

## Data sheet

DE15

### Configurable differential pressure transmitter for industrial gases

The transmitter serves to record the filling level or the content of upright or flat cylindrical tanks for industrial gases. The corresponding differential pressure of the filling level is measured. An additional integrated pressure sensor records the operating pressure of the system independent of this.

The application scope comprises filling level equipment on closed tanks, in particular in the cryogenics field.

#### Design and mode of operation

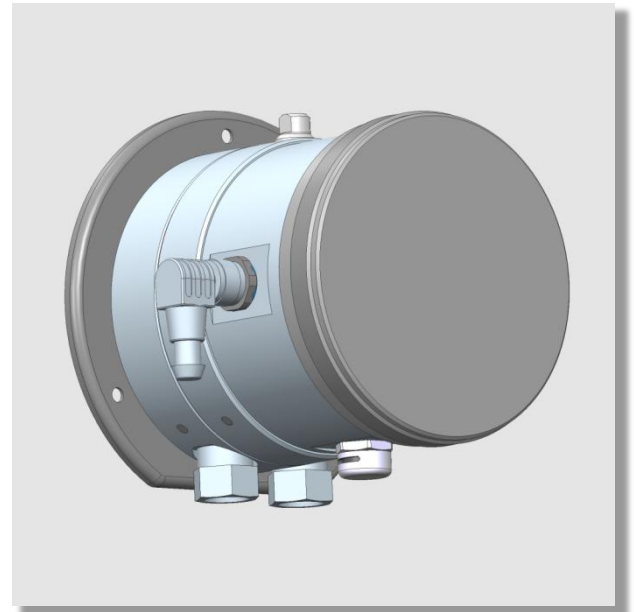
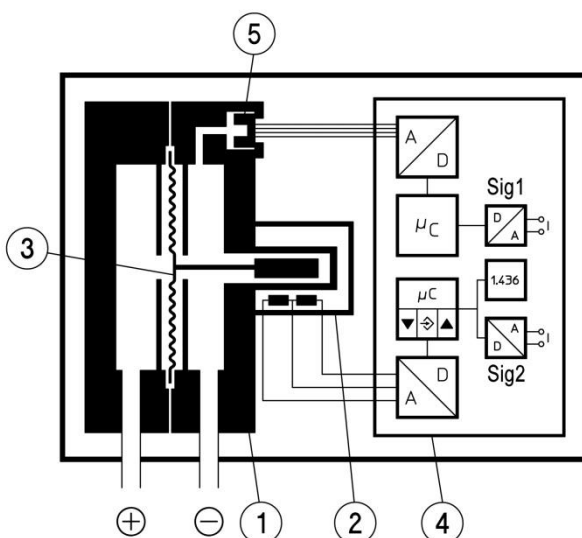
##### Differential pressure measuring system

The measuring system comprises two pressure chambers that are separated by a diaphragm. Differential pressure in one of the chambers leads to a proportional displacement of the diaphragms. This movement is transferred to an inductive displacement transducer and is converted into a 4...20 mA output signal by the downstream electronics.

##### Operating pressure measuring system

There is a ceramic sensor with a DMS bridge installed in the (-) side of the device. The current pressure changes the form of the ceramic membrane and leads to a proportional change of resistance in the DMS bridge. This change of resistance is converted into a 4...20 mA output signal by the downstream electronics.

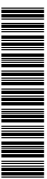
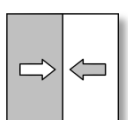
#### Functional Schematic



#### Important features

- Measuring ranges can be configured
- Parameters are set on the device using an integrated LC display, keypad and menu navigation system.
- Integrated operating pressure measurement up to 40 bar.
- Can be used for all gas-like media if they do not corrode the materials.
- Installation-friendly assembly; various adapters available for connecting to the existing measuring devices.
- Direct assembly to DA30.
- Sturdy, corrosion-resistant field casing.
- Can be overloaded on one side up to the allowed static pressure.
- Oil and grease-free for oxygen applications.

