SR
SWING CLAMP CYLINDERS

CYLINDER TYPE		COMPENSATION SYSTEM						
		SR16	SR18	SR22	SR25	SR28	SR35	SR45
CYLINDER BODY TYPE	Upper flange 	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Flange with HPC prismatic anti-deflection block 	Yes	Yes	Yes	Yes	Yes	No	No
	Lower flange 	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Cartridge 	Yes	Yes	Yes	Yes	Yes	Yes	No
	Cartridge with HPC prismatic anti-deflection block 	Yes	Yes	Yes	Yes	Yes	No	No
Metal wiper		Yes	Yes	Yes	Yes	Yes	Yes	Yes
VRF flow control valve (option)		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Single-acting version		Yes	Yes	No	Yes	No	No	No
Maximum operating pressure (bar)		500	500	500	500	500	500	500
Clamping force at 100 bar using the standard “Type 01” clamping arm with “L” length (kN)		1.9	1.5	4	3.1	7.3	10.5	13
“L” clamping arm length (mm)		40	40	52	52	60	80	100
Rod diameter (mm)		16	18	22	25	28	35	45
Piston diameter (mm)		24	24	34	34	45	55	65
Total cylinder stroke (mm)		22	22	25	25	28	36	51
Swinging stroke (mm)		8	8	10	10	12	15	15
Clamping stroke (mm)		14	14	15	15	16	21	36
Piston clamping area (cm^2)		2.51	1.98	5.27	4.17	9.75	14.1	17.3
Piston unclamping area (cm^2)		4.52	4.52	9.07	9.07	15.9	23.8	33.2
Clamping oil volume (cm^3)		5.5	4.4	13.2	10.4	27.3	50.8	88.2
Unclamping oil volume (cm^3)		9.9	9.9	22.6	22.6	44.5	85.7	169.3

CYLINDER TYPE		SELF-ADJUSTING		COMPATIBLE					
		SRA16	SRA20	SR10	SR20	SR20CD	SR32	SR40	SR50
CYLINDER BODY TYPE	Upper flange 	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
	Upper flange with integrated pneumatic valve 	No	No	Yes	No	No	Yes	No	No
	Lower flange 	No	No	Yes	Yes	No	Yes	Yes	Yes
	Lower flange with integrated pneumatic valve 	No	No	No	No	No	No	No	No
	Cartridge 	No	No	Yes	Yes	Yes	No	No	No
Metal wiper		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VRF flow control valve (option)		No	No	No	Yes	No	No	Yes	Yes
Single-acting version		No	No	Yes	Yes	Yes	No	No	No
Maximum operating pressure (bar)		250	250	350	500	500	500	500	500
Clamping force at 100 bar using the standard "Type 01" clamping arm with "L" length (kN)		0.85	1.4	0.5	1.3	0.9	3.4	5	8.7
"L" clamping arm length (mm)		30	40	26	40	40	75	100	125
Rod diameter (mm)		16	20	10	20	20	32	40	50
Piston diameter (mm)		20	24	14	25	23	40	50	63
Total cylinder stroke (mm)		20	22	16 / 26	18	14	22 / 35	36 / 61	37 / 62
Swinging stroke (mm)		7	8	8 / 8	8	6	8	11	11
Clamping stroke (mm)		13	14	8 / 18	10	8	14 / 27	25 / 50	26 / 51
Piston clamping area (cm^2)		1.13	1.38	0.75	1.76	1.01	4.52	7.06	11.54
Piston unclamping area (cm^2)		3.14	4.52	1.54	4.9	4.15	12.56	19.63	31.17
Clamping oil volume (cm^3)		2.3	3	1.2 / 2	3.2	1.4	10 / 15.8	25.4 / 43.1	42.7 / 71.6
Unclamping oil volume (cm^3)		6.3	9.9	2.5 / 4	8.8	5.8	27.6 / 44	70.7 / 119.7	115.3 / 193.2

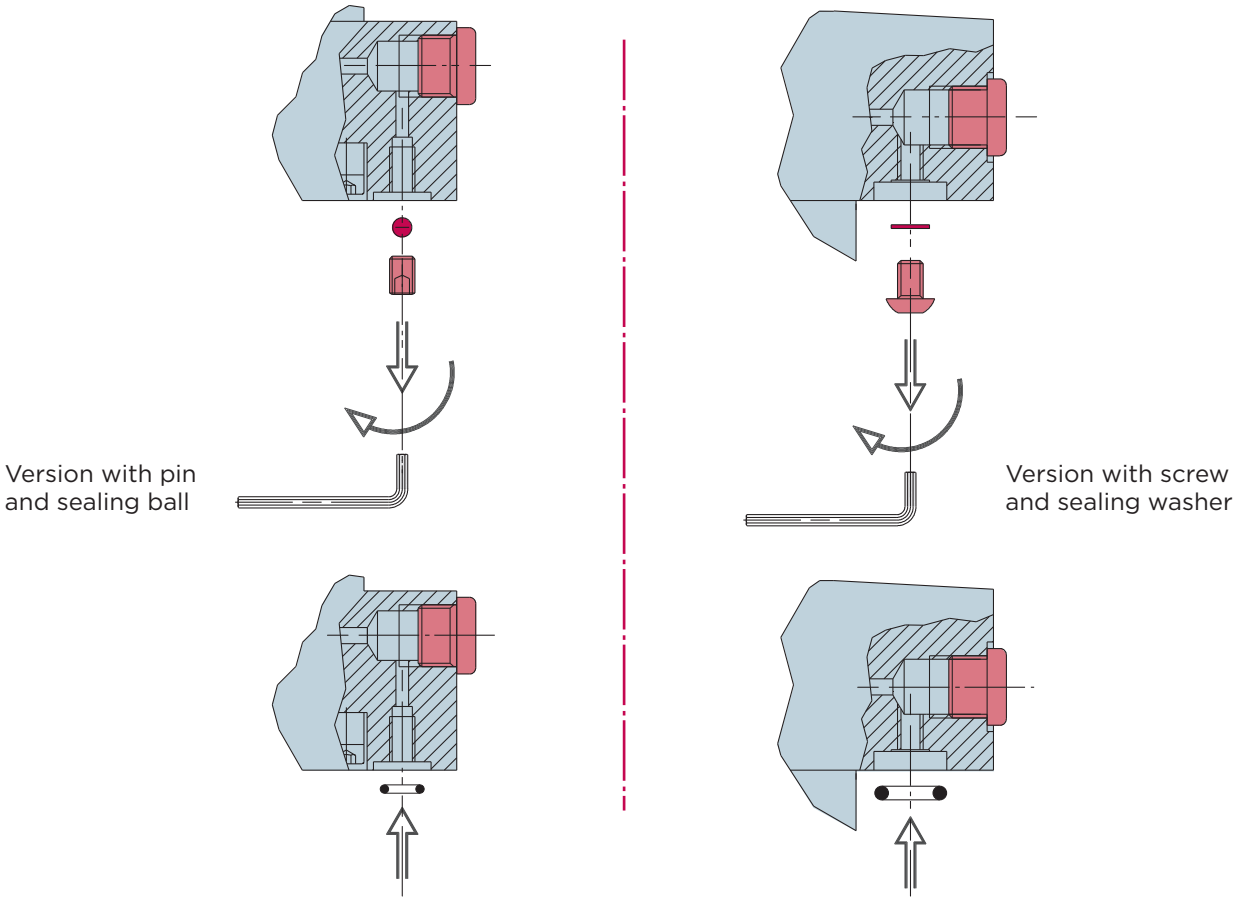
INSTALLATION OF SERIES FD CYLINDERS WITH UPPER FLANGE AND **SERIES PD** CYLINDERS WITH LOWER FLANGE WITH O-RING CONNECTION

ATTENTION: HYDROBLOCK swing clamp cylinders are rated for operating pressures ranging between **30** and **500 bar**. This pressure range must be taken into account in the cylinder planning phase, i.e. the entire system must be adequately rated. To mount HYDROBLOCK swing clamp cylinders, please proceed as follows:

1) Make sure that all preparations for installation specified in the technical catalogue for the selected cylinder have been made

2) Remove the threaded plugs and the corresponding sealing washers or balls as shown in the figure below.

INSTALLATION WITH FLANGE CONNECTION



3) Grease the delivered **O-rings** and fit them in the appropriate seat. Make sure not to damage the sealing ring as this could cause leakage. To ensure perfect sealing, the surface in the O-ring contact area should exhibit a roughness of Ra <1.6.

4) Apply grease to the mounting screws and use a torque wrench to tighten them with the tightening torque indicated in the table on page 16. The clamp arm locking device allows the angular position of the clamp arm to be adjusted after having mounted the cylinder.

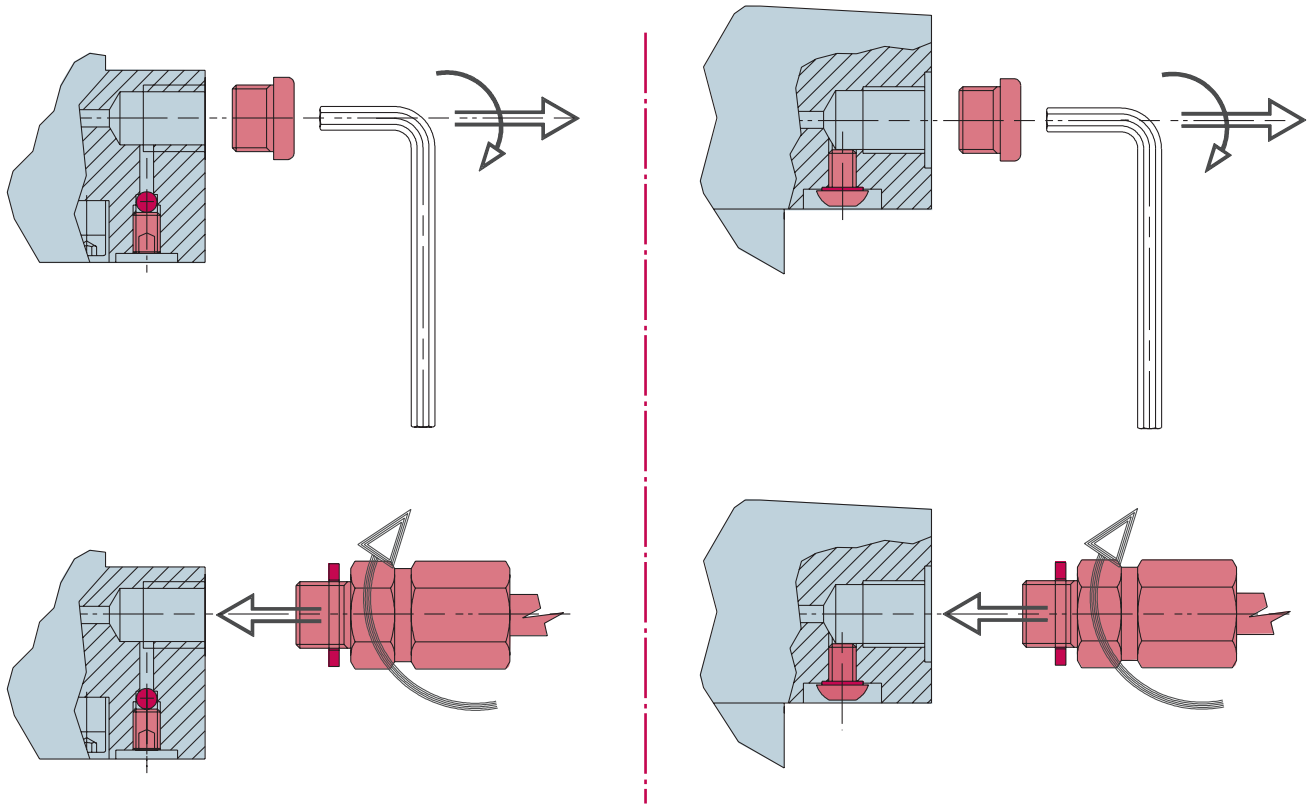
IMPORTANT: The lubrication operations mentioned in steps **3** and **4** must be performed during the initial assembly and in the case of subsequent maintenance operations to ensure proper functioning of the cylinder.

IN-LINE INSTALLATION OF SERIES FD CYLINDERS WITH UPPER FLANGE AND **SERIES PD** CYLINDERS WITH LOWER FLANGE

Hydraulic fittings: If the lateral threaded ports are used instead of the flange connections, pressure fittings with a nominal pressure of **500 bar** must be used**.**
DO NOT use thread sealants! Tightness is ensured by an O-ring seal in the fitting.

To mount the threaded fittings, proceed as follows:
1) Remove the threaded plugs.
2) Tighten the fittings with the tightening torque specified in the technical catalogue.

IN-LINE INSTALLATION

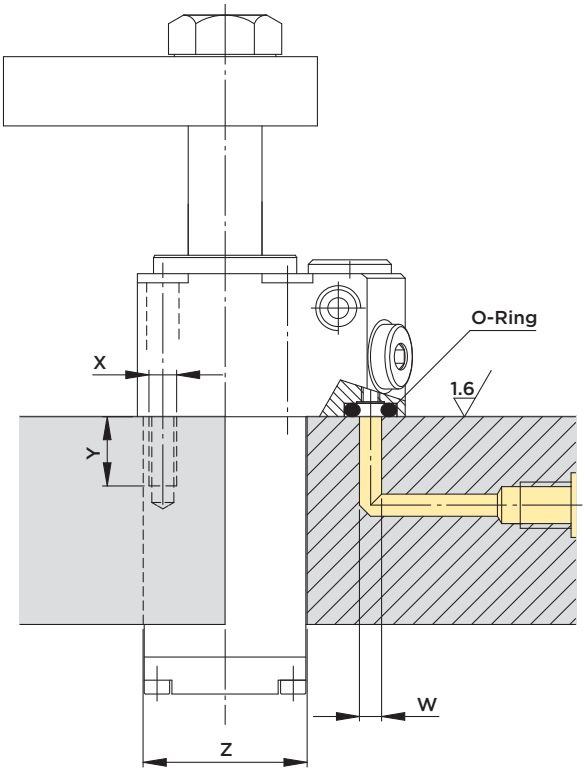


INSTALLATION OF **CD SERIES** CYLINDERS WITH CARTRIDGE BODY

To mount HYDROBLOCK swing clamp cylinders with cartridge body, please proceed as follows:
1) Make sure that there are no burrs or sharp edges in the cylinder seat to exclude any damage to the seals at the cylinder body.
2) Properly grease the seals on the outside of the cylinder body and place the cylinder into the prepared seat.
3) Apply grease to the mounting screws and use a torque wrench to tighten them with the tightening torque indicated in the table on page 16.

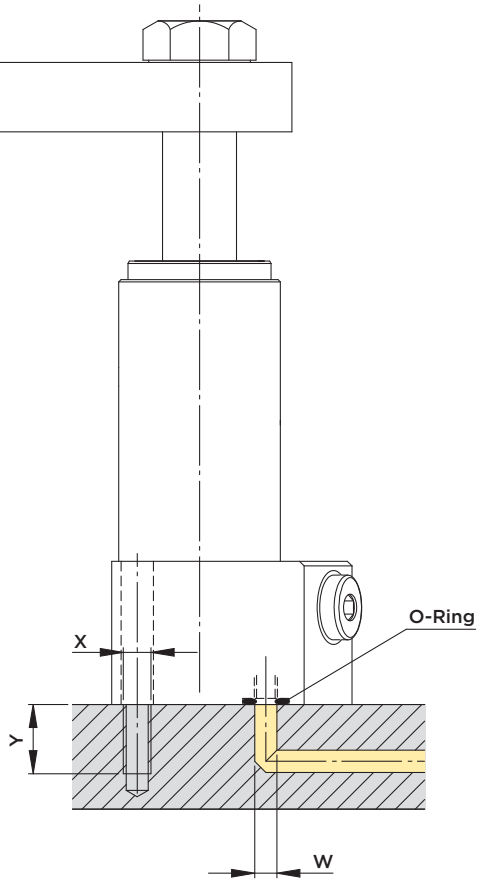
SEAT, TYPE OF INSTALLATION AND ORDER NUMBERS OF SPARE SEALS FOR **CYLINDERS WITH FLANGE CONNECTION**

Cylinder with upper flange
-FD-



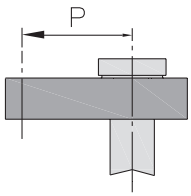
(Mounting hole)

Cylinder with lower flange
-PD-



CYLINDER TYPE	X	Y (Min)	TIGHTENING TORQUE	Z	W (Max)	OR	
						Upper flange -FD-	Lower flange -PD-
SR10	M5	12	8.5	M27x1.5 / Ø 27.5	Ø 5	Ø 6.75x1.78	Ø 6.75x1.78
SR16/CT16	M6	15	14.6	Ø 35.5	Ø 4.8	Ø 4.34x3.53	Ø 6.07x1.78
SR18/CT18	M6	15		Ø 35.5	Ø 4.8	Ø 4.34x3.53	Ø 6.07x1.78
SR20	M6	15		M45x1.5 / Ø 45.5	Ø 4	Ø 4.34x3.53	Ø 6.07x1.78
SR22/CT22	M6	15		Ø 49	Ø 4.8	Ø 4.34x3.53	Ø 6.75x1.78
SR25/CT25	M6	15		Ø 49	Ø 4.8	Ø 4.34x3.53	Ø 6.75x1.78
SR28/CT28	M8	18	36.6	Ø 63.5	Ø 4.8	Ø 4.34x3.53	Ø 6.75x1.78
SR32	M8	18		M60x1.5 / Ø 60.5	Ø 5	Ø 4.34x3.53	Ø 6.02x2.62
SR35/CT35	M10	20	70.5	Ø 75.5	Ø 4.8	Ø 4.34x3.53	Ø 4.34x3.53
SR40	M10	20	70.5	M80x2 / Ø 80.5	Ø 5	Ø 9.12x3.53	Ø 9.12x3.53
SR45/CT45	M12	24	119	Ø 91	Ø 6	Ø 9.12x3.53	Ø 9.12x3.53
SR50FD	M12	24	119	Ø 90	Ø 8	Ø 10.78x3.53	/
SR50PD	M14	30	180	M90x2 / Ø 90.5	Ø 6	/	Ø 10.78x2.62

MOUNTING THE CLAMP ARM TO **SR SERIES** SWING CLAMP CYLINDERS



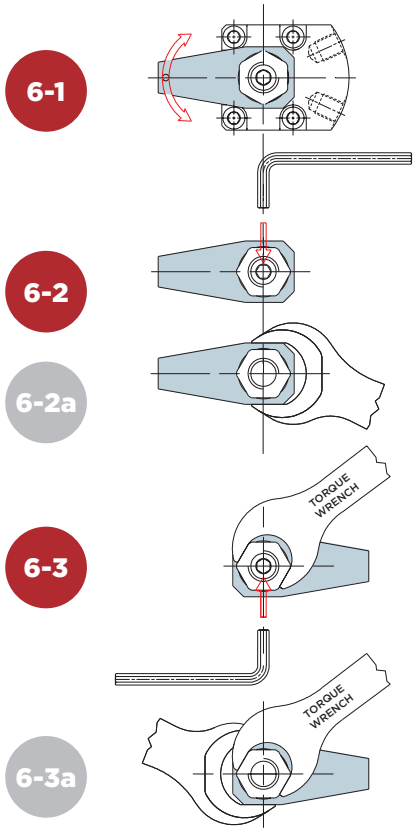
NOTE: The **FORCE/PRESSURE DIAGRAMS** included in the technical catalogue must be strictly observed in the planning phase, as they show the relation between the maximum clamping arm length, the admissible operating pressure and the effective clamping force. The maximum operating pressure and thus the clamping force exerted on the workpiece are reduced with increasing clamp arm length (**P**). It is of **fundamental importance** for perfect cylinder operation that the specified pressure values are not exceeded. The catalogue includes the formulas used for calculation and the corresponding diagrams.

ATTENTION: Failure to comply with the values specified in the **FORCE/PRESSURE** diagrams may cause the risk of accidents or damage to the cylinders that **ARE NOT COVERED BY THE MANUFACTURER'S WARRANTY!**
All **SR COMPENSATION SYSTEM** swing clamp cylinders of HYDROBLOCK are equipped with the unique compensation system designed to compensate the clamping arm clearance and angular deviations. They are particularly suited for long operating times and ensure high repeat accuracy in the positioning of the clamping arm, which minimizes wear during operation.
With this system, the piston rod or the clamp arm and **not** the cylinder body **must** be fixed when mounting the clamp arm (**figure 6-2**), in order not expose the swinging mechanism to unexpected forces, which would damage the cylinder and affect its function.

MOUNTING SEQUENCE:

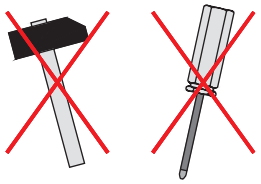
1) Place the clamping arm on the cone and align it according to the workpiece position in the fixture (**figure 6-1**).
2) Fix the cylinder rod with a hexagon wrench using the hexagon socket provided at the top as shown in **figure 6-2. (If there is no hexagon socket at the top of the rod, fix the arm with an open-end wrench, see figure 6-2a).**
3) Hold the clamp arm with the hexagon wrench or the open-end wrench (**figure 6-3 or 6-3a**) and use a torque wrench to tighten the ring nut with the torque indicated below.
4) Check the tightening torque once again after having performed several clamping strokes to eliminate any clearance formed between the clamp arm and the cone under load.

NOTE: To ensure proper tightening, firmly fix the clamp arm while tightening the nut in order to avoid any damage to the swinging mechanism of the clamp caused by forces resulting from the torque.



THREAD	M14x1.5	M16x1.5	M18x1.5	M22x1.5	M28x1.5	M30x1.5	M40x1.5	M45x1.5
TIGHTENING TORQUE (Nm)	26	39	51	78	110	120	190	190

NOTE: Swing clamp cylinders may be damaged by excessively high torques acting on the piston. If the rod cannot be reliably fastened as shown in figures 6-2 and 6-2a, fix the rod in a vice before rotating the ring nut to mount or remove the clamping arm. If the clamping arm needs to be unlocked or repositioned, make sure to remove it exclusively by using an **appropriate extracting tool**. Hammers, wrenches or other tools that may damage the cylinder **MUST NOT BE USED** for this purpose.



SENSE OF ROTATION OF THE CLAMP ARMS OF **SR SERIES** SWING CLAMP CYLINDERS

SR swing clamp cylinders of HYDROBLOCK turn in right-hand **(R)** or left-hand **(L)** direction. The sense of rotation determines the dimensions of the clamp arm on the fixture and is defined during the planning phase. However, it can be modified at a later date directly on the fixture if this turns out to be necessary for unexpected space problems or for new applications.
To identify the sense of rotation of a HYDROBLOCK SR swing clamp cylinder, check the cylinder in top view **(clamp arm side, figure 1)**. Determine in which direction the arm turns (**swinging stroke, figure 2**) in the initial lowering phase (**figure 3**):

- If the arm turns clockwise when being closed, the cylinder is of **right-hand** type **(R)**.
- If the arm turns anticlockwise when being closed, the cylinder is of **left-hand** type **(L)**.

FIG. 1

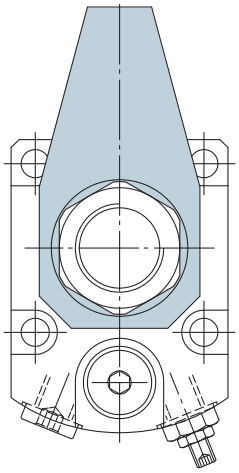


FIG. 2

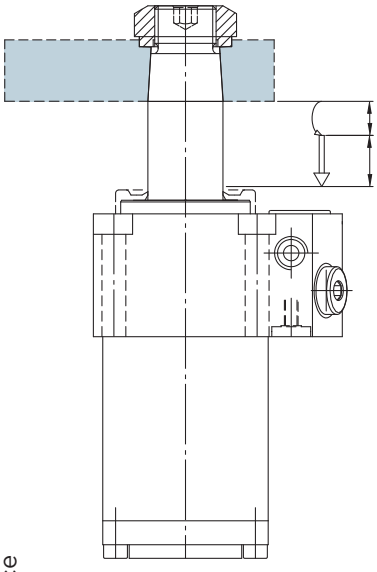


FIG. 3a

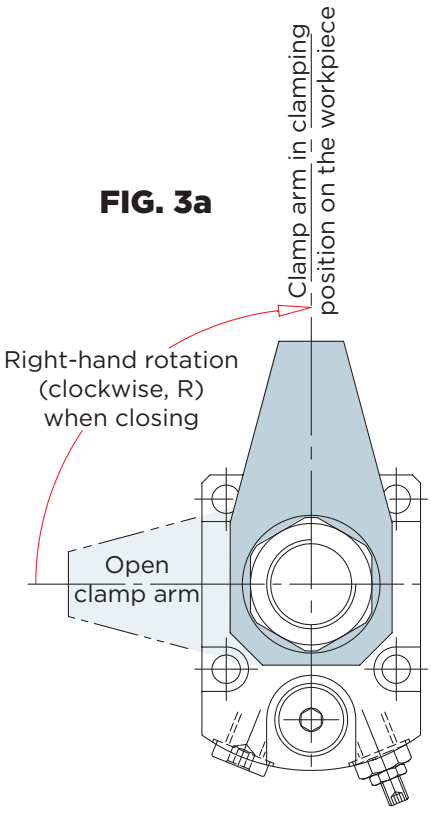


FIG. 3b

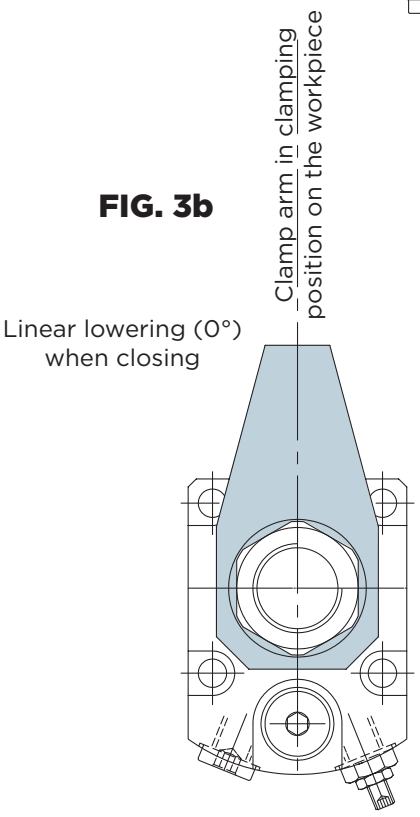
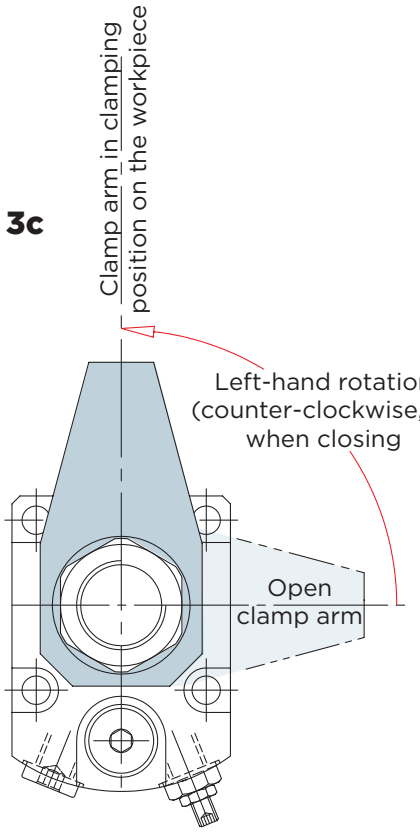
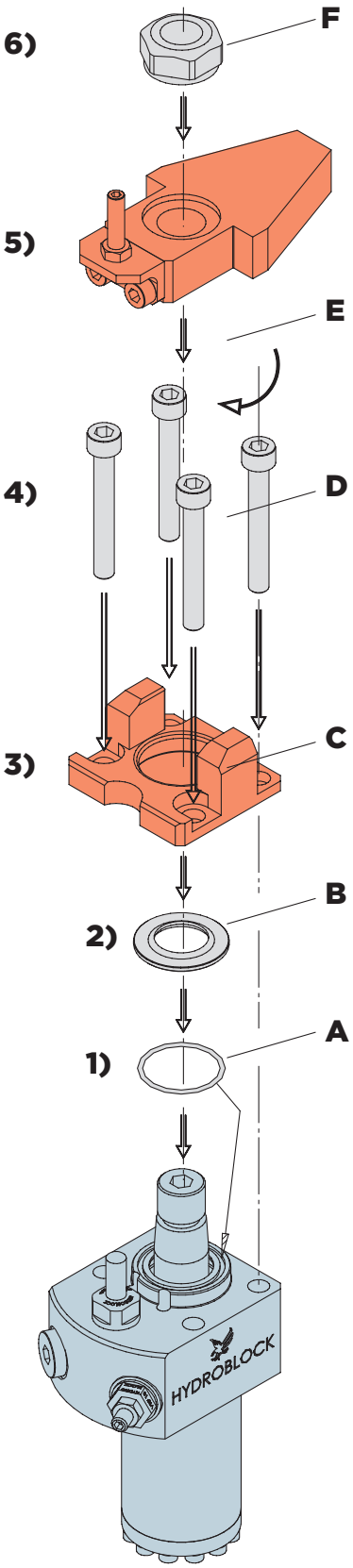


FIG. 3c



MOUNTING INSTRUCTIONS FOR THE **HPC** SYSTEM



MOUNTING OF THE HPC SYSTEM

1) Insert the rubber element **"A"** into the groove provided for this purpose.

2) Mount the metal wiper ring **"B"** by pushing it over the cylinder rod until it is in contact with the previously inserted rubber ring **"A"**.

Note: The metal wiper ring **"B"** must be precisely guided on the piston rod. If it does not move smoothly, polish the inside diameter carefully with very fine abrasive paper. Proceed with extreme caution in order not to round the wiper edge and to affect its wiping efficiency.

3) Mount the prism guide block **"C"** in the centring element on the cylinder body and ensure that the front guiding surface of the piston rod is correctly aligned.

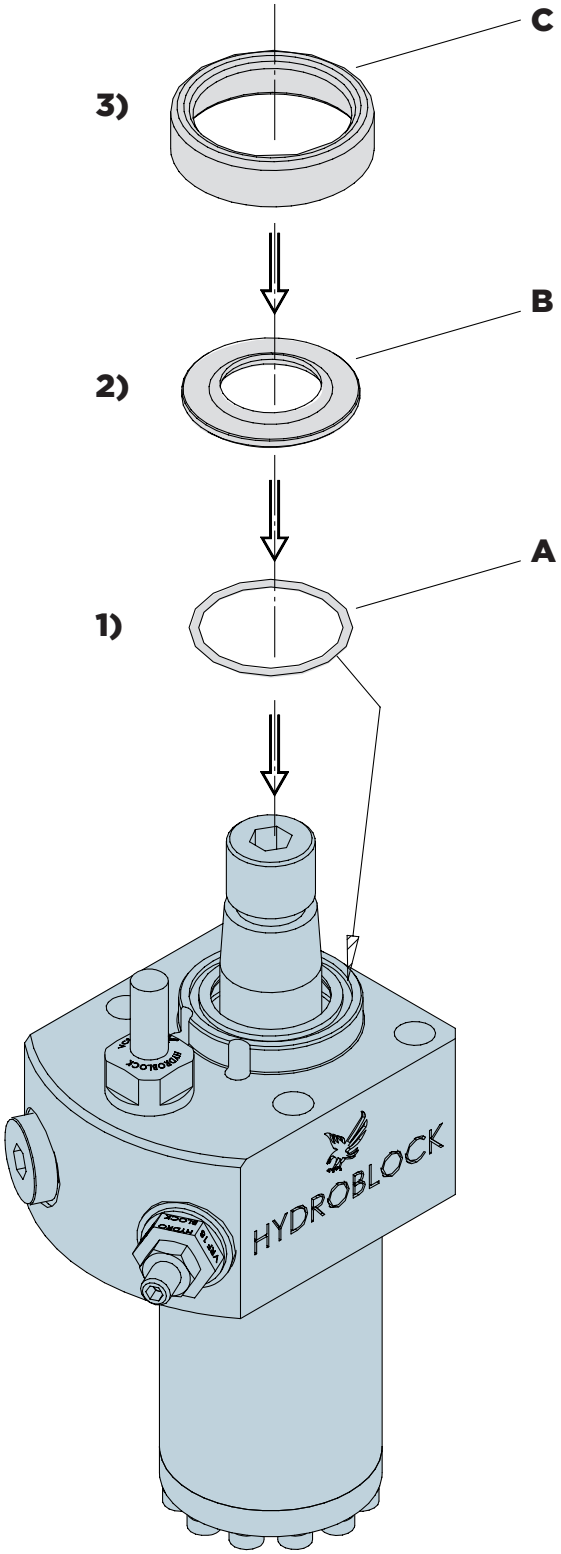
4) Insert the mounting screws **"D"** into the bores provided in the prism guide block and in the cylinder body and tighten them with the tightening torque specified on page 16.

5) Mount the appropriate clamping arm on the rod and fit it between the lateral and front guiding surfaces of the prism guide block.

6) Finally install the nut **"F"** and tighten it with the tightening torque specified in the corresponding table. Check the tightening torque of the nut after the first 1000 operating cycles.

Note: The clearance between the screws and the cylinder body minimizes angular deviations. Check the correct clamping arm alignment before tightening the mounting screws.

MOUNTING INSTRUCTIONS FOR RETROFITTED ACCESSORIES



MOUNTING OF THE METAL WIPER

1) Insert the rubber element **"A"** into the groove provided for this purpose.

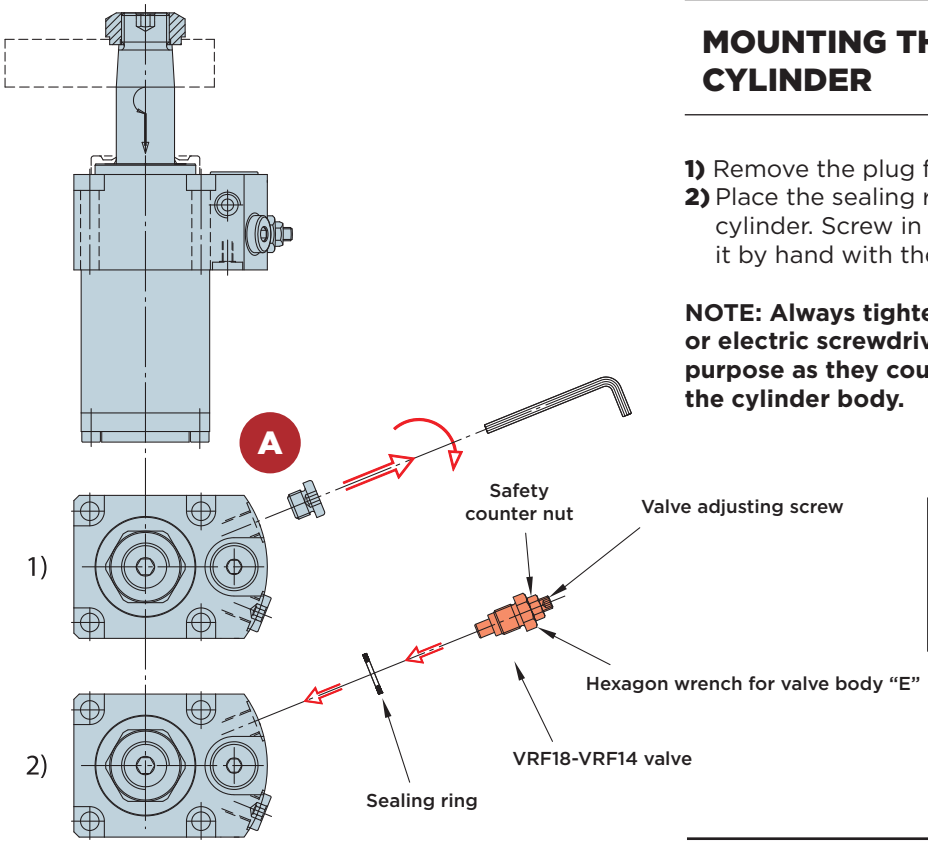
2) Mount the metal wiper ring "B" by pushing it over the cylinder rod until it is in contact with the previously inserted rubber ring **"A"**.

Note: The metal wiper ring **"B"** must be precisely guided on the piston rod. If it does not move smoothly, polish the inside diameter carefully with very fine abrasive paper. Proceed with extreme caution in order not to round the wiper edge and to affect its wiping efficiency.

3) Install steel bushing **"C"** metal wiper in the appropriate position on the cylinder body. We recommend pressing the steel bushing with the spacer element onto the rod in order to push it into place.

Note: Do not use a hammer or inappropriate tools for the installation of the steel bushing. The bushing MUST be fitted to the cylinder body by exerting an axial force onto the rod.

MOUNTING INSTRUCTIONS FOR RETROFITTED **VRF SERIES** FLOW CONTROL VALVES

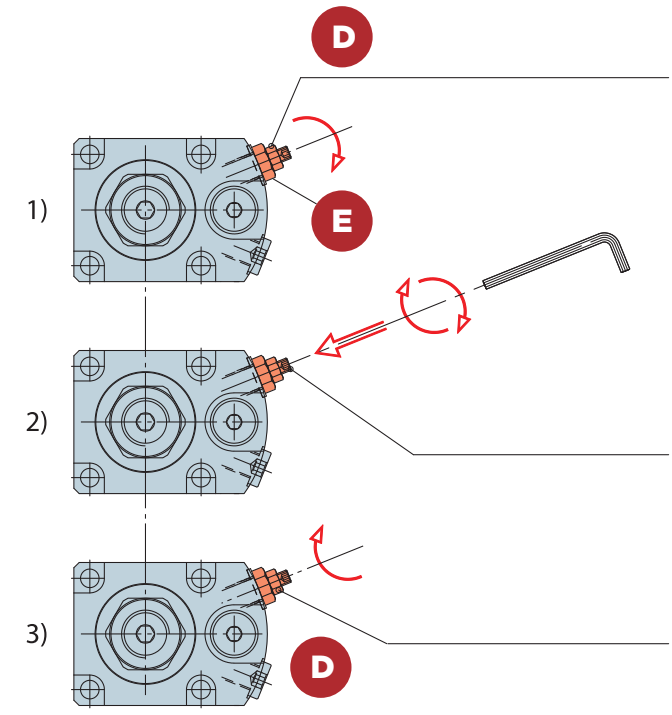


MOUNTING THE VALVE TO THE CYLINDER

1) Remove the plug from the **"A"** port (clamping).
2) Place the sealing ring into the groove provided on the cylinder. Screw in the valve up to the stop and tighten it by hand with the specified torque.

NOTE: Always tighten the valve by hand. Pneumatic or electric screwdrivers MUST NOT be used for this purpose as they could cause damage to the valve or the cylinder body.

TORQUE FOR VALVE BODY "E"
VRF18 = 16Nm
VRF14 = 40Nm



ADJUSTMENT OF THE FLOW CONTROL VALVE

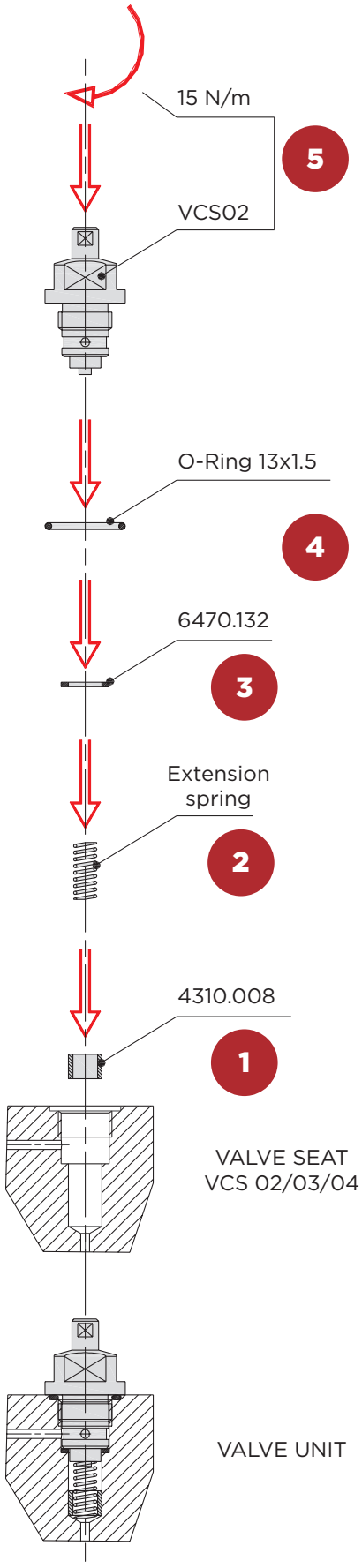
Loosen the safety counter nut "D" while fixing the valve body "E" with the hexagon wrench.

TORQUE FOR THE COUNTER NUT "D"
VRF18 = 6Nm
VRF14 = 12Nm

Adjust the flow rate using the screw at the VRF valve. Make sure to use exclusively the appropriate wrench and perform the adjustment ONLY in unpressurized condition.

After having adjusted the flow rate, tighten the "D" counter nut again.

MOUNTING INSTRUCTIONS FOR **VCS02/VCS03 VCS04** PNEUMATIC VALVES



MOUNTING SEQUENCE FOR THE VCS PNEUMATIC VALVE

1) Insert the stop element, article no. **4310.008**, into the valve seat.
2) Then place the extension spring, article no. **A/2044** into the valve seat.
3) Insert the sealing ring, article no **6740.132**, into the valve seat until it reaches the stop.
4) Mount the upper **O-Ring 13 x 1.5 mm** sealing ring in the valve seat.
5) Install the valve in the seat and tighten it with a torque of 15 N/m.

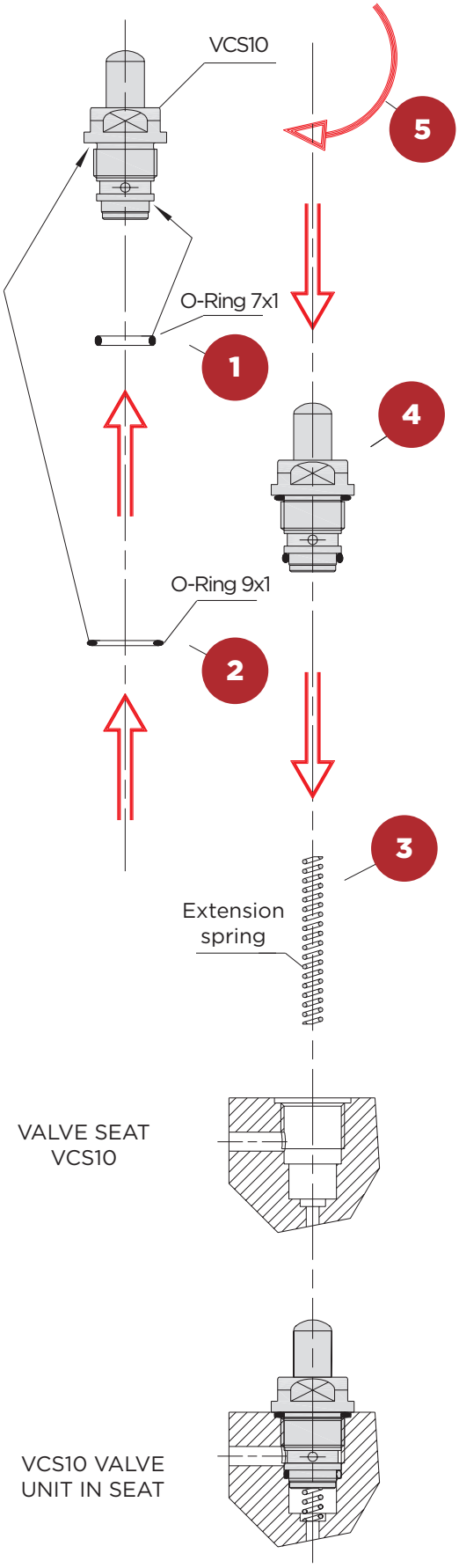
NOTE:
The maximum valve stroke is 4 mm for the VCS02 valve and 7 mm for the VCS03 and VCS04 valves.
We recommend a closing stroke of 2÷3 mm.

INSTRUCTIONS FOR THE ADJUSTMENT OF THE PNEUMATIC SYSTEM WHEN USING CLAMP ARM/WORKPIECE POSITION CONTROL VALVES

NOTE: A precise air supply flow upstream from the pressure switch provided for valve control is of prior importance for the efficient operation of the clamp arm/ workpiece position control valves.

1) Close all VCS valves except for one.
2) Close the flow control completely to interrupt the air flow.
3) Carefully reopen the flow control valve and increase the downstream pressure to set the release point of the clamp closing pressure switch.
4) Close the flow control valve slowly until no alarm is given by the pressure switch (pressure drop).
5) Open and close the VCS valve to check whether the pressure reaches the release pressure set at the pressure switch and is reduced again.

MOUNTING INSTRUCTIONS FOR THE **VCS10** PNEUMATIC VALVE



PREPARATIONS FOR VALVE MOUNTING

1) Use the metric **O-ring 7x1** as lower valve seal.
2) Use the metric **O-ring 9x1** as upper valve seal.

Mounting of the valve

3) Insert the extension spring (A/1655) into the appropriate valve seat.
4) After having inserted the extension spring into the hollow valve shaft up to the stop, place the prepared VCS10 valve into seat and tighten it with a torque of 12 N/m.

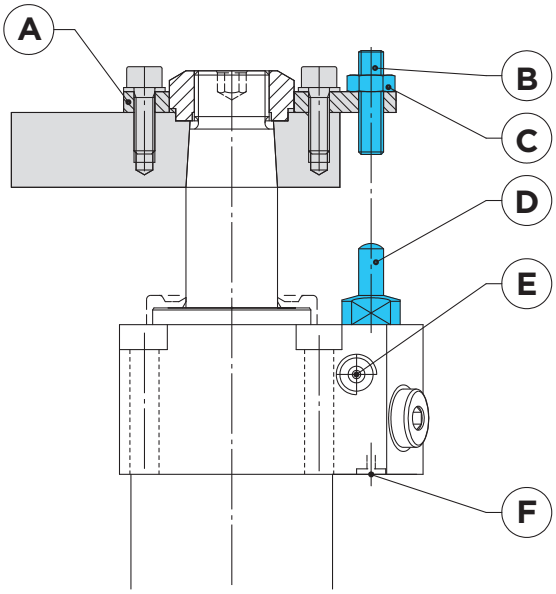
N.B.:
The maximum valve stroke is 3.5 mm.
We recommend a closing stroke of 1.5 ÷ 2 mm.

INSTRUCTIONS FOR THE ADJUSTMENT OF THE PNEUMATIC SYSTEM WHEN USING CLAMP ARM/WORKPIECE POSITION CONTROL VALVES

NOTE: A precise air supply flow upstream from the pressure switch provided for valve control is of prior importance for the efficient operation of the clamp arm/workpiece position control valves.

1) Close all VCS valves except for one.
2) Close the flow controller completely to interrupt the air flow.
3) Carefully reopen the flow control valve and increase the downstream pressure to set the release point of the pressure switch for position control.
4) Close the flow control valve slowly until no alarm is given by the pressure switch (pressure drop).
5) Open and close the VCS valve to check whether the pressure reaches the release pressure set at the pressure switch and is reduced again.

ADJUSTMENT OF THE INSTALLED **PNEUMATIC VALVE**



Adjustment of the air-operated valve

To adjust the clamp arm position control valve, please proceed as follows:

1) Pressurize the cylinder to move the clamping arm into clamping position.

2) Adjust the plate (A) to the exact radial position to ensure that the set-screw (B) is in line with the valve.

3) Supply the circuit with air at 1 - 6 bar through the port (F). The valve bolt (D) is completely extended and air escapes from the bore (E).

4) Screw in the set-screw (B) with the workpiece being clamped until the air flow is interrupted. Then tighten the screw by another 2 - 4 rotations (*) and lock the screw by means of the nut (C).

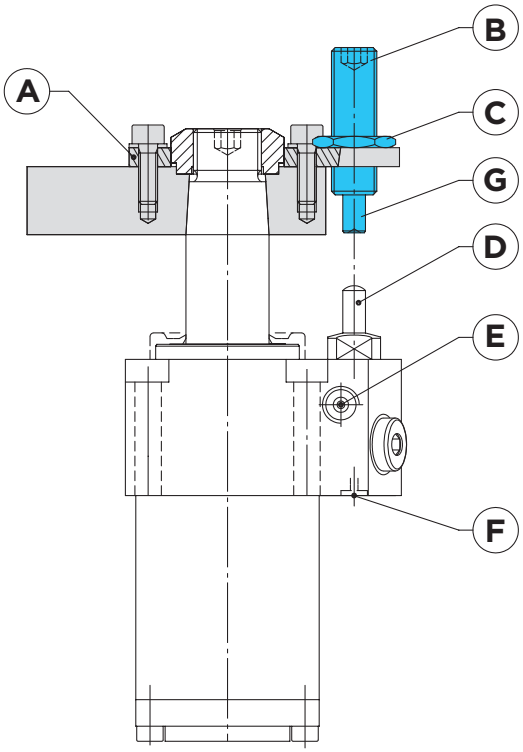
The pressure switch indicates that the pneumatic circuit is closed and enables the machine cycle start.

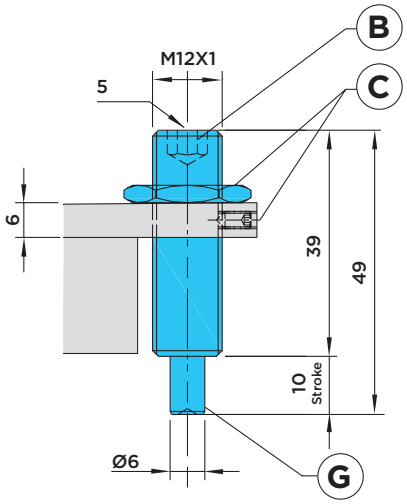
* (The additional 2÷4 rotations are required to compensate thickness variations caused by rough surfaces.)

CPV01 - VALVE PROTECTION CARTRIDGE

Valve protection cartridge.

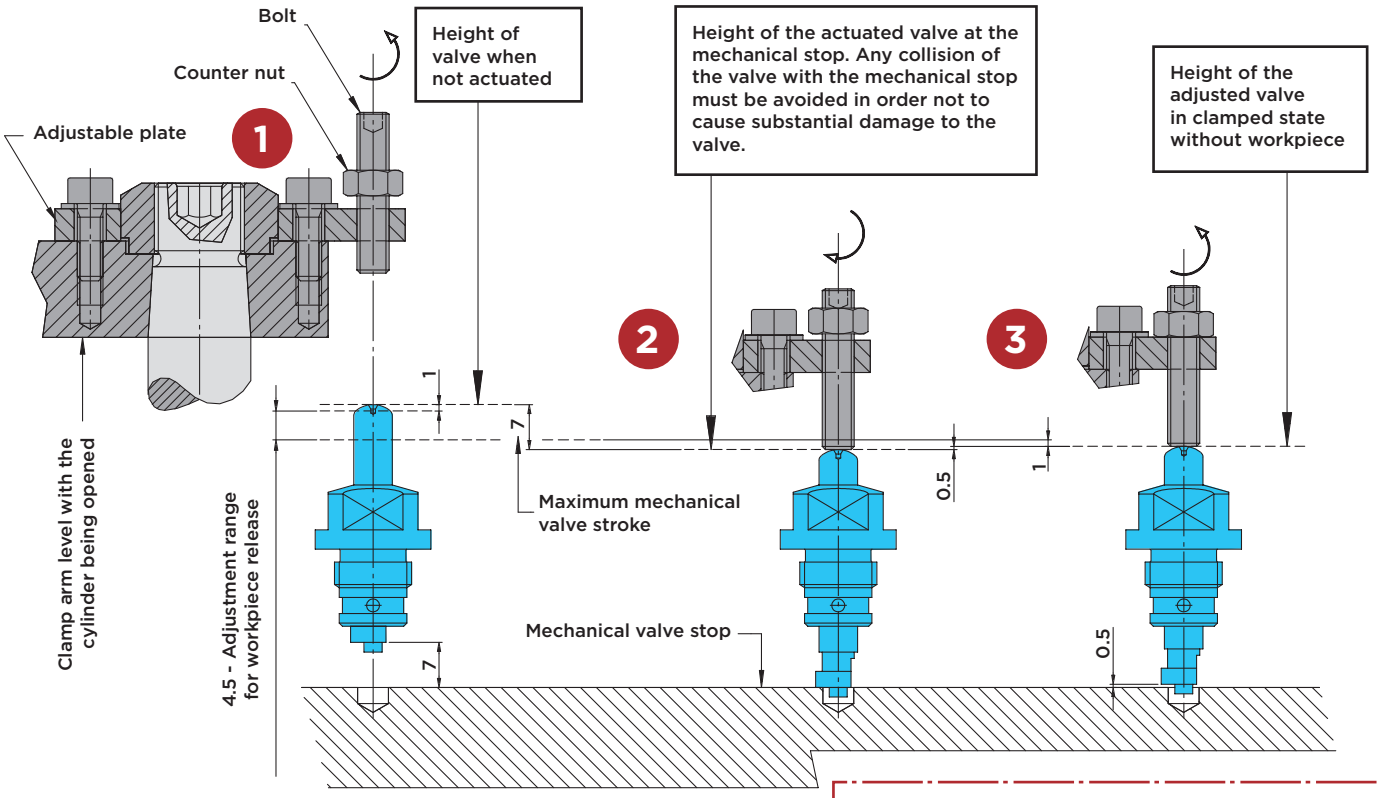
With the CPV01 valve protection cartridge, the final user can perform clamping operations without any workpiece being mounted in the fixture to check the cylinder for proper functioning or for cleaning purposes. In this case, there is no risk of damage to the VCS clamp arm position control valve caused by excess stroke.

