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AMZ 5050

SMART DIFFERENTIAL PRESSURE TRANSMITTER WITH HART® COMMUNICATION

DESCRIPTION

AMZ 5050 differential industry standard pressure transmitters are based on a proven capacitive pressure sensor technology and feature high performance, resistance to overpressure and stability in dynamic pressure and temperature environments. Certain parameters, including ZERO and SPAN are configurable in hazardous areas by use of special magnetic tool. Local LCD display features backlight and is mountable at 0, 90, 180 and 270 degrees providing flexibility in transmitter installation angle.

SPECIFICATIONS

Differential pressure ranges: 15 mbar to 70 bar
Static pressure / overpressure: up to 138 bar
Accuracy: up to ±0.075%
Output: 4...20 mA
Communication: HART®
Approvals: 0Ex ia IIC T6...T4 Ga X / 1Ex d IIC T6...T4 Gb X
Sensor: capacitive stainless steel
Turndown: up to 100:1
Display: LCD with backlight
Pressure port: 1/4″ NPTF, 1/2″ NPT (adapter), remote diaphragm seal options

APPLICATIONS

Liquid, steam and gas differential pressure measurement
Level monitoring in pressurized tanks
Filters and pumps diagnostics
Flow measurement

Appearance, mounting kit contents and/or specifications are subject to change without prior notice. We are constantly working on further improvement of our products.
Delivery is subject to standard terms of delivery.
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TECHNICAL SPECIFICATIONS

MEASURING RANGES

Differential pressure range, P_N*	Turndown ratio P_N/P_{set}	Permissible static pressure (line pressure)	Overpressure
0...1.5 kPa	20:1	1 MPa	1 MPa
0...7.5 kPa	40:1	4 MPa	4 MPa
0...37 kPa	100:1	13.8 MPa	13.8 MPa
0...187 kPa	100:1	13.8 MPa	13.8 MPa
0...690 kPa	100:1	13.8 MPa	13.8 MPa
0...2 MPa	100:1	13.8 MPa	13.8 MPa
0...7 MPa	100:1	13.8 MPa	13.8 MPa

* By default, nominal range (P_N) equals the upper range limit (URL) while lower range limit (LRL) is 0. The LRL can be set to negative URL; the setting is changed either via HART® modem/communicator or locally using special magnetic tool. P_{set} is the range set by user.
The pressure transmitter supports the following measurement units: inH2O, inHg, ftH2O, mmH_2O, mmHg, psi, bar, mbar, g/cm2, kg/cm2, Pa, kPa, MPa, atm, Torr. To select the units either HART® modem / communicator or local setup using special magnetic tool can be used. When switching units, the range of the digital display range should be taken into account.

PERFORMANCE

Pressure range	Turndown	Accuracy, % of span
P_N = 1.5 kPa	$P_N/P_{Set} \le 5$	±0.1
	$5 < P_N/P_{Set} \le 20$	$\pm[0.015 \cdot (P_N/P_{Set}) + 0.025]$
7.5 kPa ≤ P_N ≤ 7 MPa	$P_N/P_{Set} \le 10$	±0.075
	$10 < P_N/P_{Set} \le 40$	$\pm[0.00375 \cdot (P_N/P_{Set}) + 0.0375]$
	$40 < P_N/P_{Set} \le 100$	$\pm[0.00465 \cdot (P_N/P_{Set}) + 0.0015]$

Pressure range	Turndown	Temperature effect, % of span / 10 °C	Long-term stability	Line pressure effect	
				Zero Error**	Span Error
P_N = 1.5 kPa	$P_N/P_{Set} \le 5$	$\pm[0.075 \cdot (P_N/P_{Set}) + 0.025]$	±0.2% URL / year	±0.1% URL / 1 MPa	±0.2% of reading / 1 MPa
	$5 < P_N/P_{Set} P_{Set} \le 20$	$\pm[0.050 \cdot (P_N/P_{Set}) + 0.150]$			
P_N = 7.5 kPa	$P_N/P_{Set} \le 5$	$\pm[0.040 \cdot (P_N/P_{Set}) + 0.025]$		±0.03% URL / 1 MPa	±0.06% of reading / 1 MPa
	$5 < P_N/P_{Set} \le 40$	$\pm[0.030 \cdot (P_N/P_{Set}) + 0.075]$			
37 kPa ≤ P_N ≤ 7 MPa	$P_N/P_{Set} \le 5$	$\pm[0.010 \cdot (P_N/P_{Set}) + 0.030]$	±0.15% URL / 5 years	±0.005% URL / 1 MPa	±0.03% of reading / 1 MPa
	$5 < P_N/P_{Set} \le 100$	$\pm[0.012 \cdot (P_N/P_{Set}) + 0.023]$			

* Accuracy includes non-linearity, hysteresis and non-repeatability.
** Eliminated through zero trim when static pressure is at operational level.

