Introduction

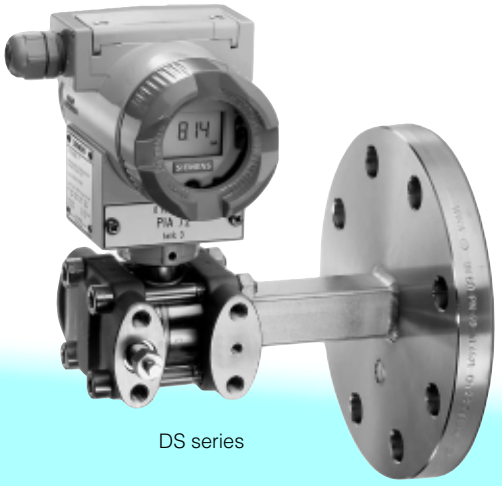


Fig. 1/23 SITRANS P transmitters for level, with built-in analog indicator or digital display

Application

The SITRANS P transmitter with mounting flange measures the level of corrosive and non-corrosive liquids in open and closed containers. Different spans are possible depending on the version.

The nominal mounting flange diameter is DN 80 or DN 100, or 3 or 4 inches.

In the case of level measurements in open containers, the low-pressure connection of the measuring cell remains open (measurement with respect to atmosphere), while for measurements in closed containers, this connection must be connected to the container in order to compensate the static pressure.

The wetted parts are constructed from a variety of materials depending on the degree of corrosion resistance required (see Technical data).

The output signal is a load-independent direct current of 4 to 20 mA linearly proportional to the level (hydrostatic 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).

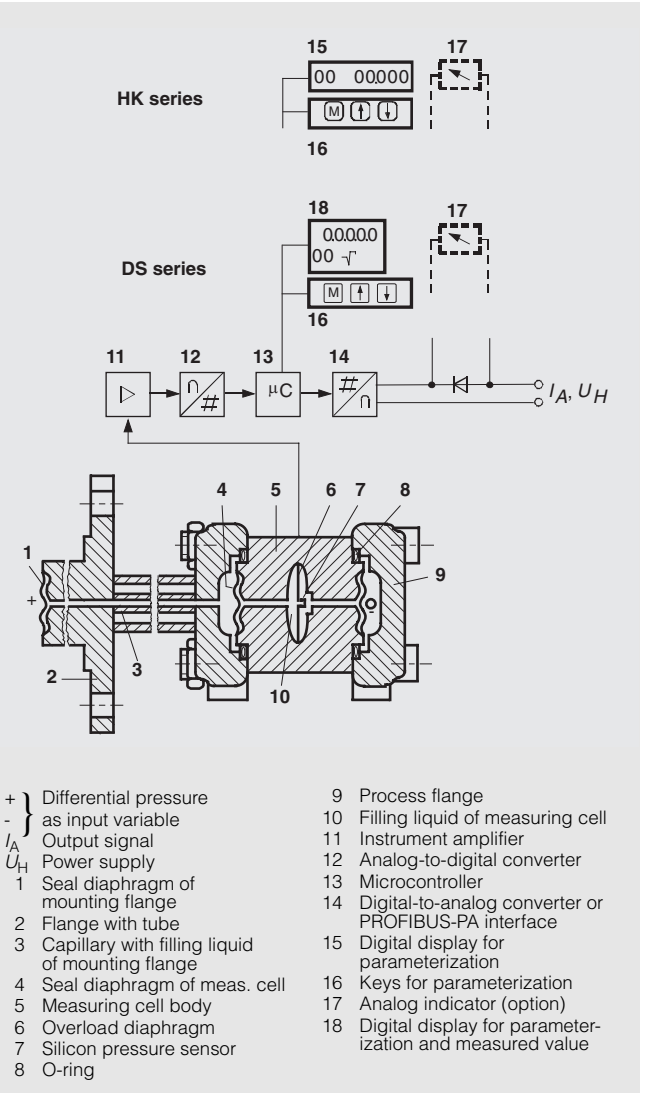
Adjustable spans

Series	Span in mbar		
	25	to	5,000
HK			
DS			
DS (PA)	Measuring cells from 250 to 5,000 mbar		

