FISCHER MESS- UND REGELTECHNIK

Operating Manual

DE44 Digital 2-channel differential pressure switch/transmitter with 4-digit color change LCD

Contents

1 Safety Instructions

1.1 General information

This operating manual contains detailed information about the installation, operation and maintenance of the instrument. This information must be observed and read by the installer, operator and other skilled personnel prior to any installation and commissioning of the instrument.

This operating manual forms part of the product and must be kept in the immediate vicinity of the instrument for easy access by the responsible personnel at any time.

The following chapters, especially the instructions on installation, commissioning and maintenance contain important safety information, the non-compliance of which may result in hazards to persons, animals, environment and objects.

1.1 Personnel qualification

Only personnel trained in the installation, commissioning and operation of this product may install and operate the same.

Skilled personnel are persons who are able to judge delegated work and possible hazards based on their technical education, proficiency and experiences, particularly due to their knowledge about the applicable norms.

1.2 Risks of non-compliance with safety instructions

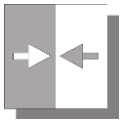
Non-compliance with these safety instructions, inappropriate use of this product, and/or operation of this product outside the limits specified for any of its technical parameters, may result in harm to persons, the environment or the system in which it is installed.

The producer is not liable for any claims for damages in such circumstances.

1.3 Safety instructions for operators

Safety instructions for the proper use of this product must be followed. This information must be available at all times to personnel responsible for installation, operation, maintenance and inspection of this product.

Adequate steps must be taken to prevent the occurrence of hazardous conditions that can be caused by electric energy and the convertible energy of the process media and/or improper connection of the instrument. Detailed information can be found in the relevant na-



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tional and/or international rules and regulations.

In Germany DIN EN, UVV apply, for industry-specific applications regulations of DVGW, Ex, GL, as well as the rules of the local authorities (EVUs in Germany).

1.4 Forbidden modifications

Modification or other technical alteration of the device by the customer is not permissible. This also applies for the use of spare parts. Any eventual modifications/ variations will be carried out solely by Fischer Mess- und Regeltechnik GmbH.

1.5 Impermissible operational modes

The operational dependability of the device is guaranteed only if it is used as intended. The device version must be adapted to the medium used in the system. The limiting values stated in the technical data must not be exceeded.

1.6 Safety Considerations during Installation and Maintenance

The safety instructions stated in this manual, existing national regulations on accident prevention and the internal rules and procedures on working, operation and safety of the operator are to be observed.

It is the responsibility of the operator to ensure that only authorised and skilled technical personnel carry out any required maintenance, inspection and installation works.

1.7 Explanation of symbols

WARNING!
...indicates a possible hazardous situation the non-observance of which might result in hazards to humans, animals, environment and objects.

INFORMATION!
…points out important information for efficient and trouble-free operation.

TIP!
…points out useful recommendations that are not necessarily required for operation that might however be of use in certain situations.

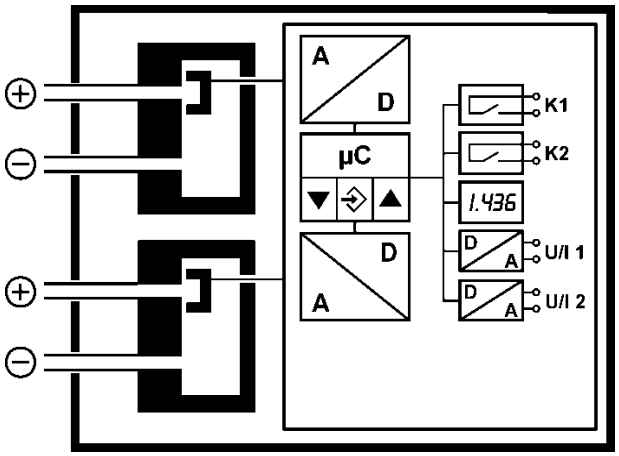
2 Intended Applications

- Air-conditioning technology
- Ventilation technology
- Environmental technology
- Monitoring roller band filters, suction systems etc.
- Draw measurements on chimneys
- Flow and control pressure measurements
- Surface technology

The device can be used as a display and switch device and has two independent differential pressure inputs. It is suitable for measuring pressure, underpressure and differential pressure for neutral gaseous mediums.

3 Product Description and Function

3.1 Functional Sheme



3.2 Principles of Operation

The basis of this switch device is two piezoresistive sensors.

The pressure to be measured, effects directly on a silicon membrane equipped with a resistance measurement bridge. The deflection caused by the pressure effecting the membrane produces a change in resistance which is assessed by the electronics integrated in the device and converted into signals for display and switch contacts.

Two optionally available transmitter outputs can be dampened, spread, inverted and transformed using a table function, including non-linear.

4 Installation

The device is intended for installation on level mounting plates. To screw connect to the mounting plate, the device has four mounting drill holes for plate screws on the back Ø 3.5 mm.

The device can be supplied with a wall mounting plate as an option (see order markings)

The device is adjusted for vertical installation in the factory, but you can choose any installation position. If you choose a different installation position to vertical, the zero point signal can be corrected by the installed zero point adjustment (see Initialisation/operating manual).

The housing protection class IP65 is only guaranteed if a suitable connection line is used.

