



II 3D Ex tc III B T125°C Dc  
II 3G Ex nA IIC T4 Gc

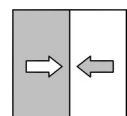


## Data sheet

### DE39 ... R/S

Digital differential pressure transmitter  
with colour-change LCD

for explosive areas  
Dust explosion protection zone 22, dry dusts  
Gas explosion protection zone 2, gases and vapours



# 1 Product and functional description

## 1.1 Performance features

### Typical applications

- Differential pressure measurements in heavily soiled media
- Filter monitoring
- Simple pump control systems
- Pump and compressor monitoring

### Important features

- 4-digit colour change LCD
- Selectable operating mode
  - Differential pressure measurement
  - 2-channel relative pressure measurement.
- Selectable pressure unit (bar, mbar, Pa, kPa, MPa, psi, InWc, mmHg)
- Selectable measured value display
  - Single-line presentation (channel 1 or channel 2)  
The respective other channel can be shown using the button ▲
  - Two-line presentation (both channels)
- Zero point correction
- Signal damping
- 2 programmable output signals (current/voltage)
- Characteristic curve spread (max. 10:1) with freely selectable offset
- Characteristic curve implementation via table (with max. 30 measuring points)
- Full parameter setting and measuring point protocol possible thanks to optionally available transmitter PC interface
- For use in areas at risk of explosion Zone 2 or Zone 22 depending on model

## 1.2 Intended use

The devices of the series DE39 can be used as display and switching device for measuring differential pressure of gaseous and fluid media. Its sturdy design also allows heavily contaminated media to be used. Always check the medium compatibility [▶ 7].

### 1.2.1 Explosion hazard area classification

#### Dust explosion protection

Devices with the order code DE39 ## V0 ### KWDL # S#### are suitable as 'Electrical equipment for use in areas with combustible dust', Zone 22 - dry dusts.

Designation as per guideline 2014/34/EU:

⊕ II 3D Ex tc IIIB T125°C Dc  
-10 °C ≤ T<sub>amb</sub> ≤ 60 °C



## **WARNING**


### **Static electricity**

The case must be equipped with an earth connection on the side to reduce the surface resistance.

### **Gas explosion protection**

Devices with the order code DE39 ## V0 ### KWDM # R##### are suitable as 'Electrical equipment for use in potentially explosive areas, Zone 2 - Gases and vapours.

Designation as per guideline 2014/34/EU:

 II 3G Ex nA IIC T4 Gc  
-10 °C ≤ T<sub>amb</sub> ≤ 60 °C

## **1.3 Design and mode of operation**

The pressure is measured by two integrated ceramic sensor elements whose measuring signals P+ and P- are analysed by a digital measuring transducer. The analysis allows two independent switch points to be set and makes two programmable output signals available. The measurements can be shown together, separately or alternately. The nominal pressures of the integrated sensors and the differential pressure measuring range are set permanently ex-works and stated on the type plate.

The unit works in two operating modes:

### **(a) Differential pressure measurement**

The first output signal (Sig 1) is proportional to the differential pressure ( $\Delta P$ ) and can be influenced by means of rooting or a table. The second output signal (Sig 2) is proportional to the pressure and can be assigned optionally to the signal P+ or P-.

### **(b) 2-channel relative pressure measurement**

The output signals are proportional to the pressure, in which the output (Sig1) is permanently assigned to the pressure (P+) and the output (Sig2) is permanently assigned to the pressure (P-). Both output signals can be rooted or influenced by means of a table.

