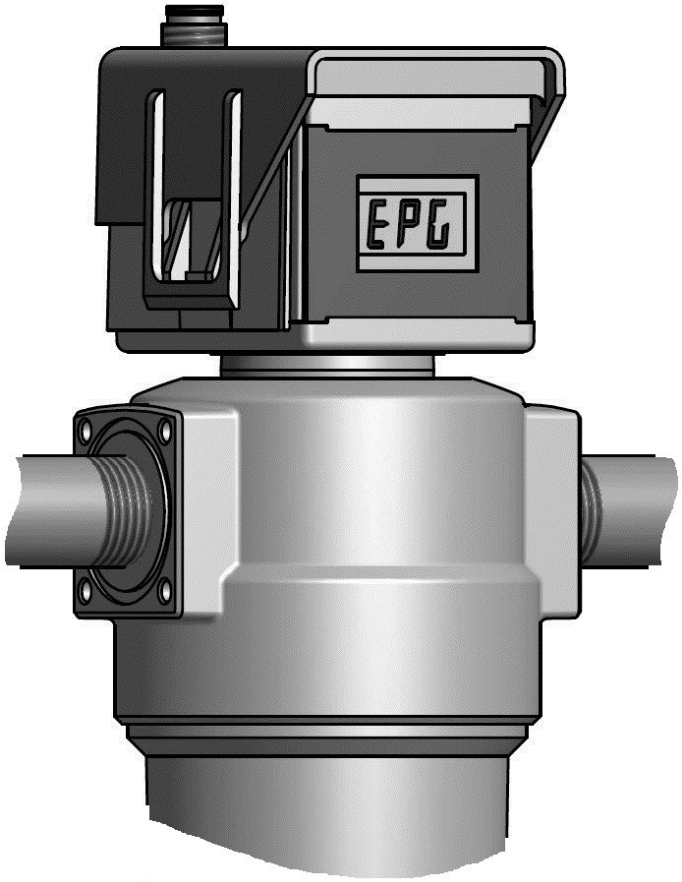
Installation and operating manual

EPG-I

Electronic Pressure Gauge with 4-20mA Output

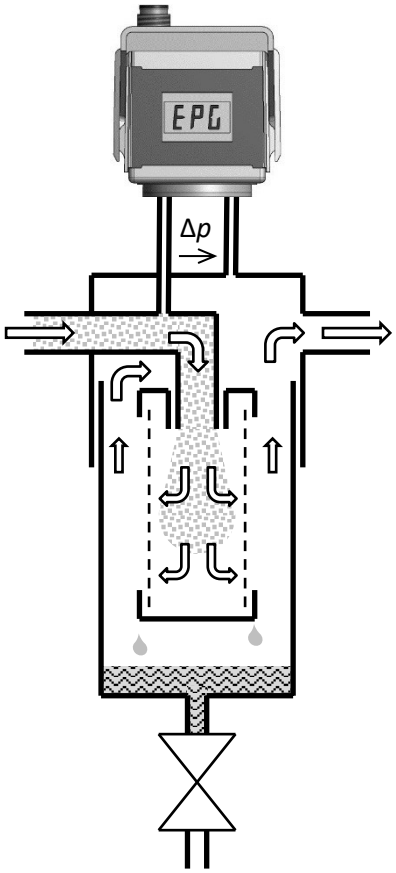


Please read the following instructions carefully before installing the product. Trouble free and safe operating of the product can only be guaranteed if recommendations and conditions stated in this manual are respected.

CE

Description

Air is gas, but in the air, there are also many solid particles. These particles could be plant pollen, volcanic dust, traffic dust, dust from grinding and polishing... All the dust that enters compressor ends in the compressed air together with tiny droplets of compressor oil and droplets of condensed air moisture. The nongaseous contents of compressed air should be removed. Of course, a degree of removal depends on process that uses that compressed air.



The removal of dust from compressed air takes place in a filter cartridge. In the filter cartridge, there is a barrier (filter media) that intercepts particles and allows gas to pass by. Although gas flows through the filter media, its flow is still impeded. This manifests as a pressure drop across filter. Physics says that pressure drop multiplied by fluid flow gives power. Therefore, filters clean compressed air and waste power. The more dust is intercepted by the filter media, the higher is the pressure drop and more energy is wasted. Once, a point is reached where it is more economically to buy a new filter cartridge than spending electricity for excessive pressure drop across the filter.