Types of protection and conformity certificates

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

● Exists



\+ } Differential pressure
\- } as input variable
I_A Output signal
U_H Power supply
1 Seal diaphragm of mounting flange
2 Flange with tube
3 Capillary with filling liquid of mounting flange
4 Seal diaphragm of meas. cell
5 Measuring cell body
6 Overload diaphragm
7 Silicon pressure sensor
8 O-ring
9 Process flange
10 Filling liquid of measuring cell
11 Instrument amplifier
12 Analog-to-digital converter
13 Microcontroller
14 Digital-to-analog converter or PROFIBUS-PA interface
15 Digital display for parameterization
16 Keys for parameterization
17 Analog indicator (option)
18 Digital display for parameterization and measured value

Fig. 1/24 Functional diagram

Mode of operation

The input pressure (hydrostatic pressure) acts on the measuring cell via the seal diaphragm (1, Fig. 1/24) of the mounting flange. The differential pressure present on the measuring cell is applied via the seal diaphragm (4) and the filling liquid in the measuring cell body (5) to the silicon pressure sensor (7) whose measuring diaphragm is then flexed.

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 differential pressure. This voltage is amplified 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. 1/25). When parameterizing with a laptop or PC, the connection is made via a HART modem (Fig. 1/26).
The signals required for communication according to the HART protocol 5.x are superimposed on the output current according to frequency shift keying (FSK).

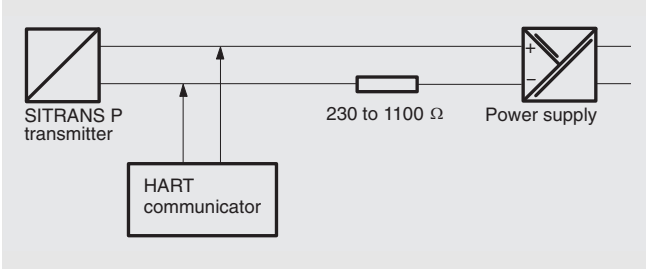


Fig. 1/25 Communication between HART communicator and transmitter

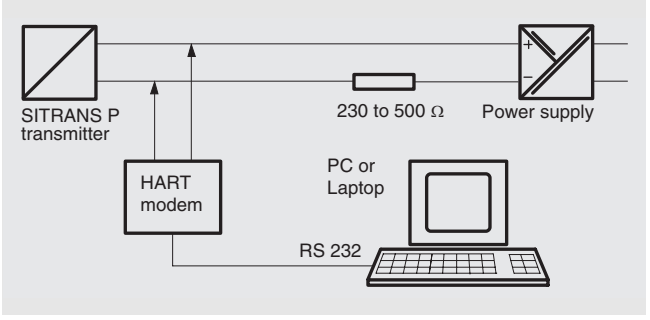


Fig. 1/26 Communication between PC or laptop and transmitter

Elements for parameterization of transmitter

Parameterization using	HK	DS
3 external keys	●	●
Built-in digital display	●	●
Laptop, PC		●
HART communicator		●
PROFIBUS-PA interface		●

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. 1/27) 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.