If the device is planned for outdoor use, we recommend using a suitable protective housing for permanent protection of the film keypad against UV radiation and as a protective measure against heavy rain and snow. The use of a sufficiently sized protective roof is required as a minimum.

4.1 Process connection

- By authorized and qualified specialized personnel only.
- The pipes need to be depressurized when the instrument is being connected.
- Appropriate steps must be taken to protect the instrument from pressure surges.
- Check the suitability of the instrument for the media that is to be measured.
- Pay attention to maximum pressures.
- The tightness of the pressure connection lines must be checked before initialization.

The pressure measuring lines need to be kept as short as possible and installed without sharp bends to avoid interfering delay times.

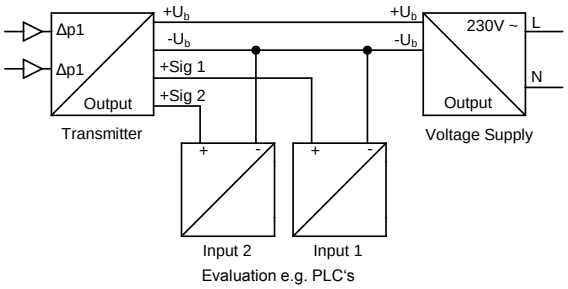
The pressure connections are marked with the (+) and (-) symbols on the device. For differential pressure measurements, the higher pressure on the (+) side and the lower pressure on the (-) side of the device are connected.

If, upon initialization, pressure is already applied to the pressure measurement lines, no zero point test and adjustment can be undertaken. In these cases, the device should be connected electrically first.

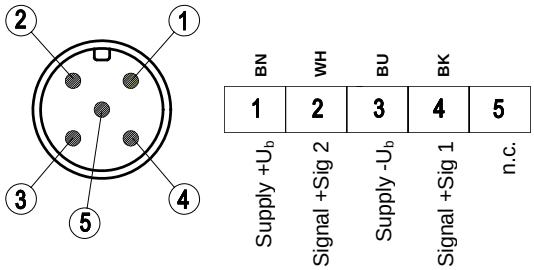
4.2 Electrical connection

- By authorized and qualified specialized personnel only.
- The instrument must be connected electrically in accordance with the relevant VDE guidelines and the guidelines of the local EVU.
- Disconnect the system before attaching the instrument.
- Install the consumer-adapted fuses.

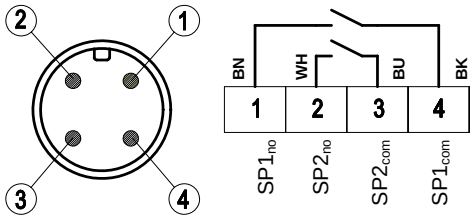
4.2.1 3-wire circuit



4.2.2 Plug 1: supply and output signal



4.2.3 Plug 2: switch outputs



5 Commissioning and Operating Manual

All electrical supply, operating and measuring lines and the pressure connections must have been correctly installed before commissioning. All connecting pipes must be laid in a way that ensures that no mechanical forces act on the instrument.

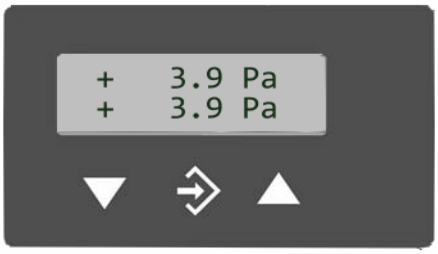
5.1 Configuration

There are a number of setting options to adjust that device optimally to the measurement point and measuring task upon initialization. In order to ar-

range the entry more clearly, the individual parameters are summarized in groups in the menu.

Depending on the current device version (current output/voltage output/contacts), several menu points are not available. This means you cannot set any switch points for a device without contacts.

5.2 Display



The 4-digit LCD display represents the current measurement value in the normal mode. If the device is equipped with contacts, a closed contact is symbolized by the inverted text "SP1" or "SP2".

For devices with two input channels, both measurement values are displayed at the same time. The switch point symbols are displayed for the corresponding channel.

In order to differentiate the measurement values between good and bad, the background lighting can change the color. A fixed color can also be selected as an alternative for the background color. The background lighting is can also be switched off.

During parameterization, the menu point and the corresponding parameter are shown on the display. The device continues to work during parameterization and therefore takes immediate effect with one exception.

5.3 Operation

Operation takes place using the buttons:

- ▼ : reduce value
- ⏎ : Enter
- ▲ : increase value

From the normal mode, you reach the menu with the ⏎ button.[1]

You can display the individual menu points and parameters with the ▲and ▼buttons.

With the ⏎ button, the respective menu point is selected or the parameters called up for change.

The display flashes if a parameter can be changed.

- The change is made with the buttons ▲and ▼.
- The value is saved with the ⏎ button.

Using the `Menüebene beenden (end menu level)` parameter, you return to the next highest menu level. If no buttons are pressed, the device automatically returns to the measurement value display.

EXAMPLE: setting the switch points

Press the ⏎ button in the normal mode to enter the menu. The following display appears

```
Menüebene
Schaltpunkte
```

In order to change the switch points, press the ⏎ button again.

```
SP1 Ein
+30.0 Pa
```

The first entry (SP1 here) of a parameter list is shown and the set value below. With the buttons ▲ or ▼, you can now also set other parameters. However, in order to change parameter SP1 for example press button ⏎ again.

```
SP1 Ein
+30.0 Pa
-50.0 ... +150.0 Pa
```

- the parameter is stated in the first line once again,
- In the second line, the value to be changed is displayed and the display flashes.
- In the 3rd line (if available), the entry limits are displayed.

