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

WORK ORDER

aux miles a local in War
CERTIFICATE # DATE 18 1940 91
ITEM DATA:
Manufacturer Model Model
Description Wifa 10 100 And 10 Jan Serial # South
Accessories
ACTION REQUESTED
- Out as Alm Almanda
CUSTODIAN DIVICE, CAIRI LAND
Turned in by: Phone
CHARGE # Date Required
INSTRUMENT USED ON: AND CLEAR 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)
CAL ENVIRONMENT: Temperature
CALIBRATED/REPAIRED:
By Collins Cal Procedure 5352
Date Z RPK 97 Accuracy Accuracy Time to complete:
Next Cal due 2 RPL 98 Cal Repair
Standards used (Asset#)
11.5 , 168
DATE COMPLETED PICKED UP BY PICKED UP BY
DATE PICKED UP 4/4/27 PICKED UP BY Least Swrit Form QA-169-2
SWHI FORM CA-109-2

WORK ORDER HISTORY

DATE	START	CAL	REP	REMARKS:
Z RCA	STOP	pM		paveed on for worm up
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TOTAL C	AL/REPAIR		-	TOTAL HOURS

1			
 IBR	ATION	CHECK	FORM

Date Calibrated	aph Work Order_	24750		
Technician	2 292-97			
Unit Under Test	Mo	del	SN SOOLA	_ASN_/880

STEP	FUNCTION OR RANGE	APPLIED	TOLERANCE	MEASURE	MEASURED VALUES		
3.2			MIN - MAX	AS FOUND	RELEASED		
	1	1,9000	1.8991 1.9009	18997 V			
				1900.2			
	Recorderand Recorderand	1.9000 V		1859,7			
	Reporder			1900,2			
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Department of Quality Assurance Calibration Laboratory • 522-5215

WÖRK ORDER

CERTIFICATE # 28772 ASSET # 01880	DATE 25 TOB98
ITEM DATA:	_
Manufacturer Orion Model tag	40
Description 1000 Serial # 50	0/4
Accessories	••••
ACTION REQUESTED (1)	
CUSTODIAN DIMO, David Law	
Turned in by: Phone 0090	
$\Delta = 0.00$	
INSTRUMENT USED ON: DOD/NASA NÚCLEAR GLP	
OTHER	gy significant on the
COPY OF CALIBRATION CERTIFICATE Yes No	
NEW WORK Yes -No If yes, an evaluation shall be made to ver	
By Date	
(K) Out of tolerance, adjusted to spe (S) Received into system, introduced ACTION TAKEN: (Calibration/Repair/Parts)	or reactivated
CAL ENVIRONMENT: Temperature	%RH
CALIBRATED/REPAIRED: By Cal Procedure CCC A	2 01-001
Date 77 46598 Accuracy WEST	(
Cal Interval Reliability Code: _5	
	epair Time
Standards used (Asset#)	
DATE COMPLETED 17 PICKED UP BY SWRI Form QA-174-0	med D

CALIBRATION CHECK FORM

Date Calibrated _	27 \$698	Work Order	29772	
Technician	16theles-			
Unit Under Test	pH Meter			_

Manufacturer Orion Model 520A/720A/920A STEP **FUNCTION OR RANGE** APPLIED **TOLERANCE MEASURED VALUES** P/F MIN MAX AS FOUND RELEASED 1 **Absolute Millivolts** 1500. Channel 1 -1500.0 mV -1499.8 mV to -1500.2 mV 10001 -1000.0 mV -999.8 mV to -1000.2 mV 500,1 -500.0 mV -499.8 mV to -500.2 mV -000.1 000.0 mV -000.2 mV to +000.2 mV 499.9 P $+500.0 \, \text{mV}$ 499.8 mV to 500.2 mV 9999 +1000.0 mV 999.8 mV to 1000.2 mV 1499.9 +1500.0 mV 1499.8 mV to 1500.2 mV ~1500.2 -1500.0 mV Channel 2 -1499.8 mV to -1500.2 mV -1000.2 -1000.0 mV -999.8 mV to -1000.2 mV - SW . -500.0 mV -499.8 mV to -500.2 mV 000.1 000.0 mV-000.2 mV to +000.2 mV 499.9 $+500.0 \, \text{mV}$ 499.8 mV to 500.2 mV $+1000.0 \, mV$ 999.8 mV to 1000.2 mV 1500.0 +1500.0 mV 1499.8 mV to 1500.2 mV 2 **Relative Millivolts**

