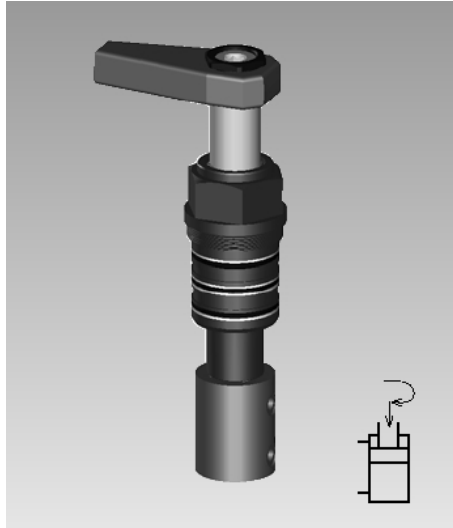




Swing clamp with reinforced swing mechanism

threaded-body type, with optional switch rod for position monitoring,
without overload protection device, double acting, max. operating pressure 500
bar



1 Description of the product

Double-acting threaded-body swing clamp with reinforced swing mechanism with and without switch rod for position monitoring.

Enables the use in limited space. The threaded-body swing clamp can be directly screwed into the fixture body down to the hex-section of the cylinder body. Oil supply is made through drilled channels.

This line is a further development of the proved ROEMHELD swing clamps with the aim to improve process safety in linked clamping systems. The most important characteristics are as follows:

- Omission of the overload protection device
In the case of a slight collision with the clamping arm during loading and unloading of the fixture, the angular position of the clamping arm will be maintained. Less critical are the weight of the clamping arm or an increased swing speed.
- FKM wiper
This wiper has a high chemical resistance when using aggressive cutting fluids.
- Reinforced swing mechanism
The reinforced swing mechanism endures a collision of the clamping arm with the workpiece during clamping up to a pressure of 100 bar.

2 Validity of the documentation

This document applies to the following products:

Swing clamps with reinforced swing mechanism of data sheet B 1.8921. The following types or part numbers are concerned:

- 1895-101-VXX35, -121-VXX35, -131-VXX35, -201-VXX35, 221-VXX35, -231-VXX35, -241-VXX35
- 1897-101-VXX38, -121-VXX38, -131-VXX38, -201-VXX38, 221-VXX38, -231-VXX38, -241-VXX38

and their versions XX:

- DH = without metallic wiper without switch rod
- DM = with metallic wiper without switch rod
- MH = without metallic wiper with switch rod
- MM = with metallic wiper with switch rod

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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.



Mandatory sign!

The symbol stands for important information, necessary protection equipment, etc.

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 designed exclusively for clamping of workpieces or as a swivelling stop in industrial applications. They must only be operated with hydraulic oil.

Furthermore the following belongs to possible uses:

- Use within the capacity indicated in the technical characteristics (see data sheet).
- 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.
- Only HLP hydraulic oils may be used.
- Solely clamping arms may be moved.

6.2 Misapplication

WARNING

Injuries, material damages or malfunctions!

- Do not modify the product!

The use of these products is not admitted:

- For domestic use.
- On pallets or machine tool tables in primary shaping and metal forming machine tools.
- If due to vibrations or other physical / chemical effects damages of the products or seals can be caused.
- In machines, on pallets or machine tool tables that are used to change the characteristics of the material (magnetise, radiation, photochemical procedures, etc.).
- In areas for which special guidelines apply, especially installations and machines:
 - For the use on fun fairs and in leisure parks.
 - In food processing or in areas with special hygiene regulations.
 - For military purposes.
 - In mines.
 - In explosive and aggressive environments (e.g. ATEX).
 - In medical engineering.
 - In the aerospace industry.
 - For passenger transport.
- For other operating and environmental conditions e.g.:
 - Higher operating pressures than indicated on the data sheet or installation drawing.
 - With hydraulic fluids that do not correspond to the specifications.
 - Higher flow rates than indicated on the data sheet or installation drawing.

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 dismantling 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 falling parts!

- Keep hands and other parts of the body out of the working area.
- Wear personal protection equipment!

Poisoning due to contact with hydraulic oil!

Wear, damage of the seals, ageing 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.

CAUTION

Great weight may fall

Some product types have a considerable weight. These have to be secured against working free during transport.

Weight specifications see chapter "Technical characteristics".

7.1 Design

This hydraulic clamping element is a pull-type cylinder where a part of the total stroke is used to swing the piston.

Thereby the clamping points are free for loading and unloading of the fixture.

