



Special Features

- Wetted parts in acid-proof, stainless steel and PEEK
- Compact, food compatible, hygienic design
- Hygienic connections conform to 3A standards, FDA demands and EHEDG guidelines
- Precise switching point without calibration
- Process temperature -40...200 °C
- Measures media with DK-values >1.5 (DK = Dielectrical Constant)
- Not influenced by foam
- LED switch indicator
- Maintenance free
- Suitable for media separation measurement
- Configurable by FlexProgrammer 9701
- ATEX approval for gas and dust



Technical Data

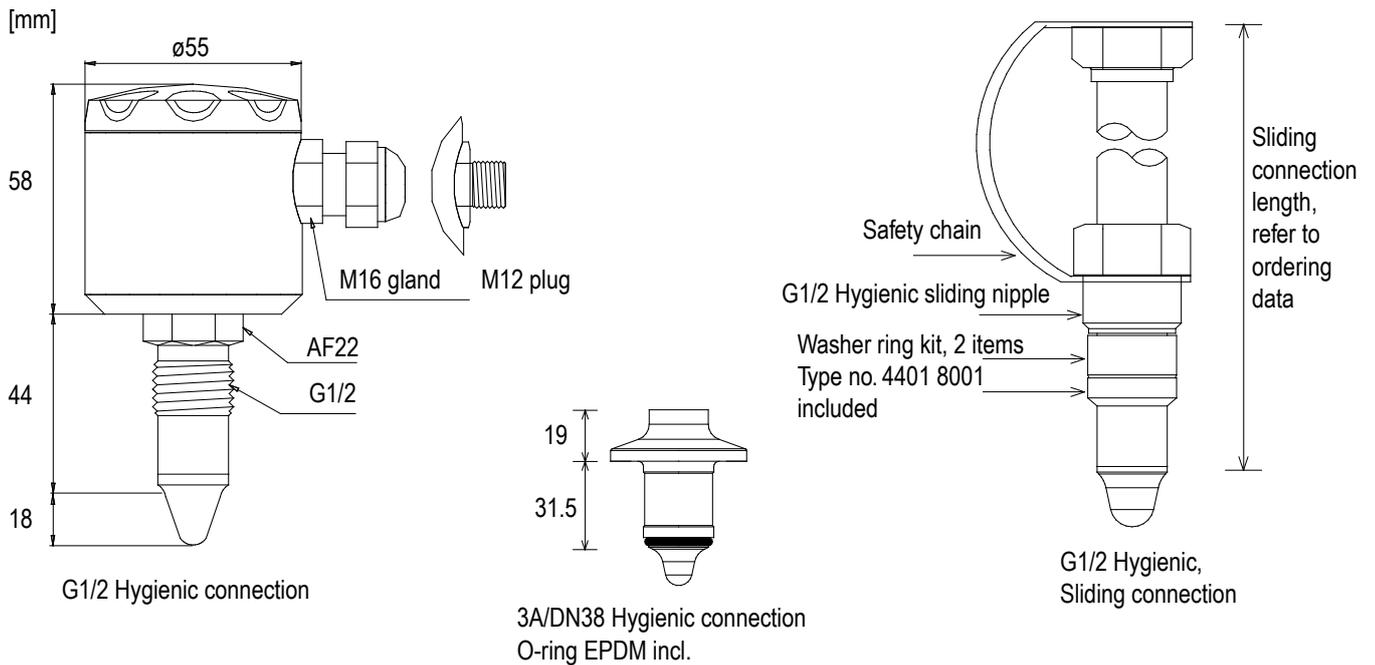
| Sensor | | Approvals/conformities | |
|------------------------------|---|--|--|
| Radiated signal | 100...180 MHz | Approvals/conformities | EN 50155 Railway, 3A, EHEDG, FDA 3A standards (Std. & 3A/DN38) |
| Process connection | Hygienic: G1/2, 3A/DN38 or sliding connection | Disposal of product and packing | |
| Adapters | Refer to page 5 | According to national laws or by returning to Baumer. | |
| Insulating material | PEEK Natura | EMC data | |
| Mechanical data | | Immunity | EN 61326 |
| Housing | Stainless Steel, W1.4301/AISI 304 | Emission | EN 61326 |
| Process connection | Stainless Steel, W1.4404/AISI 316 L | Ex data (ia) | |
| Amb. temperature | -40...85 °C | Internal inductivity | $L_i \leq 10 \mu\text{H}$ |
| Process temperature | | Internal capacity | $C_i \leq 33 \text{ nF}$ |
| Std. & 3A/DN38 | -40...115 °C (See curve 1) | Barrier data | $U \leq 30 \text{ VDC}$; $I \leq 0.1 \text{ A}$; $P \leq 0.75 \text{ W}$ |
