



Special Features

- Wetted parts in stainless steel and PEEK
- Compact design
- Precise switching point with no requirement for calibration
- Process temperature -40... 115 °C
- Measures media with DK-values >1.5 (DK = Dielectrical Constant)
- Blue LED switch indicator
- Maintenance free
- Suitable for media separation
- Configurable by FlexProgrammer 9701
- ATEX approval for gas and dust
- WHG (leakage and overfill) Approval



Technical Data

| | | | |
|--|--|--|--|
| Sensor | | ATEX data | |
| Radiated signal | 100...180 MHz | Internal inductivity | $L_i \leq 10 \mu\text{H}$ |
| Process connection | Refer to dimensional drawings | Internal capacity | $C_i \leq 43 \text{ nF}$ |
| Insulating material | PEEK | Barrier data | $U \leq 30 \text{ VDC}$; $I < 0.1 \text{ A}$; $P < 0.75 \text{ W}$ |
| Mechanical data | | Approval Ex ia IIC T5, ATEX II 1G | |
| Housing | Stainless Steel | Supply range | 12...30 VDC |
| Amb. temperature | -40...85 °C | Temperature class | T1...T4: $-40 < T_{\text{amb}} < 85 \text{ °C}$ T1...T5: $-40 < T_{\text{amb}} < 74 \text{ °C}$ |
| Process temperature | -40...115 °C Max. 130 °C for < 1 hour, $T_{\text{amb}} 40 \text{ °C}$ | Approval Ex ta IIIC T100 Da, ATEX II 1D | |
| Protection class | IP67 (IEC 529) | Supply range | 12...30 VDC |
| Media pressure | Max. 100 bar | Temperature class | T100 °C: $-40 < T_{\text{amb}} < 85 \text{ °C}$ |
| Vibrations | IEC 60068-2-6, GL test2 | Approval Ex nA II T5, ATEX II 3G | |
| Installation | Any position | Supply range | 12,5...30 VDC |
| Surface roughness wetted parts | Stainless Steel $R_a < 0.8 \mu\text{m}$ PEEK $R_a < 0.05 \mu\text{m}$ | Temperature class | T1...T5: $-40 < T_{\text{amb}} < 85 \text{ °C}$ |
| Electrical connection | | Output | |
| Cable | 5 meter, 4 wire | Output (active) | Max. 20 mA, short-circuit and high-temperature protected |
| Plug M12 | Plastic or Stainless steel 304 | Output type | PNP or NPN |
| Other electrical data | | Output polarity | NO and NC |
| Power supply | 12...30 VDC, 35 mA max. | Active "High" | PNP (VDC -1.5V) $\pm 0.5\text{V}$; $R_{\text{load}} 10 \text{ kOhm}$ |
| Damping | 0...10 sec. | Active "Low" | NPN (-VDC +1.5V) $\pm 0.5\text{V}$; $R_{\text{load}} 10 \text{ kOhm}$ |
| Power-up time | <2 sec. | Off leak current | $\pm 100 \mu\text{A Max.}$ |
| Hysteresis | $\pm 1 \text{ mm}$ | Factory Settings | |
| Repeatability | $\pm 1 \text{ mm}$ | Damping | 0.1 sec. |
| Reaction time | 0.1 sec. (100 mS) | Approvals/conformities | |
| Reverse polarity protection | Yes | Approvals/conformities | EN 1935/2004, EN 10/2011 DNV Marine Approval EN 50155 Railway 3A, EHEDG, FDA, WHG (leakage and overfill) UL listed, E36692 |
| Disposal of product and packing | | | |
| According to national laws or by returning to Baumer | | | |
| EMC data and packing | | | |
| Immunity | EN 61326 | | |
| Emission | EN 61326 | | |

Description

The Level Switch LBFS is designed to detect levels in tanks, for media separation and provide empty-pipe detection or dry-run protection for pumps.

A high frequency sweep signal is radiated from the sensor tip into the tank. The media will act as a virtual capacitor, which together with a coil in the sensor head, will form a circuit creating the switch point signal. This virtual capacitance will depend of the di-electric value DK (Dielectrical Constant) of the media.

Two output signals are available, Normally Open (NO) and Normally Closed (NC). By means of the FlexProgrammer 9701, a damping of the output signal can be activated in case of a luctuating media level, e.g. during tank illing. Additionally the output signals NO and NC can be reversed.

