

# Differential Pressure Transmitter



Registered No. 325327

## Model DE 13

### General Description

The DE 13 Electronic Differential Pressure Transmitter combines electronic measurement with a rugged sensor design, resulting in high accuracy, high differential and static overpressure rating, and ability to handle difficult media. It is available with local digital readout and electronic limit detection relays, with measuring range of 0–40 mbar to 0–25 bar.

DE 13 Transmitters are suitable for a wide range of applications, for example:

- Water and effluent treatment plants, and other filtration applications: for monitoring condition of filters
- Flow monitoring in sprinkler systems
- Flow measurement of steam and hot water, using differential pressure flow sensors, in remote heating systems
- Monitoring pressure drop across valves
- Pump control dependent on differential pressure in block unit heating power stations

### Important Features

- Highly corrosion resistant
- Rugged, wear resistant sensor design
- Low hysteresis
- Easily cleaned pressure chamber
- Unaffected by fouling

### Principles of Operation

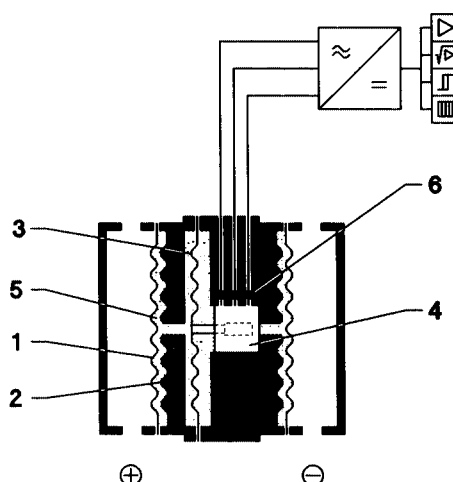
The pressures to be compared act on outer flexible stainless steel isolating diaphragms, at opposite ends of the sensing capsule. A third diaphragm in between acts as the sensing element. Both outer diaphragms are backed by intermediate plates, contoured to match the profile of the outer diaphragms. The cavity of the capsule is filled with hydraulic fluid, and is divided into two separate parts by the central sensing diaphragm. Pressures acting on the outer diaphragms are transferred to the sensing diaphragm by the fluid, through apertures in the intermediate plates. An axial metal rod joined to the sensing diaphragm forms the core of a precision LVDT displacement sensing element. The coils of the LVDT are and protected from the capsule fluid. When pressures are equal on both sides of the sensing diaphragm, it is at zero position. Pressure difference across the sensing diaphragm causes it to deflect away from the higher pressure side, resulting in linear displacement of the LVDT core. This displacement is sensed



by the LVDT's coils, and converted by an electronic module to an output signal proportional to the pressure differential. Inward deflection of each isolating diaphragm is limited by the intermediate plate behind it. This also limits the pressure that

can be transferred to the sensing diaphragm, and through it, to the isolating diaphragm on the other side. Thus, all three diaphragms are fully protected against excess differential pressure in either direction, and also against high static pressures.

### Schematic Diagram



- 1 Isolating diaphragms
- 2 Intermediate (contoured) plate
- 3 Sensing diaphragm
- 4 LVDT sensing element core
- 5 Pressure transfer fluid
- 6 LVDT sensing element coils

## Specifications

### General

Measuring ranges	0 – 40 mbar to 0 – 25 bar (see Ordering Code)		
Nominal pressure rating	100 bar		
Max. static pressure	100 bar		
Max. differential overpressure	Safe up to max. static pressure; pressure differential in either direction		
Linearity	< 1 % f.s.		
Hysteresis	< 0.3 % f.s.		
Operating temperature	Ambient: – 10 ° to + 60 °C Media: Max. 70 °C		
Temperature coefficient	Approx. 0.5 % / 10 °K		
Protection class	IP 54, per DIN 40050		

