



Pressure Switch

hydro-electric signal converter

Pressure range 5-130 bar, 50-350 bar and 50-550 bar



1 Description of the product

Hydro-electric pressure switches in piston design convert the pressure in hydraulic systems into electrical signals. The switching point can be continuously adjusted and locked by means of an adjusting knob within different adjusting ranges.

The installed micro switch is a change-over switch which can be connected as break or make contact.

The electrical connection can be rotated by 4 x 90° with the housing.

The pressure switches are designed for industrial use with normal environmental conditions for installations with a maximum system pressure of up to 600 bar.

2 Validity of the documentation

This document applies to the following products:

Pressure switches of data sheet F 9.732.

The following types or part numbers are concerned:

- 9730-500, -501, -502.
- 3534-051

3 Target group of this document

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

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.

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4 Safety instructions

DANGER

Danger of life / heavy health damages

Stands for an imminent danger.

If it is not avoided, death or very severe injuries will result.

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

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.

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 / burning due to contact with energized parts!

- Before working on electric equipment, the energized parts must be de-energized and secured.
- Do not open protection covers at electric parts.
- All electrical works must only be realised by electricians.

CAUTION

Operating pressure of 600 bar does not exceed

The maximum operating pressure of 600 bar must not be exceeded.

6 Application

6.1 Intended use

Pressure switches are used in industrial applications:

- to switch on and off motor pumps
- to switch to unpressurised mode
- for sequence control of solenoid valves
- for pressure-dependent machine tool interlock

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.

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 in 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.

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.

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

Operation with inductive loads

For operation with inductive load, a protective circuit is to be planned.

7.1 Design

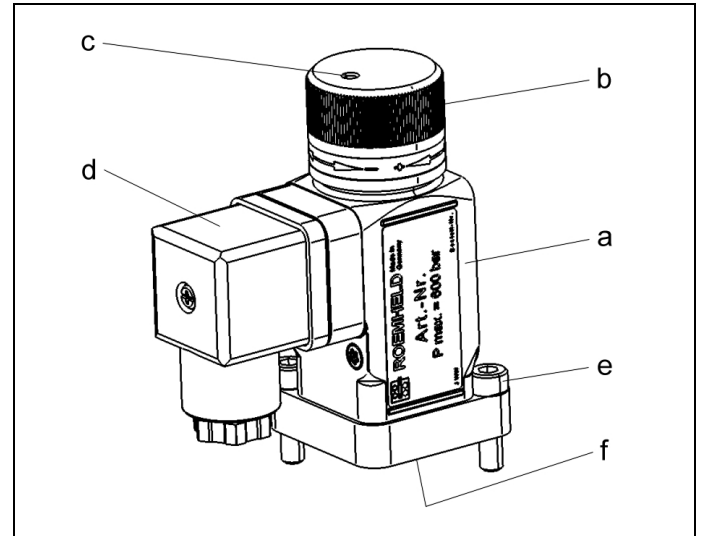


Figure 1: Components

a	Pressure switch	e	2 off socket head cap screws (M5x 18 - 8.8 DIN EN ISO 4762) - diagonal
b	Adjusting cap	f	Flange with FKM O-ring Ø5x1.5
c	Locking screw with hexagon socket SW2		
d	Plug (accessory)		

7.1.1 Connection with adaptor plate

1. Clean the support surfaces.
2. Position pressure switch.
3. Fasten the pressure switch **diagonally** at the flange. (Tightening torque 6 Nm)
4. Connect the pipe by G1/4.

7.1.2 Manifold-mounting connection

1. Drill a hole for supply of the hydraulic oil (max. Ø 4 mm) and provide thread for fixation in the fixture.
2. Grind flange surface.
3. Clean the support surfaces.
4. Align and fasten the pressure switch with O-rings on the fixture. (Tightening torque 6 Nm).

7.2 Connection of the hydraulic equipment

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

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.

7.3 Exchange against pressure switch of an older design

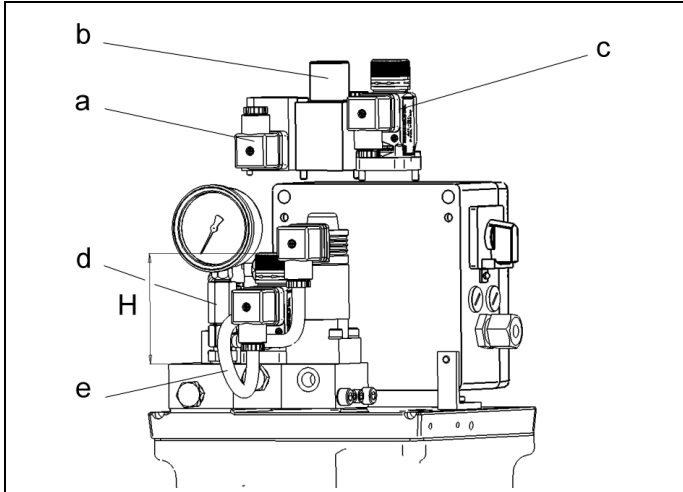


Figure 2: Components

a Pressure switch of the series F9.730	e Plug with 0.6 m cable (accessory 3141-928)
b Pressure switch of the series f9.731	h Difference in height of the pressure switches
c Pressure switch of the series f9.732	
d Pressure gauge union (accessory 9208-161)	

Note

When exchanging the pressure switches, the following has to be considered because of the different heights (H) of the pressure switches and the different positions of the plug:

- **Exchange against F9.730**
in addition, pressure gauge union and plug with cable 0.6 m.
- **Exchange against F9.731**
in addition, plug with cable 0.6 m.