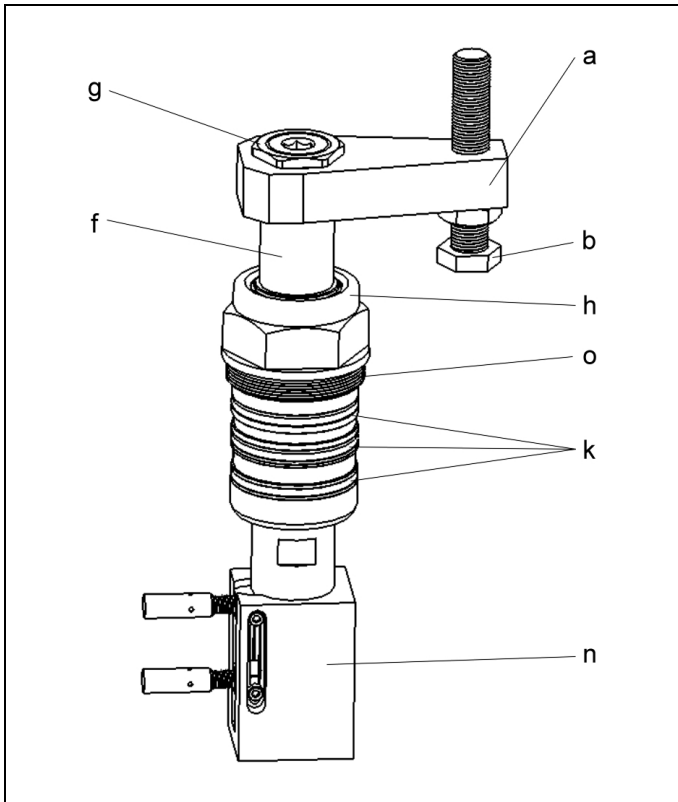


Figure 1: Components

a Clamping arm (accessory)	o Fixing possibility
b Contact bolt (accessory)	n Electrical or pneumatic position monitoring (accessory)
f Piston with integrated swing mechanism	P1 Swing stroke
g Fixing nut	P2 Clamping stroke
r Metallic wiper (optional or accessory)	
k Seals, O-ring and backup ring (included in delivery)	

7.2 Swing angle and direction

The swing clamps are available with swing angles of 0 ° up to 90 °. "Swing direction cw" means clockwise rotation, looking from above onto the piston - from the unclamped to the clamped position.

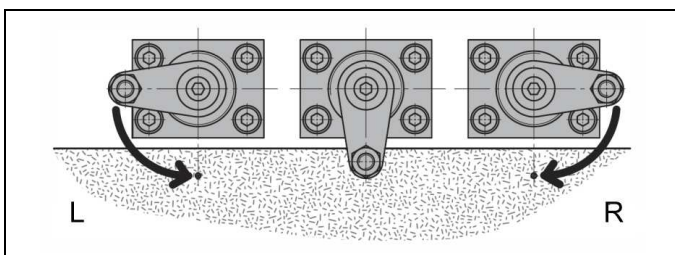


Figure 2: Swing direction
(L = counterclockwise "ccw", R = clockwise "cw")

7.3 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

Maximum flow rates do not exceed

The maximum flow rate must not be exceeded.

7.3.1 Calculation of the admissible flow rate

Admissible oil flow rate

The admissible 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 flow rate can be checked as follows:

$$Q_p \leq 0,06 \cdot \dot{V}_Z \cdot n \text{ and/or } Q_p \leq 6 \cdot v_Z \cdot A_K \cdot n$$

for clamping elements and work supports (indicated on the data sheets)

Maximum piston speed

At specified pump flow rate Q and with the effective piston area A 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]

NOTE

Oil volume

- The maximum oil volume and/or the maximum stroke speed depend on the corresponding product.
 - For clamping cylinders see data sheet A 0.100.
 - or clamping elements, work supports, hydraulic valves, power units and other hydraulic elements indicated on the corresponding data sheets.

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



7.3.2 Throttling of the flow rate

The throttling always has to be effected in the supply line to the swing clamp. Only thus pressure intensification and thereby pressures exceeding the operating pressure are avoided. The hydraulic circuit diagram shows flow control valves which allow oil return from the element without any impediments.

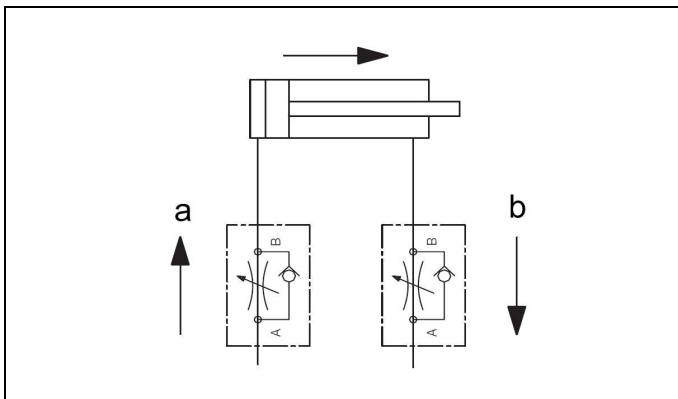


Figure 3: Hydraulic circuit diagram without flow control valves

a	Throttling direction	b	Free flow
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If a return-flow throttling is required due to a negative load, it must be guaranteed that the max. operating pressure (see technical characteristics) will not be exceeded.