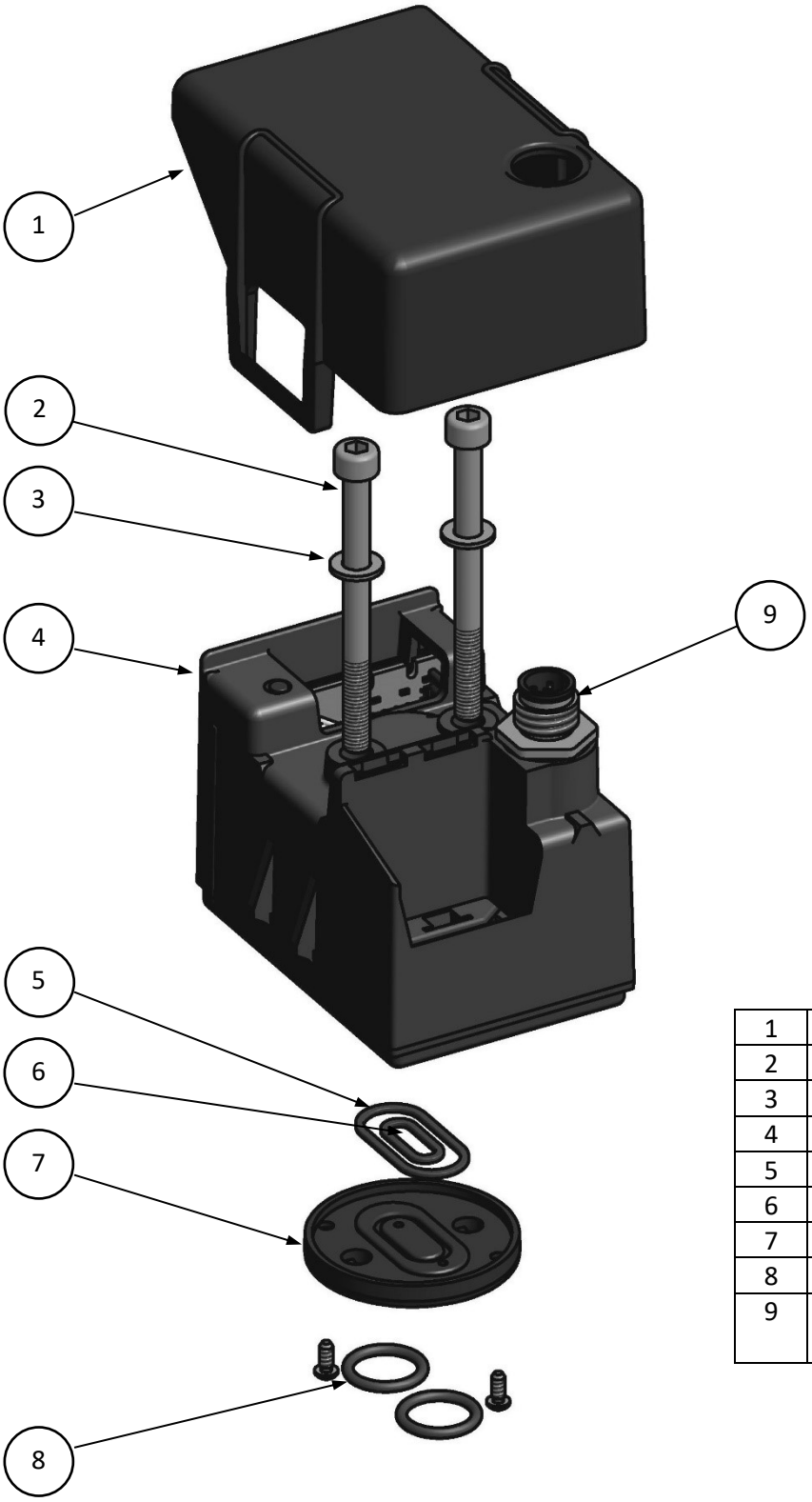
EPG – Electronic Pressure Gauge

The EPG is electronic pressure gauge is designed for monitoring of filter cartridge condition. It monitors three parameters, that are filter pressure drop and tracks filter cartridge's working and total hours. When EPG detects that those three parameters approach their limiting values, it issues a warning, that the filter cartridge should be replaced.

