Huba Control

FOR FINE PRESSURE AND FLOW MEASUREMENT

OEM relative and absolute pressure transmitter type 511

Pressure range
-1 ... 0 – 600 bar

Type 511 pressure transmitters meet the highest specifications for longevity, accuracy, temperature stability and EMC characteristics, making them suitable for an extremely wide range of demanding industrial applications.

- Compact, rugged construction for highest operational reliability
- No media egress when exceeding rupture pressure
- Negligible temperature influence on accuracy
- Excellent EMC capacity
- Saving time by quick cable mounting by the customer with swift connector

Technical overview

Pressure range

Relative	-1 ... 0 – 600 bar
Absolute	0 ... 25 bar

Operating conditions

Medium			Liquids and gases
Temperature	Ambient [1]	FPM	-15 ... +125 °C
		EPDM	-25 ... +125 °C
		NBR	-25 ... +85 °C
		FPM spec.	-40 ... +150 °C (UL max. 125 °C)
		ratiom. output, AMP JPT	max. +125 °C
		all other versions	max. + 85 °C
Tolerable overload / Rupture pressure [2]		< 6	3.0 x fs
		≥ 6	2.5 x fs (max. 900 bar)

Materials

Case		Stainless steel 1.4305 / AISI 303
Materials in contact with the medium	Pressure connection	Stainless steel 1.4305 / AISI 303
	Sensor	Ceramic Al_2O_3 (96%)
	Media stop system	PPS
	Sealing material	FPM, EPDM, NBR, FPM spec.

Media stop system

Huba-patented media stop system to prevent media egress when exeeding rupture pressure range (> 40 bar nominal value).

Electrical overview

	Output	Power supply	Load	Current consumption [4]
2 wire	4 ... 20 mA	8.0 ... 33 VDC	$< \frac{\text{supply voltage - 8 V}}{0.02\ \text{A}}$ [Ohm]	< 20 mA
3 wire	0 ... 5 V	8.0 ... 33 VDC	>10 kOhm / < 100 nF	< 4 mA
	1 ... 6 V	8.0 ... 33 VDC	>10 kOhm / < 100 nF	< 4 mA
	0 ... 10 V	11.4 ... 33 VDC	>10 kOhm / < 100 nF	< 4 mA
	0 ... 10 V	24 VAC ±15%	>10 kOhm / < 100 nF	< 4 mA
	ratiom. 10 ... 90%	5 VDC ±5%	>10 kOhm / < 100 nF	< 4 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
			optional	1000 VDC

Dynamic response

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

Protection standard

With connector DIN EN 175301-803-C	IP 65
All other versions	IP 67

Electrical connection

Cable 1.5 m
Swift connector
Connector AMP (Junior power time)
Connector M12x1 plastic thread
Connector M12x1 metal thread
Connector DIN EN 175301-803-C (mini-DIN)

Pressure connection

Inside thread	G ¼ with O-Ring seal
Outside thread	G ¼, sealed at back, DIN 3852, form E
	G ½, sealed at front
	G ½, sealed at back and manometer (combi)
	¼ -18 NPT
	R ¼, DIN 2999
	M12x1.5, sealed at back, DIN 3852, form E
	M14x1.5, sealed at back, DIN 3852, form E

Installation arrangement

Unrestricted

Tests / Admissions

Electromagnetic compatibility	CE conformity acc. EN 61326-2-3
UL	acc. Standard 61010-1
Shock acc. IEC 60068-2-27	100 *g*, 11 ms half sine wave, all 6 directions. Free fall from 2 m on concrete (6x)
Constant shock acc. IEC 60068-2-29	40 *g* for 6 ms, 1000x all 3 directions
Vibration acc. IEC 60068-2-6	20 *g*, 2 ... 2000 Hz with amplitude ± 15 mm, 1 Octave/min. all 3 directions, 50 constant load

Weight

Version with inside thread	~ 85 g
Version with outside thread	~ 95 g

Packaging (Please state on order)

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

[1] Version until +150 °C on request
[2] higher overload and rupture pressure on request
[3] at nominal pressure