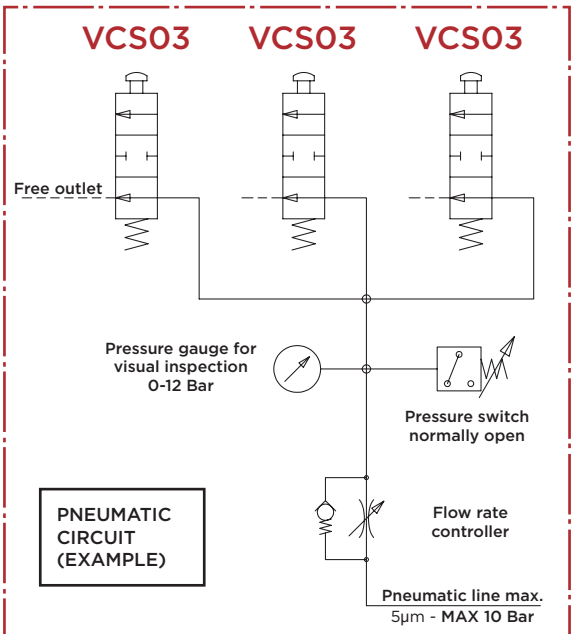




Adjustment of the valve protection cartridge (example):
To adjust the CPV01 valve protection cartridge for the clamp arm control valve, proceed as described in the above instructions **1** to **4** for the adjustment of the clamp arm position control valve.
Upon completion of the adjustment, the pressure switch will indicate that the compressed air circuit is closed and enable the machining cycle.
The bolt of the cartridge (G) can compensate an excess stroke of up to 10 mm and re-establish the starting conditions as soon as the cylinder has returned into unclamping position. Make sure that no stroke over 10 mm is performed during clamping operations without workpiece.

VALVE ADJUSTMENT
VCS03





NOTE: The volume flow in the pneumatic line must be controlled such as to ensure that the entire system is depressurized and changes to alarm mode when a single valve is opened. If the machine is not equipped with a flow control valve, retrofitting is necessary as excessively high flow rates will affect the proper function of the safety equipment.

RECOMMENDED VALVE ADJUSTMENT:

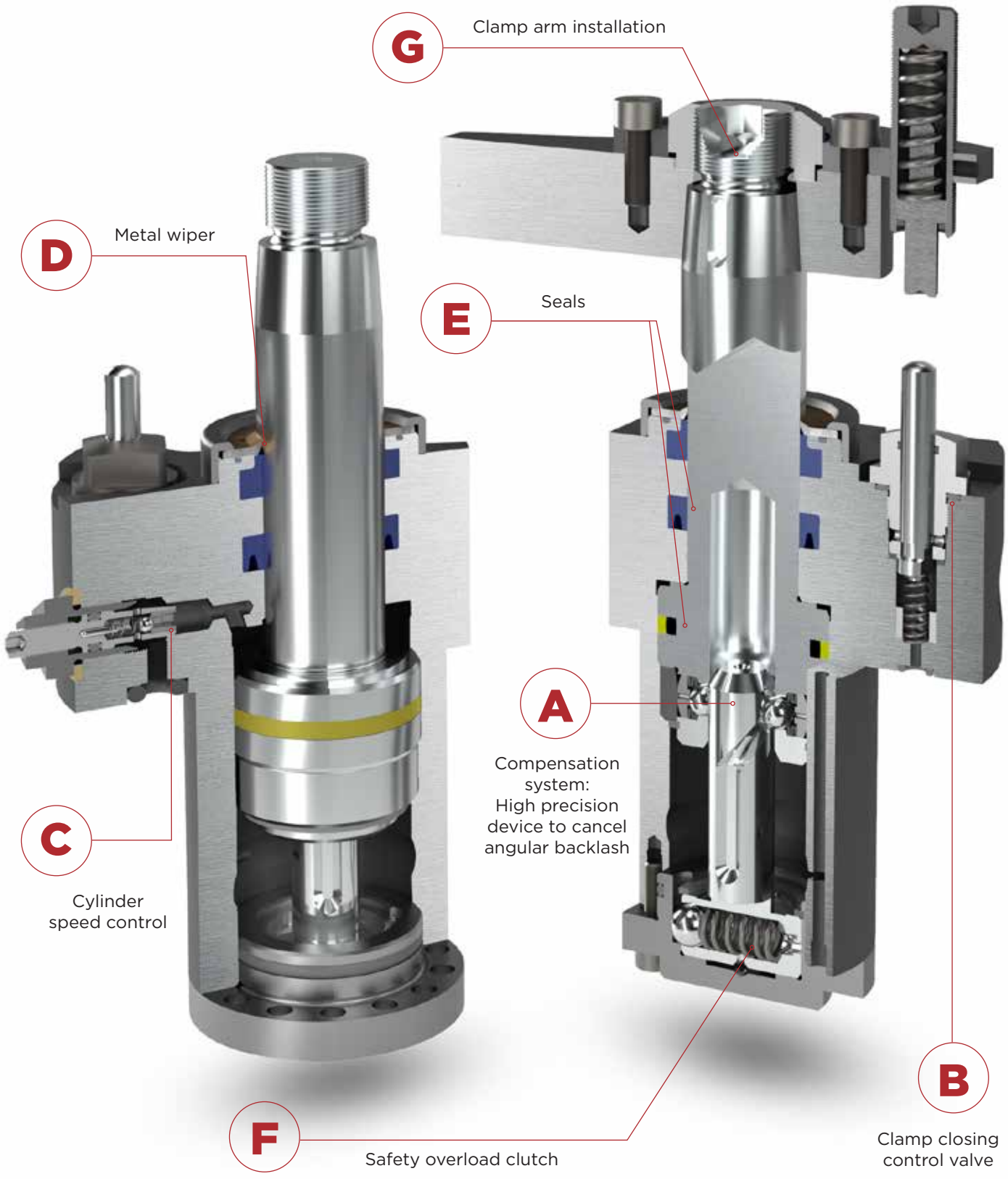
1) Pressurize the cylinders to open them until they reach the end position.

ATTENTION: Prior to performing any manual operations on the fixture, make sure that the hydraulic supply is switched off and the cylinders are prevented from closing while the work is being carried out.

2) Remove the workpieces from the machining position, if any.
3) Completely unscrew the bolts installed on the adjustable plate at the clamp arm (fig. 1).
4) Close the hydraulic cylinders up to the mechanical stop.
5) Carefully screw in the bolt until the VCS valves have reached the mechanical stop (mechanical limit stop, see figure 2).
6) Unscrew the bolt by 0.5 mm and lock it in this position using the appropriate counter nut (fig. 3). The valves are now open and the pressure switch cannot give a “Workpiece clamped” release. As soon as the workpiece is in correct position and the clamp arm is placed on it, the valve is closed and the “Workpiece clamped” release will be given via the pressure switch.

NOTE: As the VCS03 valves provide a double alarm signal via the pressure switch (for clamp arm and workpiece position control), the cylinder position must be carefully selected. Make sure that with the clamp arm being in clamped condition but with no workpiece in working position, there is still a residual stroke available to move the VSC03 valves back into open position without the risk of mechanical collision of the valves. Under the mentioned conditions, an additional clamping stroke of 3 – 5 mm will usually be sufficient for this purpose.

SR
COMPENSATION SYSTEM



Swing clamp cylinders are mainly used as clamping elements for workpiece machining in hydraulic fixtures where easy manual or automatic workpiece loading and unloading is of prior importance.
Owing to the exclusive clearance compensation system, these cylinders offer unparalleled reliability and high repeat accuracy in clamp arm positioning and are thus particularly suited for complex applications.
In combination with the pneumatic clamp arm position control valve they guarantee maximum clamping stability and reliable machining cycles in automated production processes.

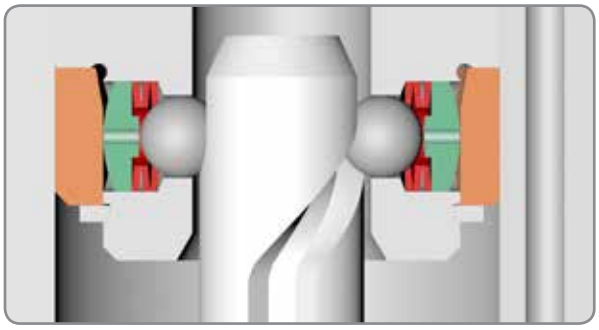
HYDROBLOCK swing clamp cylinders of the SR COMPENSATION SYSTEM series do not require cost-intensive additional equipment for repositioning to ensure that the clamping arm reaches the precise clamping point.

The clamping arm will systematically be placed at the correct point – cycle after cycle.

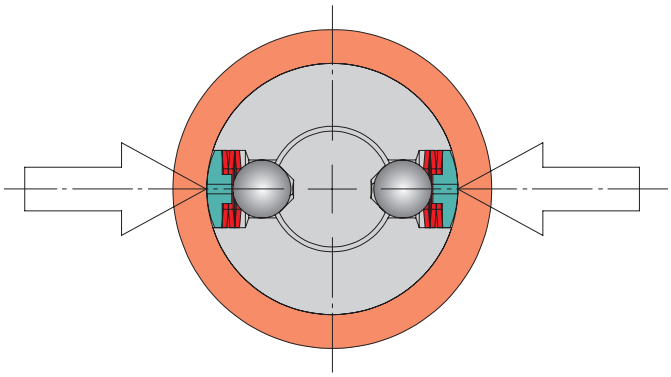
A. COMPENSATION SYSTEM

SWINGING MECHANISM WITH UNCOMPROMISING ANGULAR ACCURACY

The compensation system minimizes angular deviations of the clamp arm during the clamping process and belongs to the series equipment. Mechanical protection of the springs. Repeat accuracy of the clamp arm positioning on the workpiece +/- 0.05°.



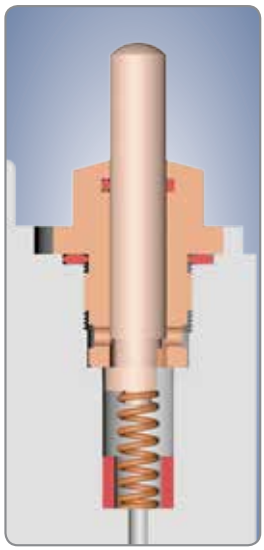
Ball positioning at a safe level to avoid any damage to the cam material.



The unique HYDROBLOCK guiding and control system for the clamp arm swing motion is **the worldwide most precise solution for positioning clamp arms on workpieces during machining**. The unparalleled repeat accuracy is achieved by a special cup spring system keeping the guide balls in the correct position over long operating times. The angular clearance is thus continuously compensated, which would otherwise inevitably lead to wear of the mechanical components. HYDROBLOCK cylinders equipped with the COMPENSATION SYSTEM ensure an angular deviation in clamp arm positioning of below +/- 0.05° (+/- 0°0'30").

OBJECTIVE
An incorrect alignment of the pressure point of the clamp arm relative to the clamping point in the fixture (which gradually increases with the mechanical wear) leads to deformations of the clamped workpiece. It is thus not possible to meet today's exacting dimensional accuracy requirements during the machining process. The uncompromising repeat accuracy in the positioning of the clamp arm on the workpiece minimizes elastic deformations and allows perfectly even workpieces with high surface quality to be produced.

B. CLAMP ARM POSITION CONTROL VALVE



The VCS pneumatic valve for active monitoring of the clamp arm position on the workpiece is of vital importance for state-of-the-art fully automatic lines. This valve can enable the machining process or disable it if any irregularities are detected in terms of workpiece positioning.

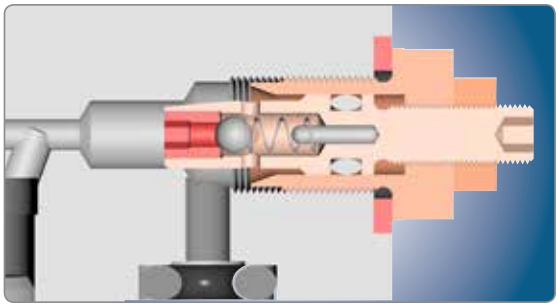
Available versions: VCS02, VCS03, VCS04, VCS10 and VCS13.
Standard equipment of cylinders in “V” version: VCS04 and VCS10 depending on the model; other versions are available upon request.

The VCS valve is directly actuated by the screw fixed to the clamping arm and not by the piston. If the clamp arm is accidentally separated from the piston, the VCS valve is not actuated and no machining enable signal is transmitted to the pressure switch. This safety level cannot be ensured by indirect clamp arm control solutions.

The VCS03 valve provides a double alarm signal through the pressure switch (monitoring of the clamp arm and workpiece position). If an automatically loaded workpiece falls down or is poorly positioned, the clamp arm performs an additional stroke as no workpiece is detected and returns in unclamping status. The machining cycle is thus blocked.

NOTE: The VSC valves are high-precision pneumatic valves. Use only filtered air 5µm.

C. CYLINDER SWING SPEED CONTROL



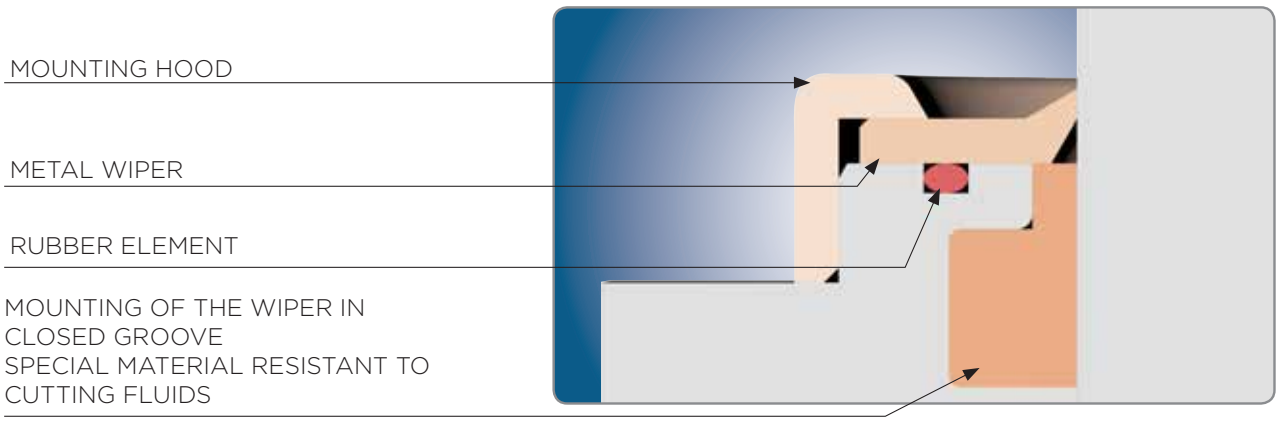
Flow control valve for the clamping process. All standard cylinders are prepared for retrofitting the flow control valve (accessory delivered upon request).

VRF
The integrated VRF flow control valve is a special valve developed by HYDROBLOCK to allow the end user to precisely adjust the swing speed of the cylinder and to exactly determine the clamping sequence of the cylinders at the workpiece to be machined.

Thanks to the precisely controlled flow of each cylinder, a well-defined clamping sequence of the different cylinders is obtained in all clamping positions. As this sequence is repeated for all workpieces, the machining quality is substantially improved. All cylinders prepared for the installation of the flow control valve (to be separately ordered) can be retrofitted accordingly.

NOTE: DO NOT USE flow control valves that impede the free oil discharge flow from the cylinder chambers. Despite the extremely robust design, the resulting overpressure would damage the swinging mechanism of the cylinder in the long run.

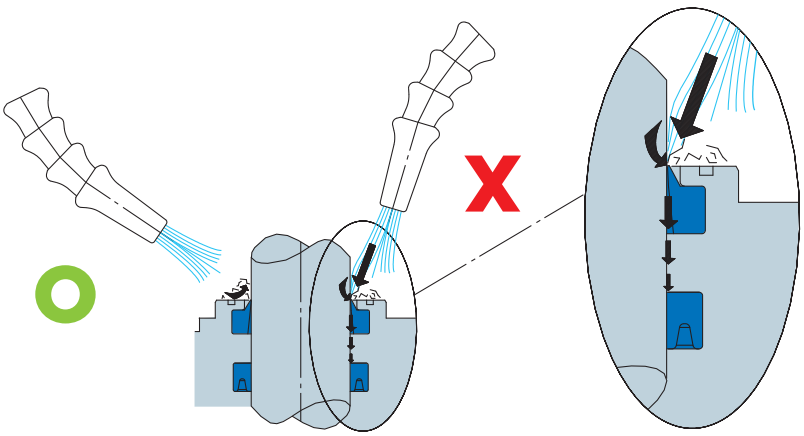
D. METAL WIPER



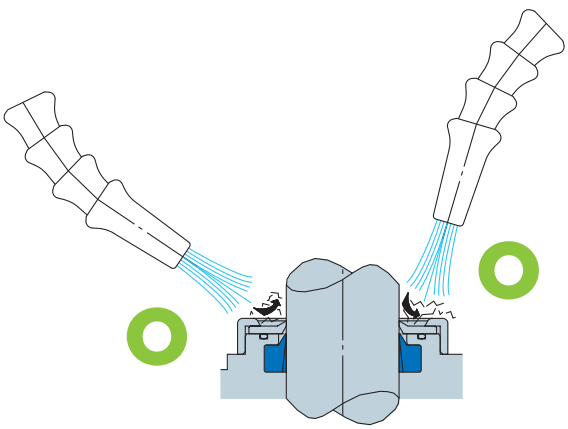
The main wiper of our swing clamp cylinders is mounted in a closed groove designed to prevent gap extrusion. It is made of special material that is resistant to modern cooling lubricants. Upon request, the main wiper is protected by a special metal wiper that is pressed directly onto the cylinder body. The metal wiper is composed of two separate components: an installation hood at the body and a profiled wiper plate that is fitted to the piston rod and can be freely moved in axial direction.

The movement between the installation hood and the wiper plate ensures efficient function of the wiper that follows the piston profile, even if the latter is elastically deformed by the clamping forces exerted by the clamp arm.

The wiper plate follows the rod and is deformed neither in diameter nor in wiper profile, which ensures efficient protection of the main wiper over a long operating time.



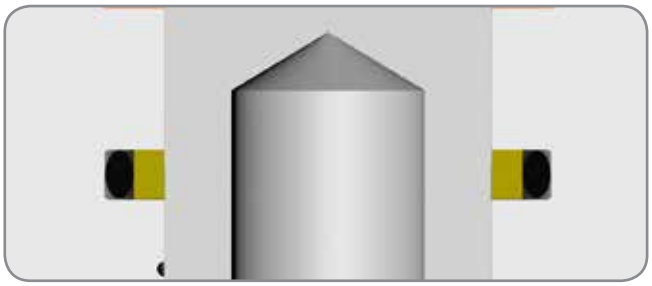
The cooling lubricant jet must not be directly aimed at the rubber wiper as there is the risk of the wiper being lifted by the pressurized cooling lubricant, which would affect the sealing efficiency. In this case, the main seal could be damaged by fluids and chips.



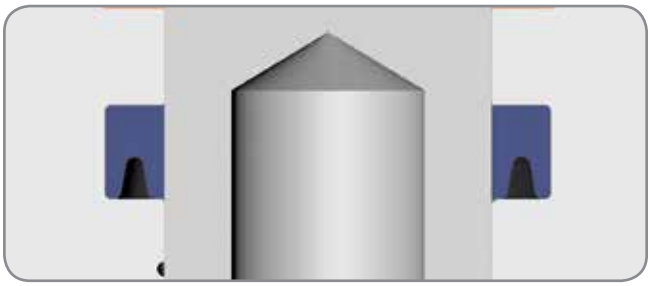
Contrary, when the (optional) metal wiper is mounted, the rubber wiper is protected against pressurized fluids and chips. The rubber wiper CANNOT be lifted by the pressurized cooling lubricant and the main seal will be not damaged by fluids or chips.

E. SEALS

Seals **FKM** (upon request)



POLYURETHANE seals as standard equipment

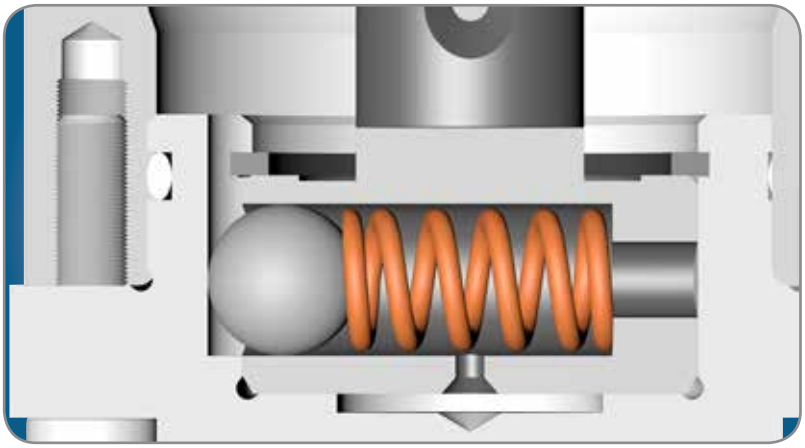


PISTON SEALS
Depending on the cylinder type, our cylinders are equipped with seals made of special polyurethane or of PTFE+ FKM. Upon request, PTFE+FKM seals are available for all types.

TENUTE PISTONE
The piston seals of our cylinders are made of PTFE+NBR. PTFE+FKM seals are available upon request.

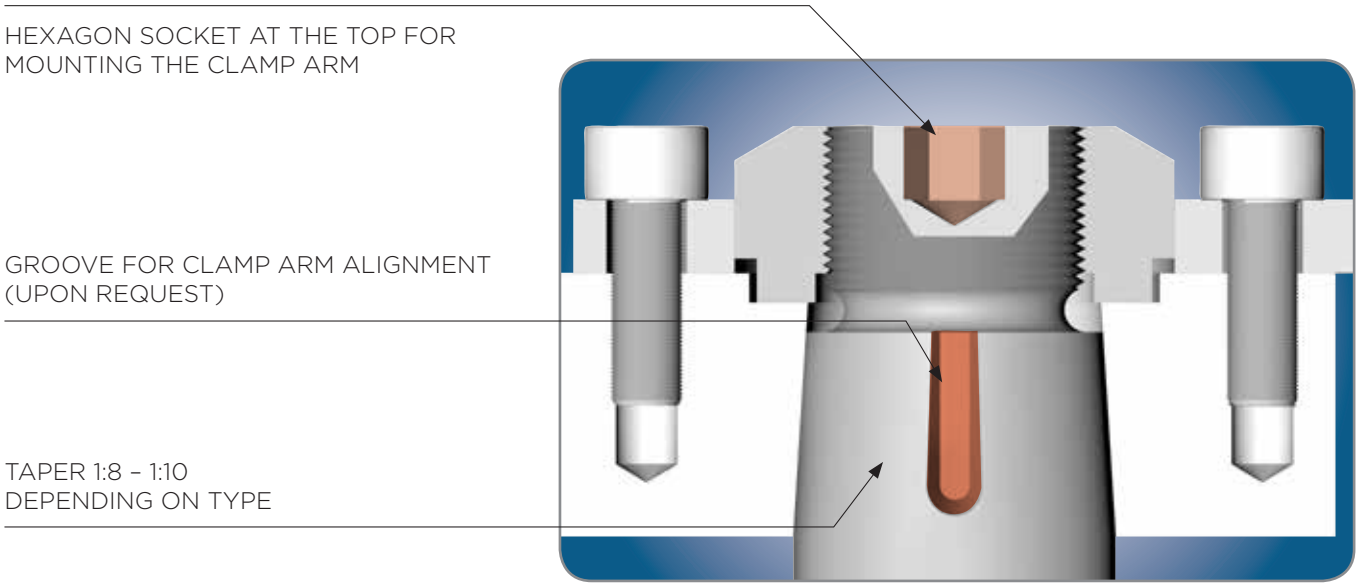
F. SAFETY OVERLOAD CLUTCH

SAFETY OVERLOAD CLUTCH
RESET INTO 360° POSITION
(UPON REQUEST)



The safety overload clutch used to be a popular option for fixtures with manual workpiece loading and unloading. When the operator had to handle heavy or bulky workpieces, there was the risk of collision with the clamp arm and overload of the swinging mechanism causing damage to the equipment. For these applications, the safety clutch with manual reset to 360° was offered to protect the equipment. In state-of-the-art lines with automated loading, the safety clutch is no longer really needed. However, it is still available upon request for special applications or requirements.

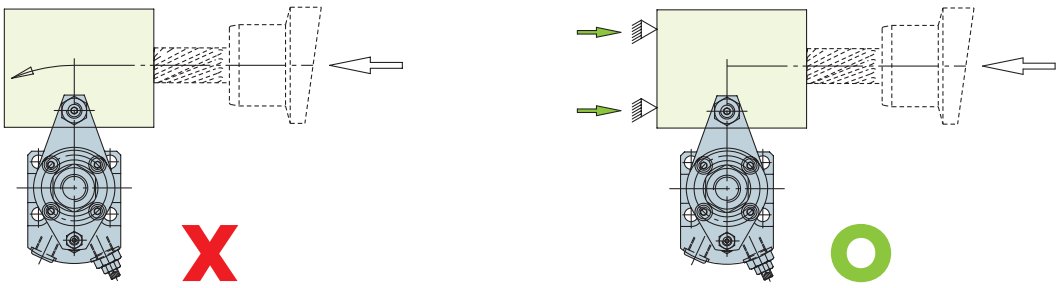
G. CLAMP ARM INSTALLATION



HEXAGON SOCKET AT THE CYLINDER TOP
In the standard version, the pistons of all HYDROBLOCK swing clamp cylinders feature a hexagon socket at the top. Using this socket, the piston can be fixed while tightening the clamp arm lock ring – an extremely practical solution that protects the swinging mechanism of the cylinder.

TAPER 1:8
All HYDROBLOCK pistons with COMPENSATION SYSTEM feature a clamp arm mounting taper of 1:8.

ALIGNMENT GROOVE
Upon request, the pistons are provided with an alignment groove at a customer-defined position. This allows the clamp arm to be easily aligned during replacement or retrofitting.



NOTE:
Swing clamp cylinders are designed for swinging at defined angles and over defined strokes.
The cylinders **MUST NOT BE EXPOSED** to radial forces producing a rotation about their own axis. This motion would damage the cylinder and affect the swinging mechanism. For this reason, supports must be provided to absorb the forces.

HPC
HARD PRISMATIC CLAMPS

METAL WIPER INTEGRATED

HYDROBLOCK offers its customers a new prismatic clamping arm guide system of type HPC-HARD PRISMATIC CLAMP to be used in combination with the unique compensation system all cylinders of the SR COMPENSATION SYSTEM series are equipped with. Thanks to the high angular accuracy guaranteed by the compensation system, the clamping arm is perfectly guided by the precise surfaces of the prismatic guiding system mounted to the cylinder body.

THE INNOVATIVE HPC SYSTEM OFFERS MANY BENEFITS

1. Linear guide to absorb the radial forces acting on the clamping arm: The clamping arm/piston rod configuration is only minimally bent, which drastically reduces the tension exerted on the clamped workpiece during machining. This ensures unparalleled manufacturing quality within narrow tolerances.

2. Prism guide to absorb the torque: The clamping arm mounted to the piston rod remains perfectly aligned even when subjected to radial thrust and does not transmit the swing torque to the internal guiding system of the piston rod. The rod is thus protected against damage caused by excessively high torque and undesired forces or vibrations acting on the workpiece are excluded.

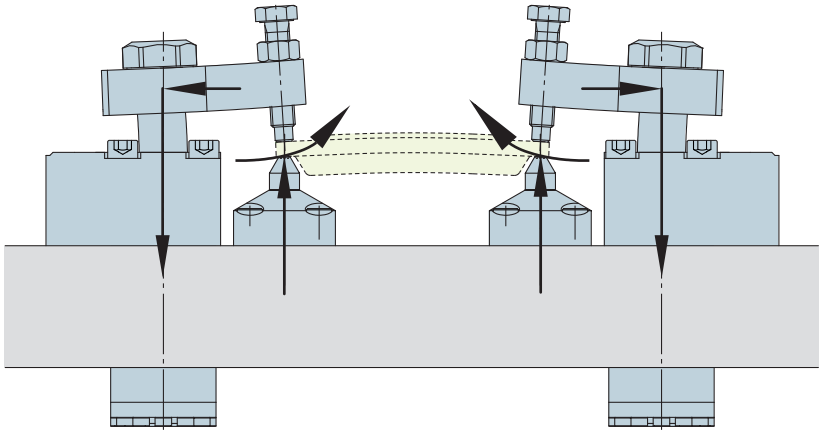
NOTE: The swing torque transmitted to the clamping arms of swing clamp cylinders is the main reason for damage to the cylinder and the resulting vibrations of the clamped workpiece!

3. Alignment of the clamping arm on the cylinder body: Incorrect mounting of the clamping arm to the rod is excluded. **Correct installation is automatically ensured.** An additional alignment is no longer required and grooves are not necessary.

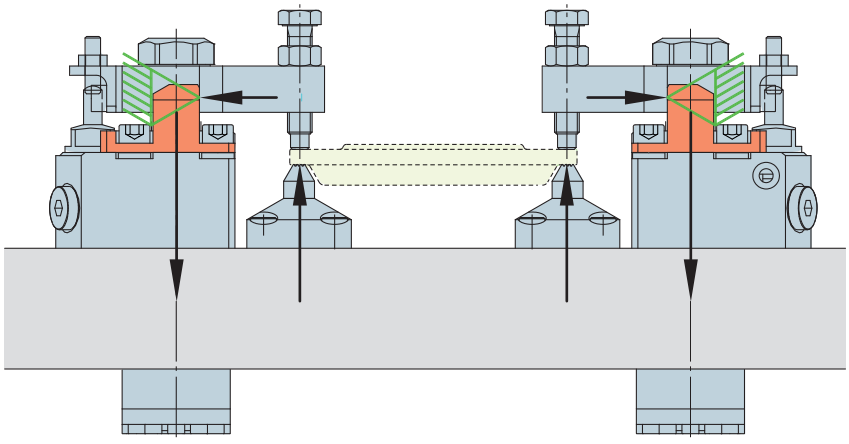
4. Protection of the cylinder swinging system: The internal swinging system cannot be damaged during mounting. When tightening the threaded nut at the clamping arm, the prismatic guide prevents any undesired transmission of the tightening torque to the swinging system.

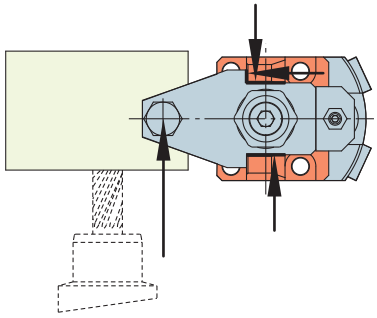
5. A 8% increase in the effective clamping force on the machined workpiece is achieved or alternatively a longer clamping arm at the same operating pressure.

SWING CLAMP CYLINDERS WITHOUT HPC SYSTEM



HYDROBLOCK SWING CLAMP CYLINDERS WITH HPC SYSTEM

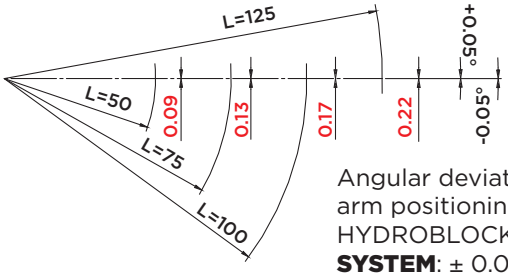




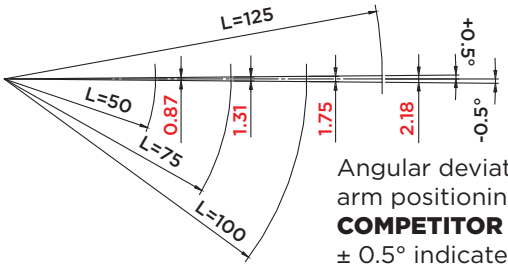
SR
COMPENSATION SYSTEM

Exclusive COMPENSATION SYSTEM compensates the angular clearance of the swinging mechanism to ensure long-term operational precision.

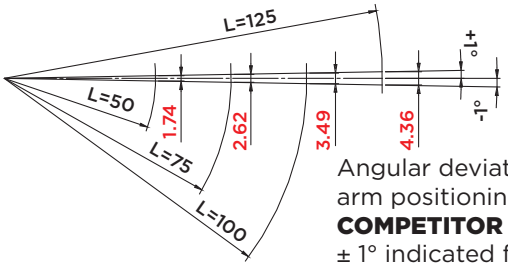
The exclusive COMPENSATION SYSTEM guarantees high repeat accuracy in the positioning of the clamp arm on the workpiece. In addition, it minimizes or almost eliminates elastic workpiece deformations that normally result from incorrect alignment of the pressure point of the clamp arm relative to the fixed clamp point in the fixture.



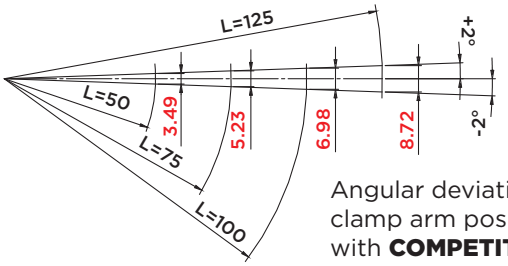
Angular deviation in clamp arm positioning using the HYDROBLOCK **COMPENSATION SYSTEM**: ± 0.05° **MAINTAINED OVER A LONG TIME**



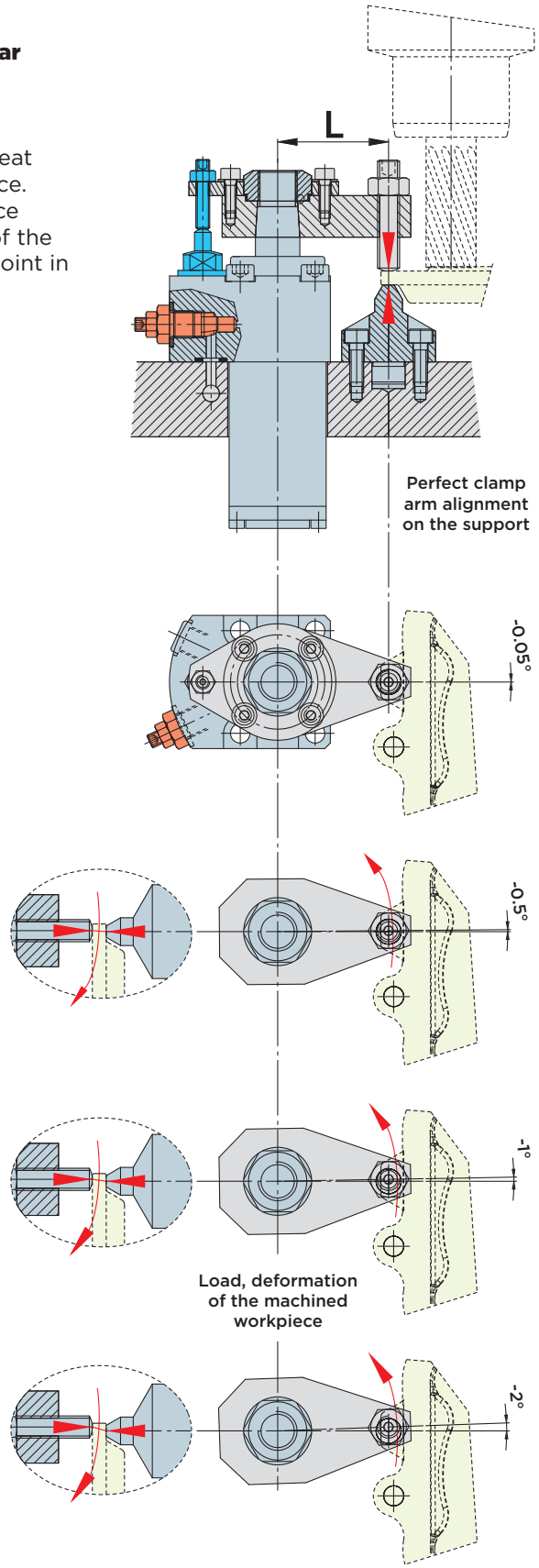
Angular deviation in clamp arm positioning with **COMPETITOR PRODUCTS**: ± 0.5° indicated for new cylinders

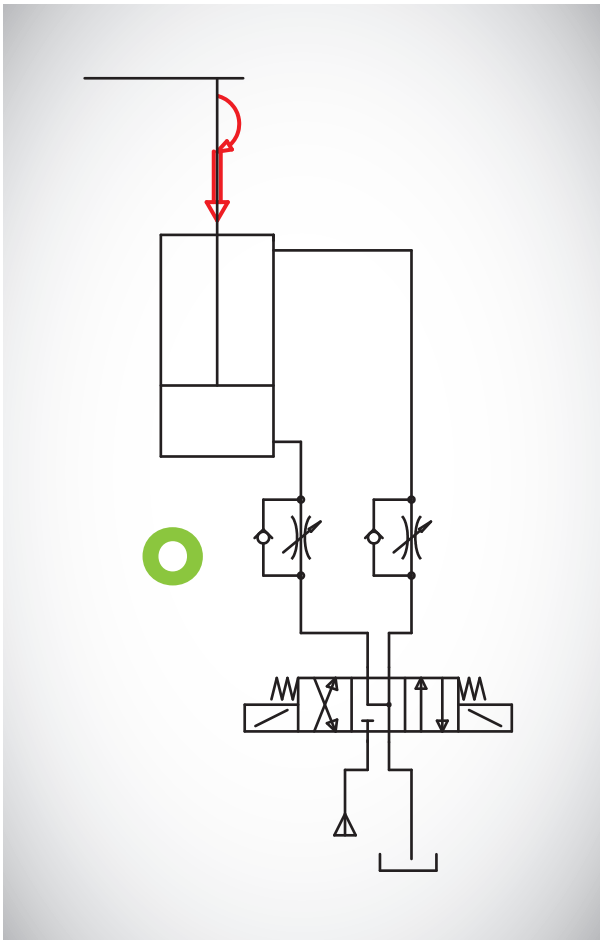


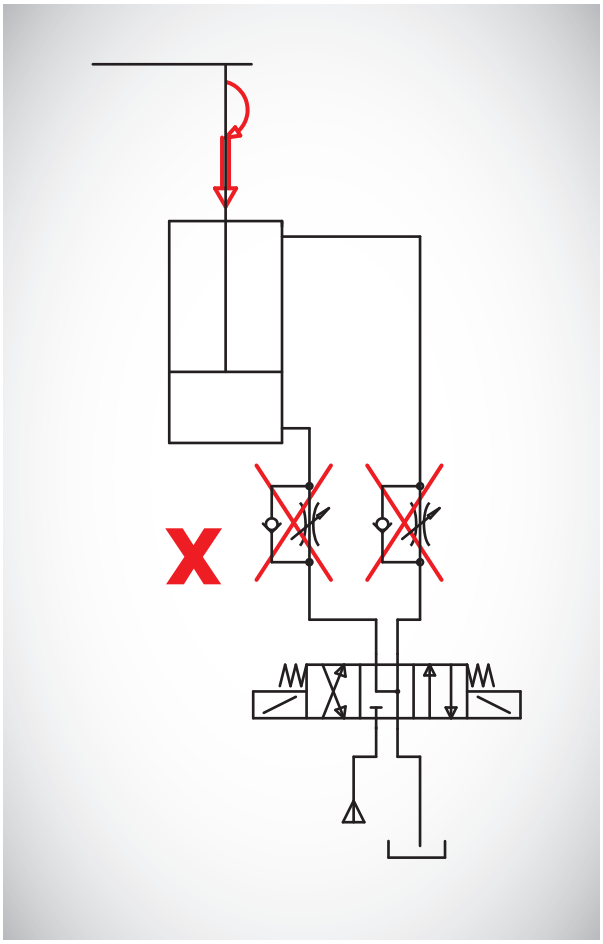
Angular deviation in clamp arm positioning with **COMPETITOR PRODUCTS**: ± 1° indicated for new cylinders



Angular deviation in clamp arm positioning with **COMPETITOR PRODUCTS**: ± 2° indicated for new cylinders







Hydraulic supply:

SR swing clamp cylinders are rated for high operating pressures (max. 500 bar). To ensure perfect cylinder operation, the hydraulic line must be purged and the flow rate must be set below the maximum admissible operating values of the component in question.

If the flow rate is too high, excessive swing speeds can be caused and lead to wear and damage to the sturdy mechanical cylinder components.

The cylinder supply flow must be CONTROLLED.
THE RETURN FLOW FROM THE CYLINDER MUST BE FREE.

Flow control valves provided as shown in the diagram or the HYDROBLOCK VRF18/VRF14 flow control valves installed directly at the clamping port A must be used for this purpose. **DO NOT INSTALL** flow control valves that impede the free oil discharge flow from the cylinder chambers. Despite the extremely robust design, the resulting overpressure would damage the swinging mechanism of the cylinder.

Please contact HYDROBLOCK for applications requiring particularly long clamp arms.

SR
COMPENSATION SYSTEM

CLAMPING FORCE CALCULATION

The clamping arm of a swing clamp cylinder generates a torque acting on the piston guide. This torque produces a friction force that reduces the clamping force. The longer the clamping arm, the lower the performance. In the following formulas, this relation is taken into consideration. The constants used have been determined by means of test measurements.
ATTENTION! Please observe the measuring units of the variables.

DOUBLE-ACTING SWING CLAMP CYLINDERS

Effective clamping force:

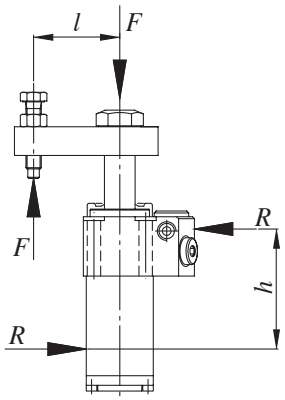
$$F = \frac{p}{A + B \cdot l} \leq F_{adm} \qquad [kN]$$

Maximum admissible clamping force*:

$$F_{adm} = \frac{C}{l} \qquad [kN]$$

Maximum admissible operating pressure:

$$p_{adm} = \frac{D}{l} + E \leq p_{max} \qquad [bar]$$



l = Clamp arm length [mm] p = Pressure [bar]

SINGLE-ACTING SWING CLAMP CYLINDERS

Effective clamping force:

$$F = \frac{p - G}{A + B \cdot l} \leq F_{adm} \qquad [kN]$$

Maximum admissible clamping force*:

$$F_{adm} = \frac{C}{l} \qquad [kN]$$

Maximum admissible operating pressure:

$$p_{adm} = \frac{D}{l} + E + G \leq p_{max} \qquad [bar]$$

l = Clamp arm length [mm] p = Pressure [bar]

The constants (A÷G) for standard HYDROBLOCK cylinders are indicated in the table below:

	SR16FS	SR16FD	SR18FS	SR18FD	SR22	SR25FS	SR25FD	SR28	SR35	SR45
A	39,8	39,8	50,5	50,5	19,0	24,0	24,0	10,3	7,1	5,8
B	0,177	0,177	0,095	0,095	0,110	0,1	0,1	0,073	0,040	0,026
C	309	309	399	399	550	736	736	900	1375	2310
D	12300	12300	20150	20150	10440	17650	17650	9230	9750	13350
E	54,78	54,78	37,88	37,88	60,25	58,20	58,20	65,38	54,96	59,25
G	12		12			13				

*** = After determination of the clamping arm length l, the maximum clamping force F must not exceed the indicated value.**

SWING CLAMP CYLINDERS: EFFECTIVE CLAMPING FORCE UND MAXIMUM SWINGING SPEED

Example:

Double-acting swing clamp cylinder: SR22.FD

Clamp arm length: l = 80
Admissible clamping force:

$$F_{adm} = \frac{C}{l} = \frac{550}{80} = 6{,}9 \qquad [\text{kN}]$$

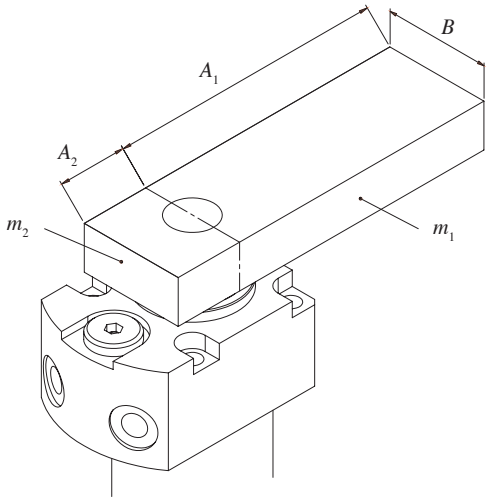
Maximum admissible operating pressure:

$$p_{adm} = \frac{D}{l} + E = \frac{10440}{80} + 60{,}25 = 191 \qquad [\text{bar}]$$

MAXIMUM SWINGING SPEED

When the clamping arms changes from the swinging motion to the pure linear movement, all forces of inertia are absorbed by the cam/ball system of the cylinder. These forces must be limited to avoid damage to the cylinder. The forces of inertia are proportional to the swinging speed and to the dimensions and the weight of the clamping arm. The larger the clamping arm, the lower the swinging speed to be selected. The swinging speed can be controlled by flow control valves as separately described.

The ratio between the torque of inertia I of the clamp arm and the swing time t (for an angle of 90°) must be located below the characteristic torque of inertia/reaction time curve of the specific cylinder in the diagram. In any case, the swing time must be above 0.2 sec.



Calculation the torque of inertia:

$$I = \frac{1}{12} \cdot m_1 (4 \cdot A_1^{\,2} + B^2) + \frac{1}{12} \cdot m_2 (4 \cdot A_2^{\,2} + B^2)$$

I = Torque of inertia [kg•m_2]
m = Mass [kg]

*** = After determination of the clamping arm length l, the maximum clamping force F must not exceed the indicated value.**

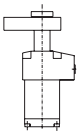
ORDER NUMBER CODE FOR **SR SERIES** SWING CLAMP CYLINDERS

SR XX.											
0 V	FD PD CD FS PS CS	0 L R	0 45 60 90	0 V2 V3 V4	0 F	0 M	0 S	0 K	O P	0 H

0: Version with POLYURETHANE seals

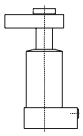
V: Version with PTFE/FKM seals

FD/FS:



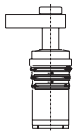
Version with upper flange, double-acting/single-acting (if available, see catalogue)

PD/PS:



Version with lower flange, double-acting/single-acting (if available, see catalogue)

CD/CS:



Built-in version, double-acting/single-acting (if available, see catalogue)

L: Left-hand type clamp arm
R: Right-hand type clamp arm

0-45-60-90: Swinging angle (in °)
(other swinging angles upon request)

V: Control valve for the clamp arm position *(upon request)*

F: Safety clutch against overload during the swing motion *(upon request)*

M: Metal wiper to protect the main wiper against chips *(upon request)*

S: VRF flow control valve to control the swing speed *(upon request)*

K: Clamp arm alignment groove *(upon request)*

O: Version with flange connection and supply via O-ring
P: Version with flange connection and supply via threaded bore

H: HPC prismatic block with integrated metal wiper

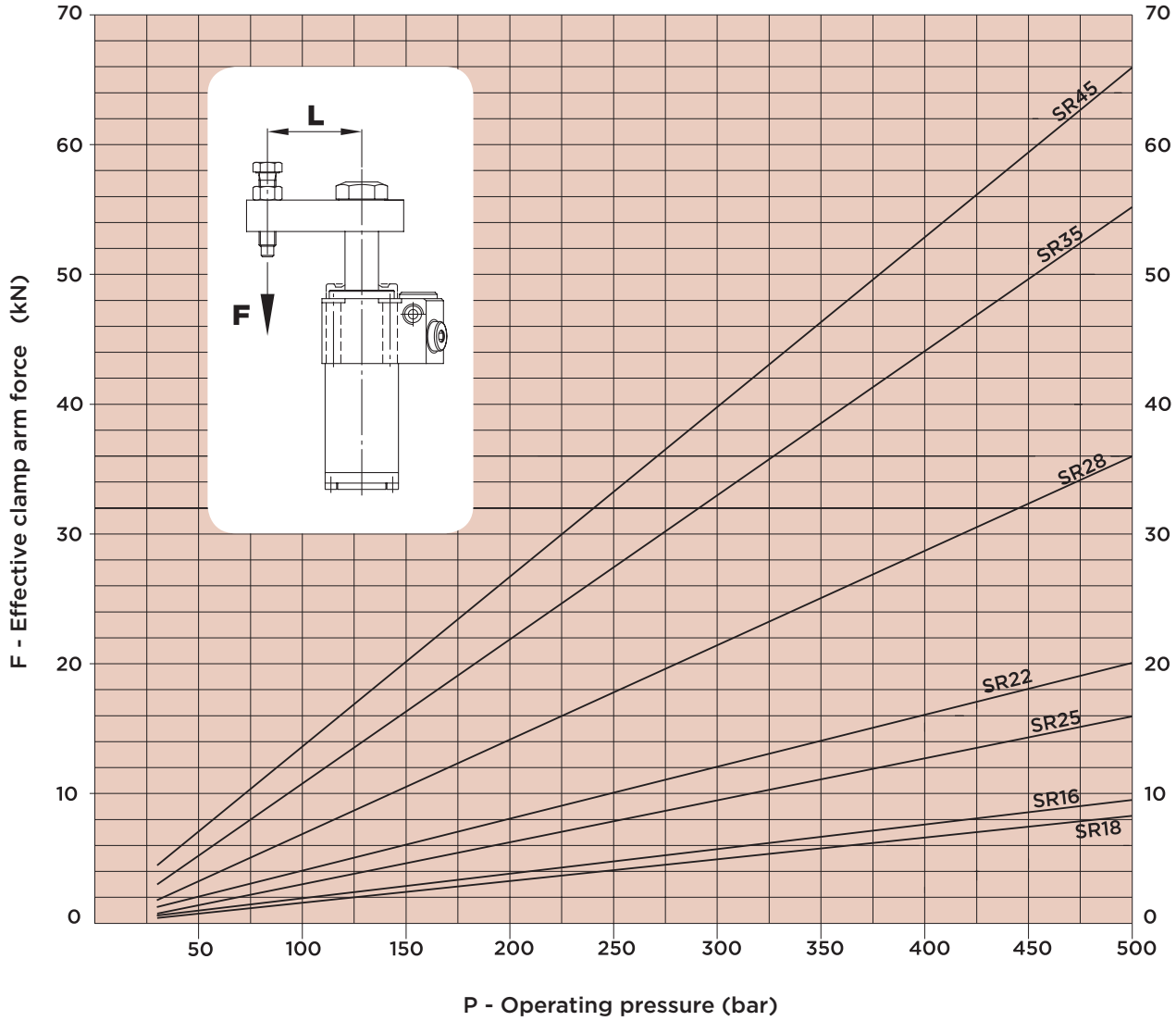
How to order SR swing clamp cylinders (example)

SR22.0FDR90 V30MS0P0

SR22 swing clamp cylinder with upper flange, double-acting version (**FD**), polyurethane seals (**O**), right-hand type clamp arm 90° (**R90**), equipped with VCS03 control valve for the clamp arm position and alarm release if no workpiece is in machining position (**V3**), without safety clutch against overload during swinging (**O**), with metal wiper to protect the main wiper against chips (**M**), with installed VRF18 flow control valve to control the swinging speed (**S**), without clamp arm alignment groove (**O**), with modular flange connection and supply via the threaded bores (**P**), without HPC prismatic block (**0**).

COMPENSATION SYSTEM

The following diagram outlines the performance data of different SR series double-acting swing clamp cylinders with compensation system as a function of the supply pressure.



