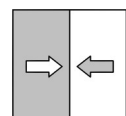


Data sheet

DE80

Differential pressure transmitter
ECO-LINE ®

09015255 • DB_EN_DE80 • Rev. ST4-C • 01/22



1 Product and functional description

1.1 Delivery scope

- Differential pressure transmitter DE80 ECO-LINE®
version as stated on the type plate
- Operating Manual
- Closing screw for degree of protection IP65
- Connection set for ventilation ducts
type No. 04005148 consisting of
2 x hose (6/4 mm) 2.50 m long
2 x measuring nozzle ABS RAL7035 light grey
4 x fastening screw ST2.9 x 9.5-C galvanised and passive.

1.2 Performance characteristics

Typical applications

- Technical facility equipment (TGA)
- Clean room technology
- Filter monitoring
- Volume flow measurement
- Control of frequency converters
- Measuring and monitoring positive, negative and differential pressures

Main features

- Robust, resistant to overpressure and maintenance-free
- Easy parameterization via DIP switch, potentiometer and button
- Measuring ranges
 - 25 Pa to 25 kPa
 - 0.25 mbar to 250 mbar
- Measuring accuracy up to 1.5%
- Switching measuring ranges via DIP switch
- Offset correction with zero point button
- Analogue output signal
 - 0/4 ... 20 mA or 0/2 ... 10 V; 3-conductor
 - 4 ... 20 mA (2-conductor)
- Optional changeover contact, adjustable via potentiometer
- Optional full graphic LC display
- Optional digital RS485 Modbus RTU interface

1.3 Intended use

DE80 is a multi-functional differential pressure transmitter with an optional changeover contact. It is suitable for measuring overpressure, under-pressure and differential pressure in neutral gaseous media.

The device may only be used for the purpose stipulated by the manufacturer. The manufacturer will not be liable for damage arising from incorrect or improper use.

1.4 Function diagram

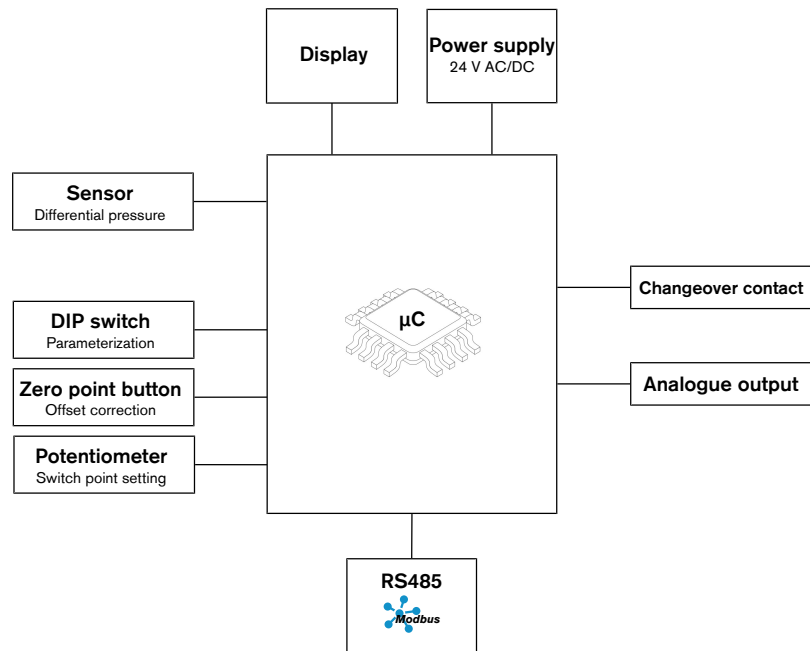


Fig. 1: Function diagram

1.5 Design and mode of operation

The device is based on a piezo-resistive sensor element that is suitable for measuring overpressure, under-pressure and differential pressure. The pressures to be compared have a direct effect on a silicon membrane equipped with a measuring bridge.

When the pressure is equal, the measuring membrane is in its idle state. If a pressure difference occurs, the membrane is deflected and a resistance change takes place on the attached measuring bridge. This change is evaluated by the device's electronics and transformed into an analogue output signal. The output signal can be attenuated and square rooted.

Optionally, the device can be delivered with a full-graphic LC display and a changeover contact.

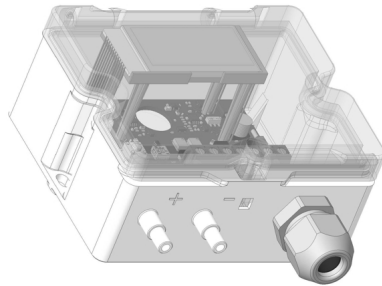
In addition, the device is available as a 2-wire or Modbus RTU variant.

