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Revision history		
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001	30/08/2024	First Issue

Document Title:	**BLPH Project - ATEX Components Data Sheets**
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Code:	D99
Requsition Number:	n/a
Customer:	CrossWind C.V., Rotterdam, The Netherlands

Pressure transmitter



Huba Control

Relative pressure transmitter

Type 520

The compact type 520 pressure transmitter is based upon the Huba Control developed thick film technology where the pressure measuring cell is fully welded.
This transmitter meets the high burst protection demands and is suitable for the use in all types of refrigerants including ammonia.

Pressure range

-1 ... 9 bar /
0 ... 2.5 – 1000 bar

+ Compact, rugged construction
+ Welded without sealing parts, no elastomer seals
+ Large selection of connections available.
+ Saving time by quick cable mounting by the customer with swift connector

Technical overview

Pressure range

Relative	-1 ... 9 bar / 0 ... 2.5 – 1000 bar

Operating conditions

Medium		Liquids, gases and refrigerants (incl. ammonia)	
Temperature	Medium	-40 ... +135 °C	(Ex) -30 ... +120 °C)
	Ambient	-30 ... +85 °C	(Ex) -25 ... +85 °C)
	Storage	-50 ... +100 °C	
Tolerable overload	≤ 6 bar	5 x fs	
	> 6 bar	3 x fs (max. 1500 bar)	
Rupture pressure	≤ 6 bar	10 x fs	
	> 6 bar	6 x fs (max. 2500 bar)	

Materials

Cover		Stainless steel 1.4404 / AISI 316L (inside thread Schrader 1.4305 / AISI 303 only)
Plug accommodation		Polyarylamide 50% GF UL 94 V-0
Materials in contact with medium	Pressure connection	Stainless steel 1.4404 / AISI 316L (inside thread Schrader 1.4305 / AISI 303 only)
	Sensor	Stainless steel

Electrical overview

		Output	Power supply	Load	Current consumption
2 wire		4 ... 20 mA	7 ... 33 VDC	$< \frac{\text{supply voltage - 7 V}}{0.02\ \text{A}}$ [Ohm]	< 23 mA
	Ex	4 ... 20 mA	10 ... 30 VDC	$< \frac{\text{supply voltage - 10 V}}{0.02\ \text{A}}$ [Ohm]	< 23 mA
3 wire		0 ... 5 V	7 ... 33 VDC	>10 kOhm / < 100 nF	< 7 mA
		1 ... 6 V	8 ... 33 VDC	>10 kOhm / < 100 nF	< 7 mA
		0 ... 10 V	12 ... 33 VDC	>10 kOhm / < 100 nF	< 7 mA
		0 ... 10 V	12 ... 33 VDC / 24 VAC ± 15%	>10 kOhm / < 100 nF	< 7 mA
		ratiom. 10 ... 90%	5 VDC ± 10%	>10 kOhm / < 100 nF	< 7 mA
	Ex	ratiom. 10 ... 90%	5 VDC ± 10%	>10 kOhm / < 100 nF	< 7 mA
Polarity reversal protection		Short circuit proof and protected against polarity reversal. Each connection is protected against crossover up to max. supply voltage.			
Insulation voltage				standard	500 VDC

Dynamic response

Response time	< 2 ms, 1 ms typ.
Load cycle	< 100 Hz

Electrical connection	**Protection standard**	**Protection class**
Swift connector with or without cable 1.5 / 2.0 / 3.0 / 5.0 m (PVC spec.)	IP 67	III
Connector DIN EN 175301-803-A or C (industrial standard 9.4 mm)	IP 65	III
Metri Pack Serie 150	IP 67	III
Connector M12x1	IP 67	III
Braids	IP 65	III
Connector RAST 2.5 (3 wire, only)	IP 00	III

Pressure connection

Inside thread	7/16 - 20 UNF	without or with Schrader
	½ -14 NPT	(≤ 60 bar)
	G ¼	with O-Ring seal FPM (-30 ... +135 °C)
Outside thread	7/16 - 20 UNF	sealing cone 45°
	¼ -18 NPT	
	7/16 - 20 UNF	sealed at back SAE 4 with O-Ring seal FPM (-20 ... +135 °C)
	G ¼	sealed at back DIN EN ISO 1179-2 with profile seal ring in FPM (-30 ... +135 °C)
	G ¼	sealed at back and manometer (combi) with profile seal ring in FPM (-30 ... +135 °C) (≤ 60 bar)
	R ¼	EN 10226
	G ½	sealed at back and manometer (combi) with profile seal ring in FPM (-30 ... +135 °C)
	⅛ - 27 NPT	(≤ 60 bar)
	G ⅛	sealed at front (≤ 60 bar)
	G ⅛	sealed at back DIN EN ISO 1179-2 with profile seal ring in FPM (-30 ... +135 °C) (> 60 bar - without ATEX certificate)
	M10x1	sealed at back DIN EN ISO 1179-2 with Profile seal ring in FPM (-30 ... +135 °C) (≤ 60 bar)
	M20x1.5	sealed at front and manometer (combi)
	G ½, G ¼	sealed at front

Installation arrangement

Unrestricted

Tests / Admissions

Electromagnetic compatibility	CE conformity acc. EN 61326-2-3
Enhanced EMC protection	EN 50121-3-2
Shock acc. IEC 68-2-27	100 g, 11 ms half sine wave, all 6 directions, free fall from 1 m on concrete (6x)
Constant shock acc. IEC 68-2-29	40 g for 6 ms, 1000x all 3 directions
Vibration acc. IEC 68-2-6	20 g, 15 ... 2000 Hz, 15 ... 25 Hz with amplitude ± 15 mm, 1 Octave/min. all 3 directions, 50 constant load
UL	ANSI/UL 61010-1 acc. E325110
Drinking water approval	NSF/ANSI 61/372 acc. MH60087
	WRAS
EAC	

Protection against explosion (Ex)	**ratiom. 10 ... 90%**	**4 ... 20 mA**
Intrinsic safety «i»	Ex II 1/2 G Ex ia IIC T4 Ga/Gb	Ex II 1/2 G Ex ia IIC T4 Ga/Gb
	Ex II 1/2 D Ex ia IIIC T125°C Da/Db	Ex II 1/2 D Ex ia IIIC T125°C Da/Db
EC type examination certificate	SEV 15 ATEX 0173	SEV 10 ATEX 0145
Connection to certified intrinsically safe resistive circuits with maximum values	Ui ≤ 15 VDC; Ii ≤ 200 mA; Pi ≤ 750 mW	Ui ≤ 30 VDC; Ii ≤ 100 mA; Pi ≤ 750 mW
Effective internal inductance and capacitance for versions with plugs complying with EN 175301-803-A or M12x1	Li = 0 nH; Ci ≤ 150 nF	Li = 0 nH; Ci = 0 nF
IECEx		SEV 16.0007

Weight

~ 90 g

Packaging (Please state on order)

Single packaging in cardboard	accessories integrated
Multiple packaging in cardboard (25 pcs)	

Accuracy

Parameter		Unit	
Characteristic line a [1]		% fs	± 0.3
Resolution		% fs	0.1
Thermal characteristic [2]	max.	% fs/10K	± 0.2
Long term stability acc. EN 60770-1	max.	% fs	± 0.25

Test conditions: 25 °C, 45% RH, power supply 24 VDC

Order code selection table in bar

			1	2	3	4	5	6	7	8	9	10	11
		520.	X	X	X	X	X	X	X	X	X	X	X
Pressure range [3]	-1 ... 9 bar		9	0	6								
	0 ... 2.5 bar		9	1	4								
	0 ... 4 bar		9	1	5								
	0 ... 6 bar		9	1	7								
	0 ... 10 bar		9	3	0								
	0 ... 16 bar		9	3	1								
	0 ... 25 bar		9	3	2								
	0 ... 40 bar		9	3	3								
	0 ... 60 bar		9	4	0								
	0 ... 100 bar		9	4	1								
	0 ... 160 bar		9	4	2								
	0 ... 250 bar		9	4	3								
	0 ... 400 bar		9	5	4								
	0 ... 600 bar		9	5	5								
	0 ... 1000 bar		9	5	7								
Application	standard					S	0						
	for oxygen applications					S	1				0		
	with drinking water approval NSF/ANSI 61/372, WRAS					S	4				0	1	
Output / power supply	0 ... 5 V	7 ... 33 VDC						1					
	1 ... 6 V	8 ... 33 VDC						6					
	0 ... 10 V	12 ... 33 VDC						2					
		12 ... 33 VDC Enhanced EMC protection						C	1,2,3				
		12 ... 33 VDC / 24 VAC ±15% *(not possible with M12x1, metri Pack, RAST, braids)*						8					
	ratiom. 10 ... 90%	5 VDC ±10%						7					
		5 VDC ±10% Ex protection					0,4	9	1,3			1	
	4 ... 20 mA	7 ... 33 VDC						3					
		7 ... 33 VDC Enhanced EMC protection *(not possible with Braids)*						A					
		10 ... 30 VDC Ex protection					0,4	4	1,3			1	
Electrical connection	Connector [4]	DIN EN 175301-803-A							1				
		DIN EN 175301-803-C (industrial standard 9.4 mm)							2				
		M12x1 *2w: IN=1 / OUT=3 3w: IN=1 / OUT=4 / GND=3*							3				
		M12x1 *2w: IN=1 / OUT=4 3w: IN=1 / OUT=3 / GND=4*							M				
		M12x1 *2w: IN=1 / OUT=2 3w: IN=1 / OUT=2 / GND=3*							P				
		RAST 2.5					0,4	7	4				
		Metri Pack Serie 150					0,4		5				
	Braids	80 ±10 mm					0,4		6				
		290 ±10 mm					0,4		7				
		480 ±10 mm					0,4		8				
		730 ±10 mm					0,4		9				
	Swift connector	without cable							0				
		with cable 1.5 m							L				
		with cable 2.0 m							N				
		with cable 3.0 m							Q				
		with cable 5.0 m							R				
Pressure connection [2]	Inside thread	$^{7}/_{16}$-20 UNF sealing cone with schrader					0,4			0	0	N	
		$^{7}/_{16}$-20 UNF sealing cone								K		1	
		½ -14 NPT [5]								D		1	
		G ¼ with O-Ring seal FPM								1		1	
	Outside thread	$^{7}/_{16}$ -20 UNF sealing cone								2		1	
		¼ -18 NPT								3		1	
		G ¼ sealed at back DIN EN ISO 1179-2 with profile seal ring in FPM								4		1	
		G ¼ sealed at back and manometer with profile seal ring in FPM								5	0	1	
		R ¼ acc. to EN 10226								7		1	
		G ½ sealed at back and manometer with profile seal ring in FPM					0,1			8		1	
		$^{7}/_{16}$-20 UNF sealed at back SAE 4 with O-Ring seal FPM					0,1			G		1	
		⅛ - 27 NPT [5]								A		1	
		G ⅛ sealed at front [5]								M		1	
		G ⅛ sealed at back DIN EN ISO 1179-2 with Profile seal ring in FPM [6]					0,1			H		1	
		M10x1 sealed at back DIN EN ISO 1179-2 with profile seal ring in FPM [5]					0,1			F		1	
		M20x1.5 sealed at front and manometer (combi)								E		1	
		G ¼ sealed at front								J		1	
		G ½ sealed at front								9		1	
Pressure orifice	without (inclusive pressure tip orifice from 100 bar on)										0		
	with										2		
Material pressure connection	Stainless steel 1.4305 / AISI 303											N	
	Stainless steel 1.4404 / AISI 316L											1	
Pressure range variation (optional)	Indicate W and state range on order (e.g.: W0... + 3bar/OUT0...5V)												W

