OCTOGON

MANUAL

QEKE

WATER FLOW AND TEMPERATURE SENSOR

Installation and user manual



Document	Version	Date	Applies to
Installation and user manual	V00x	11/2026	QEKE, all process connections, rod lengths and output versions

This manual describes the QEKE thermal flow and temperature sensor with colour display: safety, working principle, technical data, dimensions, electrical connection, installation, operation and the menu, and notes on troubleshooting.

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1 About this manual

Read this manual before installing the sensor and keep it available for later use. Technical data, dimensions and order codes in this manual are those of the QEKE datasheet.

1.1 Notices

Notice	Meaning
Warning	Risk of injury or of damage to property if the instruction is not followed.
Important	Pay particular attention to the following instruction.
Note	Further information.

1.2 Versions covered

Feature	Versions
Process connection	M18 × 1.5 internal thread (with welded base, adapter or tee) · probe rod for a clamp connector · Ø 25.4 mm (1/2″) or Ø 50.5 mm (1.5″) chuck
Rod length	L = 30, 50, 60, 70, 80 or 100 mm
Output	SA / SV: one switch + two analogue channels (flow and temperature), 4 … 20 mA or 1 … 5 V · A3 / V3: two switches + one analogue channel, 4 … 20 mA or 1 … 5 V
Basic type	FTS220

2 Safety

The QEKE monitors the flow of the medium (water) in pipes and measures its temperature.

Warning Risk of personal injury - overpressure danger.

– Before installing the device, read this manual and make sure that the product is suitable for your application without any restriction.
– Failure to follow the operating instructions or the technical data may result in personal injury or damage to property.
– In every application, check that the materials of the product are compatible with the medium to be measured.
– Use the device correctly so that it operates stably in the long term, and make sure that the medium does not damage the wetted parts of the product.

Important The operator is responsible for deciding whether the sensor is suitable for the application. Improper installation and use of the sensor void warranty claims.

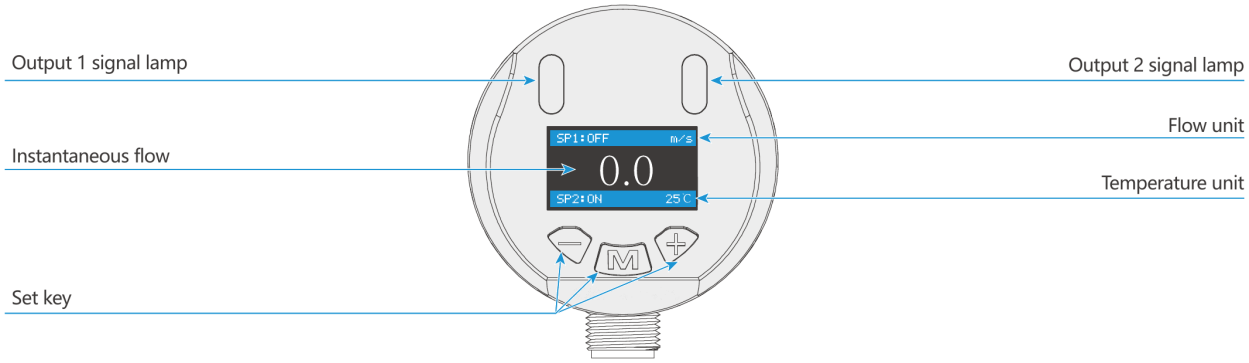
3 Product description

3.1 Working principle

The sensor works on the thermal principle. The sealed probe contains two resistors: one is heated and serves as the detecting resistor, the other is not heated and serves as the reference resistor. When the medium flows, it carries heat away from the heated resistor and its resistance changes; the difference between the two resistors is the basis for determining the flow velocity. The device measures flow velocity, not volume flow.

– No moving parts, maintenance-free, easy to install; one model suits a range of pipe diameters.
– Continuously adjustable switching points, extremely low pressure loss, compact design.
– Colour display of the flow trend and of the switching states.
– Integrated temperature measurement with temperature alarm and remote transmission of the measured values.

