

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

**PO Number:** 4514



**Certificate/SO Number:** 15-F0Q4I-20-1 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:** Jun 17, 2024  
**Calibration Date:** Jun 14, 2024  
**Due Date:** Jun 14, 2026

**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 = 100.74192  
a4 = -1.6800754 E-04  
b4 = -3.9657513 E-06  
a7 = -1.4429966 E-04  
b7 = -5.5886343 E-05  
c7 = 9.0727998 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	13-Feb-24	31-Aug-24	CAL291276	AF/AL
M1970	Hart Scientific/Fluke	5947	Fixed Point Cell, Aluminum (Al)	25-Jan-21	31-Jan-51	Lot#:M53531-A	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
M4500	Hart Scientific/Fluke	5699	SPRT	5-Sep-23	30-Sep-24	C3919038	AF/AL
M5000	Hart Scientific/Fluke	1590	Super-Thermometer II	26-Mar-24	31-Mar-25	CAL393415	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
70.14°F /21.19°C	42.20%	M1244	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

**Calibrated By:**  
 **Electronically Signed By:**  
Marc Rhoades

**Reviewed By:**  
 **Electronically Signed By:**  
Sherry Caldarelli for

**Unit Barcode:**



901B0078175

Marc Rhoades Jun 14, 2024  
Calibration Technician 12:31:59 -04:00

Derek Atkinson Jun 17, 2024  
Lab Manager 11:23:33 -04:00

**Date Received:** June 05, 2024  
**Service Level :** R9

## Supplemental Report for 15-F00Q4I-20-1 Calibration Lab Data

INTERNATIONAL TEMPERATURE SCALE OF 1990  
Secondary Standard PRT Probe

Model : Hart 5626-15-S  
Serial : 0411  
Calibration Date : 14 June 2024  
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	-195.9321	18.88218	2.5 mK
n/a	-80.0000	-80.0035	68.18500	2.0 mK
Hg TP	-38.8344	-38.8312	85.04467	1.4 mK
TPW	0.0100	0.0100	100.74192	0.6 mK
In FP	156.5985	156.5985	162.16360	1.9 mK
Sn FP	231.9280	231.9280	190.66747	2.1 mK
Zn FP	419.5270	419.5270	258.76447	3.5 mK
Al FP	660.3230	660.3230	340.05155	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 100.74344 Ohms.

### *ITS-90 Coefficients:*

RTPW = 100.74192  
a4 = -1.6800754 E-04  
b4 = -3.9657513 E-06  
a7 = -1.4429966 E-04  
b7 = -5.5886343 E-05  
c7 = 9.0727998 E-06

