

ifm electronic



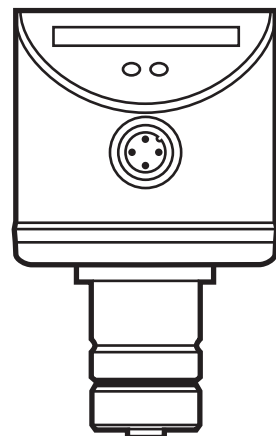
Operating instructions
Control monitor for
flow sensors

efector300[®]

SR5900

UK

704574 / 02 08 / 2010



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1 Preliminary note

1.1 Explanation of symbols

► Instruction

> Reaction, result

→ Cross-reference



Important note:

Non-compliance can result in malfunctions or interference.



LED lights green



LED lights orange



LED lights red



LED flashes

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2 Safety instructions

- Please read the product description prior to set-up of the unit. Ensure that the product is suitable for your application without any restrictions.
- Improper or non-intended use may lead to malfunctions of the unit or to unwanted effects in your application. That is why installation, electrical connection, set-up, operation and maintenance of the unit must only be carried out by qualified personnel authorised by the machine operator.

For the scope of validity cULus:

The device shall be supplied from an isolating transformer having a secondary Listed fuse rated either

a) max 5 amps for voltages 0~20 Vrms (0~28.3 Vp) or

b) 100/Vp for voltages of 20~30 Vrms (28.3~42.4 Vp).

3 Functions and features

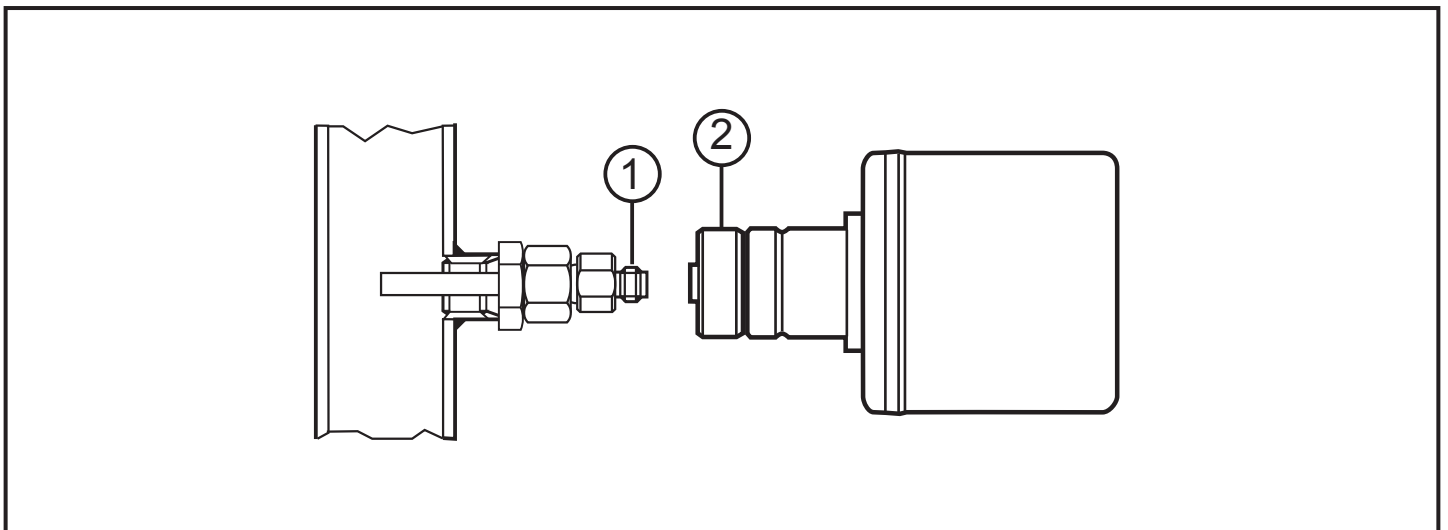
The SR5900 control monitor is designed for the connection of flow sensors of type SFxxxx. It evaluates the sensor signals and indicates whether a preset flow value has been reached.