### Electrical

Power supply	24 V AC 24 V DC	24 V AC 24 V DC	24 V DC
Power consumption (approx.)	3 VA / 3 W	3 VA / 3 W	–
Electrical connections	–	–	2-wire loop
Output signal	0/4 – 20 mA	0 – 10 V.DC	4 – 20 mA
Output load impedance	< 1000 ohms	> 2000 ohms	< 450 ohms
Output current limit (approx.)	30 mA	–	30 mA
Output voltage limit	–	12 V.DC	–
Square root conversion accuracy	+/- 0.5 %	–	–
with offset compensation	2 % (max.)	–	–
Display	3 – 1/2 digit LCD		
Span adjustment	Approx. 10 % of range full-scale		
Zero adjustment	Approx. 10 % of range full-scale		

### Connections

Electrical connections	Plug-in connector
Pressure connections	Standard DIN 19213 flanges with 2 x G 1/2 (F) threaded sockets. (Other types available: see Ordering Code).
Purge ports	Threaded sockets 2 x G 1/8; fitted with screw plugs.

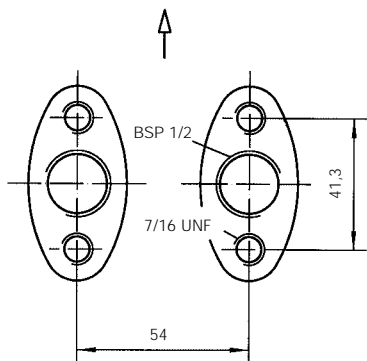
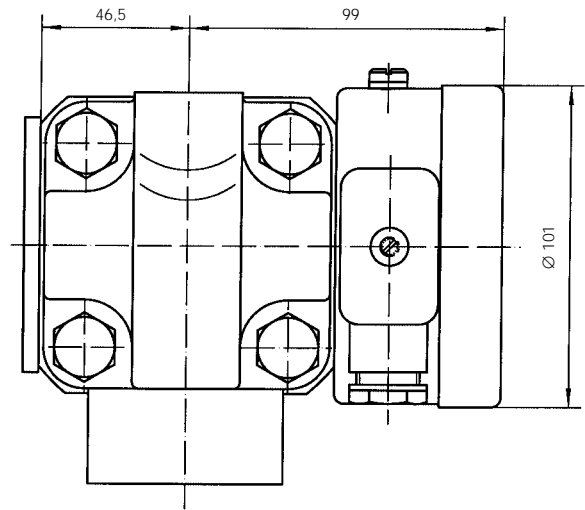
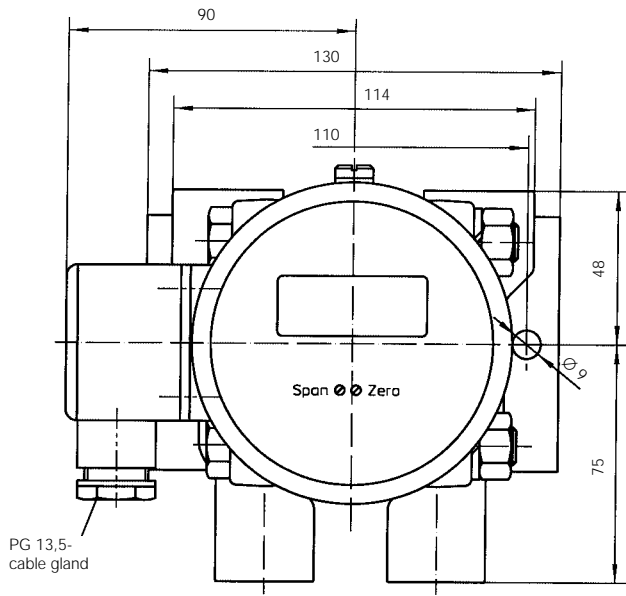
### Materials

Diaphragms (isolating / sensing)	Stainless steel 1.4571. Optional: Hastelloy-C
Seals	Viton (fluorocarbon elastomer). Optional: PTFE coated.
Intermediate plate	Aluminium alloy, hard coated
Electronics housing	Aluminium alloy (painted); plastic

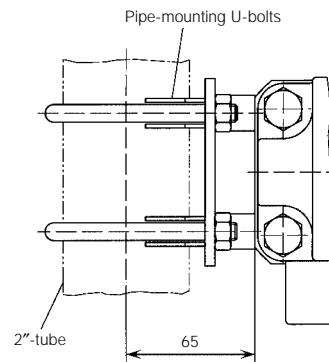
### Mounting / Installation

Pressure connections (optional: see Ordering Code):
– For metal tube: bite type ferrule connectors
– For hose: clamp collar type connectors
– Direct connection to threaded pressure tubes: 2 x G 1/2 (F) threaded sockets (using thread sealin compound)
Mounting:
– Wall mounting plate bracket
– Pipe mounting bracket kit (DZ 10) for 2" pipe

