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: 2524

Manufacturer: OMEGA Model: DP465-KC-MDSSD

Nomenclature: THERMOCOUPLE METER

Serial Number: 3130900 SwRI No: NONE Cal interval 6 Mo.

Remarks

Accuracy: MFGR Procedure: MFGR

ENVIRONMENT

Temperature: 70 Humidity: 48 Location: ROOM A11 B68 SWRI

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 Thomas J. Kennedy

Calibration Date: 07/27/93

Cal interval: 6 Months

Record Number: 00011809 Next Calibration Due: 01/27/94

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: 3130900 Calibration Date: 07/27/93

STANDARDS

Standard No: 102 Manufacturer: ANALOGIC Model: AN6520
Nomenclature: THERMOCOUPLE CALIBRATOR
Serial No: 9094 Cal.Due: 10/20/93 Cal.Rec.No: 00011005

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: 2524

Manufacturer: OMEGA Model: DP465-KC-MDSSD

Nomenclature: THERMOCOUPLE METER

Serial Number: 3130900 SwRI No: NONE Cal interval 6 Mo.

Remarks

Accuracy: MFGR Procedure: MFGR

ENVIRONMENT

Temperature: 72 Humidity: 48 Location: ROOM A11 B68 SWRI

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 T Romero Hannon

Calibration Date: 02/09/94

Cal interval: 6 Months

Record Number: 00013214 Next Calibration Due: 08/09/94

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: 3130900 Calibration Date: 02/09/94

STANDARDS

Standard No: 182 Manufacturer: JOHN FLUKE Model: 5700A
Nomenclature: CALIBRATOR
Serial No: 5200003 Cal.Due: 04/30/94 Cal.Rec.No: 00013242

Standard No: 1505 Manufacturer: HEWLETT PACKARD Model: 3458A
Nomenclature: SYSTEM MULTIMETER
Serial No: 2823A07741 Cal.Due: 04/27/94 Cal.Rec.No: 00011107

Standard No: 2868 Manufacturer: KAY Model: X0251
Nomenclature: ICE POINT REFERENCE
Serial No: 311210 Cal.Due: 12/30/94 Cal.Rec.No: 00013042

SOUTHWEST RESEARCH INSTITUTE

Department of Quality Assurance
Calibration Laboratory

CERTIFICATE OF CALIBRATION
08/26/94

Issued to: NARASI SRIDHAR DIV20,B57
Manufacturer: OMEGA
Nomenclature: THERMOCOUPLE METER
Serial Number: 3130900

Asset Number: 002524
Model Number: DP465-KC-MDSSD
SwRI Capital Number: NONE

ENVIRONMENTAL CONDITIONS

Temperature: 70.0F

Relative Humidity: 36 %

CALIBRATION INFORMATION

Location: CAL1
Procedure Number: SWRI
Remarks: ACCURACY FOR K THERMOCOUPLE IS +/- 2 DEGREES CENTIGRADE

Technician: 10004
Accuracy: MFGR SPECS
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
000182	5200003	FLUKE	5700A	CALIBRATOR	06/17/94	3	09/17/94
002868	311210	KAYE	X0251	ICE POINT REFERENCE	12/30/93	12	12/30/94

Certified by : _____

Calibration Date: 08/26/94
Interval: 6 months
Next Calibration Due: 02/24/95

Work Order: 14948

SOUTHWEST RESEARCH INSTITUTE

Department of Quality Assurance
Calibration Laboratory

CERTIFICATE OF CALIBRATION
03/06/95

Issued to: DARRELL DUNN DIV20 ,B57
Manufacturer: OMEGA
Nomenclature: THERMOCOUPLE METER
Serial Number: 3130900

Asset Number: 002524
Model Number: DP465-KC-MDSSD
SwRI/Div. I.D. #: NONE

ENVIRONMENTAL CONDITIONS

Temperature: 65.0F

Relative Humidity: 48%

CALIBRATION INFORMATION

Procedure Number: SWRI
Remarks:

Accuracy: MFGR SPECS
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
000182	5200003	FLUKE	5700A	CALIBRATOR	12/14/94	3	03/14/95
002868	311210	KAYE	X0251	ICE POINT REFERENCE	01/03/95	12	01/03/96

