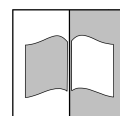




Project planning aid

Cleanroom tableau

Version RT
Technical data



Impressum

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Version history

Rev. ST4-A 10/18	Version 1 (first edition)
Rev. ST4-B 10/19	Version 2 (reference container correction)

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1 Product and functional description

1.1 Delivery scope

- Clean room panel according to specification
- Electro-technology documents
- Operating instructions of the installed measuring components
- Operating instructions of the connected external measuring transducer

1.2 Use as intended

The clean room panel is suitable for monitoring room parameters in clean rooms and safety laboratories in compliance with DIN EN ISO 14644-1 Class 1-9 and according to GMP Class A-D.

Depending on the version, the following parameters can be monitored:

- Room pressure
- Room temperature
- Room humidity
- Particle
- Current

The measuring devices, sensors, control elements etc. used in the clean room panel can be configured as required.

1.3 Product overview

As the clean room panels are produced to manufacturer's specifications, only a typical example can be shown here. However, one panel can be installed a lot more extensively because all available measuring components can be combined with each other freely.

All available components are listed in the section Technical information [► 8].

EA16 Measuring value display



Fig. 1: Clean room panel (example)

2 Assembly and commissioning

NOTICE! To achieve the protection class IP67, the panels need to be mounted with a suitable seal. Seal and attachment screws are not included in the delivery.

- A panel comprises a front plate (V2A, vertical sanding pattern with 240 grain) and various installed components (measuring equipment, control units, signal lamps).
- Assembly with sunk-head screws. There are recesses DIN 74-A4 for the sunk-head screws ISO 2009-M4 in the front plate.
- The power supply is connected via terminal strips.
- The panels can be supplied in the following mounting types.

Wall-mounting

This is realised by means of a recess in the wall in the clean room. The minimum installation depth is 49 mm.

The clean room panel is mounted in the clean room wall with a flush-mounted aluminium cover. When installed, the stainless steel front corresponds to protection class IP67. The flush-mounted cover corresponds to protection class IP20.

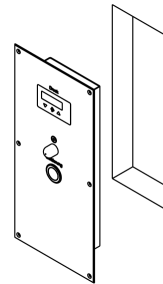


Fig. 2: Wall-mounting

Surface installation

This is realised by means of a surface-mounted housing on the wall of the clean room. The minimum installation height is 52 mm.

In the case of surface-mounted devices, the front plate is mounted to a surface-mounted housing (V2A, vertical sanding pattern with a 240 grain). When installed, the stainless steel front corresponds to protection class IP67. The surface-mounted housing corresponds to protection class IP67.

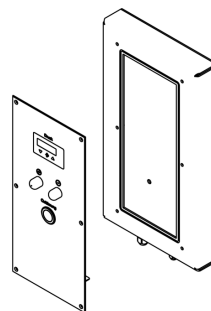


Fig. 3: Surface installation

Channel assembly

This is realised by means of a recess in the channel. The minimum installation depth is 49 mm.

The clean room panel is mounted in the channel with a rear cover made of aluminium. When installed, the stainless steel front corresponds to protection class IP67. The cover corresponds to protection class IP20.

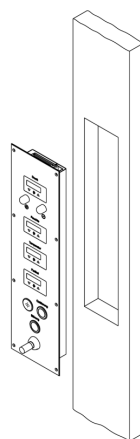


Fig. 4: Channel installation

Also see about this

📄 Order Codes [▶ 33]

3 Maintenance, servicing and disposal

3.1 Maintenance

We recommend the following regular inspections of the clean room panel to guarantee reliable operation and a long service life:

- Check the function in combination with downstream components.
- Calibration of the installed components
Please note the instructions in the section Components.
- Check any pressure connections lines for leaks.
- Check the electrical connections.

The exact test cycles need to be adapted to the operating and environmental conditions. In combination with other devices, the operating instructions for the other devices also need to be observed.

3.2 Transport

The clean room panel may not be exposed to mechanical shocks. It should be transported in the original packaging or a suitable transport container.

3.3 Service

All service tasks must be agreed with our sales department. All defective or faulty panels should be sent directly to our repair department. Return the device in the original packaging or a suitable transport container.

3.4 Disposal

Please help to protect the environment by always disposing of the work pieces and packaging materials in compliance with the valid national waste and recycling guidelines or reuse them.

4 Technical information

4.1 Application conditions

Ambient temperature	0 ... +50 °C
Storage temperature	-10 ... +70 °C
Enclosure protection class	According to assembly type (see below)

The panels are suitable for use in all clean room classes according to DIN EN ISO 14611-1 and EG-GMP Guide.

The resistance of the components to certain chemicals must be agreed with the sales department.

4.2 Auxiliary energy

It is connected via a terminal strip in the back of the housing cover. Please refer to the electro-technology documents for the terminals and/or wiring plan. Please refer to the information in the wiring diagram or the technical data of the components used for information about the auxiliary energy.



NOTICE

Power supply

Please ensure that a uniform power supply is used.

4.3 Measuring-specific components

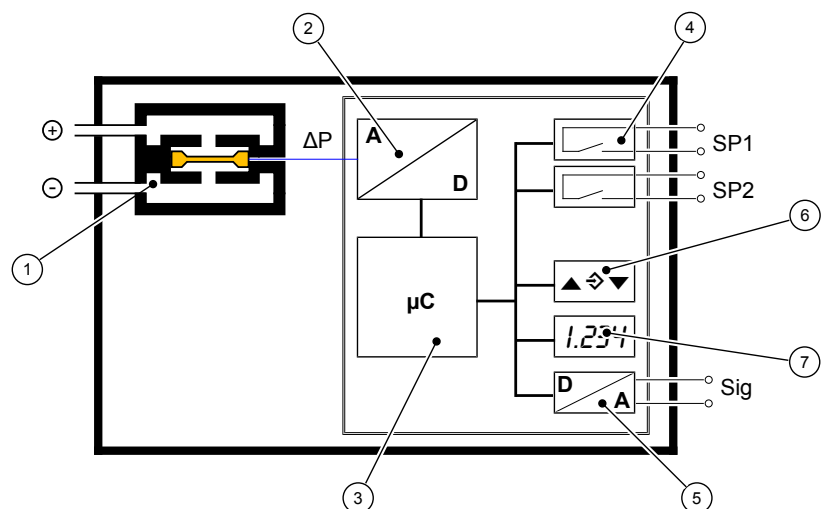
4.3.1 DE24 Room pressure transmitter/indicator

4.3.1.1 General



Fig. 5: Room pressure display

Suitable as a display and switching device for differential pressure of non-aggressive gaseous media.



1 Sensor element	2 A/D converter
3 Micro-controller	4 Switching outputs
5 Analogue output	6 Keyboard
7 Measurement data display	

Design and mode of operation

This switching device is based on a capacitive sensor element that is suitable for measuring overpressure, under-pressure and differential pressure. The measured pressure acts on the sensor element with a micro-mechanically produced differential condenser in silicon-glass technology.

Changes in pressure generate changes in capacity, which is evaluated by the device's electronics and transformed into signals on the display, switch contacts and an output signal.

