

SOUTHWEST RESEARCH INSTITUTE
 Department of Quality Assurance
 Calibration Laboratory • 522-5215

WORK ORDER

CERTIFICATE # 25041 ASSET # 005432 DATE 04 Apr 97

ITEM DATA:

Manufacturer Fisherbrand/Talos Model 15 1661
 Description Thermometer Serial # 016-832
 Accessories _____

ACTION REQUESTED cal, receive into system

CUSTODIAN DV.20, Daniel Dunn

Turned in by: _____ Phone 6040

CHARGE # 205700-561 Date Required _____

INSTRUMENT USED ON: NUCLEAR DOD NASA GLP SPPE
 OTHER _____

COPY OF CALIBRATION CERTIFICATE Yes No

- CONDITION RECEIVED:
- _____ Out of tolerance, repaired to specifications
 - _____ In tolerance, minor adjustments/repairs made
 - In tolerance, no adjustments/repairs
 - _____ Out of tolerance, adjusted to specifications
 - _____ Received into system, introduced or reactivated
 - _____ Calibration interval
 - _____ Reliability code

ACTION TAKEN: (Calibration/Repair/Parts) Calibrated Per Procedure

<u>0.01°C</u>	<u>0.0°C</u>
<u>-10.02°C</u>	<u>-10.0°C</u>
<u>45.01°C</u>	<u>45.0°C</u>
<u>90.98.03°C</u>	<u>90.0°C</u>
<u>129.99°C</u>	<u>130.0°C</u>

CAL ENVIRONMENT:
 Temperature 77 °F Humidity 27 %RH

CALIBRATED/REPAIRED:
 By [Signature] Cal Procedure 111-9-30-5163
 Date 15 Apr 97 Accuracy ±1°C
 Cal Interval 6 mths Time to complete:
 Next Cal due 15 Oct 97 Cal 2.5 Repair _____
 Standards used (Asset#) 106, 5174

DATE COMPLETED 17 Apr 97
 DATE PICKED UP 4/17/97 PICKED UP BY [Signature]

17051

SOUTHWEST RESEARCH INSTITUTE
Department of Quality Assurance
Calibration Laboratory • 522-5215

WORK ORDER

CERTIFICATE # 27263 ASSET # 025432 DATE 10 Oct 97

ITEM DATA:

Manufacturer Endevco Model 15-116A
Description Accelerometer Serial # 196-852
Accessories _____

ACTION REQUESTED cal

CUSTODIAN Doc, David

Turned in by: _____ Phone 6070

CHARGE # W. 1422-561 Date Required _____

INSTRUMENT USED ON: DOD/NASA NUCLEAR GLP SPPE ISO
 OTHER _____

COPY OF CALIBRATION CERTIFICATE Yes No

NEW WORK Yes No If yes, an evaluation shall be made to verify capabilities.

By _____ Date _____

CONDITION RECEIVED: _____ (F) Out of tolerance, repaired to specifications
_____ (G) In tolerance, minor adjustments/repairs made
 (J) In tolerance, no adjustments/repairs
_____ (K) Out of tolerance, adjusted to specifications
_____ (S) Received into system, introduced or reactivated

ACTION TAKEN: (Calibration/Repair/Parts) Calibrated Per Specimen.

27263

CAL ENVIRONMENT:
Temperature 78 °F Humidity 41 %RH

CALIBRATED/REPAIRED:
By Ken Cal Procedure ASTM E77-92
Date 29 Oct 97 Accuracy ±1°C
Cal Interval 6 mos Reliability Code: 2
Next Cal due 29 Oct 98 Cal Time 1.5 Repair Time _____
Standards used (Asset#) 219, 328

DATE COMPLETED 30 Oct 97
DATE PICKED UP 11/3/97 PICKED UP BY [Signature]

CALIBRATION CHECK FORM

Date Calibrated 29 Oct 97 Work Order 27263
 Technician E. J. G. CAL. PROCEDURE: ASTM E 77-92
 Unit Under Test THERMOMETER
 Manufacturer FISHER BRAND Model 15-166A SN C96-852 ASN 5432

STEP	FUNCTION OR RANGE	APPLIED	TOLERANCE		MEASURED VALUES		P/F
			MIN	MAX	AS FOUND	RELEASED	
		°C			°C		
		0.04	-1.0°	1.0	0.0		

