FISCHER MESS- UND REGELTECHNIK

Operating Manual

EA14D | Differential pressure analysis unit

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1 Safety guidelines

1.1 General Information

This operating manual contains instructions fundamental to the installation, operation and maintenance of the instrument that must be observed unconditionally. It must be read by the assembler, operator and the specialized personnel in charge of the device before it is installed and put into operation.

This operating manual is part of the product and therefore must be kept close to the device in a place that is easily accessible for the responsible personnel.

The following sections, in particular the instructions about assembly, commissioning and maintenance, contain important safety information, non-observance of which could lead to risks to people, animals, the environment and objects.

1.2 Personal qualification

The instrument may only be installed and commissioned by specialized personnel familiar with the installation, commissioning and operation of this product.

Specialized personnel are persons who can assess the work they have been assigned and recognize potential dangers by virtue of their specialized training, their skills and experience and their knowledge of the pertinent standards.

1.3 Risks due to Non-Observance of Safety Instructions

Non-observance of these safety instructions, the intended use of the device or the limit values given in the technical specifications can be hazardous or cause harm to persons, the environment or the plant itself.

Claims for damages from the manufacturer are excluded in this case.

1.4 Safety Instructions for the Operating Company and the Operator

The safety instructions on correct operation of the device shall be observed. The operating company must make them available to the installation, maintenance, inspection and operating personnel.

Dangers arising from electrical components, energy discharged by the medium, escaping medium and incorrect installation of the instrument must be eliminated. For more information, please refer to the applicable national and international regulations.

In Germany these are the DIN EN, UVV and, in industry-specific cases, the DVGW-, Ex-, GL-, etc., the VDE guidelines and the regulations of the local power utility companies.

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1.5 Unauthorised Modification

Modifications of or other technical alterations to the instrument by the customer are not permitted. This also applies to replacement parts. Any modifications / alterations required shall be carried out by Fischer Mess- und Regeltechnik GmbH only.

1.6 Inadmissible Modes of Operation

The operational safety of this device can only be guaranteed if it is used as intended. The device model must be suitable for the medium used in the system. The limit values given in the technical data may not be exceeded.

1.7 Safe working practices for maintenance and installation work

The safety instructions given in this operating manual, any nationally applicable regulations on accident prevention and any of the operating company's internal work, operating and safety guidelines must be observed.

The operating company is responsible for ensuring that all required maintenance, inspection and installation work is carried out by qualified specialized personnel.

1.8 Explanation of the symbols

WARNING!
… indicates a potentially dangerous situation, non-observance of which could endanger persons, animals, the environment or objects.

INFORMATION!
… highlights important information for efficient and fault-free operation.

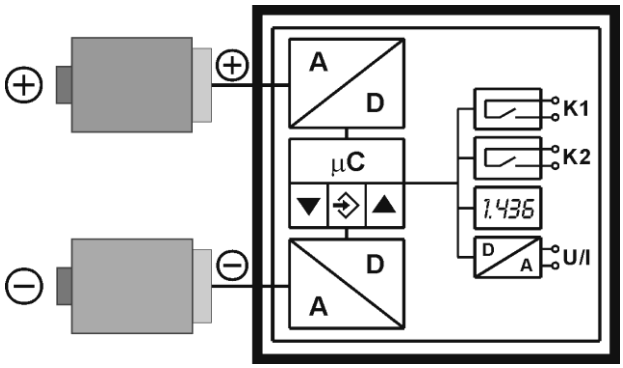
TIP!
… highlights recommendations that may be useful but which are not necessarily required in specific situations.

2 Intended use

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

3 Description of the product and functional description

3.1 Function diagram



3.2 Design and mode of operation

The device is based on an electronic evaluation circuit that analyses the measuring signals of two external pressure transmitters. The signals of the external pressure transmitters can be displayed individually for checking. The main task is to calculate the differential pressure which can be displayed and analysed. The analysis allows two independent switching points to be set; also, an output signal is available that is proportional to the differential pressure.

The external pressure transmitters are connected to the analysis switch via flexible connection cables which also carry the power supply. Only the supplied pressure transmitters may be connected.

The nominal pressures of the external sensors and the differential pressure measuring range are set permanently ex-works and stated on the type plate.