| Sliding connection | -40...200 °C (See curve 1) | Approval Ex ia IIC T5, ATEX II 1G (See table 1) | |
| < 1 hour, Tamb < 60 °C | -40...140 °C | Supply range | 24...30 VDC |
| Protection class | IP67 (IEC 529) | Temperature class | T1...T5: -40 < T _{amb} < 85 °C |
| Media pressure | Standard G½ hygienic < 100 bar | Approval Ex tD A20 IP67 T100 °C, ATEX II 1D (See table 1) | |
| (tested with water at 20°C) | 3A DN38 < 40 bar | Supply range | 12,5...30 VDC |
| | Sliding connection < 16 bar | Temperature class | T100 °C: -40 < T _{amb} < 85 °C |
| Vibrations | IEC 60068-2-6, GL test2 | Approval Ex nA II T5, ATEX II 3G (See table 1) | |
| Installation | Any position | Supply range | 12,5...30 VDC |
| Electrical connection | | Temperature class | T1...T5: -40 < T _{amb} < 85 °C |
| Cable gland M16 | Plast or Nickel-plated brass | Output | |
| Plug M12 | Nickel plated brass or stainless steel AISI 304 | Output (active) | Max. 50 mA, short-circuit and high-temperature protected |
| Other electrical data | | Output type | PNP, NPN or Digital output (Push-pull) |
| Power supply | 12,5...36 VDC, 35 mA max. | Output polarity | See drawing |
| Damping | 0...10 sec. | Active "Low" | NPN and Digital output (-VDC +2.5V) ± 0.5V ; Rload 1 kOhm |
| Power-up time | <2 sec. | Active "High" | PNP and Digital output (VDC -2.5V) ± 0.5V ; Rload 1 kOhm |
| Hysteresis | ± 1 mm | Off leak current | ± 100 µA Max. |
| Repeatability | ± 1 mm | | |
| Reaction time | 0.1 sec. (100 mS) | | |

