

S O U T H W E S T R E S E A R C H I N S T I T U T E

Department of Quality Assurance
Calibration Laboratory

CERTIFICATE OF CALIBRATION

Issued to: DIV20 B57 NARASI SRIDHAR

Device No: 2469

Manufacturer: FISHER

Model: 14-983-10B

Nomenclature: THERMOMETER

Serial Number: 183303

SwRI No: NONE

Cal interval 6 Mo.

Remarks

Accuracy: +/- 1DEG.C

Procedure: SWRI

ENVIRONMENT

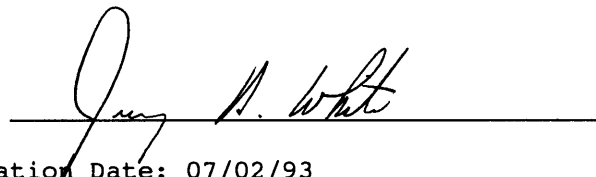
Temperature: 0 Humidity: 0 Location: SWRI BLDG. 145

CONCLUSION

Tolerance/Remarks: Received into the system, introduced or reactivated

Calibration was in accord with requirements of MIL-STD-45662A. Measurements are traceable to the National Institute of Standards and Technology. Inspection and test data are on file and available for inspection.

Signed



Calibration Date: 07/02/93

Cal interval: 6 Months

Record Number: 00011666

Next Calibration Due: 01/02/94

S O U T H W E S T R E S E A R C H I N S T I T U T E

Department of Quality Assurance
Calibration Laboratory

Device Serial No: 183303

Calibration Date: 07/02/93

STANDARDS

Standard No: 219 Manufacturer: AZONIX

Model: A1011

Nomenclature: RTD THERMOMETER

Serial No: T1587-2078

Cal.Due: 02/12/94

Cal.Rec.No: 00010541

Standard No: 328 Manufacturer: AZONIX

Model: A12001

Nomenclature: RTD TEMPERATURE PROBE

Serial No: 351477

Cal.Due: 02/12/94

Cal.Rec.No: 00010540

S O U T H W E S T R E S E A R C H I N S T I T U T E

Department of Quality Assurance
Calibration Laboratory

CERTIFICATE OF CALIBRATION

Issued to: DIV20 B57 NARASI SRIDHAR

Device No: 2469

Manufacturer: FISHER

Model: 14-983-10B

Nomenclature: THERMOMETER

Serial Number: 183303

SwRI No: NONE

Cal interval 6 Mo.

Remarks

Accuracy: +/- 1DEG.C

Procedure: SWRI

ENVIRONMENT

Temperature:

Humidity:

Location: SWRI DIV04 BLDG. 145

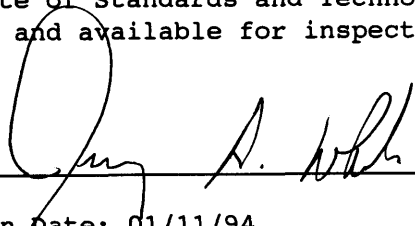
CONCLUSION

Tolerance/Remarks: Received in tolerance, no adjustments made

Room temperature.

Calibration was in accord with requirements of MIL-STD-45662A. Measurements are traceable to the National Institute of Standards and Technology. Inspection and test data are on file and available for inspection.

Signed



Calibration Date: 01/11/94

Cal interval: 6 Months

Record Number: 00013053

Next Calibration Due: 07/11/94

S O U T H W E S T R E S E A R C H I N S T I T U T E

Department of Quality Assurance
Calibration Laboratory

Device Serial No: 183303

Calibration Date: 01/11/94

STANDARDS

Standard No: 219	Manufacturer: AZONIX	Model: A1011
Nomenclature: RTD THERMOMETER		
Serial No: T1587-2078	Cal.Due: 02/12/94	Cal.Rec.No: 00010541

Standard No: 328	Manufacturer: AZONIX	Model: A12001
Nomenclature: RTD TEMPERATURE PROBE		
Serial No: 351477	Cal.Due: 02/12/94	Cal.Rec.No: 00010540

S O U T H W E S T R E S E A R C H I N S T I T U T E

Department of Quality Assurance
Calibration Laboratory

CERTIFICATE OF CALIBRATION

Issued to: DIV20 B57 NARASI SRIDHAR

Device No: 2469

Manufacturer: FISHER

Model: 14-983-10B

Nomenclature: THERMOMETER

Serial Number: 183303

SwRI No: NONE

Cal interval 6 Mo.