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 Ø3.5 mm tapping screws.

Optionally, the device can be delivered with a wall-mounting plate (see order code).

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 (external sensors)

- By authorized and qualified specialized personnel only.
- Check the suitability of the instrument for the media that is to be measured.
- The pipes need to be depressurized when the instrument is being connected.
- The pressure sensing lines must be installed on an incline so that no condensation pools can form.
- The pressure sensing lines need to be kept as short as possible and installed without sharp bends to avoid interfering delay times.
- Appropriate steps must be taken to protect the device from pressure surges.
- 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.

If the pressure sensing lines are already pressurised 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 Electronic connection

- By authorized and qualified specialized personnel only.
- The electrical connection of the device shall be performed according to relevant VDE and local electricity board regulations.
- Disconnect the system from the mains before connecting the device.
- Do not take out the connecting plug while energized

The two external sensors are connected in 2 or 3-wire connections depending on the model. Both inputs are connected identically. To help identification, the connectors are marked with '+' and '-'.

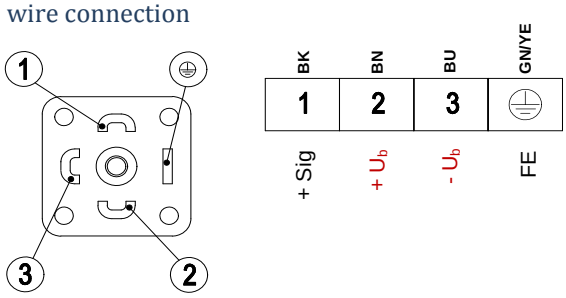
4.2.1 Electrical input signal

The following abbreviations are iused for the signals:

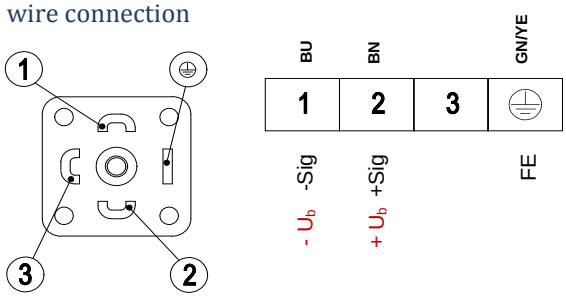
+ U_b	Power supply
- U_b	Power supply
+ Sig	Signal
- Sig	Signal
FE	Functional earth

Fall (1) ***2-wire cable socket +PE***
DIN 175 301-308-A

3 wire connection

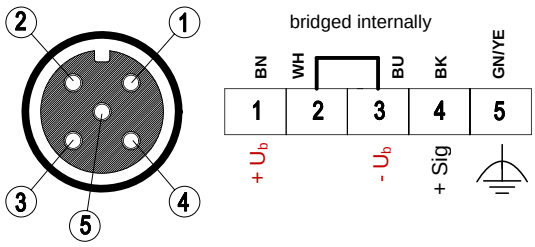


2 wire connection

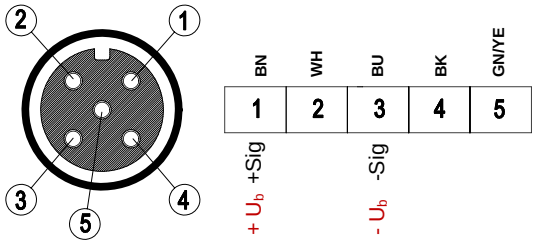


Fall (2) ***M12 connector socket***

3 wire connection

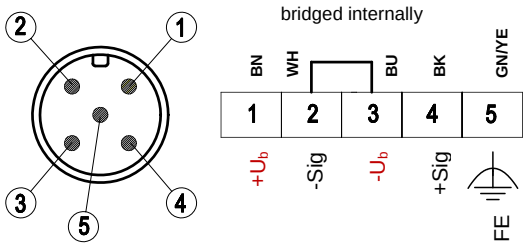


2 wire connection

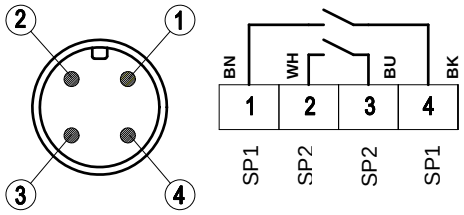


4.2.2 Electrical output signal

Connector 1: Power supply and output signal



Connector 2 : Switching outputs



SP1 Switch point 1
SP2 Switch point 2

The nominal power supply and the admissible load / resistance for the signal output are stated in the technical data.

