LFFS

Point level detection based on frequency deviation technology for high-temperature hygienic applications

LFFS-###.0

Overview

- Process temperatures up to 200 °C
- Housing design with 360° status indicator
- For hygienic and industrial applications
- 3-A- and FDA-compliant, EHEDG-certified
- With WHG and cULus approval
- Optionally available with Ex certification

Picture similar

Technical data

Performance characteristics	
Measuring principle	CleverLevel level switches (Frequency Sweep)
Hysteresis	± 1 mm
Media characteristics	DC > 1.5
Step response time	0.1 s , typ. 0.2 s , max.
Damping	0 … 10 s , adjustable
Repeatability	± 1 mm
Process conditions	
Process temperature	Refer to section "Operating conditions"
Process pressure	Refer to section "Operating conditions"
Process connection	
Connection variants	Refer to section "Dimensional drawings"
Mounting position	Any, top, bottom, side
Wetted parts material	PEEK Natura AISI 316L (1.4404) EPDM, optional
Surface roughness wetted parts	Ra ≤ 0.8 µm
Ambient conditions	
Operating temperature range	-40 … 85 °C
Storage temperature range	-40 … 85 °C
Degree of protection (EN 60529)	IP 67 , with appropriate cable
Humidity	< 98 % RH , condensing
Vibration (sinusoidal) (EN 60068-2-6)	1.6 mm p-p (2 … 25 Hz), 4 g (25 … 100 Hz), 1 octave / min.

Output signal	
Output type	PNP NPN Digital (push-pull)
Switching logic	Normally open (NO) Normally closed (NC) Active high Active low
Voltage drop	PNP: (+Vs -2.5 V) ± 0.5 V, Rload = 1 kΩ NPN: (+2.5 V) ± 0.5 V, Rload = 1 kΩ Digital (push-pull): (+Vs -2.5 V) ± 0.5 V, Rload = 1 kΩ Digital (push-pull): (+2.5 V) ± 0.5 V, Rload = 1 kΩ
Current rating	50 mA , max.
Off leak current	< 100 µA , max.
Short circuit protection	Yes
Housing	
Style	Field housing, Ø55 mm
Overall size	Refer to section "Dimensional drawings"
Material	AISI 304 (1.4301)
Electrical connection	
Connector	M12-A, 4-pin, nickel plated brass M12-A, 4-pin, stainless steel
Cable gland	M16x1.5, nickel plated brass M16x1.5, polyamid M16x1.5, stainless steel
Power supply	
Voltage supply range	12.5 … 36 V DC
Current consumption (no load)	35 mA , max.
Power-up time	< 2 s
Reverse polarity protection	Yes

The product features and technical data specified do not express or imply any warranty. Technical modifications subject to change.
2024-09-16

LFFS

Point level detection based on frequency deviation technology for high-temperature hygienic applications

LFFS-###.0

Technical data

Factory settings	
Output polarity	AUTO
Switching logic SW1	PNP
Switching range (dielectric constant DC)	< 75.3 % , DC > 2
Trigger level	80.4 %
Range hysteresis	2.4 %
Damping	0.1 s
ATEX II 1D Ex ta IIIC T200 106°C Da	
Voltage supply range	12.5 … 30 V DC
Current rating, In	100 mA
Degree of protection for cable accessories	IP 67
Temperature class T100 °C	-40 < Tamb < 85 °C
ATEX II 1G Ex ia IIC T5	
Voltage supply range	24 … 30 V DC
Maximum values for barrier selection, Ui	30 V DC , max.
Maximum values for barrier selection, Ii	100 mA
Maximum values for barrier selection, Pi	750 mW
Internal capacitance, Ci	33 nF

ATEX II 1G Ex ia IIC T5	
Internal inductance, Li	10 µH
Temperature class, T1 ... T5	-40 < Tamb < 85 °C
Recommended barrier	PROFSI3-B25100-ALG-LS
ATEX II 3 G Ex ec IIC T5	
Voltage supply range	12.5 … 30 V DC
Current rating, In	100 mA
Degree of protection for cable accessories	IP 67
Temperature class, T1 ... T5	-40 < Tamb < 85 °C
Compliance and approvals	
EMC Emission	EN 61326, installed in a closed metal tank
EMC Immunity	EN 61326, installed in a closed metal tank
Hygiene	Refer to section "Compliance and approvals"
Safety	For cULus please refer to section "Compliance and approvals" WHG (overfill, leakage)
Explosion protection	ATEX II 1D Ex ta IIIC T200 106°C Da ATEX II 1G Ex ia IIC T5 ATEX II 3 G Ex ec IIC T5
Pharma	Refer to section "Compliance and approvals"

