

PL20S - Adaptive trigger

Point level detection based on frequency deviation technology for industrial applications

PL20S-1####.1##0##.####2###0#0#

Overview

- Adaptive trigger
- Problem solver for adhesions
- Two adjustable switching outputs
- Possibility for analog output
- Applicable for use in open tanks
- 360° visible multicolor LED
- IO-Link interface



reddot winner 2021
industrial design



Technical data

Performance characteristics

Trigger modes	Adaptive trigger Window trigger Analog output
Measuring principle	CleverLevel level switches (Frequency Sweep)
Hysteresis	± 1 mm
Repeatability	± 1 mm
Media characteristics	DC > 1.5
Step response time	< 150 ms
Damping	0 ... 10 s, adjustable

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)

Surface roughness wetted parts	Ra ≤ 0.8 µm
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Surface roughness (in contact with medium)

Sensor tip (PEEK)	Not defined
	Ra ≤ 0.8 µm, optional
	Ra ≤ 0.4 µm, optional
Smooth metal surface	Not defined
	Ra ≤ 0.8 µm, optional
	Ra ≤ 0.4 µm, optional
	Ra ≤ 0.8 µm, electropolished, optional Ra ≤ 0.4 µm, electropolished, optional
Thread	Ra ≤ 1.6 µm

Ambient conditions

Operating temperature range	-40 ... 85 °C
	-40 ... 60 °C, with 4 ... 20 mA output signal
Storage temperature range	-40 ... 85 °C
Degree of protection (EN 60529)	M12-A connector, polycarbonate and stainless steel: IP67, with appropriate cable IP69K, with appropriate cable KingCrown M12-A connector (proTect+): IP68, with appropriate cable IP69K, with appropriate cable
Humidity	< 98 % RH, condensing
Vibration (EN 61373:2010)	Category 2 (bogie-mounted) Functional test: 5.4 m/s ² , 5...250 Hz, 10 min. per axis Life-time: 30.6 m/s ² , 5...250 Hz, 5 h per axis
Shock (EN 61373:2010)	Category 2 (bogie-mounted) 300 m/s ² , 18 ms, 3 impulses per axis and direction

Output signal

Output type	PNP
	NPN
	Digital (push-pull)
	4...20 mA
Switching logic	Normally open (NO)
	Normally closed (NC)
	Active high
	Active low
Voltage drop	PNP: (+Vs -1.4 V) ± 0.5 V, Rload ≥ 10 kΩ
	NPN: (-Vs +0.6 V) ± 0.3 V, Rload ≥ 10 kΩ
Current rating	100 mA, max.
Off leak current	< 100 µA, max.
Short circuit protection	Yes

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Technical data

Output signal		Factory settings – Adaptive trigger	
Interface	IO-Link 1.1	Switching logic	Normally open (NO)
IO-Link interface		Advanced setup	Disabled
IO-Link version	1.1	Set point high	100 %
IO-Link port type	Class A	Steady detection	Active
Baud rate	38,4 kbaud (COM2)	Damping	0 ms
Cycle time	≥ 6.4 ms	Trigger distance	3.0 %
SIO-mode	Yes	Startup Level	0.0 %
Housing		Factory settings – Window trigger	
Style	Compact transmitter	Switching logic	Normally open (NO)
Overall size	Refer to section "Dimensional drawings"	Switch window, min.	0 %
Material	Stainless steel	Switch window, max.	75.3 %
Electrical connection		Switch window, hysteresis	2.4 %
Connector	M12-A, 4-pin, polycarbonate M12-A, 4-pin, stainless steel	Damping	0.1 s
Power supply		Compliance and approvals	
Voltage supply range	8 ... 35 V DC	EMC Emission	EN 61326-1 EN 50121-3-2:2016
Current consumption (no load)	25 mA , typ. 53 mA , max.	EMC Immunity	EN 61326-1 EN 50121-3-2:2016
Power-up time	< 1.5 s	Hygiene	FDA (21 CFR 177.2415)
Reverse polarity protection	Yes	Safety	cULus listed, E365692

Operating conditions

Ordering key	Process connection	BCID	Continuous		Temporary (t < 1 h)	
			Process temperature @ Tamb < 50 °C	Process pressure	Process temperature max. @ Tamb < 50 °C	Process pressure @ Process temperature max.
			(° C)	(bar)	(° C)	(bar)
G070	G 1/2 A ISO 228-1 BSC	G07	-40 ... 115	-1 ... 100	135	-1 ... 100
A030	G 1/2 A hygienic	A03	-40 ... 115	-1 ... 10	135	-1 ... 5
G510	G 1/2 A DIN 3852-E	G51	-40 ... 115	-1 ... 100	135	-1 ... 100
N020	1/2-14 NPT	N02	-40 ... 115	-1 ... 100	135	-1 ... 100
T110	G 3/4 A ISO 228-1 for reverse assembly (in-shell thread)	T11	-40 ... 85	-1 ... 100	N/A	N/A
A031	G 1/2 A hygienic, length 82 mm	A03	-40 ... 115	-1 ... 100	135	-1 ... 100
A032	G 1/2 A hygienic, sliding connection, length 250 mm	A03	-40 ... 150	-1 ... 5	N/A	N/A

For further information regarding operating conditions please see the graph of the different types of internal O-rings.