Compensated range	-20...+80 °C; -40...+60 °C (optional)
Power supply effect (Nominal power supply: 24 V ±10%)	≤ ±0.05% of span / 10 V
Load resistance effect	≤ ±0.05% of span / kOhm
Response time (10...90%)	≤ 200 ms

OPERATING CONDITIONS

Medium temperature	-40...+105 °C (depends on seal)					
Ambient temperature	-40...+85 °C (consult temperature class for Ex versions)					
Storage temperature	-40...+85 °C					
Approvals	1Ex d IIC T6…T4 Gb X			0Ex ia IIC T6…T4 Ga X		
Temperature class	T4	T5	T6	T4	T5	T6
Ambient temperature	-40…85 °C	-40…70 °C	-40…60 °C	-40…80 °C	-40…60 °C	-40…50 °C
Vibration resistance	10 - 60 Hz, 0.21 mm peak to peak displacement / 60 - 2000 Hz, 3g					
Shock resistance	100 g / 11 ms					
Sensor service life	> 100×10^6 cycles					

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MECHANICAL SPECIFICATIONS

Housing, flanges	stainless steel 316L (1.4404) and aluminium alloy
Seal	EPDM (-40…105 °C); FKM (-25…105 °C); NBR (-25…105 °C); PTFE (-40…105 °C)
Diaphragm	stainless steel 316L (1.4435)
Mounting kit, Mounting bracket	carbon steel, stainless steel
Display protective cover	polycarbonate
Wetted parts	diaphragm, flanges, seal
Pressure port	1/4″ NPT; 1/2″ NPT (with adapter); remote diaphragm seals
Electrical connection	cable gland 1/2″ NPT; cable gland M20x1.5
Ingress protection	IP67
Dimensions, mm, max	177×116×110
Weight, kg, max	3.5
Explosion protection version	General industry; Intrinsically safe 0Ex ia IIC T6...T4 Ga X; Flameproof enclosure 1Ex d IIC T6...T4 Gb X. The design allows local configuration in hazardous area using special magnetic tool (supplied).

DIGITAL DISPLAY (optional)

Display	Value
Display digits	-1999…+9999
Display accuracy	0.1 % of span ± 1 digit

ELECTRICAL SPECIFICATIONS

Output signal	**Power supply**	**Load resistance**	**Power consumption**
4...20 mA / HART®	9…44 V (DC)	≤ [(U_S – U_{S_Min}) / 0.02 A] Ohm*	≤ 21 mA

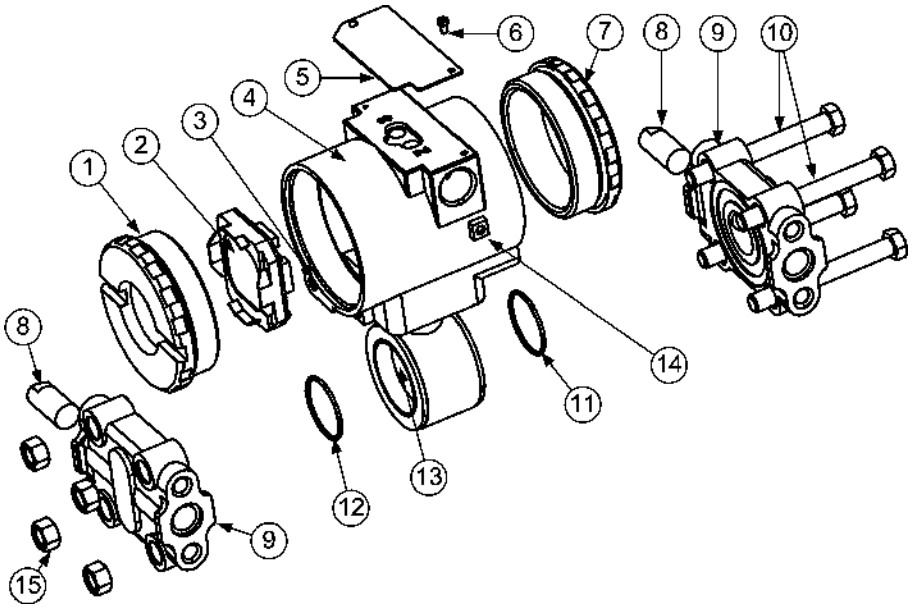
Minimum value of the supply voltage	**Without HART®, U_{S_Min}**	**With HART®, $U_{S\_Min\_HART}$**
With backlight off	9 V	14 V
With backlight on	12 V	17 V

