Electric Limit Switch
Type 4740

Fig. 1 · Type 4740 Limit Switch with mounting unit (1400-9922) for mounting onto the Type 3353 Angle Seat Valve or onto the Type 3354 Globe Valve

Mounting and Operating Instructions

EB 8357 EN
Edition November 2010
## Definitions of the signal words used in these instructions

- **DANGER!**
  indicates a hazardous situation which, if not avoided, will result in death or serious injury.

- **WARNING!**
  indicates a hazardous situation which, if not avoided, could result in death or serious injury.

- **NOTICE**
  indicates a property damage message.

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**Note:** Supplementary explanations, information and tips
1 General safety instructions

For your own safety, follow these instructions concerning the mounting, start-up and operation of the limit switch:

- The limit switch must only be mounted, started up or operated by trained and experienced personnel familiar with the product.
  According to these Mounting and Operating Instructions, trained personnel refers to individuals who are able to judge the work they are assigned to and recognize possible dangers due to their specialized training, their knowledge and experience as well as their knowledge of the relevant standards.

- Any hazards that could be caused by the process medium, the operating pressure, the signal pressure or by moving parts in the control valve are to be prevented by means of the appropriate measures.
  If inadmissible motions or forces are produced in the actuator as a result of the supply pressure, the supply pressure must be restricted by means of a suitable supply pressure reducing station.

To avoid damage to any equipment, the following also applies:

- Do not operate the limit switch with the back of the limit switch/vent opening facing upwards.
  The vent opening must not be sealed when the limit switch is installed on site.

- Proper shipping and appropriate storage are assumed.

Note: The device with a CE marking fulfills the requirements of the Directives 94/9/EC (ATEX) and 89/336/EEC (EMC).
The Declaration of Conformity is available on request.
2 Design and principle of operation

The Type 4740 Limit Switch is designed for mounting onto the Type 3353 Angle Seat Valve and the Type 3354 Globe Valve. The inductive proximity switches or microswitches cause signals to be sent to a control or alarm system when the valve travel exceeds or falls below the adjusted limit.

2.1 Technical data

The limit switch can optionally be fitted with a 3/2-way solenoid valve. When the incorporated solenoid valve is energized, a supply air pressure is applied to the actuator. When the solenoid valve is de-energized, the actuator is vented and the valve moves to its fail-safe position.

The switching points of the limit contacts can be changed within the travel range. Refer to section 5.

The limit switch is available in two versions, either with inductive proximity switches or with microswitches.

<table>
<thead>
<tr>
<th>Type 4740 Electric Limit Switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel range</td>
</tr>
<tr>
<td>Ambient temperature range</td>
</tr>
<tr>
<td>Degree of protection</td>
</tr>
<tr>
<td>Weight</td>
</tr>
</tbody>
</table>

**Version with inductive proximity switches**

| Rated voltage               | 8.2 V DC over isolating switch amplifiers acc. to IEC 60947-5-6 |

**Version with microswitches**

| Switching capacity          | 250 V AC, 16 (6) A |

**Materials**

<table>
<thead>
<tr>
<th>Housing</th>
<th>Polyamide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bonnet</td>
<td>Polycarbonate</td>
</tr>
<tr>
<td>Filter</td>
<td>Polyethylene</td>
</tr>
<tr>
<td>Mounting unit</td>
<td>Stainless steel</td>
</tr>
</tbody>
</table>

**Option: 3/2-way solenoid valve**

<table>
<thead>
<tr>
<th>Rated voltage</th>
<th>24 V DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>1.5 W</td>
</tr>
<tr>
<td>Flow rate</td>
<td>55 l/min (K_v = 0.035)</td>
</tr>
<tr>
<td>Max. operating pressure</td>
<td>7 bar</td>
</tr>
</tbody>
</table>

| Pneumatic connection      | Push-in L-connector QS-G \( \frac{1}{8} \) – 6 or ISO 228/1-G \( \frac{1}{8} \) |
3 Mounting

The **mounting unit (1400-9922)** is required for mounting the limit switch onto the Type 3353 Angle Seat Valve and the Type 3354 Globe Valve. The mounting unit is not included in the scope of delivery!

### 3.1 Mounting unit

The mounting unit (1400-9922) consists of a spring-loaded adapter (3), a guided bushing (2) and a spacer (4). The spacer (4) is only required to mount the limit switch onto a valve with fail-safe position **Valve CLOSED (FA/NC)**.

