

**Customer:** ILLIANA INSTRUMENT  
1831 Govert Drive  
Scherverville, IN 46375

**PO Number:** 4305

**Certificate/SO Number: 15-D9B9W-40-1 Revision 0**

**Manufacturer:** Hart Scientific/Fluke  
**Model Number:** 5626-15-S  
**Description:** Secondary Standard PRT  
**Serial Number:** 0411  
**ID:** ITEM 1225

**As-Found:** Data Only  
**As-Left:** Data Only

**Issue Date:** Jul 25, 2022  
**Calibration Date:** Jul 25, 2022  
**Due Date:** Jul 25, 2024

**Calibrated To:** Data Only  
**Calibration Procedure:** 1-AC14153-5

Transcat Calibration Laboratories have been audited and found in compliance with ISO/IEC 17025:2017. Accredited calibrations performed within the Lab Scope of Accreditation are indicated by the presence of the Accrediting Body Logo and Certificate Number. Any measurements on an accredited calibration not covered by the Lab Scope of Accreditation are listed in the notes section of the certificate. SCC, NRC, CLAS or ANAB do not guarantee the accuracy of an individual calibration by accredited laboratories.

Transcat calibrations, as applicable, are performed in compliance with the requirements of the Transcat Quality Manual QAC-P01-000, the customer Purchase Order and/or Quality Agreement requirements, ISO 9001:2015, ANSI/NCCL Z540.1-1994 (R2002), and ISO 10012:2003, as applicable. When specified contractually, the requirements of ISO TS16949:2009, 10CFR21, 10CFR50 App. B, ASME NQA-1:2012, and ANSI/NCCL Z540.3-2006 (R2013) are also covered.

Complete records of work performed are maintained by Transcat and are available for inspection. Laboratory standards used in the performance of this calibration are listed on this certificate.

Transcat documents the traceability of measurements to the SI units through the National Institute of Standards and Technology (NIST), or the National Research Council of Canada (NRC), or other national measurement institutes (NMI) that are signatories to the CIPM Mutual Recognition Arrangement, or accepted fundamental and/or natural physical constants, or by the use of specified methods, consensus standards or ratio type measurements. Documentation supporting traceability information is available for review upon written request at a Transcat facility. The measured quantity and the measurement uncertainty are required for further dissemination of traceability.

Uncertainties are reported with a coverage factor  $k=2$ , providing a level of confidence of approximately 95%. All calibrations have been performed using processes having a TUR of 4:1 or better (3:1 for mass calibrations), unless otherwise noted. The Test Uncertainty Ratio (TUR) is calculated in accordance with NCSL International RP-18. For mass calibrations: Conventional mass referenced to 8.0 g/cm<sup>3</sup>.

The results in this report relate only to the item calibrated or tested. Recorded calibration data is valid at the time of calibration within the stated uncertainties at the environmental conditions noted. The determination of compliance to the specification is specific to the model/serial no./ID no. referenced above based on the tolerances shown; these tolerances are either the original equipment manufacturers (OEM's) warranted specifications or the client's requested specifications. Any number of factors can cause a unit to drift out of tolerance at any time following its calibration. Limitations on the uses of this instrument are detailed in the OEM's operating instructions. This certificate may not be reproduced except in full, without the written approval of Transcat. Additional information, if applicable may be included on separate report(s).

**Notes:**

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ITS-90 Coefficients:

RTPW = 100.7413  
a4 = -1.5894149 E-04  
b4 = -1.3524252 E-06  
a7 = -1.6300724 E-04  
b7 = -3.5243187 E-05  
c7 = 4.6697456 E-06

**As Found/As Left Data**

Description	Setpoints	Accuracy	Low Limit	High Limit	As Found / As Left	O O T	Cal Process Uncertainty (k=2; ±)	Measurement Uncertainty (k=2; ±)	Units	TUR
Function Check										
External Data Verification					P					

Field not applicable.

**Traceable Standards**

Asset	Manufacturer	Model Number	Description	Cal Date	Due Date	Traceability Number	Use
31172	Hart Scientific	5915A	Fixed Point Cell - Sn	20-Nov-06	30-Nov-36	15-&31172-1-1	AF/AL
C252A	Hart Scientific	5916A	Freeze Point Cell - Zn	21-Sep-04	30-Sep-34	Lot#:L16N08	AF/AL
M1195	Hart Scientific	5914	Fixed Point Cell, Indium (In) Freeze Point	22-Jan-09	31-Jan-39	Lot#:44	AF/AL
M1359	Fluke Corporation	742A-100	Resistance Standard	15-Feb-22	31-Aug-22	CAL253883	AF/AL
M1980	Fluke	5947	Fixed Point Cell, Aluminum (Al)	22-Jul-21	31-Jul-51	Lot #M53531-B	AF/AL
M2020	Hart Scientific/Fluke	5901B-G	Fixed Point Cell, Triple Point of Water	9-Jan-20	9-Jan-50	B-G3160/12-30-2019	AF/AL
M4400	Hart Scientific/Fluke	5699	SPRT	2-Sep-21	30-Sep-22	15-&M4400-3-1	AF/AL
M5000	Hart Scientific/Fluke	1590	Super-Thermometer II	31-Jan-22	31-Jan-23	CAL251899	AF/AL

The use of the standard is defined as: AF - used for as-found readings, AL - used for as-left readings.

