9. PT1000 IMMERSION PROBE TECHNICAL SPECIFICATIONS

9.1 Models TST1300000

Immersion probes feature the sensor directly in contact with the liquid, and are installed on the tubing. Wired using the electrical connector.

Storage conditions	-40T120 °C
Operating range	-40T120 °C
Sensor	Pt1000 Class B
Construction	Direct immersion with connection to the 1/8" GAS male process fitting as per UNI 338
Electrical connection	4-pin co-moulded nylon, M12x1 (DIN-VDE0627) metric thread, IP67 max. temp. 90°C
Thermal constant over time	ca. / approx. 5 s in water - 30 s in air
Sensitive element housing	AISI 316
Insulation	100 Mohm a 500 Vcc
Maximum operating pressure	40 bar

Tab. 9.a

Legenda:

1	sensitive element NTC 10 Kohm
2	stainless steel socket
3	EX14
4	co-moulded body
5	M12 male connector

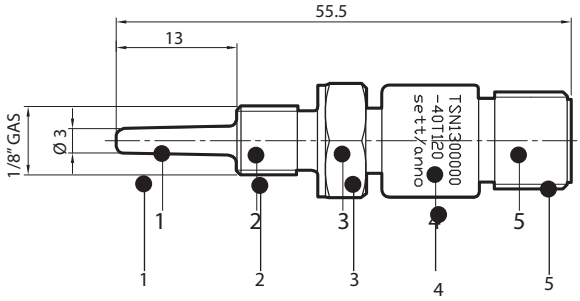


Fig. 9.a

Accessories:

- 4-pin M12 connector for 1/8 GAS sensor - cable length 3 m Code TSOPZCW030

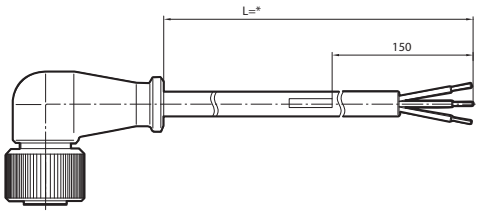
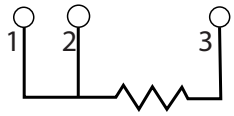


Fig. 9.b

Wiring:



PT1000	
1	red
2	red
3	white

- 4-pin M12 connector for 1/8 GAS sensor Code TSOPZCM000
- M12 connector can be assembled on site, recommended cable 3x0.2 mm^2 with outer sheath.

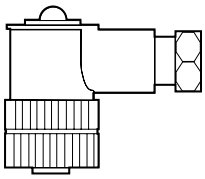
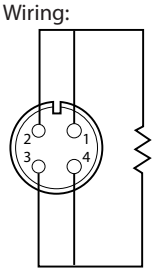


Fig. 9.c

Wiring:



PT1000

Sensor connector side view

Note:
the three-wire connection for the Pt100 must be used when the controller is fitted accordingly.
If not, the ends are to be connected together on the same terminal.

- Welding fitting Code TSOPZP T000

A	Compact thermistor with 1/8" GAS cyl. fitting
B	1/4" GAS cyl. process fitting with immersion L= 10.5 mm

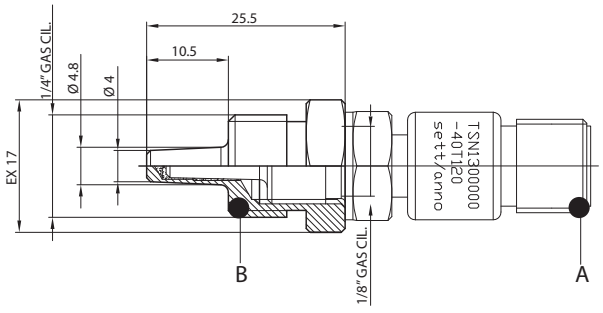


Fig. 9.d

- Welding fitting Code TSOPZRT000

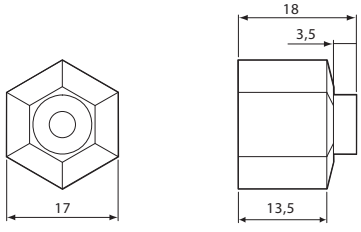


Fig. 9.e

9.2 Model TSM1500B30

Immersion probes feature the sensor directly in contact with the liquid and are secured to the tubing using a connector, available in the screw or weldable versions.
The body is nickel-coated brass, index of protection IP67, and the gasket (O-ring) is supplied together with the probe.