Remarks

Accuracy: +/- 1DEG.C

Procedure: WI930-TH03

ENVIRONMENT

Temperature: 62 Humidity: 52 Location: SWRI DIV04 BLDG. 145

CONCLUSION

Tolerance/Remarks: Received in tolerance, no adjustments made

Calibration was in accord with requirements of MIL-STD-45662A. Measurements are traceable to the National Institute of Standards and Technology. Inspection and test data are on file and available for inspection.

Signed

Calibration Date: 07/28/94

Cal interval: 6 Months

Record Number: 00014686

Next Calibration Due: 01/28/95

S O U T H W E S T R E S E A R C H I N S T I T U T E

Department of Quality Assurance
Calibration Laboratory

Device Serial No: 183303

Calibration Date: 07/28/94

STANDARDS

Standard No: 219 Manufacturer: AZONIX

Model: A1011

Nomenclature: RTD THERMOMETER

Serial No: T1587-2078

Cal.Due: 02/22/95

Cal.Rec.No: 00013377

Standard No: 328 Manufacturer: AZONIX

Model: A12001

Nomenclature: RTD TEMPERATURE PROBE

Serial No: 351477

Cal.Due: 03/10/95

Cal.Rec.No: 00013378

SOUTHWEST RESEARCH INSTITUTE
Department of Quality Assurance
Calibration Laboratory

CERTIFICATE OF CALIBRATION
01/30/95

Issued to: NARASI SRIDHAR DIV20 ,B57
Manufacturer: FISHE
Nomenclature: THERMOMETER
Serial Number: 183303

Asset Number: 002469
Model Number: 14-983-10B

SwRI Capital Number: NONE

ENVIRONMENTAL CONDITIONS

Temperature: 73.0F

Relative Humidity: 53 %

CALIBRATION INFORMATION

Location: B145
Procedure Number: WI-9-30-TH03
Remarks:

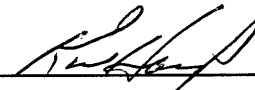
Technician: 8216
Accuracy: +/- 1DEG.C
Received IN Tolerance

Calibration was in accordance with requirements of MIL-STD-45662A.
Measurements are traceable to the National Institute of Standards and Technology. Inspection and test data are on file and available for inspection.

STANDARDS USED FOR CERTIFICATION

Asset #	Serial #	Mfg	Model #	Nomenclature	Cal Date	Int.	Cal Due
000219	T1587-2078	AZONI	A1011	RTD THERMOMETER	02/22/94	12	02/22/95
000328	351477	AZONI	A12001	RTD TEMPERATURE PROBE	03/10/94	12	03/10/95

Certified by :



Certificate#: 16276

Calibration Date: 01/30/95
Interval: 6 months
Next Calibration Due: 07/30/95

SOUTHWEST RESEARCH INSTITUTE
Department of Quality Assurance
Calibration Laboratory

CERTIFICATE OF CALIBRATION
07/28/95

Issued to: DARRELL DUNN DIV20 ,B57
Manufacturer: FISHE
Nomenclature: THERMOMETER
Serial Number: 183303
Notes:

Asset Number: 002469
Model Number: 14-983-10B

SwRI/Div. I.D. #: NONE

ENVIRONMENTAL CONDITIONS

Temperature: 74.0F

Relative Humidity: 0 %

CALIBRATION INFORMATION

Procedure Number: WI-9-30-TH03
Remarks:

Accuracy: +/- 1DEG.C
Received IN Tolerance

Calibration was in accordance with requirements of MIL-STD-45662A.
Measurements are traceable to the National Institute of Standards and Technology. Inspection and test data are on file and available for inspection.

