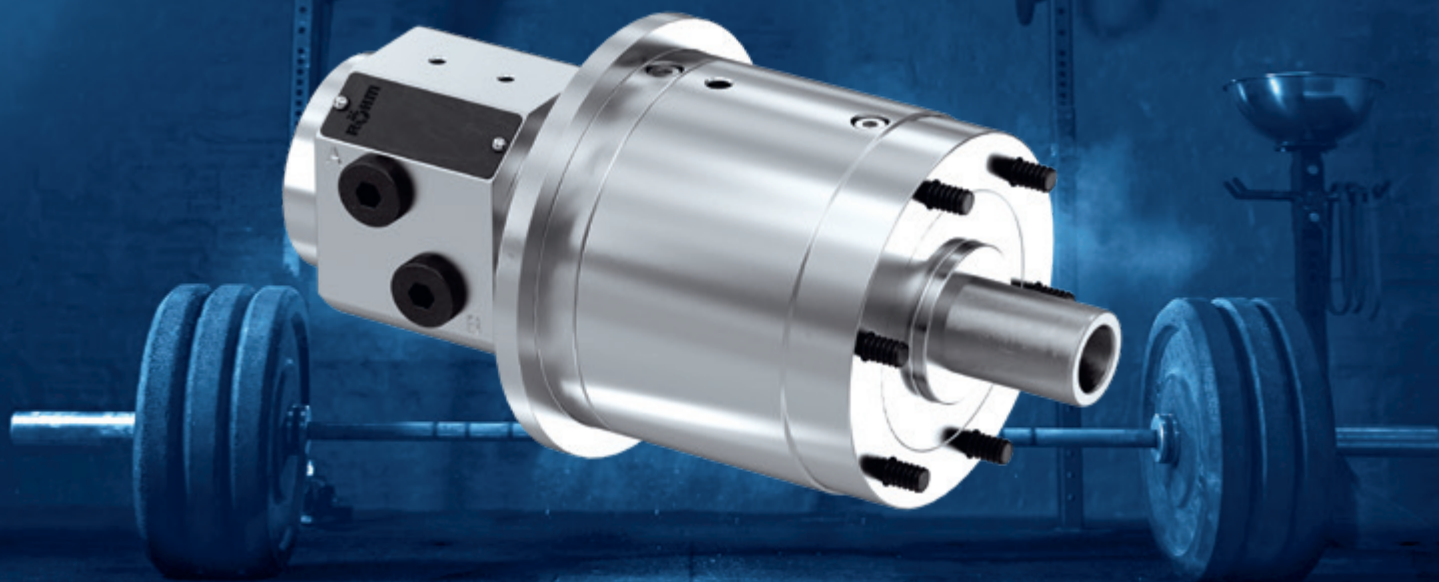




**THE FORTO-H.**  
FROM RÖHM.



**ENABLING YOUR  
MACHINE TOOL TO  
PULL IT'S WEIGHT.**

# THE FORTO-H. FROM RÖHM.

The Forto-H is a hydraulic clamping cylinder without a through-hole for operation of power chucks, collet chucks or special clamping tools. It is primarily used on CNC turning machines and machining centers for automatic clamping with solid drawbar, or partially hollow drawbar. Both horizontal and vertical installation positions are possible. This makes it particularly suitable for handling shorter or disk-shaped workpieces. In the name Forto-H, the H stands for hydraulics. Its impressive features include very high operating forces and high speeds but at the same time it has excellent smooth running properties.

Various (optional) rotary unions enable media to be fed through to the clamping device.

A range of different (optional) stroke monitoring systems allow the machine controller to monitor the piston stroke and the piston position. If there is an unexpected pressure drop during machining, a safety feature ensures that the operating force is maintained until the spindle emergency stop takes effect.

The Forto-H replaces the Röhms OVS series of cylinders without a through-hole.



## DESIGNED FOR

Automatic clamping horizontal and vertical turning machines

## APPLICATION

Rotary machining of cylindrical workpieces, adapter plates, disks, shafts.

## BENEFITS

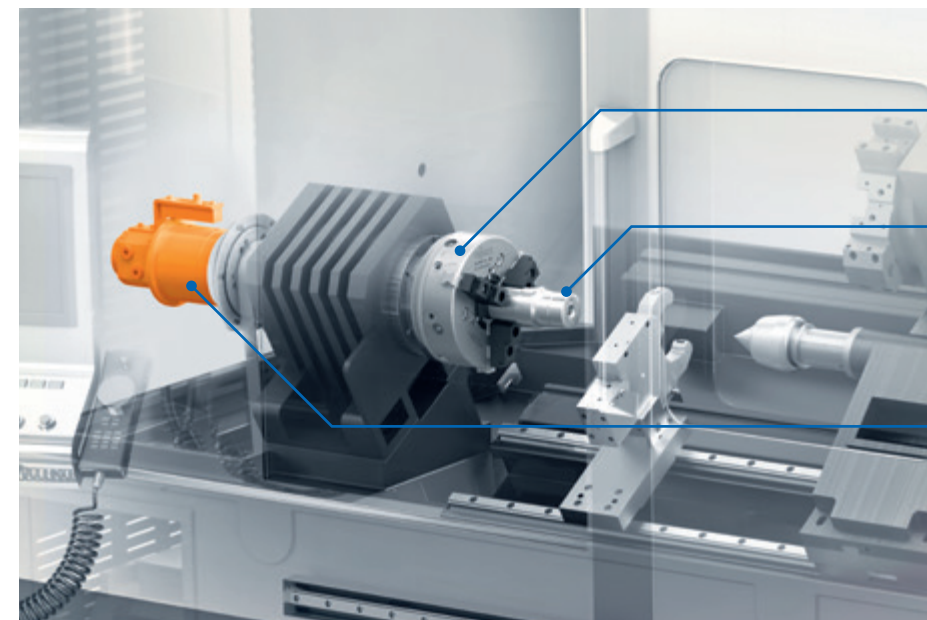
- Up to 80 bar operating pressure for high clamping force (1160 psi)
- Compact Construction
- Rigid piston design
- Large selection of compatible power chucks from Röhms
- Spindle connections compatible with cylinders made by SMW AUTOBLOK

## WHY IT'S A WISE INVESTMENT

- Long, reliable service life

# EFFECTIVELY APPLIES PRESSURE

For clamping devices in through-hole or partly hollow clamping systems



Force actuated clamping device

Workpiece

Forto-H cylinder



*For clamping devices without a through-hole, and for clamping devices with through-hole utilizing partially hollow drawbar connection.*

## WHAT CAN WE MOVE?

Cylinders without a through-hole from the Forto-H series are used for force-actuated clamping of -



Power Chucks i.e. the KFD.  
From Röhm



power-operated compensating chucks, for example the KFD-AF.  
From Röhm.



force-actuated face drivers, for example the CoK-AE.  
From Röhm.



force-actuated clamping mandrels, for example the Absis.  
From Röhm.

