OCTOGON

MANUAL

QGKK

THERMAL GAS FLOW SENSOR LED

Installation and user manual



Document	Version	Date	Applies to
Installation and user manual	V00x	11/2026	QGKK, all flow ranges and output versions

This manual describes the QGKK thermal gas flow sensor with 4-digit LED display: technical data, dimensions, installation in the pipe, electrical connection, operation and the menus of the switch/analogue and the RS485 versions, accessories and maintenance.

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1 About this manual

Read this manual before installing the sensor and keep it available for later use. Values and versions refer to the QGKK order code (section 3.4).

1.1 Versions covered

Feature	Versions
Flow range	5 · 10 · 50 · 100 · 200 · 1000 · 2000 L/min
Output	NV · NA: NPN switch + 1 ... 5 V · + 4 ... 20 mA; PV · PA: PNP switch + 1 ... 5 V · + 4 ... 20 mA; R: RS485
Connection	push-in Ø 6 or Ø 8 mm, internal thread Rc or G 1/8 ... 3/4, by flow range
Options	mounting bracket, regulating valve (up to 200 L/min)

1.2 Type marking

The device label carries the type designation FM350 together with the version data.

2 Safety

2.1 Signal words

Safety instructions are intended to protect users from dangerous situations and/or prevent material damage. In this manual the severity of the potential risk is indicated by the following signal words:

Signal word	Meaning
Danger	An imminent danger to the user. Failure to comply may result in fatal injury.
Warning	An identifiable hazard. Failure to comply may result in fatal injury and damage to equipment or plant parts.
Caution	A potential danger. Failure to comply may result in minor injury and material damage to the device and/or the plant.
Important	Information that is important to the user.

2.2 Intended use

The QGKK measures the flow of dry air and nitrogen (N2) - non-corrosive and non-flammable gases - in one flow direction. Depending on the version it has one switch output and one analogue output, or an RS485 interface.

Important The medium must be free of dew and ice. Observe the working pressure –0.09 ... 0.8 MPa and the temperature ranges in section 3.2.

2.3 Disposal

Disposal The device must be disposed of correctly in accordance with the national or local regulations for electrical and electronic equipment. Do not dispose of the device with household waste.

3 Product description

3.1 Working principle

Thermal mass flow measurement: the sensor is heated and the gas stream carries heat away; how much heat it carries away is a measure of the mass flow. Seven sizes: 5, 10, 50, 100, 200, 1000 and 2000 L/min.

3.2 Technical data

Measurement

Item	Value
Media	dry air, nitrogen (N2) · non-corrosive and non-flammable
Direction	unidirectional
Display accuracy	± 3 % F.S. ± 1 digit (1)
Analogue accuracy	± 3 % F.S. ± 1 digit (1)
Repeatability	± 3 % F.S. ± 1 digit
Linearity	± 3 % F.S.
Response time	≤ 100 ms on the analogue output · 800 ms on the switches, also 50, 80, 120, 200, 400 or 1500 ms

(1) Measured with 300 kPa at the inlet, one atmosphere at the outlet and 25 °C. (2) Measured over –0.09 ... 0.8 MPa with one atmosphere at the outlet and 25 °C; the lower figure is a vacuum.

Process and environment

Item	Value
Process connection	push-in Ø 6 or Ø 8 mm · Rc1/8 · G1/8 · Rc1/4 · G1/4 · Rc1/2 · G1/2 · Rc3/4 · G3/4, by size
Working pressure	–0.09 ... 0.8 MPa (2)
Pressure resistance	1 MPa
Protection grade	IP40
Medium temperature	0 ... +50 °C · no dew and no ice
Ambient temperature	0 ... +50 °C · storage –10 ... +60 °C
Humidity	35 ... 85 % RH, no dew
Insulation	≥ 50 MΩ at 500 V DC between leads and plastic housing
Withstand voltage	1000 V AC for one minute
EMC	IEC 61000-6-2 and IEC 61000-6-4
Weight	109.3 g with the Ø 6 fitting · 112.7 g with Ø 8 · 118 g with Rc1/4 · 128.5 g with Rc1/8,

	two metres of cable included

Electrical data and display

Item	Value
Supply voltage	12 … 24 V DC
Consumption	≤ 50 mA without load
Switch output	PNP or NPN · short-circuit protected
Switch modes	hysteresis, window, pulse - full scale 150 Hz
Voltage output	1 … 5 V · output impedance 1 kΩ
Current output	4 … 20 mA · load ≤ 300 Ω
Communication	RS485
Cable	Ø 4 mm oil-resistant PVC · 0.25 mm² · four cores · four-pin buckle plug
Display	four-digit LED · can be turned by 180°
Shown	instantaneous flow and totalized flow
Keys	set key and up/down keys