STANDARDS USED FOR CERTIFICATION

Asset #	Serial #	Mfg	Model #	Nomenclature	Cal Date	Int.	Cal Due
000219	T1587-2078	AZONI	A1011	RTD THERMOMETER	03/06/95	12	03/06/96
000328	351477	AZONI	A12001	RTD TEMPERATURE PROBE	03/06/95	12	03/06/96

Certified by : _____

Calibration Date: 07/28/95
Interval: 6 months
Next Calibration Due: 01/28/96

Certificate#: 18130

SOUTHWEST RESEARCH INSTITUTE
Department of Quality Assurance
Calibration Laboratory

CERTIFICATE OF CALIBRATION
01/31/96

Issued to: DARRELL DUNN DIV20 ,B57
Manufacturer/Model: FISHE/14-983-10B
Nomenclature: THERMOMETER
Serial Number: 183303
Asset Number: 002469
Notes:

ENVIRONMENTAL CONDITIONS

Temperature: 63.0F

Relative Humidity: 30%

CALIBRATION INFORMATION

Procedure Number: WI-9-30-TH03
Remarks:

Accuracy: +/- 1DEG.C
Received IN Tolerance

Calibration was in accordance with requirements of MIL-STD-45662A.
Measurements are traceable to the National Institute of Standards and Technology. Inspection and test data are on file and available for inspection.

STANDARDS USED FOR CERTIFICATION

Asset #	Serial #	Mfg	Model #	Nomenclature	Cal Date	Int.	Cal Due
000219	T1587-2078	AZONI	A1011	RTD THERMOMETER	03/06/95	12	03/06/96
000328	351477	AZONI	A12001	RTD TEMPERATURE PROBE	03/06/95	12	03/06/96

Certified by : 

Certificate#: 20017

Calibration Date: 01/31/96
Interval: 6 months
Next Calibration Due: 07/31/96



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
Department of Quality Assurance
Calibration Laboratory

Certificate of Calibration

20 August 1996

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: FISHE 14-983-10B
Description: THERMOMETER
Serial Number: 183303
Asset Number: 002469

Environmental Conditions

Temperature: 80.0

Humidity: 33%

Calibration Information

Calibration was in accordance with requirements of MIL-STD-45662A and ANSI/NC SL Z540-1-1994. Measurements are traceable to the National Institute of Standards and Technology (NIST). This report may not be reproduced except in full without written approval of the originator. Inspection and test data are on file and available for inspection.

Calibration Date: 19 Aug 96

Calibration Procedure: WI-9-30-TH03

Interval: 6 months

Accuracy: +/- 1DEG.C

Next Calibration Due: 19 Feb 97

Received: In Tolerance

Remarks:

Certificate # 22379

Signed:

LAST PAGE OF REPORT
Total Pages Printed: 1



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
Department of Quality Assurance
Calibration Laboratory

Certificate of Calibration

21 February 1997

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: FISHER 14-983-10B
Description: THERMOMETER
Serial Number: 183303
Asset Number: 002469

Environmental Conditions

Temperature: 78.0 Deg. F Humidity: 37%

Calibration Information

Calibration was in accordance with requirements of MIL-STD-45662A and ANSI/NC SL Z540-1-1994. Measurements are traceable to the National Institute of Standards and Technology (NIST). This report may not be reproduced except in full without written approval of the originator. Inspection and test data are on file and available for inspection.

Calibration Date: 21 Feb 97 Calibration Procedure: WI-9-30-TH03
Interval: 6 months Accuracy: +/- 1DEG.C
Next Calibration Due: 21 Aug 97 Received: In Tolerance

Remarks:

Standards Used

Asset	MFR	Model	Description	Serial No.	Due Cal
000219	AZONI	A1011	RTD THERMOMETER	T1587-2078	12 Mar 97
000328	AZONI	A12001	RTD TEMPERATURE PROB	351477	12 Mar 97

Certificate # 24347

Signed: 



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
Department of Quality Assurance
Calibration Laboratory

Certificate of Calibration

4 September 1997

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: FISHERBRAND 14-983-10B
Description: THERMOMETER
Serial Number: 183303
Asset Number: 002469

Environmental Conditions

Temperature: 81.0 Deg. F Humidity: 34%

Calibration Information

Calibration was in accordance with requirements of MIL-STD-45662A and ANSI/NCSL Z540-1-1994. Measurements are traceable to the National Institute of Standards and Technology (NIST). This report may not be reproduced except in full without written approval of the originator. Inspection and test data are on file and available for inspection.