Cylinders without through-hole from the Forto-H series are used for force-actuated partly hollow clamping of



power chucks, for example the DURO-A. From Röhm.



power chucks with large through-hole, for example the DURO-A-Plus.  
From Röhm.



power chucks with quick jaw change, for example the DURO-A RC.  
From Röhm.



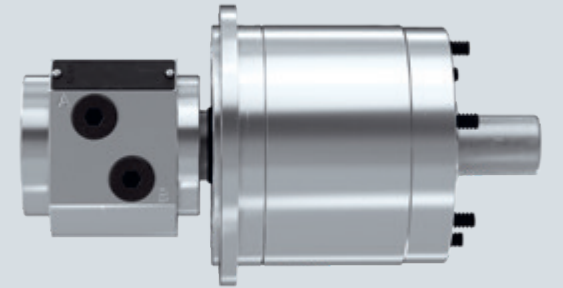
collet chucks, for example the Captis.  
From Röhm.

## UNBENDING

Linearity integrated into the design

Engineers know that a system is only as good as the weakest link in the chain. That is why our developers have designed all the assemblies with the same rigidity. A rigid piston is particularly important. Ultimately, it transmits all the compression forces, making it the heart of the Forto-H.

This exceptionally rigid construction results in this really smart feature: the distributor housing is located on the piston rod and moves axially with the piston. Typical Röhm – it's the details that make the difference.



## PUTTING ON THE PRESSURE

Smart design allows economical production Made in Germany.

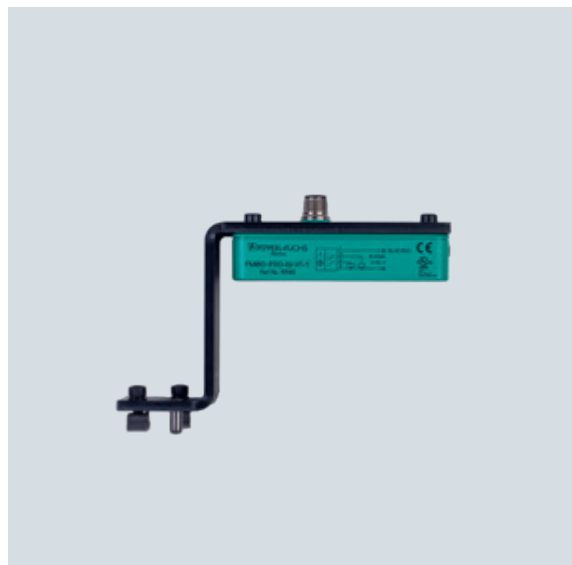
These days, a modern machine tool is so complex that you almost feel it could fly you to the moon. So it's no wonder that the individual components are subject to significant cost pressure – and the clamping cylinder is no exception. So, the Röhm brand not only has an excellent reputation, we are also committed to providing precision, long-life products that deliver high clamping forces. But what about the costs? The solution is the smart design – for example we have positioned the pressure lines diagonally. This enables the Forto-H to achieve the same excellent technical specifications as its predecessor, but our production specialists have managed to save a whole 47 seconds of machining. This reduces production costs. The Forto-H still has a robust, rigid steel housing combined with premium product quality, Made in Germany. Forto-H cylinders are produced at Röhm's headquarters in Sontheim/Brenz.

## F90 STROKE MEASURING SYSTEM

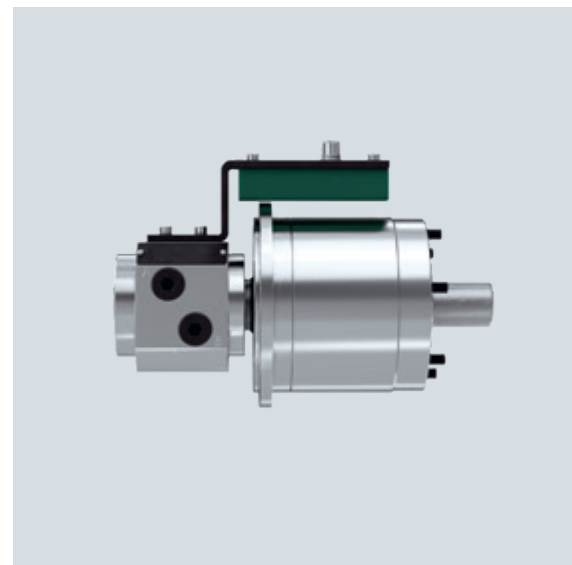
## WHEN THE STROKE IS IMPORTANT

### Optional: F90 linear motion measuring system

How do you monitor the stroke in the cylinder? This is almost always done using a stroke measuring system, which detects the position and/or the two end positions of the piston inductively (i.e. without contact). The Forto-H is set up for this. The inputting disk for stroke monitoring is integrated into the cylinder as standard. The F90 stroke measuring system from Röhm is available as an option. The F90 has a high resolution and only minimal temperature drift. It is set up ready to be bolted onto the Forto-H. Another smart detail from Röhm: the input disk is part of the piston housing. The fixed connection provides true running accuracy of just 0.1 mm, ensuring precise displacement measurements.



Optional: The inductive F90 stroke measuring system



The inductive F90 stroke measuring system is attached to the outside of the Forto-H.

