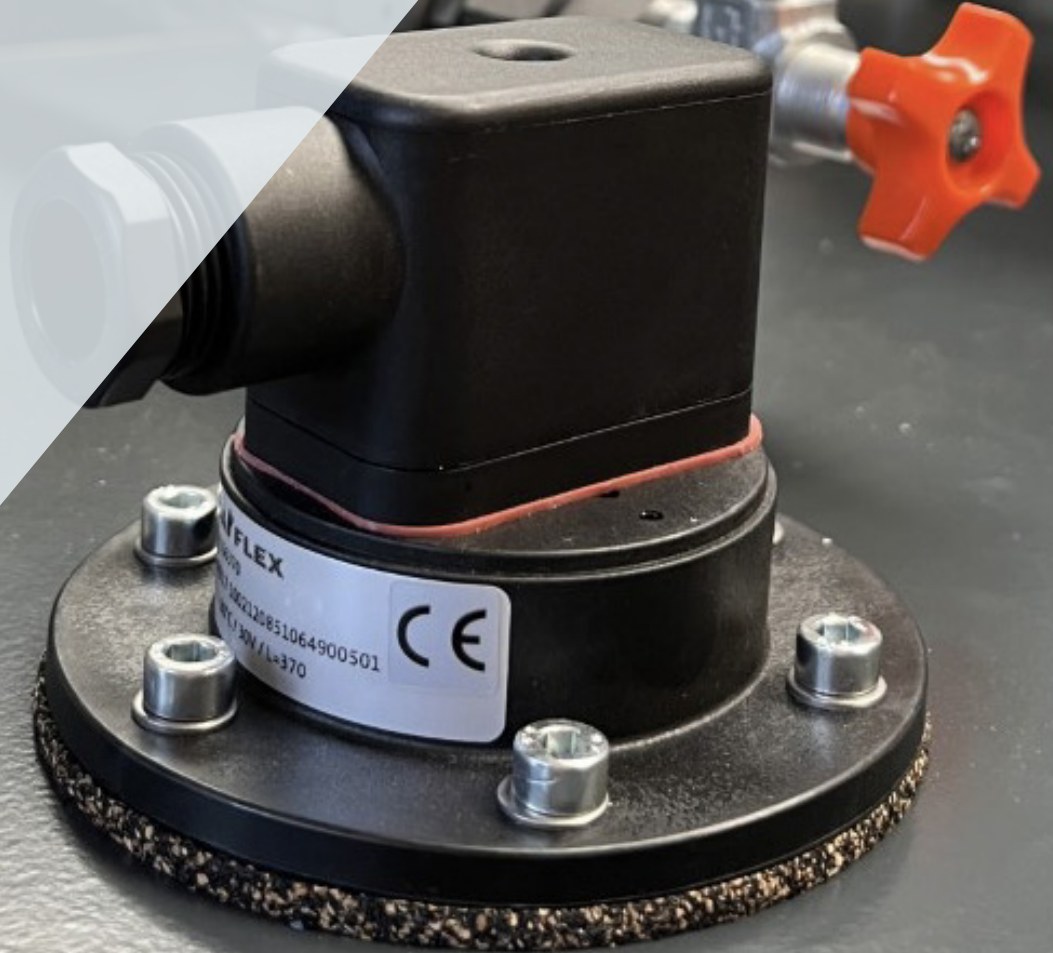


HANSA FLEX

TECHNICAL INFORMATION **SWITCHES AND SENSORS**



Technical information Switches and sensors for pressure, level and temperature

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1. General

The installation, commissioning and maintenance of hydraulic systems or their components may be carried out only by suitably qualified personnel and in strict observance of all the relevant safety regulations.

The continuous monitoring of oil pressure, fill level and temperature is an essential task in oil supply and hydraulic systems. Modern factory automation systems rely on the availability of compatible signals. The measurement of maximum or minimum pressures has a direct influence on system safety, proper functioning and process reliability. The values are also used in the monitoring of the specific pressure ranges necessary for different processes, safety shutdowns and load limiting systems.

Level and temperature switches are used to monitor the fill level and the temperature in fluid systems. They are not to be used in highly flammable or corrosive fluids. The medium must not contain particles, especially metallic particles, to avoid them being deposited on the float or between the float and the switch contact tube.