Calibration Date: 3 Sep 97 Calibration Procedure: WI-9-30-TH03
Interval: 6 months Accuracy: +/-1 DEG.C
Next Calibration Due: 3 Mar 98 Received: In Tolerance

Remarks:

Standards Used

Asset	MFR	Model	Description	Serial No.	Due Cal
000328	AZONIX	A12001	RTD TEMPERATURE PROB	351477	3 Apr 98
000219	AZONIX	A1011	RTD THERMOMETER	T1587-2078	24 Mar 98

Certificate # 26596

Signed:

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Total Pages Printed: 1



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6220 Culebra Road
San Antonio, TX 78238
Department of Quality Assurance
Calibration Laboratory

Certificate of Calibration

10 March 1998

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: FISHERBRAND 14-983-10B
Description: THERMOMETER
Serial Number: 183303
Asset Number: 002469

Environmental Conditions

Temperature: 66.00 Deg. F

Humidity: 26 % RH

Calibration Information

Calibration was in accordance with requirements of MIL-STD-45662A and ANSI/NCSL Z540-1-1994. Measurements are traceable to the National Institute of Standards and Technology (NIST). This report may not be reproduced except in full without written approval of the originator. Inspection and test data are on file and available for inspection.

The uncertainty of the calibration was sufficient to determine that the instrument met the manufacturer's specifications.

Calibration Date: 10 Mar 98

Calibration Procedure: WI 9-30-TH03

Interval: 6 months

Next Calibration Due: 10 Sep 98

Received: In Tolerance

Remarks:

Standards Used

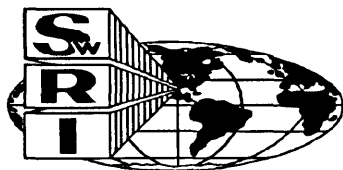
Asset	MFR	Model	Description	Serial No.	Due Cal
000219	AZONIX	A1011	RTD THERMOMETER	T1587-2078	24 Mar 98
000328	AZONIX	A12001	RTD TEMPERATURE PROBE	351477	3 Apr 98

Signed: 

Title: 

LAST PAGE OF REPORT
Total Pages Printed: 1

Certificate # 28931



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
Department of Quality Assurance
Calibration Laboratory

ACCREDITED



Certificate #
0972-01

Certificate of Calibration

19 October 1998

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: FISHERBRAND 14-983-10B
Description: THERMOMETER
Serial Number: 183303
Asset Number: 002469

Calibration Information

Calibration was in accordance with requirements of MIL-STD-45662A and ANSI/NCSL Z540-1-1994. Measurements are traceable to the National Institute of Standards and Technology (NIST). This report may not be reproduced except in full without written approval of the originator. Inspection and test data are on file and available for inspection.

This laboratory is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this calibration certificate have been determined in accordance with the laboratory's terms of accreditation unless stated otherwise in the report. The uncertainty of the calibration was sufficient to determine that the instrument met the manufacturer's specifications.

Temperature: 75.0 Deg. F

Humidity: 54 % RH

Calibration Date: 19 Oct 98

Calibration Procedure: ASTM E77-92

Interval: 6 months

Received: IN TOLERANCE

Next Calibration Due: 19 Apr 99

Remarks:

Standards Used

Asset	MFR	Model	Description	Serial No.	Due Cal
000219	AZONIX	A1011	RTD THERMOMETER	T1587-2078	16 Apr 99
000328	AZONIX	A12001	RTD TEMPERATURE PROBE	351477	27 Apr 99

Signed: 

Title: 

LAST PAGE OF REPORT
Total Pages Printed: 1

Certificate # 31644



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
(210) 522-5215
Department of Quality Assurance
Calibration Laboratory



Certificate #
0972-01

Certificate of Calibration

7 May 1999

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: FISHER SCIENTIFIC 14-983-10B
Description: THERMOMETER
Serial Number: 183303
Asset Number: 002469

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NC SL Z540-1-1994. Standards used in this calibration, described in the referenced calibration procedure with associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and is available for examination upon request. This certificate is not to be reproduced, except in full, without the written approval of the Southwest Research Institute Department of Quality Assurance Calibration Laboratory.

This laboratory is accredited by the American Association for Laboratory Accreditation (A2LA) and the results of this calibration certificate were determined in accordance with the terms of accreditation unless stated otherwise below.

The uncertainty of the calibration was sufficient to determine that the item met the manufacturer's published specifications unless stated otherwise below.