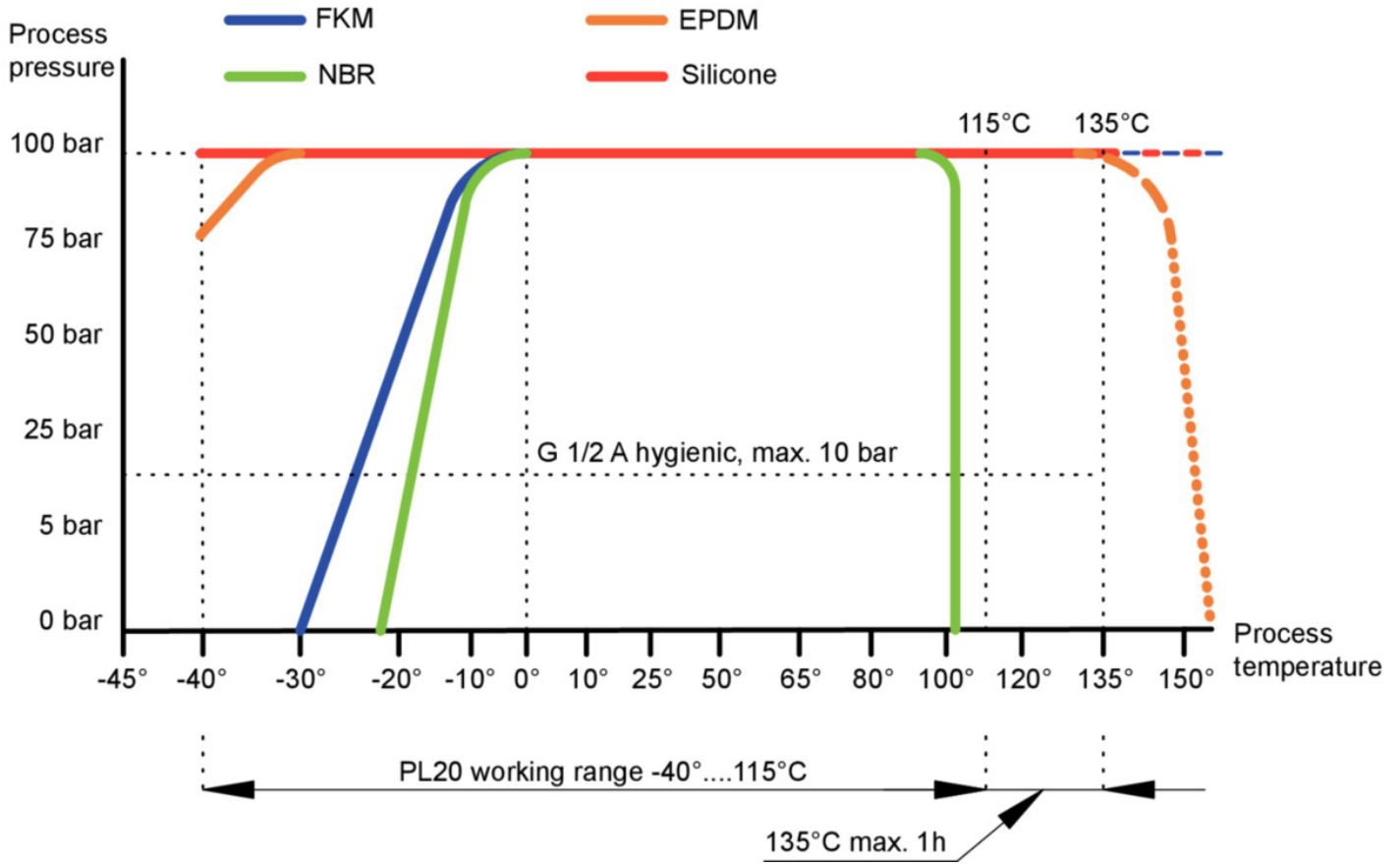
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Operating conditions