[1] typ. ; max. 0.5% fs (incl. zero point, full scale, linearity, hysteresis and repeatability)
[2] -15 ... 85 °C
[3] Other pressure ranges or pressure connections on request
[4] Delivery without female connector
[5] Pressure range ≤ 60 bar
[6] Pressure range ≤ 250 bar (max. rupture pressure 1000 bar)

Order code selection table in psi

			1	2	3	4	5	6	7	8	9	10	11
		520.	X	X	X	X	X	X	X	X	X	X	X
Pressure range [1]	-15 ... 130 psi		9	A	6								
	0 ... 30 psi		9	B	4								
	0 ... 60 psi		9	B	5								
	0 ... 100 psi		9	B	7								
	0 ... 200 psi		9	C	1								
	0 ... 300 psi		9	C	2								
	0 ... 500 psi		9	C	3								
	0 ... 750 psi		9	D	0								
	0 ... 1000 psi		9	D	1								
	0 ... 2000 psi		9	D	2								
	0 ... 3000 psi		9	D	3								
	0 ... 5000 psi		9	E	4								
	0 ... 7500 psi		9	E	5								
	0 ... 14500 psi		9	E	7								
Application	standard					S	0						
	for oxygen applications					S	1				0		
	with drinking water approval NSF/ANSI 61/372, WRAS					S	4				0	1	
Output / power supply	0 ... 5 V	7 ... 33 VDC						1					
	1 ... 6 V	8 ... 33 VDC						6					
	0 ... 10 V	12 ... 33 VDC						2					
		12 ... 33 VDC Enhanced EMC protection						C	1,2,3				
		12 ... 33 VDC / 24 VAC ±15% *(not possible with M12x1, metri pack, RAST, braids)*						8					
	ratiom. 10 ... 90%	5 VDC ±10%						7					
		5 VDC ±10% Ex protection					0,4	9	1,3			1	
	4 ... 20 mA	7 ... 33 VDC						3					
		7 ... 33 VDC Enhanced EMC protection *(not possible with Braids)*						A					
		10 ... 30 VDC Ex protection					0,4	4	1,3			1	
Electrical connection	Connector [2]	DIN EN 175301-803-A							1				
		DIN EN 175301-803-C (industrial standard 9.4 mm)							2				
		M12x1 *2w: IN=1 / OUT=3 3w: IN=1 / OUT=4 / GND=3*							3				
		M12x1 *2w: IN=1 / OUT=4 3w: IN=1 / OUT=3 / GND=4*							M				
		M12x1 *2w: IN=1 / OUT=2 3w: IN=1 / OUT=2 / GND=3*							P				
		RAST 2.5					0,4	7	4				
		Metri Pack Serie 150					0,4		5				
	Braids	80 ±10 mm					0,4		6				
		290 ±10 mm					0,4		7				
		480 ±10 mm					0,4		8				
		730 ±10 mm					0,4		9				
	Swift connector	without cable							0				
		with cable 1.5 m							L				
		with cable 2.0 m							N				
		with cable 3.0 m							Q				
		with cable 5.0 m							R				
Pressure connection [1]	Inside thread	$^{7}/_{16}$-20 UNF sealing cone with schrader					0,4			0	0	N	
		$^{7}/_{16}$-20 UNF sealing cone								K		1	
		½ -14 NPT [3]								D		1	
		G ¼ with O-Ring seal FPM								1		1	
	Outside thread	$^{7}/_{16}$ -20 UNF sealing cone								2		1	
		¼ -18 NPT								3		1	
		G ¼ sealed at back DIN EN ISO 1179-2 with profile seal ring in FPM								4		1	
		G ¼ sealed at back and manometer with profile seal ring in FPM								5	0	1	
		R ¼ acc. to EN 10226								7		1	
		G ½ sealed at back and manometer with profile seal ring in FPM					0,1			8		1	
		$^{7}/_{16}$-20 UNF sealed at back SAE 4 with O-Ring seal FPM					0,1			G		1	
		⅛ - 27 NPT [3]								A		1	
		G ⅛ sealed at front [3]								M		1	
		G ⅛ sealed at back DIN EN ISO 1179-2 with Profile seal ring in FPM [4]					0,1			H		1	
		M10x1 sealed at back DIN EN ISO 1179-2 with profile seal ring in FPM [3]					0,1			F		1	
		M20x1.5 sealed at front and manometer (combi)								E		1	
		G ¼ sealed at front								J		1	
		G ½ sealed at front								9		1	
Pressure orifice	without (inclusive pressure tip orifice from 2000 psi on)										0		
	with										2		
Material pressure connection	Stainless steel 1.4305 / AISI 303											N	
	Stainless steel 1.4404 / AISI 316L											1	
Pressure range variation (optional)	Indicate W and state range on order (e.g.: W0... + 400psi/OUT0...5V)												W

[1] Other pressure ranges or pressure connections on request
[2] Delivery without female connector
[3] Pressure range ≤ 870 psi
[4] Pressure range ≤ 3000 psi (max. rupture pressure 14500 bar)

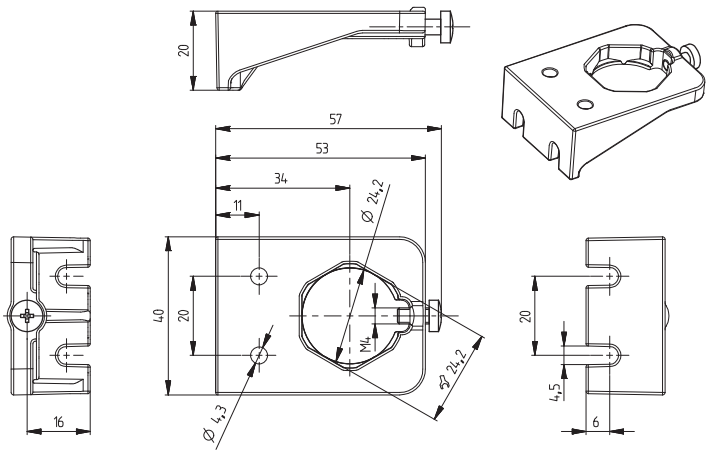
Order code selection table in MPa

			1	2	3	4	5	6	7	8	9	10	11
		520.	X	X	X	X	X	X	X	X	X	X	X
Pressure range [1]	-0.1 ... 0.9 MPa		9	F	6								
	0 ... 0.25 MPa		9	G	4								
	0 ... 0.4 MPa		9	G	5								
	0 ... 0.6 MPa		9	G	7								
	0 ... 1 MPa		9	H	0								
	0 ... 1.6 MPa		9	H	1								
	0 ... 2.5 MPa		9	H	2								
	0 ... 4 MPa		9	H	3								
	0 ... 6 MPa		9	K	0								
	0 ... 10 MPa		9	K	1								
	0 ... 16 MPa		9	K	2								
	0 ... 25 MPa		9	K	3								
	0 ... 40 MPa		9	L	4								
	0 ... 60 MPa		9	L	5								
	0 ... 100 MPa		9	L	7								
Application	standard					S	0						
	for oxygen applications					S	1				0		
	with drinking water approval NSF/ANSI 61/372, WRAS					S	4				0	1	
Output / power supply	0 ... 5 V	7 ... 33 VDC						1					
	1 ... 6 V	8 ... 33 VDC						6					
	0 ... 10 V	12 ... 33 VDC						2					
		12 ... 33 VDC Enhanced EMC protection						C	1,2,3				
		12 ... 33 VDC / 24 VAC ±15% *(not possible with M12x1, metri Pack, RAST, braids)*						8					
	ratiom. 10 ... 90%	5 VDC ±10%						7					
		5 VDC ±10% Ex protection					0,4	9	1,3				
	4 ... 20 mA	7 ... 33 VDC						3					
		7 ... 33 VDC Enhanced EMC protection *(not possible with Braids)*						A					
		10 ... 30 VDC Ex protection					0,4	4	1,3				
Electrical connection	Connector [2]	DIN EN 175301-803-A							1				
		DIN EN 175301-803-C (industrial standard 9.4 mm)							2				
		M12x1 *2w: IN=1 / OUT=3 3w: IN=1 / OUT=4 / GND=3*							3				
		M12x1 *2w: IN=1 / OUT=4 3w: IN=1 / OUT=3 / GND=4*							M				
		M12x1 *2w: IN=1 / OUT=2 3w: IN=1 / OUT=2 / GND=3*							P				
		RAST 2.5					0,4	7	4				
		Metri Pack Serie 150					0,4		5				
	Braids	80 ±10 mm					0,4		6				
		290 ±10 mm					0,4		7				
		480 ±10 mm					0,4		8				
		730 ±10 mm					0,4		9				
	Swift connector	without cable							0				
		with cable 1.5 m							L				
		with cable 2.0 m							N				
		with cable 3.0 m							Q				
		with cable 5.0 m							R				
Pressure connection [1]	Inside thread	$^{7}/_{16}$-20 UNF sealing cone with schrader					0,4			0	0	N	
		$^{7}/_{16}$-20 UNF sealing cone								K		1	
		½ -14 NPT [3]								D		1	
		G ¼ with O-Ring seal FPM								1		1	
	Outside thread	$^{7}/_{16}$ -20 UNF sealing cone								2		1	
		¼ -18 NPT								3		1	
		G ¼ sealed at back DIN EN ISO 1179-2 with profile seal ring in FPM								4		1	
		G ¼ sealed at back and manometer with profile seal ring in FPM								5	0	1	
		R ¼ acc. to EN 10226								7		1	
		G ½ sealed at back and manometer with profile seal ring in FPM					0,1			8		1	
		$^{7}/_{16}$-20 UNF sealed at back SAE 4 with O-Ring seal FPM					0,1			G		1	
		⅛ - 27 NPT [3]								A		1	
		G ⅛ sealed at front [3]								M		1	
		G ⅛ sealed at back DIN EN ISO 1179-2 with Profile seal ring in FPM [4]					0,1			H		1	
		M10x1 sealed at back DIN EN ISO 1179-2 with profile seal ring in FPM [3]					0,1			F		1	
		M20x1.5 sealed at front and manometer (combi)								E		1	
		G ¼ sealed at front								J		1	
		G ½ sealed at front								9		1	
Pressure orifice	without (inclusive pressure tip orifice from 10 MPa on)										0		
	with										2		
Material pressure connection	Stainless steel 1.4305 / AISI 303											N	
	Stainless steel 1.4404 / AISI 316L											1	
Pressure range variation (optional)	Indicate W and state range on order (e.g.: W0... + 0.3MPa/OUT0...5V)												W