Ambient Conditions: Temperature: 76.0 Degrees Fahrenheit Humidity: 33 % RH

Calibration Date: 7 May 99 **Calibration Procedure:** T.O.33K5-4-42-1, APR97

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

Remarks:

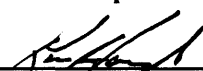
Approved by:


Jim Patterson, Supervisor of Walt Hill, Metrologist

Certificate # 34373

m:\a2la.rpt Rev date 10 Mar 99

Measurements performed by:


Ken Harp, Technician

Page 1 of 1



SOUTHWEST RESEARCH INSTITUTE™

6220 Culebra Road, P.O. Drawer 28510
Institute Quality Systems
Institute Calibration Laboratory
Phone: 210-522-5215 Fax 210-522-3692

Certificate of Calibration

Submitted By: DIV20

Address: B57

Contact: DARRELL DUNN

Manufacturer Model: FISHER SCIENTIFIC 14-983-10B

Description: THERMOMETER

Serial No: 183303

Asset No: 002469

Procedure: CL-9, 5/99

Work Order: 444051357

Date Issued: Dec 20, 2002

Calibration Date: Dec 18, 2002

****Calibration Due:** Jun 18, 2003

Calibration Location: N/A

Environment: Temp. 79.0°F Hum. 40 %RH

***As Found:** IN TOLERANCE

***As Left:** IN TOLERANCE

This certificate documents traceability to the National Institute of Standards and Technology (NIST) and the International System of Units (SI). The Laboratory quality system conforms to ISO/IEC 17025, 1999 and ANSI/NC SL Z540-1-1994 which are equivalent to relevant requirements of the ISO 9000-1994 series of standards. This certificate may not be reproduced, except in full, without the written approval of the Southwest Research Institute Calibration Laboratory. The results of this calibration relate only to the individual instrument described above. This certificate shall not be used to claim product endorsement by the American Association for Laboratory Accreditation (A2LA) or any agency of the U. S. Government.

Uncertainty evaluation includes the item under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor of $k=2$ to approximate a 95% confidence level. The calibration process provides a Test Uncertainty Ratio (TUR) of less than or equal to 25% (4:1) of the test limit unless otherwise stated in remarks or an attachment.

*The client has sole responsibility for determination of in/out of tolerance or compliance/noncompliance. An in/out of tolerance opinion is provided for your convenience based only on the Test Instrument (TI) reading(s) and limits as reported. The reported uncertainty relates only to the results at the time of calibration and does not imply any short or long term stability of the TI.

**Calibration interval is determined by the client and does not assure the instrument will remain within tolerance until this date. Any number of factors may cause the instrument to be out of tolerance before the next calibration date.

Remarks: None

Standards Used

Asset	Manufacturer	Model	Description	Cal Due
008920	HART SCIENTIFIC, INC	17660-A-120-6-W	PLATINUM RTD	Dec 31, 02
009137	HART SCIENTIFIC, INC	1575	THERMOMETER	Dec 31, 02

Approved by: Walt Hill

Metrology Group Leader

m:\Nona2\al.rpt Rev date 15, August 02

Measurements by: Vince Morales

Metrology Technician

Work Order:	444051357	Mfr.	FISHER SCEINTIFIC	Technician	V Morales
Asset No.	2469	Model	14-983-10B	Procedure	CL-9 5/99
Serial No.	183303	Type.	THERMOMETER	Cal Date.	18-Dec-02
Remarks:					

Function/Range	Test Point	TI Reading	Difference	Test Limits+/-	Uncertainty	Found/Left
Temperature	Deg C	Deg C	Deg C	Deg C	Deg C	Results
-20	-19.8	-19.5	0.3	1.0	1.2	Pass
0	0.0	0.0	0.0	1.0	1.2	Pass
40	20.0	19.9	-0.1	1.0	1.2	Pass
60	59.9	59.9	0.0	1.0	1.2	Pass
80	79.9	79.9	0.0	1.0	1.2	Pass
105	104.9	105.5	0.6	1.0	1.2	Pass



SOUTHWEST RESEARCH INSTITUTE™

6220 Culebra Road, P.O. Drawer 28510
Institute Quality Systems
Institute Calibration Laboratory
Phone: 210-522-5215 Fax 210-522-3692