4.3.1.2 Input variables

Measuring variable

Differential pressure for gas-like media

Measuring range

PA	Stat. operating pressure max.	Bursting pressure
0 ... 50	100 kPa	170 kPa
0 ... 100		
0 ... 1000		
-20 ... +80		
-25 ... +25		
-50 ... +50		
-100 ... +100		
-150 ... +50		

4.3.1.3 Output parameters**4.3.1.3.1 Analogue output**

Output signal	0 ... 20 mA	4 ... 20 mA	0 ... 10 V
Signal range	0.0 ... 21.0 mA		0.0 ... 11.0 V
Apparent $U_b \leq 26 \text{ V}$	$R_L \leq (U_b - 4 \text{ V}) / 0.02 \text{ A}$		0 ... 10 V
ohmic resist- ance $U_b > 26 \text{ V}$	$R_L \leq 1100$		$R_L > 2 \text{ k}\Omega$

4.3.1.3.2 Switch output

2 potential-free semiconductor switches	(MOSFET)
Switching function (programmable)	One-pin activator (NO) One-pin deactivator (NC)
Switching voltage	3 ... 32 V AC/DC
Switching current	max. 0.25 A
Switching output	max. 8 W ($R_{on} \leq 4 \Omega$)

4.3.1.4 Measurement accuracy**Characteristic curve deviation**

(Non-linearity and hysteresis)	
Maximum	1.0 % FS
Typical	0.5 % FS
Reproducibility	0.1 % FS

FS (Full Scale) refers to the basic measuring range. The information refers to a linear, non-spread characteristic curve at 25 °C and applies to all measuring ranges.

Temperature coefficient

max. 0.6 % FS / 10 K

In zero-point and span with reference to the basic measuring range (not spread), compensation range 4...50 °C.

4.3.1.5 Auxiliary energy

nominal voltage	24 V AC/DC
-----------------	------------

Admissible operating voltage	$U_b = 20 \dots 32 \text{ V AC/DC}$
Absorbed power	Max. 2W (2VA)
Electrical connection	Please see the supplied electro-technology documents for information about the electrical connection.

4.3.2 EA16 Measuring value display

4.3.2.1 General



Fig. 6: Measured value display

The EA16 is a measuring value display unit for measuring transducers with output signals for current and voltage acc. to IEC 60381. Up to four measuring transducers can be connected.

The stated technical data only refer to the measuring value display unit EA16 and never take into account the properties of the connected measuring transducer.

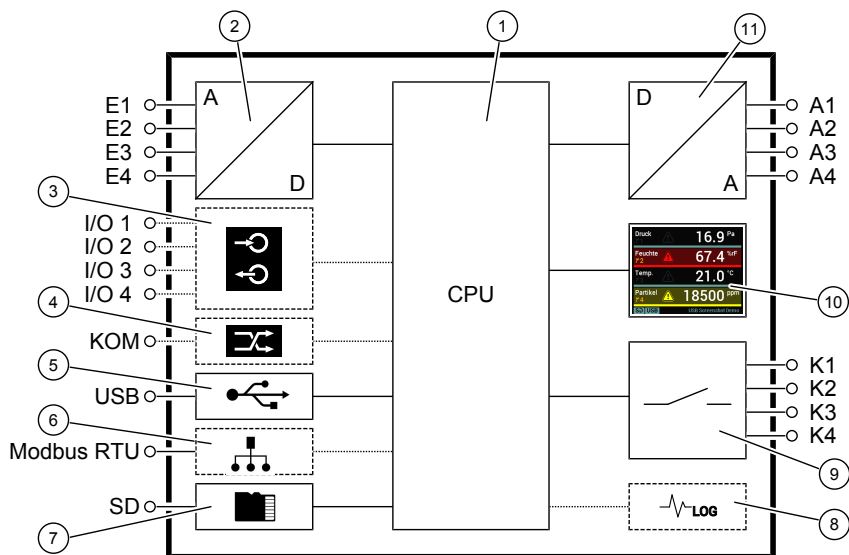


Fig. 7: Function diagram

1 Central processing unit	2 Analogue inputs
3 Digital input/output (option)	4 Digital 2-wire interface (option)
5 Micro USB interface	6 Modbus interface (option)
7 Micro SD memory card	8 Datalogger (option)
9 Switching outputs	10 Analogue outputs
11 Touch colour display	

Design and mode of operation

The measuring signals of the connected measuring transducers can be analysed by the microcontroller electronics. The configurable 3.5" touch display can display up to four measuring values at the same time. A configurable colour switch serves to present specific operating modes. Optionally, the device can be delivered with a data logger function.

The unit also has a Modbus interface and can be connected to a Modbus RTU network as a slave.

All parameters can also be set on the device via the touch display or (optionally) via a PC software. The measuring value display unit has a USB interface to which a USB stick can be connected for this purpose. For instance, the USB stick can be used to allow simple configurations to be exported to other devices. A measuring point protocol is also possible with the PC software.

In addition, the unit can also be equipped with the following options.

- **Datalogger function**
The datalogger function allows data to be recorded for all inputs and outputs and their results. Also, the accesses to the parameters and the system are recorded.
- **Modbus RTU interface**
The unit also has a Modbus interface and can be connected to a Modbus RTU network as a slave.
- **Digital 2-wire interface**
Only the FF62 sensor can be connected via the digital interface. This interface is not suitable for connecting other sensors.
- **Digital inputs and outputs (Flex I/O channels)**
These digital connections are configured ex-works either as an input or output. They can serve as a digital input for a collective alarm or as a digital output for a signal encoder.

4.3.2.2 Input variables

4.3.2.2.1 Analogue inputs A1 ... A4

Depending on the model, the measured value display unit EA16 has 2 or 4 analogue inputs for measuring transducers with output signals current of voltage acc. to IEC 60381.

Input range	Min. signal range	Resolution	Input resistance	Overload protection
0 ... 20 mA	4 mA	12 Bit	≤ 30 Ω	PTC max. 32 DC/ 140 mA
4 ... 20 mA	4 mA		≤ 30 Ω	PTC max. 32 DC/ 140 mA
0 ... 10 V	2.5V		≥ 200 kΩ	max. 32 V

4.3.2.2.2 Digital inputs I/O1 ... I/O4

The number of inputs depends on the number of Flex I/O channels configured as an output. It is configured ex-works and must be stated on the order.

Quantity	Max. 4
Input voltage	5 ... 32 V DC
Switching threshold	ON: 3.9V OFF: 2.6 V Tolerance ±10%

4.3.2.3 Output parameters

4.3.2.3.1 Analogue outputs A1 ... A4

Depending on the model, the measured value display unit EA16 has 2 or 4 analogue inputs with programmable uniform signals acc. to IEC 60381.

Output signal	Min. signal range	Resolution	Signal range
0 ... 20 mA	4 mA	12 Bit	0.0 ... 21.5 mA
4 ... 20 mA	4 mA		0.0 ... 21.5 mA
0 ... 10 V	2.5V		0.0 ... 10.5 V

4.3.2.3.2 Digital outputs I/O1 ... I/O4

The number of outputs depends on the number of Flex I/O channels configured as an input. It is configured ex-works and, like the level of output voltage, it must be stated on the order.