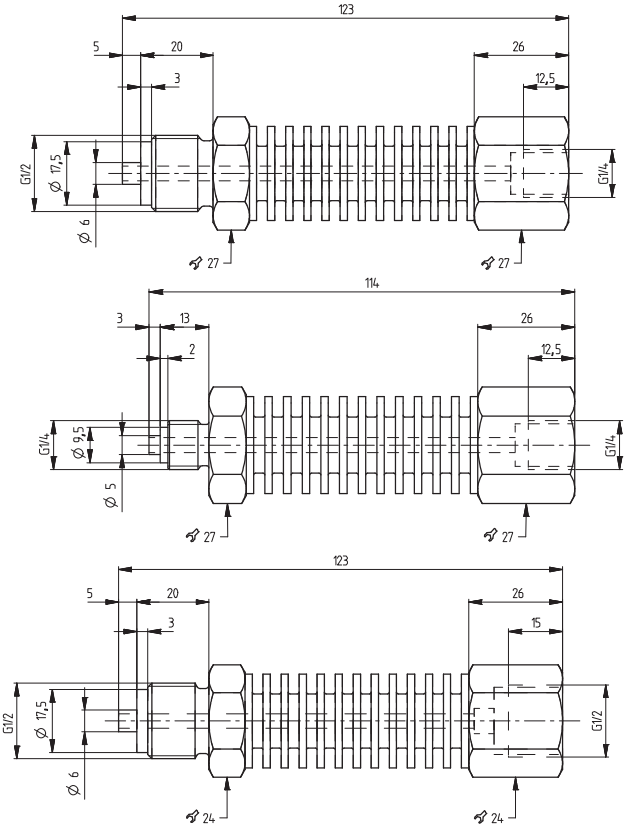
[1] Other pressure ranges or pressure connections on request
[2] Delivery without female connector
[3] Pressure range ≤ 6 MPa
[4] Pressure range ≤ 25 MPa (max. rupture pressure 100 MPa)

Accessories *(supplied loose)*	**Order number**
Swift connector	117312
Female connector DIN EN 175301-803-A with seal	103510
Female connector DIN EN 175301-803-C with seal	104244
Corner-wire box for connector M12x1	106975
Corner-wire box for connector M12x1 with cable 2.0 m	114604
Straight-wire box for connector M12x1	114570
Straight-wire box for connector M12x1 with cable 2.0 m	114605
Mounting bracket with screw	118716
Heat sink with outside thread G ½ sealed at front - inside thread G ½	105631
Heat sink with outside thread G ½ sealed at front - inside thread G ¼	105073
Heat sink with outside thread G ¼ sealed at front - inside thread G ¼	105074
Calibration certificate (≤ 600 bar)	104551

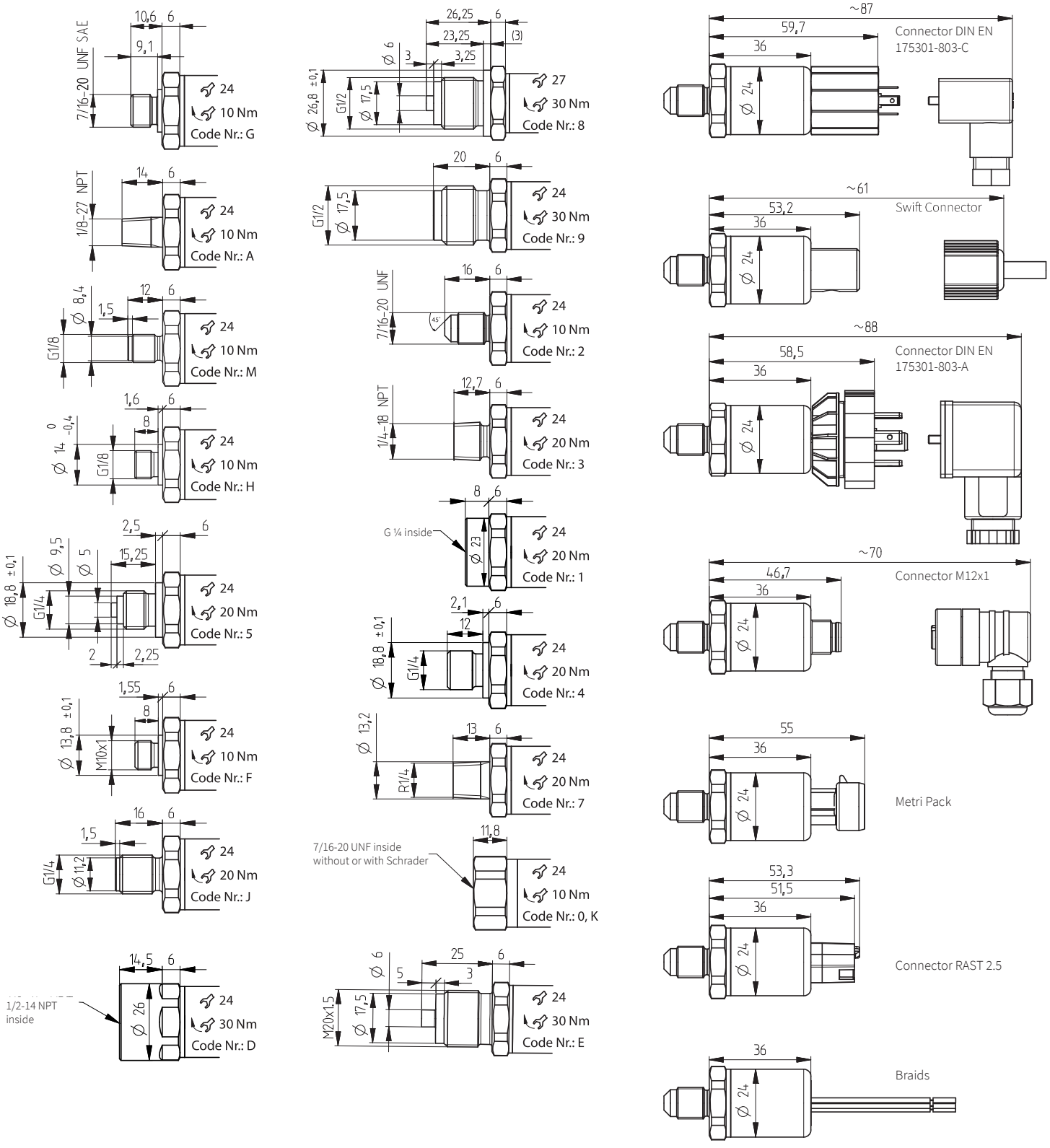
Mounting bracket



Heat sink



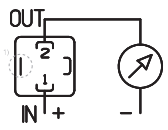
Dimensions in mm



Electrical connections

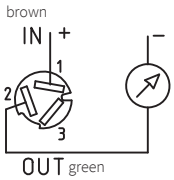
2 wire

Connector DIN EN 175301-803-A or C



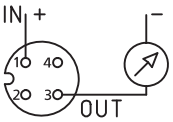
1 (IN) 2 (OUT)

Swift connector



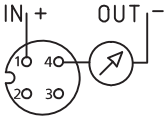
1 (IN) 2 (OUT)

Connector M12x1



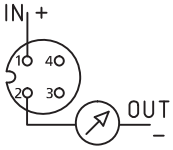
1 (IN) 3 (OUT)

Connector M12x1



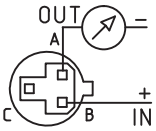
1 (IN) 4 (OUT)

Connector M12x1



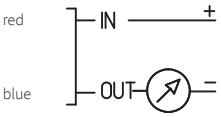
1 (IN) 2 (OUT)

Metri Pack Serie 150



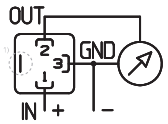
B (IN) A (OUT)

Braids



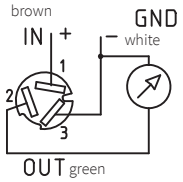
3 wire

Connector DIN EN 175301-803-A or C



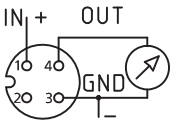
1 (IN) 2 (OUT) 3 (GND)

Swift connector



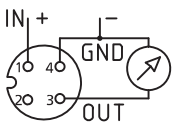
1 (IN) 2 (OUT) 3 (GND)

Connector M12x1



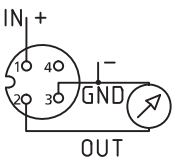
1 (IN) 4 (OUT) 3 (GND)

Connector M12x1



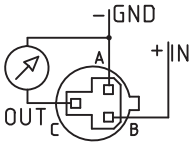
1 (IN) 3 (OUT) 4 (GND)

Connector M12x1



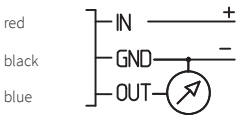
1 (IN) 2 (OUT) 3 (GND)

Metri Pack Serie 150

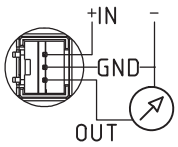


B (IN) C (OUT) A (GND)

Braids

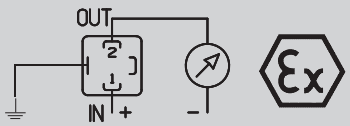


Connector RAST 2.5



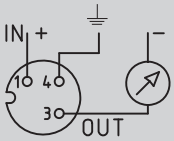
Device design with explosion protection: 4 ... 20 mA
The grounding connection is conductively connected to the transmitter housing.