Certified by : Walter S Lin

Calibration Date: 03/06/95
Interval: 6 months
Next Calibration Due: 09/06/95

Certificate#: 16602

SOUTHWEST RESEARCH INSTITUTE

Department of Quality Assurance
Calibration Laboratory

CERTIFICATE OF CALIBRATION
09/19/95

Issued to: DARRELL DUNN DIV20 ,B57
Manufacturer: OMEGA
Nomenclature: THERMOCOUPLE METER
Serial Number: 3130900
Notes:

Asset Number: 002524
Model Number: DP465-KC-MDSSD

SwRI/Div. I.D. #: NONE

ENVIRONMENTAL CONDITIONS

Temperature: 72.0F

Relative Humidity: 38%

CALIBRATION INFORMATION

Procedure Number: SWRI
Remarks:

Accuracy: MFGR SPECS
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
004164	6380025	FLUKE	5500A	MULTI-PRODUCT CALIBRATOR	08/29/95	12	08/29/96

Certified by : _____

Calibration Date: 09/19/95
Interval: 6 months
Next Calibration Due: 03/19/96

Certificate#: 18607

SOUTHWEST RESEARCH INSTITUTE

Department of Quality Assurance
Calibration Laboratory

CERTIFICATE OF CALIBRATION
03/28/96

Issued to: DARRELL DUNN DIV20 ,B57
Manufacturer/Model: OMEGA/DP465-KC-MDSSD
Nomenclature: THERMOCOUPLE METER
Serial Number: 3130900
Asset Number: 002524
Notes:

ENVIRONMENTAL CONDITIONS

Temperature: 74.0F

Relative Humidity: 36%

CALIBRATION INFORMATION

Procedure Number: TP0058
Remarks:

Accuracy: MFGR SPECS
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
000182	5200003	FLUKE	5700A	CALIBRATOR	02/02/96	3	05/02/96
002868	311210	KAYE	X0251	ICE POINT REFERENCE	01/15/96	12	01/15/97

Certified by : _____

Calibration Date: 03/28/96
Interval: 6 months
Next Calibration Due: 09/28/96

Certificate#: 20743

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

Certificate of Calibration

21 November 1996

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: OMEGA DP465-KC-MDSSD
Description: THERMOCOUPLE METER
Serial Number: 3130900
Asset Number: 002524

Environmental Conditions

Temperature: 78.0 Deg. F **Humidity:** 45%

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: 21 Nov 96 **Calibration Procedure:** NAVAIR 17-20ST-134

Interval: 6 months **Accuracy:** MFGR SPECS

Next Calibration Due: 21 May 97 **Received:** In Tolerance

Remarks:

Certificate # 23425 **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

29 May 1997

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: OMEGA DP465-KC-MDSSD
Description: PROGRAMMABLE THERMOCOUPLE ME
Serial Number: 3130900
Asset Number: 002524

Environmental Conditions

Temperature: 74.0 Deg. F **Humidity:** 41%

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: 29 May 97 **Calibration Procedure:** NAVAIR 17-20ST-134

Interval: 6 months **Accuracy:** MFG SPECS

Next Calibration Due: 29 Nov 97 **Received:** In Tolerance

Remarks:

Standards Used

Asset	MFR	Model	Description	Serial No.	Due Cal
005325	XITRON TECH	2000M	PORTABLE V/A/T CALIBRA	20007920002	1 Apr 98

Certificate # 25532 **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

9 December 1997

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: OMEGA DP465-KC-MDSSD
Description: PROGRAMMABLE THERMOCOUPLE METER
Serial Number: 3130900
Asset Number: 002524

Environmental Conditions

Temperature: 70.00 Deg. F **Humidity:** 50 % 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: 9 Dec 97 **Calibration Procedure:** NAVAIR 17-20ST-134

Interval: 6 months

Next Calibration Due: 9 Jun 98 **Received:** In Tolerance

Remarks:

Standards Used

Asset	MFR	Model	Description	Serial No.	Due Cal
005325	XITRON	TECH2000M	PORTABLE V/A/T CALIBRATOR	20007920002	1 Apr 98

Signed: _____

Title: _____

LAST PAGE OF REPORT
Total Pages Printed: 1

Certificate # 27652

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

ACCREDITED

Certificate of Calibration

4 June 1998

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: OMEGA DP465-KC-MDSSD
Description: PROGRAMMABLE THERMOCOUPLE METER
Serial Number: 3130900
Asset Number: 002524