-196.00	18.85259320	0.43582	-134.00	45.63758197	0.42339	-72.00	71.48193216	0.41122
-195.00	19.28841335	0.43621	-133.00	46.06097604	0.42313	-71.00	71.89315250	0.41107
-194.00	19.72462040	0.43653	-132.00	46.48410904	0.42287	-70.00	72.30422062	0.41092
-193.00	20.16115245	0.43680	-131.00	46.90698375	0.42262	-69.00	72.71513733	0.41077
-192.00	20.59795212	0.43701	-130.00	47.32960299	0.42237	-68.00	73.12590345	0.41062
-191.00	21.03496626	0.43718	-129.00	47.75196951	0.42212	-67.00	73.53651978	0.41047
-190.00	21.47214568	0.43730	-128.00	48.17408608	0.42187	-66.00	73.94698710	0.41032
-189.00	21.90944491	0.43738	-127.00	48.59595541	0.42162	-65.00	74.35730616	0.41017
-188.00	22.34682196	0.43742	-126.00	49.01758022	0.42138	-64.00	74.76747773	0.41002
-187.00	22.78423813	0.43742	-125.00	49.43896315	0.42114	-63.00	75.17750254	0.40988
-186.00	23.22165774	0.43739	-124.00	49.86010685	0.42091	-62.00	75.58738131	0.40973
-185.00	23.65904798	0.43733	-123.00	50.28101391	0.42067	-61.00	75.99711476	0.40959
-184.00	24.09637871	0.43724	-122.00	50.70168690	0.42044	-60.00	76.40670358	0.40944
-183.00	24.53362227	0.43713	-121.00	51.12212836	0.42021	-59.00	76.81614847	0.40930
-182.00	24.97075333	0.43700	-120.00	51.54234076	0.41999	-58.00	77.22545011	0.40916
-181.00	25.40774873	0.43684	-119.00	51.96232656	0.41976	-57.00	77.63460914	0.40902
-180.00	25.84458732	0.43666	-118.00	52.38208818	0.41954	-56.00	78.04362625	0.40888
-179.00	26.28124985	0.43647	-117.00	52.80162797	0.41932	-55.00	78.45250205	0.40874
-178.00	26.71771880	0.43626	-116.00	53.22094828	0.41910	-54.00	78.86123720	0.40860
-177.00	27.15397832	0.43604	-115.00	53.64005138	0.41889	-53.00	79.26983231	0.40846
-176.00	27.59001403	0.43580	-114.00	54.05893953	0.41868	-52.00	79.67828800	0.40832
-175.00	28.02581299	0.43555	-113.00	54.47761493	0.41846	-51.00	80.08660487	0.40818
-174.00	28.46136357	0.43529	-112.00	54.89607974	0.41826	-50.00	80.49478353	0.40804
-173.00	28.89665534	0.43502	-111.00	55.31433607	0.41805	-49.00	80.90282455	0.40790
-172.00	29.33167903	0.43475	-110.00	55.73238601	0.41785	-48.00	81.31072851	0.40777
-171.00	29.76642637	0.43446	-109.00	56.15023159	0.41764	-47.00	81.71849599	0.40763
-170.00	30.20089011	0.43417	-108.00	56.56787481	0.41744	-46.00	82.12612755	0.40750
-169.00	30.63506385	0.43388	-107.00	56.98531761	0.41724	-45.00	82.53362373	0.40736
-168.00	31.06894207	0.43358	-106.00	57.40256190	0.41705	-44.00	82.94098508	0.40723
-167.00	31.50251997	0.43327	-105.00	57.81966955	0.41685	-43.00	83.34821213	0.40709
-166.00	31.93579350	0.43297	-104.00	58.23646240	0.41666	-42.00	83.75530542	0.40696
