Introduction

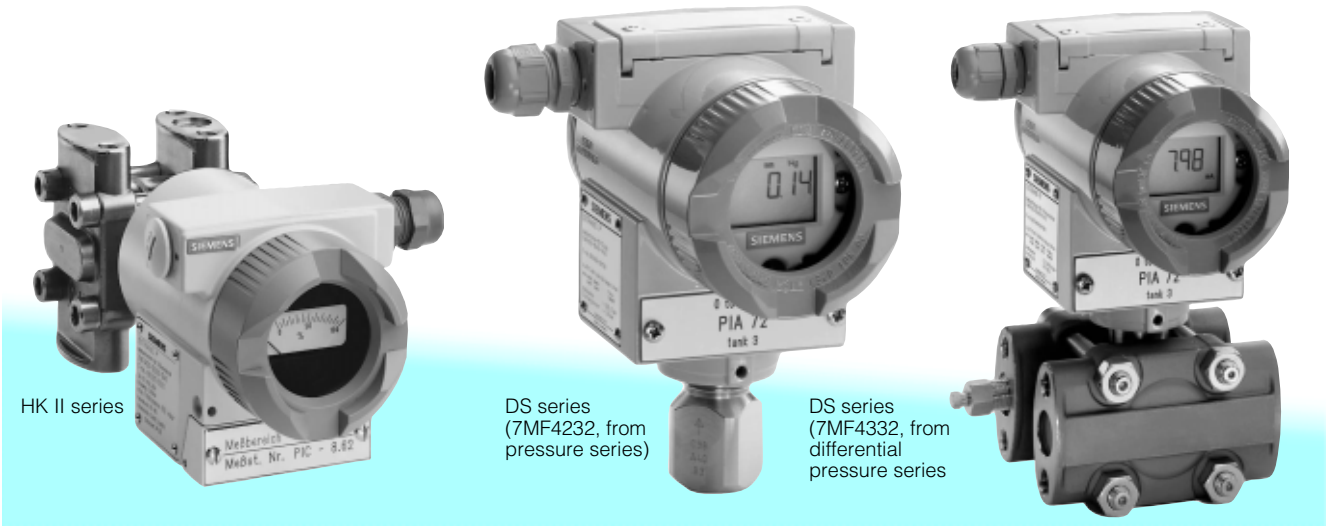


Fig. 1/8 SITRANS P transmitters for absolute pressure with built-in analog indicator or digital display

Application

The transmitter measures the absolute pressure of corrosive and non-corrosive gases, vapors and liquids. Different spans are possible depending on the version.

The output signal is a load-independent direct current of 4 to 20 mA linearly proportional to the input pressure, or a digital bus signal. Transmitters conforming to the type of protection "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1). The conformity certificate corresponds to the European standard (CENELEC), the American standard (FM) or the Canadian standard (CSA).

The transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

Adjustable spans

Series	Span in mbar			
	8.3	25 to		30,000
HK				
DS *)				
DS (PA)	Measuring cells from 250 mbar to 30 bar			

*) 160-bar measuring cell with limitations according to Ordering data page (7MF4332)

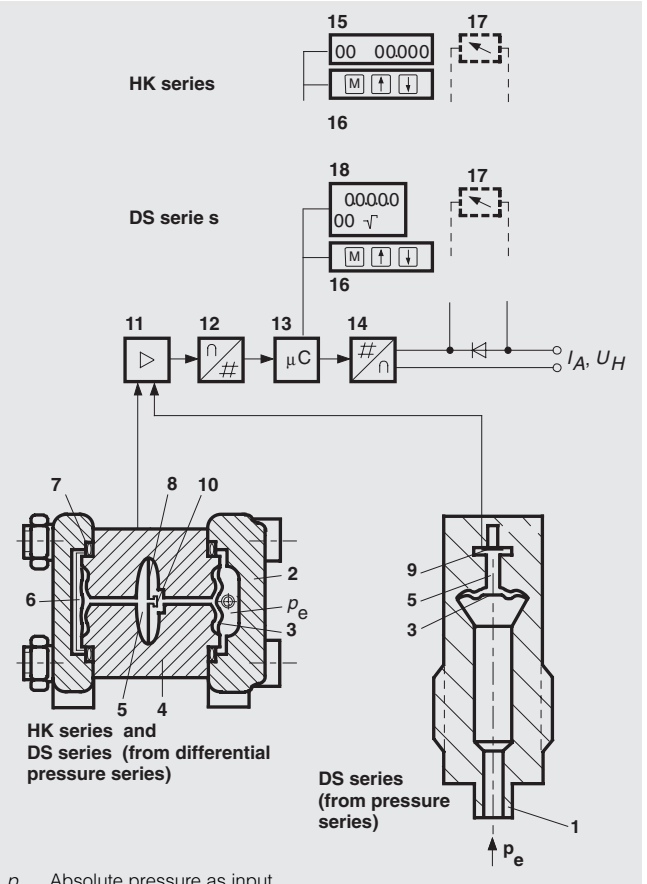
Process pressure limits

Span	Upper process pressure limit DS (7MF4232)	HK and DS (7MF4332)
Up to 250 mbar	6 bar	32 bar
Up to 1,300 mbar	10 bar	32 bar
Up to 5,000 mbar	30 bar	32 bar
Up to 30,000 mbar	100 bar	160 bar

Types of protection and conformity certificates

Series	Type of protection		Conformity certificate	
	Intrinsic safety	Explosion-proof	CENELEC	FM/CSA
HK	●		●	
DS	●	●	●	●
DS (PA)	●	●	●	o

● Exists o In planning



p_e	Absolute pressure as input variable	10	Silicon pressure sensor
I_A	Output signal	11	Instrument amplifier
U_H	Power supply	12	Analog-to-digital converter
1	Process connection	13	Microcontroller
2	Process flange	14	Digital-to-analog converter or PROFIBUS-PA interface
3	Seal diaphragm	15	Digital display for parameterization
4	Body of measuring cell	16	Keys for parameterization
5	Filling liquid	17	Analog indicator (option)
6	Reference vacuum	18	Digital display for parameterization and measured value
7	O-ring		
8	Center diaphragm		
9	Silicon abs. pressure sensor		

Fig. 1/9 Functional diagram

Mode of operation

The absolute pressure is applied via the seal diaphragm (3, Fig. 1/9) and the filling liquid (5) to the silicon pressure sensor (10) or the silicon absolute pressure sensor (9). The pressure difference between the input pressure (p_e) and the reference vacuum (6) on the low-pressure side of the measuring cells flexes the diaphragm.

Note: Without reference vacuum for DS series from pressure series (7MF4232) since a silicon absolute pressure sensor is fitted.

The resistance of four piezo-resistors fitted in the diaphragm in a bridge circuit thus changes.

