FISCHER MESS- UND REGELTECHNIK

Instruction Manual

DE45 | Digital Differential Pressure Switch / Transmitter

Table of 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.

1.2 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.

1.3 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.

1.4 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 national 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).

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1.5 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.

1.6 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.

1.7 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.

1.8 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!

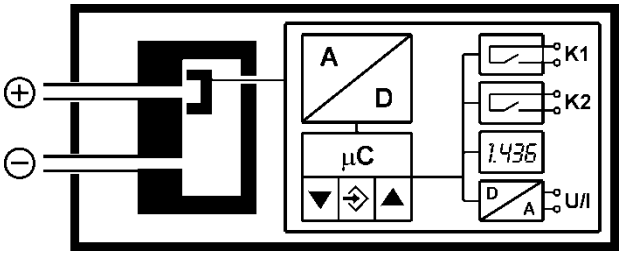
…points out useful recommendations that are not necessarily required for operation that might however be of use in certain situations.

2 Intended Applications

Display and switching device for Differential pressure of gaseous media. The instrument is to be exclusively used for the applications agreed between the manufacturer and user.

3 Product Description and Function

3.1 Functional diagram



3.2 Design and mode of operation

The device is based on a piezo-resistive sensor element that is suitable for measuring overpressure, underpressure and differential pressure. The pressures to be compared directly act on a silicon diaphragm equipped with piezo-resistive resistors. In case of equal pressure, the measuring diaphragm is in its idle state. In case of pressure difference, the force acting on the measuring membrane causes it to be moved towards the side of the lower pressure. This movement of the diaphragm induces a change of resistance, which is evaluated by the device's electronics and transformed into signals on the display, switch contacts and an output signal. The optional output signal can be dampened, spread, inverted and can also be transformed in a non-linear manner via a table function.

4 Installation and assembly

The unit is designed for mounting on flat assembly plates. For screw connection to the assembly plate, the device features four assembly bores on its back, which can be used for Ø 3.5 mm tapping screws.

Optionally, the device can be delivered with a wall-mounting plate.

At the factory, the device is calibrated for vertical installation, but the installation position is arbitrary. For any installation positions that are not vertical, the zero-point signal can be corrected via the installed zero-point adjuster.

The enclosure protection type IP 65 is only guaranteed, if a suitable power supply cable is used.

If the device is intended for outdoor use, we recommend permanently protecting the membrane keypad against UV radiation and using a suitable enclosure or at least the erection of a sufficiently dimensioned canopy as a protection measure against constant rain or snow.

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 device from pressure surges.
- Check the suitability of the device for the media to be measured.
- Maximum pressures shall be observed.
- Do not blow into the pressure connections!

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

The pressure sensing lines must be installed on a gradient so that no air pockets e.g. for liquid measurements or water pockets e.g. for gas measurements can be created. If the required incline is not reached, water and/or air filters need to be installed at suitable points.

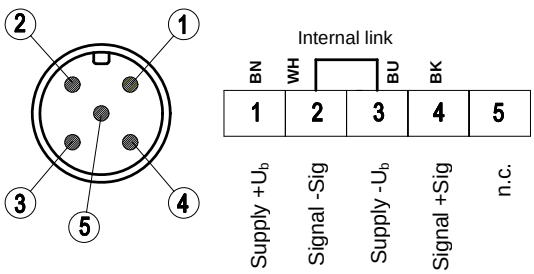
The pressure sensing lines need to be kept as short as possible and installed without sharp bends to avoid interfering delay times.

If the pressure sensing lines are already pressurized at the time of commissioning, zero-point control and adjustment cannot be performed. In such cases, the device should be only connected to the mains without the pressure sensing lines.

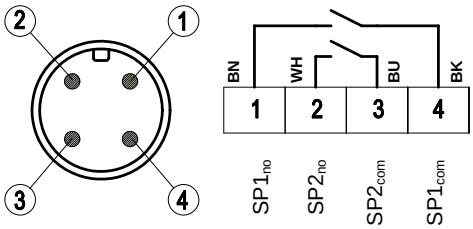
4.2 Electrical connection

- By authorized and qualified specialized personnel only.
- The instrument must be connected electrically in accordance with the relevant national guidelines and the guidelines of the local provider.
- Disconnect the system from the mains, before electrically connecting the device.
- Install the consumer-adapted fuses.

