Level Switch LBFS

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

LED switch indicator

Maintenance free

Suitable for media separation measurement

Configurable by FlexProgrammer 9701

ATEX approval for gas and dust

Description

The Level Switch LBFS designed to detect levels in tanks, 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 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 fluctuating media level, e.g. during tank filling. 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 specific media.

The Level Switch LBFS measures liquids such as water and oil. Even dry medias 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 Teflon Tape or by use of special welding adapter for the hygienic edition.

Baumer

Technical Data

Sensor

Radiated signal	100...180 MHZ
Process connection	Refer to dimensional drawings
Insulating material	PEEK

Mechanical data

Housing	Stainless Steel
Amb. temperature	-40...85°C
Process temperature	-40...115°C
Protection class	IP67 (IEC 529)
Media pressure	Max. 100 bar
Vibrations	IEC 60068-2-6, GL test2
Installation	Any position

Electrical connection

Cable	5 meter, 4 wire
Plug M12	Plastic

Other electrical data

Power supply	12...30 VDC, 35 mA max.
Damping	0...10 sec.
Power-up time	<2 sec.
Hysteresis	± 1 mm
Repeatability	± 1 mm
Reaction time	0.2 sec. typ.

Disposal of product and packing

According to national laws or by returning to Baumer

EMC data

Immunity	EN 61326
Emission	EN 61326

Ex data (ia)

Internal inductivity	$L_i \leq 10$ µH
Internal capacity	$C_i \leq 43$ nF
Barrier data	U ≤ 30 VDC ; I ≤ 0.1 A ; P ≤ 0.75 W

Approval Ex ia IIC T5, ATEX II 1G

Supply range	24...30 VDC	
Temperature class	T1...T4:	$-40 < T_{amb} < 85°C$
	T1...T5:	$-40 < T_{amb} < 74°C$

Approval Ex ta IIIC T100 Da, ATEX II 1D

Supply range	12...30 VDC	
Temperature class	T100°C:	$-40 < T_{amb} < 85°C$

Approval Ex nA II T5, ATEX II 3G

Supply range	12...30 VDC	
Temperature class	T1...T5:	$-40 < T_{amb} < 85°C$

Output

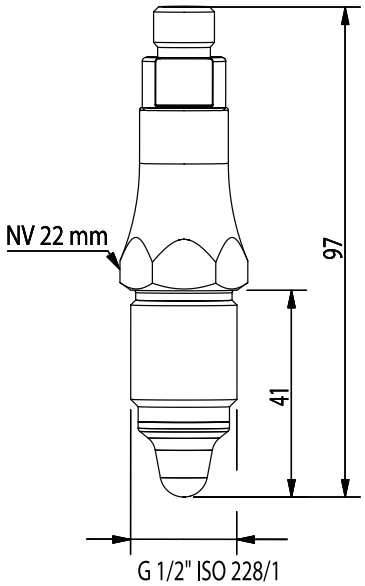
Output (active)	Max. 20 mA, short-circuit and high-temperature protected
Output type	PNP or NPN
Output polarity	NO and NC
Active "High"	PNP (VDC -1.5V) ± 0.5V ; Rload 10 kOhm
Active "Low"	NPN (-VDC +1.5V) ± 0.5V ; Rload 10 kOhm
Off leak current	± 100µA Max.

Factory Settings

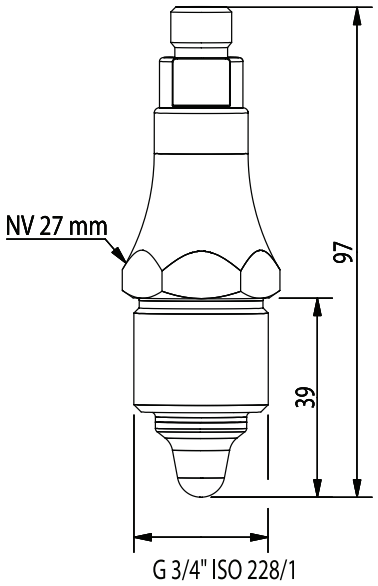
Measure	DK value > 2
Damping	0.1 sec.