Internal O-ring-typ



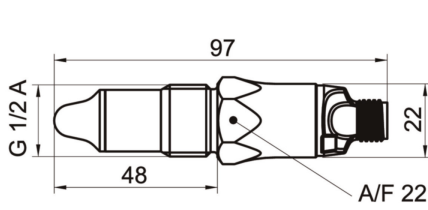
Material	Resistance
NBR	High resistance to petroleum, dilute acid, ethylene glycol, lye, mineral oils, aliphatic hydrocarbons and water. NBR is not suitable for CIP cleaning.
FKM	High resistance to mineral oils, acid, aliphatic hydrocarbons and chlorinated hydrocarbons. FKM is not suitable for steam and lye.
EPDM	High resistance to water, steam, glycol, alcohols, acid, lye and solvents and chemicals used in the Food & Beverage production. EPDM is not suitable for mineral oils.
Silicone	High resistance to water, alcohols and dilute acid. Silicone is not suitable for steam and concentrated acids and bases.

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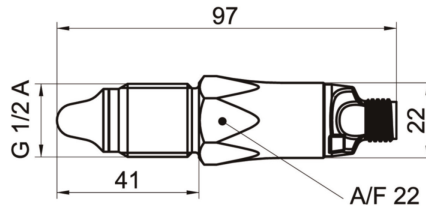
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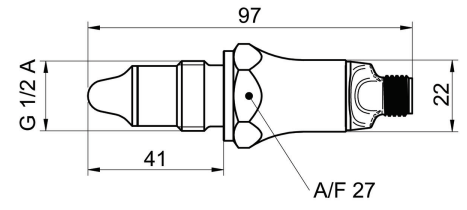
Dimensional drawings (mm)



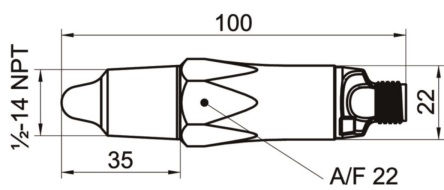
G 1/2 A hygienic (BCID: A03)



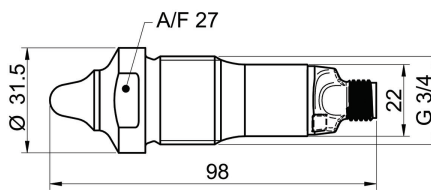
G 1/2 A ISO 228-1 BSC (BCID: G07)



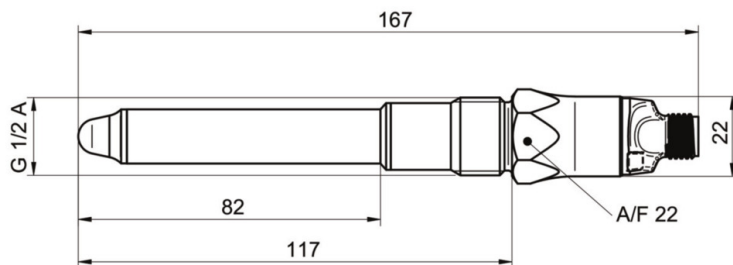
G 1/2 A DIN 3852-E (BCID: G51)



1/2-14 NPT (BCID: N02)



G 3/4 A ISO 228-1 for reverse assembly (in-shell thread) (BCID: T11)



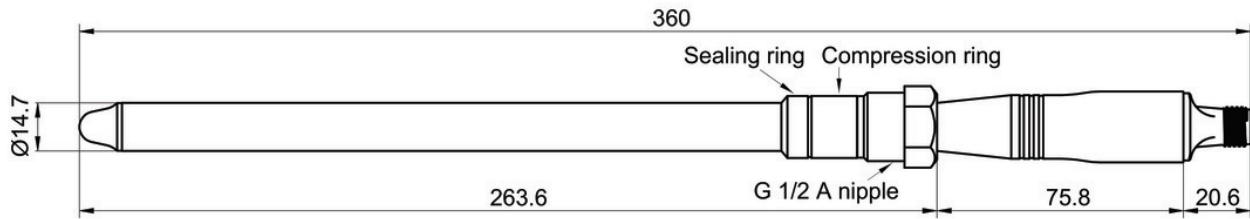
G 1/2 A hygienic, L82 mm (A03)

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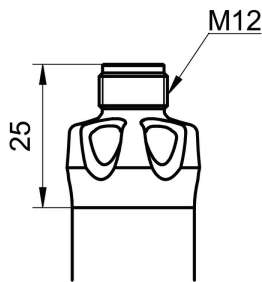
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Dimensional drawings (mm)

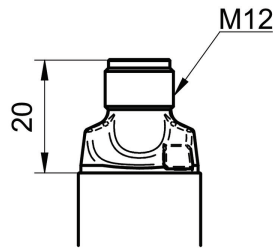


G 1/2 A hygienic, sliding connection, L250 mm (A03)

