Threaded-body work supports

with metallic wiper edge or PU wiper, single and double acting



Table of contents

1 Description of the product 2
2 Validity of the documentation 2
3 Target group of this document 2
4 Symbols and signal words 3
5 For your safety 3
6 Application 4
7 Installation 4
8 Start up 9
9 Maintenance 10
10 Trouble shooting 11
11 Technical characteristics 11
12 Storage 12
13 Disposal 12
14 Declaration of manufacture 13

1 Description of the product

Hydraulic work supports are used to provide a self-adjusting rest for workpieces and prevent their vibration and deflection under machining loads. The threaded-body design allows for direct and space-saving installation into the fixture body. Hydraulic oil supply and venting are provided via drilled channels. In case of the double acting version the return stroke of the support plunger is activated in a precisely defined time that is above all advantageous in cycle-dependent installations.
In the body of the threaded-body work supports a thin-walled locking bush is integrated, which locks cylindrically around the freely-movable support plunger when pressurising the element with hydraulic oil. The support plunger is installed hydraulically and using spring force. The correct contact at the workpiece can be controlled with the optional pneumatic contact control. The body with metallic wiper edge protects the subjacent FKM wiper against coarse and hot swarf.

2 Validity of the documentation

This document applies to the following products:
Threaded-body work supports of data sheet B 19350. The following types or part numbers are concerned:

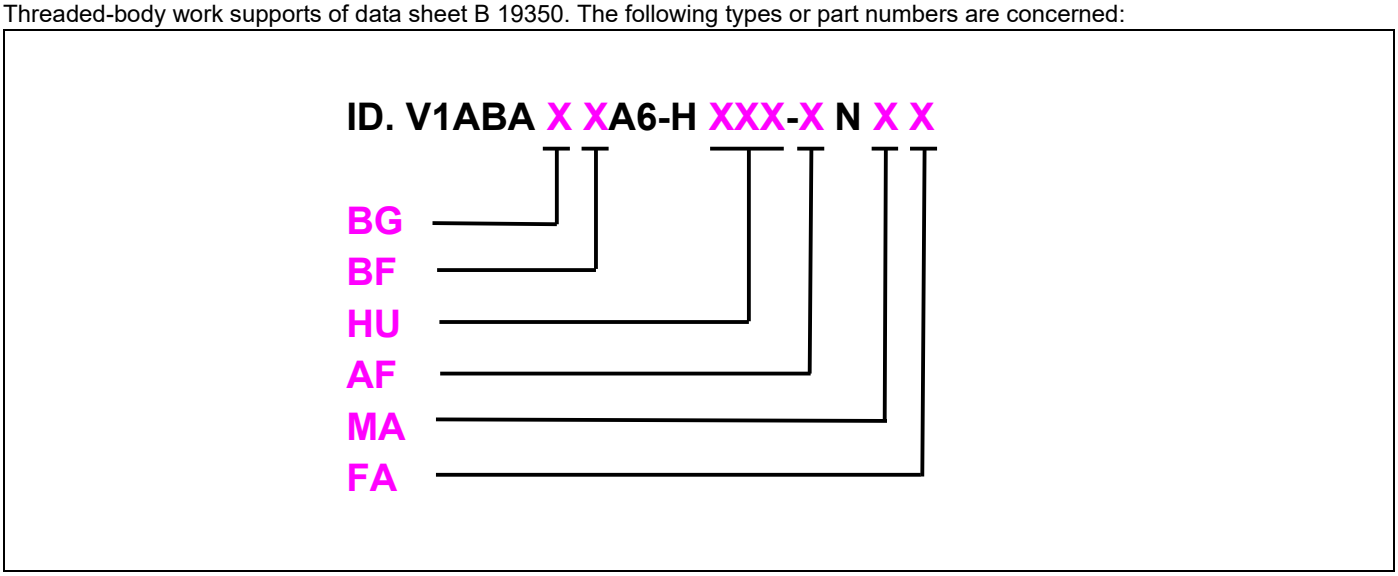


Fig. 1: Code for part numbers

BG = size	**AF = monitoring**
E = plunger Ø10 M20 x 1.5 **K** = plunger Ø16 M26 x 1.5 **L** = plunger Ø18 M32 x 1.5	**N** = contact control, drilled-through contact bolt **0** = not present
BF = design	**MA = metallic wiper edge or wiper**
A = threaded-body version, single acting **B** = threaded-body version, double acting	**M** = metallic wiper edge **P** = PU wiper
H = stroke	**FA = spring clamping forces**
006 = 6.5 mm for sizes E, K **008** = 8 mm for size L **015** = 15 mm for size K **016** = 16 mm for size L **030** = 30 mm for size L	**L** = light **N** = normal

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

Work supports are used for industrial/commercial applications in order to protect workpieces against vibration and deflection. They must only be operated with hydraulic oil.

In addition, use in compliance with the intended purpose includes:
- Use within the capacity indicated in the technical data sheets.
- Use as described in this operating manual.
- Compliance with maintenance 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!

⚠ CAUTION

Transverse forces

The products are not suitable to compensate side loads.

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.

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".

⚠ 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.

⚠ CAUTION

Transverse forces and forced states to bolt

Side loads and forced conditions on the plunger lead to premature failure.

- Provide external guides.
- Avoid forced conditions (overdetermination) of the plunger. Do not introduce any torques.

NOTE

Vent connection

- If there is a possibility that aggressive cutting lubricants and coolants penetrate through the sintered metal air filter into the interior of single-acting products, a vent hose has to be connected and be placed in a protected position.
- It is absolutely necessary to follow the instructions for venting of the spring area see data sheet G0.110.

7.1 Design

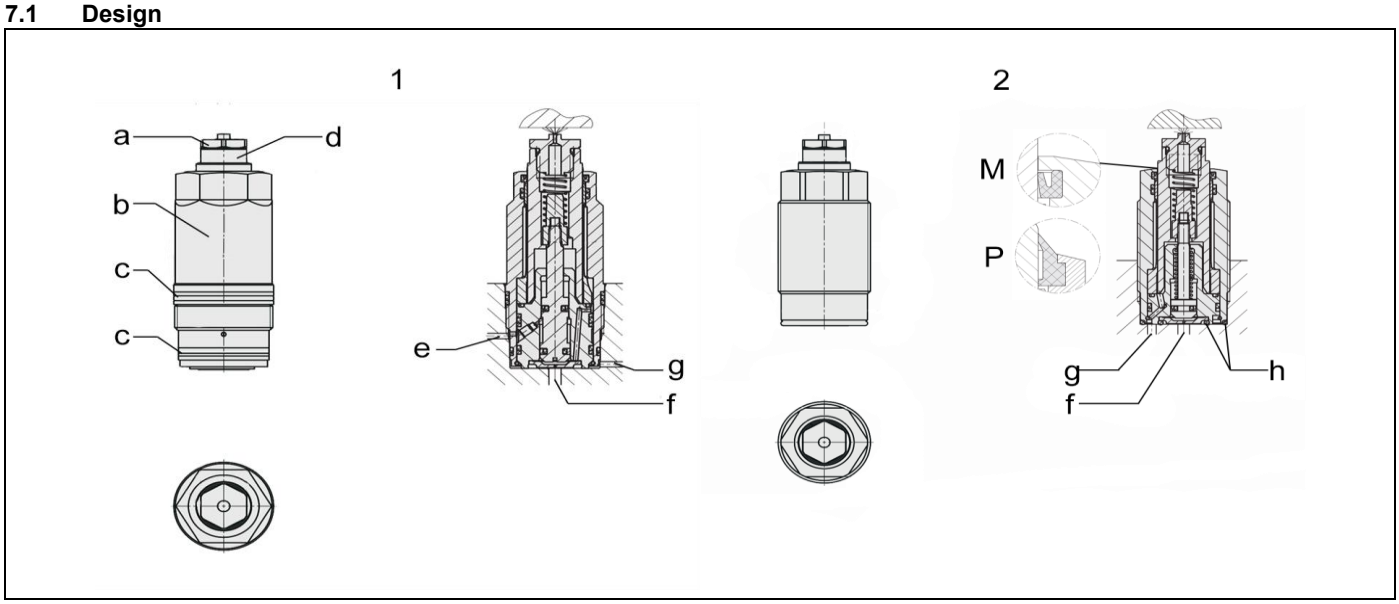


Fig. 2: Components

1	double acting design	2	single acting design
a	contact piece	f	extend port
b	body	g	port for venting, air sealing or optional contact control
c	seals	h	O-rings
d	plunger	M	metallic wiper edge
e	retract port	P	PU wiper

