Hinge clamps

with throttle valve, metallic wiper edge and optional position monitoring double acting

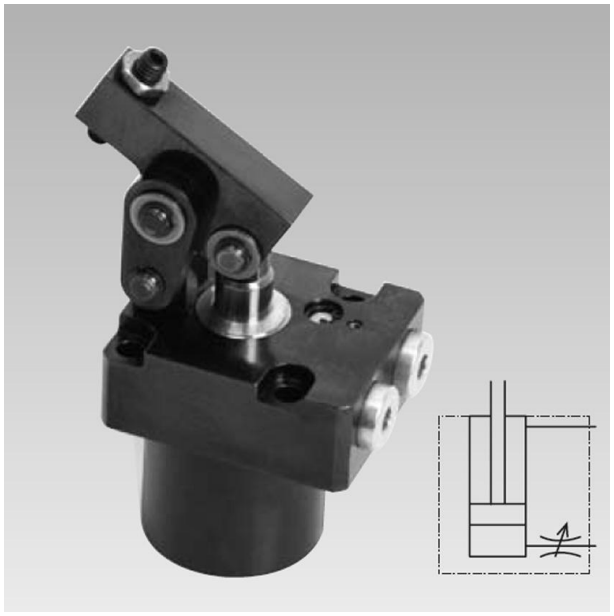


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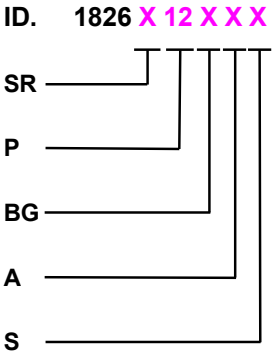
1 Description of the product

Hydraulic cylinders with integrated clamping lever. When pressurising the element, the piston moves upwards and swivels the clamping lever over the hinges forwards and at the same time downwards onto the workpiece. The piston force is deviated by 180° and, depending on the lever length, the force is available as clamping force. The kinematics are so designed that no side loads enter into the workpiece, if the clamping surface is at the same height as the centre of rotation of the clamping lever (see comparison "Forces at the clamping point"). The 3 available clamping directions (L, G, R) make it easier to adapt to the workpiece shape or the hydraulic connectivity. All sizes are optionally available with switch rod for external position monitoring. Electrical and pneumatic position monitorings for the clamping and unclamping position are available as accessories.

2 Validity of the documentation

This document applies to the following products:

Hinge clamps of data sheet B18268. The following types or part numbers are concerned:



ID Part no. SR Clamping direction R = Clockwise G = Straight L = Counter-clockwise P Operating pressure 12 = 120 bar BG size 1 = BG 1 2 = BG 2 3 = BG 3 4 = BG 4 5 = BG 5	A Version 3 = Without switch rod and sensors 4 = With switch rod and without sensors 5 = With ultrasonic sensor S Clamping lever 0 = Without clamping lever 1 = Clamping lever with contact bolt 2 = Long clamping lever

3 Target group of this document

- Specialists, fitters and set-up men of machines and installations with hydraulic expert knowledge.

Qualification of the personnel

Expert knowledge means that the personnel must

- be in the position to read and completely understand technical specifications such as circuit diagrams and product-specific drawing documents,
- have expert knowledge (electric, hydraulic, pneumatic knowledge, etc.) of function and design of the corresponding components.

An **expert** is somebody who has due to its professional education and experiences sufficient knowledge and is familiar with the relevant regulations so that he

- can judge the entrusted works,
- can recognize the possible dangers,
- can take the required measures to eliminate dangers,
- knows the acknowledged standards, rules and guidelines of the technology.
- has the required knowledge for repair and mounting.

4 Symbols and signal words

⚠ WARNING

Person damage

Stands for a possibly dangerous situation.
If it is not avoided, death or very severe injuries will result.

⚠ CAUTION

Easy injuries / property damage

Stands for a possibly dangerous situation.
If it is not avoided, minor injuries or material damages will result.



Hazardous to the environment
The symbol stands for important information for the proper handling with materials that are hazardous to the environment.
Ignoring these notes can lead to heavy damages to the environment.

Note
This symbol stands for tips for users or especially useful information. This is no signal word for a dangerous or harmful situation.

5 For your safety

5.1 Basic information

The operating instructions serve for information and avoidance of dangers when installing the products into the machine as well as information and references for transport, storage and maintenance.
Only in strict compliance with these operating instructions, accidents and property damages can be avoided as well as trouble-free operation of the products can be guaranteed.
Furthermore, the consideration of the operating instructions will:

- avoid injuries
- reduce down times and repair costs,
- increase the service life of the products.

5.2 Safety instructions

The product was manufactured in accordance with the generally accepted rules of the technology.
Observe the safety instructions and the operating instructions given in this manual, in order to avoid personal damage or material damage.

- Read these operating instructions thoroughly and completely, before you work with the product.
- Keep these operating instructions so that they are accessible to all users at any time.
- Pay attention to the current safety regulations, regulations for accident prevention and environmental protection of the country in which the product will be used.
- Use the ROEMHELD product only in perfect technical condition.
- Observe all notes on the product.
- Use only accessories and spare parts approved by the manufacturer in order to exclude danger to persons because of not suited spare parts.
- Respect the intended use.
- You only may start up the product, when it has been found that the incomplete machine or machine, in which the product shall be mounted, corresponds to the country-specific provisions, safety regulations and standards.
- Perform a risk analysis for the incomplete machine, or the machine.
  Due to the interactions between the product and the machine/fixture or the environment, risks may arise that only can be determined and minimized by the user, e.g. :
  - generated forces,
  - generated movements,
  - Influence of hydraulic and electrical control,
  - etc.

6 Application

6.1 Intended use

The products are used in industrial / commercial applications to transform hydraulic pressure into movement and /or force. They must only be operated with hydraulic oil.
Furthermore the following belongs to possible uses:

- Use within the capacity indicated in the technical characteristics.
- Use as per operating instructions.
- Compliance with service intervals.
- Qualified and trained personnel for the corresponding activities.
- Mounting of spare parts only with the same specifications as the original part.

6.2 Misapplication

⚠ WARNING

Injuries, material damages or malfunctions!

Modifications can lead to weakening of the components, reduction in strength or malfunctions.

- Do not modify the product!

The use of the products is not authorised:

- For domestic use.
- For use at fairgrounds and amusement parks.
- In food processing or in areas with special hygiene regulations.
- In mines.
- In ATEX areas (in explosive and aggressive environments, e.g. explosive gases and dusts).
- If physical effects (welding currents, vibrations or others) or chemically acting media damage the seals (resistance of the seal material) or components and this can lead to functional failure or premature failure.

For deviating operating and environmental conditions,e.g.:

- Higher operating pressures or flow rates than indicated on the data sheet or installation drawing.
- With hydraulic fluids that do not correspond to the specifications.

Side load acting on the piston rod

The application of side loads to the piston rod as well as the use of the product as a guiding element is inadmissible.