Operating conditions

Ordering key	Process connection	BCID	Continuous		Temporary (t < 1 h)	
			Process temperature @ Tamb < 60 °C	Process pressure	Process temperature max. @ Tamb < 60 °C	Process pressure @ Process temperature max.
			(° C)	(bar)	(° C)	(bar)
LFFS-##1.#	G 1/2 A hygienic	A03	-40 … 115	-1 … 10	140	-1 … 5
LFFS-##2.#	BHC 3A DN 38	B01	-40 … 115	-1 … 40	140	-1 … 40
LFFS-##3.#	G 1/2 A hygienic, sliding connection, length 100 mm	A03	-40 … 150	-1 … 16	N/A	N/A
LFFS-##4.#	G 1/2 A hygienic, sliding connection, length 250 mm	A03	-40 … 200	-1 … 16	N/A	N/A

For further information on permissible process and ambient temperatures, please refer to the operating instructions.

2024-09-16 The product features and technical data specified do not express or imply any warranty. Technical modifications subject to change.

LFFS

Point level detection based on frequency deviation technology for high-temperature hygienic applications

LFFS-###.0

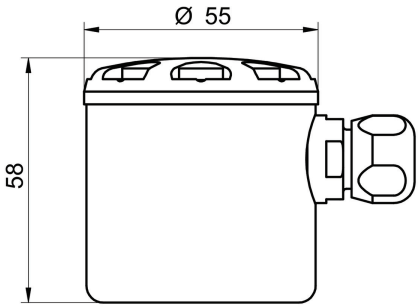
Compliance and approvals

Ordering key	Process connection	BCID	EN 1935/2004 EN 10/2011 EN 2023/2006	FDA	3-A	EHEDG EL-Class I	USP Class VI	WHG (overfill, leakage)
LFFS-##1.#	G 1/2 A hygienic	A03	■	■	■	■	■	■
LFFS-##2.#	BHC 3A DN 38	B01	■	■	■	■		■
LFFS-##3.#	G 1/2 A hygienic, sliding connection, length 100 mm	A03	■	■		■		■
LFFS-##4.#	G 1/2 A hygienic, sliding connection, length 250 mm	A03	■	■		■		■

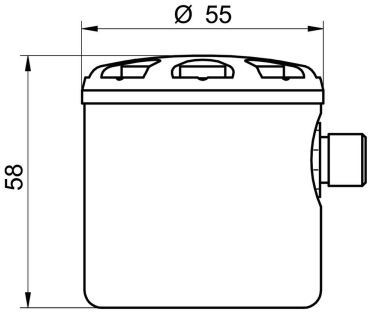
Information on product characteristics may relate to defined product options.
The requirements of the respective 3-A Sanitary Standard will be only fulfilled in combination with appropriate mounting accessories. Those are marked with the 3-A logo.
The EHEDG certification is only valid in combination with appropriate mounting accessories. Those are marked with the "EHEDG Certified" logo.

Dimensional drawings (mm)