- 1 Pressure chamber
- 2 Inductive displacement transducer
- 3 Diaphragm
- 4 Electronics
- 5 Ceramic sensor



## Technical Specification

<b>Measuring system:</b>	<b>Differential pressure</b>	<b>Operating pressure</b>
	<b>General points</b>	
Admissible ambient temperature	-20 ... 70 °C	-20 ... 70 °C
Admissible media temperature	-20 ... 70 °C	-20 ... 70 °C
Admissible storage temperature	-30 ... 80 °C	-30 ... 80 °C
Measuring ranges	See order codes	25 bar, 40 bar
Allowed static operating pressure	40 bar	25 bar, 40 bar
Overload capability	One-sided over-pressure-proof up to the rated pressure of the measuring system, resistance to under-pressure on the (+) and (-) side	
Enclosure protection class	IP65 acc. to DIN EN 60529	The ceramic sensor is integrated
Weight	approx. 4.5 kg	
	<b>Electrical data</b>	
Rated voltage	24 VDC	24 VDC
Admissible operating voltage	$U_{b1} = 12 \dots 30$ VDC	$U_{b2} = 12 \dots 30$ VDC
Electrical connection type	2-wire	2-wire
Output signal	Sig1 = 4 ... 20 mA	Sig2 = 4 ... 20 mA
Current limitation	approx. 21 mA	approx. 26 mA
Allowed load at rated voltage	950Ω	900Ω
Allowed load at operating voltage	$R_L \leq (U_{b1} - 5 \text{ V}) / 0.02 \text{ A}$	$R_L \leq (U_{b2} - 6 \text{ V}) / 0.02 \text{ A}$
Characteristic curve	Linear, flat tank, table	Linear
Characteristic curve deviation (1)	< 1 %FS	< 1 %FS
Hysteresis (1)	< 0.5 %FS	< 0.5 %FS
Tk span (2)	< 0.1 %FS/10K	< 0.2 %FS/10K
Tk zero point (2)	< 0.1 %FS/10K	< 0.2 %FS/10K
Power consumption	Approx. 1 W	Approx. 1 W
Display	4-digit LCD	No display
	<b>Connections</b>	
Process connection	Inner thread G $\frac{1}{4}$ cutting ring screw connection for 8 or 10 mm pipe	
electr. connection	Round plug connector M12 (5-pin male)	
	<b>Materials</b>	
Casing	1.4305	
Media-contacting material	1.4305, NiBe, 1.4404	Al <sub>2</sub> O <sub>3</sub>
	<b>Assembly</b>	
	Device structure	
	Wall mounting by means of assembly plate	

- (1) : Characteristic curve deviation (non-linearity and hysteresis) at 25°C, basic measuring range (linear characteristic curve, not spread)  
 (2) : With reference to the basic measuring range (linear characteristic curve, not spread), Compensation range -30..60°C.