Accuracy

Parameter		Unit	
Tolerance zero point	max.	% fs	±0.3
Tolerance full scale	max.	% fs	±0.3
Resolution		% fs	0.1
Total of linearity, hysteresis and repeatability	max.	% fs	±0.3
Long term stability acc. DIN EN 60770		% fs	±1.0
TC zero point [1]	max.	% fs/10K	±0.15
TC sensitivity [1]	max.	% fs/10K	±0.15

Test conditions: 25 °C, 45% RH, power supply 24 VDC
TC z.p. / TC s. -40 ... +125 °C

Order code selection table in bar

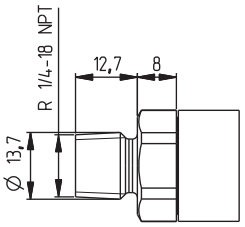
				511.	X	X	X	X	X	X	X	X	X	X
Pressure mode	Relative				9									
	Absolute				8									
Pressure range [2]	-1 ... 0 bar				9	0	0							
	0 ... 1 bar					1	1							
	0 ... 1.6 bar					1	2							
	0 ... 2.5 bar					1	4							
	0 ... 4 bar					1	5							
	0 ... 6 bar					1	7							
	0 ... 10 bar					3	0							
	0 ... 16 bar					3	1							
	0 ... 25 bar					3	2							
	0 ... 40 bar				9	3	3						2	
	0 ... 60 bar				9	4	0						2	
	0 ... 100 bar				9	4	1						2,5	
	0 ... 160 bar				9	4	2						2,5	
	0 ... 250 bar				9	4	3						2,5	
	0 ... 400 bar	(FPM spec. seal only)			9	5	4	6					2,5	
	0 ... 600 bar	(FPM spec. seal only)			9	5	5	6					2,5	
	▲ Full scale signal at these pressures													
Sealing material [2]	FPM	Fluoro elastomer						0						
	EPDM	Ethylene propylene						1						
	NBR	Butadiene Acylonitrile						2						
	FPM spec.	Fluoro elastomer spec.						6						
Adjustment	Factory								0					
Output / power supply	0 ... 5 V	8.0 ... 33 VDC	IN=1 / OUT=3 / GND=4							1				
	1 ... 6 V	8.0 ... 33 VDC	IN=1 / OUT=3 / GND=4							6				
	0 ... 10 V	11.4 ... 33 VDC	IN=1 / OUT=3 / GND=4							2				
	0 ... 5 V	8.0 ... 33 VDC	IN=1 / OUT=4 / GND=3							F	5,7			
	1 ... 6 V	8.0 ... 33 VDC	IN=1 / OUT=4 / GND=3							G	5,7			
	0 ... 10 V	11.4 ... 33 VDC	IN=1 / OUT=4 / GND=3							H	5,7			
	0 ... 10 V	24 VAC ±15%								7	1,0			
	4 ... 20 mA	8.0 ... 33 VDC								3				
	ratiom. 10 ... 90%	5 VDC ±5%								4				
Electrical connection	Cable 1.5 m										0			
	Swift connector										1			
	Connector AMP JPT [4]										2			
	Connector M12x1 plastic thread [4]										5			
	Connector M12x1 metal thread [4]										7			
	Connector DIN EN 175301-803-C (mini DIN) 2 w: IN=3 / OUT=1 3 w: IN=3 / OUT=2 / GND=1										8			
	Connector DIN EN 175301-803-C (mini DIN) 2 w: IN=1 / OUT=2 3 w: IN=1 / OUT=3 / GND=2										9			
Pressure connection [5]	Inside thread	G ¼ mit O-Ring seal (no pressure tip orifice possible)										1	1,2	
	Outside thread	G ¼ sealed at back, DIN 3852, form E										4		
	Outside thread	G ½ sealed at front										9		
	Outside thread	G ½ sealed at back and manometer (combi)										8		
	Outside thread	¼ -18 NPT										3		
	Outside thread	R ¼, DIN 2999										7		
	Outside thread	M12x1.5, sealed at back, DIN 3852, form E										5		
	Outside thread	M14x1.5, sealed at back, DIN 3852, form E										6		
Version	Stainless steel without media stopper (≤ 60 bar)												1	
	Stainless steel with media stopper (standard ≥ 40 bar)												2	
	Stainless steel with pressure tip orifice (≥ 100 bar)												5	
Pressure range variation (optional)	Indicate W and state range on order (e.g.: W0... + 8bar/OUT1...6V)													W