With buttons ▲and ▼**,** the required value is set and taken over with ⏎.

[1] A password may need to be set after pressing the button ⏎ (s.5.4.7).

5.4 Menu (Original)

- **Schaltpunkte**

  Schaltpunkt 1 Ein
  Schaltpunkt 1 Aus
  Schaltpunkt 1 Verzögerung
  Schaltpunkt 1 Funktion
  Zuordnung des Schaltpunktes
  Schaltpunkt 2 Ein
  Schaltpunkt 2 Aus
  Schaltpunkt 2 Verzögerung
  Schaltpunkt 2 Funktion

- **Eingang**

  Dämpfung
  Offsetkorrektur
  Spannenkorrektur
  Nullpunktfenster

  bei 2kanaligen Geräten:

  Dämpfung Kanal 2
  Offsetkorrektur Kanal 2
  Spannenkorrektur Kanal 2
  Nullpunktkorrektur Kanal 2

- **Messung**

  Messbereich Anfang
  Messbereich Ende
  Einheit
  Begrenzung

  bei 2kanaligen Geräten:

  Messbereich Anfang Kanal 2
  Messbereich Ende Kanal 2
  Einheit Kanal 2

- **Ausgang**

  min. Ausgang
  max. Ausgang
  Fehlersignal

- **Menu (Translation)**

- **Switch points**

  Switch point 1 on
  Switch point 1 off
  Switch point 1 delay
  Switch point 1 function
  Allocation of the switch point
  Switch point 2 on
  Switch point 2 off
  Switch point 2 delay
  Switch point 2 function

- **Input**

  Dampening
  Offset correction
  Clamping correction
  Zero point window

  For 2-channel devices:

  Dampening channel 2
  Offset correction channel 2
  Clamping correction channel 2
  Zero point window channel 2

- **Measurement**

  Measurement range beginning
  Measurement range end
  Unit
  Limitation

  For 2-channel devices:

  Measurement channel 2 beginning
  Measurement channel range 2 end
  Unit channel 2

- **Output**

  min. output
  max. output
  Error signal

- **Funktion**

  Auswahl der Funktion

  Bei Funktion RADIZIERT, TABELLE:

  Anzahl Nachkommastellen „freie Einheit“
  Messbereich Anfang „freie Einheit“
  Messbereich Ende „freie Einheit“
  „freie“ Einheit

  bei Funktion TABELLE:

  Anzahl der Wertepaare
  Wertepaar 1
  …
  Wertepaar n

- **Display**

  bei Geräten mit 2 Eingangskanälen:
  Zuordnung der Umschaltung

  Farbe Auto1:

  rot-grün Umschaltung
  grün-rot Umschaltung
  Hysterese
  Verzögerung

  Farbe Auto2:

  rot-gelb Umschaltung
  gelb-grün Umschaltung
  grün-gelb Umschaltung
  gelb-rot Umschaltung
  Hysterese
  Verzögerung

  Farbe
  Beleuchtungszeit
  Kontrast
  Bargraf

- **System**

  Software – Info
  Konfig – Info
  Passwort
  Konfig. laden
  Konfig. sichern

- **Statistik**

- **Function**

  Selection of function

  For ROOT EXTRACTED function, table:

  Number of decimal places "free unit"
  Measurement range beginning "free unit"
  Measurement range end "free unit"
  "free" unit

  For function TABLE:

  Number of value pairs
  Value pair 1
  …
  Value pair n

- **Display**

  For devices with 2 input channels:
  Allocation of changeover

  Auto1 color:

  red-green changeover
  green-red changeover
  Hysteresis
  Delay

  Auto2 color:

  red-yellow changeover
  yellow-green changeover
  green-yellow changeover
  yellow-red changeover
  Hysteresis
  Delay

  Color
  Lighting time
  Contrast
  Bar graph

- **System**

  Software – Info
  Config – Info
  Password
  Load config.
  Save config.

- **Statistics**

5.4.1 Menu level switch points

The two switch outputs are configured by four parameters

For switch point 1, these are:

SP1 Ein
SP1 Aus
SP1 Verzögerung
SP1 Funktion.

For switch point 2 correspondingly:

SP2 Ein
SP2 Aus
SP2 Verzögerung
SP2 Funktion.

SP1 Ein (SP1 on) specifies the switch-on point and **SP1 Aus (SP1 off)** the switch-off point of switch output 1. The values are displayed and set in the valid unit.

Together, the two parameters determine the switch function of switch output 1:

If **SP1 Aus (SP1 off)** is lower than **SP1 Ein (SP1 on)**, the output switches on when the measurement value exceeds **SP1 Ein (SP1 on).** It is only switched off again when measurement value **SP1 Aus (SP1 off)** falls short (hysteresis function).

If **SP1 Ein (SP1 on)** and **SP1 Aus (SP1 off)** are the same, the output switches when the measurement value exceeds **SP1 Ein (SP1 on)** and off when the measurement value falls short of **SP1 Aus (SP1 off)**.

If **SP1 Aus (SP1 off)** is larger than **SP1 Ein (SP1 on)**, the output switches on when **SP1 Ein (SP1 on)** < measurement value < **SP1 Aus (SP1 off)** applies (window function).