- Output closed if medium is flowing / output open if no medium is flowing.
This applies to the unit on delivery: output = normally open. In case of need you can change the output to normally closed (→ 8.2). It then applies: output open if medium is flowing.
- If the flow speed increases, the switching status changes when the switch point is reached.
- If the flow speed falls again, the switching status changes when the value "SP minus hysteresis" is reached.
The hysteresis is considerably influenced by the set monitoring range and it changes with the flow velocity (the higher the flow velocity the higher the hysteresis).

The response time of the unit is max. 1...10 s. It can be influenced by the setting of the switch point:

- Low switch point = quick reaction with rising flow.
- High switch point = quick reaction with falling flow.

4 Installation

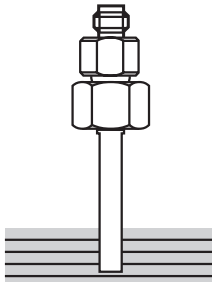
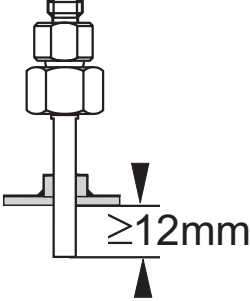
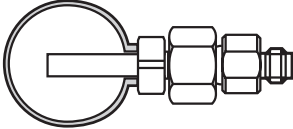
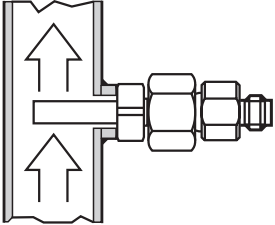
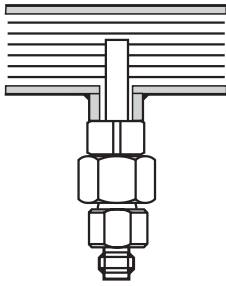
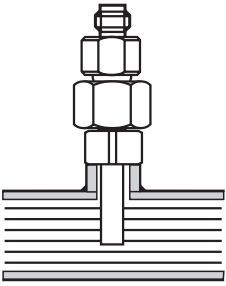
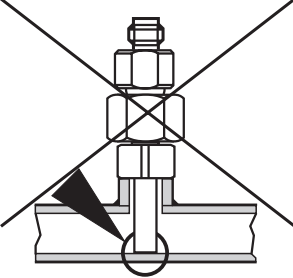
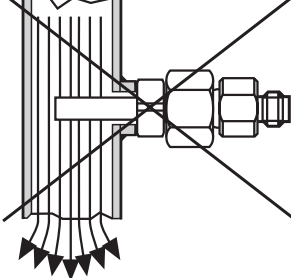


- ▶ Attach the control monitor to the flow sensor (1).
- ▶ Tighten the coupling nut (2).

The flow sensor must be directly connected to the control monitor. A connection by means of extension cables is not allowed.

4.1 Mounting of the sensors

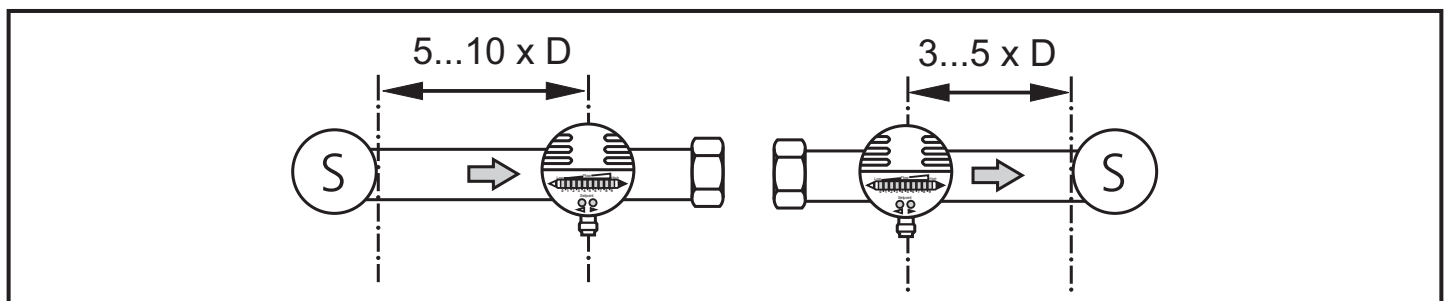
- ▶ Adhere to the notes in the installation instructions enclosed to the sensor.
- ▶ Adhere to the following notes on the installation location:

<p>General</p> <ul style="list-style-type: none"> • The sensor tip is to be completely surrounded by the medium. • Insertion depth of the sensor: minimum 12 mm. 		
<p>Recommended</p> <ul style="list-style-type: none"> • For horizontal pipes: mounting from the side. • For vertical pipes: mounting in the rising pipe. 		
<p>Conditional</p> <ul style="list-style-type: none"> • Horizontal pipe /mounting from the bottom: if the pipe is free from build-up. • Horizontal pipe /mounting from the top: if the pipe is completely filled with medium. 		
<p>To avoid</p> <ul style="list-style-type: none"> • The sensor tip must not be in contact with the pipe wall. • Do not mount in downpipes that are open at the bottom! 		

