

WATER FLOW AND TEMPERATURE SENSOR



- THERMAL PRINCIPLE · NO MOVING PARTS
- FLOW AND TEMPERATURE IN ONE DEVICE
- 0 ... 3 m/s · 60 bar · IP67 · IO-LINK



KEY DATA

Property	Value	Property	Value
Flow range	0 ... 3 m/s (water)	Pressure range	60 bar
Measuring accuracy	< 10.0 %	Protection grade	IP67
Measuring dead zone	≤ 0.01 m/s	Response time	1 ... 13 s, typically 2 s
Temperature range	0 ... 100 °C	Display	0.96" colour LCD
Media	Water · circulating water · cutting fluid	Temperature accuracy	± 1.5 °C

The device measures flow velocity, not volume flow — one sensor covers a range of pipe diameters; the conversion table is at the end of this sheet.



MEASUREMENT

Measuring principle	Thermal · a sealed probe with a heated detection resistor and an unheated reference resistor
Flow range	0 ... 3 m/s (water)
Measuring accuracy	< 10.0 %
Measuring dead zone	≤ 0.01 m/s
Temperature range	0 ... 100 °C
Temperature accuracy	± 1.5 °C, probe immersed in the medium
Response time	1 ... 13 s, typically 2 s
Initialization time	< 16 s
Temperature gradient	≤ 4 °C/s
Pressure range	60 bar

MATERIALS, PROCESS AND TEMPERATURE

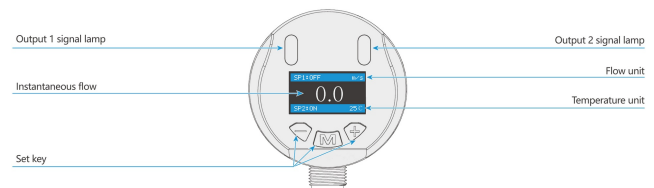
Head	Stainless steel or engineering plastic
Housing	Stainless steel
Wetted material	Stainless steel 316L · EPDM
Protection grade	IP67
Medium temperature	0 ... 100 °C
Ambient temperature	-20 ... +80 °C
Storage temperature	-20 ... +80 °C
Process connection	M18x1.5 internal thread · probe rod · Ø 25.4 mm (1/2") or Ø 50.5 mm (1.5") chuck

ELECTRICAL PROPERTIES

Supply voltage	24 Vdc ± 20 %
Switching output	PNP or NPN · IO-Link · for flow and for temperature
Analogue output	4 ... 20 mA · 1 ... 5 V · for flow and for temperature
Frequency output	Flow · 200 Hz at full scale, on OUT1
Switching current	Max. 200 mA (PNP or NPN)
Current consumption	< 100 mA
Electrical protection	Reverse polarity · short circuit · overload
Wiring	M12x1 connector, 5-pin

DISPLAY AND SETTING

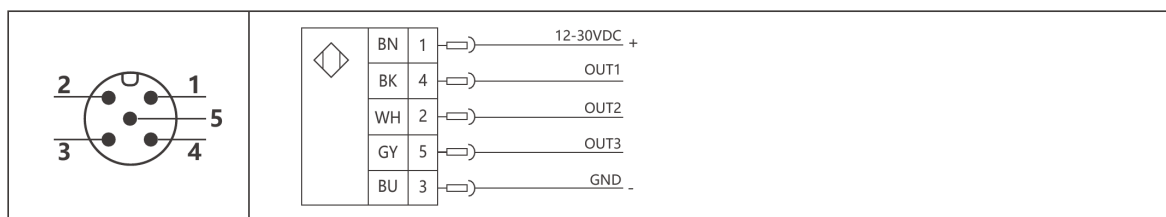
Flow	0.96" colour LCD · instantaneous flow
Temperature	0.96" colour LCD · in °C
Signal lamps	Two, one for each switching output
Setting	By the three keys -, M and +



Application: Low flow rate alarm for circulating water and cutting fluid, cut-off detection and pump idling protection.



WIRING



Output codes SA and SV — one switching output and two analogue channels, one for flow and one for temperature.

