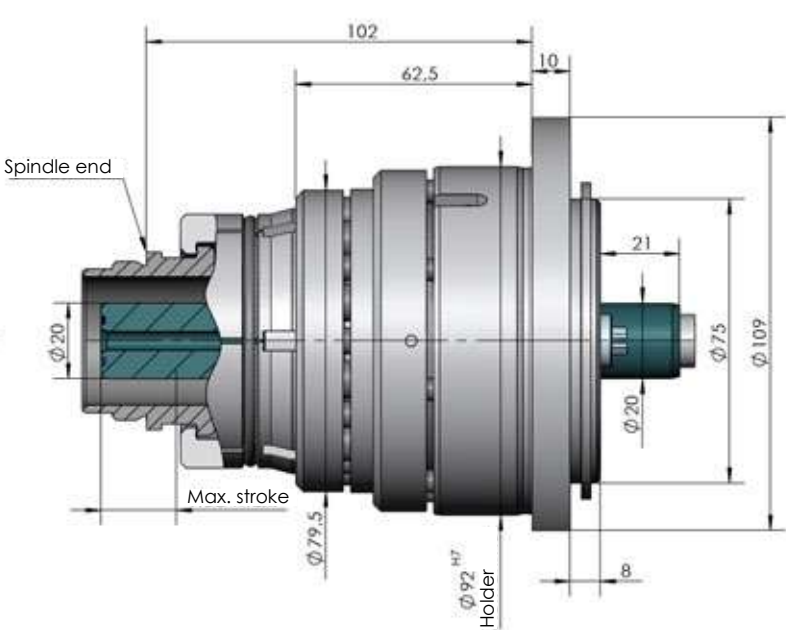
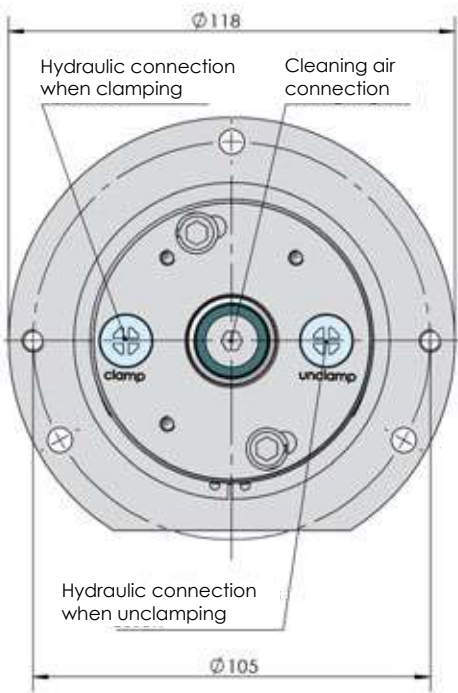
1	2	3	4	5	6	7	8	9	10	11	12
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LE92 – hydraulic

FEATURES
• Low bearing load • Axial cleaning air connection • Optional: position monitoring between the grippers

TECHNICAL DATA	
Piston area (unclamping)	16.5 cm²
Piston area (clamping)	16.5 cm²
Hydraulic pressure max.	160 bar
Min. air/hydraulic pressure	5 bar
Max. stroke	20 mm
Connection (clamping)	M10x1
Connection (unclamping)	M10x1
Cleaning air connection	G1/8
Maximum effective bearing load	300 N
Mounting diameter	92 mm

0 1 



LE95 & LE95F – hydraulic

LE95 FEATURES

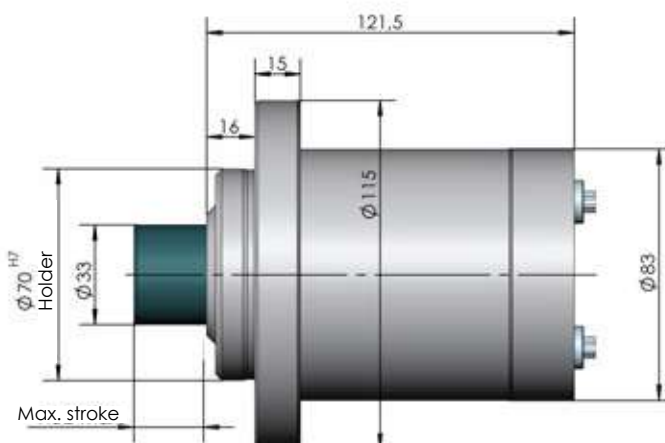
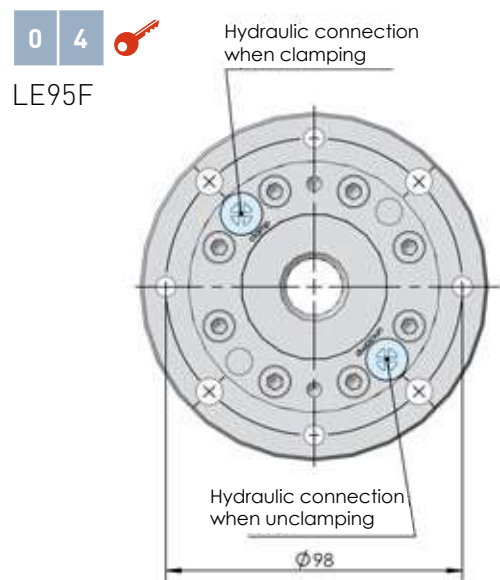
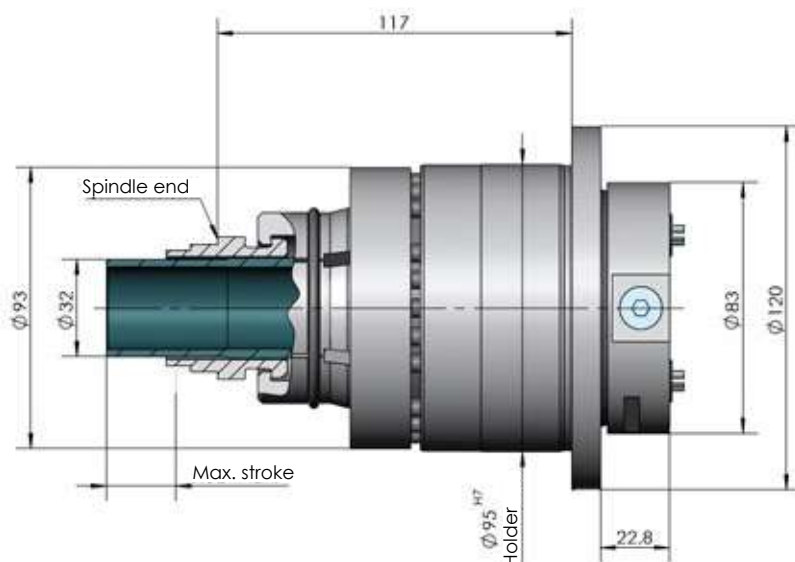
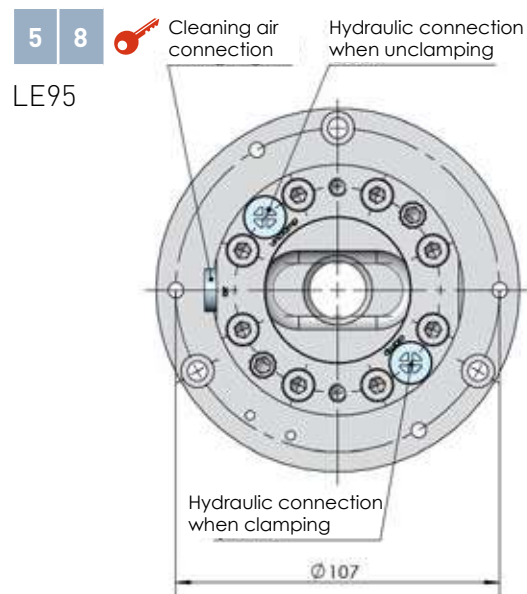
- Low bearing load
- Suitable for holding the 1K-GD rotary union
- Optional: position monitoring between the grippers
- Optional: cleaning air connection
- Optional: MSU sensor system

LE95F FEATURES

- Fix-mounted
- Suitable for holding the 1K-GD rotary union
- Optionally available with spring reset
- Optional: cleaning air connection
- Optional: MSU sensor system

TECHNICAL DATA

	LE95	LE95F
Piston area (unclamping)	19.36 cm ²	19.36 cm ²
Piston area (clamping)	17 cm ²	17 cm ²
Hydraulic pressure max.	160 bar	160 bar
Min. air/hydraulic pressure	5 bar	5 bar
Max. stroke	20.7 mm	23 mm
Connection (clamping)	M10x1	M10x1
Connection (unclamping)	M10x1	M10x1
Cleaning air connection	G1/8	G1/8
Maximum effective bearing load	2100 N	-
Mounting diameter	95 mm	95 mm



ORDER CODE

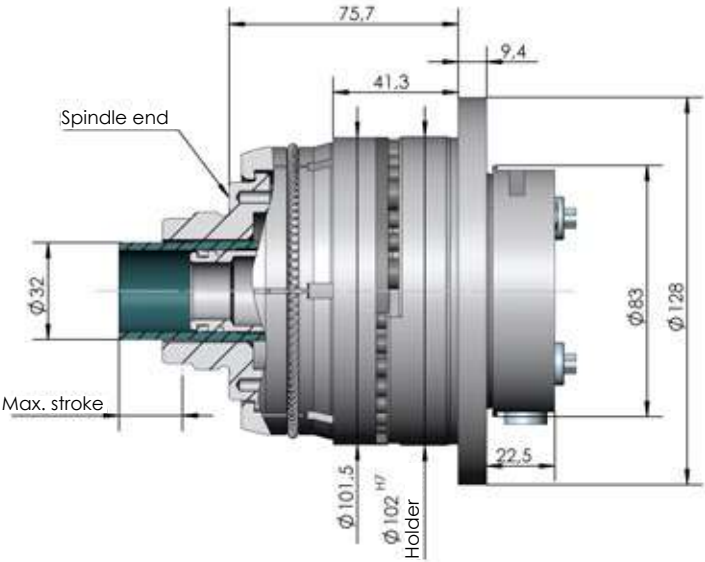
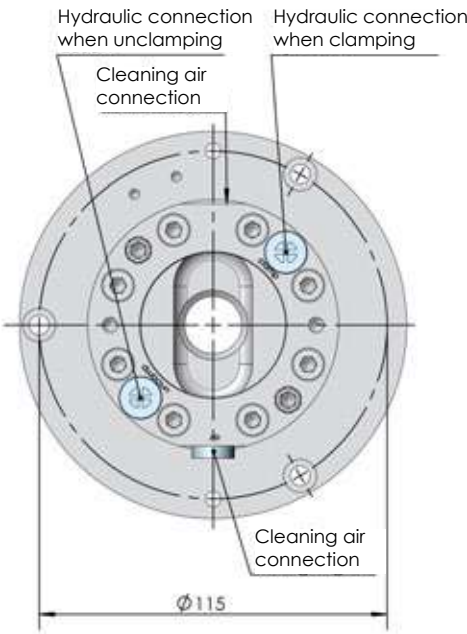
1	2	3	4	5	6	7	8	9	10	11	12
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LE102 – hydraulic

FEATURES
• Low bearing load • Suitable for holding the 1K-GD rotary union • Optional: cleaning air connection • Optional: MSU sensor system

TECHNICAL DATA	
Piston area (unclamping)	19.36 cm ²
Piston area (clamping)	17 cm ²
Hydraulic pressure max.	160 bar
Min. air/hydraulic pressure	5 bar
Max. stroke	21 mm
Connection (clamping)	M10x1
Connection (unclamping)	M10x1
Cleaning air connection	G1/8
Maximum effective bearing load	2100 N
Mounting diameter	102 mm

0 3 



Unclamping unit

LE115F – hydraulic

FEATURES

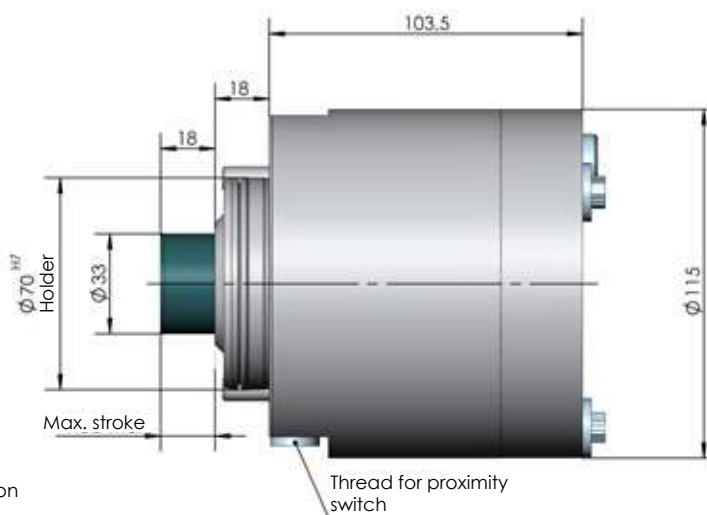
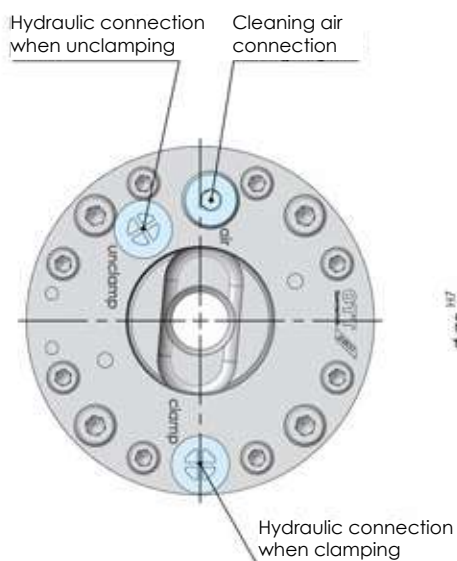
- Fix-mounted
- Suitable for holding the 1K-GD rotary union
- Optionally available with spring reset
- Optional: cleaning air connection
- Optional: MSU sensor system

TECHNICAL DATA

Piston area (unclamping)	50.6 cm ²
Piston area (clamping)	42.9 cm ²
Hydraulic pressure max.	120 bar
Min. air/hydraulic pressure	5 bar
Max. stroke	18 mm
Connection (clamping)	G1/4
Connection (unclamping)	G1/4
Cleaning air connection	G1/4
Maximum effective bearing load	-
Mounting diameter	70 mm

1

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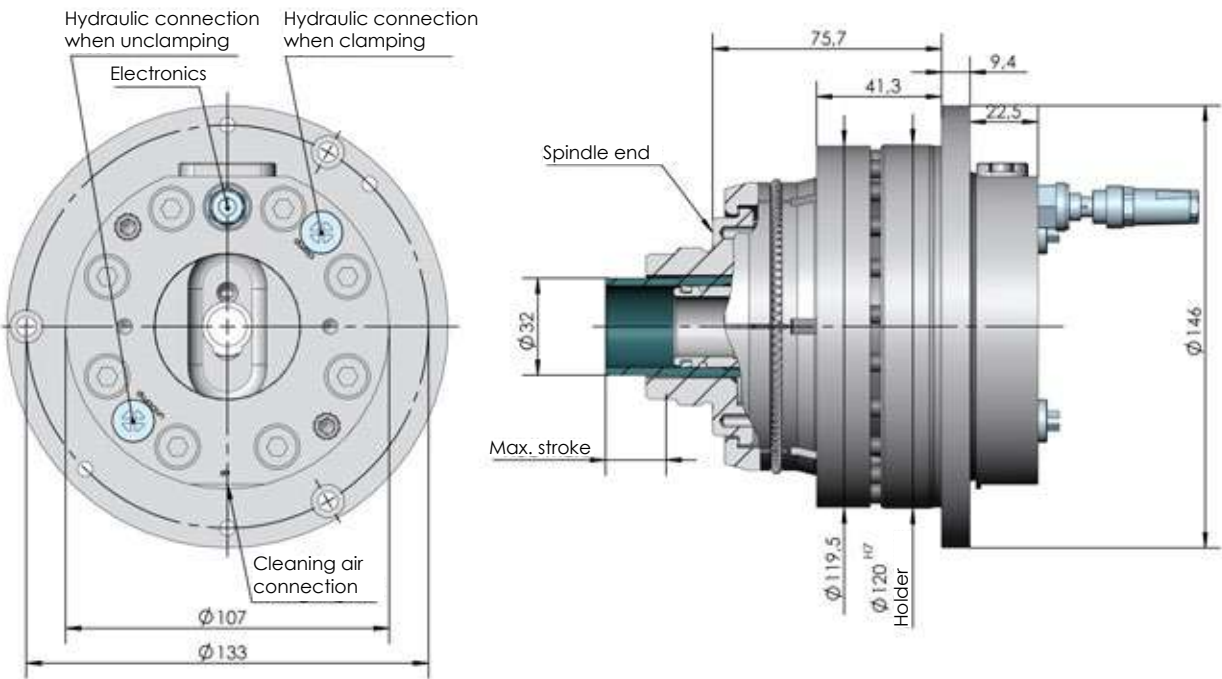
1	2	3	4	5	6	7	8	9	10	11	12
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LE120 – hydraulic

FEATURES
• Low bearing load • Short design • Built-in distance measurement system • Suitable for holding the 1K-GD rotary union • Cleaning air connection

TECHNICAL DATA	
Piston area (unclamping)	32.3 cm²
Piston area (clamping)	29.9 cm²
Hydraulic pressure max.	160 bar
Min. air/hydraulic pressure	5 bar
Max. stroke	20 mm
Connection (clamping)	M10x1
Connection (unclamping)	M10x1
Cleaning air connection	G1/8
Maximum effective bearing load	2100 N
Mounting diameter	120 mm

6 9 



Unclamping unit

LE123 – hydraulic

FEATURES

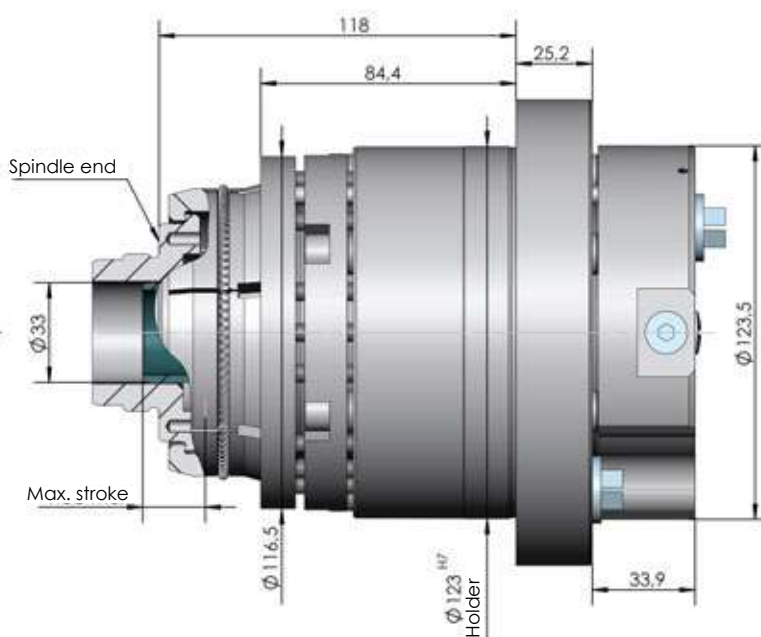
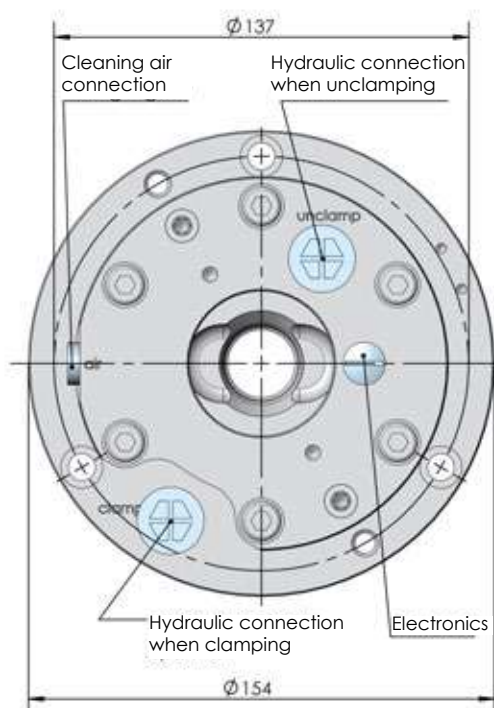
- Low bearing load
- Suitable for holding the 1K-GD rotary union
- Cleaning air connection
- Optional: position monitoring between the grippers
- Optional: MSU sensor system

TECHNICAL DATA

Piston area (unclamping)	50.6 cm ²
Piston area (clamping)	48.2 cm ²
Hydraulic pressure max.	120 bar
Min. air/hydraulic pressure	5 bar
Max. stroke	20.6 mm
Connection (clamping)	G3/8
Connection (unclamping)	G3/8
Cleaning air connection	G1/8
Maximum effective bearing load	1600 N
Mounting diameter	123 mm

5

4

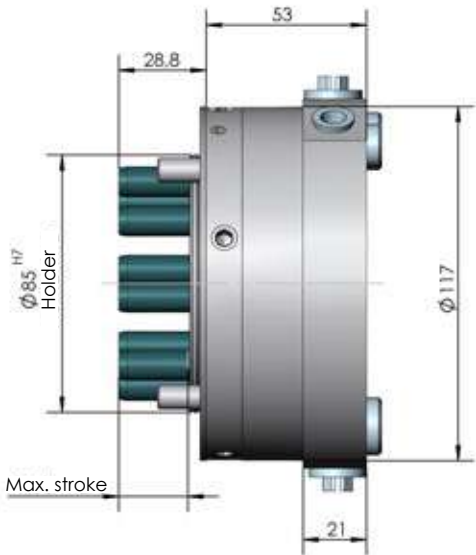
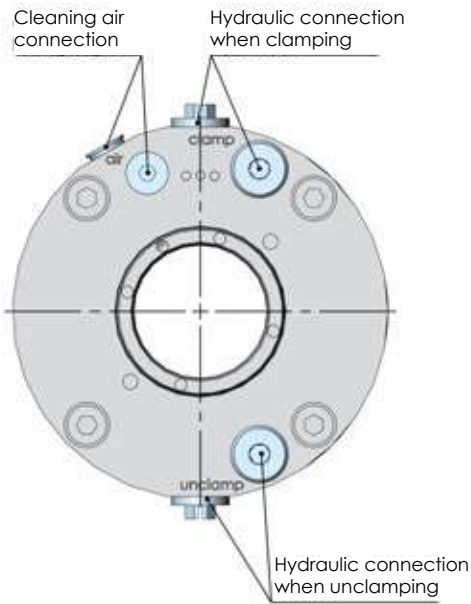


1	2	3	4	5	6	7	8	9	10	11	12
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LE124F – hydraulic

FEATURES
• Fix-mounted • Short design • Suitable for holding the 1K-GD 44 rotary union • Cleaning air connection • Optionally available with spring reset • Optional: MSU sensor system

TECHNICAL DATA	
Piston area (unclamping)	32.1 cm²
Piston area (clamping)	32.1 cm²
Hydraulic pressure max.	120 bar
Min. air/hydraulic pressure	5 bar
Max. stroke	22.8 mm
Connection (clamping)	G1/4
Connection (unclamping)	G1/4
Cleaning air connection	G1/8
Maximum effective bearing load	-
Mounting diameter	85 mm



Unclamping unit

LE140F – hydraulic

FEATURES

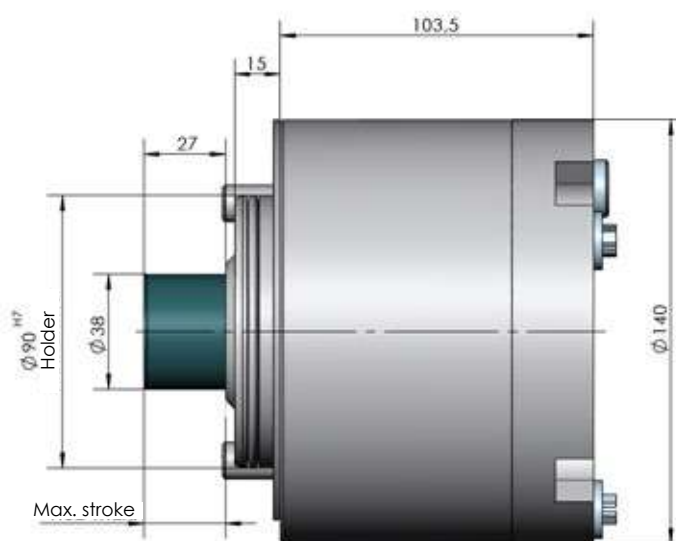
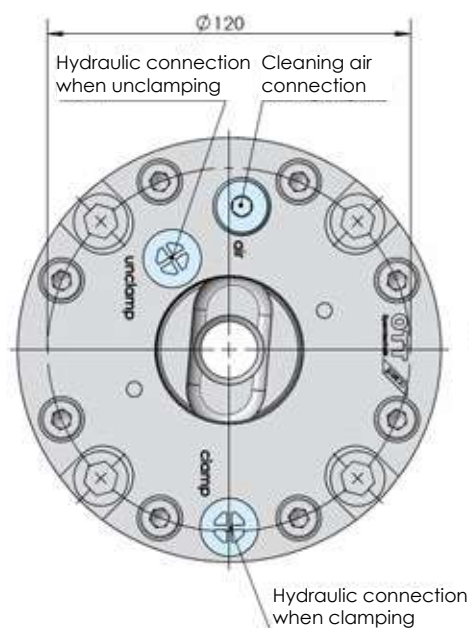
- Fix-mounted
- Suitable for holding the 1K-GD rotary union
- Cleaning air connection

TECHNICAL DATA

Piston area (unclamping)	72.4 cm ²
Piston area (clamping)	64.7 cm ²
Hydraulic pressure max.	120 bar
Min. air/hydraulic pressure	5 bar
Max. stroke	27 mm
Connection (clamping)	G1/4
Connection (unclamping)	G1/4
Cleaning air connection	G1/4
Maximum effective bearing load	-
Mounting diameter	90 mm

7

7



1	2	3	4	5	6	7	8	9	10	11	12
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LE156 – hydraulic

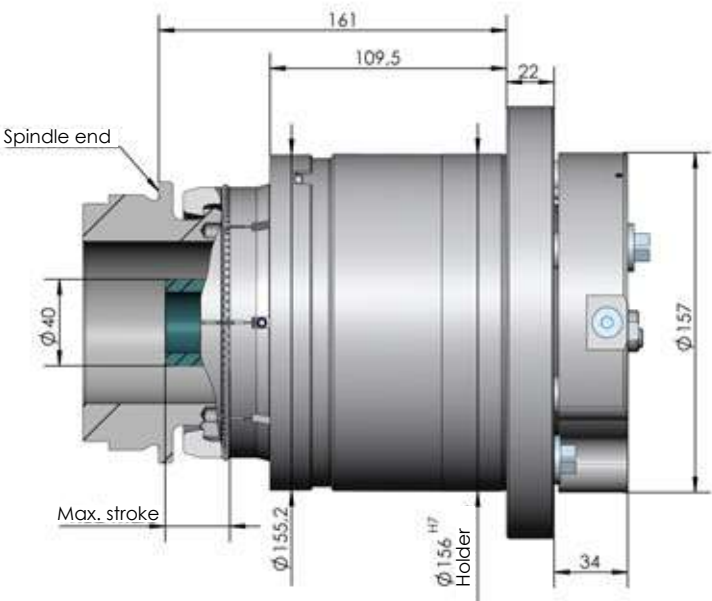
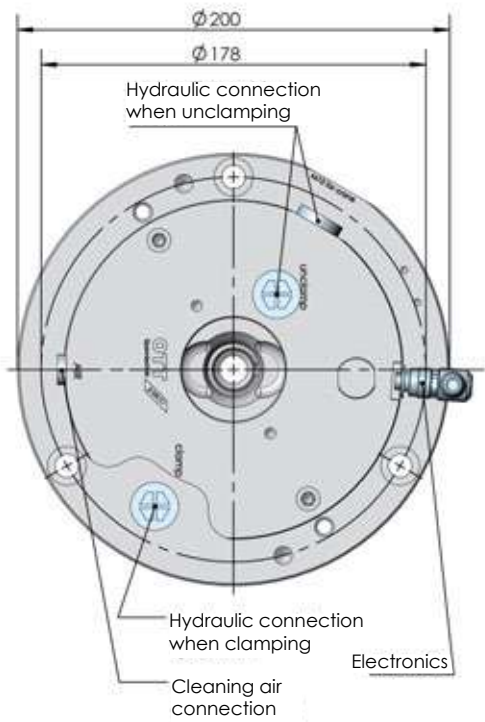
FEATURES
• Low bearing load • Built-in distance measurement system • Suitable for holding the 1K-GD rotary union • Cleaning air connection

TECHNICAL DATA	
Piston area (unclamping)	88.9 cm²
Piston area (clamping)	82.5 cm²
Hydraulic pressure max.	120 bar
Min. air/hydraulic pressure	5 bar
Max. stroke	29.9 mm
Connection (clamping)	G3/8
Connection (unclamping)	G3/8
Cleaning air connection	G1/8
Maximum effective bearing load	1700 N
Mounting diameter	156 mm