Plug 1: Power Supply and Output signal



Plug 2: Switching output



The nominal supply voltage and the admissible range can be found in the technical data.

The admissible load / resistance for the signal output are stated in the technical data.

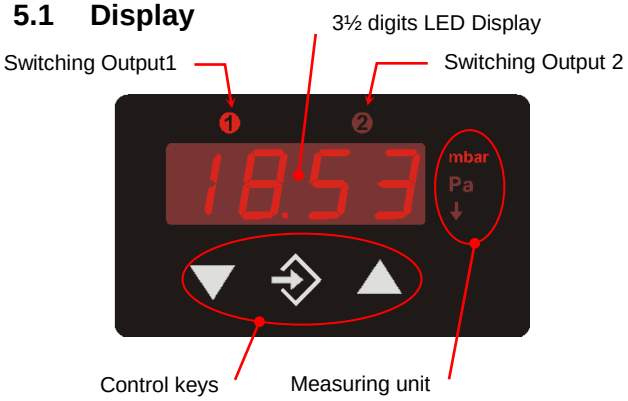
The connection "Signal ground"(-Sig) is connected internally to the supply ground. It only serves as the ground connection for the output signal. This means that the output signal is free of interference levels on the power supply lines.

5 Commissioning

All electrical supply, operating and measuring lines, and the pressure connections must have been correctly installed before commissioning. All supply lines are arranged so that there are no mechanical forces acting on the device.

The tightness of the pressure connection lines must be checked before initialization.

5.1 Display



- The 3½ digit LED display normally indicates the current differential pressure.
- The backlit symbols to the right of the 3½ digit LED display indicate the unit of pressure measurement.

The units shown in the illustrations of this document can be different from those of the actual instrument.

- Above the display, two LEDs ① ② symbolise the condition of the switching outputs. As soon as the switch is closed, the applicable LED lights up.

5.2 Control keys

The control keys have the following functions:

▼	Menu down Decrease value
⏎	Enter key
▲	Menu up Increase value

5.3 Configuration

For commissioning there is a multitude of setting options for optimum adaptation of the device to the measuring point and task at hand. This section covers these options step by step.

Depending on the device design available,[1] some menu points are not available. For example, all characteristic curve functions are masked from the menu if the device does not have a signal output.

The device can be completely set conveniently on the PC using a PC adaptor. There all parameters are immediately visible and accessible. In addition, the complete configuration can be loaded, saved and documented as a control print-out. Further guidelines on this program can be found in the documentation for this program (see accessories).

5.3.1 General

Put the device electrically into operation and ensure that the device is initially depressurised (if necessary, disconnect the pressure connection lines).

In order to set a parameter, proceed as follows:

- Press the Enter ⏎ key in order to switch into the menu. **ESC** will appear on the display.
- Use the ▼▲ arrow keys in order to select a parameter from the list.
- Press the Enter ⏎ key in order to call up the parameters.
- Use the ▼▲ arrow keys to set the required value.
- Use the Enter ⏎ key to save the value.

After you have set all the parameters, leave the menu as follows:[2]

- Using the ▼▲ arrow keys, set the **ESC** parameter. You can find this both at the start and at the end of the parameter list.
- Use the Enter ⏎ key to leave the menu.

5.3.2 Selection of pressure unit

First select the required pressure measuring unit. The unit currently valid is highlighted on the right next to the figure display. For setting, use the middle ⏎ key and then look using the right ▲ key for the **Ein** parameter. Press ⏎ again and then change the value shown using ▲ or ▼.

1 = above
2 = middle
3 = down

After selection, save the value with ⏎ and **E In** will appear again in the display.

To complete, leave the settings mode. Press ▼ until **ESC** and then ⏎. Now the pressure currently measured is represented. On the right of this, the correct pressure unit should be highlighted.