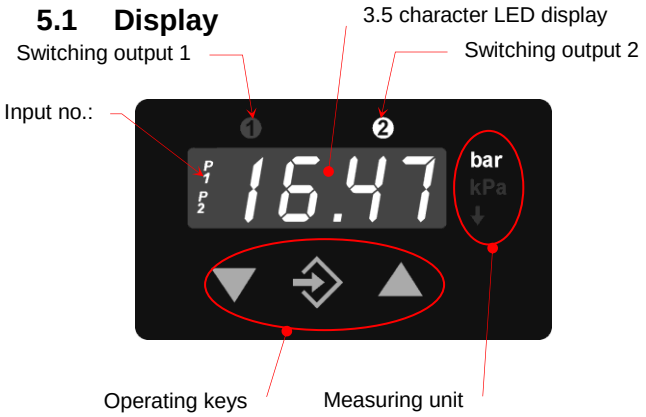
The connection "Signal ground“ (-Sig) is connected internally to the supply ground. It only serves as the ground connection for the output signal. This means that the output signal is free of interference levels on the power supply lines.

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.

Check that the pressure connections do not leak before commissioning.

5.1 Display



- The 3.5 digit LCD display represents the current differential pressure in normal mode.
- The selected measuring unit is illuminated on the right of the display.

The units shown in the picture may vary from the actual model.

- Two light diodes ① ② above the display indicate the status of the switching outputs. As soon as the switch is closed, the respective LED shines.
- When the parameters are being set, the display either shows the respective menu item or the associated parameter value. The device continues to function whilst the parameters are being set; apart from two exceptions, the changes come into effect instantly.
- The exceptions are firstly a change of switching times - here the previously valid time needs to have ended and a change to the support point table. Here all output signals and switching states are frozen until the changes have been completed.

5.2 Operating keys

The operating keys have the following function:

▼	Page down menu Reduce value
⇨	Enter key
▲	Page up menu Increase value

By using the middle ⇨ key on the membrane keypad you can access the parameter menu (setting mode). The reading now shows the text *ESC*.

By pressing the right-hand key ▲ you can page upwards through the menu and select a number of parameters.

By pressing the left-hand key ▼ you can page downwards through the menu until you return the *ESc* parameter.

Press the middle key ⇨ to call up a parameter.

You can set the parameter value using the keys ▼ and ▲.

To confirm a set parameter value, press the key ⇨.

All set parameters are only saved once you leave the menu via the *ESc* parameter.

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 model [1] some menu items may not be available. For example, all characteristic curve functions are faded out in the menu if the device does not have a signal output.

It is possible to completely configure the device using a PC adapter at the PC. Here all parameters are directly visible and accessible. Also, the entire configuration can be loaded, saved and documented as a printout. For more information about this program, please refer to the program documentation (cf. Accessories).

5.3.1 Selecting the pressure unit

First select the pressure measuring unit. The unit that is currently valid is illuminated to the right of the number displays. Press the middle key ◈ to make the setting and then search for the parameter *Ein* using the right-hand key ▲ Press ◈ again an then change the displayed value using ▲ or ▼. Once the value has been selected, save it with ◈ and *Ein* will appear again in the display.

Then leave the setting mode. Press ▼ until *ESC* and the ◈ appear. The current measured pressure is shown again. The correct pressure unit is now illuminated to the right of this.

The display can only show up to ±1999. Therefore in some cases it may not be possible to select all stated pressure units.

5.3.2 Display settings

The pressure difference is calculated by subtracting the two relative pressures P1 and P2. In some cases it helps to also view these values separately. Use the *dSP* parameter to select the display value.

dSP = 0 shows P1 (symbol P1 shines).

dSP = 1 shows P2 (symbol P2 shines).

dSP = 2 shows the differential pressure (symbols P1 and P2 shine). This is the default setting.

