



Fig. 1

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## General notes



The devices may only be assembled, started up, and operated by experienced personnel familiar with this product. Proper shipping and appropriate storage of the devices are assumed.

In these mounting and operating instructions, the term “experienced personnel” refers to persons, who are able to evaluate the responsibilities assigned to them as well as recognize potential hazards due to their specialized training, knowledge, and experience as well as their special knowledge of the relevant standards.

Staff handling/operating explosion-protected devices in hazardous areas must be specially trained or instructed, i. e. authorized to handle/operate explosion-protected devices.

For technical data, ordering data, spare parts and accessories see Data Sheet T 6051EN.

## Mounting



Before mounting, all relevant parts of the plant must be depressurized.

The transmitter must be mounted so that the connecting piece is vertically suspended. In the case of liquids and gases, the transmitter can also be mounted with horizontally suspended connecting piece. In this case, the vent hole must be positioned underneath the grounding terminal (see Fig. 2).

The electrical connection can be either on the left or on the right side of the enclosure, and the LC display can be suspended depending on the mounting position.

On mounting, it is important that an adequate clearance for opening the enclosure covers is observed.

### Mounting position



Vertical mounting



Horizontal mounting

Fig. 2

## Process connection



The air supply pipe and screw joints may only be laid and assembled by experienced personnel. They must be regularly checked for leaks and damage and, if necessary, repaired. Before starting any repair work, the process connection pipe must be depressurized.

The transmitter is provided with a connecting piece G 1/2 A acc. to DIN 16288 or an external diaphragm seal for process connection.

## Instrumentation

### External diaphragm seal

The transmitter can be provided with an external diaphragm seal, e. g. screwed-type, flange-type, in-line or cell diaphragm seal. In this case, the additional zero deviation through the process medium temperature must be observed (see Data Sheet T 6051 EN).

### Temperature separation

A transmitter **without external diaphragm seal** must be installed with a siphon when used with vapors.



**Prior to start-up, the siphon must be filled with water.**

In the case of liquids and gases with process medium temperatures above 70 °C, a siphon must be installed or a capillary tube of adequate length must be provided.

A transmitter **with external diaphragm seal** must be installed with a temperature decoupler when used for process medium temperatures above 70 °C (see Data Sheet T 6051 EN).

## Electrical connection



As far as the electrical installation of the device is concerned, the relevant electrotechnical regulations and the accident prevention regulations of the country in which the device is used must be observed. In Germany these are the VDE regulations and the accident prevention regulations of the employer's liability insurance association.

**For mounting in hazardous areas, the respective national regulations of the country in which the device is used apply. In Germany these are VDE 0165/EN 60079.**

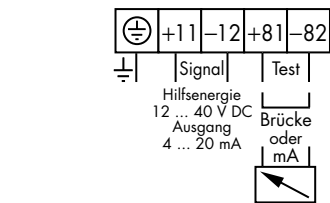
**For connection to certified intrinsically safe electric circuits, the EC-Type Examination Certificate PTB 02 ATEX 2075 applies (see page 7).**

**When connected to DC voltage signals, correct polarity must be ensured.**

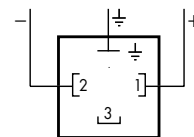
### Connecting cable

Electrical connection follows either through a cable gland M 20 × 1.5 to a terminal underneath the enclosure cover "Terminal Box" or with a plug-type connector (see Fig. 3). Preferably a covered connecting cable with a conductor cross-section of minimum 0.5 mm<sup>2</sup> and an external diameter of 6 to 8 mm is used. To guarantee the protection class IP 65, the installation must be executed correctly.

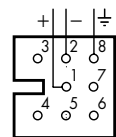
### Connecting diagrams



Terminal



Plug-type connector acc. to EN 175 301-803



Plug-type connector Han 7 D (manufactured by Harting)

Fig. 3

## Operation and adjustment

Once the enclosure cover "Terminal Box" has been screwed off and the LC display ③ is swung open, you can access the rotary switch ① to select the required functions and the button ② to set them (see also Fig. 4 and the table on page 5).

**Note:** When you have entered all settings, you must reset the device to ① **Standard operating mode**.

### ① Standard operating mode

The pressure applied is issued as a proportional output signal, and the indicating value is displayed on the LC display. If the pressure lies more than 5 % outside the measuring range, an error signal is issued and a message appears on the LC display.

### ② Zero point

The pressure applied becomes the zero point (lower measuring range value) when you press the button.

**Note:** The zero point must be minimum 20 % below the upper range value.

### ③ Upper range value and operating direction

The pressure applied becomes the upper range value (upper measuring range value) when you press the button.

**Note:** The measuring span is the difference between the lower and the upper range values. The upper range value must be minimum 20 % above the lower measuring range value.

The operating direction of the output signal appears on the LC display when you press the button. Press the button again to change the operating direction and save the settings by changing the position ③ of the rotary switch.

### ④ Damping

The damping of the output signal is indicated on the LC display. Pressing the button switches the damping in increments. Save the settings by changing the position ④ of the rotary switch.