Connector DIN EN 175301-803-A



1 (IN) 2 (OUT) ⏚

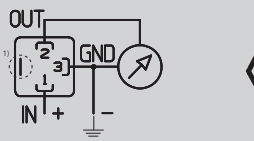
Connector M12x1



1 (IN) 3 (OUT) 4 (⏚)

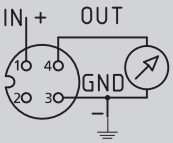
Device design with explosion protection: ratiom. 10 ... 90%
The electronic GND is connected with a 1MΩ resistor to the transmitter housing.

Connector DIN EN 175301-803-A



1 (IN) 2 (OUT) 3 (GND)

Connector M12x1



1 (IN) 3 (GND) 4 (OUT)

[1] Not connected with transmitter housing

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PERFORMANCE MADE SMARTER



Ex repeater / power supply

5104B

- 1- or 2-channel version
- 3- / 5-port 3.75 kVAC galvanic isolation
- Loop supply > 17.1 V in hazardous area
- 20 programmable measurement ranges
- Universal supply by AC or DC

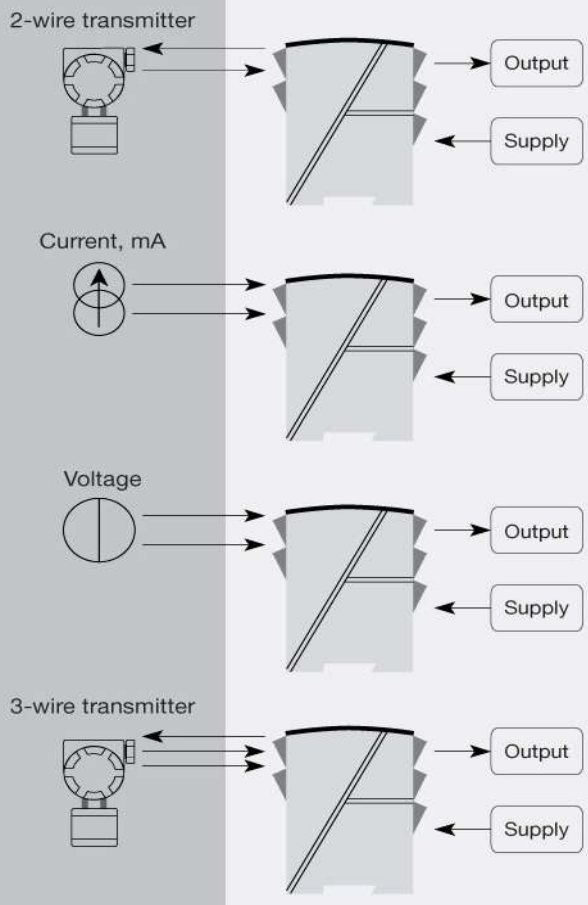
Application
- Supply voltage and safety barrier for 2-wire transmitters mounted in a hazardous area.
- Safety barrier for analog current / voltage signals from a hazardous area.
- 1 : 1 or signal conversion of analog current / voltage signals.

Technical characteristics
- The 20 factory-calibrated measurement ranges in the 5104B can be selected by the internal DIP-switches without the need for recalibration. Special measurement ranges can be delivered.
- PR5104B is based on microprocessor technology for gain and offset. The analog signal is transmitted at a response time of less than 25 ms.
- Inputs, outputs, and supply are floating and galvanically separated.
- The output can be connected either as an active current / voltage transmitter or as a 2-wire transmitter.

Mounting / installation
- Mounted vertically or horizontally on a DIN rail. By way of the 2-channel version up to 84 channels per meter can be mounted.

Note
- Not suitable for new installations requiring certification to the latest ATEX standards - see ATEX certificate DEMKO 99ATEX126013 and Declaration of conformity for details.

Applications



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Order :

Type	Input		Output		Channels	
5104B	0...20 mA	: A	Special	: 0	Single	: A
	4...20 mA	: B	0...20 mA	: 1	Double	: B
	0...10 V	: E	4...20 mA	: 2		
	2...10 V	: F	0...1 V	: 4		
	Special	: X	0.2...1 V	: 5		
			0...10 V	: 6		
			2...10 V	: 7		

Environmental Conditions

Operating temperature..... -20°C to +60°C
Calibration temperature..... 20...28°C
Relative humidity..... < 95% RH (non-cond.)
Protection degree..... IP20

Mechanical specifications

Dimensions (HxWxD)..... 109 x 23.5 x 130 mm
DIN rail type..... DIN 46277
Weight approx..... 225 g
Wire size..... 1 x 2.5 mm^2 stranded wire
Screw terminal torque..... 0.5 Nm
Vibration..... IEC 60068-2-6
2...13.2 Hz..... ±1 mm
13.2...100 Hz..... ±0.7 g

Common specifications

Supply

Supply voltage, universal..... 21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Fuse..... 400 mA SB / 250 VAC
Max. required power..... ≤ 3 W (2 channels)
Internal power dissipation..... ≤ 2 W (2 channels)

Isolation voltage

Isolation voltage, test / working..... 3.75 kVAC / 250 VAC
PELV/SELV..... IEC 61140

Auxiliary supplies

2-wire supply (pin 44...42 and 54...52)..... 28...17.1 VDC / 0...20 mA

Response time

Response time (0...90%, 100...10%)..... < 25 ms
Signal / noise ratio..... Min. 60 dB (0...100 kHz)
Accuracy..... Better than 0.1% of sel. range
EMC immunity influence..... < ±0.5% of span
Extended EMC immunity: NAMUR NE21, A criterion, burst..... < ±1% of span

Input specifications

Common input specifications

Max. offset..... 20% of max. value

Current input

Measurement range..... 0...20 mA
Min. measurement range (span)..... 16 mA
Input resistance..... Nom. 10 Ω + PTC 10 Ω

Voltage input

Measurement range..... 0...10 VDC
Min. measurement range (span)..... 8 VDC
Input resistance..... > 2 MΩ

Output specifications

Current output

Signal range..... 0...20 mA
Min. signal range..... 16 mA
Load (@ current output)..... ≤ 600 Ω
Load stability..... ≤ 0.01% of span / 100 Ω
Current limit..... ≤ 28 mA

Passive 2-wire mA output

Effect of external 2-wire supply voltage variation..... < 0.005% of span / V

Voltage output

Signal range..... 0...1 VDC / 0...10 VDC
Min. signal range..... 0.8 VDC / 8 VDC
Load (@ voltage output)..... ≥ 500 kΩ
External loop supply..... 29 VDC
of span..... = of the presently selected range

Observed authority requirements

EMC..... 2014/30/EU
LVD..... 2014/35/EU
EAC..... TR-CU 020/2011

Approvals

ATEX..... DEMKO 99ATEX126013, II (1) GD [EEx ia] IIC
c UL us, UL 913..... E233311
EAC Ex..... RU C-DK.GB08.V.00410
DNV Marine..... Stand. f. Certific. No. 2.4

PERFORMANCE MADE SMARTER



Temperature / mA converter

9113B

- Input for RTD, TC and mA
- Active / passive mA output via the same two terminals
- 1 or 2 channels
- Can be supplied separately or installed on power rail, PR type 9400
- SIL 2-certified via Full Assessment

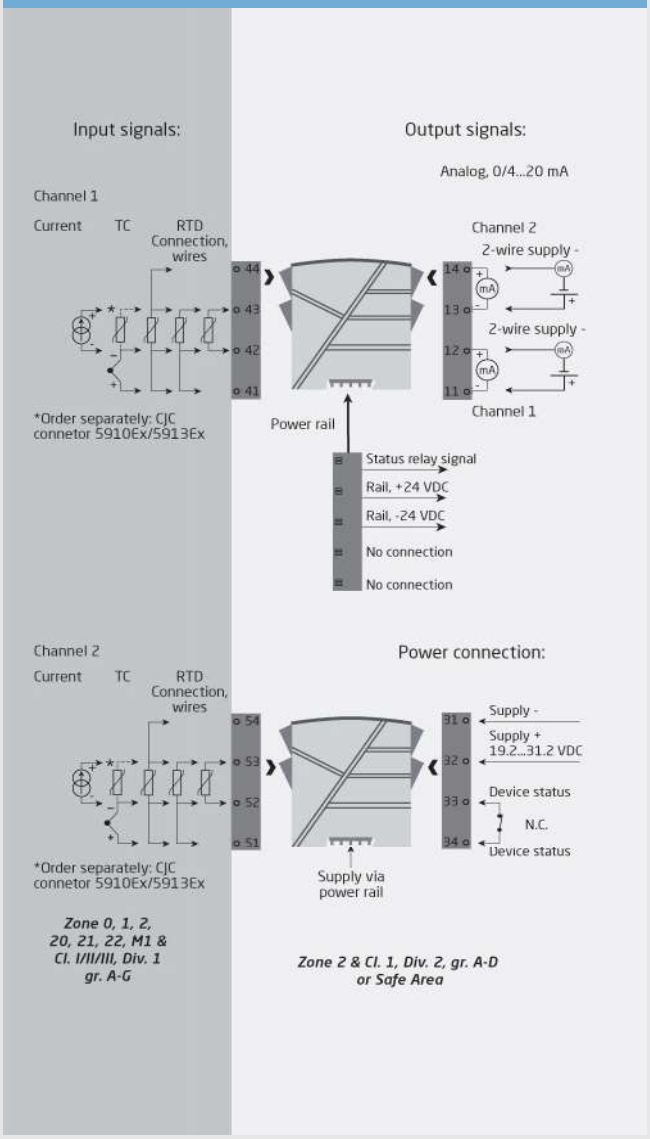
Advanced features
- Configuration and monitoring by way of detachable display front (PR 4500); process calibration and signal simulation.
- Copying of the configuration from one device to others of the same type via the display front.
- TC inputs can use either the internal CJC or a terminal with a built-in Pt100 sensor (PR 5910Ex, channel 1 / PR 5913Ex, channel 2) for higher accuracy.
- Advanced monitoring of internal communication and stored data.
- SIL 2 functionality is optional and must be activated in a menu point.

Application
- 9113Bxx can be mounted in the safe area or in zone 2 / Class 1, Division 2 and receive signals from zone 0, 1, 2 and zone 20, 21, 22 including mining / Class I/II/III, Division 1, Gr. A-G.
- Conversion and scaling of temperature (Pt, Ni and TC) and active current signals.
- The 9113 has been designed, developed and certified for use in SIL 2 applications according to the requirements of IEC 61508.
- Suitable for the use in systems up to Performance Level “d” according to ISO-13849.

Technical characteristics
- 1 green and 2 red front LEDs indicate operation status and malfunction.
- 2.6 kVAC galvanic isolation between input, output and supply.

Mounting
- The devices can be mounted vertically or horizontally without distance between neighbouring units.