5.3.3 Zero point control and adjustment

Depending on the arrangement of the two external pressure sensors, it is possible that the differential pressure can be overlapped by static pressure, which means that the differential pressure is not always zero in the idle state. The current difference can be set to zero via the menu item *-0-*. After ◈, the displayed value is saved with ▲ or ▼. The saved value is immediately subtracted from the measured pressure difference, i.e. the static differential pressure is eliminated (this display shows zero). Press ◈ to quit the menu item.

[1] with regard to the transmitter signal, voltage output, current output, etc.

5.3.4 Damping and zero-point stabilising

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

The parameter *dAM* functions like a capillary throttle. However, it only acts on the display, output signal and switch points (if these exist) but not on the measuring cell itself. With this parameter, the response time can be set to pressure jumps. The value range comprises 0.0 s to 100.0 s.

But with maximum attenuation, it will take more than 2 minutes for the reading to also 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 around zero. Within this range, the measuring value is set to zero.

Example:
A value of 0.08 mbar [2] is entered for *nP*. In this case all pressures within the range of -0.08 mbar to +0.08 mbar are set to zero. The reading will only not indicate zero anymore if the pressure exceeds these limits. However the pressure value and display do not correspond to one hundred percent. The measuring pressure and reading match again when the double value, in this case 0.16 mbar, is reached again.

5.3.5 Setting the output signal

The transmitter output signal primarily depends on the sensed pressure. However, you have the option of adjusting 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 / current) are not variable.

Parameters *nA* (start of measuring range) and *nE* (end of measuring range) define the limits between which the output signal can generally change. Both values are adjustable across the entire basic measuring range. The set values always refer to pressure (in the relevant measuring unit) and are converted when the measuring unit is changed.

The assigned signal values for *nA* and *nE* are invariable (type label, e.g. 0…10 V or 4…20 mA).

[2] 0.08 mbar ≙ 8 Pa

If nA is smaller than nE this is referred ´to a rising characteristic curve. The output signal grows as the pressure increases.

If nE is smaller than nA, this is a decreasing characteristic curve and the output signal decreases with the falling pressure.

The difference between values nA and nE must at least be 25 % of the basic measuring range. The software does not allow any larger spreads. If the range information is stated wrongly, you cannot leave the menu.

Example:
The following must apply for a basic measuring range of 400 Pa: nA – nE ≥ 100 Pa.

5.3.6 Output signal limits (Namur)

Regardless of the pressure, the three parameters oG1, oG2 and oEr define the limit values for output currents or voltages that may not be undercut or exceeded.

These limit values have priority over the range defined by the nA and nE. They primarily serve to prevent error messages in downstream systems caused by a brief overstepping of measuring ranges.

The parameter oG1 defines the limit value for the minimum output signal. The output signal may not undercut this value. Usually, this parameter is only recommended for devices with an output signal of 4..20 mA because in these devices, a value below 3.8 mA is often assessed as an error signal.

The parameter oG2 defines the limit value for the maximum output signal. The output signal may not exceed this value. This parameter can be used for all outputs (voltage and current) to limit the maximum value of e.g. 10.2 V.

The parameter oEr defines the value for the error signal. The value defined via the oEr is issued as an output signal, if the device detects an internal error and can no longer work correctly. However, the device is not able to recognise all possible errors and defects.

If you set oG1 = oG2 = 0, the output signal will no longer be checked for limits.

Tipp

If you set oG1 to the maximum value (11 V or 21 mA), you can use oG2 to adjust the output signal independent of the pressure from zero to the maximum value. You do not need to leave the menu item, the output is directly changed. You operate the device then as a transducer and can simply check the further signal processing.

5.3.7 Characteristic curve function F

In some applications, measuring pressure is an indirect unit for the actual measuring variable. Flow measurements via a panel or determining the filling level by means of hydrostatic pressure measurements are two typical examples of this. In these cases, you might want to change the output signal of the transmitter to a non-linear characteristic curve so that the following analysis receives a signal that is linear-proportional to the actual measuring variable (e.g. volume in m³ or volume flow cm³/s etc.)

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

F	
0	linear characteristic curve (standard)
1	square rooted characteristic curve
2	flat cylindrical tank
3...30	Support point table with 3 to 30 pairs of values

Whenever you change the value from F, the program creates a new table. All previous values in the table are rejected and replaced with new linear entries.