### ⑤ Error diagnosis and error signal

The error diagnosis is carried out step-by-step when you press the button. The results are issued one after the other as output signal and indicated on the LC display.

**Note:** You cannot change the position ⑤ before the error diagnosis has been completed.

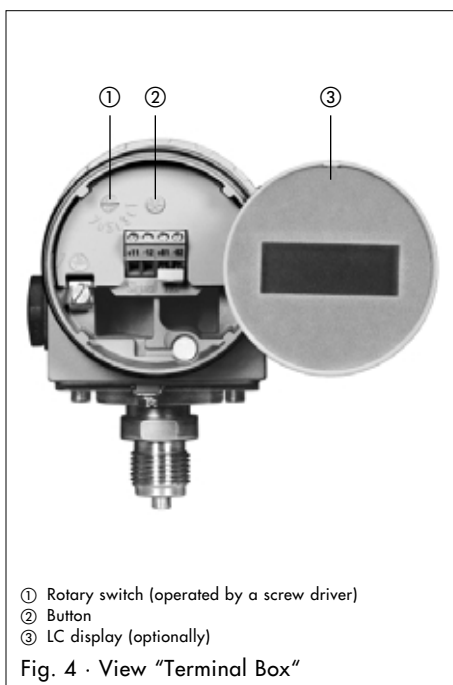


Fig. 4 · View "Terminal Box"

The error signal is issued on pressing the button and indicated on the LC display. Pressing the button again changes the error signal which is saved when you change the position ⑤.

### ⑥ Indicating value at 4 mA

The indicating value at 4 mA appears on the LC display when you press the button and the units digit is activated.

**Note:** If you do not want to change the indicating value, you can turn the rotary switch to a different position.

The indicating value is adjusted step-by-step by pressing the button. If you press the button sufficiently long, the active digit is increased to the desired value. Briefly pressing the button saves the value and switches the active digit. During the setting, the error signal is issued.

**Note:** When you change the indicating value for the lower measuring range value, the indicating value for the upper measuring range value is automatically adapted.

### ⑦ Indicating value at 20 mA

To change the indicating value at 20 mA, proceed as described for position ⑥.

Rotary switch ①	Button ②		LC display ③
Position/function	Action	Description	Displayed
<b>① Standard operating mode</b>	–	Output signal proportional to pressure Error signal	Indicating value Err
<b>② Zero point</b>	Press	Lower measuring range value	–
<b>③ Upper range value</b>	Press	Upper measuring range value	–
<b>Operating direction</b>	Press	>> ↔ <> (Output signal 20 ↔ 4 mA)	O:H ↔ O:L
<b>④ Damping</b>	Press	0.015 s	d:0
	Press	0.060 s	d:1
	Press	0.240 s	d:2
	Press	0.960 s	d:3
	Press	3.840 s	d:4
	Press	15.360 s	d:5
<b>⑤ Error diagnosis</b>	–	–	E:
	Press	Starts error diagnosis	E:S
Start RAM	Press	No error (Output signal 8 mA) Error (Output signal 16 mA)	E:1.0 E:1.1
EEPROM	Press	No error (Output signal 8 mA) Error (Output signal 16 mA)	E:2.0 E:2.1
A/D converter Status	Press	No error (Output signal 8 mA) Error (Output signal 16 mA)	E:3.0 E:3.1
	Value	Press	No error (Output signal 8 mA) Error (Output signal 16 mA)
Calculation	Press	No error (Output signal 8 mA) Error (Output signal 16 mA)	E:5.0 E:5.1
Lower measuring range value	Press	No error (Output signal 8 mA) Error (Output signal 16 mA)	E:6.0 E:6.1
	Press	No error (Output signal 8 mA) Error (Output signal 16 mA)	E:7.0 E:7.1
Upper measuring range value	Press	No error (Output signal 8 mA) Error (Output signal 16 mA)	E:8.0 E:8.1
Measured value	Press	No error (Output signal 8 mA) Error (Output signal 16 mA)	E:8.0 E:8.1
End	Press	Ends error diagnosis	E:E
<b>Error signal</b>	Press	22,8 ↔ 3,6 mA (Output = Error signal)	E:H ↔ E:L
<b>⑥ Indicating value at 4 mA</b> Indicating range –1999 ... +1999	Press	1s digit (Output = Error signal)	Indicating value
	Press	10s digit (Output = Error signal)	Indicating value
	Press	100s digit (Output = Error signal)	Indicating value
	Press	1 000s digit (Output = Error signal)	Indicating value
	Press	Sign (+/–) (Output = Error signal)	Indicating value
	Press	Decimal point (Output = Error signal)	Indicating value
<b>⑦ Indicating value at 20 mA</b> Indicating range –1999 ... +1999	Press	1s digit (Output = Error signal)	Indicating value
	Press	10s digit (Output = Error signal)	Indicating value
	Press	100s digit (Output = Error signal)	Indicating value
	Press	1 000s digit (Output = Error signal)	Indicating value
	Press	Sign (+/–) (Output = Error signal)	Indicating value