Technical Data

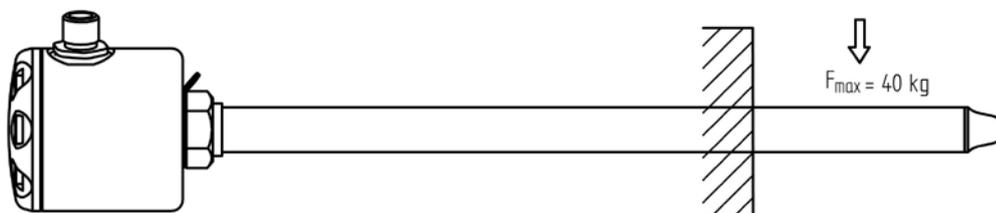
Factory Settings

| | |
|---------|---------------------|
| Output | PNP, NPN or Digital |
| Measure | DK value >1,5 |
| Damping | 0.1 sec. |

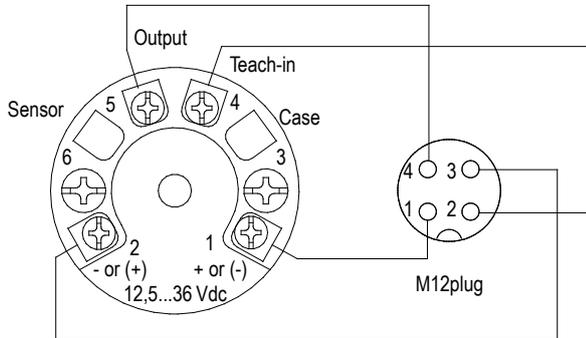
Dimensional Drawings



Sliding connection load



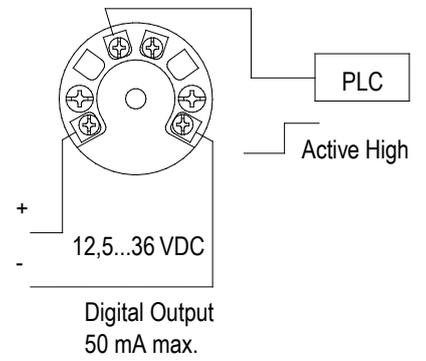
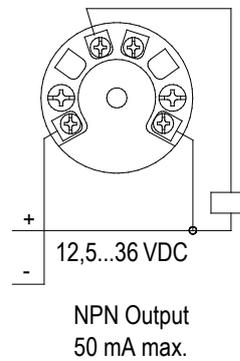
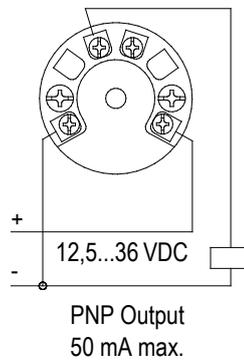
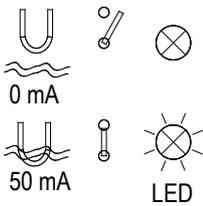
Electrical Connection



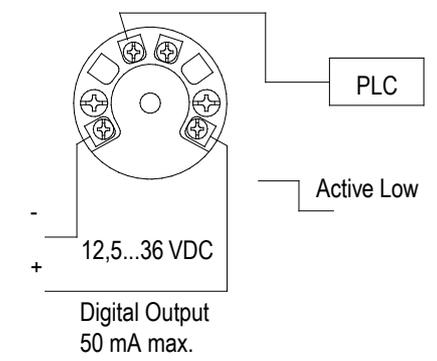
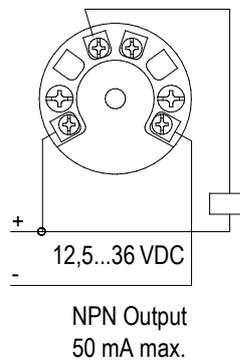
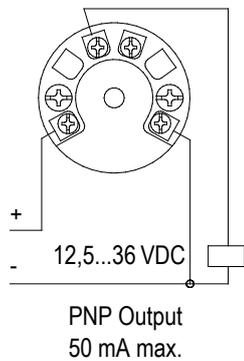
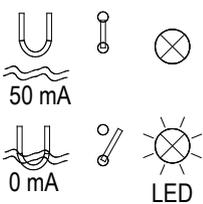
M12 plug: 1: Brown
2: White
3: Blue
4: Black

Electrical Installation

Normally Open

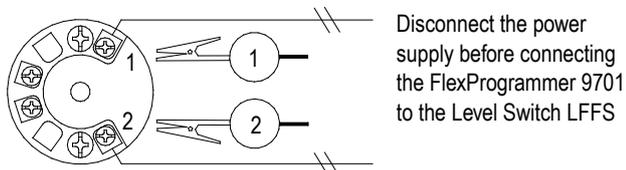
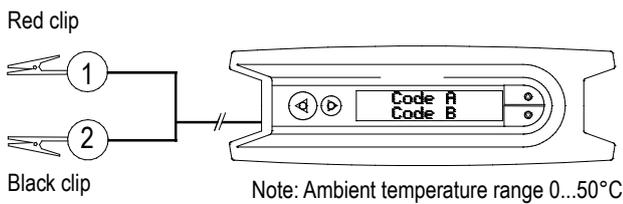