5

5





13	14	15	16	17	18	19	20	21	22	23	24
	Unclamping unit										

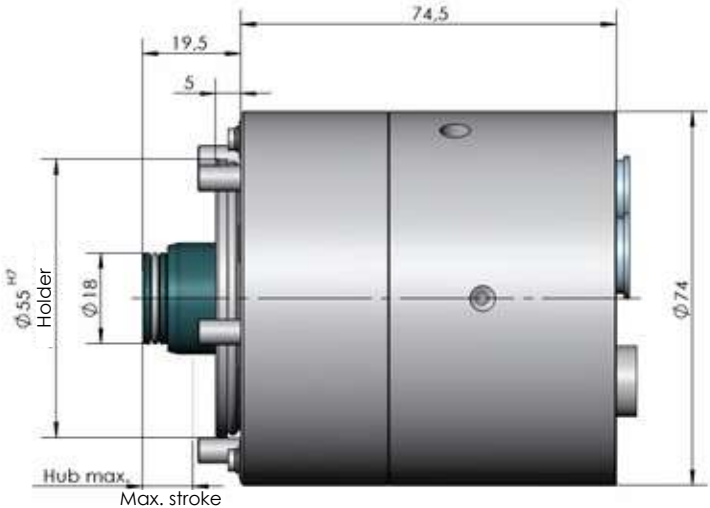
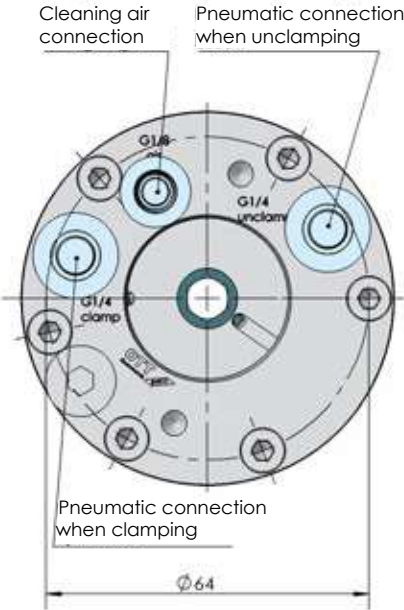
1	2	3	4	5	6	7	8	9	10	11	12
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LE74F1& LE74F2 – pneumatic

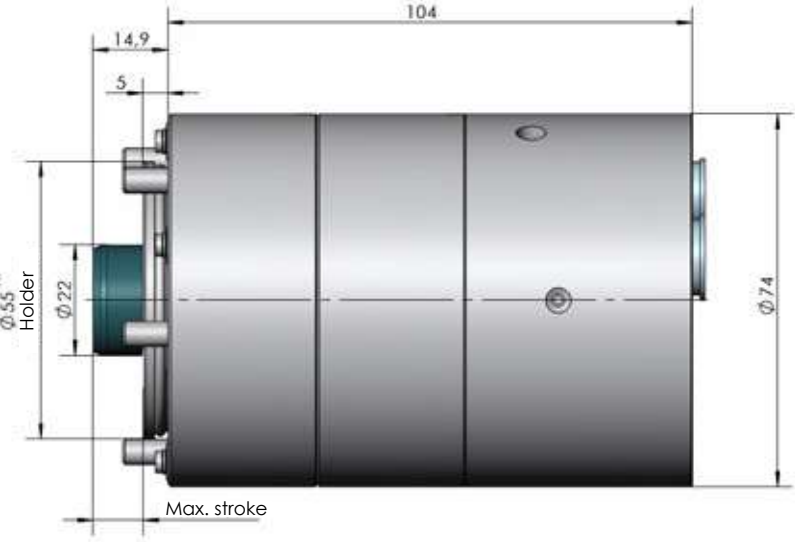
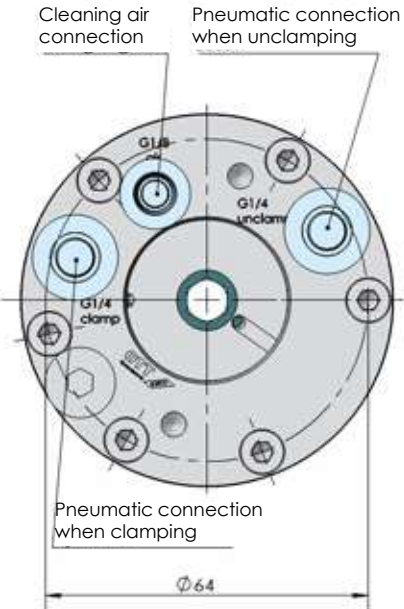
FEATURES
• Fix-mounted • Compact design • Suitable for holding the 1K-GDP rotary union • Cleaning air connection • Optional: MSU sensor system

TECHNICAL DATA	LE74F1	LE74F2
Piston area (unclamping)	20 cm²	40 cm²
Piston area (clamping)	20 cm²	20 cm²
Max. pneumatic pressure	8 bar	8 bar
Min. air/pneumatic pressure	5 bar	5 bar
Max. stroke	10 mm	10 mm
Connection (clamping)	G1/4	G1/4
Connection (unclamping)	G1/4	G1/4
Cleaning air connection	G1/8	G1/8
Maximum effective bearing load	-	-
Mounting diameter	74 mm	74 mm

7 5
LE74F1



7 4
LE74F2



Unclamping unit

LE99_2 & LE99_3 – pneumatic

FEATURES

- Low bearing load
- Modular/enclosed design
- Suitable for holding the 1K-GDP rotary union
- Cleaning air connection
- Optional: MSU sensor system

TECHNICAL DATA

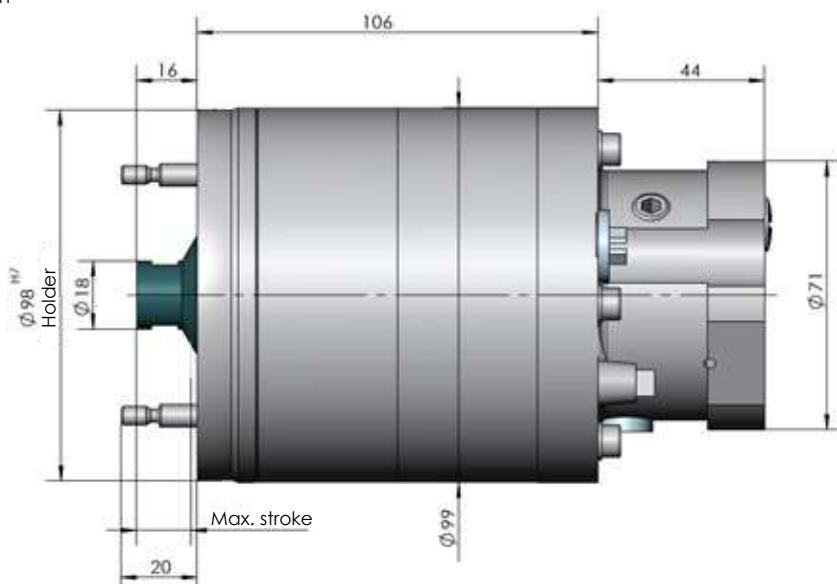
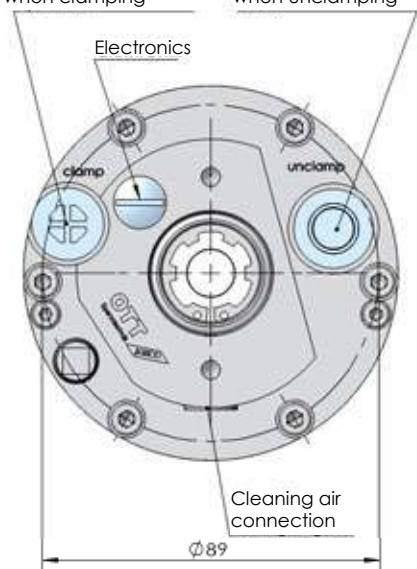
	LE99_2	LE99_3
Piston area (unclamping)	84.4 cm ²	126.6 cm ²
Piston area (clamping)	42.2 cm ²	42.2 cm ²
Max. pneumatic pressure	8 bar	8 bar
Min. air/pneumatic pressure	5 bar	5 bar
Max. stroke	14.5 mm	14.5 mm
Connection (clamping)	G1/4	G1/4
Connection (unclamping)	G3/8	G3/8
Cleaning air connection	G1/8	G1/8
Maximum effective bearing load	350 N	350 N
Mounting diameter	98 mm	98 mm

1

9



LE99_2 Pneumatic connection when clamping Pneumatic connection when unclamping

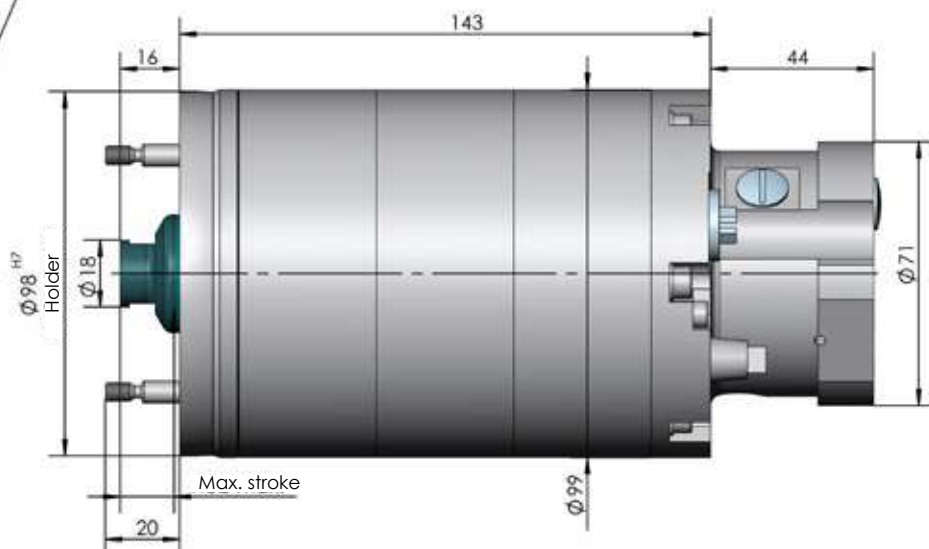
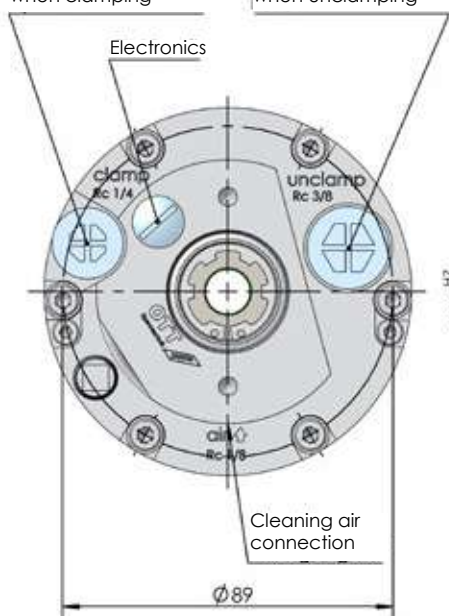


2

0



LE99_3 Pneumatic connection when clamping Pneumatic connection when unclamping



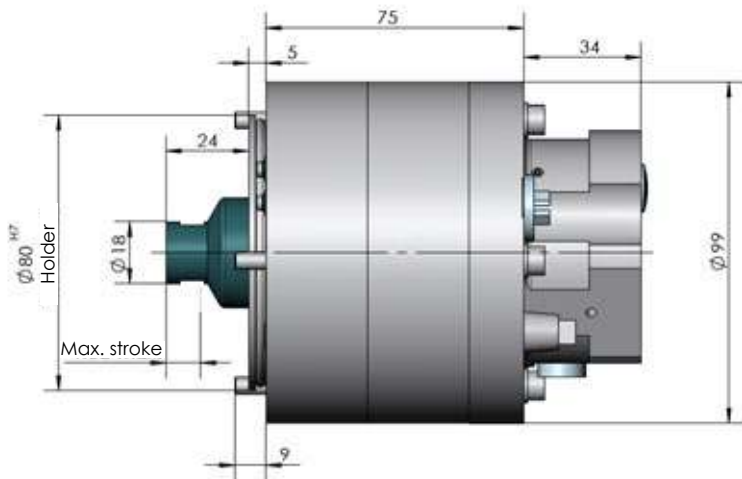
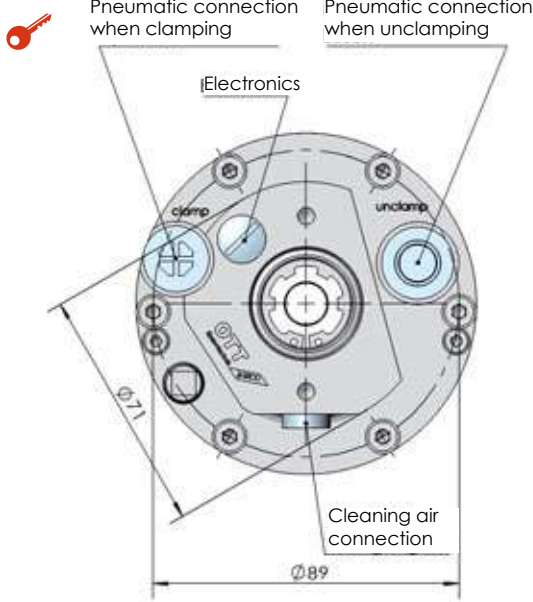
1	2	3	4	5	6	7	8	9	10	11	12
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LE99F2 & LE99F3 – pneumatic

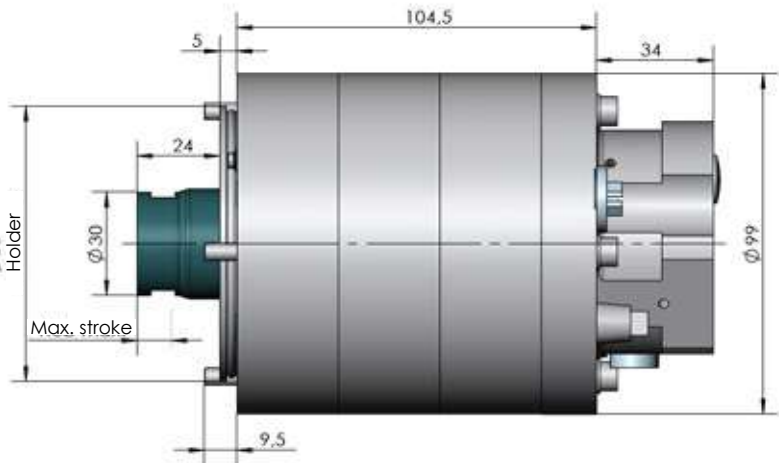
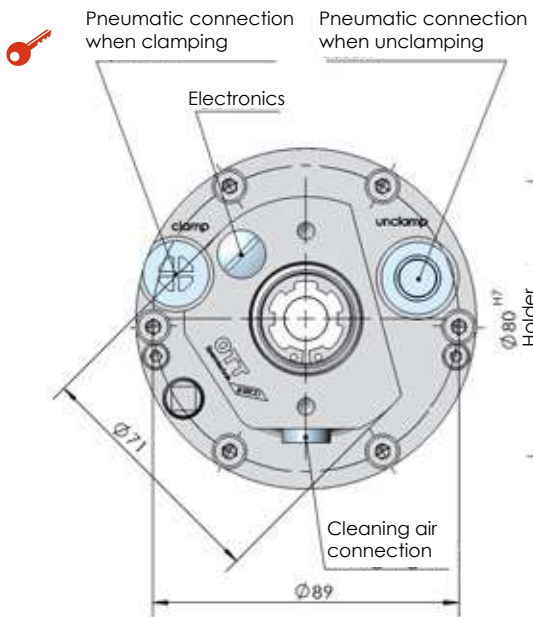
FEATURES
• Fix-mounted • Modular/enclosed design • Suitable for holding the 1K-GDP rotary union • Cleaning air connection • Optional: MSU sensor system

TECHNICAL DATA	LE99F2	LE99F3
Piston area (unclamping)	84.4 cm²	126.6 cm²
Piston area (clamping)	42.2 cm²	42.2 cm²
Max. pneumatic pressure	8 bar	8 bar
Min. air/pneumatic pressure	5 bar	5 bar
Max. stroke	10 mm	10 mm
Connection (clamping)	G1/4	G1/4
Connection (unclamping)	G3/8	G3/8
Cleaning air connection	G1/8	G1/8
Maximum effective bearing load	-	-
Mounting diameter	80 mm	80 mm

1 9
LE99F2



2 0
LE99F3



13	14	15	16	17	18	19	20	21	22	23	24
	Unclamping unit										

ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
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LE119_1 & LE119_2 & LE119_3 – pneumatic

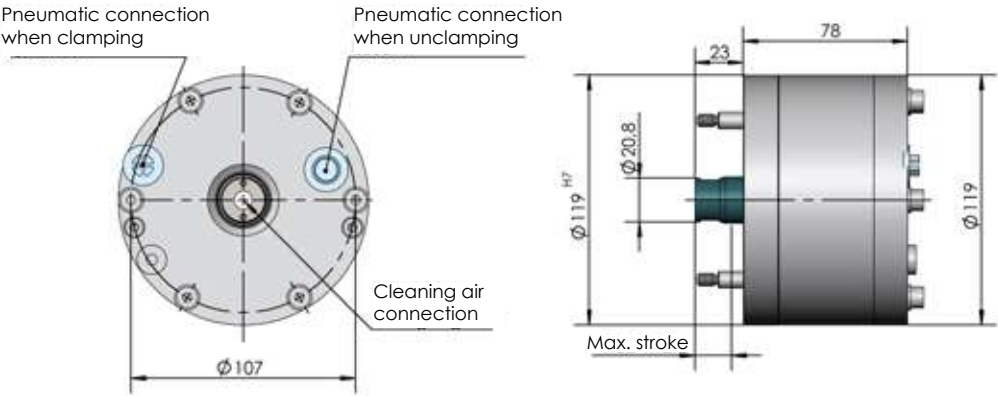
FEATURES
• Low bearing load • Modular/enclosed design • Suitable for holding the 1K-GD rotary union (optional)* • Cleaning air connection • Optional: MSU sensor system

* this results in slightly smaller piston areas

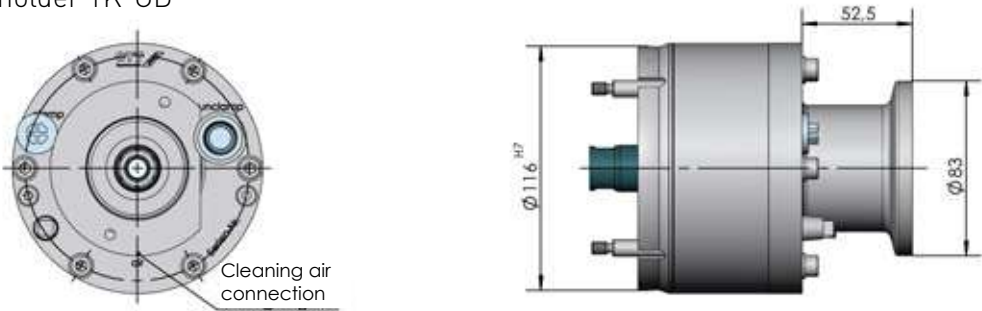
TECHNICAL DATA	LE119_1	LE119_2	LE119_3
Piston area (unclamping)	67 cm²	134 cm²	201 cm²
Piston area (clamping)	67 cm²	67 cm²	67 cm²
Max. pneumatic pressure	8 bar	8 bar	8 bar
Min. air/pneumatic pressure	5 bar	5 bar	5 bar
Max. stroke	21.5 mm	21.5 mm	21.5 mm
Connection (clamping)	G1/4	G1/4	G1/4
Connection (unclamping)	G3/8	G3/8	G3/8
Cleaning air connection	G1/8	G1/8	G1/8
Maximum effective bearing load	580 N	580 N	580 N
Mounting diameter	116 mm	116 mm	116 mm



LE119_1 without holder 1K-GD



LE119_1 with holder 1K-GD



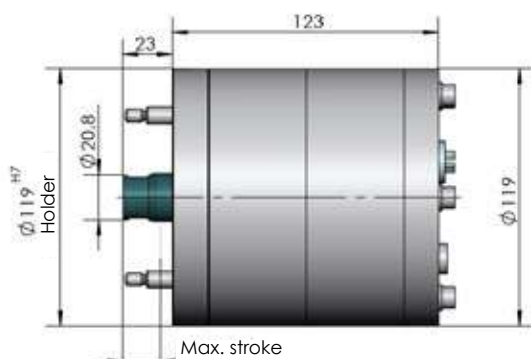
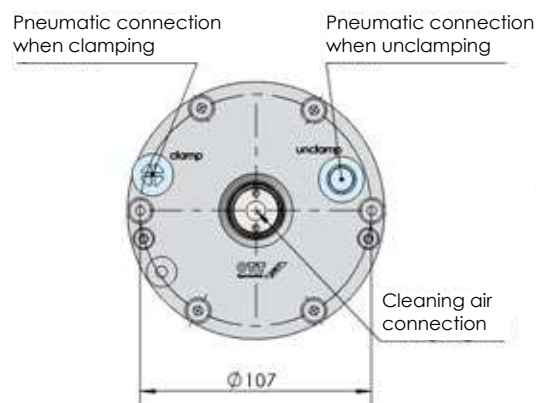
Unclamping unit

2

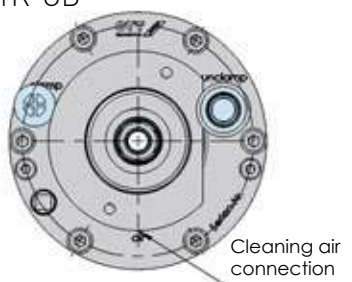
2



LE119_2 without holder 1K-GD



LE119_2 with holder 1K-GD

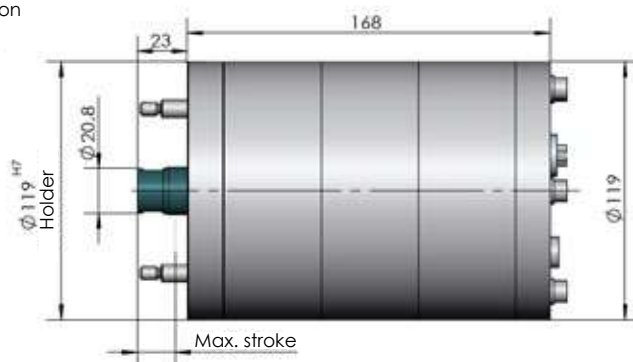
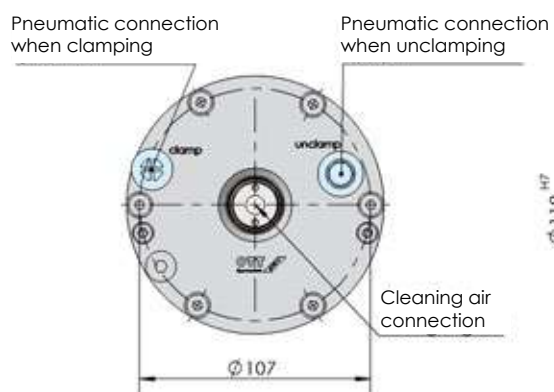


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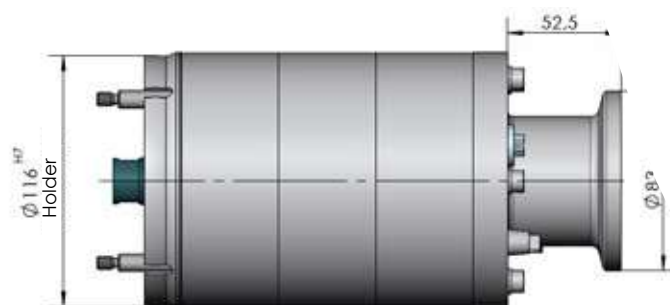
3



LE119_3 without holder 1K-GD



LE119_3 with holder 1K-GD

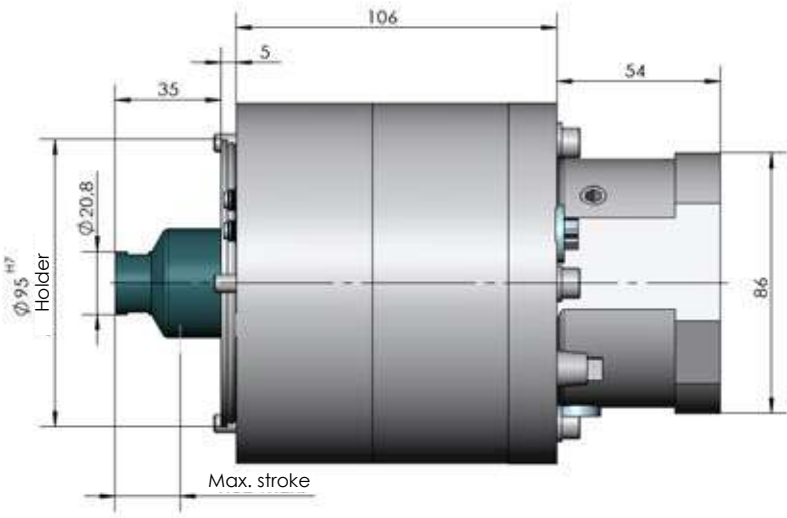
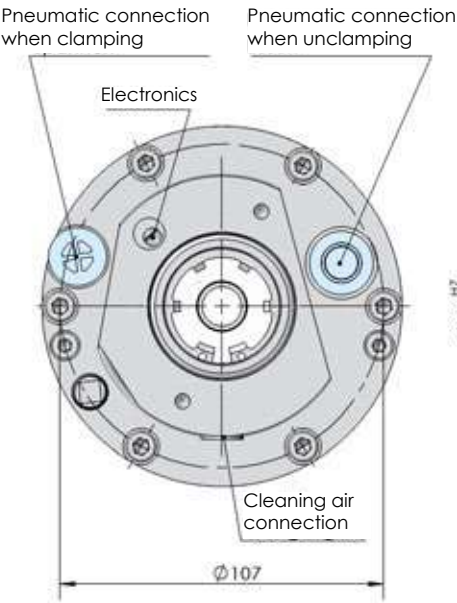


1	2	3	4	5	6	7	8	9	10	11	12
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LE119F2 – pneumatic

FEATURES
• Fix-mounted • Modular/enclosed design • Suitable for holding the 1K-GD rotary union • Cleaning air connection • Optional: MSU sensor system

TECHNICAL DATA	
Piston area (unclamping)	134 cm²
Piston area (clamping)	67 cm²
Max. pneumatic pressure	8 bar
Min. air/pneumatic pressure	5 bar
Max. stroke	21.5 mm
Connection (clamping)	G1/4
Connection (unclamping)	G3/8
Cleaning air connection	G1/8
Maximum effective bearing load	-
Mounting diameter	95 mm



13	14	15	16	17	18	19	20	21	22	23	24
	Unclamping unit										

ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
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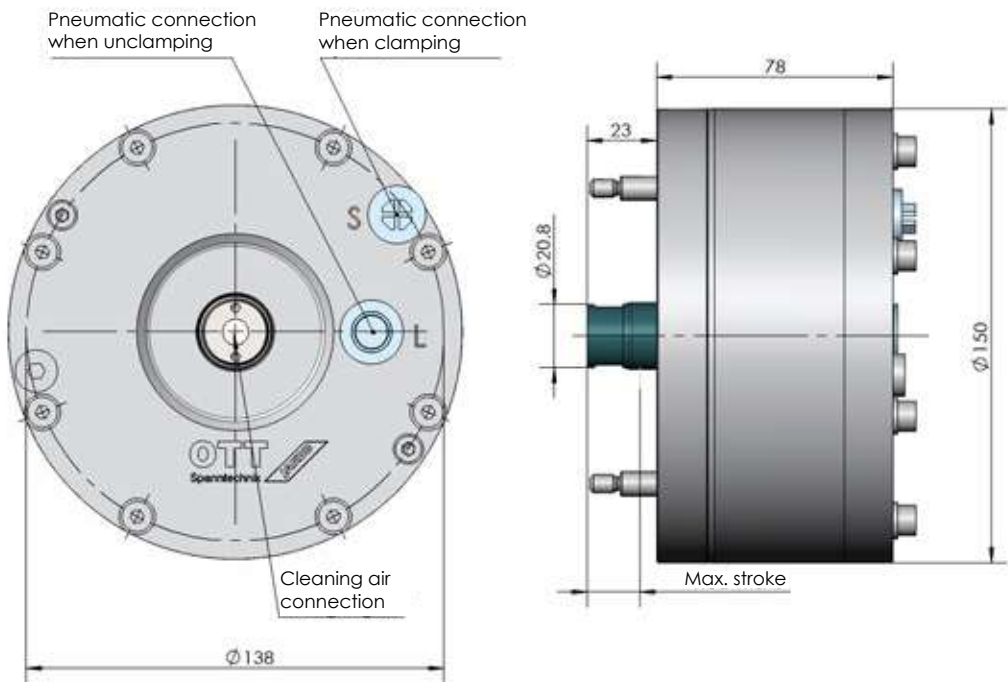
LE150_1 & LE150_2 & LE150_3 – pneumatic

FEATURES
• Low bearing load • Modular/enclosed design • Suitable for holding the 1K-GD rotary union (optional)* • Optionally available with spring reset • Optional: cleaning air connection • Optional: MSU sensor system