3.3 Versions

Code	Rated flow (L/min)	Display range (L/min)	Resolution	Connection
0005	0 … 5	0 … 5.25	0.01	Ø 6 push-in · Rc1/8 · G1/8
0010	0 … 10	0 … 10.50	0.01	Ø 6 push-in · Rc1/8 · G1/8
0050	0 … 50	0 … 52.5	0.1	Ø 6 push-in · Rc1/8 · G1/8
0100	0 … 100	0 … 105.0	0.1	Ø 8 push-in · Rc1/4 · G1/4
0200	0 … 200	0 … 210	1	Ø 8 push-in · Rc1/4 · G1/4
1000	0 … 1000	0 … 1050	1	Rc1/2 · G1/2
2000	0 … 2000	0 … 2100	1	Rc3/4 · G3/4

The resolution is the smallest display step in L/min; in cubic feet it is 0.1 ft³/min throughout.

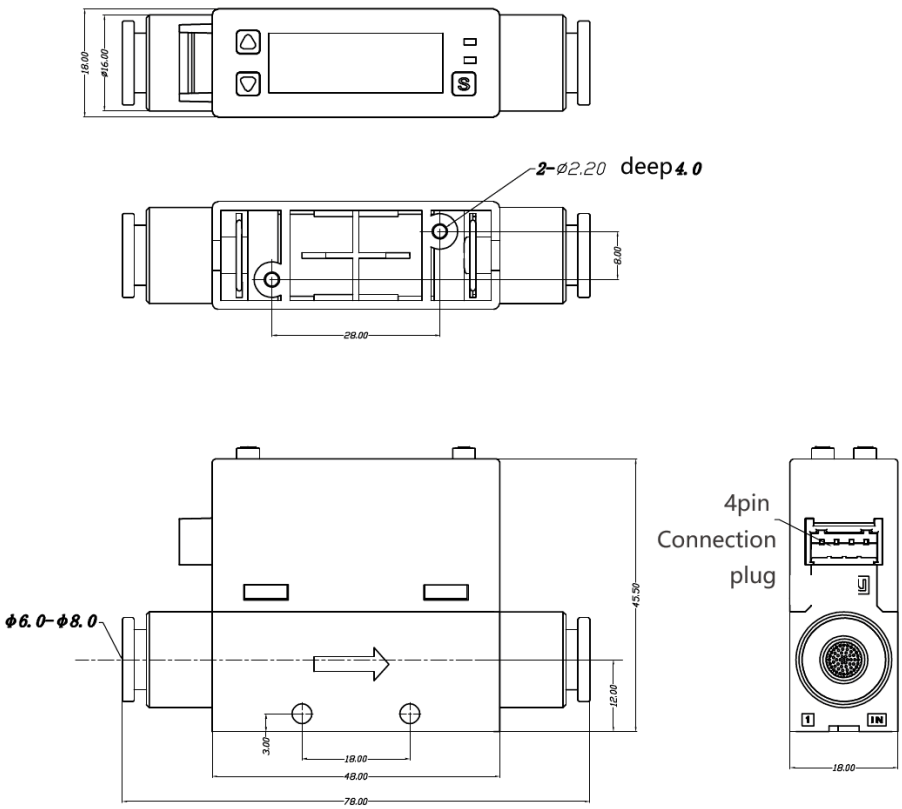
3.4 Order code

Field	Code	Meaning
1 Series	QGKK	thermal gas flow sensor
2 Range	0005 · 0010 · 0050 · 0100 · 0200 · 1000 · 2000	5 … 2000 L/min
3 Output	NV · NA	NPN switch + analogue 1 … 5 V · + analogue 4 … 20 mA
	PV · PA	PNP switch + analogue 1 … 5 V · + analogue 4 … 20 mA
	R	RS485
4 Nozzle	D6 · D8	Ø 6 mm push-in, up to 50 L/min · Ø 8 mm push-in, 100 and 200 L/min
	R18K · G18K	Rc1/8 · G1/8, up to 50 L/min
	R14K · G14K	Rc1/4 · G1/4, 100 and 200 L/min
	R12K · G12K	Rc1/2 · G1/2, 1000 L/min
	R34K · G34K	Rc3/4 · G3/4, 2000 L/min
5 Bracket	– · T	none · mounting bracket
6 Valve	– · F	none · regulating valve - only up to 200 L/min

Example: QGKK-0005-NV-D6. The nozzle follows the flow range.