Quantity	Max. 4		
Output type	PNP		
Output voltage	5V	12 V	24 V
Output current	20 mA	50 mA	100 mA

4.3.2.3.3 Switching outputs K1 ... k4

Depending on the model, the measured value display unit EA16 has none, 2 or 4 switch outputs with a programmable switching function. Optionally, the unit can be supplied with potential-free relay contacts or potential-free semiconductors (MOSFET).

Programmable switching function

Make contact (NO)

Break contact (NC)

Relay contacts

	AC	DC
Max. switching voltage	32V	32V
Max. switching current	2A	2A
Max. switching output	64 VA	64 W

Semiconductor contacts

	AC	DC
Allowed switching voltage	3 ... 32 V	3 ... 32 V
Max. switching current	1A	1A
Continuous current	0.25A	0.25A
Max. switching output	8 VA	8 W
Forward resistance R_{on}	$\leq 1 \Omega$	$\leq 1 \Omega$

4.3.2.4 Measurement accuracy

Characteristic value	Unit	Value
Max. characteristic curve deviation ⁺⁾	% FS	0.10
Typ. characteristic curve deviation ⁺⁾	% FS	< 0.05
Max. temperature coefficient range ^{x)}	% FS/10K	0.10

Characteristic value	Unit	Value
Typ. temperature coefficient range ^{x)}	% FS/10K	< 0.025
Max. temperature coefficient zero-point ^{x)}	% FS/10K	0.10
Typ. temperature coefficient zero-point ^{x)}	% FS/10K	< 0.025

^{+) Characteristic curve deviation (non-linearity and hysteresis) at 25°C and rated voltage input range with linear, not spread characteristic curve.}

^{x) In relation to the input range with a linear, not spread, characteristic curve.}

4.3.2.5 Digital interfaces

Type	
USB interface	Micro USB 2.0
SD card slot	Micro SD up to 32 GB
Field bus interface (option)	Modbus RTU
Digital 2-wire interface (option)	FF62 Temperature and moisture sensor

4.3.2.6 Display and operating interface

Characteristic value	Value
Display size	3.5"
LCD type	TN TFT
Resolution	320 x 240 Pixel
Touch	Resistive

4.3.2.7 Auxiliary energy

Parameter	DC	AC
nominal voltage	24 V DC	24 V AC 50/60Hz
Admissible operating voltage	$U_b = 18 \dots 32 \text{ V DC}$	24 V AC $\pm 20\%$ 50/60Hz
Absorbed power	Max. 11 W	Max. 22 VA
	Type 3 ... 5 W	Type 6 ... 10 VA

4.3.3 EA14 Universal display

4.3.3.1 General



Fig. 8: Particle display

The EA14 is a universal display unit for external sensor elements with output signals for current or voltage according to IEC 60381. This can be a particle sensor, a pressure sensor, a temperature sensor or also a moisture sensor.

The stated technical data only refer to the display unit EA14 and never take into account the properties of the connected measuring transducer.

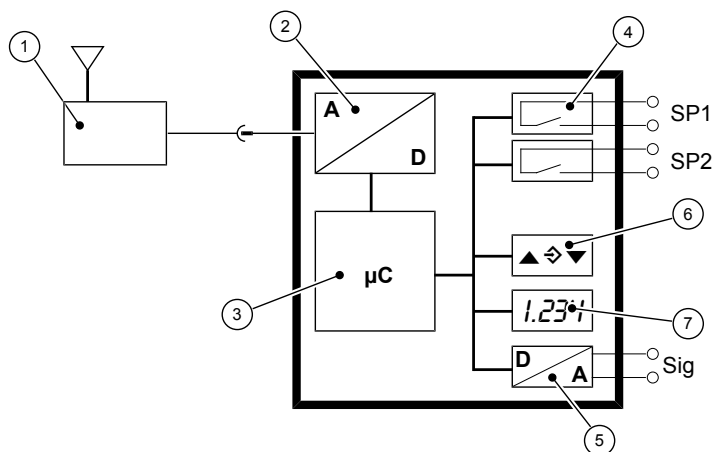


Fig. 9: Function diagram particle counter

1 Sensor element	2 A/D converter
3 Micro-controller	4 Switching outputs
5 Analogue output	6 Keyboard
7 Measurement data display	

Design and mode of operation

This device is based on an electronic analysis switch that analyses the measuring signal of an external transmitter. The main task is to display and analyse the measured signal. Optionally, an output signal can be provided that is proportional to the input signal.

4.3.3.2 Input variables

Measuring variable

Depends on the sensor element used.

Input signal

Current signal in compliance with DIN IEC 60381-1	Voltage signal in compliance with DIN IEC 60381-2
0 ... 20 mA	0 ... 10 V
4 ... 20 mA	

4.3.3.3 Output parameters

Output signal

Output signal	0 ... 20 mA	4 ... 20 mA	0 ... 10 V
Signal range	0.0 ... 21.0 mA		0.0 ... 11.0 V
Output load	$U_b \leq 26 \text{ V}$	$R_L \leq (U_b - 4 \text{ V}) / 0.02 \text{ A}$	0 ... 10 V
	$U_b > 26 \text{ V}$	$R_L \leq 1100$	$R_L > 2 \text{ k}\Omega$

Switching outputs

2 potential-free relay contacts

2 potential-free semiconductor switches (MOSFET)

	Relay	MOSFET
Progr. switching function	Open contact (NO) Break contact (NC)	One-pin activator (NO) One-pin deactivator (NC)
Max. switching voltage	32 V AC/DC	3...32 V AC/DC
Max. switching current	2 A	0.25 A
Max. switching output	64 W / VA	8 W / VA $R_{ON} \leq 4 \Omega$

4.3.3.4 Measurement accuracy

Characteristic curve deviation

Maximum	0.1 % FS
Typical	0.05 % FS

FS (Full Scale) refers to the basic measuring range. The information refers to a linear, non-spread characteristic curve at 25 °C and applies to all measuring ranges.

Temperature coefficient

Maximum	0.1 % FS / 10 K
Typical	0.025 % FS / 10 K

In zero-point and span with reference to the basic measuring range (not spread).

4.3.3.5 Auxiliary energy

nominal voltage	24 V AC/DC
Admissible operating voltage	$U_b = 20 \dots 32 \text{ V AC/DC}$
Absorbed power	Max. 2W (2VA)
Electrical connection	Please see the supplied electro-technology documents for information about the electrical connection.

4.3.4 FT61 Humidity and temperature measuring device

4.3.4.1 General



Fig. 10: Moisture/temperature display

The FT61 is suitable for measuring moisture and the temperature of non-aggressive gaseous media.