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Components integrated in the pipes, bends, valves, reductions, etc. lead to turbulence of the medium. This affects the function of the unit.

Recommendation: Adhere to the distances between sensor and sources of interference:



D = pipe diameter; S = sources of interference

5 Electrical connection

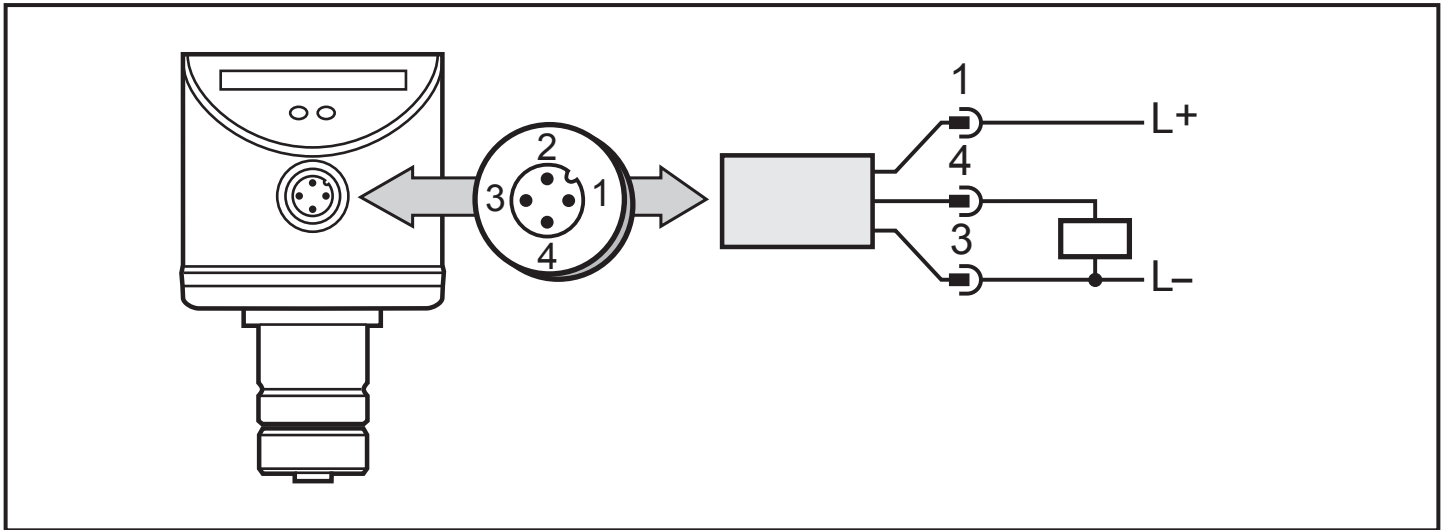


The unit must be connected by a qualified electrician.

The national and international regulations for the installation of electrical equipment must be adhered to.

Voltage supply to EN 50178, SELV, PELV.

