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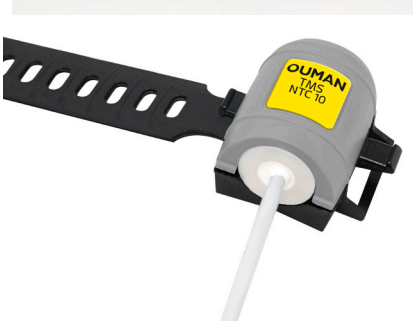
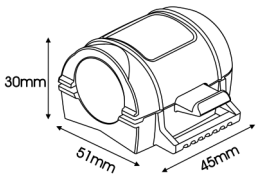
Surface sensor **TMS**



The surface sensor (TMS) is used to measure the temperature of the fluid flowing in the pipe. The sensor is installed on the surface of the water-supply pipe with a fastening strap. **NOTE!** TMS should not be used to measure cold temperatures on the surface of the pipe (condensation effect).

Type code	Meas. element	Meas. accuracy	Time constant
TMS / NTC10	NTC 10	+ 0,2 °C (0-70 °C)	< 2s
TMS / Pt1000	Pt 1000	+ 1 °C (0-70 °C)	< 2s
TMS / Ni1000	Ni 1000 LG	+ 1 °C (0-70 °C)	< 4s

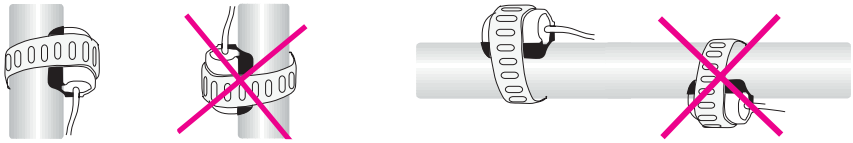
Technical information:

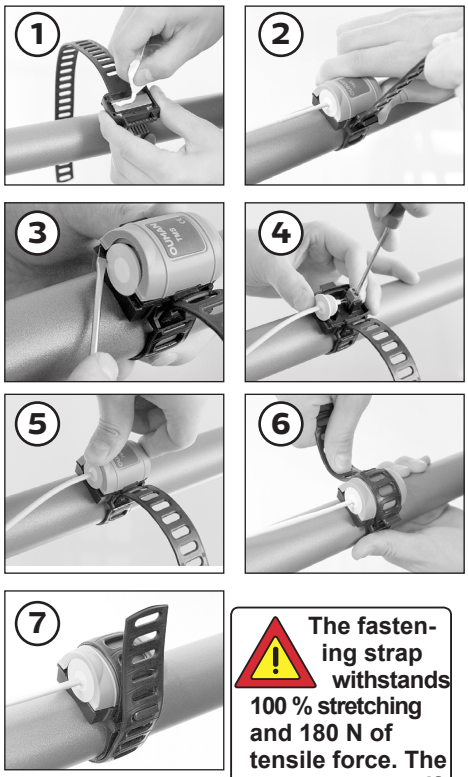


Materials	
- Plastic case	PA + GF
- Copper plate	CuBe
- Membrane seal	BE/TPE
- Fastening strap	TPE-A
Range of use	0 °C...+120 °C
Used with pipes	Pipes having DN 20...40 use adjustable meas. and up to DN 80 use informative measurement
Protection class	IP43

When using the surface sensor as a supply water sensor fasten the surface sensor to the surface of the pipe enetering the circuit 0.5...1.5 m from the valve. The surface of the pipe should be clean, rust free and smooth; the pipe can be painted. Make sure that the sensor is flush with the pipe (the straight section of pipe must be long enough).

Acceptable installation directions: On the top or side of the pipe (not the underside). The sensor is positioned so that the cable hangs down.





The fastening strap withstands 100 % stretching and 180 N of tensile force. The strap can snap if it is stretched beyond the margin of safety.