-165.00	32.36875924	0.43266	-103.00	58.65312222	0.41647	-41.00	84.16226546	0.40683
-164.00	32.80141438	0.43234	-102.00	59.06959077	0.41628	-40.00	84.56909276	0.40670
-163.00	33.23375667	0.43203	-101.00	59.48586975	0.41609	-39.00	84.97578782	0.40656
-162.00	33.66578437	0.43171	-100.00	59.90196084	0.41590	-38.00	85.38235113	0.40643
-161.00	34.09749621	0.43140	-99.00	60.31786567	0.41572	-37.00	85.78878318	0.40630
-160.00	34.52889136	0.43108	-98.00	60.73358582	0.41554	-36.00	86.19508444	0.40617
-159.00	34.95996936	0.43076	-97.00	61.14912288	0.41536	-35.00	86.60125538	0.40604
-158.00	35.39073014	0.43044	-96.00	61.56447834	0.41518	-34.00	87.00729646	0.40591
-157.00	35.82117395	0.43013	-95.00	61.97965371	0.41500	-33.00	87.413320812	0.40578
-156.00	36.25130135	0.42981	-94.00	62.39465043	0.41482	-32.00	87.81899079	0.40565
-155.00	36.68111316	0.42950	-93.00	62.80946992	0.41464	-31.00	88.22464492	0.40553
-154.00	37.11061047	0.42918	-92.00	63.22411357	0.41447	-30.00	88.63017090	0.40540
-153.00	37.53979457	0.42887	-91.00	63.63858273	0.41430	-29.00	89.03556916	0.40527
-152.00	37.96866699	0.42856	-90.00	64.05287872	0.41412	-28.00	89.44084009	0.40514
-151.00	38.39722940	0.42825	-89.00	64.46700284	0.41395	-27.00	89.84598406	0.40502
-150.00	38.82548369	0.42795	-88.00	64.88095634	0.41378	-26.00	90.25100147	0.40489
-149.00	39.25343185	0.42764	-87.00	65.29474046	0.41362	-25.00	90.65589265	0.40477
-148.00	39.68107603	0.42734	-86.00	65.70835640	0.41345	-24.00	91.06065797	0.40464
-147.00	40.10841850	0.42704	-85.00	66.12180532	0.41328	-23.00	91.46529777	0.40451
-146.00	40.53546161	0.42675	-84.00	66.53508839	0.41312	-22.00	91.86981235	0.40439
-145.00	40.96220781	0.42645	-83.00	66.94820672	0.41295	-21.00	92.27420204	0.40427
-144.00	41.38865965	0.42616	-82.00	67.36116141	0.41279	-20.00	92.67846713	0.40414
-143.00	41.81481973	0.42587	-81.00	67.77395352	0.41263	-19.00	93.08260789	0.40402
-142.00	42.24069069	0.42558	-80.00	68.18658411	0.41247	-18.00	93.48662459	0.40389
-141.00	42.66627526	0.42530	-79.00	68.59905420	0.41231	-17.00	93.89051747	0.40377
-140.00	43.09157618	0.42502	-78.00	69.01136479	0.41215	-16.00	94.29428678	0.40365
-139.00	43.51659623	0.42474	-77.00	69.42331685	0.41199	-15.00	94.69793272	0.40352
-138.00	43.94133821	0.42447	-76.00	69.83551135	0.41184	-14.00	95.10145549	0.40340
-137.00	44.36580494	0.42419	-75.00	70.24734923	0.41168	-13.00	95.50485527	0.40328
-136.00	44.78999925	0.42392	-74.00	70.65903139	0.41153	-12.00	95.90813221	0.40315
-135.00	45.21392398	0.42366	-73.00	71.07055874	0.41137	-11.00	96.31128645	0.40303