Overall, the device can be delivered with the following equipment.

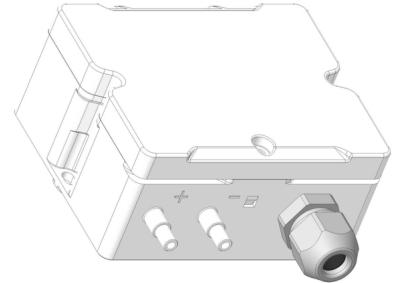
	3-con- ductor	2-con- ductor	Modbus RTU
Analogue output 0/4 ... 20 mA or 0/2 ... 10 V	x		
Current loop 4 ... 20 mA		x	
RS485 Modbus RTU			x
Options:			
Full graphic LC display	x	x	x
Changeover contact	x		

1.6 Device versions

Outwardly, the DE80 only differs in the version “with measured value display” and “without measured value display”. Both versions are available as a 2-conductor as well as a 3-conductor version. All other features can be configured using DIP switches.



With measuring value display



Without measuring value display

Fig. 2: Product summary

Connections

Connection on the pressure side is made by means of a hose nipple. The hose nipple is suitable for both 8/6 mm and 6/4 mm hose.

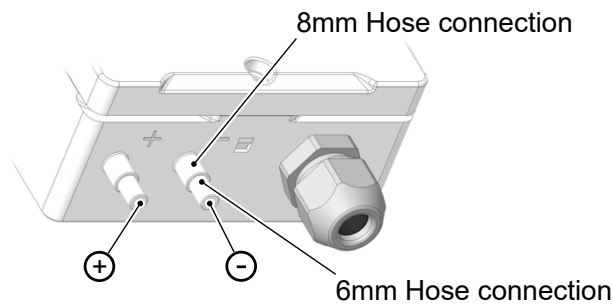


Fig. 3: Process connections

Electrical connection is made via an M16 x 1.5 cable screw connection with an internal terminal strip.

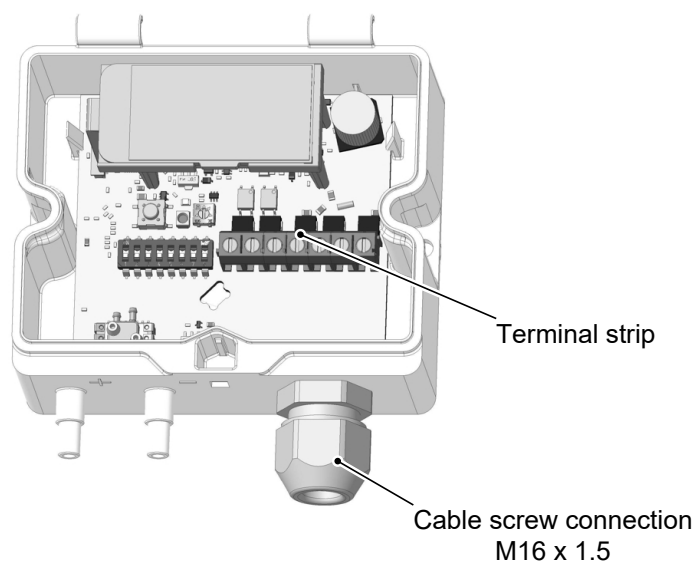


Fig. 4: Electric connections

2 Technical data

2.1 General

Type designation	DE80	
Pressure type	Differential pressure	
Measurement principle	Piezo-resistive	
Reference conditions (acc. to IEC 61298-1)		
Temperature	+15 to +25 °C	
Relative humidity	45 ... 75 %	
Air pressure	86 to 106 kPa	860 to 1060 mbar
Installation position	vertical	

2.2 Input variables

Basic measuring ranges		Overload		Bursting pressure	
1 mbar	100 Pa	0.7 bar	70 kPa	1.0 bar	100 kPa
10 mbar	1000 Pa	0.1 bar	10 kPa	0.2 bar	20 kPa
50 mbar	5000 Pa	0.8 bar	80 kPa	1 bar	100 kPa
100 mbar	10 kPa	0.8 bar	80 kPa	1 bar	100 kPa
250 mbar	25 kPa	1.4 bar	140 kPa	2.5 bar	250 kPa

Each basic measuring range can be divided into three specified measuring ranges. In the case of devices with a Modbus interface, this is parameterized via the interface. For devices with an analogue interface, the desired measuring range can be set using the DIP switches. All options are listed in the measurement accuracy table.