Accessories

		Order number
Female connector for connector M12x1		106975
Female connector AMP (Junior power timer) 2-wire		110442
Female connector AMP (Junior power timer) 3-wire		108767
Female connector swift connector	(included in delivery)	107359
Female connector mini DIN		104244
Calibration certificate		104551

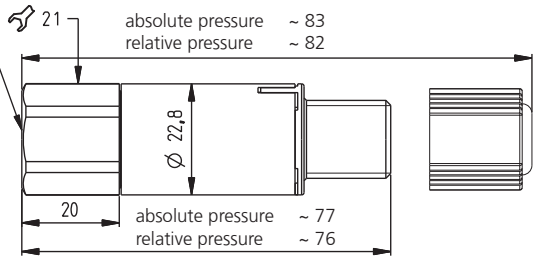
[1] TC = Temperature coefficient
[2] Other pressure range on request
[3] Other sealing material on request
[4] Delivery without female connector
[5] Other pressure connection on request

Dimensions in mm / Electrical connections

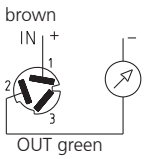


G 1/4
Inside thread

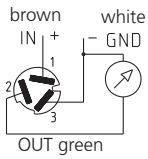
Female connector
swift connector



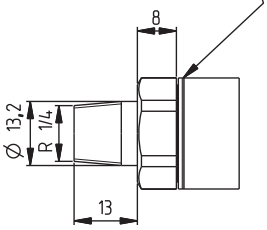
2 wire
(4 ... 20 mA)



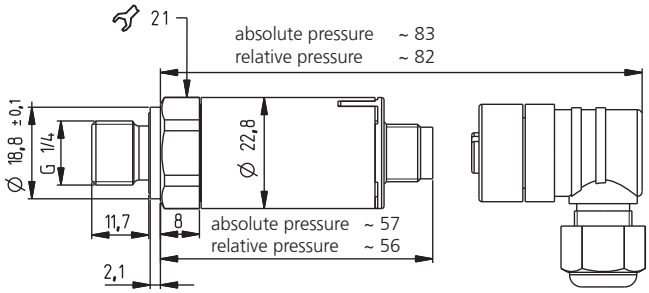
3 wire

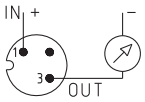


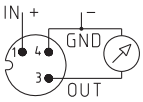
All absolute versions
are especially marked
with an indentation.



