OCTOGON

MANUAL

QZKB

PLATE-MOUNTED GEAR FLOWMETER

Installation and user manual



Document	Version	Date	Applies to
Installation and user manual	V00x	11/2026	QZKB, all sizes and versions

This manual describes the QZKB gear flowmeter with colour display: safety, working principle, technical data, dimensions, installation, electrical connection, operation and the menus of the output versions, and troubleshooting.

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1 About this manual

Read this manual before installing the flowmeter and keep it available for later use. Technical data, dimensions and order codes in this manual are those of the QZKB 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
Range	02 · 04 · 20 · 70 · 150 · 250 · 350 (section 3.5)
Output	A3 two switches or pulses + one analogue · AR RS485 + analogue · SA (see the note in chapter 6)
Temperature	standard (≤ 120 °C) · T (≤ 140 °C)
Mounting	without · with the mounting plate (F)
Basic type	FM505

2 Safety

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

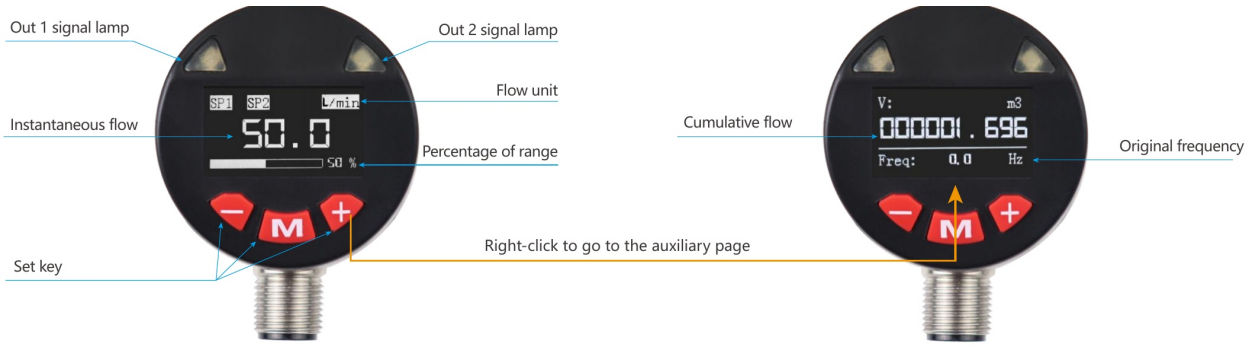
3.1 Working principle

The QZKB is a positive displacement flow sensor with two meshing precision gears. The volume displaced by the gears is used to calculate the volume of the medium passing through, so that even very small quantities can be measured. The flowmeter is used for precise continuous or intermittent measurement of liquid flow and of the instantaneous flow.

– Analogue and switching output (dual output); switching outputs PNP or NPN, selectable.
– Colour display.
– Measures various viscous media; high accuracy and repeatability.
– Communication function (version AR).
– Strong resistance to corrosion and fouling (acids and alkalis).

Applications: resins and adhesives; hydraulic oil, lubricating oil and grease; fuel oil; inks and asphalt; liquid nitrogen, refrigerants and solvents; edible oil and fish oil; fluids with chemical and corrosion-resistance requirements.

3.2 Display and keys



Left: main screen with instantaneous flow, flow unit, percentage of range and the lamps of output 1 and output 2. Right: auxiliary screen with cumulative flow and original frequency, reached with the right key (+).

Element	Function
Out 1 / Out 2 signal lamp	state of switching output 1 / 2 (SP1, SP2 on the screen)
Main screen	instantaneous flow, flow unit, percentage of range
Auxiliary screen	cumulative flow (V) and original frequency (Freq, Hz)
Keys –, M, +	setting keys (chapter 7); + on the main screen opens the auxiliary screen

3.3 Technical data

Item	Value
Measuring principle	Positive displacement — two meshing gears, each turn a known volume. The reading does not depend on the flow profile, so no straight inlet run is needed
Measuring range	Seven steps: 50 ... 2000 mL/min, 0.1 ... 4, 0.2 ... 20, 2 ... 70, 5 ... 150, 20 ... 250 and 30 ... 350 L/min
Accuracy	± 0.5 % of full scale
Repeatability	± 0.2 % of full scale
Media	Additive fuels, corrosion inhibitors, catalysts, emulsifiers, oils, fats, fragrances, adhesives, solvents, inks and insecticides · viscosity up to 10 000 Pa·s
Influence	Pressure and flow changes do not affect the accuracy
Pulse output	Q = f × 60 / K, with f the output frequency in Hz and K the pulses per litre
Housing	Stainless steel · display housing stainless steel or engineering plastic
Seal	FKM as standard

