

F20180607001

QT.T.M.10

energetx™ immersion sensors, type QT.T.M_ and QT.X_

- Immersion sensor with immersion sleeve
- Indirect measurement in water
- Measuring pin 10cm from stainless steel Ø 6mm
- Pt1000, NTC 20 kΩ, NTC 10 kΩ or Ni1000 Tk5000
- Quick connection thanks to screw cover and spring clips
- Unique "line-up" design with 8-point positioning
- Various other measuring elements available upon request

pipng



passive

Description

The immersion sensors, type QT.T.M.10, are used for temperature measurement of water in pipes of HVAC installations.

The measuring pin contains the measuring element that is in indirect contact with the water in the pipe through an immersion sleeve. The resistance value of the sensor changes as a function of the temperature in the pipe, and this according to the curve of the type of measuring element:

- | | |
|----------------|----------------|
| - QT.T.M.10 | Pt 1000 |
| - QTC10.T.M.10 | NTC 10 kΩ |
| - QTC20.T.M.10 | NTC 20 kΩ |
| - QTN.T.M.10 | Ni 1000 Tk5000 |

The QT.T.M.10 sensors are equipped as standard with a platinum measuring element Pt1000 IEC751-EN60751 class B ¹⁾. This sensor has a calibrated resistance value of 1000Ω at a temperature of 0°C.

The immersion probes are equipped with a stainless steel measuring pin with Ø 6mm, length from 5 to 45cm, a PN16 immersion sleeve made of nickel-plated brass (G½"A x Ø 8mm), an IP65 housing, including sealing ring, with 2 spring clamps (0.2 to 1.5 mm²) and an M16 swivel.

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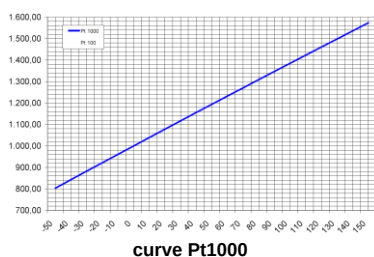
1. Article coding

The item coding includes the technical specifications of the sensor.

Example: QT.T.M.10
QT.X.10

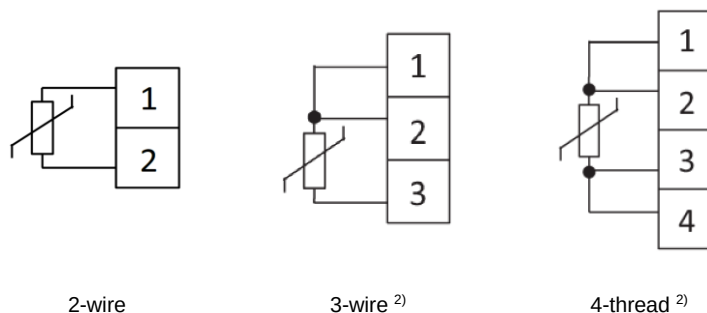
QT	T	M	10		
				Temperature sensor with measuring element	
QT				QT	Pt1000
				QTC10	NTC 10Ω
				QTC20	NTC 20Ω
				QTN	Ni1000 Tk5000
				Type	dip sleeve
	T			T	water temperature measurement
	X			X	air / water temperature measurement
				Immersion sleeve material	
		M		M	with dip sleeve brass (nickel-plated)
		S		S	with immersion sleeve stainless steel
				Length of measuring pin (L)	
			10	10	L: 100mm
			20	20	L: 200mm

2. Technical specifications



Measuring element	Pt1000 ¹⁾
Accuracy	± 0.3 K/0°C
Implementation	indirect measurement in liquid or air flow
Measuring current	< 2mA
Connection	2-wire
Electrical connection	spring terminals 0.2 - 1.5mm ²
Cable entry	swivel M16
Insulation resistance	≥ 100 MΩ, 20°C, 500 V DC
Housing	plastic
Ambient temperature	-25°C to +85°C
Medium temperature	-50°C to +120°C
Degree of protection	IP65 incl. sealing ring
Measuring pin	Ø 6 mm x 10 cm made of stainless steel (RVS)

3. Electrical connection



4. Line-up design

Thanks to the unique "line-up" design of the sensor housing with 8-point positioning, the sensor can always be easily adjusted to reflect the flow direction of the medium.