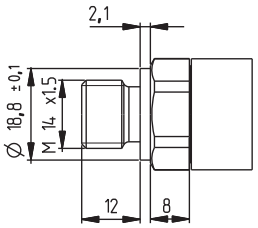
Female connector M12x1

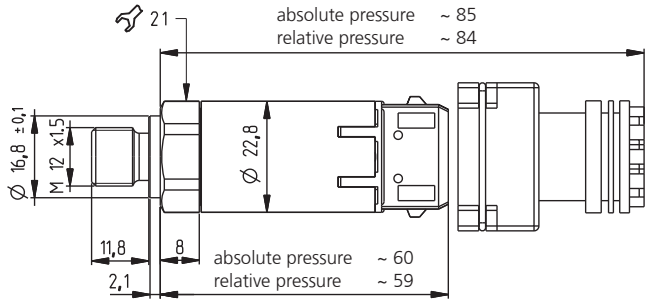


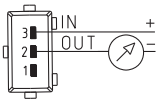


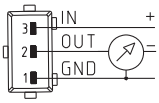


Female connector AMP JPT

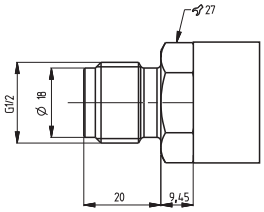


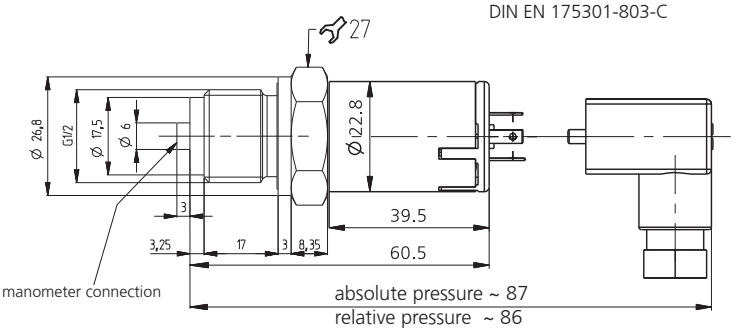


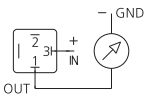


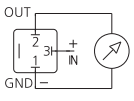


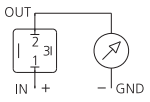
Female connector
DIN EN 175301-803-C

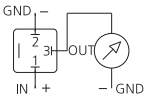












Huba Control

FOR FINE PRESSURE AND FLOW MEASUREMENT

Relative and absolute pressure transmitter type 528

Pressure range
-1 ... 0 – 60 bar

The compact type 528 pressure transmitter is based upon the well proven ceramic technology developed by Huba Control over 20 years ago.

These transmitters are suitable for applications across a broad spectrum of industries.

- Compact, rugged construction
- Negligible temperature influence on accuracy
- Saving time by quick cable mounting by the customer with swift connector
- Large selection of connections available

Technical overview

Pressure range

Relative	-1 ... 0 – 60 bar
Absolute	0 ... 1 – 16 bar

Operating conditions

Medium				Liquids and gases
Temperature	Medium	FPM	-15 ... +125 °C	(Ex) -15 ... +120 °C)
		EPDM	-40 ... +125 °C	(Ex) -30 ... +120 °C)
		NBR	-20 ... +100 °C	
		MVQ	-40 ... +125 °C	(Ex) -30 ... +120 °C)
		FPM	-40 ... +125 °C	(Ex) -30 ... +120 °C)
	Ambient		-30 ... +85 °C	(Ex) -25 ... +85 °C)
	Storage		-50 ... +100 °C	
Tolerable overload / Rupture pressure		≤ 4 bar	3.0 x fs	
		> 4 bar	2.5 x fs	

Materials

Cover		Stainless steel 1.4404 / AISI 316L
Plug accommodation		Polyarylamide 50% GF UL 94 V-0
Materials in contact with medium	Pressure connection	Stainless steel 1.4404 / AISI 316L
		PVDF
	Sensor	Ceramic Al_2O_3 (96%)
	Sealing material	FPM, EPDM, NBR, MVQ

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				500 VDC

Protection class

Protection class III

Dynamic response

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

Protection standard

Connector DIN EN 175301-803, Braids	IP 65
Connector RAST 2.5	IP 00
Swift connector, Metri Pack, Connector M12x1	IP 67

Electrical connection

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

Pressure connection

Inside thread	7/16 - 20 UNF	
	½ -14 NPT	
	G ¼	with O-Ring seal FPM spec. (-30 ... +135 °C)
Outside thread	7/16 - 20 UNF	sealed at front or sealing cone
	¼ -18 NPT	
	G ¼, G ½, G ⅛	sealed at back DIN 3852-E with Profile seal ring in FPM spec. (-30 ... +135 °C)
	G ¼, G ½	sealed at back and manometer (combi) with Profile seal ring in FPM spec. (-30 ... +135 °C)
	R ¼	EN 10226
	⅛ - 27 NPT	
	G ⅛	sealed at front or sealed at back and manometer (combi) with Profile seal ring in FPM spec. (-30 ... +135 °C)
	M10x1	sealed at back DIN 3852-E with Profile seal ring in FPM spec. (-30 ... +135 °C)
	M20x1.5	
	G ¼, G ½	sealed at front

Installation arrangement

Unrestricted

Tests / Admissions

Electromagnetic compatibility	CE conformity acc. EN 61326-2-3
Raised noise resistantcy	EN 50121-2-3
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