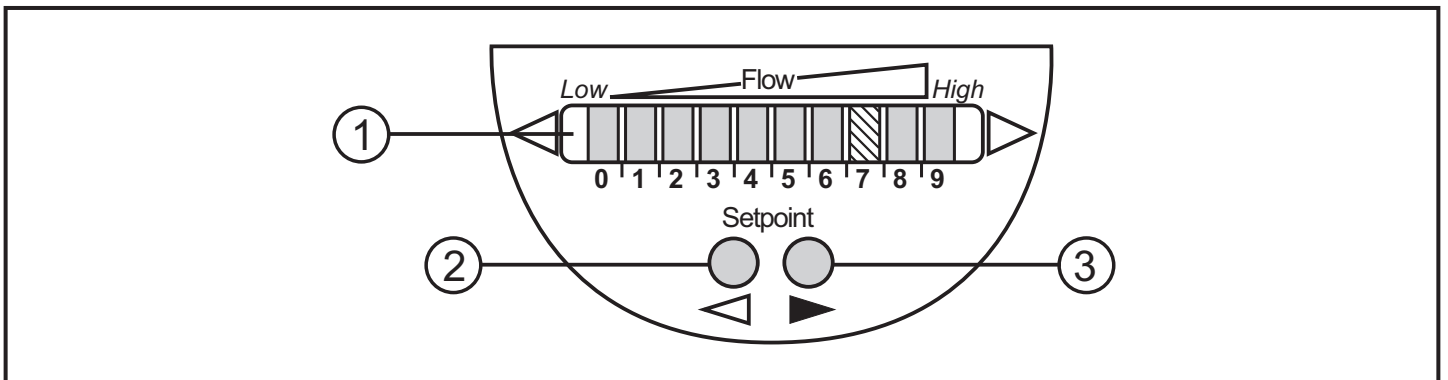
- ▶ Disconnect power.
- ▶ Connect the unit as follows:



Core colours of ifm sockets:

1 = BN (brown), 3 = BU (blue), 4 = BK (black)

6 Operating and display elements



1: Operation display


- The green LEDs indicate the current flow (the LEDs 0 to 9 represent the range between no flow and maximum flow).
- A lighting LED indicates the position of the switch point (orange = output closed, red = output open).

2, 3: Setting buttons for adjustment and configuration

7 Set-up

For the set-up, high-flow and low-flow adjustment have to be carried out.


7.1 High-flow adjustment

- ▶ Let the normal flow circulate in the installation.
- ▶ Switch on the supply voltage.
- > All LEDs light and go out again step by step. During this time the output is closed (if configured as normally open). The unit is in the operating mode.
- ▶ Press the pushbutton  and keep it pressed.
- > LED 9 lights, after approx. 5 s it flashes.
- ▶ Release the pushbutton.

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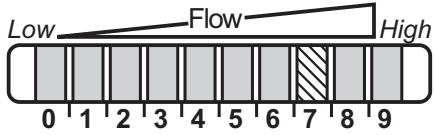
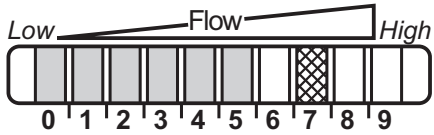
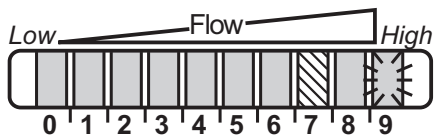
7.2 Low-flow adjustment

Note: The low-flow adjustment has to be made after the high-flow adjustment.

- ▶ Let the minimum flow circulate in the installation or ensure flow standstill.
- ▶ Press the pushbutton  and keep it pressed.
- > LED 0 lights, after approx. 5 s it flashes.
- ▶ Release the pushbutton. The unit adopts the new value and passes into the operating mode.

The unit is now adapted to your flow conditions.

- > For normal flow the display should now show example 1.

<p>Example 1: Unit adjusted</p>	
<p>Example 2: Unit not adjusted. Your normal flow is below the representation range of the display.</p>	
<p>Example 3: Unit not adjusted. Your normal flow exceeds the representation range of the display (LED 9 flashes).</p>	

7.3 Error during adjustment

If no adjustment is possible, all LEDs flash red. The unit then passes into the operating mode with unchanged values.

Possible cause /aid:

Error during installation of the flow sensor.	▶ Read chapter 4.1. Check whether all requirements have been met.
The difference between maximum flow and minimum flow is too small.	▶ Increase the flow difference and carry out the adjustment once again.
The sequence high-flow /low-flow adjustment was not adhered to.	▶ Carry out the two adjustment operations again in the right sequence.

8 Additional settings (optional)

8.1 Change the switch point

For the factory setting the switch point is at LED 7. A change makes sense if:

- The flow fluctuates much or pulsates.
 - If a faster response time of the unit is requested (low switch point = fast response with rising flow, high switch point = fast response with falling flow).
- ▶ Briefly press the pushbutton ◀ or ▶.
- > The switch point LED flashes.
- ▶ Press the pushbutton ◀ or ▶ as often as required. Each press of the pushbutton shifts the LED by one position in the indicated direction.