### 1.4 Function diagram

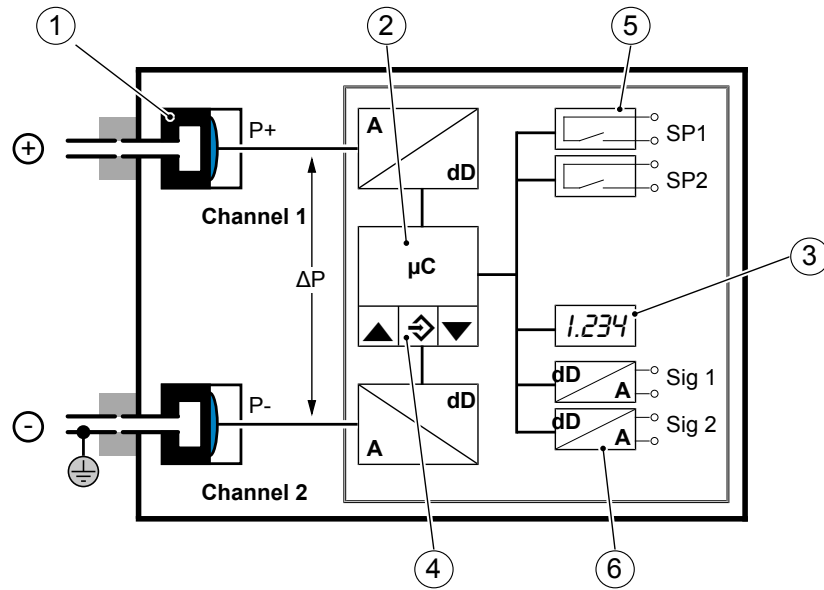


Fig. 1: Function diagram

1	Ceramic sensor element	2	Micro-controller
3	Advertisement	4	Keyboard
5	Switching outputs	6	Analogue outputs

### 1.5 Equipment versions

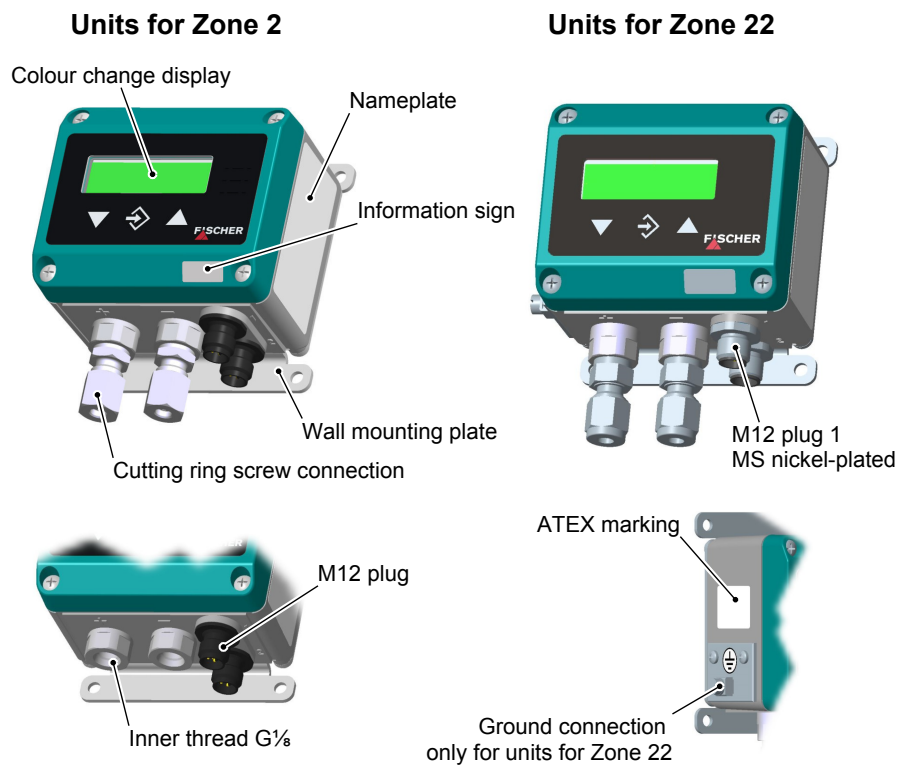


Fig. 2: Equipment versions

## 2 Technical data

### 2.1 Input variables

#### Measuring variable

Differential and relative pressure

#### Measuring range

Measuring range		Stat. operating pressure max.	Overpressure	Bursting pressure
bar	MPa	bar	bar	bar
0...6	0...0.6	6	20	35
0...10	0...1.0	10	40	70
0...16	0...1.6	16	40	70
0...25	0...2.5	25	100	150
0...40	0...4.0	40	100	150

