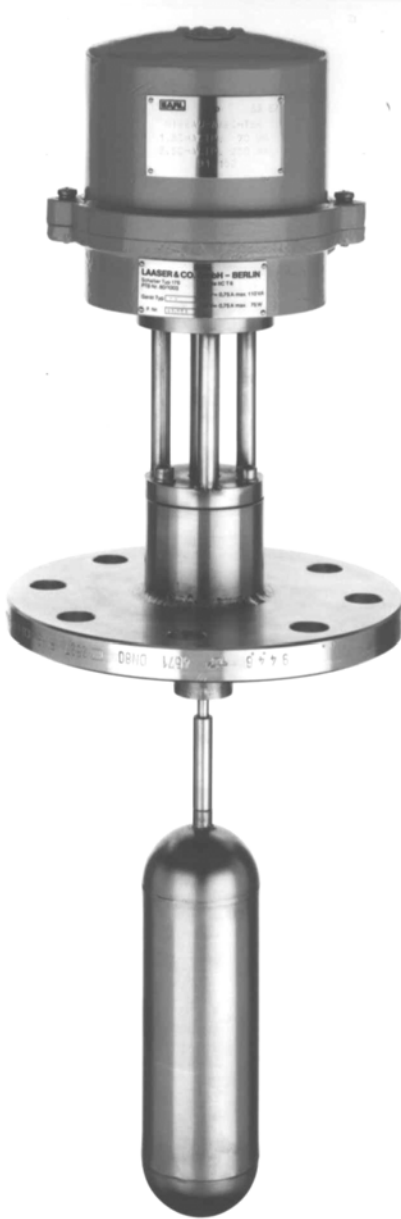


## Level switch type 89



Typ 89(Ex)ht

This **level switch type 89** is used to control liquid levels regardless of difficult operating conditions. The unit is designed for constant and long-term maintenance-free operation. According to customer specification and conditions, many variants in material, process connection and function are available.

### Operation

#### *Model with float*

The float, via the float arm, moves an encapsulated permanent magnet contained within the rising tube. One or several switch contacts are situated adjacent to the rising tube, which are operated by the magnet according to the liquid level.

#### *Model with spring-sustained displacer.*

One or several displacers are fixed to a guiding rod or core which act against the force of a pressure spring. An encapsulated permanent magnet is fixed to the upper end of the pressure spring. If the liquid level changes, the displacer weight changes in accordance with the displaced liquid column. The measuring spring transforms the difference of weight into an up and down movement of the permanent magnet, which operates either one or several switch contacts situated outside the rising tube.

With the level indicator *type 89az* the permanent magnet acts directly upon the indicator needle of the indicator.

With the level transmitter *type 89afr* and *89afD* the permanent magnet operates via a magnetic coupling a fine grinding resistance. The resistance change is converted via a measuring transformer into the electrical output signal.

### Advantages

- Reliable unit suitable for contaminated media.
- Wear and tear resistant construction with only one moving part.
- Model available for liquids with temperatures up to 500 °C and more.
- Several explosionproof models available.
- Models available for use with aggressive media.
- Models available for use in maritime and humid tropical climates.
- Simple installation and connection.
- Model with analogue output signal
- Long-term continuity of spares supply or complete units.

**Suitability**

- Automatic filling of tanks.
- Level control in gears, automatic steel hardening plants and large transformers.
- Level control in boilers.
- Overflow control.
- Detection of leakage in water cooling systems or lubricating circulation in machinery, when the unit is used in conjunction with a sump.

**Standard model type 89**

|                          |  |
|--------------------------|--|
| <i>Threaded process</i>  | G 2 ½, x < 1000 mm.  |
| <i>Float</i>             | Diameter 62 mm, length 200 mm.   |
| <i>Density of liquid</i> | > 0,5 kg/dm <sup>3</sup> .   |
| <i>Materials, wetted</i> | Corrosion and acid resistant stainless steel, material no. 1.4571 (similar to AISI 316 Ti).        |
| <i>Switch housing</i>    | Aluminium, protection class according to DIN 40 050 IP 65.<br>Cable entry Pg 11 or M 20 x 1.5 ISO. |
| <i>Contacts</i>          | One metal encapsulated S.P.C.O. reed contact.  |