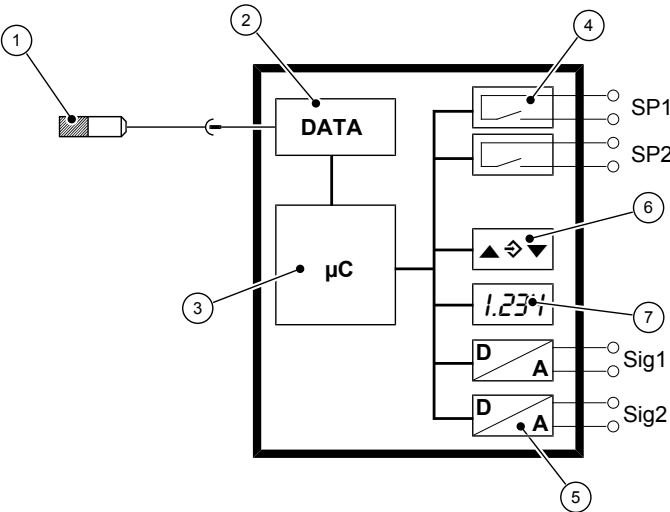


Fig. 11: Function diagram

1 Sensor element FF62	2 Serial interface
3 Micro-controller	4 Switching outputs
5 Analogue output	6 Keyboard
7 Measurement data display	

The measuring device comprises a FF62 sensor element and a FT61 display unit. The data measured on the sensor (temperature and moisture) is transferred via digital 2-wire interface to the FT61. Here the data is displayed and converted into two analogue output signals.

The standard signals 0/4...20 mA and 0...10V are available for the analogue outputs. Optionally, there are two additional switch outputs available.

4.3.4.2 Input variables

Measuring variable	Humidity and temperature of gaseous media.
Measuring sensor	FF62

Measuring ranges

	Precision	Long-term drift
0 ... 100 % rel. hum.	s. Diagram FF62	< 0.5 %rel.hum/year
-40 ... 100 °C	s. Diagram FF62	< 0.04 °C/year

4.3.4.3 Output parameters

Output signal

The device has two analogue outputs (% rel. hum., °C) with the following signals:

Output signal	0 ... 20 mA	4 ... 20 mA	0 ... 10 V
Signal range	0.0 ... 21.0 mA		0.0 ... 11.0 V
Output load	$U_b \leq 26 \text{ V}$ $U_b > 26 \text{ V}$	$R_L \leq (U_b - 4 \text{ V}) / 0.02 \text{ A}$ $R_L \leq 1100$	$0 \dots 10 \text{ V}$ $R_L > 2 \text{ k}\Omega$

Switch output

2 potential-free semiconductor switches	(MOSFET)
Switching function (programmable)	One-pin activator (NO) One-pin deactivator (NC)
Switching voltage	3 ... 32 V AC/DC
Switching current	max. 0.25 A
Switching output	max. 8 W ($R_{on} \leq 4 \Omega$)

4.3.4.4 Auxiliary energy

nominal voltage	24 V AC/DC
Admissible operating voltage	$U_b = 20 \dots 32 \text{ V AC/DC}$
Absorbed power	Max. 2W (2VA)
Electrical connection	Please see the supplied electro-technology documents for information about the electrical connection.

4.3.5 FF62 Temperature and moisture sensor

NOTICE! The sensor can only be used in connection with the EA16 of the FT61.

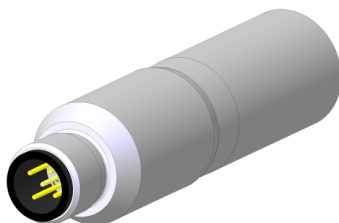


Fig. 12: Temperature and moisture sensor

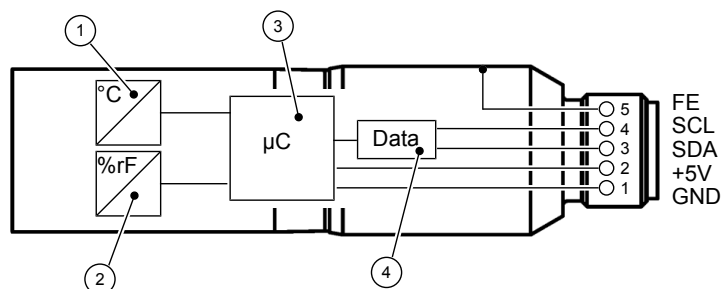


Fig. 13: Function diagram

1 Temperature sensor	2 Moisture sensor
3 Signal processing	4 Digital interface

Design and mode of operation

The basis of the FF62 is a sensor module that comprises two sensor elements, signal processing and a digital output. A capacitive sensor element is used to measure moisture. A semiconductor sensor element is used to measure the temperature. Both sensor elements are connected to an A/D converter. The data is transferred via a serial 2-wire interface.

Material	Stainless steel
Handle Diameter	18 mm
length	69 mm
Electrical connection	M12 connector 5-pin, male
Communication	Digital 2-wire interface
Storage conditions	0 ... 80 °C 20 ... 60 % re. hum-
Order number spare part	FF62

The sensor works stably within the given normal range. If the sensor is operated outside the normal range, the sensor works with an offset. The longer the sensor is operated outside the normal range, the larger the offset. After 60 hours, this can be up to +3 % rel.hum. This applies in particular from a humidity of >80 %rel.hum.

As soon as the sensor is operated within the normal range again, the sensor calibrates itself and the offset disappears.

If the sensor is exposed to extreme conditions for a longer time, this will accelerate the aging process.

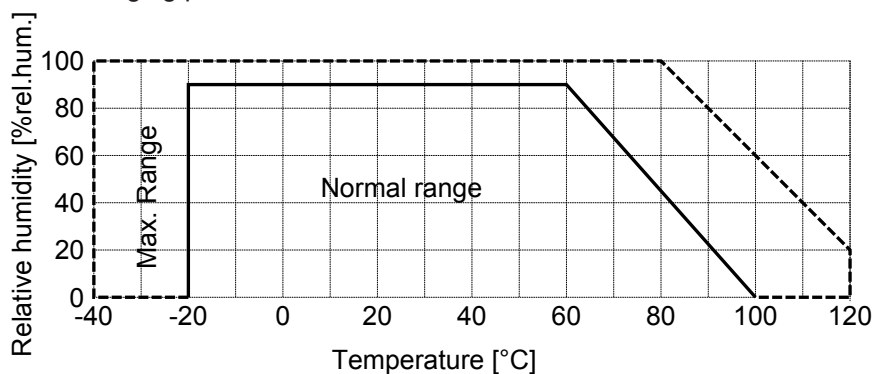


Fig. 14: Working range FF62

PUR connection cable

The FF62 can also be connected as a remote sensor. In this case, a 5-pin M12 connecting cable is required. The cable is available in various lengths up to maximum 20 m. However, the FF62 may not be operated across a larger distance. For more information about this, please see the accessories.

