OCTOGON

MANUAL

QTKD

TURBINE FLOW AND TEMPERATURE SENSOR

Installation and operating manual



Document	Version	Date	Applies to
Installation and operating manual	V00x	11/2026	QTKD, all calibers and output versions SA, SV1, SV2, R

This manual describes the QTKD electronic turbine flow and temperature sensor: technical data, dimensions, installation, electrical connection, display, keys and menus, 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 order codes refer to the QTKD order code (section 3.4).

1.1 Notices

Safety instructions are intended to protect users from dangerous situations and/or prevent material damage. In this manual the severity of a 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 danger. Non-compliance may result in minor injury and material damage to the sensor and/or the plant.
Important	Information that is important to the user.

1.2 Versions covered

Feature	Versions
Caliber	DN6 ... DN50
Process connection	G internal thread · G or R external thread · customised hydraulic joint · plate mounting · welded joint
Output	SA, SV1, SV2 (switch / pulse / IO-Link + analog current or voltage) · R (RS485)
Form	Normal form or split high-temperature type
Medium	Oil (factory default) or water

2 Safety

2.1 Intended use

Danger Use the sensor only within its specified range of application. The temperature must stay within the permissible range. Do not exceed the rated pressure and the rated electrical load. Assembly, commissioning and operation must be carried out in accordance with the applicable national and local safety regulations.

The QTKD measures the flow and the temperature of liquid media (calibrated with lubricating oil; oil or water by order code) and provides switching, pulse, analog, IO-Link or RS485 outputs.

2.2 Disposal

Sensors must be handled in accordance with the national or local regulations for electrical/electronic equipment. Sensors must not be disposed of with household waste.

3 Product description

3.1 Overview

The QTKD is an electronic turbine flow sensor with temperature measurement. The colour display carries the instantaneous flow and the current temperature at the same time, each with its unit, and above them the operating state. Two signal lamps show the state of the switching outputs. All parameters - the alarm limits, the analog assignment, the response time and the zero point of the analog range - are set on the device with the three keys.

3.2 Technical data

Item	Value
Measuring range	DN 6 ... DN 50 · 0.7 ... 660 L/min
Accuracy	≤ ±1.0 % linear
Switching accuracy	≤ ±0.5 % of the range
Analog output accuracy	≤ ±0.5 % of the range
Response time	0.1 ... 5.0 s, settable · factory default 1.0 s
Display	Colour LCD screen, flow and temperature
Calibration standard	Lubricating oil 46# at 25 °C
Measured medium	Oil (factory default) or water, set by order code
Display head housing	Engineering plastics
Shell	Stainless steel 304L · alumina by order code
Turbine rotor	Duplex steel
Transmission components	Sliding bearing
Protection class	IP67
Voltage withstand	400 bar, internal thread type
Medium temperature	-20 ... +80 °C · -30 ... +180 °C split high-temperature type
Ambient temperature	-20 ... +75 °C
Storage temperature	-10 ... +60 °C
Supply voltage	16 ... 30 Vdc
Output type	Switch PNP or NPN · IO-Link · RS485 · analog 4 ... 20 mA, 1 ... 5 V, 0 ... 10 V · pulse · frequency
Switching load	< 200 mA
Wiring protection	Reverse polarity, overload and short circuit
Outlet method	M12x1 connector · 5 poles, 4 poles with RS485

3.3 Flow range and body length

DN	Connection G	Flow range (L/min)	Body height H	L standard	L pressure module
6	1/2″	0.7 ... 10	40	80	130
10	1/2″	0.8 ... 20	40	80	130
12	1/2″	1 ... 60	40	80	130
15	1/2″	2 ... 100	45	94	141
20	3/4″	5 ... 130	45	94	141
25	1″	6 ... 160	45	112	157
32	1-1/4″	25 ... 250	55	130	163
40	1-1/2″	30 ... 300	65	150	175
50	2″	60 ... 660	72	182	198

