



# XMP i

## Precision Pressure Transmitter for Process, Chemical and Petrochemical Industry

- ▶ Ex-intrinsically safe version with HART<sup>®</sup>-communication
- ▶ internal or flush welded diaphragm
- ▶ rugged aluminium die cast case or stainless steel field housing
- ▶ nominal pressure ranges from 0 ... 350 mbar up to 0 ... 600 bar

### DESIGN

The basis of XMP i is our piezoresistive silicon sensor DSP 111 (flush-welded diaphragm) or the sensor DSP 411 (internal mounting diaphragm).

The sensor is – together with digital compensation electronics – directly mounted into the pressure port. It is connected to the configurable HART<sup>®</sup> module via a I<sup>2</sup>C interface.

With the help of this innovative housing concept, precise and long-term stable pressure transmitters with flush-welded diaphragm and low thermal error can be produced.

### OPERATING

The device is as a standard equipped with HART<sup>®</sup> communication. It is thus possible to set and transfer a variety of parameters via PC, HART<sup>®</sup> communicator, etc.

An intelligent display and operating module is optionally available. Thus, the current pressure can be displayed and the transmitter can be easily configured on-site via three buttons.

- ▶ accuracy:  
0.05 % FSO BFSL  
(0.1 FSO IEC 60770)
- ▶ turn-down 1:10
- ▶ several process connections:
  - thread (inch, NPT)
  - flange (DIN 2501, ANSI)
  - DRD
- ▶ high ingress protection IP 67
- ▶ optionally:
  - **with integrated display and operating module**
  - **cooling element for media temperatures up to 300 °C**
  - flameproof enclosure (in preparation)
  - PROFIBUS PA (in preparation)

Characteristics

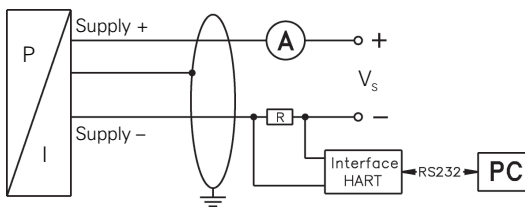
XMP i  
Precision Pressure Transmitter



Pressure ranges <sup>1</sup>											
Nominal pressure gauge [bar]	0.35	1	2	7	17	35	70	170	350	600	
Nominal pressure abs. [bar]	-	1	2	7	17	35	70	170	350	600	
Permissible overpressure [bar]	1	3	6	20	60	100	140	340	600	1000	
<sup>1</sup> On customer request we adjust the devices by software on the required pressure ranges, within the turn-down-possibility (gauge starting at 0.1 bar, abs. starting at 0.35 bar).											
Vacuum ranges											
Nominal pressure gauge [bar]	-0.17 ... 0.17		-0.35 ... 0.35		-1 ... 1		-1 ... 2		-1 ... 7		
Permissible overpressure [bar]	0.5		1		3		6		20		
Output signal / Supply											
Standard	2-wire: 4 ... 20 mA Ex-intrinsically safe version with HART <sup>®</sup> -communication / $V_s = 10 \dots 28 V_{DC}$										
Option PROFIBUS PA	digital output signal (according to IEC 61158) / $V_s = 10 \dots 30 V_{DC}$ (in preparation)										
Current consumption	max. 25 mA										
Performance											
Accuracy <sup>2,3</sup>	turn-down $\leq 1:5$ $\leq \pm 0.1$ % FSO turn-down $> 1:5$ $\leq \pm [0.1 + 0.015 \times \text{turn-down}]$ % FSO with turn-down = nominal pressure range / adjusted range										
Permissible load	$R_{max} = [(V_s - V_{smin}) / 0.02] \Omega$ load during HART <sup>®</sup> communication: $R_{min} = 250 \Omega$										
Influence effects	supply: 0.05 % FSO / 10 V permissible load: 0.05 % FSO / k $\Omega$										
Long term stability	$\leq \pm (0.1 \times \text{turn-down})$ % FSO / year										
Response time	200 ms – without consideration of electronic damping measuring rate 5/sec										
Adjustability	electronic damping: 0 ... 100 sec offset 0 ... 90 % FSO turn-down of span up to 1:10 <sup>4</sup>										
<sup>2</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)											
<sup>3</sup> for nominal pressure ranges $\leq 0.35$ bar the accuracy is calculated as follows: $\leq \pm [0.1 + 0.02 \times \text{turn-down}]$ % FSO											
<sup>4</sup> span minimal 0.1 bar (gauge) or 0.35 bar (absolute); turn-down with 35 bar maximal 1:2											
Thermal errors / Permissible temperatures											
Thermal error	$\leq \pm (0.1 \times \text{turn-down})$ % FSO / 10 K in compensated range standard: -20 ... 80 °C optional for device without display: -40 ... 60 °C										
Permissible temperatures <sup>6</sup>	without display: medium: -40 ... 125 °C environment: -40 ... 80 °C storage: -40 ... 80 °C with display: medium: -40 ... 125 °C environment: -20 ... 70 °C storage: -30 ... 80 °C										
<sup>5</sup> an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions											
<sup>6</sup> min. temperature of the medium for devices with inch thread and seals of FKM / NBR: -25 °C; for vacuum ranges and absolute pressure the max. medium temperature is 70 °C; max. temperature of the medium for nominal pressure gauge $> 0$ bar: 150 °C for 30 minutes with a max. environmental temperature of 50 °C (without cooling element); with optional cooling element its maximum permissible temperature is valid											
Electrical protection											
Short-circuit protection	permanent										
Reverse polarity protection	no damage, but also no function										
Electromagnetic compatibility	emission and immunity according to EN 61326										
Mechanical stability											
Vibration	5 g RMS (20 ... 2000 Hz)										
Shock	100 g / 11 ms										
Materials											
Pressure port	stainless steel 1.4571 (316Ti)										
Housing	aluminium die cast, powder-coated or stainless steel 1.4301 (304)										
Cable gland	brass, nickel plated										
Viewing glass	laminated safety glass										
Seals (media wetted)	thread: $P_N \leq 35$ bar: FKM / EPDM $P_N > 35$ bar: NBR others on request option: welded version for pressure ports according to EN 837 with $P_N$ between 1 and 170 bar DRD and flange: none, not included in the scope of delivery										
Diaphragm	Standard: stainless steel 1.4435 (316 L) options for process connections: Hastelloy <sup>®</sup> C-276 (2.4819), Tantal (possible from 1 bar)										
Media wetted parts	pressure port, seals, diaphragm										
Filling fluids	standard: silicon oil options for process connections: food compatible oil (with FDA approval); Halocarbon and others on request										