Environmental Conditions

Temperature: 76.00 Deg. F **Humidity:** 46 % 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: 4 Jun 98 **Calibration Procedure:** NAVAIR 17-20ST-134

Interval: 6 months

Next Calibration Due: 4 Dec 98 **Received:** In Tolerance

Remarks:

Standards Used

Asset	MFR	Model	Description	Serial No.	Due Cal
000182	FLUKE	5700A	CALIBRATOR	5200003	2 Jul 99
004528	KAYE INSTRU	K150-2C	ICE POINT/REFERENCE	701173	10 Mar 99

Signed:

Title: Staff

LAST PAGE OF REPORT
Total Pages Printed: 1

Certificate # 29978

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

Accredited

Certificate # 0972-01

Certificate of Calibration

21 January 1999

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: OMEGA DP465-KC-MDSSD
Description: PROGRAMMABLE THERMOCOUPLE METER
Serial Number: 3130900
Asset Number: 002524

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.

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. Degrees Fahrenheit Humidity: 43 % RH

Calibration Date: 21 Jan 99 **Calibration Procedure:** NAVAIR 17-20ST-134

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

Remarks:

Tom Hannon / Technician

Certificate # 32909

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

Accredited

Certificate # 0972-01

Certificate of Calibration

31 August 1999

Issued to:	DARRELL DUNN DIV20 B57
Manufacturer/Model:	OMEGA DP465-KC-MDSSD
Description:	PROGRAMMABLE THERMOCOUPLE METER
Serial Number:	3130900
Asset Number:	002524

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.

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: 40 % RH

Calibration Date: 31 Aug 99 **Calibration Procedure:** CL-228, AUG 99

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

Remarks:

Approved by:

Jim Patterson, Supervisor or Walt Hill, Metrologist

Measurements performed by:

Vince Morales, Technician

Certificate # 35661

m:\a2la.rpt Rev date 10 Mar 99

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	**Work Order:**	444051756
Address:	B57	**Date Issued:**	Jan 15, 2003
Contact:	DARRELL DUNN	**Calibration Date:**	Jan 15, 2003
Manufacturer Model:	OMEGA DP465-KC-MDSSD	****Calibration Due:**	Jul 15, 2003
Description:	THERMOCOUPLE THERMOMETER	**Calibration Location:**	N/A
Serial No:	3130900	**Environment:**	Temp. 72.0°F Hum. 38 %RH
Asset No:	002524	***As Found:**	IN TOLERANCE
Procedure:	CL-228, 8/99	***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.

*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
004164	FLUKE	5500A/SC300	CALIBRATOR	Jul 25, 03

Approved by: Walt Hill
Metrology Group Leader

Measurements by: Vince Morales
Metrology Technician

Southwest Research Institute
Calibration Laboratory
Measurement Report

Work Order:	444051756	Mfr.	Omega	Technician	V Morales
Asset No.	2524	Model	465	Rev Level	0, 20-Jun-02
Serial No.	3130900	Type.	Temperature Meter	Cal Date.	15-Jan-03
Remarks:					

Function/Range	Test Point	TI Reading	Difference	Test Limits+/-	Uncertainty	Found/Left
Type K CH1	Deg C	Deg C	Deg C	Deg C	Deg C	Results
0 mV	0	1	1	2	0	Pass
-5.965	-205	-204	1	2	0.58	Pass
13.040	320	320	0	2	0.58	Pass
34.908	840	840	0	2	0.58	Pass
54.886	1372	1373	1	2	0.58	Pass
Type K	Deg C	Deg C	Deg C	Deg C	Deg C	
Ch2 54.886 mV	1372	1373	1	2	0.58	Pass
Ch3 54.886 mV	1372	1373	1	2	0.58	Pass
Ch4 54.886 mV	1372	1373	1	2	0.58	Pass
Ch5 54.886 mV	1372	1373	1	2	0.58	Pass
Ch6 54.886 mV	1372	1372	0	2	0.58	Pass
Ch7 54.886 mV	1372	1372	0	2	0.58	Pass
Ch8 54.886 mV	1372	1372	0	2	0.58	Pass
Ch9 54.886 mV	1372	1372	0	2	0.58	Pass
Ch10 54.886 mV	1372	1372	0	2	0.58	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 of Calibration