The tables of type F = 0 to F = 2 are not visible. Internal values are used here to calculate the table. These values are invariable.

For F = 3...30 you can only influence the 1..28 intermediate values (cf. 5.3.8) You only have access to the start and end values via the nA and nE parameters.

When the parameters nA and nE are changed the table is deleted and F = 0 is set.

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

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

5.3.8 Menu jump Lin

If the value of F is greater than or equal to 3, there is a submenu Lin. here you can access all table values apart from the table start (nA) and end (nE).

This submenu has its own entry and exit point that is shown with End. The table is only saved if you return to the main menu at this point, i.e. if you change to the parameter Lin again via the key ◈.

If the table is not structured correctly, an error message Err will appear here and you cannot quit the submenu.

The table comprises 1…30 pairs of values. In the case of a device with a power output, the first pair of values is {i01|P01}[3]. The first value i01 defines the output signal. The second value P01 determines the pressure at which the output signal is issued.

Followed by the pairs of values {i02|P02} ... {i30|P30}.

Entering or changing values in the table via the membrane keypad is tiresome and prone to errors. This is only intended as an emergency solution in case access to the PC adapter is not possible.

The table is correct if the following applies for all signal values: The value is larger than the previous value. Either larger (rising characteristic curve) or smaller (falling characteristic curve) apply to the pressure values accordingly. No transition from rising to falling characteristic curves or vice versa is allowed.

5.3.9 Switch points

The two switch outputs ① ② are configured by four parameters respectively.

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

The function of the switching output ① is determined by the parameters r2A, r2E, r2d and r2F.

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

Together, the two parameters r1A and r1E determine the switch function of switch output 1:

If r1A is smaller than r1E, the output switches on, if the measured value exceeds r1E. It is only switched off again if the measured value r1A is undercut (hysteresis function).

If r1A = r1E, the output switches on if the measured value exceeds r1E and off if the measured value undercuts r1A.

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

Both parameters can be set independently over the entire range.

If the measuring unit is switched over, the switching points are converted accordingly. Rounding errors may cause deviations in the last position.

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

r1F reverse the function of the switch output. If the value = 1, the switch output works as an NO contact, if the value = 2, the switch out works as a NC contact.

5.3.10 Password

The last menu item -P- is used to enter a password. A value between 001 and 999 can be selected for the password. The value 000 cancels the password function.

If a password has been issued, the text PAS appears after ESC and ◈, and you need to enter the correct value using ◈ and ▲,▼. You will only arrive at all other menu items after doing this. In the event of an error, the display will jump 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 parameter dO enables the reading to settle if the measuring value fluctuates heavily. This filter function is similar to the dAM function, but only impacts on the reading not on the output signal. At dO = -1 only the switchpoint LEDs are controlled. At dO = -2 these are switched off.

5.3.12 Reset to default

The function rES allows all settings to be reset to the default settings. The default values can only be defined via a PC interface.

5.3.13 Free unit

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

The measuring range defined by the parameters nA and nE is converted to nAF and nEF. This also takes into account the table function (F). 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 **þ** key, you can choose the parameters from the following list one by one:

Note:
Depending on the device model, individual parameters may not be available if the device does not have this feature.

PAS **Enter password**
(only appears if the password is active), value range 000...999
000 = deactivated

[3] At a voltage output {u01|P01} ... {u30|P30}.

-0- **Setting the**

input pressure differential

dSP **Selection**

of the displayed measuring value

dAN **Attenuation**
(Jump response time T90), value range 0.0..100.0s

do **Display attenuation**
Value range -2...0...100.
-2 = Display off, LED Switch point off
-1 = Display off, LED Switch point on
0 = Display on, LED Switch point on
1...100 Display attenuation

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

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

r1d **Switching delay**
from switch output ①
Value range 0.0 to 100.0s. This value applies equally for switching on and 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 ①

r2d **Switching delay**
from switch output ②
Value range 0.0 to 100.0s. This value applies equally for switching on and off.

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

on **Measuring range unit**
Value range 1,2,3

The selection is illuminated on the right of the reading. Not all basic measuring ranges allow free switchover. The respective unit size can only be selected if the basic measuring range of the device can be shown sensibly.