* this results in slightly smaller piston areas

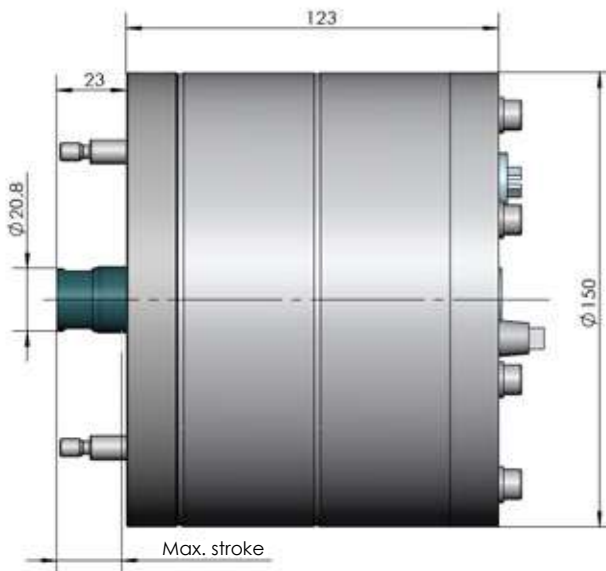
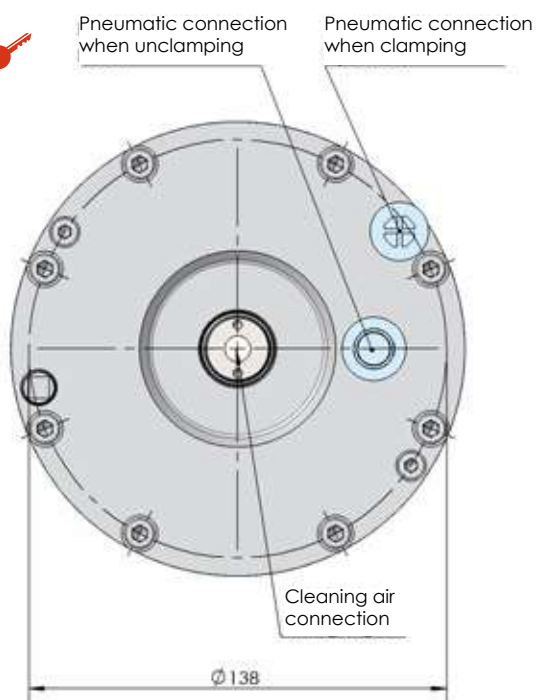
TECHNICAL DATA	LE150_1	LE150_2	LE150_3
Piston area (unclamping)	119 cm²	238 cm²	357 cm²
Piston area (clamping)	119 cm²	119 cm²	119 cm²
Max. pneumatic pressure	8 bar	8 bar	8 bar
Min. air/pneumatic pressure	5 bar	5 bar	5 bar
Max. stroke	21.5 mm	21.5 mm	21.5 mm
Connection (clamping)	G1/4	G1/4	G1/4
Connection (unclamping)	G3/8	G3/8	G3/8
Cleaning air connection	G1/8	G1/8	G1/8
Maximum effective bearing load	580 N	580 N	580 N
Mounting diameter	150 mm	150 mm	150 mm

3 1
LE150_1

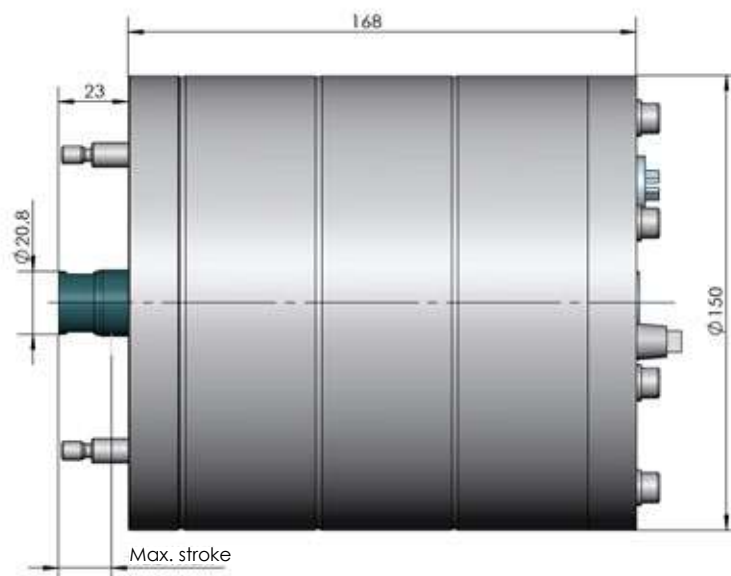
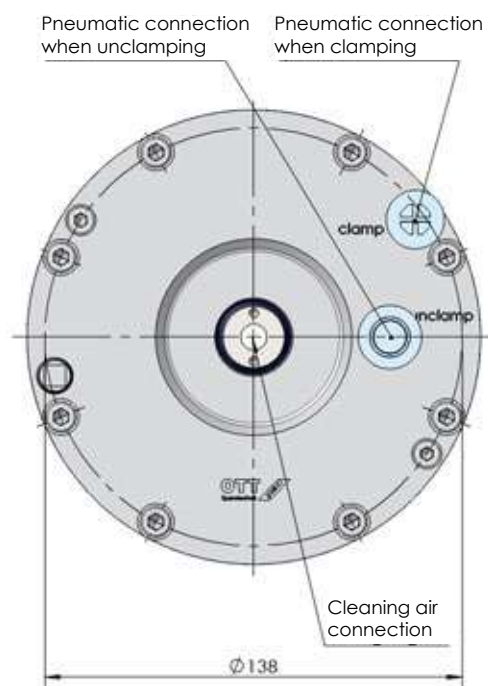


Unclamping unit

3 2 
LE150_2



3 3 
LE150_3



ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
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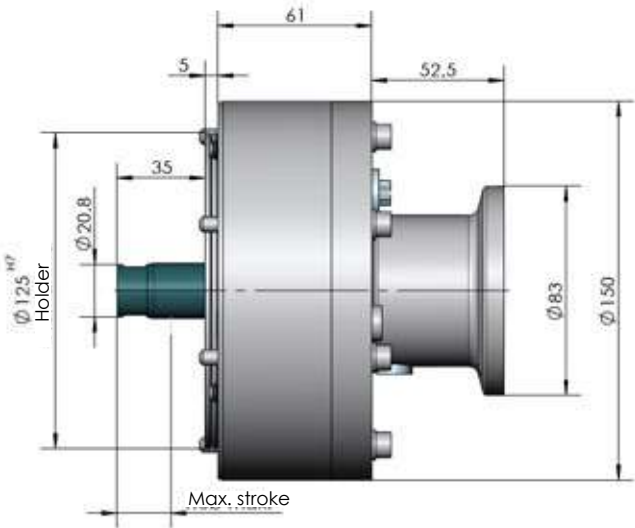
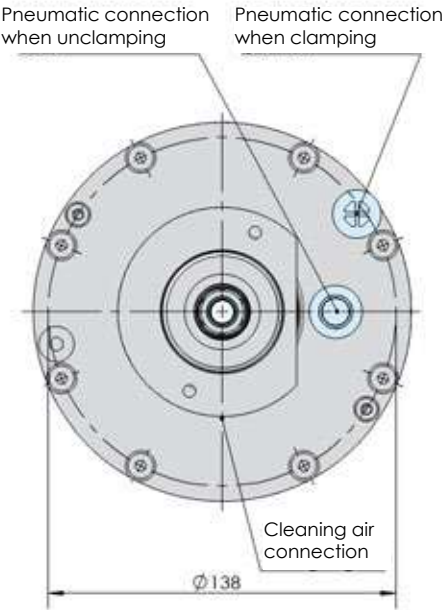
LE150F1 & LE150F2 & LE150F3 – pneumatic

FEATURES
• Fix-mounted • Modular/enclosed design • Suitable for holding the 1K-GD rotary union • Cleaning air connection • Optional: MSU sensor system

TECHNICAL DATA	LE150F1	LE150F2	LE150F3
Piston area (unclamping)	119 cm²	238 cm²	357 cm²
Piston area (clamping)	119 cm²	119 cm²	119 cm²
Max. pneumatic pressure	8 bar	8 bar	8 bar
Min. air/pneumatic pressure	5 bar	5 bar	5 bar
Max. stroke	21.5 mm	21.5 mm	21.5 mm
Connection (clamping)	G1/4	G1/4	G1/4
Connection (unclamping)	G3/8	G3/8	G3/8
Cleaning air connection	G1/8	G1/8	G1/8
Maximum effective bearing load	-	-	-
Mounting diameter	125 mm	125 mm	125 mm



LE150F1



Unclamping unit

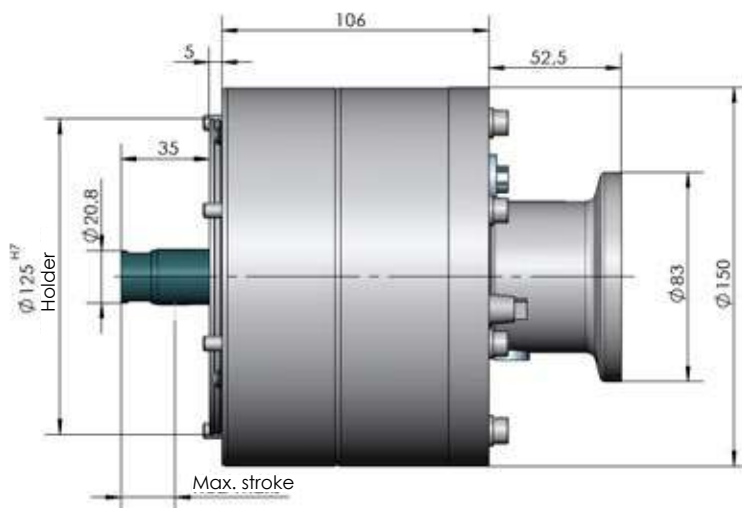
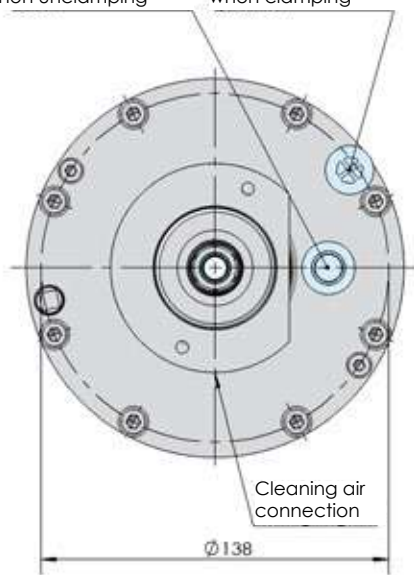
3

8



LE150F2

Pneumatic connection when unclamping
Pneumatic connection when clamping



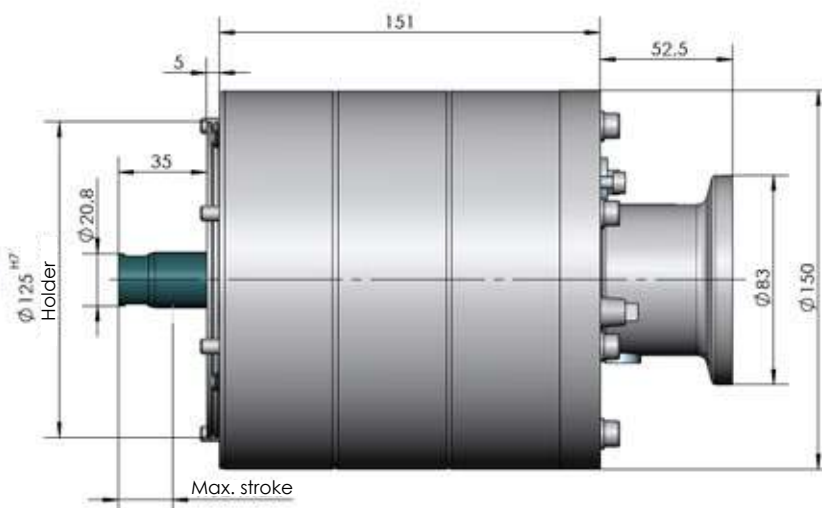
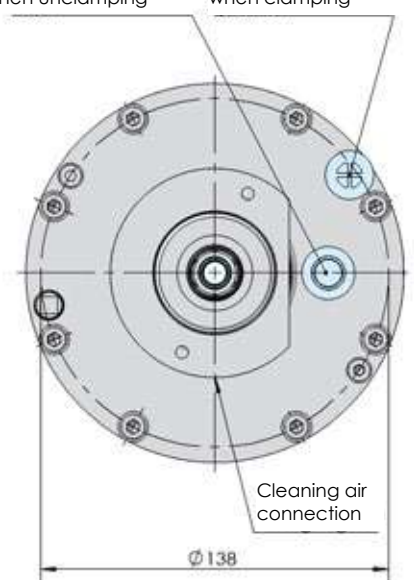
3

9



LE150F3

Pneumatic connection when unclamping
Pneumatic connection when clamping



ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
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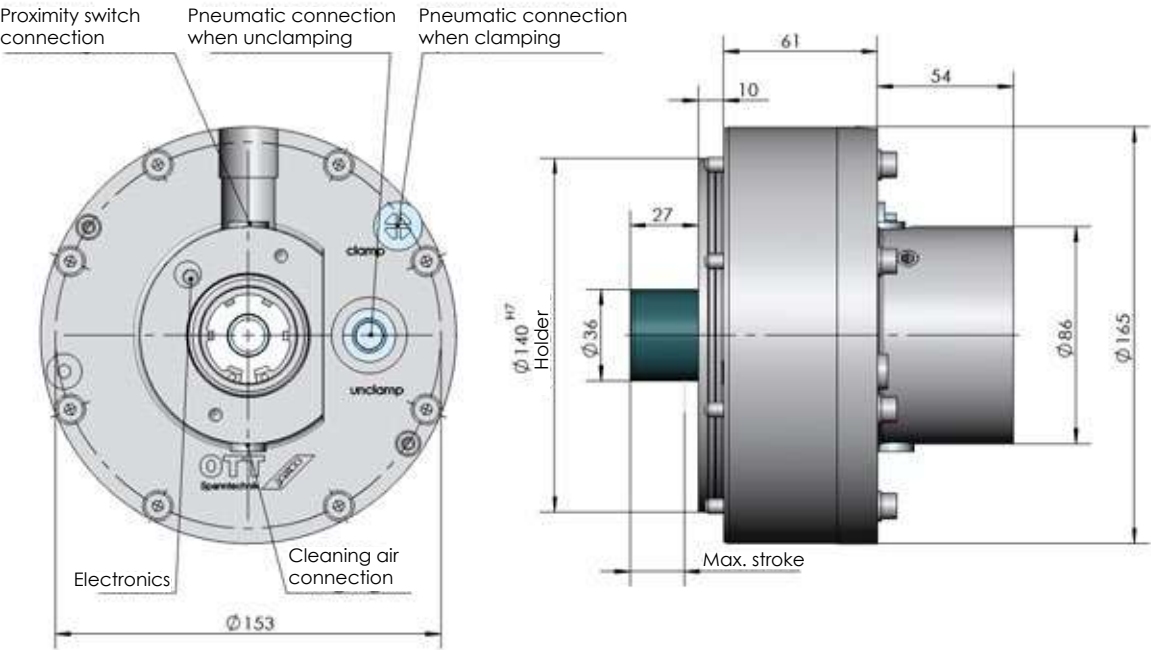
LE165F1 & LE165F2 – pneumatic

FEATURES
• Fix-mounted • Modular/enclosed design • Suitable for holding the 1K-GD rotary union • Cleaning air connection • Optional: MSU sensor system

TECHNICAL DATA	LE165F1	LE165F2
Piston area (unclamping)	143 cm²	286 cm²
Piston area (clamping)	143 cm²	143 cm²
Max. pneumatic pressure	8 bar	8 bar
Min. air/pneumatic pressure	5 bar	5 bar
Max. stroke	21 mm	21 mm
Connection (clamping)	G1/4	G1/4
Connection (unclamping)	G3/8	G3/8
Cleaning air connection	G1/8	G1/8
Maximum effective bearing load	-	-
Mounting diameter	140 mm	140 mm



LE165F1



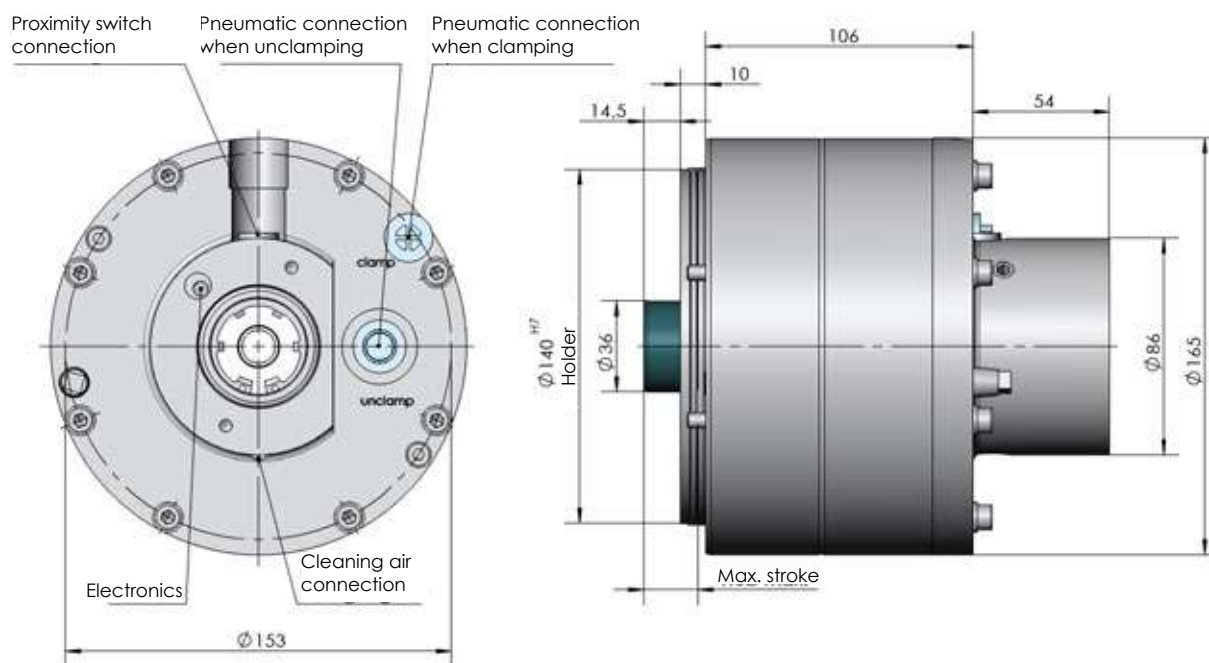
Unclamping unit

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LE165F2





ROTARY UNIONS

<u>Overview</u>	page 96
<u>Single-passage oil</u>	page 100
<u>Dual-passage rotary unions</u>	page 100
<u>Single-passage GD rotary unions</u>	page 110
<u>Integrated seal-kits</u>	page 108
<u>Self-supported rotary union</u>	page 109

OVERVIEW OF OUR ROTARY UNIONS

SINGLE-PASSAGE OIL

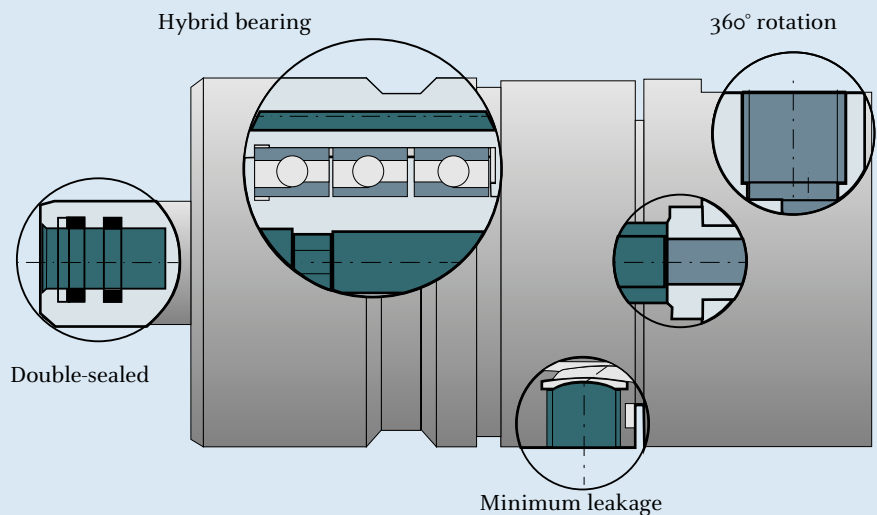
The single-passage oil rotary union is screwed directly onto the spindle shaft and is a cost-efficient alternative to the hydraulic unclamping of clamping systems.

DUAL-PASSAGE

With our dual-passage rotary unions, you can supply hydraulic oil to unclamp the clamping system through one passage whilst feeding another medium through the second passage. It is attached to the spindle shaft.

SINGLE-PASSAGE GD SINGLE-PASSAGE GDP

Single-passage GD and single-passage GDP rotary unions feature permanently closed sealing surfaces. The unique seal is compatible with all conventional media and even allows for dry operation, reducing leakage to a minimum.



The high-quality built-in hybrid bearings have low coefficients of friction and a longer grease service life, allowing them to guarantee long-term functionality at high RPMs. A labyrinth seal effectively protects the bearing against contamination, helping to maximise its life span. The coolant connection can be rotated up to 360° to make it easier to install. All GD rotary unions are available with radial and axial connections. Maintenance cycles can be calculated, which ensures optimal availability.

GD rotary unions are attached to the OTT-JAKOB unclamping unit. The installation diameter of 48 mm (GDP 32 mm) defined by OTT-JAKOB remains the standard in the industry to this day.

Based on the standard types, the OTT-JAKOB product range also includes various special rotary unions designed for special milling and boring applications, such as:

- ▲ For higher coolant pressure
- ▲ For higher flow rates
- ▲ For higher RPMs
- ▲ For limited space
- ▲ With integrated leakage sensors
- ▲ For transferring liquid CO₂ (cryogenic cooling see page 145)

Contact us to find the optimal solution for your applications.

INTEGRATED SEAL-KITS

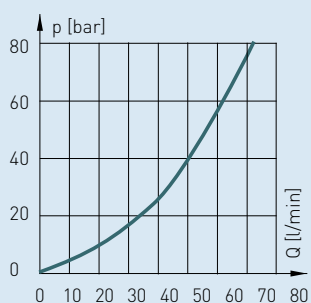
Just like the 1K-GD rotary unions, our integrated seal-kits are characterised by permanently closed sealing surfaces. Therefore, these seal-kit are also suitable for dry running. Due to the elimination of the bearing, these are very small and are the first choice in confined spaces.

SINGLE-PASSAGE SELF-SUPPORTED

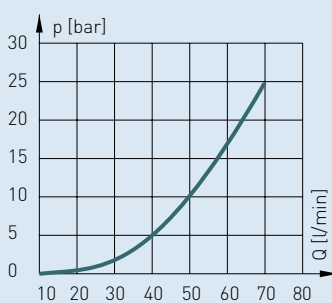
Single-passage rotary unions that are self-supported are based on the same design principles as the 1K-GD rotary unions. Only the rotor is screwed directly into the end of the drawbar shaft. There is no holder in the unclamping unit.

FLOW RATE COMPARISON

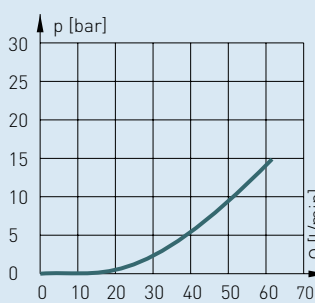
2KA



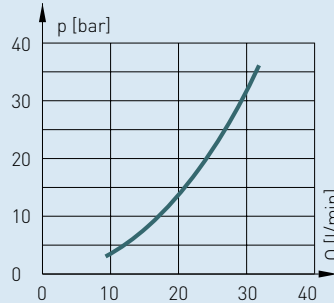
1K-GD TYPES



1K-GD-A TYPES



1K-GDP TYPES



OVERVIEW OF ROTARY UNIONS

TYPE	ORDER NUMBER AXIAL CONNECTION (MEDIUM)	ORDER NUMBER RADIAL CONNECTION (MEDIUM)	CODE	CATALOGUE PAGE	MOUNTING	RPM	NUMBER OF PASSAGES	HYDRAULIC	
								HYDRAULIC PRESSURE MAX. [BAR]	
Single-passage oil	9510080842		11	page 100	M42 × 1.5	10,000	1	160	
	9510053042		11	page 100	M52 × 1.5	10,000	1	160	
2KL		9510111422	14	page 100	M42 × 1.5	10,000	2	160	
		9510146522	14	page 100	M42 × 1.5	10,000	2	160	
		9510095622	14	page 100	M52 × 1.5	10,000	2	160	
		9510175422	14	page 100	M52 × 1.5	10,000	2	160	
2KL-ME		9510430302V01	14 ⁴	page 101	M42 × 1.5	10,000	2	160	
		9510430302	14 ⁴	page 101	M52 × 1.5	10,000	2	160	
2KL-RX		9510180822	28	page 102	M42 × 1.5	20,000	2	160	
		9510179422	28	page 102	M52 × 1.5	20,000	2	160	
2KL-SR		9510234722 ²	47	page 101	M42 × 1.5	8,000	2	160	
		9510234722 ²	47	page 101	M52 × 1.5	8,000	2	160	
2KA	9510309912V01		35	page 102	M42 × 1.5	10,000	2	160	
		9510141822	25	page 102	M42 × 1.5	10,000	2	160	
	9510309912		35	page 102	M52 × 1.5	10,000	2	160	
		9510150322	25	page 102	M52 × 1.5	10,000	2	160	
2KA-ME		9510425702V01	25 ⁴	page 103	M42 × 1.5	10,000	2	160	
		9510425702	25 ⁴	page 103	M52 × 1.5	10,000	2	160	
2KA-SR	9510267012 ²		36	page 103	M42 × 1.5	8,000	2	160	
		9510166022 ²	26	page 103	M42 × 1.5	8,000	2	160	
		9510168322 ²	26	page 103	M52 × 1.5	8,000	2	160	
2KA Universal		9510168222	27	page 104	M42 × 1.5	10,000	2	160	
		9510163422	27	page 104	M52 × 1.5	10,000	2	160	
2KA-SR Universal		9510212522 ²	29	page 105	M42 × 1.5	8,000	2	160	
		9510205822 ²	29	page 105	M52 × 1.5	8,000	2	160	
2KA-48.0 Universal	9510299812V11		83	page 106	Ø 66/8 M5	8,000	2	160	
		9510299812V10	83	page 106	Ø 66/8 M5	8,000	2	160	

INTEGRATED SEAL-KITS

Seal-kit IDS-A-Ø8	9510306832		40	page 108	Ø 35 mm	24,000	1	–	
Seal-kit IDS-R-Ø8		9510365332	40S	page 108	Ø 30 mm	24,000	1	–	

SELF-SUPPORTED ROTARY UNION

1KR	9510442022		88	page 109	M16.5x1.5 LH	on demand	1	–	
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- Standard equipment
- on request

¹ One drain hole in the axial variant

² Various signal ring variants available

³ Drainage through spindle sealing air

⁴ In addition, "M" for multisensor must be selected in field 12

OVERVIEW OF ROTARY UNIONS

TYPE	ORDER NUMBER AXIAL CONNECTION (MEDIUM)	ORDER NUMBER RADIAL CONNECTION (MEDIUM)	CODE	CATALOGUE PAGE	MOUNTING	RPM	NUMBER OF PASSAGES	HYDRAULIC	
								HYDRAULIC PRESSURE MAX. [BAR]	

STANDARD VARIANTS

1K-GD	9525002230		22	page 110	Ø 48 mm	36,000	1	–	
		9525002130	21	page 110	Ø 48 mm	36,000	1	–	
1K-GDR	9525002510		24	page 111	Ø 48 mm	24,000	1	–	
		9525002330	23	page 111	Ø 48 mm	24,000	1	–	
1K-GDR-LC-2L	9525003720		37	page 112	Ø 48 mm	20,000	1	–	
		9525006520	65	page 112	Ø 48 mm	20,000	1	–	
1K-GDP	9525014720		E7	page 113	Ø 32 mm	75,000	1	–	
		9525014220	E2	page 113	Ø 32 mm	75,000	1	–	
1K-GDP-LC	9525007120		71	page 114	Ø 32 mm	40,000	1	–	
		9525006820	68	page 114	Ø 32 mm	40,000	1	–	

SPECIAL VARIANTS

1K-GD-SL		9525002920	33	page 115	Ø 48 mm	36,000	1	–	
1K-GD-HD	9525007520		75	page 116	Ø 48 mm	24,000	1	–	
		9525002820	32	page 116	Ø 48 mm	24,000	1	–	
1K-GD-K	9525002230V02		21K	page 117	Ø 48 mm	36,000	1	–	
		9525002130V01	22K	page 117	Ø 48 mm	36,000	1	–	
1K-GD-HS-IK	9525007420		50I	page 118	Ø 48 mm	42,000	1	–	
		9525005220	39I	page 118	Ø 48 mm	42,000	1	–	
1K-GD-RA-08		9525003320	34	page 119	Ø 48 mm	24,000	1	–	
1K-GD-CM	9525011620		61	page 120	Ø 48 mm	36,000	1	–	
		9525008020	61	page 120	Ø 48 mm	36,000	1	–	
1K-GDR-CM	9525011920		B9	page 121	Ø 48 mm	24,000	1	–	
		9525009420	63	page 121	Ø 48 mm	24,000	1	–	
1K-GDV		9525010620	A6	page 122	Ø 48 mm	42,000	1	–	
1K-GD-44	9525003220		22S	page 123	Ø 44 mm	36,000	1	–	
		9525002720	21S	page 123	Ø 44 mm	36,000	1	–	
1K-GDK-Ø44-IN		9525007810	70	page 124	Ø 65.5/2 M6	20,000	1	–	
1K-SDR	9525004220		42	page 125	Ø 48 mm	36,000	1	–	
		9525004920	49	page 125	Ø 48 mm	36,000	1	–	
2K-GDSD-CO2-KSM	9525012210 [CO2]		C2	page 126	Ø 48 mm	18,000	2	–	