* Minimum load resistance for HART® communication: 250 Ohm.

Safe values for intrinsically safe design 0Ex ia IIC T6…T4 Ga X:

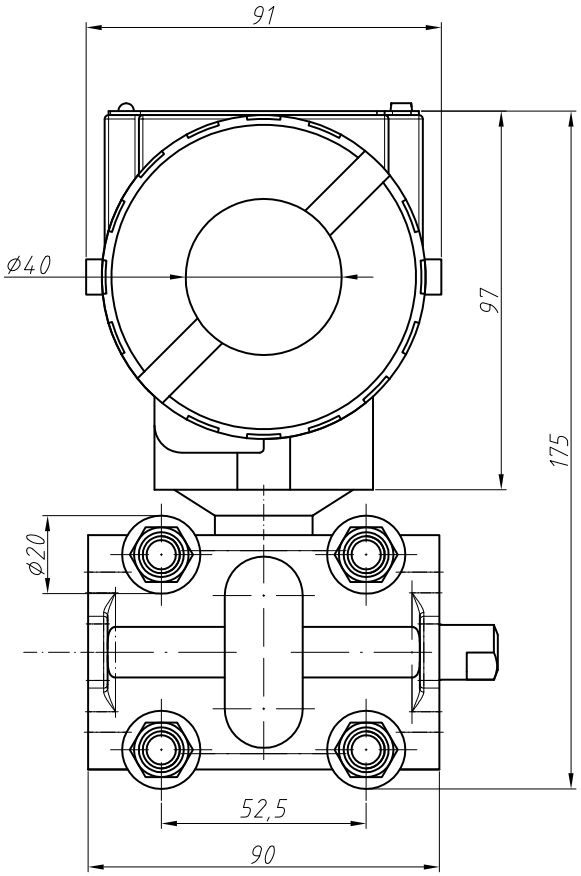
Parameter	**2-wire**
Maximum voltage, Ui	28 V
Maximum current, Ii	93 mA
Maximum power, Pi	660 mW
Maximum internal inductance, Li	5 µH
Maximum internal capacitance, Ci	10 nF