This change in resistance results in a bridge output voltage proportional to the input pressure. This voltage is amplified (11) and converted into a digital signal by means of an analog-to-digital converter (12). This signal is evaluated by a microcontroller (13), and its linearity and temperature response corrected. The signal processed in this manner is converted in a digital-to-analog converter (14) into an output current of 4 to 20 mA, or via the PROFIBUS-PA interface into a digital bus signal.

The data specific to the measuring cell as well as the data for parameterization of the transmitter are stored in a non-volatile EEPROM.

Parameterization

Depending on the version, there are different possibilities for parameterizing the transmitter and for setting or scanning the parameters.

Parameterization using the input keys (local operation)

The input keys can be used to simply set the most important parameters without any additional equipment.

Parameterization using HART communicator

When parameterizing with the HART communicator, the connection is made directly to the two-wire system (Fig. 1/10). When parameterizing with a laptop or PC, the connection is made via a HART modem (Fig. 1/11).

The signals required for communication according to the HART protocol 5.x are superimposed on the output current according to frequency shift keying (FSK).

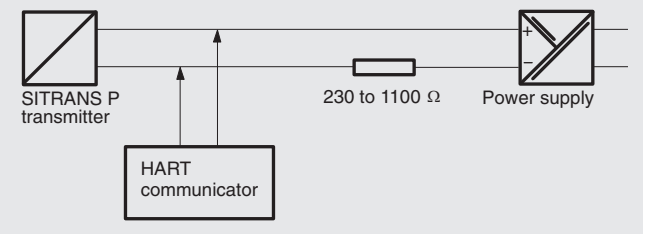


Fig. 1/10 Communication between HART communicator and transmitter

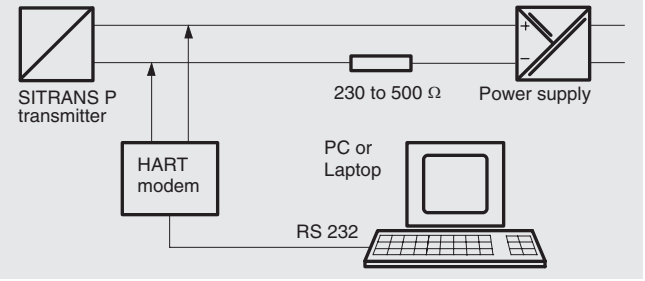


Fig. 1/11 Communication between PC or laptop and transmitter

Elements for parameterization of transmitter

Parameterization using	HK	DS
3 external keys	●	●
Built-in digital display	●	●
Laptop, PC		●
HART communicator		●
PROFIBUS-PA interface (not 7MF4232)		●

Adjustable parameters which can also be displayed

	HK	DS
Start-of-scale and full-scale values with application of a pressure	●	●
Start-of-scale and full-scale values without application of a pressure ("Blind setting")	●	●
Damping	●	●
Current transmitter function	●	●
Zero adjustment	●	●
Output signal in event of fault	●	●
Disabling of keys for operation	●	●
Measured-value display in % or mA	●	●
Measured-value display of physical unit		●
Measuring-point number (abbreviation, max. 16 characters)		●
Measuring-point description (max. 27 characters)		●
Message		●
Range limits		●
Transmitter version (e.g. material)		●
Slave pointer (only PROFIBUS-PA)		●
Further displays and parameters		●

● Possible

Parameterization via PROFIBUS-PA interface

SITRANS P transmitters with a PROFIBUS-PA interface (Fig. 1/12) are parameterized, starting from a master, using signals transmitted via PROFIBUS-DP and converted by a SIMATIC DP/PA coupler with power supply into a signal for PROFIBUS-PA. A bus terminator is required for cable lengths > 2 m.

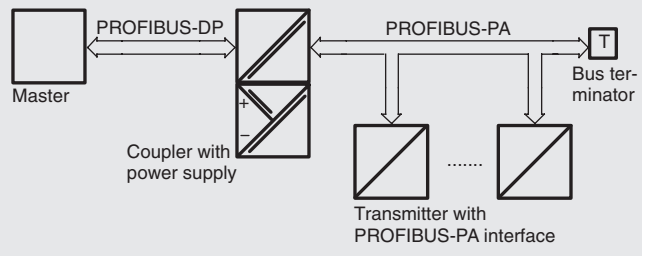


Fig. 1/12 Communication via PROFIBUS-PA interface

Technical data

Technical data

	HK 7MF4320	DS 7MF4232 (from pressure transmitter series)	DS 7MF4332 (from differential pressure transmitter series)	DS (PROFIBUS-PA) 7MF4332
Application	See page 1/16			
Mode of operation	See page 1/17			
Measuring principle	Piezo-resistive			
Input				
Measured variable	Absolute pressure			
Measuring range				
• Span (continuously adjustable)	25 mbar to 30 bar	8.3 mbar to 30 bar	8.3 mbar to 30 bar	Measuring cells from 250 mbar to 30 bar
• Lower measuring limit				
- Measuring cell with silicone oil filling	0 mbar			
- Measuring cell with inert filling liquid				
For process temp. -20 °C < $\vartheta \leq$ 60 °C	–	30 mbar	–	–
For process temp. +60 °C < $\vartheta \leq$ 100 °C	–	30 mbar + 20 mbar · (ϑ - 60)	–	–
• Upper measuring limit	100 % of max. span	100 % of max. span	100 % of max. span	–
• Start-of-scale (continuously adjustable)	Between the measuring limits	Between the measuring limits	Between the measuring limits	–
Output				
Output signal	4 to 20 mA	4 to 20 mA	4 to 20 mA	Digital bus signal
• Lower limit	3.84 mA	3.84 mA	3.84 mA	Digital status signal
• Upper limit	22 mA	20.5 or 22 mA	20.5 or 22 mA	Digital status signal
• Electric damping				
- Adjustable time constant	0 to 100 s			
• Current transmitter	Adjustable to 3.6, 4.0, 12.0, 20.0 or 22.8 mA	Adjustable from 3.6 to 22.8 mA	Adjustable from 3.6 to 22.8 mA	–
Signal on alarm	3.6 or 22.8 mA	3.6 or 22.8 mA	3.6 or 22.8 mA	Digital status signal
Load				
• Without HART communication	$R_B \leq (U_H - 11\ V)/0.023\ A$ in Ω, U_H: power supply in V	$R_B \leq (U_H - 11\ V)/0.023\ A$ in Ω, U_H: power supply in V	$R_B \leq (U_H - 11\ V)/0.023\ A$ in Ω, U_H: power supply in V	–
• With HART communication	–	R_B = 230 to 500/1100 Ω	R_B = 230 to 500/1100 Ω	–
Characteristic	Linear			
Accuracy				
Reference conditions	Increasing characteristic, start-of-scale 0 bar, stainless steel seal diaphragm, silicone oil filling and limit point setting. r = max. span/set span			
Error in measurement (including hysteresis and repeatability)	≤ 0.1 %	≤ 0.1 % at r ≤ 10 ≤ 0.2 % at 10 < r ≤ 30	≤ 0.1 % at r ≤ 10 0.2 at 10 < r ≤ 30	≤ 0.1 %
• Repeatability	Included in error in measurement			
• Hysteresis	Included in error in measurement			
Response time (T_{63}, without electric damping)	Approx. 0.2 s			
Long-term drift	≤ 0.2 % / 12 months with max. span	≤ 0.2 % / 12 months with max. span	≤ 0.2 % / 12 months with max. span	≤ 0.2 % / 12 months
Ambient temperature effect				
• At -10 to +60 °C	≤ (0.1 · r + 0.2) %	≤ (0.1 · r + 0.2) %	≤ (0.1 · r + 0.2) %	≤ 0.3 %
• At -40 to -10 °C and +60 to +85 °C	≤ (0.1 · r + 0.15) % / 10 K	≤ (0.1 · r + 0.15) % / 10 K	≤ (0.1 · r + 0.15) % / 10 K	≤ 0.25 %/ 10 K
Influence of mounting position	≤ 0.7 mbar per 10° inclination	≤ 0.05 mbar per 10° inclination	≤ 0.7 mbar per 10° inclination	≤ 0.7 mbar per 10° inclination
Influence of power supply	≤ 0.005 % per 1 V change in voltage			
Rated operating conditions				
Installation conditions				
• Installation instructions	Any mounting position	Process connection pointing vertically downwards	Any mounting position	Any mounting position
Ambient conditions				
• Ambient temperature (observe temperature class in potentially explosive atmospheres)				
- Measuring cell with silicone oil filling	-40 to 85 °C			
- Measuring cell with inert filling liquid	–	-20 to +85 °C	-	–
- - Digital display	–	-20 to +85 °C	-20 to +85 °C	-20 to +85 °C