Pressure range	400 bar with the stainless housing
Medium temperature	-30 … +120 °C as standard · +140 °C with the T field of the order code
Mounting	On a machined plate. Two sealing grooves, 1.5 mm deep on the small sizes, 2 mm from 70 L/min and 2.5 mm on the 250 L/min size
Locking threads	4 × M6 on the small sizes, 4 × M8 at 70 L/min, 4 × M12 at 150 and 250 L/min, 8 × M14 on the 350 L/min size
Largest size	The 350 L/min version has a SAE 1¼ inch 6000 PSI flange face and an outside diameter of 220 mm
Supply voltage	16 … 30 Vdc
Plug	M12 × 1, five pins: 1 BN supply +, 3 BU supply –, 4 BK OUT1, 2 WH OUT2, 5 GY OUT3
Output A3	Two switches and one analogue. OUT1 and OUT2 PNP or NPN, or a pulse — linear at 100 Hz full scale, original, or quantitative at a tenth of full scale. OUT3 is 4 … 20 mA, 1 … 5 V or 0 … 10 V
Output AR	RS485 on OUT1 and OUT2 plus the same analogue on OUT3
Output SA	Flow or temperature as switch, pulse, analogue or IO-Link
Factory setting	PNP on OUT1 and OUT2, 4 … 20 mA on OUT3
Display	Colour screen. Main page: instantaneous flow, unit, percentage of range and the two output lamps
Auxiliary page	Totalised volume and the raw frequency, reached with the right key
Keys	Three: minus, M and plus

3.4 Pulse output

Flow from the pulse output: Q = f × 60 / K (Q in L/min, f output frequency in Hz, K pulses per litre of the flowmeter).

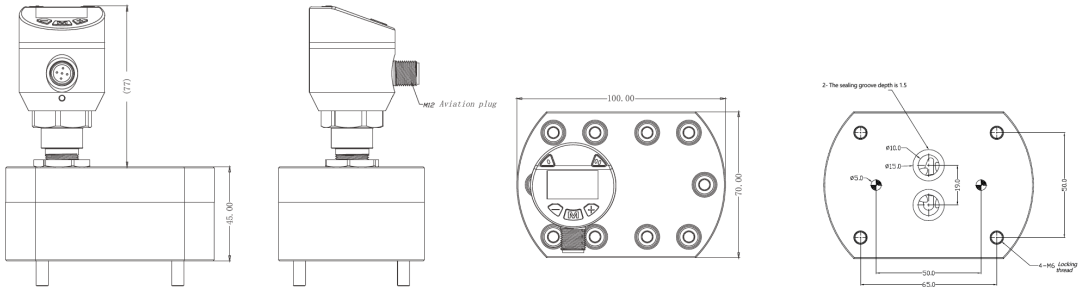
3.5 Order code

Field	Code	Meaning
1 Series	QZKB	QZKB plate-mounted gear flowmeter
2 Range	02 · 04	50 … 2000 mL/min · 0.1 … 4 L/min
	20 · 70	0.2 … 20 L/min · 2 … 70 L/min
	150 · 250	5 … 150 L/min · 20 … 250 L/min
	350	30 … 350 L/min · SAE flange face, not a plate like the others
3 Output	A3	Two switches or pulses plus one analogue, five-core
	SA	Flow or temperature as analogue, switch, pulse or IO-Link, four-core
	AR	RS485 plus one analogue, five-core
4 Temperature	— · T	≤ 120 °C · ≤ 140 °C
5 Mounting	— · F	Without · with the mounting plate

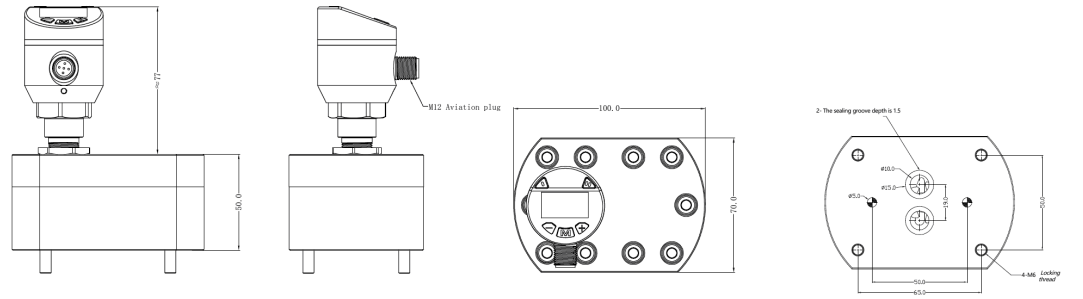
Example: QZKB-20-A3-—-F.

