OCTOGON

MANUAL

QTKA

ELECTRONIC TURBINE FLOW SENSOR

Installation and operating manual



Document	Version	Date	Applies to
Installation and operating manual	V00x	11/2026	QTKA, all calibers and output versions A3, AR, SA

This manual describes the QTKA electronic turbine flow sensor: technical data, dimensions, installation, electrical connection, the menus of the three output versions, and faults and remedies.

octogon GmbH · Roseggerstrasse 16 · 8700 Leoben · Austria · office@octogon.org

www.octogon.org

Contents

1 About this manual ... 2
1.1 Versions covered ... 2
2 Safety ... 2
2.1 Safety statement ... 2
2.2 Disposal ... 3
3 Product description ... 3
3.1 Overview ... 3
3.2 Features ... 3
3.3 Technical data ... 3
3.4 Flow range ... 4
3.5 Order code ... 4
4 Dimensions ... 5
4.1 Thread and clamp connection ... 5
4.2 Flange connection (PN 1.6 MPa) ... 6
5 Installation ... 7
5.1 Installation instructions ... 7
5.2 Installation precautions ... 7
5.3 Mounting examples ... 7
6 Electrical connection ... 7
6.1 Outputs per version ... 8
7 Display and keys ... 8
8 Operation and menus ... 9
8.1 Operating the menu ... 9
8.2 Menu of version A3 (two switches + analog) ... 9
8.3 Menu of version AR (RS485 + analog) ... 10
8.4 Menu of version SA (analog flow/temperature, switch, pulse, IO-Link) ... 10
9 Faults and remedies ... 11
10 Accessories ... 11

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 QTKA order code (section 3.5).

1.1 Versions covered

Feature	Versions
Caliber	DN6 ... DN300; DN6 and DN10 also with straight pipe section (006B, 010B)
Process connection	External thread · internal thread · flange · sanitary clamp
Output	A3 (two switches + analog) · AR (RS485 + analog) · SA (analog flow/temperature, switch, pulse, IO-Link)
Pick-up	Coil type (display unit detachable) or Hall type (up to DN25)
Temperature	Conventional ≤ 100 °C · H ≤ 130 °C · H1 ≤ 180 °C
Medium	Oil (factory default) or water

2 Safety

2.1 Safety statement

– Before installing the device, read this document to 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 property damage.
– In all applications, check that the product materials are compatible with the medium measured.

– Use the device only for the media to be measured and make sure that it is used correctly, for long-term stable operation. Make sure that the medium does not damage the wetted parts of the product.
– The operator is responsible for determining whether the flow sensor is suitable for the application.

Warning Beware of personal injury - danger from overpressure.

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 QTKA combines flow measurement, display, output and control in one intelligent digital flow sensor. It consists of a turbine body and an electronic unit: the pulse signal of the turbine is amplified, converted into a digital signal by a high-precision A/D converter and processed by the microprocessor, which measures and controls the flow and allows remote monitoring. Typical applications are hydropower, tap water, petroleum, chemical industry, mechanical equipment and hydraulic lubrication.

3.2 Features

– Colour display of the instantaneous and the totalised flow
– Remote flow monitoring and control
– Calibration on site
– Free choice of measuring and control mode and of the unit
– Switch alarm function
– Output signals according to the operating mode and the parameter settings
– Switching outputs PNP or NPN and normally open or normally closed, freely selectable