## OTHER STROKE MEASURING SYSTEMS

## WHEN DIFFERENT STROKE MONITORING IS IMPORTANT FOR THE PRESSURE

### Optional: Connection of position and stroke measuring systems using mounting brackets

If you ask our opinion, you should use the linear F90 stroke measuring system. But maybe you already asked someone else and they recommended a different system. And you are making extensive use of that system already. It's a shame, but not a problem. You can use the Forto-H with limit / proximity switches, for example from Balluff or the Bero from Pepperl+Fuchs. The connections for these and the switching disk (width: 8 mm) are fitted as standard.

## ROTARY UNION

## IF YOU NEED MORE MEDIA

### Optional: Deublin rotary unions

A single or double passage rotary union is available as an option to enable additional media (such as hydraulic oil, compressed air, coolant, etc.) to be fed to the clamping device through the cylinder. To connect the Deublin double rotary union you need the appropriate adapter plate. The connection on the rear for the rotary union is fitted on the Forto-H as standard. We are happy to support you with adaptation for your specific rotary union.



Rear connection for rotary unions (Fig.: Deublin) for media such as hydraulic oil, compressed air, etc.



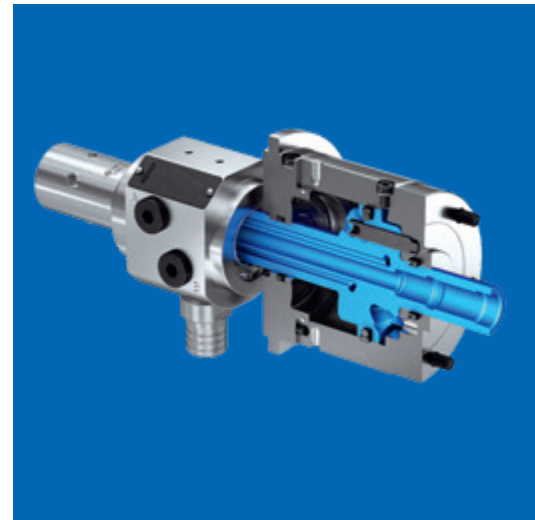
## LEAKAGE OIL NOZZLE

## WHEN OIL EASES THE PRESSURE

### Optional: Leakage oil nozzle

Because of their design, rotating assemblies – like the piston and the housing – can never be one hundred percent oil tight (especially at operating pressures of up to 80 bar/1160 psi). We have designed the Forto-H so that the resulting leakage oil is collected in a defined location at the lowest point of the distribution housing and is then fed back into the hydraulic system through a leakage oil nozzle.

**As an option, we can also supply the leakage oil nozzle fully installed.**



*Any leakage oil is fed back into the hydraulic system through the optional leakage oil nozzle*

## PRESSURE REDUCING VALVE

## CAREFULLY APPLYING PRESSURE

### Optional: Pressure reducing valve

There are a number of reasons for exercising precise control of the working pressure in the cylinder. It may be that different operations (rough machining, finishing) are carried out with different pressures. It may be that the pressure in the cylinder needs to be reduced due to the requirements of the clamping device. To do this, pressure is applied to both pressure chambers and only the differential pressure causes movement of the piston. To facilitate this from a control engineering perspective, we can provide the Forto-H with a pressure reducing valve as an option.

## KITAGAWA CONNECTION

## TO RETROFIT YOUR MACHINE

### Connection layout compatible with Kitagawa

Replacing a cylinder on a machine tool with a non-original component can have its challenges. You can alleviate these problems now and benefit from the Forto-H features and performance with the optional Forto-H with Kitagawa connections.

## CUSTOMER-SPECIFIC NAME PLATE

## YOUR MACHINE TOOL – YOUR RATING PLATE

### Optional: Customer-specific name plate

Talking about rating plates is like preaching to the choir. But let's do it anyway. Because it's such an integral component of a machine tool (or any machine), there are frequently specific requirements for the name plate. Not a problem. Our modular production makes it possible. Talk to us if you have any specific requirements for the name plate on your Forto-H and the information you want it to show.

## BALANCING

## THE FORCE COMES FROM SMOOTH RUNNING

Optional: Balancing quality 4.0 or 2.5

Because of its operating principle, the piston of the cylinder is permanently connected to the clamping device. As a result, it rotates at the same speed. To guarantee the true running accuracy of the clamping device, the cylinder has to run correspondingly smoothly in itself. We have designed the Forto-H to provide a balancing quality of 6.3.

For higher quality ratings, the cylinder, drive spindle etc. are normally collectively balanced on the machine tool in the overall system after final assembly. If you require a higher balancing quality - "direct from Röhm" so to speak - that's not a problem. As an option, we can balance your Forto-H in house to a balancing quality of 4.0 or even 2.5. Whatever is the optimum for your requirements and your production and assembly process.

# 4.0

# 2.5

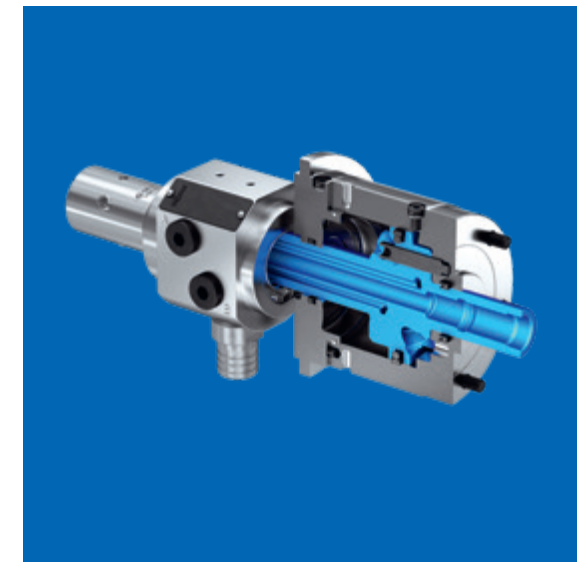
## CONNECTION FOR PRESSURE GAGE

## IF YOU WANT TO BE SURE THAT THE FORTO-H IS REALLY PUTTING ON THE PRESSURE

Accessory: Pressure measuring unit

Do you want routine monitoring of your cylinder performance? Or has it been properly maintained? Do you have insufficient clamping pressure on the clamping device? With our pressure measuring unit, you can measure the hydraulic pressure in the cylinder. To measure the pressure in the front or rear chamber, the relevant vent screw is removed and the pressure measuring unit is screwed in.