- Standard equipment
- on request

¹ One drain hole in the axial variant

² Various signal ring variants available

³ Drainage through spindle sealing air

CONNECTION			MEDIUM CONNECTION								OPTIONAL DESIGNS												
CONNECTING THREAD		CONNECTING POSITION	DRY OPERATION p = 0	CLEANING AIR [N = 0 RPM] [10 BAR]	COOLANT PRESSURE [BAR]	MQL (MIXED EXTERNALLY) [10 BAR]	COMPRESSED AIR/ROTATION [N < 10,000 RPM] [5 BAR]	CONNECTING THREAD	LIQUEFIED CO2 (LANCE) [BAR]	DRAIN HOLE [MM]	DRAWBAR CONNECTION DESIGN	SIGNAL RING	CLOSED SEALING SURFACE	AIR GAP SEAL	NUMBER OF DRAIN HOLES	DRAINAGE THROUGH UNCLAMPING UNIT	POSITION MONITORING MULTISENSOR	SUITABLE FOR SPINDLE SEALING AIR	ACTIVE DRAINAGE ³	GLASS/CERAMIC MACHINING	HOUSING CHAMFER 20.5°	INTERNAL HOUSING COOLING	TWO-STAGE LEAKAGE AND TEMPERATURE MONITORING

-	-	-	●	●	80	●	○	G1/4	-	6	8kt	-	●	-	1	-	-	-	-	-	-	-	-
-	-	-	●	●	80	●	○	G1/4	-	6	8kt	-	●	-	1	-	-	-	-	-	-	-	-
-	-	-	●	●	80	●	○	G1/4	-	6	8kt	-	●	-	1	-	-	●	-	-	-	-	-
-	-	-	●	●	80	●	○	G1/4	-	6	8kt	-	●	-	1	-	-	●	-	-	-	-	-
-	-	-	●	●	50	●	○	G1/4	-	6	8kt	-	●	-	2 ¹	-	-	-	-	-	-	-	-
-	-	-	●	●	50	●	○	G1/4	-	6	8kt	-	●	-	2 ¹	-	-	-	-	-	-	-	-
-	-	-	●	●	80	●	○	G1/8	-	3.5	8kt	-	●	-	6	-	-	●	-	-	-	●	-
-	-	-	●	●	80	●	○	G1/8	-	3.5	8kt	-	●	-	6	-	-	●	-	-	-	●	-
-	-	-	●	●	80	●	○	G1/8	-	3.5	8kt	-	●	-	6	-	-	●	-	-	-	●	-
-	-	-	●	●	80	●	○	G1/8	-	3.5	8kt	-	●	-	6	-	-	●	-	-	-	●	-

-	-	-	●	●	80	●	○	G1/4	-	6	8kt	-	●	-	1	-	-	●	●	-	-	-	-
-	-	-	●	●	150	●	○	G1/4	-	4	8kt	-	●	-	1	-	-	●	-	-	-	-	-
-	-	-	●	●	150	●	○	G1/4	-	4	8kt	-	●	-	1	-	-	●	-	-	-	-	-
-	-	-	-	●	80	-	-	G1/4	-	6	8kt	-	●	-	1	-	-	●	-	●	-	-	-
-	-	-	-	●	80	-	-	G1/4	-	6	8kt	-	●	-	1	-	-	●	-	●	-	-	-
-	-	-	●	●	80	●	○	G1/4	-	6	8kt	-	●	-	1	-	-	●	-	-	-	●	-
-	-	-	●	●	80	●	○	G1/4	-	6	8kt	-	●	-	1	-	-	●	-	-	-	●	-
-	-	-	●	●	80	●	○	G1/4	-	8	8kt	-	●	-	1	-	-	●	-	-	-	-	-
-	-	-	●	●	80	●	○	G1/4	-	6	8kt	-	●	-	1	-	-	●	-	-	-	-	●
-	-	-	●	●	80	●	○	G1/4	-	6	8kt	-	●	-	1	-	-	●	-	-	-	-	●
-	-	-	●	●	80	●	○	G1/4	-	6	8kt	-	●	-	1	-	-	●	-	-	-	-	●
-	-	-	●	●	70	●	●	G1/4	-	6	8kt	-	●	-	1	-	-	●	-	-	-	-	-
-	-	-	●	●	80	●	○	G1/4	-	6	8kt	-	●	-	12	●	-	●	-	-	-	-	-
-	-	-	●	●	80	●	○	G1/4	-	6	8kt	-	●	-	12	●	-	●	-	-	-	-	-
-	-	-	●	●	80	●	○	Ø 6	-	6	8kt	-	●	-	12	●	-	●	-	-	-	-	-
-	-	-	●	●	-	-	●	G1/4	-	6	8kt	-	-	●	1	-	-	●	-	-	-	-	-
-	-	-	●	●	-	-	●	G1/4	-	6	8kt	-	-	●	1	-	-	●	-	-	-	-	-
-	-	-	●	●	60 ^d	○	●	G1/4	●	6	6kt	-	●	●	3	-	-	●	-	-	-	-	-

ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
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1K-HYDRAULIC

FEATURES

- Hydraulic unclamping of power drawbars

TECHNICAL DATA

Max. RPM	10,000 RPM
Max. hydraulic pressure n = 0 rpm	160 bar

ORDER NUMBER

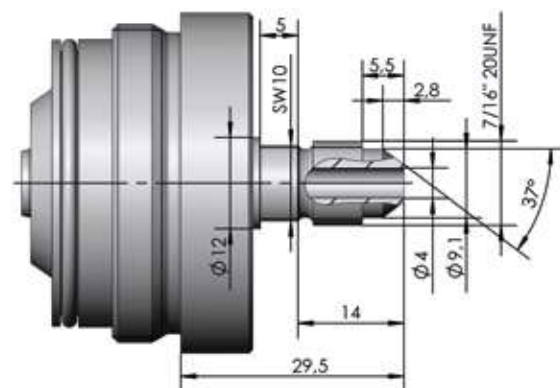
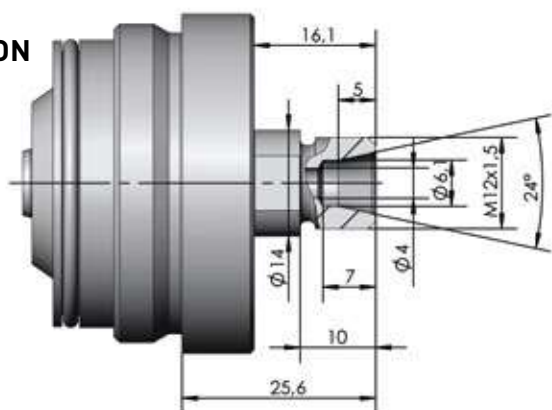
Order Number	Mounting
9510080842	M42 × 1.5
9510053042	M52 × 1.5

AXIAL



CONNECTION

M12 × 1.5



2KL

FEATURES

- Hydraulic unclamping of power drawbars
- Cleaning air during tool changing

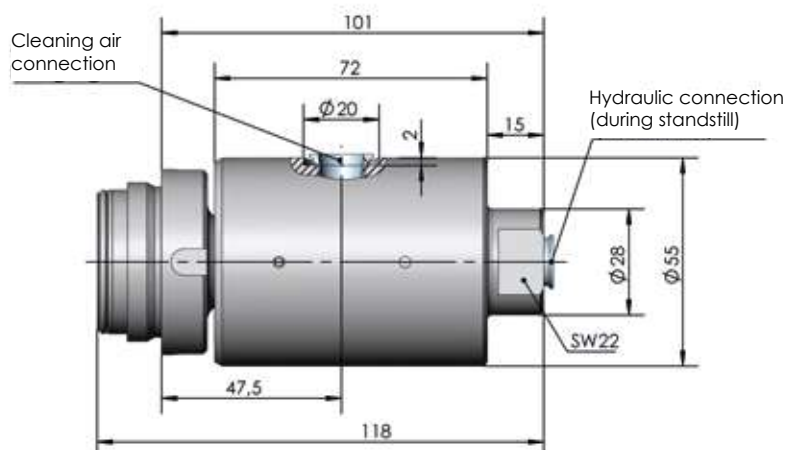
TECHNICAL DATA

Max. RPM	10,000 RPM
Max. hydraulic pressure; n = 0 rpm	160 bar
Max. air pressure; n = 0 rpm	10 bar

ORDER NUMBER

Order Number	Mounting	Hydraulic connection
9510111422	M42 × 1.5	Axial
9510146522	M42 × 1.5	Radial
9510095622	M52 × 1.5	Axial
9510175422	M52 × 1.5	Radial

RADIAL



Rotary union

2KL-ME

FEATURES

- Hydraulic unclamping of power drawbars
- Cleaning air during tool changing
- Monitoring of the drawbar shaft position

ORDER NUMBER

9510430302V01

Mounting

M42 × 1.5

Hydraulic connection

Axial

9510430302

M52 × 1.5

Radial

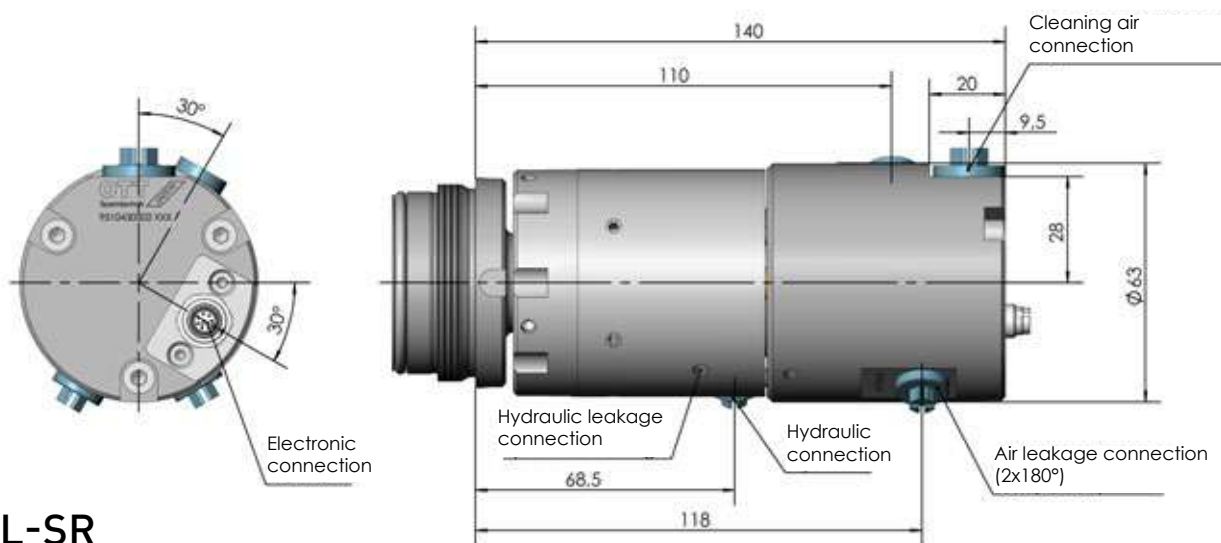
TECHNICAL DATA

Max. RPM 10,000 RPM

Max. hydraulic pressure; n = 0 rpm 160 bar

Max. air pressure; n = 0 rpm 10 bar

RADIAL

1 4 - 

2KL-SR

FEATURES

- Hydraulic unclamping of power drawbars
- Cleaning air during tool changing
- Signal ring for position monitoring

TECHNICAL DATA

Max. RPM 8,000 RPM

Max. hydraulic pressure; n = 0 rpm 160 bar

Max. air pressure; n = 0 rpm 10 bar

Max. stroke of signal ring 11 mm

ORDER NUMBER

9510234722

Mounting

M42 × 1.5

Hydraulic connection

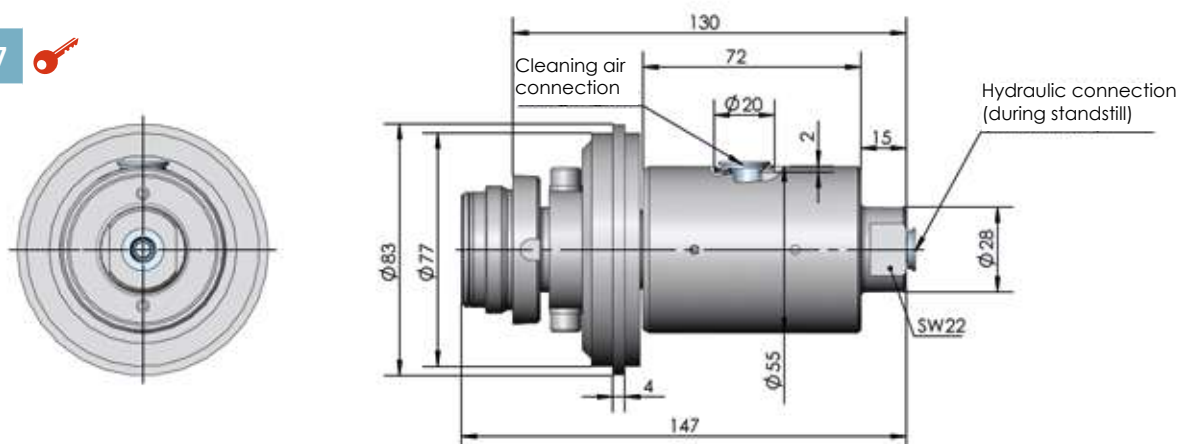
Axial

9510234722

M52 × 1.5

Axial

RADIAL

4 7 

ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
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2KL-RX

FEATURES	
• Air gap seal • Hybrid bearing • Hydraulic unclamping of power drawbars • Dry operation with compressed air • Light alloy housing	

TECHNICAL DATA	
Max. RPM	20,000 RPM
Max. hydraulic pressure; n = 0 rpm	160 bar
Max. air pressure; n = 0 rpm	10 bar

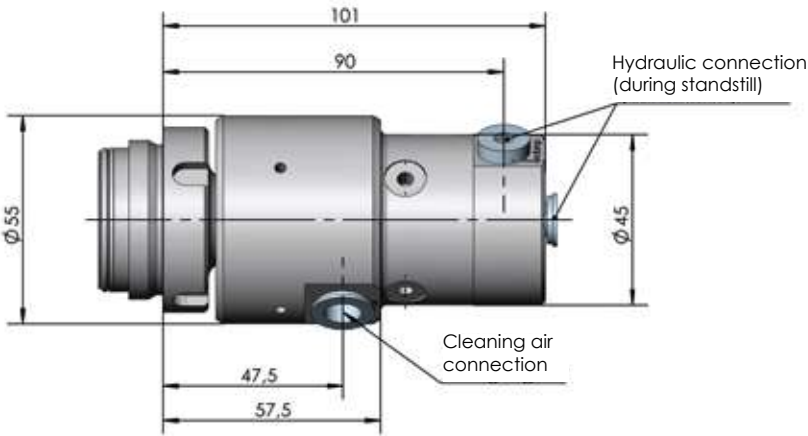
ORDER NUMBER	Mounting
9510180822	M42 × 1.5
9510179422	M52 × 1.5

RADIAL

2

8

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2KA

FEATURES	
• Closed sealing surfaces • Hydraulic unclamping of power drawbars • Central coolant supply • Suitable for dry operation • Cleaning air during tool changing	

TECHNICAL DATA	
Max. RPM	10,000 RPM
Max. coolant pressure	80 bar
Max. hydraulic pressure; n = 0 rpm	160 bar
Max. air pressure; n = 0 rpm	10 bar

ORDER NUMBER	Mounting	Hydraulic connection
9510141822	M42 × 1.5	Radial
9510150322	M52 × 1.5	Radial
9510309912V01	M42 × 1.5	Axial
9510309912	M52 × 1.5	Axial

RADIAL

2

5

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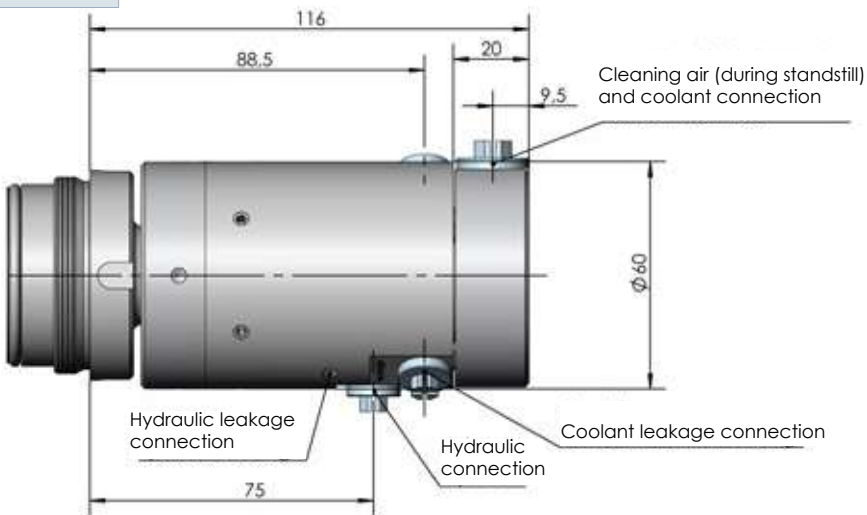
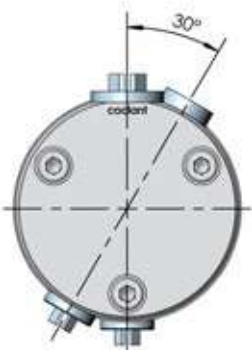


AXIAL

3

5

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2KA-ME

FEATURES

- Closed sealing surfaces
- Hydraulic unclamping of power drawbars
- Central coolant supply
- Suitable for dry operation
- Cleaning air during tool changing
- Monitoring of the drawbar shaft position

TECHNICAL DATA

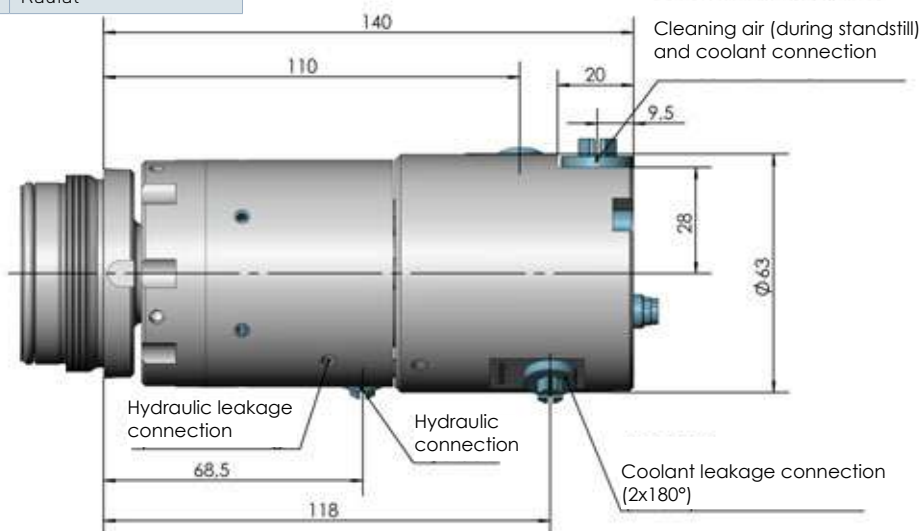
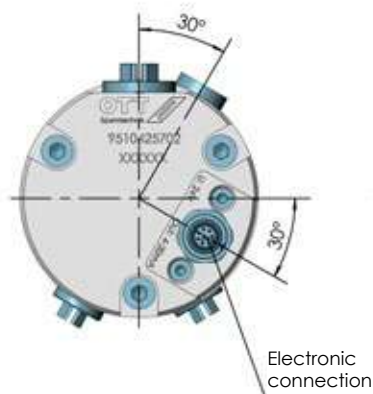
Max. RPM	10,000 RPM
Max. coolant pressure	80 bar
Max. hydraulic pressure; n = 0 rpm	160 bar
Max. air pressure; n = 0 rpm	10 bar

ORDER NUMBER

ORDER NUMBER	Mounting	Hydraulic connection
9510425702V01	M42 × 1.5	Radial
9510425702	M52 × 1.5	Radial

RADIAL

2 5 - 



2KA-SR

FEATURES

- Closed sealing surfaces
- Hydraulic unclamping of power drawbars
- Signal ring for position monitoring, various signal ring designs available
- Central coolant supply
- Suitable for dry operation
- Cleaning air during tool changing

TECHNICAL DATA

Max. RPM	8,000 RPM
Max. coolant pressure	80 bar
Max. hydraulic pressure; n = 0 rpm	160 bar
Max. air pressure; n = 0 rpm	10 bar
Max. stroke of signal ring	12.5 mm

ORDER NUMBER

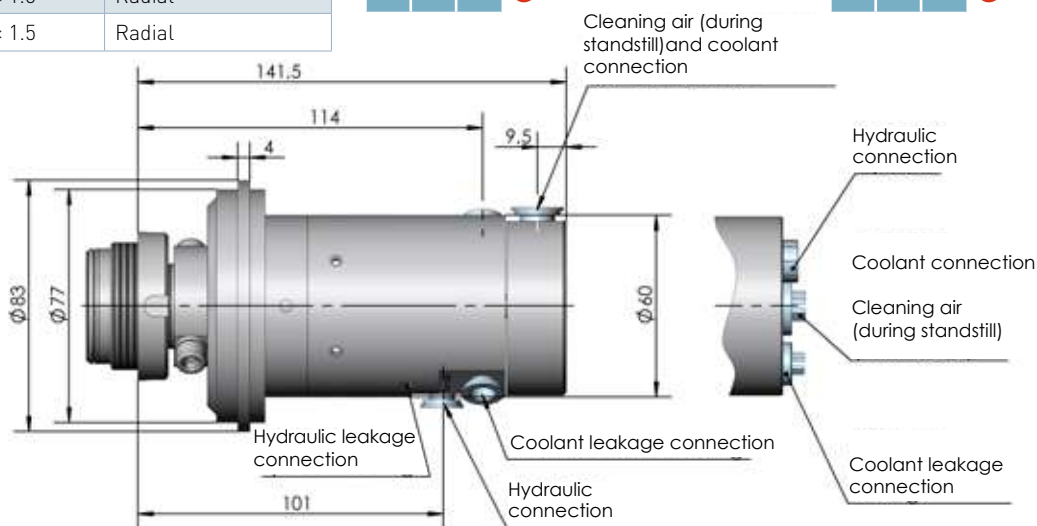
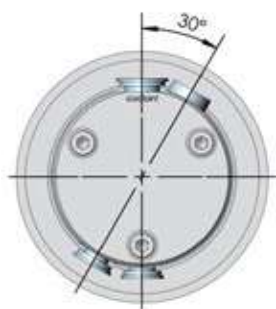
ORDER NUMBER	Mounting	Hydraulic connection
9510267012	M42 × 1.5	Axial
9510166022	M42 × 1.5	Radial
9510168322	M52 × 1.5	Radial

RADIAL

2 6 - 

AXIAL

3 6 - 



ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
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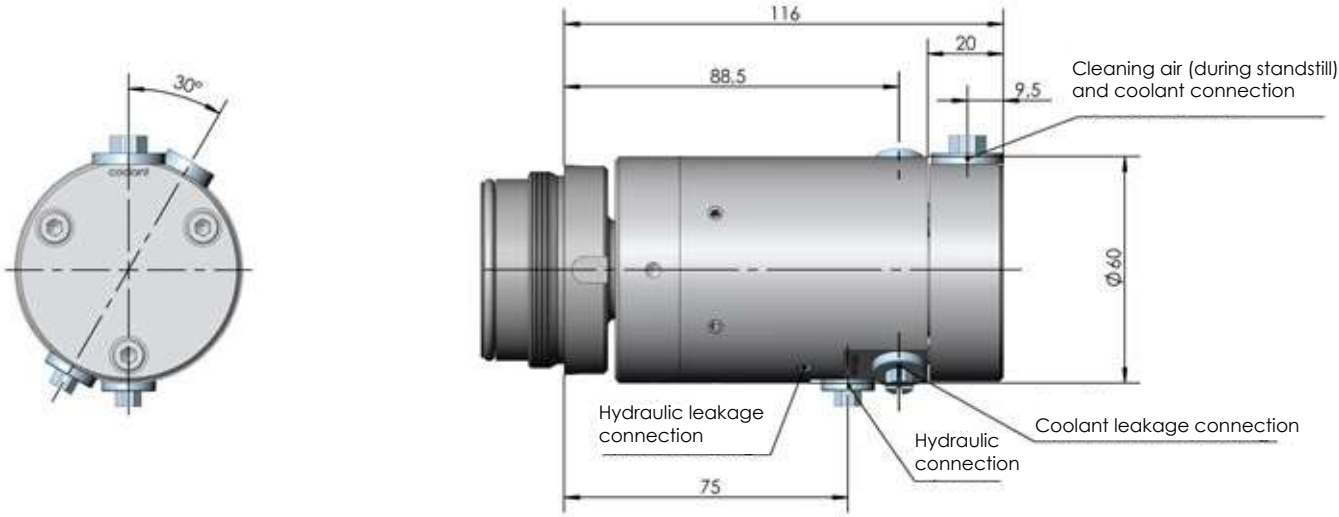
2KA UNIVERSAL

FEATURES
• Closed sealing surfaces • Hydraulic unclamping of power drawbars • Central coolant supply • Dry operation with compressed air • Suitable for dry operation • Cleaning air during tool changing • Minimum volume lubrication (mixed externally)

ORDER NUMBER	Mounting	Hydraulic connection
9510168222	M42 × 1.5	Radial
9510163422	M52 × 1.5	Radial

TECHNICAL DATA	
Max. RPM	10,000 RPM
Max. coolant pressure	80 bar
Max. hydraulic pressure; n = 0 rpm	160 bar
Max. cleaning air pressure; n = 0 rpm	10 bar
Max. compressed air (on consultation)	5 bar

RADIAL



Rotary union

2KA-SR UNIVERSAL

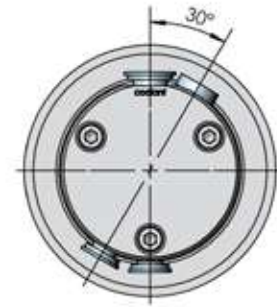
FEATURES

- Closed sealing surfaces
- Hydraulic unclamping of power drawbars
- Signal ring for position monitoring (various signal ring designs available)
- Central coolant supply
- Dry operation with compressed air
- Suitable for dry operation
- Cleaning air during tool changing
- Minimum volume lubrication (mixed externally)

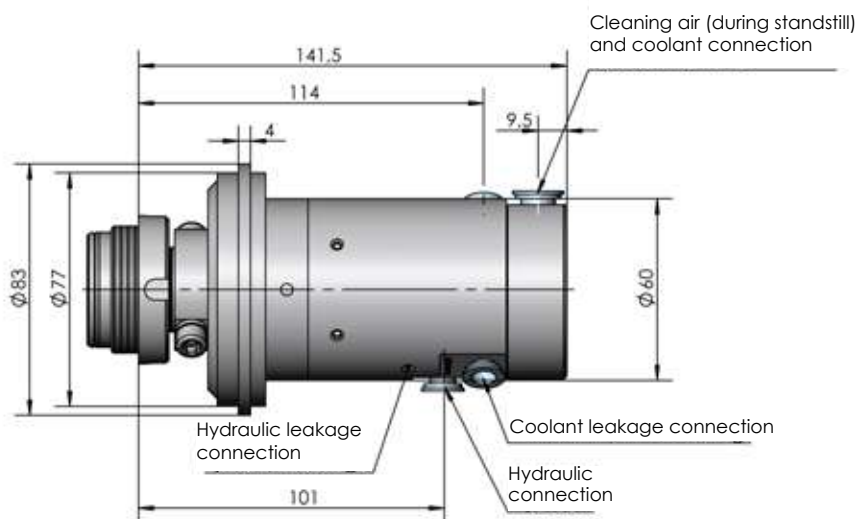
TECHNICAL DATA

Max. RPM	8,000 RPM
Max. coolant pressure	80 bar
Max. hydraulic pressure; n = 0 rpm	160 bar
Max. air pressure; n = 0 rpm	10 bar
Max. compressed air for dry operation (on consultation)	5 bar
Max. stroke of signal ring	12.5 mm

ORDER NUMBER	Mounting	Hydraulic connection
9510212522	M42 × 1.5	Radial
9510205822	M52 × 1.5	Radial



RADIAL

2 9 - 

ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
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2KA-48.0 UNIVERSAL

FEATURES
• Closed sealing surfaces • Hydraulic unclamping of power drawbars • Central coolant supply • Dry operation with compressed air • Suitable for dry operation • Cleaning air during tool changing • Minimum volume lubrication (mixed externally)

TECHNICAL DATA	
Max. RPM	10,000 RPM
Max. coolant pressure	80 bar
Max. hydraulic pressure; n = 0 rpm	160 bar
Max. air pressure; n = 0 rpm	10 bar

ORDER NUMBER	Mounting	Hydraulic connection
9510299812V11	Ø 66/8 M5	Radial
9510299812V10	Ø 66/8 M5	Radial

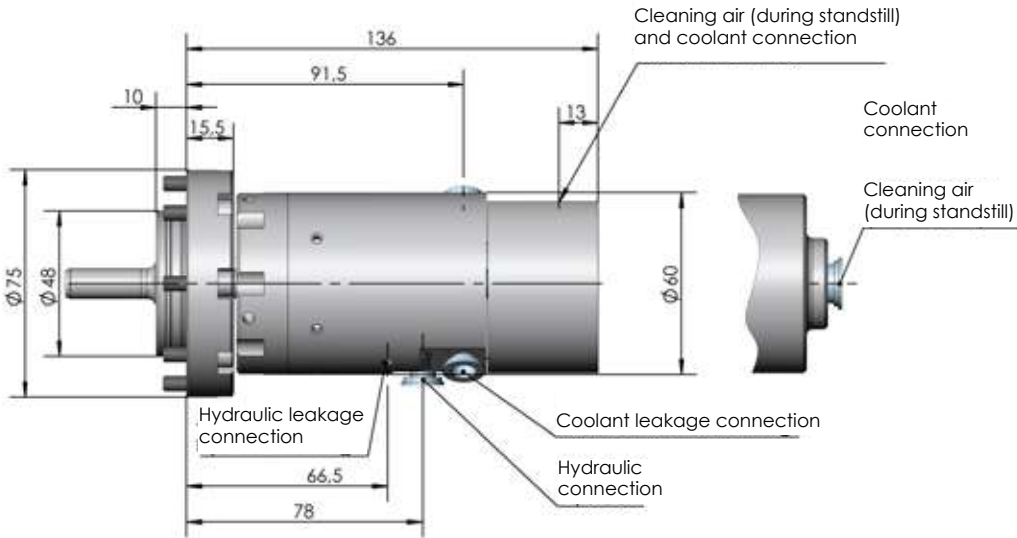


RADIAL

83-

AXIAL

83-



13	14	15	16	17	18	19	20	21	22	23	24
			Rotary union								

ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
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SEAL-KITS IDS-A-Ø8 & SEAL-KITS IDS-R-Ø8