INGENIERIA SCANDIMEX LIMITADA
Av. Lib. B. O'Higgins 240, Of.81, Stgo. - Chile
Tel.: (56-2) 2222 1576 FFax: (56-2) 2222 2745
info@scandimex.cl // www.scandimex.cl

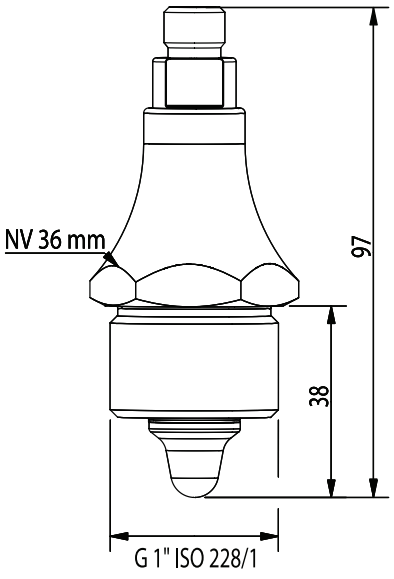
Dimensional Drawings



LBFS xx1x x

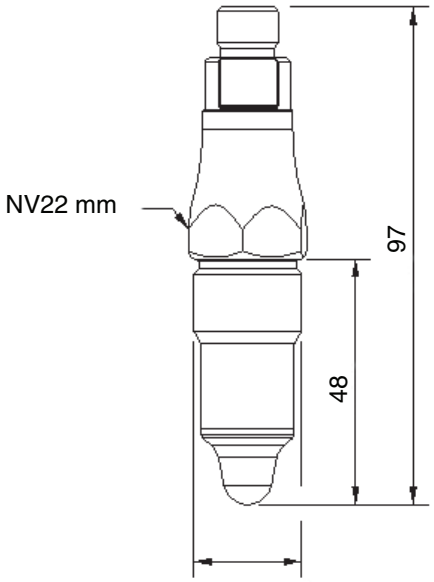


LBFS xx2x x



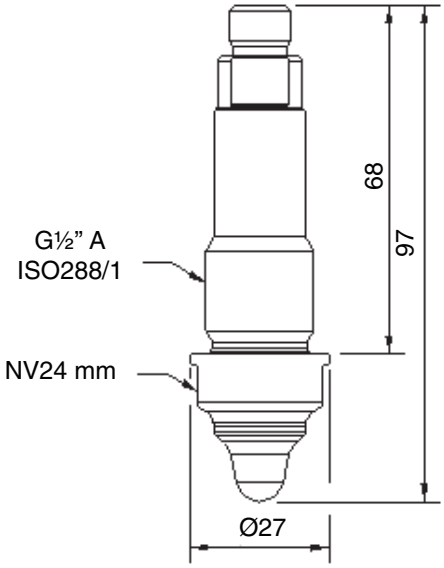
LBFS xx3x x

Dimensional Drawings



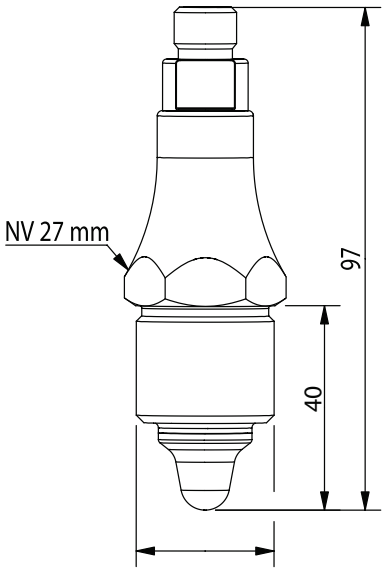
G½" hygienic

LBFS xx4x x

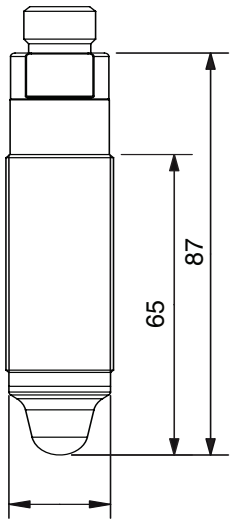


G½" revers assembly

LBFS xx5x x

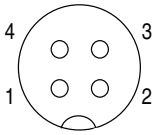


LBFS xx6x x



LBFS xx7x x

Electrical Connection

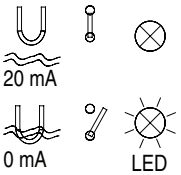


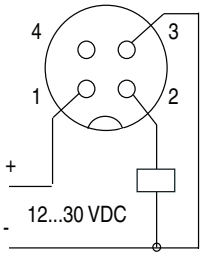
M12 plug	Cable	Function
1	Brown	+ VDC
2	White	Normally Closed
3	Blue	- VDC
4	Black	Normally Open

INGENIERIA SCANDIMEX LIMITADA
Av. Lib. B. O'Higgins 240, Of.81, Stgo. - Chile
Tel.: (56-2) 2222 1576 FFax: (56-2) 2222 2745
info@scandimex.cl // www.scandimex.cl

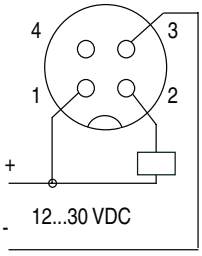
Electrical Installation

Normally Closed

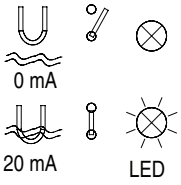


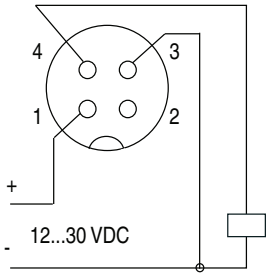


PNP Output