The pressure measuring unit is available from Röhm as an accessory for the Forto-H and is supplied ready for connection and use with a pressure gage.



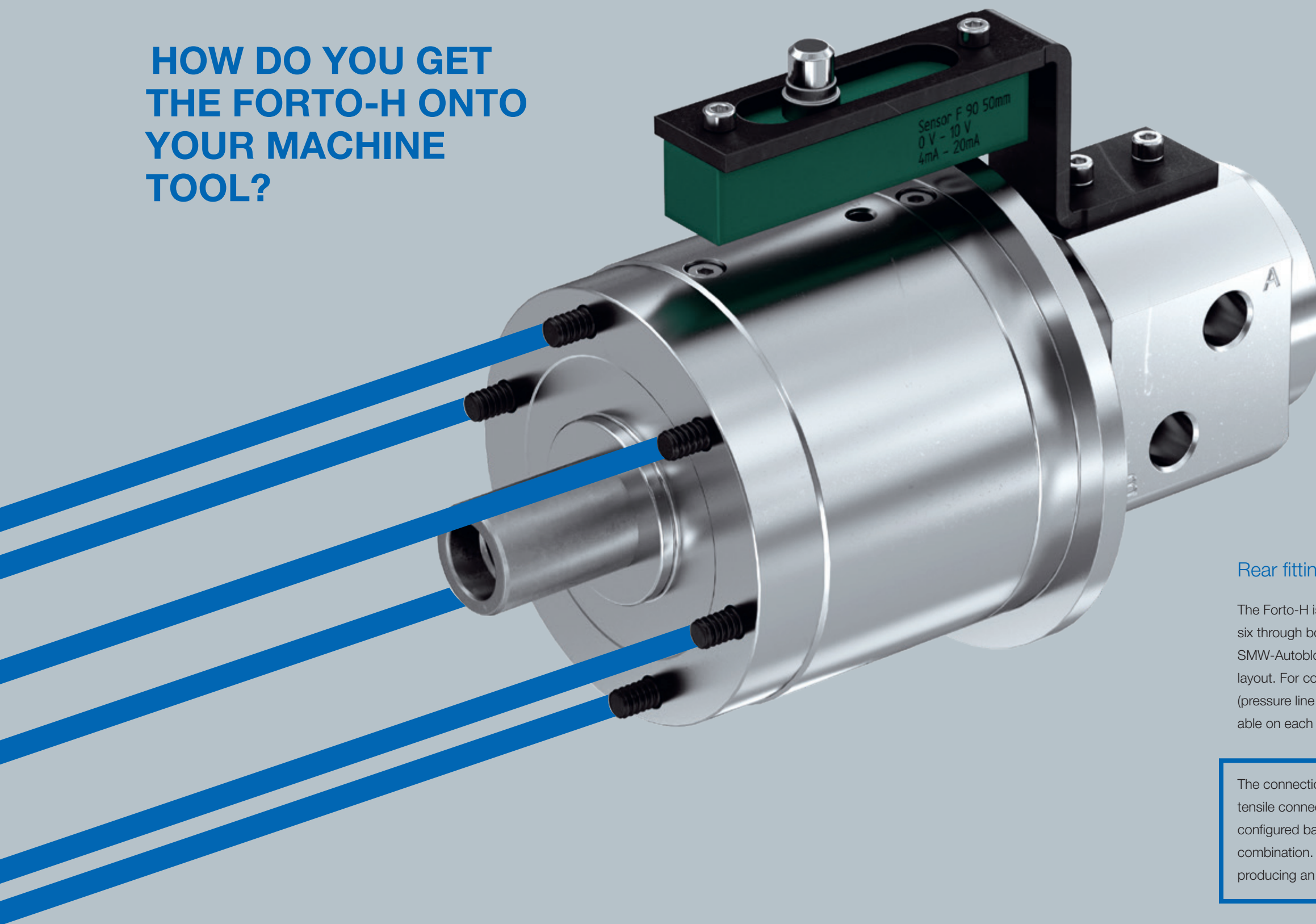
*The pressure measuring unit is attached using the threads for the front and rear vent screws.*



*The pressure measuring unit is made up of a pressure gage, including adapter for the connections on the Forto-H*