Features:

- Current pressure drop is being measured and displayed in bar or in PSI continually.
- Filter cartridge condition is estimated from pressure drop, working hours, total hours or their combination. A change filter cartridge warning is issued when these parameters approach their limiting values.
- EPG has two-wire 4-20mA output. It gets power from this signal. Thus, no additional wiring is necessary.

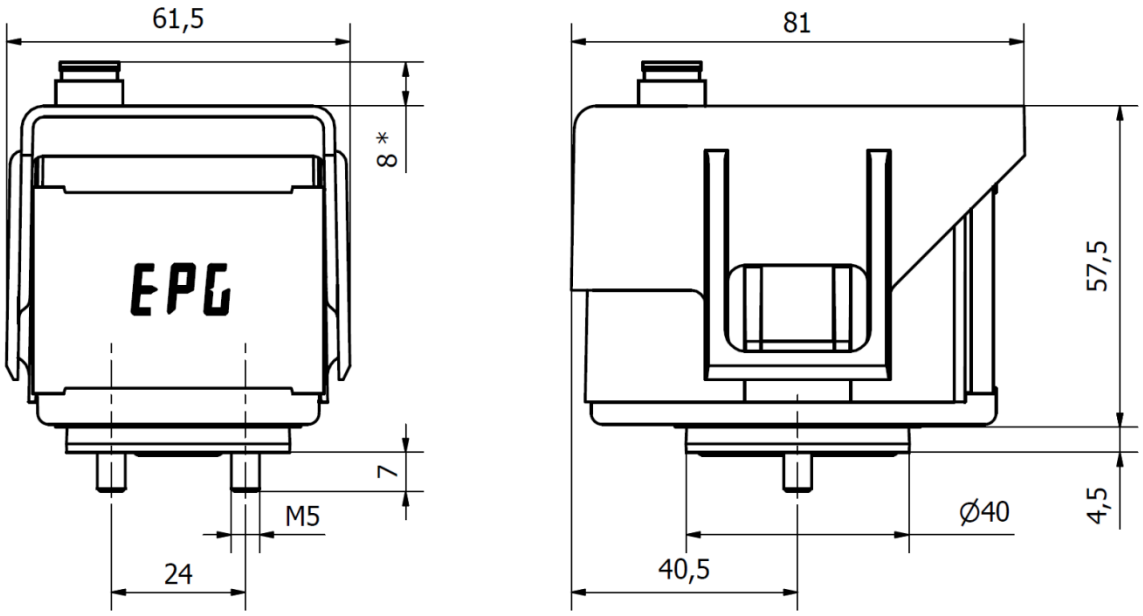
Components



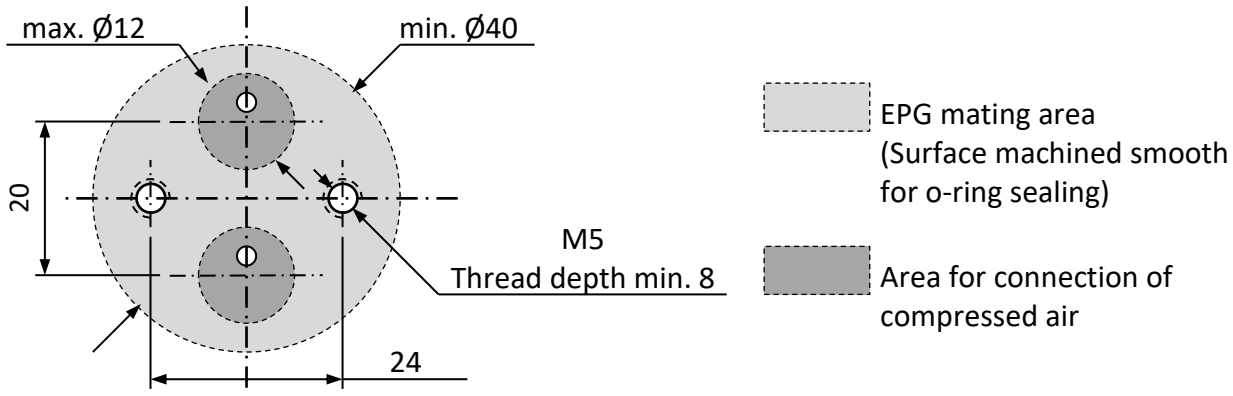
1	Cover
2	Screw M5x60 DIN912
3	Washer 5.3 DIN125A
4	EPG Body
5	Sealing, O-Ring 20 x 1.5
6	Sealing, O-Ring 10 x 1.5
7	Direction plate
8	Sealing, O-Ring 12 x 2
9	Signal connector Type: EM12M5FIX