Technical data

	HK 7MF4320	DS 7MF4232 (from pressure transmitter series)	DS 7MF4332 (from differential pressure transmitter series)	DS (PROFIBUS-PA) 7MF4332
Ambient conditions (continued)				
• Ambient temperature limits	See ambient temperature			
• Storage temperature	-50 to +85 °C			
• Climate class				
- Condensation	Permissible			
• Degree of protection (to EN 60 529)	IP 65			
• Electromagnetic compatibility				
- Emitted interference	To EN 50 081-1			
- Noise immunity	To EN 50 082-2 and NAMUR NE 21			
Medium conditions				
• Process temperature				
- Measuring cell with silicone oil filling	-40 to +100 °C (-40 to +85 °C for 30-bar cell)	-40 to +100 °C	-40 to +100 °C (-40 to +85 °C for 30-bar cell)	-40 to +100 °C (-40 to +85 °C for 30-bar cell)
- Measuring cell with inert filling liquid	–	-20 to +100 °C	–	–
• Process temperature limits	See process temperature			
• Process pressure limits	See page 1/16			
Design				
Weight (without options)	Approx. 4.5 kg	Approx. 1.5 kg	Approx. 4.5 kg	Approx. 4.7 kg
Dimensions	See Fig. 1/13	See Fig. 1/14	See Fig. 1/15	See Fig. 1/15
Material				
• Wetted parts materials				
- Connection shank	–	Stainless steel, mat. No. 1.4401 or Hastelloy C4, mat. No. 2.4610	–	–
- Oval flange	–	Stainless steel, mat. No. 1.4401	–	–
- Seal diaphragm	Stainless steel, mat. No. 1.4404, Hastelloy C276, mat. No. 2.4819, tantalum, Monel, mat. No. 2.4360 or gold	Stainless steel, mat. No. 1.4404, Hastelloy C276, mat. No. 2.4819	Stainless steel, mat. No. 1.4404, Hastelloy C276, mat. No. 2.4819, tantalum, Monel, mat. No. 2.4360 or gold	Stainless steel, mat. No. 1.4404, Hastelloy C276, mat. No. 2.4819, tantalum, Monel, mat. No. 2.4360 or gold
- Process flanges and sealing screw	Stainless steel, mat. No. 1.4408, Hastelloy C4, mat. No. 2.4610, or Monel, mat. No. 2.4360	–	Stainless steel, mat. No. 1.4408, Hastelloy C4, mat. No. 2.4610, or Monel, mat. No. 2.4360	Stainless steel, mat. No. 1.4408, Hastelloy C4, mat. No. 2.4610, or Monel, mat. No. 2.4360
- Measuring cell parts	Stainless steel, mat. No. 1.4401			
- O-ring	FPM, PTFE, FEP, FFPM or NBR	–	FPM, PTFE, FEP, FFPM or NBR	FPM, PTFE, FEP, FFPM or NBR
• Non-wetted parts materials				
- Electronics housing	Die-cast aluminium, low in copper, GD-ALSi 12, polyester-based lacquer, stainless steel rating plate	Die-cast aluminium, low in copper, GD-ALSi 12, or stainless steel precision casting, polyester-based lacquer, stainless steel rating plate	Die-cast aluminium, low in copper, GD-ALSi 12, or stainless steel precision casting, polyester-based lacquer, stainless steel rating plate	Die-cast aluminium, low in copper, GD-ALSi 12, or stainless steel precision casting, polyester-based lacquer, stainless steel rating plate
- Process flange screws	Steel, galvanized and yellow-passivized, or stainless steel	–	Steel, galvanized and yellow-passivized, or stainless steel	Steel, galvanized and yellow-passivized, or stainless steel
- Mounting bracket (option)	Steel, galvanized and yellow-passivized, or stainless steel			
Measuring cell filling	Silicone oil	Silicone oil or inert filling liquid	Silicone oil	Silicone oil
Process connection	Female thread ¼ - 18 NPT and flange connection to DIN 19 213 with mounting thread M10 or $^{7}/_{16}$ - 20 UNF	Female thread ½ - 14 NPT or connection shank G½A to DIN 16 288 or oval flange	Female thread ¼ - 18 NPT and flange connection to DIN 19 213 with mounting thread M10 or $^{7}/_{16}$ - 20 UNF	Female thread ¼ - 18 NPT and flange connection to DIN 19 213 with mounting thread M10 or $^{7}/_{16}$ - 20 UNF
Electrical connection	Screw terminals, cable inlet via screwed gland Pg 13.5 (adapter), M20 x 1.5 or ½ - 14 NPT, or Han 7D/Han 8U plug	Screw terminals, cable inlet via screwed gland Pg 13.5 (adapter), M20 x 1.5 or ½ - 14 NPT, or Han 7D/Han 8U plug	Screw terminals, cable inlet via screwed gland Pg 13.5 (adapter), M20 x 1.5 or ½ - 14 NPT, or Han 7D/Han 8U plug	Screw terminals, cable inlet via screwed gland M20 x 1.5 or ½ - 14 NPT