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

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

dPF **Decimal point position**
for free unit

nAF **Start of measuring range (display value)**
for free unit.

nEF **End of measuring range (display value)**
for free unit.

nP **Zero-point stabilising**
Value range 0 to ⅓ of the basic measuring range (3) . The value acts symmetrically around real zero.

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

0 = linear,
1 = square rooted,
2 = flat cylindrical tank,
3..30 = Table

Lin **Menu jump**
Submenu table processing
If F < 3 this menu item is faded out.

oG1 **Limit value**
Minimum output signal

oG2 **Limit value**
Maximum output signal

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

rES **Reset**
all parameters to standard values (specification of the standard values per PC)

-P- **Password setting**
Value range 000 to 999
Value 000 does not hold password protection.

6 Maintenance

The device is maintenance-free.

We recommend regular inspections to guarantee reliable operation and a long life cycle, such as:

- Checking the function in combination with downstream components.
- Checking the leak-tightness of the pressure connection lines.
- Checking the electrical connections.

The exact test cycles are adapted to the operating and ambient conditions. The operating manuals of any other connected device components shall also be observed.

7 Transport

The device must not be exposed to mechanical shocks. It shall be transported only in packaging specifically intended for transport.

8 Service

All damaged or faulty devices shall be directly sent to our repair department. Please coordinate the return of any device with our sales department.

Process media residues in and on dismantled instruments can be a hazard to people, animals and the environment. Take adequate preventive measures. If required the devices shall be thoroughly cleaned.

9 Accessories

- Wall mounting plate
- Set of cables with M12 connectors (please enquire)
- PC adapter EU03 with software

10 Disposal

For the sake of the environment ....

Please help to protect our environment and dispose of or recycle used devices as required by the applicable regulations.

11 Technical data

Measuring ranges		bar	6.0	10.0	16.0	25.0	40.0	60.0	100.0
Rated pressure of the sensor (static operating pressure)	max.	bar	6	10	16	25	40	60	100
Characteristic curve deviation)	max.	%FS	0.1						
	typ.	%FS	< 0.05						
TC span°°)	max.	%FS/10K	< 0.1						
	typ.	%FS/10K	< 0.025						
TC zero point	max.	%FS/10K	< 0.1						
	typ.	%FS/10K	< 0.025						

This information refers solely to the analysis unit and does **not** take the properties of the connected pressure transmitter into account.

°: Non-linearity and hysteresis at 25°C and rated voltage, basic measuring range (linear characteristic curve, not spread)
°°: with reference to the basic measuring range (linear characteristic curve, not spread)

	General points		
Admissible ambient temperature	-10 … 70°C		
Admissible media temperature	see data sheet for the pressure sensors that are used		
Admissible storage temperature	-20 … 70°C		
Enclosure protection class	IP65 as per DIN EN 60529		
Display	3.5 character LED		
	Electrical data		
Nominal voltage	24 V AC/DC		
Admissible operating voltage Ub	12 … 32 V AC/DC (if 2L sensors are used only 24 … 32 V DC are possible)		
Power consumption	approx. 2 W/VA but without external pressure sensors		
Electrical connection type	3-Wire		
Electrical input signal			
	2-Wire	3-Wire	
Sensor power supply[4]	14 … 22 V DC	11 … 31 V DC	
Input resistance			
U-input	-	100 kΩ	
I-suitability	440 Ω	440 Ω	
Current limit limited by PTC (approx. 8Ω)	≤ 250 mA	≤ 250 mA	
Switching output	*2x potential-free relay contacts*	*2x potential-free semiconductor switches*	
can be programmed	as open contact (NO) or break contact (NC)	SPST[5]-NO or -NC)	
U_{max}	32V AC/DC	3…32V AC/DC	
I_{max}	2 A	0.25 A	
P_{max}	64 W/VA	8 W/VA	
R_{on}	-	≤ 4 Ω	

Output signal	**0…20mA**		**4…20mA**		**0…10V**	
Admissible resistance for	$U_b \leq 26V$ $R_L \leq \frac{(U_b - 4V)}{0{,}02A}$	$U_b > 26V$ $R_L \leq 1{,}1\text{k}\Omega$	$U_b \leq 26V$ $R_L \leq \frac{(U_b - 4V)}{0{,}02A}$	$U_b > 26V$ $R_L \leq 1{,}1\text{k}\Omega$	$U_b \leq 15V$ $R_L \geq 10\text{k}\Omega$	$U_b > 15V$ $R_L \geq 2\text{k}\Omega$