**Dimensions**



**Accessories:** Mounting kit for 2-inch pipe

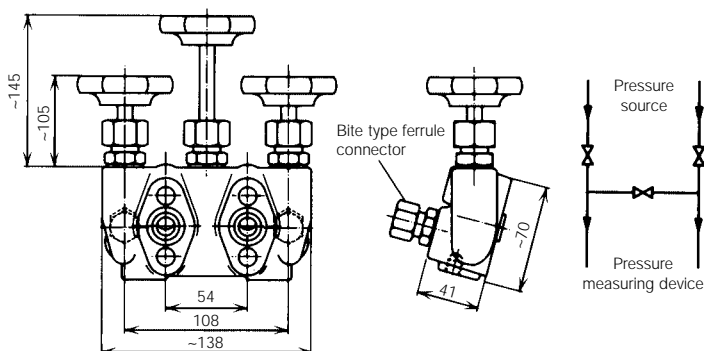


**Accessories**

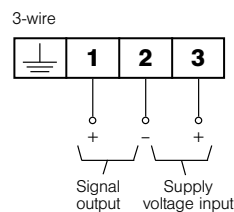
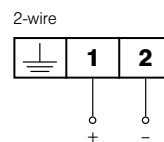
The optional 3-spindle blocking/equalising valves unit Model DZ 36 mounts directly on to the DIN 19213 standard pressure connection flanges. It is used for zero dP calibration, and static pressure testing.

**Dimensions**

3-spindle blocking/equalising valve Model DZ 36 (DIN 19213 flange mounting).



**Electrical Connections**



## Ordering Code

### Differential Pressure Transmitter

### Model DE 13

#### Range

0- 40 mbar .....	▽	5	7					
0- 60 mbar .....	▽	5	8					
0-100 mbar .....	▽	5	9					
0-160 mbar .....	▽	6	0					
0-250 mbar .....	▽	8	2					
0-400 mbar .....	▽	8	3					
- 40...+ 60 mbar .....	▽	7	0					
- 60...+ 100 mbar .....	▽	7	2					
-100...+ 150 mbar .....	▽	7	4					
-150...+ 250 mbar .....	▽	7	6					
0- 0.6 bar .....	▽	0	1					
0- 1 bar .....	▽	0	2					
0- 1.6 bar .....	▽	0	3					
0- 2.5 bar .....	▽	0	4					
0- 4 bar .....	▽	0	5					
0- 6 bar .....	▽	0	6					
0-10 bar .....	▽	0	7					
0-16 bar .....	▽	0	8					
0-25 bar .....	▽	0	9					
-1...+ 0.6 bar .....	▽	3	2					
-1...+ 1.5 bar .....	▽	3	3					
-1...+ 3 bar .....	▽	3	4					
-1...+ 5 bar .....	▽	3	5					

#### Pressure Connections

DIN 19213 flanges with threaded sockets:

2 x G 1/2 (F) .....	▽	0	3
Threaded connectors: 2 x NPT 1/2 (F) .....	▽	0	5
Threaded connectors: 2 x G 1/4 (M) .....	▽	1	1
Threaded connectors: 2 x G 1/8 (M) .....	▽	1	2
Threaded connectors: 2 x G 1/2 (M) .....	▽	1	3
Bite type ferrule connectors (1.4571) for 12 mm tube .....	▽	2	7

#### Output Signal

0- 20 mA, linear .....	▽	A
4- 20 mA, linear (2-wire, 24 V DC loop supply, no limit relays, no square root conversion) .....	▽	B
0- 10 V DC, linear .....	▽	C
4- 20 mA, linear .....	▽	P

#### Supply Voltage

24 V AC .....	▽	4
24 V DC .....	▽	9

#### Display

Without display .....	▽	0	0
3- 1/2 digit display .....	▽	1	0



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