Note: If no pushbutton is pressed for 2 s, the unit returns to the operating mode with the newly set value.

8.2 Configure the switching output

The unit is delivered as normally open. In case of need you can change the output to normally closed:

- ▶ Press the pushbutton ◀ for at least 15 s.
- > LED 0 lights, after approx. 5 s it flashes.
- > After 10 s the current setting is displayed: LEDs 5...9 light orange (= output normally open).
- > After approx. 15 s LEDs 0...4 flash orange.
- ▶ Release the pushbutton. The output is changed to normally closed operation.
- For a new changeover: repeat the operation.

8.3 Lock / unlock the unit

The unit can be locked electronically to prevent unintentional settings.

► Press both setting pushbuttons simultaneously for at least 10 s in the operating mode.

> The indication goes out, the unit locks or unlocks.

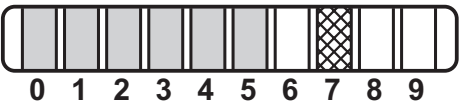
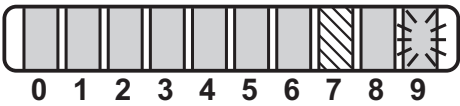

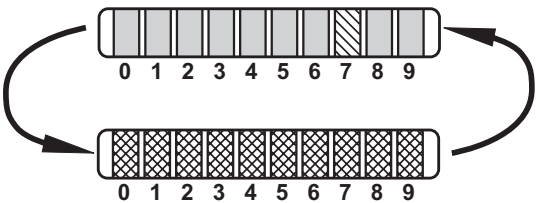
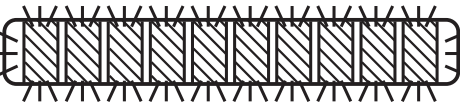
On delivery: unlocked.

9 Operation

After every power on all LEDs light and go out again step by step (during this time the output is closed if configured as normally open). The unit is then ready for operation.

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In case of power failure or interruption all settings remain.