Applications



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Order

Type	Channels		I.S. / Ex approvals	
9113B	Single	: A	ATEX, IECEx, FM, INMETRO, EAC-Ex, UKEX	: -
	Double	: B	UL 913, ATEX, IECEx, FM, INMETRO, EAC-Ex, UKEX	: -U9
			KCs, ATEX, IECEx, FM, INMETRO, EAC-Ex, UKEX	: -KCs

Example: 9113BB

Environmental Conditions

Operating temperature	-20°C to +60°C
Storage temperature	-20°C to +85°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree	IP20
Installation in	Pollution degree 2 & meas. / overvoltage cat. II

Mechanical specifications

Dimensions (HxWxD)	109 x 23.5 x 104 mm
Dimensions (HxWxD) w/ PR 4500	109 x 23.5 x 131 mm
Weight approx.	250 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13...2.08 mm^2 AWG 26...14 stranded wire
Screw terminal torque	0.5 Nm
Vibration	IEC 60068-2-6
2...13.2 Hz	±1 mm
13.2...100 Hz	±0.7 g

Common specifications

Supply

Supply voltage	19.2...31.2 VDC
Fuse	400 mA SB / 250 VAC
Max. required power	≤ 0.8 W/≤ 1.4 W (1 ch./2 ch.)
Max. power dissipation, 1 / 2 ch.	≤ 0.8 W / ≤ 1.4 W

Isolation voltage

Test /working: Input to any	2.6 kVAC / 300 VAC reinforced isolation
Analog output to supply	2.6 kVAC / 300 VAC reinforced isolation
Status relay to supply	1.5 kVAC / 150 VAC reinforced isolation

Response time

Temperature input, programmable (0...90%, 100...10%)	1...60 s
mA / V input (programmable)	0.4...60 s
Programming	PR 4500 communication interfaces
Signal / noise ratio	Min. 60 dB (0...100 kHz)
Signal dynamics, input	24 bit
Signal dynamics, output	16 bit
Accuracy	Better than 0.1% of sel. range
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE21, A criterion, burst	< ±1% of span

Input specifications

RTD input

RTD type	Pt10/20/50/100/200/250; Pt300/Pt400/500/1000; Ni50/100/120/1000
Cable resistance per wire	50 Ω (max.)
Sensor current	Nom. 0.2 mA
Effect of sensor cable resistance (3-/4-wire)	< 0.002 Ω / Ω
Sensor error detection	Programmable ON / OFF

TC input

Thermocouple type	B, E, J, K, L, N, R, S, T, U, W3, W5, LR
Cold junction compensation (CJC) via ext. sensor in 5910	20...28°C ≤ ±1°C, -20...20°C / 28...70°C ≤ 2°C
CJC via int. mounted sensor	±(2.0°C + 0.4°C * Δt)
Sensor error detection	Programmable ON or OFF (only wire breakage)
Sensor error current: When detecting / else	Nom. 2 µA / 0 µA

Current input

Measurement range	0...23 mA
Programmable measurement ranges	0...20 and 4...20 mA
Input resistance	Nom. 20 Ω + PTC 50 Ω
Sensor error detection	Programmable ON / OFF

Output specifications

Current output

Signal range	0...23 mA
Programmable signal ranges	0...20/4...20/20...0/20...4 mA
Load (@ current output)	≤ 600 Ω
Load stability	≤ 0.01% of span / 100 Ω
Sensor error indication	0 / 3.5 / 23 mA / none
NAMUR NE43 Upscale/Downscale	23 mA / 3.5 mA
Output limitation, on 4...20 and 20...4 mA signals	3.8...20.5 mA
Output limitation, on 0...20 and 20...0 mA signals	0...20.5 mA
Current limit	≤ 28 mA

Passive 2-wire mA output

Max. external 2-wire supply	26 VDC
Effect of external 2-wire supply voltage variation	< 0.005% of span / V

Status relay

Max. voltage	125 VAC / 110 VDC
Max. current	0.5 AAC / 0.3 ADC
Max. AC power	62.5 VA / 32 W

Observed authority requirements

EMC	2014/30/EU & UK SI 2016/1091
LVD	2014/35/EU & UK SI 2016/1101
ATEX	2014/34/EU & UK SI 2016/1107
RoHS	2011/65/EU & UK SI 2012/3032
EAC	TR-CU 020/2011
EAC Ex	TR-CU 012/2011
EAC LVD	TR-CU 004/2011

Approvals

ATEX	KEMA 07ATEX0148 X
IECEx	KEM 09.0052X
UKEX	DEKRA 21UKEX0175X
UKEX	DEKRA 23UKEX0109X
c FM us	FM19US0059X / FM19CA0032X
INMETRO	DEKRA 23.0005X
c UL us, UL 61010-1	E314307
c UL us, UL 913	E233311 (only 9113xx-U9)
KCs	21_AV4BO_0173X / 21_AV4BO_0174X (only 9113Bx-KCs)
EAC Ex	RU C-DK.HA65.B.00355/19
DNV Marine	TAA00000JD
ClassNK	TA24034M
SIL	SIL 2 certified & fully assessed acc. to IEC 61508

PERFORMANCE MADE SMARTER



Pulse isolator

9202B

- Interface for NAMUR sensors and switches
- Extended self-diagnostics and detection of cable fault
- 1 or 2 channels
- Can be supplied separately or installed on power rail, PR type 9400
- SIL 2-certified via Full Assessment

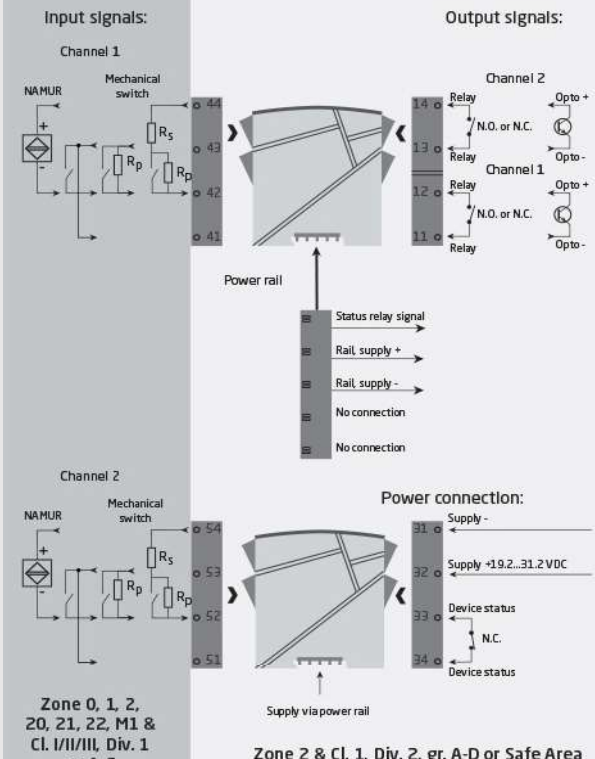
Advanced features
- Configuration and monitoring by way of detachable display front (PR 4500).
- Selection of direct or inverted function for each channel via PR 4500.
- Advanced monitoring of internal communication and stored data.
- Optional redundant supply via power rail and/ or separate supply.
- SIL 2 functionality is optional and must be activated in a menu point.

Application
- 9202B can be mounted in the safe area or in zone 2 / Cl. 1 div. 2 and receive signals from zone 0, 1, 2 and zone 20, 21, 22 including mining / Class I/II/III, Div. 1, Gr. A-G.
- Pulse isolator for transmission of signals to the safe area from NAMUR sensors and mechanical switches installed in the hazardous area.
- Monitoring of error events and cable breakage via the individual status relay and/or a collective electronic signal via the power rail.
- The 9202B has been designed, developed and certified for use in SIL 2 applications according to the requirements of IEC 61508.
- Suitable for the use in systems up to Performance Level “d” according to ISO-13849.

Technical characteristics
- 1 green and 2 yellow/red front LEDs indicate operation status and malfunction.
- 2.6 kVAC galvanic isolation between input, output and supply.

Mounting
- The devices can be mounted vertically or horizontally without distance between neighbouring units.

Applications



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Order

Type	Version	Unit channels	I.S. / Ex approvals
9202B	Opto : 1 Relay N.O. : 2 Relay N.C. : 3	Single : A Double : B	ATEX, IECEx, FM, INMETRO, CCC, EAC-Ex, UKEX : - UL 913, ATEX, IECEx, FM, INMETRO, CCC, EAC-Ex, UKEX : -U9 KCs, ATEX, IECEx, FM, INMETRO, CCC, EAC-Ex, UKEX : -KCs

Example: 9202B2B

Environmental Conditions

Operating temperature	-20°C to +60°C
Storage temperature	-20°C to +85°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree	IP20
Installation in	Pollution degree 2 & meas. / overvoltage cat. II

Mechanical specifications

Dimensions (HxWxD)	109 x 23.5 x 104 mm
Dimensions (HxWxD) w/ PR 4500	109 x 23.5 x 131 mm
Weight approx.	170 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13...2.08 mm^2 AWG 26...14 stranded wire
Screw terminal torque	0.5 Nm
Vibration	IEC 60068-2-6
2...13.2 Hz	±1 mm
13.2...100 Hz	±0.7 g

Common specifications

Supply

Supply voltage	19.2...31.2 VDC
Fuse	400 mA SB / 250 VAC
Max. required power	≤ 1.1 W...≤ 1.3 W / ≤ 1.5 W...≤ 1.9 W (1 / 2 ch.)
Max. power dissipation, 1 / 2 ch.	≤ 1.2 W / ≤ 1.6...1.8 W

Isolation voltage

Test /working: Input to any	2.6 kVAC / 300 VAC reinforced isolation
Analog output to supply	2.6 kVAC / 300 VAC reinforced isolation
Output 1 to output 2	1.5 kVAC / 150 VAC reinforced isolation
Status relay to supply	1.5 kVAC / 150 VAC reinforced isolation

Auxiliary supplies

NAMUR supply	8 VDC / 8 mA
Programming	PR 4500 communication interfaces
Response time for cable fault	< 200 ms

Input specifications

Sensor types	NAMUR according to EN 60947-5-6 / mechanical contact
Frequency range	0...5 kHz
Min. pulse length	> 0.1 ms
Input resistance	Nom. 1 kΩ
Trig level, signal	< 1.2 mA, > 2.1 mA
Trig level, cable fault	< 0.1 mA, > 6.5 mA

Output specifications

Relay output

Max. switching frequency	20 Hz
Max. voltage	250 VAC / 30 VDC
Max. current	2 AAC / 2 ADC
Max. AC power	500 VA / 60 W