	Connections
External pressure sensors	
Option M	2 x round plug connector M12 5-pole flange socket
Option H	2 x standard connectors DIN EN 175 301-803-A 3 -pin + FE (mains socket incl. 1m cable)
Power supply connector 1	5-pole flange connector circular plug connector M12
Output signal connector 2	4-pole flange connector circular plug connector M12
	Materials
Casing	Polyamide PA 6.6
Media-contacting material	see data sheet for the external pressure sensors
	Assembly
Standard	Bore-holes on the reverse side for attachment of the assembly panels
Option W	Wall mounting by means of assembly plate

[4] The sensor power supply supplies pulsating DC current or AC operating voltage.
[5] SPST-NO: **S**ingle **P**ole **S**ingle **T**hrow - **N**ormally **O**pen

11.1 Programming

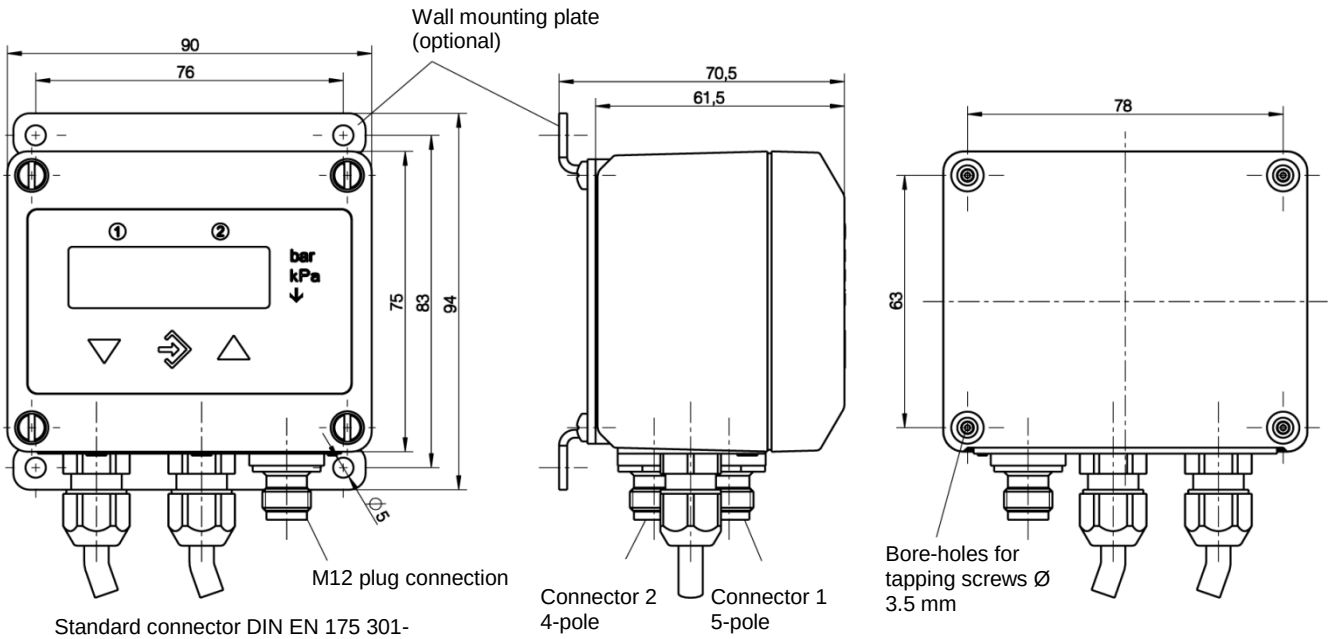
Via membrane keypad with menu-controlled operation or PC adapter EU03; can be locked with a password

	Setting parameters
Offset	Setting the input pressure differential to zero
Pressure display	P1, P2, ΔP (3)
Attenuation	0.0 … 100.0 s (jump response time 10 / 90 %) for signal output; separately also for display
Switching output ①②	Switch-off point, switch-on point, response time (0...100s), function (NC / NO contact)
Measuring range unit	bar, kPa, "fee unit" ⬇, starting value, end value and decimal point for "free unit"
Start / end of measuring range	User-definable within the basic measuring range (2)
Zero-point stabilising	0...⅓ of the basic measuring range (1)
Implementation of characteristic curve	linear, square rooted, flat cyl. tank, 3...30 support points
Password	001 ... 999 (000 = no password protection)