Special solutions are available on request!

7 Installation

⚠ WARNING

Injury by high-pressure injection (squirting out of hydraulic oil under high pressure)!

Improper connection can lead to escapes of oil under high pressure at the connections.

- Mounting or dismounting of the element must only be made in depressurised mode of the hydraulic system.
- Connection of the hydraulic line as per DIN 3852/ISO 1179.
- Unused connections have to be locked professionally.
- Use all mounting holes.

Injury by high-pressure injection (squirting out of hydraulic oil under high pressure)!

Wear, damage of the seals, ageing and incorrect mounting of the seal kit by the operator can lead to escapes of oil under high pressure.

- Before using them make a visual control.

Injury by dropping parts!

Some products have a heavy weight and can cause injury when dropping.

- Transport products professionally.
- Wear personal protection equipment!

Weight specifications see chapter "Technical characteristics".

Poisoning due to contact with hydraulic oil.

Wear, damage of the seals, aging and incorrect mounting of the seal kit by the operator can lead to escapes of oil.
Incorrect connection can lead to escapes of oil at the ports.

- For handling with hydraulic oil consider the material safety data sheet.
- Wear protection equipment.

7.1 Design

7.1.1 Design of cartridge-type version

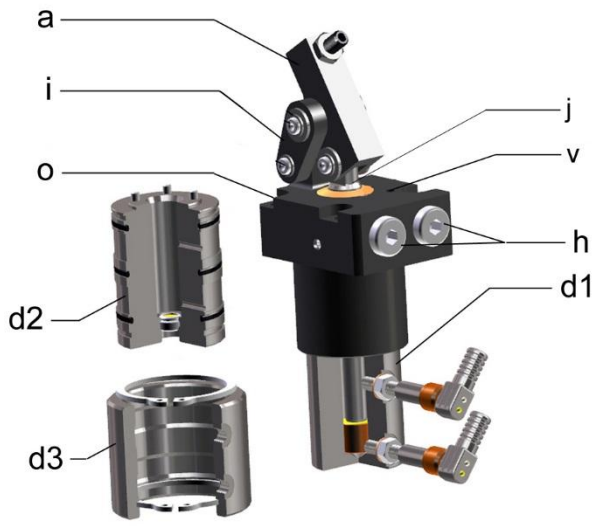


Figure 1: Components

d1 Inductive position monitoring d2 Pneumatic position monitoring cartridge-type d3 Pneumatic position monitoring mounting body pipe thread h Plugs	i Lever mechanism a Clamping lever with adjustable contact bolt or long clamping lever j Piston o Fixing screws "not represented"

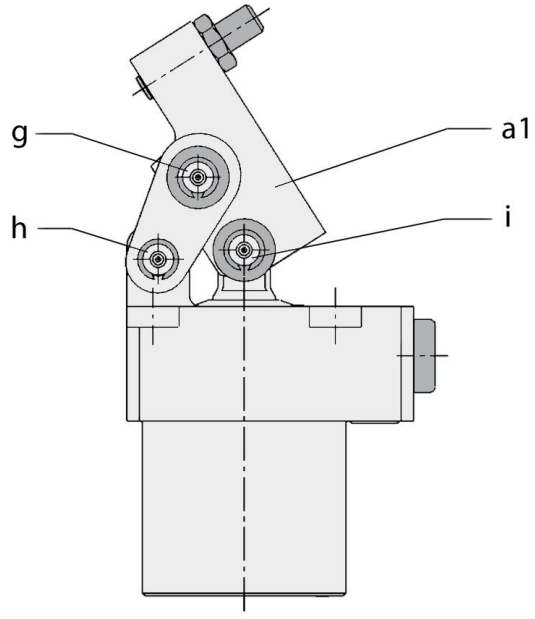


Figure 2: Components of the lever mechanism

g Upper hinge pin with snap rings and supporting disks h Lower hinge pin with snap rings	a1 Clamping lever i Piston pin with snap rings and supporting disks

7.2 Assembly of special clamping levers

⚠ WARNING

Injury by jumping out snap rings

Wear safety goggles!

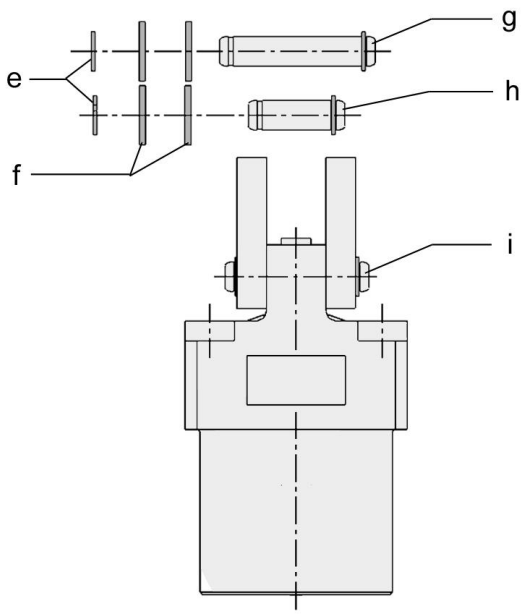


Abb. 3: Delivery - hinge clamp without clamping arm

e Snap ring f two of each supporting disk g Upper hinge pin with snap ring	h Piston pin with snap ring i Lower hinge pin preassembled with hinges

NOTE

Slightly grease the pins before assembly.

1. Mount piston pin

- Push the supporting disk onto the piston pin against the preassembled snap ring.
- Push the piston pin with the preassembled snap ring and the supporting disk through the clamping lever and connect it with the piston rod eye.
- Put the supporting disk
- Centre the snap ring on the pin cone and push the ring with a mounting sleeve (see chapter 9.2.2) until it snaps in into the snap ring groove. Counterhold at the opposite site of the pin.

2. Mount upper hinge pin

- Push the supporting disk onto the hinge pin against the preassembled snap ring.
- Push the hinge pin with the preassembled snap ring and the supporting disk through the clamping lever and connect it with the piston rod eye.
- Put the supporting disk
- Centre the snap ring on the pin cone and push the ring with a mounting sleeve (see chapter 9.2.2) until it snaps in into the snap ring groove. Counterhold at the opposite site of the pin.

3. Check all pins for axial tightness

7.3 Mounting types

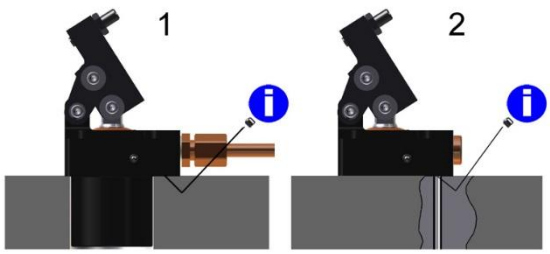


Fig. 4: Mounting types

1 In through hole with pipe thread at the back	2 In through hole with oil supply through drilled channels

NOTE

O-ring
When connected via pipe threads, both O-rings have to be inserted into the counterbore!