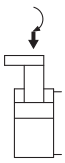
The diagram shows the effective clamping force "**F**" as a function of the operating pressure "**P**".
"**L**" = Recommended maximum clamp arm length

SR16.0 **FD**

COMPENSATION SYSTEM

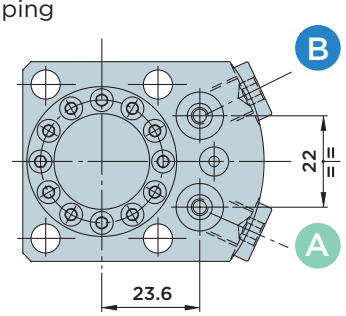
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE**

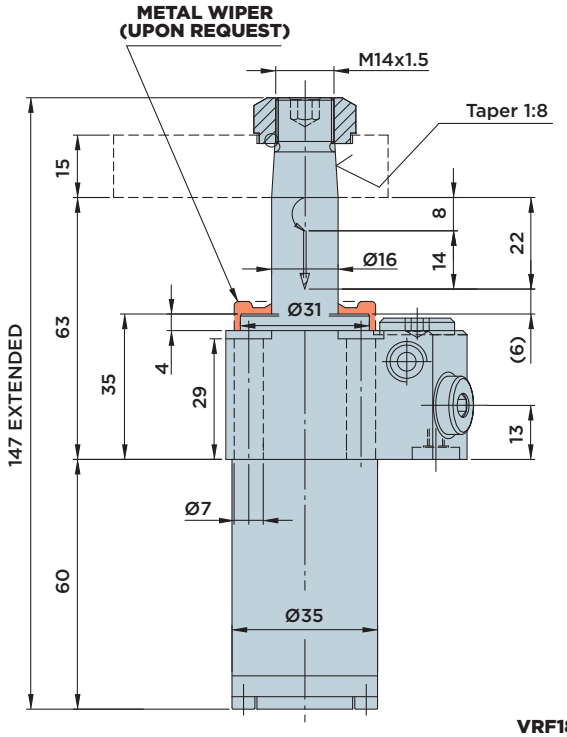
MAX. OPERATING PRESSURE = 500BAR

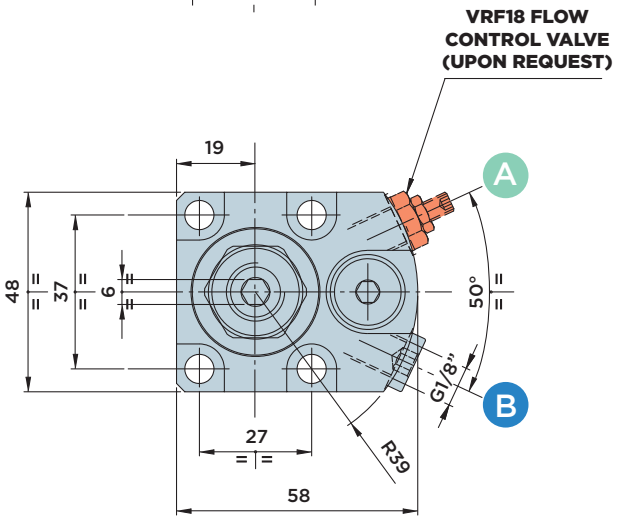


A : Clamping

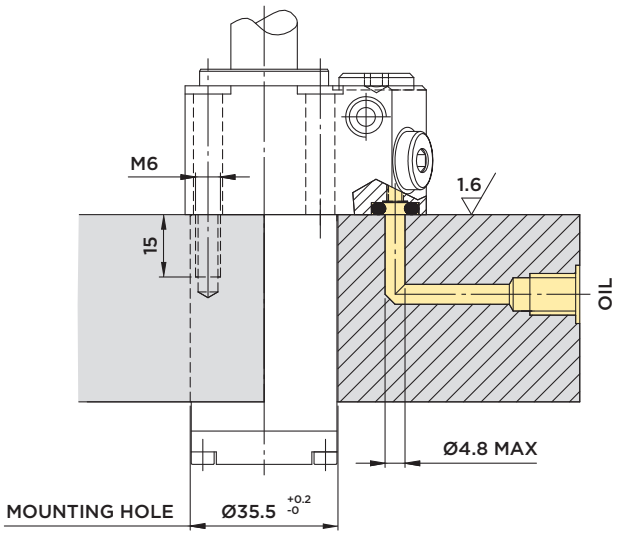
B : Unclamping







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- Mounting screws M6x40 DIN 912/12.9 grade
- O-Rings Ø4.34x3.53

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

Note:
Order code, see page 38
Clamp arms, see page 45
Clamping force diagram, see page 45

STROKE mm		EFFECTIVE PISTON AREA		TOTAL OIL VOLUME	
		Cm²		Cm³	
TOTAL	22	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	8	2.51	4.52	5.5	9.9
CLAMPING	14				

SR16.0 **FDV**

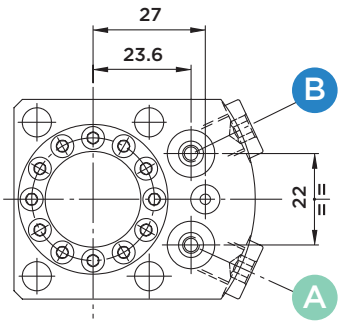
COMPENSATION SYSTEM

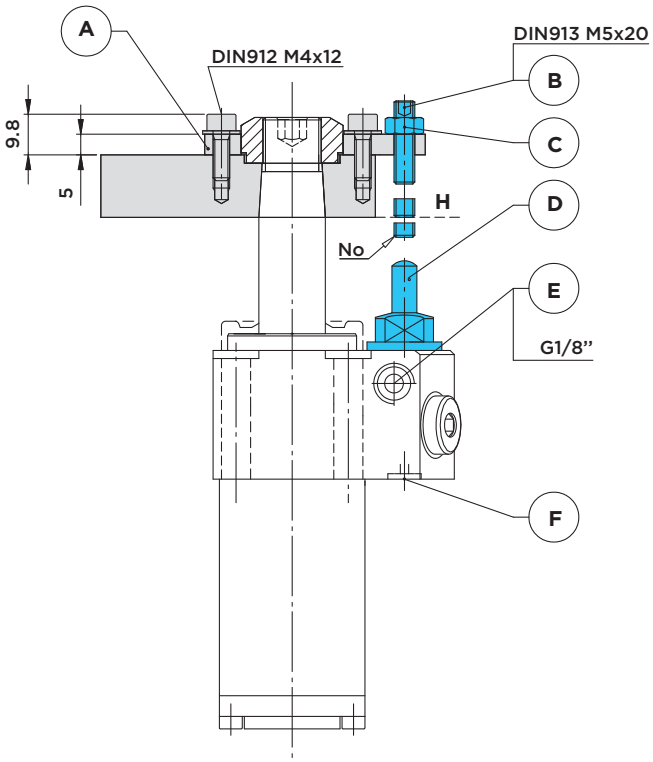
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE**

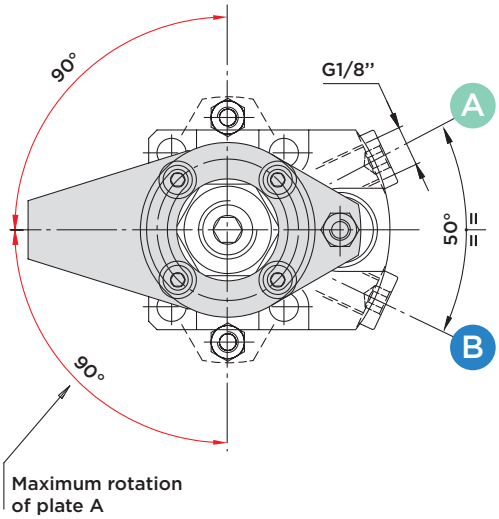
AND **CLAMP ARM POSITION CONTROL VALVE**

A : Clamping

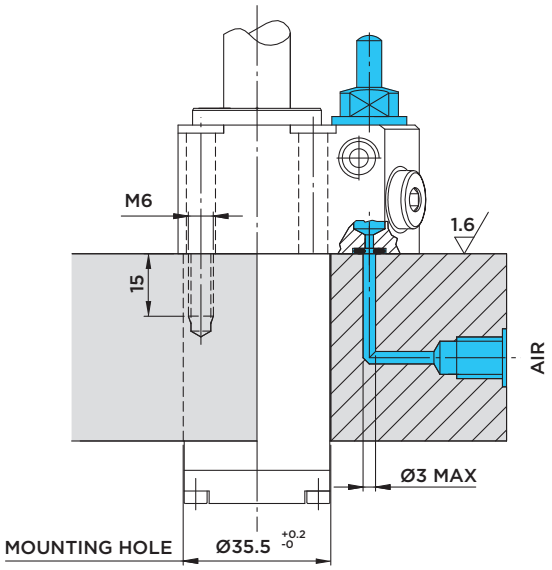
B : Unclamping







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- O-Rings Ø3.68x1.78

Valve adjustment:
To adjust the clamp arm position control valve, please proceed as follows:

1) Pressurize the cylinder to move the clamping arm into clamping position.

2) Adjust the plate (A) to the exact radial position to ensure that the set-screw (B) is in line with the valve.

3) Supply the circuit with air at 1÷6 BAR through the port (F). The valve bolt (D) is completely extended and air escapes from the bore (E).

4) Screw in the set-screw (B) with the workpiece being clamped until the air flow is interrupted. Then tighten the screw by another 2÷4 rotations (*) and lock the screw by means of the nut (C). The pressure switch indicates that the pneumatic circuit is closed and enables the machine cycle start.

* (The additional 2÷4 rotations are required to compensate thickness variations caused by rough surfaces.)

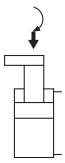
Note: After the adjustment, the tip of the set-screw **(B)** must not project beyond the lower end of the clamp arm **(level H)**.

SR16.0 **PD**

COMPENSATION SYSTEM

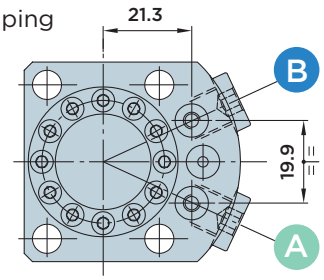
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **LOWER FLANGE**

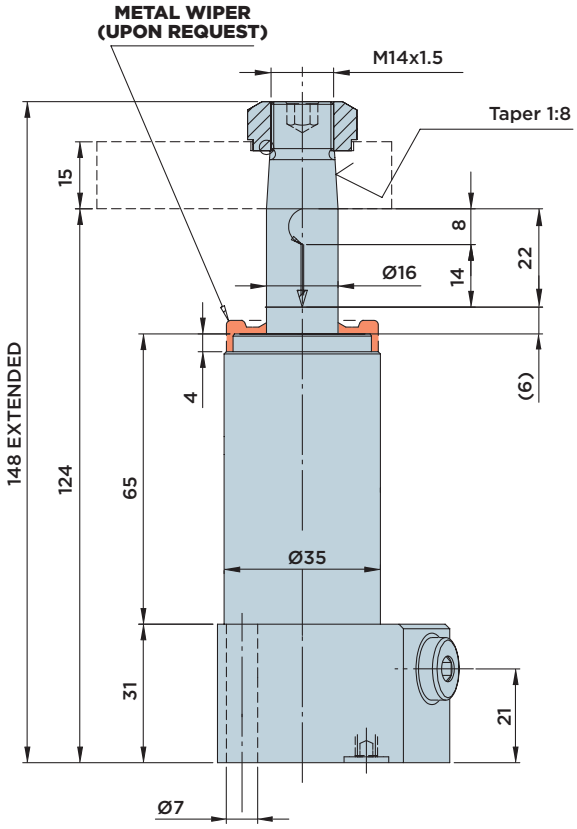
MAX. OPERATING PRESSURE = 500BAR

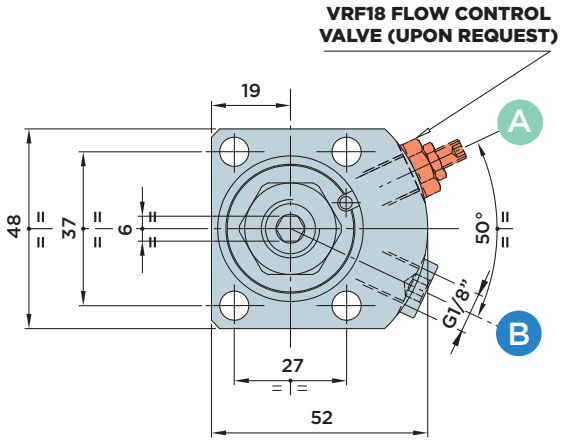


A : Clamping

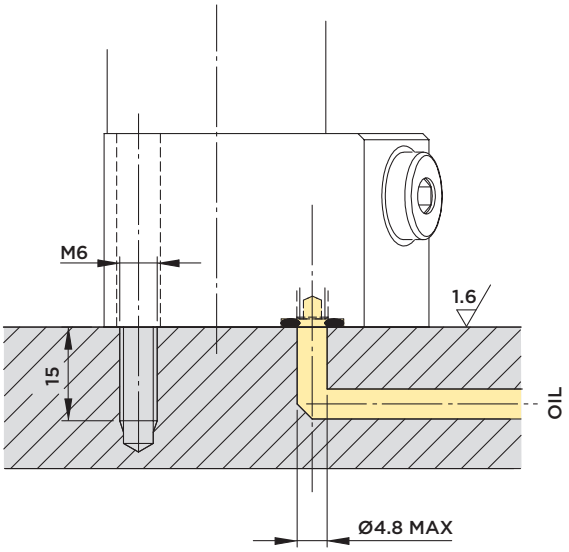
B : Unclamping







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- Mounting screws M6x40 DIN 912/12.9 grade
- O-Rings Ø6.07x1.78

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

Note:
Order code, see page 38
Clamp arms, see page 45
Clamping force diagram, see page 45

STROKE mm		EFFECTIVE PISTON AREA		TOTAL OIL VOLUME	
		Cm^2		Cm^3	
TOTAL	22	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	8	2.51	4.52	5.5	9.9
CLAMPING	14				

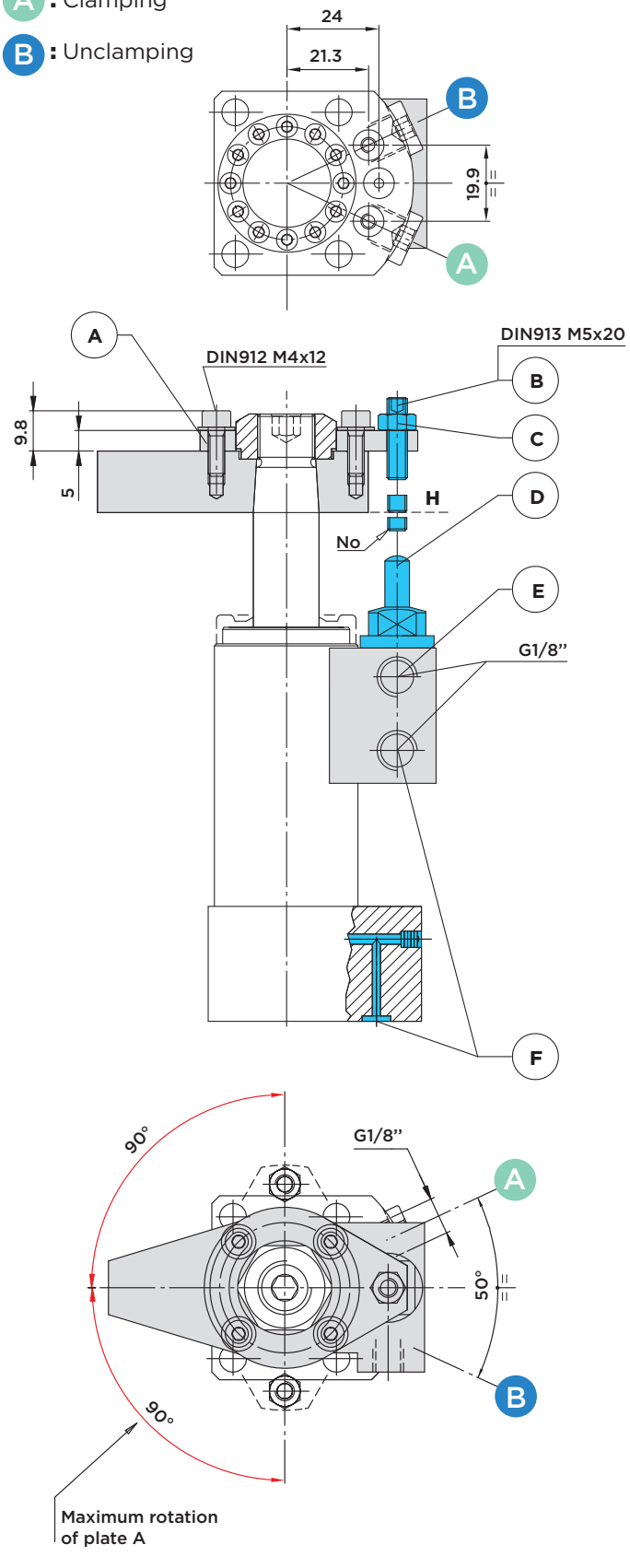
SR16.0 **PDV**

DOUBLE-ACTING SWING CLAMP CYLINDER WITH **LOWER FLANGE**

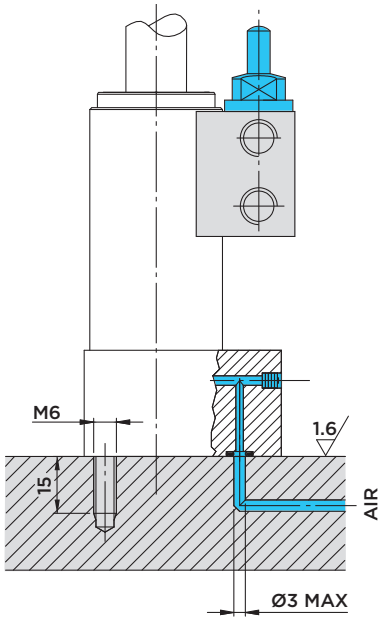
AND **CLAMP ARM POSITION CONTROL VALVE**

A : Clamping

B : Unclamping



INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- O-Rings Ø3.68x1.78

Valve adjustment:
To adjust the clamp arm position control valve, please proceed as follows:

1) Pressurize the cylinder to move the clamping arm into clamping position.

2) Adjust the plate (A) to the exact radial position to ensure that the set-screw (B) is in line with the valve.

3) Supply the circuit with air at 1÷6 BAR through the port (F). The valve bolt (D) is completely extended and air escapes from the bore (E).

4) Screw in the set-screw (B) with the workpiece being clamped until the air flow is interrupted. Then tighten the screw by another 2÷4 rotations (*) and lock the screw by means of the nut (C). The pressure switch indicates that the pneumatic circuit is closed and enables the machine cycle start.

* (The additional 2÷4 rotations are required to compensate thickness variations caused by rough surfaces.)

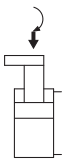
Note: After the adjustment, the tip of the set-screw **(B)** must not project beyond the lower end of the clamp arm **(level H)**.

SR16.0 **CD**

COMPENSATION SYSTEM

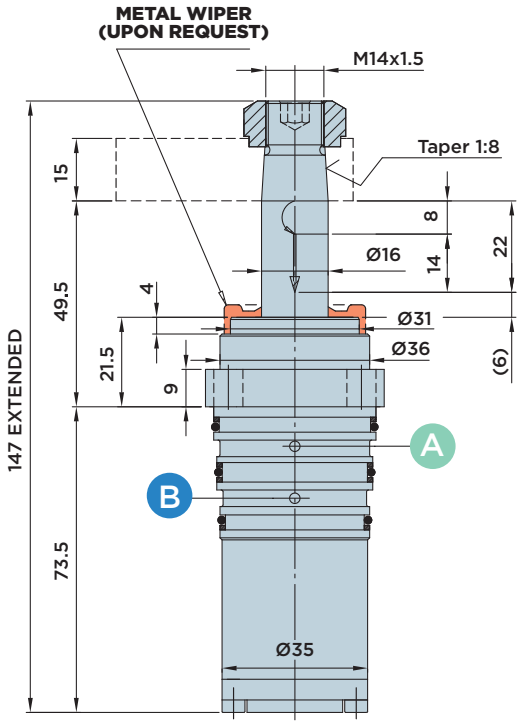
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **CARTRIDGE BODY**

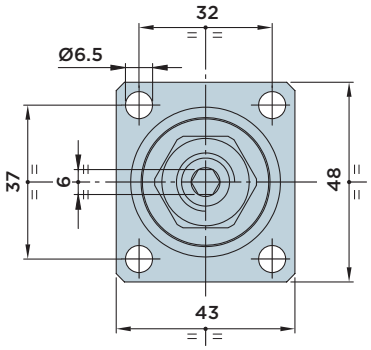
MAX. OPERATING PRESSURE = 500BAR



A : Clamping

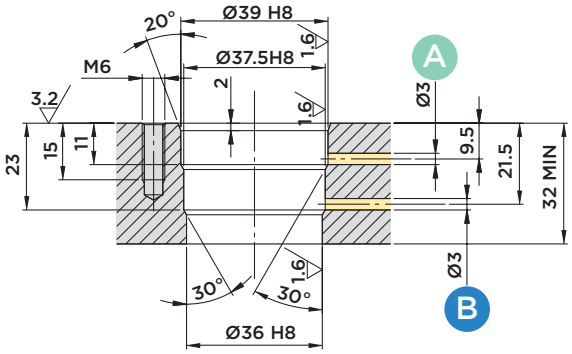
B : Unclamping



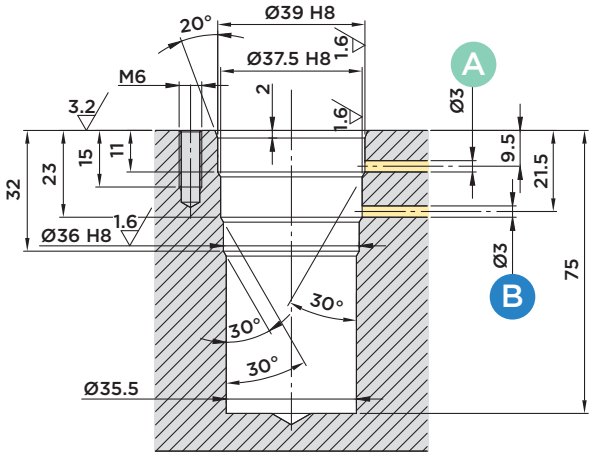


INSTALLATION DIMENSIONS

Through-hole mounting



Blind hole mounting



Included in the scope of supply:
- Mounting screws M6x20 DIN 912/12.9 grade

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

Note:

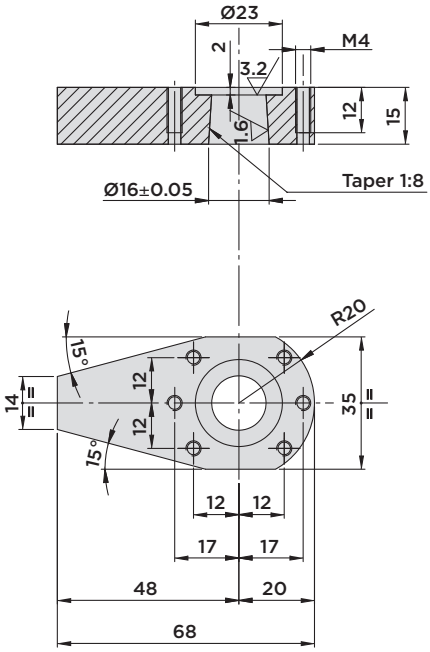
Order code, see page 38
Clamp arms, see page 45
Clamping force diagram, see page 45

STROKE mm		EFFECTIVE PISTON AREA		TOTAL OIL VOLUME	
		Cm²		Cm³	
TOTAL	22	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	8	2.51	4.52	5.5	9.9
CLAMPING	14				

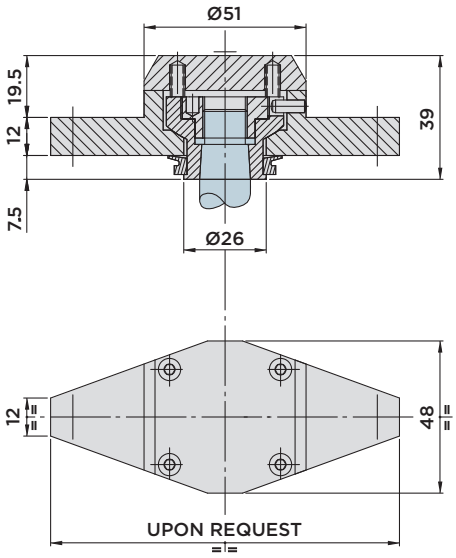
SR16 SERIES

- ACCESSORIES
- EFFECTIVE CLAMPING FORCE

CLAMP ARM 01.16

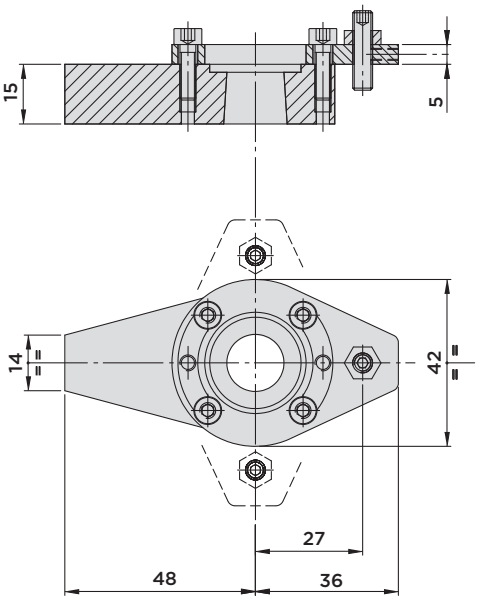


CLAMP ARM 03.16



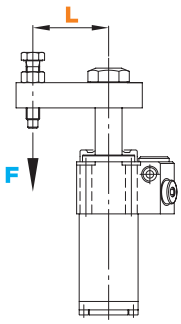
CLAMP ARM 04.16

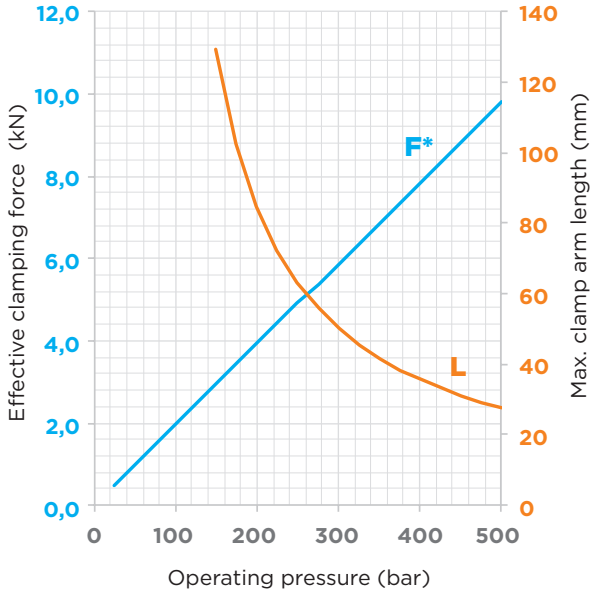
FOR CYLINDERS WITH CLAMP ARM POSITION CONTROL VALVE

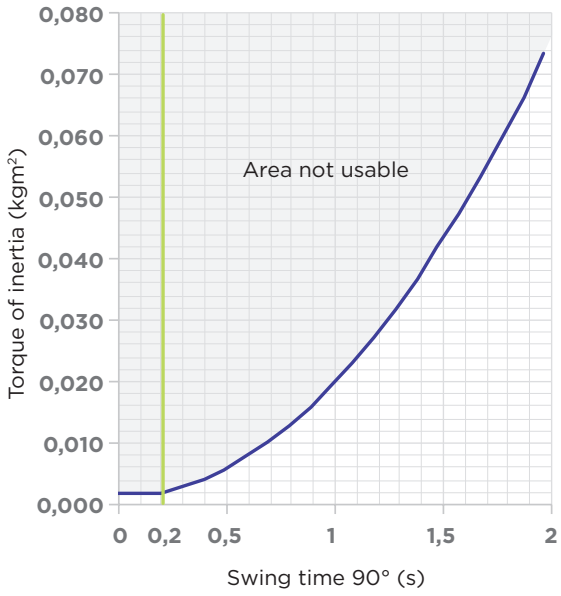


Material: C45

Effective clamping force / Swing times







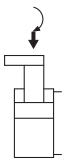
* = The effective clamping force **F** in the above diagram was determined using the standard clamp arms of type 01 and 04.

SR16.0 **FDH**

COMPENSATION SYSTEM

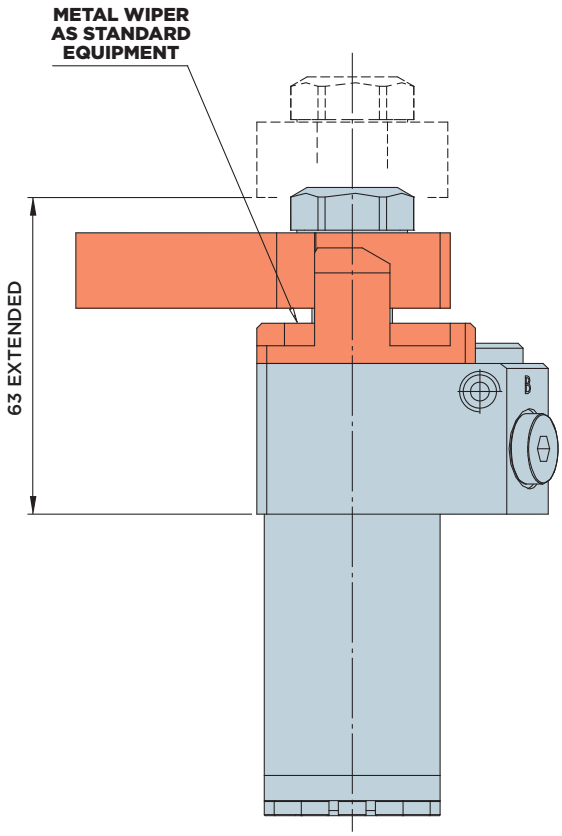
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE**

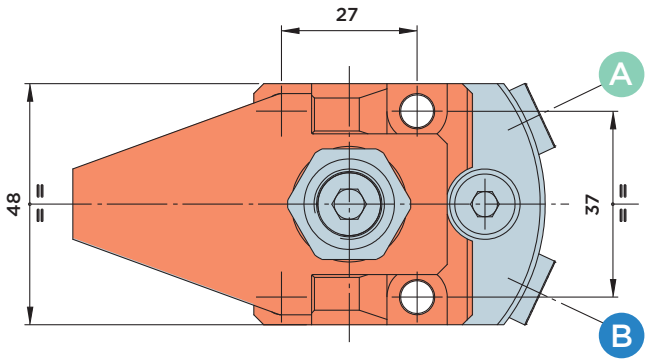
AND **HPC PRISMATIC ANTI-DEFLECTION BLOCK** MAX. OPERATING PRESSURE = 500BAR



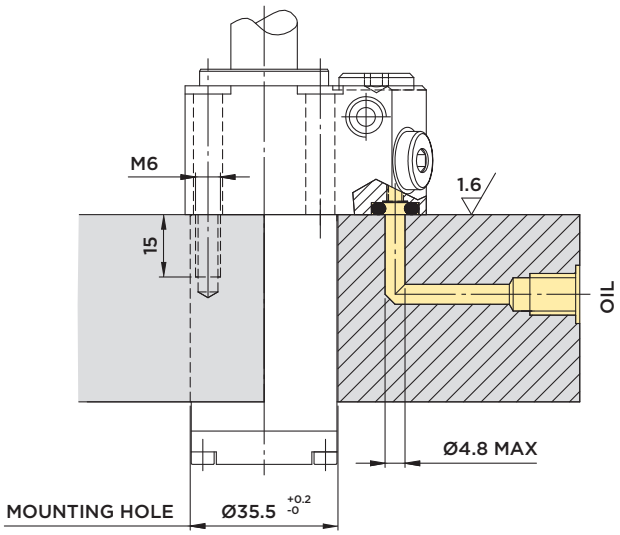
A : Clamping

B : Unclamping





INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- Mounting screws M6x45 DIN 912/12.9 grade

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

Note:
Order code, see page 38
Clamp arms, see page 49
Clamping force diagram, see page 49

STROKE mm		EFFECTIVE PISTON AREA Cm²		TOTAL OIL VOLUME Cm³	
TOTAL	22	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	8	2.51	4.52	5.5	9.9
CLAMPING	14				

SR16.0 **FDVH**

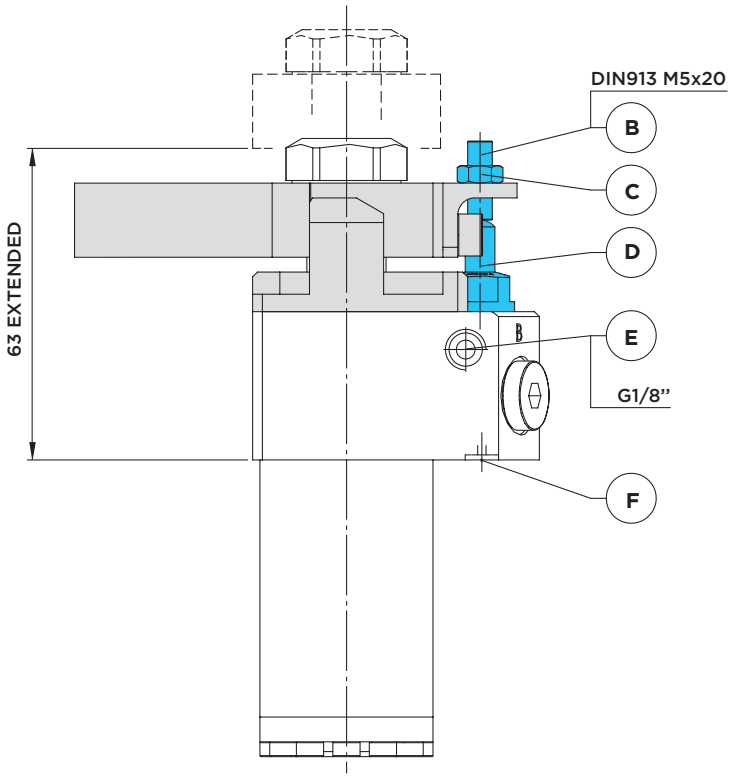
COMPENSATION SYSTEM

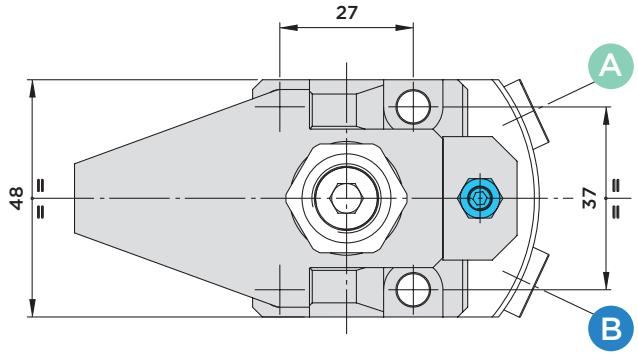
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE,**

CLAMP ARM POSITION CONTROL VALVE AND **HPC PRISMATIC ANTI-DEFLECTION BLOCK**

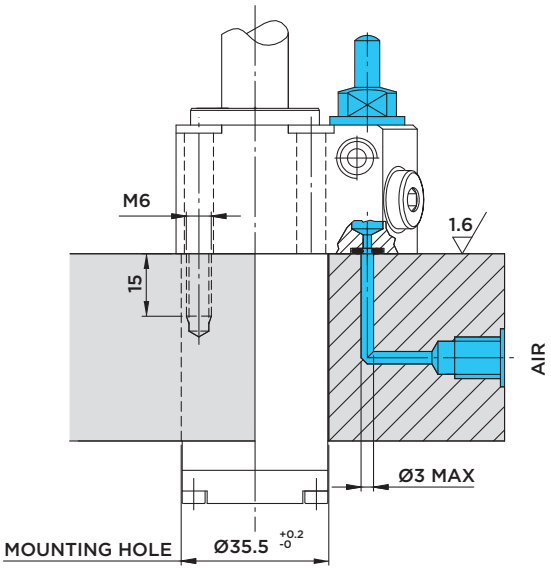
A : Clamping

B : Unclamping





INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Valve adjustment:
To adjust the clamp arm position control valve, please proceed as follows:

1) Loosen the screw (B) M5x20.

2) Pressurize the cylinder to move the clamping arm into clamping position.

3) Supply the circuit with air at 1÷6 BAR through the port (F). The valve bolt (D) is completely extended and air escapes from the bore (E).

4) Screw in the set-screw (B) with the workpiece being clamped until the air flow is interrupted. Then tighten the screw by another 2÷4 rotations (*) and lock the screw by means of the nut (C). The pressure switch indicates that the pneumatic circuit is closed and enables the machine cycle start.

* (The additional 2÷4 rotations are required to compensate thickness variations caused by rough surfaces.)

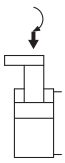
Note: After the adjustment, the tip of the set-screw **(B)** must not project beyond the lower end of the clamp arm **(level H)**.

SR16.0 **CDH**

COMPENSATION SYSTEM

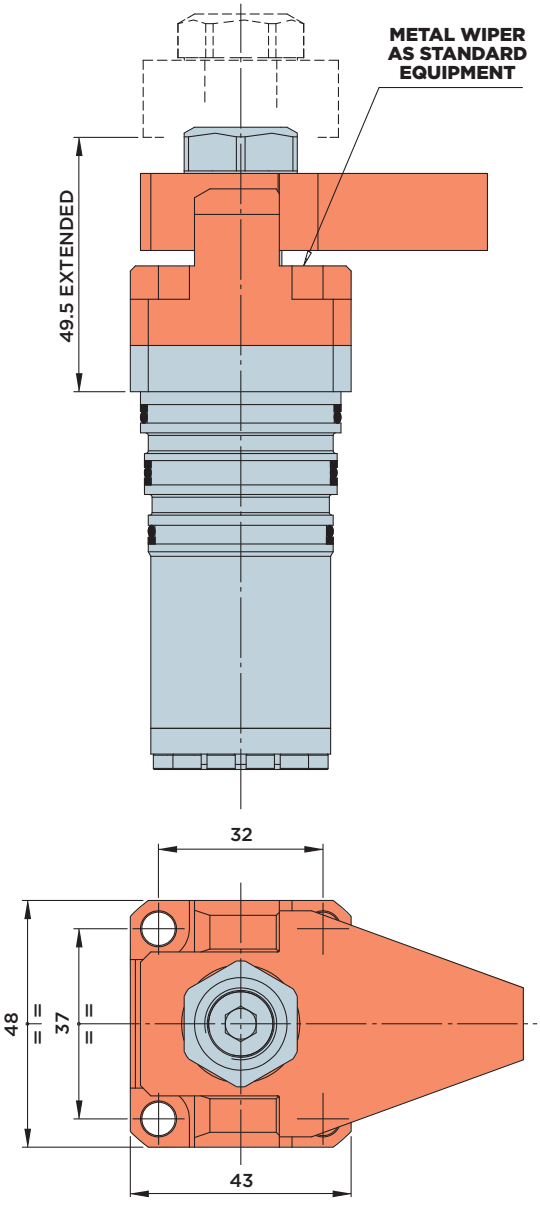
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **CARTRIDGE BODY**

AND **HPC PRISMATIC ANTI-DEFLECTION BLOCK** MAX. OPERATING PRESSURE = 500BAR



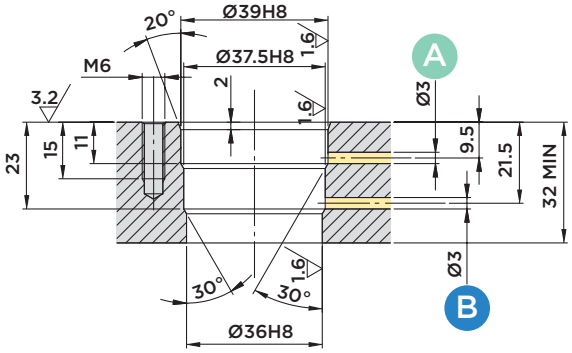
A : Clamping

B : Unclamping

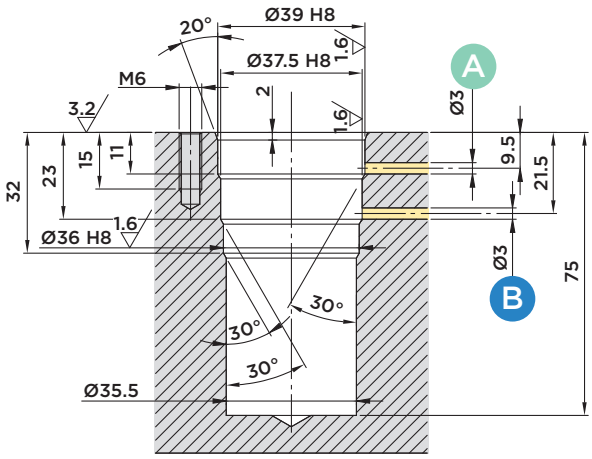


INSTALLATION DIMENSIONS

Through-hole mounting



Blind hole mounting



Included in the scope of supply:
- Mounting screws M6x30 DIN 912/12.9 grade

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

Note:

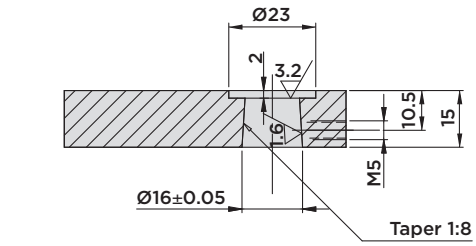
Order code, see page 38
Clamp arms, see page 49
Clamping force diagram, see page 49

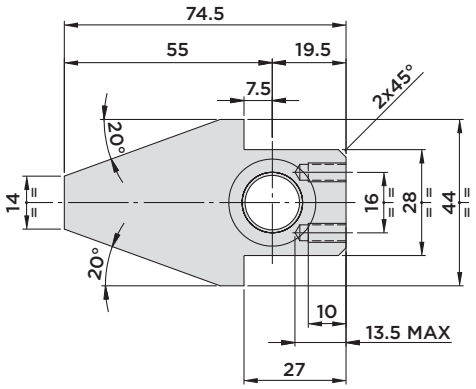
STROKE mm		EFFECTIVE PISTON AREA Cm²		TOTAL OIL VOLUME Cm³	
TOTAL	22	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	8	2.51	4.52	5.5	9.9
CLAMPING	14				

SR16 HPC SERIES

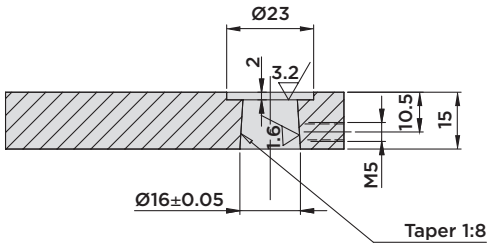
- ACCESSORIES
- EFFECTIVE CLAMPING FORCE

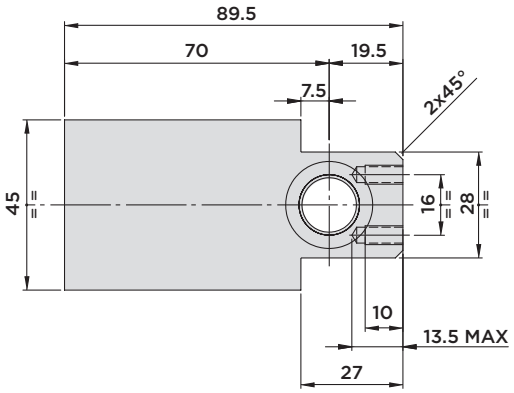
CLAMP ARM 06.16





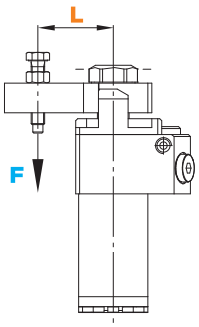
CLAMP ARM 07.16

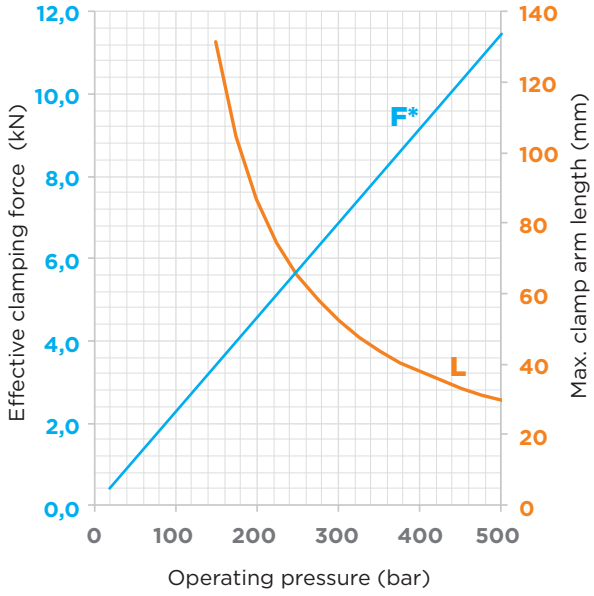


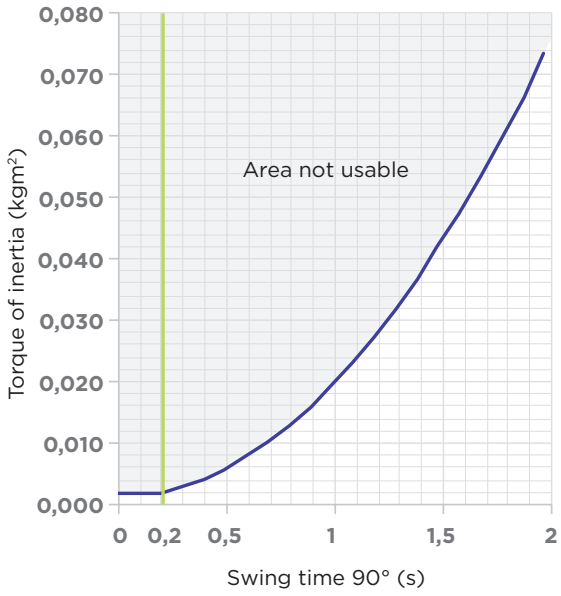


Material: C45

Effective clamping force / Swing times





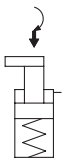


* = The effective clamping force **F** in the above diagram was determined using the standard clamp arms of type 01 and 04.

SR16.0 **FS**

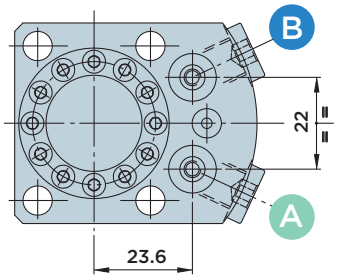
SINGLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE**

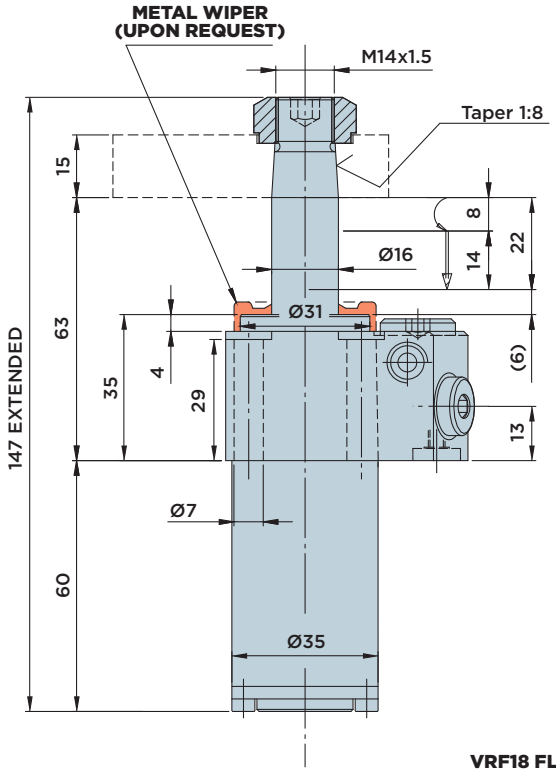
MAX. OPERATING PRESSURE = 500BAR

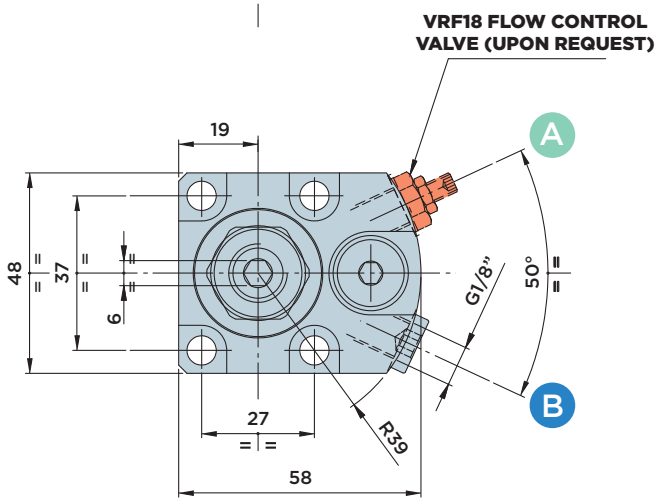


A : Clamping

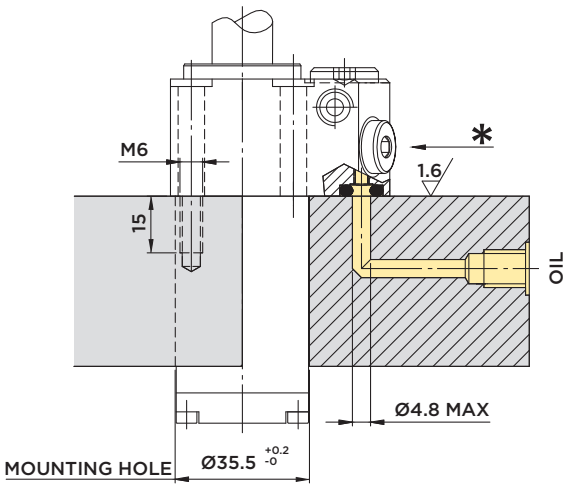
B : Venting







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



* When the external vent port is used, a vent pipe must be connected that leads into an area that is free from liquids and chips.

Included in the scope of supply:
- Mounting screws M6x40 DIN 912/12.9 grade
- O-Rings Ø4.34x3.53

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

ATTENTION: the cylinder is **NOT equipped with THE COMPENSATION SYSTEM!**

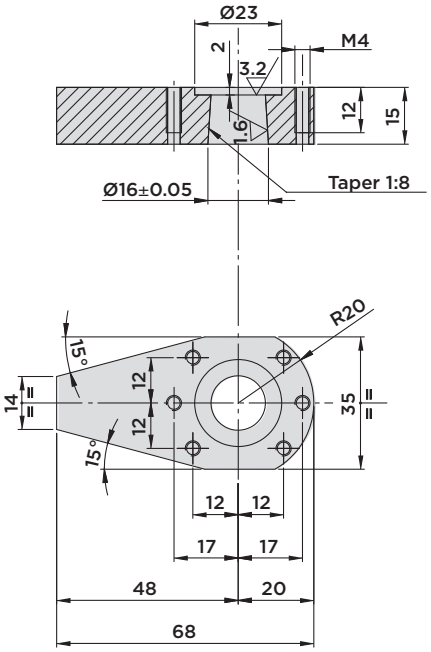
Note:
Order code, see page 38
Clamp arms, see page 51
Clamping force diagram, see page 51

STROKE mm		EFFECTIVE PISTON AREA	TOTAL OIL VOLUME
		Cm²	Cm³
TOTAL	22	CLAMP.	CLAMP.
SWINGING	8	2.51	5.5
CLAMPING	14		

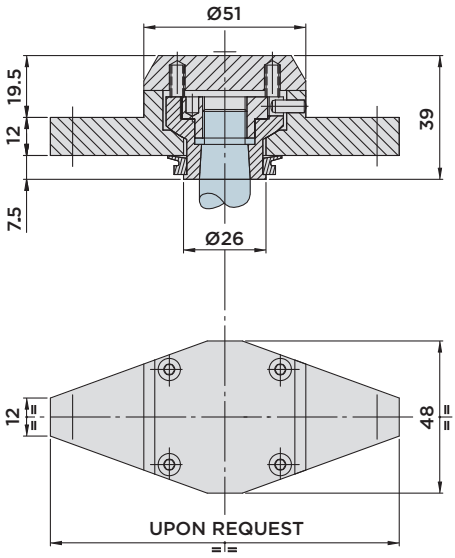
SR16 FS SERIES

- ACCESSORIES
- EFFECTIVE CLAMPING FORCE

CLAMP ARM 01.16

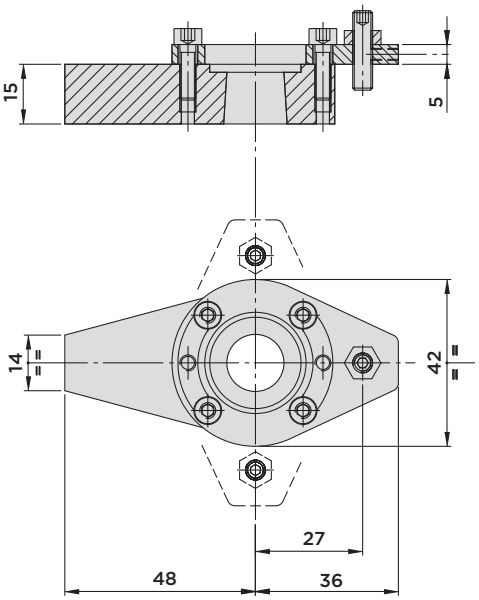


CLAMP ARM 03.16



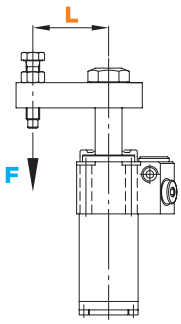
CLAMP ARM 04.16

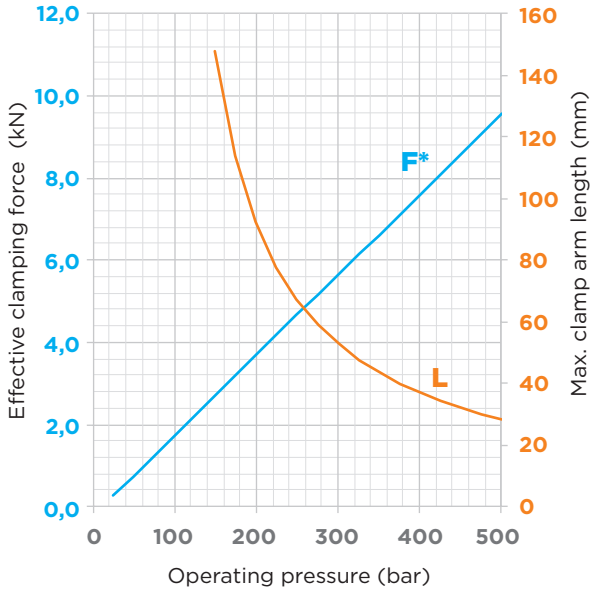
FOR CYLINDERS WITH CLAMP ARM POSITION CONTROL VALVE

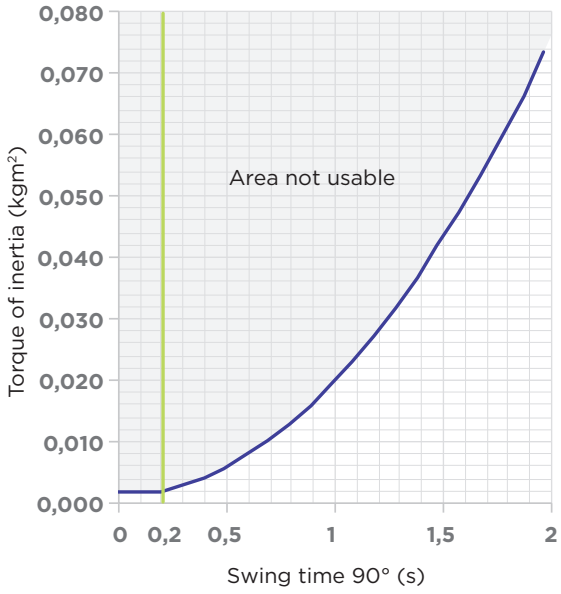


Material: C45

Effective clamping force / Swing times







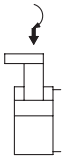
* = The effective clamping force **F** in the above diagram was determined using the standard clamp arms of type 01 and 04.