Submitted By:	DIV20	**Work Order:**	444054477
Address:	B57	**Date Issued:**	Jul 23, 2003
Contact:	DARRELL DUNN	**Calibration Date:**	Jul 23, 2003
Manufacturer Model:	OMEGA DP465-KC-MDSSD	****Calibration Due:**	Jan 23, 2004
Description:	THERMOCOUPLE THERMOMETER	**Calibration Location:**	Bldg. 64
Serial No:	3130900	**Environment:**	Temp. 72.0°F Hum. 42 %RH
Asset No:	002524	***As Found:**	IN TOLERANCE
Procedure:	TEMPERATURE METERS, MAR/03	***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.

*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
006413	FLUKE	5520A/SC1100	MULTI-PRODUCT CALIBRATOR	Jan 17, 04

Approved by: Walt Hill
Metrology Group Leader

Measurements by: Mark Romero
Metrology Technician

m:\Nona2lal.rpt Rev date 15, August 02

Southwest Research Institute
Calibration Laboratory
Measurement Report

Work Order:	444054477	Mfr.	Omega	Technician	MAR
Asset No.	002524	Model	DP465		
Serial No.	3130900	Type.	Temperature Meter	Cal Date.	23-Jul-03
Remarks:					

Function/Range	Test Point	TI Reading	Difference	+/-Limit	+/-Uncertainty	Found/Left
Type K	°C	°C	°C	°C	°C	Result
Ch1	0	0	0	2	0.7	Pass
	-200	-198	2	2	0.7	Pass
	320	320	0	2	0.7	Pass
	840	840	0	2	0.7	Pass
	1372	1372	0	2	0.7	Pass
Ch2	1372	1372	0	2	0.7	Pass
Ch3	1372	1372	0	2	0.7	Pass
Ch4	1372	1372	0	2	0.7	Pass
Ch5	1372	1372	0	2	0.7	Pass
Ch6	1372	1372	0	2	0.7	Pass
Ch7	1372	1372	0	2	0.7	Pass
Ch8	1372	1372	0	2	0.7	Pass
Ch9	1372	1372	0	2	0.7	Pass
Ch10	1372	1372	0	2	0.7	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

ACCREDITED
Certificate #
0972-01

Certificate of Calibration

Submitted By:	DIV20	**Work Order:**	444057134
Address:	B57	**Date Issued:**	Jan 30, 2004
Contact:	DARRELL DUNN	**Calibration Date:**	Jan 30, 2004
Manufacturer Model:	OMEGA DP465-KC-MDSSD	****Calibration Due:**	Jul 30, 2004
Description:	TEMPERATURE METER	**Calibration Location:**	Bldg. 64
Serial No:	3130900	**Environment:**	Temp. 72.0°F Hum. 36 %RH
Asset No:	002524	***As Found:**	IN TOLERANCE
Procedure:	TEMPERATURE METERS, MAR/03	***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.

*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
004164	FLUKE	5500A/SC300	CALIBRATOR	Aug 04, 04

Approved by: Walt Hill
Metrology Group Leader

Measurements by: Mark Romero
Metrology Technician

Southwest Research Institute
Calibration Laboratory
Measurement Report

Work Order:	444054477	Mfr.	Omega	Technician	Mark Romero
Asset No.	002524	Model	DP465		
Serial No.	3130900	Type.	Temperature Meter	Cal Date.	30-Jan-04
Remarks:					

Function/Range	Test Point	TI Reading	Difference	+/-Limit	+/-Uncertainty	Found/Left
Type K	°C	°C	°C	°C	°C	Result
Ch1	0	0	0	2	1.2	Pass
	-200	-199	1	2	1.2	Pass
	320	320	0	2	1.2	Pass
	840	841	1	2	1.2	Pass
	1372	1373	1	2	1.2	Pass
Ch2	1372	1373	1	2	1.2	Pass
Ch3	1372	1373	1	2	1.2	Pass
Ch4	1372	1373	1	2	1.2	Pass
Ch5	1372	1373	1	2	1.2	Pass
Ch6	1372	1373	1	2	1.2	Pass
Ch7	1372	1373	1	2	1.2	Pass
Ch8	1372	1373	1	2	1.2	Pass
Ch9	1372	1373	1	2	1.2	Pass
Ch10	1372	1373	1	2	1.2	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