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**Environmental Data**

Temperature	Relative Humidity	Temp/ RH Asset	Lab Area	Lab Description
70.92°F /21.62°C	51.80%	M1324	C	Primary Temperature

**Decision Rule**

When compliance statements are present, they are reported without factoring in the effects of uncertainty and comply with the guidelines as follows: The acceptance zone is defined as: less than or equal to the high limit, and/or greater than or equal to the low limit. The rejection zones are defined as greater than the high limit and/or less than the low limit. Single measurement results in the acceptance zone are identified as in-tolerance. Single measurement results in the rejection zone are identified as out-of-tolerance (OOT). When all measurement results are in the acceptance zone for repeated measurements, for the same characteristic, the test is identified as in-tolerance. For repeated characteristic measurements, a single measurement result in the rejection zone, will cause the test to be identified as out-of-tolerance (OOT). Data rejection for cause, (outliers) is permitted after the "Determining and Verifying Out Of Tolerance(OOT) and/or Op Fail Readings" procedure outlined in this document has been completed and the anomalous reading cannot be repeated, and the anomalous reading does not represent the system under test. Statements of conformity are binary.

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## Legend

Topic	Description
Accuracy	UUT specification that establishes expected tolerances and a time limit (calibration interval) over which the instrument is expected to hold these tolerances
As Found	Initial measurement results
As Left	Measurement results after adjustment and/or repair
Blank Data Field	Test is not applicable for the UUT
Cal Process Uncertainty (CPU)	The uncertainty of calibration process for the reported measurement result
Calibration Date	Indicates the date that the calibration was completed
Cover Factor (k)	A measure of uncertainty that defines an interval about the measurement result
Due Date	Indicates the end of the calibration cycle as requested by the customer
Issue Date	Indicates the date that the calibration has passed the Data Review Process and was signed by an authorized signatory or the date that a revision to the original certificate has been issued
Low / High Limits	Establishes UUT acceptable performance limits for the test measurement
Measurement Uncertainty	The dispersion of the values attributed to a measured quantity
OOA	Out of Acceptance (#)
OOT	Out of Tolerance (*)
Setpoints	Measurement target values
Traceability	Unbroken chain of comparisons relating an instrument's measurements to a known standard(s)
Traceability Number	Unique identifier(s) used to document traceability of calibration standards
TUR	Test Uncertainty Ratio, ratio of the tolerance or specification of the test measurement in relation to the uncertainty in measurement results
UUT	Unit Under test

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**Calibrated At:**  
2056 S. Alex Road  
West Carrollton, OH 45449

**Facility Responsible:**  
2056 S. Alex Road  
West Carrollton, OH 45449  
800-828-1470

**Unit Barcode:**



901B0078175

**Date Received:** May 23, 2022  
**Service Level:** P9

**Calibrated By:**

**Electronically Signed By:**  
Martha Lis

Martha Lis Jul 25, 2022  
Calibration Technician 10:46:33 -04:00

**Reviewed By:**

**Electronically Signed By:**  
Shane Smith for

Derek Atkinson Jul 25, 2022  
Lab Manager 11:25:16 -04:00

## Supplemental Report for 15-D9B9W-40-1 Calibration Lab Data

INTERNATIONAL TEMPERATURE SCALE OF 1990  
Secondary Standard PRT Probe

Model : Hart 5626-15-S  
Serial : 0411  
Calibration Date : 25 July 2022  
Customer : Illiana Instrument

This PRT was calibrated with fixed-point cells and by comparison method to a laboratory standard SPRT/Precision DC Thermometry system at a constant current of 1 mADC. The procedure is based on the technical information contained in NIST Technical Note 1265, "Guidelines for Realizing the International Temperature Scale of 1990 (ITS-90)". The following measurement points and their uncertainties (k=2) were used to calibrate the thermometer. All temperature data is in °C.

ITS-90 Fixed Point	Comparison Point Nominal	Comparison Point Actual (Standard)	Measured Resistance (Ohms) UUT	Measurement Uncertainty (k=2)
Ar TP	-189.3442	-195.8952	18.8977	2.5 mK
n/a	-80.0000	-80.0117	68.1811	2.0 mK
Hg TP	-38.8344	-38.8346	85.0423	1.4 mK
TPW	0.0100	0.0100	100.7413	0.6 mK
In FP	156.5985	156.5985	162.1619	1.9 mK
Sn FP	231.9280	231.9280	190.6662	2.1 mK
Zn FP	419.5270	419.5270	258.7633	3.5 mK
Al FP	660.3230	660.3230	340.0508	8.6 mK

Note: Data points below 0.010 °C are measured by comparison in LN2 and precision baths and are compared directly to an SPRT.

The following values were determined for the resistance at the triple point of water (RTPW) and the coefficients of the pertinent deviation functions of the ITS-90. The attached interpolation tables were generated using these values. The as found RTPW value was 100.7422 Ohms.