Technical data

Technical data

	HK 7MF4320	DS 7MF4232 (from pressure transmitter series)	DS 7MF4332 (from differential pressure transmitter series)	DS (PROFIBUS-PA) 7MF4332
Displays and controls				
Input keys		3 for local programming directly on transmitter		
Analog indicator (option)	Linear scale 0 to 100 % or customer-specific scale	Linear scale 0 to 100 % or customer-specific scale	Linear scale 0 to 100 % or customer-specific scale	–
Digital display	–	Yes	Yes	Yes
Power supply				
Terminal voltage on transmitter	DC 11 to 45 V DC 11 to 30 V in intrinsically-safe mode	DC 11 to 45 V DC 11 to 30 V in intrinsically-safe mode	DC 11 to 45 V DC 11 to 30 V in intrinsically-safe mode	Provided via bus DC 9 to 32 V DC 9 to 23 V in intrinsically-safe mode
Ripple	–	$U_{pp} \leq 0.2$ V (47 to 125 Hz)	$U_{pp} \leq 0.2$ V (47 to 125 Hz)	–
Noise	–	$U_{rms} \leq 1.2$ mV (0.5 to 10 kHz)	$U_{rms} \leq 1.2$ mV (0.5 to 10 kHz)	–
Certificates and approvals				
CENELEC		To DIN EN 50 014, DIN 50 018 and DIN EN 50 020		
• Intrinsic safety	EEx ia IIC T4 or T5 or T6	EEx ia IIC T4 or T5 or T6	EEx ia IIC T4 or T5 or T6	EEx ib IIC T4
- Conformity certificate	PTB No. Ex-92.C.2146	PTB No. Ex-94.C.2090	PTB No. Ex-94.C.2090	PTB No. Ex-97.D.2178
- Max. ambient temperature	+85 °C temp. class T4 +75 °C temp. class T5 +60 °C temp. class T6	+85 °C temp. class T4 +75 °C temp. class T5 +60 °C temp. class T6	+85 °C temp. class T4 +75 °C temp. class T5 +60 °C temp. class T6	+80 °C temp. class T4
- Connection to certified intrinsically-safe circuits with maximum values	U_o = 30 V I_k = 100 mA P = 750 mW	U_o = 30 V I_k = 100 mA P = 750 mW	U_o = 30 V I_k = 100 mA P = 750 mW	U_o = 17.5 V I_k = 128 mA P = 1.8 W
- Effective internal inductance	$L_i \leq 0.6$ mH	$L_i \leq 0.6$ mH	$L_i \leq 0.6$ mH	$L_i \leq 7.2$ µH
- Effective internal capacitance	$C_i \leq 6$ nF	$C_i \leq 8$ nF	$C_i \leq 8$ nF	$C_i \leq 0.6$ nF
• Explosion-proof	–	EEx d IIC T5 and T6	EEx d IIC T5 and T6	EEx d IIC T5 and T6
- Conformity certificate	–	PTB No. Ex-94.C.1021	PTB No. Ex-94.C.1021	PTB No. Ex-94.C.1021
- Max. ambient temperature	–	+85 °C temp. class T5 +75 °C temp. class T6	+85 °C temp. class T5 +75 °C temp. class T6	+85 °C temp. class T5 +75 °C temp. class T6
TÜV	To DIN VDE 0165/02.91, Section 6.3	–	To DIN VDE 0165/02.91, Section 6.3	To DIN VDE 0165/02.91, Section 6.3
• Ex-approved zone 2n	Ex n V II T4	In planning	Ex n V II T4	Ex n V II T4
- Registration number	08/220/1092/6	–	08/220/1092/6	TÜV 97 ATEX 1247
FMRC (Factory Mutual Research Corp.)				
• Intrinsic safety and explosion-proof	–	–	2Y9A7.AX (3610, 3615)	–
• Explosion-proof	–	–	For class I, division 1, groups A, B, C and D	For class I, division 1, groups A, B, C and D
• Dust-ignition proof	–	–	For class II, division 1, groups E, F and G, indoor and outdoor (NEMA 4X) hazardous (classified) locations	For class II, division 1, groups E, F and G, indoor and outdoor (NEMA 4X) hazardous (classified) locations
• Intrinsically safe	–	–	With entity, for use in class I, division 1, groups A, B, C, D, E, F and G, indoor and outdoor (NEMA 4X) hazardous (classified) locations	–
• Entity parameters	–	–	V_{max} = 30 V I_{max} = 100 mA L_i = 0.6 mH C_i = 8 nF	–
CSA (Certificate of Compliance)	–	–	No. LR 104225-1 Class 2258 02 and Class 2258 03	–

Technical data

	DS 7MF4232, 7MF4332	DS with PROFIBUS-PA 7MF4332
Communication Load when connecting a		
• HART communicator	230 to 1100 Ω	–
• HART modem	230 to 500 Ω	–
Cable	2-wire screened: ≤ 3.0 km Multi-core screened: ≤ 1.5 km	–
Protocol	HART, version 5.x	Layers 1 and 2 according to PROFIBUS-PA Intrinsically-safe to IEC 1158-2 Slave function Layer 7 (protocol layer) according to PROFI-BUS-DP functions (all data acyclic, measured value and status cyclic in addition)
PC/laptop requirements	IBM-compatible, main memory > 32 Mbyte, hard disk > 70 Mbyte, RS 232 interface, VGA graphics	–
Software for PC/laptop	WINDOWS 95/NT 4.0 and SIMATIC PDM	–
Device and remote control functions	–	More than 100 parameters according to PROFI-BUS-PA profile
Device profile taking into account previous HART functions for	–	Measuring-point designation Device organization Device type Device materials Hardware and firmware versions Sensor data Adjustment points Type and materials of process connection Sensor temperature Limit monitoring Slave pointer functions Alarm signalling Status information Filter time Measured value in selectable dimension
Device address	–	1 when delivered
Current consumption of device	–	Approx. 18 mA
Electronic current limiting	–	$I_{max} \leq 27$ mA in event of fault, output twice
Measured-value resolution	–	3×10^{-5} referred to full-scale value

Ordering data
7MF4320, HK series

Ordering data — Order No.