Certificate of Calibration

Submitted By: DIV20

Address: B57

Contact: DARRELL DUNN

Manufacturer Model: FISHER SCIENTIFIC 14-983-10B

Description: THERMOMETER

Serial No: 183303

Asset No: 002469

Procedure: TEMPERATURE, MAY/03

Work Order: 444053953

Date Issued: Jun 6, 2003

Calibration Date: Jun 4, 2003

****Calibration Due:** Dec 4, 2003

Calibration Location: Bldg. 64

Environment: Temp. 74.0°F Hum. 50 %RH

***As Found:** IN TOLERANCE

***As Left:** IN TOLERANCE

This certificate documents traceability to the National Institute of Standards and Technology (NIST) and the International System of Units (SI). The Laboratory quality system conforms to ISO/IEC 17025, 1999 and ANSI/NCSL Z540-1-1994 which are equivalent to relevant requirements of the ISO 9000-1994 series of standards. This certificate may not be reproduced, except in full, without the written approval of the Southwest Research Institute Calibration Laboratory. The results of this calibration relate only to the individual instrument described above. This certificate shall not be used to claim product endorsement by the American Association for Laboratory Accreditation (A2LA) or any agency of the U. S. Government.

Uncertainty evaluation includes the item under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor of $k=2$ to approximate a 95% confidence level. The calibration process provides a Test Uncertainty Ratio (TUR) of less than or equal to 25% (4:1) of the test limit unless otherwise stated in remarks or an attachment.

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**Calibration interval is determined by the client and does not assure the instrument will remain within tolerance until this date. Any number of factors may cause the instrument to be out of tolerance before the next calibration date.

Remarks: None

Standards Used

Asset	Manufacturer	Model	Description	Cal Due
009137	HART SCIENTIFIC, INC	1575	THERMOMETER	Jul 06, 03
008920	HART SCIENTIFIC, INC	17660-A-120-6-W	PLATINUM RTD	Jul 06, 03

Approved by: Walt Hill

Metrology Group Leader

m:\Nona21a1.rpt Rev date 15, August 02

Measurements by: Mark Romero

Metrology Technician

Southwest Research Institute
Calibration laboratory
Caibration Report

Work Order:	444053953	Mfr.	Fisher Scientific	Technician	Mark Romero
Asset No.	002469	Model	14-983-10B		
Serial No.	183303	Type.	THERMOMETER	Cal Date.	04-Jun-03
Remarks:					

Function/Range	Test Point	TI Reading	Difference	+/-Limit	+/-Uncertainty	Found/Left
Temperature	Deg C	Deg C	Deg C	Deg C	Deg C	Results
	-19.9	-19.5	0.4	1.0	0.6	Pass
	0.1	0.0	-0.1	1.0	0.6	Pass
	50.0	50.0	0.0	1.0	0.6	Pass
	90.0	90.7	0.7	1.0	0.6	Pass
	109.9	110.6	0.7	1.0	0.6	Pass

END OF REPORT



SOUTHWEST RESEARCH INSTITUTE™

6220 Culebra Road, P.O. Drawer 28510
Institute Quality Systems
Institute Calibration Laboratory
Phone: 210-522-5215 Fax 210-522-3692



Certificate #

0972-01

Certificate of Calibration

Submitted By: DIV20

Address: B57

Contact: DARRELL DUNN

Manufacturer Model: FISHER SCIENTIFIC 14-983-10B

Description: THERMOMETER

Serial No: 183303

Asset No: 002469

Procedure: TEMPERATURE, MAY/03

Work Order: 444056972

Date Issued: Jan 16, 2004

Calibration Date: Jan 16, 2004

****Calibration Due:** Jul 16, 2004

Calibration Location: Bldg. 64

Environment: Temp. 75.0°F Hum. 45 %RH

***As Found:** IN TOLERANCE

***As Left:** IN TOLERANCE

This certificate documents traceability to the National Institute of Standards and Technology (NIST) and the International System of Units (SI). The Laboratory quality system conforms to ISO/IEC 17025, 1999 and ANSI/NCCL Z540-1-1994 which are equivalent to relevant requirements of the ISO 9000-1994 series of standards. This certificate may not be reproduced, except in full, without the written approval of the Southwest Research Institute Calibration Laboratory. The results of this calibration relate only to the individual instrument described above. This certificate shall not be used to claim product endorsement by the American Association for Laboratory Accreditation (A2LA) or any agency of the U. S. Government.