E. J. G.

SOUTHWEST RESEARCH INSTITUTE
Department of Quality Assurance
Calibration Laboratory • 522-5215

WORK ORDER

CERTIFICATE # 29651 ASSET # 005432 DATE 08/11/98

ITEM DATA:
Manufacturer Fisherbrand / Kase Model 15 1664
Description 1/4" MEMO-C Serial # 116-852
Accessories _____

ACTION REQUESTED cal

CUSTODIAN John D. Durr

Turned in by: _____ Phone 6070

CHARGE # 70146571 Date Required _____

INSTRUMENT USED ON: (DOD/NASA) (NUCLEAR) (GLP) (SPPE) (ISO)
 OTHER _____

COPY OF CALIBRATION CERTIFICATE (Yes) (No)

NEW WORK Yes No If yes, an evaluation shall be made to verify capabilities.

By [Signature] Date 05-08-98

Work involves proprietary/confidential information or equipment (Yes) (No)

CONDITION RECEIVED: _____ (F) Out of tolerance, repaired to specifications
_____ (G) In tolerance, minor adjustments/repairs made
 (J) In tolerance, no adjustments/repairs
_____ (K) Out of tolerance, adjusted to specifications
_____ (S) Received into system, introduced or reactivated

29651

ACTION TAKEN: (Calibration/Repair/Parts) Calibrated per procedure

std unit
0.04% 0.02

CAL ENVIRONMENT:
Temperature 79 °F Humidity 37 %RH

CALIBRATED/REPAIRED:
By [Signature] Cal Procedure ASME E77-89
Date 11/19/98 Accuracy [Signature]
Cal Interval 6 mos Reliability Code: 3
Next Cal due 11/19/98 Cal Time 1.5 Repair Time _____
Standards used (Asset#) 219,328

DATE COMPLETED 11/19/98
DATE PICKED UP 5/13/98 PICKED UP BY [Signature]

SOUTHWEST RESEARCH INSTITUTE
 Department of Quality Assurance
 Calibration Laboratory • 522-5215

WORK ORDER

CERTIFICATE # 32913 ASSET # 105432 DATE 12 JAN 99

ITEM DATA:

Manufacturer Fisherbrand Model 15-166A
 Description thermometer Serial # 09-052
 Accessories _____

ACTION REQUESTED _____

CUSTODIAN Darral Anna, Div 20

Turned in by: _____ Phone 6090

CHARGE # 20-1402-571 Date Required _____

INSTRUMENT USED ON: (DOD/NASA) (NUCLEAR) (GLP) (SPPE) (ISO)
 OTHER _____

COPY OF CALIBRATION CERTIFICATE (Yes) (No)

NEW WORK Yes No If yes, an evaluation shall be made to verify capabilities.

By MAS Date 01-12-99

Work involves proprietary/confidential information or equipment (Yes) (No)

CONDITION RECEIVED: _____ (F) Out of tolerance, repaired to specifications
 _____ (G) In tolerance, minor adjustments/repairs made
 (J) In tolerance, no adjustments/repairs
 _____ (K) Out of tolerance, adjusted to specifications
 _____ (S) Received into system, introduced or reactivated

ACTION TAKEN: (Calibration/Repair/Parts) 12 0 0 7
(49.95) 50° - 50 1
(99.54) 100° 10/0 1 1/1°

CAL ENVIRONMENT:
 Temperature 23 °F Humidity 48 %RH

CALIBRATED/REPAIRED:
 By [Signature] Cal Procedure NSTA E77-89
 Date 12 JAN 99 Accuracy +/- 1°C
 Cal Interval 6 Reliability Code: _____
 Next Cal due 19 JUL 99 Cal Time 1 Repair Time _____
 Standards used (Asset#) 217 5144

DATE COMPLETED 19 JUL 99
 DATE PICKED UP 2/2/99 PICKED UP BY [Signature]

32913

29051
[Signature]
12/15/99

217
5174

SOUTHWEST RESEARCH INSTITUTE
 Department of Quality Assurance
 Calibration Laboratory • 522-5215

WORK ORDER

WORK ORDER # 35662 ASSET # 005432 DATE 16 Aug 99

ITEM DATA:

Manufacturer Fisher Scientific Model 15-166A
 Description Thermometer Serial # C96-852
 Accessories clear tube case

ACTION REQUESTED cal

CUSTODIAN Div. 20, Darrell Dunn

Turned in by: _____ Phone 6090

CHARGE # 20-04 Date Required _____

INSTRUMENT USED ON: (DOD/NASA) (NUCLEAR) (GLP) (SPPE) (ISO)
 OTHER _____

COPY OF CALIBRATION CERTIFICATE (Yes) (No)

NEW WORK Yes No If yes, an evaluation shall be made to verify capabilities.