4 Dimensions

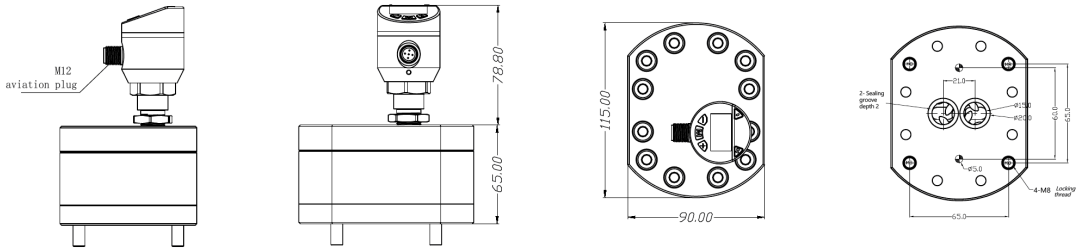
Measuring range: 2000mL/4L



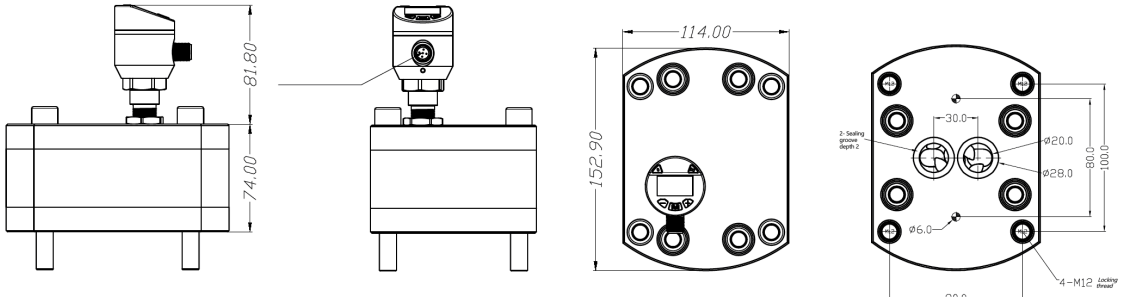
Measuring range: 20L



Measuring range: 70L

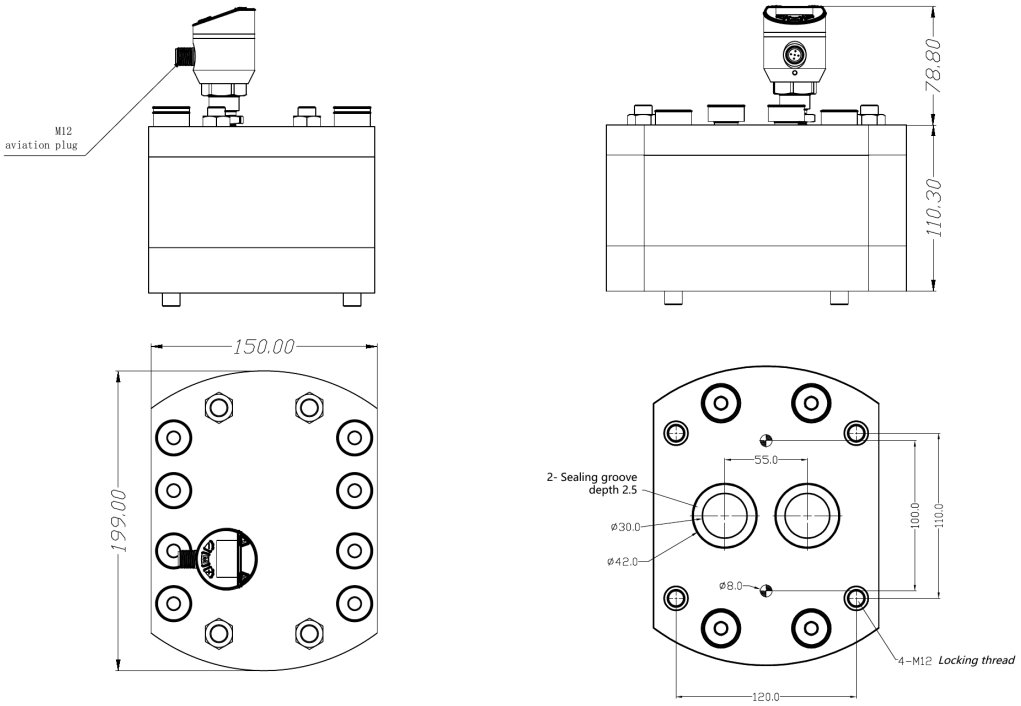


Measuring range: 150L

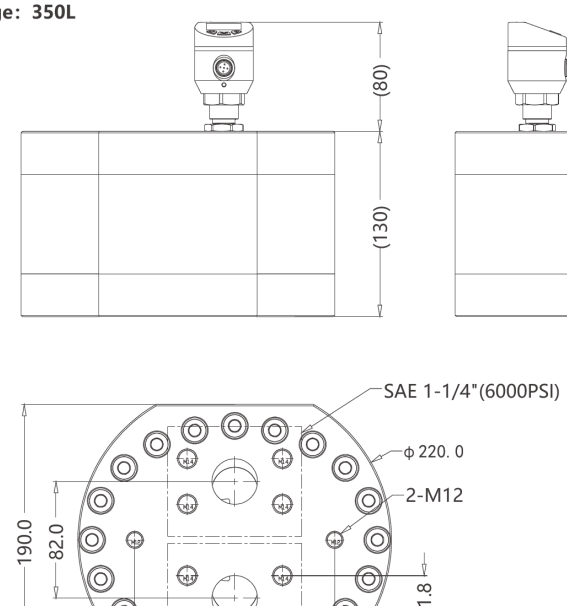


Ranges 2000 mL/min and 4 L/min, 20 L/min, 70 L/min and 150 L/min: side view, view from the plug side, top view and the sealing face (drawing for the customer's plate with sealing grooves, ports and locking threads). Dimensions in mm.

Measuring range: 250L



Measuring range: 350L



Ranges 250 L/min and 350 L/min. The 350 L/min size has an SAE 1¼" 6000 PSI flange face, eight M14 locking threads and an outside diameter of 220 mm.