You can find more information on the measuring range configuration in the operating manual.

2.3 Output sizes

Analogue output 3-conductor

The output signal can be switched between 0 ... 20 mA, 4 ... 20 mA, 0 ... 10V and 2 ... 10 V (Live Zero).

Output signal	0 to 20 mA 4 to 20 mA	0 ... 10 V 2 ... 10 V
Signal range	0.0 to 21.5 mA	0.0 to 10.75 V
Load impedance R_L	$\leq 600 \Omega$	$\geq 2 k\Omega$

Switch output (changeover contact) 3-conductor

Type	Potential-free semiconductor switch (MOS-FET)
Progr. switching function	Changeover contact
Switching voltage	3 to 32 V AC/DC
Max. switching current	0.25 A
Max. switching output	8 W / 8 VA $R_{ON} \leq 4 \Omega$

Analogue output 2-conductor

Output signal	4 to 20 mA
Signal range	3.5 to 21.5 mA
Admissible resistance R_L	$R_L \leq (U_b - 7 V)/0.02 A$

2.4 Measuring accuracy

- Based on the reference temperature, the information only applies within the compensation range.
- The measurement error includes linearity, hysteresis and non-repeatability.
- Compensation range: 0 ... 60 °C.
- TC spread (for all measuring ranges)
 - Type 0.03 %/K
 - Max. 0.06 %/K

	Measuring range [mbar]	Measurement deviation		TC zero point	
		Type	Max.	Type	Max.
Basic measuring range 1 mbar / 100 Pa					
±1	0 ... 1	0.75 %	1.5 %	0.04 %/K	0.08 %/K
±0.75	0 ... 0.75	1.25 %	2.5 %	0.08 %/K	0.16 %/K
±0.5	0 ... 0.5	1.75 %	3.5 %	0.14 %/K	0.28 %/K
±0.25	0 ... 0.25	2.25 %	4.5 %	0.20 %/K	0.40 %/K
Basic measuring range 10 mbar / 1000 Pa					
±10	0 ... 10	0.75 %	1.5 %	0.02 %/K	0.05 %/K
±5	0 ... 5	1.25 %	2.5 %	0.05 %/K	0.10 %/K
±3	0 ... 3	1.75 %	3.5 %	0.07 %/K	0.15 %/K
±1	0 ... 1	2.25 %	4.5 %	0.10 %/K	0.20 %/K
Basic measuring range 50 mbar / 5000 Pa					
±50	0 ... 50	0.75 %	1.5 %	0.02 %/K	0.05 %/K
±30	0 ... 30	1.25 %	2.5 %	0.05 %/K	0.10 %/K
±20	0 ... 20	1.75 %	3.5 %	0.07 %/K	0.15 %/K
±10	0 ... 10	2.25 %	4.5 %	0.10 %/K	0.20 %/K
Basic measuring range 100 mbar / 10kPa					
±100	0 ... 100	0.75 %	1.5 %	0.02 %/K	0.04 %/K
±80	0 ... 80	1.25 %	2.5 %	0.03 %/K	0.06 %/K
±60	0 ... 60	1.75 %	3.5 %	0.04 %/K	0.08 %/K
±40	0 ... 40	2.25 %	4.5 %	0.05 %/K	0.10 %/K
Basic measuring range 250 mbar / 25 kPa					
±250	0 ... 250	0.75 %	1.5 %	0.02 %/K	0.04 %/K
±160	0 ... 160	1.25 %	2.5 %	0.03 %/K	0.06 %/K
±100	0 ... 100	1.75 %	3.5 %	0.04 %/K	0.08 %/K
±80	0 ... 80	2.25 %	4.5 %	0.05 %/K	0.10 %/K

2.5 Digital interfaces

Modbus RTU interface

interface	RS 485
Report	Modbus RTU
Modbus specification	Application Protocol Specification V1.1b3 (April 26, 2012)
Address	1 ... 128
Baud rate	2400 ... 115200 Baud
Parity	Even, uneven, parity
Stopbits	1...2

2.6 Auxiliary energy

3-conductor version/Modbus RTU

Nominal voltage	24 V AC/DC
Admissible operating voltage U_b	19.2 V ... 28.8 V AC/DC
Power consumption	< 2W