PIN ASSIGNMENT · SA AND SV

Wire	Pin	Function
BN	1	Supply +
BU	3	Supply -
BK	4 (OUT1)	Flow switch PNP (factory setting) · flow switch NPN · IO-Link · flow frequency, 200 Hz at full scale
WH	2 (OUT2)	Flow analogue (factory setting)
GY	5 (OUT3)	Temperature analogue (factory setting)

Output codes A3 and V3 — two switching outputs and one analogue channel, each assignable to flow or to temperature.

PIN ASSIGNMENT · A3 AND V3

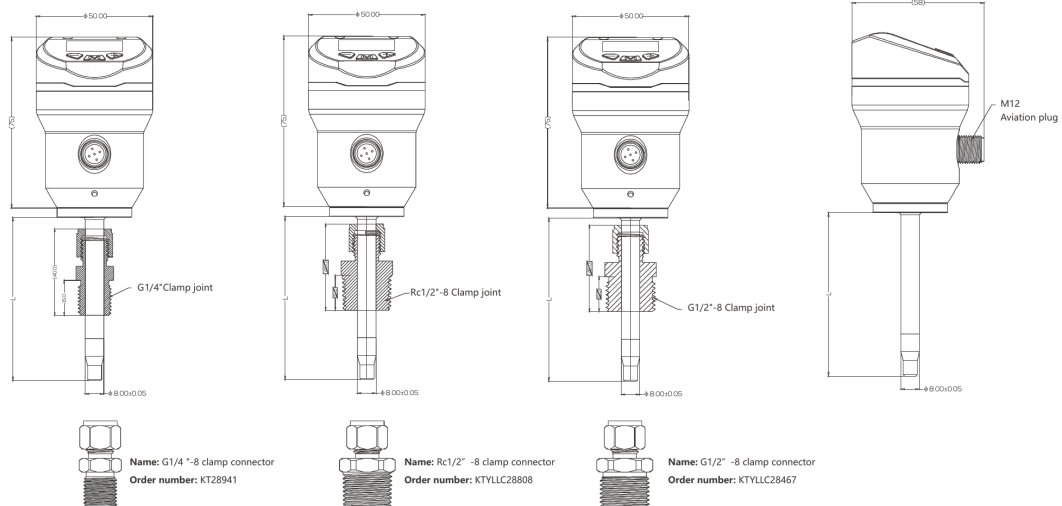
Wire	Pin	Function
BN	1	Supply +
BU	3	Supply -
BK	4 (OUT1)	Temperature switch PNP (factory setting) · temperature switch NPN · flow switch PNP · flow switch NPN · IO-Link · flow frequency, 200 Hz at full scale
WH	2 (OUT2)	Flow switch PNP (factory setting) · flow switch NPN · temperature switch PNP · temperature switch NPN
GY	5 (OUT3)	Flow analogue (factory setting) · temperature analogue

Wire colours of the M12x1 5-pin connector: 1 BN brown, 2 WH white, 3 BU blue, 4 BK black, 5 GY grey. The function of OUT1, OUT2 and OUT3 is set on the device; the factory setting is marked above.



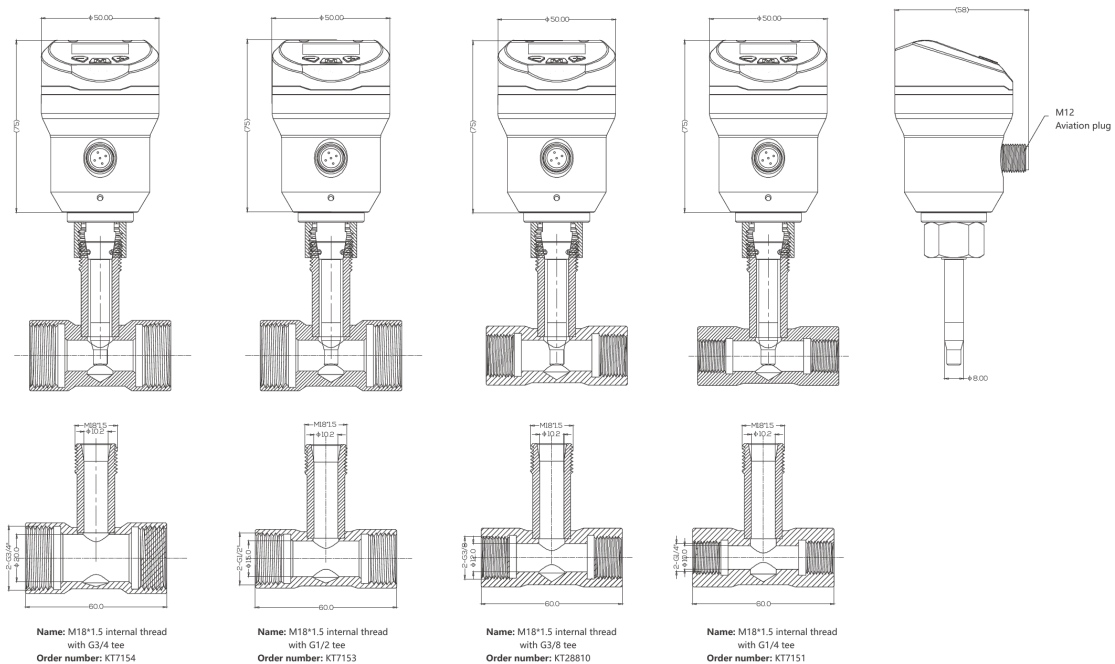
DIMENSIONS (mm)