The display circumference is limited to ±1999. For this reason not all specified pressure units may, in individual cases, be selectable.

5.3.3 Zero point control and adjustment

Ensure that the device is depressurised (if necessary, disconnect the pressure connection lines).

If the device does not indicate precisely zero the **oFI** parameter enables you to adjust the offset exactly to zero. To do this, you must tune the value of **oFI** to zero.

After zero-point adjustment, the pressure connection lines can be reconnected.

5.3.4 Damping and zero-point stabilizing

If there are unsteady pressure readings at this point of time or during operation, you can use parameters **dAn** and **nP** to stabilise the reading (and the output signal).

The **dAn** parameter acts like a capillary throttle. However, it only has an effect on the display, the output signal and the switch points but not on the measuring cell itself. You can set the response time to pressure jumps using this parameter. The values range comprehends 0.0 to 100.0 seconds.

With maximum damping, it will take more than 2 minutes for the reading also to reach zero after a pressure jump from nominal pressure (100 %) to zero.

In many cases, unsteady readings are not a problem during normal operating mode, but this is not true for the idle state, i.e. if zero (differential) pressure is expected.

In such situations, parameter **nP** can be applied. Its value defines a measuring value range of around zero. The measuring value is set to zero within this range.

[1] With reference to the transmitter signal, voltage output, current output etc.

[2] Only when you leave the menu via the **ESC** parameter are the set parameters valid.

Example:
For *nP*, a value of 0.08 mbar[3] is entered. In this case all pressures which lie within a range of -0.08 mbar to +0.08 mbar become zero. Only if the pressure exceeds these limits, will the reading no longer indicate zero. The pressure value and the reading do not however accord one hundred percent with each other. Only after a doubled value, i.e. from 0.16 mbar, will the measuring pressure and the reading match again.

5.3.5 Setting the output signal

The transmitter output signal primarily depends on the measured pressure. However, you have the option to adjust the output signal to a large extent to suit your requirements.

However, the basic measuring range (indicated on the type label) and the type of output signal (voltage or current) are not variable.

The parameters *nA* (Start of measuring range) and *nE* (End of measuring range) define the limits to which the output signal can change at all. Both values are adjustable across the entire basic measuring range. The set values always refer to pressures in the relevant valid pressure unit and are converted when the unit is changed.

The allocated signal values for *nA* and *nE* cannot be changed (see type label, e.g. 0...10 V or 4...20 mA).

If *nA* < *nE*, we speak of a rising characteristic curve. The output signal increases as the pressure rises.

If *nA* > *nE*, we speak of a falling characteristic curve and the output signal decreases as the pressure rises.

The difference between values *nA* and *nE* must be at least 25 % of the basic measuring range. The software will not allow larger spreads. You will not be able to exit the menu if you have entered incorrect range values.

Example:
With a basic measuring range of 400 Pa, the following must apply: *nE* – *nA* ≥ 100 Pa.

5.3.6 Output signal limits (Namur)

The three parameters *oCl*, *oC2* and *oEr* determine independent of the pressure, the limit values for output currents or voltages which must not be underrun or exceeded.

These limit values are superordinate to the range determined through *nA* and *nE*. They serve mainly to suppress error messages in downstream systems through short-term measuring range exceedances.

With the *oCl* parameter, the limit value for the minimum output signal is determined. The output signal cannot underrun this value. Generally this parameter is only expedient for devices with an output signal of 4...20 mA, because on these devices a value below 3.8 mA is often evaluated as an error signal.

With the *oC2* parameter, the limit value for the maximum output signal is determined. The output signal cannot exceed this value. This parameter can be used for all outputs (voltage and current) in order to limit the maximum value to e.g. 10.2 V.

With the *oEr* parameter, the value for the error signal is determined. The value specified with *oEr* is emitted as an output signal if the device detects an internal error and work no longer correctly. However, not all possible errors and defects can be detected by the device.

If you set *oCl* = *oC2* = 0, the output signal is no longer checked for limits.