By J.J.L. Date 16 Aug 99

Work involves proprietary/confidential information or equipment (Yes) (No)

CONDITION RECEIVED: _____ Out of tolerance
 _____ In tolerance
 _____ Damaged (Contact customer)
 _____ Contact _____ Date _____
 _____ Received into system, introduced or reactivated

ACTION TAKEN: (Calibration/Repair/Parts)

<u>STAND and</u>	<u>Ready</u>
<u>-18.88</u>	<u>-9.0</u>
<u>ICE</u>	<u>0.0</u>
<u>30.77</u>	<u>31.0</u>
<u>74.65</u>	<u>74.3</u>
<u>102.03</u>	<u>102.0</u>
<u>149.14</u>	<u>149.0</u>

CAL ENVIRONMENT:
 Temperature 76 °F Humidity 44 %RH

CALIBRATED/REPAIRED:
 By [Signature] Cal Procedure EL-9 - MAY 99
 Date 18 AUG 99 Accuracy 4.7
 Cal Interval L Reliability Code _____
 Next Cal Due 18 FEB 00 Cal Time 2 Repair Time _____
 Standards used (Asset #) 219 328

DATE COMPLETED 17 AUG 99
 DATE PICKED UP 8/30/99 PICKED UP BY [Signature]

35662
32513

WORK ORDER 37933

Date Received 2/24/00

Asset No. 005432 Manufacturer FISHER SCIENTIFIC Model 15-166A
 Description THERMOMETER Serial Number C96-852
 Accessory Received/Required NONE
 Div/CC ID NONE Accessory to Asset No. N/A Accuracy +/-1 DEG.C
 Div/CC DIV20 Location B57 Custodian DARRELL DUNN Tel. 6090
 Charge/Project No. 20.00751.006 Proprietary/Confidential N Date Required ROUTINE
 Work Requested CALIBRATION
 Receiving Inspection O.K.
 Delivered By DARRELL DUNN Tel. 6090

WORK HISTORY

Date	Start Time	Stop Time	Notes
			SwRI Cal-Lab - By: <u>ju</u> CAL: 08/18/99 DUE: 02/18/00 AN: 005432 SN: C96-852 <small>1 0001 0001 0000 0001 0000 1100 1100 1100</small>

PARTS

Part Name	Part Number	Cost	Failure Description

WORK SUMMARY

Failure Description _____
 Repair Action _____
 Cal Procedure CL-9 May 99 Temp 76 F Hum 49 %
 Tech [Signature] Cal Hrs. 1 Repair Hrs. _____ Part Cost _____
 Action Taken Cal
 Standards Used 219, 5174
 Date Cal 3-2-00 Int. 6 Mo. Date Due 9-2-00 Reliability Code _____
 Date Picked Up 3/22/2000 Picked Up By [Signature]

workreq.rpt Rev 30 Jan 00

37933

CALIBRATION CHECK FORM

Date Calibrated 3-2-00 Work Order 37933 Cal By [Signature]

Procedure No./Date CC-9 May 99 Unit Under Test Thermometer

Mfg. Fisher Model 15-166A SN C96-852AN 5432

STEP	FUNCTION OR RANGE	APPLIED	TOLERANCE		MEASURED VALUES		P/F
			MIN	MAX	AS FOUND	RELEASED	
		0°	-1	1	0°C		P
		41.44°C	40.44	42.44	41.8		P
		79.87°C	78.87	80.87	80.0		P
		139.80	138.80	140.80	140.5		P



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

2 March 2000

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: FISHER SCIENTIFIC 15-166A
Description: THERMOMETER
Serial Number: C96-852
Asset Number: 005432

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCSL Z540-1-1994. The results of this calibration relate only to the individual item as described above. 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 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: 49 % RH

Calibration Date: 2 Mar 00 **Calibration Procedure:** CL-9 MAY99

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

Remarks:

Approved by:

Jim Patterson, Supervisor, or Walt Hill, Metrologist
Certificate # 37933

m:\a2la.rpt Rev date 14 Dec 99

Measurements performed by:

Mack Wood, Technician

Page 1 of 1

SOUTHWEST RESEARCH INSTITUTE

Calibration Laboratory

WORK ORDER

Processed by RCRUZ at 8:44:40AM on 10/24/00

I4213

1 100011 00111 00111 00111 00111 00111 00111 00111

Work Order No 444041088

Arrived 10/24/00

Asset No. 005432 Manufacturer FISHER SCIENTIFIC

Model 15-166A

Instrument Type/Class THERMOMETER

Serial No. C96-852

Accessory No. Calibration Procedure CL-9 MAY99

Location B57

Div/Client DIV20

Custodian DARRELL DUNN

Mail Stop B57

Tel. 6090

Charge/Project No. 20.00751.006

Delivered By / Telephone DARRELL DUNN

IN4CAL

Special Instructions _____

WORK NOTES

Date	Hours	Remarks/Notes
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

REPAIR PARTS

Date	Hours	Part Name	Part Number	Failure Description	Cost
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

WORK SUMMARY

Failure Description _____

Repair Action _____

Calibration Procedure CL-9, MAY99 Temp 75F Hum. 58 %

Tech VMorales Totals Cal Hours 1.0 Repair Hours _____ Parts Cost _____

Standards Used 219

Date Picked Up 11/6/2000

Picked Up By [Signature]

41088



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

3 November 2000

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: FISHER SCIENTIFIC 15-166A
Description: THERMOMETER
Serial Number: C96-852
Asset Number: 005432

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCCL Z540-1-1994. The results of this calibration relate only to the individual item as described above. 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 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: 75.0 Degrees Fahrenheit Humidity: 50 % RH

Calibration Date: 27 Oct 00 **Calibration Procedure:** CL-9 MAY99

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

Remarks:

Approved by:

Jim Patterson, Supervisor, or Walt Hill, Metrologist

Certificate # 444041088

m.a2la.rpt Rev date 22 May 00

Measurements performed by:

Vince Morales, Technician

SOUTHWEST RESEARCH INSTITUTE

Calibration Laboratory

WORK ORDER

Processed by RCRUZ at 2:38:38PM on 4/26/01

1 0000 0000 0000 0000 0000 0000 0000

Work Order 444043346

Arrived 4/26/01

Asset No. 005432

Manufacturer FISHER SCIENTIFIC

Model 15-166A

Instrument Type/Class THERMOMETER

Serial No. C96-852

Accessory No.

Calibration Procedure CL-9 MAY99

Location B57

Div/Client DIV20

Custodian DARRELL DUNN

Mail Stop B57

Tel. 6090

Charge/Project No. 20.00751.006

Delivered By / Telephone DARRELL DUNN

IN4CAL

Special Instructions 20.00751.006

WORK NOTES

Date	Hours	Remarks/Notes
<u>5/1</u>	<u>1.0</u>	<u>Calibration</u>

REPAIR PARTS

Date	Hours	Part Name	Part Number	Failure Description	Cost

WORK SUMMARY

Failure Description None

Repair Action None

Calibration Procedure CL-9, 5/99 Temp F Hum. %

Tech R Dykstra Totals Cal Hours 1.0 Repair Hours Parts Cost

Standards Used 5174, 5243

Date Picked Up 5/2/01

Picked Up By [Signature]

43346

Southwest Research Institute
 Calibration Laboratory
 Calibration Data Sheet

Work Order 444043346	Mfr. Fisher Scientific	Technician R Dykstra
Asset No. 005432	Model 15-166A	Procedure CL-9 5/99
Serial No. C96-852	Type Thermometer	Cal Date May. 1, 01

Remarks: Partial-Immersion 76 mm					
Parameter	Applied Value	Found/Left	Instrument Error	Limits	Result
Temperature	-19.907 Deg C	-20.2 Deg C	0.29 Deg C	+/- 1 Deg C	Passed
	0.000 Deg C	0.1 Deg C	0.1 Deg C	+/- 1 Deg C	Passed
	50.000 Deg C	50.1 Deg C	0.1 Deg C	+/- 1 Deg C	Passed
	100.000 Deg C	100.0 Deg C	0.0 Deg C	+/- 1 Deg C	Passed
	149.966 Deg C	149.6 Deg C	0.36 Deg C	+/- 1 Deg C	Passed

To: rdykstra@gacal@swri30
From: "Darrell Dunn" <ddunn@swri.edu>
Cc:
Subject: RE: Thermometers
Attachment: Headers.822
Date: 5/1/01 11:59 AM

+/- 1 degree is sufficient for our needs. I see no reason to change what we have done in the past.