⚠ CAUTION

Set screws
Set screws have to be removed for connection via drilled channels.

7.4 Admissible oil flow rate

⚠ WARNING

Injury due to overload of the element
High-pressure injection (squirting out of hydraulic oil under high pressure) or flying components!
- Due to throttling or closing of ports a pressure intensification can occur.
- Connect the ports professionally!

⚠ CAUTION

Malfunction or early failure
Exceeding the max. flow rate can lead to overload and premature failure of the product..
- The maximum flow rate must not be exceeded!

7.4.1 Calculation of the admissible flow rate

Admissible flow rate
The admissible pump flow rate or the admissible stroke speed is valid for vertical mounting positions in combination with standard add-on parts as clamping arms or contact bolts, etc.
In case of other mounting positions and/or add-on parts the flow rate has to be reduced.
If the pump flow rate divided by the number of elements is larger than the admissible flow rate of one element, the flow rate has to be throttled.
This prevents an overload and therewith an early failure.
The pump flow rate can be checked as follows:

$Q_P \leq 0{,}06 \cdot \dot{V}_Z \cdot n$ or $Q_P \leq 6 \cdot v_Z \cdot A_K \cdot n$

$\dot{V}_Z$ for clamping elements and work supports (indicated on the data sheets)

Maximum piston speed

At specified pump flow rate Q_P and with the effective piston area A_K the piston speed can be calculated as follows:

$$v_m < \frac{Q_P}{6 \cdot A_K \cdot n}$$

Legend

$\dot{V}_Z$ = Admissible flow rate of the element in [cm³/s]
Q_P = Flow rate of the pump in [l/min]
A_K = Piston area in [cm²]
n = Number of elements, same dimensions
$v_Z = v_m$ = Admissible/maximum stroke speed in [m/s]

Further " things worth knowing about hydraulic cylinders, basics, detailed knowledge and calculations on hydraulic cylinders" see in the Technical library on the internet!

or download
D GB F I E

7.4.2 Throttling of the flow rate

7.4.2.1 External flow control valves

A flow rate throttling always has to be effected in the supply line to the element. This avoids pressure intensification and thereby pressures exceeding the max. operating pressure. The hydraulic circuit diagram shows flow control valves which allow oil return from the element without any impediments.

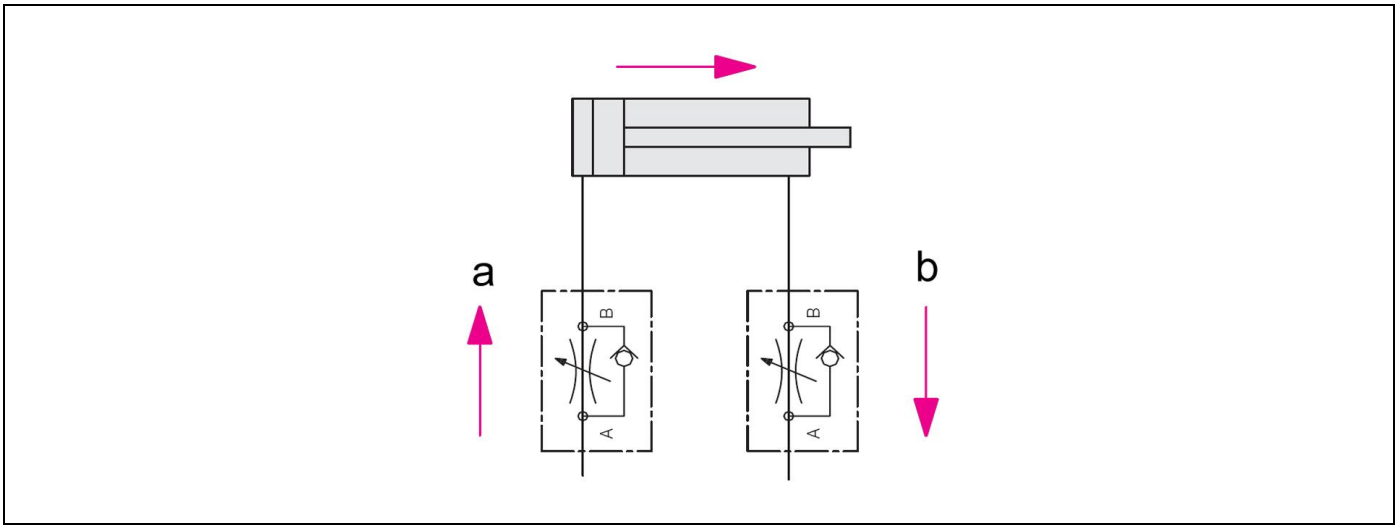


Figure 5: Hydraulic circuit diagram with flow control valves

a Throttle direction	b free flow

If throttling in the return line is required because of negative load, make sure, that the max. operating pressure (see Technical data) will not be exceeded.

7.4.2.2 Integrated flow control valve

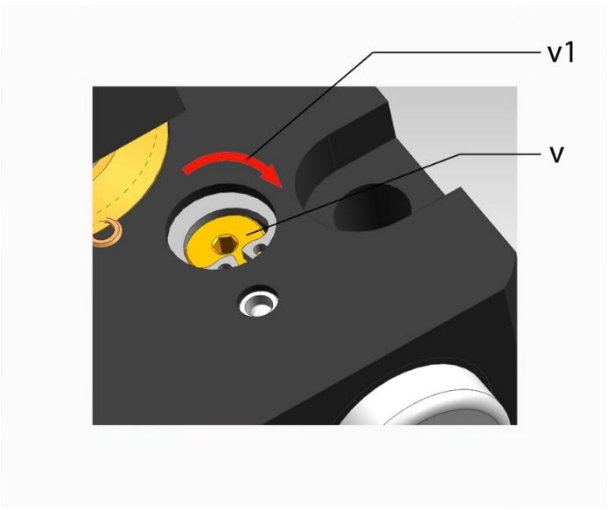


Figure 6: Integrated flow control valve

v Throttle screw SW 1.5	v1 Direction of rotation (close)

The flow control valve in port A is effective in both directions, i.e. for clamping and unclamping. The throttling screw in the flange is easily accessible from above.

NOTE

Clamping time

The hinge clamp with short clamping arm is designed for a clamping time of 0.5 s.

Throttling has to be made in the following cases:

- If the admissible flow rate per hinge clamp is exceeded due to the pump flow rate (see Technical data).
- If the clamping lever has a greater mass, that means in the case of longer clamping levers, to avoid a too hard stop in the end position. The setting is made based on feeling.

- If various hinge clamps shall move in synchronism. If a number of hinge clamps is connected to one supply line, in the majority of cases first the clamps that are closer to the power unit move. These can be slightly throttled by feeling.
- If one or several hinge clamps shall clamp delayed, possibly a sequence valve can be saved by the throttling.

NOTE

Adjust flow control valves always at operating temperatures!