Normally Closed



Configuration

FlexProgrammer 9701



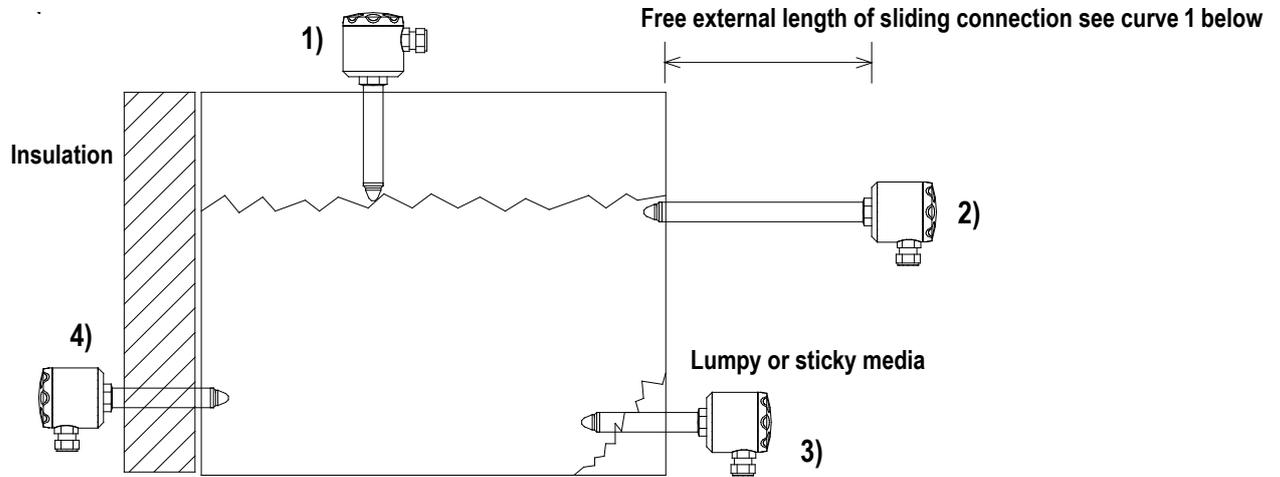
Accessories



Baumer configurable Combi-products
Baumer configurable Flex-products. configure all

Type No. 9701-0001 comprises:
FlexProgrammer
Cables
CD with the FlexProgram software

The Sliding Connection (Figure 1)



The drawing shows how the sliding connection can be used for at least 4 applications:

- 1) Mounted at the top of a tank to adjust to a maximum level.
- 2) Serving as a cooling neck in high media temperature applications.
- 3) Adjusted to place the sensor tip deeper inside the tank.
- 4) To reach in through insulation material.

It is essential that the max. ambience temperature for the electronics is never exceeded. For ATEX approved products please refer to table 1.

The working conditions for the sliding connection in different media temperatures and specified ambient temperatures can be found in curve 1.

Example, how to read Curve 1:

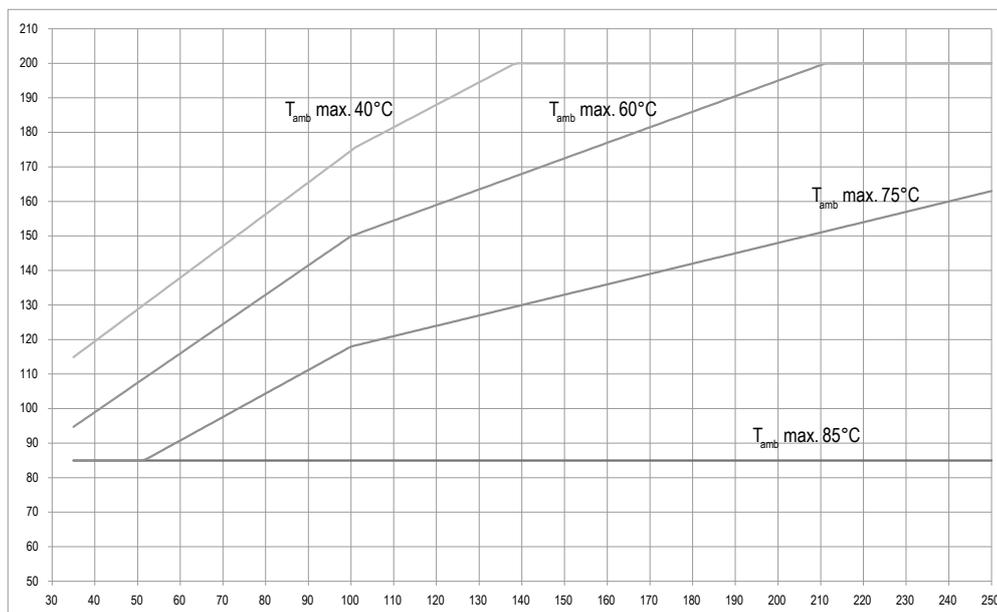
A 250 mm sliding connection is mounted in a tank with a total insert length of 150 mm. Hence the external length of the sliding connection will be 250 - 150 = 100 mm.

The media temperature will be max. 160 °C.