3.3 Technical data

Item	Value
Measuring range	DN 6 ... DN 300
Measurement accuracy	≤ ±1.0 % of the measuring range
Switching accuracy	≤ ±0.5 % of the range
Analog output accuracy	≤ ±0.5 % of the range
Response time	10 ms ... 5 s · factory default 1 s
Applicable viscosity	> 5 × 10^{-6} m^2/s
Display	Liquid crystal, four values
Measured medium	Oil (factory default) or water, set by order code
Nominal pressure PN	6.3 · 16 · 25 · 40* MPa to DN32 · 2.5 MPa to DN100 · 1.6 MPa to DN300
Max. pressure loss	0.05 MPa to DN10 · 0.035 MPa to DN32 · 0.025 MPa to DN300
Display head housing	Stainless steel or engineering plastic
Shell	Stainless steel 304
Turbine rotor	3cr13 or 2205
Protection level	IP67
Medium temperature	-30 ... +100 °C · +130 °C type H · +180 °C type H1
Ambient temperature	-10 ... +70 °C
Storage temperature	-20 ... +80 °C
Power supply voltage	12 ... 30 Vdc
Output type	Switch · analog · pulse · frequency · IO-Link · RS485
Load	Switching output < 200 mA · analog output < 500 mA
Circuit protection	Reverse polarity, overload and short circuit
Connection method	M12x1 connector, 5 poles
High pressure	Withstand pressure 15 MPa for the thread connections; higher on request as a customised version

* The asterisk at 40 MPa stands so in the data sheet.

3.4 Flow range

DN	Q min coil (m³/h)	Q min Hall (m³/h)	Q max (m³/h)	DN	Q min coil (m³/h)	Q max (m³/h)
6	—	0.04	0.6	65	8	80
10	0.2	0.06	1.2	80	10	100
12	0.4	0.12	4	100	20	222
15	0.6	0.2	6	125	25	250
20	0.8	0.25	8	150	40	400
25	1	0.36	10	200	80	800
32	1.5	—	15	250	120	1200
40	2	—	20	300	180	1800
50	4	—	40			

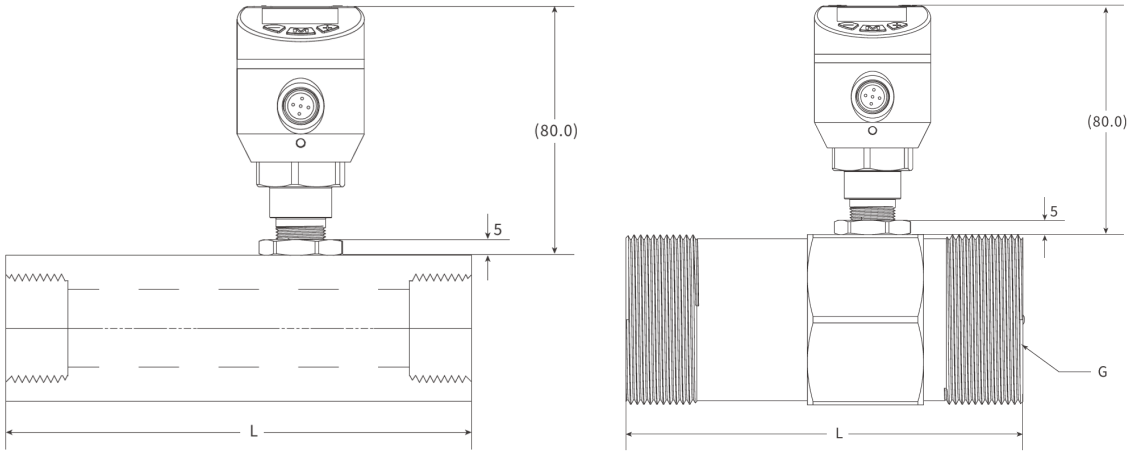
The Hall pick-up is available up to DN25; from DN65 only the coil pick-up is listed.