Technical data

Type		EPG 60 4-20mA (EPG-21.500)
System pressure range		0 – 16 bar, 0 – 232 psi
Differential pressure range		0,10 bar – 1,00 bar, 1.4 PSI – 14.5 PSI
Maximal differential pressure		1 bar / 14,7 psi
Accuracy		5%
Operating temperature	Ambient	1,5°C – 40°C
	Compressed air	1,5°C – 65°C
Mass		0,13 kg
Materials		PA6, glass fibres (housing), NBR (sealing)



(*) – EPG 60-SN (EPG-21.300) only



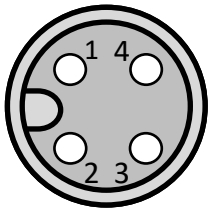
Attachment surface for the EPG on filter housing

Signal output

EPG is equipped with two wire 4-20mA current loop output.

Connector pin description

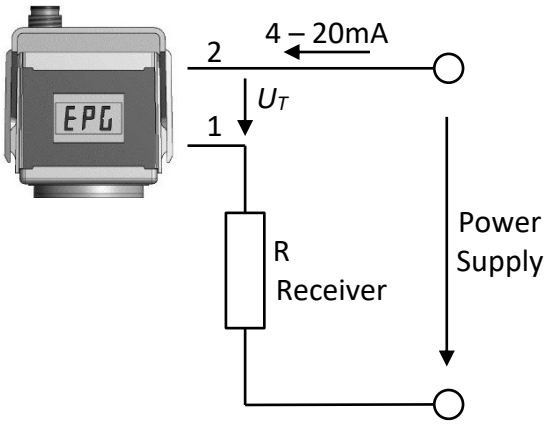
1	GND
2	Positive power supply
3	Not Connected
4	Not Connected



Alarm/ Warning Output

Transmitter voltage U_T: 8Vdc - 32Vdc

Supply reverse polarity protected



Safety instructions

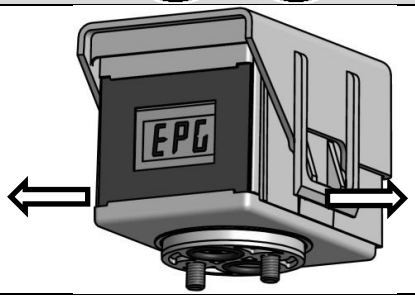
- Installation and maintenance work may only be carried out when the device is not under pressure.
- Installation and maintenance work may only be carried out by trained and experienced personnel.
- Electrical work must always be carried out by qualified electrician.
- Do not exceed maximal operating pressure or operating temperature range (see data label).
- Do not use the device in hazardous areas with potentially explosive atmospheres.
- Use original spare parts only.
- Use the device for the appropriate purpose only.

	Appropriate use
EPG series manometers are intended exclusively for measuring difference between inlet and outlet pressure of filter. This appliance must be used only for the purpose for which it was specifically designed. Any other form of use or one going beyond this shall be considered as inappropriate. We shall have no liability whatsoever for any damage incurred as a result.	