### *ITS-90 Coefficients:*

$$\begin{aligned}
 \text{RTPW} &= 100.7413 \\
 a_4 &= -1.5894149 \text{ E-04} \\
 b_4 &= -1.3524252 \text{ E-06} \\
 a_7 &= -1.6300724 \text{ E-04} \\
 b_7 &= -3.5243187 \text{ E-05} \\
 c_7 &= 4.6697456 \text{ E-06}
 \end{aligned}$$

°C	Resistance	dr/dT	°C	Resistance	dr/dT	°C	Resistance	dr/dT
-196.00	18.8521	0.4358	-134.00	45.6369	0.4234	-72.00	71.4813	0.4112
-195.00	19.2879	0.4362	-133.00	46.0603	0.4231	-71.00	71.8925	0.4111
-194.00	19.7241	0.4365	-132.00	46.4834	0.4229	-70.00	72.3035	0.4109
-193.00	20.1606	0.4368	-131.00	46.9063	0.4226	-69.00	72.7145	0.4108
-192.00	20.5974	0.4370	-130.00	47.3289	0.4224	-68.00	73.1252	0.4106
-191.00	21.0344	0.4372	-129.00	47.7513	0.4221	-67.00	73.5358	0.4105
-190.00	21.4716	0.4373	-128.00	48.1734	0.4219	-66.00	73.9463	0.4103
-189.00	21.9089	0.4374	-127.00	48.5953	0.4216	-65.00	74.3566	0.4102
-188.00	22.3463	0.4374	-126.00	49.0169	0.4214	-64.00	74.7668	0.4100
-187.00	22.7837	0.4374	-125.00	49.4383	0.4211	-63.00	75.1768	0.4099
-186.00	23.2211	0.4374	-124.00	49.8594	0.4209	-62.00	75.5867	0.4097
-185.00	23.6585	0.4373	-123.00	50.2803	0.4207	-61.00	75.9964	0.4096
-184.00	24.0958	0.4372	-122.00	50.7010	0.4204	-60.00	76.4060	0.4094
-183.00	24.5331	0.4371	-121.00	51.1215	0.4202	-59.00	76.8155	0.4093
-182.00	24.9702	0.4370	-120.00	51.5417	0.4200	-58.00	77.2248	0.4092
-181.00	25.4072	0.4368	-119.00	51.9616	0.4198	-57.00	77.6339	0.4090
-180.00	25.8440	0.4367	-118.00	52.3814	0.4195	-56.00	78.0430	0.4089
-179.00	26.2807	0.4365	-117.00	52.8009	0.4193	-55.00	78.4518	0.4087
-178.00	26.7171	0.4363	-116.00	53.2203	0.4191	-54.00	78.8606	0.4086
-177.00	27.1534	0.4360	-115.00	53.6394	0.4189	-53.00	79.2692	0.4085
-176.00	27.5894	0.4358	-114.00	54.0583	0.4187	-52.00	79.6776	0.4083
-175.00	28.0252	0.4355	-113.00	54.4769	0.4185	-51.00	80.0859	0.4082
-174.00	28.4608	0.4353	-112.00	54.8954	0.4183	-50.00	80.4941	0.4080
-173.00	28.8961	0.4350	-111.00	55.3137	0.4180	-49.00	80.9022	0.4079
-172.00	29.3311	0.4347	-110.00	55.7317	0.4178	-48.00	81.3101	0.4078
-171.00	29.7658	0.4345	-109.00	56.1495	0.4176	-47.00	81.7178	0.4076
-170.00	30.2003	0.4342	-108.00	56.5672	0.4174	-46.00	82.1255	0.4075
-169.00	30.6345	0.4339	-107.00	56.9846	0.4172	-45.00	82.5330	0.4074