7.5 Installation of manifold-mounted types

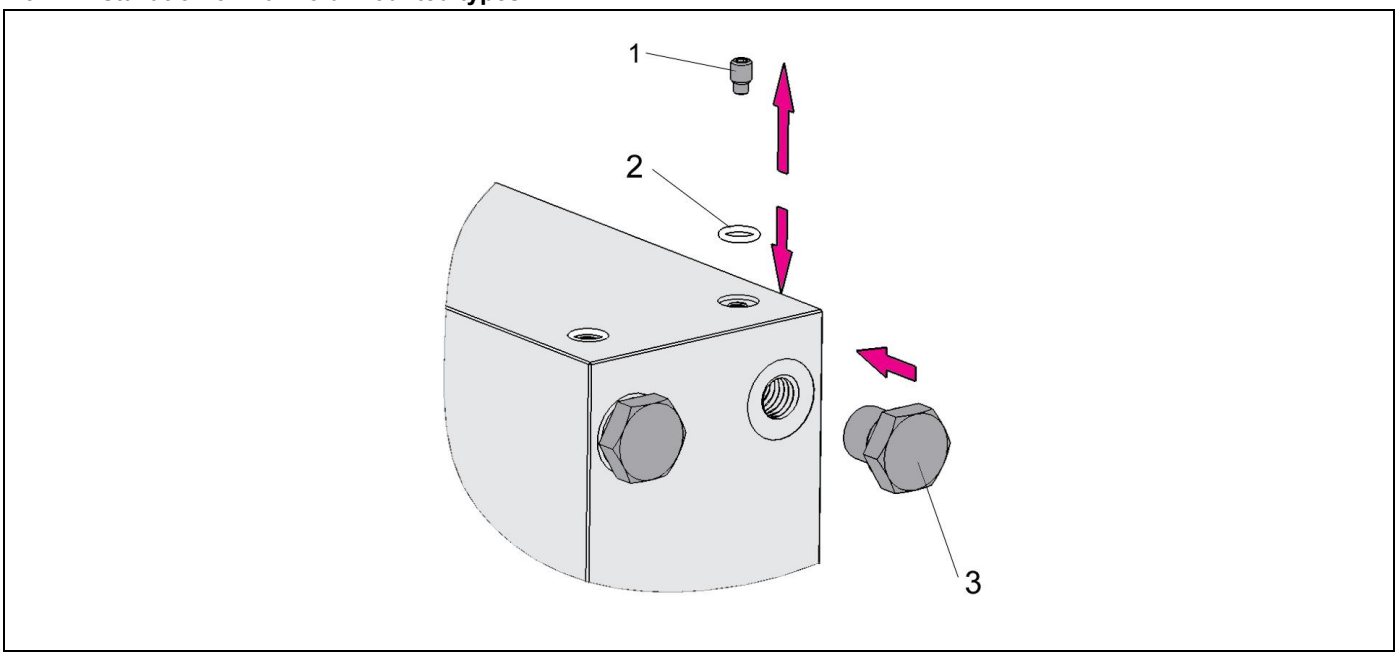


Figure 7: Example of the preparation for hydraulic ports without tubes

1 Set screw 2 O-ring (accessory, if required)	3. Screw plug (accessory, if required)

1. Drill the holes for hydraulic oil supply and return in the fixture (see also data sheet).
2. Grind or finish mill flange surface (Rz 4 and plane, marks, scratches, shrink holes, concentric machining marks are not admissible).
3. Remove set screw.
4. Seal pipe ports with screw plug (accessory, if required)
5. Close hydraulic port by means of screw plug.
6. Clean the support surfaces.
7. Position and fix on the fixture
   (use fixing screws 10.9).
8. Install bleeding screws at the upper ends of the piping.

NOTE

Tightening torques

- The tightening torques for the fixing screws have to be designed with reference to the application (e. g. as per VDI 2230).

Proposals and approximate values for the tightening torques see chapter "Technical characteristics".

7.6 Installation of pipe-mounted types

1. Clean the support surfaces.
2. Insert O-ring in counterbore
3. Fix the element at the support surface (see figure "Mounting types), use fixing screws 10.9.

⚠ WARNING

Injury by falling products!

Safety shoes have to be worn to avoid injuries due to falling objects.

NOTE

Tightening torques
- The tightening torques for the fixing screws have to be designed with reference to the application (e. g. as per VDI 2230).

Proposals and approximate values for the tightening torques see chapter "Technical characteristics".

7.7 Connection of the hydraulic equipment

1. Connect hydraulic lines to qualifying standards and pay attention to scrupulous cleanness (A = Clamp, B = Unwind)!

NOTE

More details
- See ROEMHELD data sheets A 0.100, F 9.300, F 9.310 and F 9.360.

Screwed Plug
- Use only fittings "screwed plug B and E" as per DIN 3852 (ISO 1179).

Hydraulic connection
- Do not use sealing tape, copper rings or coned fittings.

Pressure fluids
- Use hydraulic oil as per ROEMHELD data sheet A 0.100.

8 Start up

⚠ WARNING

Poisoning due to contact with hydraulic oil.
Wear, damage of the seals, aging and incorrect mounting of the seal kit by the operator can lead to escapes of oil.
Incorrect connection can lead to escapes of oil at the ports.
- For handling with hydraulic oil consider the material safety data sheet.
- Wear protection equipment.

Injury by crushing!
Components of the product make a movement while they are in operation, this can cause injuries.
- Keep parts of the body and items out of the working area!

Injury by cutting!
- Sharp-edged threads can cause cut injuries.
- Wear personal protection equipment!

⚠ CAUTION

Injury due to bursting or malfunction
Exceeding the max. operating pressure (see technical data) can cause the product to burst or malfunction.
- The maximum operating pressure must not be exceeded.
- If necessary, avoid overpressure by using suitable valves.

- Check tight seating (check tightening torque of the fixing screws, see chapter "Technical characteristics").
- Check tight seating of hydraulic connections (check tightening torque of the hydraulic connections, see chapter "Technical characteristics").
- Bleed the hydraulic system.

NOTE

Clamping time
- Without bleeding the clamping time will be considerably prolonged and function problems may occur.

- Start up of position monitoring.

Note

See operating instructions of the position monitoring.

8.1 Bleeding of pipe-mounted types

1. Loosen carefully at low pressure union nut of the pipe at the hydraulic ports.
2. Pump until bubble free oil comes out.
3. Fasten union nuts of the pipe.
4. Check tightness.

8.2 Bleeding of manifold-mounted types

1. Loosen carefully the bleeding screws of the fixture at low pressure.
2. Pump until bubble free oil comes out.
3. Fasten the bleeding screws.
4. Check correct function.
5. Check sealing of the hydraulic connections!

9 Maintenance

⚠ WARNING

Burning due to hot surface!

During operation, surface temperatures on the product can exceed 70°C.

- Maintenance and repair work should only be performed in a cooled down condition and/or with protective gloves.

Injury by crushing!

Due to the stored energy, an unexpected start of the product can occur.

- Maintenance works at the product must only be made in depressurised mode!
- Keep hands and other parts of the body out of the working area!