### 2.2 Output sizes

#### Analogue output signal

Connection type: Three-wire

Max. Spread: 10:1

Outlet	Signal range	Apparent ohmic resistance
0 ... 20 mA	0.0 ... 21.0 mA	$U_b \leq 26 \text{ V} : R_L \leq (U_b - 4 \text{ V})/0.02 \text{ A}$
4 ... 20 mA		$U_b > 26 \text{ V} : R_L \leq 1100 \Omega$
0 ... 10 V	0.0 ... 11.0 V	$R_L \geq 2 \text{ k}\Omega$

#### Switching outputs

2 potential-free semiconductor switches (MOSFET)

MOSFET	
Progr. switching function	One-pin activator (NO) One-pin deactivator (NC)
Max. switching voltage	3...32 V AC/DC
Max. switching current	0.25 A
Max. switching output	8 W / 8 VA $R_{ON} \leq 4 \Omega$

### 2.3 Measurement accuracy

Non-linearity	Max	0.5 % FS
	Typical	0.2 % FS
Hysteresis	Max	0.5 % FS
	Typical	0.2 % FS
Characteristic curve deviation <sup>1)</sup>	Max	1.0 %
Temperature drift	Zero point	0.07 % FS/K
	Measuring range	0.05 % FS/K

<sup>1)</sup> incl. non-linearity and hysteresis

## 2.4 Auxiliary energy

Rated Voltage	24 V AC/DC
Allowed operating voltage	12 ... 32 V AC/DC
Power input	approx. 2 W (VA)

A CE-compliant power supply unit with a 200 mA fuse only may be used as a power supply.

## 2.5 Operating conditions

Increase ambient temperature	-10 ... +60 °C
Media temperature	-10 ... +60 °C
Storage temperature	-20 ... +70 °C
Enclosure protection class	IP65 as per EN 60529
ATEX	EN 60079-0:2012 + A11:2013 EN 60079-15:2010 EN 60079-31:2014
EMC	EN 61326-1:2013 EN 61326-2-3:2013
RoHS	EN 50581:2012

## 2.6 Display and operating interface

### Advertisement

4...6-digit LCD, full graphic, colour backlighting

### Programming

Attenuation	0.0 ... 100.0 s (jump response time 10 / 90 %)
Switch output	Switch-off point, switch-on point, response time (0...1800s), function (NC / NO contact), channel assignment
Measuring range unit	bar, mbar, Pa, kPa, MPa, psi, InWc, mmWs, mmHg, 'free unit', starting value, end value and decimal point for 'free unit'
Output signal	User-definable within the basic measuring range <sup>(1)</sup>
Zero-point window	0... $\frac{1}{3}$ of the basic measuring range <sup>(2)</sup>
Offset correction	$\pm\frac{1}{3}$ of the basic measuring range <sup>(3)</sup>
Implementation of characteristic curve	linear, square rooted, table with 3...30 support points
Password	001 ... 999 (000 = no password protection)
Language (can be switched)	DE, EN, FR, ES, IT, PT, and HU

(1) Max. effective spread 10:1

(2) measured values around zero are set to zero.

(3) To compensate different installation positions.