-168.00	31.0683	0.4336	-106.00	57.4019	0.4170	-44.00	82.9403	0.4072
-167.00	31.5019	0.4333	-105.00	57.8189	0.4169	-43.00	83.3476	0.4071
-166.00	31.9352	0.4330	-104.00	58.2358	0.4167	-42.00	83.7546	0.4070
-165.00	32.3681	0.4327	-103.00	58.6524	0.4165	-41.00	84.1616	0.4068
-164.00	32.8008	0.4323	-102.00	59.0689	0.4163	-40.00	84.5684	0.4067
-163.00	33.2331	0.4320	-101.00	59.4852	0.4161	-39.00	84.9751	0.4066
-162.00	33.6652	0.4317	-100.00	59.9013	0.4159	-38.00	85.3817	0.4064
-161.00	34.0969	0.4314	-99.00	60.3172	0.4157	-37.00	85.7881	0.4063
-160.00	34.5283	0.4311	-98.00	60.7329	0.4155	-36.00	86.1944	0.4062
-159.00	34.9593	0.4308	-97.00	61.1484	0.4154	-35.00	86.6006	0.4060
-158.00	35.3901	0.4304	-96.00	61.5638	0.4152	-34.00	87.0066	0.4059
-157.00	35.8205	0.4301	-95.00	61.9790	0.4150	-33.00	87.4126	0.4058
-156.00	36.2507	0.4298	-94.00	62.3940	0.4148	-32.00	87.8183	0.4057
-155.00	36.6805	0.4295	-93.00	62.8088	0.4146	-31.00	88.2240	0.4055
-154.00	37.1100	0.4292	-92.00	63.2234	0.4145	-30.00	88.6295	0.4054
-153.00	37.5392	0.4289	-91.00	63.6379	0.4143	-29.00	89.0349	0.4053
-152.00	37.9680	0.4286	-90.00	64.0522	0.4141	-28.00	89.4402	0.4051
-151.00	38.3966	0.4283	-89.00	64.4663	0.4140	-27.00	89.8453	0.4050
-150.00	38.8248	0.4279	-88.00	64.8803	0.4138	-26.00	90.2504	0.4049
-149.00	39.2528	0.4276	-87.00	65.2941	0.4136	-25.00	90.6552	0.4048
-148.00	39.6804	0.4273	-86.00	65.7077	0.4134	-24.00	91.0600	0.4046
-147.00	40.1078	0.4270	-85.00	66.1211	0.4133	-23.00	91.4647	0.4045
-146.00	40.5348	0.4267	-84.00	66.5344	0.4131	-22.00	91.8692	0.4044
-145.00	40.9616	0.4265	-83.00	66.9475	0.4130	-21.00	92.2736	0.4043
-144.00	41.3880	0.4262	-82.00	67.3605	0.4128	-20.00	92.6778	0.4041
-143.00	41.8142	0.4259	-81.00	67.7733	0.4126	-19.00	93.0820	0.4040
-142.00	42.2400	0.4256	-80.00	68.1859	0.4125	-18.00	93.4860	0.4039
-141.00	42.6656	0.4253	-79.00	68.5984	0.4123	-17.00	93.8899	0.4038
-140.00	43.0909	0.4250	-78.00	69.0107	0.4122	-16.00	94.2936	0.4036
-139.00	43.5159	0.4247	-77.00	69.4228	0.4120	-15.00	94.6973	0.4035
-138.00	43.9407	0.4245	-76.00	69.8348	0.4118	-14.00	95.1008	0.4034
-137.00	44.3651	0.4242	-75.00	70.2467	0.4117	-13.00	95.5042	0.4033
-136.00	44.7893	0.4239	-74.00	70.6584	0.4115	-12.00	95.9075	0.4032
-135.00	45.2133	0.4237	-73.00	71.0699	0.4114	-11.00	96.3107	0.4030