7.2 Instructions for safe operation

⚠ CAUTION

Transverse forces

The products are not suitable to compensate side loads.

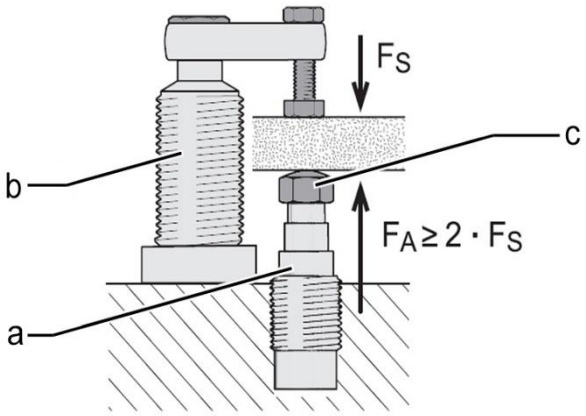


Fig. 3: Principle, force-loop during support

a work support b swing clamp	c contact piece

- Design the operating pressure so that support force F_A is more than twice the clamping force F_S. This reserve allows the compensation of machining forces.
- The recommended operating pressure is at least 100 bar (150 bar for size **E**).
- Operate the work supports only with the contact bolt to prevent damage to the plunger and penetration of liquids.
- Heavy contact bolts and extensions can impact the function of the work support.

NOTE

Receiving bore

- When using the versions with contact by air pressure and elements with vent port, pay attention that the location hole is not filled with oil.
- Otherwise oil can enter into the element and lead to malfunctions.

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

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!

7.3.1 Calculation of the admissible flow rate

Admissible 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:

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

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

Maximum piston speed
At specified pump flow rate Q_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]

NOTE

Flow rate
- The maximum oil volume and/or the maximum stroke speed depend on the corresponding product.
  - For clamping cylinders see data sheet A 0.100.
  - For 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 Technical information on the internet!

7.3.2 Throttling of the flow rate

The throttling always has to be effected in the supply line to the element. 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.