Storage conditions	-40T90 °C
Operating range	-40T90 °C
Sensor	Pt1000 Class B
Construction	Direct immersion with connection to the M14 male process
Cable	2 wires AWG 22, with sheath in TPE
Thermal constant over time	ca. / approx. 5 s in water - 45 s in air
Sensitive element housing	Nickel-coated brass & grey PA6 co-moulded body
Insulation	100 Mohm a 100 Vcc
Maximum operating pressure	25 bar
Compatible liquids	Water, Oil

Tab. 9.b

Legenda:

1	sensitive element
2	nickel-coated brass locking ring
3	co-moulded body
4	cable marking
5	tinned copper 2-wire cable
6	NTC sensor
7	2015 O-ring
8	nickel-coated brass thermometer socket

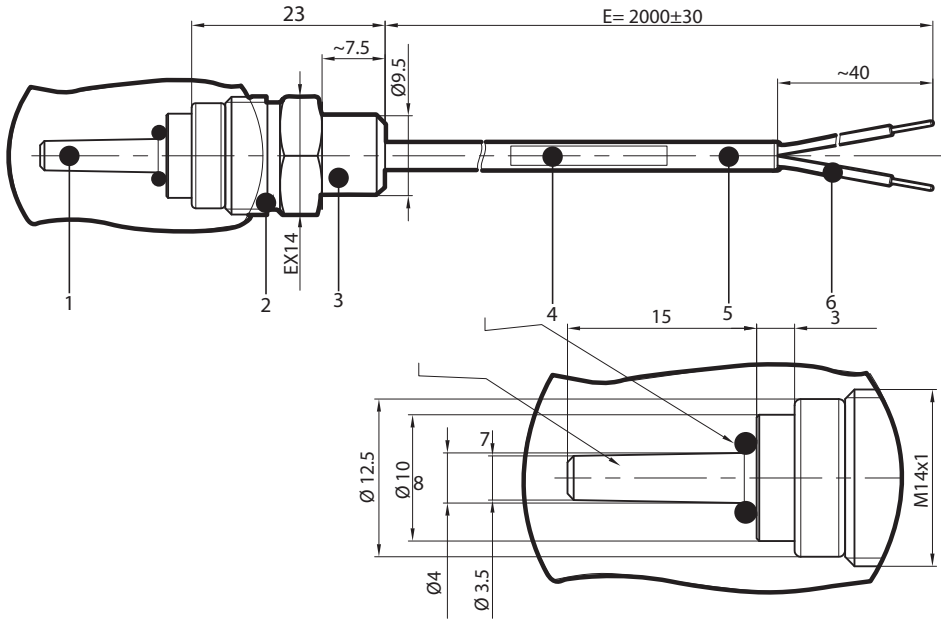
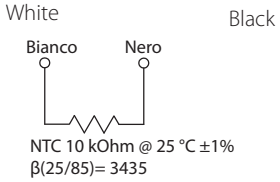


Fig. 9.f

Wiring



PT1000 Classe B

Fig. 9.g

Accessories:

- Adapter from M14 to 3/8 GA Code TSOPZRV000

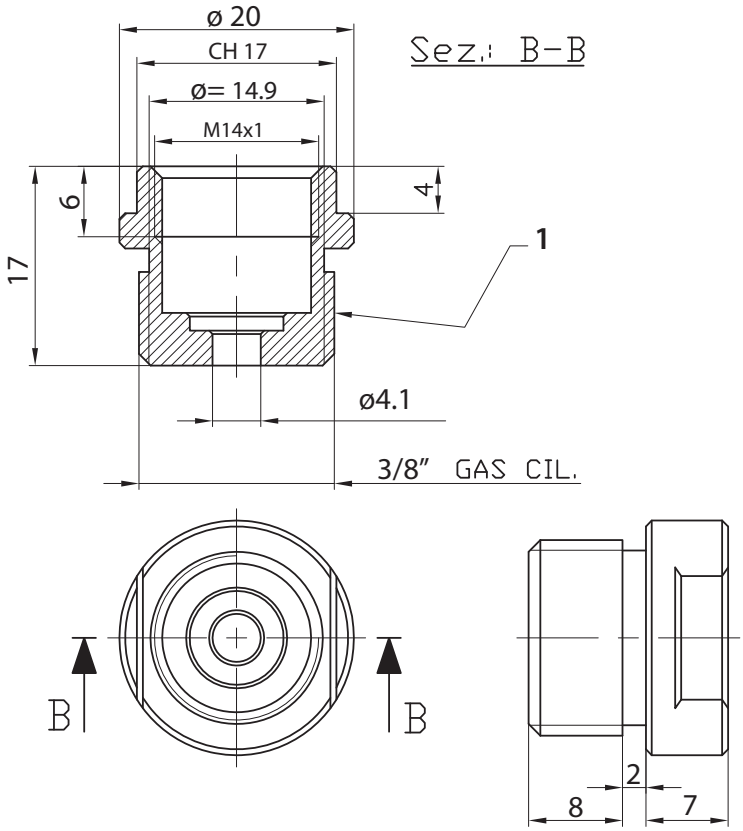


Fig. 9.h

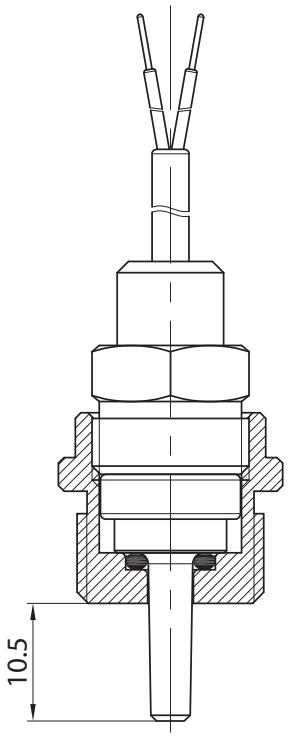


Fig. 9.i

- Weldable adapter for M14 Code TSOPZRS000

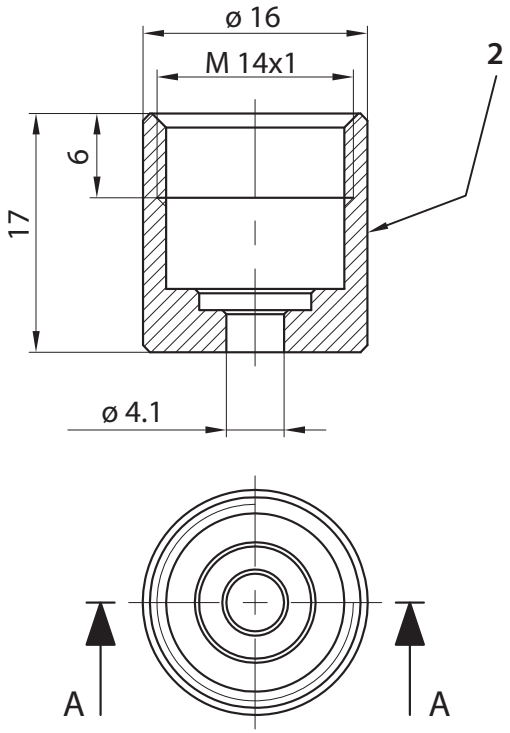


Fig. 9.j

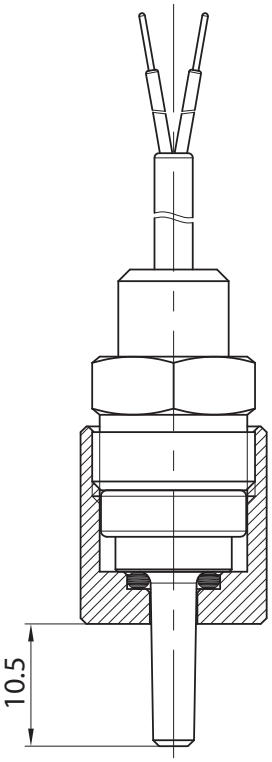


Fig. 9.k

Legenda:

1	3/8 cyl. threaded fitting with round seat, nickel-coated brass	cod: C058042A04
2	weldable cylindrical fitting with round seat, brass	cod. C058042A03

9.3 Models TSQ15MAB00

Storage conditions	-50T350 °C
Operating range	-50T350 °C
Connections	3-pin DIN connector
Sensor	Pt1000 Class B
Thermal constant over time	approx. 2.5 s in water - 10 s in air
Cable cod.TSOPZCV030 & cod.TSOPZCV100 & extension cable cod. TSOPZCV070	silicone cable L= 3 m, 10 m (max. temp. = 180 °C) with 3-pin DIN connector (max. conn. temp.= 90 °C) as for DIN-VDE0627 with M8x1 screw coupling.
Optional compression fitting TSOPZFGD30	AISI 316, 1/4 gas (see paragraph 4.4)
Index of protection connessione	IP65
Sensitive element housing	AISI 316 steel
Insulation resistance	Insulation at 100 Vdc > 100 mOhm
Maximum operating pressure	40 bar
Category of resistance to heat and fire	flame retardant

Tab. 9.c

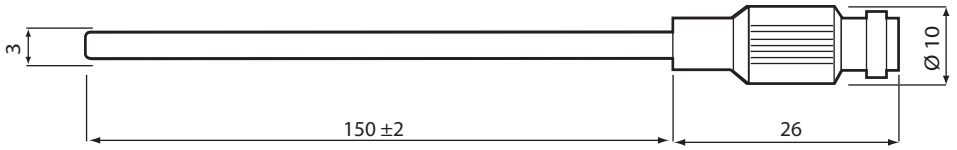


Fig. 9.l

Accessories:

A	TSOPZCV030:	silicone cable with M8 connector, length 3 m
	TSOPZCV100:	silicone cable with M8 connector, length 10 m
B	TSOPZCV070:	silicone extension cable with M8 male/female connector, length 7 m
C	TSOPZFGD30:	compression fitting suitable for 3 mm

A

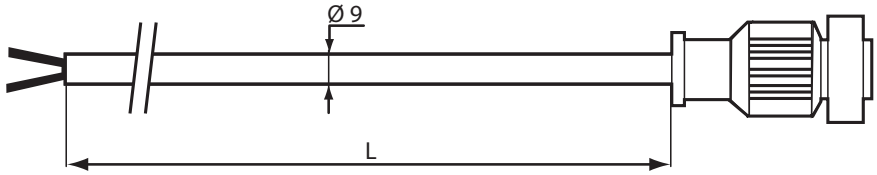


Fig. 9.m

B

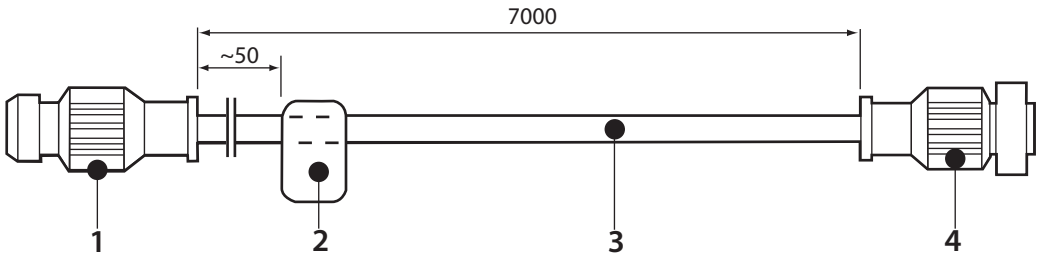


Fig. 9.n

C

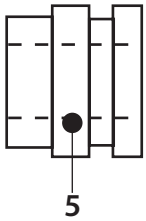


Fig. 9.o

Legenda:

1	M8 connector
2	rating label
3	24 AWG 2 wire cable insulated with silicone rubber
4	M8 co-moulded connector
5	1/4" compression fitting - D= 3 mm, AISI316 steel

10. PT1000 PIERCING PROBE TECHNICAL SPECIFICATIONS

10.1 Model PT1INF0340

Piercing probe with "L" handle and heating system.