Status relay

Max. voltage	125 VAC / 110 VDC
Max. current	0.5 AAC / 0.3 ADC
Max. AC power	62.5 VA / 32 W

NPN output

Max. switching frequency	5 kHz
Min. pulse length	> 0.1 ms
Max. load, current / voltage	80 mA / 30 VDC
Max. voltage drop at 80 mA	2.5 VDC

Observed authority requirements

LVD	2014/35/EU & UK SI 2016/1101
EMC	2014/30/EU & UK SI 2016/1091
ATEX	2014/34/EU & UK SI 2016/1107
RoHS	2011/65/EU & UK SI 2012/3032
EAC	TR-CU 020/2011
EAC Ex	TR-CU 012/2011
EAC LVD	TR-CU 004/2011

Approvals

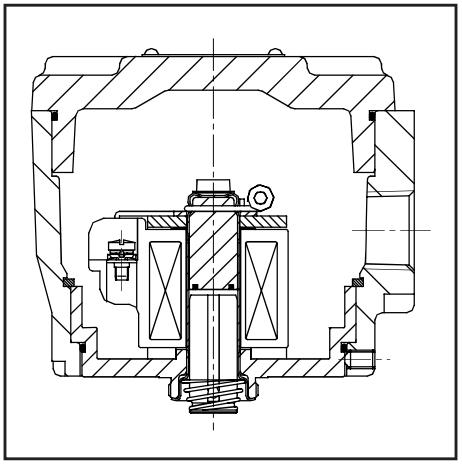
ATEX	KEMA 07ATEX0146 X
IECEx	KEM 06.0039X
UKEX	DEKRA 21UKEX0179X
UKEX	DEKRA 23UKEX0105X
c FM us	FM19US0055X / FM19CA0028X
INMETRO	DEKRA 23.0007X
c UL us, UL 61010-1	E314307
c UL us, UL 913	E233311 (only 9202xxx-U9)
CCC	2020322309003424
KCs	21_AV4BO_0179X / 21_AV4BO_0180X (only 9202Bxx-KCs)
EAC Ex	RU C-DK.HA65.B.00355/19
DNV Marine	TAA00000JD
ClassNK	TA24034M
SIL	SIL 2 certified & fully assessed acc. to IEC 61508

OPERATORS

for potentially explosive atmospheres
flameproof enclosure
II 2G/D Ex **d** IIC T6..T4 Gb / Ex **tb** IIIC Db IP66/IP67
aluminium or stainless steel enclosure

Series
NF
WSNF





FEATURES

- *Explosionproof operator for use in potentially explosive atmospheres according to ATEX-Directive 2014/34/EU*
  EC type examination certificate no.: ***LCIE 00 ATEX 6008 X***
  IECEx Certificate of Conformity no.: ***IECEx LCI 07.0015X***
- *Compliance with the Essential Health and Safety Requirements has been assured by compliance with the International and European Standards EN-IEC 60079-0, EN-IEC 60079-1 and EN-IEC 60079-31*
- *Easy electrical installation by means of a screw terminal coil*
- *Enclosure provided with a 1/2 NPT threaded entry hole (M20 x 1,5 in option) for a broad range of cable entries*
- *Ingress protection degree IP66/67*
- *A wide range of valves can be supplied with the operator*

CONSTRUCTION

Solenoid enclosure	NF	Chromated aluminium, epoxy coated
	WSNF	Stainless steel (AISI 316L)
Bonnet	NF	Steel (zinc plated)
	WSNF	Stainless steel (nickel plated)
Core, core tube and plugnut	all	Stainless steel
Shading coil	all	Copper or silver
Nameplate	NF	Stainless steel
	WSNF	Stainless steel
Coil connection	all	Embedded screw terminals
Fasteners & screws	all	Stainless steel
Safety code		IECEx / Ex II 2G Ex d IIC T6..T4 Gb
		IECEx / Ex II 2D Ex tb IIIC 85°C..135°C Db IP66/67

ELECTRICAL CHARACTERISTICS

Standard voltages	DC (=) : 24V - 48V
(Other voltages and 60 Hz on request)	AC (~) : 24V - 48V - 115V - 230V(3) / 50 Hz

TEMPERATURE CLASSIFICATION TABLES

AC (~) solenoids

Pn (watt)	solenoid size				maximum ambient °C (1) surface temperature			
	MXX	M12			T6 85°C	T5 100°C	T4 135°C	T3 200°C
insulation class F/H (155°C/180°C) 100% E.D.								
1,85(2)(3)		●			75	80		
3,7 (2)		●			60	75	100	
5,8 (2)		●			60	75	100	
10,0 (2)	●				40	60	75	
10,0 (2)		●			40	60	100	
10,5	●				25	40	60	
13,4 (2)	●				40	60	75	
14,1 (2)		●			40	60	90	
15,4		●			25	40	60	
16,5		●			40	60	75	
16,7	●					25	40	
20,0		●				25	40	
20,5	●						25	
28,0		●					25	

DC (=) solenoids

Pn (watt)	solenoid size				maximum ambient °C (1) surface temperature			
	MXX	M12			T6 85°C	T5 100°C	T4 135°C	T3 200°C
insulation class F/H (155°C/180°C) 100% E.D.								
1,8		●			75	80		
3,6		●			60	75	100	
5,7		●			60	75	100	
10,0		●			40	60	100	
11,2	●				40	60	75	
14,0		●			40	60	90	
16,8		●			40	60	75	
19,7	●				25	40	60	
23,0		●			25	40	60	
26,6		●			25	40	60	
29,5		●				25	40	
36,2		●				25	40	

Check the wattage compatibility with the product selected.
(1) **The minimum allowable ambient temperature is -60°C for the operator.** Actual temperature range can be limited depending on valve operation limits.
(2) AC (~): rectified coil construction.
(3) 230 V AC does not exist (Pn 1,85 W).

ORDERING INFORMATION

A valve supplied with the explosionproof operator will be identified with prefix NF or WSNF before the catalogue number.

Example: **NF** E 210D095 230V/50 Hz

- **NF** — operator
- E — pipe thread ISO 7/1
- 210D095 — basic number
- 230V/50 Hz — voltage

A valve supplied with the explosionproof operator will be identified with electrical interface FN, FS, FT or FU in the 15-digit product code.

15-DIGIT PRODUCT CODE

E 262 K 232 **FN** V00 H1

- E — Thread connection
- 262 — Product series
- K — Revision letter
- 232 — Valves version
- **FN** — **Electrical interface**
  - **FN** = NF
  - **FS** = WSNF
  - **FT** = NFET
  - **FU** = WSNFET
- V00 — Options
- H1 — Voltage - class

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OPTIONS

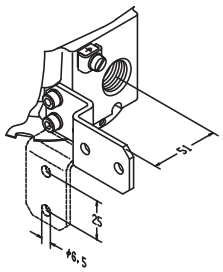
- Operators for mining, I M2 Ex d I, contact us

ORDERING EXAMPLES:

NF	B	327 B 001		230V / 50 Hz
NF	G	551 B 405		230V / 50 Hz
NFET	G	327 B 001	V	230V / 50 Hz
WSNF	E	272 A 047	MS	24V / DC
WSNF	B	320 A 184	E	24V / DC

prefix
pipe thread
basic number
suffix
voltage

MOUNTING BRACKET



Bracket kit no. **C139824**
contains: Stainless steel 304 SS screws and bracket

15-DIGIT PRODUCT CODE

E	262	K	232	**FN**	V00	H1
E	262	K	232	**FS**	V00	F8
E	262	K	232	**FT**	V00	FT
E	262	K	232	**FU**	V00	H9

Thread connection
Product series
Revision letter
Valves version
Electrical interface
Voltage - class
Options

CONNECTIONS

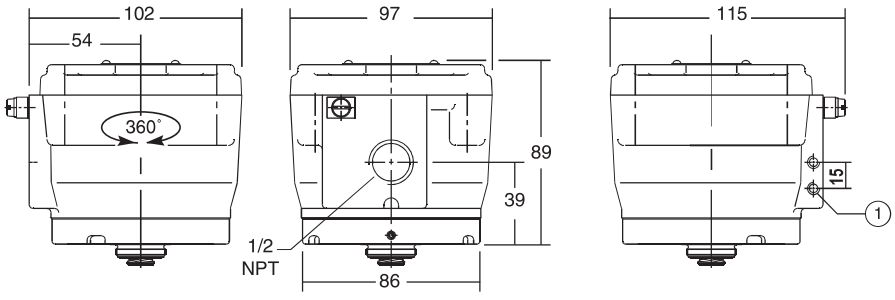
- Any ATEX approved cable entry device can be fitted in the 1/2 NPT threaded entry hole (M20 x 1.5 in option). Refer to the nameplate for identification of the maximum cable temperature
- Internal and external earthing connection
- The operator can be rotated through 360° to select the most favourable position for cable entry

DIMENSIONS (mm), WEIGHT (kg)



TYPE NF-WSNF

Prefix "NF" , "WSNF" Solenoid / Electrical interface FN/FS/FT/FU
Aluminium, stainless steel
(NF, epoxy coated)
EN-IEC 60079-1 and EN-IEC 60079-31
II 2G Ex d IIC Gb, II 2D Ex tb IIIC Db IP66/67



series	weight
NF	1,4
WSNF	2,7

(1) 2 mounting holes M5, depth 9 mm

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ASCO™ Solenoid Valves

Pilot Operated, Hung Diaphragm, 3/8" to 1 1/2"

Features and Benefits

- *Two way shut-off valves for the control air, inert gas, water, oil and other gases/liquids compatible with the sealing material used*
- *Valves do not require a minimum operating pressure*
- *All products are covered by Pressure Equipment Directive 2014/68/EU and are suitable for group 1 and 2 fluids*
- *The solenoid valves satisfy all relevant EU directives*



General

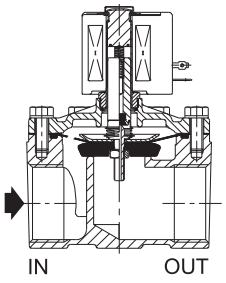
Differential pressure	See «SPECIFICATIONS» [1 bar =100 kPa]
Maximum viscosity	65 cSt (mm^2/s)
Response time	15 - 120 ms

Fluids (∗)	Temperature range (TS)	Seal materials (∗)
air, inert gas, water, oil	-20°C to +85°C	NBR (nitrile)

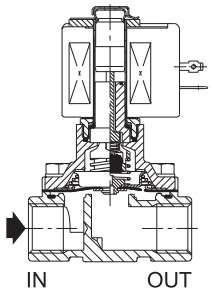
Materials of components in contact with fluid

(∗) Ensure that compatibility of materials in contact with fluids is verified.