9.1 Cleaning

⚠ CAUTION

Material damage, damage to moving components

Damage to piston rods, plungers, bolts, etc., as well as wipers and seals can lead to leakage or premature failure!

- Do not use cleaning agents (steel wool or similar) that cause scratches, marks or the like.

Material damage, damage or functional failure

Aggressive cleaning agents can cause damage, especially to seals.
The product must not be cleaned with:

- corrosive or caustic substances or
- organic, solvents such as halogenated or aromatic hydrocarbons and ketones (cellulose thinner, acetone, etc.).

The product must be cleaned at regular intervals, especially the area of the piston or the plunger housing has to be cleaned from swarf and other liquids.

In the case of heavy contamination, cleaning must be made at shorter intervals.

Note

Special care must be taken with:

- dry machining
- minimum quantity lubrication and
- small grinding swarf

Small swarf and dust can stick to the rod / plunger of the element and be pulled into the sealing gap of the metallic wiper edge.
Thus, a sticky / pasty mass of swarf / dust can arise that hardens during standstill.
Result: Malfunction due to deadlock / bonding and increased wear.
Remedy: Regular cleaning of the piston rod/support plunger in the effective area of the wiper.

9.1.1 Exchange clamping lever

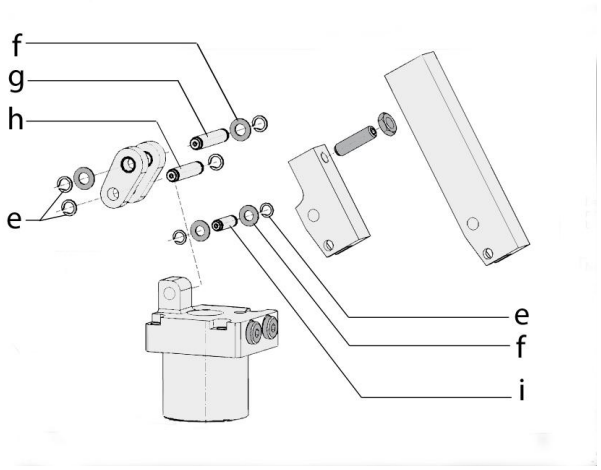


Figure 8: Clamping lever mechanism

e	Seeger snap ring	h	Lower hinge pin
f	Supporting disk	i	Piston pin
g	Upper hinge pin		

NOTE

In the case of damage at the lever mechanism, the complete subassembly "Clamping lever, complete" should be replaced.

⚠ WARNING

Injury by jumping out snap rings

Wear safety goggles!

9.1.1.1 Disassembly

To press out the pins, the snap ring at each pin has to be removed.

NOTE

For snap rings with smaller diameters there are unfortunately no special tools available for disassembly.
By means of appropriate screwdrivers, the snap rings must be **carefully** levered out of the groove.

9.1.1.2 Assembly

NOTE

Only use brand-new components.

This applies in particularly the pins and snap rings.

Slightly grease the pins before assembly.

Mounting sleeves for Seeger snap rings

Pin Ø [mm]	Seeger snap ring	Mounting sleeve inner Ø	Mounting sleeve min. outer Ø
6	SW 6	6.1	8
7	SW 7	7.1	9
8	SW 8	8.1	10
10	SW 10	10.1	12
12	SW 12	12.1	14
14	SW 14	14.1	16

Chart - pin Ø [mm]

Hinge clamps 1826X	71	72	73	74	75
Piston pin	6	6	7	8	12
Upper hinge pin	6	8	8	10	14
Lower hinge pin	6	7	8	10	14

1. Mount the appropriate snap ring at one side to all three pins.
- Centre the snap ring on the pin cone and push the ring with a mounting sleeve (see chart) until it snaps in into the snap ring groove.

2. Lower hinge pin
- Put the hinge clamp with the preassembled snap ring into the bore hole at the smaller side of the hinge and connect it to the eye on the flange of the body.
- Centre the snap ring on the pin cone and push the ring with a mounting sleeve (see chart) until it snaps in into the snap ring groove. Counterhold at the opposite site of the pin.

3. Piston pin
- 1. Push the supporting disk onto the piston pin against the preassembled snap ring.
- Push the piston pin with the preassembled snap ring and the supporting disk through the clamping lever and connect it with the piston rod eye.
- 2. Put the supporting disk
- 3. Centre the snap ring on the pin cone and push the ring with a mounting sleeve (see chart) until it snaps in into the snap ring groove. Counterhold at the opposite site of the pin.

4. Upper hinge pin
- 1. Push the supporting disk onto the piston pin against the preassembled snap ring.
- Push the hinge pin with the preassembled snap ring and the supporting disk through the clamping lever and connect it with the piston rod eye.
- 2. Put the supporting disk
- 3. Centre the snap ring on the pin cone and push the ring with a mounting sleeve (see chart) until it snaps in into the snap ring groove. Counterhold at the opposite site of the pin.

5. Check all pins for axial tightness

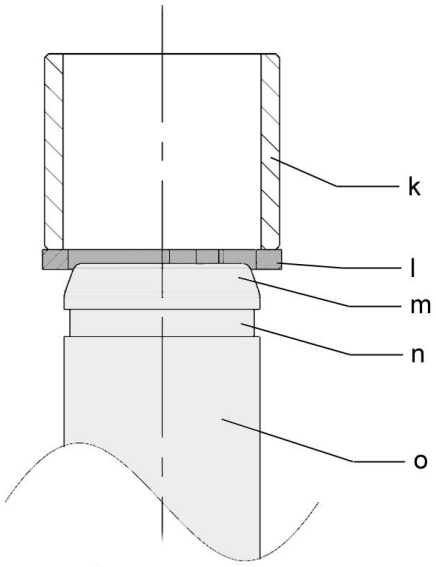


Figure 9: Mounting of the snap rings

k Mounting sleeve	n Snap ring groove
l Snap ring	o Pin
m Cone	

9.1.2 Regular checks

1. Check tightness of hydraulic connections (visual control).
2. Check running surfaces (of the piston rod or bolt) if there are marks and scratches. Traces of marks can be an indication for a contaminated hydraulic system or an inadmissible side load of the block cylinder.
3. Leakage check at the housing - piston rod, bolt or flange.
4. Clamping force control by pressure control.
5. Check if the maintenance intervals are kept.

9.1.3 Exchange seal kit

The exchange of the seal kit is made in case of external leakages. For high availability, the seals have to be changed at the latest after 500,000 cycles or 2 years.
The seal kit is available as spare part. An instruction for the exchange of the seal kit is available on request.

NOTE

Seal Kits

- Do not install seal kits which were exposed to light for a longer time.
- Pay attention to the storage conditions (see chapter "Technical characteristics").
- Only use original seals.