Read the x-axis at 100 mm on the y-axis at 160 °C and find that the ambient temperature must be kept below 50 °C. In case the radiated heat from the tank will cause a higher ambient temperature at the housing efficient insulation of the tank must be established

Media Temperature versus External Length of Sliding Connection (Curve 1)

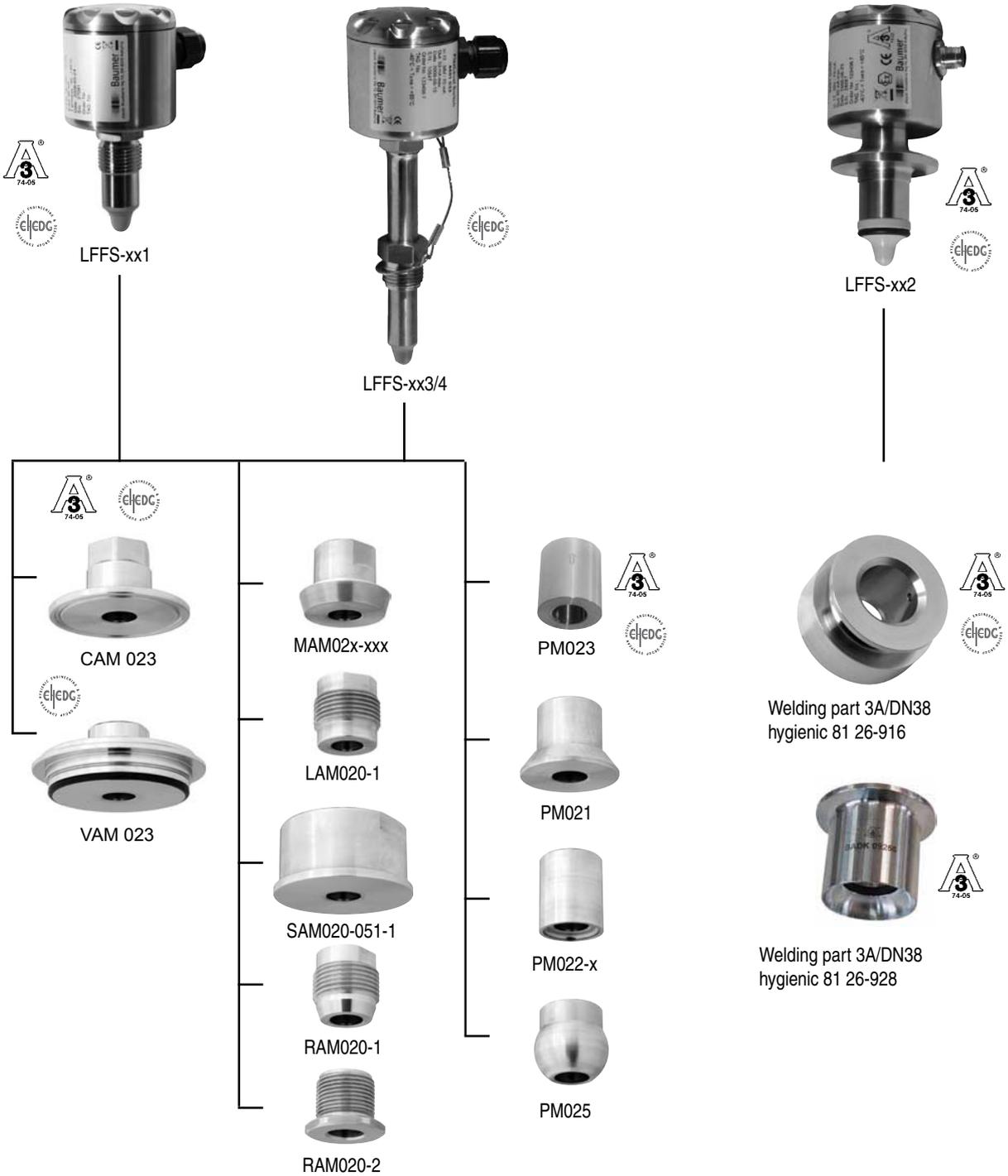
Media Temperature
°C



External length of sliding connection (mm) See figure 1

NB: Std. + 3A/DN38 = 35 mm external length

Accessories - Overview



Ex ia G - Installation

A Level Switch LFFS-1xx is Ex ia IIC T5, ATEX II 1G approved for application in hasardous areas in accordance with the current EUdirectives. The product must be installed in accordance with prevailing guidelines for zone 0 with a barrier.