FEATURES
• Closed sealing surfaces • Dry operation with compressed air • Minimum volume lubrication (mixed externally) • Min. passage Ø 8mm

TECHNICAL DATA	
Max. RPM	24,000 RPM
Max. coolant pressure	80 bar
Max. cleaning air pressure; n = 0 rpm	10 bar
Max. compressed air (on consultation)	5 bar

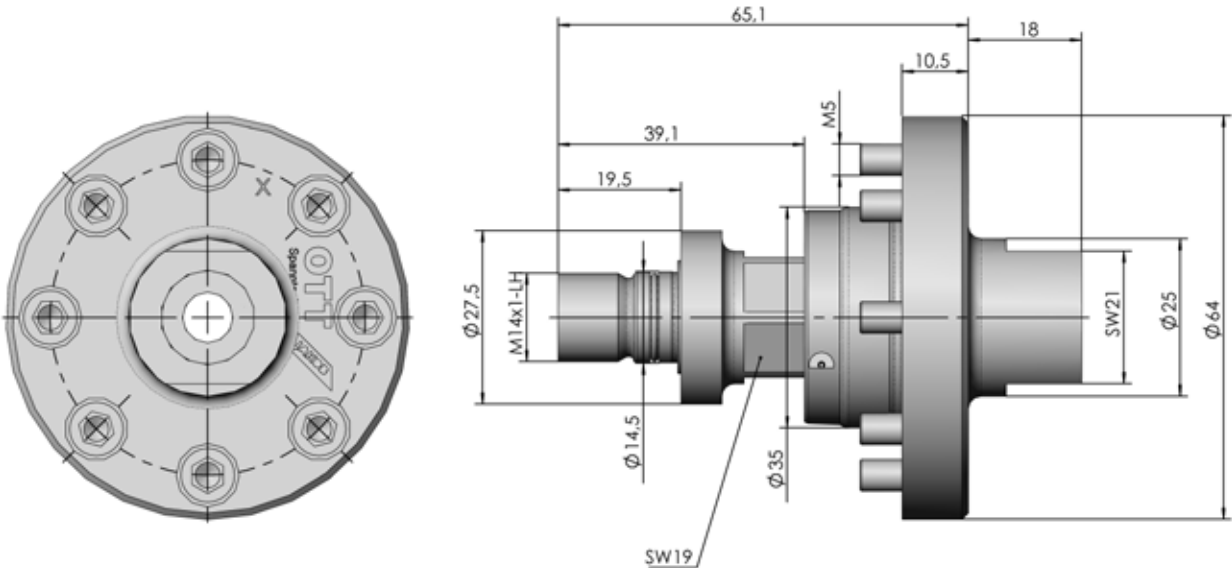
ORDER NUMBER IDS-A-Ø8	Mounting	Hydraulic connection
9510306832	Ø 35 mm	Axial

ORDER NUMBER IDS-R-Ø8	Mounting	Hydraulic connection
9510365332	Ø 30 mm	Radial

AXIAL

40-

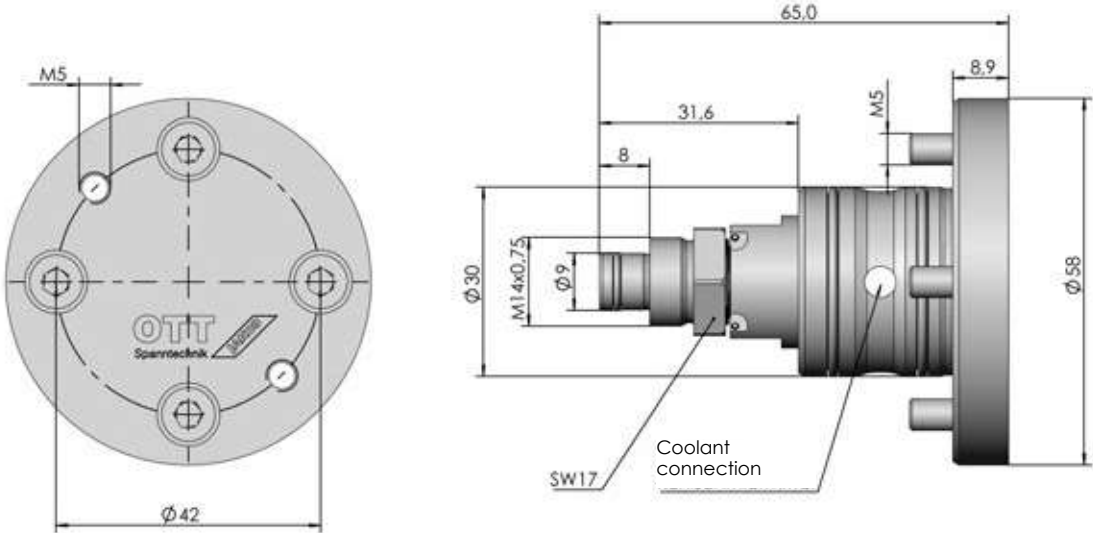




RADIAL

40S





13	14	15	16	17	18	19	20	21	22	23	24
			Rotary union								

1-KR

FEATURES
• Closed sealing surfaces • Hybrid bearing • Dry operation with compressed air • Minimum volume lubrication (mixed externally)

ORDER NUMBER	Mounting	Hydraulic connection
9510442022	M16.5x1.5 LH	Axial

TECHNICAL DATA	
Max. RPM	on demand
Max. coolant pressure	150 bar
Max. minimum volume lubrication	10 bar
Max. cleaning air pressure; n = 0 rpm	10 bar
Max. air pressure; n < 10,000 rpm (on consultation)	5 bar

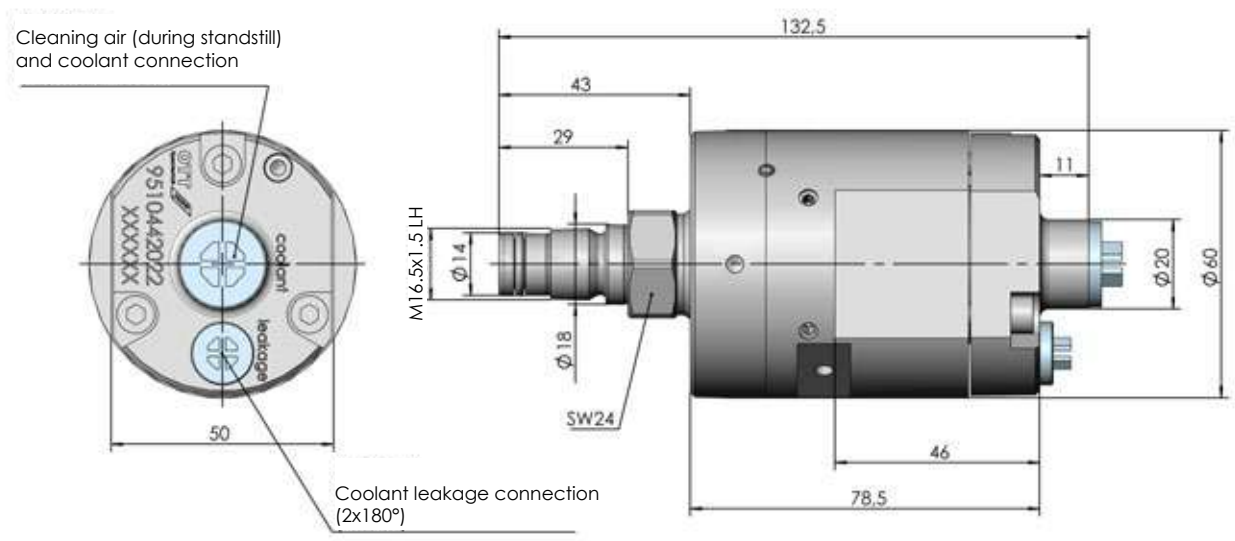
AXIAL

8

8

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ORDER CODE

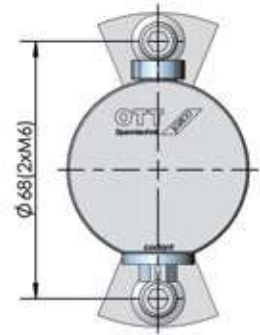
1	2	3	4	5	6	7	8	9	10	11	12
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1K-GD

FEATURES
• Closed sealing surfaces • Hybrid bearing • Dry operation with compressed air • Minimum volume lubrication (mixed externally) • Min. passage $\varnothing$ 6 mm • Balanced design

TECHNICAL DATA	
Max. RPM	36,000 RPM
Max. coolant pressure	80 bar
Max. minimum volume lubrication	10 bar
Max. cleaning air pressure; n = 0 rpm	10 bar
Max. air pressure; n < 10,000 rpm (on consultation)	5 bar

ORDER NUMBER	Coolant/cleaning air connection
9525002230	Axial
9525002130	Radial

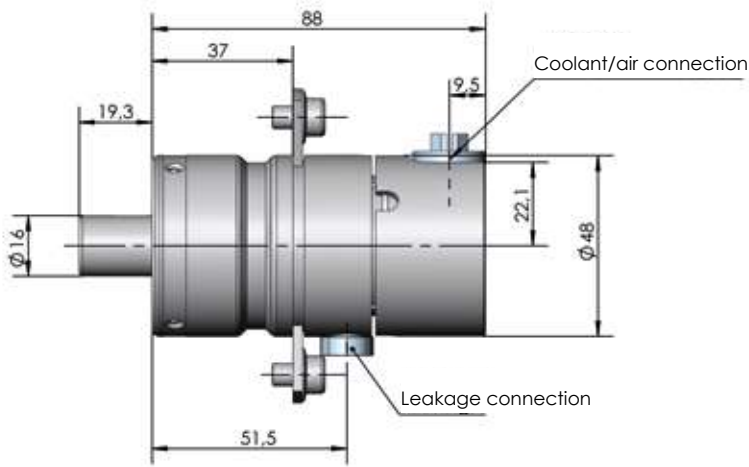


RADIAL

2

1

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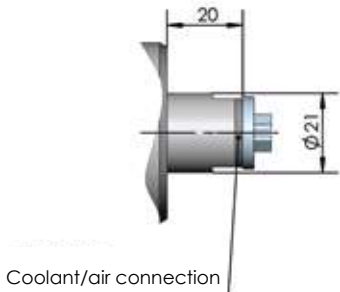


AXIAL

2

2

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Rotary union

1K-GDR

FEATURES

- Closed sealing surfaces
- Dry operation with compressed air
- Minimum volume lubrication (mixed externally)
- Min. passage $\varnothing$ 6 mm
- Balanced design

TECHNICAL DATA

Max. RPM	24,000 RPM
Max. coolant pressure	80 bar
Max. minimum volume lubrication	10 bar
Max. cleaning air pressure; n = 0 rpm	10 bar
Max. air pressure; n < 10,000 rpm (on consultation)	5 bar

ORDER NUMBER

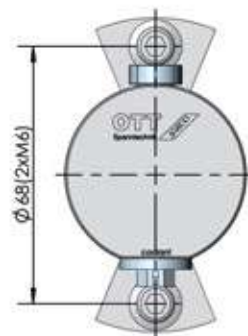
Coolant/cleaning air connection

9525002510

Axial

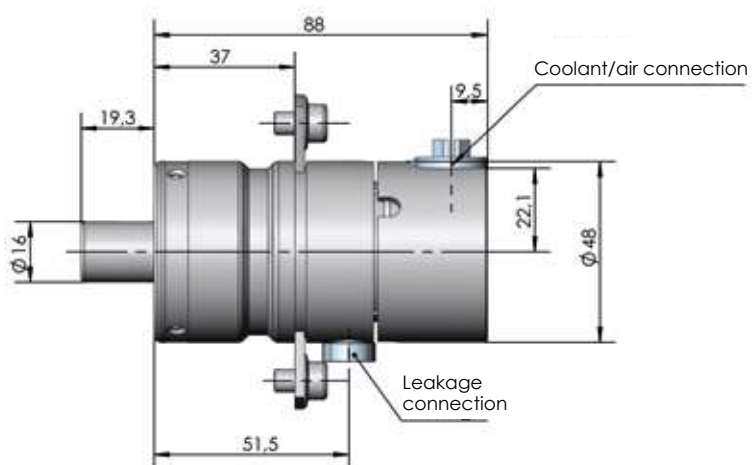
9525002330

Radial



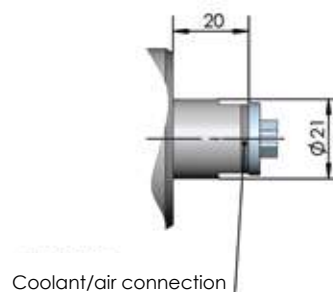
RADIAL

2 3 -



AXIAL

2 4 -



ORDER CODE

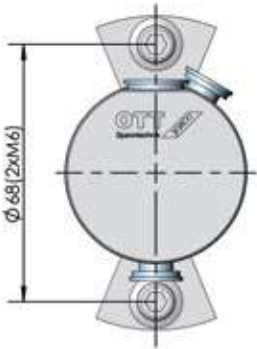
1	2	3	4	5	6	7	8	9	10	11	12
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1K-GDR-LC-2L

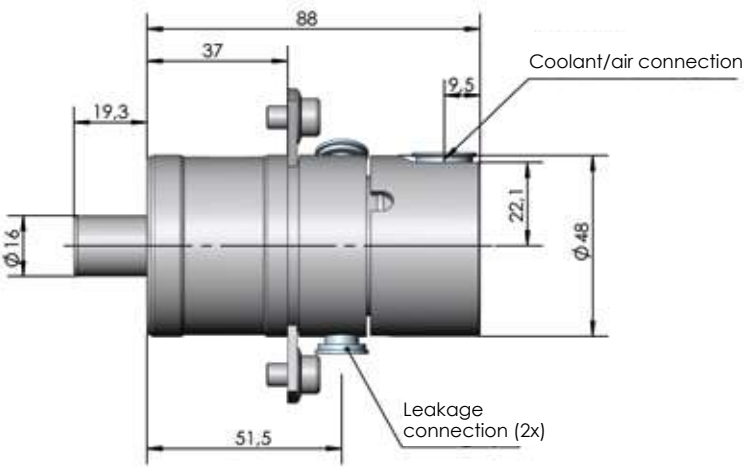
FEATURES
• Closed sealing surfaces • Dry operation with compressed air • Minimum volume lubrication (mixed externally) • Min. passage $\varnothing$ 6 mm • Two drain holes (radial version only)

TECHNICAL DATA	
Max. RPM	20,000 RPM
Max. coolant pressure	50 bar
Max. minimum volume lubrication	10 bar
Max. cleaning air pressure; n = 0 rpm	10 bar
Max. air pressure; n < 10,000 rpm (on consultation)	5 bar

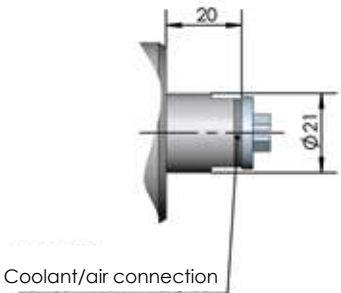
ORDER NUMBER	Hydraulic connection
9525003720	Axial
9525006520	Radial



RADIAL



AXIAL



Rotary union

1K-GDP

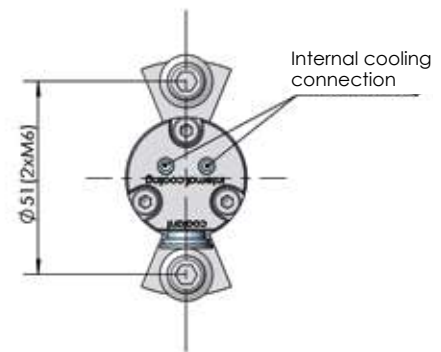
FEATURES

- Closed sealing surfaces
- Hybrid bearing
- Dry operation with compressed air
- Minimum volume lubrication (mixed externally)
- Min. passage $\varnothing$ 3.5 mm
- Balanced design

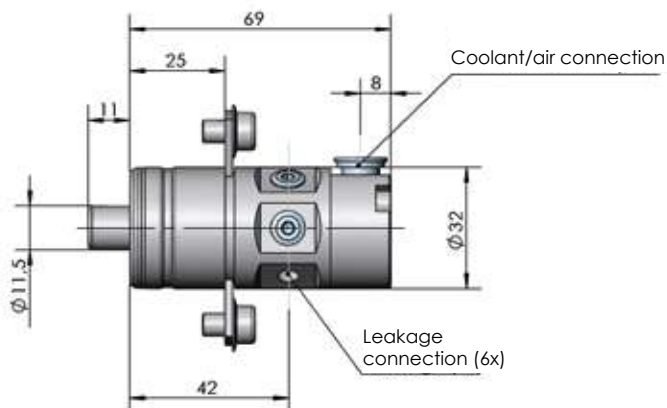
TECHNICAL DATA

Max. RPM	75,000 RPM
Max. coolant pressure	80 bar
Max. minimum volume lubrication	10 bar
Max. cleaning air pressure; n = 0 rpm	10 bar
Max. air pressure; n < 10,000 rpm (on consultation)	5 bar
Min. flow rate of inside cooling of housing	0.5 l/min
Max. coolant pressure of inside cooling of housing	10 bar
Coolant temperature	20–40°C

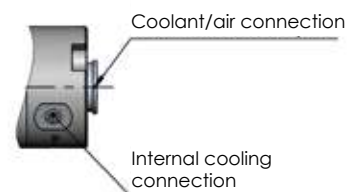
ORDER NUMBER	Coolant/cleaning air connection
9525014720	Axial
9525014220	Radial



RADIAL

E 2 - 

AXIAL

E 7 - 

ORDER CODE

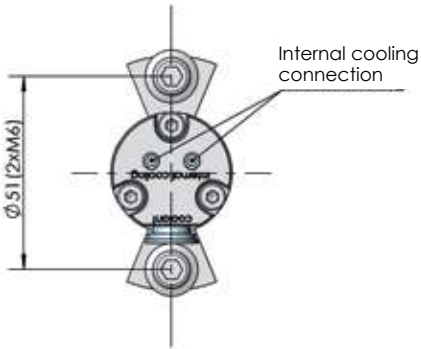
1	2	3	4	5	6	7	8	9	10	11	12
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1K-GDP-LC

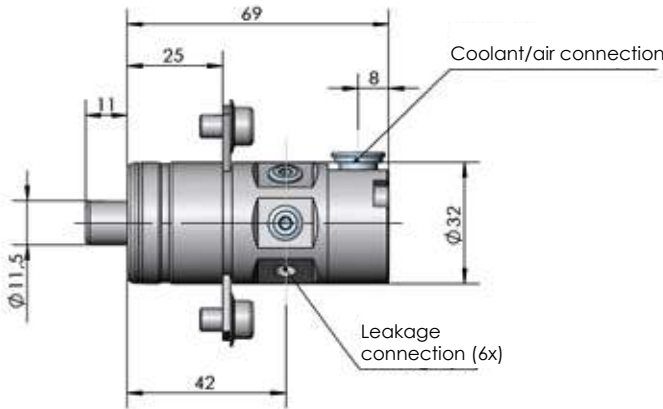
FEATURES
• Closed sealing surfaces • Hybrid bearing • Dry operation with compressed air • Minimum volume lubrication (mixed externally) • Min. passage $\varnothing$ 3.5 mm • Balanced design

TECHNICAL DATA	
Max. RPM	40,000 RPM
Max. coolant pressure	80 bar
Max. minimum volume lubrication	10 bar
Max. cleaning air pressure; n = 0 rpm	10 bar
Max. air pressure; n < 10,000 rpm (on consultation)	5 bar
Min. flow rate of inside cooling of housing	0.5 l/min
Max. coolant pressure of inside cooling of housing	10 bar
Coolant temperature	20–40°C

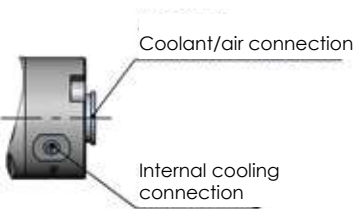
ORDER NUMBER	Coolant/cleaning air connection
9525007120	Axial
9525006820	Radial



RADIAL



AXIAL



Rotary union

1K-GD-SL

FEATURES

- Closed sealing surfaces
- Hybrid bearing
- Dry operation with compressed air
- Minimum volume lubrication (mixed externally)
- Min. passage $\varnothing$ 6 mm
- Balanced design
- Compatible with spindles with sealing air

TECHNICAL DATA

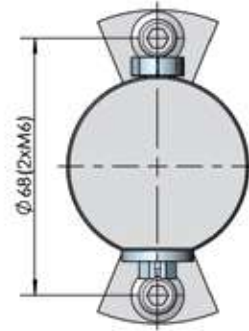
Max. RPM	36,000 RPM
Max. coolant pressure	80 bar
Max. cleaning air pressure; n = 0 rpm	10 bar
Max. air pressure; n < 10,000 rpm (on consultation)	5 bar

ORDER NUMBER

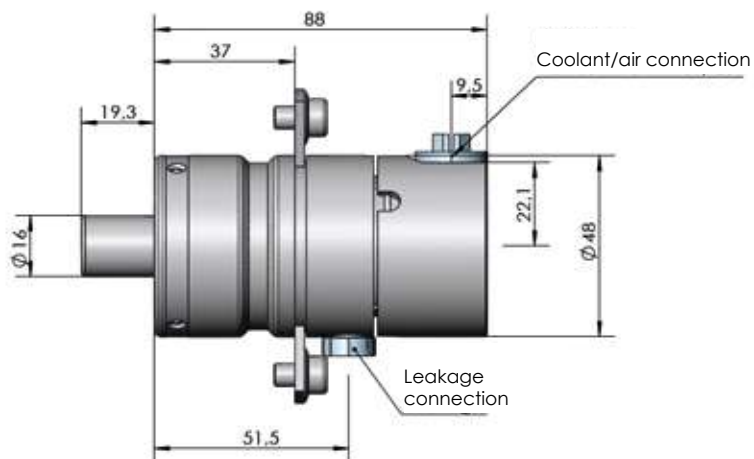
9525002920

Coolant/cleaning air connection

Radial



RADIAL

3 3 - 

ORDER CODE

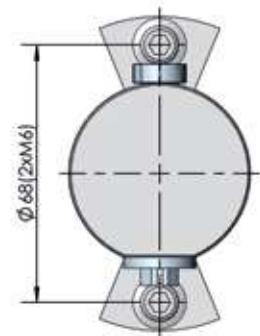
1	2	3	4	5	6	7	8	9	10	11	12
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1K-GD-HD

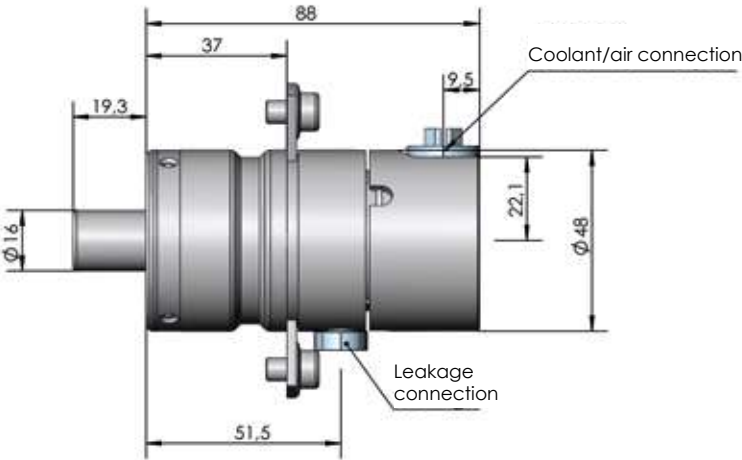
FEATURES
• Closed sealing surfaces • Hybrid bearing • Central coolant supply for high pressure • Dry operation with compressed air • Minimum volume lubrication (mixed externally) • Balanced design

TECHNICAL DATA	
Max. RPM	24,000 RPM
Max. coolant pressure	150 bar
Max. minimum volume lubrication	10 bar
Max. cleaning air pressure; n = 0 rpm	10 bar
Max. air pressure; n < 10,000 rpm (on consultation)	5 bar

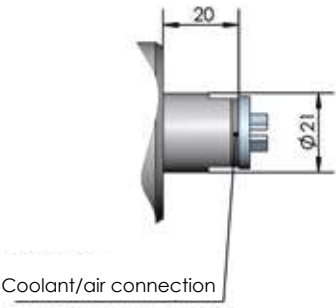
ORDER NUMBER	Coolant/cleaning air connection
9525007520	Axial
9525002820	Radial



RADIAL



AXIAL



Rotary union

1K-GD-K

FEATURES

- Closed sealing surfaces
- Hybrid bearing
- Minimum volume lubrication (mixed externally)
- Min. passage $\varnothing$ 6 mm
- Balanced design
- Suitable for machining glass or ceramic

TECHNICAL DATA

Max. RPM	36,000 RPM
Max. coolant pressure	80 bar
Max. cleaning air pressure; n = 0 rpm	10 bar

ORDER NUMBER

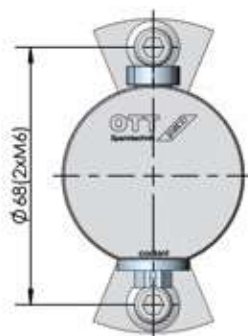
Coolant/cleaning air connection

9525002230V02

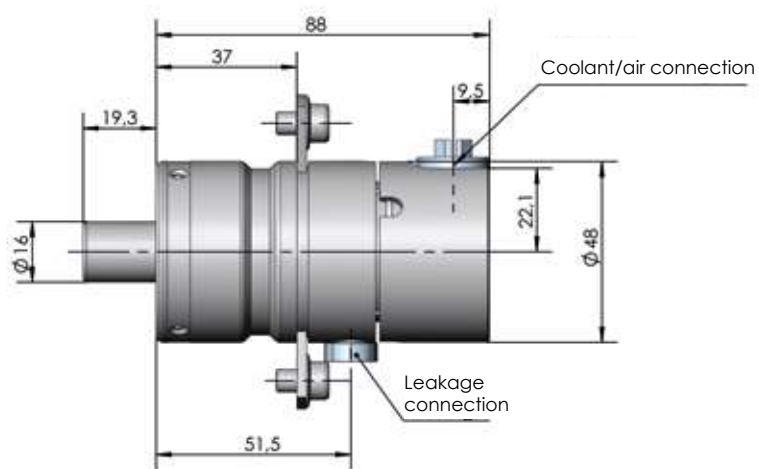
Axial

9525002130V01

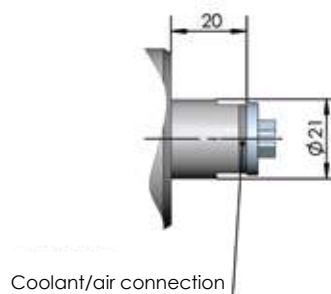
Radial



RADIAL

2 1 K 

AXIAL

2 2 K 

ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
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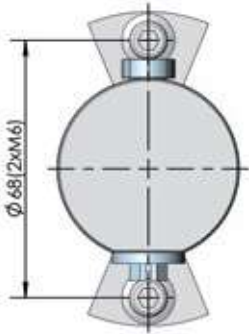
1K-GD-HS-IK

FEATURES

- Closed sealing surfaces
- Hybrid bearing for increased RPM
- Dry operation with compressed air
- Minimum volume lubrication (mixed externally)
- Min. passage $\varnothing$ 6 mm
- Balanced design

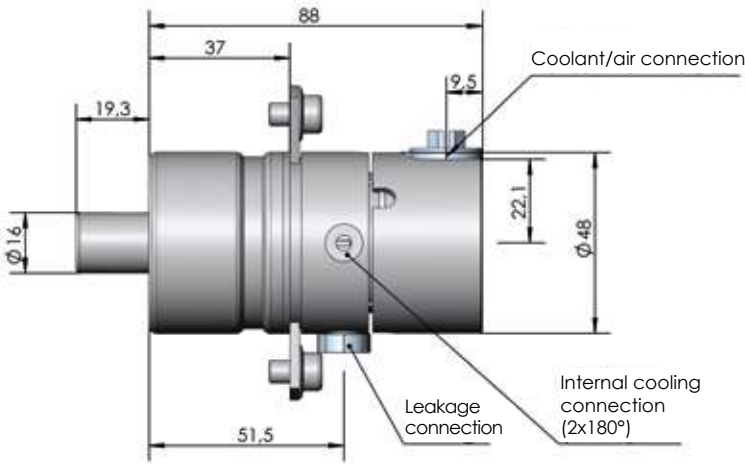
TECHNICAL DATA

Max. RPM	42,000 RPM
Max. coolant pressure	80 bar
Max. minimum volume lubrication	10 bar
Max. cleaning air pressure; n = 0 rpm	10 bar
Max. air pressure; n < 10,000 rpm (on consultation)	5 bar
Min. flow rate of inside cooling of housing	0.5 l/min
Max. coolant pressure of inside cooling of housing	10 bar
Coolant temperature	20–40°C