Explosion protection (approval AX12-XMP i)	
Standard: intrinsically safe version	aluminium die cast case: zone 0: II 1 G EEx ia IIB T4 stainless steel field housing: zone 0: II 1 G EEx ia IIC T4
Option: explosion proof housing	in preparation
Safety technical maximum values	$U_i = 28\text{ V}$ , $I_i = 93\text{ mA}$ , $P_i = 660\text{ mW}$
Permissible temperatures for environment	in zone 0: -20 ... 60 °C with patm 0.8 bar up to 1.1 bar in zone 1: -20 ... 70 °C
Connecting cables (by factory)	capacitance: signal line/shield also signal line/signal line: 160 pF/m inductance: signal line/shield also signal line/signal line: 1 µH/m
Miscellaneous	
Display (optionally)	LC-display, visible range 32.5 x 22.5 mm; 5-digit 7-segment main display, digit height 8 mm, range of indication ±9999; 8-digit 14-segment additional display, digit height 5 mm; 52-segement bargraph; accuracy 0.1% ± 1 digit
Ingress protection	IP 67
Installation position	any (standard calibration in a vertical position with the pressure port connection down; differing installation position have to be specified in the order)
Weight	min. 400 g (depending on housing and mechanical connection)
Operational life	> 100 x 10 <sup>6</sup> pressure cycles

### Wiring diagram

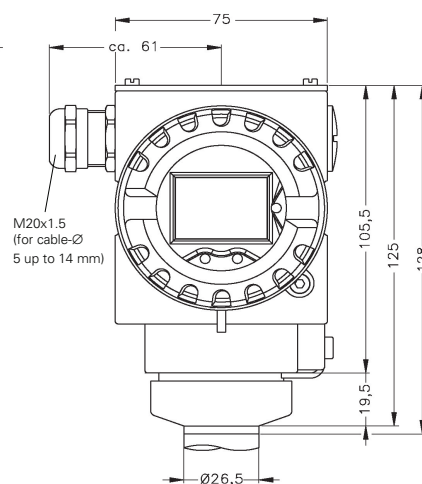
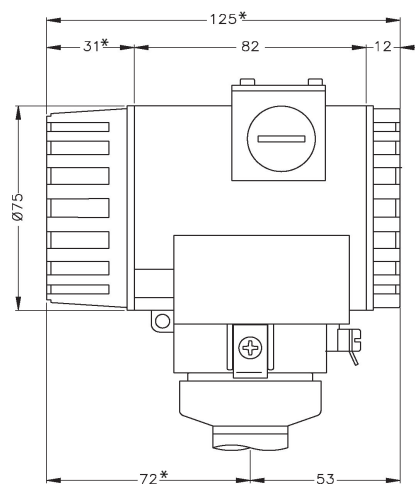


### Pin configuration

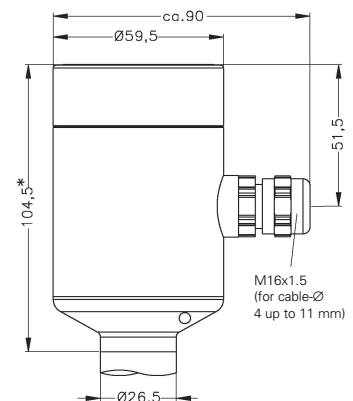
Electrical connections	aluminium die cast case: terminal clamps (clamp section: 2.5 mm <sup>2</sup> )	stainless steel field housing: terminal clamps (clamp section: 1.5 mm <sup>2</sup> )
Supply +	IN+	IN+
Supply -	IN-	IN-
Test	Test	-
Ground	⊥	⊥