Smooth rod sleeve joint installation dimensions



The probe rod version with a clamp connector — Ø 50 mm housing, 75 mm high, probe Ø 8 mm ± 0.05, 40 mm of connector with 15 mm of insertion. Three connectors: G1/4"-8, Rc1/2"-8 and G1/2"-8. Right: the side view, 58 mm deep, with the M12 connector on top.

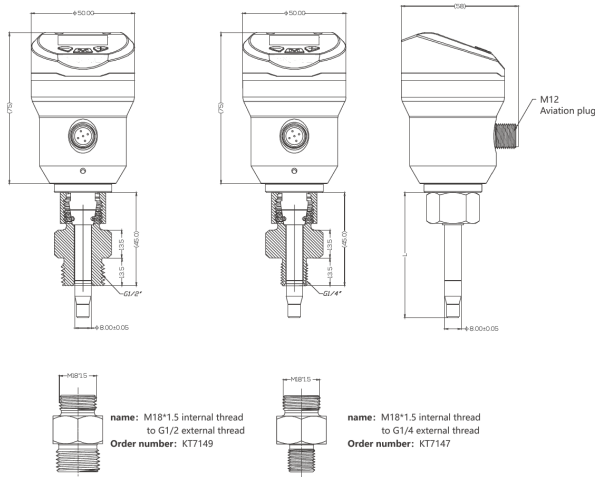
Tee (M18) installation dimensions



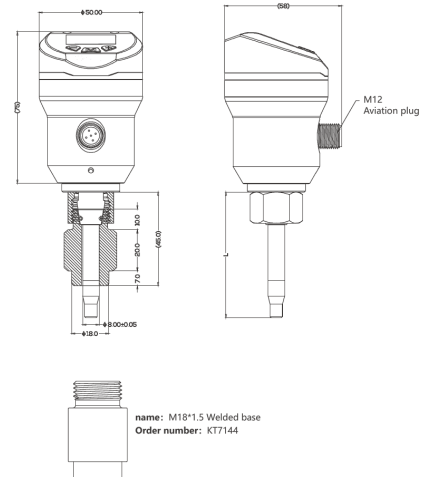
The M18x1.5 internal thread version in a tee — four sizes with a G1/4, G3/8, G1/2 or G3/4 branch, all 60 mm long, bore Ø 10.0, 12.0, 15.0 or 20.0 mm. The thread bore is Ø 10.2 mm.