°C	Resistance	dr/dT	°C	Resistance	dr/dT	°C	Resistance	dr/dT
-10.00	96.7137	0.4029	52.00	121.4627	0.3953	114.00	145.7456	0.3879
-9.00	97.1166	0.4028	53.00	121.8580	0.3952	115.00	146.1334	0.3878
-8.00	97.5194	0.4027	54.00	122.2533	0.3951	116.00	146.5212	0.3876
-7.00	97.9221	0.4025	55.00	122.6484	0.3950	117.00	146.9088	0.3875
-6.00	98.3246	0.4024	56.00	123.0433	0.3949	118.00	147.2963	0.3874
-5.00	98.7270	0.4023	57.00	123.4382	0.3947	119.00	147.6837	0.3873
-4.00	99.1293	0.4022	58.00	123.8329	0.3946	120.00	148.0710	0.3872
-3.00	99.5315	0.4021	59.00	124.2275	0.3945	121.00	148.4581	0.3870
-2.00	99.9335	0.4019	60.00	124.6220	0.3944	122.00	148.8452	0.3869
-1.00	100.3355	0.4018	61.00	125.0164	0.3943	123.00	149.2321	0.3868
0.00	100.7373	0.4017	62.00	125.4107	0.3941	124.00	149.6189	0.3867
1.00	101.1390	0.4016	63.00	125.8048	0.3940	125.00	150.0055	0.3866
2.00	101.5405	0.4014	64.00	126.1988	0.3939	126.00	150.3921	0.3864
3.00	101.9420	0.4013	65.00	126.5927	0.3938	127.00	150.7785	0.3863
4.00	102.3433	0.4012	66.00	126.9865	0.3936	128.00	151.1648	0.3862
5.00	102.7445	0.4011	67.00	127.3801	0.3935	129.00	151.5510	0.3861
6.00	103.1455	0.4009	68.00	127.7736	0.3934	130.00	151.9371	0.3860
7.00	103.5465	0.4008	69.00	128.1670	0.3933	131.00	152.3231	0.3858
8.00	103.9473	0.4007	70.00	128.5603	0.3932	132.00	152.7089	0.3857
9.00	104.3480	0.4006	71.00	128.9535	0.3930	133.00	153.0946	0.3856
10.00	104.7486	0.4005	72.00	129.3465	0.3929	134.00	153.4802	0.3855
11.00	105.1490	0.4003	73.00	129.7394	0.3928	135.00	153.8657	0.3854
12.00	105.5494	0.4002	74.00	130.1322	0.3927	136.00	154.2510	0.3852
13.00	105.9496	0.4001	75.00	130.5249	0.3926	137.00	154.6363	0.3851
14.00	106.3497	0.4000	76.00	130.9175	0.3924	138.00	155.0214	0.3850
15.00	106.7496	0.3998	77.00	131.3099	0.3923	139.00	155.4064	0.3849
16.00	107.1495	0.3997	78.00	131.7022	0.3922	140.00	155.7913	0.3848
17.00	107.5492	0.3996	79.00	132.0944	0.3921	141.00	156.1760	0.3846
18.00	107.9488	0.3995	80.00	132.4865	0.3920	142.00	156.5607	0.3845
19.00	108.3483	0.3994	81.00	132.8785	0.3918	143.00	156.9452	0.3844
20.00	108.7476	0.3992	82.00	133.2703	0.3917	144.00	157.3296	0.3843
21.00	109.1469	0.3991	83.00	133.6620	0.3916	145.00	157.7139	0.3842
22.00	109.5460	0.3990	84.00	134.0536	0.3915	146.00	158.0981	0.3840
23.00	109.9450	0.3989	85.00	134.4451	0.3914	147.00	158.4821	0.3839
24.00	110.3438	0.3987	86.00	134.8365	0.3912	148.00	158.8660	0.3838
25.00	110.7426	0.3986	87.00	135.2277	0.3911	149.00	159.2498	0.3837
26.00	111.1412	0.3985	88.00	135.6188	0.3910	150.00	159.6335	0.3836
27.00	111.5397	0.3984	89.00	136.0098	0.3909	151.00	160.0171	0.3834
28.00	111.9381	0.3983	90.00	136.4007	0.3908	152.00	160.4005	0.3833
29.00	112.3364	0.3981	91.00	136.7914	0.3906	153.00	160.7839	0.3832
30.00	112.7345	0.3980	92.00	137.1820	0.3905	154.00	161.1671	0.3831
31.00	113.1325	0.3979	93.00	137.5726	0.3904	155.00	161.5502	0.3830
32.00	113.5304	0.3978	94.00	137.9630	0.3903	156.00	161.9332	0.3829
33.00	113.9282	0.3976	95.00	138.3532	0.3902	157.00	162.3160	0.3827
34.00	114.3258	0.3975	96.00	138.7434	0.3900	158.00	162.6987	0.3826
35.00	114.7233	0.3974	97.00	139.1334	0.3899	159.00	163.0814	0.3825
36.00	115.1207	0.3973	98.00	139.5233	0.3898	160.00	163.4639	0.3824
37.00	115.5180	0.3972	99.00	139.9131	0.3897	161.00	163.8462	0.3823
38.00	115.9152	0.3970	100.00	140.3028	0.3895	162.00	164.2285	0.3821
39.00	116.3122	0.3969	101.00	140.6923	0.3894	163.00	164.6106	0.3820
40.00	116.7091	0.3968	102.00	141.0818	0.3893	164.00	164.9927	0.3819
41.00	117.1059	0.3967	103.00	141.4711	0.3892	165.00	165.3746	0.3818
42.00	117.5026	0.3966	104.00	141.8603	0.3891	166.00	165.7564	0.3817
43.00	117.8992	0.3964	105.00	142.2493	0.3889	167.00	166.1380	0.3815
44.00	118.2956	0.3963	106.00	142.6383	0.3888	168.00	166.5196	0.3814
45.00	118.6919	0.3962	107.00	143.0271	0.3887	169.00	166.9010	0.3813
46.00	119.0881	0.3961	108.00	143.4158	0.3886	170.00	167.2823	0.3812
47.00	119.4842	0.3959	109.00	143.8044	0.3885	171.00	167.6635	0.3811
48.00	119.8801	0.3958	110.00	144.1929	0.3883	172.00	168.0446	0.3810
49.00	120.2759	0.3957	111.00	144.5812	0.3882	173.00	168.4255	0.3808
50.00	120.6717	0.3956	112.00	144.9695	0.3881	174.00	168.8064	0.3807
51.00	121.0672	0.3955	113.00	145.3576	0.3880	175.00	169.1871	0.3806