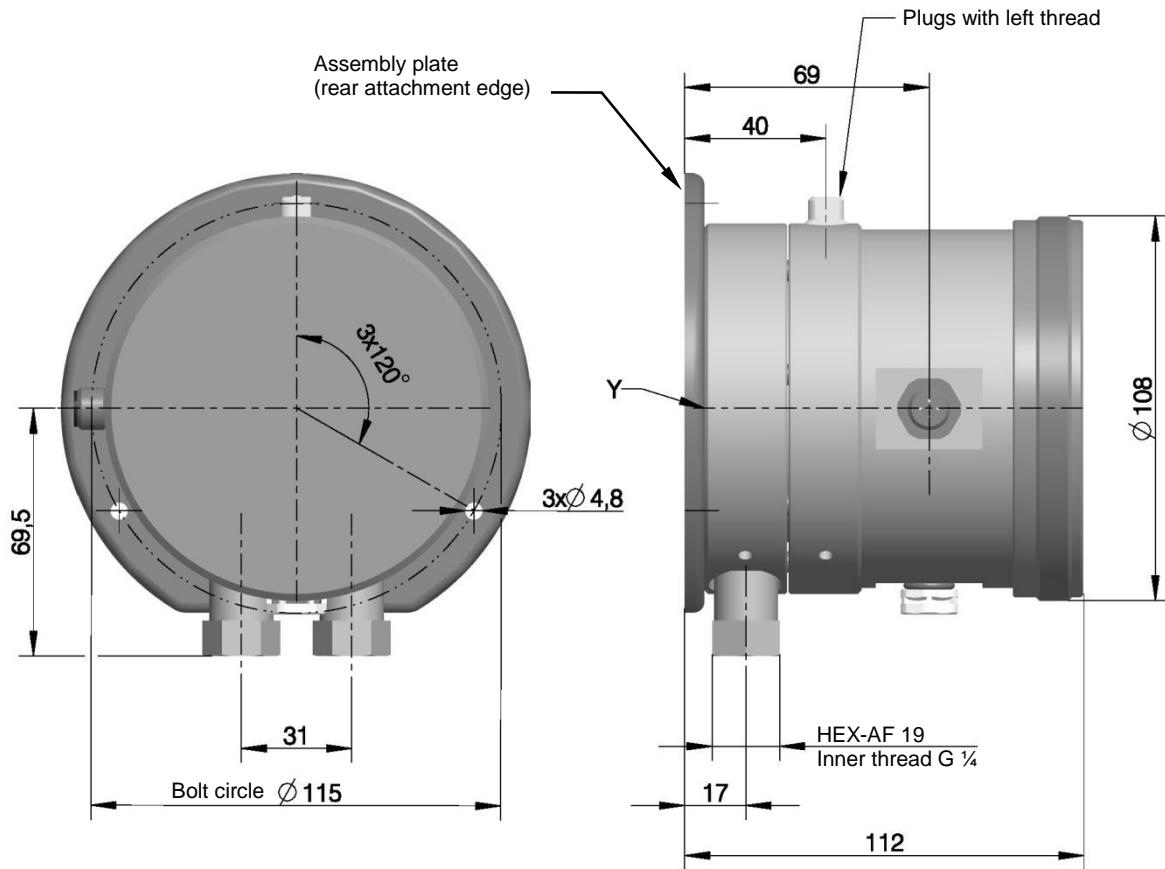
### Programming (only differential pressure measuring system)

Programming is carried out using the keypad (inside) with a menu navigation system.

	<b>Settings</b>
Attenuation	0.0 ... 100.0 s (jump response 10/90 %) for output and display
Zero-point stabilising	0..1/3 of the basic measuring range (3)
Output signal differential pressure	User-definable within the basic measuring range (4)
Offset	± 1/3 of the basic measuring range
Implementation of characteristic curve	Linear, flat tank, table (3 30 support points)
Password	001 ... 999 (000 = no password protection)

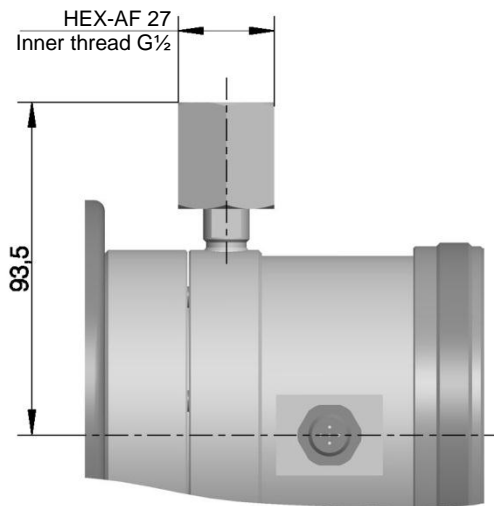
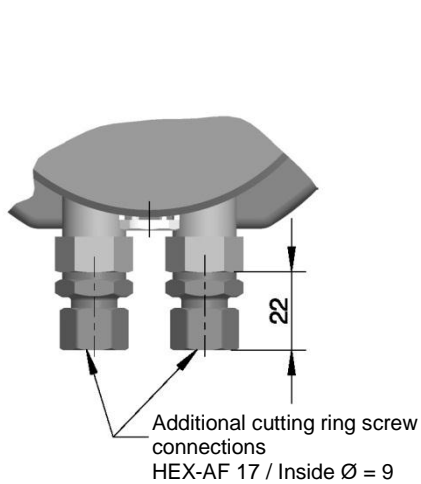
- (3) Measuring values (around zero) are set to zero.  
 (4) Maximum effective spread 4:1. Only the output signal is influenced. Falling characteristic curve possible.