-10.00	Resistance 96.71431812	dr/dT 0.40291	52.00	Resistance 121.46374860	dr/dT 0.39535	114.00	Resistance 145.74691556	dr/dT 0.38787
-9.00	97.11722730	0.40279	53.00	121.85909621	0.39523	115.00	146.13478912	0.38775
-8.00	97.52001406	0.40266	54.00	122.25432258	0.39511	116.00	146.52254279	0.38763
-7.00	97.92267846	0.40254	55.00	122.64942775	0.39498	117.00	146.91017660	0.38751
-6.00	98.32522053	0.40242	56.00	123.04441174	0.39486	118.00	147.29769057	0.38739
-5.00	98.72764026	0.40230	57.00	123.43927458	0.39474	119.00	147.68508471	0.38727
-4.00	99.12993762	0.40217	58.00	123.83401628	0.39462	120.00	148.07235906	0.38715
-3.00	99.53211258	0.40205	59.00	124.22863688	0.39450	121.00	148.45951362	0.38703
-2.00	99.93416504	0.40193	60.00	124.62313640	0.39438	122.00	148.84654842	0.38692
-1.00	100.33609489	0.40181	61.00	125.01751485	0.39426	123.00	149.23346349	0.38680
0.00	100.73790245	0.40169	62.00	125.41177227	0.39414	124.00	149.62025883	0.38668
1.00	101.13959619	0.40157	63.00	125.80590868	0.39402	125.00	150.00693448	0.38656
2.00	101.54116692	0.40145	64.00	126.19992409	0.39389	126.00	150.39349046	0.38644
3.00	101.94261466	0.40132	65.00	126.59381855	0.39377	127.00	150.77992678	0.38632
4.00	102.34393947	0.40120	66.00	126.98759205	0.39365	128.00	151.16624347	0.38620
5.00	102.74514140	0.40108	67.00	127.38124464	0.39353	129.00	151.55224055	0.38608
6.00	103.14622049	0.40096	68.00	127.77477633	0.39341	130.00	151.93851803	0.38596
7.00	103.54717679	0.40083	69.00	128.16818714	0.39329	131.00	152.32447595	0.38584
8.00	103.94801034	0.40071	70.00	128.56147710	0.39317	132.00	152.71031432	0.38572
9.00	104.34872119	0.40059	71.00	128.95464623	0.39305	133.00	153.09603316	0.38560
10.00	104.74930939	0.40047	72.00	129.34769454	0.39293	134.00	153.48163250	0.38548
11.00	105.14977497	0.40034	73.00	129.74062207	0.39281	135.00	153.86711236	0.38536
12.00	105.55011798	0.40022	74.00	130.13342884	0.39269	136.00	154.25247275	0.38524
13.00	105.95033846	0.40010	75.00	130.52611486	0.39257	137.00	154.63771370	0.38512
14.00	106.35043646	0.39998	76.00	130.91868016	0.39244	138.00	155.02283524	0.38500
15.00	106.75041200	0.39985	77.00	131.31112476	0.39232	139.00	155.40783737	0.38488
16.00	107.15026514	0.39973	78.00	131.70344868	0.39220	140.00	155.79272013	0.38476
17.00	107.54999590	0.39961	79.00	132.09565195	0.39208	141.00	156.17748353	0.38464
18.00	107.94960434	0.39949	80.00	132.48773458	0.39196	142.00	156.56212761	0.38452
19.00	108.34909048	0.39936	81.00	132.87969659	0.39184	143.00	156.94665237	0.38441
20.00	108.74845437	0.39924	82.00	133.27153801	0.39172	144.00	157.33105784	0.38429