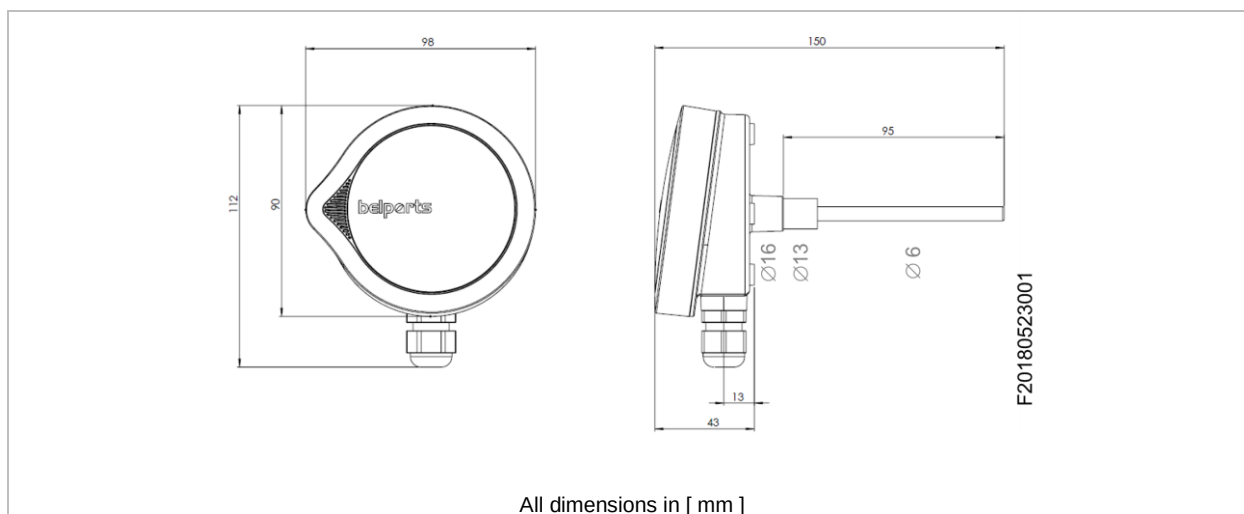
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¹⁾ Alternatively, these probes can be supplied with other measuring elements (see ordering information below)

²⁾ 3-wire or 4-wire on request

³⁾ other lengths available upon request (see ordering information below)

5. Dimensions



6. Accessories & parts

Type		Description	Measuring pin
QT.IPB.10	▲	Nickel plated brass PN16 plunger sleeve G½A x 100mm	Ø 6mm
QT.IPB.20	△	Nickel-plated brass plunger sleeve G½A x 200mm	Ø 6mm
QT.IPB.30	△	Nickel plated brass plunger sleeve G½A x 300mm	Ø 6mm
QT.IPB.35	△	Nickel plated brass plunger sleeve G½A x 350mm	Ø 6mm
QT.IPB.45	△	Nickel plated brass plunger sleeve G½A x 450mm	Ø 6mm
QT.IPS.10	△	PN40 immersion sleeve made of stainless steel 1.4571 PN40 G½A x 100mm	Ø 6mm
 For use with standard temperature sensors such as QT.X_ and cable sensors with a measuring pin Ø 6mm. The immersion sleeve QT.IPB.10 (1st) made of nickel-plated brass is included as standard in the delivery of an immersion sensor QT.T.M.10.			