SR18.0 **FD**

COMPENSATION SYSTEM

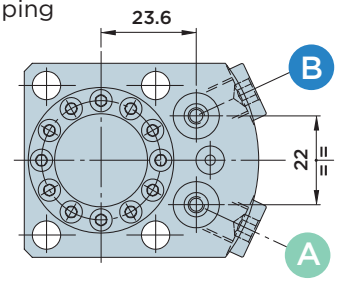
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE**

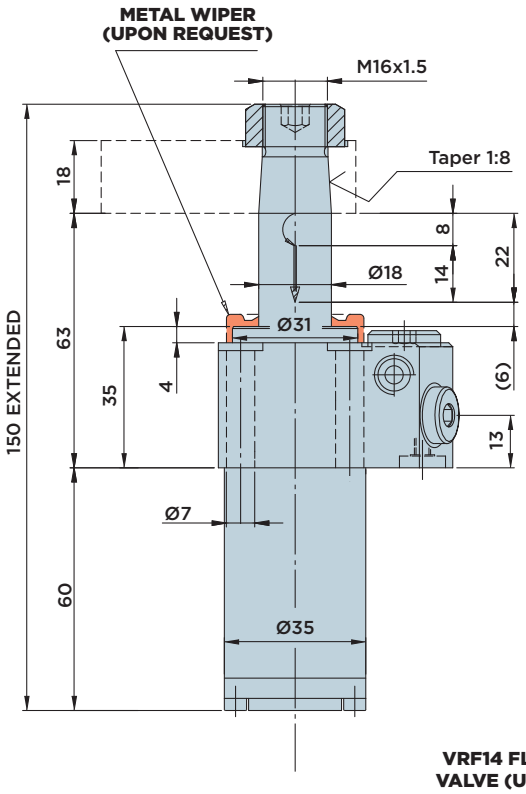
MAX. OPERATING PRESSURE = 500BAR

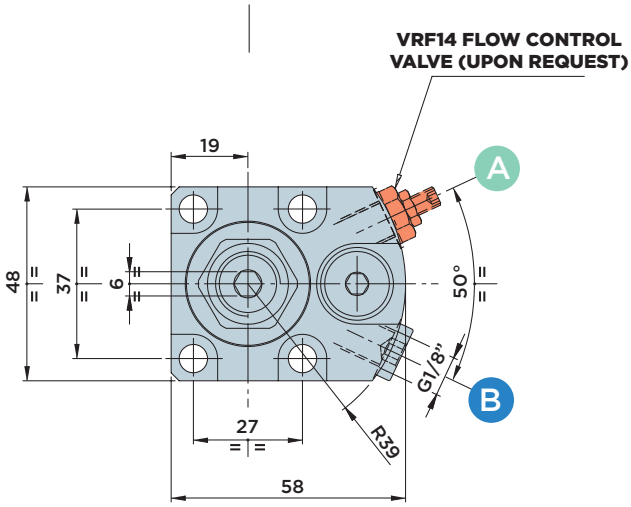


A : Clamping

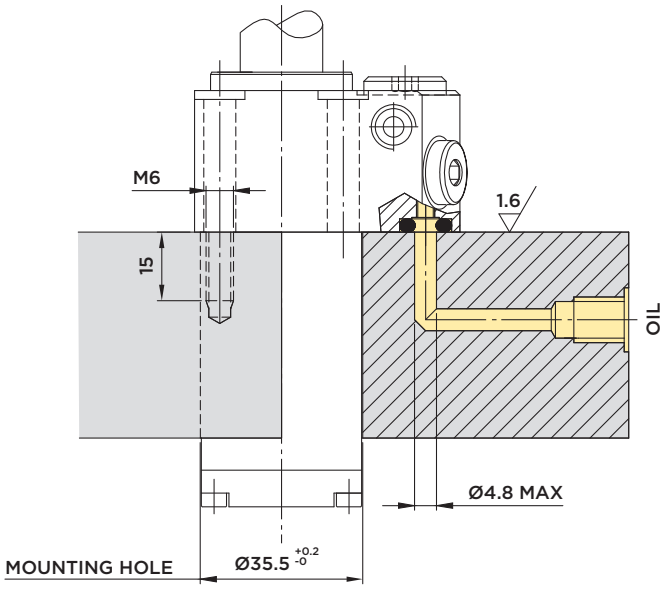
B : Unclamping







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- Mounting screws M6x40 DIN 912/12.9 grade
- O-Rings Ø4.34x3.53

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

Note:
Order code, see page 38
Clamp arms, see page 57
Clamping force diagram, see page 57

STROKE mm		EFFECTIVE PISTON AREA		TOTAL OIL VOLUME	
		Cm²		Cm³	
TOTAL	22	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	8	1.98	4.52	4.4	9.9
CLAMPING	14				

SR18.0 **FDV**

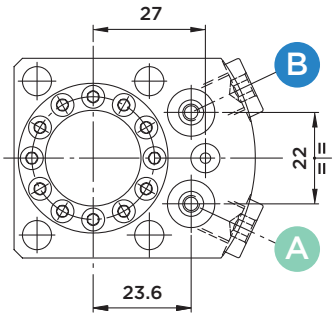
COMPENSATION SYSTEM

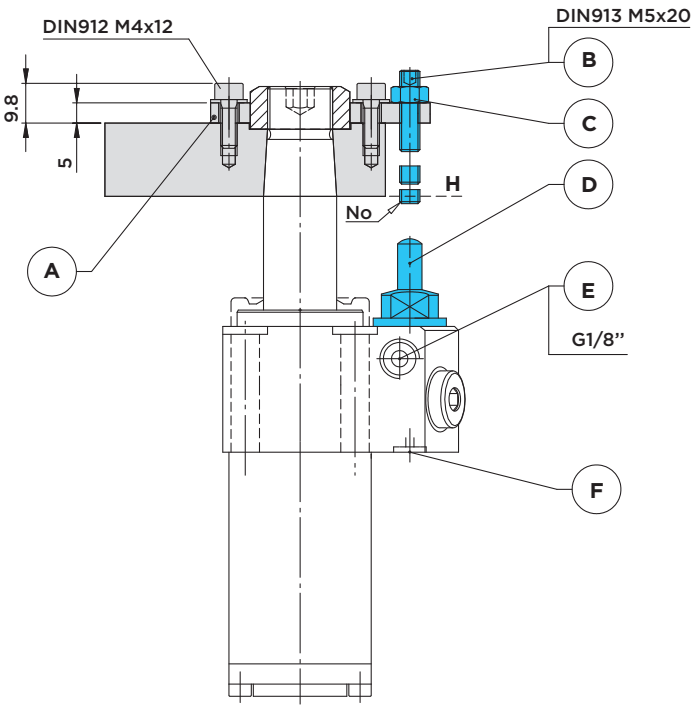
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE**

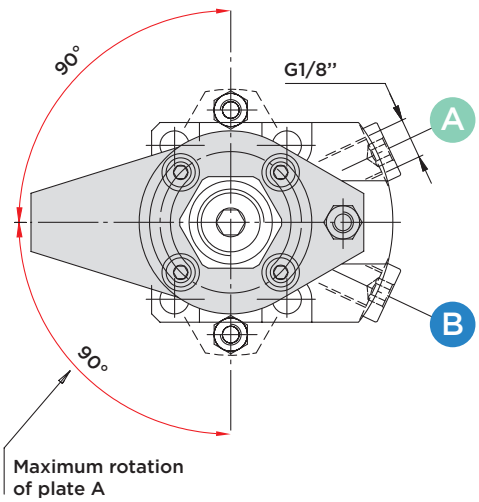
AND **CLAMP ARM POSITION CONTROL VALVE**

A : Clamping

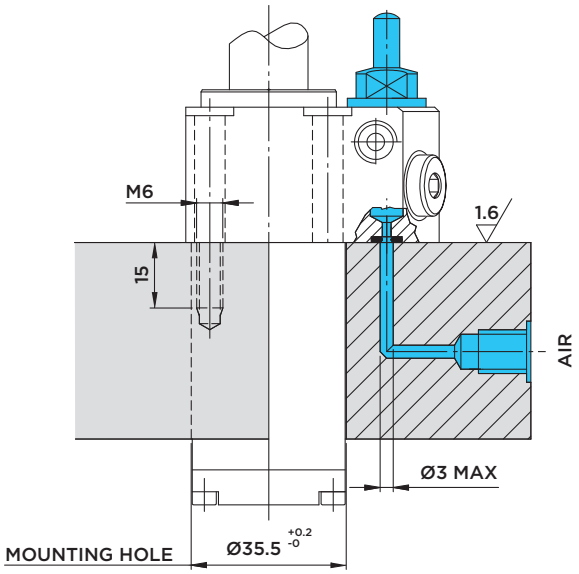
B : Unclamping







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:

- O-Rings Ø3.68x1.78

Valve adjustment:

To adjust the clamp arm position control valve, please proceed as follows:

1) Pressurize the cylinder to move the clamping arm into clamping position.

2) Adjust the plate (A) to the exact radial position to ensure that the set-screw (B) is in line with the valve.

3) Supply the circuit with air at 1÷6 BAR through the port (F). The valve bolt (D) is completely extended and air escapes from the bore (E).

4) Screw in the set-screw (B) with the workpiece being clamped until the air flow is interrupted. Then tighten the screw by another 2÷4 rotations (*) and lock the screw by means of the nut (C). The pressure switch indicates that the pneumatic circuit is closed and enables the machine cycle start.

* (The additional 2÷4 rotations are required to compensate thickness variations caused by rough surfaces.)

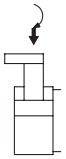
Note: After the adjustment, the tip of the set-screw **(B)** must not project beyond the lower end of the clamp arm **(level H)**.

SR18.0 **PD**

COMPENSATION SYSTEM

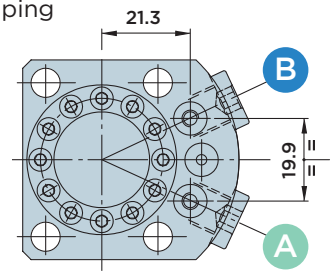
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **LOWER FLANGE**

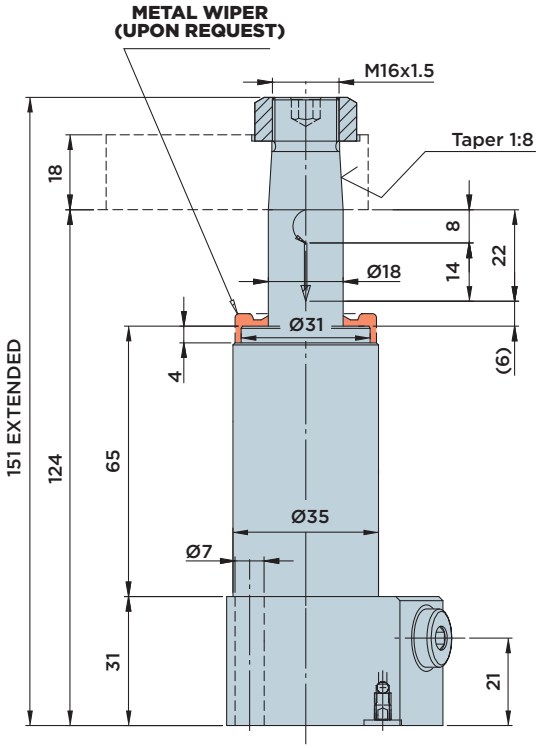
MAX. OPERATING PRESSURE = 500BAR

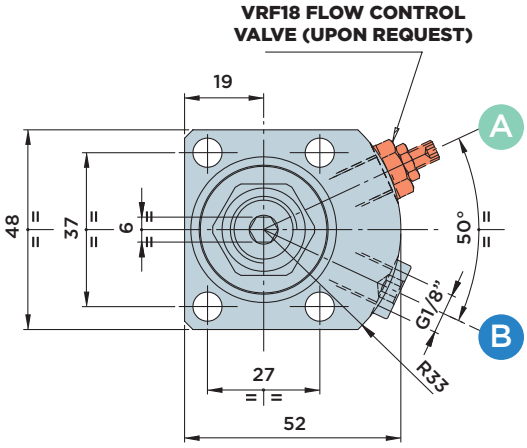


A : Clamping

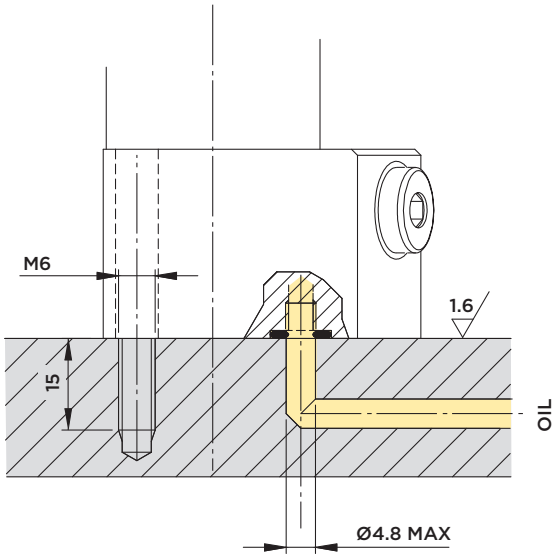
B : Unclamping







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- Mounting screws M6x40 DIN 912/12.9 grade
- O-Rings Ø6.75x1.78

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

Note:
Order code, see page 38
Clamp arms, see page 57
Clamping force diagram, see page 57

STROKE mm		EFFECTIVE PISTON AREA Cm²		TOTAL OIL VOLUME Cm³	
TOTAL	22	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	8	1.98	4.52	4.4	9.9
CLAMPING	14				

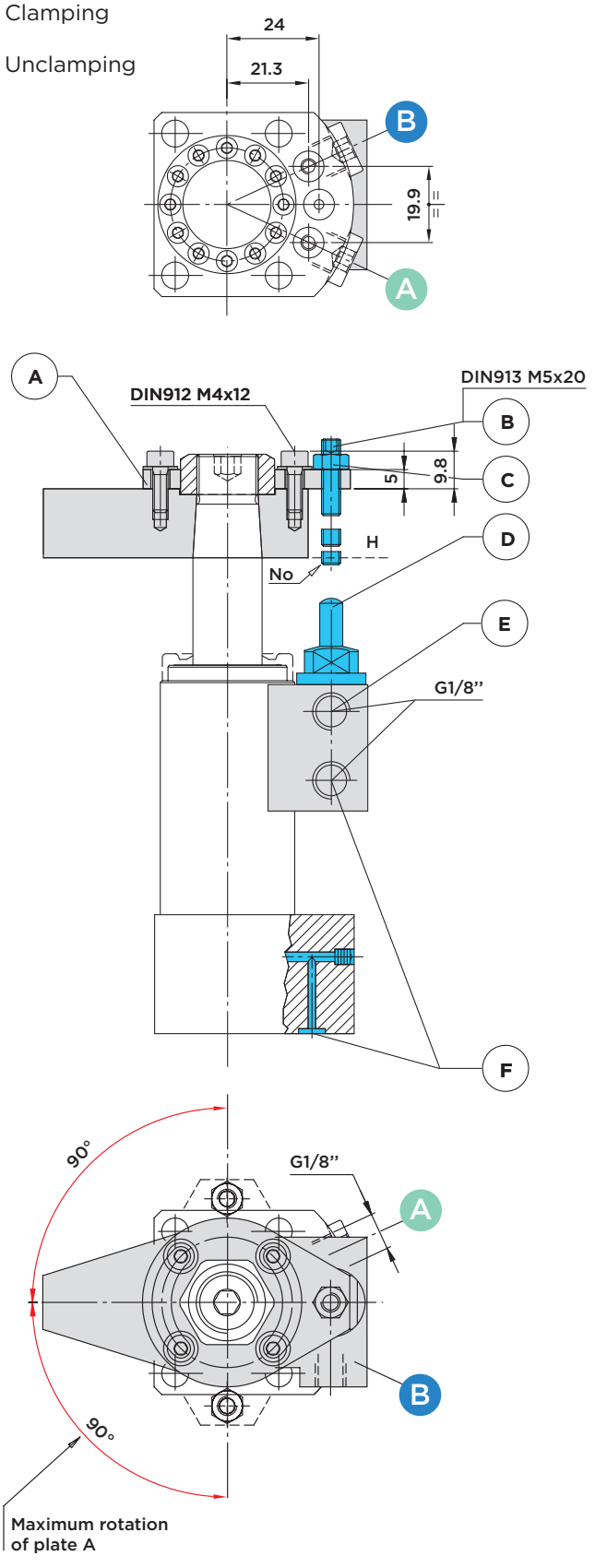
SR18.0 **PDV**

DOUBLE-ACTING SWING CLAMP CYLINDER WITH **LOWER FLANGE**

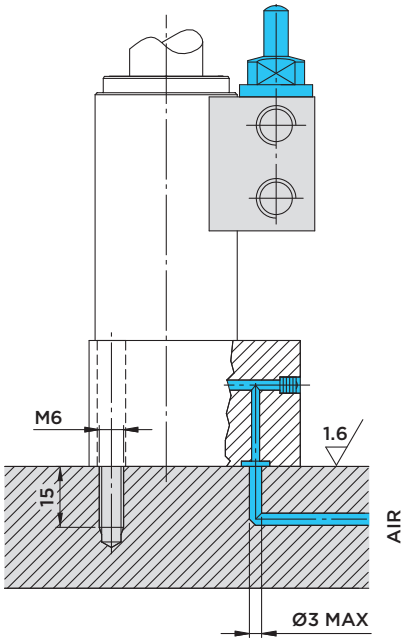
AND **CLAMP ARM POSITION CONTROL VALVE**

A : Clamping

B : Unclamping



INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:

- O-Rings Ø3.68x1.78

Valve adjustment:

To adjust the clamp arm position control valve, please proceed as follows:

1) Pressurize the cylinder to move the clamping arm into clamping position.

2) Adjust the plate (A) to the exact radial position to ensure that the set-screw (B) is in line with the valve.

3) Supply the circuit with air at 1÷6 BAR through the port (F). The valve bolt (D) is completely extended and air escapes from the bore (E).

4) Screw in the set-screw (B) with the workpiece being clamped until the air flow is interrupted. Then tighten the screw by another 2÷4 rotations (*) and lock the screw by means of the nut (C). The pressure switch indicates that the pneumatic circuit is closed and enables the machine cycle start.

* (The additional 2÷4 rotations are required to compensate thickness variations caused by rough surfaces.)

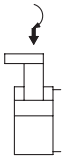
Note: After the adjustment, the tip of the set-screw **(B)** must not project beyond the lower end of the clamp arm **(level H)**.

SR18.0 **CD**

COMPENSATION SYSTEM

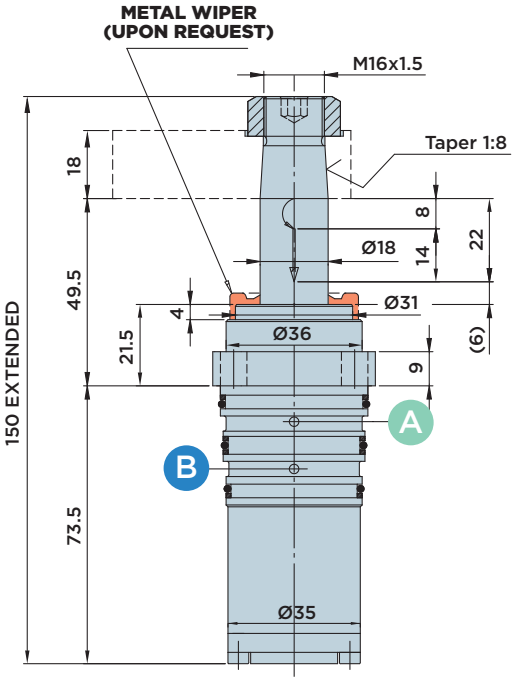
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **CARTRIDGE BODY**

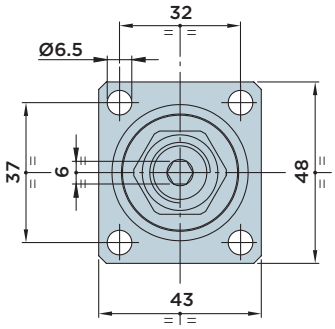
MAX. OPERATING PRESSURE = 500BAR



A : Clamping

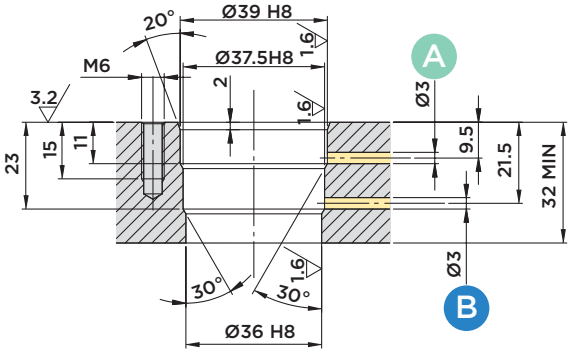
B : Unclamping



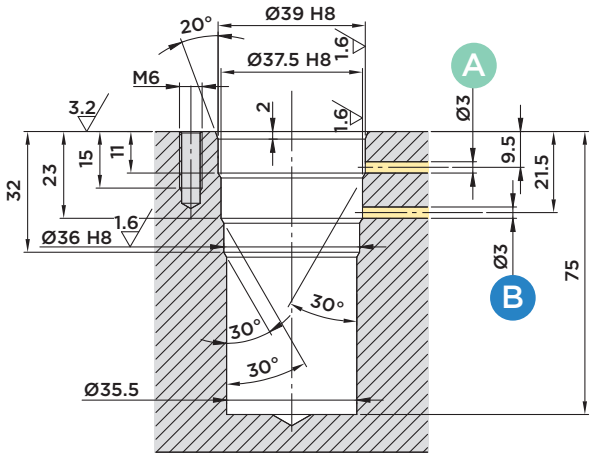


INSTALLATION DIMENSIONS

Through-hole mounting



Blind hole mounting



Included in the scope of supply:
- Mounting screws M6x20 DIN 912/12.9 grade

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

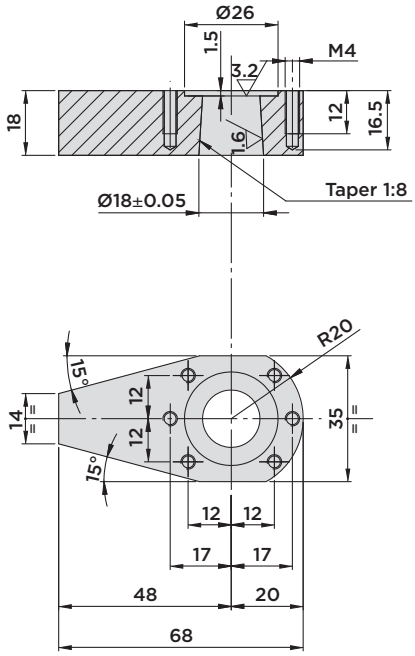
Note:
Order code, see page 38
Clamp arms, see page 57
Clamping force diagram, see page 57

STROKE mm		EFFECTIVE PISTON AREA		TOTAL OIL VOLUME	
		Cm²		Cm³	
TOTAL	22	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	8	1.98	4.52	4.4	9.9
CLAMPING	14				

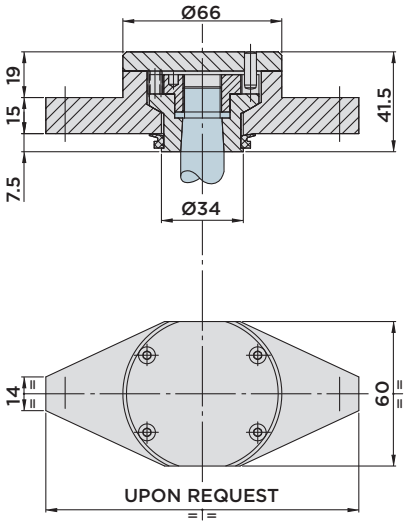
SR18 SERIES

- ACCESSORIES
- EFFECTIVE CLAMPING FORCE

CLAMP ARM 01.18

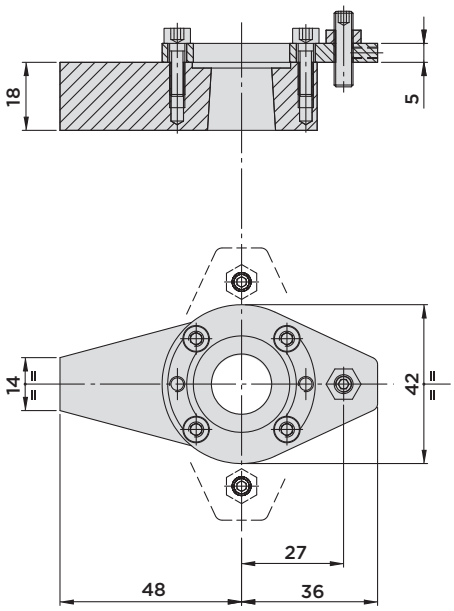


CLAMP ARM 03.18



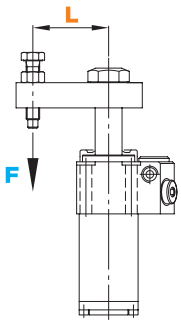
CLAMP ARM 04.18

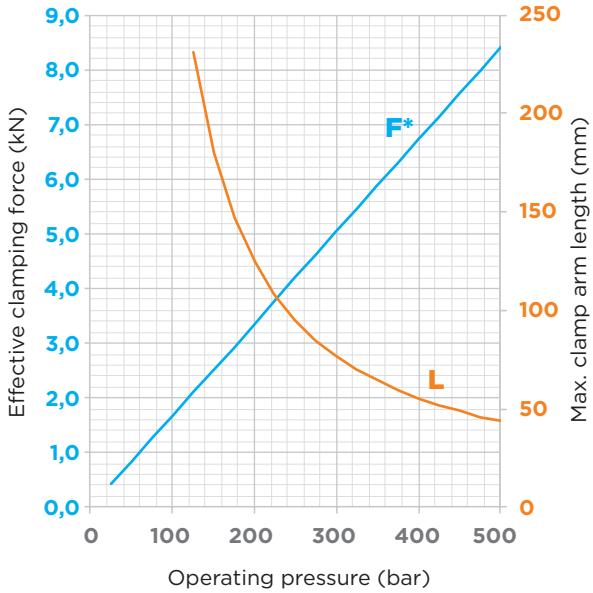
FOR CYLINDERS WITH CLAMP ARM POSITION CONTROL VALVE

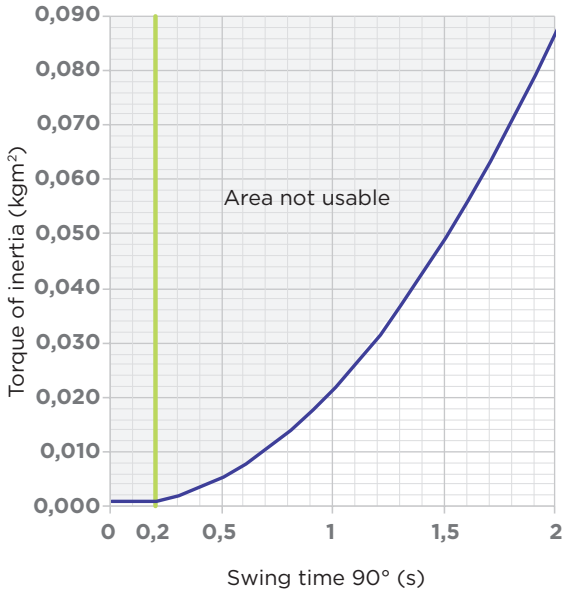


Material: C45

Effective clamping force / Swing times







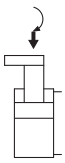
* = The effective clamping force **F** in the above diagram was determined using the standard clamp arms of type 01 and 04.

SR18.0 **FDH**

COMPENSATION SYSTEM

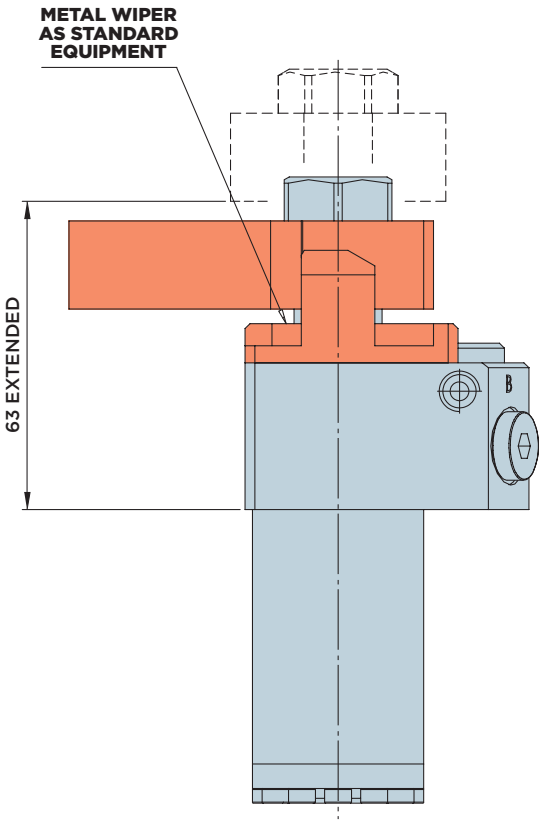
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE**

AND **HPC PRISMATIC ANTI-DEFLECTION BLOCK** MAX. OPERATING PRESSURE = 500BAR

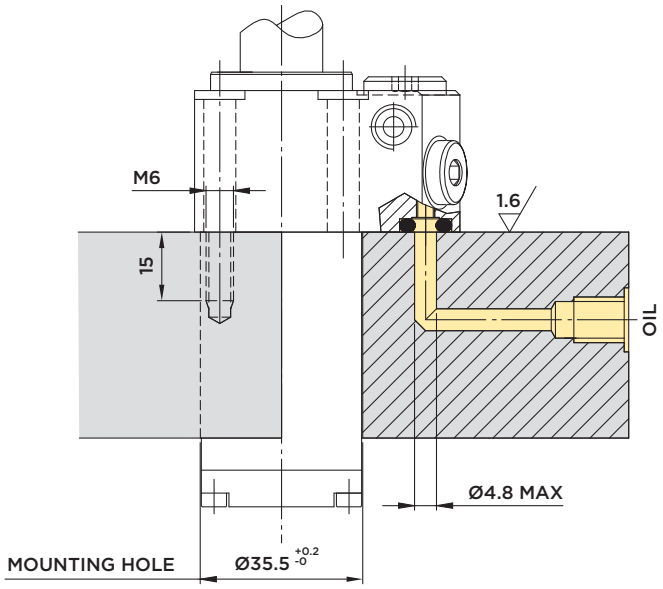


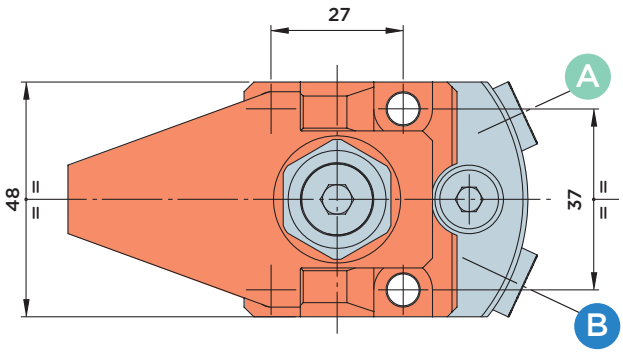
A : Clamping

B : Unclamping



INSTALLATION DIMENSIONS WITH O-RING CONNECTION





Included in the scope of supply:
- Mounting screws M6x45 DIN 912/12.9 grade

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

Note:
Order code, see page 38
Clamp arms, see page 61
Clamping force diagram, see page 61

STROKE mm		EFFECTIVE PISTON AREA Cm²		TOTAL OIL VOLUME Cm³	
TOTAL	22	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	8	1.98	4.52	4.4	9.9
CLAMPING	14				

SR18.0 **FDVH**

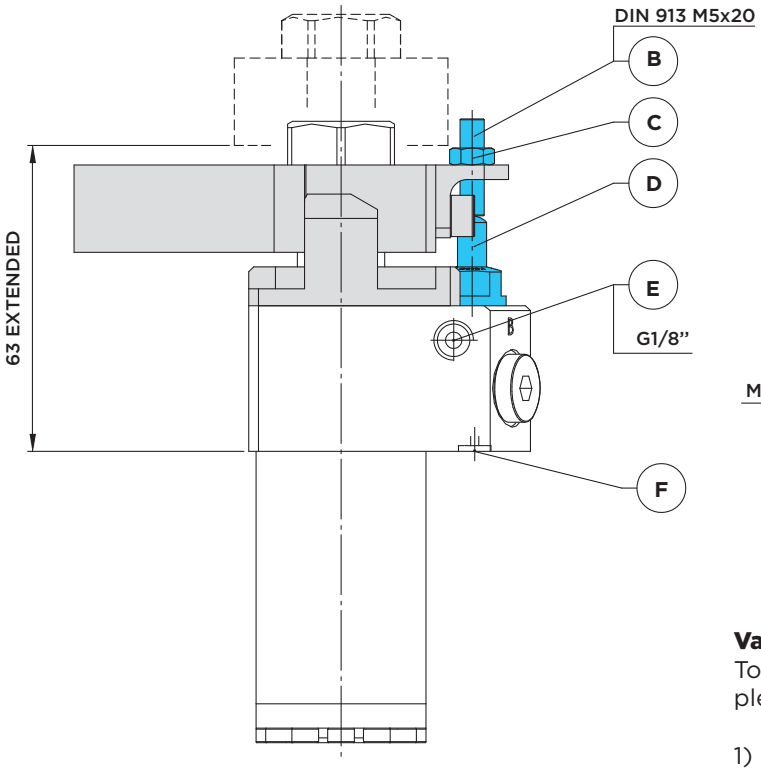
COMPENSATION SYSTEM

DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE,**

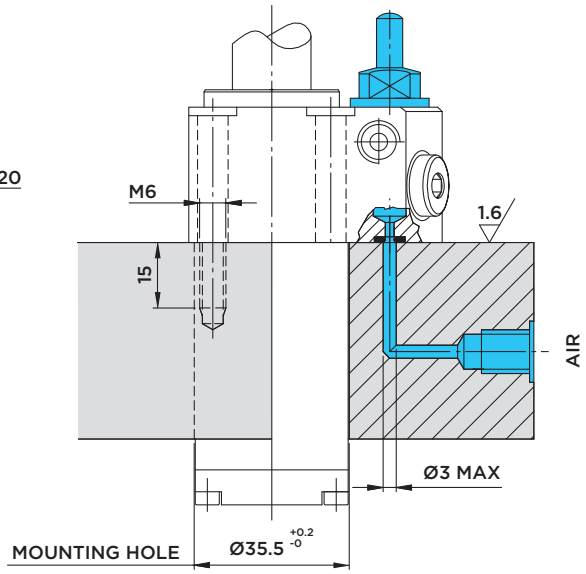
CLAMP ARM POSITION CONTROL VALVE AND **HPC PRISMATIC ANTI-DEFLECTION BLOCK**

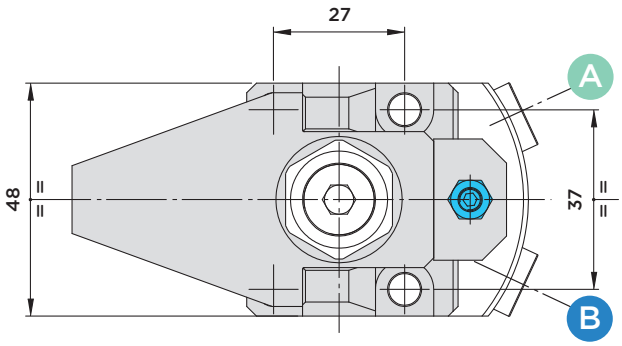
A : Clamping

B : Unclamping



INSTALLATION DIMENSIONS WITH O-RING CONNECTION





Valve adjustment:
To adjust the clamp arm position control valve, please proceed as follows:

1) Loosen the screw (B) M5x20.

2) Pressurize the cylinder to move the clamping arm into clamping position.

3) Supply the circuit with air at 1÷6 BAR through the port (F). The valve bolt (D) is completely extended and air escapes from the bore (E).

4) Screw in the set-screw (B) with the workpiece being clamped until the air flow is interrupted. Then tighten the screw by another 2÷4 rotations (*) and lock the screw by means of the nut (C). The pressure switch indicates that the pneumatic circuit is closed and enables the machine cycle start.

* (The additional 2÷4 rotations are required to compensate thickness variations caused by rough surfaces.)

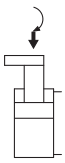
Note: After the adjustment, the tip of the set-screw **(B)** must not project beyond the lower end of the clamp arm **(level H)**.

SR18.0 **CDH**

COMPENSATION SYSTEM

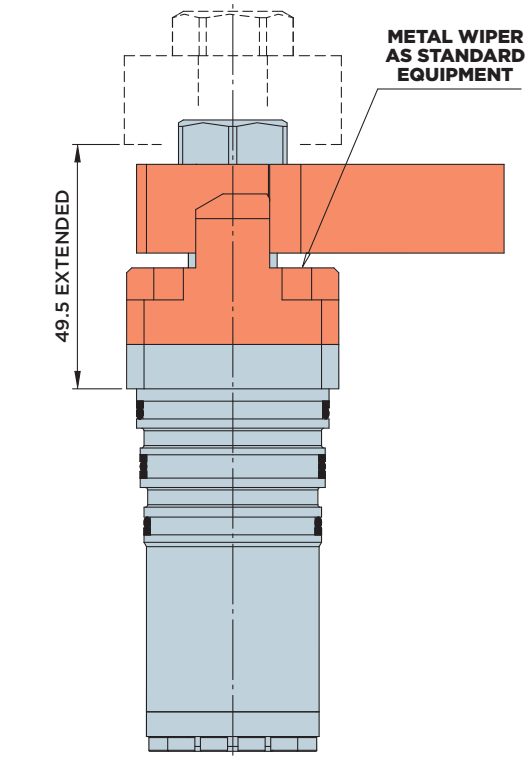
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **CARTRIDGE BODY**

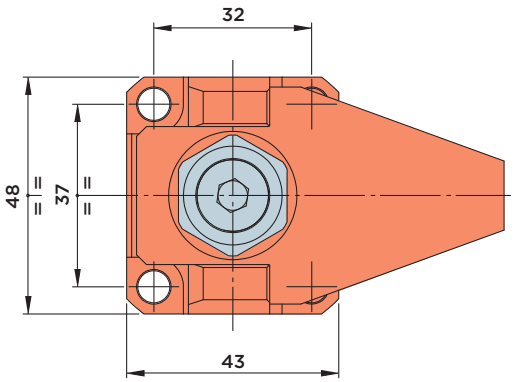
AND **HPC PRISMATIC ANTI-DEFLECTION BLOCK** MAX. OPERATING PRESSURE = 500BAR



A : Clamping

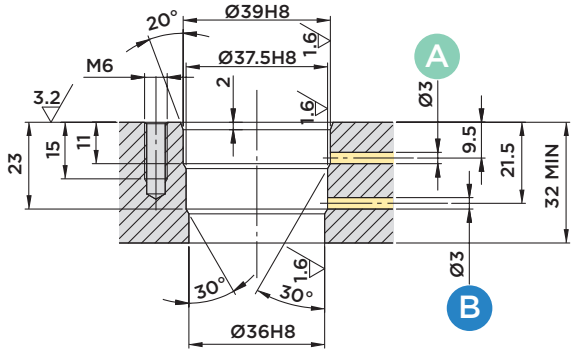
B : Unclamping



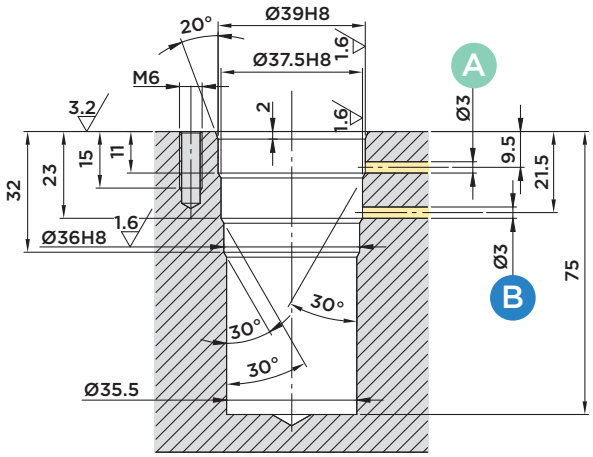


INSTALLATION DIMENSIONS

Through-hole mounting



Blind hole mounting



Included in the scope of supply:
- Mounting screws M6x30 DIN 912/12.9 grade

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

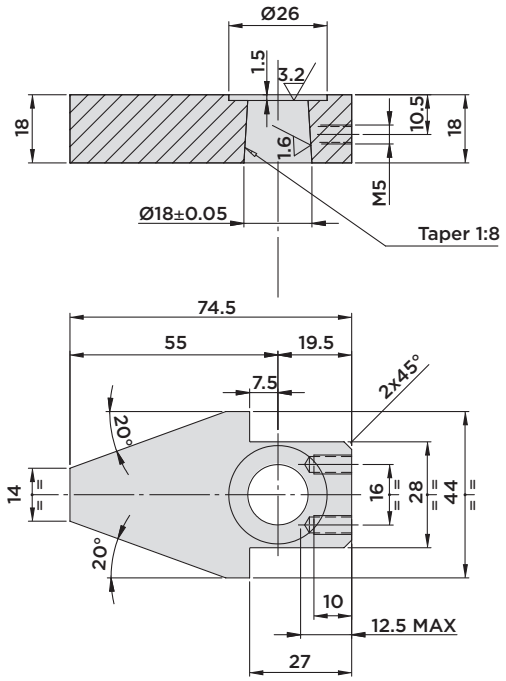
Note:
Order code, see page 38
Clamp arms, see page 61
Clamping force diagram, see page 61

STROKE mm		EFFECTIVE PISTON AREA Cm²		TOTAL OIL VOLUME Cm³	
TOTAL	22	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	8	1.98	4.52	4.4	9.9
CLAMPING	14				

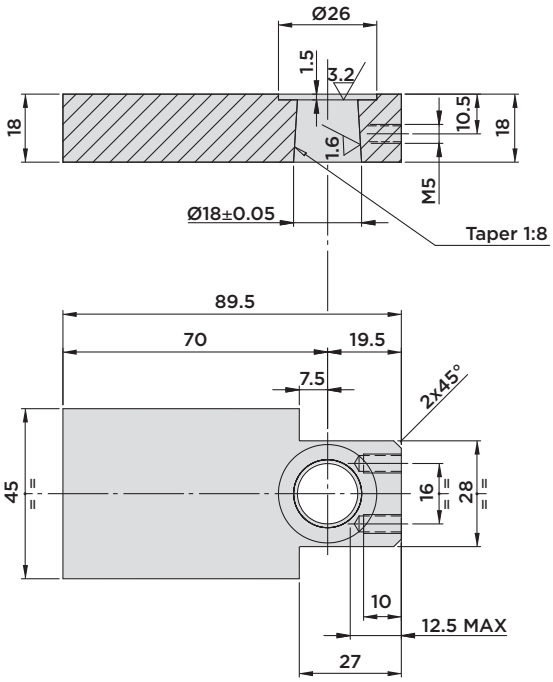
SR18 HPC SERIES

- ACCESSORIES
- EFFECTIVE CLAMPING FORCE

CLAMP ARM 06.18

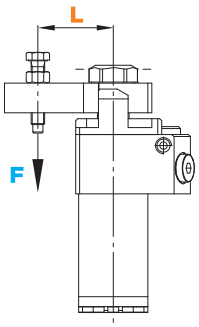


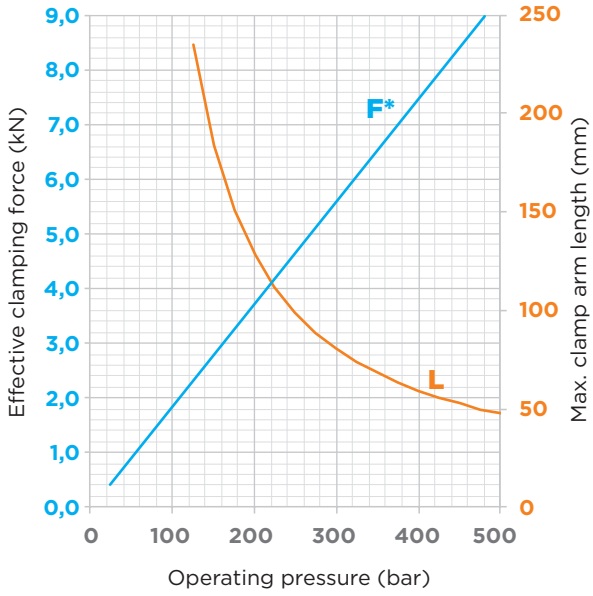
CLAMP ARM 07.18

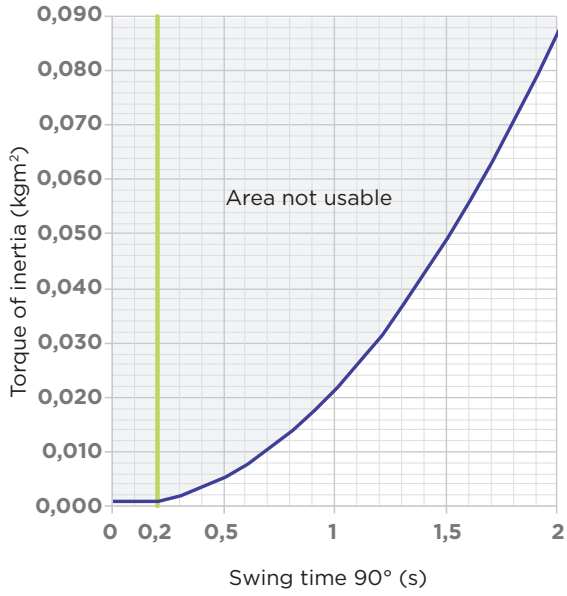


Material: C45

Effective clamping force / Swing times





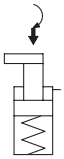


* = The effective clamping force **F** in the above diagram was determined using the standard clamp arms of type 01 and 04.

SR18.0 **FS**

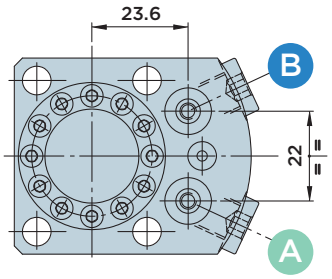
SINGLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE**

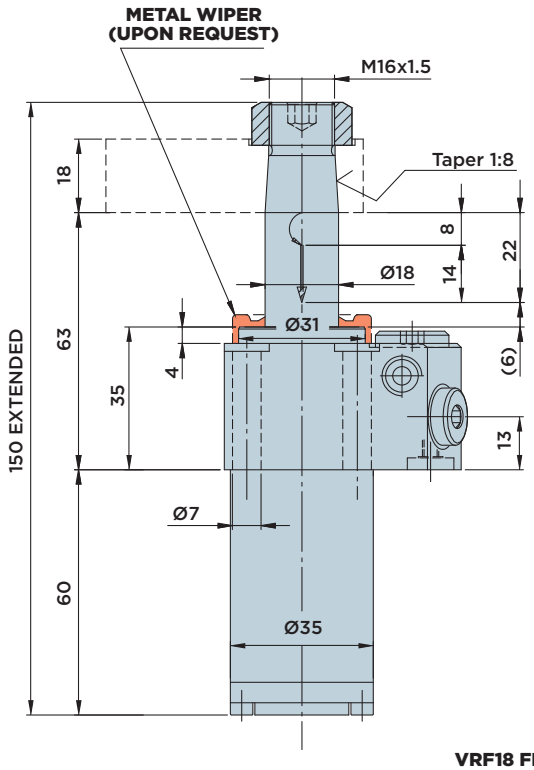
MAX. OPERATING PRESSURE = 500BAR

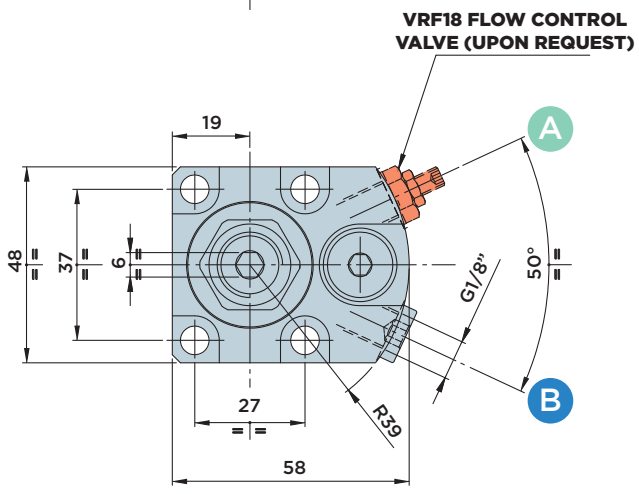


A : Clamping

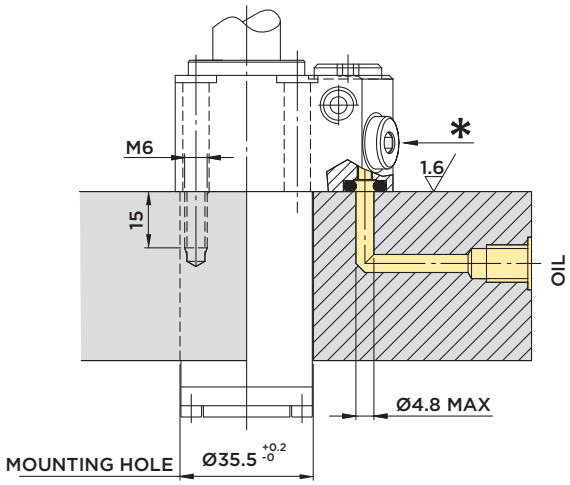
B : Venting







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



* When the external vent port is used, a vent pipe must be connected that leads into an area that is free from liquids and chips.

