

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 B168 NARASI SRIDHAR

Device No: 1869

Manufacturer: ORION

Model: 720A

Nomenclature: PH METER

Serial Number: 5885

SwRI No: NONE

Remarks

Accuracy: MFG SPEC

Procedure: MFG

ENVIRONMENT

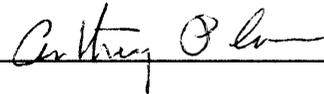
Temperature: 73 Humidity: 38 Location: ROOM A11 B68, SWRI

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 _____



Calibration Date: 09/18/92

Record Number: 00009841

Next Calibration Due: 03/18/93

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: 5885

Calibration Date: 09/18/92

STANDARDS

Standard No: 106 Manufacturer: JOHN FLUKE Model: 8506A
Nomenclature: THERMAL TRUE RMS DIGITAL MULTIMETER
Serial No: 4180021 Cal.Due: 05/06/93 Cal.Rec.No: 00009154

Standard No: 132 Manufacturer: JOHN FLUKE Model: 5100B
Nomenclature: CALIBRATOR
Serial No: 2730017 Cal.Due: 09/30/92 Cal.Rec.No: 00009040

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Issued to: DIV20 B168 NARASI SRIDHAR

Device No: 1869

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Remarks

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Procedure: MFG

ENVIRONMENT

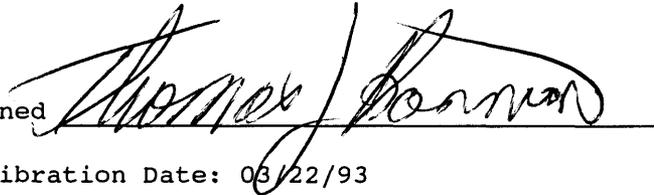
Temperature: 71 Humidity: 48 Location: ROOM A11 B68 SWRI

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



Calibration Date: 03/22/93

Record Number: 00010910

Next Calibration Due: 03/22/94

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: 5885

Calibration Date: 03/22/93

STANDARDS

Standard No: 182 Manufacturer: JOHN FLUKE Model: 5700A
Nomenclature: CALIBRATOR
Serial No: 5200003 Cal.Due: 07/29/93 Cal.Rec.No: 00010543

Standard No: 1505 Manufacturer: HEWLETT PACKARD Model: 3458A
Nomenclature: SYSTEM MULTIMETER
Serial No: 2823A07741 Cal.Due: 04/16/93 Cal.Rec.No: 00009099

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: 5885

Calibration Date: 03/09/94

STANDARDS

Standard No: 132 Manufacturer: JOHN FLUKE

Model: 5100B

Nomenclature: CALIBRATOR

Serial No: 2730017

Cal.Due: 05/04/94

Cal.Rec.No: 00012641

SOUTHWEST RESEARCH INSTITUTE
Department of Quality Assurance
Calibration Laboratory

CERTIFICATE OF CALIBRATION
03/29/95

Issued to: DARRELL DUNN DIV20 ,B57
Manufacturer: ORION
Nomenclature: PH METER
Serial Number: 5885

Asset Number: 001869
Model Number: 720A

SwRI/Div. I.D. #: NONE

ENVIRONMENTAL CONDITIONS

Temperature: 71.0F

Relative Humidity: 45%

CALIBRATION INFORMATION

Procedure Number: MFGR
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
000132	2730017	FLUKE	5100B	CALIBRATOR	11/16/94	6	05/16/95

Certified by : _____

Calibration Date: 03/29/95
Interval: 12 months
Next Calibration Due: 03/29/96

Certificate#: 16751



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

Certificate of Calibration

2 May 1996

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: ORION 720A
Description: PH METER
Serial Number: 5885
Asset Number: 001869

Environmental Conditions

Temperature: 72.0 Humidity: 44%

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: 5 Apr 96 Calibration Procedure: CLCP-PH-001
Interval: 12 months Accuracy: MFGR SPECS
Next Calibration Due: 4 Apr 97 Received: Out of Tolerance