7.4 Installation of products with external sealing

7.5 Design

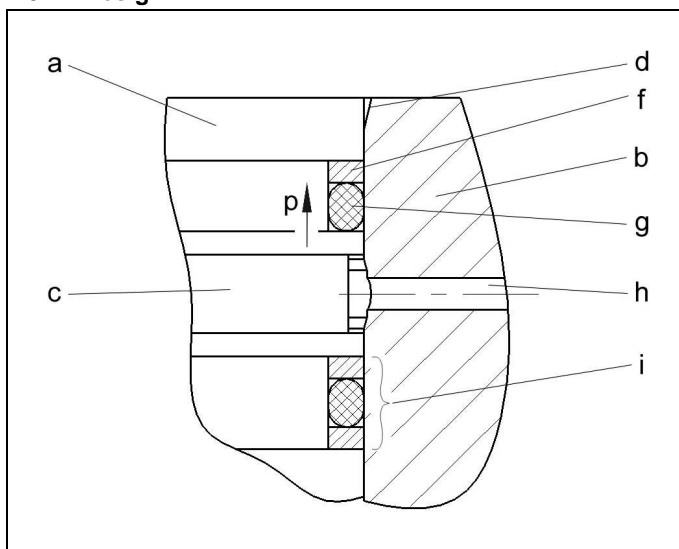


Figure 4: Components

a	Body of the element	g	O-ring seal
b	Fixture body	h	Supply bore holes in the fixture body
c	Slot to transmit the hydraulic fluid	i	Combination for pressure supply from both sides
d	Insertion chamfer	p	Pressure direction
f	Back-up ring remote from the pressure side		

7.6 Installation

WARNING

Injury by crushing!

- Due to protruding components there can be pinch points during installation.
- Keep hands and fingers away from pinch points!

Injury by cutting!

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



For works at and with the product, wear protective gloves!

Before starting the installation check the following:

- Is the location hole made as per data sheet?
 - Are the indicated tolerances and surfaces kept?
 - Is the wall thickness in the fixture sufficient?
- Are the tapers in the fixture made as per drawing?
- Are the bore holes in the installation geometry are deburred and round?
- Are machining residues as swarf, dirt and foreign particles removed?
- Are crests of threads covered?
- Are seals and components greased or lubricated before installation?
 - Pay attention to compatibility of seals with the medium!
 - It is recommended to use the medium to be sealed for lubrication.
- Do not use grease with additions of solids as molybdenum sulphite or zinc sulphite.
- Do not use sharp objects for installation!
- Pay attention to protruding back-up rings. Use aids for correct positioning.
- Use always installation aids, if possible.

Procedure for installation

1. Insert seals.
2. Insert or screw in into location hole.
3. Screw in or fasten, pay attention to smooth running. Pay attention that the seals will not be damaged.
4. Fasten with corresponding tightening torque (see general characteristics). See chapter Technical characteristics.

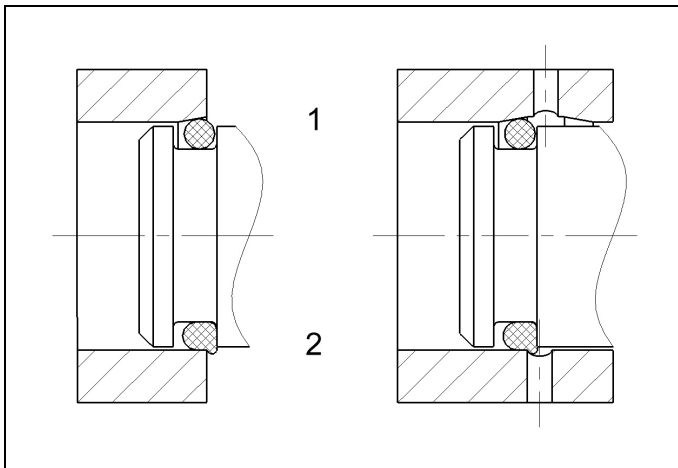


Figure 5: Installation with insertion chamfer and cross hole

1 Correct with chamfer	2 Incorrect without chamfer
------------------------	-----------------------------

7.7 Connection of the hydraulic equipment

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

i 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.

7.8 Assembly and disassembly of the clamping arm

⚠ WARNING

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!

⚠ CAUTION

When tightening and untightening the fixing nut, the piston has to be backed up

- No torques must be introduced into the piston.
- The conical surfaces of the piston and the clamping arm must be clean and grease free!

i Note

When tightening and untightening the fixing nut, the clamping arm or the hexagon socket in the piston have to be backed up. It is recommended to effect tightening and untightening in the swing range.