## INSTALLATION

# HOW DO YOU GET THE FORTO-H ONTO YOUR MACHINE TOOL?



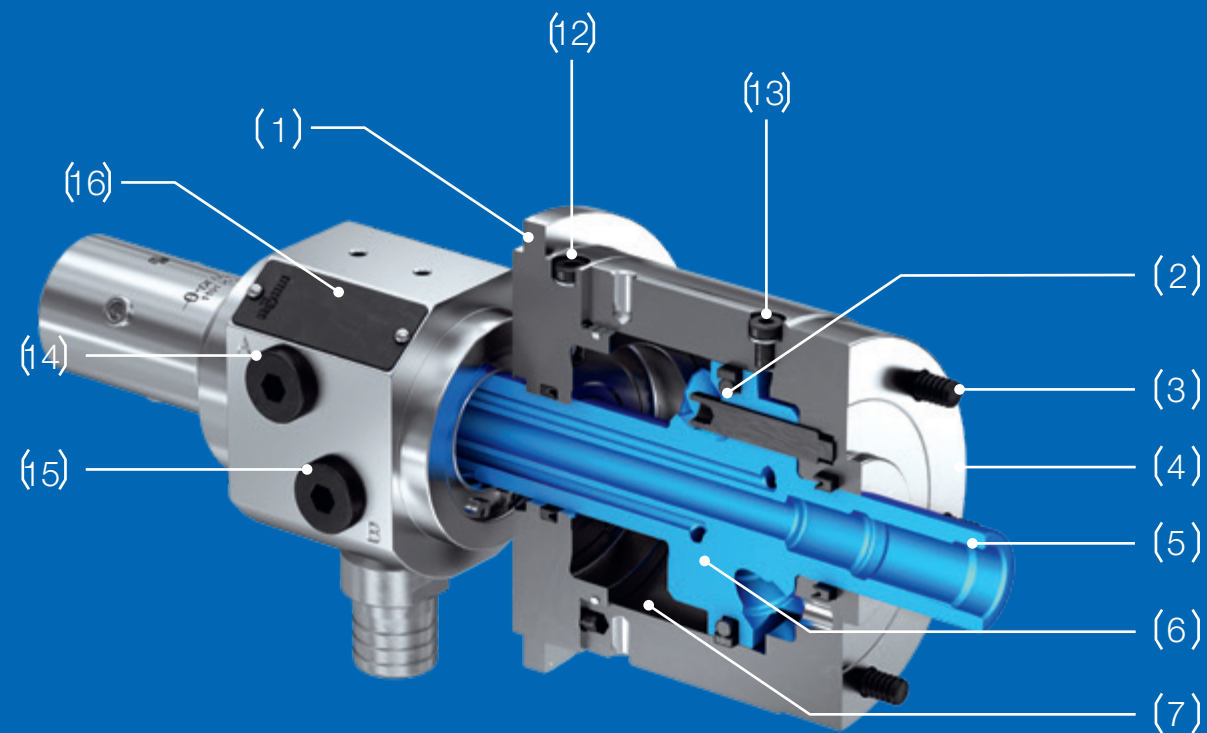
## Rear fitting, 6-way

The Forto-H is bolted onto the machine spindle from the rear using six through bolts (supplied). The connection layout corresponds to the SMW-Autoblok. As an option, you can choose a Kitagawa connection layout. For connection to the hydraulic supply, G3/8" connections (pressure line and return line) are provided. Two connections are available on each side of the distributor housing.

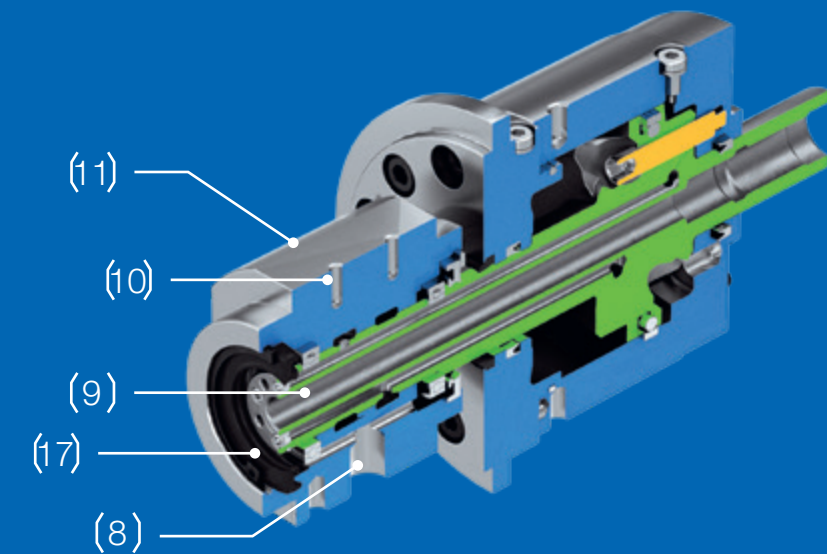
The connection to the clamping device is made using a tensile connection. This tensile connection is always customized and is configured based on the cylinder – clamping device – machine tool combination. We are happy to support you in designing and producing an appropriate tensile connection for your configuration.

GOOD TO KNOW

## TECHNOLOGY



- |  |   |
|--|---|
| (1) Input disk for stroke measuring system                               | (12) Rear piston chamber vent                 |
| (2) Driving pin  | (13) Front piston chamber vent                |
| (3) Rear fitting   | (14) Hydraulic connection (push)              |
| (4) Piston housing   | (15) Hydraulic connection (pull)              |
| (5) Drawbar connection thread  | (16) Name plate (optional: customer-specific) |
| (6) Piston   | (17) Connection for rotary union              |
| (7) Pressure chamber   |   |
| (8) Connection for leakage oil fitting<br>(leakage oil fitting optional) |   |
| (9) Media feedthrough  |   |
| (10) Connections for stroke measuring system                             |   |
| (11) Distributor housing   |   |



## HOW THE FORTO-H FROM RÖHM WORKS

The steel piston housing (4) is connected to the machine spindle using six bolts (3) on the rear. Inside the piston housing, the piston (6) moves to perform the actuation, i.e. opening and closing of the clamping device. The piston has a through-hole (9), enabling optional additional media to be fed through to the clamping device. To extend the cylinder (and thus - normally - to open the clamping device), the hydraulic line (14) is put under pressure. This causes hydraulic oil to flow into the pressure chamber (7) and moves the piston. To retract the cylinder (and thus - normally - to close the clamping device), the hydraulic line (15)

