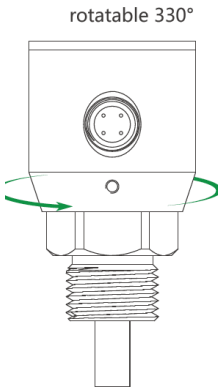


SETTABLE THERMAL FLOW SWITCH



- REPEATABILITY 1 % BELOW 0.6 M/S
- 1 ... 150 CM/S WATER · 3 ... 300 CM/S OIL · 20 ... 2000 CM/S AIR
- 304 AND 316L STAINLESS · IP67 · 100 BAR · -20 ... +85 °C

KEY DATA

Property	Value	Property	Value
Setting range	1 ... 150 cm/s water · 3 ... 300 cm/s oil · 20 ... 2000 cm/s air	Repeatability	1 % below 0.6 m/s · 3 % below 1.5 m/s · 10 % above
Output	PNP · NPN · relay, normally open and closed, settable	Switching load	500 mA at 24 Vdc PNP or NPN · 60 W relay
Supply voltage	12 ... 30 Vdc	Response time	2 s typical · 1 ... 8 s to initialise
Pressure range	100 bar	Medium temperature	-20 ... +85 °C · ambient -40 ... +85 °C
Protection grade	IP67	Materials	Housing 304 · probe 316L stainless

Two sensors sit in one probe, one heated; the flowing medium narrows the difference between them. The setting is a velocity, not a flow.



MEASUREMENT

Measuring principle	Thermal diffusion — a reference sensor and a heated sensor in one probe, their temperature difference the measure
Setting range	1 ... 150 cm/s water · 3 ... 300 cm/s oil · 20 ... 2000 cm/s air. These are velocities, not flows. The scale is calibrated in water
Repeatability	1 % below 0.6 m/s · 3 % below 1.5 m/s · 10 % above 1.5 m/s
Setting	Inductive keys with the magnetic pen · handheld unit · computer
Response time	2 s typical · 1 ... 8 s to initialise
Media	Water, oil, gas and anything else compatible with stainless steel · hydraulics, lubrication, pumps, cooling, ventilation, water treatment and leak detection

MATERIALS AND PROCESS

Materials	Housing 304 stainless · probe 316L stainless · all-metal body
Process connection	G1/2 or G1/4 male · R1/2 or R1/4 male · M18 × 1.5 female · clamp 25.5 mm (1½") or 50.5 mm (1½"), to ISO 2852:1993
Probe length	25 mm to DN10 · 30 mm from DN15 · 50 mm from DN40 · 60 and 80 mm, see the order code
Pressure range	100 bar
Medium temperature	-20 ... +85 °C · ambient and storage -40 ... +85 °C
Housing	Turnable through 330°, so the plug can be aimed after installation
Protection grade	IP67

ELECTRICAL PROPERTIES

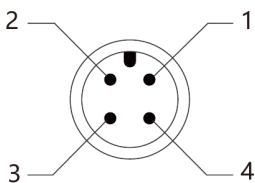
Supply voltage	12 ... 30 Vdc
No-load current	≤ 40 mA at 24 Vdc
Plug	M12 × 1, four pins: 1 BN supply +, 3 BU supply -, 4 BK output, 2 WH output
Output PNP	Three-core cable · output on pin 4
Output NPN	Three-core cable · output on pin 4
Output relay	Four-core cable · pins 2 and 4 as the changeover, NO or NC
Switching function	Normally open or normally closed, set in the field
Switching load	500 mA at 24 Vdc for PNP and NPN · 60 W for the relay
Protection	Reverse polarity, overload and short circuit

LED INDICATOR

LED row	Eight LEDs: three red, one yellow, four green
Red	Below the switching point — the switch has not operated
Yellow	At the switching point — the switch operates
Green	Above it; the more green lamps, the higher the velocity