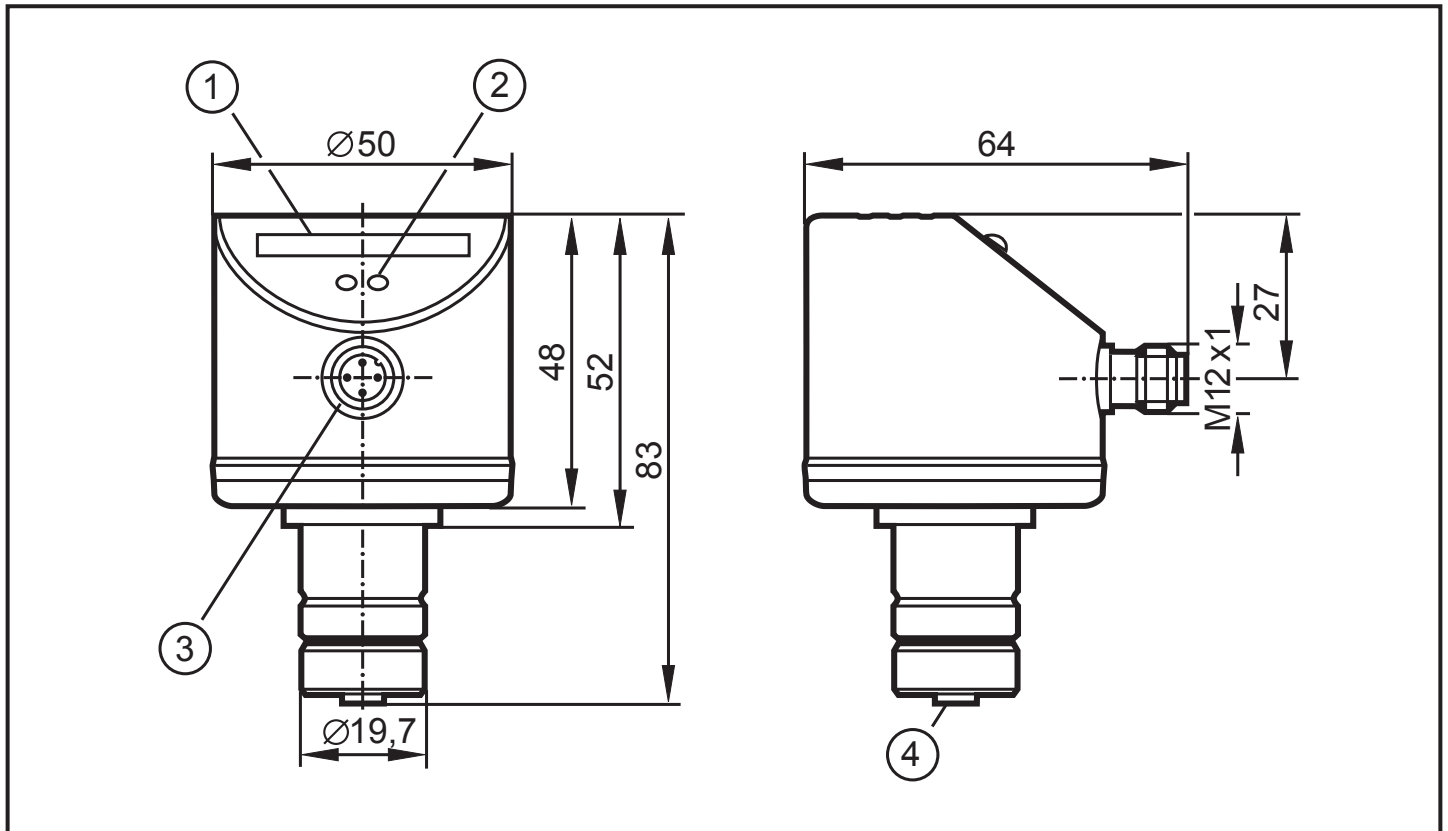
Operating indicators	
	<p>Green LED bar: current flow within the representation range.</p> <p>Indication of the switch point (SP):</p> <ul style="list-style-type: none"> - LED orange: output closed. - LED red: output open.
	<p>LED 9 flashes: current flow above the representation range.</p>
	<p>LED 0 flashes: current flow far below the representation range.</p>
Interference indicators	
	<p>Short circuit at the switching output: Operating indicator and red LEDs light alternately.</p> <p>If the short circuit has been rectified, the unit immediately passes into the normal operating state. The current operating state is displayed.</p>
	<p>Wire break or short circuit of the sensor cable: LEDs flash orange.</p>
<p>Display OFF (no LED lights):</p>	<p>Operating voltage too low (< 19 V) or failed.</p> <p>► Ensure a correct voltage supply.</p>

10 Maintenance

Recommended maintenance:

- ▶ Check the sensor tip for build-up from time to time.
- ▶ Clean it using a soft cloth. Stubborn build-up (e.g. lime) can be removed using a common vinegar cleaning agent.

11 Scale drawing



- 1: LED bar display
- 2: Set button
- 3: Connection for voltage supply and output signals
- 4: Connection for flow sensor

12 Technical data

Application area.....	liquids and gases
Operating voltage [V].....	19...36 DC
Current rating [mA].....	250
Short-circuit protection, pulsed; reverse polarity / overload protection (connection for voltage supply and output signals)	
Voltage drop [V].....	< 2.5
Current consumption [mA]	< 70
Power-on delay time [s].....	10, optically indicated
Flow monitoring	
- output switches ON when flow is present (for output function = normally open)	
- output switches OFF when flow is present (for output function = normally closed)	
Liquids	
Setting range [cm/s].....	3...300
Greatest sensitivity [cm/s]	3...60
Gases	
Setting range [cm/s].....	200...3000
Greatest sensitivity [cm/s].....	200...800
Optical function indication.....	LED bar display
Response time [s].....	1...10
Operating temperature [°C]	-20...60
Protection rating	IP 67 (with sensor attached)
Protection class	III
Shock resistance [g]	30 (DIN / IEC 68-2-27, 6 ms)
Vibration resistance [g]	5 (DIN / IEC 68-2-6, 55-2000 Hz)
Housing materials.....	stainless steel 316L / 1.4404; stainless steel 304 / 1.4301; PC (Makrolon); PBT-GF 20; EPDM/X (Santoprene), CuZnPb2
EMC	
EN 61000-4-2 ESD:	4 kV CD / 8 kV AD
EN 61000-4-3 HF radiated:	10 V/m
EN 61000-4-4 Burst:	2 kV
EN 61000-4-6 HF conducted:	10 V

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More information at www.ifm.com