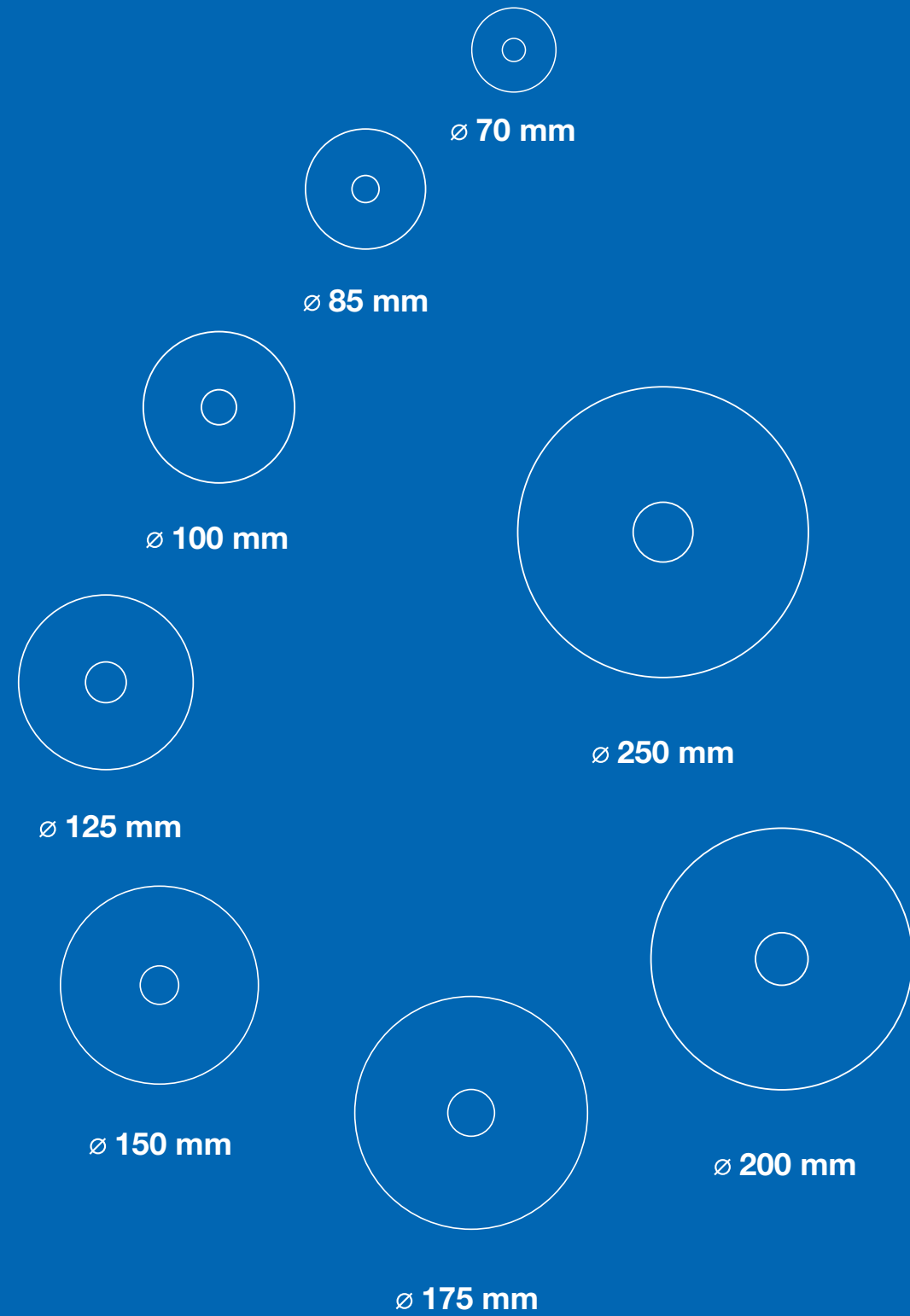
is put under pressure. The clamping device and cylinder are connected using a draw connection individually configured for the clamping device. A threaded draw connection (5) is provided on the piston for this purpose. The input disk for the stroke measuring system (1) is permanently connected to the piston housing. The stroke measuring system itself is fitted on the distributor housing (11) (10), which in turn is permanently connected to the piston and moves with it.

You can find further information about the Forto-H on our website:

**ROEHM.BIZ/EN/FORTO-H**



# A FULL RANGE.



Size	70	85	100	125	150	175	200	250
Piston stroke [mm]	40	32	32	40	(40)	(45)	(50)	(50)
Max. operating pressure [bar]	80	80	80	80	(80)	(80)	(80)	(80)
Min. operating pressure [bar]	8	8	8	8	(8)	(8)	(8)	(8)
Max. clamping force [kN] tension/pressure	25/23	40/38	53/55	82/85	(130/-)	(180/-)	(230/-)	(380/-)
Max. speed [rpm]	8000	8000	8000	6300	(6300)	(5500)	(4500)	(2500)
Weight [kg]	13	12	15.5	20.5	(23)	(27)	(49)	(88)
Length [mm]	260	244	249	278	(290)	(295)	(370)	(395)
Max. external diameter [mm]	140	140	160	186	(195)	(215)	(245)	(295)
Leakage [l/min] at max. pressure	(3)	(3)	(3)	(3)	(2.5)	(3)	(3)	(3)
Mass moment of inertia [kgm <sup>2</sup> ]	0.0194	0.01657	0.03315	0.0633	(TBC)	(TBC)	(TBC)	(TBC)
Connecting thread	M20x1.5	M20x1.5	M24	M30	(M30)	(M36)	(M42x3)	(M42x3)
Spindle connection	50	50	80	95	(95)	(125)	(125)	(160)
Pitch diameter	100	100	120	145	(170)	(195)	(225)	(275)
ID no.	443472	443473	443474	443475	443476	443477	443478	443479



F90 stroke monitoring inc. holder	1383458	1383458	1383459	1383460	1383461	1383462	1383463	1383464
Deublin single rotary union	10003958	10003958	10003958	10003959	10003959	10003959	10003959	10003959
Deublin double rotary union	1118081	1118081	1118081	1118081	1118081	1118081	1118081	1118081
Adapter plate <sup>(1)</sup>	1022186	1022186	1022186	1022187	1022187	1022187	1022187	1022187



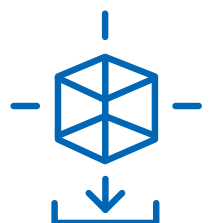
Accessory:  
Pressure measuring technology