If you set *oCl* to the maximum value (11 V or 21 mA), you can change using *oC2* the output signal independent of pressure from zero to the maximum value. It is not necessary to leave the menu item; the output is then carried out immediately. You then operate the device as a signal transmitter and can then easily check the other signal processing.

5.3.7 Characteristic curve function *F*

For certain applications, a pressure measurement is only an indirect measurement for the actual variable. Flow measurements across an aperture or filling level determination through hydrostatic pressure measurement are two typical examples of this. In these cases it may be necessary to change the output signal of the transmitter through a non-linear characteristic curve so that the subsequent evaluation receives a signal linearly proportional to the actual measured value (e.g. volume in m³ or volume flow in cm³/s etc.)

The *F* parameter allows you to select between the following variants:

F	**Characteristic curve**
0	Linear characteristic curve (standard)
1	Root-extracted characteristic curve
2	Horizontal cylindrical tank
3...30	Support point table with 3 to 30 value pairs

Whenever you change the value of *F*, the program will create a new table. All previous table values are rejected and replaced with new linear entries.

The tables for types *F* = 0 to *F* = 2 are not visible. Here internal values are used for table calculation. These values cannot be modified.

[3] 0.08 mbar ≙ 8 Pa

For F = 3...30, you only have influence on the 1...28 intermediate values (see section 0) you only have access to the start and end value via the nA and nE parameters.

If the parameters nA and nE are changed, the table will be deleted and F = 0 is set.

At the start of measuring range (nA), 0% is emitted by the output signal (e.g. 0 mA).

At the end of measuring range (nE), 100% is emitted by the output signal (e.g. 20 mA).

5.3.8 Menu jump Lin

If the value of F is larger than or the same as 3, a submenu named Lin appears. Here you can access all table values except for the start of the table (nA) and the end (nE).

This submenu has its own entry and exit point, which is represented with End. The table is not saved until you switch back to this point in the main menu, meaning that you switch back using the ↵ key to the Lin parameter.

If the table is not structured correctly, an error message Err will appear at this point, and you will not be able to exit the submenu.

The table consists of 3...30 value pairs. On a device with a power output, the first value pair is {i01|P01}[4]. The initial value i01 determines the level of the output signal. The second value P01 determines at which pressure the output signal should be emitted.

Then come the value pairs {i02|P02} ... {i30|P30}.

The entry of or changes to the table values via the membrane keyboard is extremely strenuous and prone to errors. It is only intended as an emergency solution in case access to the PC adaptor is not possible.

The table is correct if the following applies for all signal values: the value is larger than the previous value. For the pressure values, therefore, either the larger (rising characteristic curve) or the lower (falling characteristic curve) apply accordingly. A transition from a rising to a falling characteristic curve or vice versa is not permitted.

5.3.9 Switch Points

The two switching outputs ① ② are configured through four parameters each.

The function of the switching output ① is determined through the parameters r1A, r1E, r1d and r1F.

The function of the switching output ② is determined through the parameters r2A, r2E, r2d and r2F.

The operating principle of this parameter is shown on example of switching output ①.

r1A determines the switch-off point, and r1E determines the switch-on point for switching output ①. The values are set in the valid measuring unit (shown on the right).

Together, both the r1A and r1E parameters determine the switching function of switching output ①:

If r1A is smaller than r1E, the output switches on if the measuring value exceeds r1E. It does not switch off until the measuring value underruns r1A (hysteresis function).

If r1A and r1E are equal, the output switches on if the measuring value exceeds r1E and off if the measuring value underruns r1A.

If r1A is larger than r1E, the output switches on if r1E < measuring value < r1A applies (window function).

Both parameters can be set independently across the entire measuring range.

If the measuring unit is switched, the switch points are recalculated accordingly. Here rounding errors may cause deviations in the last point.

r1d allows the reaction of the switching output ① to be delayed by 0.0 to 100.0 s. This value applies equally for switch-on and switch-off.

r1F reverses the function of the switching output. If the value = 1, the switching output functions as an NO contact, if the value = 2, the switching output functions as an NC contact.