Housing

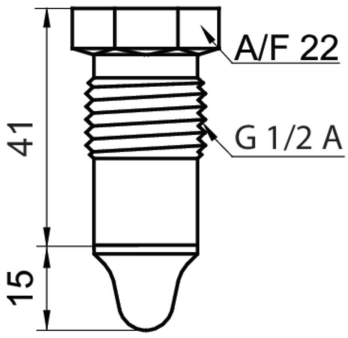


Housing with cable gland M16x1.5

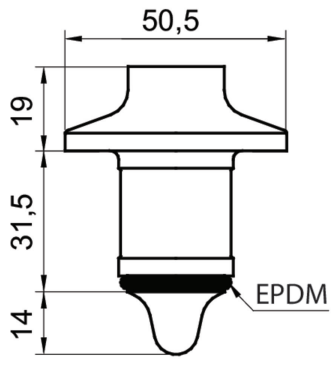


Housing with connector M12-A, 4-pin

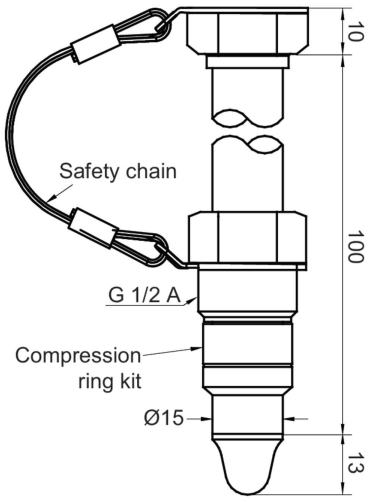
Process connection



G 1/2 A hygienic (BCID: A03)



BHC 3A DN 38, including O-ring ZPX2-123 (BCID: B01)



G 1/2 A hygienic, sliding connection, 100 mm adjustable, including compression ring kit ZPX1-006 (BCID: A03)

The product features and technical data specified do not express or imply any warranty. Technical modifications subject to change.
2024-09-16

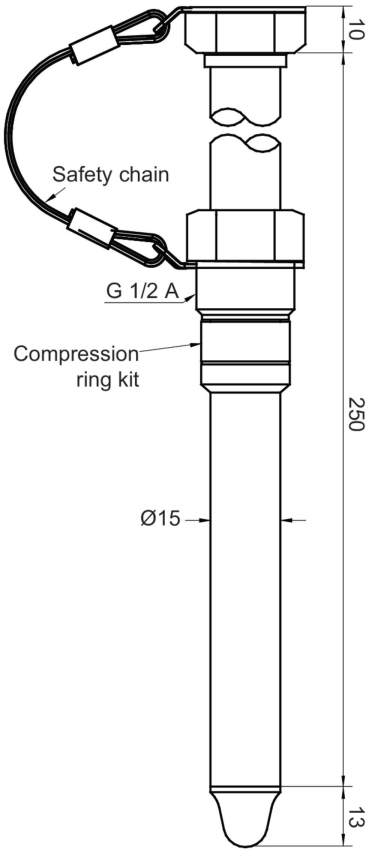
LFFS

Point level detection based on frequency deviation technology for high-temperature hygienic applications

LFFS-###.0

Dimensional drawings (mm)

Process connection



G 1/2 A hygienic, sliding connection, 250 mm adjustable, including compression ring kit ZPX1-006 (BCID: A03)

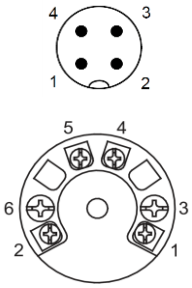
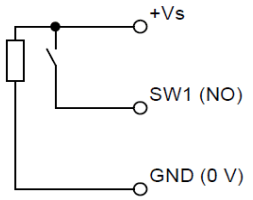
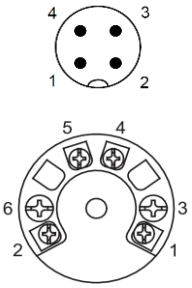
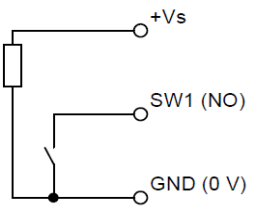
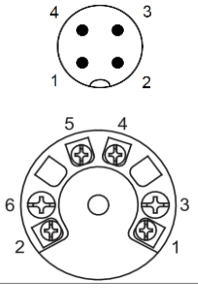
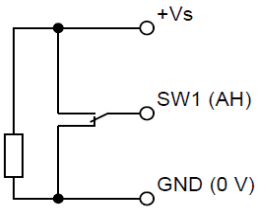
2024-09-16 The product features and technical data specified do not express or imply any warranty. Technical modifications subject to change.