This is required for power units as per data sheet D8.011 (oil volume V=5 l).

For further queries! Customer telephone +49(0)6405 - 89 441.

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 600 bar does not exceed

The maximum operating pressure of 600 bar must not be exceeded.

The switching point adjustment of the pressure switch ex works is approx. in the centre of the pressure range.

The switching point is continuously adjustable by means of the adjusting cap and can be fixed in the desired position by a locking screw.

- Unscrew locking screw
- Increase switching pressure by screwing in the adjusting cap in the direction of arrow (+).
- Reduce switching pressure by screwing out the adjusting cap in the direction of arrow (-).
- Ensure proper operation by repeated exceeding and falling short of the switching point.
- Tighten locking screw, if required.

Note

For more precise adjustment of the switching pressure an appropriate pressure gauge should be used.

9 Maintenance

Check if the hydraulic ports are tight (visual control). The pressure switch itself is maintenance free.

10 Trouble shooting

In case of troubles check the connections, the electrical characteristics, the operating pressure and the correct mounting.

11 Technical characteristics

Adjusting ranges

Part-no.:	Pressure adjusting range [bar]:	Hysteresis:
9730-500	50...550	8 ...12 % at 500 ... 250 bar
9730-501	50...350	8 ...12 % at 300 ... 100 bar
9730-501	5...130	8 ...12 % at 100 ... 30 bar

General characteristics

Operating fluid:	Hydraulic oil HLP22, 32 and 46 (other media - please contact us)
Fluid temperature:	max. 80°C
Fluid connection:	Manifold mounting or with connecting plate (accessory).
Environmental temperature:	-10°C to +80°C
Max. operating pressure:	600 bar
Vibration resistance:	10g (10 ... 2000Hz)
Shock resistance:	30g
Material:	Cylinder body: zinc die casting; adjusting cap: alu (powder coated)
Seals:	FKM
Mounting position:	any

Electrical characteristics

Port:	Plug DIN 43650, form a
Switching element:	change-over switch
Max. load:	4A at 250V ACc; max 3,0 A at 28V DC; min. 5mAa
Code class (EN 60529):	IP 65

Switching symbol / contact layout

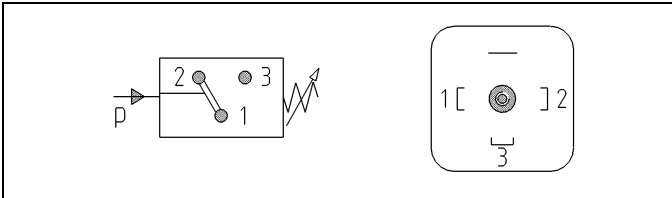


Figure 3: Switching symbol / contact layout

Weights

Types	Weight [kg]
9730-500	0.325
9730-501	
9730-502	

Note

Further information

- For further technical data see ROEMHELD data sheet.

12 Accessory

- 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.

ROEMHELD elements are tested with mineral oil. The exterior of the elements is protected against corrosion.

The residual oil film after the test procedure provides for a six-month interior protection against corrosion when stored in dry and tempered rooms.

14 Disposal

DANGER



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 EC-Declaration of conformity

16 Manufacturer

Manufacturer

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16.1 Validity of the documentation

This document applies to the following products:

Pressure switches of data sheet F 9.732.

The following types or part numbers are concerned:

- 9730-500, -501, -502.
- 3534-051

16.2 EC-Declaration of conformity

The listed products are designed and manufactured in line with the relevant versions of the EC directives **2006/95/EC - Low voltage directive** and in compliance with the valid technical rules and standards.

In accordance with **2006/42/EC** (EC MSRL) and E 982 these products are components that are not ready for use and are exclusively designed for the installation into an incomplete machine / machine.

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 IV was prepared for the products.

16.3 List of the applied standards

2004/108/EC EMC - Electromagnetic compatibility

2006/42/EC Machinery Directive

DIN EN ISO 4413, 2011-04, Hydraulic fluid power - General rules and safety requirements for systems and their components

DIN EN ISO 12100, 2011-03, Safety of machinery; Basic concepts, General principles for design (replacement for part 1 and 2)

DIN EN 61058-1; 2008-09, Switches for appliances - Part 1: General requirements

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