2-conductor version

Nominal voltage	24 V DC
Admissible operating voltage U_b	12 V ... 28.8 V DC

2.7 Operating conditions

Ambient temperature range	-20 to +70 °C
Medium temperature range	-20 to +70 °C
Storage temperature range	-20 to +70 °C
Protection class	IP54 IP65 with enclosed screw plug
EMC	EN 61326-1:2013 EN 61326-2-3:2013 EN 60730-1:2013
RoHS	EN IEC 63000:2018

2.8 Display

Display	Full graphic LC display
Resolution	128 x 64 Pixel
Back lighting	None
Measuring data display	Display format depends on the measuring range

2.9 Construction design

Process connection		Outer Ø	Inner Ø
Plug nipple	Hose	6 mm	4 mm
	Hose	8 mm	6 mm
Electrical connection	2-conductor	3-conductor	3-conductor Modbus changeover RTU contact
Cable screw connection M16 x 1.5	Print terminal No. of pins 3	Print terminal No. of pins 3	Print terminal No. of pins 7 Print terminal No. of pins 5
Cable screw connection clamping area	5 mm to 10 mm		
Fine-stranded conductor (with ferrule)	0.25 mm ² to 1 mm ²		
Single stranded conductor	0.34 mm ² to 1.5 mm ²		
Installation position	User-defined		
Dimensions (without connections)	92 x 45 x 83		
Weight	Max. 150 g		

2.9.1 Materials

Materials of the parts that come into contact with the medium

Process connection (housing)	Polycarbonate PC
Sensor element	Silicon
Hoses	EPDM

Materials of the parts that come into contact with the surroundings

Housing	Polycarbonate PC
Housing sealant	EPDM
Cable screw connection	Polyamide PA 6
Cable screw connection sealant	TPE or CR (Neoprene)
Closing screw	Galvanised steel

2.9.2 Dimension drawings

All dimensions in mm unless otherwise stated

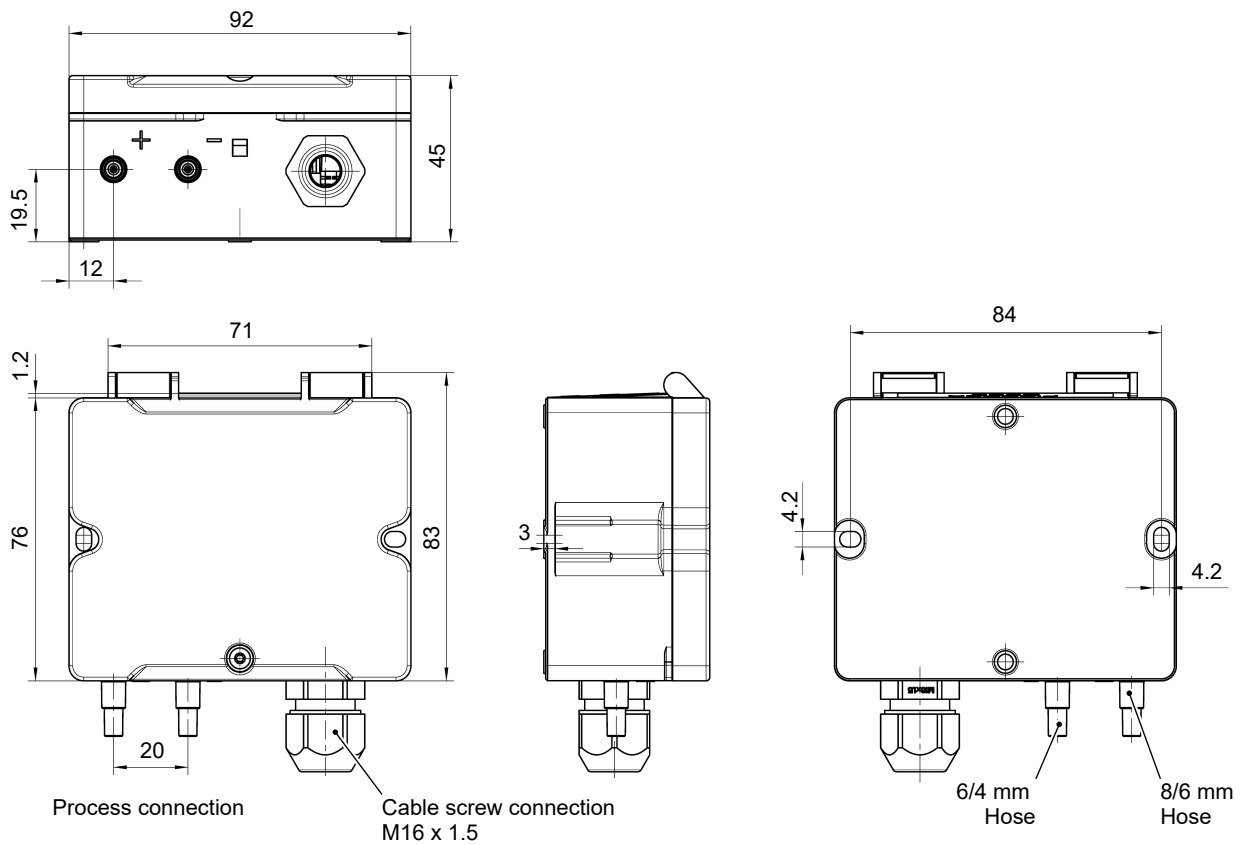
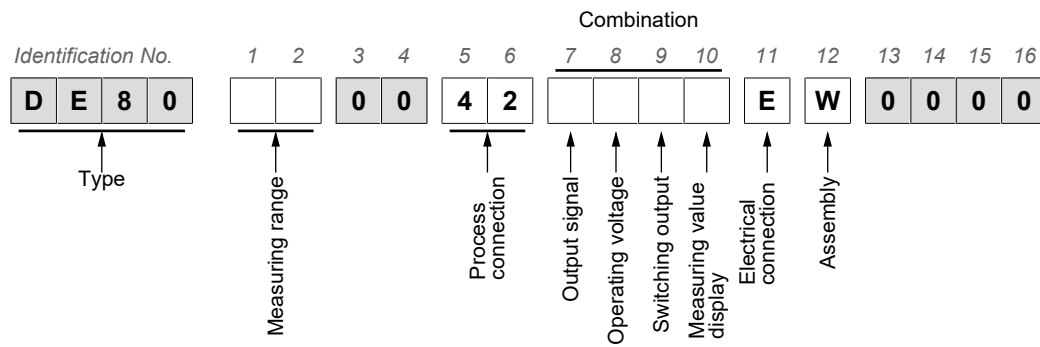