1500 mV

1500 mV

1499.3 mV to 1500.7 mV

1499.3 mV to 1500.7 mV

Channel 1

Channel 2

Department of Quality Assurance Calibration Laboratory • 522-5215

WORK ORDER

CERTIFICATE #
ITEM DATA:
Manufacturer Oxion Model EAGLO Description Oxion Ion Analyza Serial # \$0000
Description
Accessories
ACTION REQUESTED
CUSTODIAN DULGO CAMPOL SULA
Turned in by: Phone
Turned in by: Phone Phone
INSTRUMENT USED ON: ☐ (DOD/NASA) ☑ (NUCLEAR) ☐ (GLP) ☐ (SPPE) ☐ (ISO) ☐ OTHER
COPY OF CALIBRATION CERTIFICATE (Yes) (No)
NEW WORK Yes Mo If yes, an evaluation shall be made to verify capabilities.
By
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) (Thick Calibration Conditions)
·

CAL ENVIRONMENT: Temperature73 Humidity40 %RH
CALIBRATED/REPAIRED: By WAR CALIBRATED CALI
Date 24 MAR 99 Accuracy Mts
Cal Interval 12 Reliability Code:
Next Cal due 24 MAR 60 Cal Time 1. S Repair Time
Standards used (Asset#) 6413
DATE COMPLETED 24, MARSI
DATE PICKED UP BY The PICKED UP BY
SwRI Form QA-174-0

30577

CALIBRATION CHECK FORM

Date Calibrated 24 MAR 99	Work Order 33 S77
Technician Warales	

Unit Under Test pH Meter SN S00/4 ASN 1880 Model 290A/520A/720A/920A Manufacturer Orion **STEP** APPLIED **TOLERANCE FUNCTION OR RANGE MEASURED VALUES** P/F **AS FOUND** RELEASED MIN MAX 1 **Absolute Millivolts** -1500.2ml -1500.0 mV -1499.2 mV to -1500.8 mV Channel 1 -10002m -1000.0 mV -999.5 mV to -1000.5 mV 500.2n -500.0 mV -499.7 mV to -500.3 mV -0.2m 000.0 mV -000.2 mV to +000.2 mV 499.8m4 +500.0 mV 499.7 mV to 500.3 mV 999.7m +1000.0 mV 999.5 mV to 1000.5 mV +1500.0 mV 1499.2 mV to 1500.8 mV -1500.21 Channel 2 -1500.0 mV -1499.2 mV to -1500.8 mV -1000.2mV -1000.0 mV -999.5 mV to -1000.5 mV -500.2m -500.0 mV -499.7 mV to -500.3 mV -0.2m Vm 0.000 -000.2 mV to +000.2 mV +500.0 mV 499.7 mV to 500.3 mV +1000.0 mV 999.5 mV to 1000.5 mV +1500.0 mV 1499.2 mV to 1500.8 mV **Relative Millivolts** 1500 mV 1499.1 mV to 1500.9 mV Channel 1 1500 mV 1499.1 mV to 1500.9 mV Channel 2

workreg.rpt Rev 30 Jan 00

CALIBRATION CHECK FORM

Date Calibrated 7 June Work Order 38599 Cal By	Morch	
------------------------------------------------	-------	--

Procedure No./Date: <u>CL-78</u>, <u>JUNE 99</u> Unit Under Test: <u>PH METER</u>

Mfg.: ORION Model: 720A SN SOYA AN 1870

STEP	FUNCTION OR RANGE	APPLIED	TOLE	ERANCE	MEASUREI	P/F	
*****			MIN	- MAX	AS FOUND	RELEASED	
2.2	MILLIVOLTS						
	INPUT 1	0.000mV	-0.5	+0.5mV	-0.2 m		Pus
		1000.0mV	999	1001mV	1000. 2ml		
		-1000.0mV	-999	-1001mV	-0.2 m) 1000.2ml 1000.4ml		\prod
	****						1
	Na i nioi ma						
	MILLIVOLTS INPUT 2	0.000mV	-0.5	+0.5mV	-0.2 m		
		1000.0mV	999	1001mV	1000.0m	,	
		-1000.0mV	-999	-1001mV	-0.2 ml 1000.0ml -1000.5m		V
			<u> </u>				