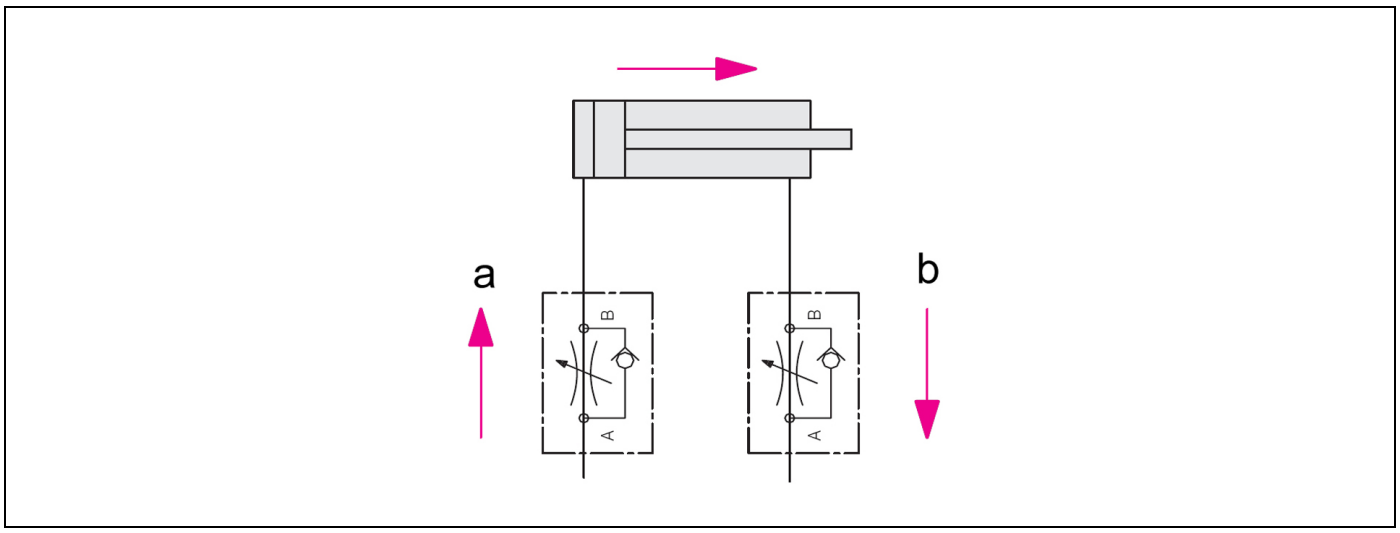


Figure 4: Hydraulic circuit diagram without flow control valves

a Throttling direction	b Free flow

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

7.4.1 Design

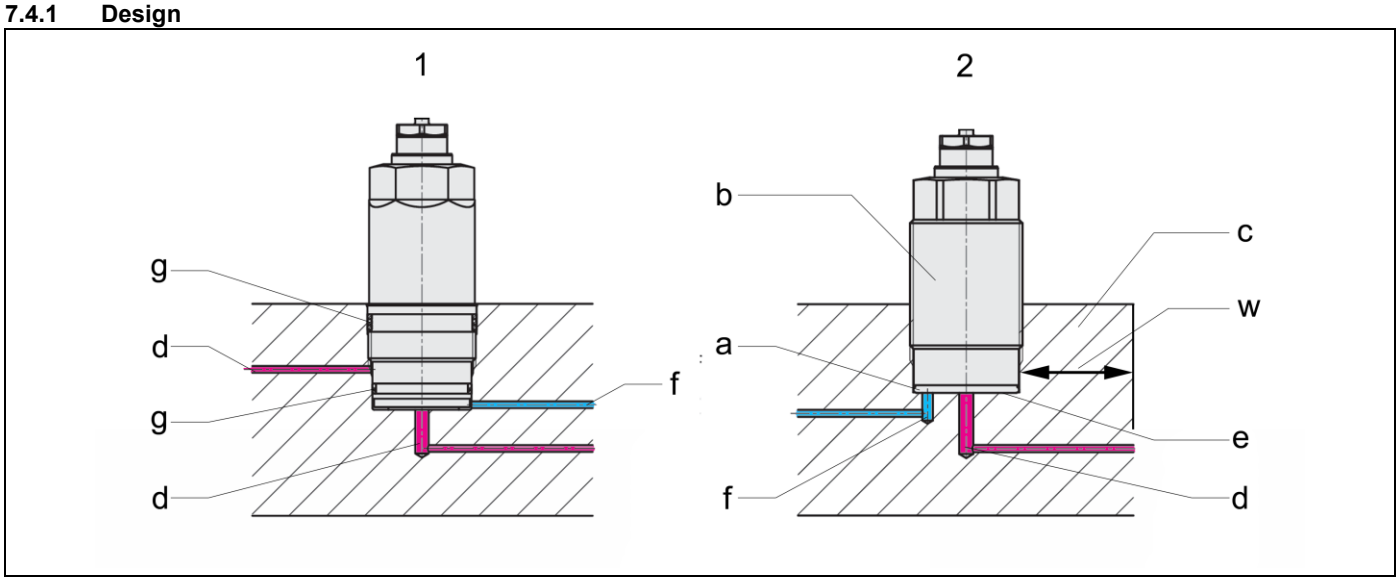


Fig. 5: Installing work supports

1	double acting design	e	plane surface and installation dimensions as per indications on the data sheet
2	single acting design	f	pneumatic connection for venting, air sealing or optional contact control
a	O-ring	g	spacer/O-ring
b	body	w	wall thickness, depending on the max. operating pressure and the material of the fixture
c	fixture body		
d	hydraulic port		

NOTE

Mounting the work supports

The location hole must be dry and oil-free to ensure that no liquids penetrate into the spring area of the work supports.