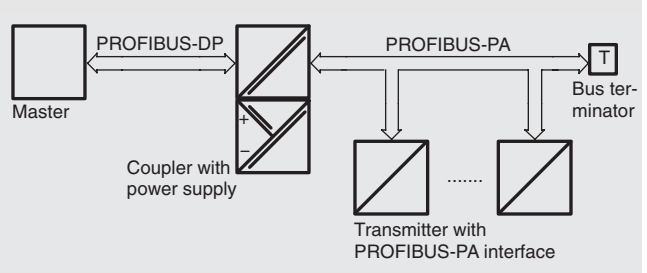


Fig. 1/27 Communication via PROFIBUS-PA interface

Technical data

Technical data

	HK 7MF4620	DS 7MF4632	DS with PROFIBUS-PA 7MF4632
Application		See page 1/42	
Mode of operation		See page 1/43	
Measuring principle		Piezo-resistive	
Input			
Measured variable		Level	
Measuring range			
• Span (continuously adjustable)		-100 % and +100 % of max. span	
• Lower measuring limit	-100 % of max. span	-100 % of max. span	–
• Upper measuring limit	+100 % of max. span	+100 % of max. span	–
• Start-of-scale (continuously adjustable)	Between the measuring limits	Between the measuring limits	–
• Minimum static pressure		30 mbar (absolute)	
Output			
Output signal	4 to 20 mA	4 to 20 mA	Digital bus signal
• Lower limit	3.84 mA	3.84 mA	Digital status signal
• Upper limit	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	–
Signal on alarm	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	–
• With HART communication	–	R_B = 230 to 500/1100 Ω	–
Characteristic	Linear	Linear	–
Accuracy			
Reference conditions	Start-of-scale value 0 bar, silicone oil filling and mounting flange without tube, limit point setting. r = max. span/set span		
Error in measurement (including hysteresis and repeatability)	≤ 0.15 %	≤ 0.15 % at r ≤ 10 ≤ 0.3 % at 10 < r ≤ 30 (0.005 · r + 0.05) · 1.5 % at 30< r ≤ 100	≤ 0.15 %
• 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	≤ 0.1 % / 12 months with max. span	≤ 0.1 % / 12 months with max. span	≤ 0.1 % / 12 months
Ambient temperature effect			
• At -10 to +60 °C			
- 250-mbar cell	≤ (0.5 · r + 0.2) %	≤ (0.5 · r + 0.2*)) %	≤ 0.7 %
- 600-mbar cell	≤ (0.3 · r + 0.2) %	≤ (0.3 · r + 0.2*)) %	≤ 0.5 %
- 1600- and 5000-mbar cells	≤ (0.25 · r + 0.2) %	≤ (0.25 · r + 0.2*)) %	≤ 0.45 %
• At -40 to -10 °C and +60 to +85 °C			
- 250-mbar cell	≤ (0.25 · r + 0.15) % / 10 K	≤ (0.25 · r + 0.15*)) % / 10 K	≤ 0.4 % / 10 K
- 600-mbar cell	≤ (0.15 · r + 0.15) % / 10 K	≤ (0.15 · r + 0.15*)) % / 10 K	≤ 0.3 % / 10 K
- 1600- and 5000-mbar cells	≤ (0.12 · r + 0.15) % / 10 K	≤ (0.12 · r + 0.15*)) % / 10 K	≤ 0.27 % / 10 K
Static pressure effect			
• On start-of-scale value			
- 250-mbar cell		≤ 0.3 % · r per nominal pressure	
- 600-mbar cell		≤ 0.15 % · r per nominal pressure	
- 1600- and 5000-mbar cells		≤ 0.1 % · r per nominal pressure	
• On span		≤ 0.1 % · r per nominal pressure	
Influence of mounting position		None	
Influence of power supply		≤ 0.005 % per 1 V change in voltage	

*) 0.4 instead of 0.2 and 0.3 instead of 0.15 for 10 < r ≤ 30.

Technical data

	HK 7MF4620	DS 7MF4632	DS with PROFIBUS-PA 7MF4632
Rated operating conditions			
Installation conditions			
• Installation instructions		Mounting position dependent on flange	
Ambient conditions			
• Ambient temperature (observe temperature class in potentially explosive atmospheres)			
- Measuring cell		-40 to +85 °C	
- Digital display	–	-20 to +85 °C	-20 to +85 °C
• 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			
- At P_{abs} ≥1 bar		-40 to +180 °C	
- At P_{abs} < 1 bar		-40 to +80 °C	
• Process temperature limits		See process temperature	
• Process pressure limits		Nominal pressure (PN)	
Design			
Weight (transmitter with mounting flange (without tube))			
• To DIN		Approx. 11 to 13 kg	
• To ANSI		Approx. 11 to 18 kg	
Dimensions	See Fig. 1/28	See Fig. 1/29	See Fig. 1/29
Material			
• Wetted parts materials			
- High-pressure side			
Seal diaphragm of mounting flange	Stainless steel, mat. No. 1.4571, Monel 400, mat. No. 2.4360, Hastelloy B2, mat. No. 2.4617, Hastelloy C276, mat. No. 2.4819, Hastelloy C4, mat. No. 2.4610, tantalum, PTFE, ECTFE		
Sealing face	Smooth to DIN 2526, form D or ANSI B16.5 RF for stainless steel, mat. No. 1.4571 DIN 2526, form E or ANSI B16.5 RFSF for other materials		
- Low-pressure side			
Seal diaphragm		Stainless steel, mat. No. 1.4404	
Process flanges and sealing screw		Stainless steel, mat. No. 1.4408	
Connection shank		Stainless steel, mat. No. 1.4401	
O-ring		FPM (Viton)	
• 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
- Process flange screws	Steel, galvanized and yellow-passivized, or stainless steel		
- Mounting bracket (option)	Steel, galvanized and yellow-passivized, or stainless steel		
- Sealing material in the process flanges			
For vacuum applications		Copper	
For other applications		Viton	
Filling liquid			
• Measuring cell		Silicone oil	
• Mounting flange		Silicone oil or other material	
Process connection			
• High-pressure side		Flange to DIN and ANSI	
• Low-pressure side	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 M20 x 1.5 or ½ - 14 NPT