Uncertainty evaluation includes the item under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor of $k=2$ to approximate a 95% confidence level. The calibration process provides a Test Uncertainty Ratio (TUR) of less than or equal to 25% (4:1) of the test limit unless otherwise stated in remarks or an attachment.

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**Calibration interval is determined by the client and does not assure the instrument will remain within tolerance until this date. Any number of factors may cause the instrument to be out of tolerance before the next calibration date.

Remarks: None

Standards Used

Asset	Manufacturer	Model	Description	Cal Due
009137	HART SCIENTIFIC, INC	1575	THERMOMETER	Feb 05, 04
008920	HART SCIENTIFIC, INC	5614-17660-A-12	PLATINUM RTD	Feb 07, 04

Approved by: Walt Hill
Metrology Group Leader
m:\a2la1.rpt Rev date 15, August 02

Measurements by: Mark Romero
Metrology Technician

Southwest Research Institute
Calibration laboratory
Caibration Report

Work Order:	444056972	Mfr.	Fisher-Scientific	Technician	Mark Romero
Asset No.	002469	Model	14-983-10B		
Serial No.	183303	Type.	THERMOMETER	Cal Date.	16-Jan-04
Remarks:					

Function/Range	Test Point	TI Reading	Difference	+/-Limit	+/-Uncertainty	Found/Left
Temperature	Deg C	Deg C	Deg C	Deg C	Deg C	Result
	-19.9	-19.6	0.3	1.0	0.6	Pass
	0.1	0.0	-0.1	1.0	0.6	Pass
	50.0	49.8	-0.2	1.0	0.6	Pass
	100.0	100.9	0.9	1.0	0.6	Pass
END OF REPORT						



SOUTHWEST RESEARCH INSTITUTE™

6220 Culebra Road, P.O. Drawer 28510
Institute Quality Systems
Institute Calibration Laboratory
Phone: 210-522-5215 Fax 210-522-3692



Certificate #

0972-01

Certificate of Calibration

Submitted By: DIV20

Address: B57

Contact: DARRELL DUNN

Manufacturer Model: FISHER SCIENTIFIC 14-983-10B

Description: THERMOMETER

Serial No: 183303

Asset No: 002469

Procedure: TEMPERATURE, JAN/04

Work Order: 444059850

Date Issued: Jul 20, 2004

Calibration Date: Jul 20, 2004

****Calibration Due:** Jan 20, 2005

Calibration Location: Bldg. 64

Environment: Temp. 77.0°F Hum. 44 %RH

***As Found:** IN TOLERANCE

***As Left:** IN TOLERANCE

This certificate documents traceability to the National Institute of Standards and Technology (NIST) and the International System of Units (SI). The Laboratory quality system conforms to ISO/IEC 17025, 1999 and ANSI/NCCL Z540-1-1994 which are equivalent to relevant requirements of the ISO 9000-1994 series of standards. This certificate may not be reproduced, except in full, without the written approval of the Southwest Research Institute Calibration Laboratory. The results of this calibration relate only to the individual instrument described above. This certificate shall not be used to claim product endorsement by the American Association for Laboratory Accreditation (A2LA) or any agency of the U. S. Government.

Uncertainty evaluation includes the item under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor of $k=2$ to approximate a 95% confidence level. See Remarks or attached Calibration Report with the same Work Order number for calibration data.

*The client has sole responsibility for determination of in/out of tolerance or compliance/noncompliance. An in/out of tolerance opinion is provided for your convenience based only on the Test Instrument (TI) reading(s) and limits as reported. The reported uncertainty relates only to the results at the time of calibration and does not imply any short or long term stability of the TI.

**Calibration interval is determined by the client and does not assure the instrument will remain within tolerance until this date. Any number of factors may cause the instrument to be out of tolerance before the next calibration date.