3.2 Display and keys



Main screen: instantaneous flow with unit, temperature, the states of the switching outputs and the two output signal lamps; keys –, M, +.

Element	Function
Output 1 / output 2 signal lamp	state of switching output OUT1 / OUT2
Main screen	instantaneous flow with flow unit, temperature in °C, switching states
Keys –, M, +	setting keys (chapter 7)
Left key (–) held on the main screen	clears the flow reading (zero-point calibration, see chapter 8)

3.3 Technical data

Item	Value
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

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
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
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 +

3.4 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.

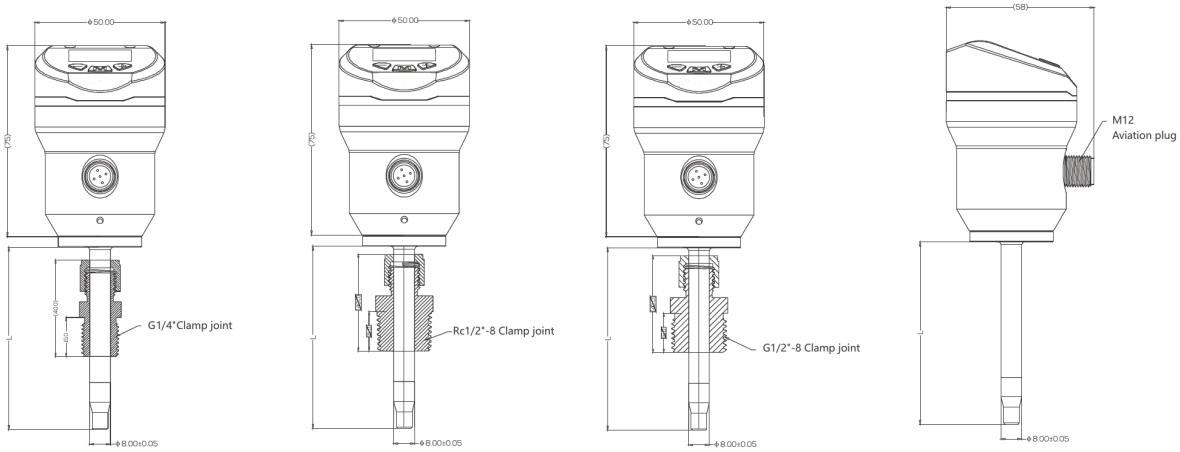
3.5 Flow conversion table

The device measures the flow velocity. The table converts velocity into volume flow (m^3/h) for the nominal pipe size; the 3 m/s column is the top of the measuring range.

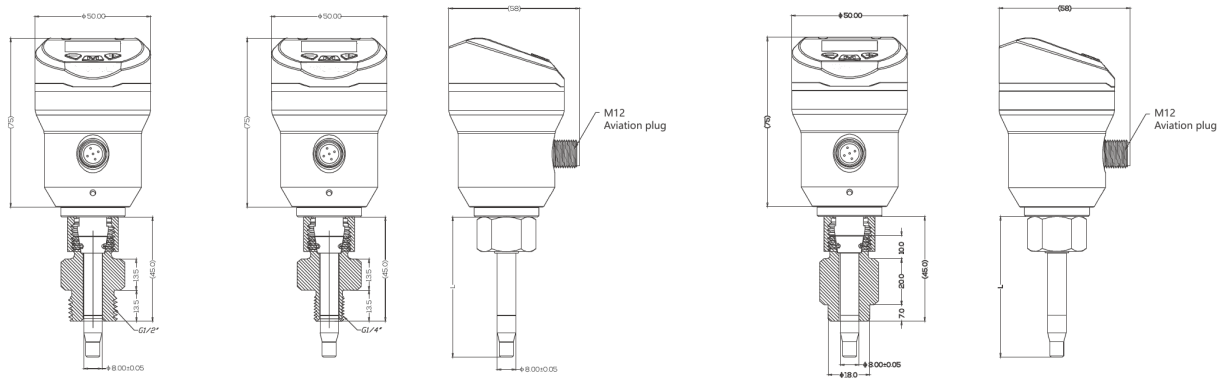
DN	0.3 m/s	0.6 m/s	1 m/s	3 m/s
10	0.085	0.17	0.28	0.85
15	0.19	0.38	0.64	1.9
20	0.34	0.68	1.13	3.4
25	0.53	1.06	1.76	5.3
32	0.87	1.74	2.9	8.7
40	1.36	2.71	4.52	13.55
50	2.12	4.24	7.07	21.2
65	3.58	7.17	11.95	35.85
80	5.43	10.86	18.1	54.3
100	8.48	16.96	28.27	84.8