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

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

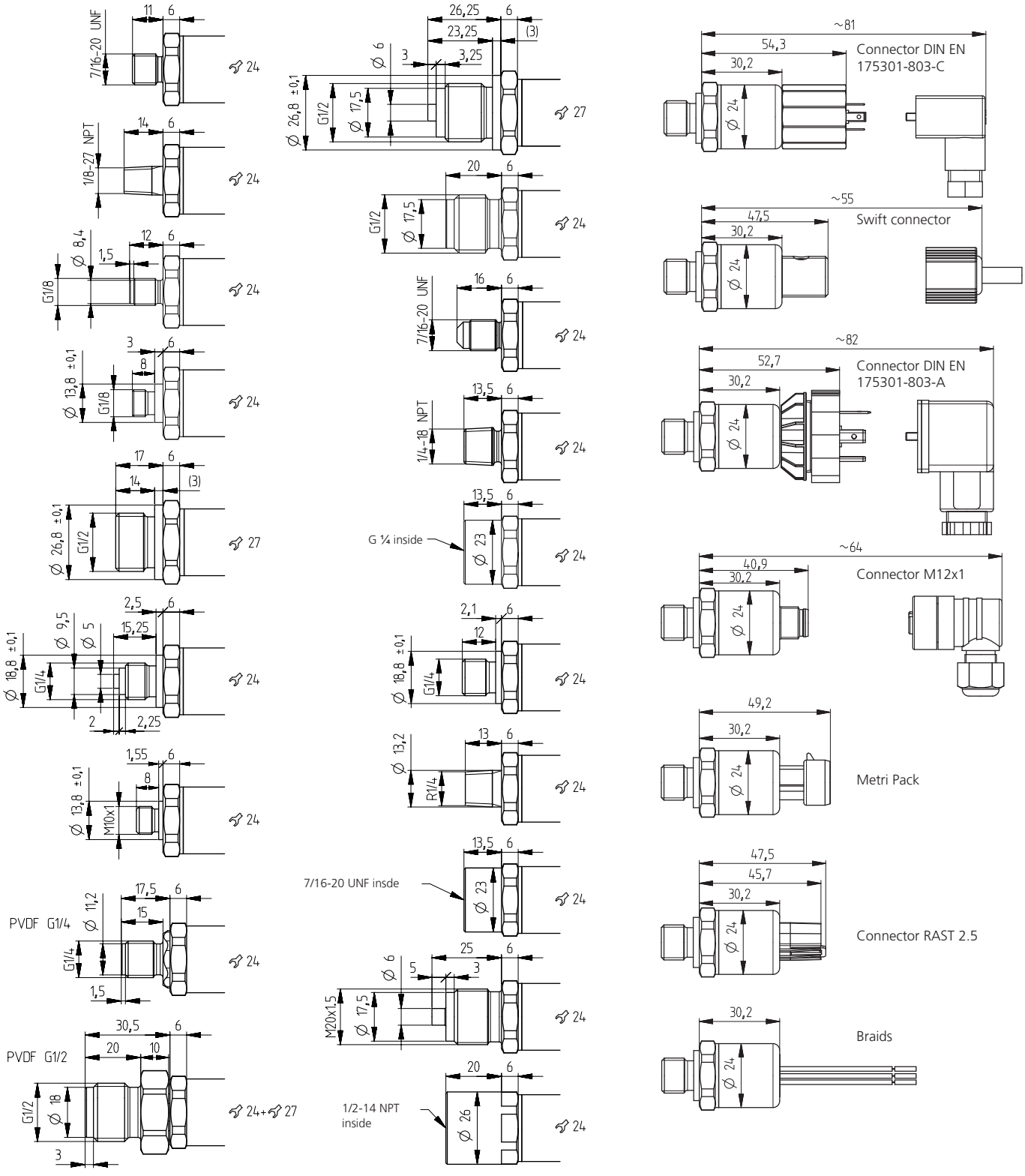
Test conditions: 25 °C, 45% RH, power supply 24 VDC