Size	Plan mm	Note
2000 mL/min and 4 L/min	100 × 70	Height 45 · plug height about 77
20 L/min	100 × 70	Height 50 · plug height about 77
70 L/min	115 × 90	Height 65 · plug height 78.8
150 L/min	152.9 × 114	Height 74 · plug height 81.8
250 L/min	199 × 150	Height 110.3 · plug height 78.8
350 L/min	Ø220	Height about 130 · plug height about 80
Sealing grooves	1.5 · 2 · 2.5	Depth, by size
Locking threads	4×M6 · 4×M8 · 4×M12 · 8×M14	By size

5 Installation

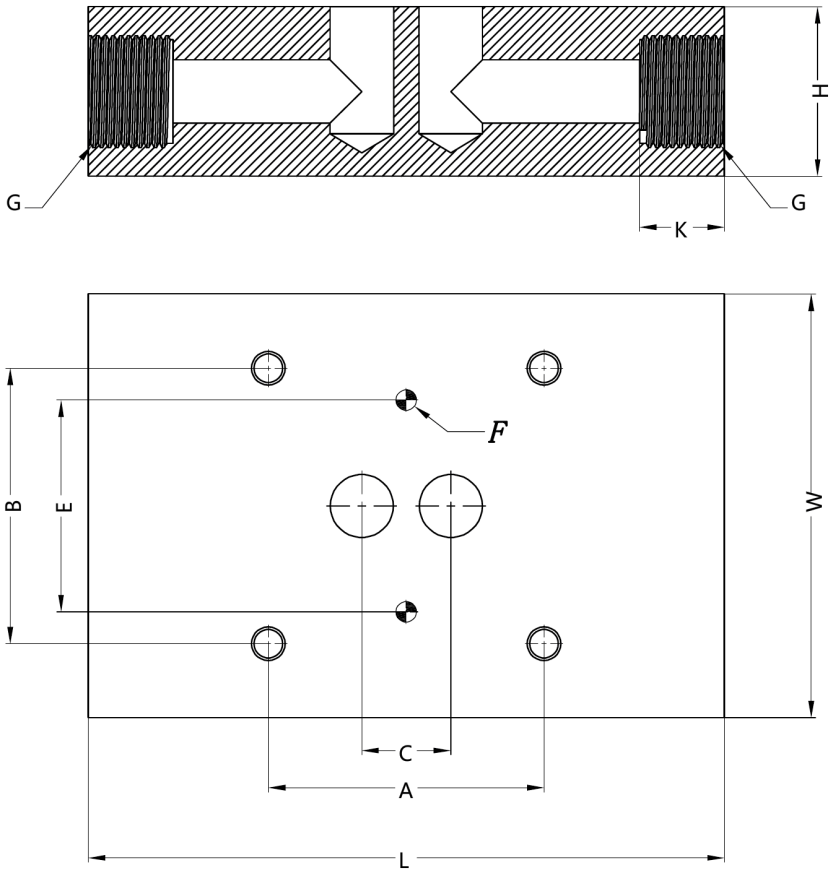
– The flowmeter is mounted on a machined plate, not in a pipe. The reading does not depend on the flow profile, so no straight inlet run is needed; pressure and flow changes do not affect the accuracy.