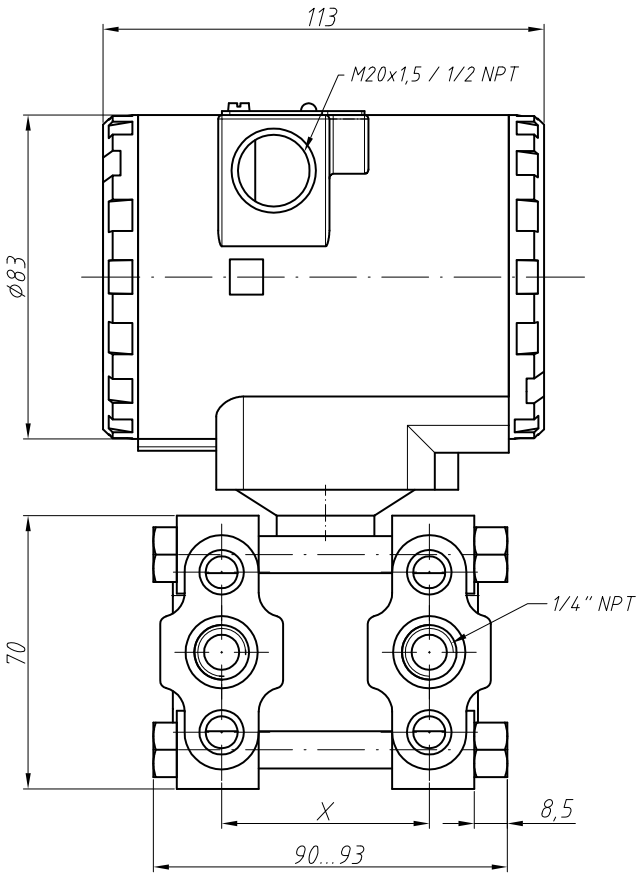
COMPONENTS



1 – Display protective cover
2 – Display (orientation changes in steps of 90°)
3 – Locking screw
4 – Housing
5 – Identification plate
6 – Identification plate holding screw
7 – Terminal board cover
8 – Blanking plug(s)
9 – Flanges
10 – Flange bolts
11, 12 – O-rings
13 – Sensor
14 – Housing ground screw
15 – Clamping nuts

DIMENSIONS (mm)