°C	Resistance	dr/dT	°C	Resistance	dr/dT	°C	Resistance	dr/dT
176.00	169.5677	0.3805	238.00	192.9342	0.3732	300.00	215.8498	0.3659
177.00	169.9482	0.3804	239.00	193.3073	0.3731	301.00	216.2158	0.3658
178.00	170.3285	0.3802	240.00	193.6804	0.3729	302.00	216.5816	0.3657
179.00	170.7088	0.3801	241.00	194.0533	0.3728	303.00	216.9473	0.3656
180.00	171.0889	0.3800	242.00	194.4262	0.3727	304.00	217.3129	0.3655
181.00	171.4689	0.3799	243.00	194.7989	0.3726	305.00	217.6783	0.3654
182.00	171.8488	0.3798	244.00	195.1715	0.3725	306.00	218.0437	0.3652
183.00	172.2286	0.3797	245.00	195.5439	0.3724	307.00	218.4089	0.3651
184.00	172.6082	0.3795	246.00	195.9163	0.3722	308.00	218.7740	0.3650
185.00	172.9877	0.3794	247.00	196.2885	0.3721	309.00	219.1390	0.3649
186.00	173.3671	0.3793	248.00	196.6606	0.3720	310.00	219.5039	0.3648
187.00	173.7464	0.3792	249.00	197.0326	0.3719	311.00	219.8687	0.3647
188.00	174.1256	0.3791	250.00	197.4045	0.3718	312.00	220.2333	0.3645
189.00	174.5047	0.3789	251.00	197.7763	0.3717	313.00	220.5979	0.3644
190.00	174.8836	0.3788	252.00	198.1479	0.3715	314.00	220.9623	0.3643
191.00	175.2624	0.3787	253.00	198.5195	0.3714	315.00	221.3266	0.3642
192.00	175.6412	0.3786	254.00	198.8909	0.3713	316.00	221.6908	0.3641
193.00	176.0197	0.3785	255.00	199.2622	0.3712	317.00	222.0548	0.3640
194.00	176.3982	0.3784	256.00	199.6334	0.3711	318.00	222.4188	0.3638
195.00	176.7766	0.3782	257.00	200.0044	0.3709	319.00	222.7826	0.3637
196.00	177.1548	0.3781	258.00	200.3754	0.3708	320.00	223.1464	0.3636
197.00	177.5329	0.3780	259.00	200.7462	0.3707	321.00	223.5100	0.3635
198.00	177.9109	0.3779	260.00	201.1169	0.3706	322.00	223.8734	0.3634
199.00	178.2888	0.3778	261.00	201.4875	0.3705	323.00	224.2368	0.3633
200.00	178.6665	0.3776	262.00	201.8580	0.3704	324.00	224.6001	0.3631
201.00	179.0442	0.3775	263.00	202.2284	0.3702	325.00	224.9632	0.3630
202.00	179.4217	0.3774	264.00	202.5986	0.3701	326.00	225.3262	0.3629
203.00	179.7991	0.3773	265.00	202.9688	0.3700	327.00	225.6891	0.3628
204.00	180.1764	0.3772	266.00	203.3388	0.3699	328.00	226.0519	0.3627
205.00	180.5536	0.3771	267.00	203.7087	0.3698	329.00	226.4146	0.3626
206.00	180.9306	0.3769	268.00	204.0784	0.3697	330.00	226.7772	0.3624
207.00	181.3076	0.3768	269.00	204.4481	0.3695	331.00	227.1396	0.3623
208.00	181.6844	0.3767	270.00	204.8177	0.3694	332.00	227.5019	0.3622
209.00	182.0611	0.3766	271.00	205.1871	0.3693	333.00	227.8641	0.3621
210.00	182.4377	0.3765	272.00	205.5564	0.3692	334.00	228.2262	0.3620
211.00	182.8141	0.3763	273.00	205.9256	0.3691	335.00	228.5882	0.3619
212.00	183.1905	0.3762	274.00	206.2947	0.3690	336.00	228.9501	0.3617
213.00	183.5667	0.3761	275.00	206.6636	0.3688	337.00	229.3118	0.3616
214.00	183.9428	0.3760	276.00	207.0325	0.3687	338.00	229.6734	0.3615
215.00	184.3188	0.3759	277.00	207.4012	0.3686	339.00	230.0349	0.3614
216.00	184.6947	0.3758	278.00	207.7698	0.3685	340.00	230.3963	0.3613
217.00	185.0704	0.3756	279.00	208.1383	0.3684	341.00	230.7576	0.3612
218.00	185.4461	0.3755	280.00	208.5067	0.3683	342.00	231.1188	0.3610
219.00	185.8216	0.3754	281.00	208.8750	0.3681	343.00	231.4798	0.3609
220.00	186.1970	0.3753	282.00	209.2431	0.3680	344.00	231.8407	0.3608
221.00	186.5723	0.3752	283.00	209.6111	0.3679	345.00	232.2016	0.3607
222.00	186.9474	0.3751	284.00	209.9791	0.3678	346.00	232.5623	0.3606
223.00	187.3225	0.3749	285.00	210.3469	0.3677	347.00	232.9228	0.3605
224.00	187.6974	0.3748	286.00	210.7145	0.3676	348.00	233.2833	0.3603
225.00	188.0722	0.3747	287.00	211.0821	0.3674	349.00	233.6436	0.3602
226.00	188.4469	0.3746	288.00	211.4495	0.3673	350.00	234.0039	0.3601
227.00	188.8215	0.3745	289.00	211.8169	0.3672	351.00	234.3640	0.3600
228.00	189.1960	0.3743	290.00	212.1841	0.3671	352.00	234.7240	0.3599
229.00	189.5703	0.3742	291.00	212.5512	0.3670	353.00	235.0839	0.3598
230.00	189.9446	0.3741	292.00	212.9182	0.3669	354.00	235.4436	0.3596
231.00	190.3187	0.3740	293.00	213.2850	0.3667	355.00	235.8033	0.3595
232.00	190.6927	0.3739	294.00	213.6518	0.3666	356.00	236.1628	0.3594
233.00	191.0665	0.3738	295.00	214.0184	0.3665	357.00	236.5222	0.3593
234.00	191.4403	0.3736	296.00	214.3849	0.3664	358.00	236.8815	0.3592
235.00	191.8139	0.3735	297.00	214.7513	0.3663	359.00	237.2407	0.3591
236.00	192.1875	0.3734	298.00	215.1176	0.3662	360.00	237.5998	0.3589
237.00	192.5609	0.3733	299.00	215.4838	0.3660	361.00	237.9587	0.3588