9.1.4 Trouble shooting

Trouble	Cause	Remedy
Piston does not extend:	hydraulic oil supply or return is impeded	check and blow through tubes or channels
Piston extends jerkily:	air in the hydraulic system	hydraulic bleeding
System pressure reduces:	hydraulic port leaky	seal
	wear of seals	replace seals

10 Accessory

10.1 Pneumatic position monitoring to be mounted at products with extended piston rod



10.1.1 Description of the product

The cartridge type is screwed at the cylinder bottom. A signal sleeve is provided at the extended piston rod causing the activation of the pneumatic jets.
When required, the mounting body is put onto the cartridge-type version and held by the supplied safety ring.

10.1.2 Validity of the documentation

These operating instructions apply to the pneumatic position monitoring with the following part number:

- 0353 341, -342, -343, -344, -345

Mounting body for tetrofitting of the cartridge type

- 0353 341A, -342A, -343A, -344A, -345A

10.1.3 For your safety

Qualification of the user

All works may only be effected by qualified personnel familiar with the handling of pneumatic components.

10.1.4 Application

10.1.4.1 Intended use

Pneumatic position monitorings are used for industrial applications in order to get a feedback from both end positions of the stroke range of a product.
They are exclusively designed to be mounted at ROEMHELD products and for their control.
In addition, applies the intended use of the products for which they have been designed.

10.1.5 Installation

1. Screw the signal sleeve to the switch rod.
2. Screw the cartridge-type body to the flange (4 screws).
3. Put the mounting body onto the cartridge type and fix it with a safety ring.
4. Connect both pneumatic ports **(d = unclamped** and **b = clamping range)**.
5. If there is any danger of fluids being sucked into the filter G1/8, the filter element has to be removed and a vent hose has to be connected.

NOTE

For interpretation of the pneumatic pressure we recommend to use a pneumatic pressure switch.
Parallel connection for up to 8 swing clamps is possible. For a greater number there are special solutions. Please contact us.
A signal evaluation with differential pressure switches is possible.

10.1.6 Start up

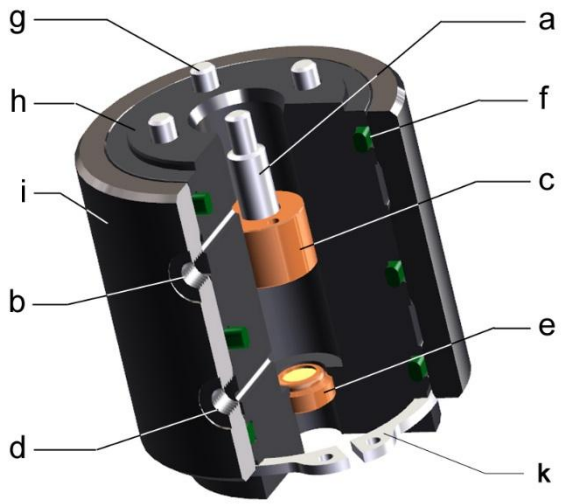


Figure 10: Design

a	Fixation of the signal sleeve	d	Lower pneumatic port, unclamped
b	Upper pneumatic port, clamping range	e	Venting by means of the filter element
c	Signal sleeve	f	O-ring
h	Cartridge type	g	Fixing screw
i	Mounting body	k	Safety ring

1. Connect pneumatic ports to the position monitoring.
2. The piston position will be signalled by the pressure build up at the upper or lower pneumatic port:

Pressure built-up and/or signal sleeve is	Piston is in
at the top (Fig. Design)	clamping position
at the bottom	unclamping position

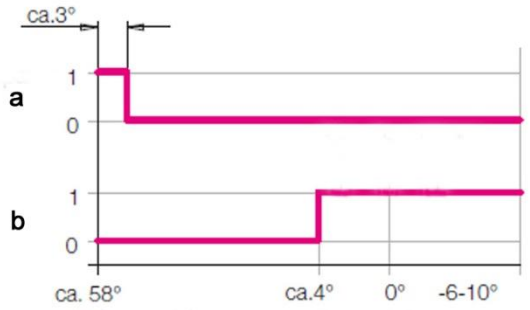


Figure 11: Signal course

a Unclamped b Clamped	0 = Passage 1 = Closed

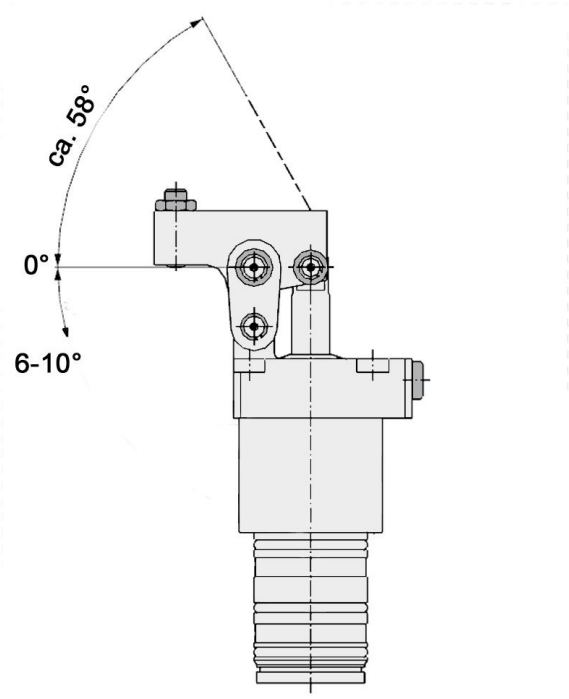


Figure 12: Clamping arm position

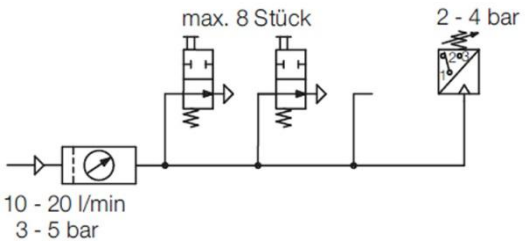


Figure 13: Monitoring by pneumatic pressure switch

Technical data

Connection	Drilled channels or threads M5
Nominal diameter	2 mm
Max. air pressure	10 bar
Range of operating pressure	3…5 bar
Differential pressure *) at 3 bar system pressure 5 bar system pressure	 min. 1.5 bar min. 3.5 bar
Air volume **)	10…20 l/min

*) Minimum pressure difference, if one or several position monitorings are not operated.
**) For measuring of the flow rate appropriate devices are available.

NOTE

Signal evaluation
A signal evaluation with differential pressure switches is possible.

Impurities in the compressed air
- The pollution of the compressed air can lead to interferences in the measurement .

10.1.7 Maintenance

⚠ WARNING

Burning due to hot surface!
During operation, surface temperatures on the product can exceed 70°C.
- Maintenance and repair work should only be performed in a cooled down condition and/or with protective gloves.