Included in the scope of supply:
- Mounting screws M6x40 DIN 912/12.9 grade
- O-Rings Ø4.34x3.53

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

ATTENTION: the cylinder is **NOT equipped with THE COMPENSATION SYSTEM!**

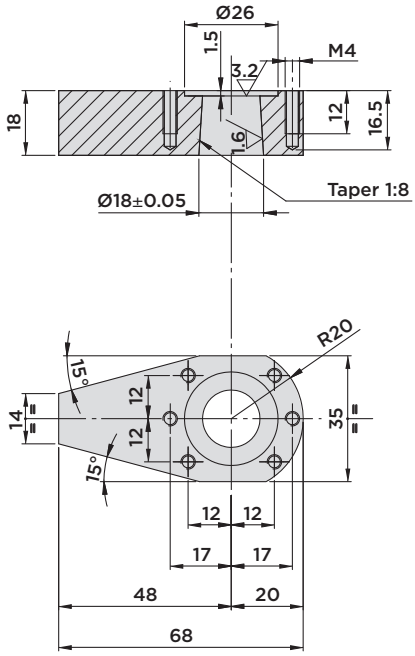
Note:
Order code, see page 38
Clamp arms, see page 63
Clamping force diagram, see page 63

STROKE mm		EFFECTIVE PISTON AREA	TOTAL OIL VOLUME
		Cm^2	Cm^3
TOTAL	22	CLAMP.	CLAMP.
SWINGING	8	1.98	4.4
CLAMPING	14		

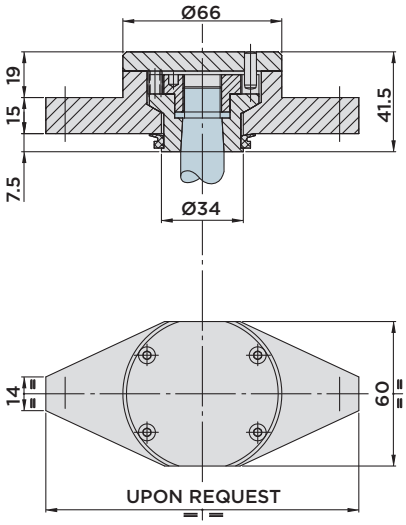
SR18 FS SERIES

- ACCESSORIES
- EFFECTIVE CLAMPING FORCE

CLAMP ARM 01.18

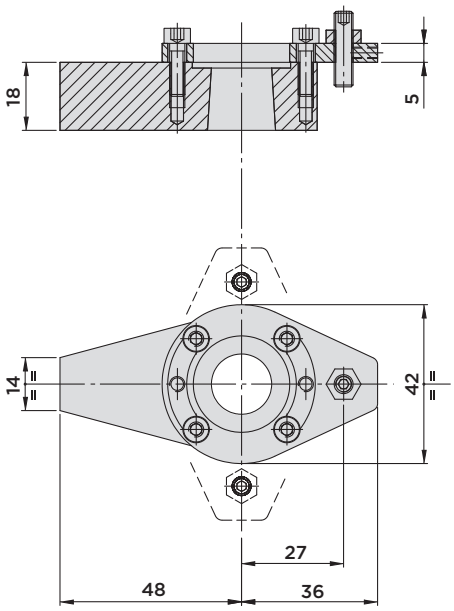


CLAMP ARM 03.18



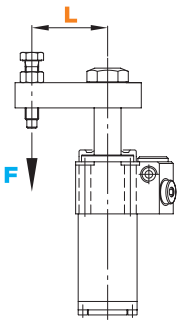
CLAMP ARM 04.18

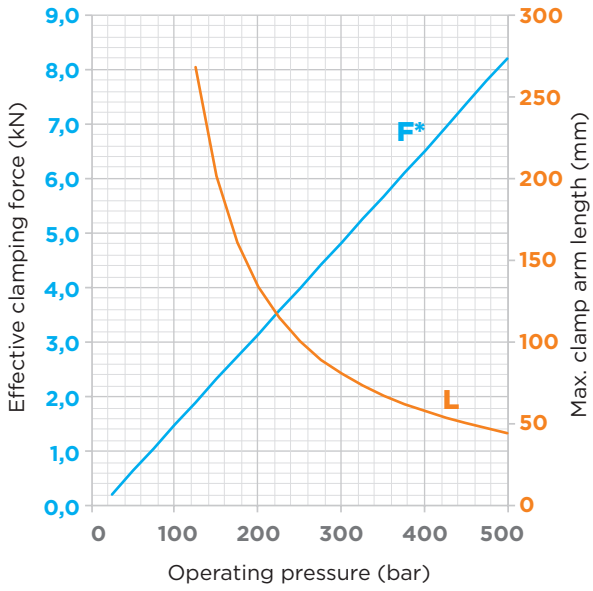
FOR CYLINDERS WITH CLAMP ARM POSITION CONTROL VALVE

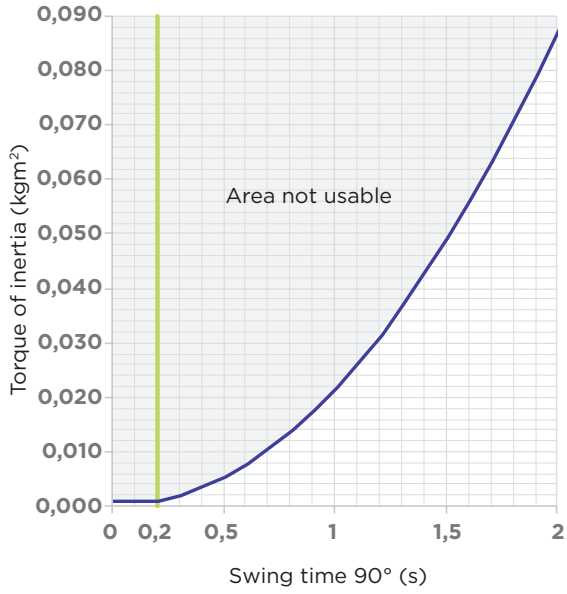


Material: C45

Effective clamping force / Swing times







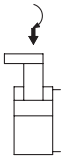
* = The effective clamping force **F** in the above diagram was determined using the standard clamp arms of type 01 and 04.

SR22.0 **FD**

COMPENSATION SYSTEM

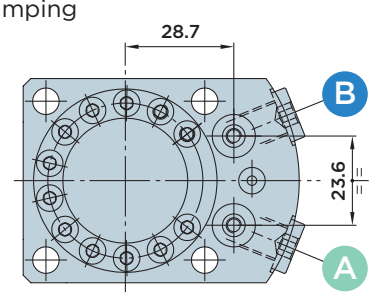
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE**

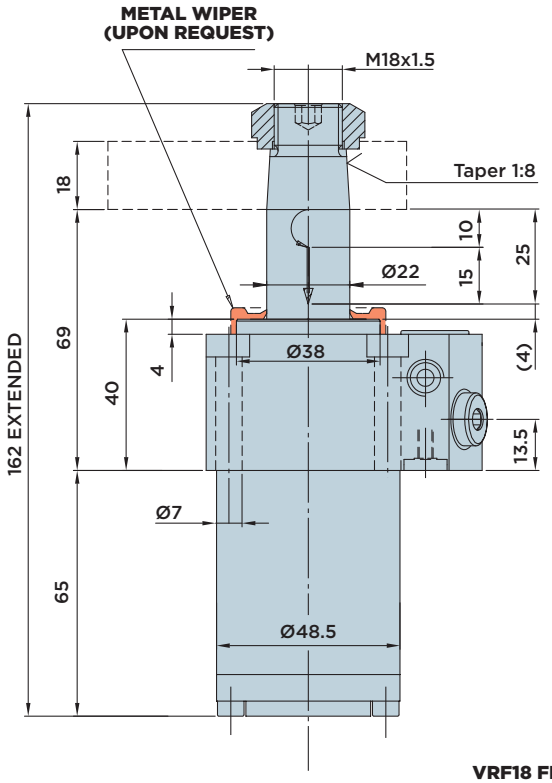
MAX. OPERATING PRESSURE = 500BAR

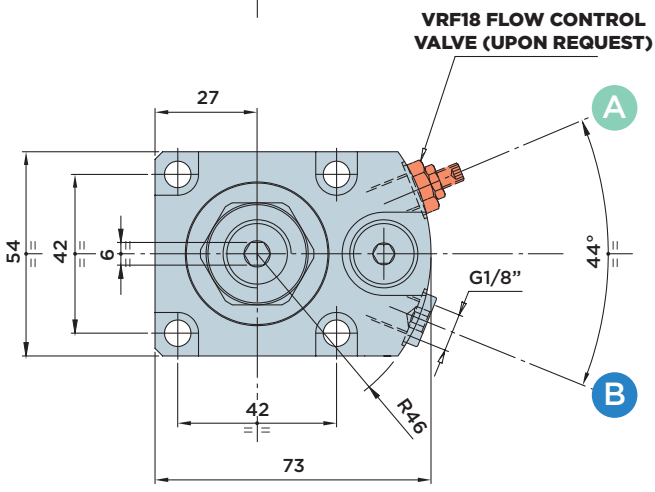


A : Clamping

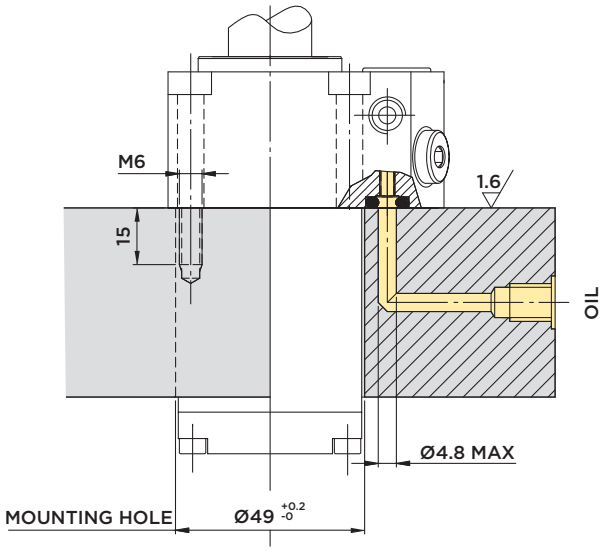
B : Unclamping







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- Mounting screws M6x40 DIN 912/12.9 grade
- O-Rings Ø4.34x3.53

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

Note:
Order code, see page 38
Clamp arms, see page 69
Clamping force diagram, see page 69

STROKE mm		EFFECTIVE PISTON AREA Cm²		TOTAL OIL VOLUME Cm³	
TOTAL	25	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	10	5.27	9.07	13.2	22.6
CLAMPING	15				

SR22.0 **FDV**

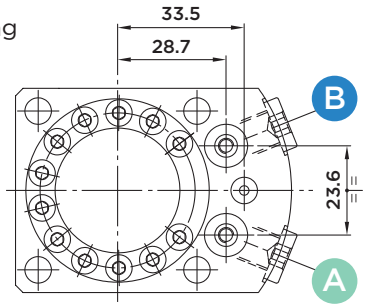
COMPENSATION SYSTEM

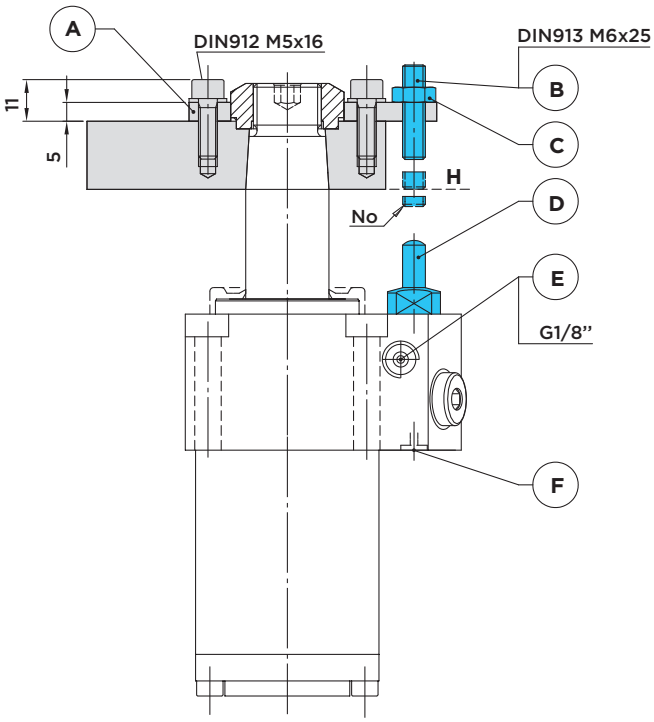
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE**

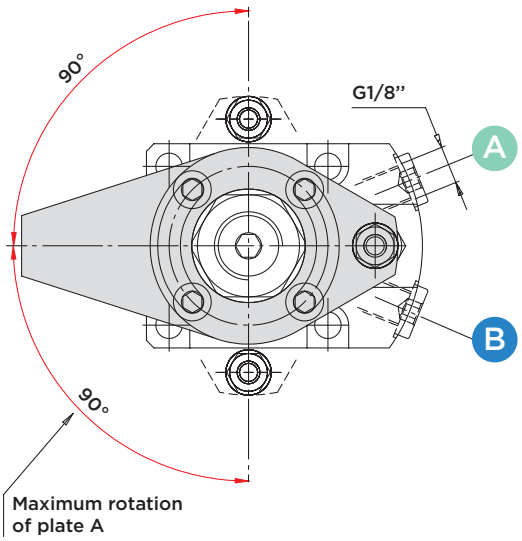
AND **CLAMP ARM POSITION CONTROL VALVE**

A : Clamping

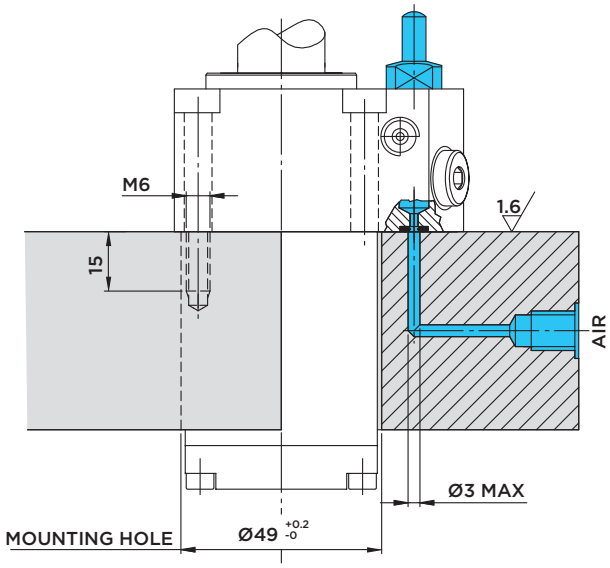
B : Unclamping







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:

- O-Rings Ø3.68x1.78

Valve adjustment:

To adjust the clamp arm position control valve, please proceed as follows:

1) Pressurize the cylinder to move the clamping arm into clamping position.

2) Adjust the plate (A) to the exact radial position to ensure that the set-screw (B) is in line with the valve.

3) Supply the circuit with air at 1÷6 BAR through the port (F). The valve bolt (D) is completely extended and air escapes from the bore (E).

4) Screw in the set-screw (B) with the workpiece being clamped until the air flow is interrupted. Then tighten the screw by another 2÷4 rotations (*) and lock the screw by means of the nut (C). The pressure switch indicates that the pneumatic circuit is closed and enables the machine cycle start.

* (The additional 2÷4 rotations are required to compensate thickness variations caused by rough surfaces.)

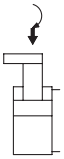
Note: After the adjustment, the tip of the set-screw **(B)** must not project beyond the lower end of the clamp arm **(level H)**.

SR22.0 **PD**

COMPENSATION SYSTEM

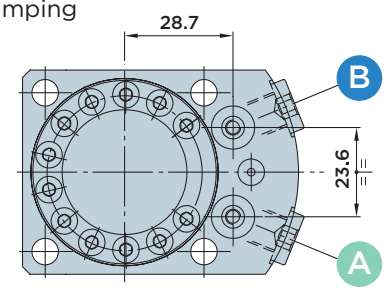
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **LOWER FLANGE**

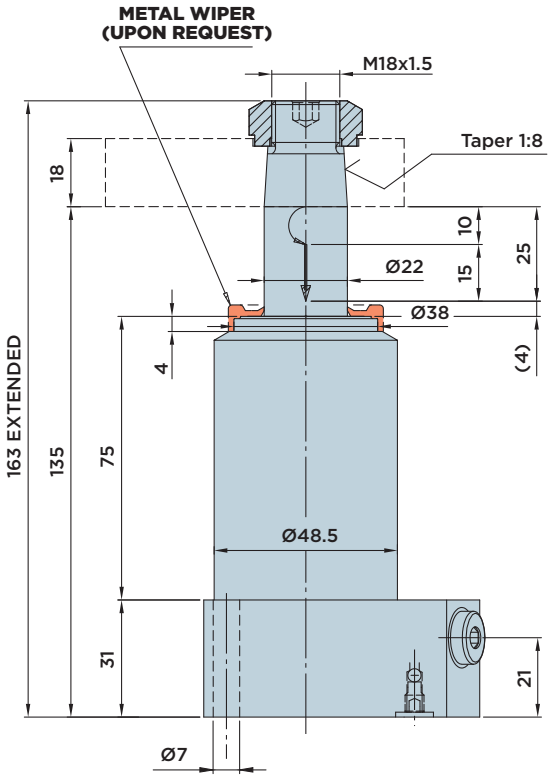
MAX. OPERATING PRESSURE = 500BAR

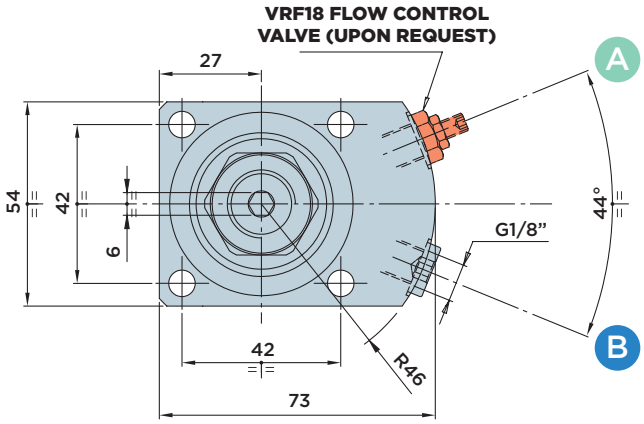


A : Clamping

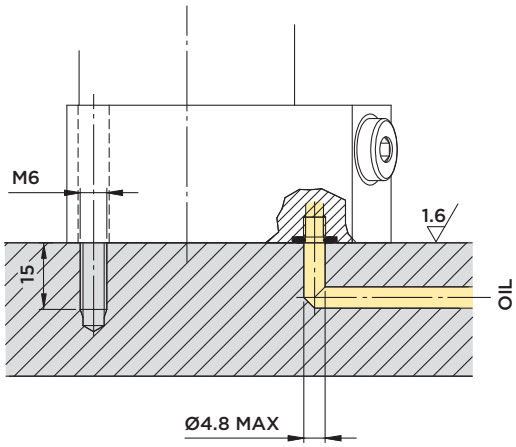
B : Unclamping







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- Mounting screws M6x40 DIN 912/12.9 grade
- O-Rings Ø6.75x1.78

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

Note:
Order code, see page 38
Clamp arms, see page 69
Clamping force diagram, see page 69

STROKE mm		EFFECTIVE PISTON AREA Cm²		TOTAL OIL VOLUME Cm³	
TOTAL	25	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	10	5.27	9.07	13.2	22.6
CLAMPING	15				

SR22.0 **PDV**

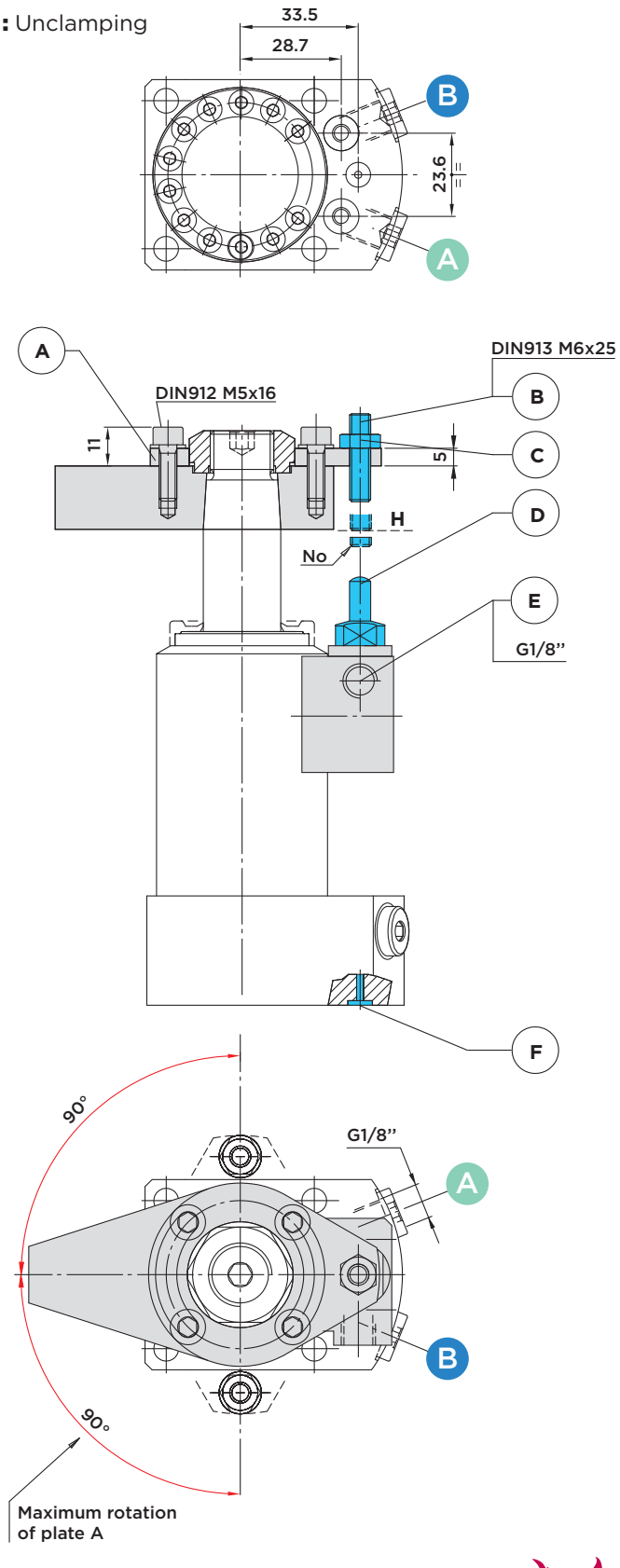
COMPENSATION SYSTEM

DOUBLE-ACTING SWING CLAMP CYLINDER WITH **LOWER FLANGE**

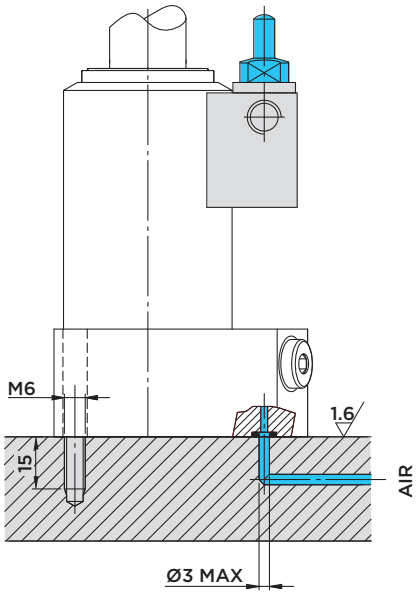
AND **CLAMP ARM POSITION CONTROL VALVE**

A : Clamping

B : Unclamping



INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- O-Rings Ø3.68x1.78

Valve adjustment:
To adjust the clamp arm position control valve, please proceed as follows:

1) Pressurize the cylinder to move the clamping arm into clamping position.

2) Adjust the plate (A) to the exact radial position to ensure that the set-screw (B) is in line with the valve.

3) Supply the circuit with air at 1÷6 BAR through the port (F). The valve bolt (D) is completely extended and air escapes from the bore (E).

4) Screw in the set-screw (B) with the workpiece being clamped until the air flow is interrupted. Then tighten the screw by another 2÷4 rotations (*) and lock the screw by means of the nut (C). The pressure switch indicates that the pneumatic circuit is closed and enables the machine cycle start.

* (The additional 2÷4 rotations are required to compensate thickness variations caused by rough surfaces.)

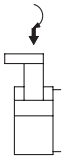
Note: After the adjustment, the tip of the set-screw **(B)** must not project beyond the lower end of the clamp arm **(level H)**.

SR22.0 **CD**

COMPENSATION SYSTEM

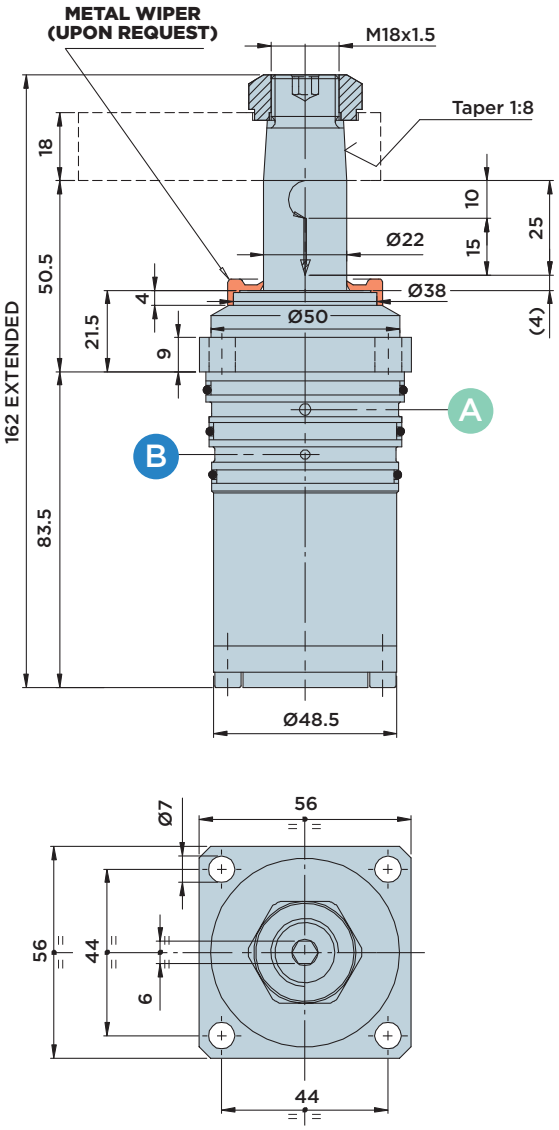
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **CARTRIDGE BODY**

MAX. OPERATING PRESSURE = 500BAR



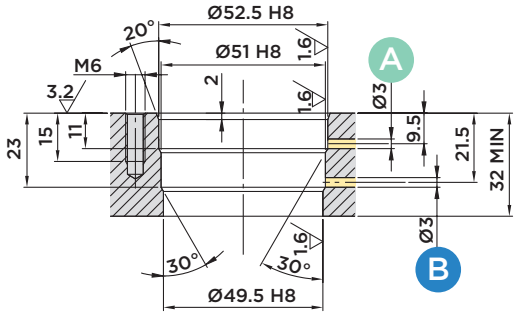
A : Clamping

B : Unclamping

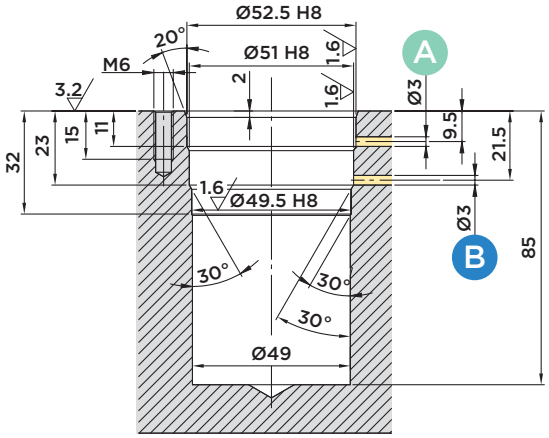


INSTALLATION DIMENSIONS

Through-hole mounting



Blind hole mounting



Included in the scope of supply:
- Mounting screws M6x20 DIN 912/12.9 grade

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

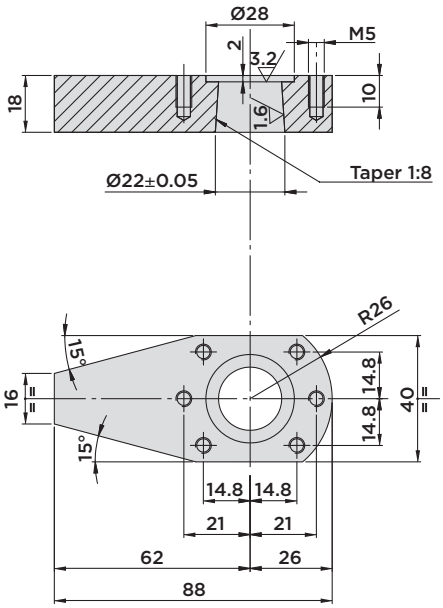
Note:
Order code, see page 38
Clamp arms, see page 69
Clamping force diagram, see page 69

STROKE mm		EFFECTIVE PISTON AREA		TOTAL OIL VOLUME	
		Cm^2		Cm^3	
TOTAL	25	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	10	5.27	9.07	13.2	22.6
CLAMPING	15				

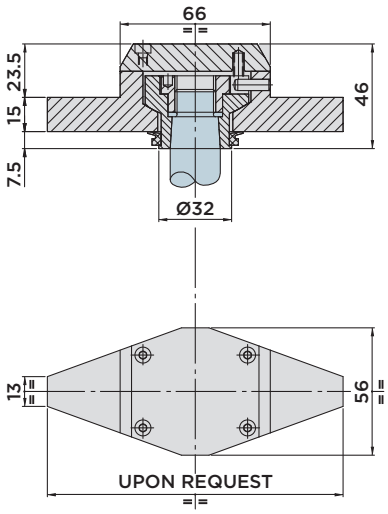
SR22 SERIES

- ACCESSORIES
- EFFECTIVE CLAMPING FORCE

CLAMP ARM 01.22

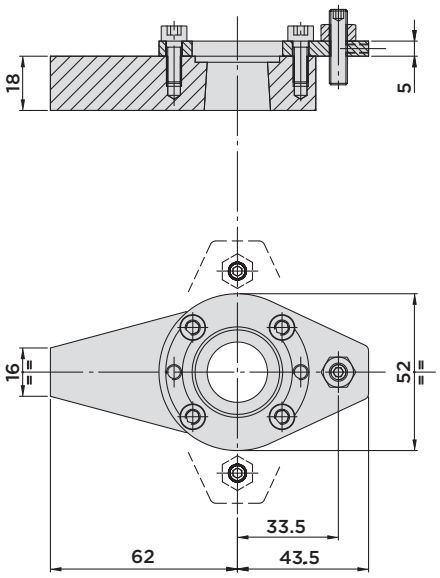


CLAMP ARM 03.22



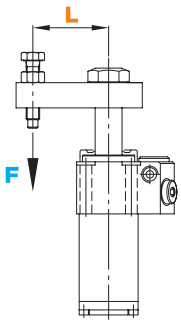
CLAMP ARM 04.22

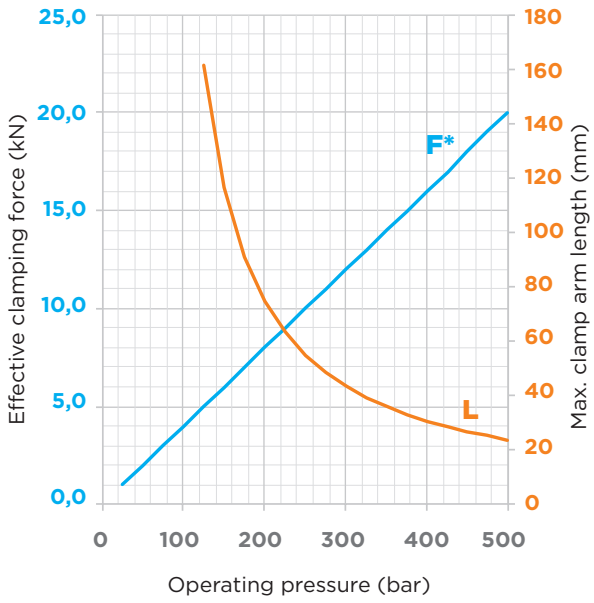
FOR CYLINDERS WITH CLAMP ARM POSITION CONTROL VALVE

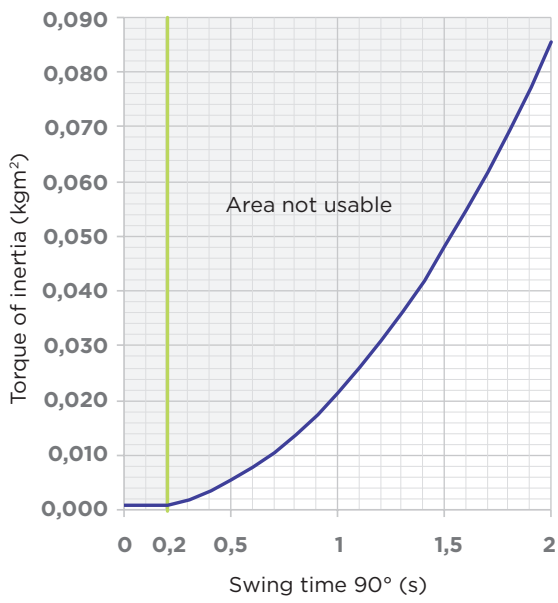


Material: C45

Effective clamping force / Swing times







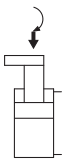
* = The effective clamping force **F** in the above diagram was determined using the standard clamp arms of type 01 and 04.

SR22.0 **FDH**

COMPENSATION SYSTEM

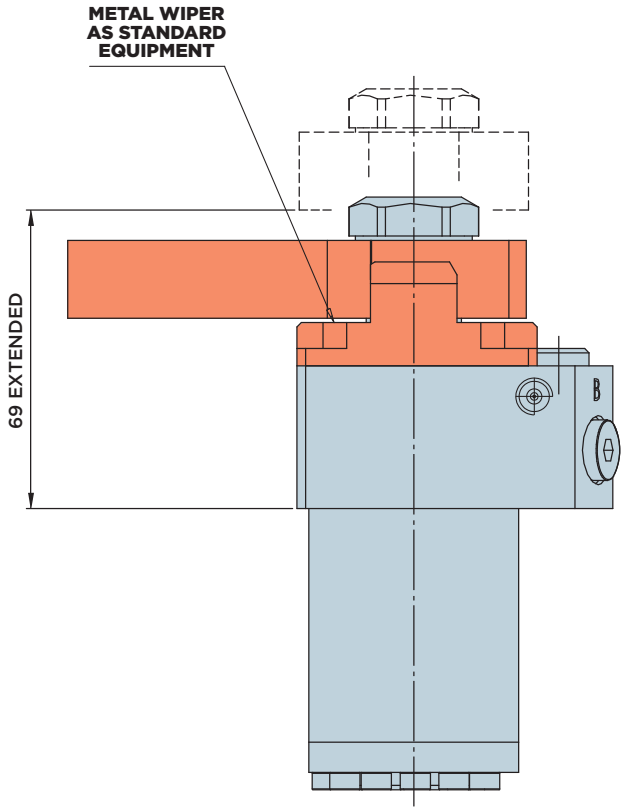
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE**

AND **HPC PRISMATIC ANTI-DEFLECTION BLOCK** MAX. OPERATING PRESSURE = 500BAR

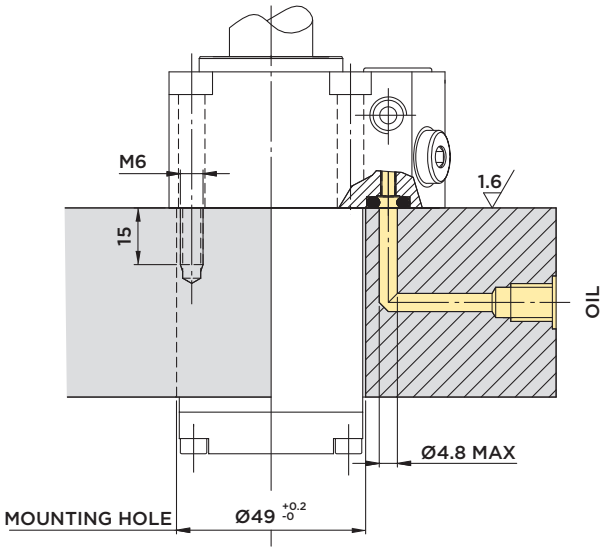


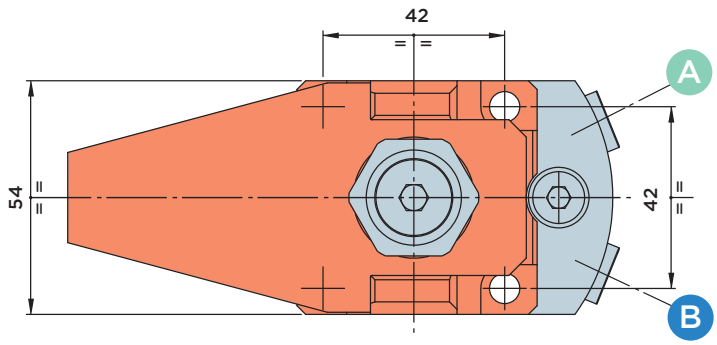
A : Clamping

B : Unclamping



INSTALLATION DIMENSIONS WITH O-RING CONNECTION





Included in the scope of supply:
- Mounting screws M6x50 DIN 912/12.9 grade

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

Note:
Order code, see page 38
Clamp arms, see page 73
Clamping force diagram, see page 73

STROKE mm		EFFECTIVE PISTON AREA Cm²		TOTAL OIL VOLUME Cm³	
TOTAL	25	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	10	5.27	9.07	13.2	22.6
CLAMPING	15				

SR22.0 **FDVH**

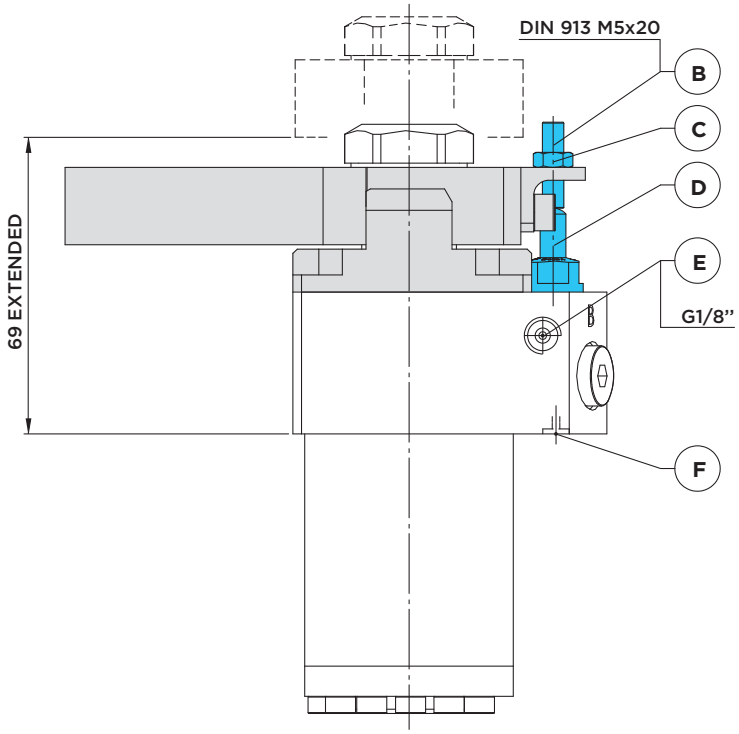
COMPENSATION SYSTEM

DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE,**

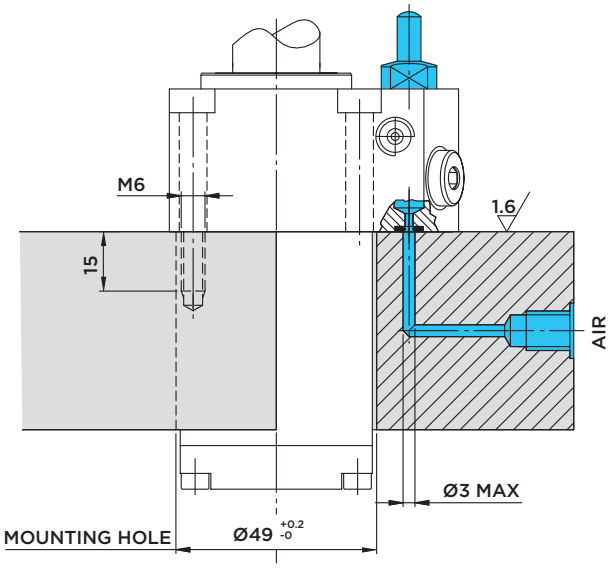
CLAMP ARM POSITION CONTROL VALVE AND **HPC PRISMATIC ANTI-DEFLECTION BLOCK**

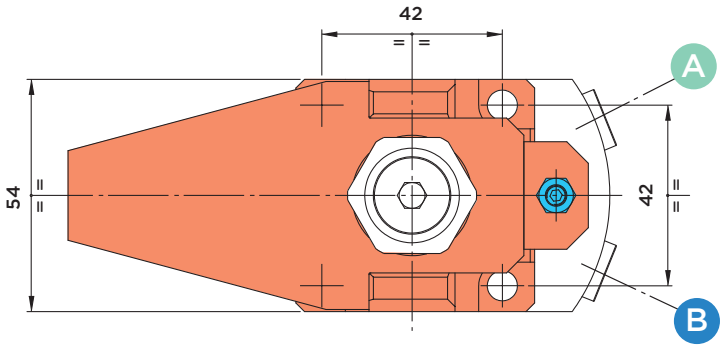
A : Clamping

B : Unclamping



INSTALLATION DIMENSIONS WITH O-RING CONNECTION





Valve adjustment:
To adjust the clamp arm position control valve, please proceed as follows:

1) Loosen the screw (B) M5x20.

2) Pressurize the cylinder to move the clamping arm into clamping position.

3) Supply the circuit with air at 1÷6 BAR through the port (F). The valve bolt (D) is completely extended and air escapes from the bore (E).

4) Screw in the set-screw (B) with the workpiece being clamped until the air flow is interrupted. Then tighten the screw by another 2÷4 rotations (*) and lock the screw by means of the nut (C). The pressure switch indicates that the pneumatic circuit is closed and enables the machine cycle start.

* (The additional 2÷4 rotations are required to compensate thickness variations caused by rough surfaces.)

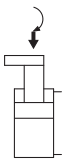
Note: After the adjustment, the tip of the set-screw **(B)** must not project beyond the lower end of the clamp arm **(level H)**.

SR22.0 **CDH**

COMPENSATION SYSTEM

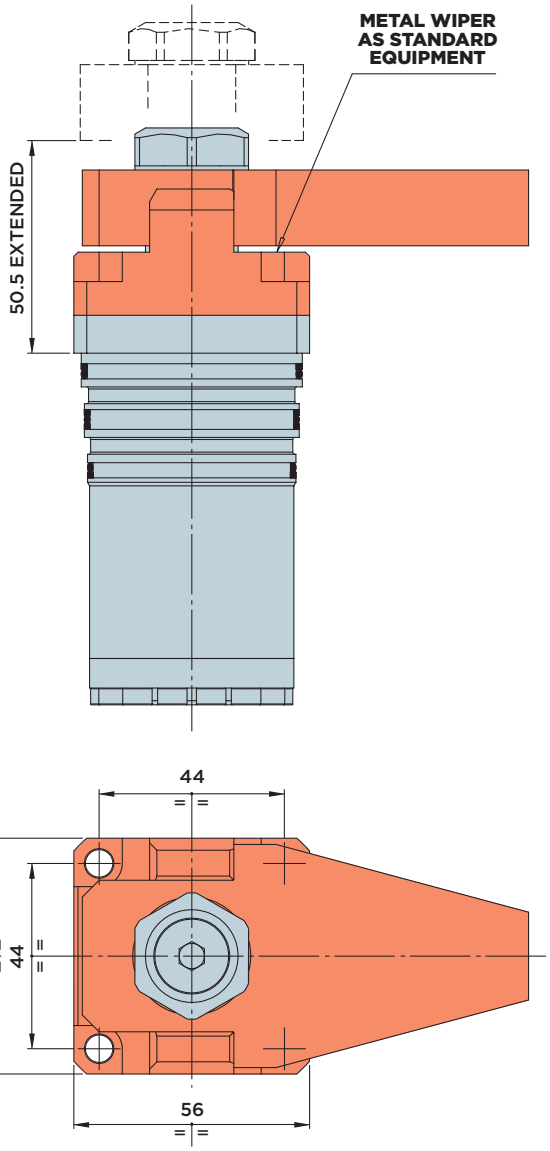
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **CARTRIDGE BODY**

AND **HPC PRISMATIC ANTI-DEFLECTION BLOCK** MAX. OPERATING PRESSURE = 500BAR



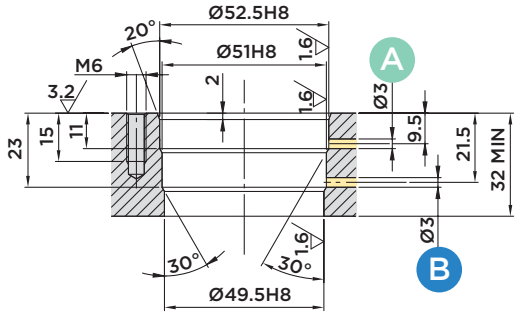
A : Clamping

B : Unclamping

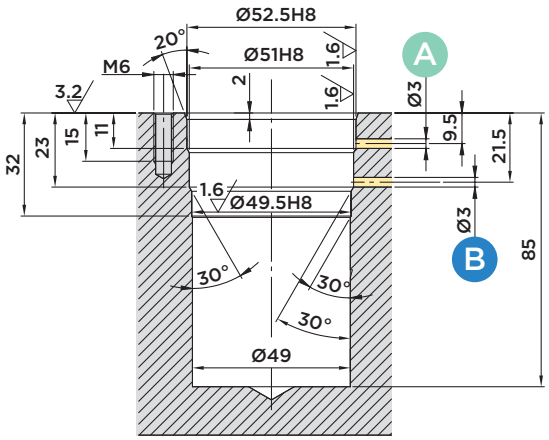


INSTALLATION DIMENSIONS

Through-hole mounting



Blind hole mounting



Included in the scope of supply:
- Mounting screws M6x30 DIN 912/12.9 grade

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

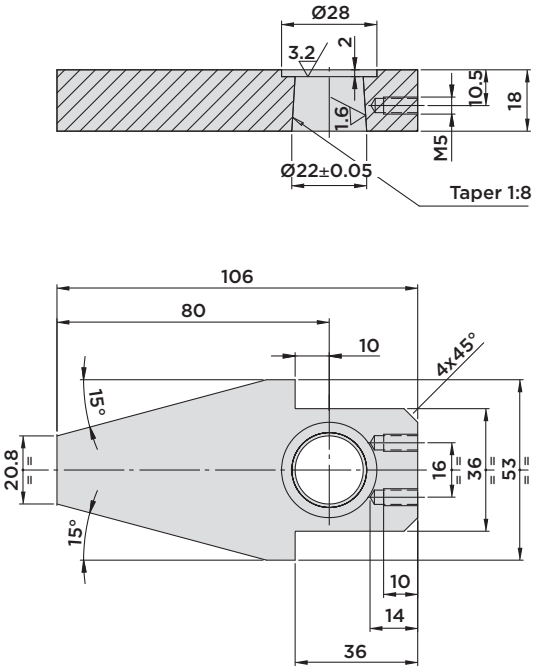
Note:
Order code, see page 38
Clamp arms, see page 73
Clamping force diagram, see page 73

STROKE mm		EFFECTIVE PISTON AREA Cm²		TOTAL OIL VOLUME Cm³	
TOTAL	25	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	10	5.27	9.07	13.2	22.6
CLAMPING	15				

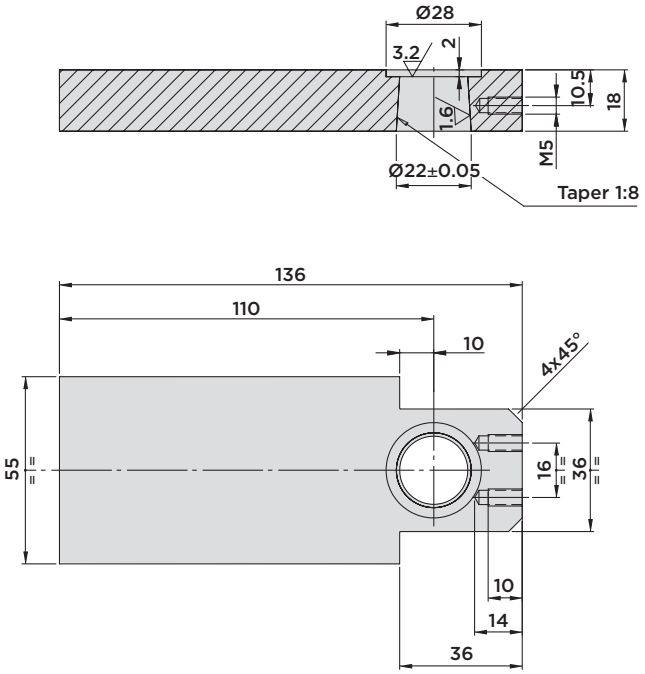
SR22 HPC SERIES

- ACCESSORIES
- EFFECTIVE CLAMPING FORCE

CLAMP ARM 06.22

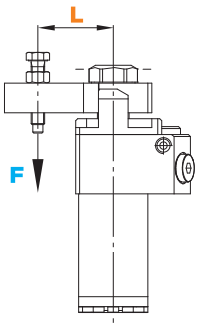


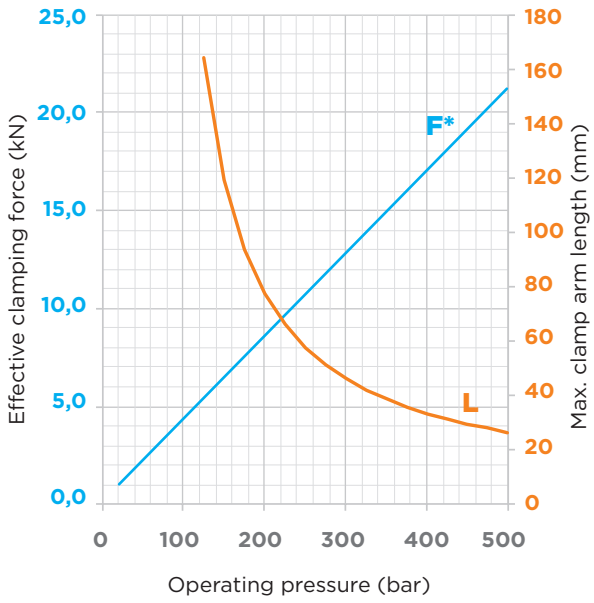
CLAMP ARM 07.22

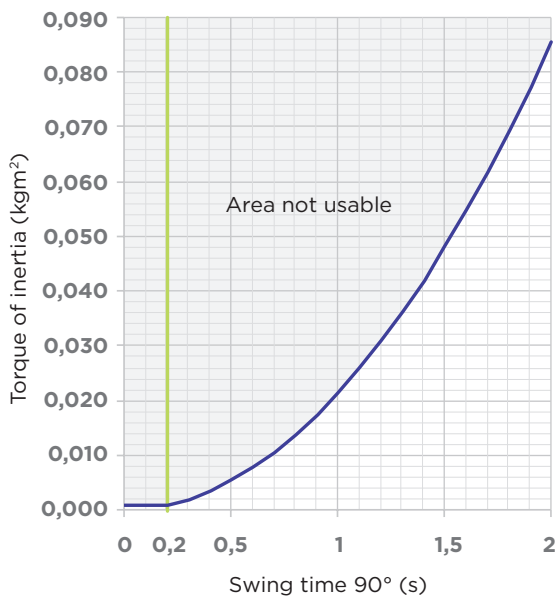


Material: C45

Effective clamping force / Swing times







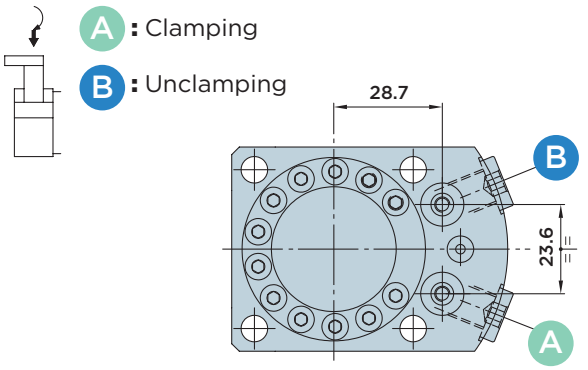
* = The effective clamping force **F** in the above diagram was determined using the standard clamp arms of type 01 and 04.