▲ standard

△ on demand

7. Sensor characteristics

Temp. °C	KP10 mV	NI 1000 DIN Ω	NI 1000LG Ω	NTC 1,8 kΩ	NTC 10-AN kΩ	NTC 10 kΩ	NTC 10 C kΩ	NTC 10-KB Ω	NTC 20 kΩ	PT 1000 Ω	PT 100 Ω
-50	2232	743	790,88	63,229	441,30	672,600	329,500	9854	1659,082	803,10	80,31
-40	2332	791	830,83	35,480	239,80	337,270	188,500	9712	810,861	842,70	84,27
-30	2432	842	871,69	20,660	135,20	176,680	111,300	9466	414,698	882,20	88,22
-20	2532	893	913,48	12,440	78,91	96,970	67,770	9067	221,088	921,60	92,16
-10	2632	946	956,24	7,730	47,54	55,300	42,470	8472	122,431	960,90	96,04
±0	2732	1000	1000,00	4,940	29,49	32,660	27,280	7661	70,203	1000,00	100,00
+10	2832	1056	1044,79	3,240	18,79	19,900	17,960	6667	41,567	1039,00	103,90
+20	2932	1112	1090,65	2,170	12,26	12,490	12,090	5573	25,350	1077,90	107,79
+25	2982	1141	1113,99	1,800	10,00	10,000	10,000	5025	20,000	1097,40	109,74
+30	3032	1171	1137,61	1,490	8,19	8,055	8,313	4492	15,887	1116,70	111,67
+40	3132	1230	1185,71	1,050	5,59	5,320	5,827	3518	10,211	1155,40	115,54
+50	3232	1291	1234,97	0,750	3,89	3,600	4,160	2702	6,718	1194,00	119,40
+60	3332	1353	1285,44	0,550	2,76	2,490	3,020	2056	4,517	1232,40	123,24
+70	3432	1417	1337,14	0,402	1,99	1,750	2,228	1563	3,099	1270,70	127,07
+80	3532	1483	1390,12	0,300	1,46	1,260	1,668	1193	2,166	1308,90	130,89
+90	3632	1549	1444,39	0,230	1,08	0,920	1,266	923	1,541	1347,00	134,70
+100	3732	1618	1500,00	0,180	0,82	0,680	0,973	723	1,114	1385,00	138,50
+110	3832	1688	1556,98	0,140	0,62	0,510	0,758	576	0,820	1422,90	142,29
+120	3932	1760	1615,36	0,110	0,48	0,390	0,597	467	0,609	1460,60	146,06
+130	4032	1833	1675,18	0,090	0,38	0,300	0,747	385	0,460	1498,20	149,82
+140	4132	1909	1736,47	0,071	0,30	0,230	0,381	324	0,350	1535,80	153,58
+150	4232	1987	1799,26	–	0,24	0,180	–	–	0,270	1573,30	157,33

Note: The measurement current affects the accuracy of the measurement due to its own heating of the measuring element and should not exceed max.10mA.

Intended values: Pt100, Pt1000 (thin film): <2 mA, Ni 1000 DIN: <2 mA, NTCs <1 mA, KP10: 0.45 ... 5 mA.

The Pt100/Pt1000 guidelines also apply to tolerance classes - A and 1/3DIN.

To prevent inductive coupling, the sensor cable must be shielded (J-Y (St) 2 x 2 x 0.8).

Sensor cords should best not be laid in parallel with power-carrying cables.

Attention: please respect the EMC guidelines!

Platinum probes such as Pt100 or Pt1000, are classified in IEC 751 / EN 60751 into two classes according to their accuracy:

DIN Class A : $\Delta T = 0.15 + 0.002 \cdot T$

DIN Class B : $\Delta T = 0.30 + 0.005 \cdot T$

In addition, the DIN added additional classes here that allow e.g. 1/2 or 1/3 of the deviation, e.g:

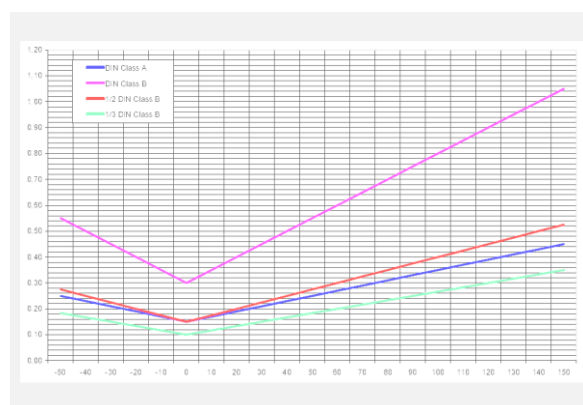
1/2 DIN Class B

$\Delta T = 1/2 \cdot (0.30 + 0.005 \cdot T) = 0.15 + 0.0025 \cdot T$

1/3 DIN Class B

$\Delta T = 1/3 \cdot (0.30 + 0.005 \cdot T) = 0.10 + 0.0017 \cdot T$

The graph shows the deviation according to these standards in a temperature range of -50°C to +150°C.





8. Active sensors, MODBUS or BACnet

These immersion sensors are also available as active sensors with 0..10Vdc and 4..20mA output or also as bus-communicative sensors available with MODBUS or BACnet protocol:

Series	Sensor type	Product datasheet
QT.T.M.10.Onion	0..10Vdc / 4..20mA	
QT.T.M.10.A	MODBUS RTU / ASCII	8.111b
QT.T.M.10.B	BACnet MS/TP	

These series of immersion temperature sensors are available with or without LCD display.

9. OEM & custom solutions

In addition to its standard delivery program, BELPARTS can also offer you specific OEM versions and customized solutions depending on your applications for small, medium and large series.

For example, sensors can be provided:

- with 3-wire or 4-wire connection
- specific prefabricated assemblies
- In customized corporate style and/or colors
- ...