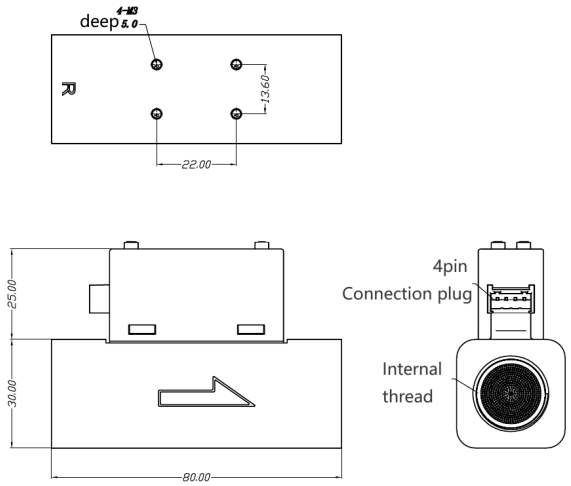
4 Dimensions

Piping type

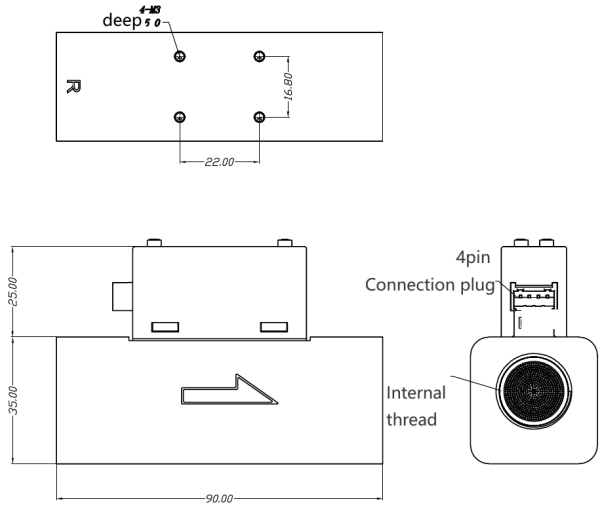


Push-in and internal thread type up to 200 L/min. Dimensions in mm.

Flow range: 1000L



Flow range: 2000L



1000 and 2000 L/min. Dimensions in mm.

Version	Length	Width	Height	Mounting holes	Connection
Push-in, up to 200 L/min	78.00	18.00	45.50	2 × Ø 2.20, 4.0 deep · 28.00 apart	Ø 6.0 … Ø 8.0
Thread, up to 200 L/min	70.05	18.00	45.50	2 × Ø 2.20, 4.0 deep · 28.00 apart	Rc or G, internal
1000 L/min	80.00	30.00	25.00	4 × M3, 5.0 deep · 22.00 × 13.60	Rc1/2 or G1/2
2000 L/min	90.00	35.00	25.00	4 × M3, 5.0 deep · 22.00 × 16.80	Rc3/4 or G3/4

The length is measured over the fittings, the width over the body and the height over the head with the display; for the 1000 and 2000 L/min versions the height is 25.00 mm over the body, 30.00 or 35.00 mm over the flow channel.

5 Installation

5.1 Piping

– Arrange the pipes in accordance with the flow direction of the gas and the arrow on the body.

– Install a straight pipe of 8 cm or more with an inner diameter of 9 mm or more on the IN side. Bends in the piping or changes in cross-section may change the accuracy by ± 2 % F.S.

– Do not discharge the gas from the OUT side directly into the atmosphere without piping; this affects the accuracy.

Tightening torque

When piping a metal body, observe the applicable torque in the table below. Hold the body with a spanner while tightening the fitting. A torque above the table value may damage the product; an insufficient torque may let the thread loosen and cause leakage.

Connection thread	Applicable torque
Rc1/2″, G1/2″	28 … 30 N·m
Rc3/4″, G3/4″	28 … 30 N·m

After installation, admit gas and connect the power supply. Carry out a function check and a leak test to verify that the installation is correct.

5.2 Mounting

Fasten the sensor with the side mounting holes of the body (section 4) or with the mounting bracket (section 8.1).

6 Electrical connection

Core	Pin	Switch and analogue version	RS485 version
RD	1	supply +	supply +
BU	4	supply –	supply –
YE	3	switch output SP1 · PNP or NPN by order code	RS485 (B)
WH	2	analogue 1 … 5 V or 4 … 20 mA by order code	RS485 (A)

Wire colours to IEC 60757: RD red, BU blue, YE yellow, WH white. Four cores in every version; the plug is a four-pin buckle connector, moulded onto two or ten metres of cable (section 8.1).