### Housing designs <sup>7</sup> (dimensions in mm)

#### aluminium die cast case



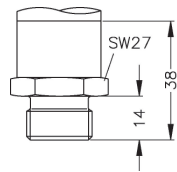
#### stainless steel field housing



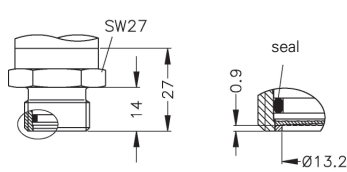
\* without display and operating module marked dimensions decrease by 19 mm (with aluminium die cast case) or by 23.5 (with stainless steel field housing)

<sup>7</sup> aluminium die cast case is horizontally rotatable as standard

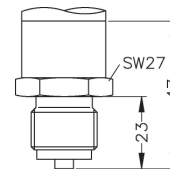
### Standard pressure ports (dimensions in mm)



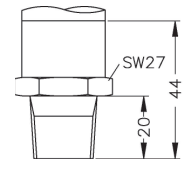
G1/2" DIN 3852



G1/2" flush (DIN 3852)<sup>8</sup>



G1/2" EN 837  
M20x1.5



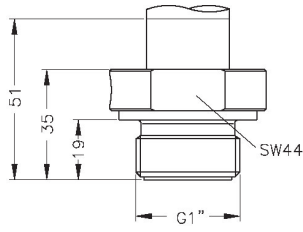
1/2" NPT

⇒ with pressure ranges > 40 bar the length increases by 6 mm

<sup>8</sup> not possible for vacuum and nominal pressure ranges > 35 bar

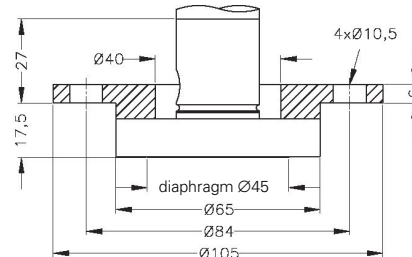
### Process connections up to 35 bar (dimensions in mm)

#### Inch thread (DIN 3852)

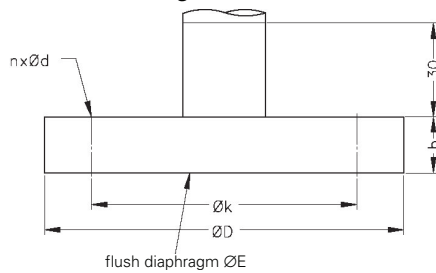


G1" flush

#### DRD<sup>9</sup>

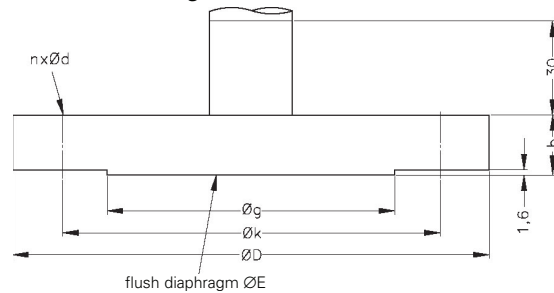


#### Flange<sup>10</sup> (DIN 2501)



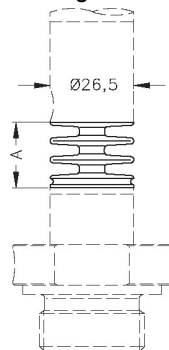
dimensions in mm			
size	DN25/PN40	DN50/PN40	DN80/PN16
D	115	165	200
E	30	89	89
k	85	125	160
b	18	20	20
n	4	4	8
d	14	18	18

#### Flange<sup>10</sup> (ANSI B16.5)



dimensions in mm		
size	2"/150 lbs	3"/150 lbs
D	152.4	190.5
E	86	89
g	91.9	127
k	120.7	152.4
b	19.1	23.9
n	4	4
d	19.1	19.1

#### Cooling element



temperature range	150° C	300° C
size A	22	34
number of cooling fins	2	3

<sup>9</sup> mounting flange is included in the delivery (already pre-assembled)

<sup>10</sup> DN80/PN16, 2"/150 lbs and 3"/150 lbs only possible for nominal pressure ranges  $P_N \leq 7$  bar

HART<sup>®</sup> is a registered trade mark of HART Communication Foundation; Hastelloy<sup>®</sup> is a brand name of Haynes International Inc. Windows<sup>®</sup> is a registered trade mark of Microsoft Corporation

This data sheet contains product specification, properties are not guaranteed. Subject to change without notice.