5.3.10 Password

The last menu item -P- serves for the input of a password. A value of 001 to 999 can be selected as a password. The value 000 renders the password function invalid.

If a password was assigned, a text PAS is shown after ESC and ↵, and you must enter the right value by using ↵ and ▲▼. Only by doing so will you be able to access all other menu items. In the event of an error, the reading goes back to the start of the menu ESC.

If the password is forgotten, it can only be reset by the manufacturer or overwritten via the PC adapter.

5.3.11 Display Options

The d0 parameter permits the reading to be steadied if the measuring value fluctuates severely. This filter function is similar to the dAM function, but has an effect only on the display and not on the output signal. With d0 = -1, only the switch point LEDs can be controlled. With d0 = -2, these are switched off.

[4] With a voltage output you've got {u01|P01} ... {u30|P30}.

5.3.12 Reset to Default values

The rES function serves to reset all settings to default. Default values can only be defined via PC interface.

5.3.13 Free Unit

If the device is designed for a "free" third unit (membrane symbol: ⬇), the display can be scaled at will using the parameters nAF, nEF and dPF.

The measuring range defined through the parameters nA and nE is converted into nAF and nEF. Here the table function (F) is also taken into account. The value of dPF determines the position of a decimal point.

5.4 Parameter overview

After switching on the device, it will briefly indicate the software version number and then enters the normal operating mode. By using the middle ◈ key on the membrane keypad you can access the parameter menu. The reading now shows the text ESC. By using the right ▲ key, you can choose the parameters from the following list one by one:

Note:
Depending on the device design, individual parameters may not be available if the device does not possess this feature

PAS **Enter password**
(only comes up if password is active),
values range 000..999
000 = deactivated

dAn **Damping**
(Jump response time T_{90}),
values range 0.0...100.0s

d0 **Display damping**
Value range -2...0...100.
-2 = Display off, LED switching pt. off
-1 = Display off, LED switching pt. on
0 = Display on, LED switching pt. on
1...100 Display damping

r1A **Switch-off point**
From switching output ①

r1E **Switch-on point**
From switching output ①

r1d **Switching delay**
From switching output ①
Values range 0.0 to 100.0s.
This value applies equally for switch-on and switch-off.

r1F **Switching function**
From switching output ①
Values range 1,2
1 = Switching output as NO contact,
2 = Switching output as NC contact

r2A **Switch-off point**
From switching output ②

r2E **Switch-on point**
From switching output ②

r2d **Switching delay**
From switching output ②
Values range 0.0 to 100.0s.
This value applies equally for switching on or off.

r2F **Switching function**
From switching output ②
Values range 1,2
1 = Switching output as NO contact,
2 = Switching output as NC contact

E In **Measuring range unit**
Values range 1,2,3
The selection is highlighted on the right-hand side next to the display. Not all basic measuring ranges allow any switching. The respective unit size can only then be selected if the basic measuring range of the device can be represented meaningfully

nA **Start of measuring range**
The measuring value is set in a way that results in a minimum output signal. (e.g.: 0V, 0mA or 4mA).

nE **End of measuring range**
The measuring value is set in a way that results in a maximum output signal. (e.g.: 10 V or 20 mA).

nP **Zero point stabilisation**
Value range 0...⅓ FS
Defines a measuring value range of around zero

dPF **Free Unit**
Position of decimal place

nAF **Free Unit**
Measuring range start point (displayed value)

nEF **Free Unit**
Measuring range end point (displayed value)

oFI **Offset correction measuring input 1**
Value range -⅓ FS...0... +⅓ FS

F **Characteristic curve function**
Value range 0...30

0 = linear,
1 = root-extracted,
2 = horizontal cylindrical tank
3..30 = table

Lin **Menu entry**
Submenu table processing
If F < 3, this menu item is masked.

oG1 **Limit value**
Minimum output signal

oG2 **Limit value**
Maximum output signal

oEr **Error signal**
(Output signal in case of error)

rES **Reset**
All parameters to default values (specification of default values via PC)

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

- M12 connectors with pre-wired cable lengths on request.
- PC serial interface adaptor with software model EU03.F300.