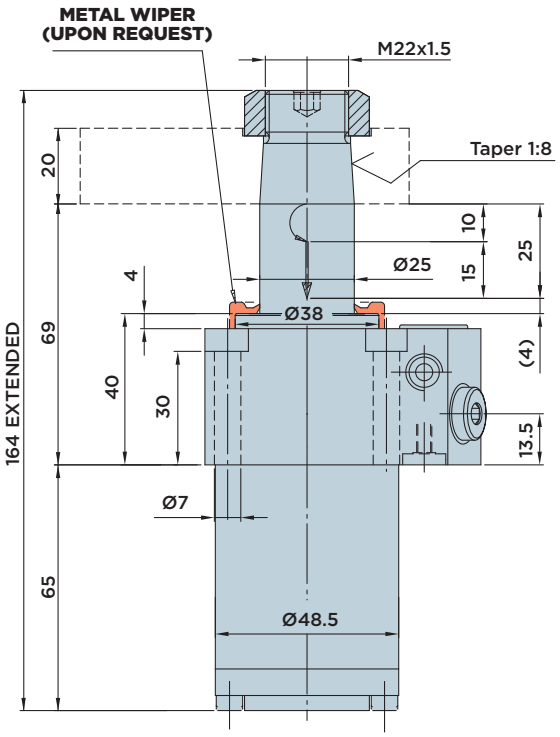
SR25.0 **FD**

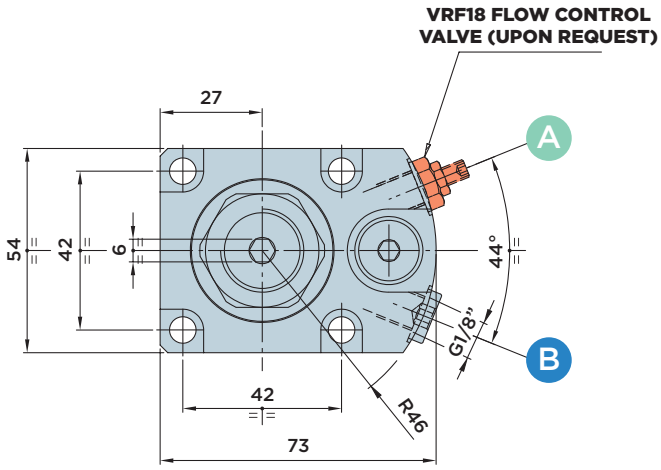
COMPENSATION SYSTEM

DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE**

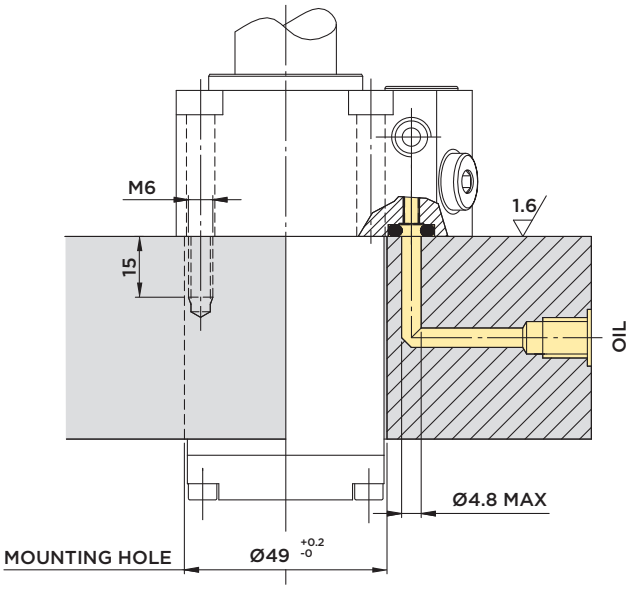
MAX. OPERATING PRESSURE = 500BAR







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- Mounting screws M6x40 DIN 912/12.9 grade
- O-Rings Ø4.34x3.53

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

Note:
Order code, see page 38
Clamp arms, see page 79
Clamping force diagram, see page 79

STROKE mm		EFFECTIVE PISTON AREA Cm²		TOTAL OIL VOLUME Cm³	
TOTAL	25	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	10	4.17	9.07	10.4	22.6
CLAMPING	15				

SR25.0 **FDV**

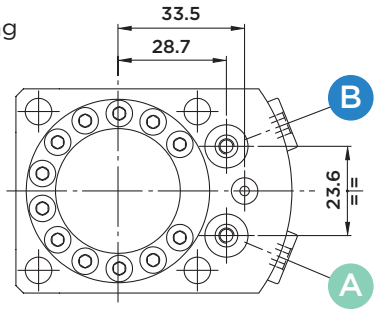
COMPENSATION SYSTEM

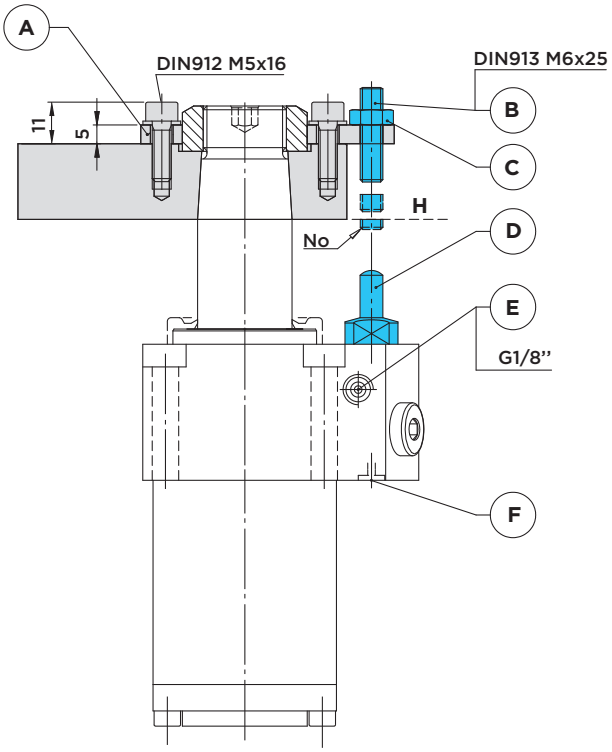
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE**

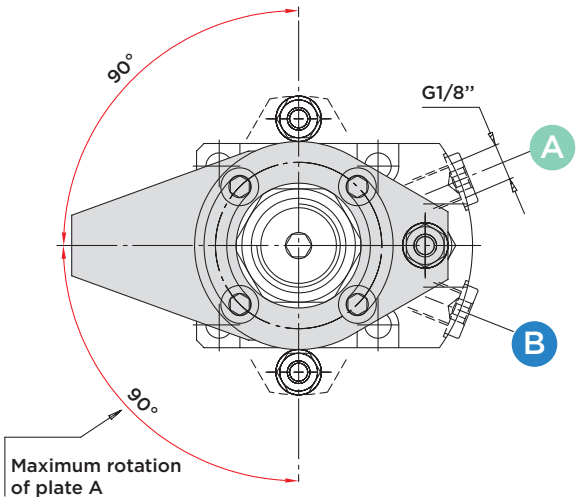
AND **CLAMP ARM POSITION CONTROL VALVE**

A : Clamping

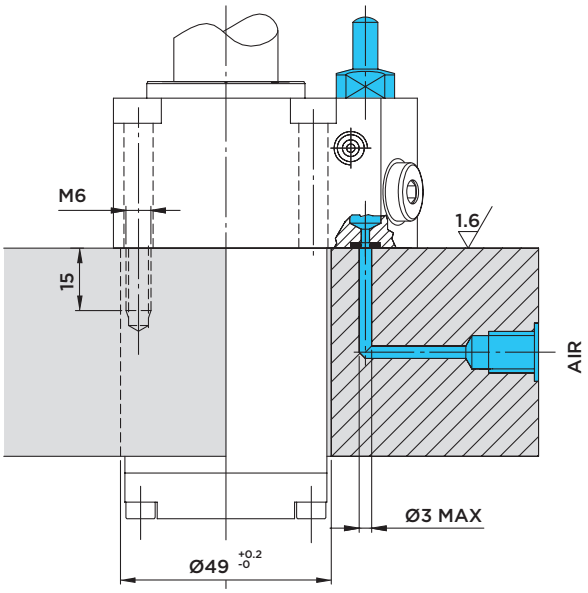
B : Unclamping







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- O-Rings Ø3.68x1.78

Valve adjustment:
To adjust the clamp arm position control valve, please proceed as follows:

1) Pressurize the cylinder to move the clamping arm into clamping position.

2) Adjust the plate (A) to the exact radial position to ensure that the set-screw (B) is in line with the valve.

3) Supply the circuit with air at 1÷6 BAR through the port (F). The valve bolt (D) is completely extended and air escapes from the bore (E).

4) Screw in the set-screw (B) with the workpiece being clamped until the air flow is interrupted. Then tighten the screw by another 2÷4 rotations (*) and lock the screw by means of the nut (C). The pressure switch indicates that the pneumatic circuit is closed and enables the machine cycle start.

* (The additional 2÷4 rotations are required to compensate thickness variations caused by rough surfaces.)

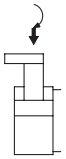
Note: After the adjustment, the tip of the set-screw **(B)** must not project beyond the lower end of the clamp arm **(level H)**.

SR25.0 **PD**

COMPENSATION SYSTEM

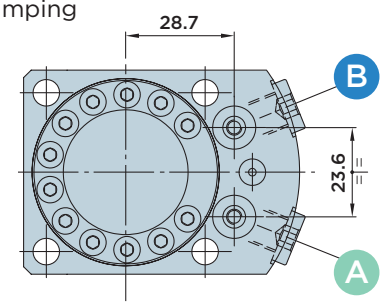
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **LOWER FLANGE**

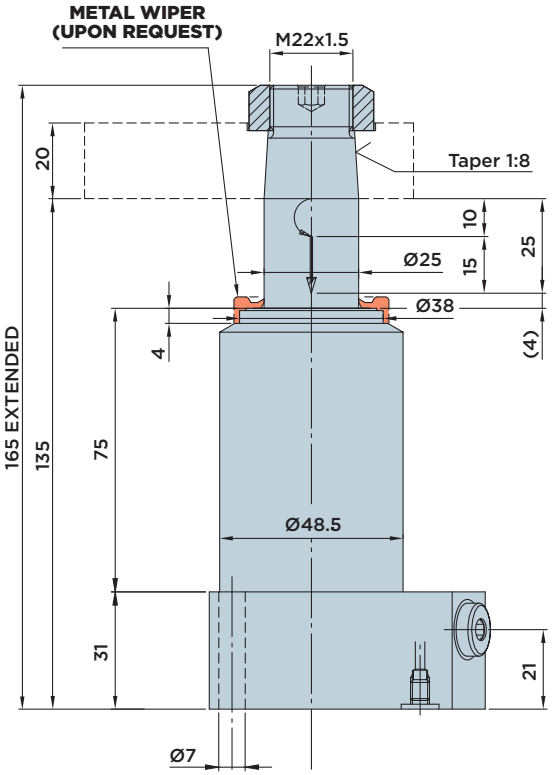
MAX. OPERATING PRESSURE = 500BAR

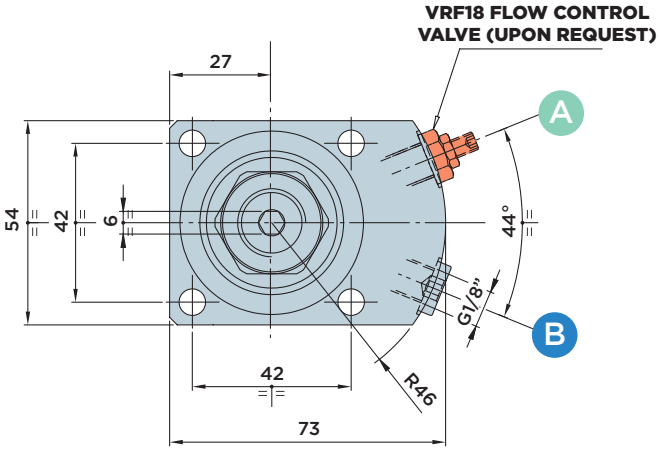


A : Clamping

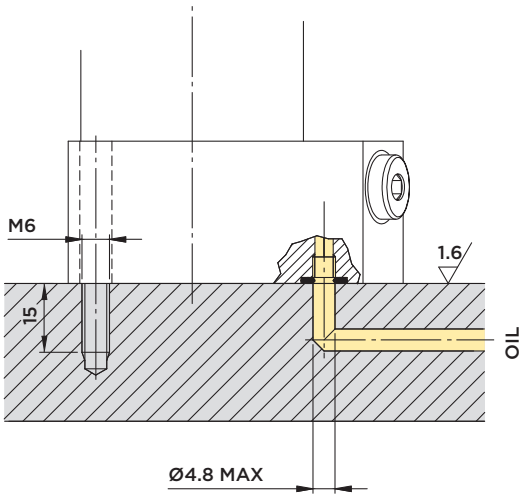
B : Unclamping







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- Mounting screws M6x40 DIN 912/12.9 grade
- O-Rings Ø6.75x1.78

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

Note:
Order code, see page 38
Clamp arms, see page 79
Clamping force diagram, see page 79

STROKE mm		EFFECTIVE PISTON AREA Cm²		TOTAL OIL VOLUME Cm³	
TOTAL	25	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	10	4.17	9.07	10.4	22.6
CLAMPING	15				

SR25.0 **PDV**

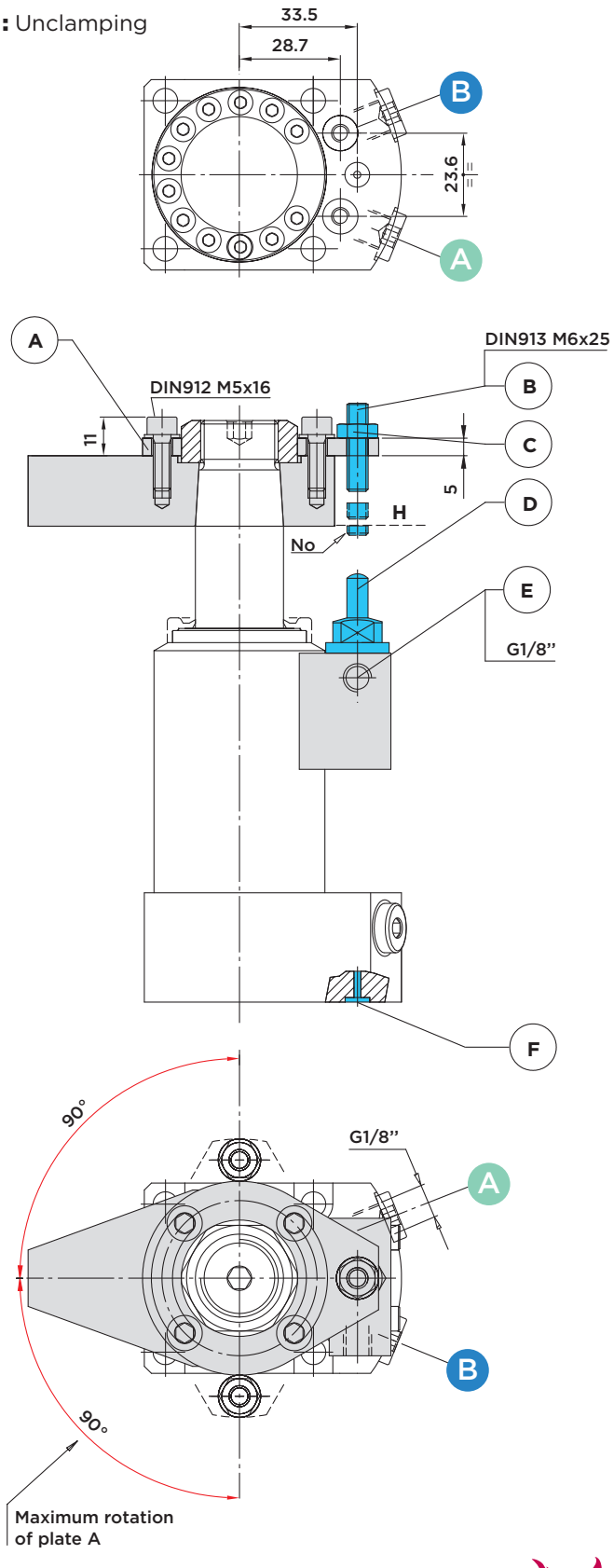
COMPENSATION SYSTEM

DOUBLE-ACTING SWING CLAMP CYLINDER WITH **LOWER FLANGE**

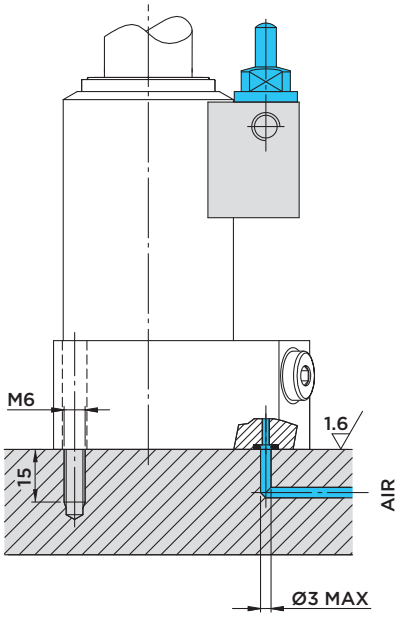
AND **CLAMP ARM POSITION CONTROL VALVE**

A : Clamping

B : Unclamping



INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- O-Rings Ø3.68x1.78

Valve adjustment:
To adjust the clamp arm position control valve, please proceed as follows:

1) Pressurize the cylinder to move the clamping arm into clamping position.

2) Adjust the plate (A) to the exact radial position to ensure that the set-screw (B) is in line with the valve.

3) Supply the circuit with air at 1÷6 BAR through the port (F). The valve bolt (D) is completely extended and air escapes from the bore (E).

4) Screw in the set-screw (B) with the workpiece being clamped until the air flow is interrupted. Then tighten the screw by another 2÷4 rotations (*) and lock the screw by means of the nut (C). The pressure switch indicates that the pneumatic circuit is closed and enables the machine cycle start.

* (The additional 2÷4 rotations are required to compensate thickness variations caused by rough surfaces.)

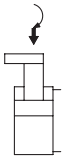
Note: After the adjustment, the tip of the set-screw **(B)** must not project beyond the lower end of the clamp arm **(level H)**.

SR25.0 **CD**

COMPENSATION SYSTEM

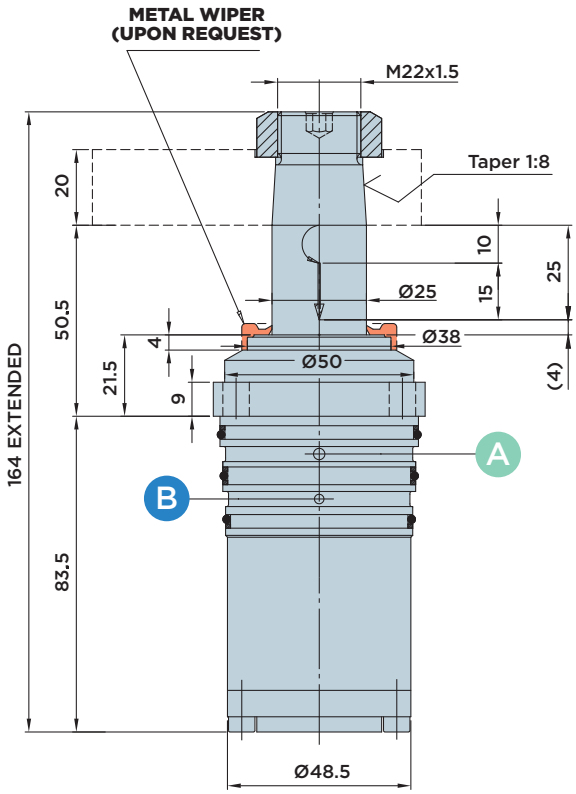
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **CARTRIDGE BODY**

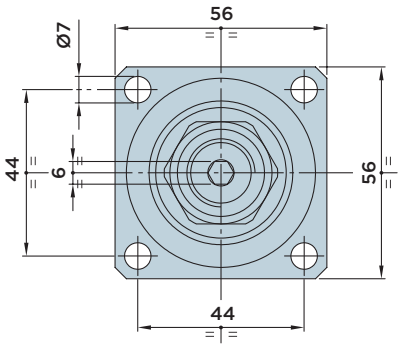
MAX. OPERATING PRESSURE = 500BAR



A : Clamping

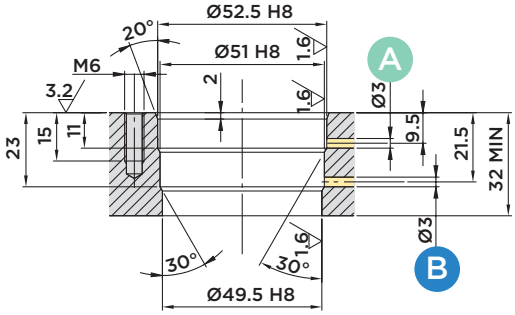
B : Unclamping



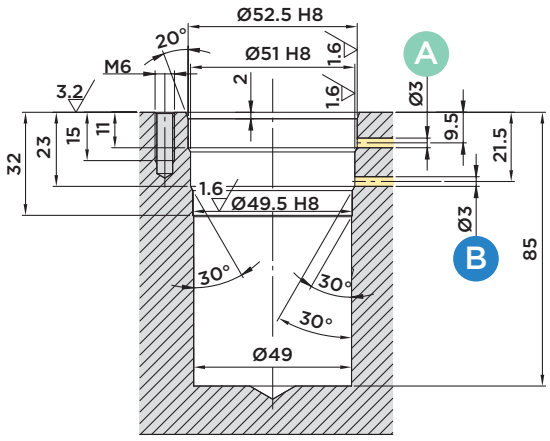


INSTALLATION DIMENSIONS

Through-hole mounting



Blind hole mounting



Included in the scope of supply:
- Mounting screws M6x20 DIN 912/12.9 grade

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

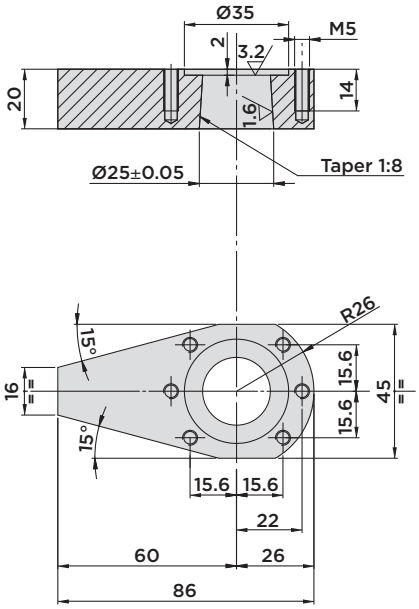
Note:
Order code, see page 38
Clamp arms, see page 79
Clamping force diagram, see page 79

STROKE mm		EFFECTIVE PISTON AREA		TOTAL OIL VOLUME	
		Cm²		Cm³	
TOTAL	25	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	10	4.17	9.07	10.4	22.6
CLAMPING	15				

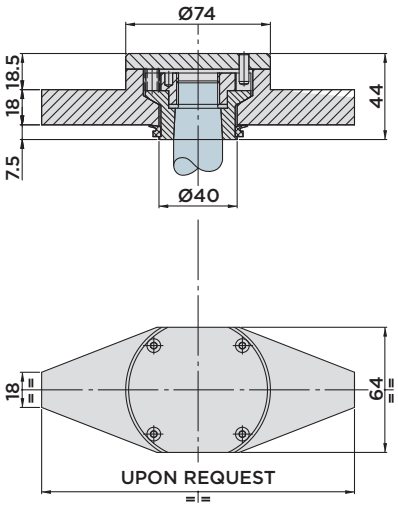
SR25 SERIES

- ACCESSORIES
- EFFECTIVE CLAMPING FORCE

CLAMP ARM 01.25

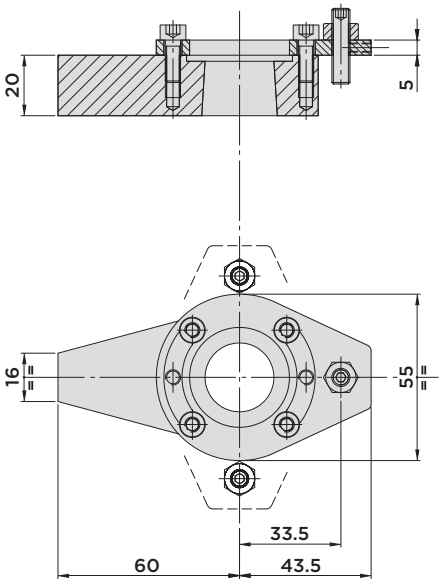


CLAMP ARM 03.25



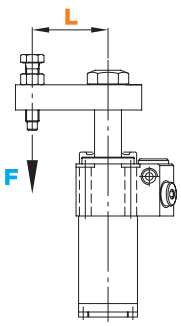
CLAMP ARM 04.25

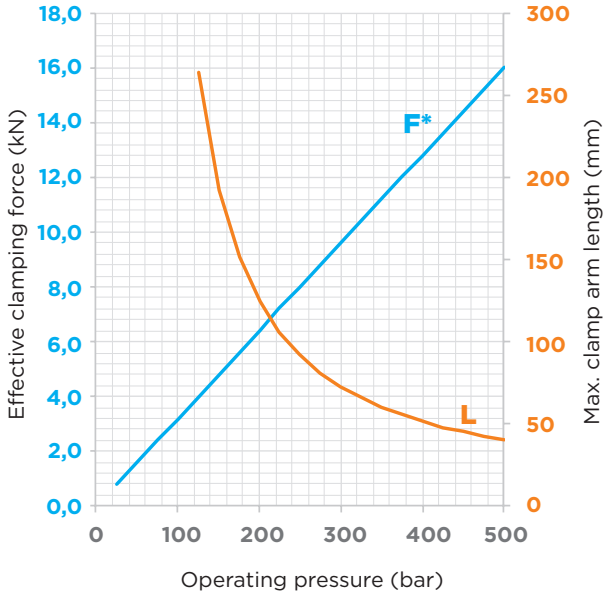
FOR CYLINDERS WITH CLAMP ARM POSITION CONTROL VALVE

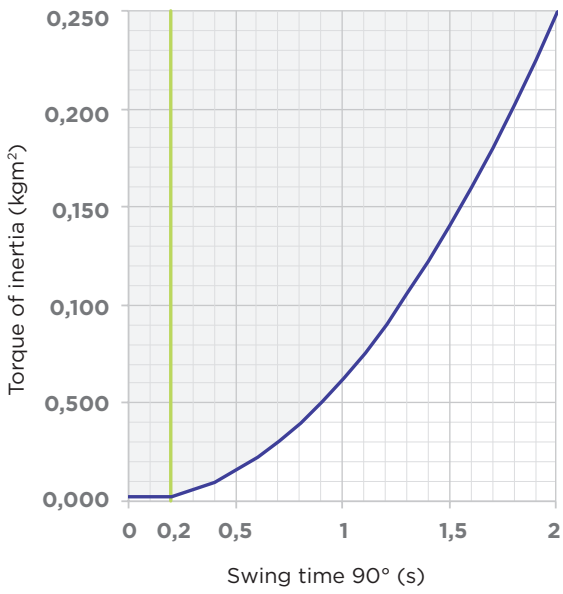


Material: C45

Effective clamping force / Swing times







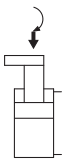
* = The effective clamping force **F** in the above diagram was determined using the standard clamp arms of type 01 and 04.

SR25.0 **FDH**

COMPENSATION SYSTEM

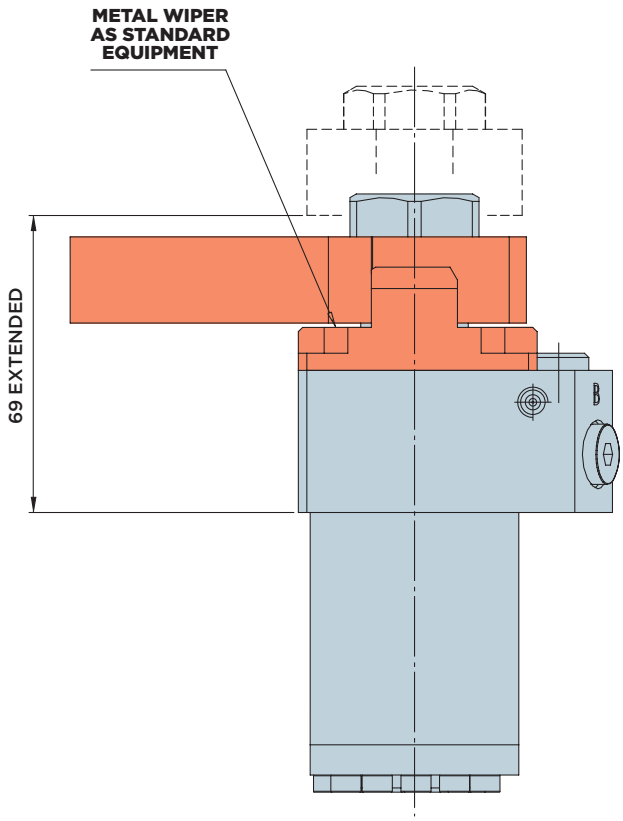
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE**

AND **HPC PRISMATIC ANTI-DEFLECTION BLOCK** MAX. OPERATING PRESSURE = 500BAR

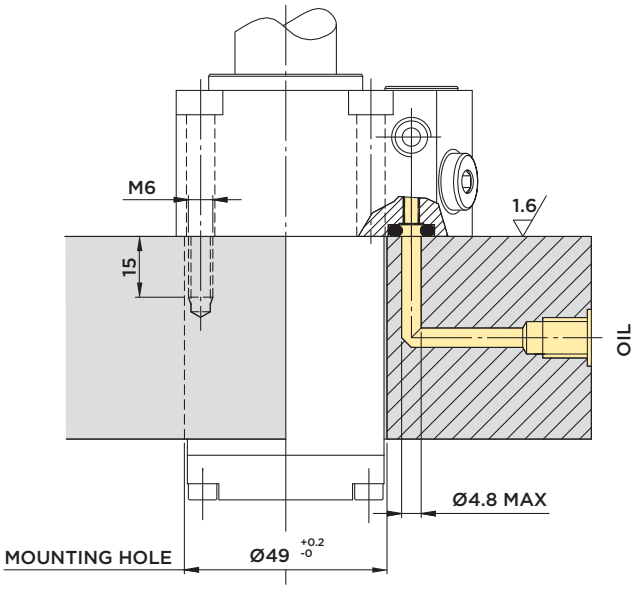


A : Clamping

B : Unclamping



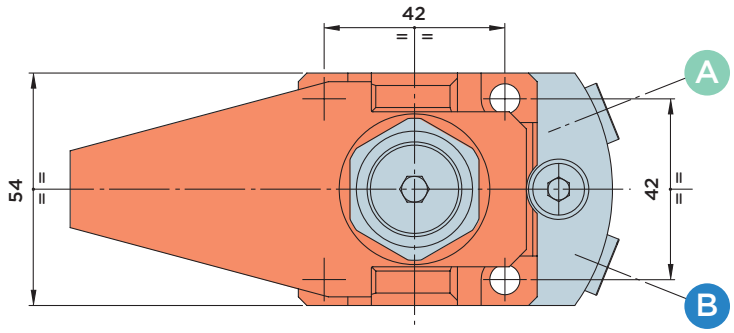
INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- Mounting screws M6x50 DIN 912/12.9 grade

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

Note:
Order code, see page 38
Clamp arms, see page 83
Clamping force diagram, see page 83



STROKE mm		EFFECTIVE PISTON AREA Cm²		TOTAL OIL VOLUME Cm³	
TOTAL	25	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	10	4.17	9.07	10.4	22.6
CLAMPING	15				

SR25.0 **FDVH**

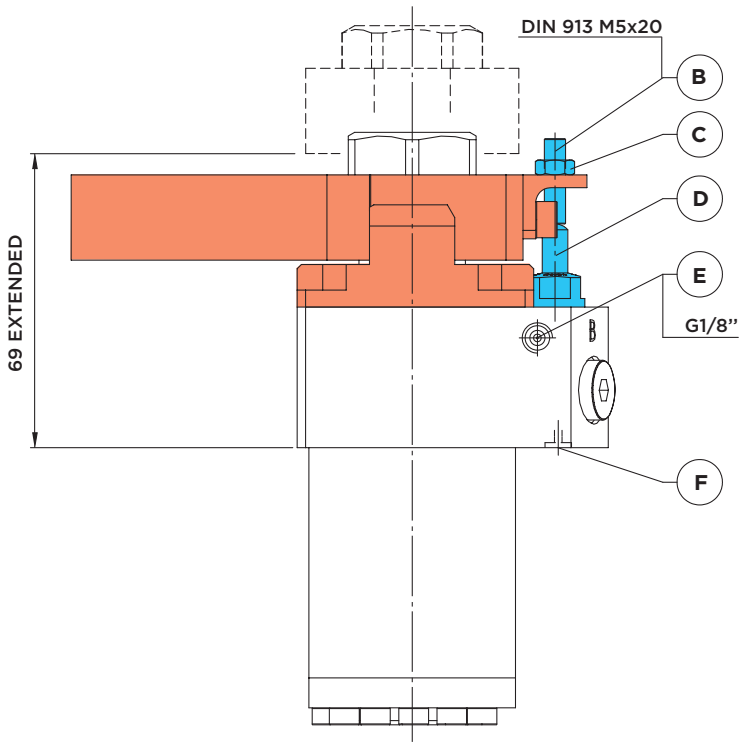
COMPENSATION SYSTEM

DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE,**

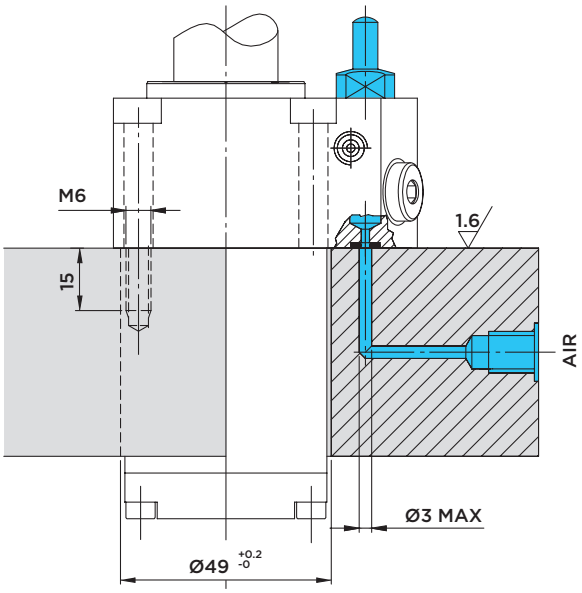
CLAMP ARM POSITION CONTROL VALVE AND **HPC PRISMATIC ANTI-DEFLECTION BLOCK**

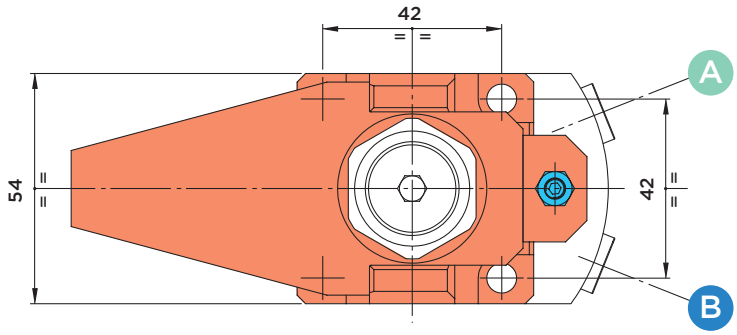
A : Clamping

B : Unclamping



INSTALLATION DIMENSIONS WITH O-RING CONNECTION





Valve adjustment:
To adjust the clamp arm position control valve, please proceed as follows:

1) Loosen the screw (B) M5x20.

2) Pressurize the cylinder to move the clamping arm into clamping position.

3) Supply the circuit with air at 1÷6 BAR through the port (F). The valve bolt (D) is completely extended and air escapes from the bore (E).

4) Screw in the set-screw (B) with the workpiece being clamped until the air flow is interrupted. Then tighten the screw by another 2÷4 rotations (*) and lock the screw by means of the nut (C). The pressure switch indicates that the pneumatic circuit is closed and enables the machine cycle start.

* (The additional 2÷4 rotations are required to compensate thickness variations caused by rough surfaces.)

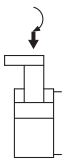
Note: After the adjustment, the tip of the set-screw **(B)** must not project beyond the lower end of the clamp arm **(level H)**.

SR25.0 **CDH**

COMPENSATION SYSTEM

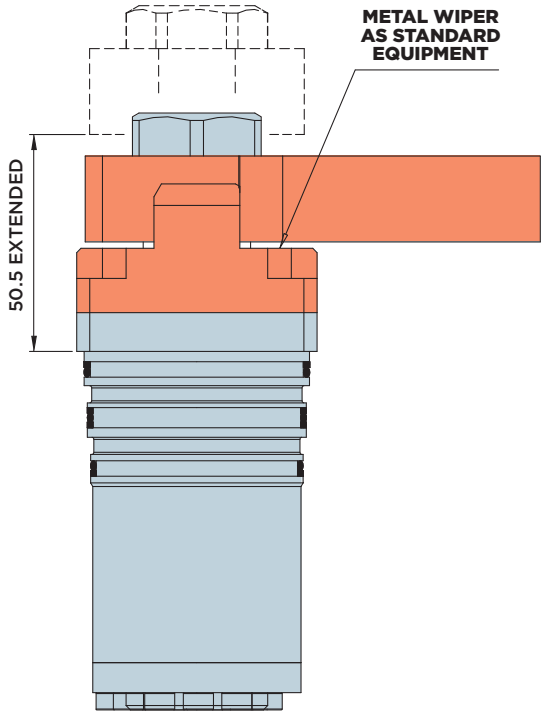
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **CARTRIDGE BODY**

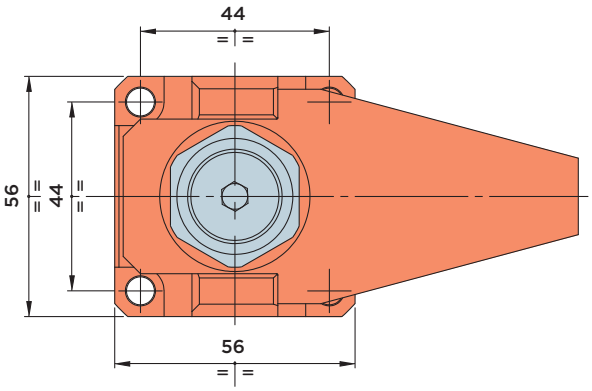
AND **HPC PRISMATIC ANTI-DEFLECTION BLOCK** MAX. OPERATING PRESSURE = 500BAR



A : Clamping

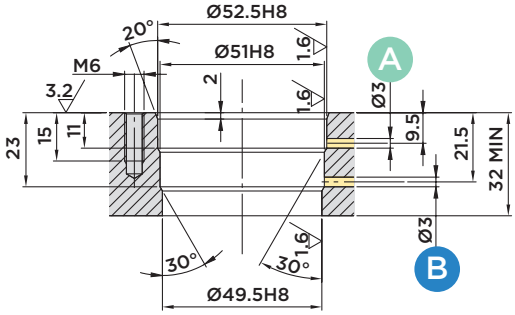
B : Unclamping



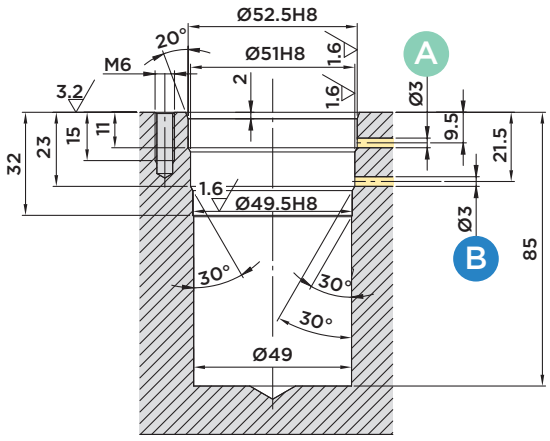


INSTALLATION DIMENSIONS

Through-hole mounting



Blind hole mounting



Included in the scope of supply:
- Mounting screws M6x30 DIN 912/12.9 grade

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

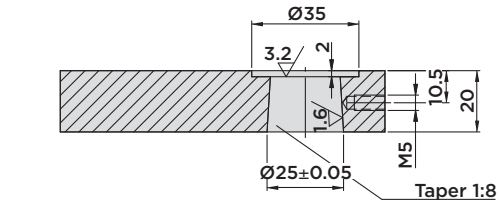
Note:
Order code, see page 38
Clamp arms, see page 83
Clamping force diagram, see page 83

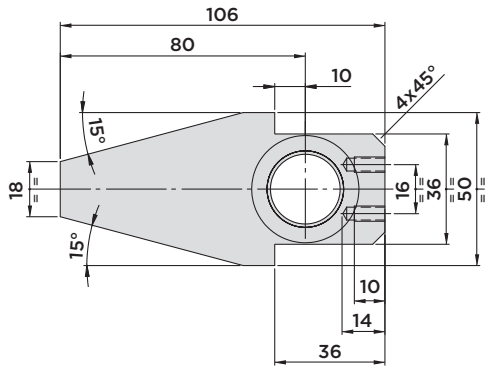
STROKE mm		EFFECTIVE PISTON AREA Cm²		TOTAL OIL VOLUME Cm³	
TOTAL	25	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	10	4.17	9.07	10.4	22.6
CLAMPING	15				

SR25 HPC SERIES

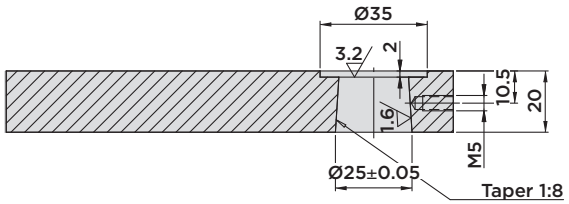
- ACCESSORIES
- EFFECTIVE CLAMPING FORCE

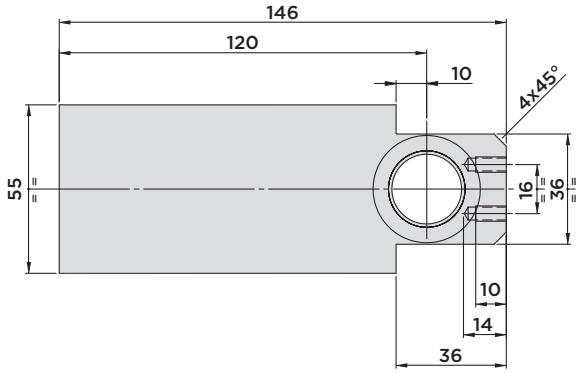
CLAMP ARM 06.25





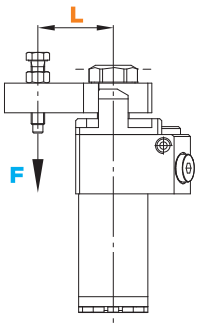
CLAMP ARM 07.25

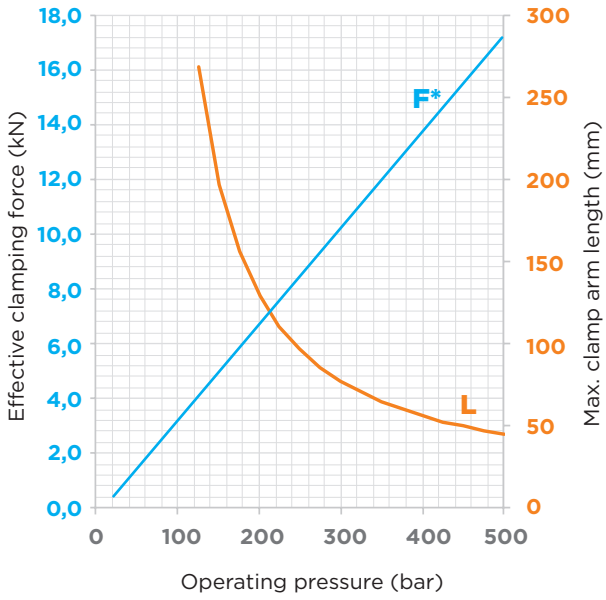


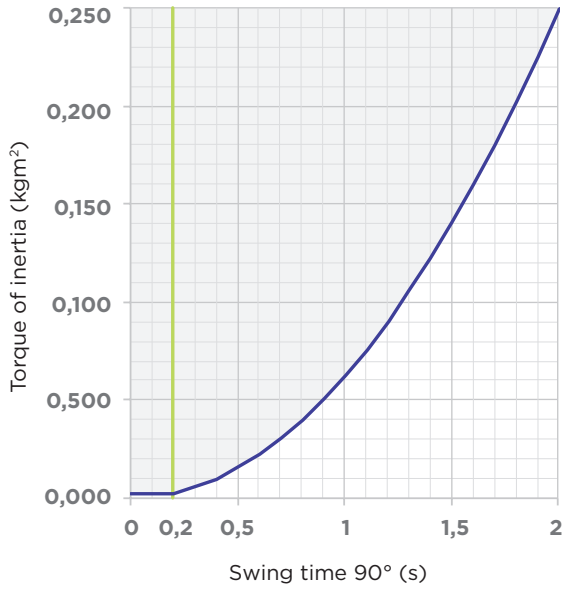


Material: C45

Effective clamping force / Swing times





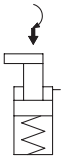


* = The effective clamping force **F** in the above diagram was determined using the standard clamp arms of type 01 and 04.

SR25.0 **FS**

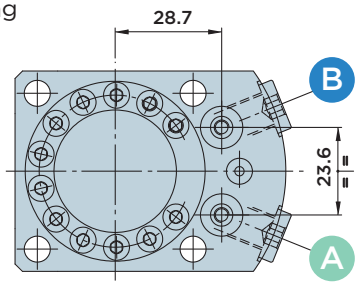
SINGLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE**

MAX. OPERATING PRESSURE = 500BAR

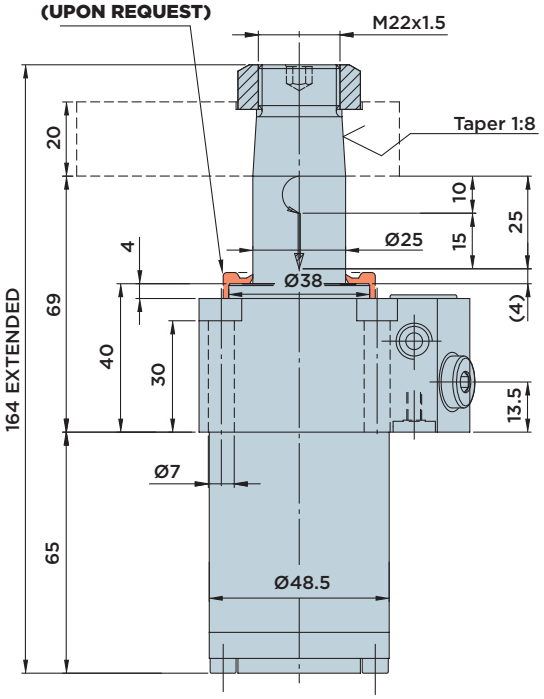


A : Clamping

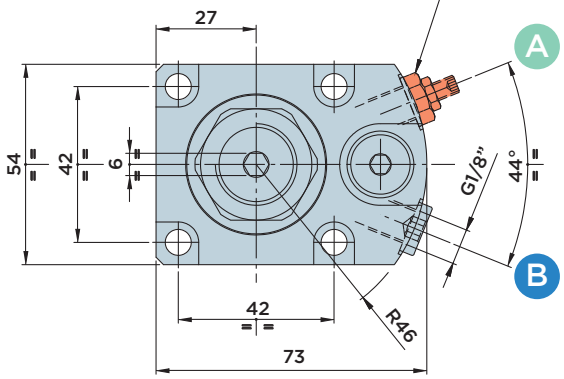
B : Venting



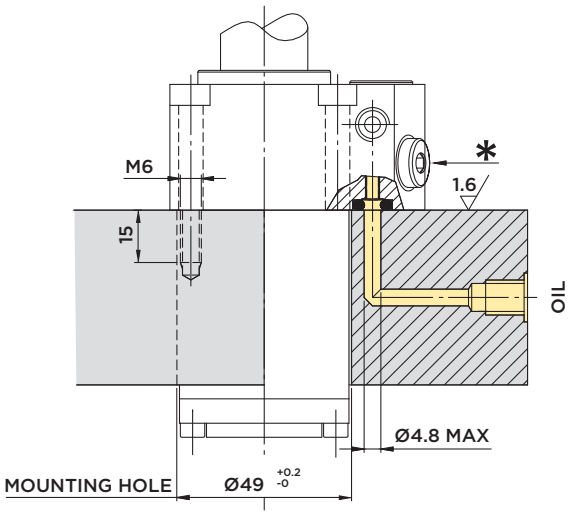
METAL WIPER (UPON REQUEST)



VRF18 FLOW CONTROL VALVE (UPON REQUEST)



INSTALLATION DIMENSIONS WITH O-RING CONNECTION



* When the external vent port is used, a vent pipe must be connected that leads into an area that is free from liquids and chips.

Included in the scope of supply:
- Mounting screws M6x40 DIN 912/12.9 grade
- O-Rings Ø4.34x3.53

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

ATTENTION: the cylinder is **NOT equipped with THE COMPENSATION SYSTEM!**

Note:

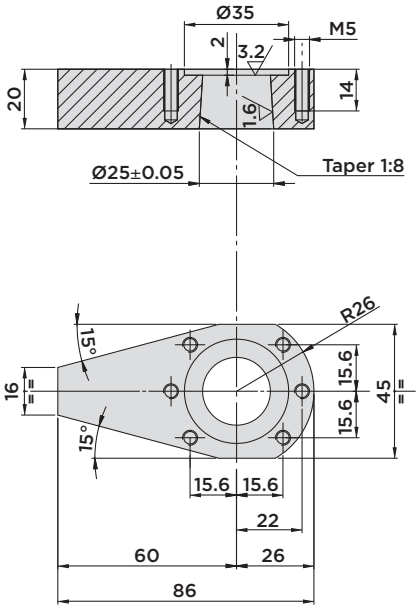
Order code, see page 38
Clamp arms, see page 85
Clamping force diagram, see page 85

STROKE mm		EFFECTIVE PISTON AREA	TOTAL OIL VOLUME
		Cm^2	Cm^3
TOTAL	25	CLAMP.	CLAMP.
SWINGING	10	4.17	10.4
CLAMPING	15		

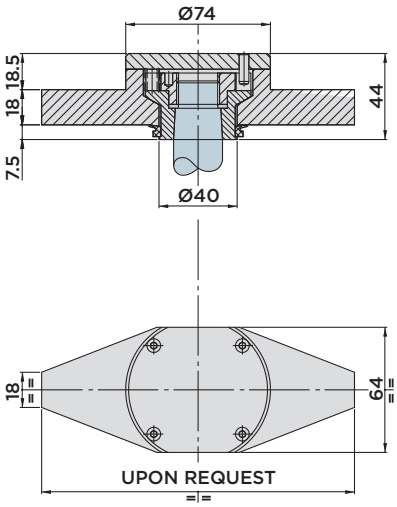
SR25 FS SERIES

- ACCESSORIES
- EFFECTIVE CLAMPING FORCE

CLAMP ARM 01.25

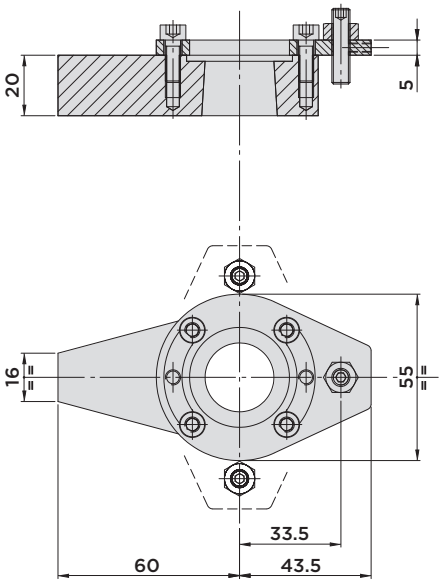


CLAMP ARM 03.25



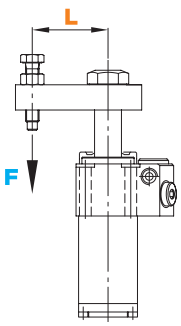
CLAMP ARM 04.25

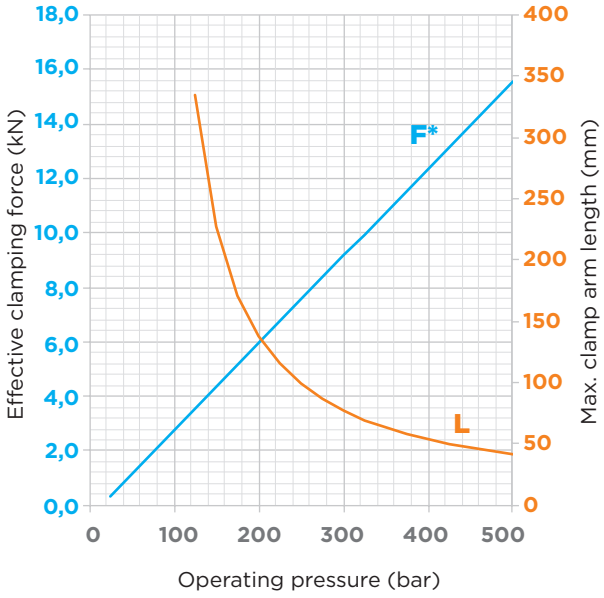
FOR CYLINDERS WITH CLAMP ARM POSITION CONTROL VALVE

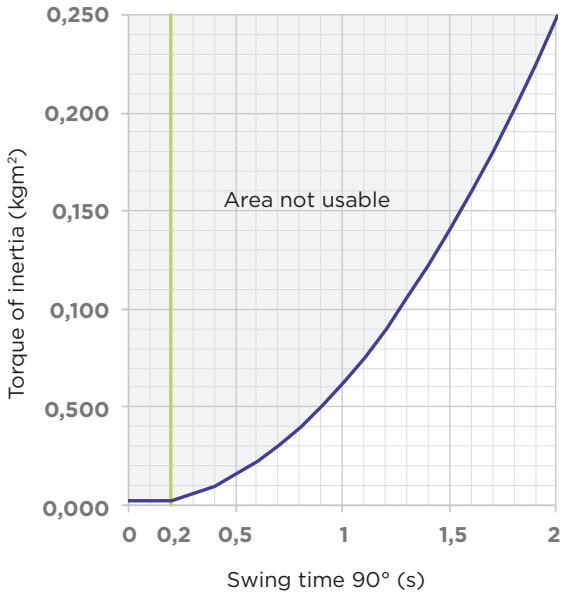


Material: C45

Effective clamping force / Swing times







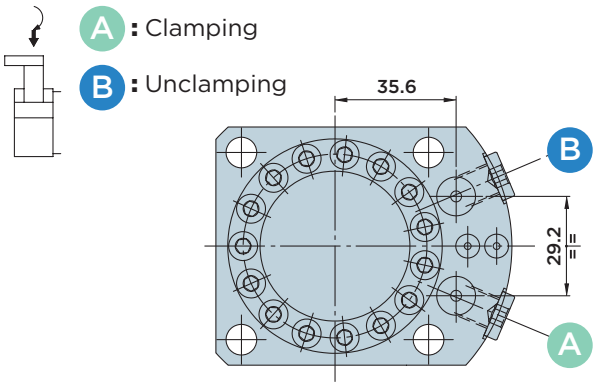
* = The effective clamping force **F** in the above diagram was determined using the standard clamp arms of type 01 and 04.