The measurement is precise and unaffected by the mounting position in the tank. In the Flex-software a compensation for foam, bubbles and condensate as well as sticky media can be set.

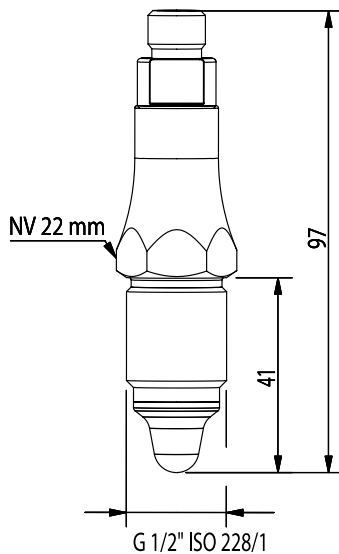
The Flex-software also features an adjustment facility making the user able to adjust the sensor to a speciiic media.

The Level Switch LBFS measures liquids such as water and oil. Even dry media can be measured, eg. coal dust or plastic granulate.

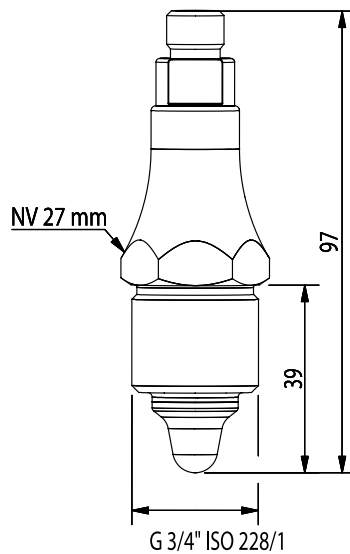
Level Switch LBFS can be delivered with PNP output as well as NPN output.

The process connection can easily be sealed by use of PTFE tape or by use of special welding adapter for the hygienic edition.

