EARL Level switch type 89

Application

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.

Typ 89(Ex)ht

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 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.

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 in maritime climates.
- Simple installation and connection.
- Long-term continuity of spares supply or complete units.

Suitability

- Automatic filling of tanks.
- Overflow control.
- Detection of leakage in water cooling systems or lubricating circulation in machinery, when the unit is used in conjunction with a sump.

Techn. Stand 03-2021

Standard model type 89

Process connection	Flange DN 50 PN 16/ 2” ANSI 150lbs RF (x < 1000 mm.).
Float	Diameter 48,3 mm, length 200 mm.
Density of liquid	> 0,5 kg/dm³.
Materials, wetted	Corrosion and acid resistant stainless steel, 1.4571 (AISI 316 Ti).
Switch housing	Aluminium, protection class according to DIN 60529 IP 65. Cable entry M 20 x 1.5 ISO.

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.
- 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 ½”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.

Hazardous class variation

Type 89(Ex)ib	simple electrical equipment acc. EN 60079-11/5.7
Type 89(Ex)	Ex de II CT6
Type 89(Ex)ia	II ½ G Ex c ia T85°c IP65
Type 89(Ex)de	II ½ G Ex c de T85°c IP65

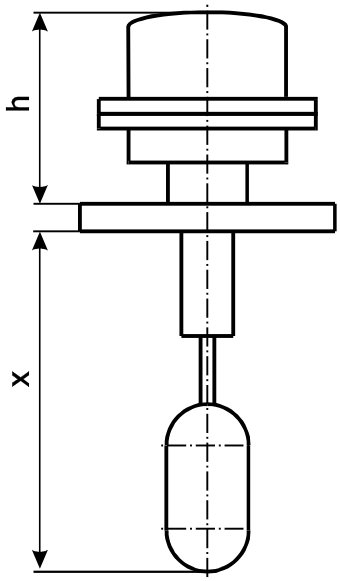
Techn. Stand 03-2021

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	up to 500 °C (higher values on request)
Surrounding temperature	-25 to +40 °C (other values on request)

Techn. Stand 03-2021

Installation and electrical connection

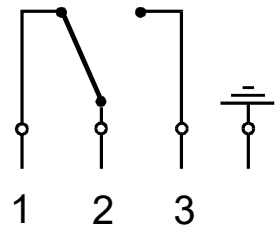
When installing the unit, great care must be taken to ensure that the rising tube, the float arm and the float or displacer are not damaged in any way. For electrical connection the switch housing cover is removed. The cable is fed through the cable entry and connected to terminals and earth. Then the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

Switch contact (S.P.D.T.)

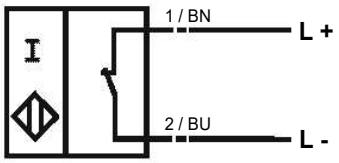
Typ	Contact-material	U max	I max	P max
GWW / GWW ht	AgSnO	250 V AC/DC	3:00 AM	450 VA / 300 W
GWG / GWG ht	Gold	42 V AC/DC	300 mA	13 VA / 13 W
177 GWW	AgSnO	250 V AC/DC	2:00 AM	450 VA / 300 W
177 GWG	Gold	42 V AC/DC	300 mA	13 VA / 13 W
Microswitch		250 V AC	10 (4) A	

Inductive proximity switch (S.P.S.T.)
Ui = 16V; Ii = 25 mA; Pi = 64 mW

Wiring diagram for micro switches and magnetic contacts



Wiring diagram for inductive proximity switch (NC)



Techn. Stand 03-2021

03/2021 Subject to technical changes