Technical data

Technical data

	HK 7MF4620	DS 7MF4632	DS with PROFIBUS-PA 7MF4632
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	–
Digital display	–	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	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)	–
Noise	–	$U_{rms} \leq 1.2$ 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 ib IIC T4
- Conformity certificate	PTB No. Ex-92.C.2146	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	+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 = 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	$L_i \leq 7.2$ µH
- Effective internal capacitance	$C_i \leq 6$ 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
- Conformity certificate	–	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
TÜV	To DIN VDE 0165/02.91, Section 6.3		
• Ex-approved zone 2n	Ex n V II T4		
- Registration number	08/220/1092/6	08/220/1092/6	TÜV 97 ATEX 1247

Technical data

	DS 7MF4632	DS with PROFIBUS-PA 7MF4632
Communication Load when connecting a		
• HART communicator	230 to 1100 Ω	–
• HART modems	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 PROFIBUS-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} ≤ 27 mA in event of fault, output twice
Measured-value resolution	–	3 x 10^{-5} referred to full-scale value

7MF4620, HK series

Ordering data — Order No.

SITRANS P transmitter for level, HK series

Two-wire system, including 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 (please order mounting flange 7MF4912-2... separately, see page 1/51)

7MF4620- **1 ■ Y ■ ■ - 1 ■ ■ ■**

Span

25	to	250	mbar
60	to	600	mbar
160	to	1,000	mbar
500	to	5,000	mbar

→ **D**
→ **E**
→ **F**
→ **G**

Process connection of low-pressure side

Female thread ¼ - 18 NPT and flange connection to DIN 19213
- Mounting thread M10
- Mounting thread $^{7}/_{16}$ - 20 UNF

→ **0 2**

Non-wetted parts materials

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

→ **0**
→ **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**

Ordering note: 1st order item: Transmitter 7MF4620-...
2nd order item: Mounting flange 7MF4912-2...

Example for ordering:
Item line 1:7MF4620-1EY20-1AA1-Z
B line:Y01
C line:Y01: 80 to 143 mbar
Item line 2:7MF4912-2GE01

Ordering data — Order code

Further designs

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

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**
Use	
• In zone 10/11 (basic unit EEx ia)	**E01**
• In zone 0 (basic unit EEx ia)	**E02**
Over-filling safety device for flammable and non-flammable liquids (max. PN 32) (basic unit EEx ia)	**E08**
Interchanging of process connection side (high-pressure side: left, low-pressure side: right)	**H01**

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, plain text with linear characteristic: **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 setting for "Y01" can be made in the factory.

Power supply units: see page 2/50.

Ordering data — Order No.

SITRANS P transmitter for level, DS series

Two-wire system, including 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 (please order mounting flange 7MF4912-3... separately, see page 1/51)

7MF4632- **-1 ■ Y ■■ - 1 ■■■**

Span

25	to	250 mbar	**D**
25	to	600 mbar	**E**
53	to	1,600 mbar	**F**
160	to	5,000 mbar	**G**

Process connection of low-pressure side

Female thread ¼ - 18 NPT and flange connection to DIN 19213

- Mounting thread M10 — **0**
- 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**
Stainless steel	Stain. steel precision casting	**3**

Explosion protection

- Without explosion protection — **A**
- With explosion protection (CENELEC) Type of protection:
  - "Intrinsic safety" (EEx ia) — **B**
  - "Explosion-proof" (EEx d) [1] — **D**
  - "Intrinsic safety and explosion-proof" (EEx ia and EEx d) [1] — **P**
- Use in zone 2n (TÜV) — **E**

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).