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**WARNING! Risk of cut injury**

*Do not touch the sharp thread of the adapter.*

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**Limit switch with:**

- **Inductive proximity switches** (Fig. 2a): Thread the guided bushing (2) with the beveled part (2.1) facing downwards onto the stem of the adapter (3.1), while holding the screw inside the adapter stationary with a screwdriver.

- **Microswitches** (Fig. 2b): Thread the guided bushing (2) with the straight rim (2.2) facing downwards onto the stem of the adapter (3.1), while holding the screw inside the adapter stationary with a screwdriver.

**Valve with fail-safe position:**

- **Valve OPEN (FE/NO):** The spacer is **not** required.

- **Valve CLOSED (FA/NC):** To mount the limit switch onto the valve, insert the spacer (4) into the sleeve of the adapter (3.2) as far as it will go.

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The prepared mounting unit for a limit switch with proximity switches (2a) and with microswitches (2b) for mounting the limit switch onto a valve with fail-safe position **Valve CLOSED (FA/NC)**.

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*Fig. 2 · Mounting unit (1400-9922)*
3.2 Mounting the limit switch onto the valve

**Note:** In valves with the fail-safe position Valve CLOSED (FA/NC), we recommend to extend the actuator stem (air applied to the actuator), to facilitate access to the cap (5.2) described in step 2. Before mounting the limit switch onto the valve (step 3), retract the actuator stem again (actuator vented).

1. Use an open-end wrench (SW 32) or a pair of pliers to remove the transparent dome (5.1) from the actuator bonnet.
2. Use a socket wrench (SW 11) to unscrew the cap (5.2) from the actuator stem.
3. Thread the ready-assembled adapter (2, 3 and possibly 4, Fig. 2) from the top into the actuator (5).
4. Carefully place the limit switch (1) on the ready-assembled adapter. For the version with microswitches, make sure that the switches (1.5, Fig. 7) in the limit switch do not get damaged.
5. Lock the limit switch in the required position using the locking screw (1.4).

**WARNING!**
The spring on the adapter is loaded. While dismantling the limit switch, the adapter may spring back out of the actuator.
Fig. 5 · Mounting the limit switch

Mounting onto the limit switch with micro-switches and proximity switches.

Item 4 is not required for mounting the limit switch onto valves with fail-safe position Valve OPEN (FE/NO).
4 Connections

4.1 Electrical connection

⚠️ **Risk of electric shock!**

For electrical installation, you are required to observe the relevant electrotechnical regulations and the accident prevention regulations that apply in the country of use.

1. Undo the four screws on the housing cover and remove the housing cover.
2. Route the wires through the cable gland to the terminals as shown in Fig. 6.
3. Replace housing cover and fasten down with the four screws.

4.2 Pneumatic connection (with optional solenoid valve)

The pneumatic connections are designed as push-in L-connectors QS-G 1/8 – 6 or with ISO-228/1-G 1/8 thread, depending on the version.

The following assignment applies:
- Connection 1: Supply air
- Connection 2: Output

**NOTICE**

The supply air must be dry and free from oil and dust. The maintenance instructions for upstream pressure reducing stations must be observed.

Blow through all air pipes and hoses thoroughly prior to connecting them.

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**Fig. 6 · Electrical connection**
5 Setting the limit contacts

If it should be necessary to adjust the limit contacts, the switching point can be adjusted within the travel range.

**NOTICE**
*To prevent destroying the limit switch, do not adjust the screw (1.2) before you have loosened the screws (1.1). Observe the sequence described in steps 2 and 3!*

1. Undo the four screws on the housing cover and remove the housing cover.
2. Undo the two screws (1.1) of the limit contact (1.3) to be adjusted so that it can move on the rail (1.4).
3. Adjust the limit contact (1.3) with the screw (1.2):
   - Turn the screw clockwise to move the limit contact towards the top end position.
   - Turn the screw counterclockwise to move the limit contact towards the bottom end position.
4. Lock the limit contact (1.3) in position using the screws (1.1).

The second limit contact is adjusted in the same way.

5. Replace the housing cover and fasten down with the four screws.

Fig. 7 · Setting the limit contacts
6 Dimensions in mm

- Version with solenoid valve:
  - Push-in L-connector QS-G ¾ – 6 or
  - ISO 228/1-G ¾

In the version without solenoid valves, the pneumatic connections are sealed by blanking plugs.