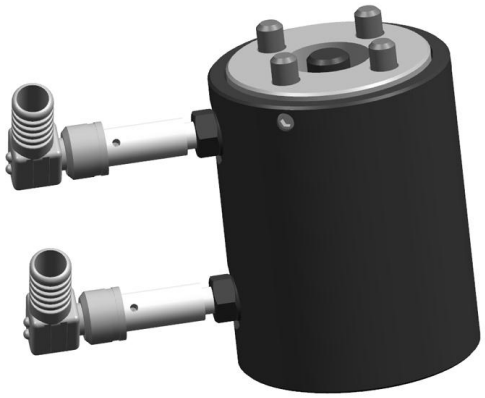
10.1.7.1 Cleaning
The position monitoring must be cleaned at regular intervals.

10.1.7.2 Regular checks
- Check position monitoring if there are damages.
- Check tight seating of the position monitoring.
- The position monitoring itself is maintenance free.

10.1.8 Trouble shooting

Trouble	Cause	Remedy
No signal	Insufficient pressure differential	Throttle flow rate, reduce pressure
	Position monitoring has become loose	Fix again position monitoring
	Leakage in the system	Check supply lines
Incorrect signals:	Position monitoring has become loose	Fix again position monitoring

10.2 Electrical position monitoring to be mounted at products with switch rod



10.2.1 Description of the product
The position monitoring is screwed on the cylinder bottom.
A signal sleeve is fixed at the switching disk causing the activation of the inductive proximity switches.
The position monitoring is delivered with and without proximity switches; sensors and plugs are available as an accessory.

10.2.2 Validity of the documentation

These operating instructions apply to the electrical position monitoring with the following part numbers:
without switch

- 0353 351, -352, -353, -354, -355

with switch and plug

- 0353 351S, -352S, -353S, -354S, -355S

10.2.3 For your safety

Qualification of the user

All works may only be effected by qualified personnel familiar with the handling of electric components.

10.2.4 Application

10.2.4.1 Intended use

Position monitorings are used for industrial/commercial applications to obtain electrical feedback from both end positions or intermediate positions of a product.
They are exclusively designed to be mounted at ROEMHELD products and for their control.
In addition, applies the intended use of the products for which they have been designed.

10.2.4.2 Misapplication

Position monitoring systems are not suitable for applications where coolants are used, since swarf can influence the function of the magnetic sensors.

10.2.5 Installation

1. Screw the signal sleeve to the switch rod.
2. Screw the adapter to the flange (4 screws).
3. Put the control housing in any angular position on the adapter and lock it with 3 set screws.
4. Connect both proximity switches E1 and E2 as per electrical circuit diagram.

NOTE

Application of Position Control

- Position monitoring is not suitable for applications where coolants and lubricants are used.
- Install protection covers against possible swarf.

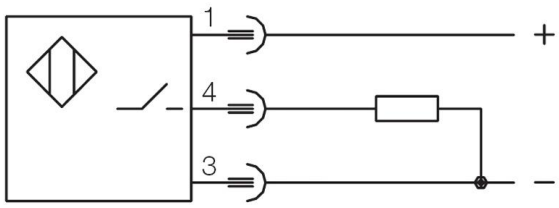


Figure 14: Circuit diagram for pnp(+) inductive proximity switches

1	brown +
3	blue -
4	black

10.2.6 Start up

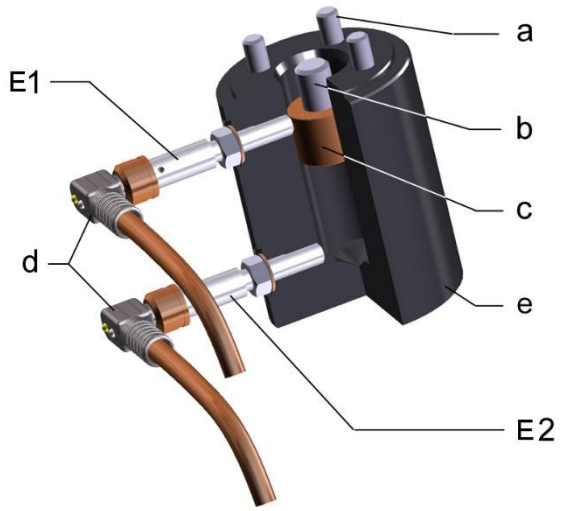


Figure 15: Design of the electrical position monitoring

E2 Proximity switch (unclamped) E1 Proximity switch (clamping range) a Fixing screws (position monitoring)	b Fixing screw (signal sleeve) c Signal sleeve d Plug e Control housing

Adjustment of proximity switches

1. Unclamp piston.
2. Screw in proximity switch E2 up to the stop on the signal sleeve and turn back 1/2 rotation. Tighten safety nut at the proximity switch.
3. Clamp piston.
4. Screw in proximity switch E1 up to the stop on the signal sleeve and turn back 1/2 rotation. Tighten safety nut at the proximity switch.

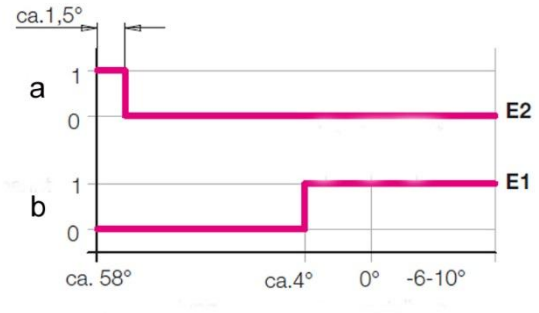


Figure 16: Signal course - clamping

a	Unclamped	0	Signal OFF
b	Clamped	1	Signal ON

Figure shows the signal course at both proximity switches during a clamping and unclamping process (max. = total stroke).