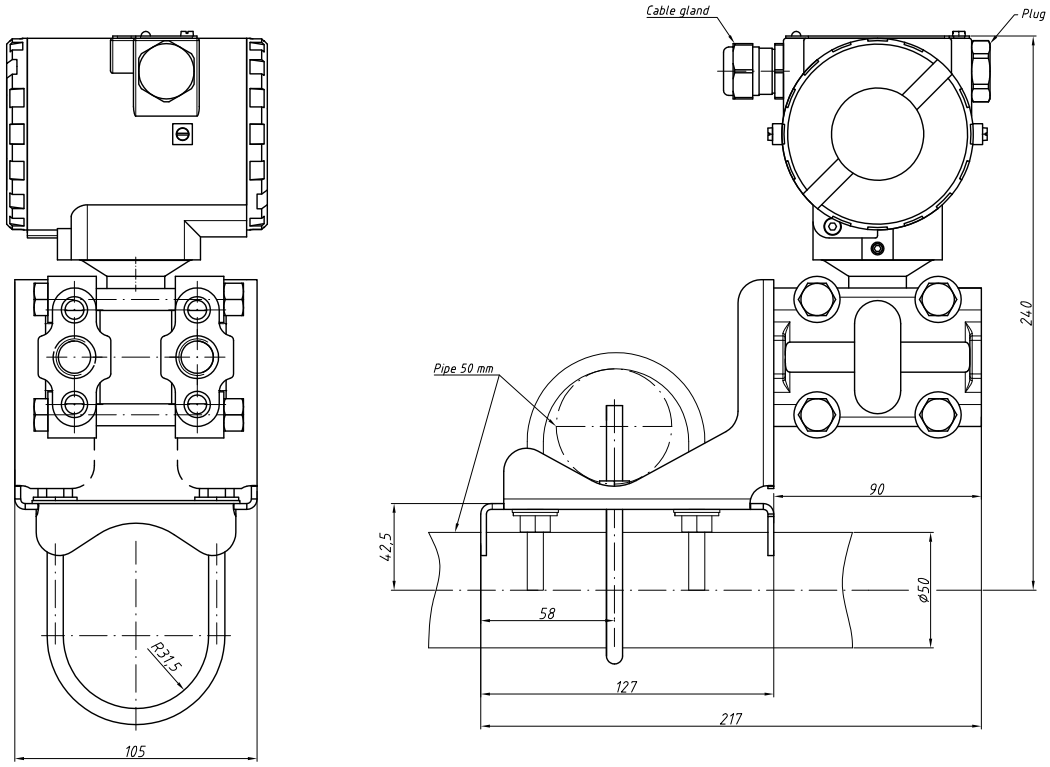




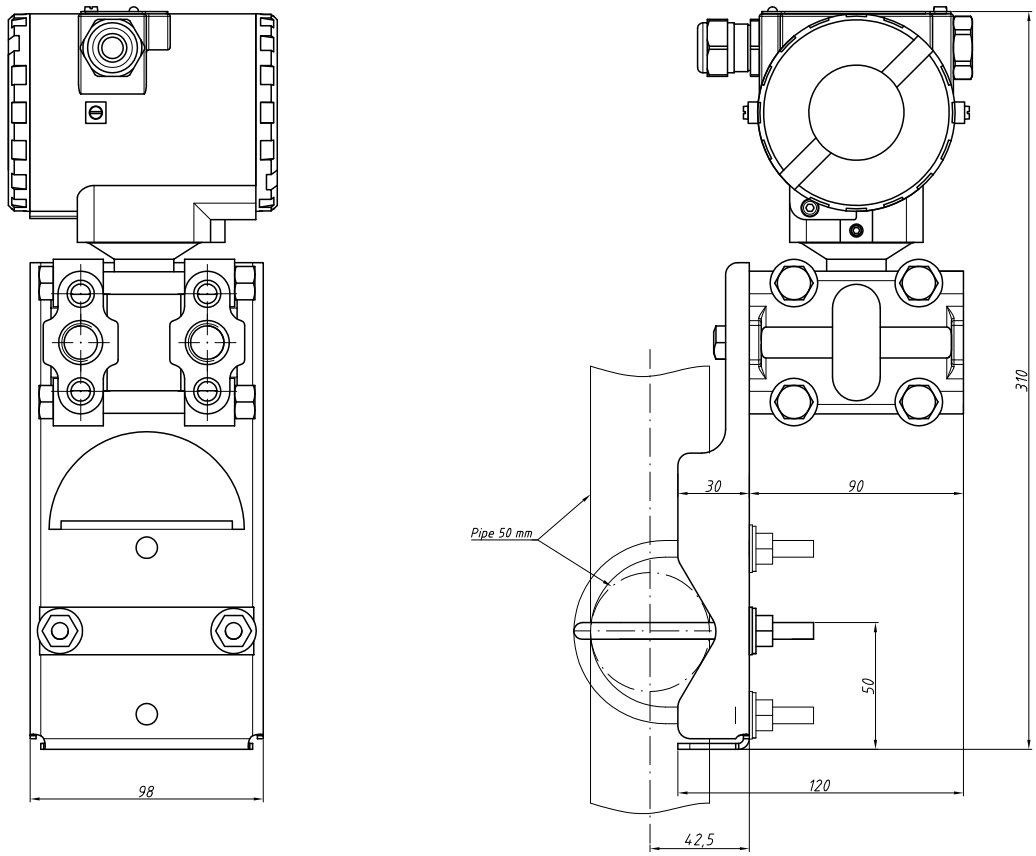
URL, kPa	1,5 - 187	690	2000	7000
X, mm	54	55	56	57

DIMENSIONS (mm)