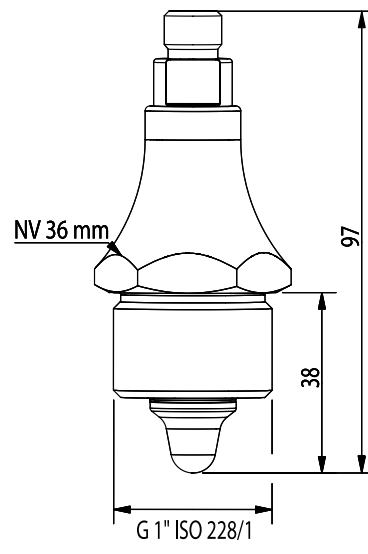
Dimensional Drawings



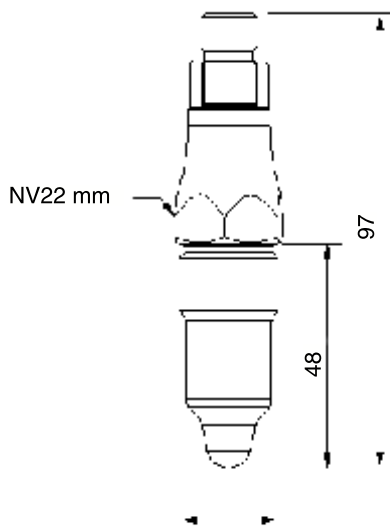
LBFS xx1x x



LBFS xx2x x

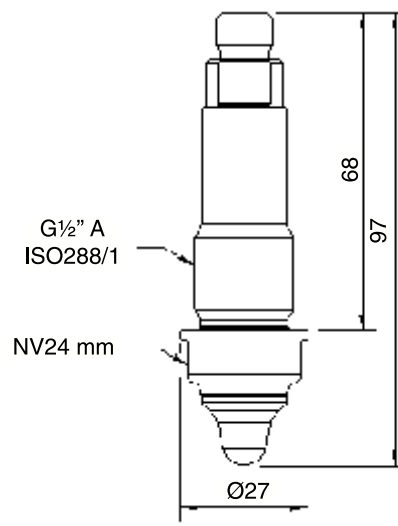


LBFS xx3x x



G 1/2" hygienic

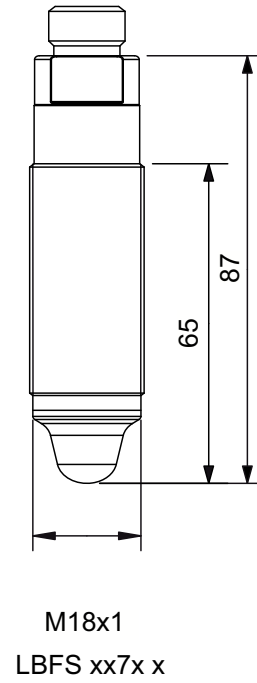
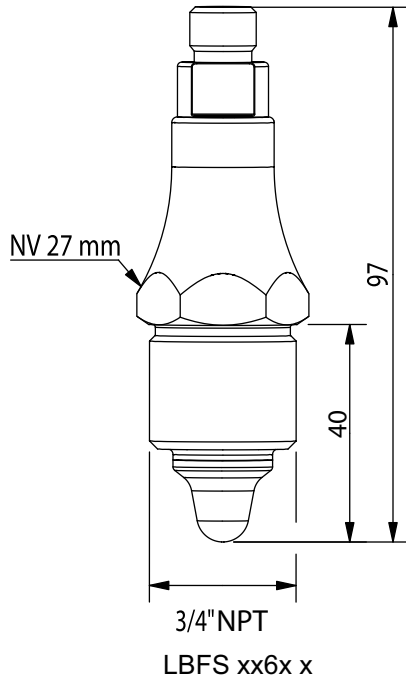
LBFS xx4x x



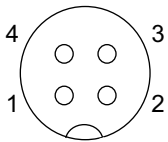
G 1/2" reverse assembly

LBFS xx5x x

Dimensional Drawings



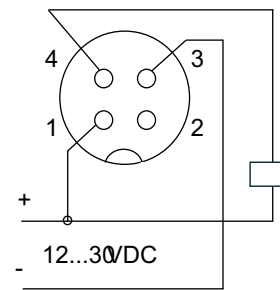
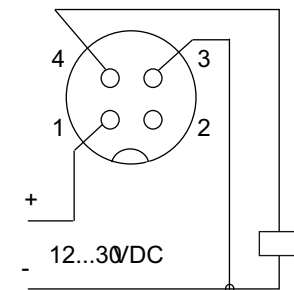
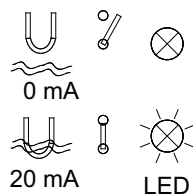
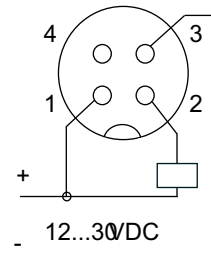
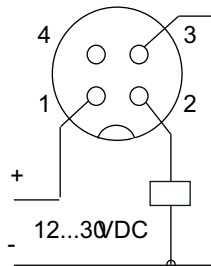
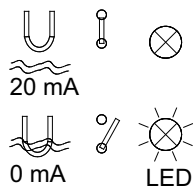
Electrical Connection



| M12 plug | Cable | Function |
|----------|-------|-----------------|
| 1 | Brown | + VDC |
| 2 | White | Normally closed |
| 3 | Blue | - VDC |
| 4 | Black | Normally open |

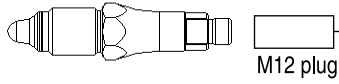
Electrical Installation

Normally Closed

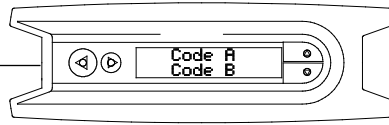


Configuration

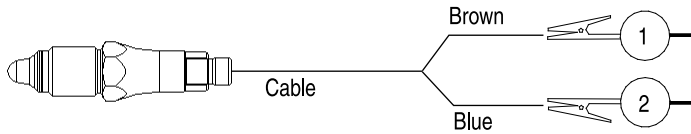
FlexProgrammer 9701



M12 plug



Note: Ambient temperature range 0...50°C



Disconnect the power supply before connecting the Flex-Programmer 9701 to the Level Switch LBFS

Accessories

FlexProgrammer 9701



The FlexProgrammer 9701 is a dedicated tool to configure Baumer configurable products

Type N° 9701-0001 comprises:

- FlexProgrammer
- USB cable
- CD with the FlexProgram software

Accessories examples

LB020



CAM023



ISO 2852 clamp

VAM023



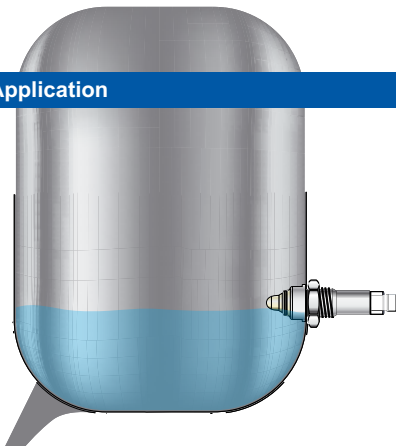
Varivent

PM023

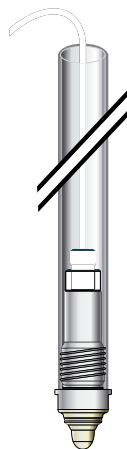


G½ hygienic welding sleeve in AISI 316

Application



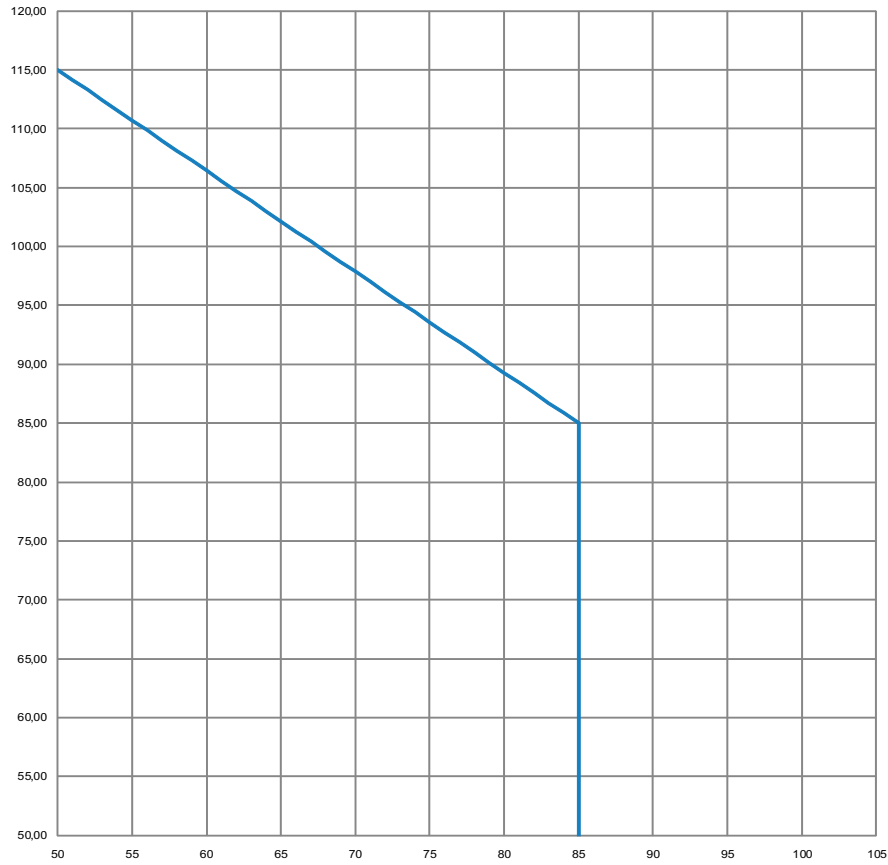
LBFS xx5x x



LBFS xx5x x

Media Temperature versus Ambient Temperature

Media Temperature
°C



Ambient Temperature

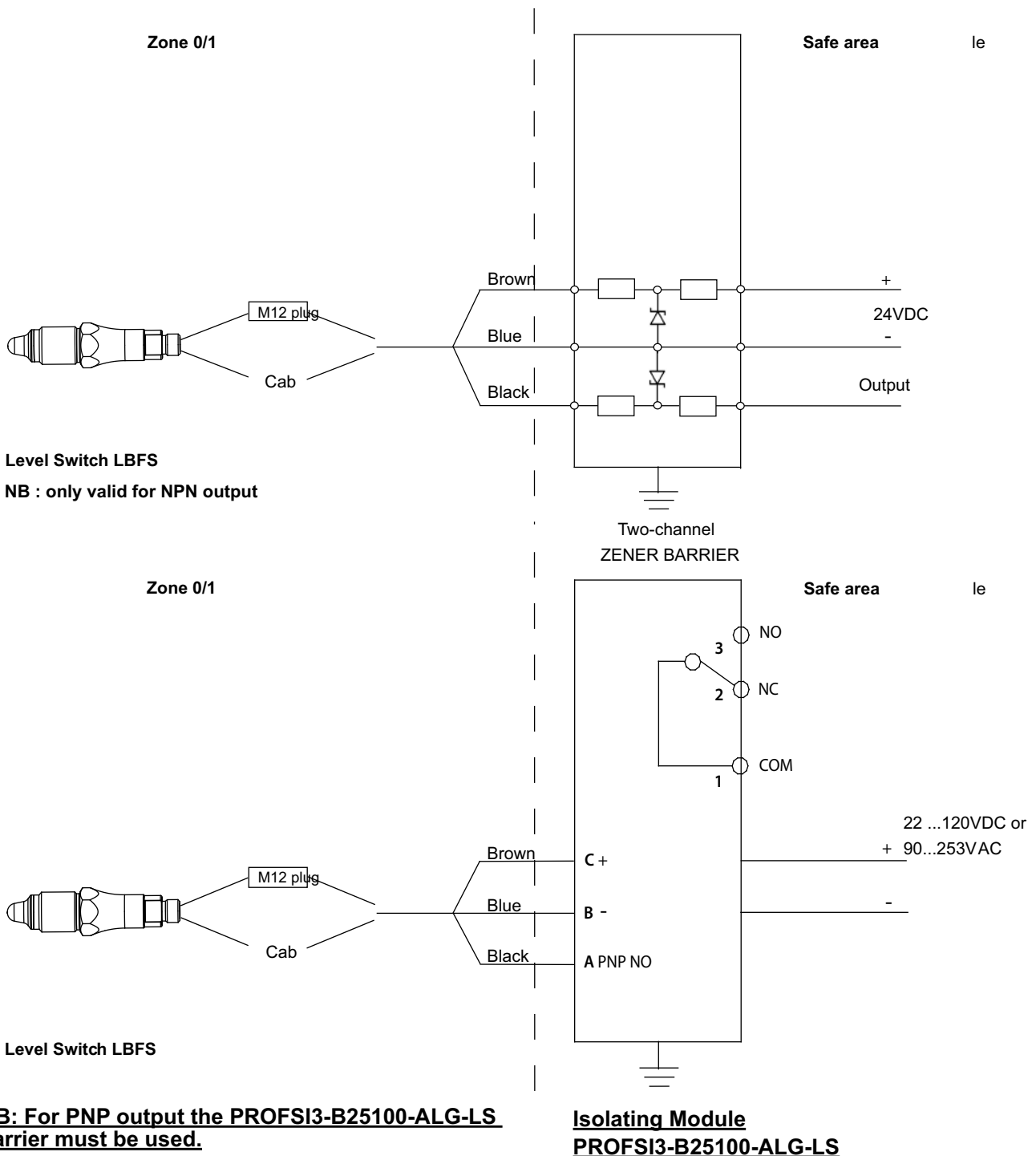
Ex ia IIC T5, ATEX II 1G - Installation

A Level Switch LBFS 1xxx x is Ex ia IIC T5, ATEX II 1G approved for application in hazardous 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 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. Use the isolating module PROFSI 3-B25100-ALG-LS (for PNP output only) or a ZENER Barrier (for NPN output only) as shown below (see installation manual for special instructions).

Ex-data

| | |
|----------------------|--|
| Supply range | 24...30 VDC |
| Temperature class | T1...T4: $-40 < T_{amb} < 85 \text{ }^\circ\text{C}$ T1...T5: $-40 < T_{amb} < 74 \text{ }^\circ\text{C}$ |
| Internal inductivity | $L_i < 10 \text{ } \mu\text{H}$ |
| Internal capacity | $C_i < 43 \text{ nF}$ |
| 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.