SITRANS P transmitter for absolute pressure, HK series

Two-wire system, Instruction Manual (in same language as rating plate; see "Further designs"), 1 sealing screw (same material as process flange), measuring cell filling: silicone oil, measuring cell cleaning: normal

7MF4320- **1** ☐☐☐☐ **- 1** ☐☐☐

Span

25	to	250 mbar
130	to	1,300 mbar
500	to	5,000 mbar
3,000	to	30,000 mbar

→ D
→ F
→ G
→ H

Wetted parts materials

(Process flanges made of stainless steel)

Seal diaphragm	Parts of meas. cell	
Stainless steel	Stainless steel	→ A
Hastelloy	Stainless steel	→ B
Hastelloy	Hastelloy	→ C
Tantalum	Tantalum	→ E
Monel	Monel	→ H
Gold	Gold	→ L
Version for remote seal[1])		→ Y

→ 2

Process connection

Female thread ¼ - 18 NPT and flange connection to DIN 19 213

- With mounting thread M10 → 0
- With mounting thread $^{7}/_{16}$ - 20 UNF → 2

Non-wetted parts materials

Process flange screws	Electronics housing	
Steel	Die-cast aluminium	→ 0
Stainless steel	Die-cast aluminium	→ 2

Explosion protection

- Without explosion protection → A
- With explosion protection (CENELEC) Type of protection: "Intrinsic safety" (EEx ia) → B
- Use in zone 2n (TÜV) → E

Electrical connection/cable inlet

- Screwed gland Pg 13.5 (adapter) → A
- Screwed gland M20 x 1.5 → B
- Screwed gland ½ -14 NPT → C
- Han 7D plug → D

Indicator

- Without → 1
- Housing cover with analog indicator
  - Scale 0 to 100 %, linear divisions → 3
  - Scale as specified (Order code Y20 required) → 5

Example for ordering
Item line:7MF4320-1HA00-1AA5-Z
B line:A01 + Y01 + Y20
C line:Y01: 0 to 20 bar
C line:Y20: 0 to 20 bar

Ordering data — Order code

Further designs

Please add **"Z"** to Order No. and specify Order code(s).

Transmitter with mounting bracket made of	
• Steel	**A01**
• Stainless steel	**A02**
Instead of FPM (Viton), process flange O-ring made of:	
• PTFE (Teflon)	**A20**
• FEP (with silicone core, approved for food)	**A21**
• FFPM (Kalrez)	**A22**
• NBR (Buna N)	**A23**
Han 7D plug (metal, gray)	**A30**
Han 8U plug (instead of Han 7D)	**A31**
Sealing screw ¼ - 18 NPT with valve (in material of process flange)	**A40**
Rating plate inscription (instead of German)	
• English	**B11**
• French	**B12**
• Spanish	**B13**
• Italian	**B14**
Manufacturer's test certificate M to DIN 55 350, Part 18 and to ISO 9001	**C11**
Acceptance test certificate B to DIN 50 049/EN 10 204-3.1B	**C12**
Factory certificate to DIN 50 049-2.2/EN 10 204-2.2	**C14**
Acid gas version to NACE (only together with seal diaphragm made of Hastelloy and process flange screws made of stainless steel)	**D07**
Use	
• In zone 10/11 (basic unit EEx ia)	**E01**
• In zone 0 (basic unit EEx ia)	**E02**
Process flange made of:	
• Hastelloy	**K01**
• Monel	**K02**
See page 1/54 for four-wire system	

Additional information

Please add **"Z"** to Order No. and specify Order code(s) and plain text.

Measuring range to be set, specify in plain text:	
Y01: ... to ... mbar, bar, kPa, MPa	**Y01**
Measuring-point text (max. 16 characters), specify in plain text:	
Y15:	**Y15**
Measuring-point number/identification (max. 27 characters), specify in plain text:	
Y16:	**Y16**
Customer-specific scale for analog indicator, specify in plain text:	
Y20: ... to ... mbar, bar, kPa, MPa	**Y20**

Only the setting for "Y01" can be made in the factory.

Power supply units: see page 2/50.

[1]) Version 7MF4320-1DY.. only up to max. span 200 mbar.

7MF4232, DS series
(from pressure transmitter series)

Ordering data — Order No.

SITRANS P transmitter for absolute pressure, DS series

Two-wire system, Smart version; Instruction Manual (in same language as rating plate; see "Further designs")

7MF4232- ■■■■■ - 1 ■■■

Measuring cell filling	Meas. cell cleaning	
Silicone oil	Normal	1
Inert liquid	Grease-free	3

Span

8.3	to	250 mbar	D
43	to	1,300 mbar	F
160	to	5,000 mbar	G
1,000	to	30,000 mbar	H

Wetted parts materials

Seal diaphragm	Connection shank	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Version for remote seal [3])		Y 0

Process connection

• Connection shank G½A	0
• Female thread ½ - 14 NPT	1
• Oval flange and connection shank made of stainless steel - Mounting thread $^{7}/_{16}$ - 20 UNF - Mounting thread M10	2 3

Non-wetted parts materials

• Housing made of die-cast aluminium	0
• Housing: stainl. steel precision casting	3

Explosion protection

• Without explosion protection	A
• With explosion protection (CENELEC) Type of protection: - "Intrinsic safety" (EEx ia) - "Explosion-proof" (EEx d)[1]) - "Intrinsic safety + explosion-proof" (EEx ia and EEx d) (in planning)[1])	 B D P
• Use in zone 2n (TÜV) (in planning)	E
• With explosion protection (FM + CSA) Intrinsic safety and explosion-proof (is + xp) (in planning)[1])	N C

Electrical connection/cable inlet

• Screwed gland Pg 13.5 (adapter) [2])	A
• Screwed gland M20 x 1.5	B
• Screwed gland ½ -14 NPT	C
• Han 7D plug [2])	D

Indicator

• Basic version with housing cover without window (built-in digital display hidden)	1
• Housing cover with analog indicator - Scale 0 to 100 %, linear divisions - Scale as specified (Order code Y20 required)	3 5
• Housing cover with window (built-in digital display visible)	6

Ordering data — Order code

Further designs

Please add **"Z"** to Order No. and specify Order code(s).

Transm. with mount. bracket made of	
• Steel	**A01**
• Stainless steel	**A02**
Han 7D plug (metal, gray)	**A30**
Han 8U plug (instead of Han 7D)	**A31**
Rating plate inscription (instead of German)	
• English	**B11**
• French	**B12**
• Spanish	**B13**
• Italian	**B14**
Manufacturer's test certificate M to DIN 55 350, Part 18 and to ISO 9001	**C11**
Acceptance test certificate B to DIN 50 049/EN 10 204-3.1B	**C12**
Factory certificate to DIN 50 049-2.2/EN 10 204-2.2	**C14**
Setting of upper limit of output signal to 22.0 mA	**D05**
Acid gas version to NACE (only together with seal diaphragm made of Hastelloy and process flange screws made of stainless steel)	**D07**
IP 68 (not together with Han 7D plug or screwed gland Pg 13.5)	**D12**
Use in zone 0 (basic device EEx ia)	**E02**
Oxygen application (max. 190 bar with oxygen measurement and inert filling liquid)	**E10**
See page 1/54 for four-wire system	

Additional information

Please add **"Z"** to Order No. and specify Order code(s) and plain text.