4.3.5.1 Temperature measurement range

Measuring range	-40 ... +100 °C	
Measurement accuracy	±0.5 °C	5 ... 45 °C (see diagram)
Repetition accuracy	± 0.1 °C	
Long-term drift	< 0.04 °C/year	

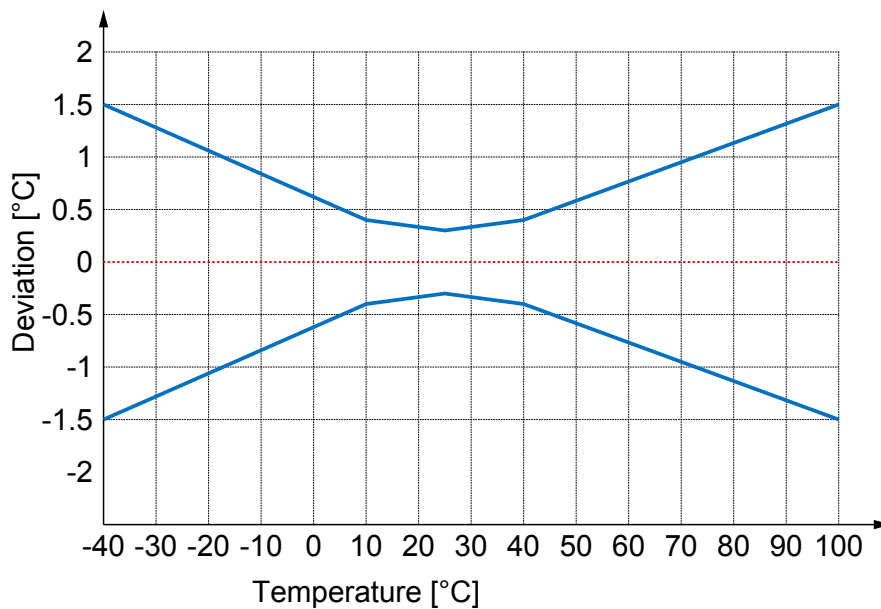


Fig. 15: Measurement accuracy [°C]

4.3.5.2 Humidity measurement range

Measurement accuracy	±2 %rel.hum	10 ... 90 % rel.hum (see diagram)
Hysteresis	±1 %rel.hum	
Repetition accuracy	±0.1 %rel.hum	
Long-term drift	< 0.5 %rel.hum/year	

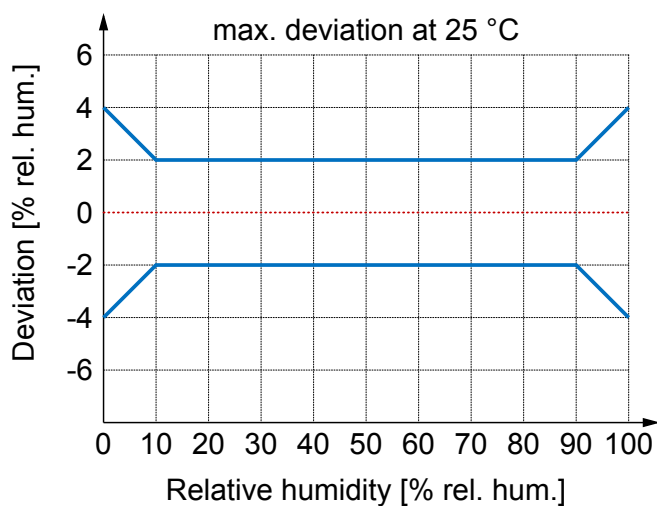


Fig. 16: Measurement accuracy [% rel. hum.]

4.3.6 TW68 Resistance thermometer

4.3.6.1 General

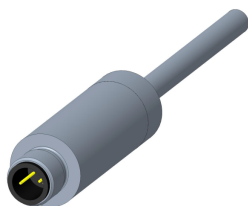


Fig. 17: Resistance thermometer

The TW68 serves direct measurement of the temperature of non-aggressive gaseous media.

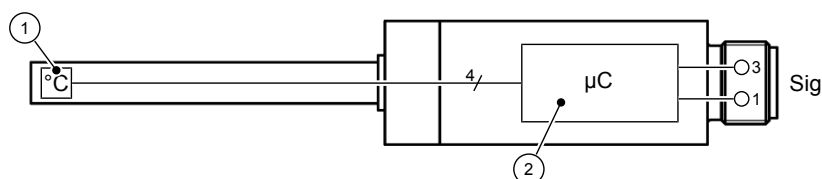


Fig. 18: Function diagram

1 Pt100 Measuring insert:

2 Measurement converter

Design and mode of operation

The temperature is measured with a Pt100 measuring insert in a 4-conductor switch. The integrated measuring transducer converts the Pt100 signal into an analogue output signal.

4.3.6.2 Input variables

Measuring variable

Temperature of gas-like media.

Measuring ranges

0 ... +50 °C

Other ranges on request

4.3.6.3 Output parameters

Output signal 4 ... 20 mA

Apparent ohmic resistance $(U_b - 10 \text{ V})/0.023 \text{ A}$

4.3.6.4 Measurement accuracy

Characteristic curve deviation $\pm 0.3 \text{ K}$

Long-term stability $\leq 0.1 \text{ K/year}$

Temperature drift 0.1 %/K

Response time 1 sec

4.3.6.5 Auxiliary energy

nominal voltage 24 V AC/DC

Admissible operating voltage $U_b = 20 \text{ ... } 32 \text{ V AC/DC}$

Absorbed power Max. 1W (1VA)

Electrical connection M12 connection cable, see accessories. Please see the supplied electro-technology documents for information about the electrical connection.

4.3.7 DE22 Differential pressure transmitter

4.3.7.1 General

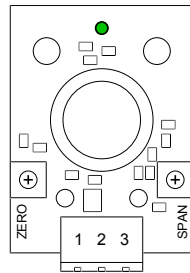


Fig. 19: Differential pressure transmitter

The DE22 is suitable for measuring very small over-pressure, under-pressure and differential pressures of non-aggressive gaseous media.

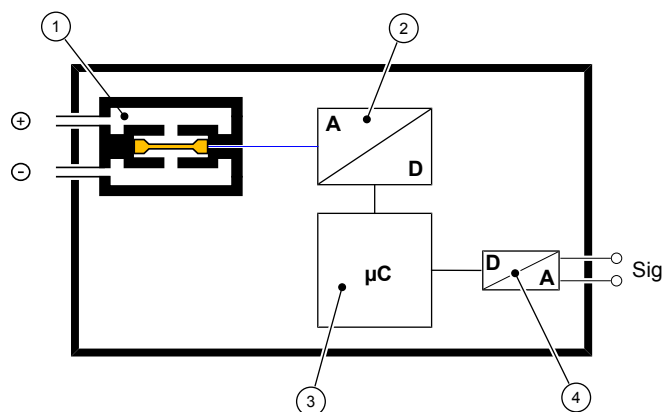


Fig. 20: Function diagram

1 Sensor element	2 A/D converter
3 Micro-controller	4 D/A converter

The basis of this transmitter is a capacitive sensor element. The pressure that is to be measured acts on the sensor element with a micro-mechanically produced differential condenser. A pressure change generates a change of capacity that is evaluated by the device's integrated electronics and transformed into an analogue signal.

4.3.7.2 Input variables

Measuring variable

Differential pressure for gas-like media.