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 22.0 mA	**D05**
IP 68 (not together with Han 7D, Han 8U or Pg 13.5 plug)	**D12**
Use in zone 0 (basic unit EEx ia)	**E02**
Over-filling safety device for flammable and non-flammable liquids (max. PN 32) (basic unit EEx ia)	**E08**
Interchanging of process connection side (high-pressure side: left, low-pressure side: right)	**H01**
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, plain text with linear characteristic: **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 1/48 for **example for ordering**

Power supply units: see page 2/50.

[1] Without cable gland.
[2] Not together with type of protection "Explosion-proof".

7MF4632, DS series with PROFIBUS-PA

Ordering data — Order No.

7MF4632- **-1 Y -1 -Z P01**

SITRANS P transmitter for level, DS series with PROFIBUS-PA

Two-wire system, including 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 (please order mounting flange 7MF4912-3... separately, see page 1/51)

Span

Up to 250 mbar	D
Up to 600 mbar	E
Up to 1,600 mbar	F
Up to 5,000 mbar	G

Process connection of low-pressure side

Female thread ¼ - 18 NPT and flange connection to DIN 19213 with
- Mounting thread M10 — 0 2
- Mounting thread $^{7}/_{16}$ - 20 UNF

Non-wetted parts materials

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

Explosion protection
- Without explosion protection — A
- With explosion protection Type of protection: "Intrinsic safety" (EEx d) [1] — D
- Use in zone 2n (TÜV) — E
- With explosion protection (FM) Explosion-proof (xp) [1] — G C
- 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).

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**
IP 68	**D12**
Interchanging of process connection side (high-pressure side: left, low-pressure side: right)	**H01**

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 1/48 for **example for ordering**

[1]) Without cable gland.

Ordering data

Order No. Order code

Mounting flange
Directly fitted onto SITRANS P transmitter for level, for:

HK series (7MF4620-...)
DS series and DS series with PROFIBUS-PA (7MF4632-...)

Flange	Nom. diam.	Nom. press.	
Connection to DIN 2501	DN 80	PN 40	D
	DN 100	PN 16	G
		PN 40	H
Connection to ANSI B16.5	3 inch	Class 150	Q
		Class 300	R
	4 inch	Class 150	T
		Class 300	U
Other version Add Order code and plain text: Nominal diameter: ...; Nom. pressure: ...			Z

7MF4912- 2 3 [D G H Q R T U Z]

Wetted parts materials

• Stainless steel, mat. No. 1.4571	A
• With PFA	D
• With PTFE	E
• With ECTFE	F
• Monel 400, mat. No. 2.4360	G
• Hastelloy B2, mat. No. 2.4617	H
• Hastelloy C276, mat. No. 2.4819	J
• Hastelloy C4, mat. No. 2.4610	U
• Tantalum	K
Other version Add Order code and plain text: Wetted parts materials: ...	Z

[A D E F G H J U K Z] 0

Sealing face: see "Technical data"

Tube length

• Without tube	0
• 50 mm	1
• 100 mm	2
• 150 mm	3
• 200 mm	4

[0 1 2 3 4]

Filling liquid

• Silicone oil M5	1
• Silicone oil M50	2
• High-temperature oil	3
• Halocarbon oil (for O_2 measurements)	4
• Vegetable oil	5
• Glycerine/water [1])	6
Other version Add Order code and plain text: Filling liquid:	9

[1 2 3 4 5 6 9]

[J1Y K1Y M1Y]