Measuring range to be set, specify in plain text: **Y01: ... to ... mbar, bar, kPa, MPa**	**Y01**
Measuring-point number/identification (max. 16 characters), specify in plain text: **Y15: .....**	**Y15**
Measuring-point text (max. 27 characters), specify in plain text: **Y16: .....**	**Y16**
Customer-specific scale for analog indicator, specify in plain text: **Y20: ... to ... mbar, bar, kPa, MPa**	**Y20**

Only the settings for "Y01" and "D05" can be made in the factory.

See page 1/22 for **example for ordering**.
Power supply units: see page 2/50.

[1]) Without cable gland.
[2]) Not together with type of protection "Explosion-proof".
[3]) Version 7MF4232-■DY.. only up to max. span 200 mbar.

7MF4332, DS series
(from differential pressure transmitter series)

Ordering data — Order No.

SITRANS P transmitter for absolute pressure, DS series

Two-wire system, Smart version; Instruction Manual (in same language as rating plate; see "Further designs"), 1 sealing screw (same material as process flange), measuring cell filling: silicone oil, measuring cell cleaning: normal

7MF4332- **1** ■■■■ **- 1** ■■■

Span

	8.3	to	250 mbar
D	43	to	1,300 mbar
F	160	to	5,000 mbar
G	1.0	to	30 bar
H	5.3	to	160 bar
K			

Wetted parts materials

Seal diaphragm	Parts of meas. cell	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Tantalum	Tantalum	E
Monel	Monel	H
Gold[1])	Gold	L
Version for remote seal[3])		Y

Process connection

Female thread ¼ - 18 NPT and flange connection to DIN 19 213

- With sealing screw opposite process connection
  - Mounting thread M10 — 0
  - Mounting thread $^{7}/_{16}$ - 20 UNF — 2
- Sealing screw on side of process flanges
  - Mounting thread M10 — 4 [4])
  - Mounting thread $^{7}/_{16}$ - 20 UNF — 6 [4])

Non-wetted parts materials

Process flange screws	Electronics housing	
Steel	Die-cast aluminium	0
Stainless steel	Die-cast aluminium	2
Stainless steel	Stain. st. prec. cast.	3

Explosion protection

- Without explosion protection — A
- With explosion protection (CENELEC) Type of protection:
  - "Intrinsic safety" (EEx ia) — B
  - "Explosion-proof" (EEx d) [5]) — D
  - "Intrinsic safety and explosion-proof" (EEx ia and EEx d) [5]) — P [4])
- Use in zone 2n (TÜV) — E
- With explosion protection (FM + CSA) Intrinsic safety and explosion-proof (is + xp)[5]) — N [4])

Electrical connection/cable inlet

- Screwed gland Pg 13.5 (adapter) [2]) — A
- Screwed gland M20 x 1.5 — B
- Screwed gland ½ -14 NPT — C
- Han 7D plug [2]) — D

Indicator

- Basic version with housing cover without window (built-in digital display hidden) — 1
- Housing cover with analog indicator
  - Scale 0 to 100 %, linear divisions — 3
  - Scale as specified (Order code Y20 required) — 5
- Housing cover with window (built-in digital display visible) — 6

Ordering data — Order code

Further designs

Please add **"Z"** to Order No. and specify Order code(s).

Transm. with mounting bracket made of	
• Steel	**A01**
• Stainless steel	**A02**
Instead of FPM (Viton), process flange O-ring made of	
• PTFE (Teflon)	**A20**
• FEP (with silicone core, approved for food)	**A21**
• FFPM (Kalrez)	**A22**
• NBR (Buna N)	**A23**
Han 7D plug (metal, gray)	**A30**
Han 8U plug (instead of Han 7D)	**A31**
Sealing screw ¼ - 18 NPT with valve (in material of process flange)	**A40**
Rating plate inscription (instead of German)	
• English	**B11**
• French	**B12**
• Spanish	**B13**
• Italian	**B14**
Manufacturer's test certificate M to DIN 55 350, Part 18 and to ISO 9001	**C11**
Acceptance test certificate B to DIN 50 049/ EN 10 204-3.1B	**C12**
Factory certificate to DIN 50 049-2.2/EN 10 204-2.2	**C14**
Setting of upper limit of output signal to 22 mA	**D05**
Acid gas version to NACE (only together with seal diaphragm made of Hastelloy and process flange screws made of stainless steel)	**D07**
IP 68 (not together with Han 7D, Han 8U or Pg 13.5 plug)	**D12**
Use in zone 0 (basic device EEx ia)	**E02** [4])
Vent on side for gas measurements	**H02** [4])
Process flanges made of:	
• Hastelloy	**K01** [4])
• Monel	**K01** [4])
See page 1/54 for four-wire system	

Additional information

Please add **"Z"** to Order No. and specify Order code(s) and plain text.

Measuring range to be set, specify in plain text: **Y01: ... to ... mbar, bar, kPa, MPa**	**Y01**
Measuring-point number/identification (max. 16 characters), specify in plain text: **Y15: .....**	**Y15**
Measuring-point text (max. 27 characters), specify in plain text: **Y16: .....**	**Y16**
Customer-specific scale for analog indicator, specify in plain text: **Y20: ... to ... mbar, bar, kPa, MPa**	**Y20**

Only the settings for "Y01" and "D05" can be made in the factory.

See page 1/22 for **example for ordering**

Power supply units: see page 2/50.

[1]) Only together with process flange screws made of stainless steel.
[2]) Not together with type of protection "Explosion-proof".
[3]) Version 7MF4332-1DY .. only up to max. span 200 mbar.
[4]) Not for measuring cell 5.3 to 160 bar.
[5]) Without cable gland.

Ordering data — Order No.