Measuring range

PA	Stat. operating pressure max.	Bursting pressure
0 ... 25	100 kPa	170 kPa
0 ... 50		
0 ... 100		
0 ... 250		
0 ... 500		
0 ... 1000		
-25 ... +25		
-50 ... +50		
-100 ... +100		

4.3.7.3 Output parameters

Output signal	4 ... 20 mA
Output load	$R_L \leq (U_b - 12 \text{ V}) / 0.022 \text{ A}$

4.3.7.4 Measurement accuracy

	Option 1	Option 2	Option 3
Characteristic curve deviation ¹⁾	0.25 % FS	0.4 % FS	0.8 % FS
Long-term stability	$\leq 0.5 \text{ % FS / year}$		
Temperature coefficient ²⁾	$\pm 0.54 \text{ % FS / 10 K}$		
Response time (10 ... 90%)	250 ms		
Heat-up time	15 sec		

¹⁾ Incl. linearity, repetition and hysteresis.

²⁾ In zero-point and span with reference to the compensation range 2 ... 54 °C.

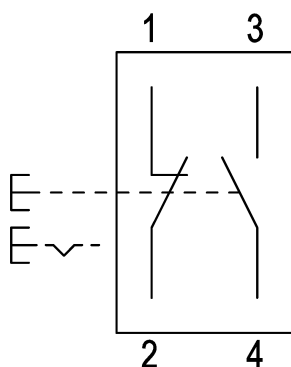
4.3.7.5 Auxiliary energy

nominal voltage	24 V AC/DC
Admissible operating voltage	$U_b = 12 \dots 36 \text{ V DC}$ $U_b = 19.2 \dots 28.8 \text{ V AC}$
Absorbed current	Max. 20 mA

4.4 Command and alarm devices

4.4.1 Pushbutton

4.4.1.1 Pushbutton with cap



Contact element

Switching function	Impulse or break
Switch system	Jump switch element
Switching current	5A
Contacts	Ö + S
No. of contacts	1 to 4
Contact material	Gold
Max. switching voltage	250 V AC

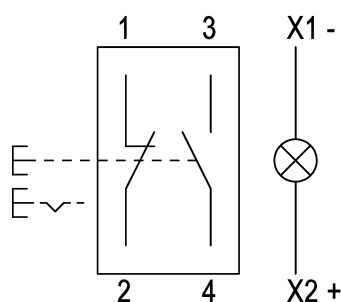
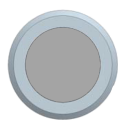
Front frame set

Form	Round
Diameter	35 mm
Material	Stainless steel
Colour	Natural
Design	Flat

Pressure hood

Material	Aluminum
Colour	Black anodised
Design	Flat
Appearance	Opaque
Illumination	Cannot be illuminated
Protection rating	IP67

4.4.1.2 Illuminated pushbutton



Contact element

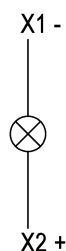
Switching function	Impulse or break
Switch system	Jump switch element
Switching current	5A
Contacts	Ö + S
No. of contacts	1 to 4
Contact material	Gold
Max. switching voltage	250 V AC

Front frame set

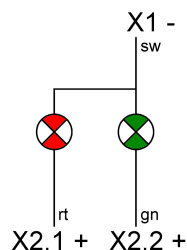
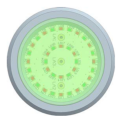
Form	Round
Diameter	35 mm
Material	Stainless steel
Colour	Natural
Design	Flat

Pressure hood plastic

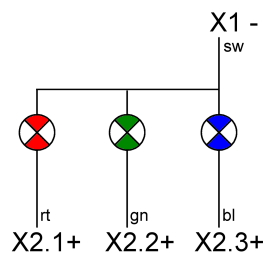
Material	Plastic
Colour	Green, yellow, blue, red, white
Version	Flat
Optics	Transparent
Illumination	Can be illuminated
Protection	IP67

4.4.2 Signal lamp**4.4.2.1 Signal lamp type LE07**

Material	Stainless steel
Handle Diameter	35 mm
Colour	Green, yellow, blue, red, white
Version	Flat
Optics	Transparent
Operating voltage	24v DC
Absorbed current	ca. 60 mA
Protection	IP67

4.4.2.2 Signal lamp Type LE10

Material	Stainless steel
Diameter	47 mm
Colour	Green, red
Symbol	Concentric circles
Design	Flat
Appearance	Transparent
Operating voltage	24 V DC
Power consumption	ca. 20 mA
Protection rating	IP67

4.4.2.3 Signal lamp Type LE11 (RGB)

Material	Stainless steel
Handle Diameter	47 mm
Colour	Green, red, blue (Additive colour mix)
Symbols	Area
Version	Flat
Optics	Transparent
Operating voltage	24v DC
Absorbed current	ca. 20 mA
Protection	IP67

4.4.2.4 Access signal lamp

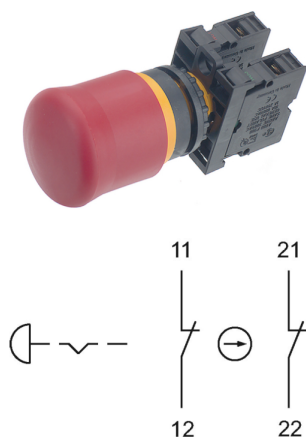


Type LE06

Material	Stainless steel, glass
Diameter	35 mm
Sluice symbols	Green arrow Yellow triangle Red circle with slash line
Operating voltage	24 V DC
Power consumption	75 mA
Protection rating	IP67

4.4.3 Emergency open button (emergency unlocking)

4.4.3.1 Standard version



Contact element

Number of contact elements	1 ... 2
Switch system	Pushbutton element
Switching current	1.5 A
Max. switching voltage	230V AC, 220V DC
Contacts	Break contact
Safety function	Forced opening
No. of contacts	1
Contact material	---
Connection Inch	Cage clamp

LED element

Number of LED elements	1
Colour	red
Operating voltage	12 ... 30 V AC/DC
Operating current	5 ... 15 mA
Connection Inch	Cage clamp

Control element

Form	Round
Handle Diameter	38mm
Height over front plate	48 mm
Lighting	With and without lighting
Switching function	Lock, overload-protected
Unlocking	Pull release
Material	Plastic
Pressure hood colour	red
Pressure hood form	Mushroom
Button base colour	Yellow
Protection	IP66

Assembly

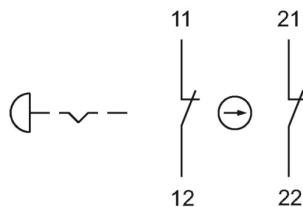
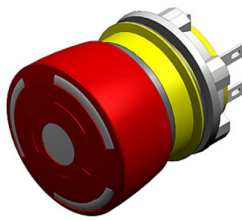
Version	Front plate assembly, raised
Assembly of contact elements	Attachment adapter
Installation opening	22 mm



Hood with lead seal

Basic function	for units with a mushroom diameter 38 with a planned separating points after emergency stop can be reused
Colour	transparent
Handle Diameter	48 mm
Height over front plate	52 mm
Protection	IP65

4.4.3.2 Compact design



Contact element

Switch system	Pushbutton element
Max. switching voltage	250 V AC/DC
Switching current	5A
Contacts	Ö
Safety function	Forced opening
No. of contacts	2
Contact material	Gold
Connection Inch	Flat connector 2.8 x 0.5 mm