Ordering data

Order code

Further designs

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

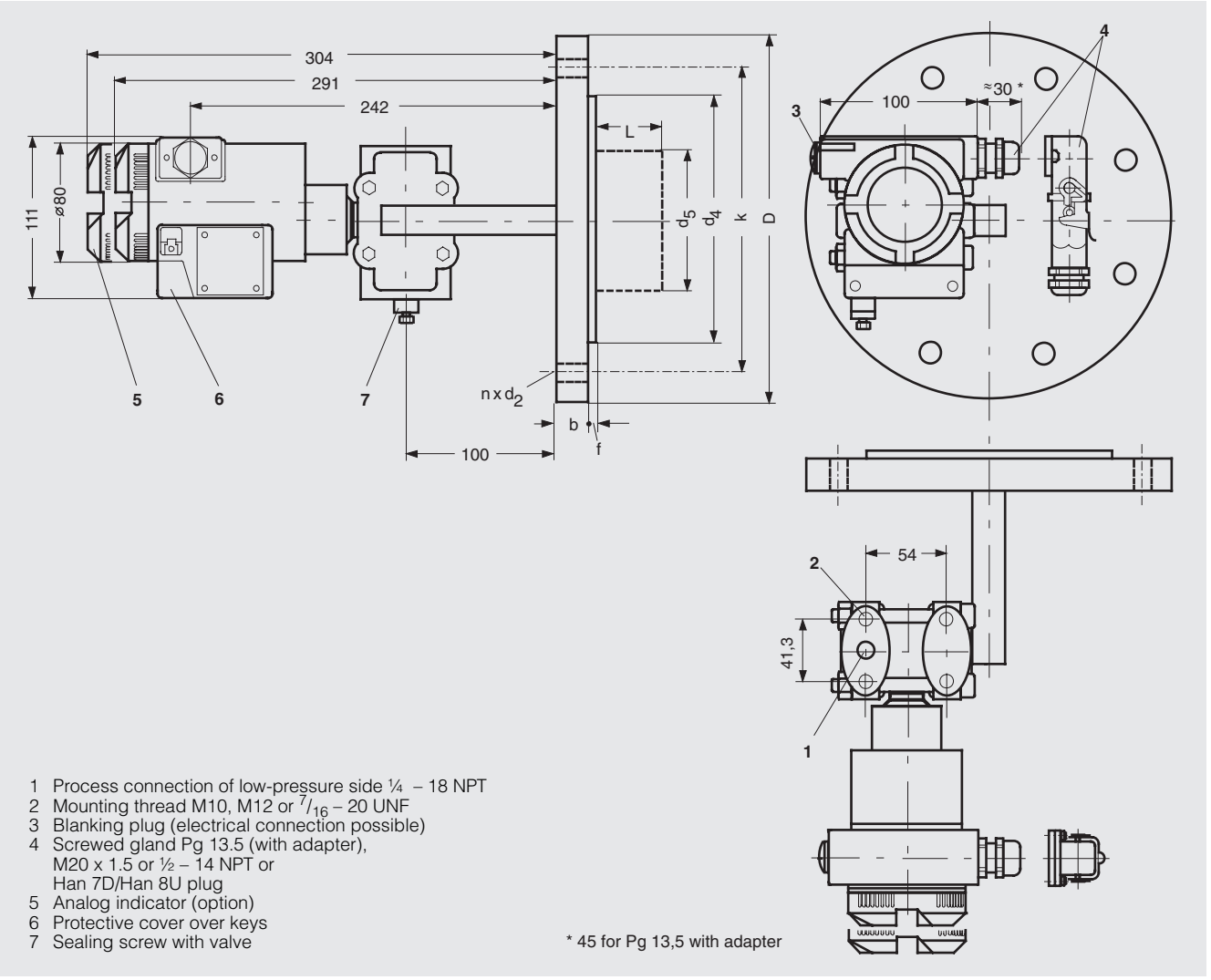
With flame flashover lock-out for mounting on zone 0 (including documentation)	**A01**
Manufacturer's test certificate M to DIN 55 350, Part 18, and to ISO 9001 Acceptance test certificate B to DIN 50 049, Section 3.1/EN 10 204	**C11** **C12**
Vacuum-resistant design (for use in vacuum range)	**V04**
Calculation of span of associated transmitter Enclose filled-in questionnaire (see page 1/81) with order. **Note:** Suffix "Y01" required with transmitter!	**Y05**

Note:
See page 1/59 ff for minimum span values and data on limits of use and temperature errors.

See page 1/48 for **example for ordering**

[1]) Not suitable for vacuum applications.