3.5 Order code

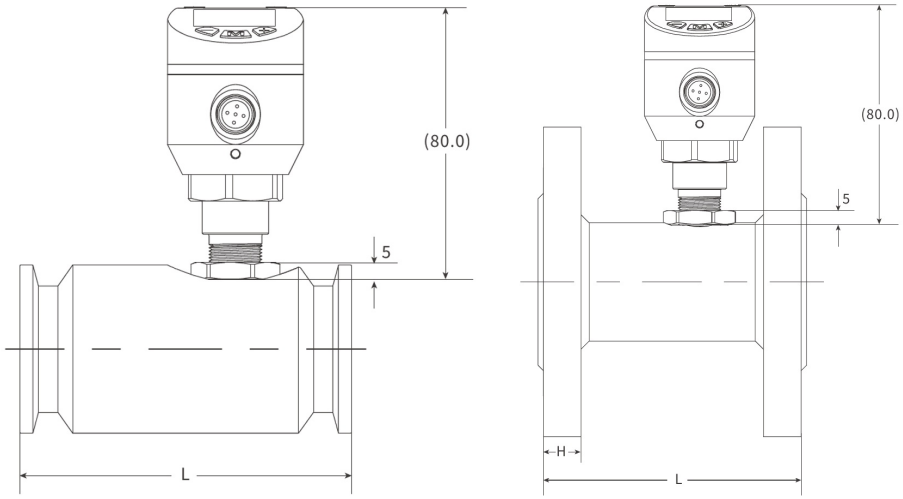
Field	Code	Meaning
1 Series	QKA120	Electronic turbine flow sensor
2 Caliber	006 · 006B · 010 · 010B · 012 · 015 · 020 · 025 · 032 · 040 · 050 · 065 · 080 · 100 · 125 · 150 · 200 · 250 · 300	DN6 … DN300; suffix B = DN6 or DN10 with straight pipe section
3 Supply	DC	DC 24 V ±20 %
4 Output	A3 · SA · AR	Two-way switch / pulse / frequency + analog · analog (flow/temperature) / switch / pulse / frequency / IO-Link · RS485 communication + analog
5 Process	M · K	External / internal thread, up to DN50 · withstand pressure 15 MPa
	F	Flanged joint · max. pressure 4 MPa
	H	Sanitary clamp, up to DN100 · max. pressure 1.6 MPa · ISO 2852-1993
6 Pick-up	— · G	Coil type, display unit detachable · Hall type, up to DN25, display unit must not be disassembled
7 Temperature	— · H · H1	≤ 100 °C · ≤ 130 °C · ≤ 180 °C (H1: coil type mandatory; mount more than 500 mm away from the power frequency source)
8 Medium	— · S	Oil (factory default) · water

Example: QKA120-015DCA3K - DN15, DC supply, output A3, internal thread, coil pick-up, conventional temperature, oil. Fields 6, 7 and 8 are left out when the default applies.

4 Dimensions



Left internal thread, right external thread connection. Dimensions in mm.



Left sanitary clamp, right flange connection.

The head is the same for all connections: height 80.0 mm, Ø 41.00 mm, 53.0 mm across the connector, 5 mm hexagon. Sealing: cutting-ring ED joint for the internal thread, flat gasket for the external thread, chuck gasket for the clamp, flange gasket for the flange.

4.1 Thread and clamp connection

DN	External thread G	L ext.	Internal thread G	L int.	Clamp Ø D	L clamp
6	G1/2	65	1/2	80	50.5	50
10	G1/2	65	1/2	80	50.5	50
12	G3/4	65	1/2	80	50.5	50
15	G1 (33.2)	75	1/2	110	50.5	75
20	G1 (33.2)	85	3/4	115	50.5	85
25	G1-1/4 (41.9)	100	1	140	50.5	100
32	G1-1/2 (47.8)	120	1-1/4	172	50.5	120
40	G2 (59.6)	140	1-1/2	180	64	140
50	G2-1/2 (75.1)	150	2	200	78	150
65	G3	175	2-1/2	235	91	175
80		200	3	260	106	200
100					119	220

All dimensions in mm. With the straight pipe section (order codes 006B and 010B) the body length of DN6 and DN10 is 345 mm instead of 65 mm. Empty cells as in the data sheet.