21.00	109.14769604	0.39912	83.00	133.66325886	0.39160	145.00	157.71534404	0.38417
22.00	109.54681554	0.39900	84.00	134.05485916	0.39148	146.00	158.09951100	0.38405
23.00	109.94581288	0.39888	85.00	134.44633893	0.39136	147.00	158.48355873	0.38393
24.00	110.34468812	0.39875	86.00	134.83769819	0.39124	148.00	158.86748726	0.38381
25.00	110.74344128	0.39863	87.00	135.22893696	0.39112	149.00	159.25129661	0.38369
26.00	111.14207240	0.39851	88.00	135.62005527	0.39100	150.00	159.63498681	0.38357
27.00	111.54038152	0.39839	89.00	136.01105313	0.39088	151.00	160.01855786	0.38345
28.00	111.93896866	0.39827	90.00	136.40193056	0.39076	152.00	160.40200980	0.38333
29.00	112.33723387	0.39814	91.00	136.79268760	0.39064	153.00	160.78534265	0.38321
30.00	112.73537717	0.39802	92.00	137.18332424	0.39052	154.00	161.16855643	0.38309
31.00	113.13339859	0.39790	93.00	137.57384053	0.39040	155.00	161.55165116	0.38298
32.00	113.53129817	0.39778	94.00	137.96423647	0.39028	156.00	161.93462686	0.38286
33.00	113.92907594	0.39766	95.00	138.35451210	0.39016	157.00	162.31748355	0.38274
34.00	114.32673194	0.39753	96.00	138.74466742	0.39004	158.00	162.70022127	0.38262
35.00	114.72426618	0.39741	97.00	139.13470247	0.38991	159.00	163.08284002	0.38250
36.00	115.12167870	0.39729	98.00	139.52461725	0.38979	160.00	163.46533983	0.38238
37.00	115.51896953	0.39717	99.00	139.91441180	0.38967	161.00	163.84772073	0.38226
38.00	115.91613870	0.39705	100.00	140.30408613	0.38955	162.00	164.22998274	0.38214
39.00	116.31318624	0.39693	101.00	140.69364027	0.38943	163.00	164.61212587	0.38202
40.00	116.71011219	0.39680	102.00	141.08307423	0.38931	164.00	164.99415015	0.38191
41.00	117.10691655	0.39668	103.00	141.472338803	0.38919	165.00	165.37605560	0.38179
42.00	117.50359937	0.39656	104.00	141.86158170	0.38907	166.00	165.75784225	0.38167
43.00	117.90016068	0.39644	105.00	142.25065525	0.38895	167.00	166.13951012	0.38155
44.00	118.29660049	0.39632	106.00	142.63960872	0.38883	168.00	166.52105922	0.38143
45.00	118.69291885	0.39620	107.00	143.02844211	0.38871	169.00	166.90248958	0.38131
46.00	119.08911576	0.39608	108.00	143.41715545	0.38859	170.00	167.28380123	0.38119
47.00	119.48519127	0.39595	109.00	143.80574875	0.38847	171.00	167.66499419	0.38107
48.00	119.88114540	0.39583	110.00	144.19422205	0.38835	172.00	168.04606847	0.38096
49.00	120.27697817	0.39571	111.00	144.58257536	0.38823	173.00	168.42702410	0.38084
50.00	120.67268961	0.39559	112.00	144.97080870	0.38811	174.00	168.80786110	0.38072
51.00	121.06827975	0.39547	113.00	145.35892209	0.38799	175.00	169.18857950	0.38060