Fig. 5: Dimension drawing

3 Order codes



Measurement range:

[1.2]	
0E	Basic measuring range 1 mbar / 100 Pa
1E	Basic measuring range 10 mbar/ 1000 Pa
2E	Basic measuring range 50 mbar/ 5000 Pa
3E	Basic measuring range 100 mbar/ 10 kPa
4E	Basic measuring range 250 mbar/ 25 kPa

Process connection:

[5.6]	
42	Plug nipple for 6/4 mm or 8/6 mm hose

Combined identification number

[7-10]		
AL00	Output signal	: 0/4-20 mA, 0/2-10V, 3-conductor
	operating voltage	: 24 V AC/DC
	switching output	: without
	measured value display	: without
AL0C	Output signal	: 0/4-20 mA, 0/2-10V, 3-conductor
	operating voltage	: 24 V AC/DC
	switching output	: without
	measured value display	: 4-digit
AL3C	Output signal	: 0/4-20 mA, 0/2-10V, 3-Leiter
	operating voltage	: 24 V AC/DC
	switching output	: Changeover contact
	measured value display	: 4-digit measured value display
B900	Output signal	: 4-20 mA, 2-conductor
	operating voltage	: 24 V DC
	switching output	: without
	measured value display	: without
B90C	Output signal	: 4-20 mA, 2-conductor
	operating voltage	: 24 V DC
	switching output	: without
	measured value display	: 4 digit
ML0C	Output signal	: Modbus RTU, RS485, 3 conductor
	operating voltage	: 24 V AC/DC
	switching output	: without
	measured value display	: 4 digit
ML00	Output signal	: Modbus RTU, RS485, 3 conductor
	operating voltage	: 24 V AC/DC
	switching output	: without
	measured value display	: without

Electrical connection:**[11]****E** Cable screw connection**Assembly:****[12]****W** Wall mounting**3.1 Accessories**

- **Connection set**

To connect the differential pressure transmitter to the ventilation channels comprising

- PVC hose
- ABS measuring nozzle including attachment screws.

Designation	Hose	Length	Order no.
Connection set	2 x 6/4 mm	2.5 m	04005148
	2 x 8/6 mm	2.5 m	04005224

- **Spare parts**

Designation	Order no.
Locking screw	01001758

3.2 Information about the document

This document contains all technical data about the device. Great care was taken when compiling the texts and illustrations. nevertheless, errors cannot be ruled out.

Subject to technical amendments.

Notes



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