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



Certificate of Calibration

7 June 2000

Issued to:

DARRELL DUNN DIV20 B57

Manufacturer/Model: ORION EA 920

Description:

EXPANDABLE IONANALYZER

Serial Number:

S001A

Asset Number:

001880

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: 74.0 Degrees Fahrenheit

Humidity: 40 % RH

Calibration Date: 7 Jun 00

Calibration Procedure: CL-79, 6/99

Condition as Received: See Remarks

Remarks: FOUND WITHIN TOLERANCE FOR LIMITED CALIBRATION OF MILLIVOLTS ONLY

Approved by:

Jim Patterson, Supervisor, or Walt Hill, Metrologist

Certificate # 38599 m \a2la.rpt Rev date 22 May 00 Measurements performed by:

Page 1 of 1

Calibration Laboratory

WORK ORDER

Processed	by RCRUZ	Z at 3:14:42PM o	n 7/20/01				
		iiii III Manufacturer	Work Order 444044 ORION	497 Model <u>I</u>	EA 920	Arrived <u>7/20/01</u>	
Instrumer	nt Type/Cl	ass EXPANDAL	BLE IONANALYZER	Serial No. S	5001A		
Accessory	No.	Calibrat	ion Procedure <u>CL-79, 6/99</u>			Location <u>B57</u>	
Div/Client	<u>DIV20</u>	Cı	ustodian DARRELL DUNN	Mail	Stop <u>B57</u>	Tel. <u>6090</u>	
Charge/P	roject No.	00751.006	Delivered B	By / Telephone			
IN4C	CAL	Special Instruc	tions				_
			WORK NOT	ES		See and the second	
Date	Hours	Remarks/Note	1. /				
Date	Hours	Part Name	REPAIR PART	'S Failure Desci	ription	Cost	
				_			Ž
			WORK SUMM	ARY			
Failure D	escription	l					•
Repair A	ction		1:0				•
Calibrati	on Proced		6/99		Temp //	_	
Tech	Mass	Anthony L	Mono Totals Cal Hours /	Repair Ho	ours	Parts Cost	
Standard	s Used	182					<u>.</u>
					$\overline{}$	$\overline{}$	-
Date Pick	ked Up	7/31/01	Picl	ked Up By	Thurs !		-

Southwest Research Institute Calibration Laboratory

Work Order 441044497	Mfg. Orion	Tech Hit futher Courses
Asset No. 00 (000)	Model 720A and EA920	Procedure CL-79, Jun 99 /
Serial No. \$ 00/A	Type pH Meter	Cal Date 18 July 400/

Calibration As Found/As Released Data

Parameter	Standard Reading	UUT As Found	Tolerance	UUT As Released
2.2	Standard Reading	OUT NOT OUT		
Millivolts				
	0.000 mV	- A (a)/	-0.5 to +0.5 mV	
Input 1	1000.0 mV	- 0.lav 1000.\$ mV -1000.5 mV	999 to 1001 mV	
	1000.0 mV	100.8 11	999 to 1001 mV -999 to -1001 mV	
	-1000.0 mV	- 10W. S AV	-999 to -1001 mv	
				
Millivolts				
Input 2	0.000 mV	- 0.1 m V 1000. 1 m V -1000. 5 m V	-0.5 to +0.5 mV	
	1000.0 mV	1000. [M V	999 to 1001 mV	
	-1000.0 mV	-1000,5 ml	-999 to -1001 mV	V
			 	
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Southwest Research Institute 6220 Culebra Road San Antonio, TX 78238 (210) 522-5215 **Department of Quality Assurance** Calibration Laboratory



Certificate of Calibration

23 July 2001

Issued to:

DARRELL DUNN DIV20 B57

Manufacturer/Model:

ORION EA 920

Description:

EXPANDABLE IONANALYZER

Serial Number: Asset Number:

S001A 001880

Work Order Number: 444044497

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: 73.0 Degrees Fahrenheit

Humidity: 38 % RH

Calibration Date: 23 Jul 01

Calibration Procedure: CL-79, 6/99

Condition as Received: LIMITED CALIBRATION

Condition as Released: LIMITED CALIBRATION

Remarks: LIMITED CALIBRATION: CAL MILLIVOLT USE ONLY.