Exchanging work supports

To get a dry location hole, the hydraulic oil in drilled channels must be removed.

7.4.2 Installation

⚠ WARNING

Injury by crushing!

Due to protruding components there can be pinch points during installation.

- Keep hands and fingers away from pinch points!

⚠ CAUTION

Product not properly tightened

Product can loosen during operation.

- Fix and/or secure with sufficient tightening torque.



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.

7.4.3 Connection of the hydraulic equipment

⚠ CAUTION

Work by qualified personnel

- Works only to be effected by authorised personnel.

1. Connect hydraulic lines to qualifying standards and pay attention to scrupulous cleanness!

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.

Hydraulic oil

The hydraulic oil must be perfectly filtered with particles not larger than nominally 10 µm. This is the reason why we offer a filter unit (part-no. 3887-060), which
can be directly integrated in the tubing of the low-pressure side (see page 2).

Completely bleeded

After completion of all assembly and installation works, the hydraulic system must be completely bleeded.

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!

⚠ 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.

1. Check tight seat.
2. Check tight seat of the hydraulic ports (check tightening torque of the hydraulic ports).
3. Bleed the hydraulic system.

NOTE

Clamping time

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

8.1 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!

⚠ CAUTION

Maintenance and repair work

All maintenance and repair works only to be effected by ROEMHELD service staff.

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.

9.2 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
Plunger does not extend	Oil flow rate too high	Reduce oil flow rate
	Inner parts corroded	Repair required by ROEMHELD
	Penetration of cooling liquids	Repair required by ROEMHELD
	Broken spring	Repair required by ROEMHELD
Plunger does not retract	Inner parts corroded	Repair required by ROEMHELD
	Penetration of cooling liquids	Repair required by ROEMHELD
	Broken return spring	Repair required by ROEMHELD
Plunger moves back	Operating pressure not sufficient	Check the dimensioning of the operating pressure as per catalogue
		Adjust the operating pressure correspondingly
	Load (clamping and machining force) too high	Check dimensioning of the load
		Adjust the operating pressure correspondingly
		Use other elements (work support/swing clamp)

11 Technical characteristics

Characteristics

Size	Recommended minimum pressure [bar]	Minimum pressure for retracting (applies only to the double-acting design) [bar]	Admissible flow rate [cm³/s]	Max. air pressure for positive air pressure connection [bar]	Admissible load force [kN]
E	150	**20**	**25**	**0.2**	**2.5**
K	100	**20**	**25**	**0.2**	**5/8**
L	100	**20**	**25**	**0.2**	**7/9/13**

Stroke and weight

Size	Stroke (mm)	Weight, single acting [kg]	Weight, double acting [kg]
E	6.5	**0.1**	**0.1**
K	6.5/15	**0.19/0.26**	**0.21/0.31**
L	8/16/30	**0.33/0.43/0.6**	**0.39/0.52/0.76**

Work support tightening torques

Thread	Tightening torques [Nm]		
	Size		
	E	K	L
M20 × 1.5	20		
M26 × 1.5	36		
M32 × 1.5	75		

The table values take the following into account:
1. Friction value μ_{total} = 0.14
2. Utilization of the minimum yield point = 90 %
3. Torsion torque when tightening

The friction value μ_{total} = 0.14 is valid for non-lubricated threads and screw heads.

NOTE

Further information
- For further technical data see ROEMHELD data sheet.

12 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.

13 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.

14 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 accordance with (EU) Regulation **2023/1230**, as amended, and the applicable technical standards.
In accordance with EU-MSVO, these products are components 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 directive 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 must not be put into service until it has been established that the incomplete machinery or machinery into which the product is to be incorporated complies with the provisions of (EU) Regulation 2023/1230.

The manufacturer commits to transmit the special documents of the products to state authorities on request.
The technical documentation as per Appendix IV Part B was prepared for the products.

Laubach, 30.07.2026