Remarks:

PARAMETER/	MEASURED VALUES	MEASURED VALUES
RANGE	AS FOUND	AS RELEASED
CH1		
CH1		
1.5V	1.4986V	1.4993V
-1.5V	-1.4987V	-1.4995V
CH2		
CH2		
1.5V	1.4987V	1.4997V
-1.5V	-1.4984V	-1.4992V

Certificate # 20742

Signed: 

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Department of Quality Assurance
Calibration Laboratory

Out of Tolerance Notice

8 May 1996

The following asset was found to be out of tolerance when submitted for calibration. Please be aware measurements made with this instrument may be inaccurate.

Instrument Information

Issued to: DARRELL DUNN DIV20 B57

Manufacturer/Model: ORION 720A

Description: PH METER

Serial Number: 5885

Asset Number: 001869

SwRI Cap No.: NONE

Accuracy: MFGR SPECS

Calibration Interval: 12 months

Calibration Procedure: MFG

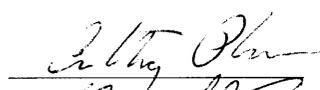
Calibration Results

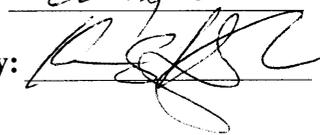
Out of Tolerance Date: 1 May 96

Last Valid Calibration Date: 1 May 95

PARAMETER/ RANGE	MEASURED VALUES AS FOUND	MEASURED VALUES AS RELEASED
CH1		
1.5V	1.4986V	1.4993V
-1.5V	-1.4987V	-1.4995V
CH2		
1.5V	1.4987V	1.4997V
-1.5V	-1.4984V	-1.4992V

Certificate # 20742

Signed: 

Checked by: 

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Out of Tolerance Notice

CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES

NONCONFORMANCE REPORT

Project No. 20-5708-573

NCR No. 96-04

PART 1: DESCRIPTION OF NONCONFORMANCE The Orion pH Meter Model 720A, s/n 5885, was out of tolerance upon recalibration (see attached notice). Initiated by: R. Brient Date: 5/15/96	
PART 2: PROPOSED DISPOSITION AND CORRECTIVE ACTION Disposition: Accept all measurements taken with the meter since last calibration. Basis of Disposition: The meter was out of tolerance a maximum of .0016 volts, which at approximately .059 volts per pH unit, equates to a maximum error of around .027 pH units. The pH parameter requires an accuracy of no more than 0.1 pH unit. Action to correct nonconformance: Meter was recalibrated to tolerance. If the out of tolerance occurs again at the next scheduled calibration, additional measures shall be taken, such as repair or replacement, to assure that the out of tolerance does not occur again. Target date for completion: <u>5/15/96</u> Proposed by: D. Dunn Date: 5/15/96	
PART 3: APPROVAL Element Manager: <u>N. Swickal</u> Date: <u>5/15/96</u> Director of QA: <u>Dunn Malan</u> Date: <u>5/15/96</u> Comments/Instructions:	
PART 4: CLOSE OUT Comments: <u>Not required</u> Verified by: <u>[Signature]</u> Date: <u>5/15/96</u>	

distribution: D. DUNN
N. SCIDNAR
B. SAGAR
H. GARCIA
E.M.



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

Out of Tolerance Notice

8 May 1996

The following asset was found to be out of tolerance when submitted for calibration. Please be aware measurements made with this instrument may be inaccurate.