Approved by:

Walt Hill, Supervisor

Institute Calibration Laboratory

m\a2la.rpt Rev date 8 Jan 01

Measurements performed by:

Mark Romero, Technician

Page 1 of 1

Calibration Laboratory

WORK ORDER

100M 10 M 00M	31 [1] []	BERSON, 7/3/02 10:4 III III Manufacturer <u>OR</u>	Arrived 7/2	3/02 Work Ord Model <u>EA</u>		49295
Equipme	nt Type	EXPANDABLE ION	VANALYZER Seri	al No. <u>S001A</u>	Accesso	ory No.
Interval	<u>12 M</u>	Calibration	n Procedure <u>CL-79, 6/99</u>		Loc	eation <u>B57</u>
Div/Clien	1 <u>DIV20</u>	Cust	odian <u>DARRELL DUN</u>	N Mail Sto	op <u>B57</u> T e	el <u>6090</u>
IN L	<u>INE</u>	Special Instructi	ons <u>LIMITED: MV USE</u>	ONLY,		
Notify b	efore adju	istments or repairs.	() Provide data with o	certificate (🗸) Certifi	cate Typ	
Charge/	Project N	o. <u>00751.006 1.20</u>	Requester	· / Telephone		
This info	ormation i	is correct for the wo	rk requested.	full the		
			WORK NO	OTES		
Date	Hours	Remarks/Notes				
		€1 # # #*** # # # # # # # # # # # # # # #				
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		•				
Date	Hours	Part Name	Part Number	Failure Descripti	ion	Cost
		-				— —
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			WORK SUM	MARY		
Failure D	escription	1				
Repair Ac	ction					
Tech <u>F</u> Standards	-	A	Repair Hrs Pa	arts Cost T	Temp <u>22</u> F	Hum. <u>//</u> %
——————————————————————————————————————	ed Up	7/10/2002	Pi	icked Up By	u Q	

Southwest Research Institute Calibration laboratory Calibration Sheet.

Found/Left

Work Order:	444049295	Mfr.	Orion	Technician	8216
Asset No.	001880	Model	720A and EA920	Procedure	CL-79 7/99
Serial No.	S001A	Туре.	pH Meter	Cal Date.	9-Jul-02

Remarks:

(1) The Difference is equal to TI reading - Test Point reading.

(2) If no value is listed the uncertainty is >4/1

The results can be Pass, Fail, or if blank "not determinable". If "not determinable" it is up to the end user to determine if results meet their needs.

Function/Range	Test Point	TI Reading	Difference (1)	Test Limits+/-	Uncertainty (2)	
m Volts	m Volts	m Volts	m Volts	m Volts	m Volts	Results
Input 1	0.0	0.1	0.1	0.5	0.0	Pass
iiiput i	1000.0	1000.3	0.3	1.0	0.0	Pass
	-1000.0	-1000.5	-0.5	1.0	0.0	Pass
Function/Range	Test Point	TI Reading	Difference (1)	Test Limits+/-	Uncertainty (2)	
m Volts	m Volts	m Volts	m Volts	m Volts	m Volts	Results
Input 2	0.0	-0.1	-0.1	0.5	0.0	Pass
iiput 2	1000.0	1000.1	0.1	1.0	0.0	Pass
	-1000.0	-1000.5	-0.5	1.0	0.0	Pass



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

Certificate of Calibration

9 July 2002

Issued to:

DARRELL DUNN DIV20 B57

Manufacturer/Model:

ORION EA 920

Description:

EXPANDABLE IONANALYZER

Serial Number: Asset Number:

S001A 001880

Work Order Number: 444049295

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:

72.0 Degrees Fahrenheit

Humidity: 41 % RH

Calibration Date: 9 Jul 02

Calibration Procedure: CL-79, 6/99

Condition as Received: LIMITED CALIBRATION

Condition as Returned: LIMITED CALIBRATION

Remarks: LIMITED CALIBRATION: MILLIVOLT USE ONLY.

Approved by:

Measurements performed by:

Institute Calibration Laboratory