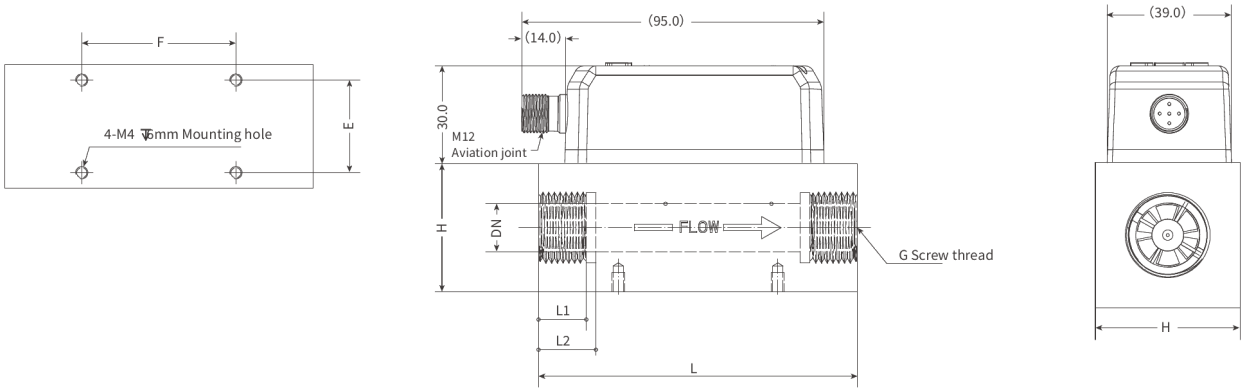
All lengths in mm. The analog output starts at 0 L/min.

3.4 Order code

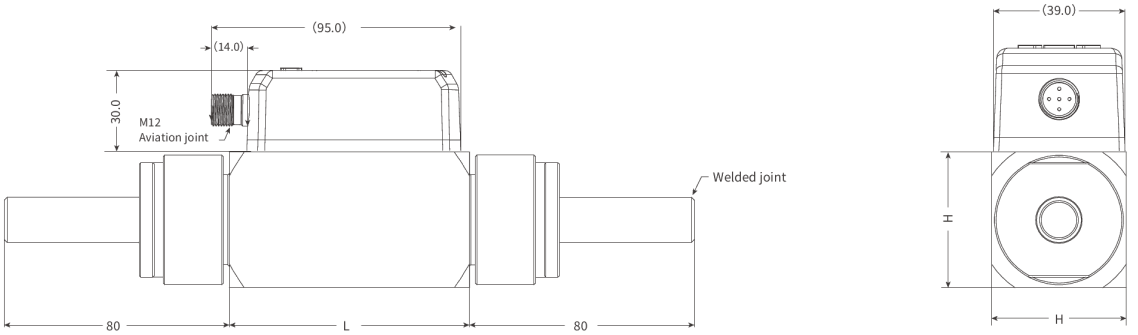
Field	Code	Meaning
1 Series	QTKD	Electronic turbine flow and temperature sensor
2 Caliber	006 · 010 · 012 · 015 · 020 · 025 · 032 · 040 · 050	DN6 ... DN50
3 Process	GK · GM · RM	Internal thread G · external thread G · external thread R
	LM · BS · HS	Customised hydraulic joint · plate mounting · welded joint
4 Output	SA · SV1 · SV2	Switch / pulse / IO-Link + analog 0/4 ... 20 mA · 0/1 ... 5 V · 0/1 ... 10 V
	R	RS485 output
5 Body	– · L	Stainless steel 304L · alumina
6 Form	– · H	Normal form · split high-temperature type, -30 ... +180 °C, stainless steel only
7 Medium	– · S	Oil (factory default) · water
8 Pressure	– · P	No pressure detection hole · with pressure detection hole G1/4 for a pressure module

Example: QTKD-015 GK SA - - - -. Fields 5 to 8 are written as a dash when the default applies.

4 Dimensions



Internal thread type: mounting holes 4 x M4, 6 mm deep (left), side and front view. Dimensions in mm.