Dimensional drawings



1 Process connection of low-pressure side ¼ – 18 NPT
2 Mounting thread M10, M12 or $^{7}/_{16}$ – 20 UNF
3 Blanking plug (electrical connection possible)
4 Screwed gland Pg 13.5 (with adapter), M20 x 1.5 or ½ – 14 NPT or Han 7D/Han 8U plug
5 Analog indicator (option)
6 Protective cover over keys
7 Sealing screw with valve

* 45 for Pg 13,5 with adapter

Fig. 1/28 Dimensions of HK series (transmitter including mounting flange)

Connection to DIN 2501

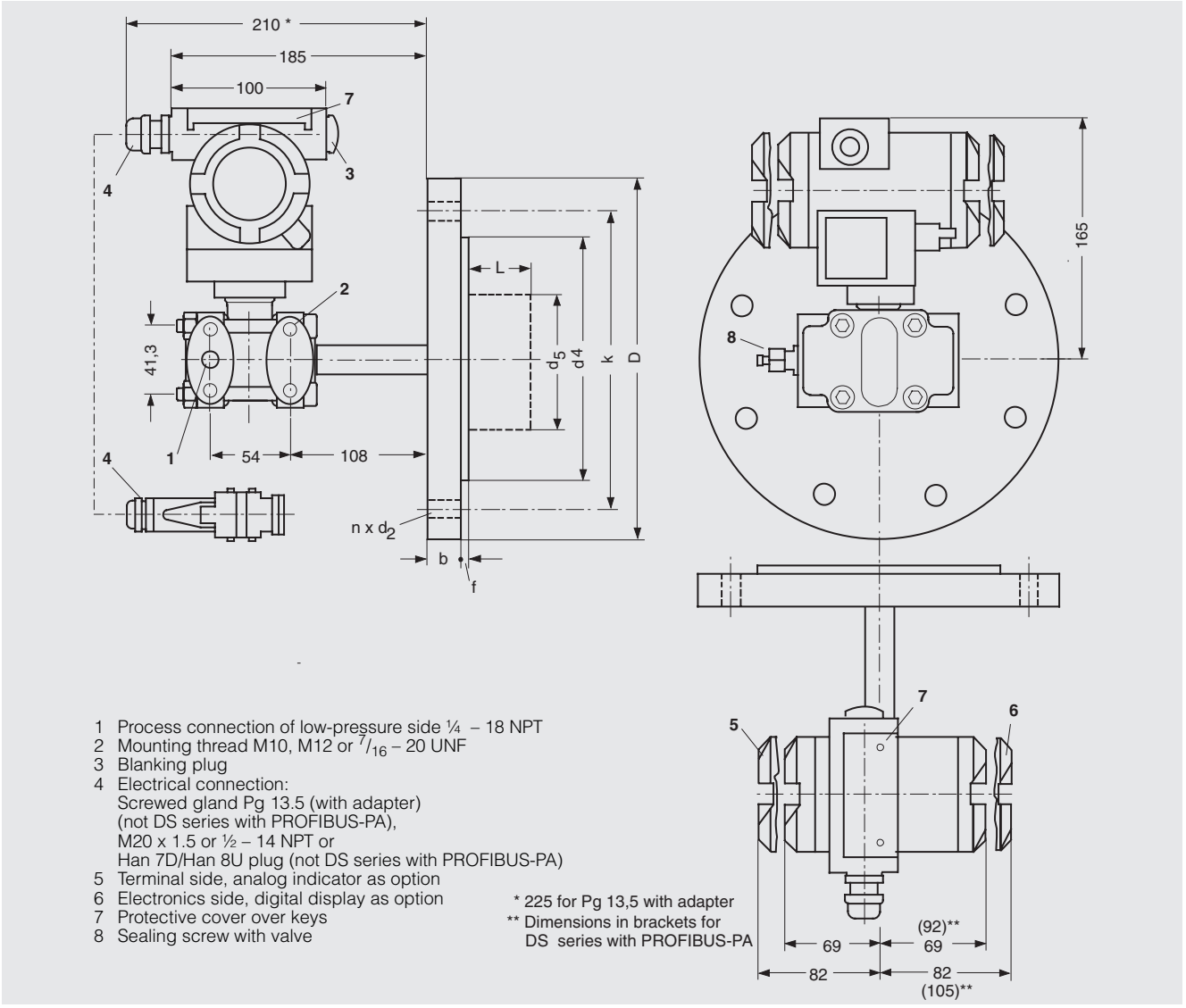
Nom. diam.	Nom. press.	b	D	d	d_2	d_4	d_5	d_M	f	k	n	L
DN 80	PN 40	24	200	90	18	138	76	72 [1])	3	160	8	
DN 100	PN 16	20	220	115	18	158	94	89	3	180	8	0, 50, 100, 150, or 200
	PN 40	24	235	115	22	162	94	89	3	190	8	