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 Specifications

			Positive range (0…)										Plus over minus range (±)								
Measuring range		mbar	4	6	10	16	25	40	60	100	160	250	2,5	4	6	10	16	25	40	60	100
		Pa	400	600	1000	1600							250	400	600	100	1600				
		kPa	0,4	0,6	1,0	1,6	2,5	4,0	6,0	10,0	16,0	25,0	0,25	0,4	0,6	1,0	1,6	2,5	4,0	6,0	10,0
Static operation pressure	max	mbar	50		100		250		500		1500		50			100		250		500	
Burst pressure		mbar	150		300		750		1500		3000		150			300		750		1500	
Straight line deviation°)	max.	%FS	1,0										1,0								
	typ.	%FS	0,5										0,5								
TC Span°°)	max.	%FS/10K	1,0		0,3						0,4		1,0	0,5	0,3						
	typ.	%FS/10K	0,3										0,3								
TC Offset°°)	max.	%FS/10K	1,0		0,4								1,0	0,5	0,4						
	typ.	%FS/10K	0,2										0,2								

°) : Straight line deviation = nonlinearity + hysteresis; at 25 °C; pressure within specified range (characteristic linear, not spreaded)
°°) : Pressure within specified range (not spreaded); compensated temperature range 0 to 60 °C

General

Operating temperature (ambient)	-10 ... 70°C
Operating temperature (medium)	-10 ... 70°C
Storage temperature	-20 ... 70°C
Protection class	IP65 according to DIN EN 60529

Electrical

Nominal Voltage	24V AC/DC	
Perm. Operating Voltage U_b	12 ... 32V AC/DC	
Connection type	Three Wire Connection	
Output signal	0 ... 20mA, 4 ... 20mA AC/DC	0 ... 10V DC
Perm. Load	$R_L \leq (U_b - 4\ V) / 0{,}02A$ (if $U_b \leq 26V$) $R_L \leq 1100\ \Omega$ (if $U_b > 26V$)	$R_L \geq 2\ K\Omega$ (if $U_b \geq 15V$), $R_L \geq 10\ K\Omega$ (if $U_b = 12 \ldots 15V$)
Power consumption	Approx. 2W / VA	
Display Unit	3½ digit LED	

Switching Contacts

EMR	2 sets of voltage free relay contacts; programmable n.o. or n.c. U_{max} = 32V AC/DC, I_{max} = 2 A, P_{max} = 64 W/VA
SSR	2 sets of voltage free semiconductor switch (MOSFET); programmable SPST-n.o. or n.c. U = 3 … 32V AC/DC, I_{max} = 0,25A, P_{max} = 8 W/VA, $R_{ON} \leq 4\ \Omega$

Connections

Pressure connections	threaded hose coupling (aluminum) for 6/4 mm or 8/6 mm hose
Electrical connections	2 x round shell male connector sockets M12 Connector 1 (5-pin): power supply and analog signal output Connector 2 (4-pin): relay contacts (alt. solid-state switch output)

Material

Housing	Polyamide PA 6.6
Media contact	Silizium, PVC, aluminum, brass

Mounting

	Rear mounting holes for panel mounting Panel mounting kit Wall mountable using adaptor plate
Outdoor application	If the instrument is intended for outdoor application, we highly recommend using an adequate protective housing (or at least a big enough shelter) as protection against UV-radiation on the membrane keyboard and against exposure of the instrument to rain or snow.