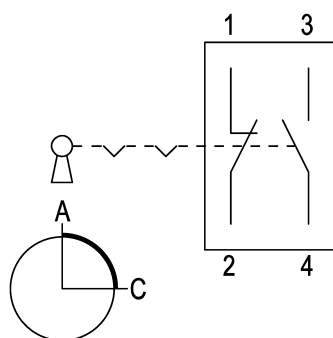
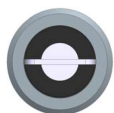
Actuation element

Form	Round
Handle Diameter	32 mm
Height over front plate	26 mm
Switching function	Lock overload-protected
Unlocking	Rotary release in clockwise direction
Material	Plastic
Pressure hood colour	red
Pressure hood form	Mushroom
Button base colour	Yellow
Protection	IP65

Assembly

Version	Front plate assembly, flat
Installation opening	Ø22 mm

4.4.4 Key switch



Front colour	Black
Front material	Plastic
Design	Flat
Switch angle	90 °
Protection rating	IP65
Key removal	A + C
Number of keys	2
Switching function	Rest - break
Switch levels	2
Switch system	Jump switch element
Contacts	Ö + S
No. of contacts	1 to 4
Contact material	Gold
Switching current	5A
Switching voltage	250 V AC

Front frame set

Form	Round
Diameter	35 mm
Material	Stainless steel
Colour	Natural
Design	Flat

Other locks with other switch levels and/or key removal on request.

4.4.5 Signaler (horn)



Assembly in the front plate (Type LE03)

Material	Stainless steel
Colour	Natural
Diameter	35 mm
Signaler	Piezo buzzer
Rated Voltage	24 V DC
Operating voltage	15 ... 30 V DC
Frequency	3.5 kHz ±500 Hz
Sound pressure	85 dB/10 cm
Power consumption	max. 12 mA
Protection rating	IP67

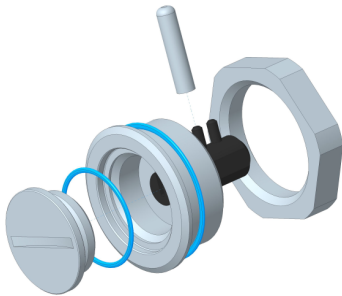
Assembly behind the front plate

Material	Plastic
Signaler	Piezo buzzer
Rated Voltage	24 V DC
Operating voltage	15 ... 30 V DC
Resonance frequency	2.9 kHz ±500 Hz
Sound pressure	105 dB/10 cm
Power consumption	max. 35 mA
Protection rating	IP20

4.5 Pressure Connections

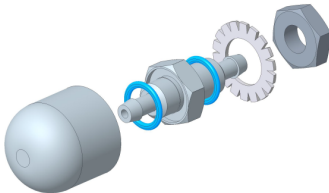
The calibration valve significantly reduces the annual calibration effort and is protected from misuse by a key switch. This key can disconnect the reference line and redirect it to the hose connection of the valve. Using the calibration pipes, it is possible to calibrate the differential pressure measuring unit on site without having to remove it.

4.5.1 Calibration valve



Material	Stainless steel, polycarbonate
Seals	Polymer
Handle Diameter	35 mm
Diameter of cap	25 mm
Hose connection	4/2.5 mm hose
Protection	IP67

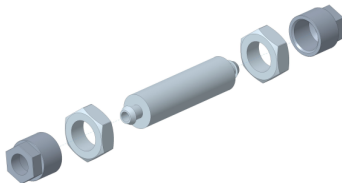
4.5.2 Calibration pipes



Material	Stainless steel
Seals	Polymer
Cover hood	With hole *) Without hole
Diameter covering hood	20 mm
Hose connection	6/4 mm hose
Protection	IP67 (Pressure line open)

*) The cover hood with a hole serves absorption of the room pressure.

4.5.3 Reference pressure connection

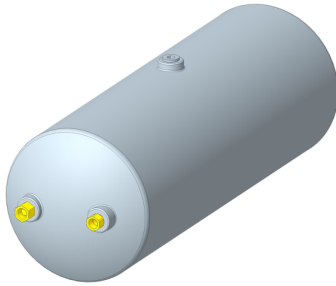


Material	MS nickel-plated
Hose connection	6/4 mm hose 6/8 mm hose
Protection rating	IP20

The reference pressure line is usually located behind the front plate.

5 Accessories

5.1 Reference pressurized container



Pressure vessel for damping atmospheric fluctuations on the reference pressure signal in pressure-controlled rooms. The amplitude of the atmospheric pressure is smoothed to a stable signal. The smoothed signal is used as a reference for subsequent room pressure control loops.

Order no.	06411297
Material	Aluminium
Max. Pressure	Atmosphere
Permissible ambient temperature	-50 ... 65 °C
Diameter	246 mm
Length	750 mm
Volume	30 l
Weight	5 kg
Connection	3/8"
Assembly	Tension strap

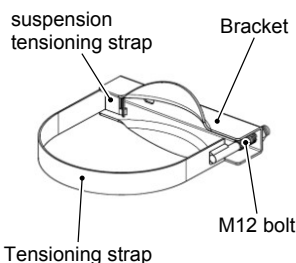


Fig. 21: Tensioning strap with bracket

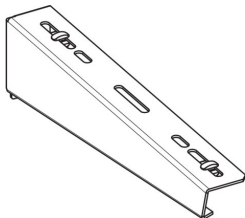


Fig. 22: Wall bracket (example)