Both parameters can be set independently over the whole measurement range.

SP1 Verzögerung (SP1 delay) allows the reaction of the switch output 1 to be delayed by 0 to 100 s. This value applies the switching on and off in the same way.

SP1 Funktion (SP1 function) changes the function of the switch output. Here you can select whether the contact works as a closer (NO) or opener (NC).

The change to the switch times takes effect upon the next switch process. Any previously valid time continues to run without changes.

With **Zuordnung SP (allocation SP)** it can be established which input is allocated to the contacts for devices with two input channels. It is possible to allocate both contacts to one channel or each channel to contact. For the switch point input, the unit and the entry range are adapted accordingly.

5.4.2 Menu level input

If, during operation, you notice that the measurement value display is very restless, you can stabilize the display (and the output signal) with the parameters **Dämpfung (dampening)** and **Nullpunktfenster (zero point window).**

The effect of the **Dämpfung (dampening)** parameter corresponds with a capillary reducer. However, it only affects the display, output signal and switch point and not the actual measurement cell. You can set the reaction time to pressure jumps with this parameter. The value range is 0.0 s to 100.0 s.

At maximum dampening, it takes more than two minutes until a pressure jump from the nominal pressure (100%) to zero also displays zero. The reaction applies correspondingly for other input factors.

In lots of cases, the restless display does not cause a disturbance in the normal mode but does disturb in the rest status, therefore when you expect a (differential) pressure of zero.

This is the exact purpose served by the **Nullpunktfenster (zero point window)** parameter. Its value defines a measurement value range at around zero. The measurement value is set to 0 within this range. Zero is only no longer output on the display when the pressure leaves the set window. From double the window value, the measurement pressure and display then match again. This avoids jumps in the display.

Setting the offset (zero point shifting) makes sense if the display shows a different value to zero without differential pressure (deduct measurement line). The zero point window should be set to zero by the offset correction.

Select the **Offsetkorrektur (offset correction)** parameter for this and correct the display value with the buttons ▲ and ▼ until zero appears on the display.

5.4.3 Menu level measurement

The output signal of the transmitter primarily depends on the measured pressure. However, you have the opportunity to adjust the output signal in other ranges to suit your requirements.

The basic measurement range (see type label) cannot be changed as well as the type of output signal (voltage or current).

Both of the channels are configured with three parameters. Configuration takes place in the same way as the first one for the second channel.

For channel 1, these are:

`Messbereich Anfang`
`Messbereich Ende`
`Einheit`

For channel 2 correspondingly:

`Messbereich 2 Anfang`
`Messbereich 2 Ende`
`Einheit 2`

The `Messbereich Anfang (measurement range beginning)` and `Messbereich Ende (measurement range end)` initially sets the two pressures between which the output signal even changes. Both values can be set over the whole basic measurement range. The set values always relate to the pressures in the respective valid pressure unit and are also converted if any changes to the unit are made.

The signal values (current / voltage) for the `Messbereich Anfang (measurement range beginning)` and `Messbereich Ende (measurement range end)` are fixed in contrast.

If the `Messbereich Anfang (measurement range beginning)` is less than `Messbereich Ende (measurement range end)`, we speak of an increasing curve; the output signal increases with growing pressure.

If the `Messbereich Ende (measurement range end)` is less than `Messbereich Anfang (measurement range beginning` we speak of a decreasing curve; the output signal drops with growing pressure.

The difference between the two values `Messbereich Anfang (measurement range beginning)` and `Messbereich Ende (measurement range end)` must be at least 25%of the basic measurement range.

With the `Einheit (unit)` parameter, you can select a unit deviating from the unit of the basic measurement range. The user must consider that not each unit makes sense. The calculation is done automatically.

The `Begrenzung (limitation)` parameter allows limitation of the display on the range between the `Messbereich Anfang (measurement range beginning)` and `Messbereich Ende (measurement range` end)

Tipp

This makes sense for contents measurements to avoid "negative contents". If the limitation is set to "no", then the measurement values that are larger or smaller than the end of values are shown.

5.4.4 Menu level output

The `min. Ausgang (min. output)`, `max. Ausgang (max. output)` and `Fehlersignal (error signal)` parameters specify the limits of the output signal irrespective of the pressure. These limits cannot be exceeded or fallen short of. The limit values have priority over the range specified by the measurement range beginning and measurement range end.

These parameters mainly serve the purpose of suppressing error messages in downstream systems due to brief measurement range excesses.

The `min. Ausgang (min. output)` parameter generally only makes sense for devices with an output signal 4…20 mA because values under 3.8 mA are frequently assessed as error signals.

The `max. Ausgang (max. output)` parameter can be used for voltage and current to limit the maximum value.

The value specified with the `Fehlersignal (error signal)` parameter is issued if the device identifies an internal error and can no longer work correctly.

You must make sure that not all possible errors and defects can be recognized by the actual device.

5.4.5 Menu level function

In the function menu, an adjustment can be made to the display and the output to suit specific requirements. There are the following functions for this:

`LINEAR`: linear implementation of the input on the display and the output. The range specified in the "menu level measurement" serves as the measurement range.