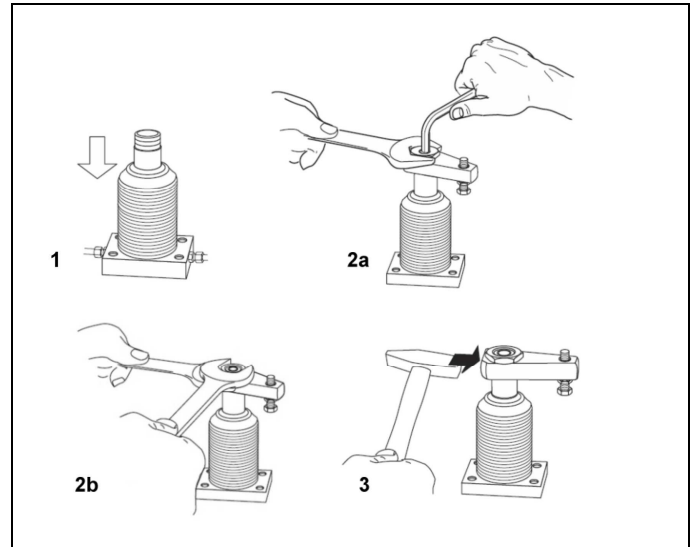


Figure 6: Assembly / disassembly (example)

7.8.1 Assembly of the clamping arm - with pressure

1. Retract piston and pressurise clamping line (port A) (Fig. Assembly, **Pos. 1**).
2. Put the clamping arm in the intended clamping position.
3. Fasten fixing nut and hold clamping arm with an Allen key (Tightening torque of the fixing nut for the clamping arm see technical characteristics. Fig. Assembly, **Pos. 2**).
4. Clamp several times.
5. Check if the clamping point is within the clamping stroke (Fig. Adjustment of the clamping arm, **Pos. 2**).

7.8.2 Assembly of the clamping arm - without pressure

1. Put the clamping arm onto the piston.
2. Move the piston manually to the clamping position.
3. Align clamping arm.
4. Fasten fixing nut with an Allen key and hold the clamping arm with an open-ended wrench (Tightening torque of the fixing nut for the clamping arm see technical characteristics. Fig. Assembly, **Pos. 2**).
5. Clamp several times.
6. Check if the clamping point is within the clamping stroke (Fig. Adjustment of the clamping arm, **Pos. 2**).

i NOTE

Tightening torque of the fastening nut

- Tightening torque of the fixing nut for the clamping arm see technical characteristics.

7.8.3 Disassembly of the clamping arm - without pressure

⚠ CAUTION

Piston rod guide

Heavy hammering can destroy the piston rod guide!

1. Loosen the fixing nut one revolution. Hold the clamping arm with an Allen key (**Pos. 2b**).
2. Hammer **slightly** onto the front face to loosen the clamping arm (**Pos. 3**).

7.9 Adjustment of contact bolt

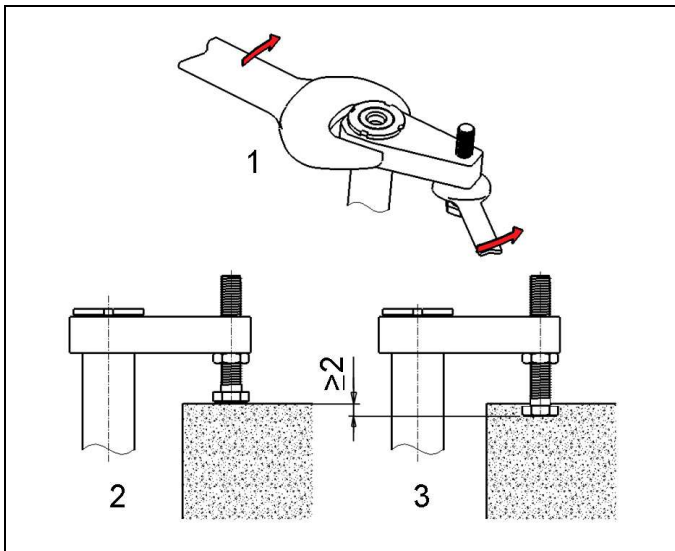


Figure 7: Adjustment of the clamping arm (example)

1. Loosen the lock nut at the contact bolt and completely turn back the contact bolt. (Fig. Adjustment of the clamping arm, **Pos. 1**).
2. Move the clamping arm to the clamping position above the workpiece. (Pay attention to the tolerance of the swing angle)
3. Screw out the contact bolt until it contacts the workpiece. (Fig. Adjustment of the clamping arm, **Pos. 2**).
4. Move the clamping arm back to the unclamping position.
5. Unscrew the contact bolt again by the half of the clamping stroke.
6. Tighten the lock nut at the contact bolt. Hold the clamping arm with an open-ended wrench. (Fig. Adjustment of the clamping arm, **Pos. 1**).

7.9.1 Check adjustment of the contact bolt

1. Move the clamping arm, with throttled flow rate and low pressure to the clamping position onto the workpiece. Pay attention that the contact bolt touches the workpiece only after completion of the swing stroke.
2. Measure and note the distance between clamping arm and upper edge of the workpiece in clamped condition (**Pos. 2**).
3. Unclamp swing clamp again.
4. Unload workpiece out of the fixture.
5. Clamp swing clamp again.
6. Measure the distance as described below item 2. The distance measured now should be at least 2 mm smaller.