20 mA max.

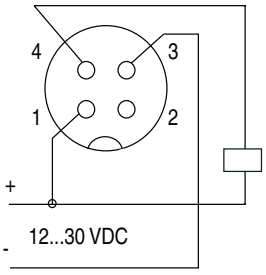


NPN Output
20 mA max.





PNP Output
20 mA max.



NPN Output
20 mA max.

Ordering Details - Level Switch LBFS

		LBFS xxxx x (x)
Safety	**5´ digit**	
Standard		0
Ex ia IIC T5, ATEX II 1G (Gas)		1
Ex ta IIIC T100 Da, ATEX II 1D (Dust) {2}		2
Ex nA II T5, ATEX II 3G		3
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 Acessories Universal) 3A / EHEDG {4} {6}		4
G1/2” for reverse assembly {1}		5
3/4”NPT {6}		6
M18x1 {5}		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**	
Configuring according to customer specification		(C)

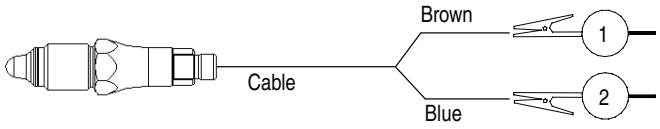
Notes:

{1} Max. 85°C media temperature
{2} Not valid with “cable connection”
{3} Max ambient temperature 70°C
{4} Max 130°C for <1 hour, Tamb 40°C
{5} Only available in AISI 304
{6} Only available in AISI 316L

Configuration

FlexProgrammer 9701

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 No. 9701-0001 comprises:
FlexProgrammer
Cable with 2 aligator clips
Cable from FlexProgrammer to M12 plug for TE2
Cable from FlexProgrammer to M12 Plug for LFFS, LBFS, CPX
USB cable
CD with the FlexProgram software