`RADIZIERT (ROOT EXTRACTED)`: the input signal is root extracted here on the display and given to the output. This is required for the flow measurement with differential pressure for example. A "free unit" can be defined for the display. The beginning and end of the display range and the number of decimal

places are specified here. There is also the option of defining the unit with 4 characters.

TABELLE (TABLE): this function allows the free adaptation of the input to the display and output using a table with up to 30 bases. The value pairs with measurement value and display value are entered for the bases.

Caution: when changing from TABLE to a different function, the table is initialized again and the existing values are lost.

With the parameters **Nachkomma MB**, **MB Anfang** and **MB Ende (decimal point MR, MR beginning and MR end)** the display range is specified. The user is free to configure.

With **Einheit MB (unit MR)** the user is given the opportunity to use a fully independent unit. There are letters (capital, lower case), numbers and several symbols available. The unit can be max. 4 characters.

If the **TABELLE (TABLE)** function is selected, the **number of pairs** must also be entered. With this parameter, it is specified how may value pairs (bases) the table consists of. min. 3 and max. 30 bases are permitted.

Caution: if the number of value pairs is changed, the table is initialized anew and the existing values deleted.

With **value pair 1** to (maximal) **value pair 30,** you can view and change the individual value pairs

```
Wertepaar     1
+0.0 Pa     +0.0 %
+0.0  ... +100.0 Pa
```

A pair of values consists of a measurement value (left side) and a display value (right side).

The measurement value must be within the measurement range and the display value must be within the defined "free unit". The respective limits are displayed upon entry. The table must contain increasing values.

Note:
The function is only effective on channel 1.

5.4.6 Menu level display

The parameters for the display influence are summarized in this menu.

The most important parameter is **Farbe (color)**. A specific background color (red, green, yellow, blue, pink, turquoise and white) can be selected here. However, there are also two automatic functions with color changeover available.

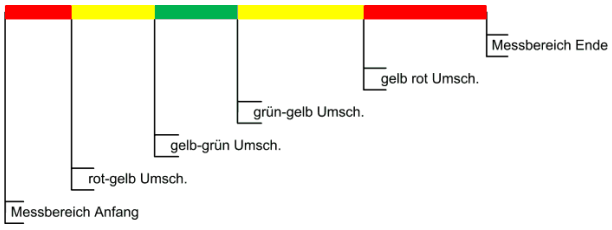
Auto1: red-green,
Auto2: Rd-Ye-Gr.

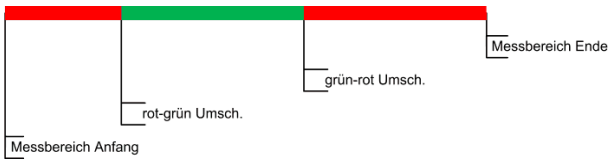
Alternatively, the background lighting can be permanently switched off.

For devices with 2 input channels, an input channel can be specified which the color change relates to with the **Zuordnung Umschaltung (allocation changeover)**. This allocation is independent of the allocation of switch points.

In the mode with automatic color changeover, there is the option of entering the necessary switch thresholds "red-yellow changeover", "yellow-green changeover", "green-yellow changeover", "yellow-red changeover, "red-green changeover" and "green-red" changeover.

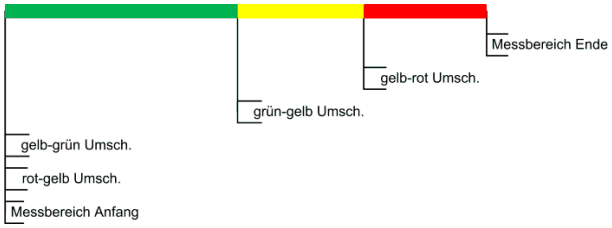
The switch thresholds can be shifted within the measurement range. The sequence of the switch points cannot be changed.





Note: if a range should not be used, the corresponding switch thresholds can be set to the same value. An example can be seen in this sketch:

Only the green, yellow and red ranges are required here. In order to fade out the bottom red and yellow ranges, the switch thresholds "red-yellow changeover" and "yellow-green changeover" are set to the measurement range beginning.



With the Hysterese (hysteresis) parameter, the quick and unwanted change of color can be prevented. The hysteresis can be set in a range of 0.1... 10%.

Note: for large hysteresis values, attention must be paid that the ranges of the individual colors do not overlap. Otherwise it may be the case that the color change does not work as required.

Another option for avoiding unwanted color changes is offered by the Verzögerung (delay) parameter. The color change can be delayed in a range of 0…100s.

If lighting is not required to permanently, the Beleuchtungszeit (lighting time) parameter can be used to set when the lighting switches off after the last push of a button. Alongside permanent lighting, automatic shutdown is possible after 10…600 s. The set time is only valid if the Hintergrundfarbe (background color) parameter is not set to "off".

The legibility of the display depends on the temperature and the reading angle among other aspects. In order to allow the best possible legibility, this can be adjusted with the Kontrast (contrast) parameter. When changing the contrast, it can happen that the display is empty or displayed black. In this case, the contrast must be enlarged or reduced.

With the Bargraf (bar graph) parameter, the display can be changed over as follows. The measurement value is either shown with large figures or the display is made with smaller figures and an additional bar graph to be able to detect the measurement value quicker.

5.4.7 Menu level system

The Software Info and Konfig Info menu points display information on the device. This information is helpful to be able to answer questions on the device more quickly.