Ex tD - Installation

A Level Switch LFFS-2xx is Ex tD A20 IP67 T100°C, ATEX II 1D approved for application in hasardous areas in accordance with the current EU-directives. The product must be installed in accordance with prevailing guidelines for zone 20 without a barrier.

Ex ia G, Ex nA G - Installation

A Level Switch LFFS-3xx is Ex nA II T5, ATEX II 3G approved for application in hasardous areas in accordance with the current EU-directives. The product must be installed in accordance with prevailing guidelines for zone 2 without a barrier.

Ex ia IIC T5, ATEX II 1G - Installation

A Level Switch LFFS-1xx is Ex ia IIC T5, ATEX II 1G approved for application in hasardous areas in accordance with the current EUdirectives. The product must be installed in accordance with prevailing guidelines for zone 0 with a barrier.

A certified Ex ia or isolation barrier with the maximum values $U_{max} = 30 \text{ VDC}$; $I_{max} = 0.1 \text{ A}$; $P_{max} = 0.75 \text{ W}$ must be used.

Conditions for Ex-Certification (Table 1)

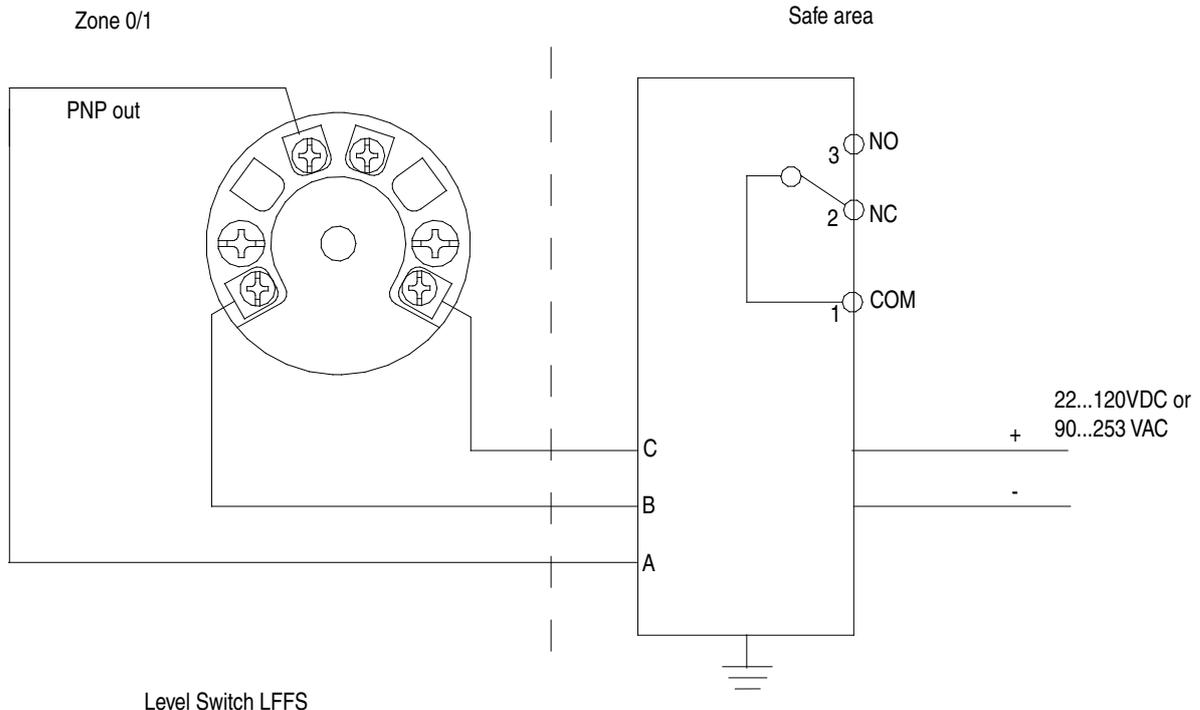
| Connection Type | Tamb °C | Media Temp. max. °C | Note |
|-----------------|----------|---------------------|---------|
| Std. & 3A/DN38 | -40...85 | 85 | |
| | -40...60 | 95 | {2} |
| | -40...40 | 115 | {2} |
| Sliding 100 mm | -40...85 | 85 | |
| | -40...60 | 150 | {2} |
| | -40...40 | 175 | {2} |
| Sliding 250 mm | -40...85 | 85 | |
| | -40...60 | 195 | {2} |
| | -40...40 | 200 | {2} {3} |

Note {2}: Provided that the sensor tip at the instrument is the only part in contact with the media.