Mounting dimensions of threaded locking joint (M18)

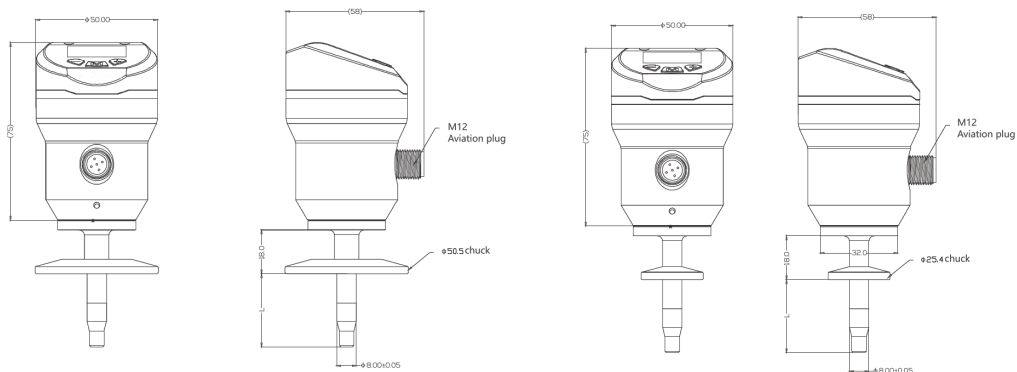


Solder lock joint (M18) installation dimensions



Left and centre: the M18x1.5 internal thread version with a threaded adapter to G1/2 or to G1/4, 13.5 mm each side, probe reach 45 mm. Right: the same version with the welded base.

Chuck mounting dimensions



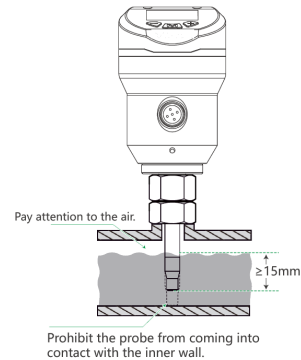
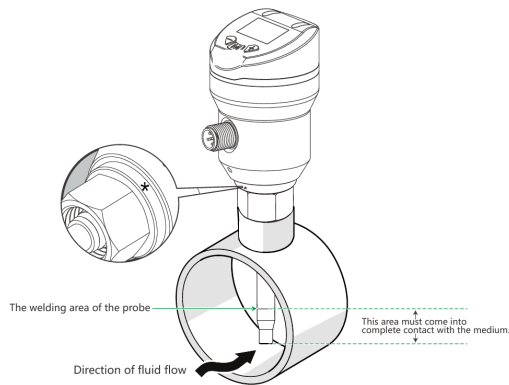
The two chuck versions, $\varnothing 25.4$ mm (1/2") and $\varnothing 50.5$ mm (1.5"), 18 mm from the chuck face to the housing; the larger one is 32 mm across the flange seat. L is the probe length — 30, 50, 60, 70, 80 or 100 mm by order code. The star marks the flow direction.



INSTALLATION

When installing the sensor, ensure that the water flow direction is consistent with the direction of the star

The medium must completely surround the sensor probe



The star on the housing has to point in the direction of flow. The probe must be completely surrounded by the medium, must reach at least 15 mm into it and must not touch the pipe wall; a pocket of air at the probe falsifies the reading. The welded area of the probe — the lower part of the rod — has to be in full contact with the medium.



FLOW CONVERSION TABLE

VOLUME FLOW IN m^3/h

DN	0.3 m/s	0.6 m/s	1 m/s	3 m/s
10	0.085	0.17	0.28	0.85
15	0.19	0.38	0.64	1.9
20	0.34	0.68	1.13	3.4
25	0.53	1.06	1.76	5.3
32	0.87	1.74	2.9	8.7
40	1.36	2.71	4.52	13.55
50	2.12	4.24	7.07	21.2
65	3.58	7.17	11.95	35.85
80	5.43	10.86	18.1	54.3
100	8.48	16.96	28.27	84.8
125	13.25	26.5	44.18	132.5
150	19.09	38.17	63.62	190.85
200	33.93	67.86	113.1	339.3
250	53.01	106.03	176.71	530.15
300	76.34	152.68	254.47	763.4
350	103.9	207.82	346.36	1039.1
400	135.72	271.43	452.39	1357.15
450	171.77	343.53	572.56	1717.65
500	212.06	424.12	706.86	2120.6

Volume flow in m^3/h for four flow velocities and nineteen nominal pipe sizes. The device measures velocity, not volume flow — the table is the conversion. The 3 m/s column is the top of the measuring range.