Other accessories

LB020

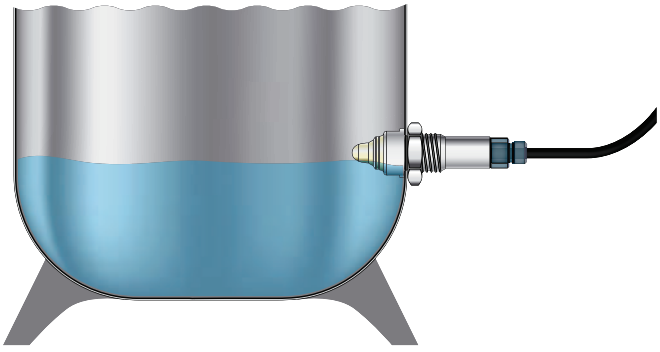
G1/2 welding sleeve AISI 304
(for non hygienic installation)

CAM023

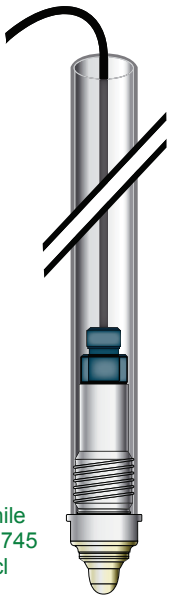
VAM023

PM023

Application



LBFS xx5x x

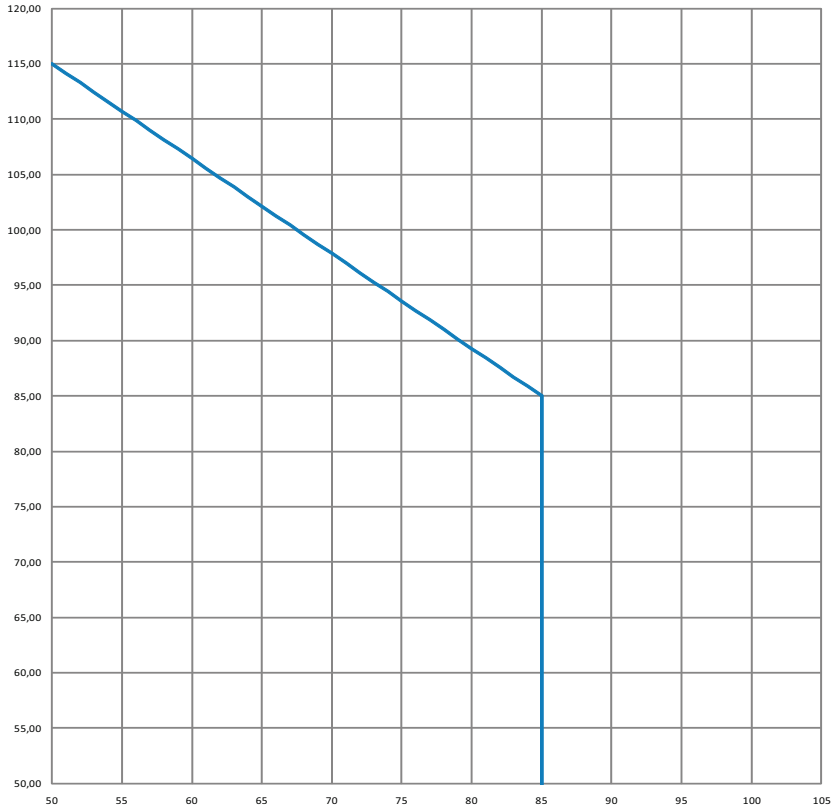


LBFS xx5x x

INGENIERIA SCANDIMEX LIMITADA
Av. Lib. B. O'Higgins 240, Of.81, Stgo. - Chile
Tel.: (56-2) 2222 1576 FFax: (56-2) 2222 2745
info@scandimex.cl // www.scandimex.cl