(1) Measuring values (around zero) were set to zero. (e.g. to suppress seepage).
(2) Maximum effective spread 10:1. Only the output signal is influenced. This in turn enables a decreasing characteristic curve, if the start of the measuring range > end of the measuring range.
(3) Pressure displays P1 and P2 serve checking purposes. All setting parameters refer to ΔP.

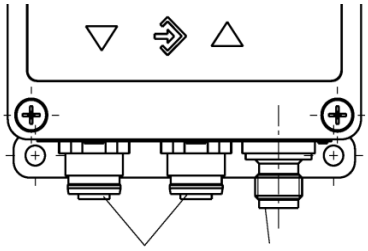
12 Dimensional drawings (all dimensions in mm unless otherwise specified)

Option H: 3-wire cable socket +PE (DIN 175 301-308-A)



Standard connector DIN EN 175 301-803-A 3 -pin + FE (mains socket incl. 1m cable)

Option M: M12 connector socket



Round plug connector M12 5-pole flange socket

M12 plug connection

13 Order Codes

Differential pressure analysis unit with 3 ½-digit LED display

Type EA14

D	0						K			M	

Differential pressure ..... > **D**

Measuring ranges

0…. 2.5 bar ..... > **0 4**
0…. 6 bar ..... > **0 6**
0…. 10 bar ..... > **0 7**
0…. 16 bar ..... > **0 8**
0…. 25 bar ..... > **0 9**
0…. 40 bar ..... > **1 0**
0…. 60 bar ..... > **1 1**
0…. 100 bar ..... > **1 2**

Electrical connection pressure transmitter

M12 plug connection, two-plug ..... > **M**
Plug connection DIN EN 175301-803 A, 1m cable, double ..... > **H**

Electrical input signal (2x same signal)

0 – 20 mA 3-wire (STANDARD) ..... > **A**
4 - 20 mA 2-wire ..... > **B**
0 – 10 V DC 3-wire (STANDARD) ..... > **C**

Electrical output signal

without analogue electrical output signal ..... > **0**
0 – 20 mA 3-wire (STANDARD) ..... > **A**
0 – 10 V DC 3-wire (STANDARD) ..... > **C**
4 – 20 mA 3-wire (STANDARD) ..... > **P**

Operating voltage

24 V DC/AC (12 - 32 V DC/AC)[6] ..... > **K**

Measuring unit

Standard pressure units ..... > **0**
Nm³/h ..... > **A**
m³/h ..... > **B**
0 - 100% ..... > **C**
mmWS ..... > **D**
mmWC ..... > **E**
l/min ..... > **F**

Measured value display / contact elements

3 1/2-digit-LED – 2 relay contacts ..... > **3**
3 1/2-digit-LED – 2 semiconductor switches ..... > **6**

Electrical connection

M12 plug connection ..... > **M**

Assembly option

Standard (attachment boreholes on rear side) ..... > **0**
Wall mounting ..... > **W**

[6] If 2L sensors are used, only 24 … 32 V DC are possible

14 Manufacturer's Declarations and Certificates

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

Differenzdruck-Auswerteeinheit / Differential Pressure Indicator

EA14 D ##########

gemäß gültigem Datenblatt übereinstimmen mit der

specified by the actual data sheet complies with the

EG-Richtlinie

2004/108/EG (EMV)

EC Directive

2004/108/EC (EMC)

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

DIN EN 61326-1:2004-05
DIN EN 61326-2-3
DIN EN 61010-1:2002-08

The instruments have been tested in compliance with the norms (Immunity for industrial environments, emission for residential environments):

DIN EN 61326-1:2004-05
DIN EN 61326-2-3
DIN EN 61010-1:2002-08

Die Geräte werden gekennzeichnet mit:

The gauges are marked with:

CE

Bad Salzuflen, 19.03.08
(Ort, Datum / place, date)

(rechtsverb. Unterschrift / authorized signature)

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