°C	Resistance	dr/dT	°C	Resistance	dr/dT	°C	Resistance	dr/dT
176.00	169.56917931	0.38048	238.00	192.93568299	0.37317	300.00	215.85124874	0.36593
177.00	169.94966056	0.38036	239.00	193.30885546	0.37306	301.00	216.21717957	0.36581
178.00	170.33002328	0.38024	240.00	193.68191067	0.37294	302.00	216.58299394	0.36570
179.00	170.71026748	0.38013	241.00	194.05484865	0.37282	303.00	216.94869185	0.36558
180.00	171.09039318	0.38001	242.00	194.42766942	0.37270	304.00	217.31427331	0.36547
181.00	171.47040041	0.37989	243.00	194.80037299	0.37259	305.00	217.67973834	0.36535
182.00	171.85028919	0.37977	244.00	195.17295939	0.37247	306.00	218.04508692	0.36523
183.00	172.23005954	0.37965	245.00	195.54542862	0.37235	307.00	218.41031907	0.36512
184.00	172.60971149	0.37953	246.00	195.91778070	0.37223	308.00	218.77543480	0.36500
185.00	172.98924505	0.37942	247.00	196.29001566	0.37212	309.00	219.14043411	0.36488
186.00	173.36866025	0.37930	248.00	196.66213351	0.37200	310.00	219.50531699	0.36477
187.00	173.74795711	0.37918	249.00	197.03413427	0.37188	311.00	219.87008347	0.36465
188.00	174.12713565	0.37906	250.00	197.40601795	0.37177	312.00	220.23473353	0.36453
189.00	174.50619590	0.37894	251.00	197.77778457	0.37165	313.00	220.59926719	0.36442
190.00	174.88513788	0.37882	252.00	198.14943414	0.37153	314.00	220.96368445	0.36430
191.00	175.26396160	0.37871	253.00	198.52096669	0.37142	315.00	221.32798531	0.36418
192.00	175.64226710	0.37859	254.00	198.89288223	0.37130	316.00	221.69216977	0.36407
193.00	176.02125438	0.37847	255.00	199.26368077	0.37118	317.00	222.05623784	0.36395
194.00	176.39972348	0.37835	256.00	199.63488233	0.37106	318.00	222.42018952	0.36384
195.00	176.77807442	0.37823	257.00	200.00592693	0.37095	319.00	222.78402481	0.36372
196.00	177.15630722	0.37811	258.00	200.37687458	0.37083	320.00	223.14774371	0.36360
197.00	177.53442189	0.37800	259.00	200.74770529	0.37071	321.00	223.51134623	0.36349
198.00	177.91241847	0.37788	260.00	201.11841909	0.37060	322.00	223.87483237	0.36337
199.00	178.29029697	0.37776	261.00	201.48901599	0.37048	323.00	224.23820212	0.36325
200.00	178.66805741	0.37764	262.00	201.85949600	0.37036	324.00	224.60145549	0.36314
201.00	179.04569982	0.37752	263.00	202.22985913	0.37025	325.00	224.96459248	0.36302
202.00	179.42322422	0.37741	264.00	202.60010540	0.37013	326.00	225.32761309	0.36290
203.00	179.80063063	0.37729	265.00	202.97023483	0.37001	327.00	225.69051732	0.36279
204.00	180.17791907	0.37717	266.00	203.34024743	0.36990	328.00	226.05330517	0.36267
205.00	180.55508956	0.37705	267.00	203.71014321	0.36978	329.00	226.41597664	0.36256
206.00	180.93214213	0.37693	268.00	204.07992219	0.36966	330.00	226.77853173	0.36244
207.00	181.30907679	0.37682	269.00	204.44958437	0.36955	331.00	227.14097044	0.36232
208.00	181.68589357	0.37670	270.00	204.81912978	0.36943	332.00	227.50329276	0.36221
209.00	182.06259248	0.37658	271.00	205.18855843	0.36931	333.00	227.86549870	0.36209
210.00	182.43917355	0.37646	272.00	205.55787032	0.36920	334.00	228.22758825	0.36197
211.00	182.81563680	0.37635	273.00	205.92706548	0.36908	335.00	228.58956141	0.36186
212.00	183.19198226	0.37623	274.00	206.29614391	0.36896	336.00	228.95141818	0.36174
213.00	183.56820993	0.37611	275.00	206.66510563	0.36885	337.00	229.31315856	0.36162
214.00	183.94431985	0.37599	276.00	207.03395065	0.36873	338.00	229.67478254	0.36151
215.00	184.32031202	0.37587	277.00	207.40267898	0.36861	339.00	230.03629013	0.36139
216.00	184.69618649	0.37576	278.00	207.77129063	0.36849	340.00	230.39768131	0.36127
217.00	185.07194325	0.37564	279.00	208.13978562	0.36838	341.00	230.75895608	0.36116
218.00	185.44758234	0.37552	280.00	208.50816395	0.36826	342.00	231.12011445	0.36104
219.00	185.82310378	0.37540	281.00	208.87642564	0.36815	343.00	231.48115639	0.36093
220.00	186.19850758	0.37529	282.00	209.24457070	0.36803	344.00	231.84208193	0.36081
221.00	186.57379376	0.37517	283.00	209.61259913	0.36791	345.00	232.20289103	0.36069
222.00	186.94896235	0.37505	284.00	209.98051096	0.36780	346.00	232.56358371	0.36058
223.00	187.32401337	0.37493	285.00	210.34830618	0.36768	347.00	232.92415996	0.36046
224.00	187.69894683	0.37482	286.00	210.71598481	0.36756	348.00	233.28461977	0.36034
225.00	188.07376276	0.37470	287.00	211.08354686	0.36745	349.00	233.64496313	0.36023
226.00	188.44846117	0.37458	288.00	211.45099234	0.36733	350.00	234.00519004	0.36011
227.00	188.82304209	0.37446	289.00	211.81832126	0.36721	351.00	234.36530049	0.35999
228.00	189.19750553	0.37435	290.00	212.18553363	0.36710	352.00	234.72529448	0.35988
229.00	189.57185152	0.37423	291.00	212.55252945	0.36698	353.00	235.08517200	0.35976
230.00	189.94680006	0.37411	292.00	212.91960873	0.36686	354.00	235.44493304	0.35964
231.00	190.32019119	0.37399	293.00	213.28647149	0.36675	355.00	235.80457760	0.35953
232.00	190.69418492	0.37388	294.00	213.65321774	0.36663	356.00	236.16410566	0.35941
233.00	191.06806128	0.37376	295.00	214.01984747	0.36651	357.00	236.52351722	0.35930
234.00	191.44182027	0.37364	296.00	214.38636070	0.36640	358.00	236.88281228	0.35918
235.00	191.81546191	0.37352	297.00	214.75275743	0.36628	359.00	237.24199081	0.35906
236.00	192.18898624	0.37341	298.00	215.11903768	0.36616	360.00	237.60105282	0.35895
237.00	192.56239326	0.37329	299.00	215.48520145	0.36605	361.00	237.95999830	0.35883