-----Original Message-----

From: rdykstra@swri.edu (mailto:rdykstra@swri.edu)
Sent: Tuesday, May 01, 2001 10:51 AM
To: ddunn@swri.edu
Cc: WHill@swri.edu
Subject: Thermometers

Darrel, you have 11 Partial-Immersion thermometers in for calibration.

In the past they have been calibrated with an accuracy of +/- 1 Deg C. (Range is -20 to 150 Deg C). Is this accuracy sufficient for your needs?

The reason I am asking is the thermometers are labelled as ASTM 1C thermometers and according to the ASTM the scale error accuracy is +/- 0.5 Deg C.

I do not have all the data collected as of now. I will tell you so far all meet the +/- 1 deg C, not all are meeting the +/- 0.5 deg C spec.

The asset numbers are as follows: 007164, 005434, 007167, 007165, 007169, 005432, 007166, 007168, 003242, 005433, and 007171.

Let me know what accuracy will fit your needs.

Roger Dykstra
Cal Lab. X5076



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

2 May 2001

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: FISHER SCIENTIFIC 15-166A
Description: THERMOMETER
Serial Number: C96-852
Asset Number: 005432
Work Order Number: 444043346

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCSL Z540-1-1994. The results of this calibration relate only to the individual item as described above. 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 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: 72.0 Degrees Fahrenheit Humidity: 42 % RH

Calibration Date: 1 May 01 **Calibration Procedure:** CL-9 MAY99

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

Remarks:

Approved by:

Walt Hill, Supervisor
Institute Calibration Laboratory

Measurements performed by:

Roger Dykstra, Technician

SOUTHWEST RESEARCH INSTITUTE

Calibration Laboratory

WORK ORDER

Received by RCRUZ, 10/26/01 11:23:26AM

||||| ||||| ||||| ||||| ||||| ||||| |||||

Arrived 10/26/01

Work Order **444045915**

Asset No 005432 Manufacturer FISHER SCIENTIFIC

Model 15-166A

Equipment Type THERMOMETER

Serial No. C96-852

Accessory No.

Interval 6 M

Calibration Procedure CL-9 MAY99

Location B57

Div/Client DIV20

Custodian DARRELL DUNN

Mail Stop B57

Tel 6090

IN4CAL

Special Instructions 20.00751.006

Notify before adjustments or repairs. (Provide data with certificate) (Certificate Type 2540)

Charge/Project No. 00751.006 1.20

Requester / Telephone

This information is correct for the work requested.

WORK NOTES

Date	Hours	Remarks/Notes
<u>10/30</u>	<u>1.5</u>	<u>cal</u>

Date	Hours	Part Name	Part Number	Failure Description	Cost
<u>n/a</u>					

Failure Description n/a

Repair Action n/a

Tech R Dyksm Cal Hrs. 1.5 Repair Hrs Parts Cost Temp 76 F Hum. 44 %

Standards Used S17A, S243

Date Picked Up 11/16/01

Picked Up By B-D

444045915



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

Certificate of Calibration

30 October 2001

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: FISHER SCIENTIFIC 15-166A
Description: THERMOMETER
Serial Number: C96-852
Asset Number: 005432
Work Order Number: 444045915

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCSL 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.

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: 44 % RH


Calibration Date: 30 Oct 01 **Calibration Procedure:** CL-9 MAY99

Condition as Received: IN TOLERANCE

Condition as Received: IN TOLERANCE

Remarks:

Approved by:



Walt Hill, Supervisor
Institute Calibration Laboratory

Measurements performed by:



Roger Dykstra, Technician

Southwest Research Institute
 Calibration Laboratory
 Calibration data sheet

Work Order:	444045915	Mfr. Fisher Scientific	Technician Roger Dykstra
Asset No.	005432	Model 15-166A	Procedure CL-9, 5/99
Serial No.	C96-852	Type. Thermometer	Cal Date. 10/30/01

Remarks: The reported uncertainty is based on a standard uncertainty multiplied by a coverage Factor of k=2, which provides a level of confidence of approximately 95 %. The test limits are specified in the procedure.