- PNP switch output: connect the load between YE (SP1) and the negative supply.
- NPN switch output: connect the load between the positive supply and YE (SP1).
- Analogue output: connect the input of the downstream device between WH and the negative supply.
- RS485 version: YE to RS485 (B), WH to RS485 (A).

Supply 12 … 24 V DC. Current output: load ≤ 300 Ω; voltage output: output impedance 1 kΩ.

7 Operation

7.1 Display and keys

Element	Function
LED display	four digits: instantaneous flow; totalized flow
Set key S	opens the menu, opens a value and returns from it
Up/down keys ▲ ▼	move between menu items; change a value
Connector	four-pin plug on the side of the head
IN / OUT	piping connections; flow direction as the arrow on the body
Side mounting holes	fastening of the body

7.2 Switching function

When the flow rises above or falls below the set switching limits (SP, rP), the switching state of the output changes. The following switching functions can be selected:

Function	Description
Hysteresis, normally open / normally closed	First set the switch point SP, then the reset point rP. The difference between SP and rP is the hysteresis; if SP is changed again, the hysteresis changes with it.
Window, normally open / normally closed	SP is the upper limit value, rP the lower limit value. The width of the window is set by the difference between SP and rP.

7.3 Menu navigation

- From the display press S to open the level 1 menu.
- ▲ and ▼ move between the menu items.
- S opens the value of the item; change it with ▲ or ▼; S returns to the item.
- At **EF** press S to open the level 2 menu; ▲ at **EF** returns to the display.

7.4 Menus of the switch and analogue version

Level 1

Display	Function	Factory setting
SP1	switch alarm value	20 % of the range
rP1	switch reset value	90 % of the SP1 value
ASP	lower range limit	lower range limit
AEP	upper range limit	upper range limit
EF	open the level 2 menu	–

Level 2

Display	Function	Factory setting
rES	restore the factory settings	–
ou1	switching function: **Hno** hysteresis normally open, **Hnc** hysteresis normally closed, **Fno** window normally open, **Fnc** window normally closed	**Hno**
dS1	switch-on delay of OUT1	0 s
dr1	switch-off delay of OUT1	0 s
oFSt	display value compensation	0
FILt	filter coefficient, adjustable from 1 to 50	5
SPdL	reaction rate of the display value (increase/decrease)	10
ZERo	zero cut-off value (L/min)	5
P-n	switch output PNP or NPN	**PnP**
Fc	flow coefficient correction	1.00
EF	back to the level 2 menu start	–

7.5 Menus of the RS485 version

Level 1

Display	Function	Factory setting
id	RS485 address	1
bAud	baud rate setting	**2**
EF	open the level 2 menu	–

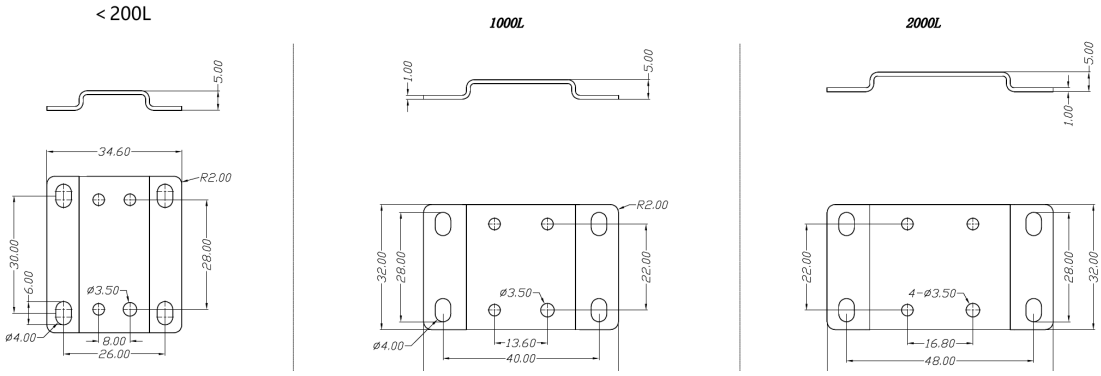
Level 2

Display	Function	Factory setting
rES	reset the totalized flow to zero	–
oFSt	display value compensation	0
FILt	filter coefficient, adjustable from 1 to 50	5
SPdL	reaction rate of the display value (increase/decrease)	10
ZERo	zero cut-off value (L/min)	–
Fc	flow coefficient correction	1.00
EF	back to the level 2 menu start	–

Further details of the RS485 protocol are available on request.