Order code selection in bar

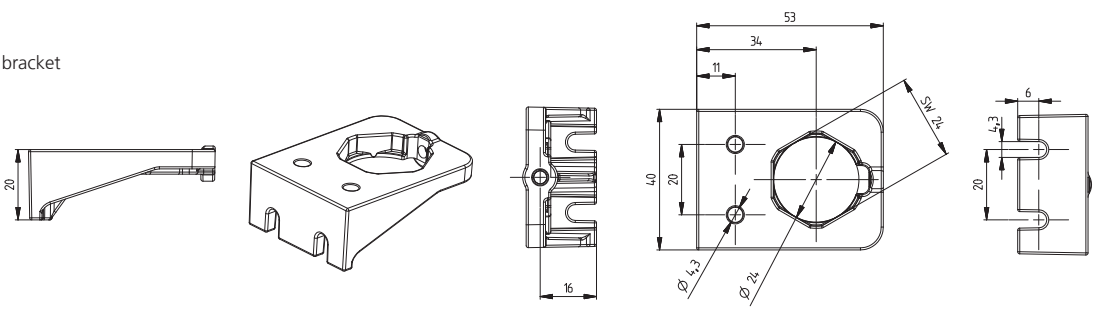
				1	2	3	4	5	6	7	8	9	10	11
				528.	X	X	X	X	X	X	X	X	X	X	X
Pressure range (relative) [3]	-1 ... 0 bar			9	0	1								
	0 ... 1 bar			9	1	1								
	0 ... 1.6 bar			9	1	2								
	0 ... 2.5 bar			9	1	4		0,4						
	0 ... 4 bar			9	1	5		0,4						
	0 ... 6 bar			9	1	7		0,4						
	0 ... 10 bar			9	3	0		0,4						
	0 ... 16 bar			9	3	1		0,4						
	0 ... 25 bar			9	3	2		0,4					1	
	0 ... 40 bar			9	3	3		0,4					1	
	0 ... 60 bar			9	4	0		0,4					1	
Pressure range (absolute) [3]	0 ... 1 bar			8	1	1								
	0 ... 1.6 bar			8	1	2								
	0 ... 2.5 bar			8	1	4								
	0 ... 4 bar			8	1	5								
	0 ... 6 bar			8	1	7								
	0 ... 10 bar			8	3	0								
	0 ... 16 bar			8	3	1								
Sealing material	FPM	Fluoro elastomer	(Ex) -15 ... +120 °C)				0							
	EPDM	Ethylene propylene	(Ex) -30 ... +120 °C)				1							
	NBR	Butadiene Acylonitrile					2							
	MVQ	Silicone polymer	(Ex) -30 ... +120 °C)				3							
	FPM	Fluoro elastomer	(Ex) -30 ... +120 °C)				5							
Application	standard							0						
	for oxygen applications						0	1				1	1	
	with drinking water approval NSF 61						0	4				1	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 / 24 VAC ±15% *(not possible with M12x1, metri Pack, RAST, braids)*							8					
	ratiom. 10 ... 90%	5VDC ±10%							7					
		5VDC ±10% Ex protection							9					
	4 ... 20 mA	7 ... 33 VDC							3					
		7 ... 33 VDC Raised noise resistantcy *((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 [5]						0,4		5				
	Braids	80 ±10 mm								6				
		290 ±10 mm								7				
		480 ±10 mm								8				
		730 ±10 mm								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 [3]	Inside thread	7/16-20 UNF sealing cone									K		1	
		½ -14 NPT									D		1	
		G ¼ with O-Ring seal FPM spec.									1		1	
	Outside thread	7/16 -20 UNF sealing cone									2		1	
		¼ -18 NPT									3		1	
		G ¼ sealed at back DIN 3852-E, with profile seal ring in FPM spec.									4		1	
		G ¼ sealed at back and manometer, with profile seal ring in FPM spec.									5	1	1	
		R ¼ acc. to EN 10226									7		1	
		G ½ sealed at back and manometer, with profile seal ring in FPM spec.						0,1			8		1	
		7/16-20 UNF sealed at front									G		1	
		⅛ - 27 NPT									A		1	
		G ⅛ sealed at front									M		1	
		G ⅛ sealed at back DIN 3852-E, with Profile seal ring in FPM spec.						0,1			H		1	
		G ¼ sealed at front									J	1	2	
		G ½ sealed at back and manometer, with profile seal ring in FPM spec.						0,1			C		1	
		M10x1 sealed at back, with profile seal ring in FPM spec						0,1			F		1	
		M20x1.5									E		1	
		G ½ sealed at front									9			
Pressure orifice	without											1		
	with											2		
Material pressure connection	Stainless steel 1.4404 / AISI 316L												1	
	PVDF outside thread	sealed at front G ¼, G ½	≤ 16 bar										2	
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] For pressure ranges ≤ 10 bar (relative) only possible if deareation through the cable is assured