Storage conditions	-50T200 °C
Operating range	-50T200 °C
Connections	Stripped ends, with terminals
Sensor	Pt1000 Class B
Thermal constant over time (in air)	approx. 45 s
Cable	Food-safe thermoplastic sheath with 4 wires size 0.15 mm2
Wires colours	White-black, PT1000 / red, electric heater.
Maximum heater voltage	24 Vac
Electrical resistance of heater	7 Ohm ±0,6
Cable lenght	3 m
Sensitive element index of protection	IP67
Sensitive element housing	AISI 316 stainless steel. Length 100 mm diam. 4 mm. With pointed tip
Cap filler	Aluminium
Classification according to protection against electric shock (sensitive element & cable)	Insulation: Outer sheath, and inside on wires
Category of resistance to heat and fire	Flame retardant
Insulation resistance	20 Mohm 500 Vcc
Dielectric strength	500 Vac
Food compatibility	Suitable for permanent food contact

Tab. 10.a

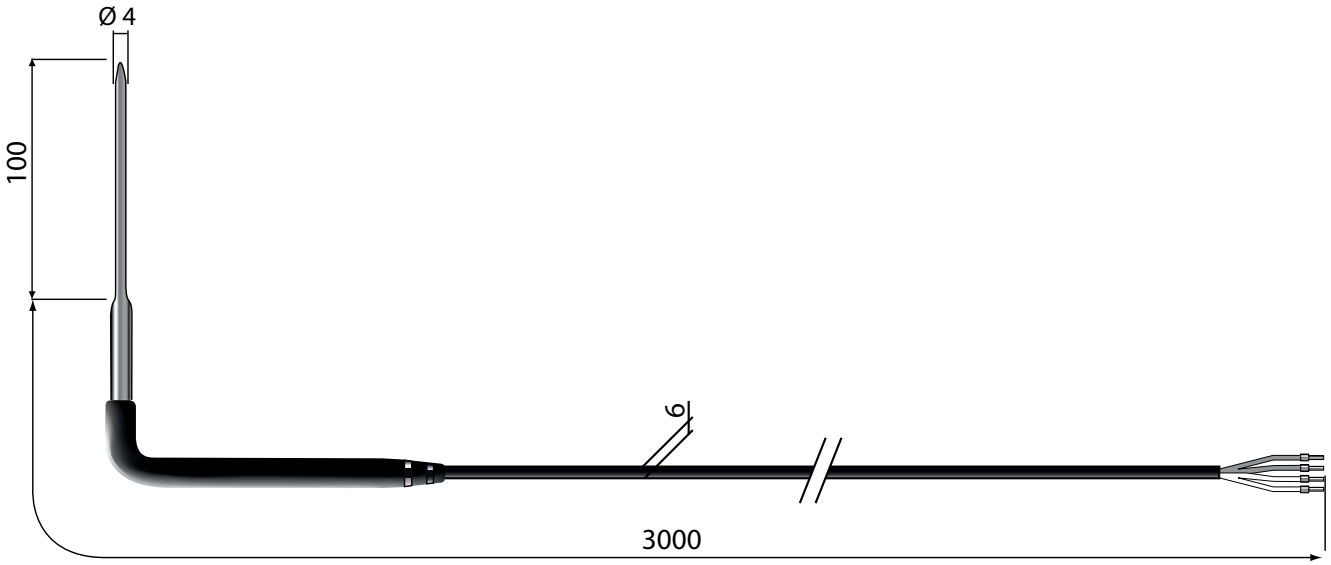


Fig. 10.a

Legenda:

a	red, electric heater
b	white/white, NTC

11. TABLE OF PT1000 PROBE VALUES

11.1 Table of temperature-resistance values for PT1000 probe class B

R (0) = 1000.00 Ω

α = 0.003 850 1/°C

Temper. [°C]	Resist. [W]	Temper. [°C]	Resist. [W]	Temper. [°C]	Resist. [W]	Temper. [°C]	Resist. [W]	Temper. [°C]	Resist. [W]	Temper. [°C]	Resist. [W]
-196	202.47	-125	500.60	-54	787.17	17	1066.27	88	1339.46	159	1606.82
-195	206.77	-124	504.70	-53	791.14	18	1070.16	89	1343.26	160	1610.54
-194	211.08	-123	508.81	-52	795.12	19	1074.05	90	1347.07	161	1614.27
-193	215.38	-122	512.91	-51	799.09	20	1077.94	91	1350.87	162	1617.99
-192	219.67	-121	517.00	-50	803.06	21	1081.82	92	1354.68	163	1621.71
-191	223.97	-120	521.10	-49	807.03	22	1085.70	93	1358.48	164	1625.43
-190	228.25	-119	525.19	-48	811.00	23	1089.59	94	1362.28	165	1629.15
-189	232.54	-118	529.28	-47	814.97	24	1093.47	95	1366.08	166	1632.86
-188	236.82	-117	533.37	-46	818.94	25	1097.35	96	1369.87	167	1636.58
-187	241.10	-116	537.46	-45	822.90	26	1101.23	97	1373.67	168	1640.30
-186	245.38	-115	541.54	-44	826.87	27	1105.10	98	1377.47	169	1644.01
-185	249.65	-114	545.62	-43	830.83	28	1108.98	99	1381.26	170	1647.72
-184	253.92	-113	549.70	-42	834.79	29	1112.86	100	1385.06	171	1651.43
-183	258.19	-112	553.78	-41	838.75	30	1116.73	101	1388.85	172	1655.14
-182	262.45	-111	557.86	-40	842.71	31	1120.60	102	1392.64	173	1658.85
-181	266.71	-110	561.93	-39	846.66	32	1124.47	103	1396.43	174	1662.56
-180	270.96	-109	566.00	-38	850.62	33	1128.35	104	1400.22	175	1666.27
-179	275.22	-108	570.07	-37	854.57	34	1132.21	105	1404.00	176	1669.97
-178	279.47	-107	574.14	-36	858.53	35	1136.08	106	1407.79	177	1673.68
-177	283.71	-106	578.21	-35	862.48	36	1139.95	107	1411.58	178	1677.38
-176	287.96	-105	582.27	-34	866.43	37	1143.82	108	1415.36	179	1681.08
-175	292.20	-104	586.33	-33	870.38	38	1147.68	109	1419.14	180	1684.78
-174	296.43	-103	590.39	-32	874.32	39	1151.55	110	1422.93	181	1688.48
-173	300.67	-102	594.45	-31	878.27	40	1155.41	111	1426.71	182	1692.18
-172	304.90	-101	598.50	-30	882.22	41	1159.27	112	1430.49	183	1695.88
-171	309.13	-100	602.56	-29	886.16	42	1163.13	113	1434.26	184	1699.58
-170	313.35	-99	606.61	-28	890.10	43	1166.99	114	1438.04	185	1703.27
-169	317.57	-98	610.66	-27	894.04	44	1170.85	115	1441.82	186	1706.96
-168	321.79	-97	614.71	-26	897.98	45	1174.70	116	1445.59	187	1710.66
-167	326.01	-96	618.76	-25	901.92	46	1178.56	117	1449.37	188	1714.35
-166	330.22	-95	622.80	-24	905.86	47	1182.41	118	1453.14	189	1718.04
-165	334.43	-94	626.84	-23	909.80	48	1186.27	119	1456.91	190	1721.73
-164	338.64	-93	630.88	-22	913.73	49	1190.12	120	1460.68	191	1725.42