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

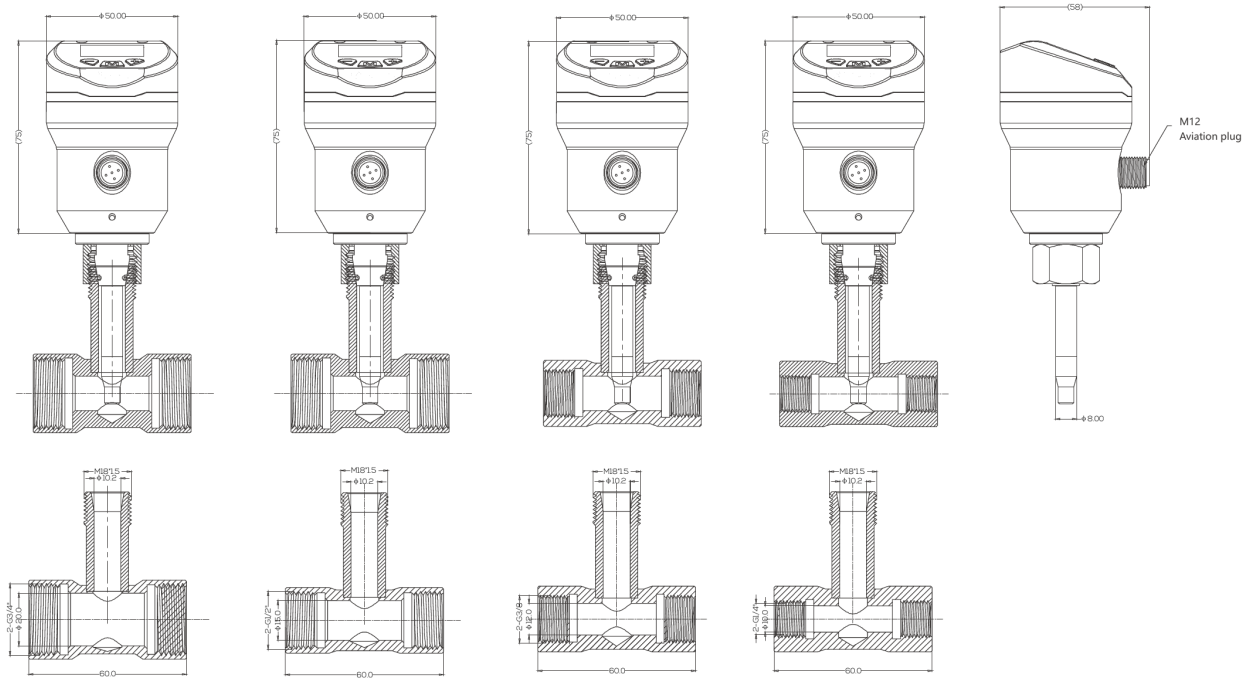
4 Dimensions



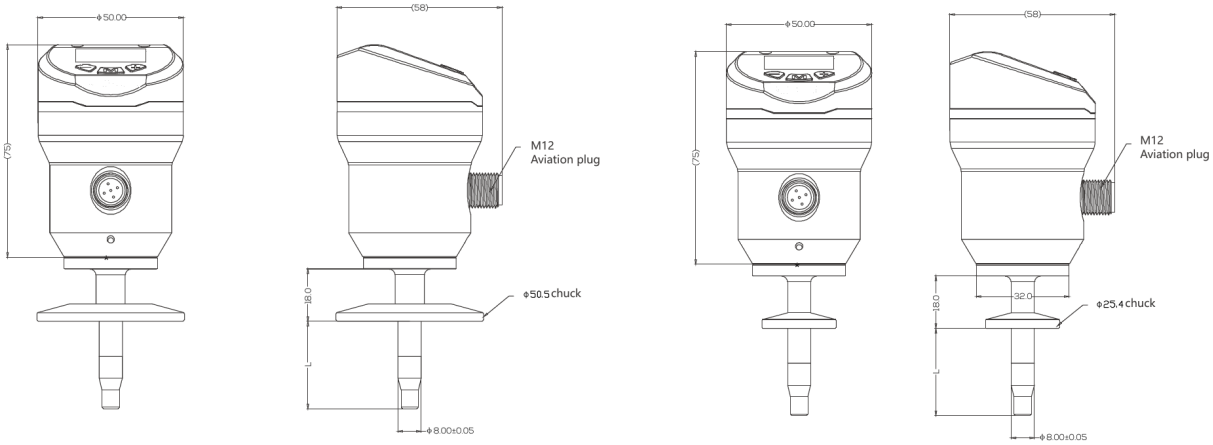
Probe rod version with clamp connector G1/4″, Rc1/2″ or G1/2″: housing Ø 50 mm, about 75 mm high, 58 mm deep with the M12 connector; probe Ø 8 mm ± 0.05. L = rod length.



M18 × 1.5 internal thread version with threaded adapter to G1/2″ or G1/4″ (13.5 mm each side, 45 mm overall), and with welded base (right).



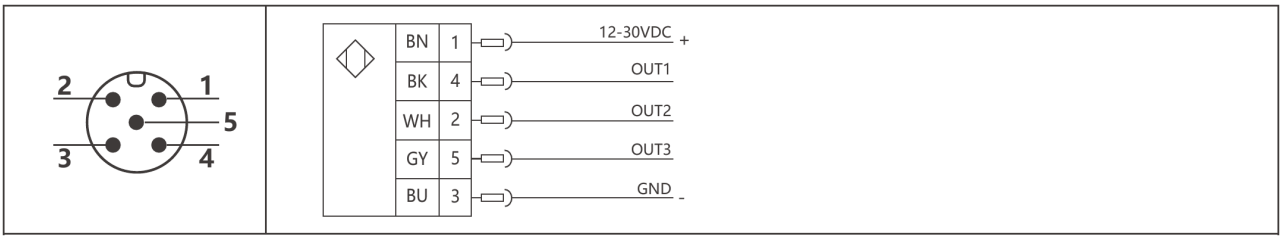
M18 × 1.5 internal thread version in a tee with G3/4, G1/2, G3/8 or G1/4 branch; tee 60 mm long, bore Ø 20.0, 15.0, 12.0 or 10.0 mm, thread bore Ø 10.2 mm.



Chuck versions Ø 50.5 mm (1.5″) and Ø 25.4 mm (1/2″): 18 mm from the chuck face to the housing. L = rod length (order code). The star marks the flow direction.

Dimensions in mm.

5 Electrical connection



M12 × 1 connector, 5-pin. Supply voltage: see the technical data (section 3.3).

Wire colours: 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 (chapter 7); the factory setting is marked.

