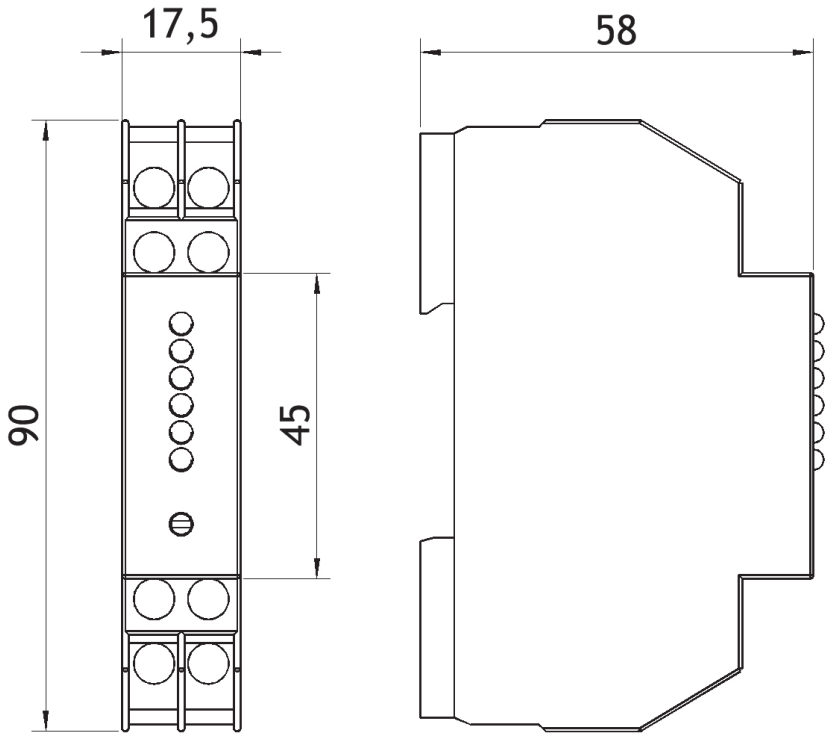
Instruction manual

Switching amplifier for flow probes
SKM 420 GR
SKM 421 GR



Dimensions in mm

Safety notes

- Only professionals with sufficient knowledge are allowed to install and operate this switching amplifier.
- During installation and operation comply with the relevant national regulations, standards and installation provisions.
- Prior to installation disconnect the system from power supply.

Intended use

Flow probes of the series ST… 4…(fluids)/LT… 4…(gas/air) are connected to the switching amplifier SKM 420/SKM 421. The switching amplifier monitors the probe signal for exceeding or falling below a user adjusted switching point for the flow speed. The relay output is active (closed contact) when the signal has exceed the switching point. The switching amplifier is designed for installation on a top hat rail (EN 60715) in a closable control cabinet with at least IP54 enclosure rating which provides sufficient mechanical protection.

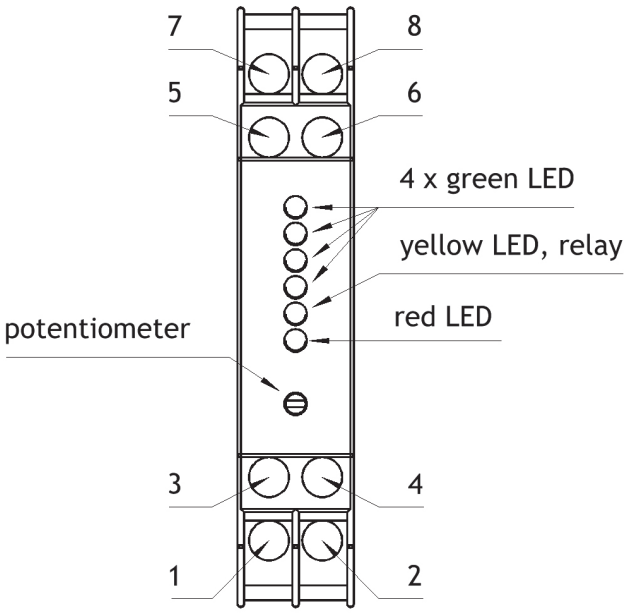
Non-intended use

The switching amplifier **may not** be used in areas where functional safety (SIL) is required or where malfunctions can result in hazards to persons and equipment.
The switching amplifier **may not** be installed in explosion hazard areas. Outgoing cables **may not** be routed in explosion hazard areas.
The switching amplifier is a standard component and not a safety device per MRL 2006/42/EG. For safety applications a detailed assessment of the applicability of the measurement probe and the switching amplifier per EN ISO 13849 or another applicable standard by the system designer is required.