Note {3}: Max. allowed media temperature.

Ex-data

| | |
|----------------------|---|
| Supply range | 24...30 VDC |
| Temperature class | T1...T5: See table 1 |
| Internal inductivity | $L_i < 10 \mu\text{H}$ |
| Internal capacity | $C_i < 33 \text{ nF}$ |
| Barrier data | $U < 30 \text{ VDC}$; $I < 0.1 \text{ A}$; $P < 0.75 \text{ W}$ |



NB: For PNP output the PROFSI3-B25100-ALG-LS barrier must be used.

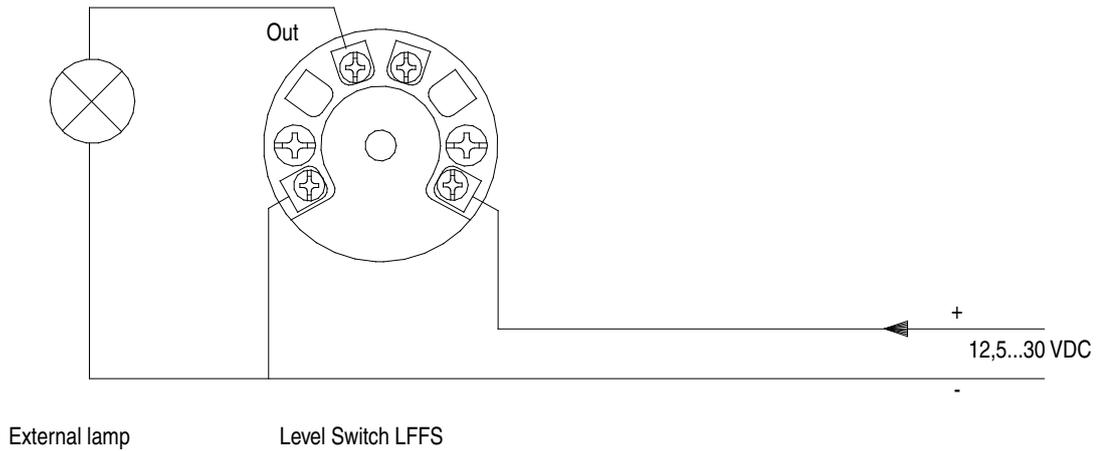
Isolating Module
PROFSI3-B25100-ALG-LS

Ex tD A20 IP67 T100, ATEX II 1D - Installation

A Level Switch LFFS-2xx is Ex tD A20 IP67 T100°C, ATEX II 1D approved for application in hazardous areas in accordance with the current EU-directives. The product must be installed in accordance with prevailing guidelines for zone 20 without a barrier.

Ex-data

| | |
|-------------------|---------------------------|
| Supply range | 12,5...30 VDC, max 100 mA |
| Temperature class | T100: See table 1 |