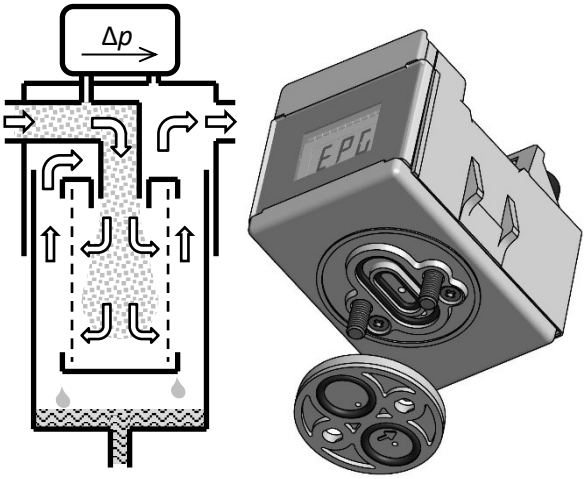
Installation guidelines

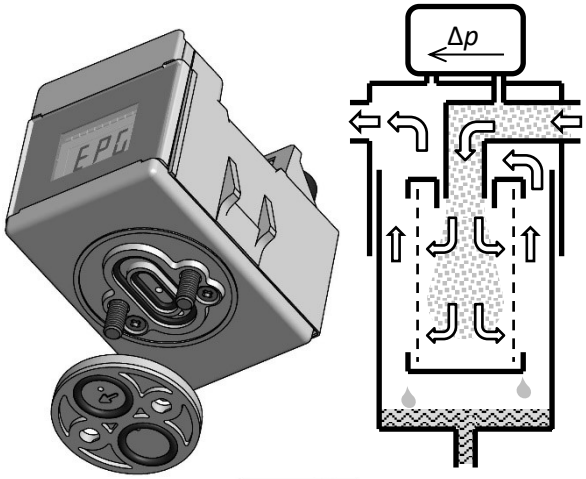
Keep to the safety rules when working with pressure equipment.

Rise cover holders a bit on the both sides of EPG and remove the cover.

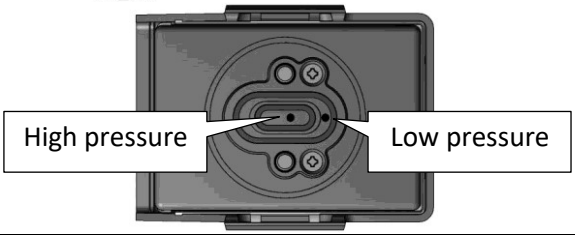


The direction plate should be rotated so that the arrow on the bottom of direction plate points in the direction of air flow through filter.



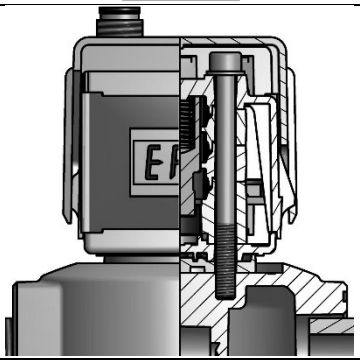


Under the EPG body, there are two connection holes to pressure measuring cell. The EPG measures positive pressure difference where pressure in the middle hole must be higher than pressure in the back hole.



Check that all four o-rings are in the right position and that all o-ring seats are clean.

Screw EPG on the filter head firmly! Unless, measurement would not be corrected and EPG may be damaged.

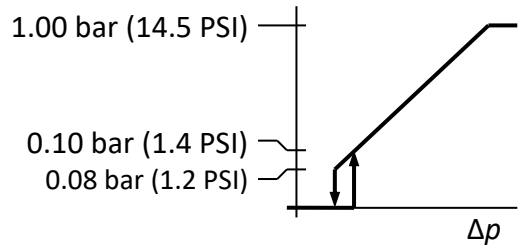


Operation

The EPG comprises a differential pressure measurement cell. Inside a cell, there is piston that is pushed against spring by the pressure difference. The highest is the pressure difference, the more is the piston displaced. The piston is metallic. Around it, there are metallic rings. The piston and rings form a circuit of capacitors. The piston displacement causes capacitance change which is measured by electronics. The measured pressure difference is displayed in bar or in PSI. To select units, the EPG must be connected to Service Network.

The implemented measuring principle does not require a lot of electrical power. Therefore, EPG could be supplied from two wire 4-20mA current loop.

Example of measurement display sequence



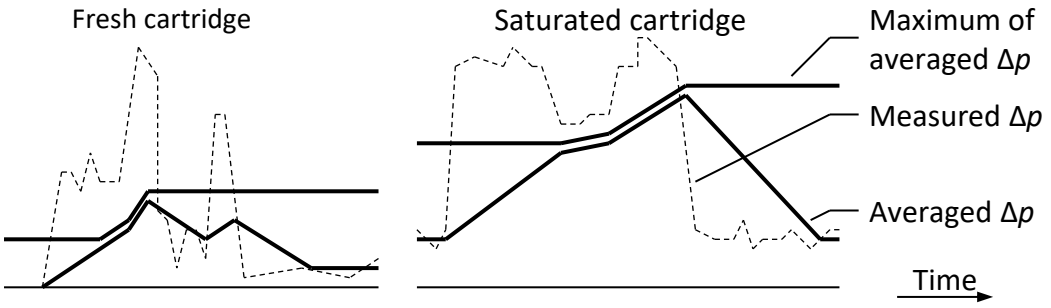
EPG characteristics (not to scale)*

* - Current signal 4-20mA has no initial hysteresis

Pressure difference recording

Pressure drop across filter cartridge depends on airflow and filter cartridge saturation. For maintenance service to follow how filter cartridge gets saturated, pressure drop must be read at the same conditions. Pressure drop values that are read at different airflow rates cannot be compared for to estimate filter cartridge condition.