Scope of delivery

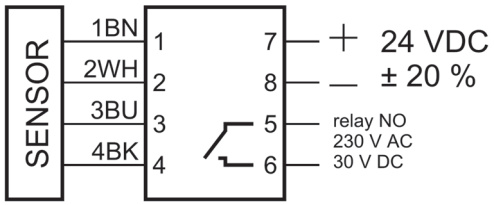
Switching amplifier SKM 420 GR/SKM 421 GR, screw driver, this manual

Display and operating elements



LED green	Adjusted switching point is exceeded.
LED yellow	Adjusted switching point is reached.
LED red	Flow speed is below adjusted switching point.
potentiometer	Turning it clockwise leads to a lower switching point, turning it counter-clockwise leads to a higher switching point.

Connecting diagramm



Installation notes

- Install device in a lockable control cabinet which ensures degree of contamination 2, overvoltage category II and provides adequate mechanical protection.
- Protect the power supply circuit with an external fuse: 1 A (fast reaction) according to IEC 60127.
- Protect the relay circuit with an external fuse: 1.6 A (fast reaction) according to IEC 60127.
- The device meets the EMC requirements for industrial environments. The use in other environments may require further EMC measures. Use shielded cable to improve the noise immunity and in case of long connection cables.
- Ensure sufficient air circulation by providing a gap of min. 5 mm to either side of the device. Reducing of the ambient temperature leads to a longer lifetime of the device.
- Snap device from the top onto a top-hat rail (EN 60715). For removal press clamping fixture located on the bottom side of the switching amplifier housing.
- Observe connecting diagram for wiring.
- Install flow probe in accordance with the related operation manual.

Adjustment of switching point

General

- The relay contact is closed when the yellow LED is lit.
- Set the switching point with the potentiometer at the front of the device.
- Keep flow rate and medium temperature stable during adjustment of the switching point and wait for the temperature to equalise between the probe and medium.
- Flow rate must be within the detection range of the probe.

Monitoring a flow limit for being fallen below or standstill

- Specify the flow rate and wait for the start-up time.
- Turn the potentiometer screw counter-clockwise until the red LED is lit.
- Turn the potentiometer screw clockwise until the yellow LED and 2 green LEDs are lit. The relay contact is closed.
- Reduce flow rate and watch the LED display and the switching output. If the yellow LED goes out, the relay contact opens.
- Repeat procedure if necessary with 1 green LED when the relay contacs do not open after reducing the flow rate.

Monitoring a flow limit for being exceeded

- Specify the flow rate or stop the flow and wait for the standby time.
- Turn the potentiometer clockwise until the yellow LED is lit.
- Turn the potentiometer screw counter-clockwise until the red LED is lit. The relay contact is open.
- Increase the flow rate. Monitor the LED display and switching output. If the limit value is exceeded, the yellow LED is lit and the relay contact is close.
- For a reliable monitoring the first green LED should also be lit after the flow commences.
- If necessary, change the adjustment.

Maintenance, cleaning and decommissioning

- Repairs on the unit must be done only by the manufacturer.
- The same safety notes apply for the decommissioning as for the commissioning procedure
- Disposal note: Do not dispose the device in the domestic waste, comply with relevant laws and national regulations.

Trouble shooting

Error	Possible cause of error	remedy
All LED are dark.	Wrong or no supply voltage..	Verify kind and value of supply voltage.
Changes in flow rate are not detected.	Use of flow probe outside of specification or improper installation of flow probe.	Verify working conditions and installation of the connected flow probe.
Invers behaviour of the LED display.	Wiring fault at terminal 2 and 4.	Verify wiring of flow probe at switching amplifier.
The switching behaviour has changed.	Staining of the flow probe.	Cleaning of the flow probe with appropriate means.

Technical data

Supply voltage ..... 24 V DC ± 20 % (SELV)
Current consumption ..... ≤ 60 mA
Output ..... Relay, normally open (SPST-NO)
Switching voltage max. ..... 250 V AC / 30 V DC
Switching current max. ..... 1 A AC / 1 A DC (resistive load)
Ambient temperature ..... -20…60 °C
Detection range flow ..... depends on the connected flow probe
Degree of protection terminals (EN 60529) ..... IP 20
Degree of protection housing (EN 60529) ..... IP 40
Environment conditions ..... degree of contamination 2
Rated insulation voltage relay ..... 300 V, reinforced insulation
Connecting terminal ..... 8 x screw terminal
Connection cross section max. ..... 2 x 2.5 mm² massiv, 2 x 1.5 mm² braid with ferrule
Tightning torque max. ..... 0.8 Nm
Housing material ..... PC-GF