**Dimensional drawings** (all dimensions in mm unless otherwise specified)

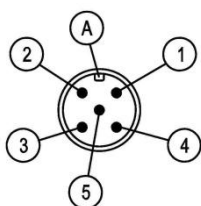


**Additional cutting ring screw connections**

**Additional pressure connection**



**Electrical closure**



Pin	Signal name			Cable colour
1	Differential pressure	+U <sub>b1</sub>	+Sig1	Brown
2	Differential pressure	- U <sub>b1</sub>	- Sig1	White
3	Operating pressure	+U <sub>b2</sub>	+Sig2	Blue
4	Operating pressure	- U <sub>b2</sub>	- Sig2	Black
5	Functional earth			Green/yellow
A	Coding			

**Order Codes**

**Configurable differential pressure transmitter for industrial gases**  
Oil and grease-free (for O2 measurements)

**Type DE15**           B 9 0   0 0

- Measuring range allowed stat. operating pressure**
- 0 ... 160 mbar 40 bar .....> **6 0**
- 0 ... 250 mbar 40 bar .....> **8 2**
- 0 ... 400 mbar 40 bar .....> **8 3**
- 0 ..... 0.6 bar 40 bar .....> **0 1**
- 0 ..... 1 bar 40 bar .....> **0 2**
- 0 ..... 1.6 bar 40 bar .....> **0 3**
- 0 ..... 2.5 bar 40 bar .....> **0 4**
  
- Design**
- Δp Measuring range, can be configured without operating pressure measurement .....> **D**
- Δp Measuring range, can be configured with integrated operating pressure measurement 25 bar .....> **E**
- Δp Measuring range, can be configured with integrated operating pressure measurement 40 bar .....> **F**
  
- Pressure connection**
- Inner thread G 1/4 .....> **0 1**
- Swagelok clamp ring screw connection made of .4571 for 8 mm pipe .....> **S 4**
- Swagelok clamp ring screw connection made of .4571 for 10 mm pipe .....> **S 5**
  
- Additional pressure connection**
- not available .....> **0**
- Union nut G½ .....> **1**
  
- Electrical output signal**
- Differential pressure measuring system: 4 - 20 mA 2-wire connection
- Operating pressure measuring system : 4 - 20 mA 2-wire connection.....> **B**
  
- Operating voltage**
- Differential pressure measuring system: 24 VDC
- Operating pressure measuring system : 24 VDC .....> **9**
  
- Design**
- Device structure (Standard) .....> **0**
- Wall mounted (using assembly plate).....> **B**

**Accessories**

Order no.	Designation	Usage
06401822	5-pin x 10 m connection cable with M12-coupling, 90° angled	for supply / signal
06011204	Screw connection G3/8 Media 4 1.4404 bridging length 50 mm	Suitable for attachment to e.g. Samson Media 4, DE15 with pressure connection S5, on device side G3/8 connection thread
06011205	Screw connection G3/8 Media 5 1.4404 bridging length 90 mm	Suitable for attachment to e.g. Samson Media 5, DE15 with pressure connection S5, on device side G3/8 connection thread