Remarks: None

Standards Used

Asset	Manufacturer	Model	Description	Cal Due
009137	HART SCIENTIFIC	1575	THERMOMETER	Sep 05, 04
008920	HART SCIENTIFIC	5614-17660-A-12	PLATINUM RTD	Sep 09, 04

Approved by: Walt Hill
Metrology Group Leader
m:\a2la1.rpt Rev date 11, May 04

Measurements by: Mark Romero
Metrology Technician

Southwest Research Institute
Calibration laboratory
Caibration Report

Work Order:	444059850	Mfr.	Fisher Scientific	Technician	Mark Romero
Asset No.	002469	Model	14-983-10B		
Serial No.	183303	Type.	THERMOMETER	Cal Date.	20-Jul-04
Remarks:					

Function/Range	Test Point	TI Reading	Difference	+/-Limit	+/-Uncertainty	Found/Left
Temperature	Deg C	Deg C	Deg C	Deg C	Deg C	Result
-20	-19.8	-19.5	0.3	1.0	0.58	Pass
0	0.1	-0.1	-0.2	1.0	0.58	Pass
50	50.0	50.0	0.0	1.0	0.58	Pass
85	85.1	85.8	0.7	1.0	0.58	Pass
100	100.0	100.5	0.5	1.0	0.58	Pass
END OF REPORT						



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Certificate #

0972-01

Certificate of Calibration

Submitted By: DIV20

Address: B57

Contact: DARRELL DUNN

Manufacturer Model: FISHER SCIENTIFIC 14-983-10B

Description: THERMOMETER

Serial No: 183303

Asset No: 002469

Procedure: TEMPERATURE, JAN/04

Work Order: 444062200

Date Issued: Jan 6, 2005

Calibration Date: Jan 6, 2005

****Calibration Due:** Jul 6, 2005

Calibration Location: Bldg. 64

Environment: Temp. 73.0°F Hum. 40 %RH

***As Found:** IN TOLERANCE

***As Left:** IN TOLERANCE

This certificate documents traceability to the National Institute of Standards and Technology (NIST) and the International System of Units (SI). The Laboratory quality system conforms to ISO/IEC 17025, 1999 and ANSI/NCCL Z540-1-1994 which are equivalent to relevant requirements of the ISO 9000-1994 series of standards. This certificate may not be reproduced, except in full, without the written approval of the Southwest Research Institute Calibration Laboratory. The results of this calibration relate only to the individual instrument described above. This certificate shall not be used to claim product endorsement by the American Association for Laboratory Accreditation (A2LA) or any agency of the U. S. Government.

Uncertainty evaluation includes the item under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor of $k=2$ to approximate a 95% confidence level. See Remarks or attached Calibration Report with the same Work Order number for calibration data.

*The client has sole responsibility for determination of in/out of tolerance or compliance/noncompliance. An in/out of tolerance opinion is provided for your convenience based only on the Test Instrument (TI) reading(s) and limits as reported. The reported uncertainty relates only to the results at the time of calibration and does not imply any short or long term stability of the TI.

**Calibration interval is determined by the client and does not assure the instrument will remain within tolerance until this date. Any number of factors may cause the instrument to be out of tolerance before the next calibration date.

Remarks: None

Standards Used

Asset	Manufacturer	Model	Description	Cal Due
009414	HART SCIENTIFIC	1502A	TEMPERATURE READOUT	Mar 30, 05
010692	HART SCIENTIFIC	5618	PLATINUM RTD	Feb 16, 05

Approved by: Walt Hill
Metrology Group Leader
m:\a2la1.rpt Rev date 11, May 04

Measurements by: Bob Trollinger
Metrology Technician

Southwest Research Institute
Calibration Laboratory
Measurement Report

Work Order:	444062200	Mfr.	Fisher-Scientific	Technician	blt
Asset No.	002469	Model	14-983-10B		
Serial No.	183303	Type.	THERMOMETER	Cal Date.	06-Jan-05
Remarks: No accuracy is provided by manufacturer. +/- 1 Degree C resolution is used as the accuracy specification.					
TOTAL IMMERSION					

Function/Range	Test Point	TI Reading	Difference	+/-Limit	+/-Uncertainty	Found/Left
Temperature	°C	°C	°C	°C	°C	Result
	-18.9	-19.0	-0.1	1.0	1.2	Pass
	0.1	0.0	-0.1	1.0	1.2	Pass
	50.0	50.0	0.0	1.0	1.2	Pass
	99.9	100.0	0.1	1.0	1.2	Pass
END OF REPORT						