	Brass body	Stainless steel body
Body	Brass	AISI 304 SS (AISI 316 SS on request)
Core tube	Stainless steel	Stainless steel
Core and plugnut	Stainless steel	Stainless steel
Springs	Stainless steel	Stainless steel
Seat	Brass	Stainless steel
Seals, diaphragm and disc	NBR	NBR
Disc holder (NO function)	PA	PA
Shading coil	Copper	Silver



NC function



NO function

Electrical characteristics

Coil insulation class	F or H
Connector	Spade plug (cable Ø 6-10 mm)
Connector specification	ISO 4400 / EN 175301-803, form A
Electrical safety	IEC 335
Electrical enclosure protection	Moulded IP65 (EN 60529)
Standard voltages	DC (=) : 24V - 48V
(Other voltages and 60 Hz on request)	AC (~) : 24V - 48V - 115V - 230V / 50 Hz

Prefix option	Power ratings				Operator ambient temperature range (TS) [1]	Replacement coil		Type [2]
	Inrush ~	Holding ~		Hot/cold =		~	=	
	(VA)	(VA)	(W)	(W)	(°C)	230 V/50 Hz	24 V DC	
SC	55	23	10.5	-	-20 to +75	400425-117	-	01
	78	35	16.7	-	-20 to +50	400425-217	-	01
	110	33.6	15.4	12/16.8	-20 to +75	400525-117	400625-142	02
	240	43	20	16.8/23	-20 to +50	400525-217	400625-242	02

[1] 3/8" up to 1" max. operator ambient temperature range (TS) 60°C.
[2] For dimensions, see drawing(s) for each construction type on the following page(s).

Specifications

Pipe size	Orifice size	Flow coefficient Kv		Operating pressure differential (bar) Min.	Max. (PS) Air (∗) ~	Air (∗) =	Water (∗) ~	Water (∗) =	Oil (∗) ~	Oil (∗) =	Power coil (W) ~	Power coil (W) =	Catalog number Brass	Catalog number Stainless steel	Options Maintained manual operator	FPM	EPDM	CR
	(mm)	(m^3/h)	(l/min)															
NC - Normally closed																		
Rp 3/8"	16	2.6	43	0	16	16	16	16	-	-	10.5	16.8	**SCE210C493**	-	MO	V	E	J
Rp 1/2"	16	3.4	57	0	16	16	16	16	-	-	10.5	16.8	**SCE210C494**	-	MO	V	E	J
					16	16	16	16	16	-	16.7	16.8	-	**SCE210C487**	MO	V	E	J
Rp 3/4"	19	4.3	72	0	16	16	16	16	-	-	10.5	16.8	**SCE210D495**	-	MO	V	E	J
	16	3.9	65	0	16	16	16	16	16	-	16.7	16.8	-	**SCE210C488**	MO	V	E	J
Rp 1"	25	9.6	160	0	16	16	16	16	16	10	15.4	23	**SCE210B454** [3]	-	MO	V	E	J
													-	**SCE210D489**	-	V	E	J
Rp 1 1/4"	28	12.8	213	0	9	6	9	6	9	4	15.4	23	**SCE210B155** [3]	-	MO	V	E	J
Rp 1 1/2"	32	19.3	322	0	9	5	9	5	9	3	15.4	23	**SCE210B156** [3]	-	MO	V	E	J

[3] Mounting position, DC only: piping horizontal, solenoid upright.

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Specifications

Pipe size	Orifice size	Flow coefficient Kv		Operating pressure differential (bar)							Power coil (W)		Catalog number		Options			
				Min.	Max. (PS)										Maintained manual operator	FPM	EPDM	CR
					Air (∗)		Water (∗)		Oil (∗)				Brass	Stainless steel				
	(mm)	(m^3/h)	(l/min)		~	=	~	=	~	=	~	=						
NO - Normally open																		
Rp 3/8”	16	2.6	43	0	16	16	16	16	16	10	10.5	23	**SCE210C433**	-	-	V	E	J
Rp 1/2”	16	3.4	57	0	16	16	16	16	16	10	10.5	23	**SCE210C434**	-	-	V	E	J
		2.6	43	0	16	16	16	16	10	10	10.5	23	-	**SCE210B430**	-	V	E	J
Rp 3/4”	19	4.7	79	0	16	16	16	16	16	10	10.5	23	**SCE210C435**	-	-	V	E	J
	16	2.6	43	0	16	16	16	16	10	10	10.5	23	-	**SCE210B438**	-	V	E	J
Rp 1”	25	11.2	185	0	16	-	16	-	16	-	20	-	**SCE210B457** (1)	-	-	V	E	J
Rp 1 1/4”	28	12.8	213	0	9	-	9	-	9	-	20	-	**SCE210B058** (1)	-	-	V	E	J
Rp 1 1/2”	32	19.3	322	0	9	-	9	-	9	-	20	-	**SCE210B059** (1)	-	-	V	E	J

(∗) Ensure that compatibility of materials in contact with fluids is verified.
(1) Mounting position: piping horizontal, solenoid upright.

Options

- Valves can also be supplied with FPM (fluoroelastomer), EPDM (ethylene-propylene) and CR (chloroprene) diaphragms, seals and discs. Use the appropriate optional suffix letter for identification
- Waterproof enclosure with embedded screw terminal coil according to protection class IP67, CEE-10
- Explosionproof enclosures for use in zones 1/21-2/22, categories 2-3 to ATEX Directive 2014/34/EU
- Electrical enclosures according to “NEMA” standards are available
- Compliance with “UL”, “CSA” and other local approvals available on request
- Mounting brackets for brass bodied valves, suffix MB (Except pipe size Rp 1, 1 1/4 and 1 1/2)
- For protection against corrosion caused by the environment or the fluid, contact us
- Other pipe connections are available on request
- Connector with visual indication and peak voltage suppression or with cable length of 2 m

Installation

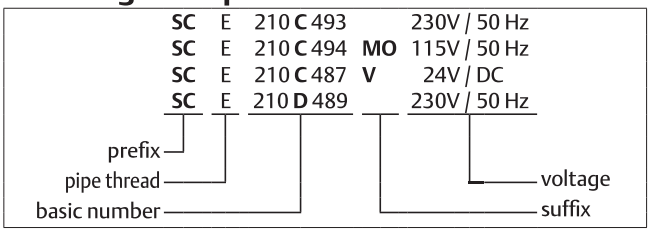
- The solenoid valves can be mounted in any position without affecting operation, unless indicated otherwise in the specifications table.
- Stainless steel valves are standard supplied with mounting brackets
- Pipe connection is E = Rp (ISO 7/1)
- Installation/maintenance instructions are included with each valve

Spare parts kit and accessories

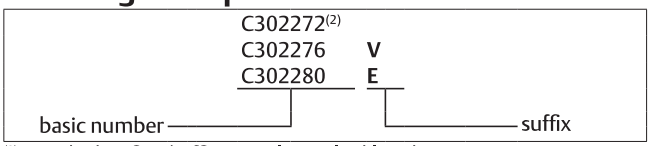
Catalog number	Spare parts kits no.		Mounting bracket
	~	=	
SCE210C493/C494	**C302272**	**C326540**	**038713-000**
SCE210D495	**C302276**	**C326541**	**038713-000**
SCE210B454	**C302283**	**C326542**	-
SCE210B155	**C302283**	**C133801**	-
SCE210B156	**C302286**	**C133802**	-
SCE210C433/C434	**C326551**	**C326543**	**038713-000**
SCE210C435	**C326552**	**C326544**	**038713-000**
SCE210B457	**C302337**	-	-
SCE210B058	**C302339**	-	-
SCE210B059	**C302340**	-	-
SCE210C487/C488	**C302328**	**C326548**	**standard**
SCE210B430/B438	**C326553**	**C326550**	**standard**
SCE210D489	**C302329**	**C326549**	-

- Not available

Ordering Examples Valves:



Ordering Examples Kits:



(2) Standard prefixes/suffixes are also applicable to kits.

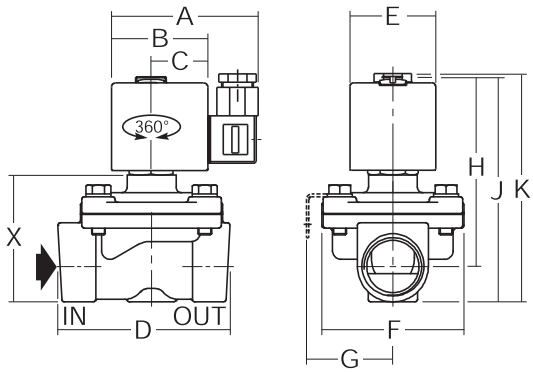
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Dimensions (mm), Weight (kg)

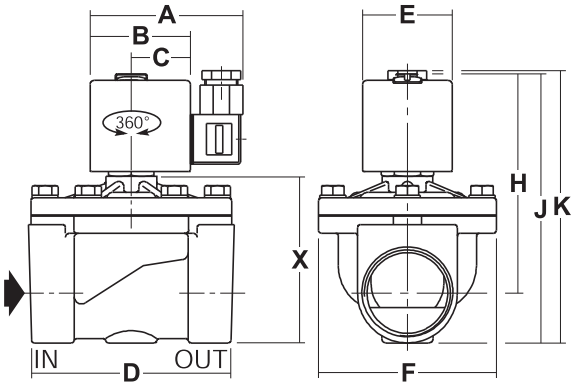


TYPE 01-02
Prefix "SC" Solenoid
Epoxy moulded
IEC 335 / ISO 4400
IP65

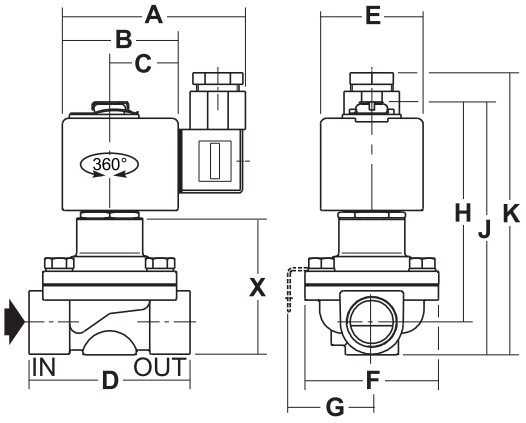
Type 01: SCE210C493/C494/D495 (AC)
SCE210C487/C488 (AC)
Type 02: SCE210C493/C494/D495/C487/C488 (DC)
SCE210D489/B454/B155 (AC/DC)

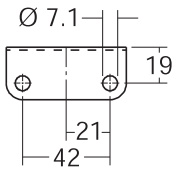


Type 02: SCE210B156 (AC/DC)