Connection to ANSI B16.5

Nom. diam.	Nom. press. lb/sq.in.	b inch (mm)	D inch (mm)	d_2 inch (mm)	d_4 inch (mm)	d_5 inch (mm)	d_M inch (mm)	f inch (mm)	k inch (mm)	n inch (mm)	L inch (mm)
3 inch	150	0.94 (23.8)	7.5 (190.5)	0.75 (19.0)	5 (127)	3 (75.5)	2.81 [1]) (72)	0.06 (1.6)	6 (152.4)	4	
	300	1.12 (28.6)	8.25 (209.5)	0.87 (22.2)	5 (127)	3 (75.5)	2.81 [1]) (72)	0.06 (1.6)	6.69 (168.3)	8	0, 2, 3.94, 5.94 or 7.12
4 inch	150	0.94 (23.8)	9 (228.5)	0.75 (19.0)	6.19 (157.2)	3.69 (94)	3.5 (89)	0.06 (1.6)	7.5 (190.5)	8	(0, 50, 100, 150 or 200)
	300	1.25 (31.7)	10 (254)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.5 (89)	0.06 (1.6)	7.88 (200)	8	

d Internal diameter of gasket to DIN 2690
d_M Effective diaphragm diameter

[1]) 89 mm = 3½ inch with tube length L=0.



1 Process connection of low-pressure side ¼ – 18 NPT
2 Mounting thread M10, M12 or $^{7}/_{16}$ – 20 UNF
3 Blanking plug
4 Electrical connection:
Screwed gland Pg 13.5 (with 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 with valve

* 225 for Pg 13,5 with adapter
** Dimensions in brackets for DS series with PROFIBUS-PA

Fig. 1/29 Dimensions of DS series and DS series with PROFIBUS-PA (transmitter including mounting flange)

Connection to DIN 2501

Nom. diam.	Nom. press.	b	D	d	d_2	d_4	d_5	d_M	f	k	n	L
DN 80	PN 40	24	200	90	18	138	76	72 [1])	3	160	8	
DN 100	PN 16	20	220	115	18	158	94	89	3	180	8	0, 50, 100, 150, or 200
	PN 40	24	235	115	22	162	94	89	3	190	8	

Connection to ANSI B16.5

Nom. diam.	Nom. press. lb/sq.in.	b inch (mm)	D inch (mm)	d_2 inch (mm)	d_4 inch (mm)	d_5 inch (mm)	d_M inch (mm)	f inch (mm)	k inch (mm)	n inch (mm)	L inch (mm)
3 inch	150	0.94 (23.8)	7.5 (190.5)	0.75 (19.0)	5 (127)	3 (75.5)	2.81 [1]) (72)	0.06 (1.6)	6 (152.4)	4	
	300	1.12 (28.6)	8.25 (209.5)	0.87 (22.2)	5 (127)	3 (75.5)	2.81 [1]) (72)	0.06 (1.6)	6.69 (168.3)	8	0, 2, 3.94, 5.94 or 7,12
4 inch	150	0.94 (23.8)	9 (228.5)	0.75 (19.0)	6.19 (157.2)	3.69 (94)	3.5 (89)	0.06 (1.6)	7.5 (190.5)	8	(0, 50, 100, 150 or 200)
	300	1.25 (31.7)	10 (254)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.5 (89)	0.06 (1.6)	7.88 (200)	8	

d Internal diameter of gasket to DIN 2690
d_M Effective diaphragm diameter

[1]) 89 mm = 3½ inch with tube length L=0.