1. Spread a thin layer of heat-conducting silicon grease on the copper plate on the bottom surface of the sensor. To make it easier to spread the grease, cut the corner of the bag open and squeeze the grease on the bottom surface of the sensor.
2. Wrap the fastening strap around the pipe. Thread the end of the strap through the loop on the surface sensor, pull the strap tightly around the pipe and slip the tab on the sensor through the hole on the strap. Make sure that that the surface sensor is not loose.
3. Pry the case open with e.g., a screwdriver.
4. Puncture the seal on the membrane seal and thread the cable through the membrane seal. Connect the cable to the row connector in the sensor casing. Connect the sensor to the regulating device as a two-wire connection using weak current cable. The length and polarity of the cable is irrelevant.
5. Close the cover of the sensor casing and secure the fastening strap.
6. Pull the fastening strap over the cover of the surface sensor and attach it to the tab on the other side of the surface sensor.
7. Pipes whose diameter is 20-40 mm, the fastening strap must be wrapped around the pipe twice. Cut the strap to the proper length along the groove between the holes.

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Vastusarvotaulukot / Resistanstabell / Resistance table

NTC10

Tol. ± 0,2 °C (0-70 °C)

Temperature/Resistance

°C	Ω
-50	672 600
-40	337 270
-30	177 210
-25	130 540
-20	97 140
-15	72 990
-10	55 350
-5	42 340
0	32 660
5	25 400
10	19 900
15	15 710
20	12 490
25	10 000
30	8 055
35	6 531
40	5 325
45	4 368
50	3 602
55	2 987
60	2 488
65	2 084
70	1 753
75	1 482
80	1 257
85	1 072
90	917,4
95	788,2
100	679,8
110	511,0
120	389,4
130	300,5
140	234,7

Ni 1000 LG

Tol. ± 0,4 °C (0 °C)
DIN EN43760
tcr 5000 ppm / K

Temperature/Resistance

°C	Ω
-50	790,9
-40	830,8
-30	871,7
-25	892,5
-20	913,5
-15	934,7
-10	956,2
-5	978,0
0	1000,0
5	1022,3
10	1044,8
15	1067,6
20	1090,7
25	1114,0
30	1137,6
35	1161,5
40	1185,7
45	1210,2
50	1235,0
55	1260,1
60	1285,4
65	1311,1
70	1337,1
75	1363,5
80	1390,1
85	1417,1
90	1444,4
95	1472,0
100	1500,0
110	1557,0
120	1615,4
130	1675,2
140	1736,5

Pt 1000

Tol. ± 0,3 °C (0 °C)
DIN EN60751 B
tcr 3850 ppm / K

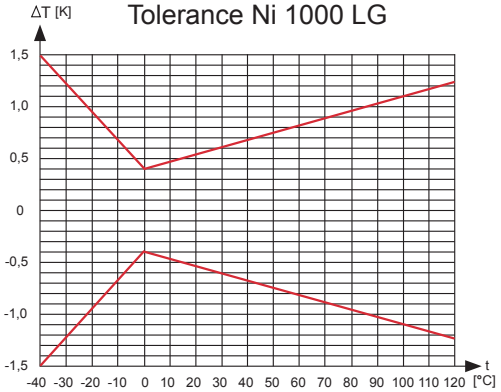
Temperature/Resistance

°C	Ω
-50	803,1
-40	842,7
-30	882,2
-25	901,9
-20	921,6
-15	941,2
-10	960,9
-5	980,4
0	1000,0
5	1019,5
10	1039,0
15	1058,5
20	1077,9
25	1097,3
30	1116,7
35	1136,1
40	1155,4
45	1174,7
50	1194,0
55	1213,2
60	1232,4
65	1251,6
70	1270,8
75	1289,9
80	1309,0
85	1328,0
90	1347,1
95	1366,1
100	1385,1
110	1422,9
120	1460,7
130	1498,3
140	1535,8

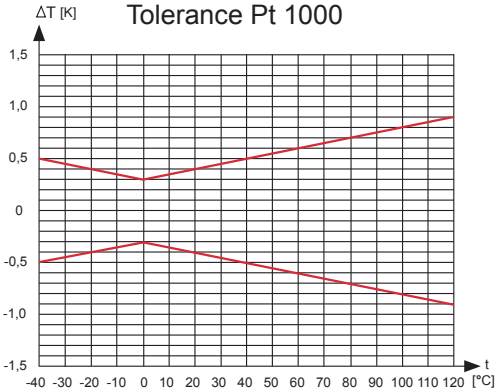
2 x 0,5 mm² (Cu)

50 m	100 m
3,36 Ω	6,72 Ω

Tolerance Ni 1000 LG



Tolerance Pt 1000



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