SITRANS P transmitter for absolute pressure, DS series with PROFIBUS-PA

Two-wire system, Smart version; Instruction Manual (in same language as rating plate; see "Further designs"), 1 sealing screw (same mat.l as process flange), measuring cell filling: silicone oil, measuring cell cleaning: normal

7MF4332- **1 ■■■■ - 1 ■■■ -Z P01**

Span

Up to 250 mbar	**D**
Up to 1,300 mbar	**F**
Up to 5,000 mbar	**G**
Up to 30,000 mbar	**H**

Wetted parts materials
(Process flanges made of stainless steel)

Seal diaphragm	Parts of meas. cell	
Stainless steel	Stainless steel	**A**
Hastelloy	Stainless steel	**B**
Hastelloy	Hastelloy	**C**
Tantalum	Tantalum	**E**
Monel	Monel	**H**
Gold[1])	Gold	**L**
Version for remote seal[2])		**Y**

Process connection

Female thread ¼ - 18 NPT and flange connection to DIN 19 213

• With sealing screw opposite process connection	
- Mounting thread M10	**0**
- Mounting thread $^{7}/_{16}$ - 20 UNF	**2**
• Sealing screw on side of process flanges	
- Mounting thread M10	**4**
- Mounting thread $^{7}/_{16}$ - 20 UNF	**6**

Non-wetted parts materials

Process flange	Stainl. steel prec. casting screws	
Steel	Die-cast aluminium	**0**
Stainless steel	Die-cast aluminium	**2**
Stainless steel	Stainl. steel prec. casting	**3**

Explosion protection

•• Without explosion protection	**A**
• With explosion protection Type of protection: "Explosion-proof" (EEx d)	**D**
• Use in zone 2n (TÜV)	**E**
• With explosion protection (FM) explosion-proof (xp)	**GC**
• With explosion protection EEx ib	**Q**

Electrical connection/cable inlet

•• Screwed gland M20 x 1.5	**B**
• Screwed gland ½ - 14 NPT	**C**

Indicator

•• Basic version with housing cover without window (built-in digital display hidden)	**1**
• Housing cover with window (built-in digital display visible)	**6**

Ordering data — Order code

Further designs

Please add **"Z"** to Order No. and specify Order code(s).

Transmitter with mounting bracket made of	
• Steel	**A01**
• Stainless steel	**A02**
Instead of FPM (Viton), process flange O-ring made of	**A20**
• PTFE (Teflon)	**A21**
• FEP (with silicone core, approved for food)	**A22**
• FFPM (Kalrez)	**A23**
• NBR (Buna N)	
Sealing screw ¼ - 18 NPT with valve (in material of process flange)	**A40**
Rating plate inscription (instead of German)	
• English	**B11**
Manufacturer's test certificate M to DIN 55 350, Part 18 and to ISO 9001	**C11**
Acceptance test certificate B to DIN 50 049/ EN 10 204-3.1B	**C12**
Factory certificate to DIN 50 049-2.2/EN 10 204-2.2	**C14**
Acid gas version to NACE (only together with seal diaphragm made of Hastelloy and process flange screws made of stainless steel)	**D07**
IP 68	**D12**
Vent on side for gas measurements	**H02**
Process flanges made of:	
• Hastelloy	**K01**
• Monel	**K02**

Additional information

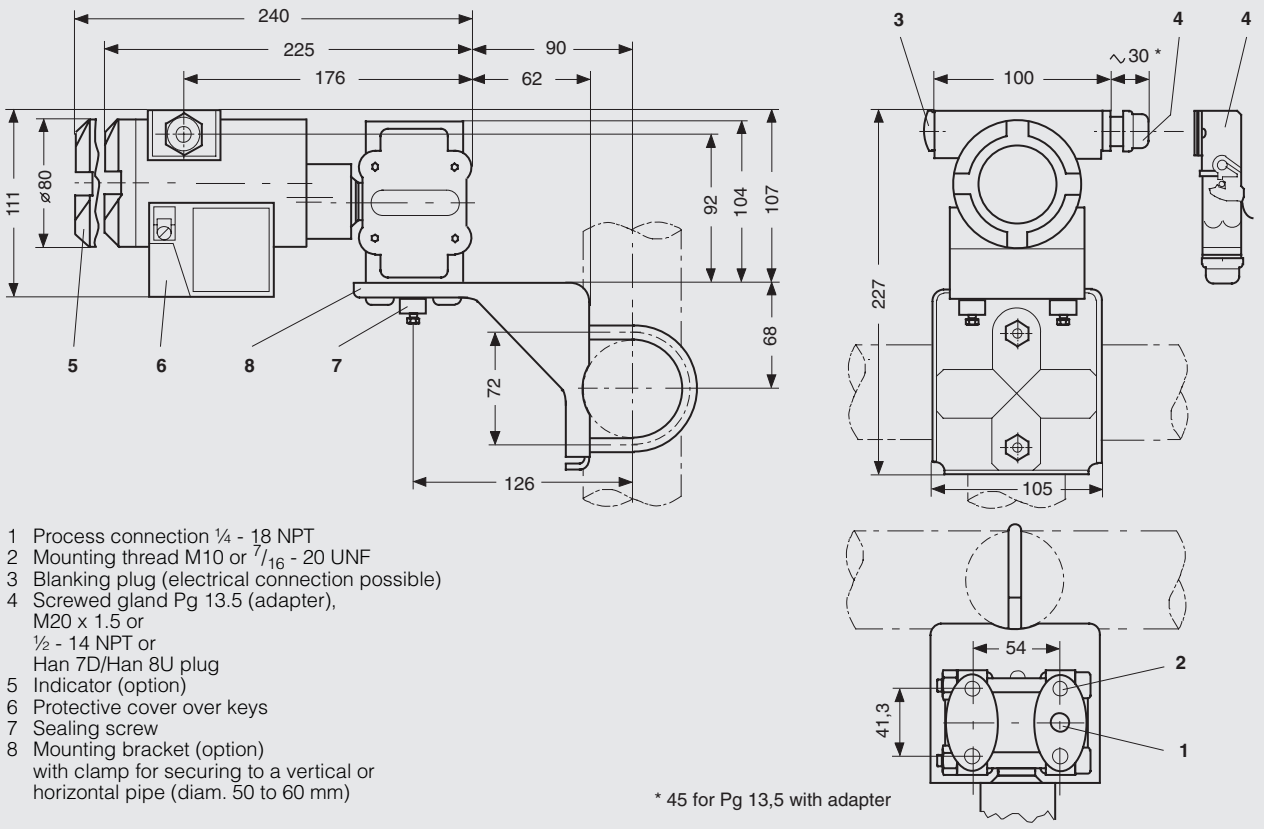
Please add **"Z"** to Order No. and specify Order code(s) and plain text.

Measuring-point number/identification (max. 16 characters), specify in plain text: **Y15: .....**	**Y15**
Measuring-point text (max. 27 characters), specify in plain text: **Y16: .....**	**Y16**

See page 1/22 for example for ordering

[1]) Only together with process flange screws made of stainless steel.
[2]) Version 7MF4332-1DY .. only up to max. span 200 mbar.