With angled pipe bracket

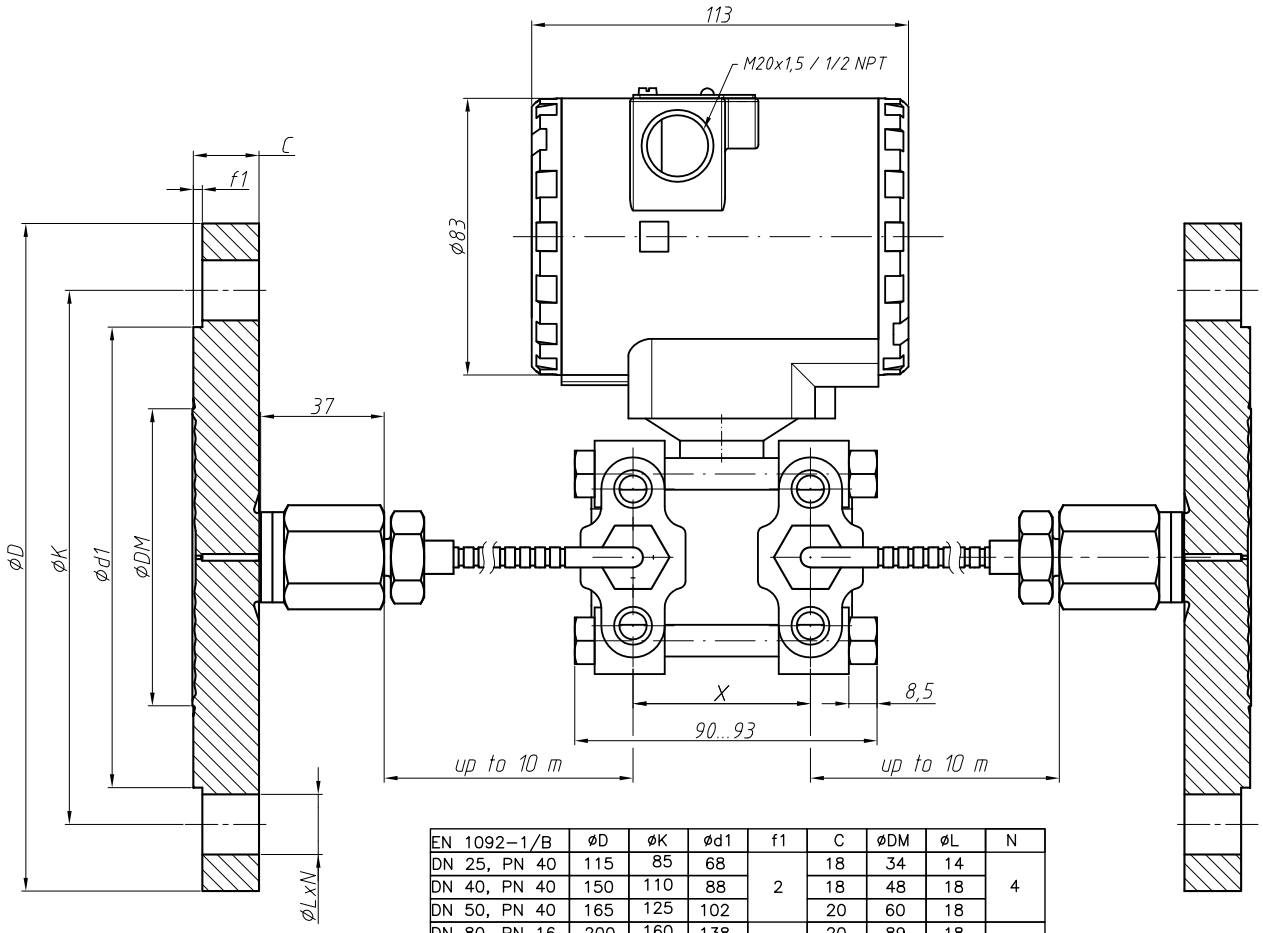


With straight pipe bracket



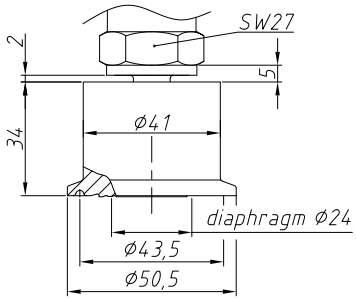
DIMENSIONS (mm)

Remote diaphragm seal

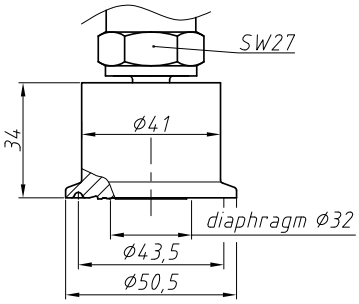


EN 1092–1/B	ØD	ØK	Ød1	f1	C	ØDM	ØL	N
DN 25, PN 40	115	85	68	2	18	34	14	4
DN 40, PN 40	150	110	88		18	48	18	
DN 50, PN 40	165	125	102		20	60	18	
DN 80, PN 16	200	160	138	3	20	89	18	8
DN 100, PN 40	235	190	162		24	89	22	

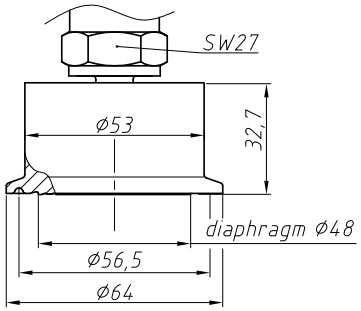
Clamping socket as per DIN 32676 DN 25 (1″)



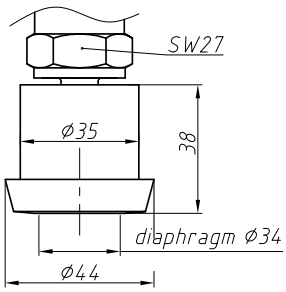
Clamping socket as per DIN 32676 DN 40 (1 1/2″)



