



GENERAL

These highly reliable compact electronic flow switches are designed for detecting the flow of fluids in pipes.

The device's sensitivity is adjusted using two potentiometers. When the flow speed reaches a customer-preselected threshold value (switchpoint), the device switches an electronic circuit. The switching state is indicated by an LED.

FEATURES

- G1/2" connection for easy mounting directly to pipes.
- No moveable parts in the detection zone.
- Temperature-compensated operating range.
- Highly resistant to pollution and corrosion.

DIMENSIONS

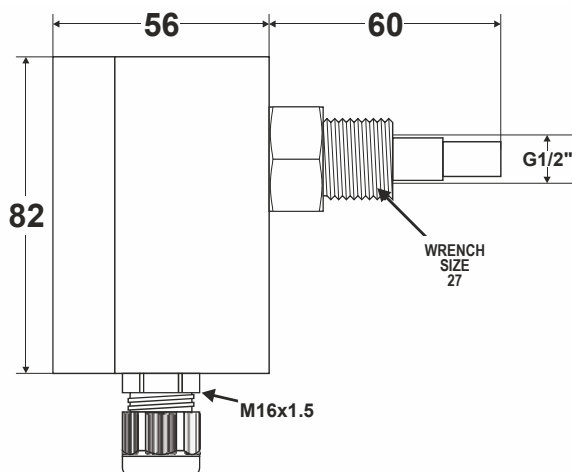


Fig. 1. KSW, dimensions (mm)

SPECIFICATIONS

Type	KSW-230	KSW-24
Media	liquids	liquids
Power supply	230VAC, 50Hz, ±6%	24 VAC/DC ±5%
Power indication	green "voltage" LED	green "voltage" LED
Power consump.	4.5 VA	4.5 VA
Ambient temp.	-20 ... +60 °C	-20 ... +60 °C
Medium temp.	-10 ... +80 °C	-10 ... +80 °C
Relay contact	SPDT	SPDT
Contact load	250 VAC, 6 A	250 VAC, 6 A
Min. contact load	10 mA / 5 VDC	10 mA / 5 VDC
Switch indication	yellow "flow" LED	yellow "flow" LED
Setpt. adjustment	2 potentiometers	2 potentiometers
Range	0.05 ... 3 m/sec	0.05 ... 3 m/sec
Response time	1...10 sec	1...10 sec
Immersion depth	45 mm	45 mm
Max. pressure	20 bar	20 bar
Process connect.	G 1/2"	G 1/2"
Housing IP	IP 65	IP 65
Sensor IP	IP 67	IP 67
Protection class	II	II
Wiring terminals	5 x 2.5 mm ²	5 x 2.5 mm ²
Probe material	1.4305	1.4305
Weight	350 g	350 g

MOUNTING

- The device can be mounted in a standard T-piece with connection G1/2".
- Vertical and horizontal mounting possible. In vertical pipes, the flow direction should be from bottom to top.
- Select a mounting location in an area where the probe is completely immersed in / surrounded by the medium and with calm flow. Specifically, the device should not be mounted immediately upstream or downstream from bends (upstream calming distance = approx. 10X the pipe diameter; downstream calming distance = approx. 5X the pipe diameter).
- Whenever possible, install the probe in the middle of the pipe (distance from the wall at least 1/3 of the pipe diameter).
- Do not install the device directly behind a heating register (rapid changes in temperature may lead to false sensor readings).
- Do not install the device in a copper or brass pipe! In combination with a stainless steel probe, any chlorine present in the liquid medium would corrode the pipe.
- Maintenance: The sensor should be cleaned regularly by immersion in soapy warm water for about 10 minutes under warm water flow using a clean rag. Do not use screwdrivers or other hard tools to clean the sensor!

FIELD WIRING

In the case of 230 VAC or 24 VAC power supply, connect the power supply to terminals L (+) and N (-).

In the case of 24 VDC power supply, connect common 15, normally-closed 16, and normally-open 18 accordingly.

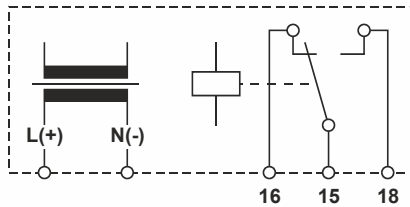


Fig. 2. Wiring diagram

NOTE: To ensure IP rating, use only cables having diameters of 6...9 mm.

MEASURING PRINCIPLE

The KSW operates consists of two identical resistive sensors located inside a probe. One sensor measures the temperature of the medium. The second sensor heats up to a controlled permanent temperature.

When no liquid is flowing, the temperature of this second, heated sensor remains stable, but as soon as medium flows, its temperature drops. The resultant change is registered by the built-in electronics, which attempt to re-establish its original temperature by increasing the electrical current. The extra current required to do this is proportional to the medium speed.

COMMISSIONING

- Set both potentiometers to the lowest sensitivity (i.e., to the left limit stop).
- Switch on mains voltage; green "Voltage" LED lights up; switch ON work flow.
- Turn the "Rough" potentiometer slowly CW until the "Flow" LED lights up.
- After 2-3 minutes, adjust the setting using the "Fine" potentiometer. To achieve a stable switch point, you may turn the "Fine" potentiometer slightly past the switching point.
- Check the glycol concentrations (max. 30%).

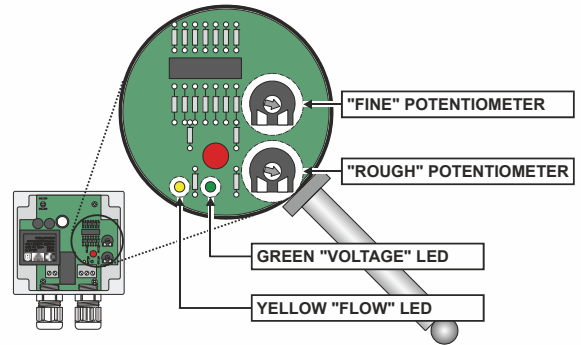


Fig. 3. KSW (cover removed)

TROUBLESHOOTING

Problem	Possible cause	Correction
Device does not function at all.	None or wrong mains voltage connected.	Check mains voltage and connection.
Device does not detect flow.	Sensor installed incorrectly. Glycol concentration exceeds 30%.	Check installation conditions. Reduce glycol concentration.
Switching behavior changes.	Sensor heavily soiled by medium. Glycol concentration exceeds 30%.	Carefully clean sensor with water. Reduce glycol concentration.
Device switches at rapid temperature increase.	Temp. range is outside technical specifications.	Turn "Fine" potentiometer slightly further CW. Check temp. range of system.