– Machine the plate according to the drawing of the sealing face (chapter 4): two sealing grooves, 1.5 mm deep on the small sizes, 2 mm from 70 L/min and 2.5 mm on the 250 L/min size.

– Locking threads: 4 × M6 on the small sizes, 4 × M8 at 70 L/min, 4 × M12 at 150 and 250 L/min, 8 × M14 on the 350 L/min size. The 350 L/min size has an SAE 1¼" 6000 PSI flange face.

5.1 Mounting plate

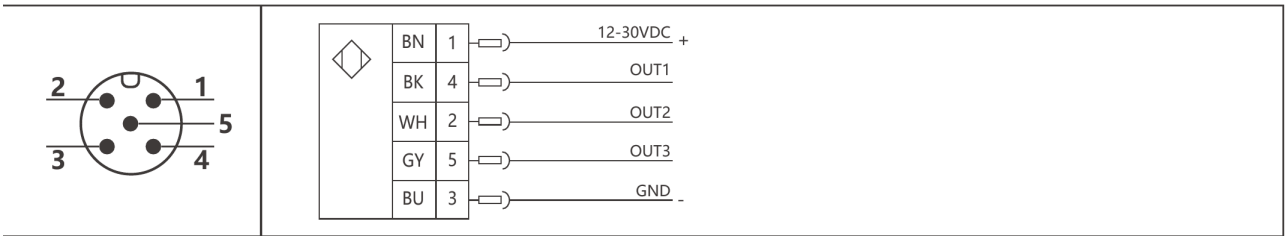
The mounting plate can be ordered with the meter (order code field 5, F). E is 50, 60, 80 and 100 mm down the four rows of the table; F, the locating hole, is Ø5, Ø5, Ø6 and Ø8.



Mounting plate: section and top view. G pipe thread. Dimensions in mm.

Range L/min	L	W	H	A	B	C	K	Pipe thread
20	120	91	40	65	50	19	20	G1/2
70	150	100	40	65	65	21	20	G3/4
150	155	165	50	90	100	30	25	G1
250	200	200	80	120	110	55	25	G1 1/2

6 Electrical connection



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

Wire colours: 1 BN brown (supply +), 2 WH white (OUT2), 3 BU blue (supply –), 4 BK black (OUT1), 5 GY grey (OUT3). What OUT1 to OUT3 carry depends on the output version.

6.1 Version A3 - two switches + one analogue

Wire	Pin	Function
BN	1	supply +
BU	3	supply –
BK	4 (OUT1)	flow switch PNP (factory setting) · flow switch NPN · linear pulse (100 Hz at full scale) · original pulse · quantitative pulse (full scale × 0.1)
WH	2 (OUT2)	flow switch PNP (factory setting) · flow switch NPN
GY	5 (OUT3)	flow analogue: 4 ... 20 mA (factory setting) · 1 ... 5 V · 0 ... 10 V

6.2 Version AR - RS485 + analogue

Wire	Pin	Function
BN	1	supply +
BU	3	supply –
BK	4 (OUT1)	RS485 (B)
WH	2 (OUT2)	RS485 (A)
GY	5 (OUT3)	flow analogue: 4 ... 20 mA (factory setting) · 1 ... 5 V · 0 ... 10 V

Note Version SA (four-core): the wiring and the menu of this version are not covered by this manual; please contact octogon.