LFFS

Point level detection based on frequency deviation technology for high-temperature hygienic applications

LFFS-###.0

Electrical connection

Output type	Electrical connection	Equivalent circuit	Function	Pin assignment
PNP Normally open (NO)			+Vs SW1 Teach-in GND (0 V) +Vs SW1 Teach-in GND (0 V)	1 4 2 3 1 5 4 2
NPN Normally open (NO)			+Vs SW1 Teach-in GND (0 V) +Vs SW1 Teach-in GND (0 V)	1 4 2 3 1 5 4 2
Digital (push-pull) Active high			+Vs SW1 Teach-in GND (0 V) +Vs SW1 Teach-in GND (0 V)	3 4 2 1 2 5 4 1

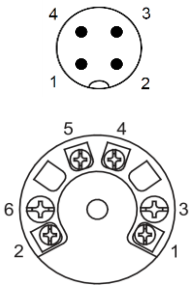
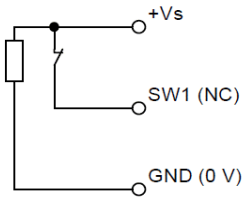
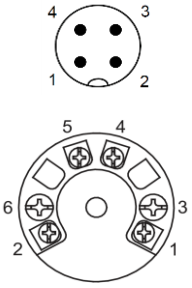
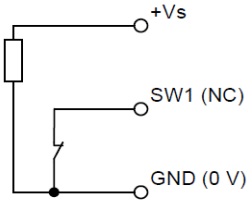
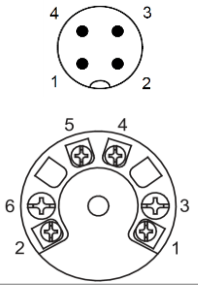
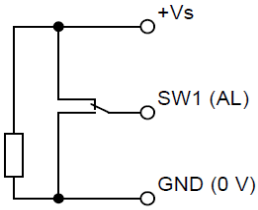
2024-09-16 The product features and technical data specified do not express or imply any warranty. Technical modifications subject to change.

LFFS

Point level detection based on frequency deviation technology for high-temperature hygienic applications

LFFS-###.0

Electrical connection

Output type	Electrical connection	Equivalent circuit	Function	Pin assignment
PNP Normally closed (NC)			+Vs SW1 Teach-in GND (0 V) +Vs SW1 Teach-in GND (0 V)	3 4 2 1 2 5 4 1
NPN Normally closed (NC)			+Vs SW1 Teach-in GND (0 V) +Vs SW1 Teach-in GND (0 V)	3 4 2 1 2 5 4 1
Digital (push-pull) Active low			+Vs SW1 Teach-in GND (0 V) +Vs SW1 Teach-in GND (0 V)	1 4 2 3 1 5 4 2

Ordering information

Ordering key - Configuration possibilities see website

	LFFS	-	#	#	#	.	#
Product							
LFFS							
Compliance and approvals							
Standard			0				
ATEX II 1G Ex ia IIC T5 Ga			1				
ATEX II 1D Ex ta IIIC T200 106°C Da			2				
ATEX II 3G Ex ec IIC T5			3				
UL listed, E365692			A				
Electrical Connection							
M12-A, 4-pin, nickel plated brass				1			
Cable gland, M16x1.5, nickel plated brass				2			
Cable gland, M16x1.5, polyamid				3			
M12-A, 4-pin, stainless steel				4			
Cable gland, M16x1.5, stainless steel				5			

The product features and technical data specified do not express or imply any warranty. Technical modifications subject to change.
2024-09-16

LFFS

Point level detection based on frequency deviation technology for high-temperature hygienic applications

LFFS-###.0

Ordering information

Ordering key - Configuration possibilities see website

	LFFS	-	#	#	#	.	#
Process Connection							
G 1/2 A hygienic, PEEK-tip (A03)					1		
BHC 3A DN 38, PEEK-tip (B01)					2		
G 1/2 A hygienic, PEEK-tip (A03), sliding connection, 100 mm adjustable, incl. Compression ring kit ZPX1-006					3		
G 1/2 A hygienic, PEEK-tip (A03), sliding connection, 250 mm adjustable, incl. Compression ring kit ZPX1-006					4		
Configuration							
Factory settings							0
Customer-specific							C

(1) Including O-ring ZPX2-123

2024-09-16 The product features and technical data specified do not express or imply any warranty. Technical modifications subject to change.