Sensors with specific measurement elements can also be produced:



Meetelement	Tolerantie	Voorbeelden regelsystemen
KP10	±0.2 K/25°C	Kieback&Peter
NI 1000	±0.4 K/0°C	Sauter, JCI, Saia
NI 1000 LG	▲ ±0.4 K/0°C	Siemens (L+G)
NTC 1,8	±0.3 K/25°C	tac
NTC 10	▲ ±0.2 K/25°C	Trend, Infotech, Saia, Elesta
NTC 10 AN	±0.2 K/25°C	Andover
NTC 10 C	±0.3 K/25°C	Carel
NTC 10 KB	±0.5 K/25°C	Satchwell
NTC 20	▲ ±0.2 K/25°C	Honeywell
PT 100	±0.3 K/0°C	Sauter
PT 100 CL A	±0.15K/0°C	EN60751 F0,15 (Class A)
PT 100 1/3DIN	±0.1K/0°C	EN60751 F0,1 (1/3DIN)
PT 1000	▲ ±0.3 K/0°C	Honeywell, Danfoss
PT 1000 CL A	±0.15K/0°C	EN60751 F0,15 (Class A)
PT 1000 1/3DIN	±0.1K/0°C	EN60751 F0,1 (1/3DIN)

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10. Trademarks, trademarks & intellectual

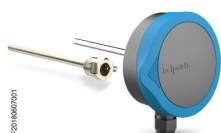
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MS Windows is a registered trademark of Microsoft Corp. MODBUS is a registered trademark of Schneider Electric. BACnet is a registered trademark of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).



11. Ordering Information

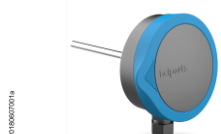
Type	Measuring element	L [mm]	Sleeve	Resistance	Accuracy
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QT_T_
Standard 2-wire sensors with length 100mm with PN16 immersion sleeve made of nickel-plated brass

QT.T.M.10	▲	Pt 1000	100	Ms	1000 @ 0°C	±0,3 K @ 0°C
QTC20.T.M.10	▲	NTC 20 kΩ	100	Ms	20 kΩ @ +25°C	±0,2 K @ +25°C
QTC10.T.M.10	▲	NTC 10 kΩ	100	Ms	10 @ +25°C	±0,2 K @ +25°C
QTN.T.M.10	▲	Ni 1000 Tk5000	100	Ms	1000 @ 0°C	±0,4 K @ 0°C

Standard 2-wire sensors with length 100mm with PN40 stainless steel immersion sleeve

QT.T.S.10	▲	Pt 1000	100	SS	1000 @ 0°C	±0,3 K @ 0°C
QTC20.T.S.10	▲	NTC 20 kΩ	100	SS	20 kΩ @ +25°C	±0,2 K @ +25°C
QTC10.T.S.10	▲	NTC 10 kΩ	100	SS	10 @ +25°C	±0,2 K @ +25°C
QTN.T.S.10	▲	Ni 1000 Tk5000	100	SS	1000 @ 0°C	±0,4 K @ 0°C


QT_X_
Alternatives (without immersion sleeve)

QT.X.05	△	Pt 1000	50	1)	1000 @ 0°C	±0,3 K @ 0°C
QT.X.10	▲		100	1)		
QT.X.15	△		150	1)		
QT.X.20	▲		200	1)		
QT.X.25	△		250	1)		
QT.X.30	△		300	1)		
QT.X.35	△		350	1)		
QT.X.45	△		450	1)		
QTC20.X.05	△	NTC 10 kΩ	50	1)	10 kΩ @ +25°C	±0,2 K @ +25°C
QTC20.X.10	▲		100	1)		
QTC20.X.15	△		150	1)		
QTC20.X.20	▲		200	1)		
QTC20.X.25	△		250	1)		
QTC20.X.30	△		300	1)		
QTC20.X.35	△		350	1)		
QTC20.X.45	△		450	1)		

▲ standard

△ on demand

1) Immersion sleeve made of nickel-plated brass (Ms) or stainless steel (SS) to be ordered separately

► depending on the type, minimum quantities may apply: please contact us.

11. Ordering Information (continued)

Type	Measuring element	L [mm]	Sleeve	Resistance	Accuracy

▲ standard

△ on demand

¹⁾ Immersion sleeve made of nickel-plated brass (Ms) or stainless steel (SS) to be ordered separately

► depending on the type, minimum quantities may apply: please contact us.