°C	Resistance	dr/dT	°C	Resistance	dr/dT	°C	Resistance	dr/dT
362.00	238.31882722	0.35871	424.00	260.33803750	0.35146	486.00	281.90467904	0.34410
363.00	238.67753960	0.35860	425.00	260.68949362	0.35134	487.00	282.24878234	0.34398
364.00	239.03613541	0.35848	426.00	261.04083205	0.35122	488.00	282.59276601	0.34386
365.00	239.39461464	0.35836	427.00	261.39205276	0.35110	489.00	282.93663001	0.34374
366.00	239.75297729	0.35825	428.00	261.74315573	0.35099	490.00	283.28037430	0.34362
367.00	240.11122335	0.35813	429.00	262.09414093	0.35087	491.00	283.62399886	0.34350
368.00	240.46935279	0.35801	430.00	262.44500834	0.35075	492.00	283.96750364	0.34338
369.00	240.82736562	0.35790	431.00	262.79575792	0.35063	493.00	284.31088861	0.34327
370.00	241.18526182	0.35778	432.00	263.14638966	0.35051	494.00	284.65415373	0.34315
371.00	241.54304138	0.35766	433.00	263.49690353	0.35040	495.00	284.99729896	0.34303
372.00	241.90070429	0.35755	434.00	263.84729949	0.35028	496.00	285.34032428	0.34291
373.00	242.25825053	0.35743	435.00	264.19757752	0.35016	497.00	285.68322964	0.34279
374.00	242.61568009	0.35731	436.00	264.54773760	0.35004	498.00	286.02601500	0.34267
375.00	242.97299296	0.35720	437.00	264.89777969	0.34992	499.00	286.36868034	0.34255
376.00	243.33018913	0.35708	438.00	265.24770376	0.34981	500.00	286.71122561	0.34243
377.00	243.68726858	0.35696	439.00	265.59750980	0.34969	501.00	287.05365078	0.34231
378.00	244.04423130	0.35685	440.00	265.94719776	0.34957	502.00	287.39595581	0.34218
379.00	244.40107727	0.35673	441.00	266.29676762	0.34945	503.00	287.73814066	0.34206
380.00	244.75780648	0.35661	442.00	266.64621936	0.34933	504.00	288.08020530	0.34194
381.00	245.11441892	0.35650	443.00	266.99555294	0.34922	505.00	288.42214969	0.34182
382.00	245.47091457	0.35638	444.00	267.34476833	0.34910	506.00	288.76397379	0.34170
383.00	245.82729342	0.35626	445.00	267.69386551	0.34898	507.00	289.10567757	0.34158
384.00	246.18355545	0.35615	446.00	268.04284444	0.34886	508.00	289.44726099	0.34146
385.00	246.53970064	0.35603	447.00	268.39170510	0.34874	509.00	289.78872401	0.34134
386.00	246.89572898	0.35591	448.00	268.74044745	0.34862	510.00	290.13006660	0.34122
387.00	247.25164046	0.35579	449.00	269.08907147	0.34851	511.00	290.47128872	0.34110
388.00	247.60743505	0.35568	450.00	269.43757712	0.34839	512.00	290.81239033	0.34098
389.00	247.96311275	0.35556	451.00	269.78596437	0.34827	513.00	291.15337139	0.34086
390.00	248.31867352	0.35544	452.00	270.13423320	0.34815	514.00	291.49423187	0.34074
391.00	248.67411737	0.35533	453.00	270.48238356	0.34803	515.00	291.83497173	0.34062
392.00	249.02944426	0.35521	454.00	270.83041544	0.34791	516.00	292.17559093	0.34050
393.00	249.38465419	0.35509	455.00	271.17832880	0.34779	517.00	292.51608944	0.34038
394.00	249.73974712	0.35498	456.00	271.52612361	0.34768	518.00	292.85646722	0.34026
395.00	250.09472306	0.35486	457.00	271.87379983	0.34756	519.00	293.19672423	0.34014
396.00	250.44958197	0.35474	458.00	272.22135744	0.34744	520.00	293.53686043	0.34002
397.00	250.80432384	0.35462	459.00	272.56879640	0.34732	521.00	293.87687579	0.33989
398.00	251.15894865	0.35451	460.00	272.91611668	0.34720	522.00	294.21677027	0.33977
399.00	251.51345638	0.35439	461.00	273.26331825	0.34708	523.00	294.55654383	0.33965
400.00	251.86784701	0.35427	462.00	273.61040107	0.34696	524.00	294.89619643	0.33953
401.00	252.22212052	0.35416	463.00	273.95736512	0.34685	525.00	295.23572805	0.33941
402.00	252.57627689	0.35404	464.00	274.30421036	0.34673	526.00	295.575133863	0.33929
403.00	252.93031610	0.35392	465.00	274.65093676	0.34661	527.00	295.91442815	0.33917
404.00	253.28423814	0.35380	466.00	274.99754428	0.34649	528.00	296.25359656	0.33905
405.00	253.63804297	0.35369	467.00	275.34403290	0.34637	529.00	296.59264383	0.33893
406.00	253.99173058	0.35357	468.00	275.69040257	0.34625	530.00	296.93156992	0.33880
407.00	254.34530095	0.35345	469.00	276.03665327	0.34613	531.00	297.27037480	0.33868
408.00	254.69875406	0.35334	470.00	276.38278496	0.34601	532.00	297.60905842	0.33856
409.00	255.05208988	0.35322	471.00	276.72879761	0.34589	533.00	297.94762075	0.33844
410.00	255.40530840	0.35310	472.00	277.07469118	0.34577	534.00	298.28606176	0.33832
411.00	255.75840958	0.35298	473.00	277.42046565	0.34566	535.00	298.62438140	0.33820
412.00	256.11139341	0.35287	474.00	277.76612097	0.34554	536.00	298.96257963	0.33808
413.00	256.46425987	0.35275	475.00	278.11165711	0.34542	537.00	299.30065643	0.33796
414.00	256.81700893	0.35263	476.00	278.45707404	0.34530	538.00	299.63861176	0.33783
415.00	257.16964057	0.35251	477.00	278.80237172	0.34518	539.00	299.97644557	0.33771
416.00	257.52215477	0.35240	478.00	279.14755012	0.34506	540.00	300.31415783	0.33759
417.00	257.87445510	0.35228	479.00	279.49260921	0.34494	541.00	300.65174851	0.33747
418.00	258.22683074	0.35216	480.00	279.83754895	0.34482	542.00	300.989211756	0.33735
419.00	258.57899247	0.35204	481.00	280.18269930	0.34470	543.00	301.32656496	0.33723
420.00	258.93103665	0.35193	482.00	280.52707023	0.34458	544.00	301.66379065	0.33710
421.00	259.28296327	0.35181	483.00	280.87165170	0.34446	545.00	302.00089461	0.33698
422.00	259.63477230	0.35169	484.00	281.21611369	0.34434	546.00	302.33787681	0.33686
423.00	259.98646372	0.35157	485.00	281.56045615	0.34422	547.00	302.67473719	0.33674