2. Safety instructions

The operator of the system must ensure that:

- The safety instructions and operating manuals are available and complied with.
- The product is used in the conditions described in the operating manual and installation instructions, for the purpose indicated on the identification plate and for applications for which it was intended.
- The relevant national accident prevention regulations are observed.
- The permissible data and conditions of use are complied with.
- Safety devices are used and the prescribed maintenance works are carried out.
- The statutory regulations relevant to disposal are observed.
- The applicable national installation regulations are complied with.

3. Technical information

3.1. Installation instructions

Before installing or removing the devices, ensure that the system is depressurised. The devices must be installed in the system at the process connections intended and permitted for that purpose.

In the case of level switches, it is possible that the supplied bistable contacts have a different switching status to the one intended for proper operation of the system. For this reason, the float should always be pushed once from bottom to top on the level switch tube directly before installation. This clearly establishes the switching status.

The maximum permissible voltages and currents (see technical data) must be observed when connecting the devices to the electricity supply and used as the basis for determining the necessary cable cross sections and circuit breakers. In addition, the maximum permissible operating temperatures of the devices must be taken into account when selecting the connection cables.

Seals to protect against escaping oil are normally used at the process connection of the devices. When fitting the seals, ensure that they are correctly seated. Defective seals must be replaced immediately.

3.2. Technical parameters for pressure switches

Mechanical pressure switches (piston-type pressure switches) convert pressure by means of a spring-loaded piston into an electrical switching signal as soon as a preset pressure value is reached. The switching point can be set by an infinitely variable mechanical adjustment device. A headless screw is used to prevent the inadvertent resetting of the pressure switch. The installed microswitch can work as a normally closed, changeover or normally open contact switch, depending on how it is connected. The microswitches have an operating life of ca. 1 million cycles. The repeat accuracy is ca. 1-2% of the full scale, depending on the switch type, model etc. The reset difference in bar becomes slightly greater, the closer the value is to the full scale. The advantages are the robust and compact design, the low amount of auxiliary energy required, simplicity of operation, high switchable currents and a good price-performance ratio.

An electronic pressure switch changes a pressure into an electronic signal by means of an electronic pressure sensor (piezoresistive or piezoelectric). The switching output is controlled by a semiconductor element. Depending on the model, these pressure switches have LED indicators, analogue outputs and several configurable switching outputs. The advantages compared to mechanical pressure switches are higher accuracy, no mechanical wear and therefore several million switching cycles. In addition, the reset point can normally also be set. Thus, an electronic pressure switch can replace two mechanical pressure switches without settable hysteresis per switching output. Furthermore, the ability to set the delay time prevents unwanted switching caused by pressure peaks in the hydraulic system.

In the case of electronic pressure switches, it must be noted that the maximum current-carrying capacity of the switching output is often only in a range well below 500 mA.

When selecting pressure switches, in addition to the desired pressure setting range, the maximum permissible system pressure must also be noted.

3.3. Technical parameters for temperature and level switches

Switches intended for level monitoring in hydraulic systems are normally float switches. These devices monitor the fill level but can also be used as combined devices to monitor fill levels and temperature in oil containers of hydraulic systems at the same time. Another combined use is with visual monitoring. Reed switches, microswitches and bimetal switches create electrical switching signals that can then be processed by the system controls. Mechanical level switches normally create a switching signal when the fluid in the tank rises above or falls below a set fill level.

Electronic level switches have higher measuring accuracies and settable switching/reset points. They have LED indicators, analogue outputs and several configurable switching outputs, depending on the model. The switching output is controlled by a semiconductor element. The advantages compared to mechanical level switches are greater reliability, higher accuracy, no mechanical wear and a high number of switching cycles.

Temperature switches are used as separate components below the surface of the oil in the hydraulic tank or in combination with a level switch. Temperature recording and signal processing is done by means of temperature sensors with fixed switching points and normally closed, changeover or normally open contact switches as well as by resistance thermometers.

4. Maintenance

Repairs to devices may be carried out only by qualified personnel. Alteration, maintenance or installation work must be in accordance with the instructions in the operating manual and installation instructions. Original replacement parts should always be used.

The relevant safety and operating regulations of the country of use must be observed when performing maintenance work of any kind.

5. Disposal information

Hydraulic oil, hydraulic hose lines, hydraulic components and electronic components or devices may not be thoughtlessly placed in the ordinary refuse; they must be collected and disposed of in accordance with the applicable waste disposal regulations. The national requirements of the country and, if appropriate, information given in the safety data sheets must be observed.