4.2 Flange connection (PN 1.6 MPa)

DN	Flange Ø D	Bolt circle K	Hole Ø	Holes N	Thickness H	Body length L
12	95	65	14	4	14	65
15	95	65	14	4	14	75
20	105	75	14	4	16	85
25	115	85	14	4	16	100
32	140	100	18	4	18	120
40	150	110	18	4	18	140
50	165	125	18	4	20	150
65	185	145	18	8	20	175
80	200	160	18	8	20	200
100	220	180	18	8	22	220
125	250	210	18	8	22	250
150	285	240	22	8	24	300
200	340	295	22	12	26	360
250	400	355	26	12	28	400
300	460	410	26	12	32	500

5 Installation

5.1 Installation instructions

Important Before installing or removing the sensor, make sure that there is no medium in the system, to prevent leakage.

- Connect the sensor to the selected process connection.
- Tighten fully; recommended tightening torque 25 to 35 N·m.
- In critical applications such as severe vibration or shock, decouple the sensor mechanically, for example with a hose.

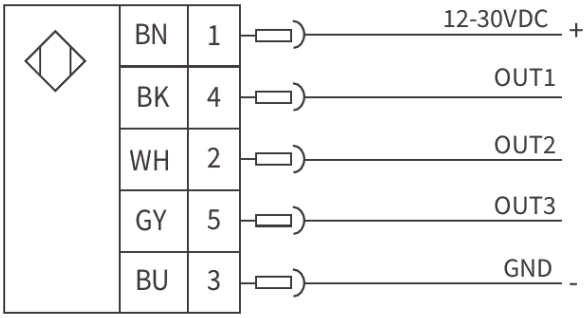
5.2 Installation precautions

- The pipe must have a sufficiently long straight section before and after the sensor: 10 times the caliber before and 5 times the caliber after the sensor.
- Purge new pipes before installing the sensor, so that foreign matter cannot damage it.
- Do not weld flanges with the sensor fitted. After welding the flanges, remove welding slag and burrs from the pipe.
- Observe the flow direction: the arrow on the sensor must match the flow direction of the medium.
- Outdoors, protect the installation against water. If the cable runs higher than the housing, lead it downwards before it enters the housing, so that rain cannot run along the cable into the housing.
- Avoid strong electromagnetic interference (such as high-power frequency converters or motors); separate power and signal cables when wiring.
- Avoid pipes with mechanical vibration. If unavoidable, take measures against vibration, such as a hose section or a shock pad.
- Avoid long unsupported pipes, whose sag can cause leaks between sensor and flange. If unavoidable, place pipe supports close to the sensor before and after it.
- No foreign matter such as metal or iron filings or entangling fibres may be in the pipe.

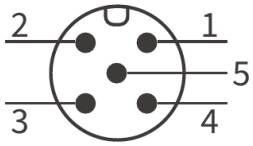
5.3 Mounting examples

Correct	Wrong
Sensor in a horizontal section followed by a rising pipe, outlet higher than the sensor (h > 0), so that the pipe stays full	Sensor directly before a free outlet at the same level
Sensor in a vertical pipe with upward flow, outlet higher than the sensor (h > 0)	Sensor in a vertical pipe with downward flow ending in a free outlet
Sensor at the lowest point of the line	Sensor at the highest point of the line, where air bubbles collect
Valve after the sensor	Valve before the sensor

6 Electrical connection



Wiring diagram.



M12x1 connector, 5 poles, seen on its pins.