°C	Resistance	dr/dT	°C	Resistance	dr/dT	°C	Resistance	dr/dT
362.00	238.3175	0.3587	424.00	260.3369	0.3515	486.00	281.9037	0.3441
363.00	238.6763	0.3586	425.00	260.6884	0.3513	487.00	282.2478	0.3440
364.00	239.0348	0.3585	426.00	261.0397	0.3512	488.00	282.5918	0.3439
365.00	239.3933	0.3584	427.00	261.3909	0.3511	489.00	282.9357	0.3437
366.00	239.7517	0.3582	428.00	261.7420	0.3510	490.00	283.2794	0.3436
367.00	240.1099	0.3581	429.00	262.0930	0.3509	491.00	283.6230	0.3435
368.00	240.4681	0.3580	430.00	262.4439	0.3508	492.00	283.9665	0.3434
369.00	240.8261	0.3579	431.00	262.7946	0.3506	493.00	284.3099	0.3433
370.00	241.1840	0.3578	432.00	263.1453	0.3505	494.00	284.6532	0.3431
371.00	241.5418	0.3577	433.00	263.4958	0.3504	495.00	284.9963	0.3430
372.00	241.8994	0.3575	434.00	263.8462	0.3503	496.00	285.3394	0.3429
373.00	242.2570	0.3574	435.00	264.1965	0.3502	497.00	285.6823	0.3428
374.00	242.6144	0.3573	436.00	264.5466	0.3500	498.00	286.0251	0.3427
375.00	242.9717	0.3572	437.00	264.8967	0.3499	499.00	286.3677	0.3425
376.00	243.3289	0.3571	438.00	265.2466	0.3498	500.00	286.7103	0.3424
377.00	243.6860	0.3570	439.00	265.5964	0.3497	501.00	287.0527	0.3423
378.00	244.0430	0.3568	440.00	265.9461	0.3496	502.00	287.3950	0.3422
379.00	244.3998	0.3567	441.00	266.2957	0.3495	503.00	287.7372	0.3421
380.00	244.7566	0.3566	442.00	266.6451	0.3493	504.00	288.0793	0.3419
381.00	245.1132	0.3565	443.00	266.9945	0.3492	505.00	288.4212	0.3418
382.00	245.4697	0.3564	444.00	267.3437	0.3491	506.00	288.7630	0.3417
383.00	245.8261	0.3563	445.00	267.6928	0.3490	507.00	289.1047	0.3416
384.00	246.1823	0.3561	446.00	268.0418	0.3489	508.00	289.4463	0.3415
385.00	246.5385	0.3560	447.00	268.3906	0.3487	509.00	289.7878	0.3413
386.00	246.8945	0.3559	448.00	268.7394	0.3486	510.00	290.1291	0.3412
387.00	247.2504	0.3558	449.00	269.0880	0.3485	511.00	290.4704	0.3411
388.00	247.6062	0.3557	450.00	269.4365	0.3484	512.00	290.8115	0.3410
389.00	247.9619	0.3556	451.00	269.7849	0.3483	513.00	291.1525	0.3409
390.00	248.3175	0.3554	452.00	270.1332	0.3482	514.00	291.4933	0.3407
391.00	248.6729	0.3553	453.00	270.4813	0.3480	515.00	291.8341	0.3406
392.00	249.0282	0.3552	454.00	270.8294	0.3479	516.00	292.1747	0.3405
393.00	249.3834	0.3551	455.00	271.1773	0.3478	517.00	292.5152	0.3404
394.00	249.7385	0.3550	456.00	271.5251	0.3477	518.00	292.8556	0.3403
395.00	250.0935	0.3549	457.00	271.8728	0.3476	519.00	293.1958	0.3401
396.00	250.4484	0.3547	458.00	272.2203	0.3474	520.00	293.5360	0.3400
397.00	250.8031	0.3546	459.00	272.5678	0.3473	521.00	293.8760	0.3399
398.00	251.1577	0.3545	460.00	272.9151	0.3472	522.00	294.2159	0.3398
399.00	251.5123	0.3544	461.00	273.2623	0.3471	523.00	294.5556	0.3397
400.00	251.8667	0.3543	462.00	273.6094	0.3470	524.00	294.8953	0.3395
401.00	252.2209	0.3542	463.00	273.9563	0.3468	525.00	295.2348	0.3394
402.00	252.5751	0.3540	464.00	274.3032	0.3467	526.00	295.5742	0.3393
403.00	252.9291	0.3539	465.00	274.6499	0.3466	527.00	295.9135	0.3392
404.00	253.2831	0.3538	466.00	274.9965	0.3465	528.00	296.2527	0.3390
405.00	253.6369	0.3537	467.00	275.3430	0.3464	529.00	296.5918	0.3389
406.00	253.9906	0.3536	468.00	275.6894	0.3463	530.00	296.9307	0.3388
407.00	254.3441	0.3535	469.00	276.0356	0.3461	531.00	297.2695	0.3387
408.00	254.6976	0.3533	470.00	276.3818	0.3460	532.00	297.6082	0.3386
409.00	255.0509	0.3532	471.00	276.7278	0.3459	533.00	297.9467	0.3384
410.00	255.4041	0.3531	472.00	277.0737	0.3458	534.00	298.2852	0.3383
411.00	255.7572	0.3530	473.00	277.4195	0.3457	535.00	298.6235	0.3382
412.00	256.1102	0.3529	474.00	277.7651	0.3455	536.00	298.9617	0.3381
413.00	256.4631	0.3528	475.00	278.1107	0.3454	537.00	299.2998	0.3380
414.00	256.8159	0.3526	476.00	278.4561	0.3453	538.00	299.6377	0.3378
415.00	257.1685	0.3525	477.00	278.8014	0.3452	539.00	299.9756	0.3377
416.00	257.5210	0.3524	478.00	279.1466	0.3451	540.00	300.3133	0.3376
417.00	257.8734	0.3523	479.00	279.4916	0.3449	541.00	300.6509	0.3375
418.00	258.2257	0.3522	480.00	279.8366	0.3448	542.00	300.9884	0.3373
419.00	258.5778	0.3520	481.00	280.1814	0.3447	543.00	301.3257	0.3372
420.00	258.9299	0.3519	482.00	280.5261	0.3446	544.00	301.6629	0.3371
421.00	259.2818	0.3518	483.00	280.8707	0.3445	545.00	302.0000	0.3370
422.00	259.6336	0.3517	484.00	281.2151	0.3443	546.00	302.3370	0.3369
423.00	259.9853	0.3516	485.00	281.5595	0.3442	547.00	302.6739	0.3367