The test points are per the ASTM 1C table.

Parameter	Test Point	As Found / As left	Error	Test Limits	Uncertainty
Temperature	-19.88	-20.2	-0.32	1	0.2
Degree C	0.10	0.0	-0.10	1	0.2
	50.08	50.0	-0.08	1	0.2
	99.95	100.0	0.05	1	0.2
	149.92	150.0	0.08	1	0.2

SOUTHWEST RESEARCH INSTITUTE

Calibration Laboratory

WORK ORDER

Received by RCRUZ, 5/9/02 9:18:19AM



Arrived 5/9/02

Work Order **444048467**

Asset No. 005432 Manufacturer FISHER SCIENTIFIC

Model 15-166A

Equipment Type THERMOMETER

Serial No. C96-852

Accessory No.

Interval 6 M

Calibration Procedure CL-9 MAY99

Location B57

Div/Client DIV20

Custodian DARRELL DUNN

Mail Stop B57

Tel 6090

IN LINE

Special Instructions 20.00751.006

Notify before adjustments or repairs. () Provide data with certificate (✓) Certificate Type _____

Charge/Project No. 00751.006 1.20

Requester / Telephone

This information is correct for the work requested.

WORK NOTES

Date	Hours	Remarks/Notes
<u>5/9/02</u>	<u>1.0</u>	<u>cal</u>

Date	Hours	Part Name	Part Number	Failure Description	Cost
<u>n/a</u>					

WORK SUMMARY

Failure Description n/a

Repair Action r/r

Tech RJES Cal Hrs. 1.0 Repair Hrs Parts Cost Temp 74 F Hum. 55 %

Standards Used 5243 due 12/3/02

5174 due 3/18/03

Date Picked Up 6/6/2002 Picked Up By Darrell Dunn

444048467

Southwest Research Institute
Calibration Laboratory
Calibration Data Sheet

Workorder 444048467
Asset #. 005432
Serial #. C96-852

Mfr. Fisher Scientific
Model 15-166A
Type Thermometer

Technician R Dykstra
Procedure CL-9, 5/99
Cal Date 5/9/02

Ambient Conditions:

Temperature 74 Degree F
Humidity 55 % R.H.
Baro. Pressure N/A PSIA

Data sheet Revision:

Revision 0 2/21/02

Standards used:

Asset #	Due Date	Nomenclature
005243	12/03/02	H.P. 34420A Digital Multi-Meter
005174	02/18/03	RTD probe

Is statement of compliance to a specification requested. Yes
(if statement is required, print yes otherwise leave blank)

Tolerance 1.00 Degree C Range -20 to 150 Degree C
(if not required leave blank)

Degree C	Degree C	Degree C	Degree C	Degree C	
Std Reading	As Found TI Reading	Error	Test Limits	Uncertainty	Results
-19.88	-20.2	-0.32	1	0.35	Pass
0.09	0.0	-0.09	1	0.35	Pass
49.99	50.0	0.01	1	0.35	Pass
99.96	100.0	0.04	1	0.35	Pass
149.90	149.8	-0.10	1	0.35	Pass

Remarks:

The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor of k=2, which provides a level of confidence of approximately 95%.

If compliance testing to a specification is requested. The results can be pass, fail, or if blank "Not determinable". If results are not determinable it is to end user to determine if results meet thier needs.

If compliance testing to a specification is not requested, only data and uncertainty will be given on data sheet.



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

Certificate of Calibration

10 May 2002

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: FISHER SCIENTIFIC 15-166A
Description: THERMOMETER
Serial Number: C96-852
Asset Number: 005432
Work Order Number: 444048467

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCSL 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.

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: 74.0 Degrees Fahrenheit Humidity: 55 % RH

Calibration Date: 10 May 02 **Calibration Procedure:** CL-9 MAY99

Condition as Received: IN TOLERANCE

Condition as Returned: IN TOLERANCE

Remarks:

Approved by:


Walt Hill, Metrology Group Leader
Institute Calibration Laboratory

Measurements performed by:


Roger Dykstra, Technician