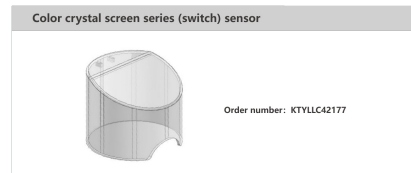
COMPLIANCE AND CERTIFICATION

Measuring accuracy	< 10.0 %
Protection grade	IP67
Temperature accuracy	± 1.5 °C with the probe immersed in the medium
IO-Link	The switching outputs are IO-Link capable
Electrical protection	Reverse polarity, short circuit and overload protection
Wetted materials	Stainless steel 316L · EPDM · head stainless steel or engineering plastic
Pressure rating	60 bar

ORDER CODE AND ACCESSORIES

Cable sockets, process parts and cover

- The sensor is wired through an M12x1 5-pin connector; the factory standard is the moulded socket ZL05-PC02G with 2 m of PVC cable. Sockets are offered with 2, 5 or 10 m of polyurethane or PVC cable, straight or angled, and as connectors wired on site through a Pg7 or Pg9 gland. On the process side each of the four process connections has its own part: a clamp connector for the probe rod, a welded base, an adapter or a tee for the M18x1.5 internal thread, and nothing at all for the two chuck versions. A protective cover for the display head is available.



Connector
M12x1 · 5-pin

Cable
2 · 5 · 10 m

ORDER CODE

Field	Code	Meaning
1 Series	QEKE	QEKE electronic flow and temperature sensor
2 Process	M18K	M18x1.5 internal thread · with a welded base, an adapter or a tee · the direction of the device can be turned on site
	G	Probe rod, for a clamp connector
	H25	Ø 25.4 mm chuck, 1/2" to GB / ISO 2852:1993
	H50	Ø 50.5 mm chuck, 1.5" to GB / ISO 2852:1993
3 Rod length	L30	L = 30 mm · recommended with the chuck versions only
	L50	L = 50 mm · recommended with the chuck versions only
	L60	L = 60 mm · recommended with M18x1.5 for ≤ DN32
	L70	L = 70 mm · recommended with M18x1.5 for ≥ DN40
	L80	L = 80 mm · recommended with M18x1.5 for ≥ DN50
	L100	L = 100 mm · recommended with M18x1.5 for ≥ DN80
4 Output	SA	One switch + two analogue channels, 4 ... 20 mA
	SV	One switch + two analogue channels, 1 ... 5 V
	A3	Two switches + one analogue channel, 4 ... 20 mA
	V3	Two switches + one analogue channel, 1 ... 5 V

Example: QEKE-M18K-L60-SA. The factory standard is the cable socket ZL05-PC02G, that is 2 m of PVC cable on an M12x1 5-pin socket.



ACCESSORIES

Item	Order code	Data
Cable socket M12x1, 5-pin, straight, moulded cable	ZL05-PU02G · PU05G · PU010G · ZL05-PC02G · PC05G · PC010G	2, 5 or 10 m · PU is polyurethane, PC is PVC · ZL05-PC02G is the factory standard
Cable socket M12x1, 5-pin, angled, moulded cable	ZL05-PU02W · PU05W · PU010W · ZL05-PC02W · PC05W · PC010W	2, 5 or 10 m
Field-wireable connector M12x1, 5-pin	GL05 straight · WL05 angled	Pg7 or Pg9 cable gland · wired on site
Clamp connector · for the probe rod version	KT28941 (G1/4"-8) · KTYLLC28808 (Rc1/2"-8) · KTYLLC28467 (G1/2"-8)	Clamps the Ø 8 mm probe rod · insertion 15 mm, overall 40 mm
Welded base M18x1.5	KT7144 · FA002-M18	Stainless steel 304 · welded into the pipe, the sensor screws in
Threaded adapter M18x1.5 female to male	KT7149 (to G1/2) · KT7147 (to G1/4)	Stainless steel 304 · 13.5 mm each side · FA004-M18G12S and FA004-M18G14S
Tee M18x1.5 female	KT7151 (G1/4) · KT28810 (G3/8) · KT7153 (G1/2) · KT7154 (G3/4)	Stainless steel 304 · 60 mm long, Ø 10.0 ... 20.0 mm bore · FA003-M18G14 ... G34
Protective cover for the display head	KTYLLC42177	For the colour-display series · protects the display and the keys

These are the order numbers of the manufacturer; KT and KTYLLC numbers are its own article numbers, FA numbers its type designations.