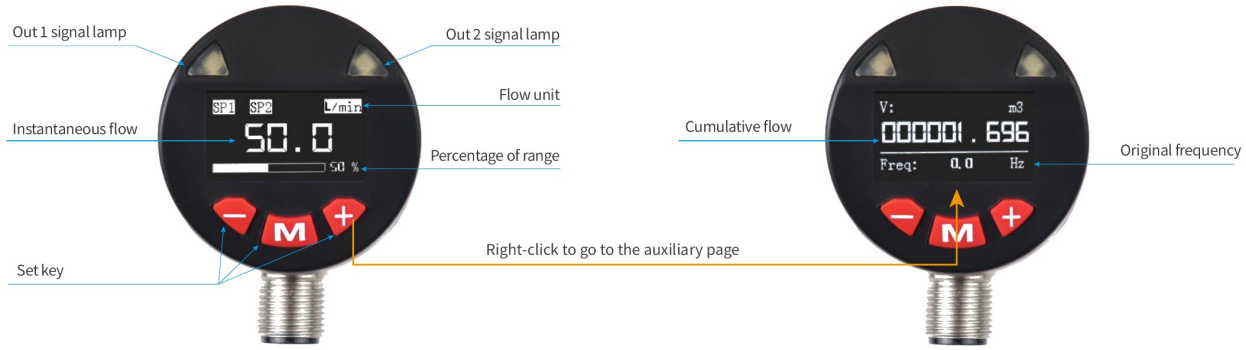
Pin	Wire	Signal
1	BN brown	Power supply + · 12 … 30 Vdc
4	BK black	OUT1
2	WH white	OUT2
5	GY grey	OUT3
3	BU blue	Power supply – · GND

6.1 Outputs per version

Code	OUT1 · pin 4 · BK	OUT2 · pin 2 · WH	OUT3 · pin 5 · GY
A3	Flow switch PNP (factory default) · flow switch NPN · linear pulse (full scale 100 Hz) · original pulse · quantitative pulse (full scale × 0.1)	Flow switch PNP (factory default) · flow switch NPN	Flow 4 … 20 mA (factory default) · flow 1 … 5 V · flow 0 … 10 V
AR	RS485 (B)	RS485 (A)	Flow 4 … 20 mA (factory default) · flow 1 … 5 V · flow 0 … 10 V
SA	Flow switch PNP or NPN · temperature switch PNP or NPN · linear pulse (full scale 100 Hz) · original pulse · quantitative pulse (full scale × 0.1) · IO-Link	Flow 4 … 20 mA (factory default) · flow 1 … 5 V · flow 0 … 10 V	Temperature 4 … 20 mA (factory default) · temperature 1 … 5 V · temperature 0 … 10 V

Pin 1 (BN) and pin 3 (BU) carry the supply in every configuration; temperature is measured with code SA only. The register assignment of the RS485 interface (version AR) is not part of this manual.

7 Display and keys



Main interface Auxiliary interface

Left the main screen, right the auxiliary screen; the right key (+) changes between the two.

The display head shows four values. The main page carries the instantaneous flow, the flow unit, the percentage of range and the state of the two switching outputs; the auxiliary page carries the totalised volume and the original frequency of the turbine. All parameters, including the two alarm limits, are set on the device with the three keys **–**, **M** and **+**. The head can be turned; with the coil pick-up it can also be detached from the measuring body. On versions AR and SA the main screen shows the flow (**F:**) and the current temperature (**T:**).

8 Operation and menus

8.1 Operating the menu

Key	On the main screen	In the menu
M	opens level 1 of the menu	opens the selected item; confirms the value and returns to the item list
–	–	moves to the previous item; decreases a value
+	changes to the auxiliary screen and back	moves to the next item; increases a value

- Level 1 ends with the item **Menu 2 Set**: press **M** to open level 2, press **+** to return to the main screen.
- After the last item of level 2, **+** returns to the main screen.
- **Factory Reset**: 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.

8.2 Menu of version A3 (two switches + analog)

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	Flow range (upper range value)
Menu 2 Set	Opens level 2

Level 2

Item	Function
Factory Reset	Restore 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**: pulse output (set pulse) · **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	Unit: L/min, mL/min, m³/h
PNP/NPN Set	Switching outputs PNP or NPN
F-C-data	Flow coefficient value (example display: 1.00) (1)
F-H-data	Historical maximum of the flow
F-PACE	Filter damping
Low flow cut	Low-flow cut-off
A0-Mode	Analog output: 4-20mA · 0-20mA · 1-5V · 0-5V · 2-10V · 0-10V (2)
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 (time after which the screen is switched off; example display: **NO**)

(1) In the menu overview this item is listed as **F-L-data** (historical minimum); the setting pages show **F-C-data**.