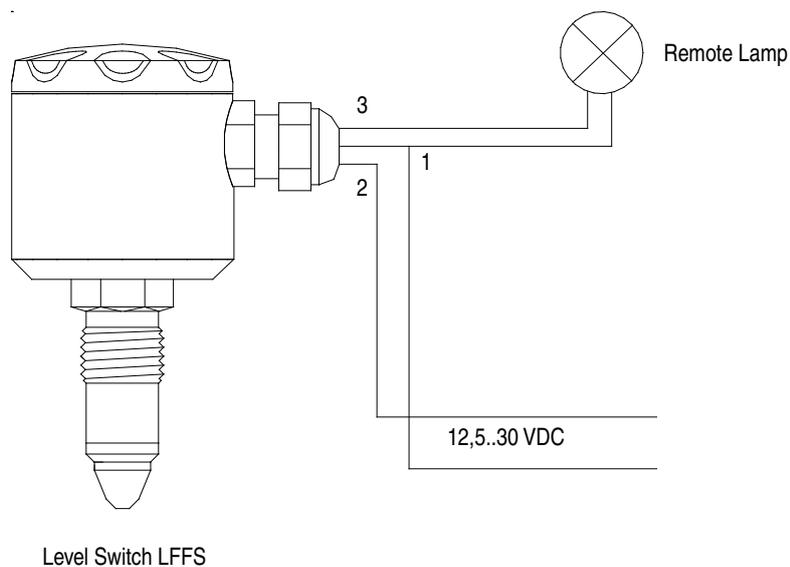
Ex nA II T5, ATEX II 3G - Installation

A Level Switch LFFS-3xx is Ex nA II T5, ATEX II 3G approved for application in hazardous areas in accordance with the current EU-directives.

The product must be installed in accordance with prevailing guidelines for zone 2 with a barrier.

Ex-data

| | |
|-------------------|--------------------------|
| Supply range | 12,5...30 VDC, Max. 0.1A |
| Temperature class | T1...T5: See table 1 |



Ordering details

| | | - | | | |
|---|----------|------|--|--|---|
| Model | | | | | |
| Level Switch | | LFFS | | | |
| Safety | 5' digit | | | | |
| Standard | | | | | 0 |
| Ex ia IIC T5, ATEX II 1G (Gas) * | | | | | 1 |
| Ex tD A20 IP67 T100 °C, ATEX II 1D (Dust) | | | | | 2 |
| Ex nA II T5, ATEX II 3G | | | | | 3 |
| Electrical Connection | 6' digit | | | | |
| Plug, M12, Nickel plated brass | | | | | 1 |
| Cable gland, M16 brass | | | | | 2 |
| Cable gland, M16 Polyamid | | | | | 3 |
| Plug, M12, stainless | | | | | 4 |
| Process Connection | 7' digit | | | | |
| G1/2, PEEK tip ⁽¹⁾ | | | | | 1 |
| 3A/DN38 Hygienic connection ⁽¹⁾ | | | | | 2 |
| G1/2, PEEK tip, sliding connection, 100 mm adjustable, incl. washer ring kit 4401 8001 ⁽²⁾ | | | | | 3 |
| G1/2, PEEK tip, sliding connection, 250 mm adjustable, incl. washer ring kit 4401 8001 ⁽²⁾ | | | | | 4 |
| Configuration | 8' digit | | | | |
| No configuration | | | | | 0 |
| Configuring according to customer specification | | | | | C |

* For PNP output the barrier module PFOFSI3-B25100-ALG-LS is required for funtional purposes.

⁽¹⁾ The 3A mark and the EHEDG certficate is valid only when the product is mounted in a 3A marked or EHEDG certified counter part and installed according to the installation manual. Use also a 3A marked O-ring or gasket if relevant. The 3A marked products conforms to the 3A Sanitary Standard criteria. Materials and surfaces fulfill the FDA demands and are certified by EHEDG.

⁽²⁾ Certified by EHEDG. Fulfills the FDA demand.
EPDM O-rings supplied with 3A marked products are conform to Sanitary Standard Class II (8% milk fat max.)
EPDM gaskets supplied with 3A marked products are conform to Sanitary Standard Class I (8% milk fat max.)
Refer to the 3A marked counter parts in the data sheet "Accessories Universal".

The washer ring kit for sliding connection, type no. 4401 8001
Can be ordered separately.
Baumer recommended to replace this kit if deformed.

3A certificate / EHEDG certificate

{1} The 3A mark and the EHEDG certficate is valid only when the product is mounted in a 3A marked or EHEDG certified counter part and installed according to the installation manual. Use also a 3A marked O-ring or gasket if relevant. The 3A marked products conforms to the 3A Sanitary Standard criteria. Materials and surfaces fulfill the FDA demands and are certified by EHEDG.

{2} Certified by EHEDG. Fulfills the FDA demand.
EPDM O-rings supplied with 3A marked products are conform to Sanitary Standard Class II (8% milk fat max.)
EPDM gaskets supplied with 3A marked products are conform to Sanitary Standard Class I (8% milk fat max.)
Refer to the 3A marked counter parts in the data sheet "Accessories Universal".

Level Switch LFFS, example