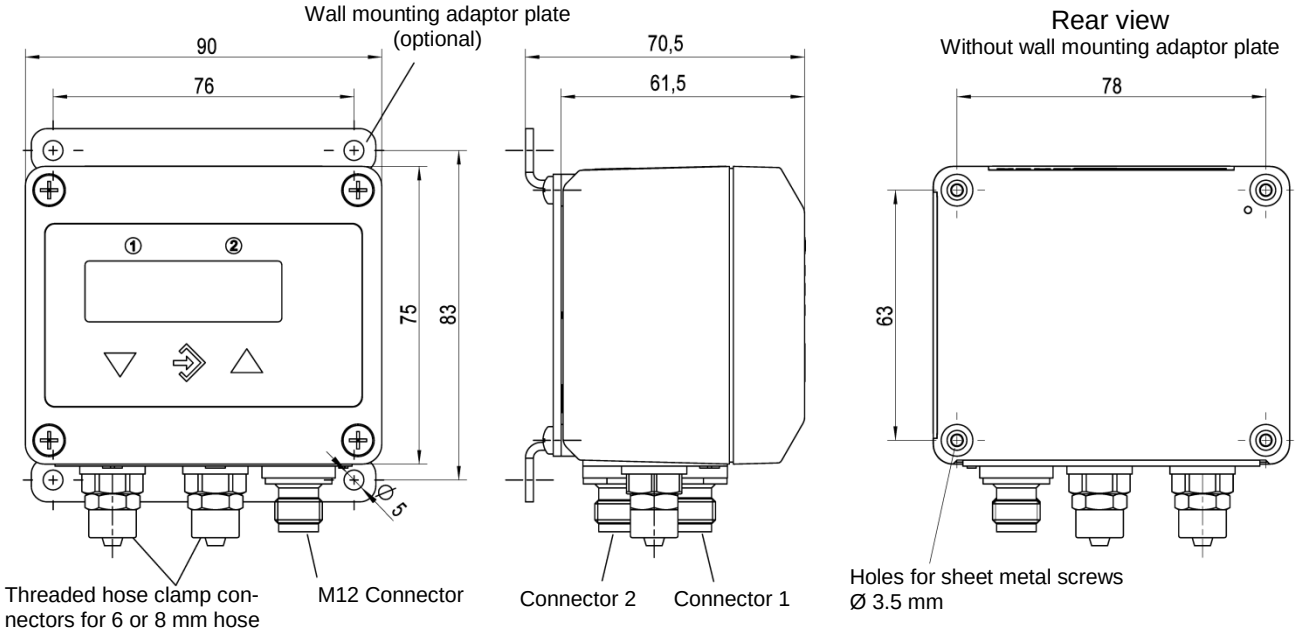
11.1 Programming

Via membrane key-switches, programming mode can be password protected.

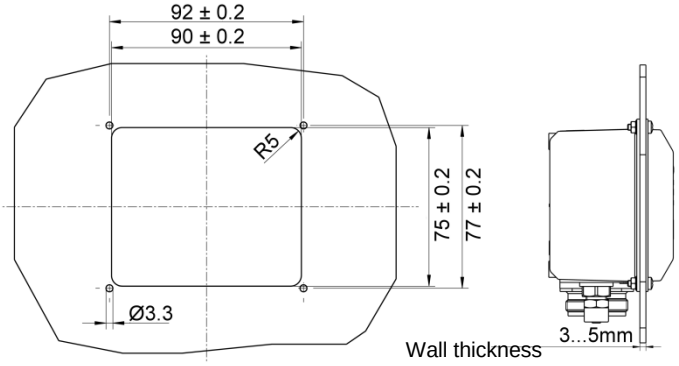
	Settings
Input filtering	0 ... 100.0 secs (10 / 90% step response time) for signal output, display separated
Relay/switch 1 / 2	Activation point, de-activation point, response time delay (0.0 ... 100.0 secs), logic (n.o. /n.c.)
Measurement unit selection	mbar / Pa / „free unit“ start value, end value and decimal place for „free unit“
Zero suppression	0 ... 1/3 of the basic measuring range (1)
Output signal start/end value	Can be set at any point of the basic measuring range (2)
Zero pressure calibration	± 1/3 of the basic measuring range (3)
Output characteristic	Linear, square rooted, horizontal cylindr. tank, table (3...30 entries)
Password	001 ... 999 (000 = password protection disabled)

Notes:
(1): Measured values (about zero) are set to zero (used for zero drift suppression); see rating plate for basic measuring range
(2): Maximum effective turn-down ratio = 4:1. Only the output signal is affected.
Transfer function is inverted if start value > end value.
(3): Zero calibration setting may change with mounting orientation.