(2) The analog signals of the device are listed in chapter 6 (outputs per version).

8.3 Menu of version AR (RS485 + analog)

Level 1

Item	Function	Example display
485 ID	RS485 device address	1
Baud set	Baud rate	9600
parity set	Parity bit	None
stop bit set	Stop bits	1 bit
F-URV	Flow range (upper range value)	–
Menu 2 Set	Opens level 2	–

Level 2

Item	Function
Factory Reset	Restore the factory settings (hold **M** for 5 s)
Unit Set	Unit: L/min, mL/min, m³/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
A0-Mode	Analog output (example display: 4-20mA)
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 (time after which the screen is switched off; example display: **NO**)

On version AR the main screen shows the flow (**F:**) and the temperature (**T:**).

8.4 Menu of version SA (analog flow/temperature, switch, pulse, IO-Link)

Level 1

Item	Function
SP1 Set	Switching point of switch 1
RP1 Set	Reset point of switch 1
T-LRV	Lower temperature limit (lower range value)
T-URV	Upper temperature limit (upper range value)
F-URV	Flow range (upper range value)
Menu 2 Set	Opens level 2

Level 2

Item	Function
Factory Reset	Restore 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-A-OUT** flow analog output · **T-A-OUT** temperature analog output
ds1 Set	Switching delay of switch 1
dR1 Set	Reset delay of switch 1
Unit Set	Unit: L/min, mL/min, m³/h
T-ofst	Temperature offset
Flow-C	Flow coefficient value
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
PNP/NPN Set	Switching output PNP or NPN

A0-Mode	Analog output: 4-20mA · 0-20mA · 1-5V · 0-5V · 2-10V · 0-10V (2)
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 (time after which the screen is switched off; example display: **NO**)

(2) The analog signals of the device are listed in chapter 6 (outputs per version).

On version SA the main screen shows the flow (**F:**) and the temperature (**T:**).

9 Faults and remedies

Fault	Possible cause	Remedy
No output signal after switching on	1. No flow in the pipe, or the flow is below the starting flow. 2. The supply is connected to an output wire. 3. The display circuit is damaged.	1. Increase the flow, or use a device of smaller nominal size that suits the flow range. 2. Connect the wires correctly. 3. Replace the device.
Output signal without flow	1. Poor earthing of the device; 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 the device correctly to eliminate interference. 2. Replace the preamplifier. 3. Repair or replace the power supply to eliminate the interference.
Unstable instantaneous flow reading	1. The flow is unstable. 2. Amplifier sensitivity too high or too low; extra or missing pulses. 3. Debris in the housing. 4. Poor earthing. 5. The flow is below the lower limit. 6. Foreign matter in the pipe disturbs the flow.	1. Test again when the flow is stable. 2. Replace the preamplifier. 3. Remove the dirt. 4. Check the earth connection.
Totalised 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 device. 3. The device itself is out of tolerance.	1. Enter the correct coefficient after recalibration. 2. Adjust the flow in the pipe, or select a device of suitable size. 3. Recalibrate.
Key fault	Poor contact of a key, or a key is locked.	Replace the display board.

10 Accessories

Accessory	Data
Cable socket M12x1, 5-pin, straight, moulded cable	PUR or PVC cable, 2, 5 or 10 m
Cable socket M12x1, 5-pin, angled, moulded cable	PUR or PVC cable, 2, 5 or 10 m
Field-wireable connector M12x1, straight or angled	4-pin or 5-pin, Pg7 or Pg9 cable gland, wired on site
Cable socket with shielded cable	Moulded cable sockets are also available with a shielded cable
Protective cover	Transparent cover for the display head

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