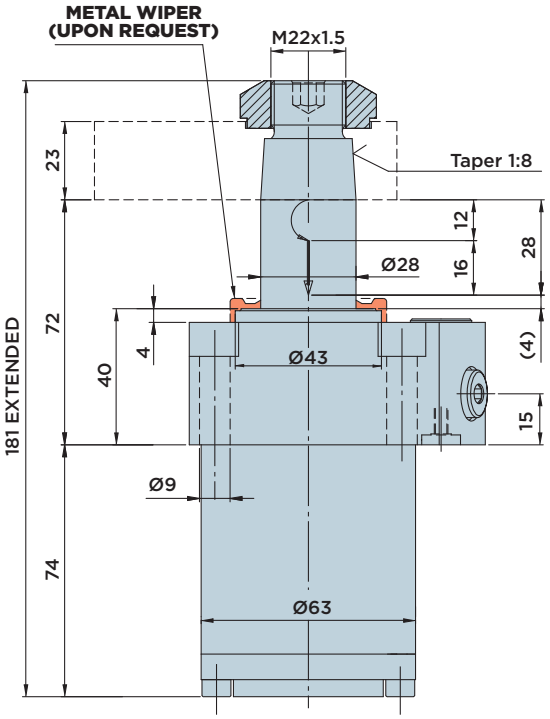
SR28.0 **FD**

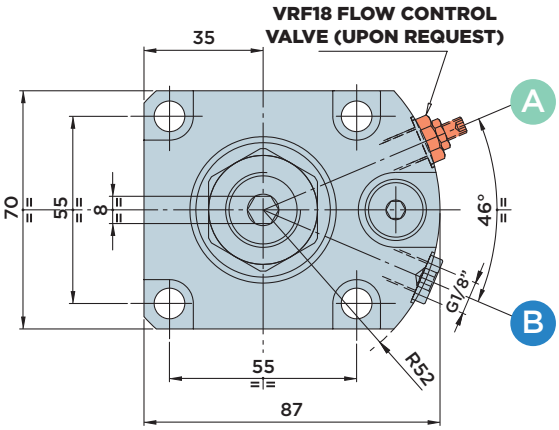
COMPENSATION SYSTEM

DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE**

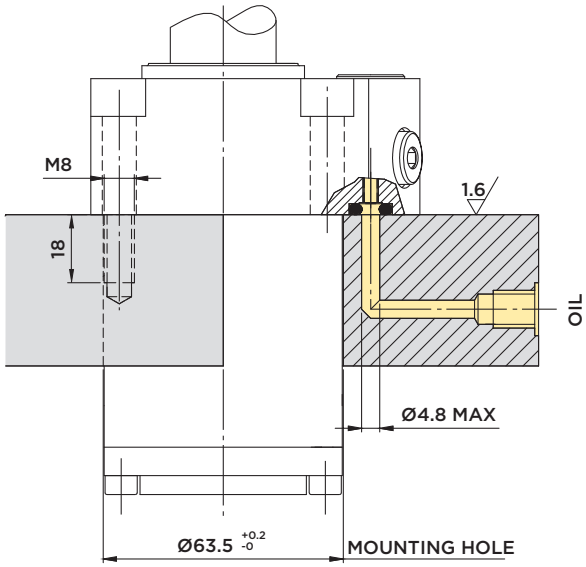
MAX. OPERATING PRESSURE = 500BAR







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- Mounting screws M8x40 DIN 912/12.9 grade
- O-Rings Ø4.34x3.53

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

Note:

Order code, see page 38
Clamp arms, see page 91
Clamping force diagram, see page 91

STROKE mm		EFFECTIVE PISTON AREA Cm²		TOTAL OIL VOLUME Cm³	
TOTAL	28	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	12	9.75	15.9	27.3	44.5
CLAMPING	16				

SR28.0 **FDV**

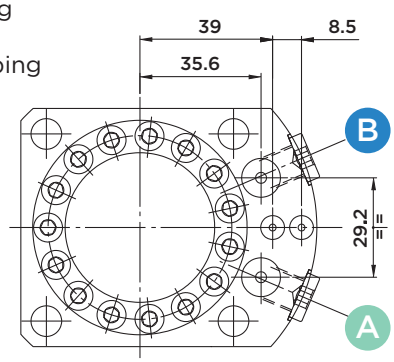
COMPENSATION SYSTEM

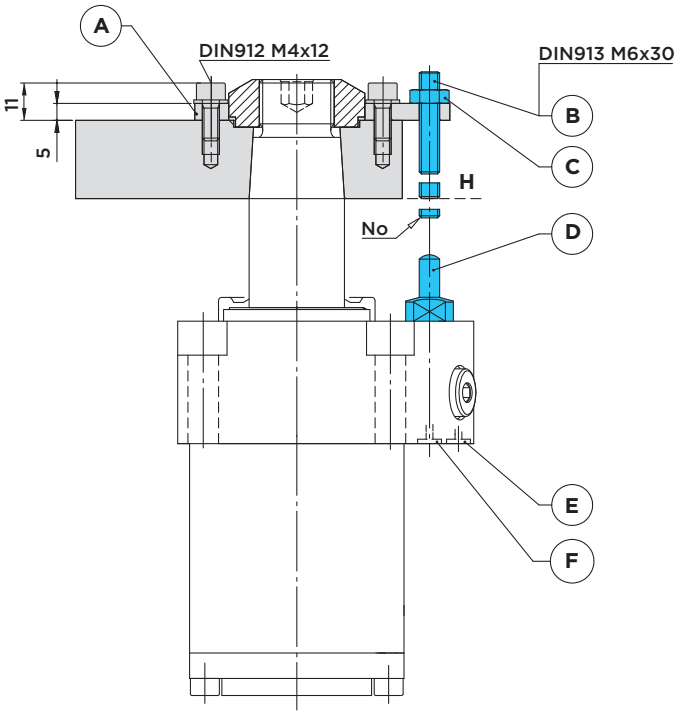
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE**

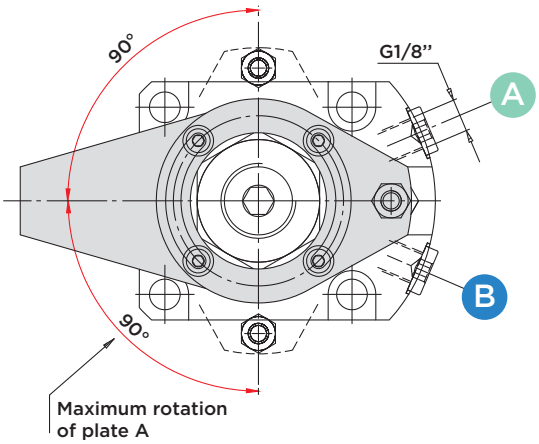
AND **CLAMP ARM POSITION CONTROL VALVE**

A : Clamping

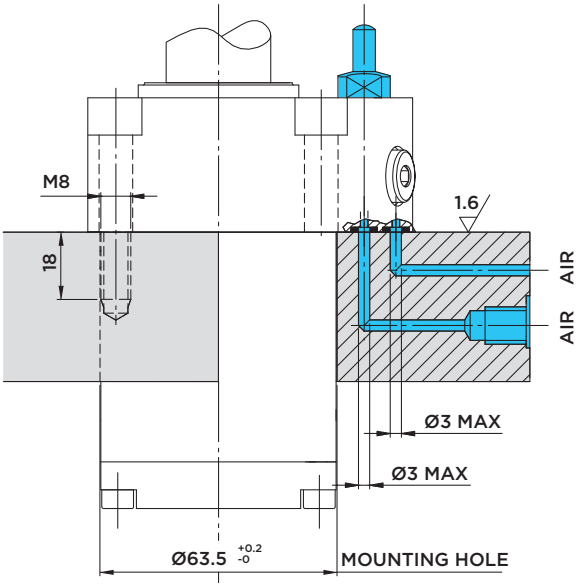
B : Unclamping







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- O-Rings Ø3.68x1.78

Valve adjustment:
To adjust the clamp arm position control valve, please proceed as follows:

1) Pressurize the cylinder to move the clamping arm into clamping position.

2) Adjust the plate (A) to the exact radial position to ensure that the set-screw (B) is in line with the valve.

3) Supply the circuit with air at 1÷6 BAR through the port (F). The valve bolt (D) is completely extended and air escapes from the bore (E).

4) Screw in the set-screw (B) with the workpiece being clamped until the air flow is interrupted. Then tighten the screw by another 2÷4 rotations (*) and lock the screw by means of the nut (C). The pressure switch indicates that the pneumatic circuit is closed and enables the machine cycle start.

* (The additional 2÷4 rotations are required to compensate thickness variations caused by rough surfaces.)

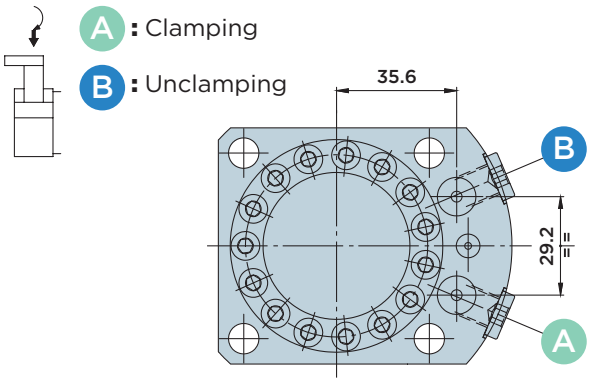
Note: After the adjustment, the tip of the set-screw **(B)** must not project beyond the lower end of the clamp arm **(level H)**.

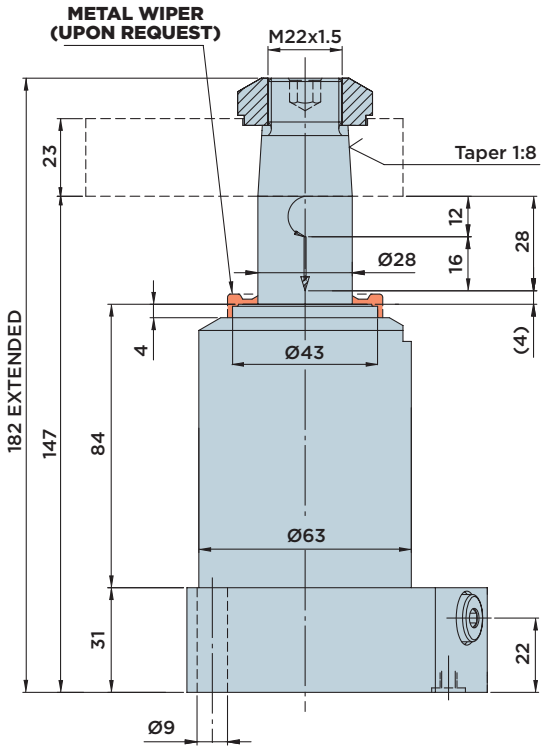
SR28.0 **PD**

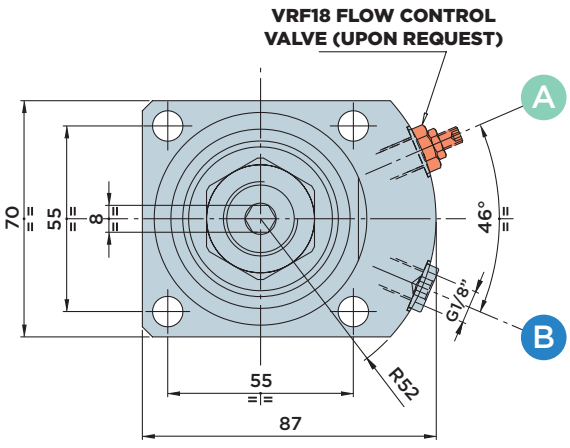
COMPENSATION SYSTEM

DOUBLE-ACTING SWING CLAMP CYLINDER WITH **LOWER FLANGE**

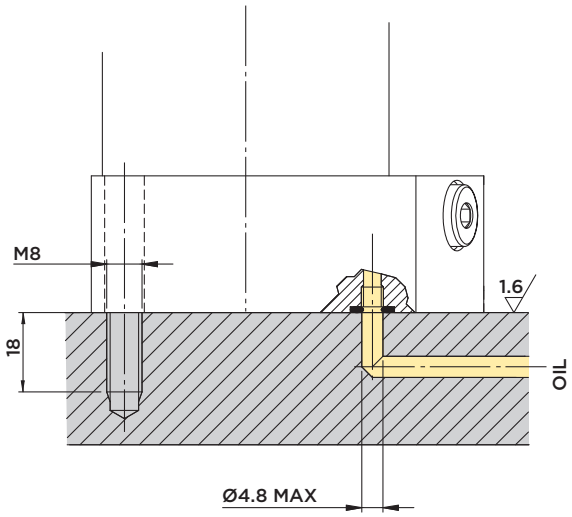
MAX. OPERATING PRESSURE = 500BAR







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- Mounting screws M8x45 DIN 912/12.9 grade
- O-Rings Ø6.75x1.78

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

Note:
Order code, see page 38
Clamp arms, see page 91
Clamping force diagram, see page 91

STROKE mm		EFFECTIVE PISTON AREA Cm²		TOTAL OIL VOLUME Cm³	
TOTAL	28	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	12	9.75	15.9	27.3	44.5
CLAMPING	16				

SR28.0 **PDV**

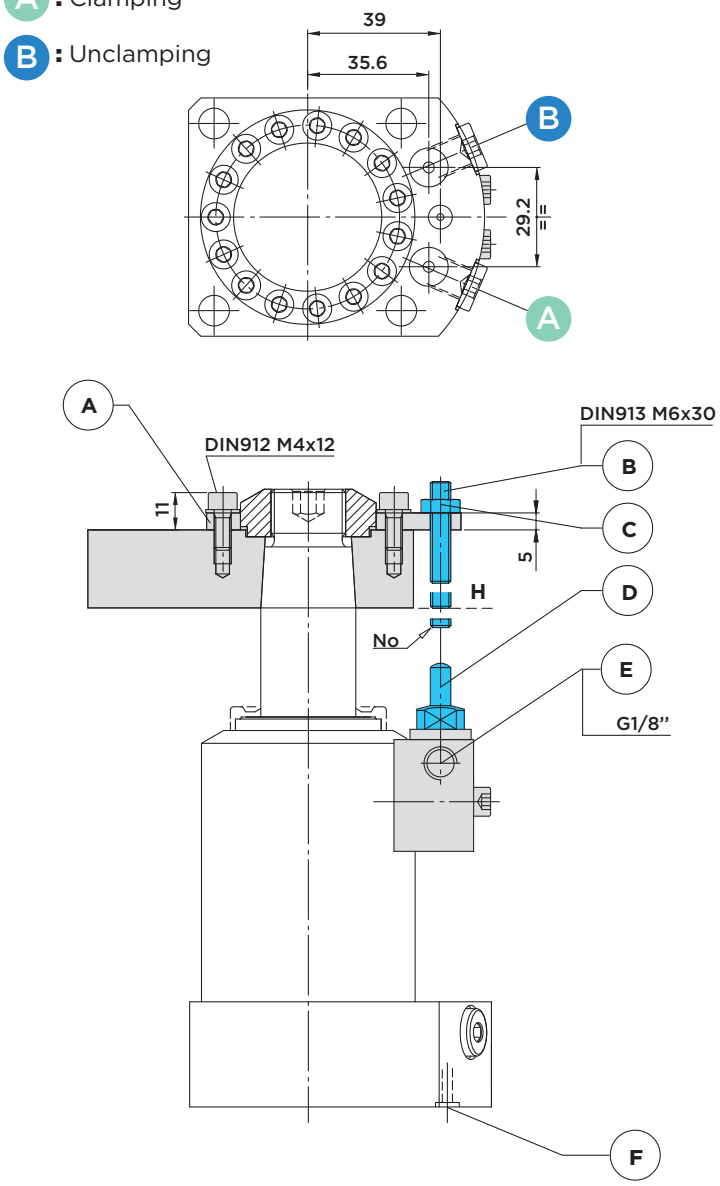
COMPENSATION SYSTEM

DOUBLE-ACTING SWING CLAMP CYLINDER WITH **LOWER FLANGE**

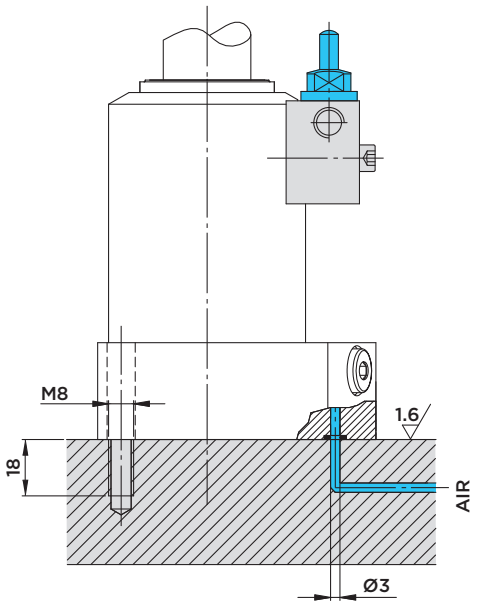
AND **CLAMP ARM POSITION CONTROL VALVE**

A : Clamping

B : Unclamping



INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- O-Rings Ø3.68x1.78

Valve adjustment:
To adjust the clamp arm position control valve, please proceed as follows:

1) Pressurize the cylinder to move the clamping arm into clamping position.

2) Adjust the plate (A) to the exact radial position to ensure that the set-screw (B) is in line with the valve.

3) Supply the circuit with air at 1÷6 BAR through the port (F). The valve bolt (D) is completely extended and air escapes from the bore (E).

4) Screw in the set-screw (B) with the workpiece being clamped until the air flow is interrupted. Then tighten the screw by another 2÷4 rotations (*) and lock the screw by means of the nut (C). The pressure switch indicates that the pneumatic circuit is closed and enables the machine cycle start.

* (The additional 2÷4 rotations are required to compensate thickness variations caused by rough surfaces.)

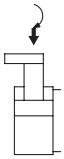
Note: After the adjustment, the tip of the set-screw **(B)** must not project beyond the lower end of the clamp arm **(level H)**.

SR28.0 **CD**

COMPENSATION SYSTEM

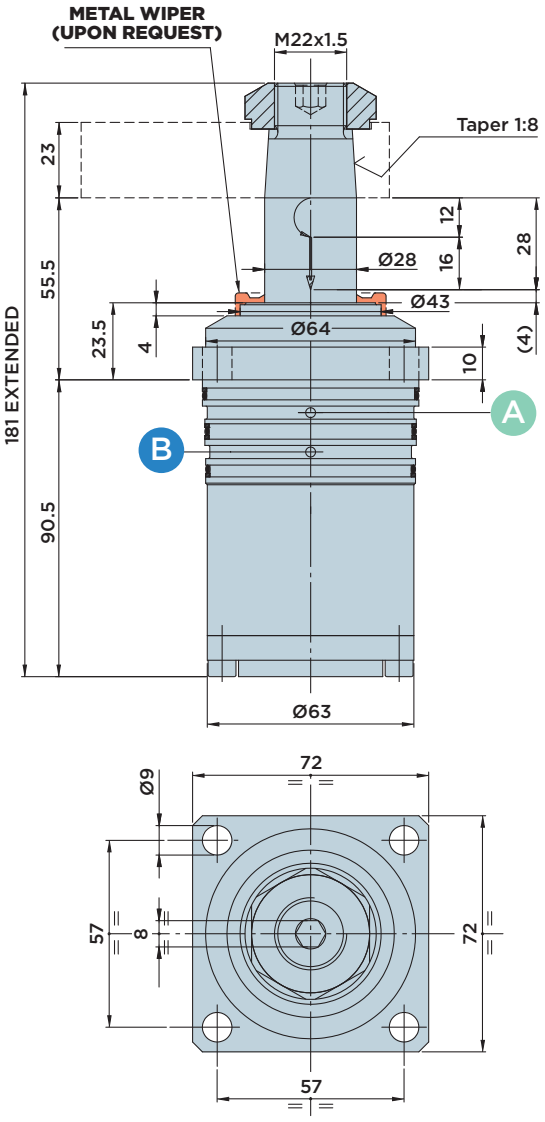
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **CARTRIDGE BODY**

MAX. OPERATING PRESSURE = 500BAR



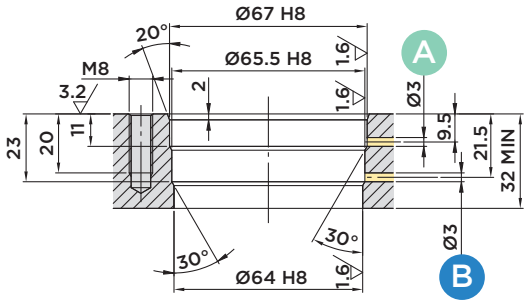
A : Clamping

B : Unclamping

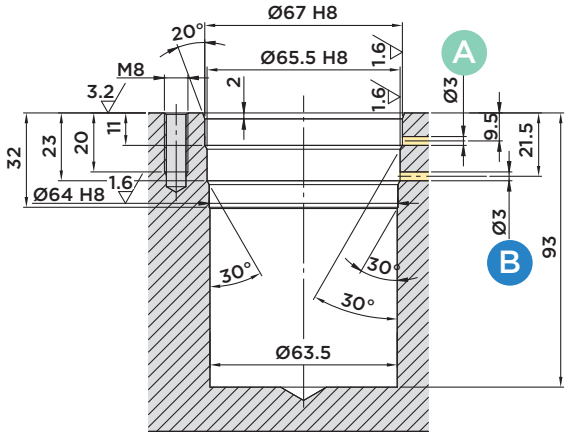


INSTALLATION DIMENSIONS

Through-hole mounting



Blind hole mounting



Included in the scope of supply:
- Mounting screws M8x25 DIN 912/12.9 grade

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

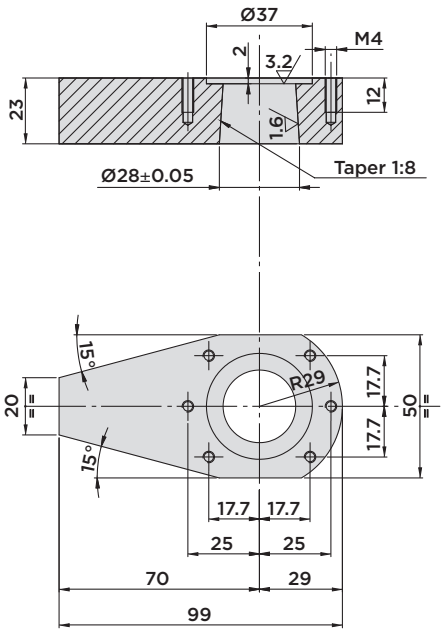
Note:
Order code, see page 38
Clamp arms, see page 91
Clamping force diagram, see page 91

STROKE mm		EFFECTIVE PISTON AREA		TOTAL OIL VOLUME	
		Cm^2		Cm^3	
TOTAL	28	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	12	9.75	15.9	27.3	44.5
CLAMPING	16				

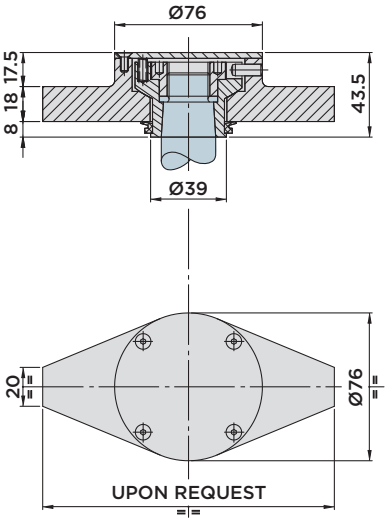
SR28 SERIES

- ACCESSORIES
- EFFECTIVE CLAMPING FORCE

CLAMP ARM 01.28

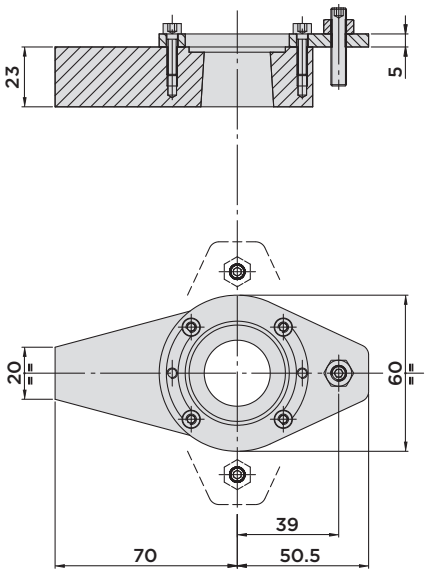


CLAMP ARM 03.28



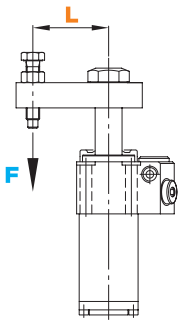
CLAMP ARM 04.28

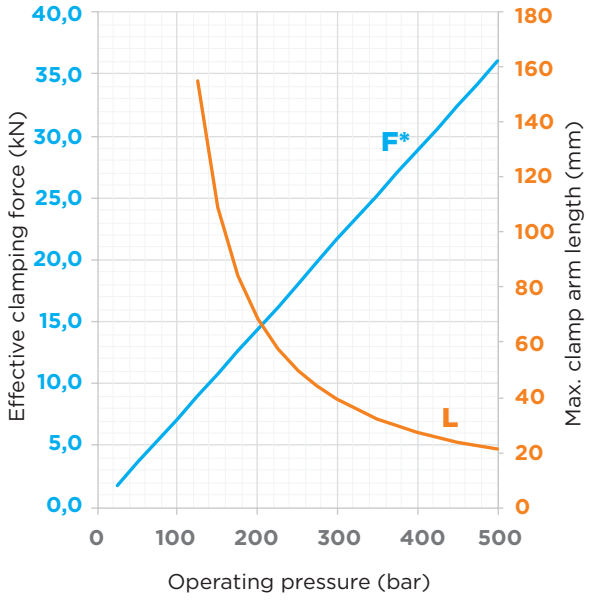
FOR CYLINDERS WITH CLAMP ARM POSITION CONTROL VALVE

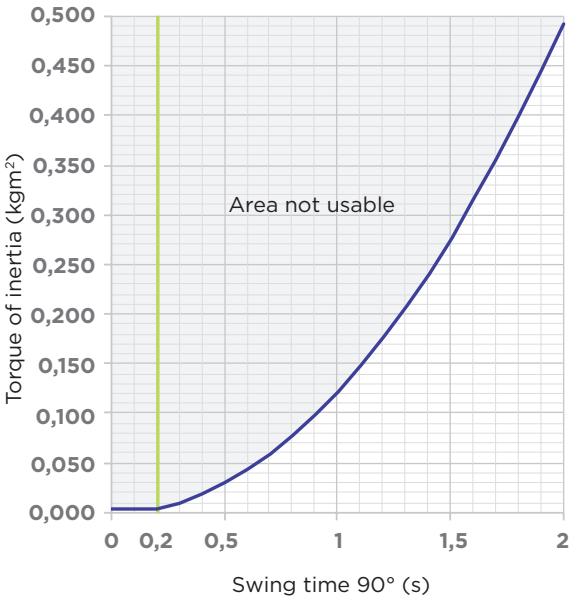


Material: C45

Effective clamping force / Swing times







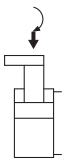
* = The effective clamping force **F** in the above diagram was determined using the standard clamp arms of type 01 and 04.

SR28.0 **FDH**

COMPENSATION SYSTEM

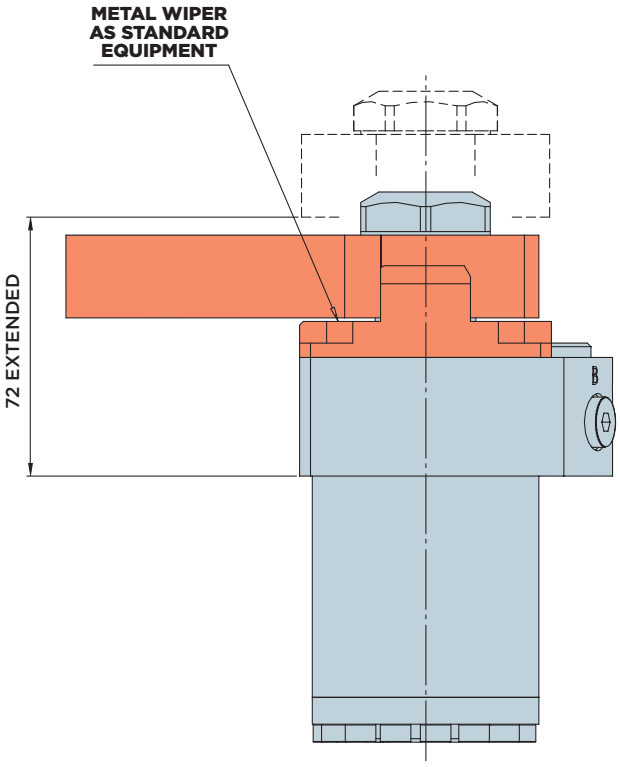
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE**

AND **HPC PRISMATIC ANTI-DEFLECTION BLOCK** MAX. OPERATING PRESSURE = 500BAR

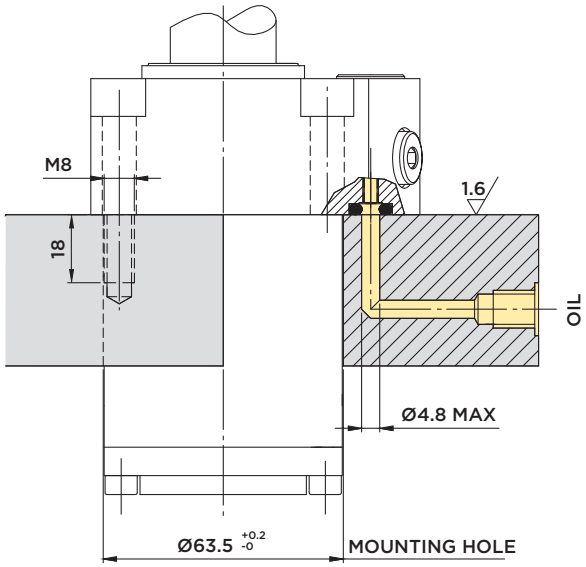


A : Clamping

B : Unclamping



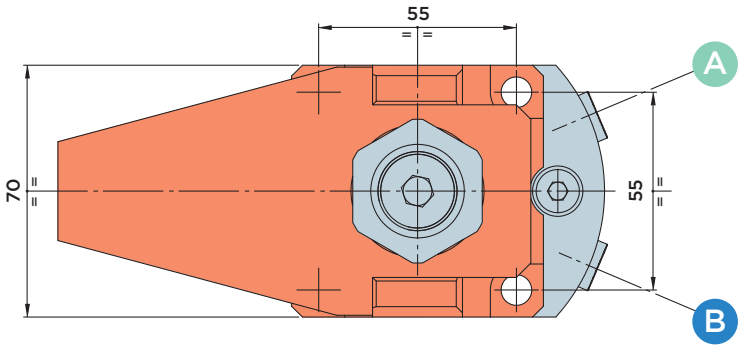
INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- Mounting screws M8x50 DIN 912/12.9 grade

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

Note:
Order code, see page 38
Clamp arms, see page 95
Clamping force diagram, see page 95



STROKE mm		EFFECTIVE PISTON AREA Cm²		TOTAL OIL VOLUME Cm³	
TOTAL	28	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	12	9.75	15.9	27.3	44.5
CLAMPING	16				

SR28.0 **FDVH**

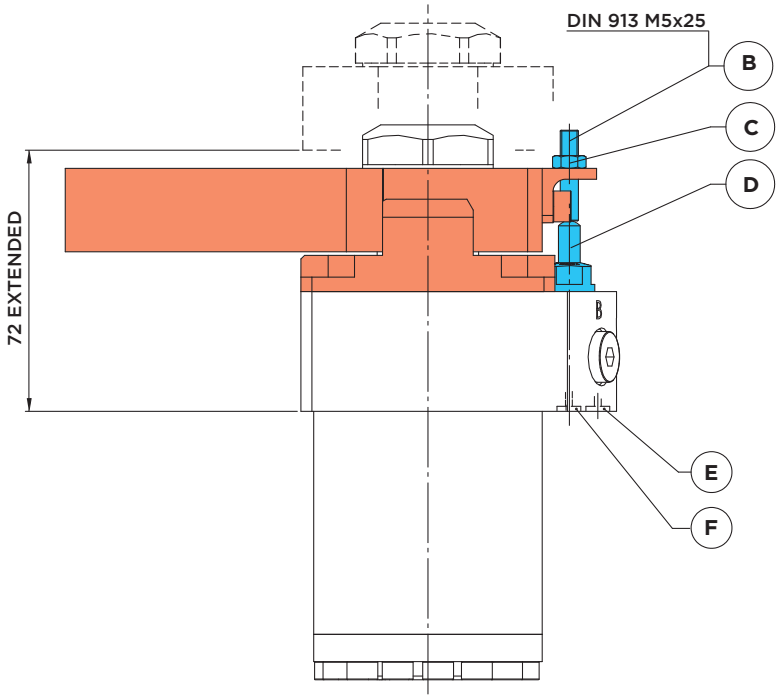
COMPENSATION SYSTEM

DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE,**

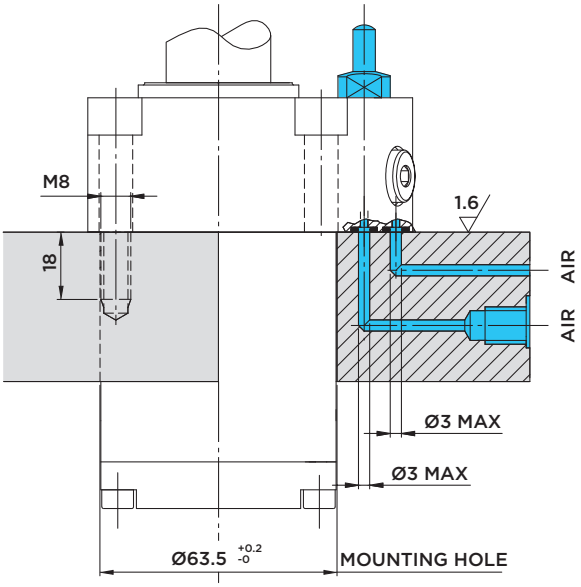
CLAMP ARM POSITION CONTROL VALVE AND **HPC PRISMATIC ANTI-DEFLECTION BLOCK**

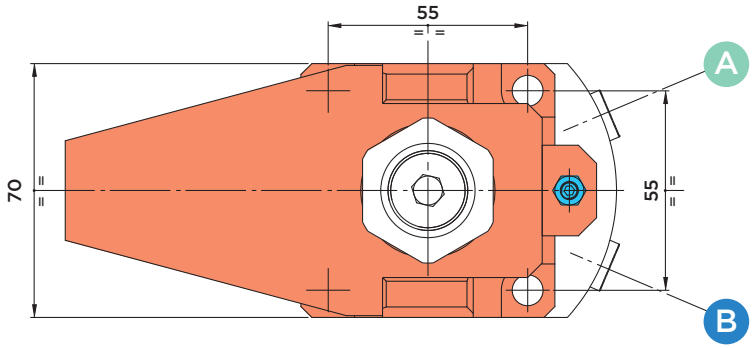
A : Clamping

B : Unclamping



INSTALLATION DIMENSIONS WITH O-RING CONNECTION





Valve adjustment:
To adjust the clamp arm position control valve, please proceed as follows:

1) Loosen the screw (B) M5x25.

2) Pressurize the cylinder to move the clamping arm into clamping position.

3) Supply the circuit with air at 1÷6 BAR through the port (F). The valve bolt (D) is completely extended and air escapes from the bore (E).

4) Screw in the set-screw (B) with the workpiece being clamped until the air flow is interrupted. Then tighten the screw by another 2÷4 rotations (*) and lock the screw by means of the nut (C). The pressure switch indicates that the pneumatic circuit is closed and enables the machine cycle start.

* (The additional 2÷4 rotations are required to compensate thickness variations caused by rough surfaces.)

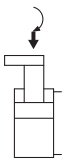
Note: After the adjustment, the tip of the set-screw **(B)** must not project beyond the lower end of the clamp arm **(level H)**.

SR28.0 **CDH**

COMPENSATION SYSTEM

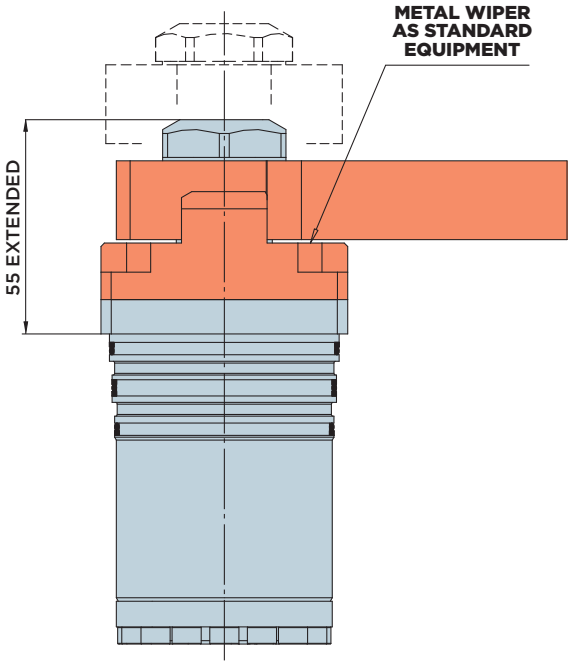
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **CARTRIDGE BODY**

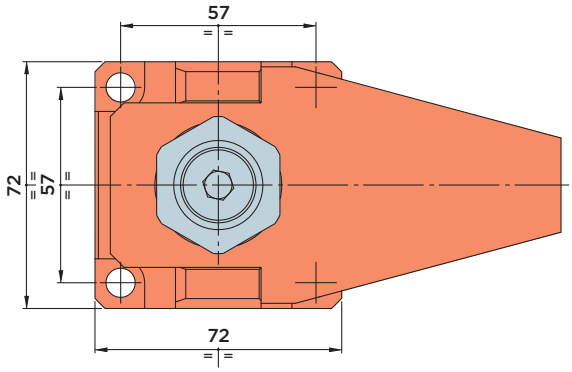
AND **HPC PRISMATIC ANTI-DEFLECTION BLOCK** MAX. OPERATING PRESSURE = 500BAR



A : Clamping

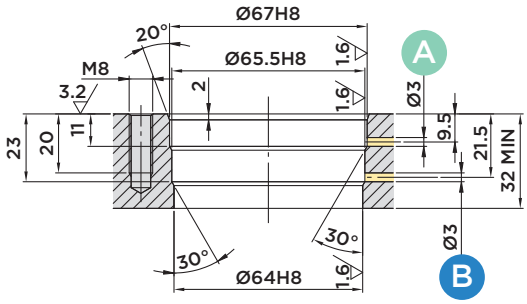
B : Unclamping



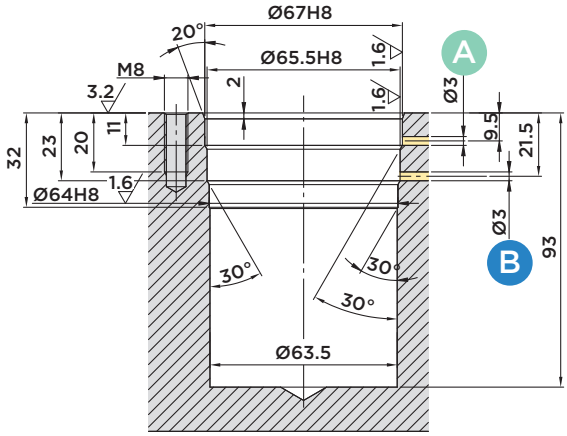


INSTALLATION DIMENSIONS

Through-hole mounting



Blind hole mounting



Included in the scope of supply:
- Mounting screws M8x30 DIN 912/12.9 grade

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

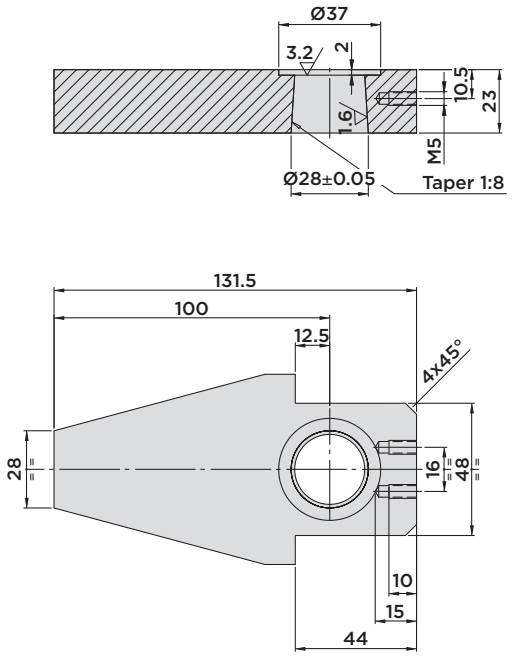
Note:
Order code, see page 38
Clamp arms, see page 95
Clamping force diagram, see page 95

STROKE mm		EFFECTIVE PISTON AREA Cm²		TOTAL OIL VOLUME Cm³	
TOTAL	28	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	12	9.75	15.9	27.3	44.5
CLAMPING	16				

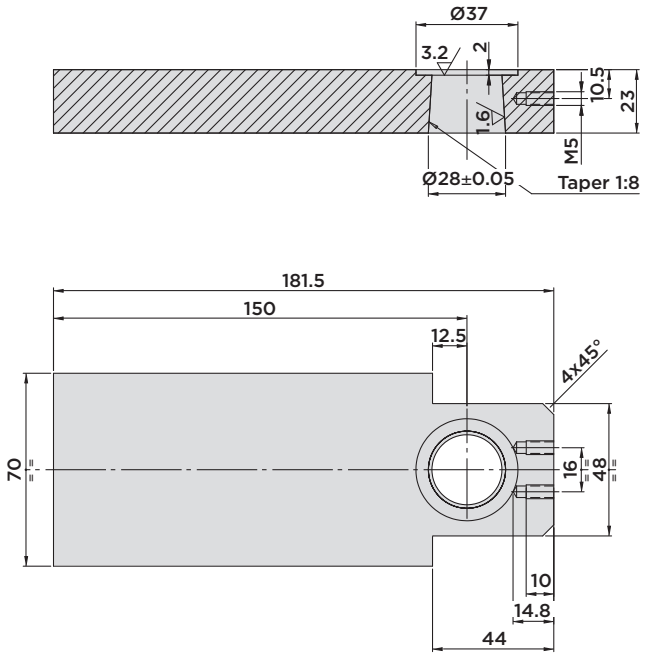
SR28 HPC SERIES

- ACCESSORIES
- EFFECTIVE CLAMPING FORCE

CLAMP ARM 06.28

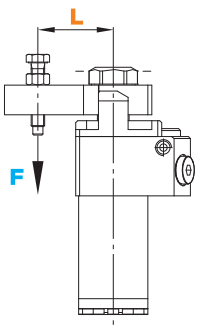


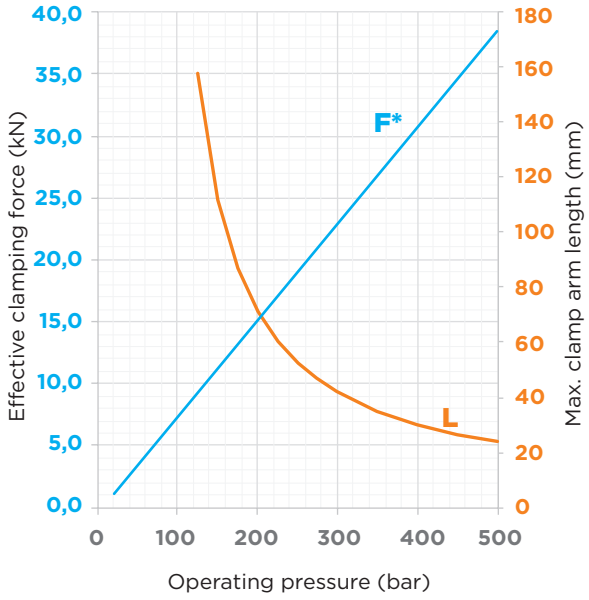
CLAMP ARM 07.28

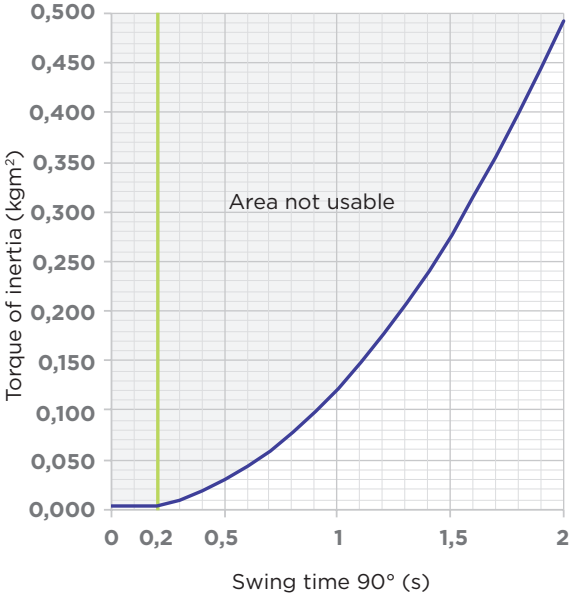


Material: C45

Effective clamping force / Swing times







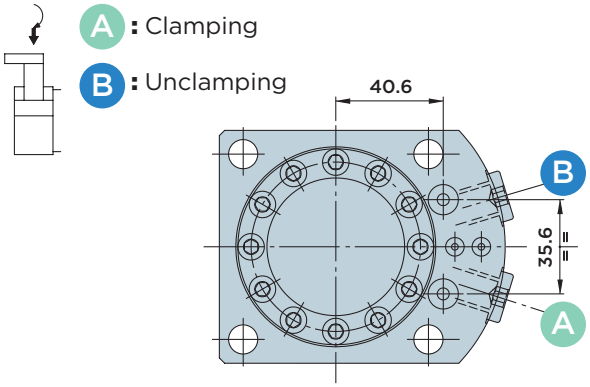
* = The effective clamping force **F** in the above diagram was determined using the standard clamp arms of type 01 and 04.

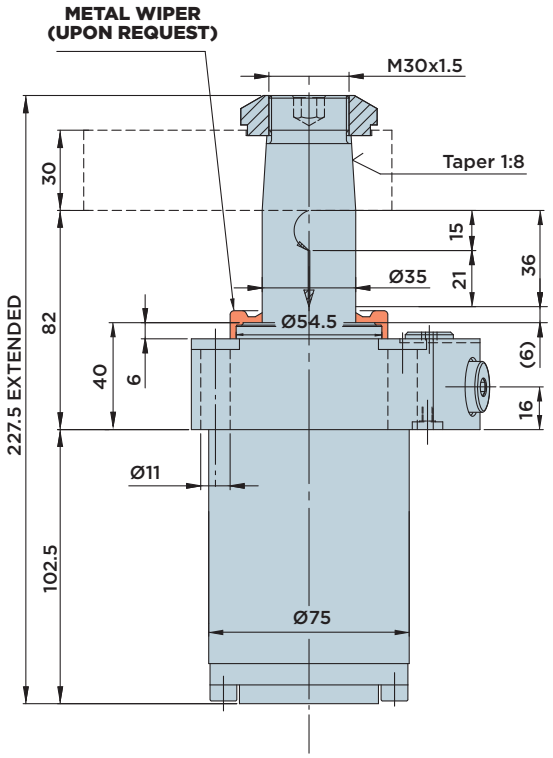
SR35.0 **FD**

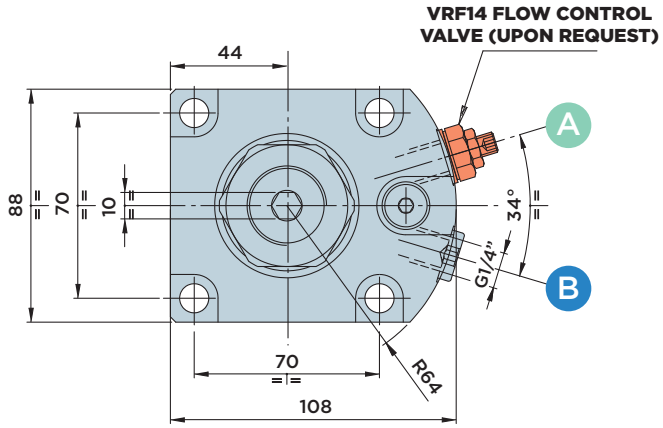
COMPENSATION SYSTEM

DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE**

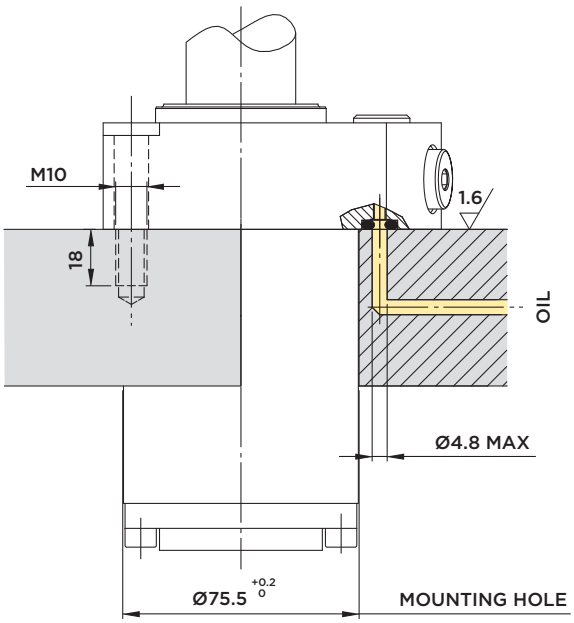
MAX. OPERATING PRESSURE = 500BAR







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- Mounting screws M10x45 DIN 912/12.9 grade
- O-Rings Ø4.34x3.53

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

Note:
Order code, see page 38
Clamp arms, see page 101
Clamping force diagram, see page 101

STROKE mm		EFFECTIVE PISTON AREA		TOTAL OIL VOLUME	
		Cm²		Cm³	
TOTAL	36	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	15	14.1	23.8	50.8	85.7
CLAMPING	21				

SR35.0 **FDV**

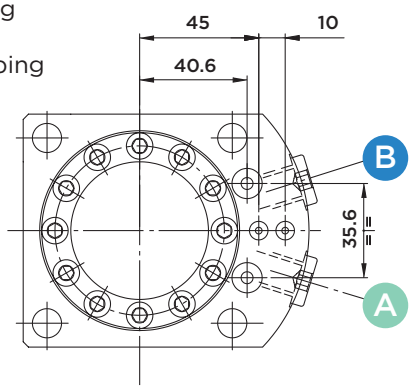
COMPENSATION SYSTEM

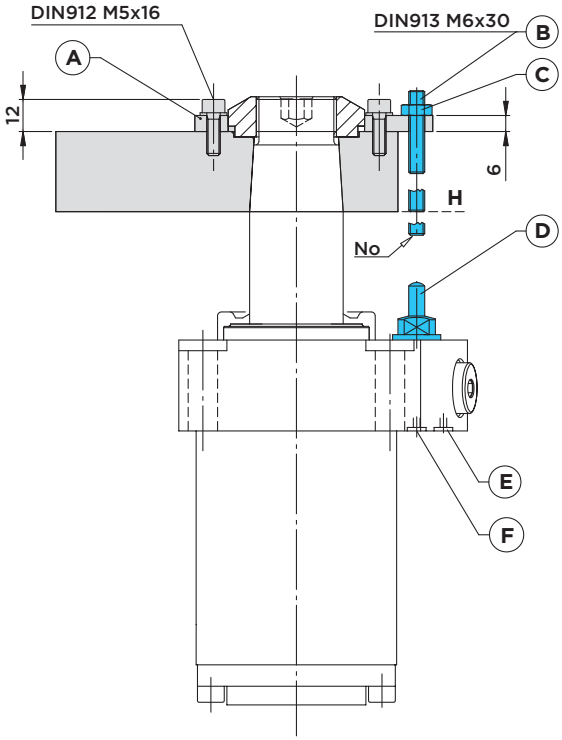
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE**

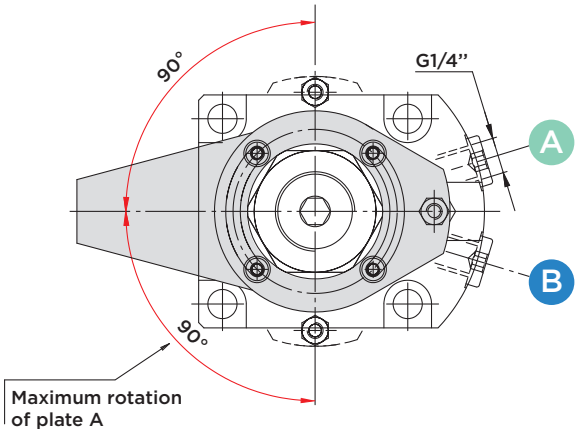
AND **CLAMP ARM POSITION CONTROL VALVE**

A : Clamping

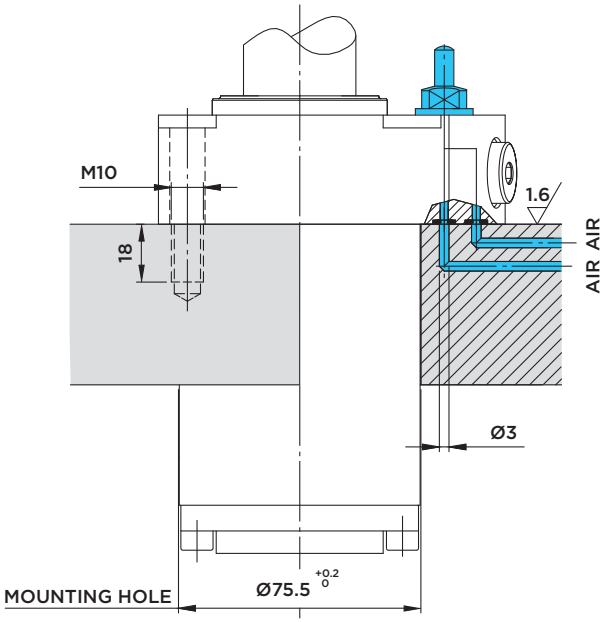
B : Unclamping







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:

- O-Rings Ø3.68x1.78

Valve adjustment:

To adjust the clamp arm position control valve, please proceed as follows:

1) Pressurize the cylinder to move the clamping arm into clamping position.