In the software info, the device type, controller ID and die firmware version are displayed.

The configuration information is to be taken from the basic measurement range, the specified output signal and the existing contacts.

In the Passwort (password) menu point, the menu can be protected against unauthorized changes with a password. The password is a number from 1 to 999. A 0 entry means that a password is not active.

A password must be set if the user presses the button to enter the menu from the normal mode. It immediately jumps back to the normal mode if the incorrect password is entered. If the password is not active, the display immediately jumps to the menu.

Caution: the user does not have the option of deleting a forgotten password!

With the Konfig. laden (load configuration) menu point, a configuration saved by the user can be loaded. This means you can reinstate a working set of parameters after adjustment tests for example.

Note: if a configuration has not yet been saved by the user, the standard values (supply status) are loaded. In this case, any existing measurement range spreads or switch points are reset and the device must be reconfigured.

The Konfig. sichern (save configuration) menu point serves the purpose of saving existing parameters in a protected memory. This is helpful if the setting of a working device should be optimized. You can quickly reinstate the original status with Konfig. sichern and Konfig. laden.

5.4.8 Menu level statistics

The operating time and the relay switch cycles are displayed from delivery.

The operating time is displayed in days (d) and hours (h)

6 Maintenance

The device does not require maintenance.

In order to ensure reliable operation and a long service life of the device we recommend regular checking of the device as follows:

- Check the function in connection with slave components.
- Check the tightness of the pressure connection lines.
- Check the electrical connections.

The exact test cycles have to be adapted to the operating and environmental conditions. The operating manuals of all other devices are also to be observed if there is an interaction of different device components.

7 Transport

The product must be protected against severe impacts. Therefore transport is to be effected only in the packaging intended for transport.

8 Service

All defective or faulty devices are to be sent directly to our repair department. We would like to ask you to coordinate all device returns with our sales department.

Remaining medium in and on dismantled measuring instruments may cause danger to persons, environment and equipment. Take reasonable precautions! Clean the instrument thoroughly if necessary.

9 Accessories

No accessories

10 Disposal

Protect your environment....

Kindly help us protecting the environment and dispose of or recycle the used products in accordance with the relevant regulations.

11 Technical data

Basic measurement range		mbar	4	6	10	16	25	40	60	100	±2.5	±4	±6	±10	±16	±25	±40	±60	±100
		Pa	400	600	1000	1600					±250								
		kPa	0.4	0.6	1	1.6	2.5	4	6	10	±0.25	±0.4	±0.6	±1	±1.6	±2.5	±4	±6	
Max. stat. operating pressure		mbar	50		100		250		500		50			100		250		500	
Burst pressure		mbar	150		300		750		1500		150			300		750		1500	
Characteristic deviation [°]	max	%FS	1.0								1.0								
	Typ.	%FS	0.5								0.5								
TK range [°°]	max	%FS/ 10K	1.0		0.3						1.0	0.5	0.3						
	Typ.	%FS/ 10K	0.3								0.3								
TK zero point [°°]	max	%FS/ 10K	1.0		0.4						1.0	0.5	0.4						
	Typ.	%FS/ 10K	0.2								0.2								

[°] : Characteristic curve deviation (non-linear and hysteresis) at 25°C, basic measurement range (linear characteristic curve, not spread)
[°°] : in relation to the basic measurement range (not spread), compensation range 0... 60~C

General

Authorized environmental temperature	-10 ... 70°C
Authorized medium temperature	-10 ... 70°C
Authorized storage temperature	-20 ... 70°C
Housing protection class	IP 65 acc. to DIN EN 60529

Electrical data

Nominal voltage	24 VDC / VAC			
Auth. operating voltage (U_b)	12-32 VDC / VAC			
Electrical connection type	Triple conductor			
Output signal	**0 … 20 mA**	**4 ... 20 mA**	**0 ... 10V**	
Authorized load	$R_L \leq (U_b - 4V) / 0.02$ A	for $U_b \leq 26$ VDC/VAC	RL ≥ 10 kΩ	for $U_b < 15$ VDC/VAC
	$R_L \leq 1100$ Ω	for $U_b > 26$ VDC/VAC	RL ≥ 2 kΩ	for $U_b \geq 15$ VDC/VAC
Characteristic Curve				
P1	linear, root extracted, table with 3...30 bases			
P2	linear			

Programmable switching contacts	**2 sets of voltage free relay contacts as make (no) or break (nc) contact**	**2 sets of voltage free solid state relay SPST[2] as make (no) or break (nc) contact**
U_{max}	32 V AC/DC	3 ... 32 V AC/DC
I_{max}	2A	0,25 A
P_{max}	64 W/VA	8 W/VA ($R_{on} \leq 4\Omega$)
Power intake	max. 3 W / VA	
Measured Value Display	4-digit LCD with details of the measurement unit Multi-coloured lighting (red, yellow and green) Selectable bar graph display	
Units	mbar, Pa, kPa, inchWS, mmWS, mmHg	

Connections

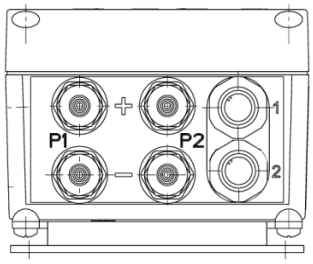
Electrical connection	2 x M12 round plug connector Plug 1 for supply and analogue output signals (5-pole, male) Plug 2 for switch contacts (4-pole, male)
Pressure Connections	Aluminium hose screw connections for hose 6/4mm and 8/6mm