Instrument Information

Issued to: DARRELL DUNN DIV20 B57

Manufacturer/Model: ORION 720A

Description: PH METER

Serial Number: 5885

Asset Number: 001869

SwRI Cap No.: NONE

Accuracy: MFGR SPECS

Calibration Interval: 12 months

Calibration Procedure: MFG

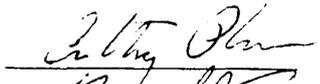
Calibration Results

Out of Tolerance Date: 1 May 96

Last Valid Calibration Date: 1 May 95

PARAMETER/ RANGE	MEASURED VALUES AS FOUND	MEASURED VALUES AS RELEASED
CH1		
1.5V	1.4986V	1.4993V
-1.5V	-1.4987V	-1.4995V
CH2		
1.5V	1.4987V	1.4997V
-1.5V	-1.4984V	-1.4992V

Certificate # 20742

Signed: 

Checked by: 

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Total pages printed: 1

Out of Tolerance Notice



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Calibration Laboratory

Certificate of Calibration

18 April 1997

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: ORION 720A
Description: PH METER
Serial Number: 005885
Asset Number: 001869

Environmental Conditions

Temperature: 75.0 Deg. F Humidity: 43%

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: 18 Apr 97 Calibration Procedure: CLCP-PH-001
Interval: 12 months Accuracy: MFGR SPECS
Next Calibration Due: 17 Apr 98 Received: In Tolerance

Remarks:

Standards Used

Asset	MFR	Model	Description	Serial No.	Due Cal
000168	FLUKE	335A	DC VOLTAGE STANDARD/D	775024	4 Aug 97

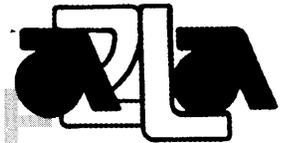
Certificate # 24981

Signed: 

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 6220 Culebra Road
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 Calibration Laboratory



ACCREDITED

Certificate of Calibration

20 May 1998

Issued to: DARRELL DUNN DIV20 B57
 Manufacturer/Model: ORION 720A
 Description: PH METER
 Serial Number: 005885
 Asset Number: 001869

Environmental Conditions

Temperature: 76 Deg. F Humidity: 42 % 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: 20 May 98 Calibration Procedure: CLCP-PH-001

Interval: 12 months Received: Out of Tolerance

Next Calibration Due: 20 May 99

Remarks:

Out of Tolerance Data

The unit was found to be in an Out of Tolerance condition as indicated below. An evaluation should be made by the user to determine any adverse impact that may have occurred.

Absolute Millivots

Channel 1

Applied:	Reading:	Limits:	As left:
0.0mV	.3mv	-.2 +.2	0.0mV

	500.0mV	499.4mV	499.7 - 500.3mV	500.0mV
	1000.0mV	999.1mV	999.5 - 1000.5mV	1000.0mV
	1500.0mV	1499.0mV	1499.2 - 1500.8mV	1500.1mV
Channel 2	500.0mV	499.5mV	499.7 - 500.3mV	500.0mV
	1000.0mV	999.2mV	999.5 - 1000.5mV	1000.0mV
	1500.0mV	1499.0mV	1499.2 - 1500.8	1500.1mV

Certificate # 29638

Certificate of Calibration

20 May 1998

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: ORION 720A
Description: PH METER
Serial Number: 005885
Asset Number: 001869

Signed: *Vincent Morales*
Title: Cal. Tech.

Checked By: *[Signature]*
Title: *[Signature]*

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Southwest Research Institute
6220 Culebra Road
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(210) 522-5215
Department of Quality Assurance
Calibration Laboratory

Certificate of Calibration

15 June 1999

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: ORION 720A
Description: PH/ION METER
Serial Number: 005885
Asset Number: 001869

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: 75.0 Degrees Fahrenheit Humidity: 42 % RH

Calibration Date: 15 Jun 99 **Calibration Procedure:** CL-78, JUNE 99

Condition as Received: IN TOLERANCE

Condition as Released: LIMITED CALIBRATION

Remarks: LIMITED: CAL MV USE ONLY

Approved by:

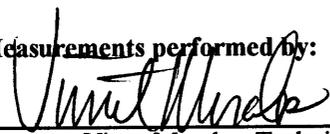


Jim Patterson, Supervisor or Walt Hill, Metrologist

Certificate # 34807

m:\nona21a.rpt Rev date 13 Apr 99

Measurements performed by:



Vince Morales, Technician

Page 1 of 1