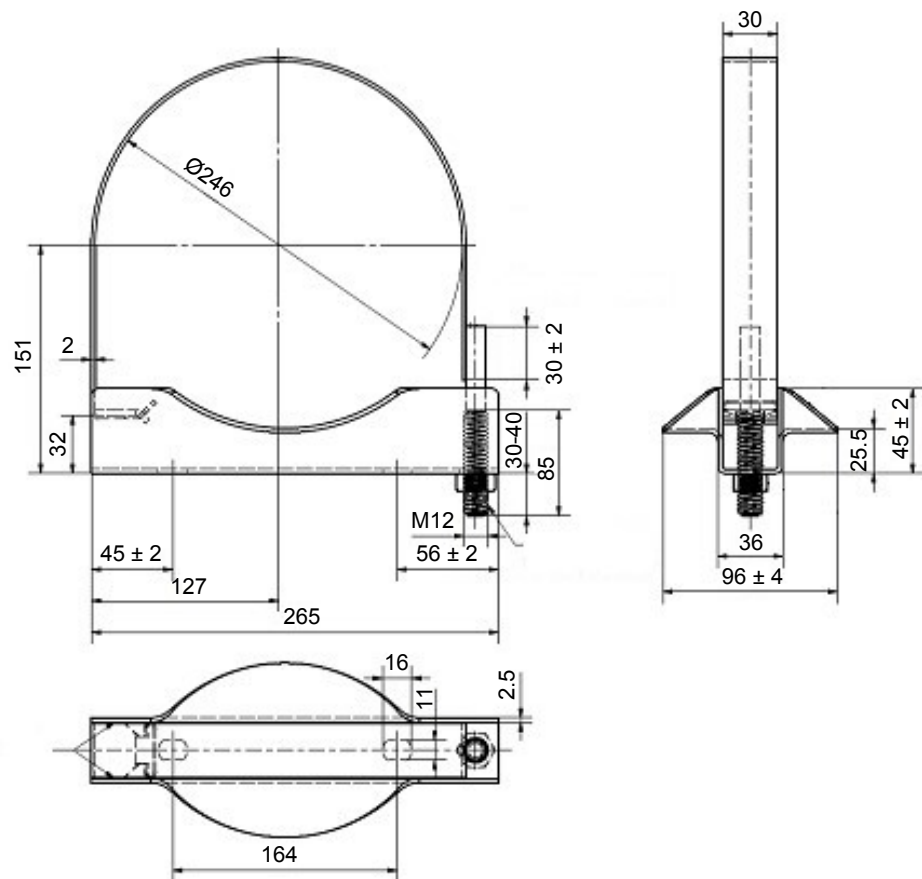


Fig. 23: Tensioning strap with bracket

In any case, sufficient attention must be paid to the reference pressure. The room pressure can only be determined exactly with a stable reference.

With the reference pressure distributors, the reference pressure line can be divided into up to six main lines. If more main lines are required, a further distributor can be used.

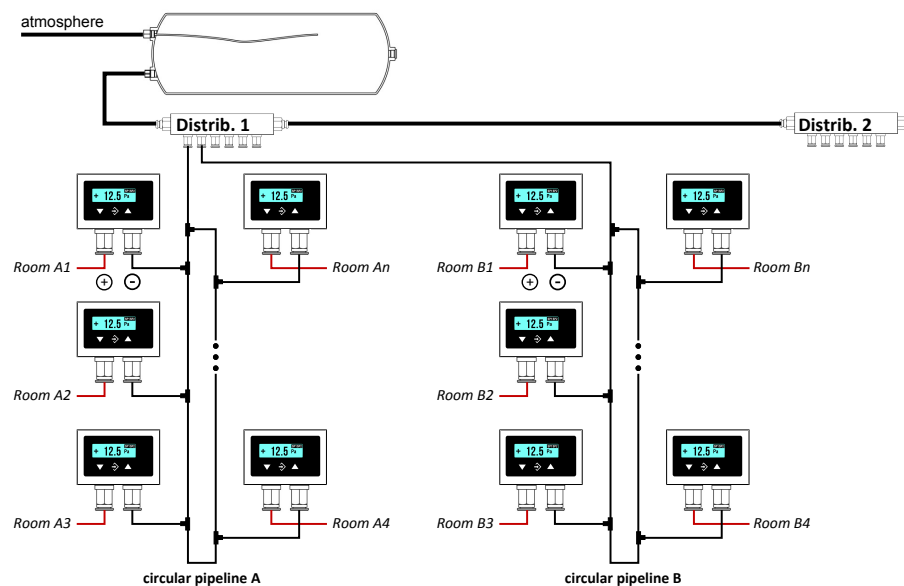
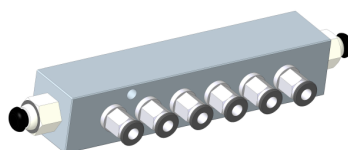


Fig. 24: Mounting of the reference pressure line

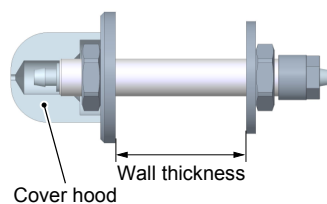
5.2 Reference pressure distributor



This distributor allows the reference pressure line to be split to 6 further main lines. The pressure connections can either be equipped with hose screw connections or plug connections. Those connections that are not required are closed with blind plugs.

Order no.	06411134
Material	Stainless steel
Seals	Polymer
Diameter x length	41 x 193 mm
Distributor	1 opening 6 outlets
hose	6/4 mm or 8/6 mm hose
Connection	Pneumatic plug-in connection or CK Hose connection nickel-plated brass
Assembly	Wall structure

5.3 Separation element

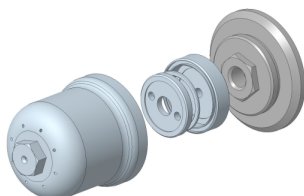


Material	MS nickel-plated
Thread	M10 x 1
Hose connection	6/4 mm hose 6/8 mm hose
Protection rating	IP20

Order no.	Wall thickness
06401349	50 mm
06401350	75 mm
06401351	100 mm

Order no.	Wall thickness
06401352	125 mm
06401353	150 mm
06401392	160 mm
06401744	250 mm

5.4 Room pressure filter element



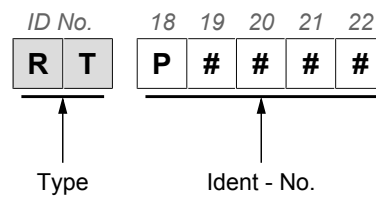
Order number	06021247
Material	Stainless steel
Seals	Polymer (gassing resistant)
Handle Diameter	50 mm
Cover bell	40 mm
Hepa filter	Class H14 (exchangeable)
Autoclave-capable	Housing and inner parts
Protection	IP67

The room pressure filter element isolates hazardous substances within the room in which the pressure is to be measured. This effectively rules out the possibility of carry-over of hazardous substances to the place where the measurements are taken.

5.5 M12 Connection cable

Order no. PUR connecting line 5-pin shielded M12 socket / open cable end	
09011316	1 m
09011317	2 m
09011318	5 m
09011319	10 m
09011320	20 m
Order no. PUR connecting cable 5-pin shielded M12 socket / M12 connector	
09011277	1 m
09011278	2 m
09011299	5 m
09011315	10 m
09011295	20 m

6 Order Codes



The order is placed as agreed with our sales department. The description of the panel is written in plain text based on the following specifications. An Ident – No. is issued for each panel and is used for the order.

Assembly type		
Wall-mounting		
Surface installation		
Channel assembly		
Measuring-specific components		Details
EA16	Measuring value display	Channels, input signals, output signals, switch outputs, Flex I/O, interfaces, datalogger
EA14	Universal display	Input signal, output signal, switch outputs
FT61	Measuring value display	Measuring range, output signals, switching outputs
FF62	Temperature and moisture sensor	Spare part for EA16 and FT61
TW68	Resistance thermometer	Measuring range
DE22	Differential pressure transmitter	Measuring range
Command and alarm devices		
Pushbutton with cap		Quantity
Illuminated pushbutton		Quantity, colour
Indicator lamp		Type, quantity, colour
Key-operated switch		Switching function
Signaler		Assembly type
Emergency-stop key		Design
Pressure Connections		
Calibration valve		
Calibration pipes		
Reference pressure connection		Hose size
Accessories		
Reference pressurized container		
Reference pressure distributor		Hose size
Separation element		Hose size, wall thickness
Room pressure filter element		Filter type
M12 Connection cable		Type, number of poles, length

6.1 Information about the document

This document contains all technical data about the device. Great care was taken when compiling the texts and illustrations; Nevertheless, errors cannot be ruled out.

Subject to technical amendments.



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