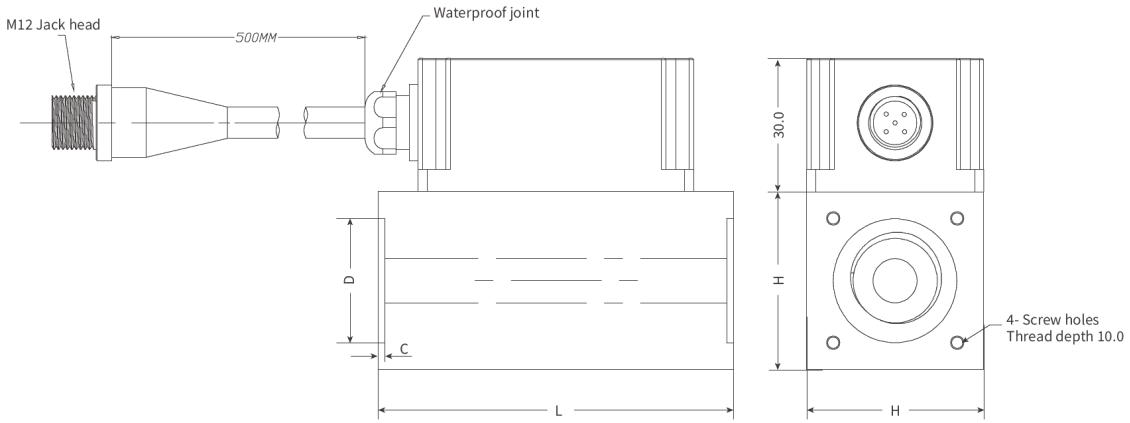


Welded joint type.

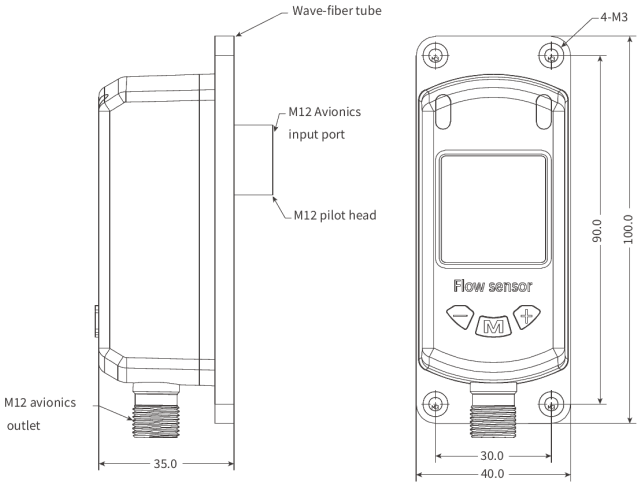
DN	Body height H	Effective thread length L1	Thread length L2	Fixing E × F
6	40	12	15	30 × 50
10	40	12	15	30 × 50
12	40	12	15	30 × 50
15	45	12	15	35 × 50
20	45	16	19	35 × 50
25	45	18	21	35 × 50
32	55	20	23	45 × 50
40	65	22	25	55 × 50
50	72	24	27	55 × 50

Head 95.0 × 39.0 mm, 30.0 mm from the axis to the M12 connector, mounting 4 × M4, 6 mm deep. Body lengths L in section 3.3.

4.1 Split and plate-mounted type



Split type: measuring body with M12 plug, display head connected by a 500 mm cable.



Display head of the split type: 100.0 × 40.0 × 35.0 mm, fixed to a plate with four M3 screws.

In the split version the display head sits away from the measuring body, connected by a 500 mm cable with an M12 plug at each end - the version for medium temperatures up to 180 °C and for pipes where the head cannot be read in place.

4.2 Sealing rings and mounting plates

DN	Sealing ring D × C	Plate H × H	Hole pitch J × K	Locking screw	Thread P	Joint length G	Thread depth U
6	Ø 28 × 2	40 × 40	28 × 28	M3 × 20	3/8″	20	15
10	Ø 28 × 2	40 × 40	28 × 28	M3 × 20	1/2″	20	15
12	Ø 28 × 2	40 × 40	28 × 28	M3 × 20	1/2″	20	15
15	Ø 28 × 2	40 × 40	28 × 28	M3 × 20	1/2″	20	15
20	Ø 38 × 2.4	45 × 45	32 × 32	M3 × 20	3/4″	20	17
25	Ø 38 × 2.4	45 × 45	32 × 32	M3 × 20	1″	20	17
32	Ø 50 × 2.4	55 × 55	45 × 45	M5 × 25	1-1/4″	20	20
40	Ø 55 × 2.4	65 × 65	50 × 50	M5 × 25	1-1/2″	25	20
50	Ø 68 × 2.4	75 × 75	55 × 55	M5 × 25	2″	25	20