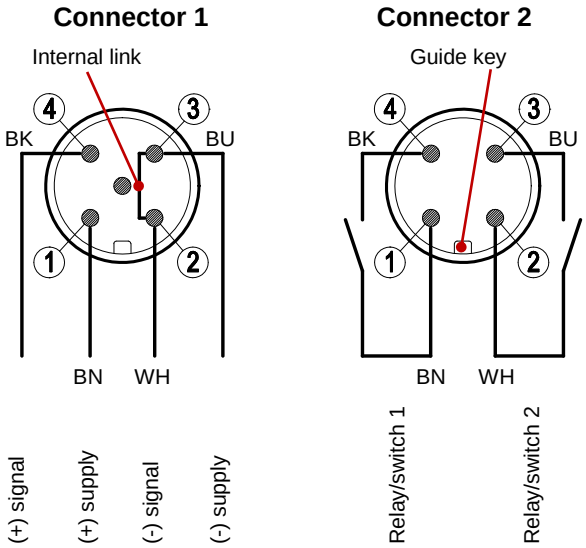
12 Dimensions (All units in mm unless stated otherwise)



Panel mounting



Electrical connection



13 Ordering code

Digital Differential Pressure Switch / Transmitter, with 3 ½-digt LED display

Type DE45 | | | **0** | **0** | | | | **K** | | | **M** | |

Measuring range

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

Pressure connection

Threaded hose clamp connector (aluminum) for 6 / 4 mm hose	>	4 0
Threaded hose clamp connector (aluminum) for r 8 / 6 mm hose	>	4 1

Signal output

No signal output		>	0
Current output: 0-20mA	linear, 3-wire	>	A
Voltage output: 0-10V DC	linear, 3-wire	>	C
Current output: 4-20mA	linear, 3-wire	>	P

Supply voltage

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

Unit of measurement

Standard Units	>	0

Display and switching element

3 1/2-digit-LED – 2 sets of voltage free relay contacts	>	3
3 1/2-digit-LED – 2 solid state switch output	>	6

Electrical connections

M12 round shell connector	>	M

Mounting

Standard (rear fastening holes)	>	0
Top hat rail mounting	>	S
Panel mounting kit	>	T
Wall mounting	>	W

13.1 Accessories

Ordering code	Designation	Pins	Application	Length
06401993	cable with M12 connector (female)	4-pins	for relay/switch	2 m
06401994	cable with M12 connector (female)	4-pins	for relay/switch	5 m
06401995	cable with M12 connector (female)	5-pins	for supply/output signal	2 m
06401996	cable with M12 connector (female)	5-pins	for supply/output signal	5 m
EU03.F300	PC-programming interface inclusive software			

14 EC Declaration of Conformity

FISCHER
MESS- UND REGELTECHNIK

CE

EU Declaration of Conformity

(Translation)

For the product described as follows

Product designation **Digital Differential Pressure Switch / Transmitter**

Type designation **DE45**

it is hereby declared that it corresponds with the basic requirements specified in the following designated directives:

2014/30/EU	*EMC Directive*
2011/65/EU	*RoHS Directive*

The products were tested in compliance with the following standards.

Electromagnetic compatibility (EMC)

EN 61326-1:2013	*Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements*
EN 61326-2-3:2013	*Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-3: Particular requirements - Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning*

RoHS

EN 50581:2012	*Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances*

Also they were subjected to the conformity assessment procedure „**Internal production control**".

The object of the declaration described above is in conformity with Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Sole responsibility for the issue of this declaration of conformity in relation to fulfilment of the fundamental requirements and the production of the technical documents is with the manufacturer.

Manufacturer **FISCHER Mess- und Regeltechnik GmbH**

Bielefelder Str. 37a
32107 Bad Salzuflen, Germany

Tel. +49 5222 974 0

Documentation representative Mr. Stefan Richter
Dipl. Ing.
General Manager R & D

The devices bear the following marking: CE

Bad Salzuflen, 2016-09-29

S. Richter
General Manager R & D

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