**Factory default**

- ② Zero point: 0 or –0.1 bar, depends on the measuring element; ③ Upper range value: max. measuring span; Operating direction: >>;  
 ④ Damping: 0.015 s; ⑤ Error signal: 22.8 mA; ⑥ Indicating value at 4 mA: 0 %; ⑦ Indicating value at 20 mA: 100 %

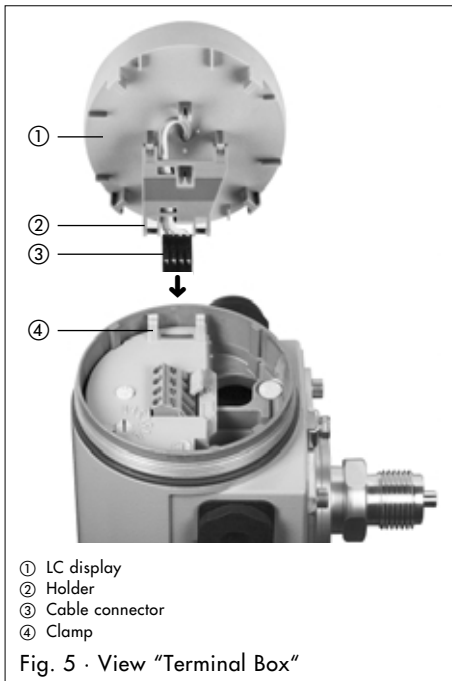
## Installing the LC display

The transmitter can be retrofitted with an LC display as follows (see Fig. 5):

1. Screw off enclosure cover "Terminal Box."
2. Insert cable connector ③ with gold contacts directed inwards into the slot between the clamps ④.
3. Place holder ② onto the clamps ④ and swing LC display ① closed.

**Note:** The LC display ① can be placed on the holder ② turned by 90 degrees which allows it to be adapted to the mounting position of the transmitter (see "Mounting position", Fig. 2).

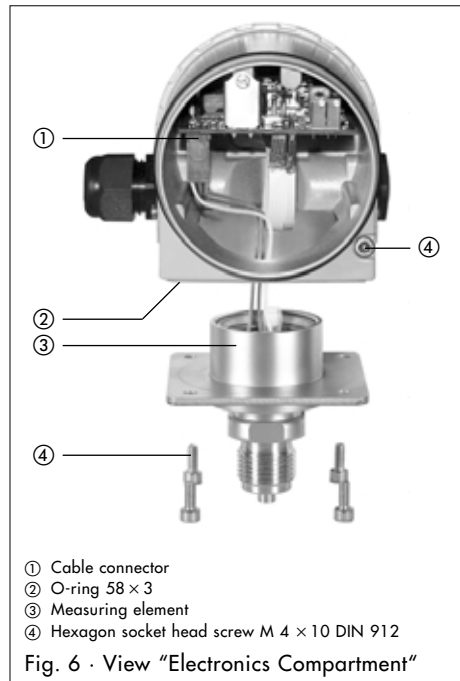
4. Test the function of the LC display ①.
5. Screw on enclosure cover.



## Changing the measuring element

With removed transmitter the measuring element can be changed as follows (see Fig. 6):

1. Turn hexagon socket head screw ④ in clockwise direction until the screw head does not rest in the cover clearance anymore and screw off enclosure cover "Electronics Compartment."
2. Pull off cable connector ① from plug ST2.
3. Unscrew 4 hexagon socket head screws ④ and remove measuring element ③ from the enclosure.
4. Check O-ring ② for damages and replace it if necessary.
5. Change measuring element ③ and attach it with 4 hexagon socket head screws ④ at the enclosure.
6. Stick cable connector ① onto plug ST2.
7. Test the function of the transmitter.
8. Screw open enclosure cover and turn hexagon socket head screw ④ counterclockwise until the screw head rests in the cover clearance.



## Certifications

EC-Type Examination Certificate PTB 02 ATEX 2075 (extract)  
for Type 6051-1 Electrical Transmitter



II 2 G EEx ia IIC T6

for use in hazardous areas (Zone 1 or 21)

For connection to certified intrinsically safe electric circuits, refer to the permissible maximum values for the input voltage  $U_i$ , input current  $I_i$ , power dissipation  $P_i$ , internal capacitance  $C_i$  and internal inductance  $L_i$  listed in the following table:

Signal circuit	
Terminals	11/12 or 81/82
$U_i$	28 V
$I_i$	115 mA
$P_i$	1 W
$C_i$	5 nF
$L_i$	49 $\mu$ H

The correlation between the temperature class and the permissible ambient temperature is shown in the following table:

Ambient temperature in temperature class	<b>T6</b>	-45 ... +60 °C
	<b>T5</b>	-45 ... +70 °C
	<b>T4</b>	-45 ... +80 °C

**Note:** The EC-Type Examination Certificate is available on request

(Specifications subject to change without notice)

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