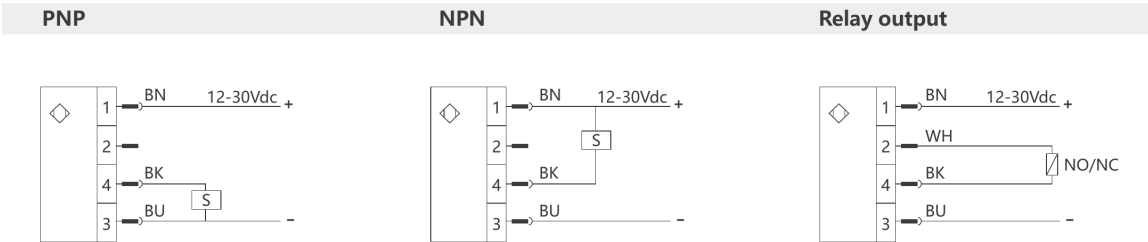


WIRING, SETTING AND INSTALLATION



M12 connectors

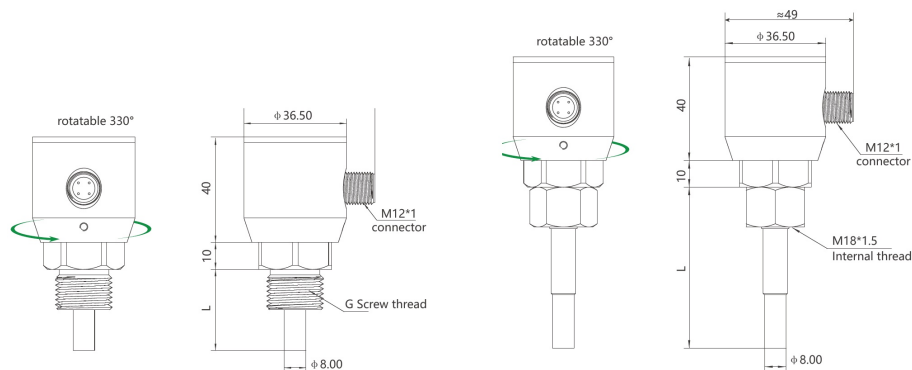
The M12 × 1 plug seen from the front: 1 brown supply plus, 3 blue supply minus, 4 black and 2 white the outputs. The plug turns through 330°, so it can be aimed after the device is screwed in.



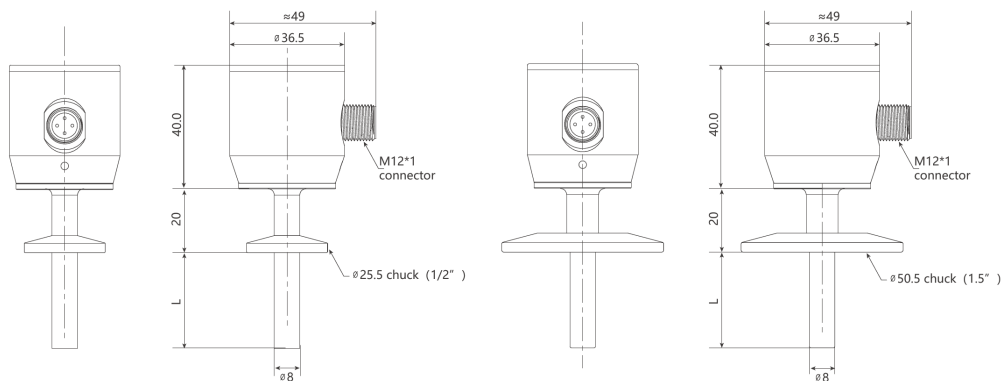
The three output versions. PNP and NPN take a three-core cable and switch on pin 4; the relay takes a four-core cable and uses pins 2 and 4 as the changeover, normally open or normally closed.



DIMENSIONS (mm)



The male-thread version on the left, the M18 × 1.5 female version on the right. Both turn through 330° at the plug.



The two clamp versions, 25.5 mm and 50.5 mm, to ISO 2852:1993.

Four versions are drawn: G male thread, M18 × 1.5 female, and two clamp connections.

OVERALL DIMENSIONS (mm)

Feature	mm	Note
Overall height	≈ 49	
Housing diameter	Ø36.5	
Housing height	40	Without the process connection
Thread length, male versions	10	G or R thread
Clamp collar height	20	Both clamp versions
Clamp diameter	25.5 · 50.5	½ inch and 1½ inch, to ISO 2852:1993
Probe diameter	Ø8	The same on every version
Probe length L	25 · 30 · 50 · 60 · 80	See the order code
Plug	M12 × 1	Turnable through 330°



COMPLIANCE AND CERTIFICATION

Measuring principle	Thermal diffusion, reference and heated sensor
Repeatability	1 % below 0.6 m/s, 3 % below 1.5 m/s, 10 % above
Protection grade	IP67
Pressure rating	100 bar
Wetted materials	316L stainless probe, 304 stainless housing
Clamp connections	25.5 and 50.5 mm, to ISO 2852:1993
Relay rating	60 W

ZL04-PC02G is the factory standard of the first family, ZL03-PC02G of the second.