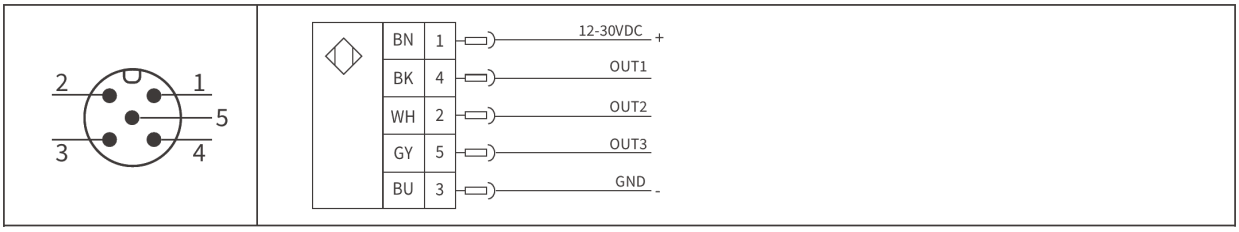
All dimensions in mm; sealing ring D × C = diameter × wire diameter. Mounting plates are used for the plate-mounted version, order code BS.

5 Installation

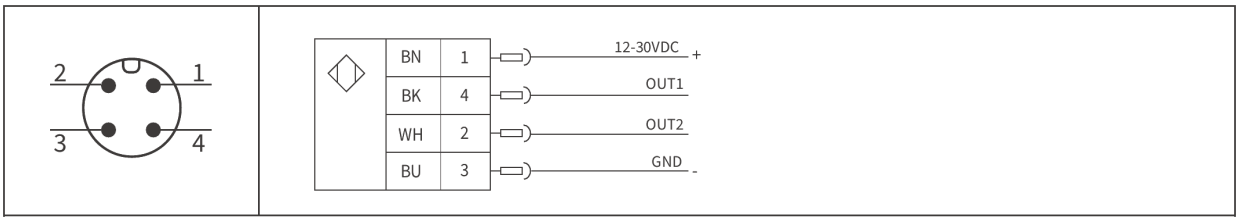
Install the sensor in a horizontal pipe with a straight pipe section of 5 × the pipe diameter before and after the sensor.

Topic	Instruction
Pipe slope	When the straight pipe section is installed horizontally, control the slope of the pipe strictly, so that the fluid fills the whole pipe and no local air pockets or liquid accumulations occur.
Venting and draining	Install suitable vent and drain valves to remove gas and fluid from the pipe before start-up, so that the pipe is always full during measurement.
Tightness	Check the tightness of pipe joints and valves to prevent leaks and a partly filled pipe.
Location	Do not install the straight pipe section where the pipe may not be full, such as undulating sections or areas where siphoning can occur.
Fluid properties	Design the pipe diameter and the flow velocity according to the properties of the fluid (viscosity, density) to ensure full-pipe measurement.
Pipe cleaning	Before installation make sure that the straight pipe section is clean and free of debris, dirt or welding slag. Impurities can damage the turbine blades or disturb the flow.
Commissioning	After installation, increase the flow gradually, observe the readings of the sensor and whether the pipe is full, and correct problems in time.
Inspection	Maintain and inspect pipes and sensor regularly; remove debris that may clog the pipe, for long-term stable full-pipe measurement.

6 Electrical connection



Versions SA, SV1, SV2: M12x1 connector, 5 poles, seen on its pins, and the wiring. Supply voltage according to the technical data: 16 ... 30 Vdc.



Version R (RS485): 4 poles. Supply voltage according to the technical data: 16 ... 30 Vdc.