°C	Resistance	dr/dT	°C	Resistance	dr/dT
548.00	303.01147574	0.33662	610.00	323.64985415	0.32899
549.00	303.34809240	0.33649	611.00	323.97884781	0.32887
550.00	303.68458715	0.33637	612.00	324.30771755	0.32875
551.00	304.02095994	0.33625	613.00	324.63646334	0.32862
552.00	304.35721075	0.33613	614.00	324.96508516	0.32850
553.00	304.69333953	0.33601	615.00	325.29358298	0.32837
554.00	305.02934626	0.33588	616.00	325.62195677	0.32825
555.00	305.36523088	0.33576	617.00	325.95020651	0.32813
556.00	305.70099338	0.33564	618.00	326.27833218	0.32800
557.00	306.03663370	0.33552	619.00	326.60633374	0.32788
558.00	306.37215183	0.33540	620.00	326.93421118	0.32775
559.00	306.70754771	0.33527	621.00	327.26196446	0.32763
560.00	307.04282132	0.33515	622.00	327.58959357	0.32750
561.00	307.37797262	0.33503	623.00	327.91709848	0.32738
562.00	307.71300157	0.33491	624.00	328.24447916	0.32726
563.00	308.04790815	0.33478	625.00	328.57173560	0.32713
564.00	308.38269230	0.33466	626.00	328.89886776	0.32701
565.00	308.71735401	0.33454	627.00	329.22587563	0.32688
566.00	309.05189323	0.33442	628.00	329.55275919	0.32676
567.00	309.38630993	0.33429	629.00	329.87951840	0.32663
568.00	309.72060408	0.33417	630.00	330.20615325	0.32651
569.00	310.05477564	0.33405	631.00	330.53266372	0.32639
570.00	310.38882457	0.33393	632.00	330.85904978	0.32626
571.00	310.72275084	0.33380	633.00	331.18531142	0.32614
572.00	311.05655443	0.33368	634.00	331.51144860	0.32601
573.00	311.39023528	0.33356	635.00	331.83746132	0.32589
574.00	311.72379338	0.33344	636.00	332.16334954	0.32576
575.00	312.05722869	0.33331	637.00	332.48911326	0.32564
576.00	312.39054116	0.33319	638.00	332.81475244	0.32551
577.00	312.72373078	0.33307	639.00	333.14026707	0.32539
578.00	313.05679750	0.33294	640.00	333.465565713	0.32527
579.00	313.38974130	0.33282	641.00	333.79092260	0.32514
580.00	313.72262614	0.33270	642.00	334.11606347	0.32502
581.00	314.05525998	0.33257	643.00	334.44107970	0.32489
582.00	314.38783480	0.33245	644.00	334.76597129	0.32477
583.00	314.72028656	0.33233	645.00	335.09073822	0.32464
584.00	315.05261523	0.33221	646.00	335.41538046	0.32452
585.00	315.38482077	0.33208	647.00	335.73989801	0.32439
586.00	315.71690317	0.33196	648.00	336.06429084	0.32427
587.00	316.04886237	0.33184	649.00	336.38855894	0.32414
588.00	316.38069836	0.33171	650.00	336.71270228	0.32402
589.00	316.71241110	0.33159	651.00	337.03672086	0.32389
590.00	317.04400056	0.33147	652.00	337.36061466	0.32377
591.00	317.37546670	0.33134	653.00	337.68438366	0.32364
592.00	317.70680951	0.33122	654.00	338.00802785	0.32352
593.00	318.03802894	0.33110	655.00	338.33154721	0.32339
594.00	318.36912496	0.33097	656.00	338.65494172	0.32327
595.00	318.70009755	0.33085	657.00	338.97821138	0.32314
596.00	319.03094668	0.33073	658.00	339.30135617	0.32302
597.00	319.36167231	0.33060	659.00	339.62437607	0.32290
598.00	319.69227441	0.33048	660.00	339.94727108	0.32277
599.00	320.02275296	0.33035	661.00	340.27004117	0.32265
600.00	320.35310793	0.33023			
601.00	320.68333928	0.33011			
602.00	321.01344699	0.32998			
603.00	321.34343103	0.32986			
604.00	321.67329137	0.32974			
605.00	322.00302799	0.32961			
606.00	322.33264084	0.32949			
607.00	322.66212991	0.32937			
608.00	322.99149517	0.32924			
609.00	323.32073659	0.32912			