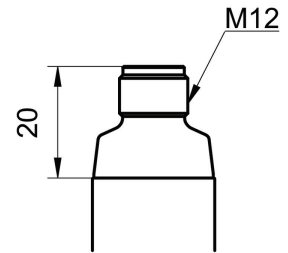
Housing



Connector M12-A, 4-pin, stainless steel (with LED), KingCrown



Connector M12-A, 4-pin, polycarbonate (with LED)



Connector M12-A, 4-pin, stainless steel (without LED)

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Electrical connection

Output type	Equivalent circuit	Electrical connection	Function	Pin assignment
Programmable output IO-Link PNP			+Vs	1
			SW1 (IO-Link)	4
			SW2	2
Programmable output IO-Link NPN			+Vs	1
			SW1 (IO-Link)	4
			SW2	2
Programmable output IO-Link Digital (push-pull)			+Vs	1
			SW1 (IO-Link)	4
			SW2	2
			GND (0 V)	3
			Frame Ground	Plug thread

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Electrical connection

Output type	Equivalent circuit	Electrical connection	Function	Pin assignment
Programmable output IO-Link + Analog 4...20 mA PNP			+Vs	1
			SW1 (IO-Link)	4
			iout	2
Programmable output IO-Link + Analog 4...20 mA NPN			+Vs	1
			SW1 (IO-Link)	4
			iout	2
Programmable output IO-Link + Analog 4...20 mA Digital (push-pull)			+Vs	1
			SW1 (IO-Link)	4
			iout	2
			GND (0 V)	3
			Frame Ground	Plug thread

Ordering information

Ordering key - Configuration possibilities see website

	PL20S	-	1	#	#	#	#	.	1	#	#	0	#	#	.	####	2	#	#	#	0	####	0	#
Product	Level switches																							
Version	Adaptive trigger																							
Trigger mode Switch 1	Adaptive trigger																							
	Window trigger																							
Trigger mode Switch 2	Adaptive trigger																							
	Window trigger																							
	Analog (4...20 mA)																							
Output type switch 1	PNP																							
	NPN																							
	Digital (push-pull)																							

2023-03-16 The product features and technical data specified do not express or imply any warranty. Technical modifications subject to change.

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Ordering information

Ordering key - Configuration possibilities see website

	PL20S	-	1	#	#	#	#	.	1	#	#	0	#	#	.	####	2	#	#	#	0	####	0	#	
Output type switch 2																									
PNP																									
NPN																									
Digital (push-pull)																									
Analog (4...20 mA)																									
Interface																									
I/O-link																									
Protection class																									
IP67, IP69K																									
Baumer proTect+ (IP68, IP69K)																									
Electrical connection																									
M12-A, 4-pin, polycarbonate (with LED)																									
M12-A, 4-pin, stainless steel (without LED)																									
M12-A, 4-pin, stainless steel KingCrown (with LED)																									
Cable length																									
Without cable																									
Process temperature																									
-40...115 °C																									
-40...150 °C																									
-40...85 °C																									
Max. process pressure																									
5 bar																									
10 bar																									
100 bar																									
Process connection																									
G 1/2 A ISO 228-1 (G07)																									
1/2-14 NPT (N02)																									
G 1/2 A hygienic (A03)																									
G 1/2 A DIN 3852-E (G51)																									
G 1/2 A hygienic, length 82 mm (A03)																									
G 1/2 A hygienic, sliding connection, length 250 mm. (A03)																									
G 3/4 A ISO 228-1 for reverse assembly (in-shell thread) (T11)																									
Process connection material																									
AISI 316L (1.4404)																									
Surface roughness																									
Standard																									
Ra ≤ 0.8 µm																									
Ra ≤ 0.4 µm																									
Electropolished, Ra ≤ 0,8 µm																									
Electropolished, Ra ≤ 0,4 µm																									
Gasket material (external)																									
Without																									
NBR																									
FKM																									
EPDM																									
Glass / aramide fiber with NBR																									

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Ordering information

Ordering key - Configuration possibilities see website

	PL20S	-	1	#	#	#	#	.	1	#	#	0	#	#	.	####	2	#	#	#	0	####	0	#		
Sealing-/ O-ring (internal)																										
NBR																									1	
FKM																										2
EPDM																										3
Silicone																										4
Explosion protection																										
Without																										0
Industrial approvals																										
Standard																										0
WHG																										1
Special approvals																										
Standard																										0
Configuration																										
Factory settings																										0
Customer-specific																										1

(1) Including gasket ZPX3-14C0 (glass/aramide fiber with NBR)