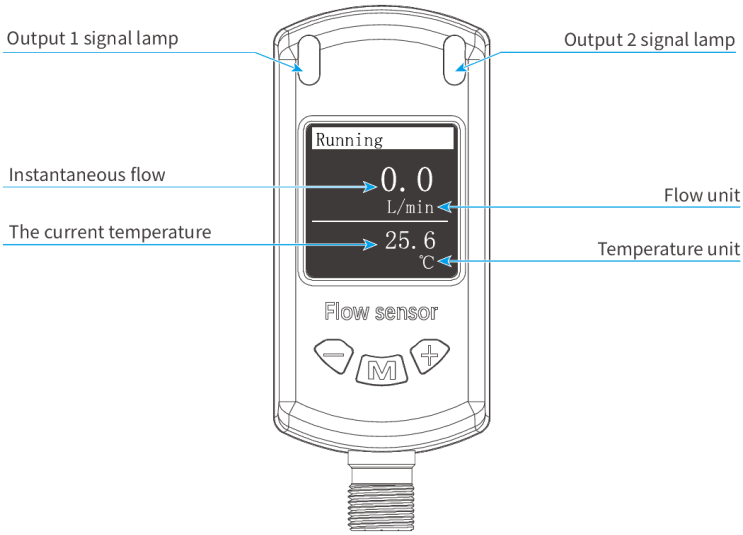
Pin	Wire	Signal
1	BN brown	Power supply + · 16 ... 30 Vdc
4	BK black	OUT1
2	WH white	OUT2
5	GY grey	OUT3 · not present on the RS485 version
3	BU blue	Power supply – · GND

6.1 Outputs per version

Code	OUT1 · pin 4 · BK	OUT2 · pin 2 · WH	OUT3 · pin 5 · GY
SA	Flow switch PNP (factory default) or NPN · temperature switch PNP or NPN · flow linear frequency (full scale 0 … 100 Hz) · flow original frequency · flow quantitative frequency (full scale 0.5 %L/Hz) · IO-Link	Flow 4 … 20 mA (factory default) · 20 … 4 mA · 0 … 20 mA · 20 … 0 mA	Temperature 4 … 20 mA (factory default) · 20 … 4 mA · 0 … 20 mA · 20 … 0 mA
SV1	as SA	Flow 1 … 5 V (factory default) · 5 … 1 V · 0 … 5 V · 5 … 0 V	Temperature 1 … 5 V (factory default) · 5 … 1 V · 0 … 5 V · 5 … 0 V
SV2	as SA	Flow 1 … 10 V (factory default) · 10 … 1 V · 0 … 10 V · 10 … 0 V	Temperature 1 … 10 V (factory default) · 10 … 1 V · 0 … 10 V · 10 … 0 V
R	RS485 (B)	RS485 (A)	- · four-pole connector, no OUT3

Pin 1 (BN) and pin 3 (BU) carry the supply in every configuration. On version R the device address and the baud rate are set in the menu (section 8.4); the register assignment is not part of this manual.

7 Display and keys



Display head: main screen.

No.	Element	No.	Element
1	Output 1 signal lamp	7	**–** up/decrease key
2	Output 2 signal lamp	8	**M** enter/exit/save key
3	Instantaneous flow	9	**+** down/increase key
4	Flow unit	10	Instantaneous flow (auxiliary screen)
5	Current temperature	11	Frequency (auxiliary screen)
6	Temperature unit	12	Totalised flow (auxiliary screen)

The top line shows the operating state (**Running**). **+** changes from the main screen to the auxiliary screen, **–** back.

8 Operation and menus

8.1 Operating the menu

- On the main screen press **M**: level 1 (**Setting**) opens with the lines **OUT1**, **OUT2**, **OUT3** and **EF**.
- **+** and **–** move down and up; **M** opens the selected line or parameter.
- In a parameter, press **+** or **–** to change or switch the value; **M** confirms.
- On **EF**, **M** opens level 2; **+** returns to the main screen. After the last line of level 2, **+** returns to the main screen.

8.2 Switching function

If the measured value rises above or falls below the set switching limits (**Fsp**, **Frp**), the switching state of the output changes. The following switching functions can be selected:

Function	Setting	Behaviour
Hysteresis, normally open	**Hno**	The output switches at the switching point **Fsp** and resets at the reset point **Frp**.
Hysteresis, normally closed	**Hnc**	As above, with the output inverted.
Window, normally open	**Fno**	The window lies between **Frp** (lower limit) and **Fsp** (upper limit).
Window, normally closed	**Fnc**	As above, with the output inverted.