Type 01: SCE210C433/C434/C435 (AC)
SCE210B430/B438 (AC)
Type 02: SCE210B457/B058/B059 (AC/DC)





Mounting brackets for valves: (0.3 kg)
SCE210C493/C494/D495
SCE210C487/C488/D489
SCE210C433/C434/C435

Type	Prefix option	Catalog number	A	B	C	D	E	F	G	H	J	K	X	Weight [1]
01	SC	SCE210C493/C494	86	51	30	70	45	58	41	83	98	112	46	0.9
		SCE210D495	86	51	30	71	45	58	41	87	105	119	54	1.0
		SCE210C487/C488	86	51	30	71	45	58	41	87	105	119	55	1.0
		SCE210C433/C434	86	51	30	70	45	58	41	95	109	120	60	0.9
		SCE210C435	86	51	30	71	45	58	41	99	117	127	68	1.0
		SCE210B430/B438	86	51	30	71	45	58	41	98	116	127	67	1.0
02	SC	SCE210C493/C494	91	56	33	70	50	58	41	93	107	104	46	1.0
		SCE210D495	91	56	33	71	50	58	41	97	115	111	54	1.1
		SCE210C487/C488	91	56	33	71	50	58	41	97	116	112	55	1.1
		SCE210D489	91	56	33	95	50	98	41	112	134	134	75	2.2
		SCE210C433/C434	91	56	33	70	50	58	41	101	116	112	60	1.1
		SCE210C435	91	56	33	71	50	58	41	105	123	119	68	1.2
		SCE210B430/B438	91	56	33	71	50	58	41	105	123	119	67	1.1
		SCE210B454	91	56	33	95	50	83	-	114	134	131	75	2.0
		SCE210B457	91	56	33	95	50	83	-	155	176	160	98	2.1
		SCE210B155	86	56	33	95	50	83	-	112	143	148	86	2.0
		SCE210B156	86	56	33	111	50	99	-	125	153	158	96	2.8
		SCE210B058	86	56	33	95	50	83	-	161	187	187	130	2.0
		SCE210B059	86	56	33	111	50	99	-	167	194	194	137	2.5

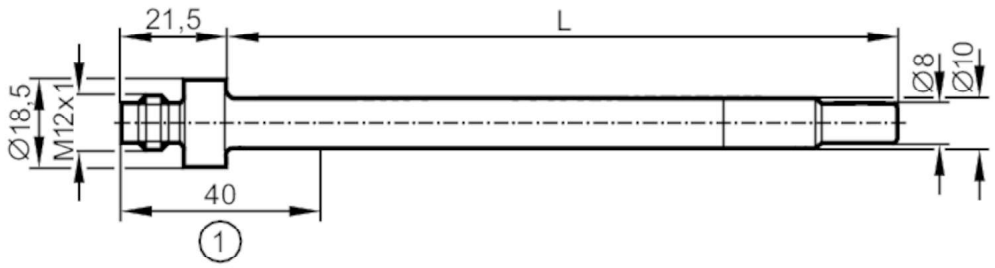
[1] Incl. coil(s) and connector(s)

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TT1050

Temperature probe sensor

TT-100KBBD10-...../US/



1 plug area
L = probe length corresponds to installation length EL

Product characteristics			
Measuring range		-40...150 °C	-40...302 °F
Process connection		Ø 10 mm	
Installation length EL	[mm]	160	
Application			
Special feature		Gold-plated contacts	
Measuring element		1 x Pt 1000; (to DIN EN 60751, class A)	
Media		liquids and gases	
Pressure rating	[bar]	160	
Minimum installation depth	[mm]	15	
Electrical data			
Protection class		III	
Measuring/setting range			
Probe length L	[mm]	160	
Measuring range		-40...150 °C	-40...302 °F
Accuracy / deviations			
Accuracy	[K]	± (0,15 K + 0,002 x|t|)	
Response times			
Dynamic response T05 / T09	[s]	1 / 3; (to DIN EN 60751)	
Operating conditions			
Ambient temperature	[°C]	-25...80	
Note on ambient temperature		plug area	
Storage temperature	[°C]	-40...100	
Protection		IP 68; IP 69K	
Tests / approvals			
Shock resistance		DIN EN 60068-2-27	50 g (11 ms)
Vibration resistance		DIN EN 60068-2-6	10 g (10...2000 Hz)
MTTF	[years]	22831	
Mechanical data			
Weight	[g]	54.3	
Dimensions	[mm]	Ø 10	
Materials		stainless steel (316L/1.4404)	

TT1050

Temperature probe sensor

TT-100KBBD10-...../US/

Materials (wetted parts)		stainless steel (316L/1.4404)
Process connection		Ø 10 mm
Probe diameter	[mm]	10
Installation length EL	[mm]	160

Remarks

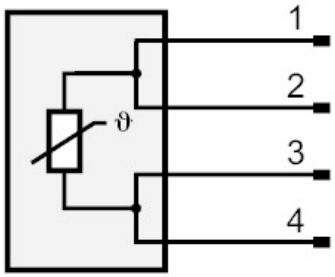
Remarks	The values for accuracy apply to flowing water.
Pack quantity	1 pcs.

Electrical connection

Connector: 1 x M12; coding: A; Contacts: gold-plated



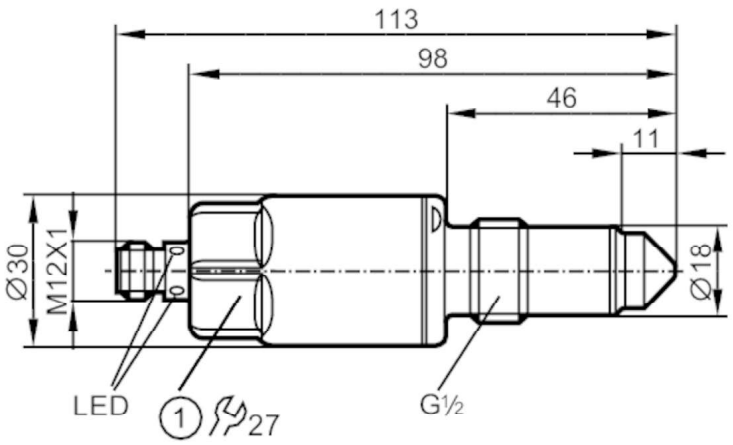
Connection



LMT01A

Sensor for point level detection in hazardous areas

LMACE-A12E-QSKG-1/US/3D/3G



1 Tightening torque 20...25 Nm

EC 1935/2004 EHEDG Certified IO-Link

Product characteristics		
Number of inputs and outputs		Number of digital outputs: 2
Factory setting		oils; oil-based media; powder
Process connection		threaded connection G 1/2 sealing cone
Application		
Special feature		Gold-plated contacts
Media		Liquids; viscous media; powder
Cannot be used for		See the operating instructions, chapter "Function and features".
Medium temperature	[°C]	-20...85
Probe length	[mm]	11
Tank pressure	[bar]	-1...40
Electrical data		
Operating voltage	[V]	18...30 DC
Current consumption	[mA]	< 50
Protection class		III
Reverse polarity protection		yes
Measuring principle		capacitive
Inputs / outputs		
Number of inputs and outputs		Number of digital outputs: 2
Outputs		
Total number of outputs		2
Output signal		switching signal; IO-Link
Electrical design		PNP/NPN
Number of digital outputs		2
Output function		normally open / normally closed; (parameterisable)
Max. voltage drop switching output DC	[V]	2.5
Permanent current rating of switching output DC	[mA]	100

LMT01A

Sensor for point level detection in hazardous areas

LMACE-A12E-QSKG-1/US/3D/3G

Short-circuit protection		yes	
Type of short-circuit protection		pulsed	
Overload protection		yes	
Measuring/setting range			
Factory setting		oils; oil-based media; powder	
Response times			
Response time	[s]	< 0.5	
Interfaces			
Communication interface		IO-Link	
Transmission type		COM2 (38,4 kBaud)	
IO-Link revision		1.1	
SDCI standard		IEC 61131-9	
Profiles		Smart Sensor: Process Data Variable; Device Identification	
SIO mode		yes	
Required master port type		A	
Process data analogue		1	
Process data binary		2	
Min. process cycle time	[ms]	2.3	
Supported DeviceIDs		**Type of operation**	**DeviceID**
		default	305
Operating conditions			
Ambient temperature	[°C]	-20...60	
Storage temperature	[°C]	-40...85	
Protection		IP 67; (when used outside the hazardous area: IP 68 / IP 69)	
Tests / approvals			
ATEX marking		II 3D Ex tc IIIC T90°C Dc X	
		II 3G Ex nA IIC T4 Gc X	
EMC		DIN EN 61000-6-2	
		DIN EN 61000-6-4	open tanks
		DIN EN 61000-6-3	closed tanks
Shock resistance		DIN EN 68000-2-27	50 g (11 ms)
Vibration resistance		DIN EN 68000-2-6	20 g (10...2000 Hz)
MTTF	[years]	223	
Mechanical data			
Weight	[g]	218	
Dimensions	[mm]	Ø 30 / L = 113	
Materials		stainless steel (316L/1.4404); PEEK; PEI; FKM	
Materials (wetted parts)		PEEK; surface characteristics: Ra < 0,8 / Rz 4	
Process connection		threaded connection G 1/2 sealing cone	
Displays / operating elements			
Display		switching status	LED, yellow
		operating status	LED, green

LMT01A

Sensor for point level detection in hazardous areas

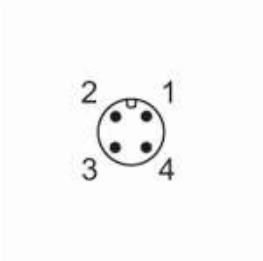
LMACE-A12E-QSKG-1/US/3D/3G

Remarks

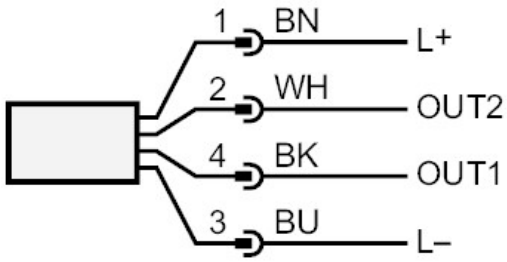
Pack quantity	1 pcs.

Electrical connection

Connector: 1 x M12; coding: A; Contacts: gold-plated



Connection



OUT1:	switching output IO-Link Teach
OUT2:	switching output
	colours to DIN EN 60947-5-2
	Core colours :
BK =	black
BN =	brown
BU =	blue
WH =	white