-163	342.84	-92	634.92	-21	917.67	50	1193.97	121	1464.45	192	1729.10
-162	347.04	-91	638.96	-20	921.60	51	1197.82	122	1468.22	193	1732.79
-161	351.24	-90	643.00	-19	925.53	52	1201.67	123	1471.98	194	1736.48
-160	355.43	-89	647.03	-18	929.46	53	1205.52	124	1475.75	195	1740.16
-159	359.63	-88	651.06	-17	933.39	54	1209.36	125	1479.51	196	1743.84
-158	363.82	-87	655.09	-16	937.32	55	1213.21	126	1483.28	197	1747.52
-157	368.00	-86	659.12	-15	941.24	56	1217.05	127	1487.04	198	1751.20
-156	372.19	-85	663.15	-14	945.17	57	1220.90	128	1490.80	199	1754.88
-155	376.37	-84	667.17	-13	949.09	58	1224.74	129	1494.56	200	1758.56
-154	380.55	-83	671.20	-12	953.02	59	1228.58	130	1498.32	201	1762.24
-153	384.72	-82	675.22	-11	956.94	60	1232.42	131	1502.08	202	1765.91
-152	388.89	-81	679.24	-10	960.86	61	1236.26	132	1505.83	203	1769.59
-151	393.06	-80	683.25	-9	964.78	62	1240.09	133	1509.59	204	1773.26
-150	397.23	-79	687.27	-8	968.70	63	1243.93	134	1513.34	205	1776.93
-149	401.40	-78	691.29	-7	972.61	64	1247.77	135	1517.10	206	1780.60
-148	405.56	-77	695.30	-6	976.53	65	1251.60	136	1520.85	207	1784.27
-147	409.72	-76	699.31	-5	980.44	66	1255.43	137	1524.60	208	1787.94
-146	413.88	-75	703.32	-4	984.36	67	1259.26	138	1528.35	209	1791.61
-145	418.03	-74	707.33	-3	988.27	68	1263.09	139	1532.10	210	1795.28
-144	422.18	-73	711.34	-2	992.18	69	1266.92	140	1535.84	211	1798.94
-143	426.33	-72	715.34	-1	996.09	70	1270.75	141	1539.59	212	1802.60
-142	430.48	-71	719.34	0	1000.00	71	1274.58	142	1543.33	213	1806.27
-141	434.62	-70	723.35	1	1003.91	72	1278.40	143	1547.08	214	1809.93
-140	438.76	-69	727.35	2	1007.81	73	1282.23	144	1550.82	215	1813.59
-139	442.90	-68	731.34	3	1011.72	74	1286.05	145	1554.56	216	1817.25
-138	447.04	-67	735.34	4	1015.62	75	1289.87	146	1558.30	217	1820.91
-137	451.17	-66	739.34	5	1019.53	76	1293.70	147	1562.04	218	1824.56
-136	455.31	-65	743.33	6	1023.43	77	1297.52	148	1565.78	219	1828.22
-135	459.44	-64	747.32	7	1027.33	78	1301.33	149	1569.52	220	1831.88
-134	463.56	-63	751.31	8	1031.23	79	1305.15	150	1573.25	221	1835.53
-133	467.69	-62	755.30	9	1035.13	80	1308.97	151	1576.99	222	1839.18
-132	471.81	-61	759.29	10	1039.03	81	1312.78	152	1580.72	223	1842.83
-131	475.93	-60	763.28	11	1042.92	82	1316.60	153	1584.45	224	1846.48
-130	480.05	-59	767.26	12	1046.82	83	1320.41	154	1588.18	225	1850.13
-129	484.16	-58	771.25	13	1050.71	84	1324.22	155	1591.91	226	1853.78
-128	488.28	-57	775.23	14	1054.60	85	1328.03	156	1595.64	227	1857.43
-127	492.39	-56	779.21	15	1058.49	86	1331.84	157	1599.37	228	1861.07
-126	496.49	-55	783.19	16	1062.38	87	1335.65	158	1603.09	229	1864.72