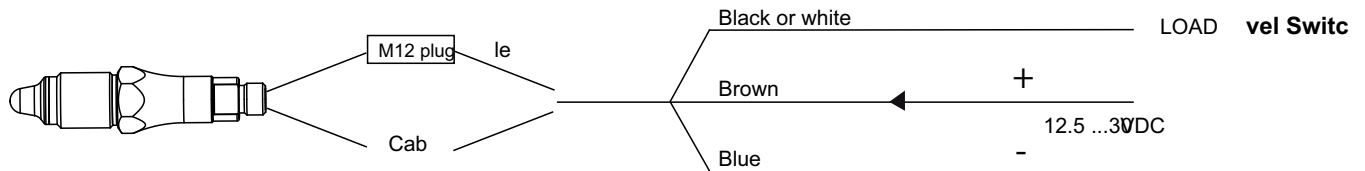
Ex ta IIIC T100 Da, ATEX II 1D - Installation

A Level Switch LBFS 2xxx x Ex ta IIIC T100 Da, 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 |



Level Switch LBFS

NB : The cable must be fixed to an external strain relief not more than 5 cm from the Level Switch. Only IP 67 compliant cable must be used for installation.
See below.

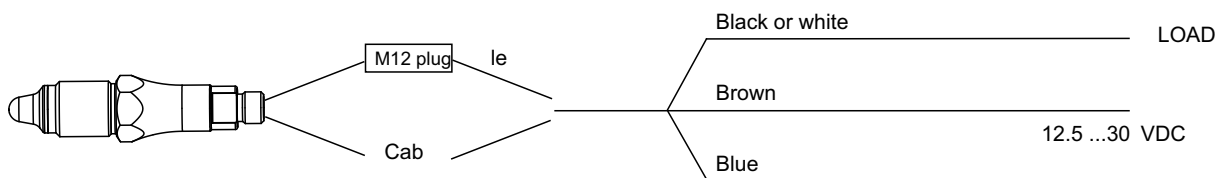
Ex nA II T5, ATEX II 3G - Installation

A Level Switch LBFS3 xxx x 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 without a barrier.

Ex-data

| | |
|-------------------|--------------------------|
| Supply range | 12.5...30 VDC, Max. 0.1A |
| Temperature class | T1...T5 |



Level Switch LBFS

Ordering details

| | - | | | | | |
|---|-----------|--|--|--|--|---|
| Model | | | | | | |
| Level Switch | LBFS | | | | | |
| Safety | 5' digit | | | | | |
| Standard | | | | | | 0 |
| Ex ia IIC T5, ATEX II 1G (Gas) ⁽⁶⁾ | | | | | | 1 |
| Ex ta IIIC T100 Da, ATEX IIIC 1D (Dust) ⁽²⁾ | | | | | | 2 |
| Ex nA II T5, ATEX II 3G | | | | | | 3 |
| Ex ia IIC T5 / Ex ta IIIC T100 Da (combined gas/dust) ⁽²⁾ | | | | | | 4 |
| UL listed, E36692 ⁽²⁾ | | | | | | A |
| Electrical Connection | 6' digit | | | | | |
| Plug, M12 plastic with LED | | | | | | 1 |
| Cable 5 meter ⁽³⁾ | | | | | | 2 |
| Plug, M12, stainless steel, without LED | | | | | | 3 |
| Process Connection | 7' digit | | | | | |
| G1/2" | | | | | | 1 |
| G3/4" | | | | | | 2 |
| G1" | | | | | | 3 |
| G1/2" hygienic (for Accessories Universal) 3A / EHEDG ⁽⁵⁾ | | | | | | 4 |
| G1/2" for reverse assembly, glasiber-aramide-NBR lat seal included ⁽¹⁾ | | | | | | 5 |
| 3/4" NPT ⁽⁴⁾ | | | | | | 6 |
| M18x1 | | | | | | 7 |
| Process Connection material | 8' digit | | | | | |
| Stainless Steel 1.4301 - AISI 304 | | | | | | 1 |
| Stainless Steel 1.4404 - AISI 316L | | | | | | 2 |
| Output Configuration | 9' digit | | | | | |
| PNP output | | | | | | 1 |
| NPN output | | | | | | 2 |
| Configuration | 10' digit | | | | | |
| No configuration | | | | | | 0 |
| Configuring according to customer specification | | | | | | C |

(1) Max. 85 °C media temperature

(2) Not valid with "cable connection"

(3) Max ambient temperature 70 °C

(4) Only available in AISI 304

(5) Only available in AISI 316L

(6) For PNP output the barrier module PFOFSI3-B25100-ALG-LS is required for functional purposes. For NPN output a standard barrier may be used.

Authorised Dealer



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