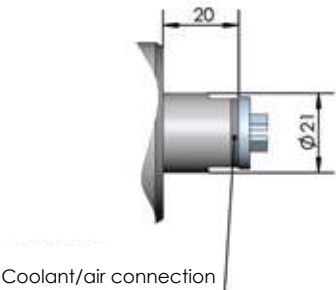


ORDER NUMBER	Coolant/cleaning air connection
9525007420	Axial
9525005220	Radial

RADIAL



AXIAL



Rotary union

1K-GD-RA-08

FEATURES

- Closed sealing surfaces
- Min. passage $\varnothing$ 8 mm
- Hybrid bearing
- Dry operation with compressed air
- Minimum volume lubrication (mixed externally)
- Balanced design

TECHNICAL DATA

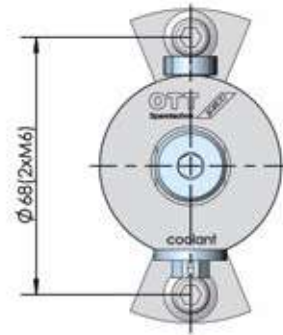
Max. RPM	24,000 RPM
Max. coolant pressure	80 bar
Max. minimum volume lubrication	10 bar
Max. cleaning air pressure; n = 0 rpm	10 bar
Max. air pressure; n < 10,000 rpm (on consultation)	5 bar

ORDER NUMBER

Coolant/cleaning air connection

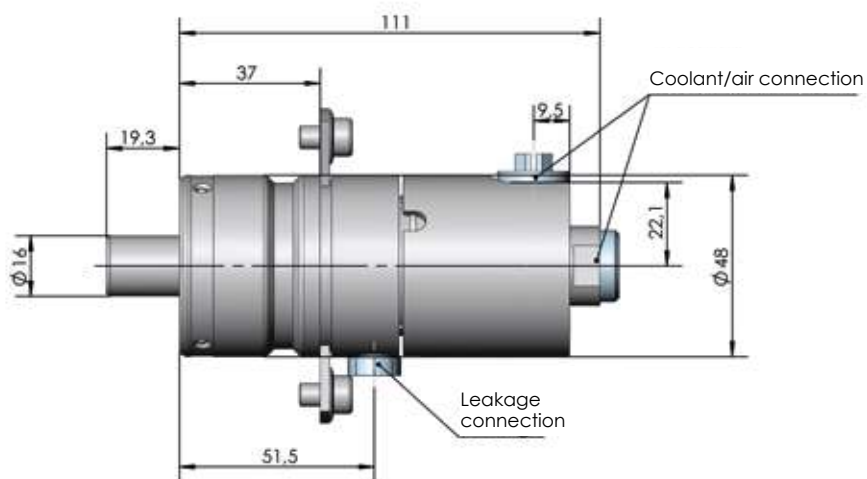
9525003320

Radial/axial



AXIAL

3 4 -



ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
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1K-GD-CM

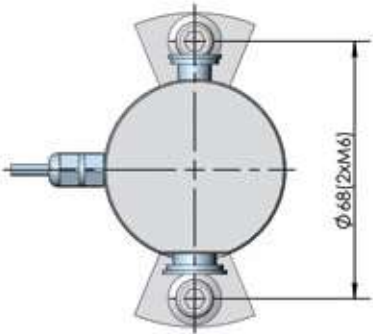
FEATURES

- Closed sealing surfaces
- Hybrid bearing
- Dry operation with compressed air
- Minimum volume lubrication (mixed externally)
- Min. passage $\varnothing$ 6 mm
- Balanced design
- Two-tier leakage and temperature monitoring

TECHNICAL DATA	
Max. RPM	36,000 RPM
Max. coolant pressure	80 bar
Max. minimum volume lubrication	10 bar
Max. cleaning air pressure; n = 0 rpm	10 bar
Max. air pressure; n < 10,000 rpm (on consultation)	5 bar

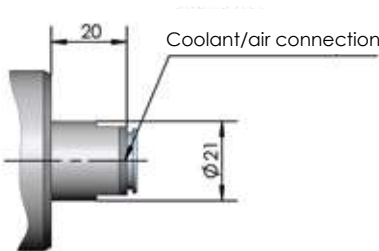
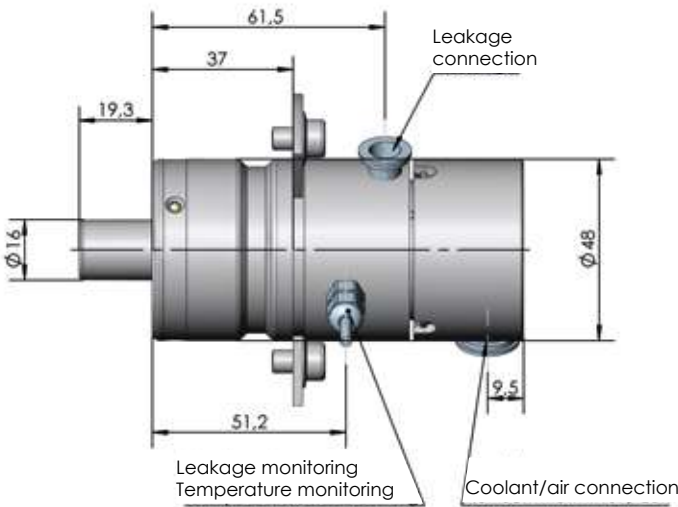
See page 134 for more information on condition monitoring.

ORDER NUMBER	Coolant/cleaning air connection
9525011620	Axial
9525008020	Radial



RADIAL

61-



Rotary union

1K-GDR-CM

FEATURES

- Closed sealing surfaces
- Dry operation with compressed air
- Minimum volume lubrication (mixed externally)
- Min. passage $\varnothing$ 6 mm
- Balanced design
- Two-tier leakage and temperature monitoring

TECHNICAL DATA

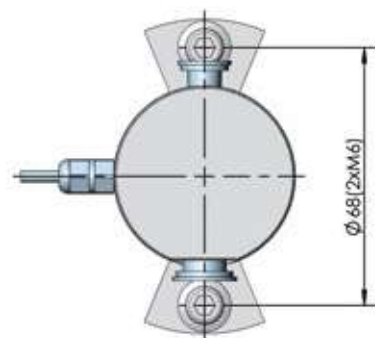
Max. RPM	24,000 RPM
Max. coolant pressure	80 bar
Max. cleaning air pressure; n = 0 rpm	10 bar
Max. air pressure; n < 10,000 rpm (on consultation)	5 bar

See page 134 for more information on condition monitoring.

ORDER NUMBER

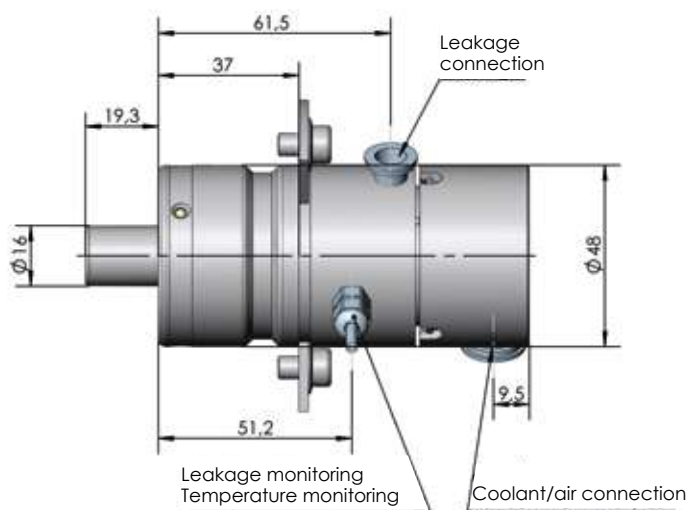
Coolant/cleaning air connection

9525011920	Axial
9525009420	Radial



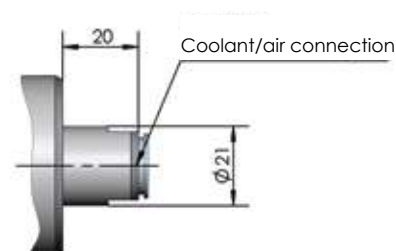
RADIAL

6 3 -



AXIAL

B 9 -



ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
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1K-GDV

FEATURES
• Closed sealing surfaces • Hybrid bearing • Dry operation with compressed air • Minimum volume lubrication (mixed externally) • Min. passage $\varnothing$ 6 mm • Balanced design

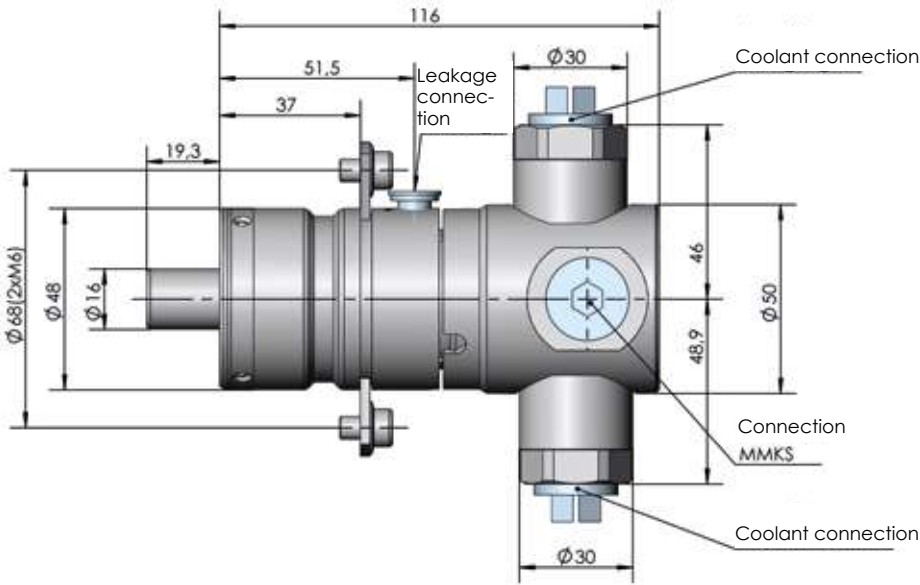
TECHNICAL DATA	
Max. RPM	42,000 RPM
Max. coolant pressure	70 bar
Max. minimum volume lubrication	10 bar
Max. cleaning air pressure; n = 0 rpm	10 bar
Air pressure under rotation	6 bar

ORDER NUMBER	Hydraulic connection
9525010620	Radial



RADIAL

A6-



Rotary union

1K-GD-44

FEATURES

- Closed sealing surfaces
- Hybrid bearing
- To be used with unclamping unit LE124F (page 74)
- Dry operation with compressed air
- Minimum volume lubrication (mixed externally)
- Min. passage $\varnothing$ 6 mm
- Balanced design

TECHNICAL DATA

Max. RPM	36,000 RPM
Max. coolant pressure	80 bar
Max. minimum volume lubrication	10 bar
Max. cleaning air pressure; n = 0 rpm	10 bar
Max. air pressure; n < 10,000 rpm (on consultation)	5 bar

ORDER NUMBER

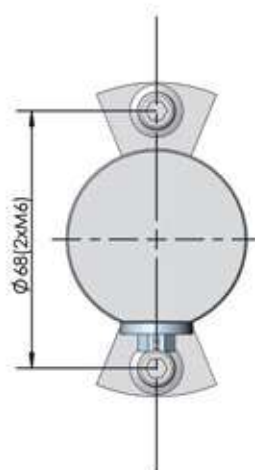
Hydraulic connection

9525003220

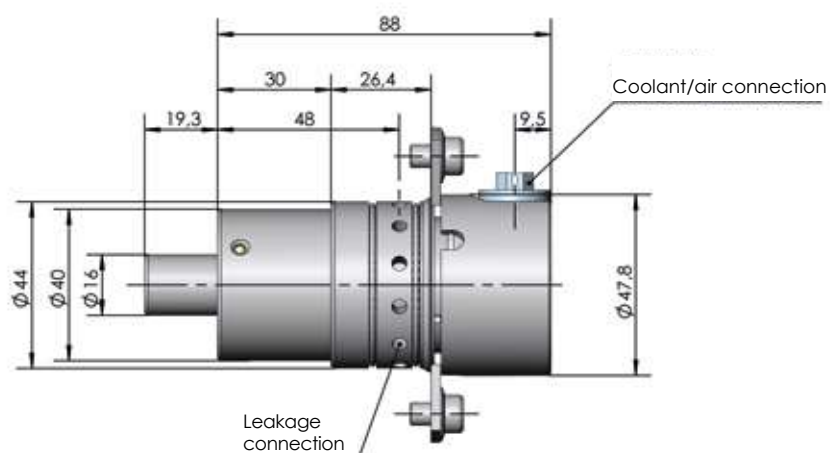
Axial

9525002720

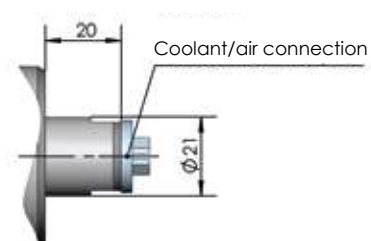
Radial



RADIAL

2 1 S 

AXIAL

2 2 S 

1	2	3	4	5	6	7	8	9	10	11	12
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 1K-GDK-44-IN

FEATURES

- Closed sealing surfaces
- Hybrid bearing
- Dry operation
- Minimum volume lubrication (mixed externally)
- Min. passage $\varnothing$ 6 mm
- For installation in LE 120-F

TECHNICAL DATA

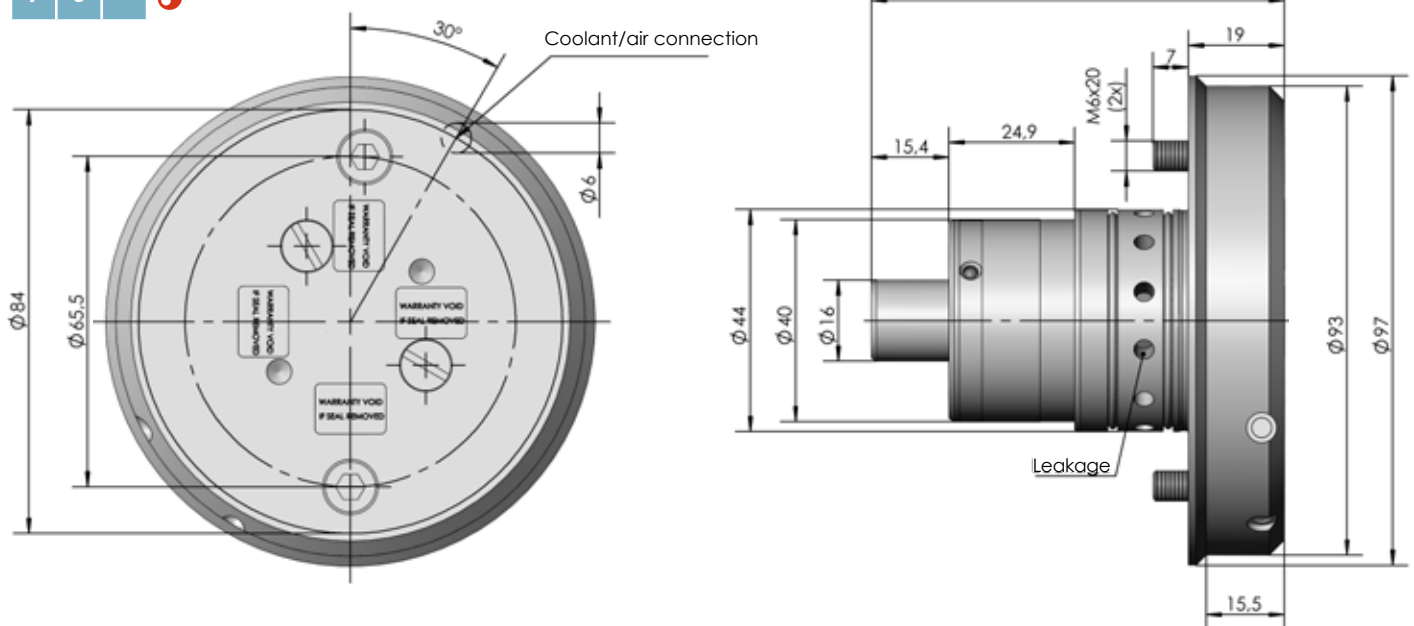
Max. RPM	20,000 RPM
Max. coolant pressure	80 bar
Max. minimum volume lubrication	10 bar
Max. cleaning air pressure; n = 0 rpm	10 bar
Air pressure under rotation	5 bar

ORDER NUMBER

9525007810	Radial
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RADIAL

70 - 



Rotary union

1K-SDR

FEATURES

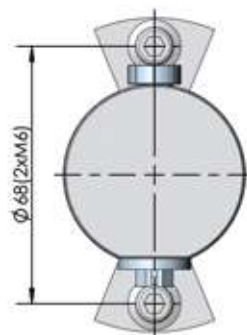
- Air gap seal
- Dry operation with compressed air

TECHNICAL DATA

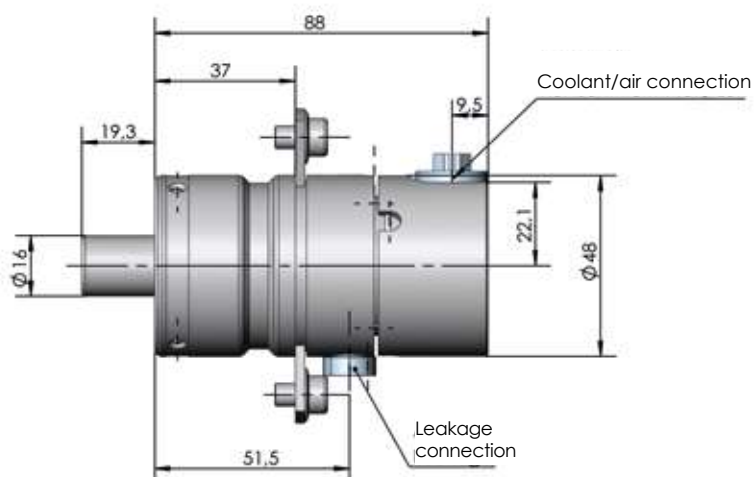
Max. RPM	36,000 RPM
Max. air pressure; n < 10,000 rpm (on consultation)	10 bar

ORDER NUMBER

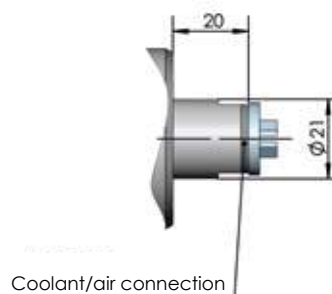
ORDER NUMBER	Hydraulic connection
9525004220	Axial
9525004920	Radial



RADIAL



AXIAL



ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12
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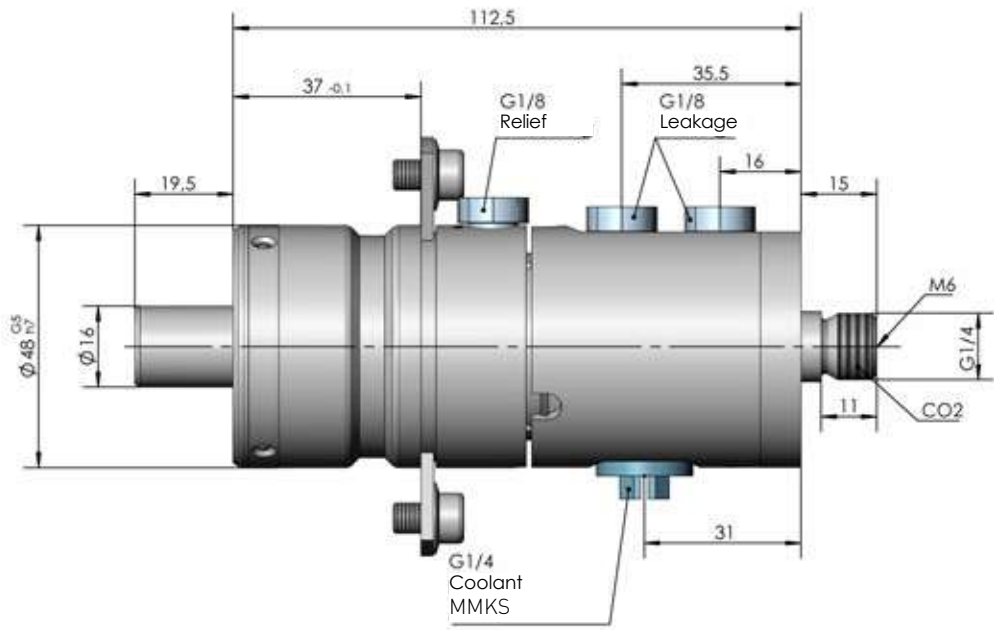
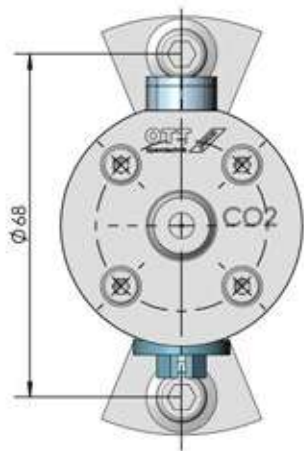
2K-GDSD-CO2

FEATURES
• Closed sealing surfaces • Hybrid bearing • Air gap seal – MMKS/coolant • Dry operation with compressed air • Liquefied CO₂ • Minimum volume lubrication (mixed externally) • Coolants

TECHNICAL DATA	
Max. RPM	18,000 RPM
Liquid CO ₂ pressure	80 bar
Pressure for minimum volume lubrication max.	8 bar
Max. coolant pressure	60 bar

ORDER NUMBER	Coolant/cleaning air connection
9525012210	CO ₂ axial Compressed air MMKS radial

AXIAL



13	14	15	16	17	18	19	20	21	22	23	24
			Rotary union								



ASSISTANCE SYSTEMS

<u>MSU: 3-in-1 monitoring system</u>	<u>page 130</u>
<u>PLANKO: built-in contact face sensing system</u>	<u>page 132</u>
<u>Condition monitoring: Leakage monitoring</u>	<u>page 134</u>
<u>GAUS: telemetry system</u>	<u>page 136</u>

1	2	3	4	5	6	7	8	9	10	11	12
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MSU

3-IN-1 MONITORING SYSTEM



MONITORING OF DRAWBAR SHAFT POSITION, PISTON POSITION AND LEAKAGE

WHY MONITOR ...

▲ ...THE DRAWBAR SHAFT POSITION?

From the drawbar shaft position, the current tool position can be derived, making it possible to determine whether the tool is clamped or unclamped. In this way, a misfed tool is detected before the spindle starts.

▲ ...THE PISTON POSITION?

Monitoring the piston position ensures there is no contact between the piston of the unclamping unit and the rotating spindle shaft during machining.

▲ ...LEAKAGE?

The process-integrated leakage test serves as an early warning system and prevents liquid from entering the spindle.

OUR SOLUTION

MSU – SENSORSYSTEM

MSU is a sensor-based assistance system that can be integrated into OTT-JAKOB unclamping units and combines three monitoring functions: distance measurement, piston monitoring and optional leakage monitoring. Alternatively, the distance measurement system can be integrated into all dual-passage rotary unions.

SYSTEM DESIGN

The integrated distance measuring system for detection of the drawbar shaft position consists of an inductive sensor in the unclamping unit and a target ring on the drawbar shaft connection. Monitoring of the piston position takes place via an inductive sensor on the piston. The leakage sensor is located in the leakage channel. If the leakage is discharged through the unclamping unit, it is guided past the sensor. Regardless of the coolant used, a signal can be output in the event of leakage.

OPERATION

The drawbar shaft position is monitored via an electronic distance measuring system. This detects the exact position of the drawbar shaft and thus the current tool position. The position is output either as an analogue current or voltage signal, or as a digital signal. The system recognises the three clamping states "unclamped", "tool clamped" and "clamped without tool" and forwards the corresponding digital signal to the machine controller. The piston monitoring issues a digital signal to the machine controller as soon as the piston reaches a safe end position. This signal ensures that the piston is in the "tool clamped" state.

The leakage sensor triggers a signal if a programmable flow rate is exceeded.

YOUR ADVANTAGES

COMPACT DESIGN

The sensors and evaluation electronics are pre-assembled in a space-saving manner in the unclamping unit or dual-passage rotary union – this ensures optimum protection against external mechanical influences and avoids additional effort during installation.

HIGH COMPATIBILITY

MSU can be integrated into all OTT-JAKOB unclamping units and also adapted to special solutions. The free choice of output signals makes this system fully compatible with all common machine controllers.

WEAR-FREE MEASUREMENT

Inductive sensors are used to monitor the unclamp piston and drawbar shaft position. The leakage detection sensor functions using the calorimetric measuring principle.

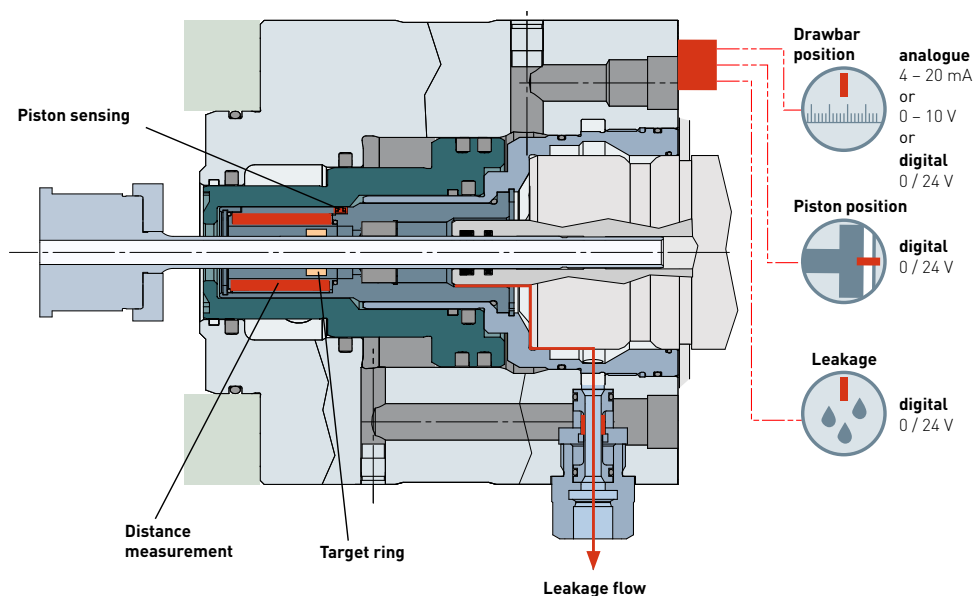
DIVERSE EVALUATION OPTIONS

Further statistical information can be derived from the measurement signals, including the number of tool changes.

MSU sensor system without leakage monitoring:



MSU sensor system with leakage monitoring:

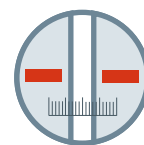


1	2	3	4	5	6	7	8	9	10	11	12
		Features									

PLANKO

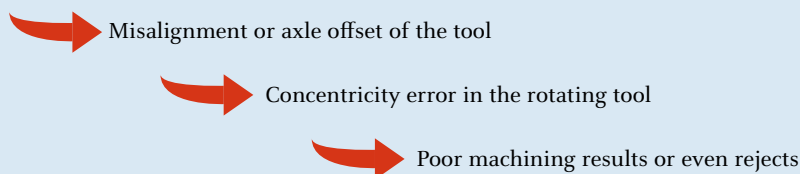
BUILT-IN CONTACT FACE SENSING SYSTEM

FOR MONITORING THE CONTACT SURFACE



WHY TOOL CONTACT FACE SENSING?

Coolant residue can cause chips of material to stick to tool contact surfaces



OUR SOLUTION

PLANKO – CONTACT FACE SENSING SYSTEM

PLANKO enables live monitoring of the clamping quality of HSK tools in the machine tool spindle. The face contact is evaluated using a direct radar distance measurement system in the area of the tool contact surfaces. In the event of chip contamination, the measured air gap is compared against a calibration value stored only once for a correct face contact and the difference is converted into an analogue voltage-signal. This can then be used to evaluate the tool misalignment.

SYSTEM DESIGN

The system consists of a reading head positioned on the motor spindle stator and a passive sensor unit comprising resonator, cable and antenna, any number of which can be integrated into the spindle nose and at any angle.

OPERATION

The reading head generates a high-frequency electromagnetic signal which is transmitted to the antenna on the rotor side via the stator-rotor air interface. This signal is passed on to the resonator through the cable and, due to the reflective metallic walls, forms a resonance. The frequency of this resonance determines the distance of the tool. The quality of the face contact is determined by means of sequential inquiry of the sensors during a rotation.

Deviation from the
optimal tool position

Chip

YOUR ADVANTAGES

HIGHLY PRECISE MEASUREMENTS

During spindle run-up, the sensor element can detect an air gap at spindle speeds of up to 20,000 rpm. The minimum distance resolution depends on the individual design of the contact surfaces and the number of sensors.

SHORT MEASURING TIME

PLANKO is able to identify a missing face contact within around 30 milliseconds of the start of the spindle run-up at a spindle acceleration rate of 1,100 U/s².

COMPACT ASSEMBLY GROUP

The miniaturised reading head incorporates all measurement functions. No other evaluation electronics are necessary in the control cabinet.

COST-EFFECTIVE OVERALL SYSTEM

The number of sensors can be defined freely for the specific application. This makes it possible to implement the system in a design optimised for cost-effectiveness.