The airflow in the installation could vary a lot. Because of that, the EPG averages measured pressure difference first. The maximal average pressure difference is recorded. Over time, as the filter cartridge gets saturated, this recorded value is pushed up. The filter cartridge is considered saturated when the maximum average pressure difference crosses a predetermined limit.



Method of pressure difference recording

Filter cartridge working hours recording

Dust gets into the filter cartridge by airflow. Therefore, the amount of dust in the filter cartridge and time when there is airflow through the filter are correlated. The EPG sums time when a pressure drop is present across the filter cartridge. That is, when there is airflow through the filter. When this recorded working time passes a predetermined value, the filter cartridge is considered saturated.

Filter cartridge total hours recording

Filer media in the filter cartridge is aging. Therefore, the filter cartridge must be replaced before the filter media start decaying. The EPG counts elapsed hours since the filter cartridge has been replaced.

Filter cartridge wear-out

Each of three recorded values (maximal averaged Δ*p*, working and total hours) is divided by predetermined limit separately to get percentage of wear-out to that value. To select limit, the EPG must be connected to Service Network.

In the settings of EPG, there is selected also which of the recorded values takes place in the total wear-out. The total wear-out is equal to maximal value of percentages of the selected recorded values. The total wear-out is then displayed.

When the total wear-out passes 90%, displayed text starts to flash and message Change Filter Cartridge appears.

Example of wear-out display sequence

Filter cartridge replacement and reset of wear-out recorder

When a filter cartridge is replaced, the wear-out recorder must be reset. First, the EPG cover is removed to get to a reset button. The button must be hold pressed during display of pressure difference measurement. Then, “rSt” is displayed. Now, the button must be released for a question mark to replace “rSt”. If the button is pressed again, a reset of wear-out recorder takes place and “YES” is displayed. If the button is not pressed again while the question mark is displayed, no reset of wear-out recorder takes place and “no” is displayed.

Such reset procedure is used to avoid accidental reset of wear-out recorder.

Hold reset button		Release button		Press button		Reset successful	
Hold reset button		Release button		Wait		No reset	

Procedure for filter cartridge wear-out recorder reset

Setting of EPG's Parameters

Normally, parameters are set over Service Network. Besides, they may be set by a reset button in a mode, which can be entered when a text "EPG" is displayed. This text is displayed at power on and at filter cartridge wear-out recorder reset. When "EPG" is displayed, the reset button must be hold until a text "PAr" is displayed. Then, the reset button is released. Now, the EPG shows values of parameters sequentially. If the reset button is pressed, a value of currently displayed parameter is changed. In the end of sequence, a question mark is displayed. To confirm changes, the button must be pressed. If we don't press the button, while the question mark is displayed, the changes are discharged.

Entering a parameters changing mode					
Power-on, wear-out recorder reset		Press and hold reset button		Release reset button	
Displaying and changing parameters					
	Differential pressure units	1 2	bar PSI	default	
	Wear out displayed	1 2	yes no	default	
	Total hours limit	1 2 3 4 5	off 2160 h 4380 h 6480 h 8760 h	 default	
	Working hours limit	1 2 3 4 5 6 7 8	off 720 h 1080 h 1800 h 2160 h 3600 h 4800 h 7200 h	default	
	Maximal average pressure difference limit	1 2 3 4	off 0,35 bar 0,5 bar 0,7 bar	 default	
	Averaging filter response	1 2	Slow Fast	default	
	Alarm output polarity	1 2	NC – opens on warning NO – closes on warninig	default	
Confirmation					
	Press button		Changes become effective		
	Wait		Changes are discharged		

Troubleshooting

EPG measures no pressure difference.

There is no airflow through the filter or the size of filter is large for a given airflow.

Direction plate is fixed backward.

EPG blinks and displays message "EPG" instead measured pressure

Batteries should be replaced and their contacts should be checked.

Warranty exclusion

The guarantee shall be void if:

- The installation and operating manual was not followed with respect to installation, initial commissioning and maintenance.
- The unit was not operated properly and appropriately.
- The unit was operated when it was clearly defective.
- Non-original spare parts or replacement parts were used.
- The unit was not operated within the permissible technical parameters.
- Unauthorized constructional changes were made to the unit or if the unit has been opened/disassembled by an unauthorized person.

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