Materials, assembly

Housing material	Nylon PA 6.6
Material touching medium	Silicone, PVC, aluminium, brass
Assembly	Back fixing holes Wall mounting

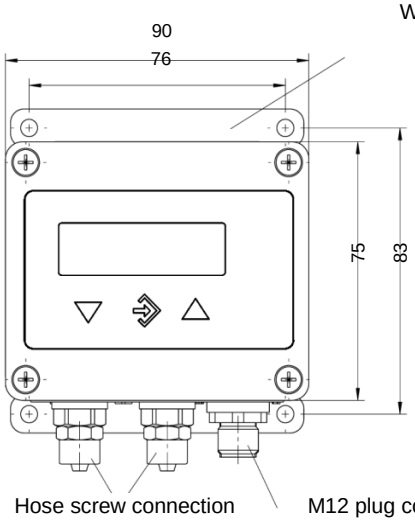
[2] SPST: **S**ingle **P**ole **S**ingle **T**hrow

12 Dimensional drawings

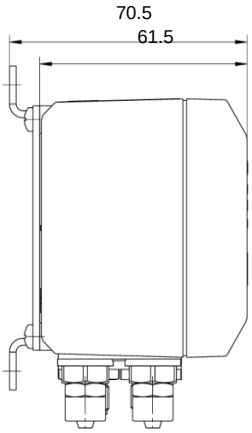


Plug 1

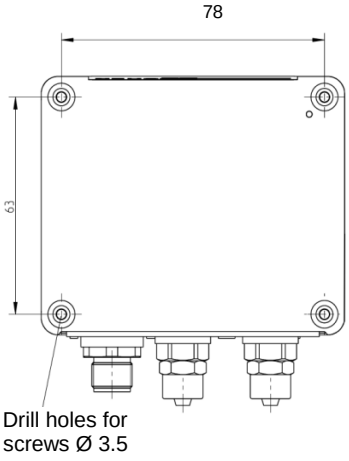
Plug 2



Wall mounting plate (optional)

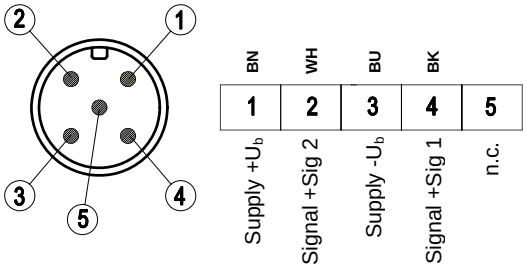


Back view
Without wall mounting plate
(Standard design)

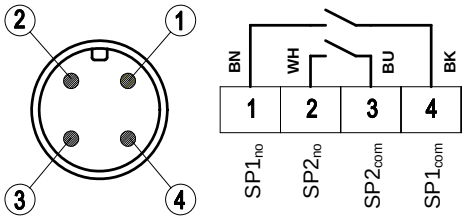


Wiring diagram

Plug 1



Plug 2



Programming

With film keypad with menu-guided operation; password lock

	Settings
Damping	0.0 ... 100.0 s (jump response time 10/90%)
Display allocation	P1 and P2 are shown at the same time
Switch output Channel 1 and channel 2	Switch-off point, switch-on point and response time (0...100 s), Function (opener/closer), allocation to relay
Zero point stabilization	⅓ of the basic measurement range
Zero point correction	⅓ of the basic measurement range
Zero point window	Measurement values around zero are set to zero within these limits
Output signal characteristic curve	Any settings within the basic measurement range linear, root extracted, table with 3...30 bases
Password	001 ... 999 (000 ⇒ no password protection)

13 Order codes

Digital 2-channel differential pressure switch/transmitter with 4 digit color change LCD

DE44 [ ] [ ] [ ] [ ] [ ] [ ] [ ] **K** **W** [ ] **M** [ ]

Channel 1 - measurement range — **auth. stat. operating pressure**

0	…	4	mbar	50	mbar	>	5	2
0	…	6	mbar	50	mbar	>	5	3
0	…	10	mbar	100	mbar	>	5	4
0	…	16	mbar	100	mbar	>	5	5
0	…	25	mbar	250	mbar	>	5	6
0	…	40	mbar	250	mbar	>	5	7
0	…	60	mbar	500	mbar	>	5	8
0	…	100	mbar	500	mbar	>	5	9
0	…	160	mbar	1500	mbar	>	6	0
0	…	250	mbar	1500	mbar	>	8	2
-2.5	…	+2.5	mbar	50	mbar	>	A	6
-4	…	+4	mbar	50	mbar	>	A	7
-6	…	+6	mbar	50	mbar	>	A	8
-10	…	+10	mbar	100	mbar	>	A	9
-16	…	+16	mbar	250	mbar	>	B	1
-25	…	+25	mbar	250	mbar	>	B	2
-40	…	+40	mbar	500	mbar	>	C	5
-60	…	+60	mbar	500	mbar	>	B	3
-100	…	+100	mbar	500	mbar	>	B	4
0	…	400	Pa	50	mbar	>	D	7
0	…	500	Pa	50	mbar	>	J	7
0	…	600	Pa	50	mbar	>	D	8
0	…	1000	Pa	100	mbar	>	D	9
0	…	1600	Pa	100	mbar	>	E	1
-250	…	+250	Pa	50	mbar	>	L	6
0	…	1	kPa	50	mbar	>	N	1
0	…	1.6	kPa	100	mbar	>	N	2
0	…	2.5	kPa	250	mbar	>	N	3
0	…	4	kPa	250	mbar	>	N	4
0	…	6	kPa	500	mbar	>	N	5
0	…	10	kPa	500	mbar	>	E	5
-1	…	+1	kPa	50	mbar	>	L	8
-1.6	…	+1.6	kPa	100	mbar	>	L	9
-2.5	…	+2.5	kPa	100	mbar	>	M	6
-4	…	+4	kPa	250	mbar	>	M	7
-6	…	+6	kPa	100	mbar	>	M	8