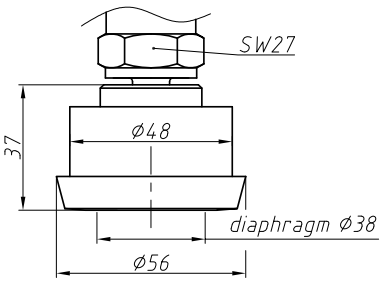
Clamping socket as per DIN 32676 DN 50 (2″)



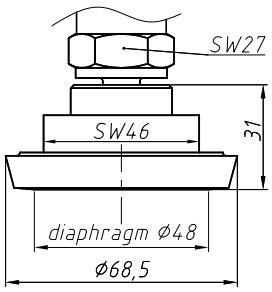
Taper socket with grooved union as per DIN 11851 DN 25



Taper socket with grooved union as per DIN 11851 DN 40



Taper socket with grooved union as per DIN 11851 DN 50



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ORDERING CODE

AMZ 5050	-X	-XXXX	-XX	-XX	-X	-X	-X	-X	-X	-X	-X	-X	-X	-X	-XX
MEASUREMENT TYPE															
Differential	D														
UPPER RANGE LIMIT (URL)															
1.5 kPa		1500													
7.5 kPa		7500													
37 kPa		3701													
187 kPa		1872													
690 kPa		6902													
2 MPa		2003													
7 MPa		7003													
Other		XXXX													
STATIC PRESSURE															
1 MPa (URL 1.5 kPa)			01												
4 MPa (URL 7.5 kPa)			04												
13.8 MPa (URL 37 kPa and above)			13												
DIAPHRAGM MATERIAL / FILL FLUID															
Stainless steel / silicone oil				11											
FLANGE MATERIAL															
Stainless steel 316L					S										
SEALS															
FKM (-25...+105 °C, standard)						F									
NBR (-25...+105 °C)						N									
EPDM (-40...+105 °C)						E									
PTFE (-40...+105 °C)						P									
ACCURACY															
0.075% (URL ≥ 7.5 kPa)							Z								
0.1% (URL = 1.5 kPa)							A								
DISPLAY															
No								0							
Yes								1							
DRAIN VALVES LOCATION															
No drain valves									V						
Opposite pressure ports									A						
ELECTRICAL CONNECTION															
Cable gland 1/2″ NPT										N					
Cable gland M20x1.5										M					
OUTPUT SIGNAL															
4...20 mA / HART®											H				
4...20 mA / HART® / 0Ex ia IIC T6...T4 Ga X											I				
4...20 mA / HART® / 1Ex d IIC T6...T4 Gb X											P				

ORDERING CODE (CONTINUED)

AMZ 5050	-X	-XXXX	-XX	-XX	-X	-X	-X	-X	-X	-X	-X	-X	-X	-X	-XX
PRESSURE PORT															
1/4″ NPT												4			
1/2″ NPT (with adapter)												2			
Flange connection with optional capillary tube												RSFXXX*			
Hygienic connection with optional capillary tube												RSHXXX*			
VALVE MANIFOLD**															
No													0		
Valve manifold included													1		
Valve manifold installed***													2		
MOUNTING KIT															
Not included														0	
Pipe bracket, straight														1	
Pipe bracket, angled														2	
VERSION															
Standard															00

Example: AMZ 5050-D-7003-13-11-S-F-A-1-V-N-H-2-0-1-00

* Submit separate port configuration for both H and L ports according to Table 1. A unique code will be assigned to the configuration. For example the RSF92 code was assigned to the following configuration:
H side: Flange DN 80 / PN 16; silicone oil; direct mounting; 316L diaphragm; no seal.
L side: Flange DN 80 / PN 16; silicone oil; capillary tube 3 m; 316L diaphragm; no seal.
** The valve manifold configuration makes a separate line in the order. Use valve manifold data sheet for the order configuration.
*** The transmitter is supplied assembled with valve manifold and leak tested.

Table 1 Remote diaphragm seal options

Type	Size	Filling fluid	Capillary length	Diphragm	Seal
RSF – Flange	EN 1092-1/B: DN 25, DN 40, DN 50, DN 80, DN 100	Silicone oil; High temperature silicone oil; Food grade oil	Direct mounting; With capillary tube – length 0.5 to 10 m	316L stainless steel	No seal; NBR; PTFE; FKM
RSH – Hygienic	Clamp DIN 32676: DN 25, DN 40, DN 50; DIN 11851: DN 25, DN 40, DN 50				