7.10 Assembly of the metallic wiper

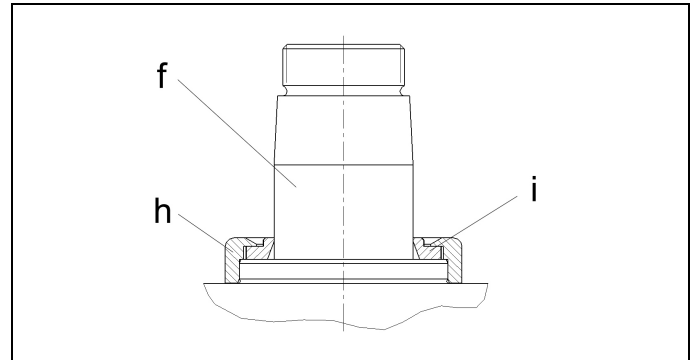


Figure 8: Metallic wiper

f	Piston with integrated swing mechanism	i	Metallic wiper, wiper ring (accessory)
h	Metallic wiper, retaining ring (accessory)		

The swing clamp is optionally supplied with mounted metallic wiper.

The metallic wiper can also be mounted later as an accessory:

1. Put the wiper ring onto the piston rod until the ring touches the body, pay attention to smooth running.
2. If the wiper ring is too stiff, the hard sealing edge must be ground with emery since otherwise the piston rod will be damaged in the long run.
3. Uniformly press the retaining ring without jamming, onto the collar of the body.

8 Start up

⚠ WARNING

Poisoning due to contact with hydraulic oil!

Wear, damage of the seals, ageing 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.

⚠ CAUTION

Operating pressure of 500 bar does not exceed

The maximum operating pressure of 500 bar must not be exceeded.

- 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.

i 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!

8.3 Admissible operating pressure

NOTE

Various Clamps

- The swing clamps are designed for a maximum pressure (see chapter Technical characteristics).
- According to the version of the used clamping arm, the operating pressure must be reduced considerably.
- Please pay attention to the clamping force diagrams on the data sheet.

9 Maintenance

WARNING

Burning due to hot surface!

- In operating conditions, surface temperatures of more than 70 °C can appear at the product.
- All maintenance and repair works must only be effected in cooled mode or with safety gloves.

9.1 Cleaning

CAUTION

Avoid damages of the moved components

Avoid damages of the moved components (rods, plungers, bolts, etc.) as well as of wiper and seal.

Aggressive cleaning agents

The product must not be cleaned with:

- Corrosive or corroding components or
- Organic solvents as halogen or aromatic hydrocarbons and ketones (cellulose thinner, acetone, etc.), because this can destroy the seals.

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.

9.2 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.

9.3 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.

10 Trouble shooting

Trouble	Cause	Remedy
Piston rod with clamping arm does not retract	Clamping pressure is not available or too low	Check at the pressure generator, if pressure is available and high enough (minimum pressure: 30 bar)
Swing angle is not completely effected or exceeded (tolerance of end position $\pm 2^\circ$):	Too much clearance in the swing mechanism	⚠ Caution ! Repair required by ROEMHELD
	Operating pressure too low	Adjust operating pressure in accordance with the technical characteristics.
Piston rod has too much play:	Guide or piston rod are worn out	Exchange piston rod, exchange component, if required
Clamping pressure reduces due to leakages at the swing clamp:	Wear at the seals	Exchange seals

Trouble	Cause	Remedy
Piston rod with clamping arm does not retract	Clamping pressure is not available or too low	Check at the pressure generator, if pressure is available and high enough (minimum pressure: 30 bar)
Swing angle is not completely effected or exceeded (tolerance of end position $\pm 2^\circ$):	Too much clearance in the swing mechanism	⚠ Caution! Repair required by ROEMHELD
	Operating pressure too low	Adjust operating pressure in accordance with the technical characteristics.
Piston rod has too much play:	Guide or piston rod are worn out	Exchange piston rod, exchange component, if required
Clamping pressure reduces due to leakages at the swing clamp:	Wear at the seals	Exchange seals

11 Technical characteristics

General characteristics

Types	Maximum operating pressure [bar]	Effective clamping force*) [kN]
1895-XX1-VXX35	500	17.0
1897-XX1-VXX38	500	41.0

*) depending on the version of the clamping arm

Tightening torques

Types	Tightening torque of the fixing nut of the clamping arm [Nm]
1895-XX1-VXX35	120
1897-XX1-VXX38	500

Weights

Types	Total stroke [mm]	Weight [kg]
1895-XX1-VXX35	35	2.35
1897-XX1-VXX38	38	6.10

i NOTE

Further information

- For further technical data see ROEMHELD data sheet.

Proposal, tightening torques for screws of tensile strength 8.8, 10.9, 12.9

i NOTE

The indicated values are approximate values and have to be interpreted according to the user's application!

See note!