2) Adjust the plate (A) to the exact radial position to ensure that the set-screw (B) is in line with the valve.

3) Supply the circuit with air at 1÷6 BAR through the port (F). The valve bolt (D) is completely extended and air escapes from the bore (E).

4) Screw in the set-screw (B) with the workpiece being clamped until the air flow is interrupted. Then tighten the screw by another 2÷4 rotations (*) and lock the screw by means of the nut (C). The pressure switch indicates that the pneumatic circuit is closed and enables the machine cycle start.

* (The additional 2÷4 rotations are required to compensate thickness variations caused by rough surfaces.)

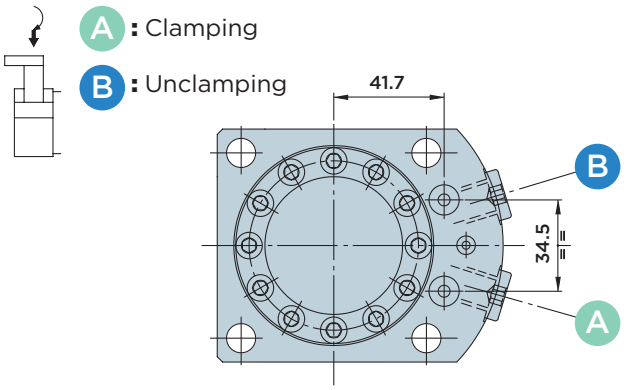
Note: After the adjustment, the tip of the set-screw **(B)** must not project beyond the lower end of the clamp arm **(level H)**.

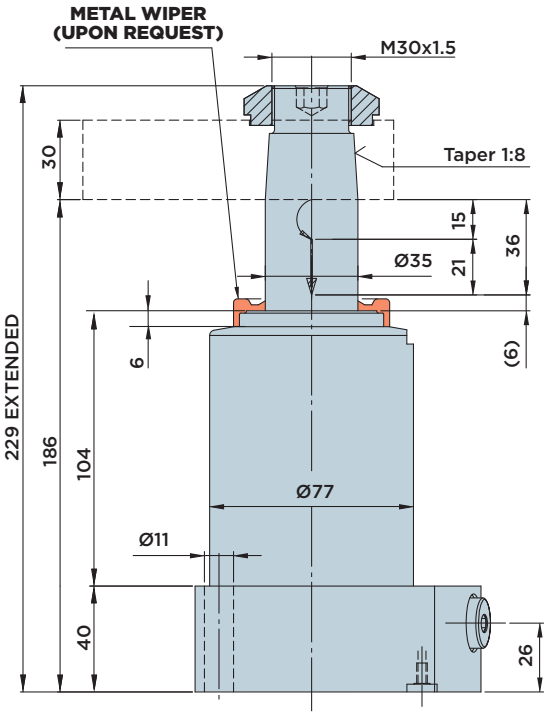
SR35.0 **PD**

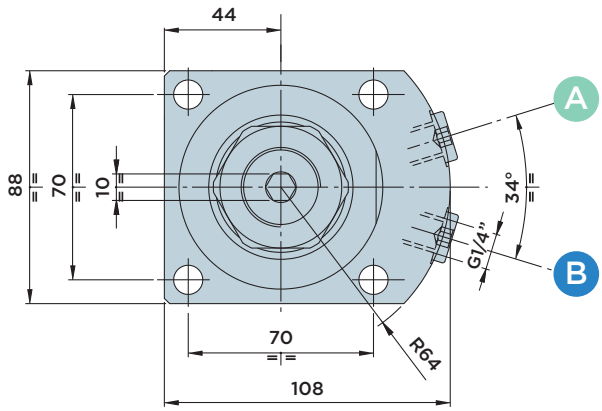
COMPENSATION SYSTEM

DOUBLE-ACTING SWING CLAMP CYLINDER WITH **LOWER FLANGE**

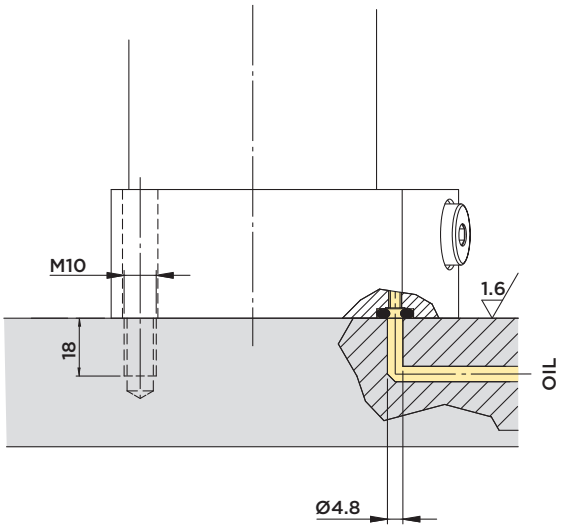
MAX. OPERATING PRESSURE = 500BAR







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



The VRF4 flow control valve cannot be installed.

Included in the scope of supply:
- Mounting screws M10x55 DIN 912/12.9 grade
- O-Rings Ø4.34x3.53

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

Note:

Order code, see page 38
Clamp arms, see page 101
Clamping force diagram, see page 101

STROKE mm		EFFECTIVE PISTON AREA Cm²		TOTAL OIL VOLUME Cm³	
TOTAL	36	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	15	14.1	23.8	50.8	85.7
CLAMPING	21				

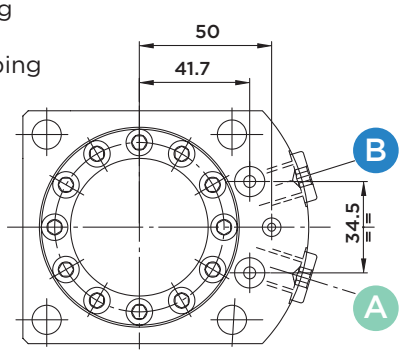
SR35.0 **PDV**

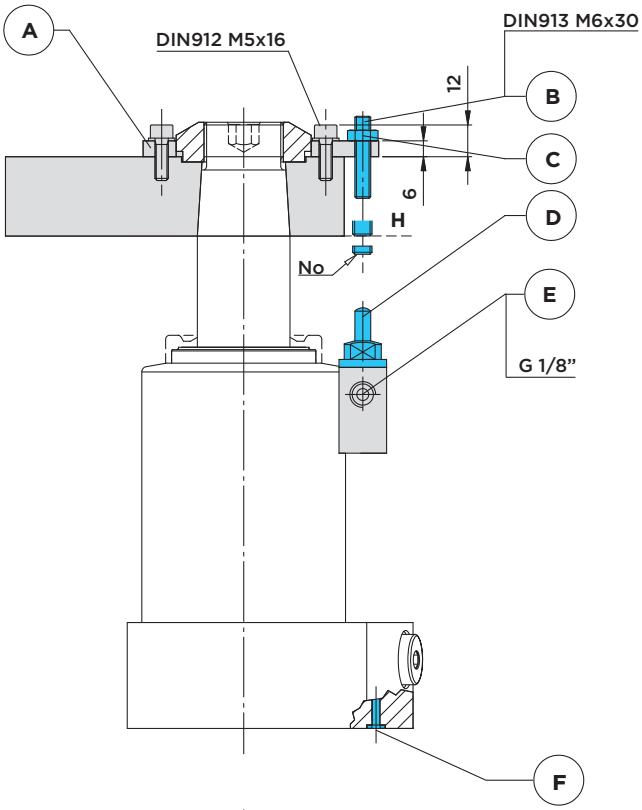
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **LOWER FLANGE**

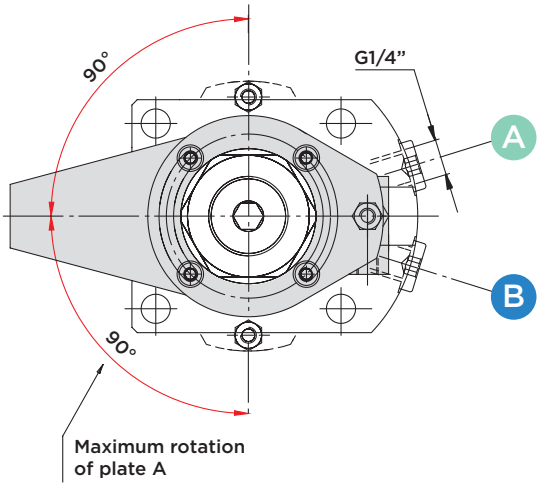
AND **CLAMP ARM POSITION CONTROL VALVE**

A : Clamping

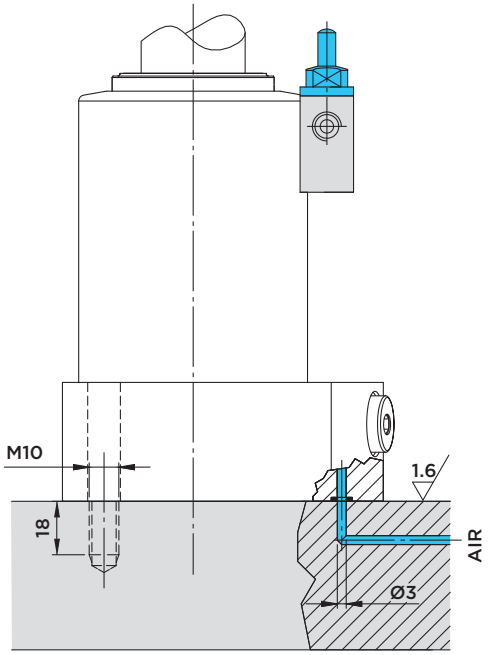
B : Unclamping







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:

- O-Rings Ø3.68x1.78

Valve adjustment:

To adjust the clamp arm position control valve, please proceed as follows:

1) Pressurize the cylinder to move the clamping arm into clamping position.

2) Adjust the plate (A) to the exact radial position to ensure that the set-screw (B) is in line with the valve.

3) Supply the circuit with air at 1÷6 BAR through the port (F). The valve bolt (D) is completely extended and air escapes from the bore (E).

4) Screw in the set-screw (B) with the workpiece being clamped until the air flow is interrupted. Then tighten the screw by another 2÷4 rotations (*) and lock the screw by means of the nut (C). The pressure switch indicates that the pneumatic circuit is closed and enables the machine cycle start.

* (The additional 2÷4 rotations are required to compensate thickness variations caused by rough surfaces.)

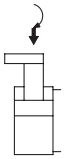
Note: After the adjustment, the tip of the set-screw **(B)** must not project beyond the lower end of the clamp arm **(level H)**.

SR35.0 **CD**

COMPENSATION SYSTEM

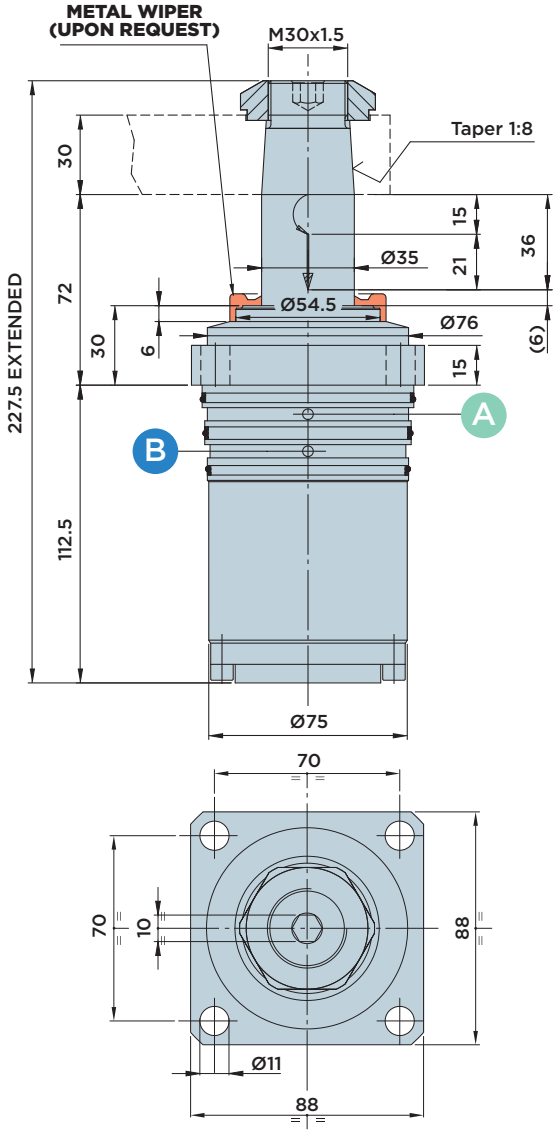
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **CARTRIDGE BODY**

MAX. OPERATING PRESSURE = 500BAR



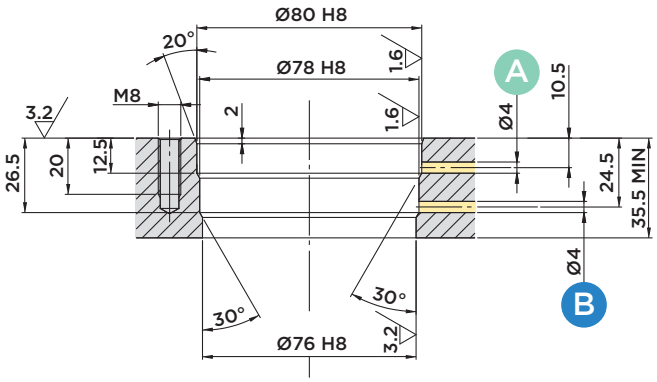
A : Clamping

B : Unclamping

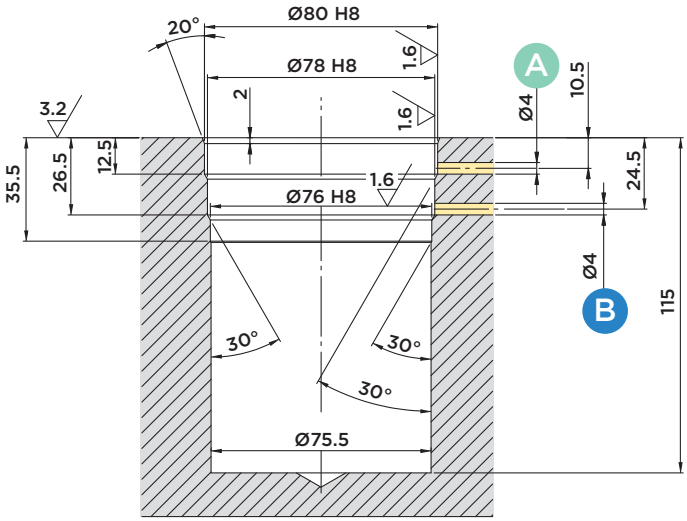


INSTALLATION DIMENSIONS

Through-hole mounting



Blind hole mounting



Included in the scope of supply:
- Mounting screws M10x30 DIN 912/12.9 grade

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

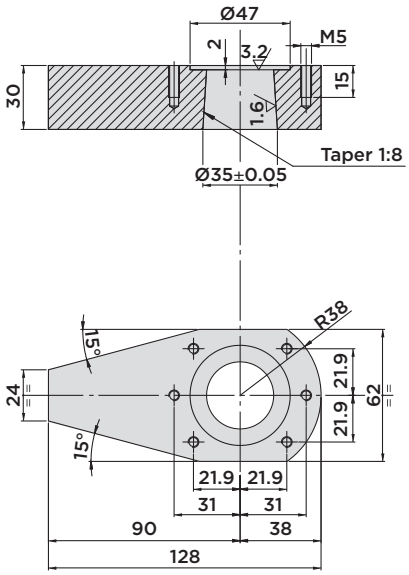
Note:
Order code, see page 38
Clamp arms, see page 101
Clamping force diagram, see page 101

STROKE mm		EFFECTIVE PISTON AREA Cm²		TOTAL OIL VOLUME Cm³	
TOTAL	36	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	15	14.1	23.8	50.8	85.7
CLAMPING	21				

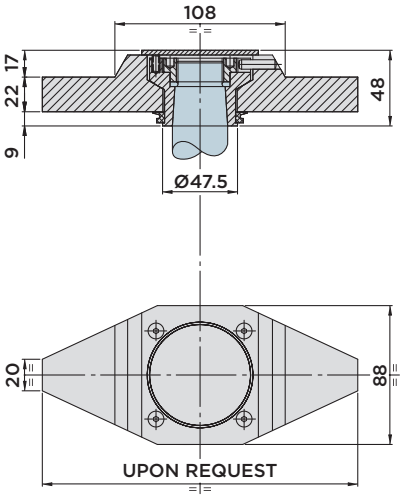
SR35 SERIES

- ACCESSORIES
- EFFECTIVE CLAMPING FORCE

CLAMP ARM 01.35

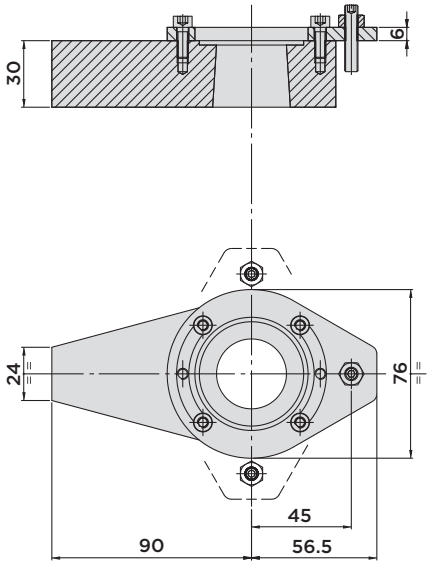


CLAMP ARM 03.35



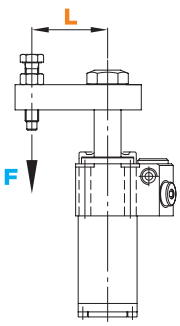
CLAMP ARM 04.35

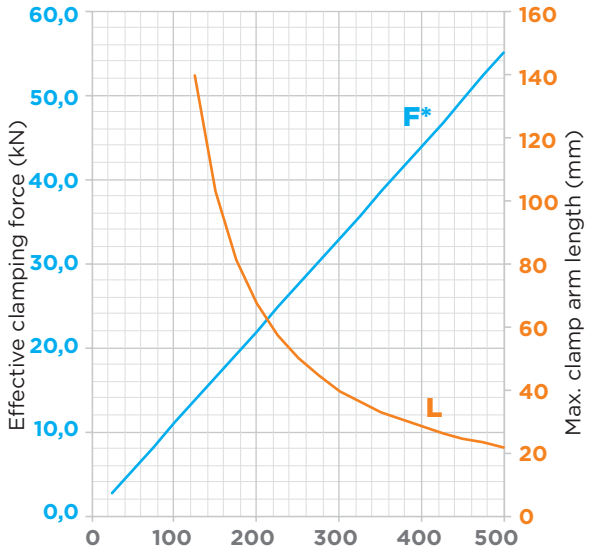
FOR CYLINDERS WITH CLAMP ARM POSITION CONTROL VALVE

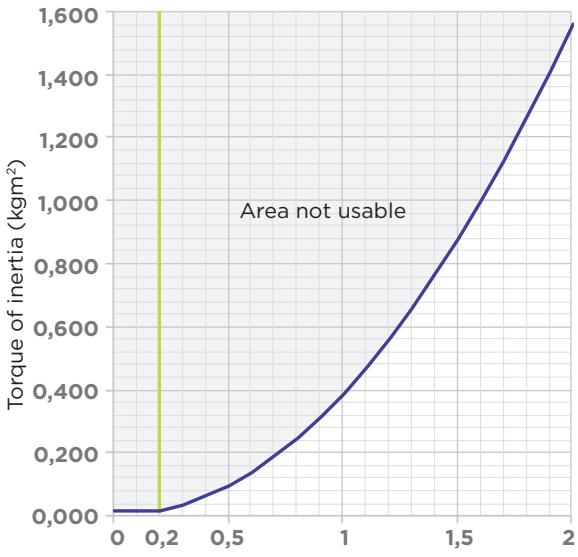


Material: C45

Effective clamping force / Swing times







* = The effective clamping force **F** in the above diagram was determined using the standard clamp arms of type 01 and 04.

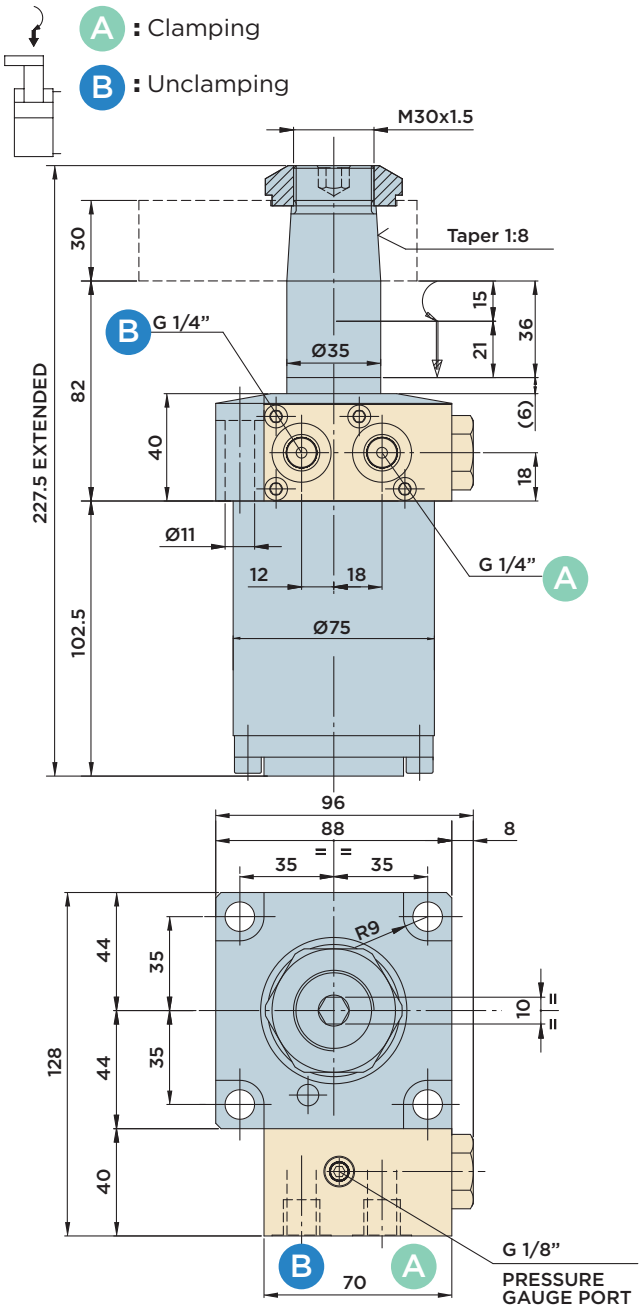
SR35.0 **RPS**

COMPENSATION SYSTEM

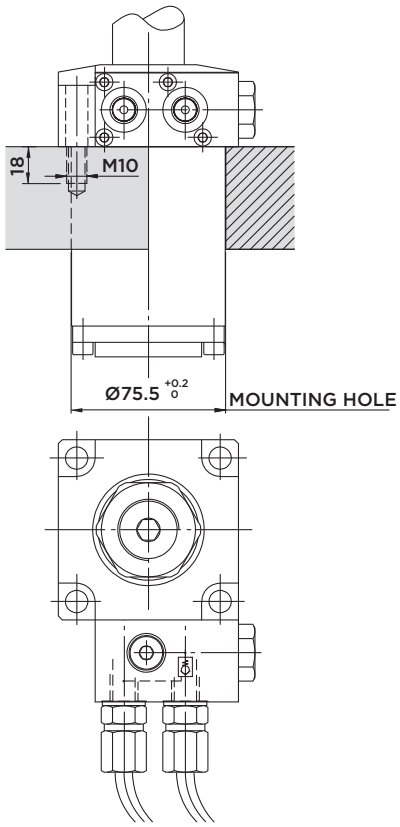
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE** AND **HYDRAULICALLY**

PILOT-OPERATED CHECK VALVE

MAX. OPERATING PRESSURE = 350BAR



INSTALLATION DIMENSIONS



Hydraulic supply:
The hydraulically pilot-operated check valve that is mounted by O-rings directly to the cylinder head ensures that the pressure is maintained even in case of a supply pressure drop. As a special anti-extrusion O-ring is used for this purpose, the supply of other components is not affected at all when pressurizing the cylinder. A G1/8" port is provided for a pressure gauge that is directly connected with the cylinder chamber.

Included in the scope of supply:
- Mounting screws M10x45 DIN 912/12.9 grade

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized
- Valve block: Free machining steel

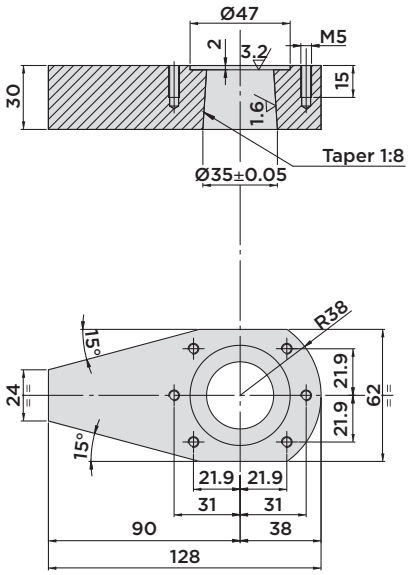
Note:
Order code, see page 38
Clamp arms, see page 103
Clamping force diagram, see page 103

STROKE mm		EFFECTIVE PISTON AREA		TOTAL OIL VOLUME	
		Cm^2		Cm^3	
TOTAL	36	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	15	14.1	23.8	50.8	85.7
CLAMPING	21				

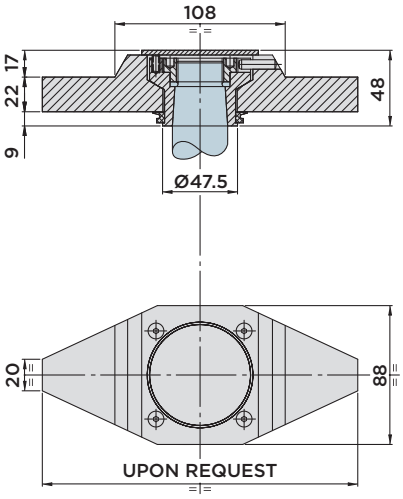
SR35RPS SERIES

- ACCESSORIES
- EFFECTIVE CLAMPING FORCE

CLAMP ARM 01.35

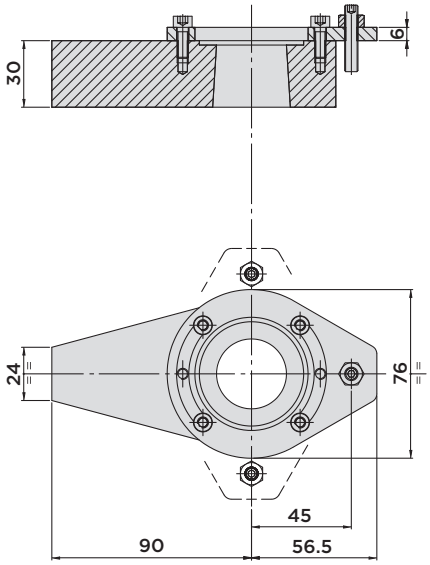


CLAMP ARM 03.35



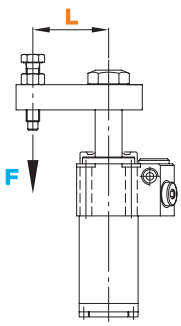
CLAMP ARM 04.35

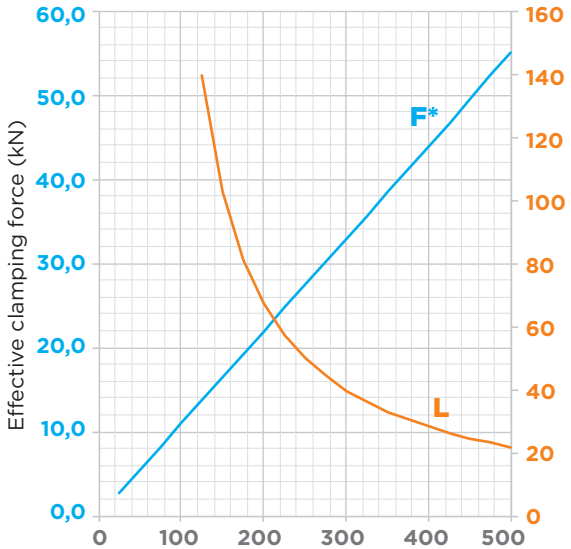
FOR CYLINDERS WITH CLAMP ARM POSITION CONTROL VALVE

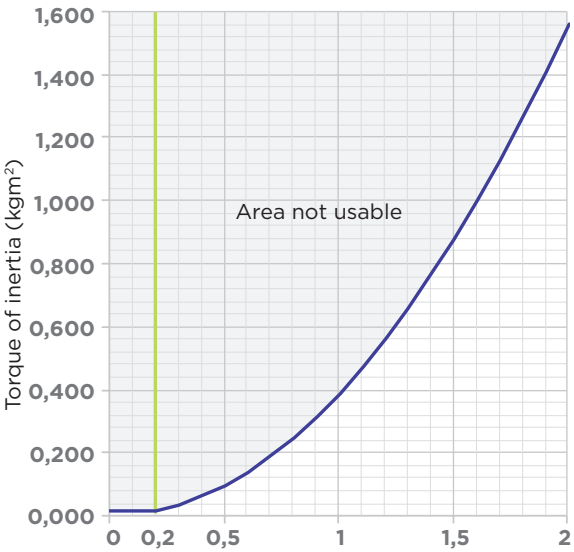


Material: C45

Effective clamping force / Swing times







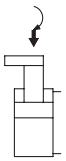
* = The effective clamping force **F** in the above diagram was determined using the standard clamp arms of type 01 and 04.

SR45.0 **FD**

COMPENSATION SYSTEM

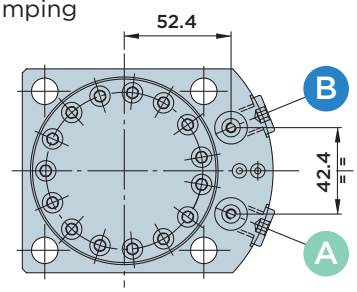
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE**

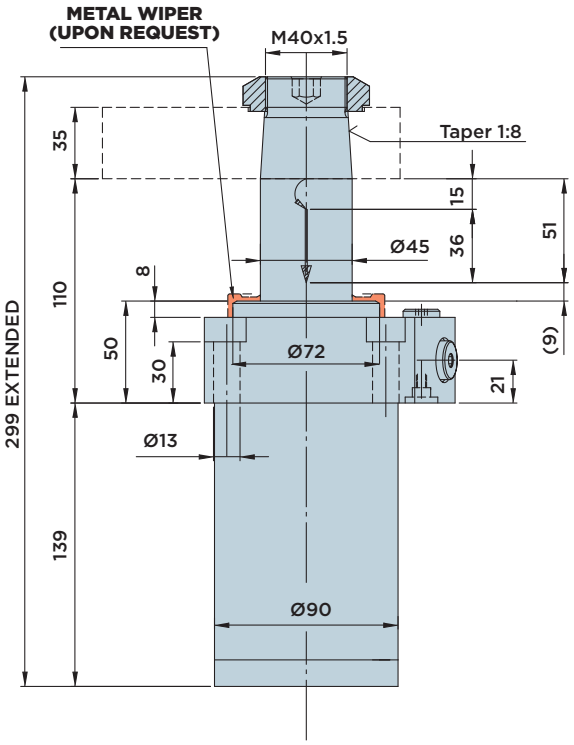
MAX. OPERATING PRESSURE = 500BAR

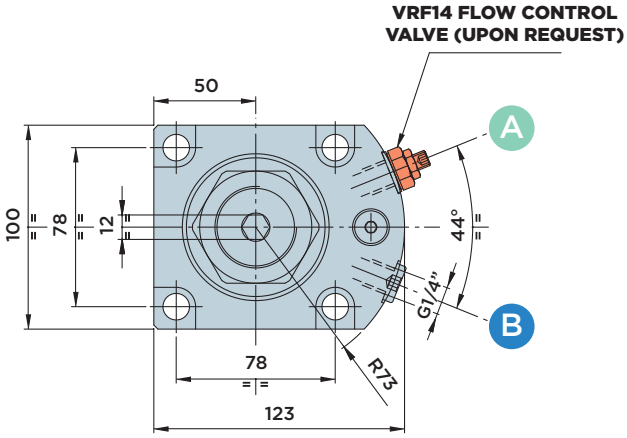


A : Clamping

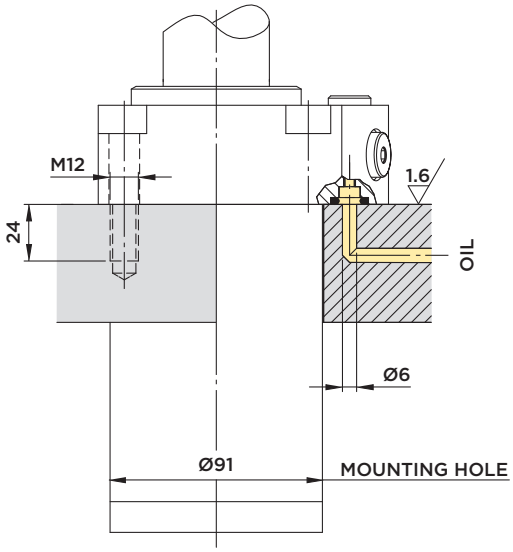
B : Unclamping







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- Mounting screws M12x50 DIN 912/12.9 grade
- O-Rings Ø9.12x3.53

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

Note:
Order code, see page 38
Clamp arms, see page 108
Clamping force diagram, see page 108

STROKE mm		EFFECTIVE PISTON AREA Cm²		TOTAL OIL VOLUME Cm³	
TOTAL	51	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	15	17.3	33.2	88.2	169.3
CLAMPING	36				

SR45.0 **FDV**

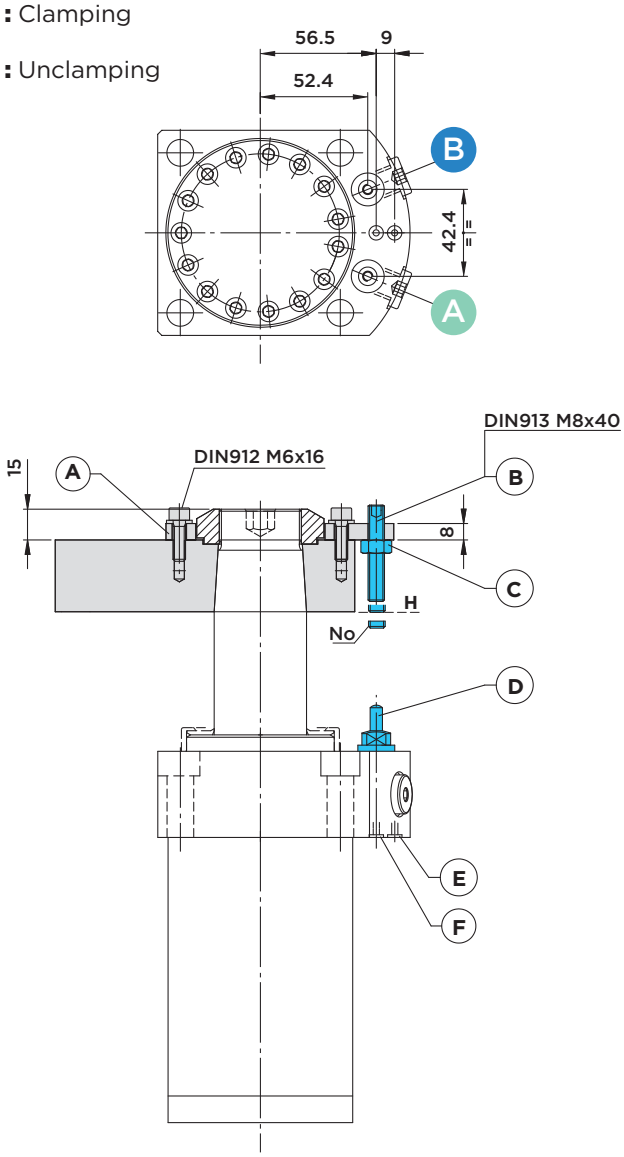
COMPENSATION SYSTEM

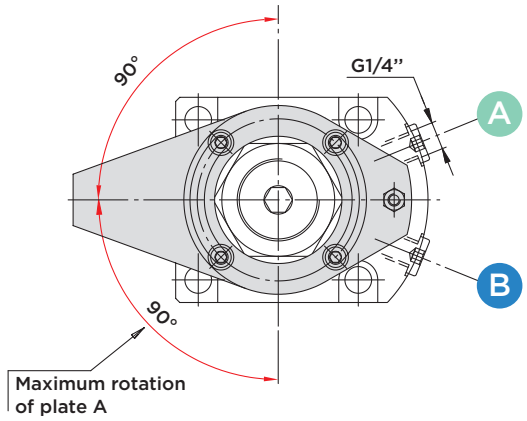
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **UPPER FLANGE**

AND **CLAMP ARM POSITION CONTROL VALVE**

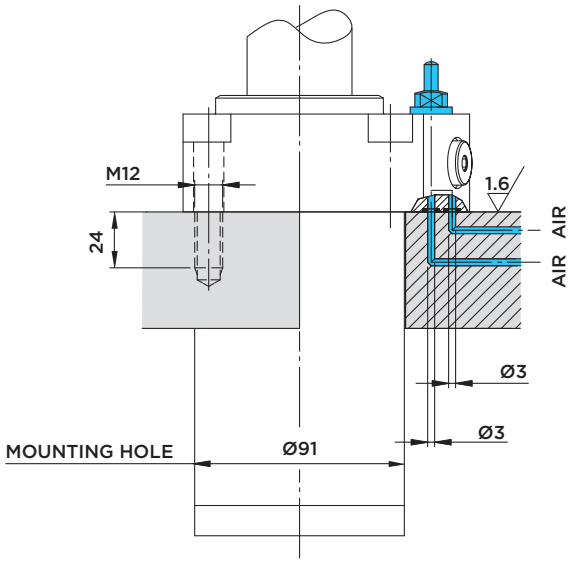
A : Clamping

B : Unclamping





INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- O-Rings Ø3.68x1.78

Valve adjustment:
To adjust the clamp arm position control valve, please proceed as follows:

1) Pressurize the cylinder to move the clamping arm into clamping position.

2) Adjust the plate (A) to the exact radial position to ensure that the set-screw (B) is in line with the valve.

3) Supply the circuit with air at 1÷6 BAR through the port (F). The valve bolt (D) is completely extended and air escapes from the bore (E).

4) Screw in the set-screw (B) with the workpiece being clamped until the air flow is interrupted. Then tighten the screw by another 2÷4 rotations (*) and lock the screw by means of the nut (C). The pressure switch indicates that the pneumatic circuit is closed and enables the machine cycle start.

* (The additional 2÷4 rotations are required to compensate thickness variations caused by rough surfaces.)

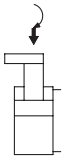
Note: After the adjustment, the tip of the set-screw **(B)** must not project beyond the lower end of the clamp arm **(level H)**.

SR45.0 **PD**

COMPENSATION SYSTEM

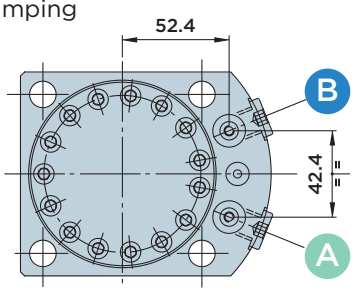
DOUBLE-ACTING SWING CLAMP CYLINDER WITH **LOWER FLANGE**

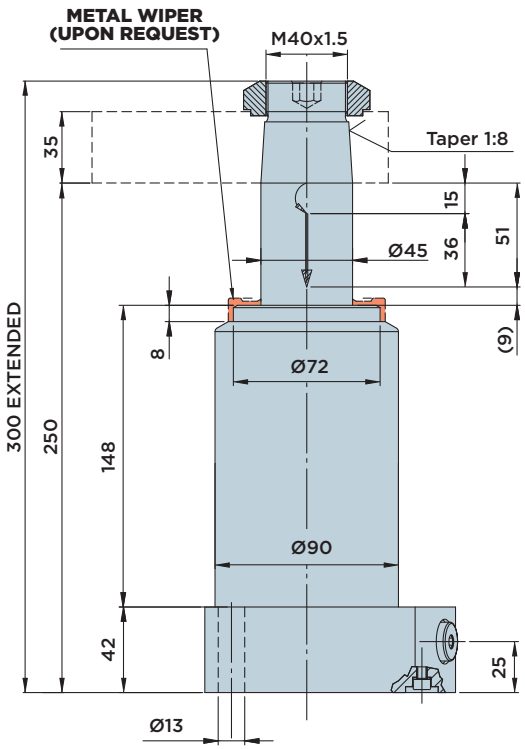
MAX. OPERATING PRESSURE = 500BAR

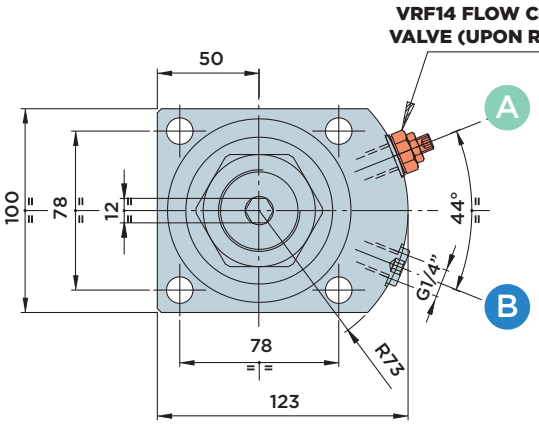


A : Clamping

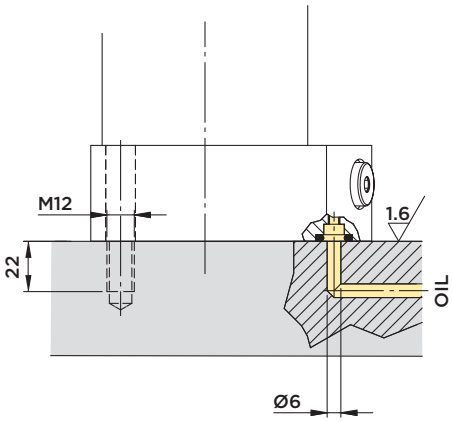
B : Unclamping







INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- Mounting screws M12x50 DIN 912/12.9 grade
- O-Rings Ø9.12x3.53

Material:
- Piston/rod: Case-hardened steel, ground
- Body: Free machining steel, nitrocarburized

Note:

Order code, see page 38
Clamp arms, see page 108
Clamping force diagram, see page 108

STROKE mm		EFFECTIVE PISTON AREA Cm²		TOTAL OIL VOLUME Cm³	
TOTAL	51	CLAMP.	UNCLAMP.	CLAMP.	UNCLAMP.
SWINGING	15	17.3	33.2	88.2	169.3
CLAMPING	36				

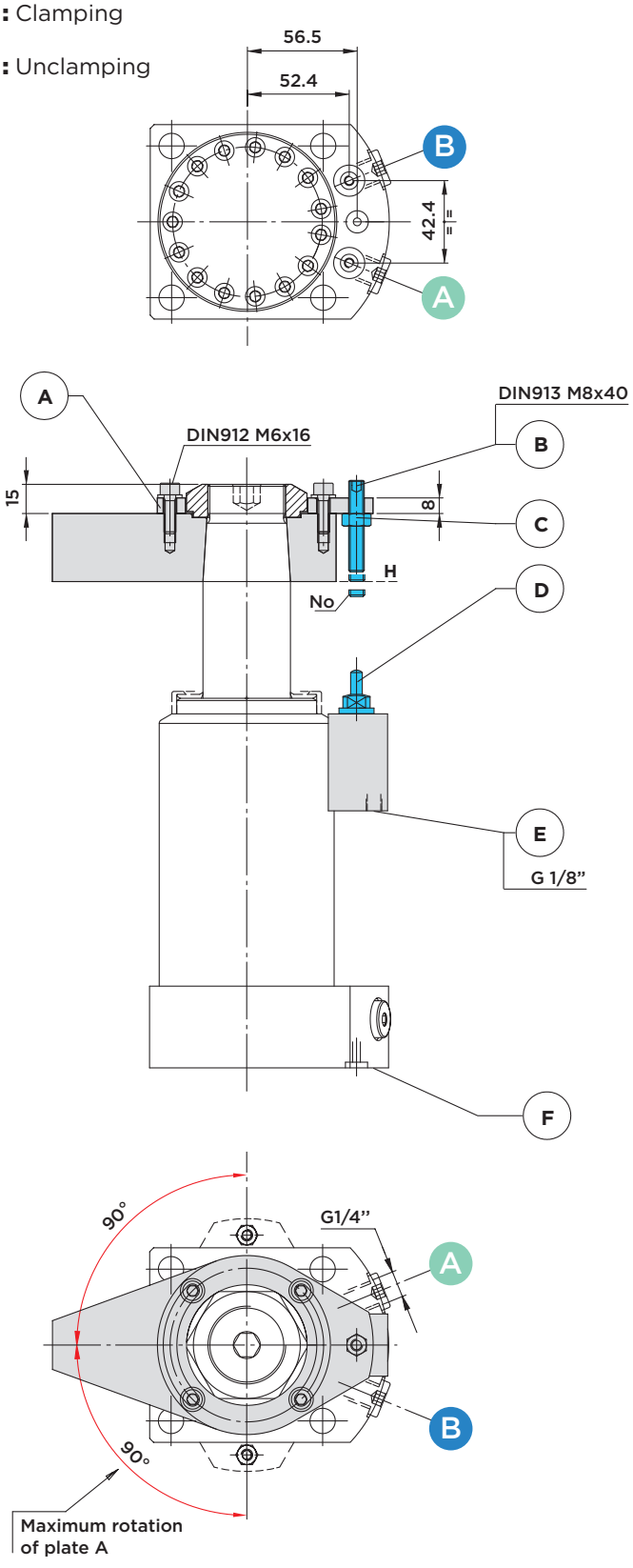
SR45.0 **PDV**

DOUBLE-ACTING SWING CLAMP CYLINDER WITH **LOWER FLANGE**

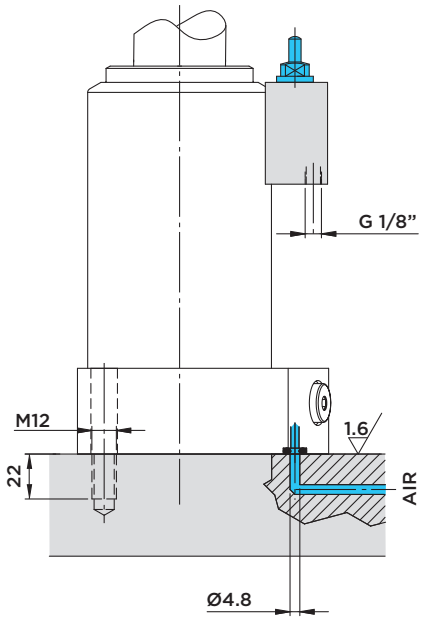
AND **CLAMP ARM POSITION CONTROL VALVE**

A : Clamping

B : Unclamping



INSTALLATION DIMENSIONS WITH O-RING CONNECTION



Included in the scope of supply:
- O-Rings Ø3.68x1.78

Valve adjustment:
To adjust the clamp arm position control valve, please proceed as follows:

1) Pressurize the cylinder to move the clamping arm into clamping position.

2) Adjust the plate (A) to the exact radial position to ensure that the set-screw (B) is in line with the valve.

3) Supply the circuit with air at 1÷6 BAR through the port (F). The valve bolt (D) is completely extended and air escapes from the bore (E).

4) Screw in the set-screw (B) with the workpiece being clamped until the air flow is interrupted. Then tighten the screw by another 2÷4 rotations (*) and lock the screw by means of the nut (C). The pressure switch indicates that the pneumatic circuit is closed and enables the machine cycle start.

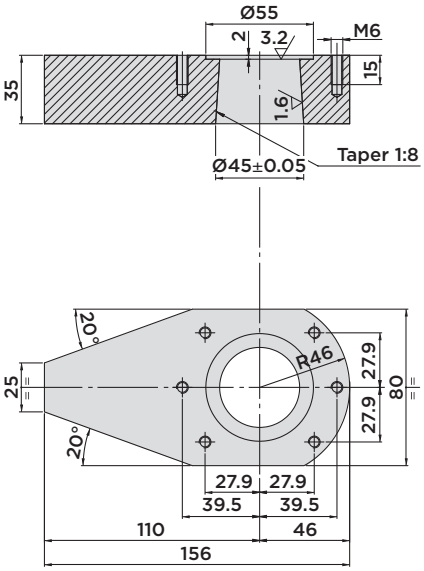
* (The additional 2÷4 rotations are required to compensate thickness variations caused by rough surfaces.)

Note: After the adjustment, the tip of the set-screw **(B)** must not project beyond the lower end of the clamp arm **(level H)**.

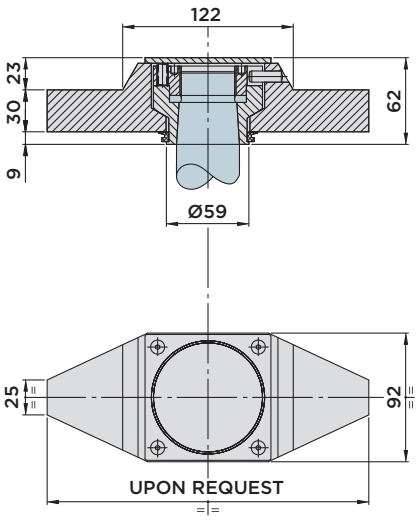
SR45 SERIES

- ACCESSORIES
- EFFECTIVE CLAMPING FORCE

CLAMP ARM 01.45

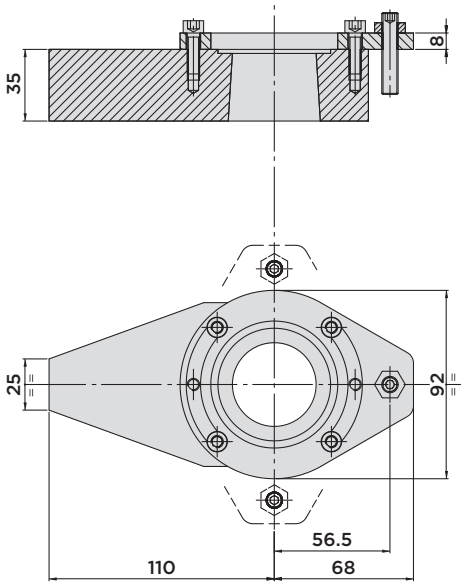


CLAMP ARM 03.45



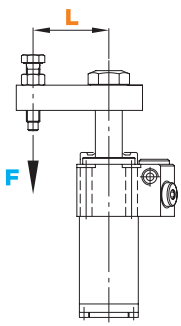
CLAMP ARM 04.45

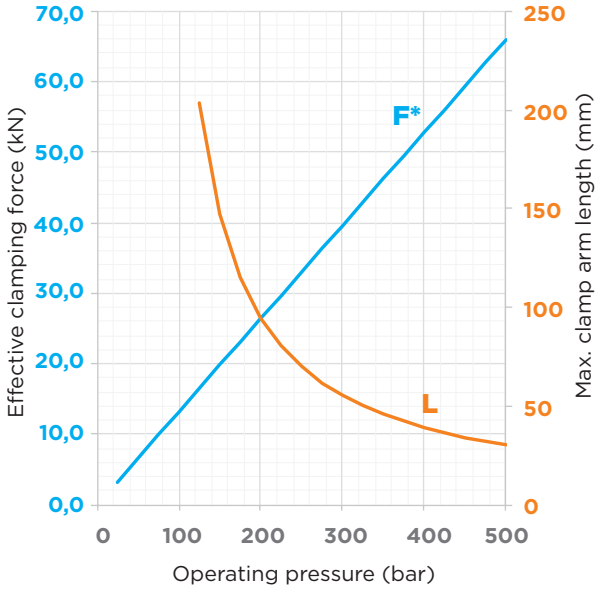
FOR CYLINDERS WITH CLAMP ARM POSITION CONTROL VALVE

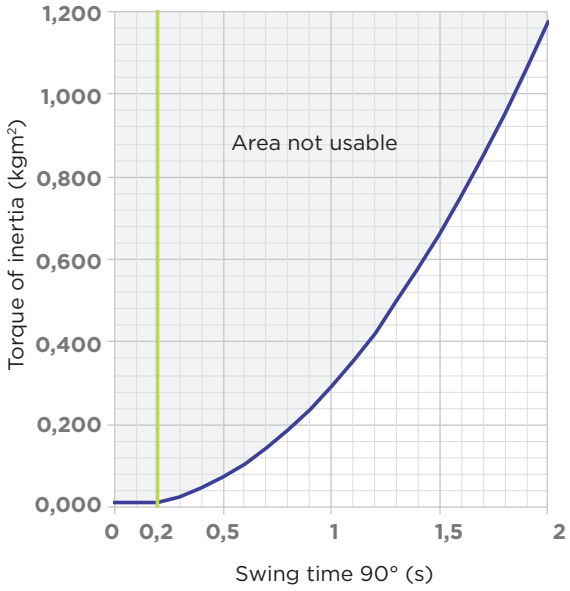


Material: C45

Effective clamping force / Swing times







* = The effective clamping force **F** in the above diagram was determined using the standard clamp arms of type 01 and 04.