For the hysteresis function, set the switching point **Fsp** first and then the reset point **Frp**; if **Fsp** is changed again, the hysteresis changes with it. For the window function, the width of the window is the difference between **Fsp** (upper limit) and **Frp** (lower limit).

8.3 Level 1: outputs

Line	Parameter	Setting
OUT1	**Item**	**Flow** or **Temp**: flow or temperature mode
	Type	**Hno** hysteresis NO · **Hnc** hysteresis NC · **Fno** window NO · **Fnc** window NC · **Fre** original frequency · **Fre-L** linear frequency (0-100 Hz) · **Fre-R** quantitative frequency (0.5 %L/Hz) · **IOLink**; the frequency types only in flow mode
	Fsp	Switching point (hysteresis mode) or upper limit (window mode)
	Frp	Reset point (hysteresis mode) or lower limit (window mode)
OUT2	**Item**	**Flow** or **Temp**
	Type	Analog signal: **4-20mA** (factory default) · **20-4mA** · **0-20mA** · **20-0mA**; voltage versions **1-5V** (factory default) · **5-1V** · **0-5V** · **5-0V** or **1-10V** (factory default) · **10-1V** · **0-10V** · **10-0V**
OUT3	**Item**	**Temp** or **Flow**
	Type	Analog signal, choice as for **OUT2**

8.4 Level 2: extended functions (EF)

Line	Function	Factory default
Res	Restore the parameters to their default values	–
max	Maximum value: maximum flow of the system	–
Dap	Damping time: lower for higher sensitivity, higher for less fluctuation	1.0 s
Dis	Refresh time of the display	1 s
Lan	Display language: Chinese or English	Chinese
Uni	Unit: L/min, m^3/h, kg/min, mL/min	L/min
Aag	Display direction: 0°, 90°, 180° or 270°	–
BL	Screen control: **on** always on; **off** display switches off after 30 s without key press (acquisition and outputs continue)	on
Den	Density value	1.00
Zer	Zero cut-off value	0.2
Tem-H	Upper temperature limit	80.0
Tem-L	Lower temperature limit	-20.0
F-R	Flow range	20.0
T-A	Temperature compensation: temperature = original temperature + compensation	–
Addr	Communication address (RS485)	1
Baud	Baud rate (RS485)	9600

Change a value with **+** or **–**. The factory setting of the display language is Chinese; this manual uses the English display texts (**Lan** = **English**).

9 Maintenance, cleaning and removal

9.1 Maintenance

The sensor does not require maintenance. Check periodically whether it is working properly.

Warning If the sensor does not work properly, stop the operation immediately.

Warning The surface of the housing may become very hot at high operating temperatures.

9.2 Cleaning

Caution Unsuitable cleaning agents may damage the sensor.

The following cleaning agents can be used to clean polycarbonate: mild soap or detergent, isopropyl alcohol. Rinse with water immediately after cleaning. Do not leave cleaning agent on the surface of the product. Do not clean the product in high heat or in direct sunlight.

The following substances are known to affect the integrity of polycarbonate parts and must not be used:

- halogenated solvents (benzene, gasoline, acetone or carbon tetrachloride),
- strongly alkaline agents,
- methyl ethyl ketone,
- abrasive substances.

9.3 Removal

Danger Remove the sensor only when the system is de-energised and depressurised (electrical, hydraulic/pneumatic). Disconnecting the sensor from pressure and power supply must be performed by trained or instructed personnel in accordance with the state of the art.

10 Accessories

Accessory	Data
Cable socket M12x1, 5 poles	PUR or PVC cable, 2, 5 or 10 m · for versions SA, SV1, SV2
Cable socket M12x1, 4 poles	PUR or PVC cable, 2, 5 or 10 m · for version R
Self-wiring socket M12x1	4 or 5 poles, Pg7 (Pg9) cable gland
Mounting plate	For the plate-mounted version, order code BS (section 4.2)
Pressure module	Screwed into the pressure detection hole, order code P; separate product, not described here

Accessories are ordered by description; the order codes are given in the data sheet. Please state the sensor type with the enquiry.