Thread	Tightening torque [Nm]		
	8.8	10.9	12.9
M6	10	15	18
M8	25	36	45
M10	49	72	84
M12	85	125	145
M14	135	200	235
M16	210	310	365
M20	425	610	710
M24	730	1050	1220
M30	1,450	2100	2450

Note: Valid for workpieces and set screws made of steel with metric thread and connecting surface dimensions as per DIN 912, 931, 933, 934 / ISO 4762, 4014, 4017, 4032

In the table values for tightening torques the following is considered:

Design steel/steel, friction value $\mu_{ges} = 0.14$ - not oiled, utilisation of the minimum yield point = 90%.

12 Accessory

12.1 Selection of the clamping arm

CAUTION

Using an incorrect clamping arm

When using incorrect clamping arms, damages can occur.

When selecting the clamping arm, the corresponding operating pressures as shown in the clamping force diagram (see ROEMHELD data sheet) must not be exceeded. If longer clamping arms will be used, not only the operating pressure but also the flow rate has to be reduced.

- Position monitoring

NOTE

- See ROEMHELD data sheet.

13 Storage

CAUTION

Storage of components!

- The product may not be exposed to direct solar radiation, because the UV light can destroy the seals.
- A storage differing from the storage conditions is inadmissible.
- In case of improper storage, the seals can embrittle and resinification of the anti-corrosive oil or corrosion at the element can occur.

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.

14 Disposal



Hazardous to the environment

Due to possible environmental pollution, the individual components must be disposed only by an authorised 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.

15 Declaration of manufacture

Manufacturer

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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

Declaration of manufacture of the products

Swing clamps with reinforced swing mechanism of data sheet B 1.8921. The following types or part numbers are concerned:

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- MH = without metallic wiper with switch rod
- MM = with metallic wiper with switch rod

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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.

Responsible person for the documentation:

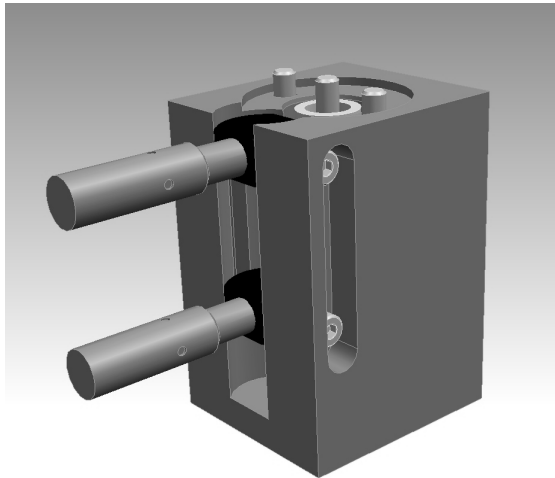
Dipl.-Ing. (FH) Jürgen Niesner, Tel.: +49(0)6405 89-0.

Römheld GmbH
Friedrichshütte

Laubach, 03.02.2014

16 Electrical position monitoring

Electrical position monitoring to be mounted at products with switch rod



16.1 Description of the product

The position monitoring is screwed on the cylinder bottom. A control cam is fixed at the switching disk causing the activation of the inductive proximity switches.

The minimum distance to the positions to be monitored depends on the switch type and is indicated in the chart.

Different versions are available according to the application conditions.

The position monitoring is delivered without proximity sensors; sensors are available as accessory.

16.2 Validity of the documentation

These operating instructions apply to the electrical position monitoring with the following part numbers:

- without switch 0353 813, 815,
- with standard switch 0353 814, 811,

16.3 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.

16.4 For your safety

Qualification of the user

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

16.5 Application

16.5.1 Intended use

Position monitorings are used for industrial applications in order to get an 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.

16.5.2 Misapplication

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

16.6 Installation

1. Screw on position monitoring at the flange and at the piston rod.
2. Connect both proximity switches S1 and S2 as per electrical circuit diagram.