°C	Resistance	dr/dT	°C	Resistance	dr/dT
548.00	303.0106	0.3366	610.00	323.6491	0.3290
549.00	303.3472	0.3365	611.00	323.9781	0.3289
550.00	303.6837	0.3364	612.00	324.3069	0.3287
551.00	304.0201	0.3363	613.00	324.6357	0.3286
552.00	304.3564	0.3361	614.00	324.9643	0.3285
553.00	304.6925	0.3360	615.00	325.2928	0.3284
554.00	305.0285	0.3359	616.00	325.6212	0.3283
555.00	305.3644	0.3358	617.00	325.9494	0.3281
556.00	305.7002	0.3356	618.00	326.2776	0.3280
557.00	306.0358	0.3355	619.00	326.6056	0.3279
558.00	306.3713	0.3354	620.00	326.9334	0.3278
559.00	306.7067	0.3353	621.00	327.2612	0.3276
560.00	307.0420	0.3352	622.00	327.5888	0.3275
561.00	307.3771	0.3350	623.00	327.9163	0.3274
562.00	307.7122	0.3349	624.00	328.2437	0.3273
563.00	308.0471	0.3348	625.00	328.5710	0.3271
564.00	308.3819	0.3347	626.00	328.8981	0.3270
565.00	308.7165	0.3345	627.00	329.2251	0.3269
566.00	309.0511	0.3344	628.00	329.5520	0.3268
567.00	309.3855	0.3343	629.00	329.8787	0.3266
568.00	309.7198	0.3342	630.00	330.2054	0.3265
569.00	310.0540	0.3341	631.00	330.5319	0.3264
570.00	310.3880	0.3339	632.00	330.8583	0.3263
571.00	310.7219	0.3338	633.00	331.1845	0.3261
572.00	311.0557	0.3337	634.00	331.5107	0.3260
573.00	311.3894	0.3336	635.00	331.8367	0.3259
574.00	311.7230	0.3334	636.00	332.1626	0.3258
575.00	312.0564	0.3333	637.00	332.4883	0.3256
576.00	312.3897	0.3332	638.00	332.8140	0.3255
577.00	312.7229	0.3331	639.00	333.1395	0.3254
578.00	313.0560	0.3329	640.00	333.4649	0.3253
579.00	313.3889	0.3328	641.00	333.7901	0.3251
580.00	313.7218	0.3327	642.00	334.1153	0.3250
581.00	314.0544	0.3326	643.00	334.4403	0.3249
582.00	314.3870	0.3325	644.00	334.7652	0.3248
583.00	314.7195	0.3323	645.00	335.0900	0.3246
584.00	315.0518	0.3322	646.00	335.4146	0.3245
585.00	315.3840	0.3321	647.00	335.7391	0.3244
586.00	315.7161	0.3320	648.00	336.0635	0.3243
587.00	316.0481	0.3318	649.00	336.3878	0.3241
588.00	316.3799	0.3317	650.00	336.7119	0.3240
589.00	316.7116	0.3316	651.00	337.0359	0.3239
590.00	317.0432	0.3315	652.00	337.3598	0.3238
591.00	317.3747	0.3313	653.00	337.6836	0.3236
592.00	317.7060	0.3312	654.00	338.0072	0.3235
593.00	318.0372	0.3311	655.00	338.3308	0.3234
594.00	318.3683	0.3310	656.00	338.6542	0.3233
595.00	318.6993	0.3308	657.00	338.9774	0.3231
596.00	319.0302	0.3307	658.00	339.3006	0.3230
597.00	319.3609	0.3306	659.00	339.6236	0.3229
598.00	319.6915	0.3305	660.00	339.9465	0.3228
599.00	320.0220	0.3304	661.00	340.2693	0.3226
600.00	320.3523	0.3302			
601.00	320.6825	0.3301			
602.00	321.0127	0.3300			
603.00	321.3426	0.3299			
604.00	321.6725	0.3297			
605.00	322.0022	0.3296			
606.00	322.3319	0.3295			
607.00	322.6613	0.3294			
608.00	322.9907	0.3292			
609.00	323.3200	0.3291			