## 2.7 Construction design

### Process connection

Type	the material.	Size
Inner thread	1.4404	G $\frac{1}{8}$
Cutting ring screw connection	1.4571	6 mm tube
Cutting ring screw connection	1.4571	8 mm tube
Cutting ring screw connection	Nickel-plated brass	6 mm tube
Cutting ring screw connection	Nickel-plated brass	8 mm tube

### Materials

Housing	Polyamide (PA) 6.6
Media-contacting material	CrNi steel 1.4404, FKM, Rubalit® 708 + Process connection (see above)

### Assembly

Attachment boreholes on the rear side for attachment to mounting plates.
Wall mounting using wall mounting plate
Panel mounting set for installing the panel
Assembly of the mounting rails using an adapter

### 2.7.1 Dimensional drawings

#### Wall mounting

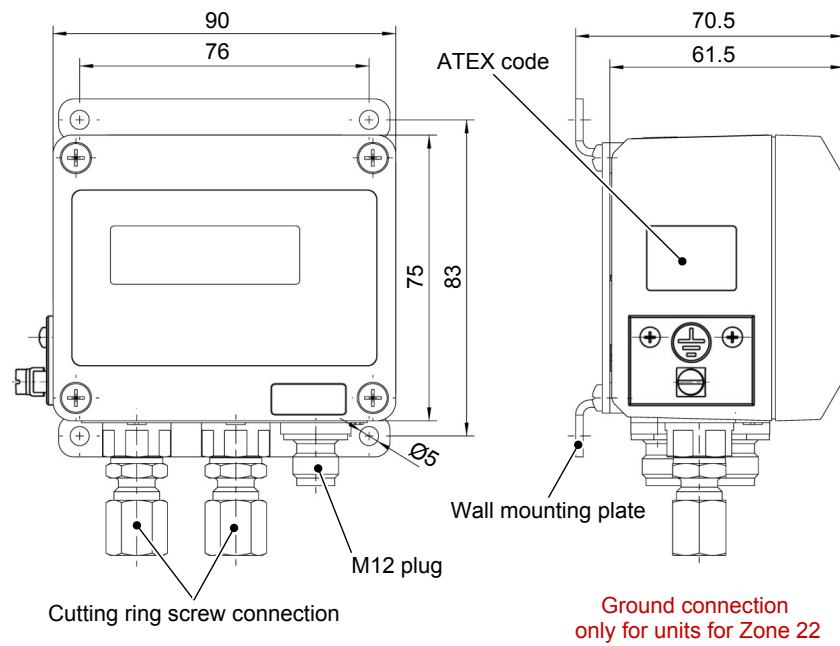


Fig. 3: Dimensional picture

#### Attachment boreholes on rear side

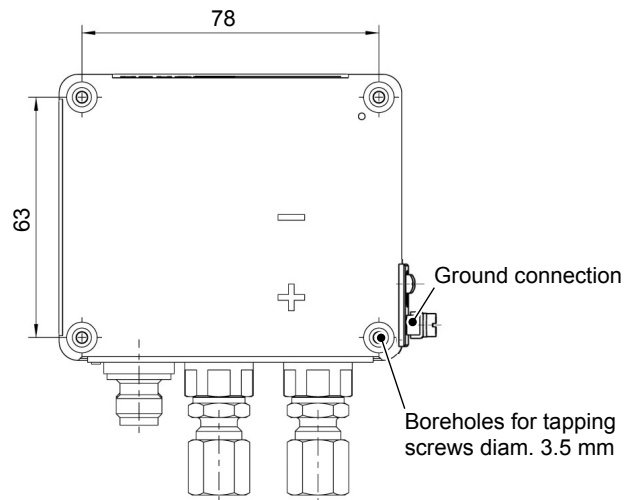
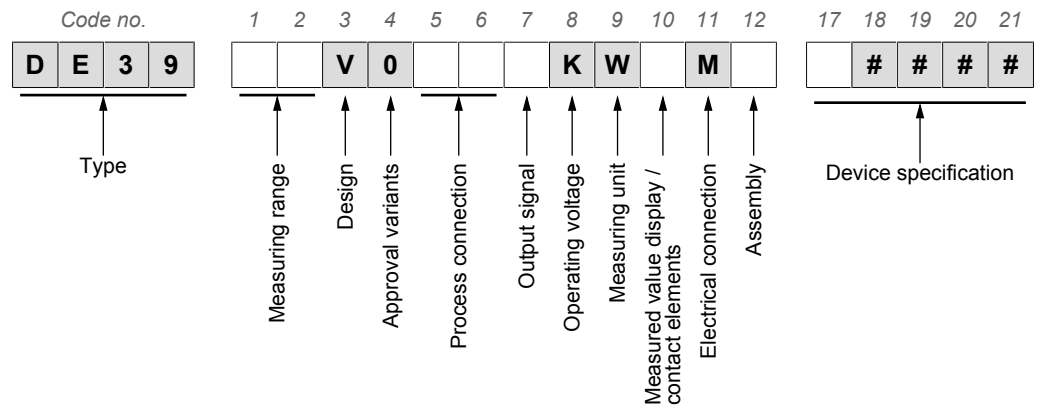