i NOTE

Application of Position Control

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

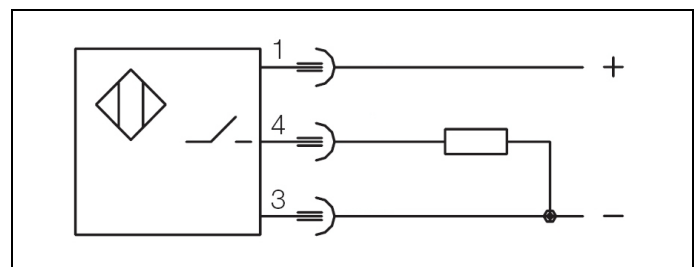


Fig. 9: circuit diagram for pnp (+) magnetic sensor

- | | |
|---|---------|
| 1 | brown + |
| 3 | blue - |
| 4 | black |

16.7 Start up

16.7.1 Electrical position monitoring

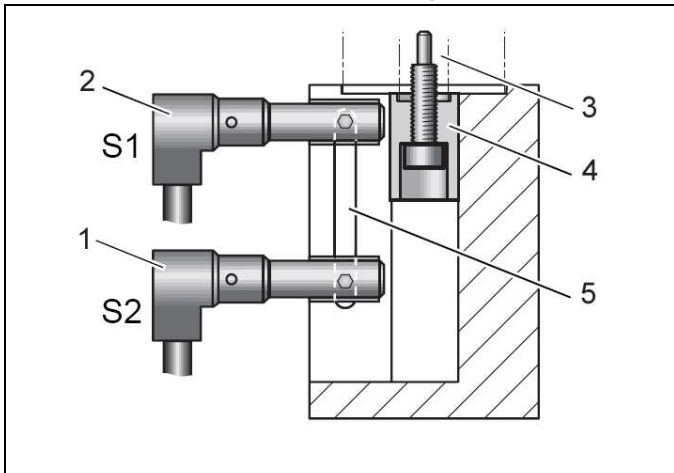


Figure 10: Design of the electrical position monitoring

1 Proximity switch S2 (clamped)	4 Signal sleeve
2 Proximity switch S1 (unclamped)	5 Slot for displacement of the proximity switches
3 Switch rod of the swing clamp	

Adjustment of proximity switches

1. Unclamp piston.
2. Screw in proximity switch S1 up to the stop on the signal sleeve and turn back 1/2 rotation.
3. Fix S1 with a headless screw. The distance to the signal sleeve must be 0.5 mm.
4. Displace S1 to the upper stop in the slot. Fix S1 with the socket head cap screw.
5. Clamp piston.
6. Displace S2 in the slot so that a signal course as per figures (Fig. signal course) will be achieved. Fix S2 with the socket head cap screw.



Figure 11: Signal course - clamping

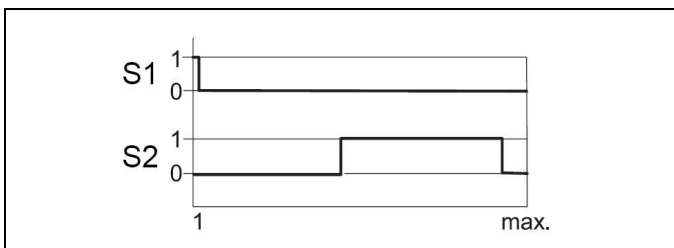


Figure 12: Signal course - unclamping

1 Signal ON	0 Signal OFF
-------------	--------------

The two figures show the signal course at both proximity switches during a clamping and unclamping process (max. = total stroke).

16.8 Maintenance

⚠ WARNING

Burning due to hot surface!

- In operating conditions, surface temperatures of more than 70 °C can appear at the product.
- All maintenance and repair works must only be effected in cooled mode or with safety gloves.

16.8.1 Cleaning

The position monitoring must be cleaned at regular intervals.

16.8.2 Regular checks

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

16.9 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:		

16.10 Technical characteristics

Operating voltage UB:	10 ... 30 V DC
Residual ripple:	max. 15%
Switching function:	Interlock
Output:	PNP
Cylinder body material:	Steel, corrosion resistant
Protection as per DIN 40050	IP 67

i Note

Further technical data with reference to the position monitoring are included in the ROEMHELD data sheet.

16.10.1 Technical characteristics / stroke end sensor

Switch off power	24V / 2A
Switching voltage, min.	12V
Switching current, min.	10 mA (at 12 V)
Operating temperature	-5 ... +80 °C

i Note

Further technical data with reference to the position monitoring are included in the data sheet.

16.10.2 Technical data, magnetic sensor

Housing material	aluminium black anodised
Operating voltage UB:	10 ... 30 V DC
Residual ripple:	max. 10%
Current consumption	< 15 mA
Voltage drop (max. load)	< 2 V
Protected against short circuits	yes
Protection against reverse battery	installed
Switching frequency	1 kHz
Switching hysteresis	3 mm
Switching function:	Interlock
Output:	PNP
Housing material:	Stainless steel
Protection as per DIN 40050	IP 67
Environmental temperature	-25 °C to +100 °C
Plug connection	M8 plug
Output (interlock)	pnp npn 3829-234 3929-240

Note

Further technical data with reference to the position monitoring are included in the data sheet.

16.10.3 Technical data / proximity sensor

Environmental temperature:	-25 °C to +80 °C	-25 °C to +120 °C
Rated operating distance Sn:	1.5 mm	1.5 mm
Secured operating distance:	0 ... 1.2 mm	0 ... 2.0 mm
Hysteresis:	max. 15 %	max. 15 %
Repetitive accuracy:	max. 5%	max. 5%
Body material:	1.4104 steel, corrosion resistant	
Code class:	IP 68	IP 68
Connection type:	plug S4	plug S4
Voltage:	DC	DC
Switching function:	interlock	interlock
Output:	pnp	pnp
Operating voltage UB:	10 ... 30 V	10 ... 30 V
Design voltage:	24 V	24 V
Design current:	200 mA	200 mA
Residual ripple:	max. 15%	max. 15%
Switching frequency	1 kHz	2 kHz
Protection against reverse battery:	installed	installed
Protected against short circuits	yes	yes

16.11 Accessory

- Plug with cable
- Spare proximity switch

Note

See ROEMHELD data sheet

16.12 Disposal



Hazardous to the environment

Due to possible environmental pollution, the individual components must be disposed only by an authorised 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.