Media Temperature versus Ambient Temperature

Media Temperature
°C



Ambient Temperature

INGENIERIA SCANDIMEX LIMITADA
Av. Lib. B. O'Higgins 240, Of.81, Stgo. - Chile
Tel.: (56-2) 2222 1576 FFax: (56-2) 2222 2745
info@scandimex.cl // www.scandimex.cl

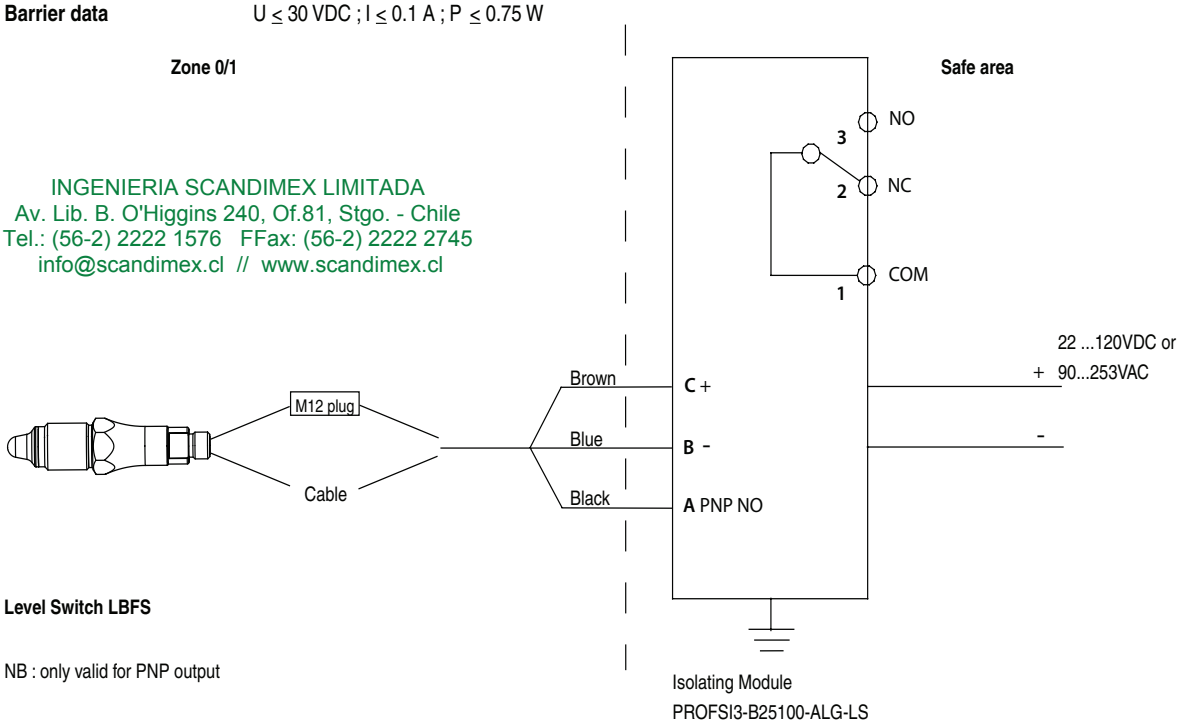
Ex ia IIC T5, ATEX II 1G - Installation

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 EU-directives. 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 VDC ; I_{max} = 0.1 A ; P_{max} = 0.75 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