7 Operation and menus

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 Menu of version A3

Level 1

Item	Function
SP1 Set	switching point of switch 1
RP1 Set	reset point of switch 1
SP2 Set	switching point of switch 2
RP2 Set	reset point of switch 2
F-URV	range: full scale of the flow
Menu 2 Set	opens level 2

Level 2

Item	Function
Factory Reset	restores the factory settings (hold **M** for 5 s)
OUT1 Set	output mode of OUT1: **W-NC** window, normally closed · **W-NO** window, normally open · **H-NC** hysteresis, normally closed · **H-NO** hysteresis, normally open · **S-Hz-OUT** set pulse output · **F-Hz-OUT** original pulse output
OUT2 Set	output mode of OUT2: **W-NC** · **W-NO** · **H-NC** · **H-NO**
dS1 Set	switching delay of switch 1
dR1 Set	reset delay of switch 1
dS2 Set	switching delay of switch 2
dR2 Set	reset delay of switch 2
Unit Set	flow unit: L/min · mL/min · m^3/h
F-L-data	historical minimum of the flow
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
PNP/NPN Set	switching outputs PNP or NPN
A0-Mode	analogue output signal: 4 … 20 mA · 1 … 5 V · 0 … 10 V (1)
d-P-set	decimal places of the reading
Digit colour	colour of the main reading
BG colour	background colour of the main screen
SCRN-Set	screen-off setting value (s); example display **NO**

7.3 Menu of version AR

Level 1

Item	Function	Example display
485 ID	RS485 address	1
Baud set	baud rate	9600
parity set	parity bit	None
stop bit set	stop bits	1 bit
F-URV	range: full scale of the flow	–
Menu 2 Set	opens level 2	–

Level 2

Item	Function
Factory Reset	restores the factory settings (hold **M** for 5 s)
Unit Set	flow unit: L/min · mL/min · m^3/h
F-L-data	historical minimum of the flow
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
A0-Mode	analogue output signal: 4 ... 20 mA · 1 ... 5 V · 0 ... 10 V (1)
d-P-set	decimal places of the reading
Digit colour	colour of the main reading
BG colour	background colour of the main screen
SCRN-Set	screen-off setting value (s); example display **NO**

The register map of the RS485 interface is not part of this manual; please request it from octogon.

(1) The menu also offers 0 ... 20 mA, 0 ... 5 V and 2 ... 10 V; the analogue signals of this flowmeter are those of chapter 6.

8 Troubleshooting

Fault	Possible cause	Remedy
No output signal after switching on	1. No medium flow, or the flow is below the starting flow. 2. Supply connected to an output wire. 3. Display circuit damaged.	1. Increase the flow, or use a flowmeter of a smaller size that suits the flow range. 2. Connect the cables correctly. 3. Replace the flowmeter.
Output signal although there is no flow	1. Poor earthing of the flowmeter; interference from power lines and other earth lines. 2. Amplifier sensitivity too high, or self-excitation. 3. Unstable supply, poor filtering or other electrical interference.	1. Earth correctly to eliminate the interference. 2. Replace the preamplifier. 3. Repair or replace the power supply to eliminate the interference.
Unstable instantaneous flow reading	1. Unstable medium flow. 2. Amplifier sensitivity too high or too low; extra or missing pulses. 3. Debris in the housing. 4. Poor earthing. 5. Flow below the lower limit. 6. Foreign matter in the line disturbing the flow.	1. Test again when the flow is stable. 2. Replace the preamplifier. 3. Remove the dirt. 4. Check the earth connection.
Indicated cumulative flow does not match the actual volume	1. Wrong meter coefficient entered. 2. The operating flow is below or above the flow range of the selected flowmeter. 3. The flowmeter itself is out of tolerance.	1. Enter the correct coefficient after recalibration. 2. Adjust the flow, or choose a flowmeter of suitable size. 3. Recalibrate.
Key fault	Poor contact of a key, or a key is locked.	Replace the display board.

9 Accessories

M12 × 1 connecting cables, 5-pin, PUR or PVC, 2, 5 or 10 m, straight or angled, also shielded - the factory standard is 2 m PVC. Self-wiring sockets with Pg7/Pg9 gland. The mounting plate is a field of the order code (section 5.1).

Accessories are ordered by description; order numbers: see the datasheet.