Dimensions in mm



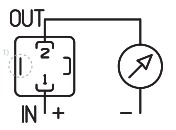
Mounting bracket



Electrical connections

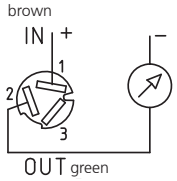
2 wire

Connector DIN EN 175301-803-A or C



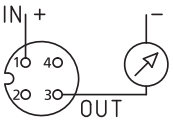
1 (IN) 2 (OUT)

Swift connector



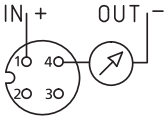
1 (IN) 2 (OUT)

Connector M12x1



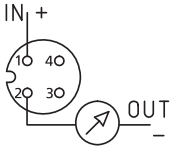
1 (IN) 3 (OUT)

Connector M12x1



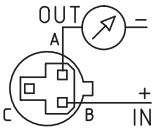
1 (IN) 4 (OUT)

Connector M12x1



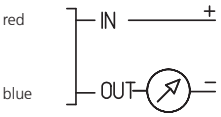
1 (IN) 2 (OUT)

Metri Pack Serie 150



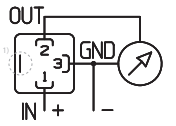
B (IN) A (OUT)

Braids



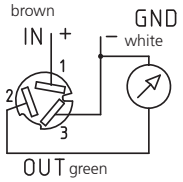
3 wire

Connector DIN EN 175301-803-A or C



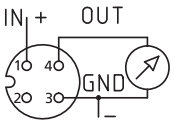
1 (IN) 2 (OUT) 3 (GND)

Swift connector



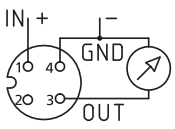
1 (IN) 2 (OUT) 3 (GND)

Connector M12x1



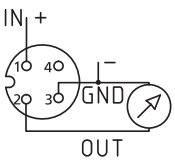
1 (IN) 4 (OUT) 3 (GND)

Connector M12x1



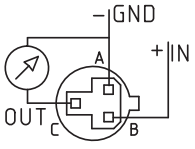
1 (IN) 3 (OUT) 4 (GND)

Connector M12x1



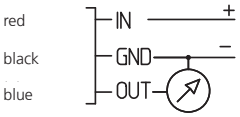
1 (IN) 2 (OUT) 3 (GND)

Metri Pack Serie 150

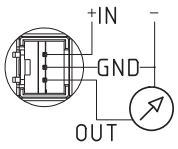


B (IN) C (OUT) A (GND)

Braids

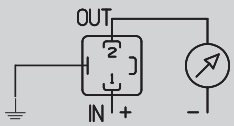


Connector RAST 2.5



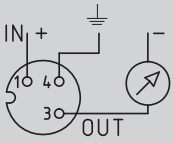
Device design with explosion protection: 4 ... 20 mA
The grounding connection is conductively connected to the transmitter housing.

Connector DIN EN 175301-803-A



1 (IN) 2 (OUT) ⏚

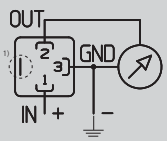
Connector M12x1



1 (IN) 3 (OUT) 4 (⏚)

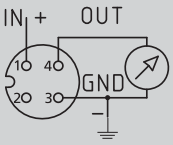
Device design with explosion protection: ratiom. 10 ... 90%
The electronic GND is connected with a 1MΩ resistor to the transmitter housing.

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