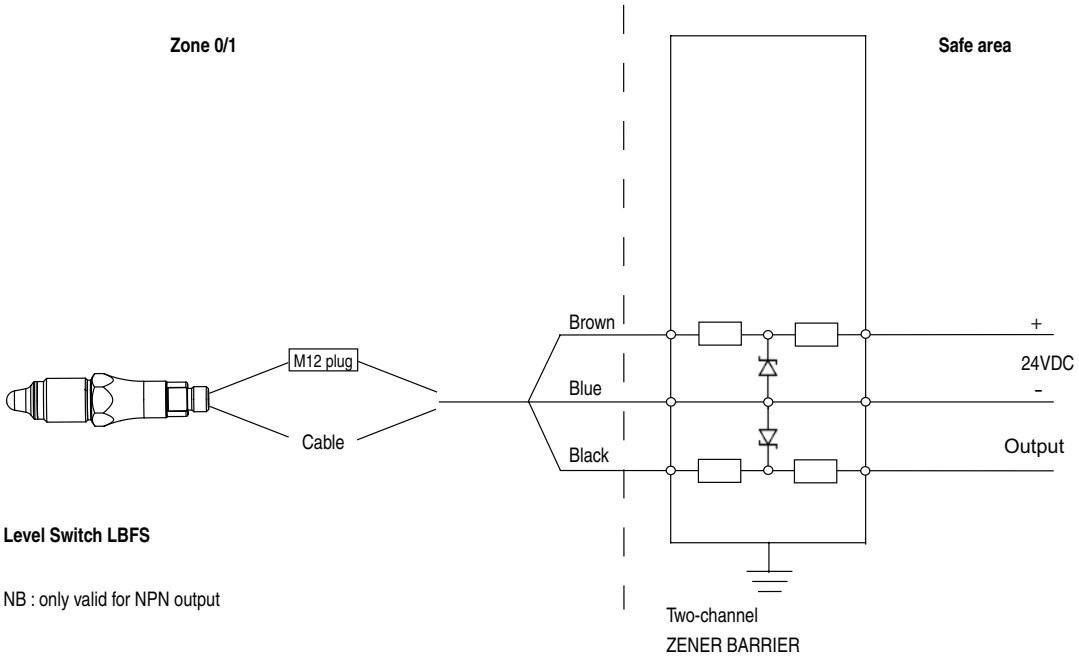
Supply range	24...30 VDC
Temperature class	T1...T4: $-40 < T_{amb} < 85°C$
	T1...T5: $-40 < T_{amb} < 74°C$
Internal inductivity	$L_i \leq 10$ µH
Internal capacity	$C_i \leq 43$ nF
Barrier data	U ≤ 30 VDC ; I ≤ 0.1 A ; P ≤ 0.75 W



Level Switch LBFS

NB : only valid for PNP output

Isolating Module
PROFSI3-B25100-ALG-LS



Level Switch LBFS

NB : only valid for NPN output

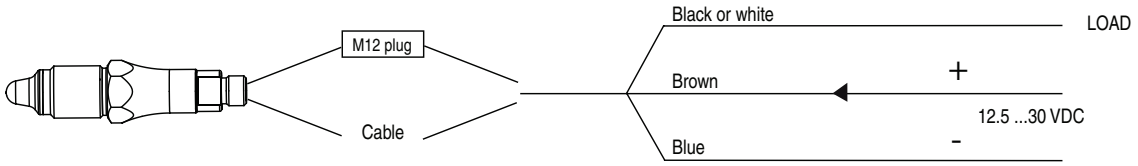
Two-channel
ZENER BARRIER

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 ia and Ex ta - Installation for both gas and dust

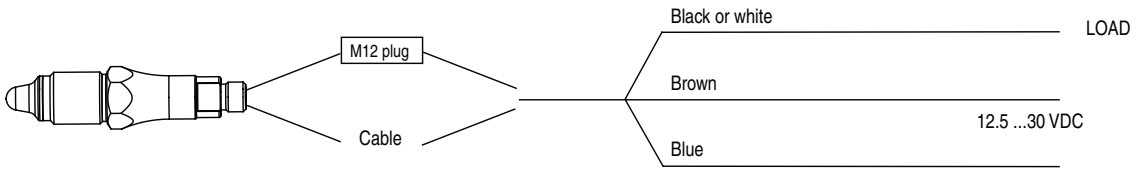
Only IP 67 compliant cable must be used for installation
The cable must be fixed to an external strain relief not more than 5cm from the Level Switch
A zener barrier / isolating module must be used for protection

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