Channel 2 - measurement range — **auth. stat. operating pressure**

0	…	4	mbar	50	mbar	>	5	2
0	…	6	mbar	50	mbar	>	5	3
0	…	10	mbar	100	mbar	>	5	4
0	…	16	mbar	100	mbar	>	5	5
0	…	25	mbar	250	mbar	>	5	6
0	…	40	mbar	250	mbar	>	5	7
0	…	60	mbar	500	mbar	>	5	8
0	…	100	mbar	500	mbar	>	5	9
0	…	160	mbar	1500	mbar	>	6	0
0	…	250	mbar	1500	mbar	>	8	2
-2.5	…	+2.5	mbar	50	mbar	>	A	6
-4	…	+4	mbar	50	mbar	>	A	7
-6	…	+6	mbar	100	mbar	>	A	8
-10	…	+10	mbar	100	mbar	>	A	9
-16	…	+16	mbar	250	mbar	>	B	1
-25	…	+25	mbar	250	mbar	>	B	2
-40	…	+40	mbar	500	mbar	>	C	5
-60	…	+60	mbar	500	mbar	>	B	3
-100	…	+100	mbar	500	mbar	>	B	4
0	…	400	Pa	50	mbar	>	D	7
0	…	500	Pa	50	mbar	>	J	7
0	…	600	Pa	50	mbar	>	D	8
0	…	1000	Pa	100	mbar	>	D	9
0	…	1600	Pa	100	mbar	>	E	1
-250	…	+250	Pa	50	mbar	>	L	6
0	…	1	kPa	50	mbar	>	N	1
0	…	1.6	kPa	100	mbar	>	N	2
0	…	2.5	kPa	250	mbar	>	N	3
0	…	4	kPa	250	mbar	>	N	4
0	…	6	kPa	500	mbar	>	N	5
0	…	10	kPa	500	mbar	>	E	5
-1	…	+1	kPa	50	mbar	>	L	8
-1.6	…	+1.6	kPa	100	mbar	>	L	9
-2.5	…	+2.5	kPa	100	mbar	>	M	6
-4	…	+4	kPa	250	mbar	>	M	7
-6	…	+6	kPa	500	mbar	>	M	8

Pressure connection

Aluminium screw connection for 6/4 mm hose	>	4 0
Aluminium screw connection for 8/6 mm hose	>	4 1

Electrical output signal (channel 1 and 2)

without analogue electrical output signal	>	0
0 - 20 mA 3-conductor channel 1+2	>	4
0 - 10 V DC 3-conductor channel 1+2	>	5
4 - 20 mA 3-conductor channel 1+2	>	6

Operating voltage

24 V DC/AC (12-32 V DC/AC)	>	K

Measurement unit

Selectable pressure units	>	W

Measured value display/switch elements

4-digit color change LCD – 2 relay contacts	>	C
4-digit color change LCD – 2 semiconductor switches	>	D

Electrical connection

M12 plug connection	>	M

Assembly option

Standard (back fixing holes)	>	0
Wall mounting	>	W

14 Declaration of conformity

EG-Konformitätserklärung

Wir erklären in alleiniger Verantwortung, dass nachstehend genannte Produkte

EC Declaration of Conformity

We declare under our sole responsibility that the products mentioned below

Digitaler 2-kanal-Differenzdruckschalter / -transmitter mit 4-stelliger Farbwechsel-LCD / **Digital 2-channel Differential Pressure Switch / Transmitter with 4-digit color changing LCD**

DE44############

gemäß gültigem Datenblatt übereinstimmen mit den

as specified by the current data sheet complies with

EG-Richtlinien

2004/108/EG (EMV)
2006/95/EG (NSR)

EC-directives

2004/108/EC (EMC)
2006/95/EC (LVD)

Die Produkte wurden entsprechend der folgenden Normen geprüft (Störfestigkeit für Industriebereich, Störaussendung für Wohnbereich):

The products were tested in compliance with the following standard (Interference immunity for industrial environments, interface emission for residential environments)

DIN EN 61326-1:2006-10
DIN EN 61326-2-3:2007-05
DIN EN 61010-1:2002-08

DIN EN 61326-1:2006-10
DIN EN 61326-2-3:2007-05
DIN EN 61010-1:2002-08

Die Geräte werden gekennzeichnet mit:

The devices bear the following marking:

CE

Bad Salzuflen, 12.11.10
(Ort, Datum / place, date)

(rechtsverb. Unterschrift / legally authorized signature)

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