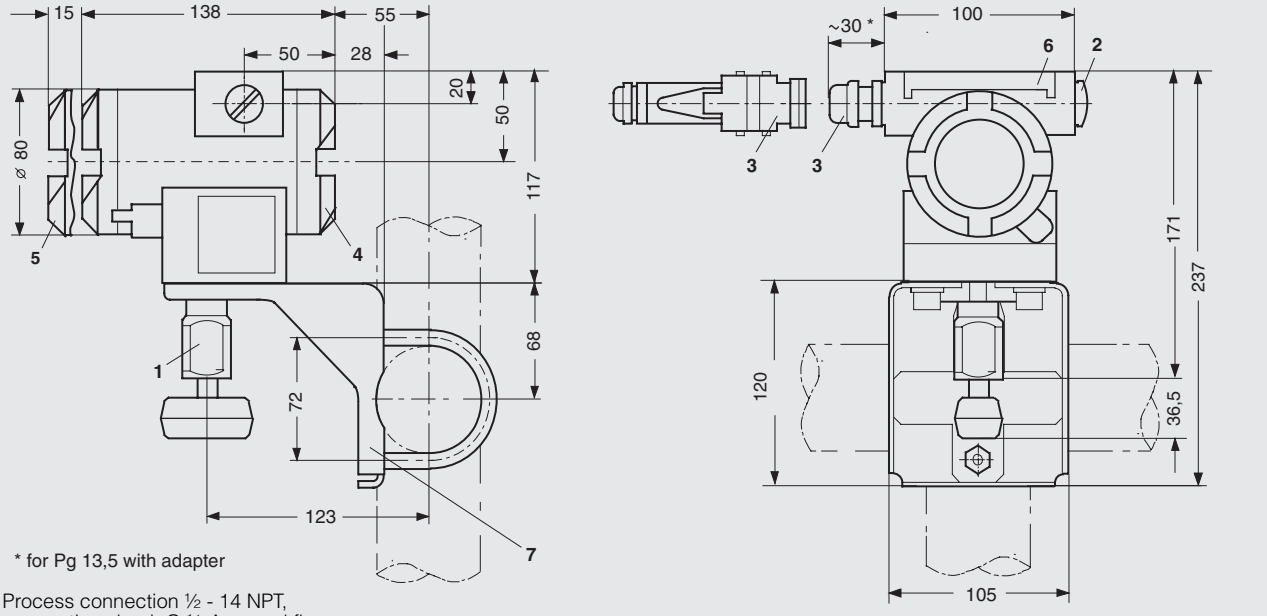
Dimensional drawings



1 Process connection ¼ - 18 NPT
2 Mounting thread M10 or $^{7}/_{16}$ - 20 UNF
3 Blanking plug (electrical connection possible)
4 Screwed gland Pg 13.5 (adapter),
M20 x 1.5 or
½ - 14 NPT or
Han 7D/Han 8U plug
5 Indicator (option)
6 Protective cover over keys
7 Sealing screw
8 Mounting bracket (option)
with clamp for securing to a vertical or
horizontal pipe (diam. 50 to 60 mm)

* 45 for Pg 13,5 with adapter

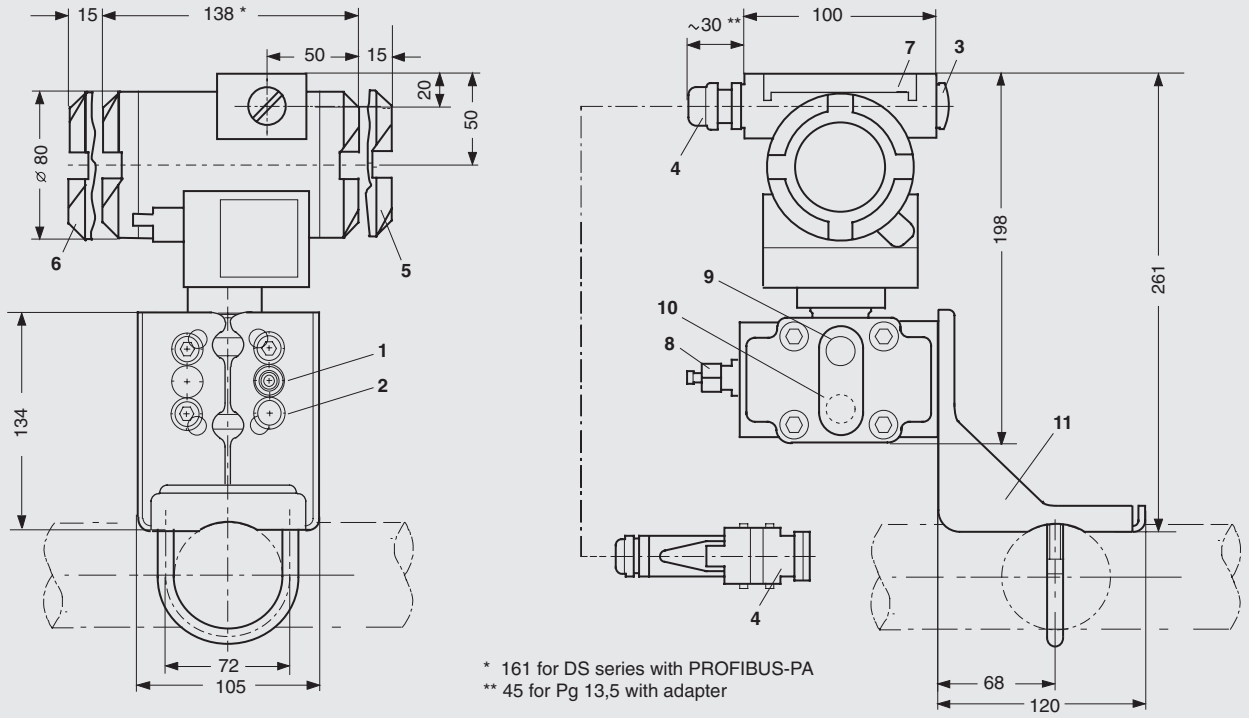
Fig. 1/13 Dimensions of HK series



* for Pg 13,5 with adapter

1 Process connection ½ - 14 NPT,
connection shank G ½ A or oval flange
2 Blanking plug
3 Electrical connection:
Screwed gland Pg 13.5 (adapter),
M20 x 1.5 or ½ - 14 NPT or
Han 7D/Han 8U plug
4 Terminal side, analog indicator as option
5 Electronics side, digital display
6 Protective cover over keys
7 Mounting bracket (option)

Fig. 1/14 Dimensions of DS series (7MF4232)



* 161 for DS series with PROFIBUS-PA
** 45 for Pg 13,5 with adapter

1 Process connection ¼ - 18 NPT
2 Mounting thread M10 or $^{7}/_{16}$ - 20 UNF
3 Blanking plug
4 Electrical connection:
screwed gland Pg 13.5 (adapter),
(not DS series with PROFIBUS-PA)
M20 x 1.5 or ½ - 14 NPT or
Han 7D/Han 8U plug
(not DS series with PROFIBUS-PA)
5 Terminal side, analog indicator as option
6 Electronics side, digital display as option
7 Protective cover over keys
8 Sealing screw
9 Vent on side for liquid measurements
10 Vent on side for gas measurements (suffix H02)
11 Mounting bracket (option)

Fig. 1/15 Dimensions of DS series (7MF4332) and DS series with PROFIBUS-PA