

## Operating instructions for Vacuum Switch

### 1 Operation

A vacuum switch monitors a preset vacuum value. It opens or closes an electrical circuit as a result of a defined deflection of the membranes or a defined piston stroke when this value is reached (depending on the compressive force and spring preload).

### 2 Intended use



Observe the specifications and information in the data sheet and the operating instructions.

- The vacuum switch can be used for monitoring liquids and gaseous media such as air, hydraulic oil, oil emulsions and water. Special regulations apply for oxygen.
- Take into account the operating conditions (temperature, humidity, etc.) and comply with the limit values specified in the data sheet.
- Note that extreme temperature influences (differing to room temperature) can lead to switch-point deviations or failure of the vacuum switch.
- Only use the product in the original condition. Do not make any unauthorised changes.
- Eliminate mechanical loading of the vacuum switch due to heavy knocks or vibrations.
- Make sure that the protection class (IPxx) specified in the data sheet corresponds with your environmental and operating conditions.
- Observe the specified vacuum range. Avoid static or dynamic overpressures that exceed the specified vacuum range. Exceeding the vacuum range causes changes to the behaviour and service life or damage.
- It is recommended not to use the vacuum switch as the only means of switching off a device from the mains supply. Equipment for spark quenching is to be provided in inductively loaded DC circuits, e.g. magnets.
- Responsibility of the user: The specifications described in the data sheet and these operating instructions are based on basic tests during product development and empirical values. These can not be applied to all applications. It is the responsibility of the user to determine whether our products are suitable for the respective application and in case of doubt can only be verified by suitable practical tests.

### 3 Safety regulations



To ensure proper and safe use of the vacuum sensor, the regulations of the government safety organisations (e.g. BGV A3), the Association of Electrical Engineering (e.g. VDE 0702) or the relevant national regulations as well as these operating instructions must be observed.

### 4 Designations and functions

#### Service life and accuracy

The service life and repeat accuracy are affected by the speed and number of vacuum changes, the number of load changes, the load type and the influences of temperature.

#### Contact materials

Layher vacuum switches are fitted with silver contacts as standard and can be delivered with gold contacts as an option. Gold contacts are almost exclusively used for low electrical loads. In summary, the following applies for gold-plated contacts: The product of current and voltage should not exceed 0.12 VA. The current flow

should have a current < 400 mA and a voltage < 30 V. These values are to be interpreted as peak values for alternating current.

#### Contact protection

The microswitches used in the vacuum pressure switches are generally suitable for direct current as well as alternating current operation. However inductive, capacitive and lamp loads can significantly reduce the service life of a microswitch in certain circumstances and in extreme cases cause damage to the contacts. In such cases, appropriate protective measures are required.

#### Switch-back difference

The switch-back difference (hysteresis) is designated as the vacuum difference between the upper and lower switch-point. The switch-back difference depends on the set switch-point. The specification only represents a typical average value.

#### Switch-point tolerances

The specified tolerances refer to room temperature and a new condition. These can change even beyond the switch-point tolerance due to ageing, the influence of temperature, media or the speed of vacuum increase.

#### Switch-point set at the factory

Our vacuum switches can be delivered with a switch-point that has already been set at the factory. These switch-points are set at room temperature. For critical applications, we recommend a check and, if necessary, a correction of the switch-points after final assembly (including cabling) of the vacuum switch.

#### Installation position

Any, preferably with vacuum connection below. Switch-points set at the factory have the vacuum connection below for vertical installation positions. Changing the installation position can lead to displacements for switch-points at the start of the vacuum range. Ideally switch-points should lie in the middle of the switch-point range.

### 5 Norms and standards

Layher vacuum switches with a rated voltage of 250 Volt are covered by the Low Voltage Directive. An EC declaration of conformity has been issued for these vacuum switches and is kept at our office.

### 6 Assembly

Remove all transportation provisions such as protective films, caps or cardboard boxes. The individual materials can be disposed of in recycling collection containers. Only work with tools that comply with regulations.

Screw the vacuum switch in the pressure connection provided. For this purpose, use the hexagonal shaped attachment at the vacuum switch and use a spanner (acc. to DIN 894 or similar). The tightening torque complies with the connection thread used. The correct tightening torque depends on the size, material and form of the seal used. For the vacuum switch, it is dependent on the size and the material of the vacuum connection thread as well taking into consideration the material of the counterpart. Connect the electrical line to the contacts provided. (See drawing in data sheet). Make sure that the cable is not crushed, bent or stretched when laid.

Caution: Improper procedures can destroy or damage the vacuum switch.

### 7 Commissioning



The regulations of the government safety organisations and the relevant national regulations must be observed when commissioning the vacuum switch.

Cable the electrical connections (see drawing in data sheet) with a continuity checker. The maximum permitted switching power (see data sheet) may not be exceeded when using a test lamp as a continuity tester.

First screw in the adjustment screw (see drawing in data sheet) with the aid of an approved screwdriver.

Apply the desired switching pressure to the vacuum switch with the aid of a suitable inspection gauge.

Unscrew the adjustment screw until the continuity tester responds and the differential vacuum switch switches.

Turn the adjustment screw accordingly if the switching pressure needs to be corrected.

### 8 Maintenance



The device is maintenance free and a check of the switch-points is at the discretion of the user. The usual preventative maintenance work must be performed in each case.

Large and continuous switch-point deviations can indicate that the switch is not used according to regulations, the limit values are exceeded or the device is too old.

### 9 Disassembly



Proceed in the reverse order for disassembly. Remove the cable from the connection point and unscrew the vacuum switch using a spanner (acc. to DIN 894 or similar) over the hexagonal shaped attachment.

Caution: When disassembling, make sure that the system in which the vacuum switch is situated is in a depressurised state and disconnected from the power supply.

### 10 Technical data

Temperature resistance of the membranes and sealant.

NBR .....	-25°C bis +85°C
FKM (Viton) .....	-5°C bis +120°C
EPDM .....	-25°C bis +120°C

For additional technical data see data sheet

### Symbols



Information



Warning



Hazard