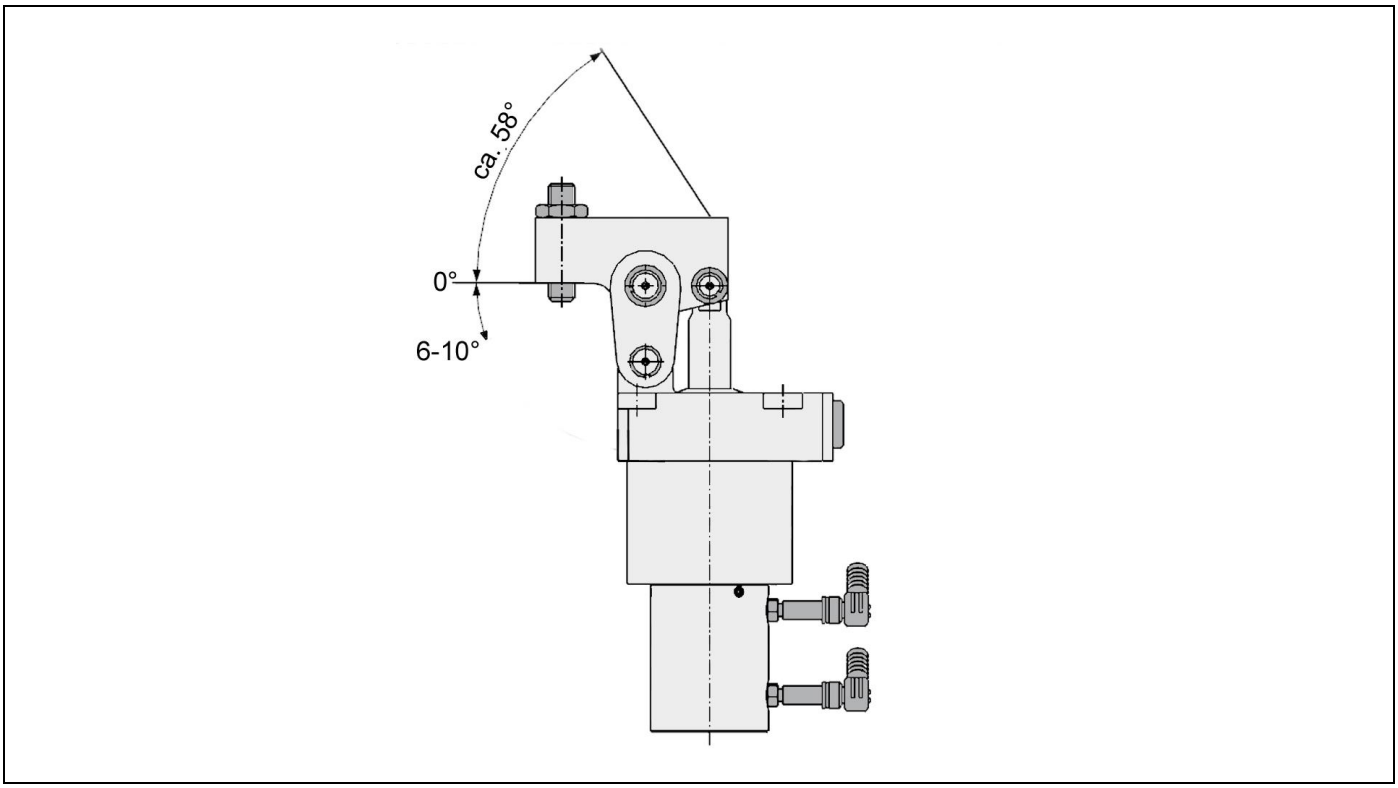


Figure 17: Clamping arm position

Technical data

Operating voltage	10…30 V DC
Max. residual ripple	10%
Max. constant current	100 mA
Switching function	interlock
Output	PNP
Housing material	stainless steel
Thread	M5 x 0.5
Code class	IP 67
Ambient temperature	-25…+70 °C
LED Function display	Yes
protected against short circuits	Yes
Connection type	Plug
Length of cable	5 m

10.2.7 Maintenance

⚠ WARNING

Burning due to hot surface!

During operation, surface temperatures on the product can exceed 70°C.

- Maintenance and repair work should only be performed in a cooled down condition and/or with protective gloves.

10.2.7.1 Cleaning

The position monitoring must be cleaned at regular intervals.

10.2.7.2 Regular checks

- Check position monitoring if there are damages.
- Check tight seating of the position monitoring.
- The position monitoring itself is maintenance free.

10.2.8 Trouble shooting

Trouble	Cause	Remedy
No signal when extending or retracting the piston:	No supply voltage	Check supply voltage and switch on again, if necessary
Incorrect signals:	Proximity switch or position monitoring has become loose	Adjust and fix again proximity switch or position monitoring
No signal:		

10.2.9 Accessory

- Plug with cable
- Spare proximity switch

Note

See ROEMHELD data sheet

10.3 Technical characteristics

Characteristics

Type	Maximum operating pressure (bar)	Maximum clamping force Without switch rod 70 bar (kN)	Maximum clamping force Without switch rod 120 bar (kN)	Maximum clamping force With switch rod 70 bar (kN)	Maximum clamping force With switch rod 120 bar (kN)
1826X121XX	120	2.6	4.5	2.3	4.0
1826X122XX	120	3.5	6.0	3.1	5.3
1826X123XX	120	4.4	7.6	4.0	7.0
1826X124XX	120	7.3	12.6	6.8	11.6
1826X125XX	120	12.1	20.8	11.5	19.8

X = Code letter version L, G, R

Tightening torques and admissible flow rate

Type	Screws 10.9 DIN 912 / ISO 4762	Tightening torque [Nm]	Admissible flow rate [cm³/s]
1826X121XX	M 5 × 25	8.7	16
1826X122XX	M 5 × 25	8.7	25
1826X123XX	M 6 × 25	15	40
1826X124XX	M 8 × 30	36	75
1826X125XX	M 10 × 30	72	150

NOTE

Further information

- For further technical data see ROEMHELD data sheet. B18268

11 Storage

⚠ CAUTION

Damage due to incorrect storage of components

In case of improper storage, the seals can embrittle and resinification of the anti-corrosive oil or corrosion on/in the element can occur.

- Storage in the packaging and moderate environmental conditions.
- The product must not be exposed to direct sunlight, since UV light may cause serious damage to the seals.

The elements are tested by default with mineral oil. The exterior of the elements is treated with a corrosion inhibitor.
The oil film remaining after the test provides for a six-month interior corrosion protection, if stored in dry and uniformly tempered rooms.
For longer storage times, the element has to be filled with a non-resinifying corrosion inhibitor and the outside surfaces must be treated.

12 Disposal



Hazardous to the environment
Due to possible environmental pollution, the individual components must be disposed only by an authorized expert company.

The individual materials have to be disposed as per the existing regulations and directives as well as the environmental conditions. Special attention has to be drawn to the disposal of components with residual portions of hydraulic fluids. The instructions for the disposal at the material safety data sheet have to be considered.
For the disposal of electrical and electronic components (e.g. stroke measuring systems, proximity switches, etc.) country-specific legal regulations and specifications have to be kept.

13 Declaration of manufacture

Manufacturer

Römheld GmbH Friedrichshütte
Römheldstraße 1-5
35321 Laubach, Germany
Tel.: +49 (0) 64 05 / 89-0
Fax: +49 (0) 64 05 / 89-211
E-mail: info@roemheld.de
www.roemheld.com

Responsible person for the documentation:
Dipl.-Ing. (FH) Jürgen Niesner, Tel.: +49(0)6405 89-0.

Declaration of manufacture of the products

They are designed and manufactured in line with the relevant versions of the directives **2006/42/EC**(EC MSRL) and in compliance with the valid technical rules and standards.
In accordance with EC-MSRL, these products are components, that are not yet ready for use and are exclusively designed for the installation in a machine, a fixture or a plant.

According to the pressure equipment directives the products are not to be classified as pressure reservoirs but as hydraulic placing devices, since pressure is not the essential factor for the design, but the strength, the inherent stability and solidity with regard to static or dynamic operating stress.

The products may only be put into operation after it was assessed that the incomplete machine / machine, in which the product shall be installed, corresponds to the machinery directives (2006/42/EC).

The manufacturer commits to transmit the special documents of the products to state authorities on request.
The technical documentation as per appendix VII part B was prepared for the products.

Laubach, 22.10.2026