**Further models**

- Flanged connection DN.... PN.... of material no. 1.4571 (similar to AISI 316Ti).
- With float for one set point up to about 1000 mm below flange, with two set points for level difference up to 200 mm.
- With either one or several displacers fixed individually to the guiding rod or core, according to the requested number of set points.
- Installed within a float chamber mounted sideways to the container.
- With tube to protect the float in case of turbulent media.
- With max. 4 set points adjustable by customer via scale.
- With max. 6 fixed set points, factory set.
- Explosionproof models to several standards.
- Units with inductive proximity sensor or pneumatically operated switch contact.
- Flange or threaded process and other wetted parts of the following materials:  
sea-water, corrosion and acid resistant special steel; 254 SMO; Monel, Hastelloy C, PVC or PVDF.

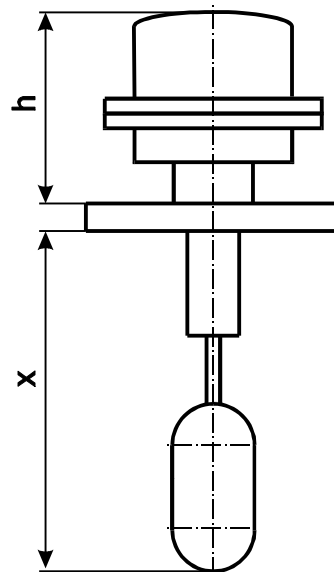
- Switch housing:  
Acid resistant material no. 1.4408; (similar to AISI CF-8), protection class according to DIN 40 050 to IP67; cable entry up to Pg21 or 1/2"NPT.
- With reliable mechanical indication of actual level ( type 89az).
- As density transmitter (type 89afi D).
- As electrical level transmitter ( type 89afr) or pneumatically ( type 89afp).
- Further alternatives on request.

### Technical data

#### Set point adjustment

- By moving the displacers on the guiding rod or core.
- By moving the contacts in relation to the position of the permanent magnet within switch housing

Sizes „h“ and „x“ depend on the lowest set point of the level difference to be switched. The dimensions and the wall-thickness of the floats or displacers depend on the medium and the operating pressure.



#### Repeatability of set point

1 - 2 mm level difference with constant density and steady level-surface.

#### Hysteresis

|                      |   |
|----------------------|---|
| Units with float     | ≤ 5 mm between rising and falling level |
| Units with displacer | on request                              |

### Operating pressure

Standard 16 bar, max. up to 320 bar.

### Operating temperature (of the liquid)

|  |   |
|--|---|
| Standard model   | up to 100 °C                            |
| Explosionproof model   | up to 80 °C (higher values on request)  |
| High-temperature version<br>(also for intrinsically safe circuits) | up to 500 °C (higher values on request) |
| Surrounding temperature  | -25 to +40 °C (other values on request) |

### Installation and electrical connection

When installing the unit, great care must be taken to ensure that the rising tube, the float arm and the float or displacer are not damaged in any way. For electrical connection the switch housing cover is removed. The cable is fed through the cable entry and connected to terminals and earth. Then the cover is replaced. Cable entry up to Pg 21.

### Switch contacts

#### Metal encapsulated S.P.C.O. snap action reed contacts

- *Type GW with silver-palladium contacts.*  
Capacity: 250 V AC/1 A, p = max. 250 VA, or 250 V DC/1 A, p = max. 100 W.

*Type GWW with AgSnO-contacts.*

Capacity: 250 V AC/3 A, p = max. 750 VA, or 250 V DC/3 A p = max. 300 W.

*Type GWG with gold contacts.*

Capacity: 42 V AC/0.3 A, P = max. 13 VA, or 42 V DC/0.3 A, P = max. 13 W.

- *Type 177(Ex) GWW and GWG*

*Protection class: Ex II 2 G Ex de II CT6, TÜV 03 ATEX 2163.*

*Capacity type 177 Ex GWW:* 250 V AC/2A, p = max. 300 VA or 250 V DC.  
p = max. 200 W.

*Capacity type 177 Ex GWG* 42 VAC/0,3 A, p = max. 13 VA or 42 VDC/0.3A,  
p = max. 13 W

- *Inductive proximity sensor* (Namur or direct switching 2- and 3-wire performance).
- *Pneumatic contacts.*

### Wiring diagram for micro switches and reed contacts