The pressure measuring unit fits on all cylinder sizes and has the ID number:	1385327
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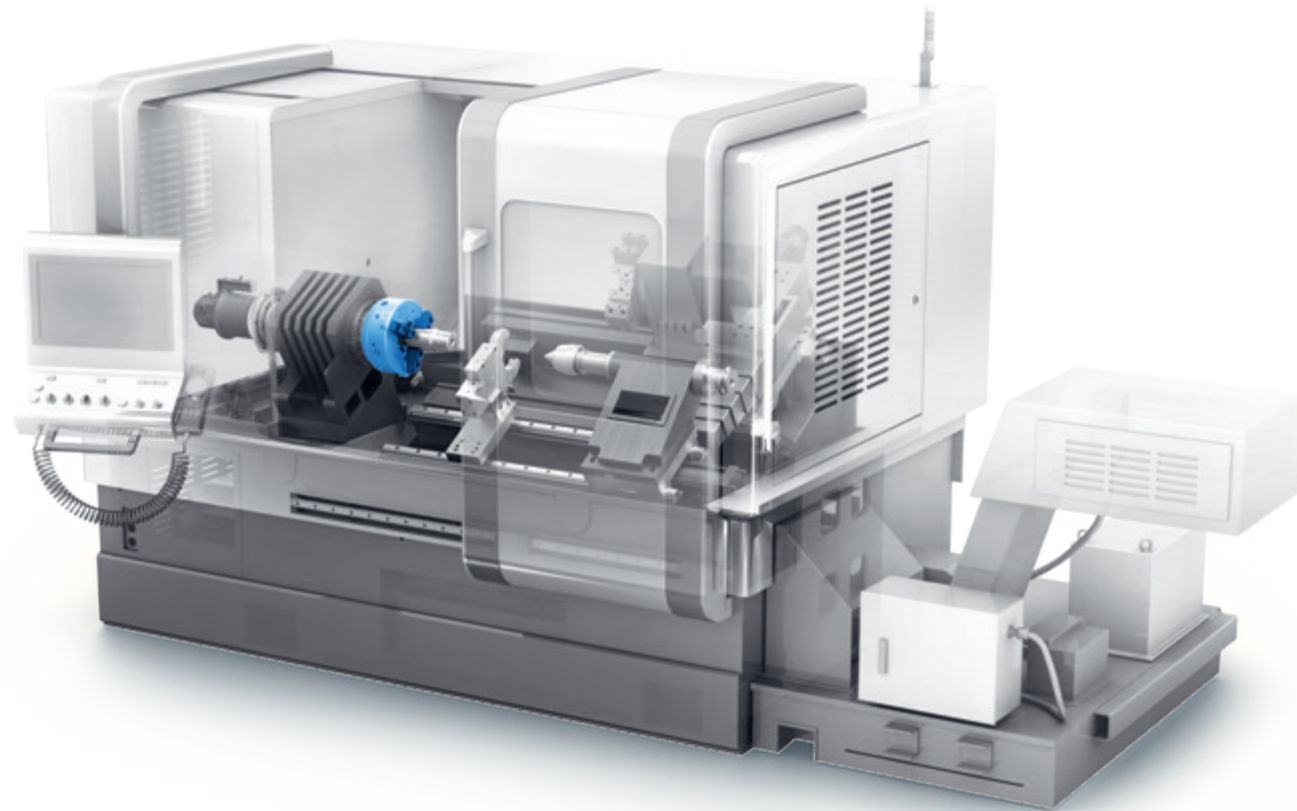
The values in brackets are preliminary and are subject to change.












<sup>(1)</sup> Necessary for use of double rotary union

You can find CAD data for the Forto-H at [roehm.biz/en/Forto-H](http://roehm.biz/en/Forto-H)



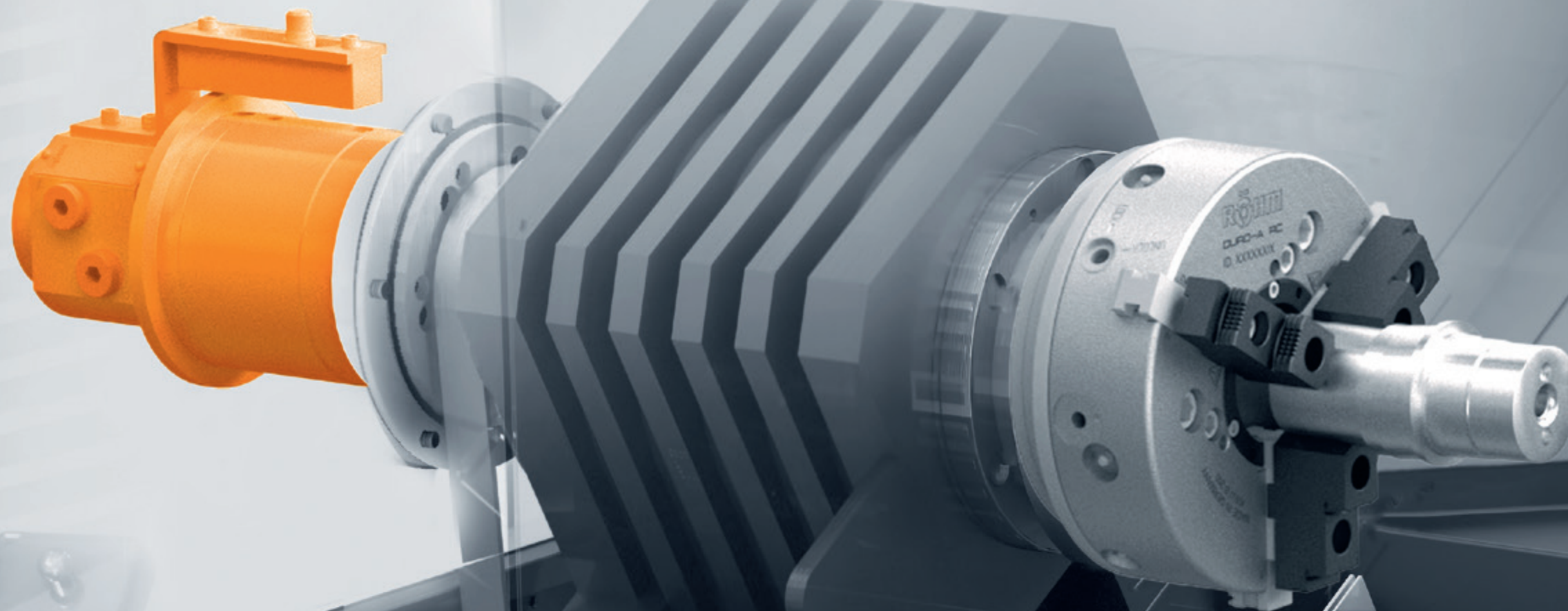
# WHAT FITS WHERE



Size	70	85	100	125	150	175	200	250
 KFD (2-jaw)		125, 160	200	250, 315	400		500, 630	
 KFD (3-jaw)	110	125, 130	160	200	250, 315		400, 500, 630	
 KFD-AF		160	160, 200	250	315			
 CoK-AE	142							
 Captis	32	32, 42	42, 52, 65	80, 100, 120	120			
 Absis	00, 01, 02		03, 04					
 Agilis	00, 01, 02, 03	04, 05, 06, 07	07					
 KZF		40, 60	60, 80	80				
 DURO-A	110	135, 165	165, 210	210, 254, 315	254, 315, 400	400		
 DURO-A RC		180	215	260	315		400	
 DURO-A Plus		140	140, 175	200, 250	250, 315		315, 400	




**ENABLING YOUR  
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## YOU NEED THE WHOLE SYSTEM ...


The Forto-H series cylinders are a key component for clamping on your machine tool. But precision clamping also requires other components. That's why we offer the complete system.