Temper. [°C]	Resist. [W]
230	1868.36
231	1872.00
232	1875.64
233	1879.28
234	1882.92
235	1886.56
236	1890.19
237	1893.83
238	1897.46
239	1901.10
240	1904.73
241	1908.36
242	1911.99
243	1915.62
244	1919.24
245	1922.87
246	1926.49
247	1930.12
248	1933.74
249	1937.36
250	1940.98
251	1944.60
252	1948.22
253	1951.83
254	1955.45
255	1959.06
256	1962.68
257	1966.29
258	1969.90
259	1973.51
260	1977.12
261	1980.73
262	1984.33
263	1987.94
264	1991.54
265	1995.14
266	1998.75
267	2002.35
268	2005.95
269	2009.54
270	2013.14
271	2016.74
272	2020.33
273	2023.93
274	2027.52
275	2031.11
276	2034.70
277	2038.29
278	2041.88
279	2045.46
280	2049.05

Temper. [°C]	Resist. [W]
281	2052.63
282	2056.22
283	2059.80
284	2063.38
285	2066.96
286	2070.54
287	2074.11
288	2077.69
289	2081.27
290	2084.84
291	2088.41
292	2091.98
293	2095.55
294	2099.12
295	2102.69
296	2106.26
297	2109.82
298	2113.39
299	2116.95
300	2120.52
301	2124.08
302	2127.64
303	2131.20
304	2134.75
305	2138.31
306	2141.87
307	2145.42
308	2148.97
309	2152.52
310	2156.08
311	2159.62
312	2163.17
313	2166.72
314	2170.27
315	2173.81
316	2177.36
317	2180.90
318	2184.44
319	2187.98
320	2191.52
321	2195.06
322	2198.60
323	2202.13
324	2205.67
325	2209.20
326	2212.73
327	2216.26
328	2219.79
329	2223.32
330	2226.85
331	2230.38

Temper. [°C]	Resist. [W]
332	2233.90
333	2237.43
334	2240.95
335	2244.47
336	2247.99
337	2251.51
338	2255.03
339	2258.55
340	2262.06
341	2265.58
342	2269.09
343	2272.60
344	2276.12
345	2279.63
346	2283.14
347	2286.64
348	2290.15
349	2293.66
350	2297.16
351	2300.66
352	2304.17
353	2307.67
354	2311.17
355	2314.67
356	2318.16
357	2321.66
358	2325.16
359	2328.65
360	2332.14
361	2335.64
362	2339.13
363	2342.62
364	2346.10
365	2349.59
366	2353.08
367	2356.56
368	2360.05
369	2363.53
370	2367.01
371	2370.49
372	2373.97
373	2377.45
374	2380.93
375	2384.40
376	2387.88
377	2391.35
378	2394.82
379	2398.29
380	2401.76
381	2405.23
382	2408.70

Temper. [°C]	Resist. [W]
383	2412.17
384	2415.63
385	2419.10
386	2422.56
387	2426.02
388	2429.48
389	2432.94
390	2436.40
391	2439.86
392	2443.31
393	2446.77
394	2450.22
395	2453.67
396	2457.13
397	2460.58
398	2464.03
399	2467.47
400	2470.92
401	2474.37
402	2477.81
403	2481.25
404	2484.70
405	2488.14
406	2491.58
407	2495.02
408	2498.45
409	2501.89
410	2505.33
411	2508.76
412	2512.19
413	2515.62
414	2519.06
415	2522.48
416	2525.91
417	2529.34
418	2532.77
419	2536.19
420	2539.62
421	2543.04
422	2546.46
423	2549.88
424	2553.30
425	2556.72
426	2560.13
427	2563.55
428	2566.96
429	2570.38
430	2573.79
431	2577.20
432	2580.61
433	2584.02

Temper. [°C]	Resist. [W]
434	2587.43
435	2590.83
436	2594.24
437	2597.64
438	2601.05
439	2604.45
440	2607.85
441	2611.25
442	2614.65
443	2618.04
444	2621.44
445	2624.83
446	2628.23
447	2631.62
448	2635.01
449	2638.40
450	2641.79
451	2645.18
452	2648.57
453	2651.95
454	2655.34
455	2658.72
456	2662.10
457	2665.48
458	2668.86
459	2672.24
460	2675.62
461	2679.00
462	2682.37
463	2685.74
464	2689.12
465	2692.49
466	2695.86
467	2699.23
468	2702.60
469	2705.97
470	2709.33
471	2712.70
472	2716.06
473	2719.42
474	2722.78
475	2726.14
476	2729.50
477	2732.86
478	2736.22
479	2739.57
480	2742.93
481	2746.28
482	2749.63
483	2752.98
484	2756.33

Temper. [°C]	Resist. [W]
485	2759.68
486	2763.03
487	2766.38
488	2769.72
489	2773.07
490	2776.41
491	2779.75
492	2783.09
493	2786.43
494	2789.77
495	2793.11
496	2796.44
497	2799.78
498	2803.11
499	2806.44
500	2809.78

Tab. 11.a