ACCREDITED
Certificate #
0972-01

Certificate of Calibration

Submitted By:	DIV20	**Work Order:**	444059851
Address:	B57	**Date Issued:**	Jul 13, 2004
Contact:	DARRELL DUNN	**Calibration Date:**	Jul 13, 2004
Manufacturer Model:	OMEGA DP465-KC-MDSSD	****Calibration Due:**	Jan 13, 2005
Description:	TEMPERATURE METER	**Calibration Location:**	Bldg. 64
Serial No:	3130900	**Environment:**	Temp. 73.0°F Hum. 40 %RH
Asset No:	002524	***As Found:**	IN TOLERANCE
Procedure:	TEMPERATURE METERS, OCT/03	***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. 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
006413	FLUKE	5520A/SC1100	MULTI-PRODUCT CALIBRATOR	Feb 19, 05

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

Measurements by: Scott Kester
Metrology Technician

Southwest Research Institute
Calibration Laboratory
Measurement Report

Work Order:	444059851	Mfr.	Omega	Technician	SRK
Asset No.	002524	Model	DP465		
Serial No.	3130900	Type.	Temperature Meter	Cal Date.	13-Jul-04
Remarks:					

Function/Range	Test Point	TI Reading	Difference	+/-Limit	+/-Uncertainty	Found/Left
Type K	°C	°C	°C	°C	°C	Result
Ch1	0	1	1	2	1.2	Pass
	-200	-199	1	2	1.2	Pass
	320	320	0	2	1.2	Pass
	840	840	0	2	1.2	Pass
	1372	1372	0	2	1.2	Pass
Ch2	1372	1372	0	2	1.2	Pass
Ch3	1372	1372	0	2	1.2	Pass
Ch4	1372	1372	0	2	1.2	Pass
Ch5	1372	1372	0	2	1.2	Pass
Ch6	1372	1372	0	2	1.2	Pass
Ch7	1372	1372	0	2	1.2	Pass
Ch8	1372	1372	0	2	1.2	Pass
Ch9	1372	1372	0	2	1.2	Pass
Ch10	1372	1372	0	2	1.2	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

ACCREDITED
Certificate #
0972-01

Certificate of Calibration

Submitted By:	DIV20	**Work Order:**	444062189
Address:	B57	**Date Issued:**	Jan 7, 2005
Contact:	DARRELL DUNN	**Calibration Date:**	Jan 7, 2005
Manufacturer Model:	OMEGA DP465-KC-MDSSD	****Calibration Due:**	Jul 7, 2005
Description:	TEMPERATURE METER	**Calibration Location:**	Bldg. 64
Serial No:	3130900	**Environment:**	Temp. 73.0°F Hum. 41 %RH
Asset No:	002524	***As Found:**	IN TOLERANCE
Procedure:	TEMPERATURE METERS, OCT/03	***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. 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
004164	FLUKE	5500A/SC300	CALIBRATOR	Aug 03, 05

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

Measurements by: Curtis Laurence
Metrology Technician

Southwest Research Institute
Calibration Laboratory
Measurement Report

Work Order:	444062189	Mfr.	Omega	Technician	WCL
Asset No.	002524	Model	DP465		
Serial No.	3130900	Type.	Temperature Meter	Cal Date.	07-Jan-05
Remarks:					

Function/Range	Test Point	TI Reading	Difference	+/-Limit	+/-Uncertainty	Found/Left
Type K	°C	°C	°C	°C	°C	Result
Ch1	0	0	0	2	1.2	Pass
	-200	-199	1	2	1.2	Pass
	320	320	0	2	1.2	Pass
	840	840	0	2	1.2	Pass
	1372	1372	0	2	1.2	Pass
Ch2	1372	1372	0	2	1.2	Pass
Ch3	1372	1373	1	2	1.2	Pass
Ch4	1372	1373	1	2	1.2	Pass
Ch5	1372	1373	1	2	1.2	Pass
Ch6	1372	1372	0	2	1.2	Pass
Ch7	1372	1373	1	2	1.2	Pass
Ch8	1372	1372	0	2	1.2	Pass
Ch9	1372	1373	1	2	1.2	Pass
Ch10	1372	1372	0	2	1.2	Pass

END OF REPORT