5.1 Versions SA and SV - one switch + two analogue channels

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)

5.2 Versions A3 and V3 - two switches + one analogue channel

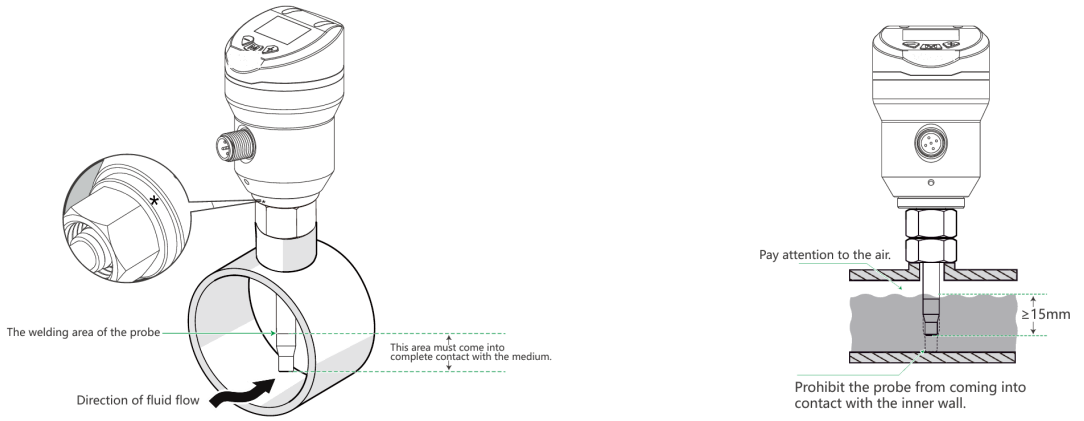
Wire	Pin	Function
BN	1	Supply +
BU	3	Supply –
BK	4 (OUT1)	Temperature switch PNP (factory setting) · temperature switch NPN · flow switch PNP · flow switch NPN · IO-Link · flow frequency, 200 Hz at full scale
WH	2 (OUT2)	Flow switch PNP (factory setting) · flow switch NPN · temperature switch PNP · temperature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

Analogue signal: 4 ... 20 mA (SA, A3) or 1 ... 5 V (SV, V3). Switching current max. 200 mA.

6 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



Left: the star on the housing points in the direction of flow; the welded area of the probe must be in complete contact with the medium. Right: the medium must surround the probe completely (≥ 15 mm); no air at the probe; the probe must not touch the pipe wall.

– Install the sensor so that the direction of flow matches the direction of the star (and the arrow) on the housing; the star faces the incoming flow. If it is not aligned with the flow, the measured velocity may deviate considerably.

– The medium must surround the probe completely. The probe must reach at least 15 mm into the medium; the probe should be installed to half the inner diameter of the pipe.

– The welded area of the probe - the lower part of the rod - must be completely immersed in the medium.

– Pay attention to air: an air pocket at the probe falsifies the reading. In operation, make sure that the pipe is completely filled. If it is not, the sensing part may not be in contact with the medium; the flow reading may then show 0, deviate strongly or jump, and the temperature reading may be too high.

– The probe must not touch the inner wall or the bottom of the pipe.

– With the M18 × 1.5 internal thread version (welded base, adapter or tee), the direction of the device can be turned on site.

6.1 Accessories

M12 × 1 cable sockets, 5-pin, with 2, 5 or 10 m of polyurethane or PVC cable, straight or angled, and connectors wired on site through a Pg7 or Pg9 gland; the factory standard is 2 m of PVC cable. For the process side: clamp connector for the probe rod, welded base, threaded adapter or tee for the M18 × 1.5 internal thread. A protective cover for the display head protects the display and the keys. Accessories are ordered by description; order numbers: see the datasheet.

7 Operation and menu

7.1 Operating the menu

Key	In the item list	In the value display
M	opens the selected item (on the main screen: opens level 1)	confirms the value and returns to the item list
–	moves to the previous item	decreases the value
+	moves to the next item	increases the value

- Press **M** on the main screen to open level 1 of the menu.
- Level 1 ends with the item **Menu 2 Set**: press **M** to open level 2, or press **+** to return to the main screen.
- After the last item of level 2, **+** returns to the main screen.
- **Factory Reset**: the display shows **5S**; hold **M** for 5 s to restore the factory settings.
- Each item shows its name in two languages on the display; this manual uses the English name.