ELECTRICAL ACCESSORIES

Electrical accessory	Material	Straight (G)	Angled (W)
M12 × 1, 4-pin, 2 m	PUR	ZL04-PU02G	ZL04-PU02W
M12 × 1, 4-pin, 5 m	PUR	ZL04-PU05G	ZL04-PU05W
M12 × 1, 4-pin, 10 m	PUR	ZL04-PU010G	ZL04-PU010W
M12 × 1, 4-pin, 2 m	PVC	ZL04-PC02G	ZL04-PC02W
M12 × 1, 4-pin, 5 m	PVC	ZL04-PC05G	ZL04-PC05W
M12 × 1, 4-pin, 10 m	PVC	ZL04-PC010G	ZL04-PC010W
Self-wiring socket, 4-pin	Pg7 / Pg9 gland	GL04	WL04

ELECTRICAL ACCESSORIES · CONTINUED

Electrical accessory	Material	Straight (G)	Angled (W)
Second family, 2 m	PUR	ZL03-PU02G	ZL03-PU02W
Second family, 5 m	PUR	ZL03-PU05G	ZL03-PU05W
Second family, 10 m	PUR	ZL03-PU010G	ZL03-PU010W
Second family, 2 m	PVC	ZL03-PC02G	ZL03-PC02W
Second family, 5 m	PVC	ZL03-PC05G	ZL03-PC05W
Second family, 10 m	PVC	ZL03-PC010G	ZL03-PC010W



The welded bases and the M18 tees are tied to one thread family: the M18 parts serve the female version only, the others the male versions only.

MOUNTING ACCESSORIES

Mounting accessory	Note	Material	Order number
Welded base, M18 × 1.5 female	For the M18 version only	304 stainless	FA002-M18
Welded base, G1/4	For a male-thread version	304 stainless	FA002-G14
Welded base, G1/2	For a male-thread version	304 stainless	FA002-G12
Welded base, G1/2 high pressure	For a male-thread version	304 stainless	FA002-G12H
Welded base, Rc1/4	For a male-thread version	304 stainless	FA002-R14
Welded base, Rc1/2	For a male-thread version	304 stainless	FA002-R12
Welded base, M12 × 1	For a male-thread version	304 stainless	FA002-M12
Adapter M18 female to G1/4 male	Probe insertion 15 mm	304 stainless	FA004-M18G14S
Adapter M18 female to G1/4 male	Probe insertion 15 mm	Brass	FA004-M18G14T
Adapter M18 female to G1/2 male	Probe insertion 15 mm	304 stainless	FA004-M18G12S
Adapter M18 female to G1/2 male	Probe insertion 15 mm	Brass	FA004-M18G12T
Tee, M18 female with G1/4 branch	For the M18 version only	304 stainless	FA003-M18G14
Tee, M18 female with G3/8 branch	For the M18 version only	304 stainless	FA003-M18G38
Tee, M18 female with G1/2 branch	For the M18 version only	304 stainless	FA003-M18G12
Tee, M18 female with G3/4 branch	For the M18 version only	304 stainless	FA003-M18G34

The conventional stainless tees are rated 40 bar and the high-pressure stainless tees 200 bar; the switch itself is rated 100 bar.

MOUNTING ACCESSORIES · TEES

Mounting accessory	Note	Material	Order number
Tee G1/4, small bore 4 mm	—	PP	FA010-04G14
Tee G1/4, straight bore 6 mm	—	PP	FA010-06G14
Tee G1/4, small bore 8 mm	—	PP	FA010-08G14
Tee G1/2, straight bore 10 mm	—	PP	FA010-10G12
Tee G1/2, straight bore 12 mm	—	PP	FA010-12G12
Tee adapter G1/4, gas only	—	PP	FA012-01
Tee R1/2, DN15	40 bar	Stainless steel	FA013-R12K
Reducing tee R3/4 – R1/2 – R3/4, DN20	40 bar	Stainless steel	FA013-R12KR34K
Reducing tee R1 – R1/2 – R1, DN25	40 bar	Stainless steel	FA013-R12KR1K
Reducing tee R1.2 – R1/2 – R1.2, DN32	40 bar	Stainless steel	FA013-R12KR1.2K
Tee G1/2, DN15	200 bar	Stainless steel	FA014-G12K
Reducing tee G3/4 – G1/2 – G3/4, DN20	200 bar	Stainless steel	FA014-G12KG34K
Reducing tee G1 – G1/2 – G1, DN25	200 bar	Stainless steel	FA014-G12KG1K



Example: QSKD-P-G12M-L30. Normally open or normally closed is set at the device, not at the order.

ORDER CODE

Field	Code	Meaning
1 Series	QSKD	QSKD thermal flow switch
2 Output	P · N	PNP · NPN, three-core cable
	C	Relay, four-core cable
3 Connection	G12M · G14M	G1/2 male thread · G1/4 male thread
	R12M · R14M	R1/2 male thread · R1/4 male thread
	M18K	M18 × 1.5 female thread, for use with the mounting accessories
	H25 · H50	Clamp 25.5 mm (1/2 inch) · 50.5 mm (1.5 inch), to ISO 2852:1993
4 Probe length	L25 · L30	25 mm to DN10 · 30 mm from DN15
	L50	50 mm from DN40 · male thread only
	L60	60 mm — from DN15 with M18, from DN50 with a male thread
	L80	80 mm — from DN40 with M18, from DN80 with a male thread