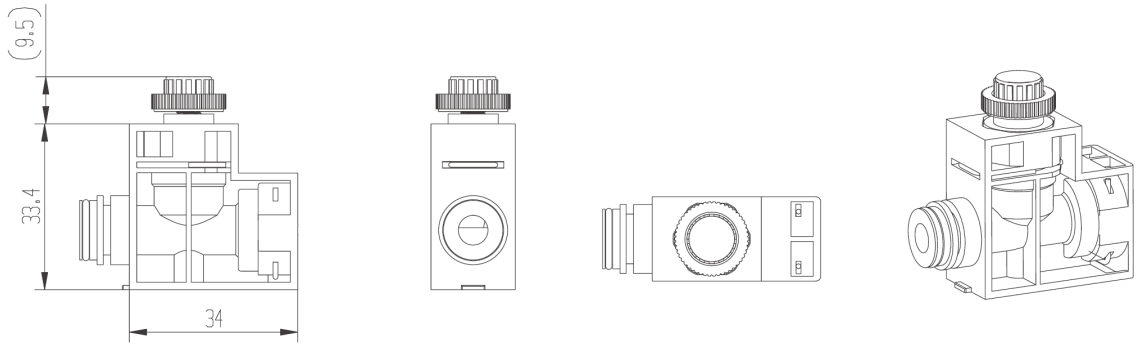
8 Accessories

8.1 Mounting bracket, regulating valve and cable



Mounting brackets up to 200 L/min, for 1000 and for 2000 L/min. Dimensions in mm.

Mounting bracket (order code field 5, T): 34.60 × 30.00 mm with 26.00 mm hole spacing up to 200 L/min, 50.00 × 32.00 mm with 40.00 mm for 1000 L/min, 58.00 × 32.00 mm with 48.00 mm for 2000 L/min, each 1 mm thick.



Regulating valve. Dimensions in mm.

Regulating valve (order code field 6, F): screwed between the fittings, adds 34 mm of width and 33.4 mm of height; with it the device is 104.00 mm long in the thread version and 112.00 mm in the push-in version. Available up to 200 L/min only.

Cable: four-pin buckle plug moulded onto 2 or 10 m of PVC lead, order numbers XH4PC02G and XH4PC10G.

8.2 Panel meter S10

The S10 is a separate device: a panel meter for the cabinet that takes the analogue signal of the sensor, shows it and switches on it.

Item	Value
Input	analogue (pulse) · PT100 on request
Display range	–199.9 … 999.9
Temperature drift	≤ ± 0.015 % F.S. per °C · typically about ± 75 ppm/°C
EMC	IEC 61000-4-4 ± 4 kV / 5 kHz · IEC 61000-4-5 surge 4 kV
Output	switch or analogue
Supply voltage	24 V DC ± 20 % · ≤ 3 W
Ambient temperature	–10 … +60 °C · humidity ≤ 90 % RH
Front size	40 × 40 mm · 44.2 mm deep, 37.7 mm behind the panel
Panel cut-out	36 +0.5 × 36 +0.5 mm · at least 43 mm pitch · panel 1 … 3.2 mm thick · corner radius below R3.5
Terminals	eight screw terminals · two switch outputs, supply in, supply out, analogue in
Order model	S10-21 · analogue input, two switch outputs, reading in L/min

9 Maintenance and removal

9.1 Maintenance and cleaning

The device does not require maintenance.

Warning Periodically check whether the device is working properly. If it does not work properly, stop the operation immediately.

Caution Use of an improper cleaning agent may damage the device.

The following cleaning agents can be used to clean polycarbonate:

- mild soap or detergent
- isopropyl alcohol

Immediately after cleaning, rinse with water. Do not leave cleaner on the surface of the product. Do not clean the product in high heat or in direct sunlight.

The following cleaning agents are known to affect the integrity of polycarbonate components and must not be used:

- ZEP Fast 505, Pinesol, Formula 409
- halogenated solvents (benzene, gasoline, acetone or carbon tetrachloride)
- strong alkalis
- methyl ethyl ketone
- abrasive substances

9.2 Removal

Danger Only remove the device when it is de-energised and depressurised (electrical, hydraulic/pneumatic). Disconnecting the device from pressure and power supply must be carried out by trained or instructed personnel in accordance with the state of the art.

Warning Be aware that the surface of the housing may become very hot at higher operating temperatures.