7.2 Level 1

Item	Function	Unit / note
SP1 Set	switching point of switch 1	–
RP1 Set	reset point of switch 1	–
SP2 Set	switching point of switch 2	not available on versions SA and SV (one switch)
RP2 Set	reset point of switch 2	not available on versions SA and SV (one switch)
T-LRV	lower limit of the temperature range (analogue output)	°C
T-URV	upper limit of the temperature range (analogue output)	°C
F-URV	flow range: full scale of the flow analogue output	flow unit
R	pipe radius: half of the actual inner diameter of the pipe	mm
Menu 2 Set	opens level 2	–

7.3 Level 2

Item	Function
Factory Reset	restores the factory settings (hold **M** for 5 s)
OUT1 Set	output mode of OUT1: **F-W-NC** flow window, normally closed · **F-W-NO** flow window, normally open · **F-H-NO** flow hysteresis, normally open · **F-H-NC** flow hysteresis, normally closed · **T-W-NC** · **T-W-NO** · **T-H-NO** · **T-H-NC** the same for the temperature · **F-Hz-OUT** flow pulse output
OUT2 Set	output mode of OUT2: **F-W-NC** flow window, normally closed · **F-W-NO** flow window, normally open · **F-H-NO** flow hysteresis, normally open · **F-H-NC** flow hysteresis, normally closed · **T-W-NC** · **T-W-NO** · **T-H-NO** · **T-H-NC** the same for the temperature - not available on versions SA and SV (one switch)
dS1 Set	switching delay of switch 1 (s)
dR1 Set	reset delay of switch 1 (s)
dS2 Set	switching delay of switch 2 (s) - not available on versions SA and SV (one switch)
dR2 Set	reset delay of switch 2 (s) - not available on versions SA and SV (one switch)
T-ofst	temperature offset (°C), default 0.0
F-ofst	flow zero correction
unit set	flow unit: m/s · m³/h · L/min
F-c-data	flow coefficient value, default 1.00 (chapter 8)
F-H-data	historical maximum of the flow

F-PACE	filter damping
Low flow cut	low-flow cut-off: flow values below the set value are suppressed
d-p-set	decimal places of the reading
A0-Mode	analogue output: flow or temperature
PNP/NPN Set	switching outputs PNP or NPN
Digit colour	colour of the main reading
BG colour	background colour of the main screen

8 Notes on use and troubleshooting

8.1 Flow deviation too large

Adjust the flow coefficient in level 2, **F-c-data**: if the indicated instantaneous flow is too high, set the coefficient below 1; if it is too low, set it above 1. The actual value depends on the application. Indicated flow = measured flow × flow coefficient (default 1.00).

8.2 Analogue output

The factory unit is m/s and the default flow range is 3 m/s.

- If a volume flow unit is used (m^3/h, L/min), set the flow range and the pipe radius in level 1 by hand.
- **F-URV**: range of the flow analogue output. For the values see the flow conversion table (section 3.5).
- **R**: half of the actual inner diameter of the pipe.

8.3 No reading although there is flow

- Check that the medium at the probe is flowing.
- Check that the bottom of the probe does not touch the bottom of the pipe; it must not touch it.
- Check the installation step by step against chapter 6.
- If all of this is correct, carry out a zero-point calibration by holding down the left key (–).

8.4 Temperature deviation too large

First check that the probe is in the medium. Compare the actual medium temperature with the displayed temperature. If they differ, correct the temperature in level 2, **T-ofst**: the default offset is 0.0; to raise the reading by 1 °C set 1.0, to lower it by 1 °C set –1.0. The actual value depends on the application.