EASY TO CALIBRATE

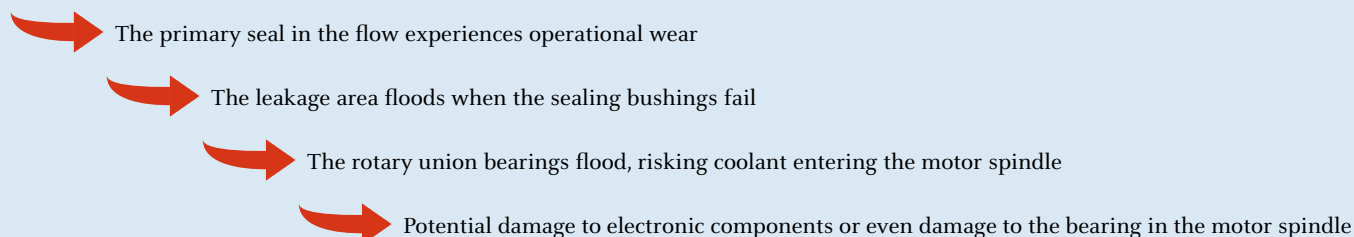
Calibration requires just one tool.

CONDITION MONITORING

LEAKAGE MONITORING



WHY CHOOSE LEAKAGE MONITORING?



OUR SOLUTION – OPTION 1

EXTERNAL LEAKAGE MONITORING

External leakage monitoring detects the presence of coolant or oil in the leakage tube.

SYSTEM DESIGN

With external leakage monitoring, the calorimetric sensor is positioned in a measuring device that is installed in the leakage drain of the rotary union.

OPERATION

If the programmable and predetermined flow rate limit is exceeded inside the tube, a signal is emitted which appears directly on the measuring device or which can be sent to the machine control unit. Two basic variants are available: for water-based and oil-based coolants.



YOUR ADVANTAGES

EASY TO INSTALL

As it is installed in the leakage tube, it is not necessary to interfere with the machine spindle.

VARIOUS APPLICATIONS

Can be used wherever the leakage or drainage of a medium has to be monitored. It is also compatible with rotary unions from other manufacturers.

CAN BE RETROFITTED

It can be installed at a later date without having to replace the rotary union.

TECHNICAL DATA

Wear detection	An alarm sounds after 30 seconds if the (average) leakage is > 100 ml/min
Breakdown detection	An alarm sounds after 10 seconds if the (average) leakage is > 250 ml/min
Permissible media (depending on order)	Coolant (aqueous emulsion, max. 15% oil) Hydraulic oil Water
Required media purity	-/17/14 (under ISO 4406)
Filter grade	50 µm
Operating voltage	24 V DC (+/-10%)
Max. power consumption	100 mA
Transistor	PNP
Max. output current	100 mA (short-circuit-proof)
Temperature range of medium	0–85°C
Working temperature of electronics	50°C
Order number	9580001020

13	14	15	16	17	18	19	20	21	22	23	24
			Rotary union								

OUR SOLUTION – OPTION 2

INTERNAL LEAKAGE MONITORING (1K-GD-CM/1K-GDR-CM)

A two-tier sensor monitors possible coolant leakage in the area of the sealing bushings and flooding of the bearings inside the rotary union.

SYSTEM DESIGN

OTT-JAKOB rotary unions with integrated CM are using two calorimetric sensors for measuring leakage flow rates. It also features temperature sensors.

OPERATION

A blockage in the leakage drainage causes coolant to build up. If a certain level in the leakage area of the rotary union is exceeded, the rotary union bearings are at risk of being flooded. A switching output signals this condition in the form of information. Likewise, a switching signal is generated if coolant enters the bearing of the rotary union. Both outgoing switching signals are generated separately. This makes it possible to generate a prewarning level.



YOUR ADVANTAGES

TROUBLE-FREE RETROFITTING

As a part of our modular product range, an existing OTT-JAKOB GD rotary union can be retrofitted without further modifications.

BUILT-IN TEMPERATURE SENSOR

Rotary union temperature monitoring in all operating modes.

1K-GD-CM:



1K-GDR-CM:



TECHNICAL DATA

SENSOR			
Permissible operating temperature	0 ... 85°C		
Temperature threshold 1	80°C		
Temperature threshold 2	100°C		
Permissible bearing temperature	0 ... 85°C		
	Min.	Typical	Max.
Operating voltage U_B , all of the details below are based on this value	18 V	24 V	30 V
Operating current without load at output 1 and 2			70 mA
Voltage level of outgoing signal 1 when "low"	0 V		$0.1 \times U_B$ V
Voltage level of outgoing signal 1 when "high"	$0.9 \times U_B$ V		U_B V
Maximum current at output 1			
Voltage level of outgoing signal 2 when "low"	0 V		$0.1 \times U_B$ V
Voltage level of outgoing signal 2 when "high"	$0.9 \times U_B$ V		U_B V
Maximum current at output 2			-100 mA
Voltage at T_IRX	5 V		30 V
Voltage at T_TX	5 V		30 V

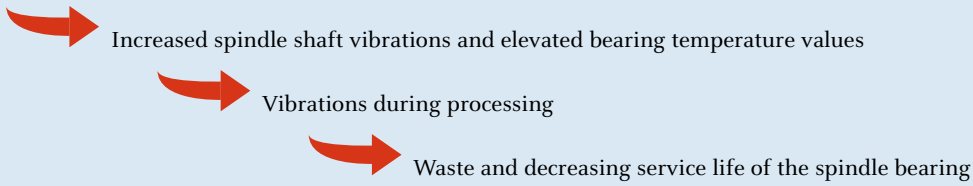
GAUS TELEMETRY SYSTEM

FOR MONITORING THE BEARING'S INTERNAL TEMPERATURE



WHY TEMPERATURE MONITORING?

Defective bearing pressure angle position caused by collision of the spindle with components in the machining area



OUR SOLUTION

GAUS TELEMETRY SYSTEM

GAUS is a modular telemetry system for recording the bearing's internal temperature. In addition, GAUS can be used to monitor the spring force as well as vibrations on rotating components.

SYSTEM DESIGN

GAUS consists of an inductively coupled transponder system which transfers energy between stator and rotor electronics with integrated radio transmission.

OPERATION

A temperature sensor on the rotor determines the bearing's internal temperature and sends the raw data to the stator. The measurements are evaluated there. The recorded temperature data is transferred via a 4–20 mA interface. The measured spring force is output to a 4–20 mA interface in a linear manner. Vibration measurements are provided via an RS232 interface.



YOUR ADVANTAGES

OPERATION AT HIGH SPEEDS

Due to its zero-contact construction and small installation area, GAUS can be used at high speeds of up to 32,000 rpm.

CONTINUOUS MONITORING

GAUS features an approximately 2 mm air gap for continuous measurement during machining and when the machine is idle.

STABLE DATA TRANSFER

The send/receive structure is independent of the angle and, as such, guarantees robust measurement logging and reliable radio transmission in any tool position.

MONITORING IN ANY POSITION

Measurements are possible in all possible drawbar shaft states. The axial displacement of the drawbar shaft's head or the spindle shaft relative to the receiver in the unclamping unit has no negative impact on the transfer.

F





OUR PRODUCT HIGHLIGHTS

OTT-JAKOB – YOUR COMPLETE SYSTEMS SPECIALIST.

The modular system presented on the previous pages is only a general framework for complete clamping systems. Besides the aforementioned standards, our main strength lies in new developments to solve complex problems that cannot even be covered by those standards. The following pages contain selected special solutions, highlights and current new developments.

<u>Fastest clamping system</u>	<u>page 140</u>
<u>Strongest clamping system</u>	<u>page 141</u>
<u>Shortest clamping system</u>	<u>page 142</u>
<u>Longest clamping system</u>	<u>page 143</u>
<u>Power drawbar with gas spring</u>	<u>page 144</u>
<u>CO₂ rotary union</u>	<u>page 145</u>
<u>ELLE – electric unclamping unit</u>	<u>page 146</u>
<u>Wood processing</u>	<u>page 147</u>
<u>Clamping unit for tool adjustment</u>	<u>page 148</u>
<u>Hollow shaft unclamping unit</u>	<u>page 149</u>

ORDER CODE

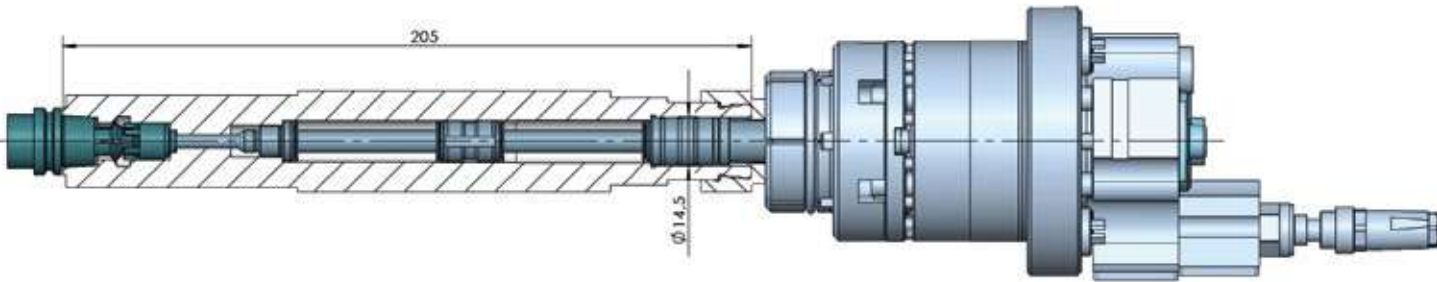
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FASTEST CLAMPING SYSTEM

TECHNICAL DATA	
Clamping force (static)	2.8 kN
RPM	75,000 min ⁻¹
Piston ø	41.5 mm
Piston area	10 cm ²
Max. oil volume	11 cm ³



The miniaturisation trend for electronic components is ongoing and is being driven by developments in the field of mobile devices such as smartphones. OTT-JAKOB clamping systems designed for maximum RPM are used in specially developed machines in order to drill the circuit boards.

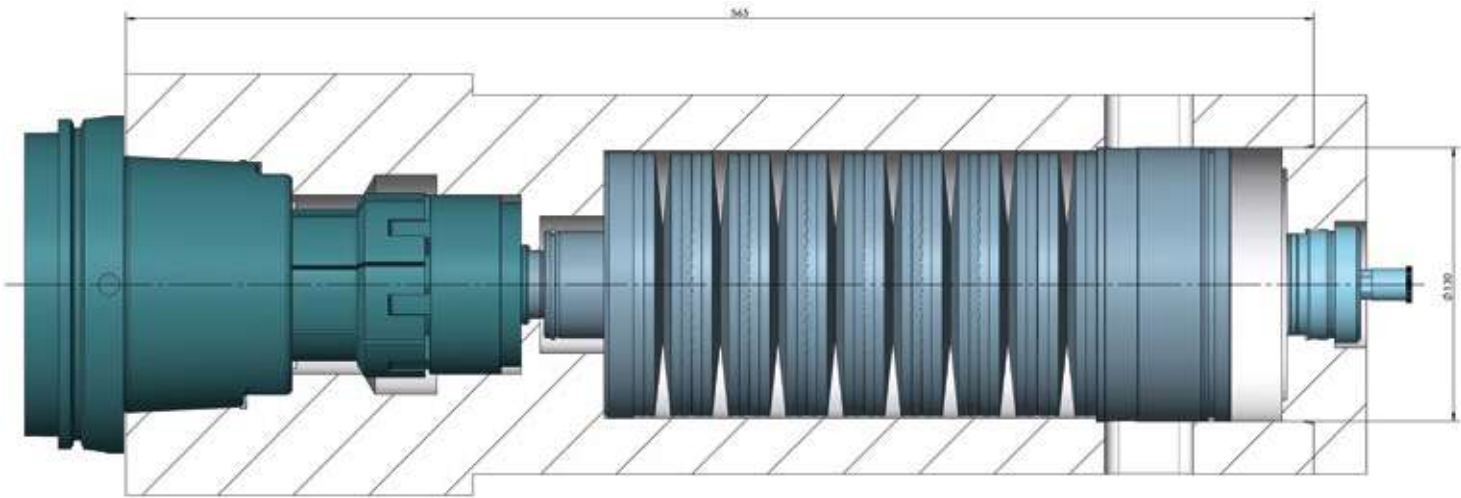


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I	F	-	1	6	0	A	K	M	1	-	G	G	0	0	1	1	-	0	5	6	5	,	0

STRONGEST CLAMPING SYSTEM

TECHNICAL DATA	
Clamping force (static)	150 kN
RPM	250 min ⁻¹
Piston ø	130 mm
Piston area	133 cm ²

Aeroplane components that are subjected to high mechanical stresses, for example, undercarriages, are made of titanium or titanium alloys in modern planes. High torque is required to machine titanium due to its specific properties. High pull-in forces are needed to connect the tool holder to the spindle securely whilst absorbing the powerful forces of the machining process. Our strongest clamping systems are designed to machine difficult materials and are installed in machines and spindles that are used to manufacture aeroplane components.



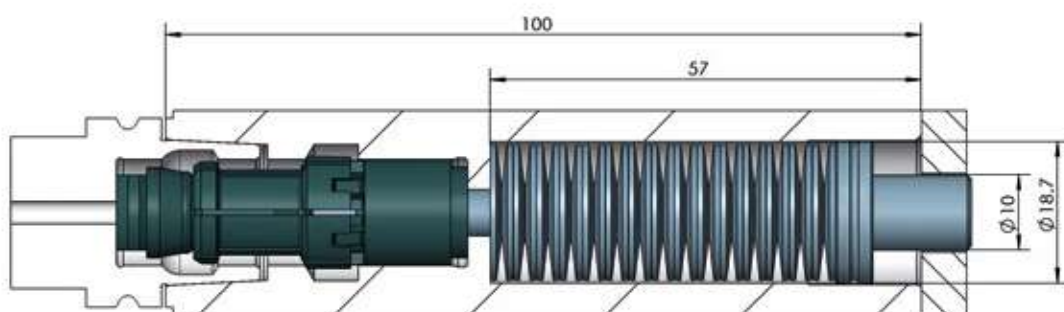
ORDER CODE

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I	F	H	2	5	-	E	K	W	2	-	0	-	0	0	0	0	-	0	1	0	0	,	0

SHORTEST CLAMPING SYSTEM

TECHNICAL DATA

Clamping force (static)	2.3 kN
RPM	50,000 min ⁻¹
Piston ø	18 mm
Min. release force	2.0 kN



Many dental surgeries use a dental manufacturing solution that can produce replacement teeth, largely eliminating the need for dental casts. An intraoral camera is used to measure the tooth precisely using a few digital photos. The replacement tooth is then designed to fit perfectly on a computer and produced by a linked machine tool. Fitted with our shortest clamping systems, the end product is milled from a ceramic block in minutes. The replacement tooth can often be fitted in the same session.

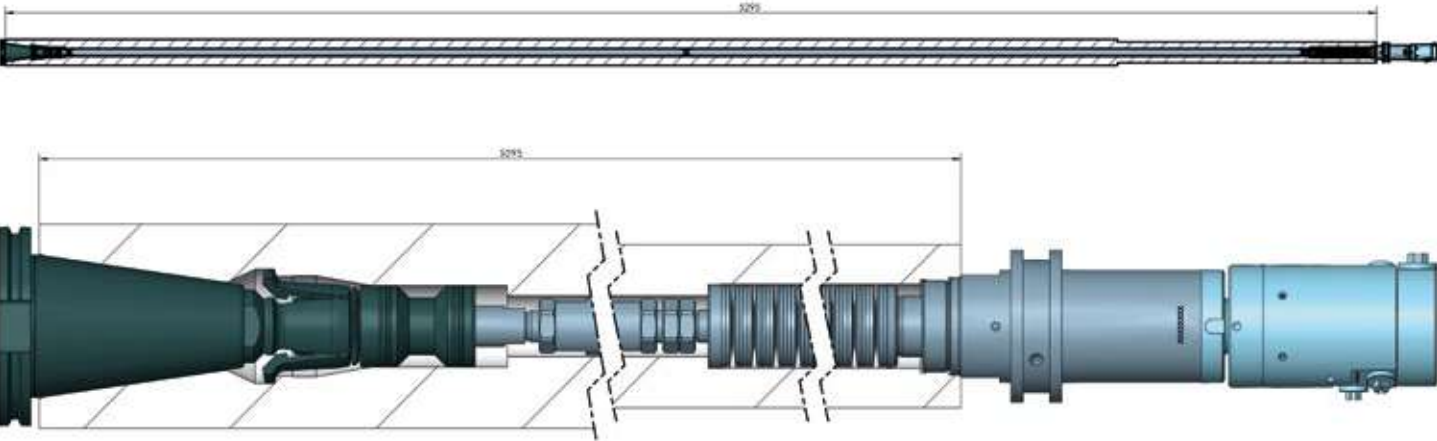
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E	S	-	4	0	-	A	1	-	2	X	H	-	0	0	2	5	-	5	2	9	5	,	0

LONGEST CLAMPING SYSTEM

TECHNICAL DATA	
Clamping force (static)	25 kN
RPM	2,000 min ⁻¹
Piston ø	48 mm
Piston area	17.15 cm ²
Max. oil volume	55 cm ³



The growing use of wind power as a renewable source of electricity has led to the construction of increasingly large wind turbines. In offshore wind farms, turbine blade lengths of 80 m and more are not uncommon. The enormous forces generated by these blades have to be absorbed by the hubs and transferred to the gears and the generator. Once cast, large machining and drilling centres are required to machine the huge hubs. These machines are fitted with our longest clamping systems. This makes it possible to reach and produce the necessary holes, even the internal ones.

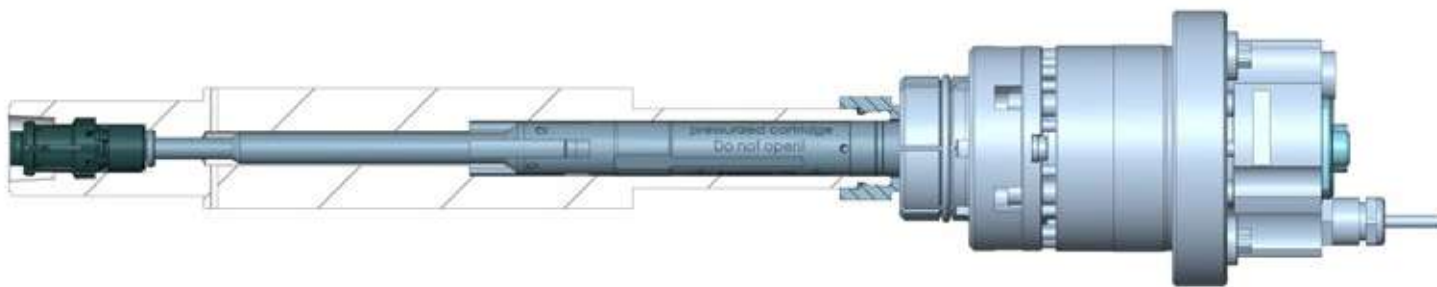


ORDER CODE

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I	F	G	2	5	-	E	B	-	5	-	E	-	5	9	0	7	-	0	2	5	7	,	5

CLAMPING SYSTEM WITH GAS SPRING

TECHNICAL DATA	
Clamping force (static)	2.3 kN
RPM	75,000 min ⁻¹



Optical components, such as lenses for cameras on mobile phones, are only rarely made of glass and are now mainly produced using a plastic die-casting process. The required moulds are manufactured on small milling machines with very high speeds. As vibrations have to be kept to an absolute minimum during the machining process, OTT-JAKOB clamping systems with gas springs are used in these machines.

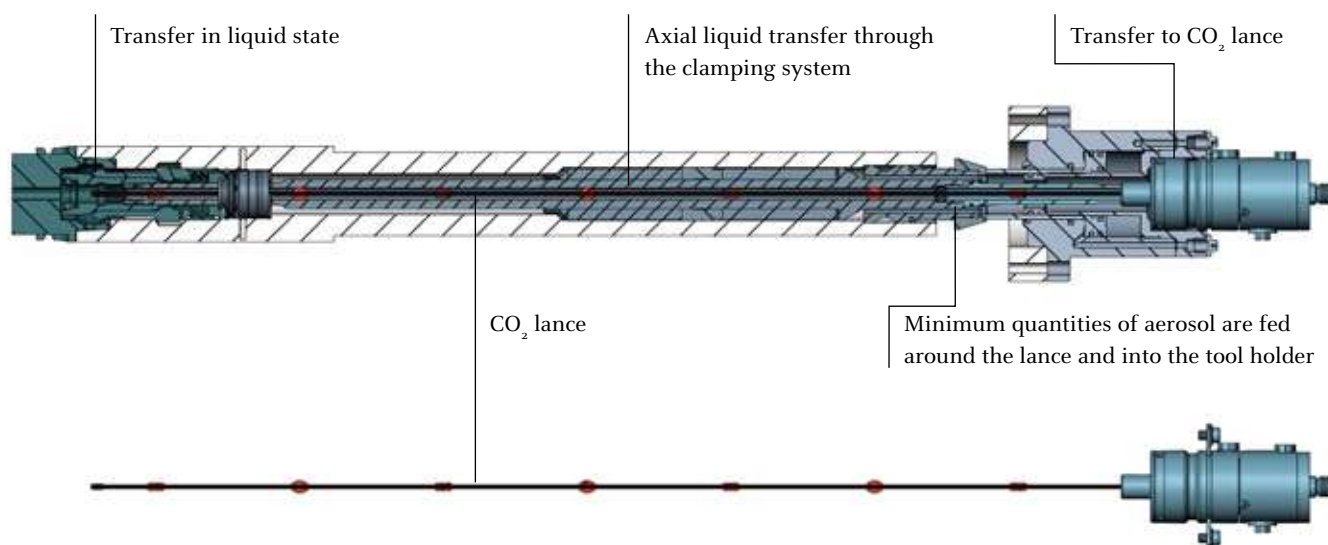


ORDER CODE

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I	F	H	6	3	-	A	B	-	5	-	K	-	0	4	B	2	-	0	6	9	8	,	5

CLAMPING SYSTEM FOR THE TRANSFER OF LIQUEFIED CO₂

TECHNICAL DATA	
Max. RPM	18,000 min ⁻¹
Liquid CO ₂ pressure	80 bar
Max. MQL pressure	8 bar
Max. coolant pressure	60 bar



Cryogenic cooling with CO₂ is growing in relevance. Advantages are to be expected, or have already been confirmed by university research projects, in the rough machining of hard-to-machine materials such as turbine steel and nickel-based alloys in particular:

- ▲ Significant process cooling
- ▲ Higher productivity with no impairment to tool service life
- ▲ Lower manufacturing costs

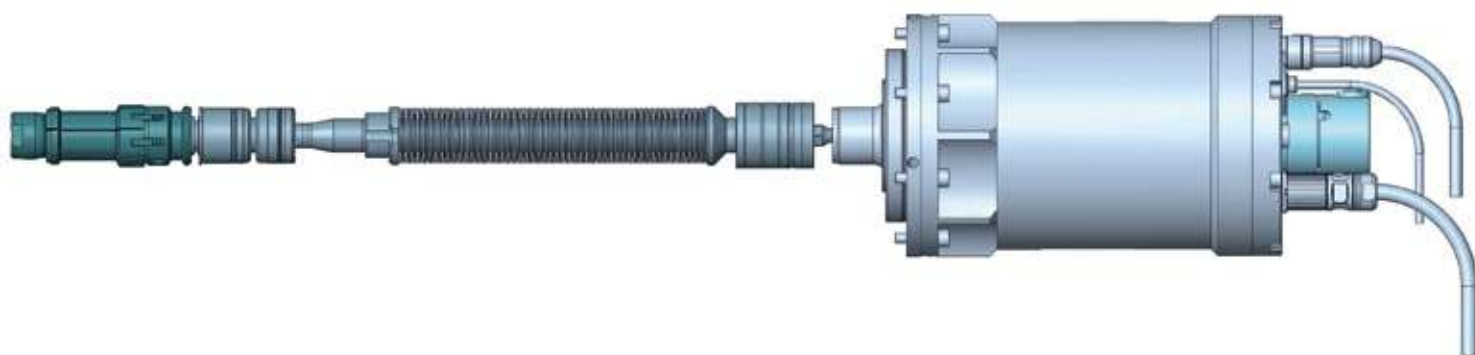
For the CO₂ to have its cooling effect on the cutting edge of the tool, the liquid gas has to be pressurised when transferred through the spindle to the tool holder and not experience any changes in cross section. For this high-tech field, OTT-JAKOB has developed a special rotary union and lance, as shown above, that can be used for these applications.

ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
I	F	H	6	3	-	A	B	-	5	-	E	-	7	0	2	1	-	0	4	6	5	,	0

ELECTRIC UNCLAMPING UNIT

TECHNICAL DATA	
Release force F_L	10 kN
Clamping/unclamping cycles	Max. 6 changes per min
Nominal output	1.5 kW
Nominal current	1.82 A _{eff}
Motor operating mode	S7 10%
Recommended inverter output	6.6 kVA



Hydraulic unclamping units are often unsuitable for workpieces made of carbon (e.g. components for quad or octocopters), wood or composites. This is largely due to the fact that the mostly small workbench-mounted machines that are used have no hydraulic unit. Additionally, other parts are frequently attached to the milled areas, which is why oil contamination is disadvantageous. The electric unclamping unit ELLE from OTT-JAKOB is a solution developed especially for such machining applications as well as for electrically operated spindles.



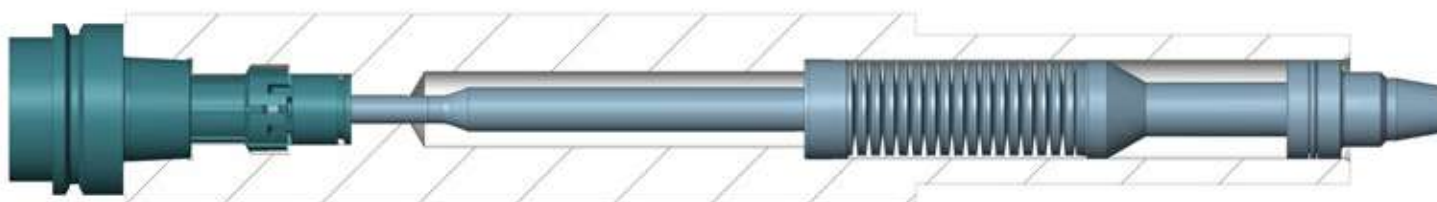
ORDER CODE

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I	F	H	6	3	-	F	D	S	8	-	K	-	0	0	0	0	-	0	4	5	2	,	0

WOOD PROCESSING

TECHNICAL DATA

Release force F_L	7.1kN
RPM	24,000 min ⁻¹
Clamping force	11kN
Interface	HSK F-63



Both in large furniture factories and in small joineries, CNC machines are used to machine wood. They are used for all work steps, such as sawing, drilling, milling, grinding, gluing edges and much more. A wide range of products are produced in this way – window frames, doors, wall panelling, tables and chairs as well as components for wooden houses. For applications in the wood industry OTT-JAKOB offers adapted clamping systems without coolant lubricant transfer, as well as the F63 clamping unit, which was specially developed for wood processing.



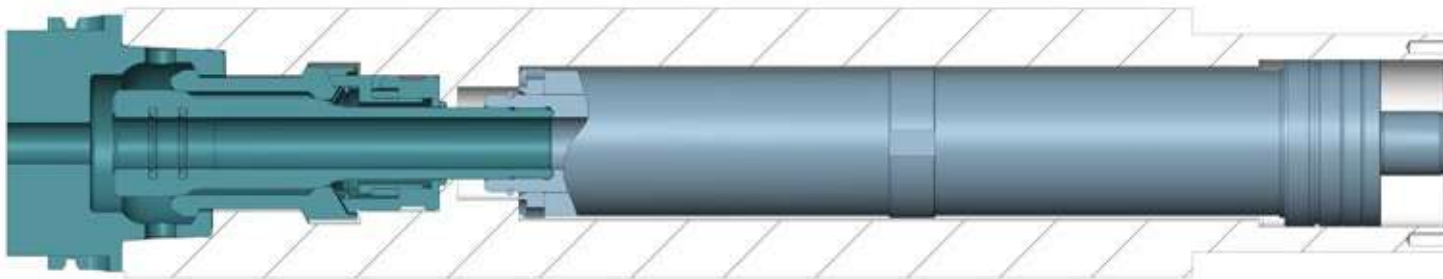
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I	F	-	1	0	0	A	B	S	2	-	K	-	0	0	0	0	-	0	5	1	8	,	0

CLAMPING UNIT FOR TOOL ADJUSTMENT

TECHNICAL DATA

Clamping force	45 kN
Clamping unit bore	20mm H7
RPM	5,000 min ⁻¹



To make production more efficient, tools that can be adjusted during processing are also used. In the so-called cross-feed process, the cutting edge is controlled via an additional axis in the tool. With another drive, this ensures maximum process reliability and a significant reduction in machining time. For these applications, which are mainly found in engine and transmission construction, OTT-JAKOB offers a clamping unit through which this kind of actuation can occur.