16.13 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

Declaration of manufacture of the products

These operating instructions apply to the electrical position monitoring with the following part numbers:

- without switch 0353 813, 815,
- with standard switch 0353 814, 811,

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.

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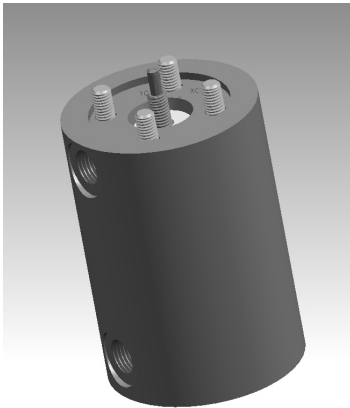
Dipl.-Ing. (FH) Jürgen Niesner, Tel.: +49(0)6405 89-0.

Römheld GmbH
Friedrichshütte

Laubach, 03.02.2014

17 Pneumatic position monitoring

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



17.1 Description of the product

The position monitoring is screwed on the cylinder bottom. A control cam is provided at the extended piston rod causing the activation of the pneumatic jets.

17.2 Validity of the documentation

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

- 0353 808; -810

17.3 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.

17.4 For your safety

Qualification of the user

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

17.5 Application

17.5.1 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.

17.5.2 Misapplication

Position monitoring systems are not suitable for applications where coolants are used.

17.6 Installation

1. Screw on position monitoring at the flange and at the piston rod.
2. Connect both pneumatic ports (**b = unclamped** and **d = clamping range**).

Note

For interpretation of the pneumatic pressure we recommend to use a differential pressure switch.

Parallel connection for up to 8 swing clamps is possible. For a greater number there are special solutions. Please contact us.

17.7 Start up

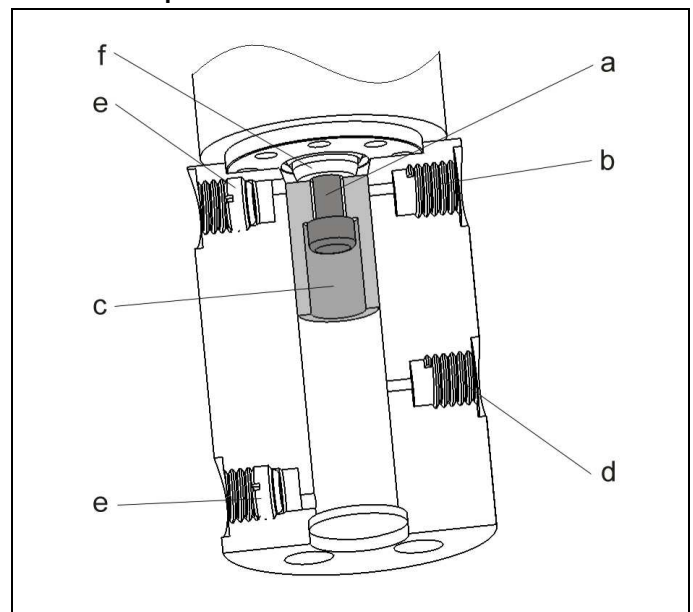


Figure 13: Design

a	Fixation of the signal sleeve	d	Lower pneumatic port, clamping range
b	Upper pneumatic port, unclamped	e	Venting by means of the filter element
c	Signal sleeve with switching cams	f	Switch rod of the swing clamp

1. Connect the pneumatic ports of the differential pressure switch 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
at the top (Fig. Design)	extended
at the bottom	retracted

NOTE

For interpretation of the pneumatic pressure we recommend to use the differential pressure switches type PEL. Series connection for up to 4 swing clamps is possible.

NOTE

Evaluation of the pneumatic pressure

- For interpretation of the pneumatic pressure we recommend to use a differential pressure switch.
- Parallel connection for up to 8 elements is possible. For a greater number there are special solutions. Please contact us.

Evaluation of the pneumatic pressure

- The dependence between pipe length, jet diameter, leakage, pressure and flow rate determines the measurable pressure differential. In case of a too high flow rate the pressure differential is too low.
- For the interpretation of the pneumatic pressure we recommend to use a differential pressure switch. Parallel connection of up to four elements is possible.

Impurities in the compressed air

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

17.8 Maintenance

WARNING

Burning due to hot surface!

- In operating conditions, surface temperatures of more than 70 °C can appear at the product.
- All maintenance and repair works must only be effected in cooled mode or with safety gloves.

17.8.1 Cleaning

The position monitoring must be cleaned at regular intervals.

17.8.2 Regular checks

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

17.9 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

17.10 Technical characteristics

Cylinder body material:	Steel, corrosion resistant
-------------------------	----------------------------

Note

Further technical data with reference to the position monitoring are included in the data sheet.

17.11 Disposal



Hazardous to the environment

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