(1)  ... for clamping. That's why Röhm provides compatible, force-actuated clamping devices.

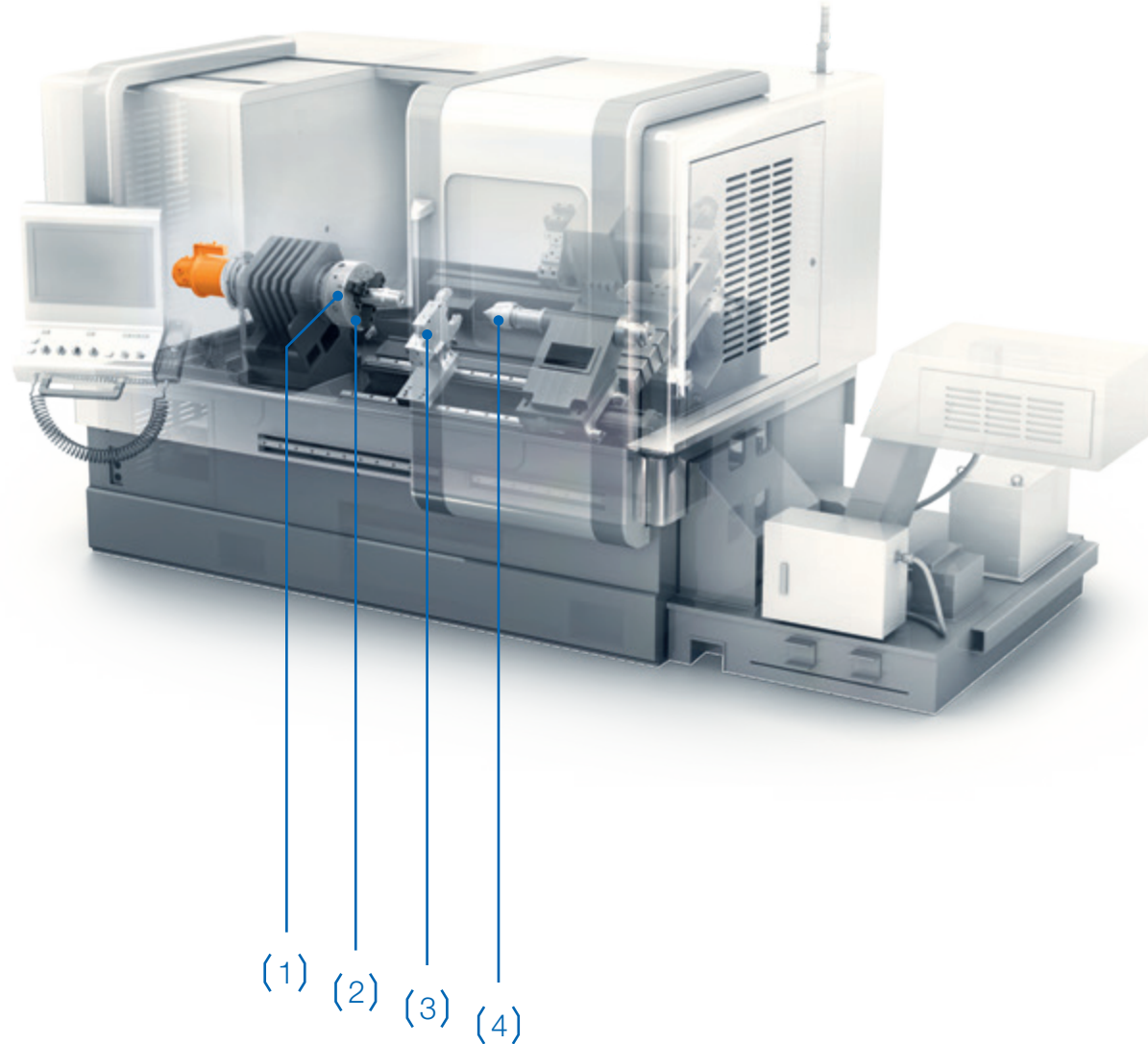
(2)  ... for loading workpieces correctly. That's why Röhm supplies an extensive range of top jaws.

(3)  ... to support long turned parts for maximum accuracy. That's why Röhm supplies self-centering steady rests.

(4)  ... to center long turned parts on the opposite side. That's what Röhm centering points are for.

 ... to not just achieve high clamping forces, but also to measure them. That's why Röhm offers the F-senso chuck. Simply clamp in the lathe chuck. Measure the clamping force. Done.

 ... for automated production. Röhm offers a comprehensive selection of grippers and positioners for placement and loading robots.



You can buy clamping and gripping technology from Röhm conveniently 24/7 in our online shop:

[eshop247.roehm.biz](https://eshop247.roehm.biz)



# MAYBE YOU NEED SOMETHING ELSE ...

The Forto-H can clamp a large number of force-actuated clamping devices. But maybe you have requirements that call for a special solution.

Perhaps because you have different needs in terms of the geometries to be machined. Or the volumes

to be produced result in different general conditions. Whatever you need, at RöhM we have the right clamping solution. That's our promise.

... because you want to machine long workpieces. Then go for the cylinder with extra large through-hole, the Forto-HT, which can even machine rods.



... because you don't have (or want) a hydraulic supply on your machine tool. In this case, we suggest air-operated cylinders (LVS = air-operated cylinders without through-hole with safety valve) from RöhM. These cylinders are ideal for applications where no oil can be used, for example in wood machining.



... because you are using manual clamping technology as you don't have a hydraulic supply on your machine tool. In this case, choose air-operated front-end chucks (LVE) from RöhM. They combine a pneumatic cylinder and the clamping device in a single module. These cylinder/chuck combinations are ideal for retrofitting on manual machines. The piston is actuated pneumatically.