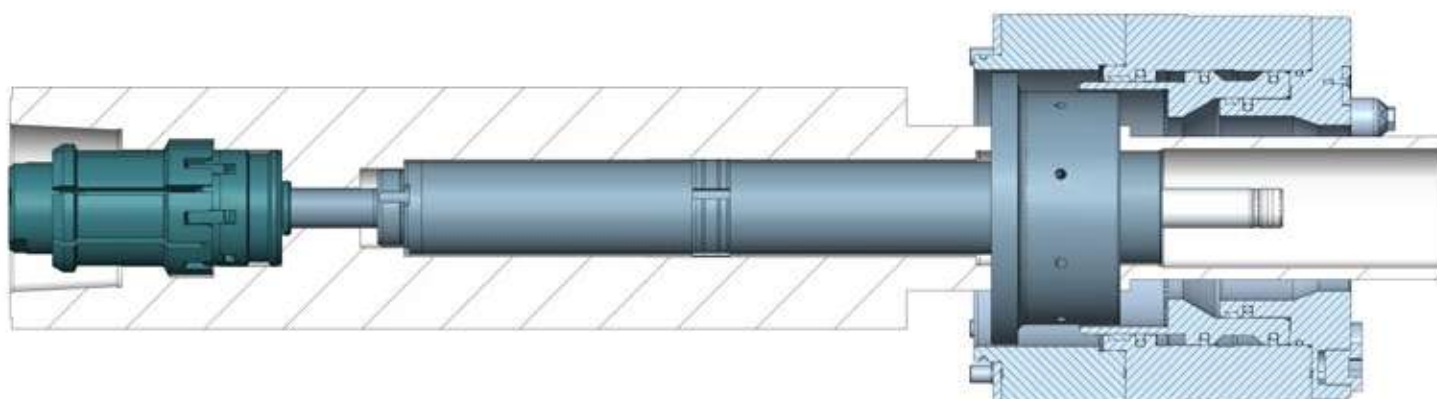
ORDER CODE

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I	F	-	1	0	0	E	B	-	5	-	M	9	0	0	0	0	-	0	5	9	4	,	0

HOLLOW SHAFT UNCLAMPING UNIT

TECHNICAL DATA

Holder Ø	140 mm
Piston area (unclamping)	44.2cm ²



Directly driven spindles place special demands on the system design. The characteristic structure of such spindles – electric motor, coupling and machining spindle – makes transferring coolant for the tool very complex. For this reason, this spindle structure is predominantly found in grinding spindles that do not require coolant. Likewise, automatic tool changing becomes difficult with this design. With the hollow shaft unclamping unit from OTT-JAKOB, the structure can be retained while at the same time the tool can be changed automatically. In addition, this unclamping unit allows the transfer of cleaning air and monitoring of the drawbar shaft position.





POWER-CHECK

POWER-CHECK

WHY MONITOR PULL FORCE?

In machine tool technology, monitoring pull force as part of quality assurance is essential in order to guarantee consistently precise machining results. Reduced clamping force can have a long-term impact:

- ▲ Poor surface quality due to vibrations
- ▲ Increased tool wear and shorter tool life spans
- ▲ Spindle taper corrosion caused by micro-movements
- ▲ Tool breakage
- ▲ Machine downtime
- ▲ Risk of injury to the machine operator

PROTECTION CLASS
IP67

POWER-CHECK 2

With Power-Check 2, OTT-JAKOB is providing reliable, highly precise testing technology designed to monitor the tool pull force of a clamping system. The intelligent measurement device regularly gathers status information, which makes it possible to identify a loss of clamping force quickly. Power-Check 2 is compatible with all tool standards and tool clamping systems from all manufacturers.



Features

- ▲ Exchangeable adapter for all common tool standards
- ▲ Adapters featuring a gripper groove for use within the tool magazine
- ▲ Automated mode for self-activation when tools are changed
- ▲ Energy-saving mode for an extended battery life
- ▲ Adjustable sleeve to simulate tool tolerances
- ▲ Can store data for up to 4,000 measurements
- ▲ LED display for measurement data
- ▲ USB port for data readout and battery charging
- ▲ Software for logging and processing measurement data

DESIGNS

SIZE	POSSIBLE INTERFACES
-5 kN	SK 10 ... 25 // HSK 20, 25
-20 kN	SK 30, 40 // HSK 32, 40, 50
-75 kN	SK 50 // HSK 63, 80, 100 // KM™ 32, 40, 50, 63, 80 // KM4X™ 63 // PSC 40, 50, 63, 80
-200 kN	SK 60 // HSK 125, 160 // KM™ 100 // KM4X™ 100, 125

POWER-CHECK
MAGAZINE*

The Power-Check Magazine was designed for continuous, fully automated operation within the tool magazine, which means it is predestined to be integrated into an Industry 4.0 environment. The device runs on a long-life battery which lasts for up to 30,000 measurement processes. The measurement data is transmitted to the OTT-JAKOB RS485 bus antenna.



POWER-CHECK MAGAZINE
RECEIVER*

- RS485 Bus Antenna
- ▲ Connects to the machine control system
 - ▲ Value output in digital and analogue format



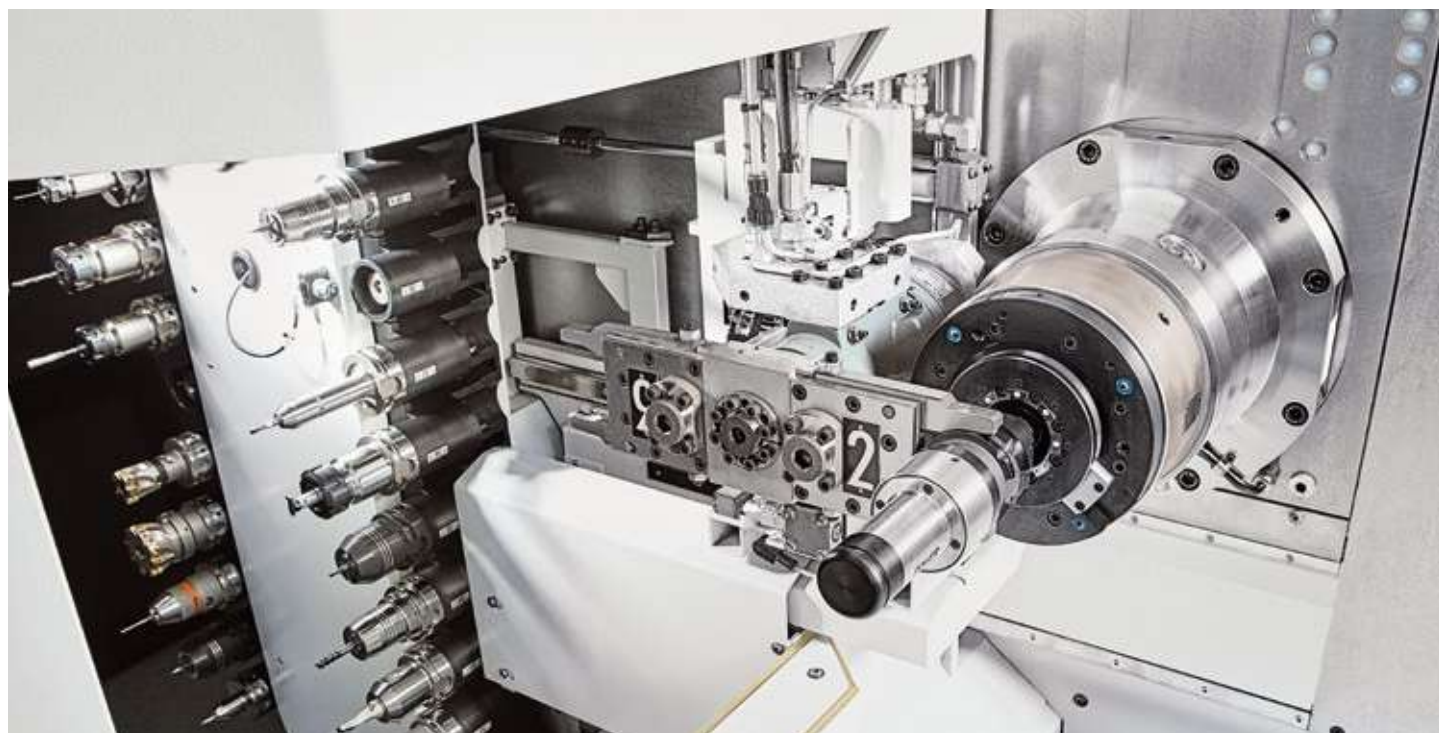
* Not available in every country

PERMANENT MONITORING WITH THE POWER-CHECK MAGAZINE

TECHNICAL DATA	
Accuracy class	2% of the maximum value of the measuring range *
Temperature range	+15°C to +35°C
Maximum load	130 % of the maximum value of the measuring range
Breaking load	200 % of the maximum value of the measuring range
Measuring system	Strain gauges
Battery runtime	2 years / 30,000 measurements
Protection class	IP67



In a highly productive environment such as automotive mass production, uninterrupted production is essential. Measures to ensure product and process quality need to be automated as far as possible. The OTT-JAKOB Power-Check Magazine was developed for fully automatic verification of the tool pull force. The device is integrated into the tool magazine and fitted just like a tool for the clamping force measurement. This type of monitoring can be carried out at regular intervals without requiring intervention by a service technician.



* Not available in every country



POWER-CHECK 2 **BASIC DEVICE**

MEASURING RANGE	CONNECTING THREAD	ORDER NUMBER
0.5–5 kN	M16 × 1.5	9510313492
2.5–20 kN	M16 × 1.5	9510313592
10–75 kN	M16 × 1.5	9510313692
25–200 kN	M35 × 1.5	9510313792

POWER-CHECK **ADAPTER**

ADAPTER	For manual operation	For automatic operation
STANDARD	Order number	Order number

SK 30 (M16 × 1.5)	DIN 69871/69872 // ISO 7388-1/3 A [2007]	9510158292	9510331032
	ANSI B5.50 // ISO 7388-1/3 U [2007]	9510158392	9510331132
	MAS 403-30° // ISO 7388-2/3 J 30° [2007]	9510158592	9510331332
	MAS 403-45° // ISO 7388-2/3 J 45° [2007]	9510158492	9510331232
	DIN 2080	9510162592	

SK 40 (M16 × 1.5)	DIN 69871/69872 // ISO 7388-1/3 A [2007]	9510158692	9510323732
	ANSI B5.50 // ISO 7388-1/3 U [2007]	9510158792	9510323832
	MAS 403-30° // ISO 7388-2/3 J 30° [2007]	9510158992	9510324032
	MAS 403-45° // ISO 7388-2/3 J 45° [2007]	9510158892	9510323932
	MAS 403-0° // ISO 7388-2/3 J 0° [2007]	9510169492	
	DIN 2080	9510162692	

SK 45 (M16 × 1.5)	DIN 69871/69872 // ISO 7388-1/3 A [2007]	9510159092	
	ANSI B5.50 // ISO 7388-1/3 U [2007]	9510159192	
	MAS 403-30° // ISO 7388-2/3 J 30° [2007]	9510159392	
	MAS 403-45° // ISO 7388-2/3 J 45° [2007]	9510159292	
	DIN 2080	9510162792	

SK 50 (M16 × 1.5)	DIN 69871/69872 // ISO 7388-1/3 A [2007]	9510159492	9510309792
	ANSI B5.50 // ISO 7388-1/3 U [2007]	9510159592	9510324132
	MAS 403-30° // ISO 7388-2/3 J 30° [2007]	9510159792	9510324332
	MAS 403-45° // ISO 7388-2/3 J 45° [2007]	9510159692	9510324232
	MAS 403-0° // ISO 7388-2/3 J 0° [2007]	9510166292	
	DIN 2080	9510162892	

SK 60 (M16 × 1.5)	DIN 69871/69872 // ISO 7388-1/3 A [2007]	9510159892	
	ANSI B5.50 // ISO 7388-1/3 U [2007]	9510159992	
	MAS 403-30° // ISO 7388-2/3 J 30° [2007]	9510160292	
	MAS 403-45° // ISO 7388-2/3 J 45° [2007]	9510160192	



POWER-CHECK ADAPTER

ADAPTER	For manual operation	For automatic operation
STANDARD	Order number	Order number

HSK	E20	9560167292	
	E25	9560006992	
	A 32 / E 32 B 40	9560007092	9560204532 on request
	A 40 / E 40 B 50 / F 50	9560007192	9560212032 on request
	A 50 / E 50 B 63 / F 63	9560007292	9560204632 on request
	A 63 / E 63 B 80 / F 80	9560007392	9560185192 on request
	A 80 B 100	9560007492	9560214032 on request
	A 100 B 125	9560007592	9560204732 on request
	A125/B160 (up to max. 75 kN)	9560007692	
	A100/B125 (only for PC 2 200 kN)	9560232732	
	A 125 B 160 (only for PC 2 200 kN)	9560232832	9560204832 on request
	A160 (only for PC 2 200 kN)	9560273132	
PSC	C3 ISO/PSC 32	9560228292	
	C4 ISO/PSC 40	9560148192	
	C5 ISO/PSC 50	9560148292	
	C6 ISO/PSC 63	9560126692	
	C8 ISO/PSC 80	9560148392	
	C10 ISO/PSC 100 (PC 2 200 kN)	9560292132	
KM™	KM 32 ISO	9560317932	
	KM 40 ISO	9560219192	
	KM 50 ISO	9560174192	9560286332
	KM 63 ISO	9560172492	9560271132
	KM 80 ISO	9560174292	9560297432
	KM 100 ISO (only for PC 2 200 kN)	9560247792	
KM4X™	KM4X 63	9560300532	
	KM4X 100 (only for PC 2 200 kN)	9560257332	
	KM4X 125 (only for PC 2 200 kN)	9560315132	

HSK



PSC



KM™



KM4X™



POWER-CHECK MAGAZINE*

STANDARD	For automatic operation	
	Order number	
SK 30	ISO DIN 69871/872	9510392622V01
	ANSI B 5.50	9510392622V02
	MAS 403/45 BT/PT 1	9510392622V03
	MAS 403/30 BT/PT 2	9510392622V04
SK 40	ISO DIN 69871/872	9510392622V11
	ANSI B 5.50	9510392622V12
	MAS 403/45 BT/PT 1	9510392622V13
	MAS 403/30 BT/PT 2	9510392622V14
SK 50	ISO DIN 69871/872	9510392722V21
	ANSI B 5.50	9510392722V22
	MAS 403/45 BT/PT 1	9510392722V23
	MAS 403/30 BT/PT 2	9510392722V24
HSK**	E25	9560290512
	A 32 / E 32	9560331212
	A 40 / E 40	9510392622V52
	A 50 / E 50	9510392622V53
	A 63 / E 63	9510392722V61
	A 80	9510392722V62
	A 100	9510392722V63
KM™	KM 50 ISO	9510392722V81
	KM 63 ISO	9510392722V82
	KM 80 ISO	9510392722V83
PSC	PSC 63	9510392722V92
	PSC 80	9510392722V93



POWER-CHECK MAGAZINE RECEIVER*

RECEIVER UNIT	For automatic operation	
	Order number	
	RS485 BUS ANTENNA	9580001820V04

* Not available in every country ** forms B and F available on demand

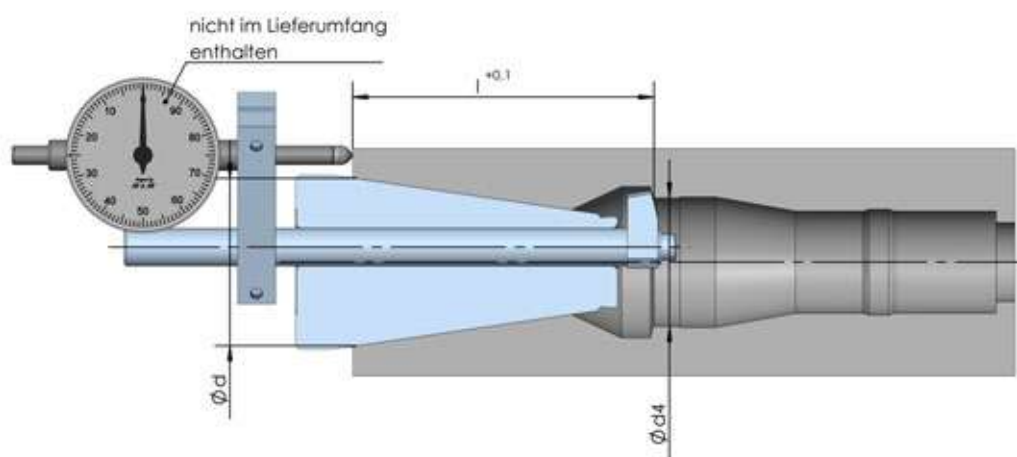


ACCESSORIES

STEEP TAPER SPINDLE EDGE

The measuring device for the steep taper spindle edge measures the following:

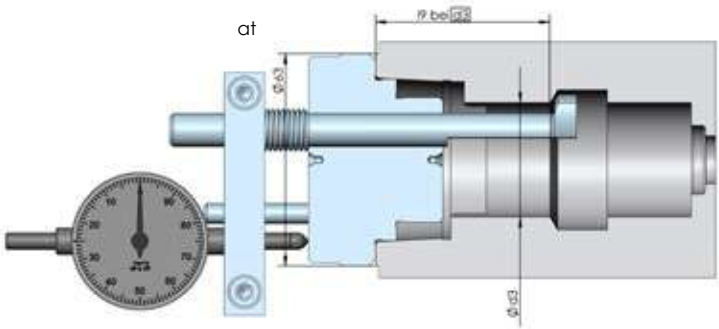
- ▲ The position of the diameter d
- ▲ The dimension l



NOMINAL SIZE	REFERENCE MEASUREMENT			TOOL STANDARD	ORDER NUMBER
	l	ø d	ø d ₄		
SK 30 universal contour	59	31.75	22.5	DIN 69871/69872 // ISO 7388/1/2 Type A ANSI B 5.50 – 1978 // ISO 7388/1/2 Type B MAS 403-1982 BT/PT 30°/45°	9510257532
SK 30	63.5	31.75	19.5	DIN 69871/69872 // ISO 7388/1/2 Type A	9510018632
	62		22.5	DIN 2080 OTT-Rille	9510018732
	54		19.5	ANSI B 5.50 – 1978 // ISO 7388/1/2 Type B	9510018832
SK 40 universal contour	79.5	44.45	34	DIN 69871/69872 // ISO 7388/1/2 Type A DIN 2080 OTT-Rille ANSI B 5.50 – 1978 // ISO 7388/1/2 Type B MAS 403-1982 BT/PT 30°/45°	9510012032
SK 45	108	57.15	34	DIN 69871/69872 // ISO 7388/1/2 Type A	9560132232
	100		41.3	DIN 2080 OTT-Rille	9510011932
	93		34	ANSI B 5.50 – 1978 // ISO 7388/1/2 Type B	9510018932
SK 50 universal contour	116.5	69.85	49	DIN 69871/69872 // ISO 7388/1/2 Type A DIN 2080 OTT-Rille ANSI B 5.50 – 1978 // ISO 7388/1/2 Type B MAS 403-1982 BT/PT 30°/45°	9510127032
SK 60 universal contour				DIN 69871/69872 // ISO 7388/1/2 Type A ANSI B 5.50 – 1978 // ISO 7388/1/2 Type B	9510127422

HSK SPINDLE EDGE

The measuring device for the HSK spindle measures the dimension l_9 :

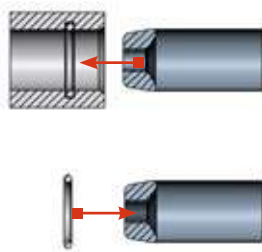


NOMINAL SIZE	REFERENCE MEASUREMENT		ORDER NUMBER
	l_{9js8}	[with d3]	
E20	15 ±0.003	[11]	9560192332
E25	18.5 ±0.0165	[14]	9560134232
A32/B40/E32	30 ±0.0165	[17]	9560134032
A40/B50/E40	44 ±0.0195	[21]	9560133232
A50/B63/E50/F63	45 ±0.0195	[26]	9560132232
A63/B80/E63/F80	52 ±0.023	[34]	9560076032
A80/B100	56 ±0.023	[42]	9560135832
A100/B125	70 ±0.023	[53]	9560136132
A125/B160	86 ±0.027	[67]	9560136332
A160	113 ±0.027	[85]	9560136532
A50 short/B63 short/ E50 short/F63 short	31.5 ±0.0195	[26]	9560132932
63 short	40 ±0.0195	[34]	9560089832
A63 short	38 ±0.0195	[34]	9560120432
A80 short	45 ±0.0195	[42]	9560174832
A100 short	55 ±0.023	[53]	9560172332
A125 short	70 ±0.023	[67]	9560185932

MOUNTING AIDS

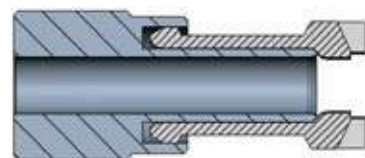
MOUNTING SLEEVE

- ▲ To protect the seals of the sealing bushing and radial/axial bushing while mounting the drawbar shaft
- ▲ For mounting the seal on the drawbar shaft



MOUNTING TOOL

For mounting HSK gripper segments easily



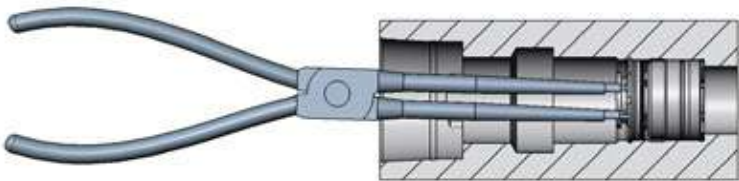
NOMINAL SIZE	THREAD	L	ORDER NUMBER
A32/B40/E32	M6		9560479041
A40/B50/E40/F50	M8		9560339441
A50/B63/E50/F63	M10		9560379531
	M12		9560459041
A63/B80/E63/F80	M14		9560116941
A80/B100	M16	29.4	9560525241
A100/B125: Only for drawbar shaft	M16	40	9560136041
A100/B125: Only if HSK M20 × 1.5	M20		9560216831
A125/B160	M24		9560238441

NOMINAL SIZE	ORDER NUMBER	
	Type K (silver)	Type B (black)
E25 (without picture)	9560156132	
A32/B40/E32	9560111131	
A40/B50/E40/F50	9560111231	
A50/B63/E50/F63	9560111331	
A63/B80/E63/F80	9560111431	–
A80/B100	9560111521	–
A100/B125	9560111621	–
A125/B160	9560111721	–
A160	9560111821	–

MOUNTING PLIER

For the snap ring of the sealing bushing
and radial-axial bushing

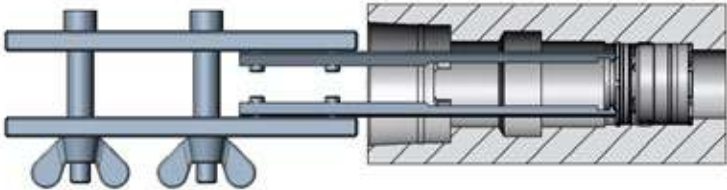
SIZE	ORDER NUMBER
A32-50	9560273532
A63-80	9560097732
A80-125	9560296032



DISMOUNTING TOOL

For sealing bushing

SIZE	ORDER NUMBER
A32	9560261732
A40-A100	9560160932



AFTER-SALES SERVICE

When you buy an OTT-JAKOB clamping system, you gain access to a wide range of services. Be it support over the phone, repairs or on-site visits, we provide a reliable, personalised service from a single source.

Our service team consists of long-standing personnel with unrivalled expertise in tool clamping technology. We also have a global network of trained service partners through which we can react quickly anywhere in the world.

HELPLINE

Call our helpline for quick answers to technical queries.

Availability: 8 a.m. to 4 p.m. from Monday to Friday

☎ +49 (0)8364 982 159
+49 (0)8364 982 158
@ service@ott-jakob.de

In urgent cases, you can also contact our technicians outside of business hours at **hotline@ott-jakob.de**.

REPAIRS

OTT-JAKOB clamping systems are synonymous with longevity. Repairs can even be carried out after many years of continuous operation.

Our repair service is a cost-effective, environmentally friendly alternative to buying a new component. We guarantee professional, high-quality repairs exclusively with original components. Not only do we fix the problem, we also perform all necessary maintenance. We can therefore provide a **one-year guarantee** on every repair.

☎ +49 (0)8364 982 158
@ service@ott-jakob.de

REPAIR PROCESS:

1. Carefully pack the defective components into a box.
2. Enclose a delivery note with contact information (phone number or email address) and a description of the problem.
3. Send the parcel to the following address:

OTT-JAKOB Spanntechnik GmbH
Service department
Industriestrasse 3-7
87663 Lengenwang, Germany

4. You will receive a quotation within two working days of the arrival of the goods as well as initial damage appraisal. We will immediately inform you if a repair is not cost-effective. On request, we can prepare an in-depth damage analysis with detailed maintenance recommendations.
5. Once the quotation is released, the delivery time is approximately two weeks (depending on the availability of the components). Spare parts are available for particularly urgent orders.



EXPRESS REPAIRS

We provide an express repair service for particularly urgent repairs.

Please notify us of your repair in advance by phone. Provided the goods arrive at our premises by 9 o' clock, shipment on the following working day is possible.

More information on the additional costs of this service is available on request.

☎ +49 (0)8364 982 158
@ service@ott-jakob.de

SPARE PARTS

Our spare parts service is available if you would like to repair your clamping system yourself. Due to the longevity of our clamping systems, it is important to us that spare parts are available in the long term. Sometimes we can even supply them over decades. Contact us by phone or email and provide us with the ID or serial number of your clamping system or assembly unit along with your enquiry. This is normally located on the component. If you cannot find the numbers, please send us a photo and/or a detailed description of the component – we will then get in touch with you immediately.

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ON-SITE SERVICE

Be it installation, repair or troubleshooting, our service team can even support you on-site anywhere in the world. We provide the following on-site services:

- ▲ Support with assembly and start-up
- ▲ Troubleshooting and rectification
- ▲ Inspection and maintenance
- ▲ Maintenance training

We would be happy to provide you with other services on request.

☎ +49 (0)8364 98 21 -59
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YOUR ADVANTAGES

- ▲ Qualified and experienced service technicians
- ▲ Custom-fit original parts
- ▲ Spare parts available for years and even decades
- ▲ Rapid response times worldwide
- ▲ Personal, individual support



INFOTHEK

Whether you need data sheets, product information or instructions – in our Infothek you will find all important documents about OTT-JAKOB products for download. Register at infothek.ott-jakob.de and get access to more than 400 product-specific documents.



Data sheets



Product information



Instructions



Leaflets and catalogues



Videos



Software

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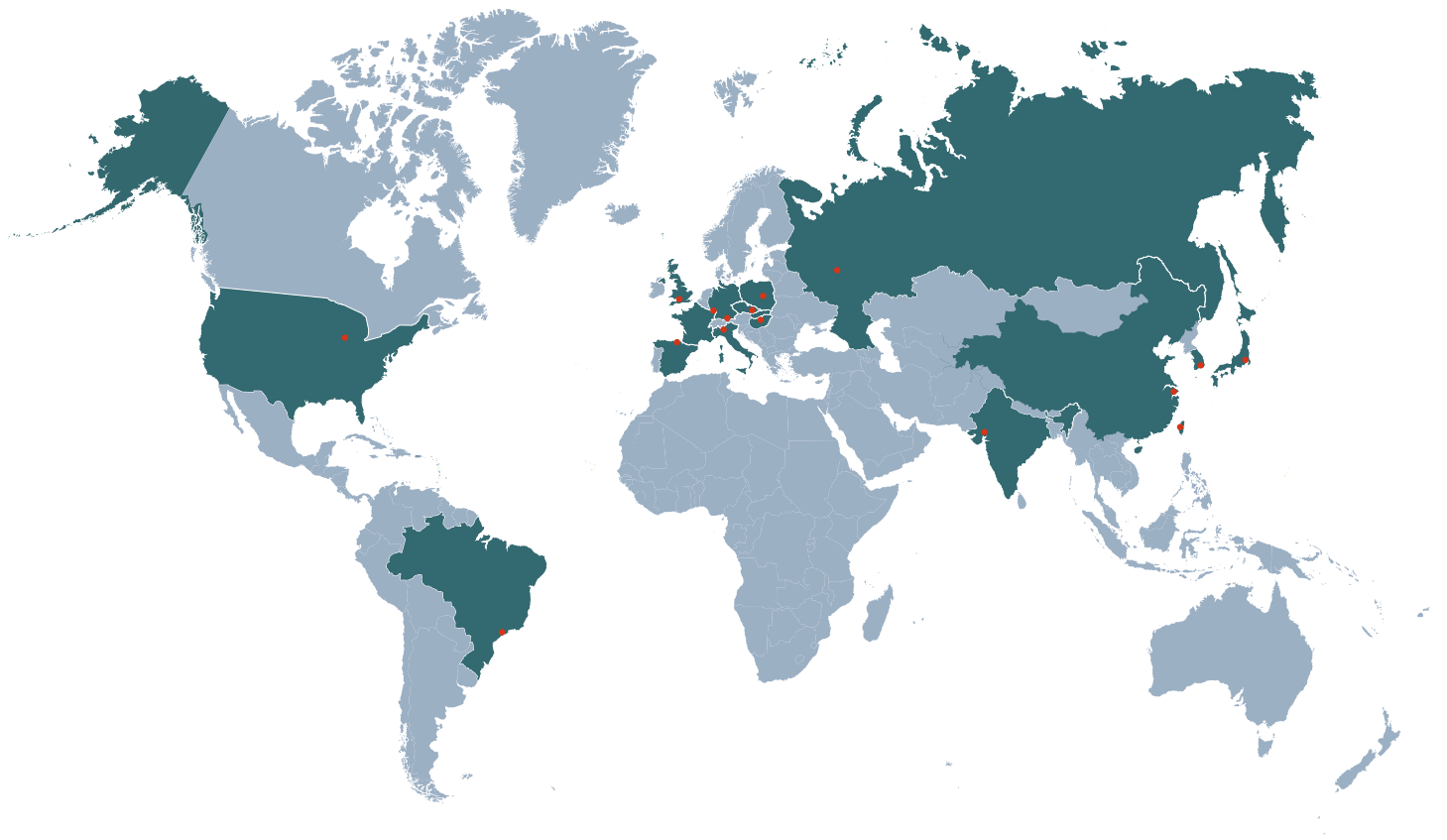
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