Fig. 4: Rear view of dimensional picture



### 3 Order Codes



#### Measuring range:

[1.2] (Code no.)	
06	0...6 bar
07	0...10 bar
08	0...16 bar
09	0...25 bar
10	0...40 bar

#### Design:

[3] (Code no.)	
R	CrNi Steel 1.4404

#### Approval variants:

[4] (Code no.)	
0	Default

#### Process connection:

[5.6] (Code no.)	
00	Inner thread G $\frac{1}{8}$
24	Cutting ring screw connection made of 1.4571 for 6 mm tube
25	Cutting ring screw connection made of 1.4571 for 8 mm tube
28	Cutting ring connection made of brass galvanised for 6 mm tube
29	Cutting ring connection made of brass galvanised for 8 mm tube

#### Output signal:

[7] (Code no.)	
0	without output signal
4	0 ... 20 mA
5	0 ... 10 V
6	4 ... 20 mA

#### Operating voltage:

[8] (Code no.)	
K	24 V AC/DC

**Measuring unit:**

<b>[9]</b>	<b>(Code no.)</b>
<b>W</b>	Selectable pressure units

**Measured value display / contact elements:**

<b>[10]</b>	<b>(Code no.)</b>
<b>dD</b>	4-digit colour change LCD          2 semiconductor switches

**Electrical connection**

<b>[11]</b>	<b>(Code no.)</b>
<b>M</b>	M12 plug connection          Zone 2
<b>L</b>	M12 connector socket Ms-nickel-plated          Zone 22

**Assembly:**

<b>[12]</b>	<b>(Code no.)</b>
<b>0</b>	Attachment boreholes on rear side (standard)
<b>W</b>	Wall mounting

**Device specification:**

<b>[17]</b>	<b>(Code no.)</b>
<b>R</b>	Gas explosion protection zone 2, gases and vapours
<b>S</b>	Dust explosion protection zone 22, dry dusts

<b>[18...21]</b>	<b>(Code no.)</b>
<b>####</b>	Ser. No.

### 3.1 Accessories

Order no.	Designation	No. of Poles	length
06401993	M12 Connection cable for switching outputs	4-pin	2m
06401994	M12 Connection cable for switching outputs	4-pin	5m
06401563	M12 Connection cable for switching outputs	4-pin	7m
06401572	M12 Connection cable for switching outputs	4-pin	10m
06401995	M12 Connection cable for supply/signal	5-pin	2m
06401996	M12 Connection cable for supply/signal	5-pin	5m
06401564	M12 Connection cable for supply/signal	5-pin	7m
06401573	M12 Connection cable for supply/signal	5-pin	10m

### Remote configuration

Order no.		
EU05 0000	Transmitter PC interface incl. PC software	without battery
EU05 0001	Transmitter PC interface incl. PC software	With battery
EU03 F300	Transmitter PC interface incl. PC software	

A data sheet is available on our website [www.fischermesstechnik.de](http://www.fischermesstechnik.de) or on request.

### 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.



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