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

WORK ORDER

WORK ORDER # 36481 ASSET # 00622 DATE 20 OCT. 99

ITEM DATA:

Manufacturer Omega Model PX302-015GV

Description pressure transducer Serial # 980121

Accessories box, spec sheet

ACTION REQUESTED Cal

CUSTODIAN Div. 20, Ron Groom

Turned in by: Jim Pilkey Phone

CHARGE # 20.01402.607 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 Mail Date 10/20/99

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) Cal

CAL ENVIRONMENT:

Temperature 68 °F Humidity 41 %RH

CALIBRATED/REPAIRED:

By [signature] Cal Procedure CCCP-P1-001 Jun99

Date 10-27-99 Accuracy ±0.25% BFSL

Cal Interval 6 mos Reliability Code

Next Cal Due 4-27-00 Cal Time 2.5 Repair Time

Standards used (Asset #) 5259, 4259

DATE COMPLETED 10-27-99

DATE PICKED UP 11/3/99 PICKED UP BY [signature]

SwRi Form QA-174-0

36481

PRESSURE CALIBRATION DATA SHEET

Date 10-27-99 Work Order 36481 Technician [signature]
Inst Cust. RonGreen Ext _____ Charge # 20-01402-661 time 2.5

A) Unit Under Test Omega Press Transducer
Model PX302-015GV Serial No. 980121 Asset No. 7622
Range 15 psi Uncertainty ±0.25% FS (L,H,R) Std Unc _____

B) Calibration Standard (1) Mensor
Model 5014 Serial No. 340119 B Asset No. 5259
Uncertainty ±0.003 PSI (±0.01%) Std Unc _____

C) Calibration Standard (2) Phillips DMM
Model PM2535 Serial No. DM638003 Asset No. 4259
Uncertainty ±0.019% Rd Std Unc _____
Comb Unc (rss B&C) 0.021% FS TUR (A Unc/Comb Unc) 12/1

If less than 4:1, **Total** combined calibration Unc (kXrss) _____
k=_____ Explanation _____
Env: Room Temp. 68°F Humidity 41% Baro Press. 29.32" Hg
Conversion Factor(s) N/A

STANDARD	INCREASING	DECREASING	TOLERANCE: ±0.25% FS (L,H,R)	
UNITS: PSI	UNITS: mV	UNITS: mV	UNITS: * See notes	
AS FOUND			MIN	MAX
0	-1.746	-1.756		
3	18.293	18.286		
6	38.389	38.379		
9	58.468	58.463		
12	78.482	78.483		
15	98.382	↗		
AS DELIVERED				

NOTES: *1) Above data within ± 0.12% of BFSL
2) Measurement Uncertainty ± 0.02% FS
3) Excitation 10.0010 V

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

Accredited

Certificate # 0972-01

Certificate of Calibration

27 October 1999

Issued to:	RON GREEN DIV20 B57
Manufacturer/Model:	OMEGA PX302-015GV
Description:	PRESSURE TRANSDUCER
Serial Number:	980121
Asset Number:	007622

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: 68.0 Degrees Fahrenheit Humidity: 41 %RH

Calibration Date: 27 Oct 99 **Calibration Procedure** CLCP-PI-001 JUN99

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

Remarks:

Approved by:

Jim Patterson, Supervisor or Walt Hill, Metrologist

Certificate # 36481

Measurements performed by:

Mack Wood, Technician

m:\a2la.rpt Rev date 10 Mar 99

SOUTHWEST RESEARCH INSTITUTE

Calibration Laboratory

WORK ORDER

Processed by WHILL at 10:04:22AM on 6/12/01

Work Order 444044000 Arrived 6/12/01

Asset No. 007622 Manufacturer OMEGA Model PX302-015GV

Instrument Type/Class PRESSURE TRANSDUCER Serial No. 980121

Accessory No. Calibration Procedure CLCP-PI-001, 6/99 Location B57

Div/Client DIV20 Custodian RON GREEN Mail Stop B57 Tel. 5305

Charge/Project No. 00751.006 1.20 Delivered By / Telephone JIM PRIKRYL/

IN4CAL Special Instructions

WORK NOTES

Date	Hours	Remarks/Notes
		0-100mV
		0-15PSI ±0.25% FS BFSL
		Red +IN FOUND
		Blk -IN
		Grn tOut
		wht -OUT Exc ??
		100mV

SwRI Cal-Lab By: mw
CAL: 10/27/99 DUE: 04/27/00
AN: 007622 SN: 980121

REPAIR PARTS

Date	Hours	Part Name	Part Number	Failure Description	Cost

WORK SUMMARY

Failure Description

Repair Action

Calibration Procedure Temp 69 F Hum. 40 %

Tech Totals Cal Hours 2.5 Repair Hours Parts Cost

Standards Used 5259, 4259

Date Picked Up 9/19/01 Picked Up By

Southwest Research Institute
Calibration Laboratory
Calibration Data Sheet

Work Order 444044000	**Mfr.** Omega	**Technician** C.M.Wood
Asset No. 7622	**Model** PX302	**Procedure** CLCP-PI-001
Serial No. 971112	**Type**	**Cal Date** **Jun. 15, 01**
Remarks:		

Parameter	Applied Value	Found/Left	Instrument Error	Test Uncertainty	Result
Pressure	PSI	mV	N/A	+/-mV	
	0	1.016		0.026	
	3.75	26.106		0.026	
	7.50	51.229		0.027	
	11.25	76.283		0.028	
	15.00	101.162		0.029	
	11.25	76.283		0.028	
	7.50	51.229		0.027	
	3.75	26.107		0.026	
	0	1.020		0.026	

PRESSURE TRANSDUCER CALIBRATION DATA SHEET *

WORK ORDER #: 444044000 **DATE:** 6/15/01 **TECH.**

UUT Omega pressure transducer
ASN: 7622

R SPAN: 15	**LRP:** 0	**URP:** 15	**UNITS:** 1	psi
EP SPAN: 100	**LEP:** 0	**UEP:** 100	**UNITS:** 3	mV

TOLERANCE +/-% : 0.25 m = 6.682505 **UUT resolution:** 0.001
b = 1.05386 **UUT repeatability** 0.004

CALIBRATION STANDARD 1 **Setability:** 0.0005
ASSET #: 5259 **MFR:** mensor

CALIBRATION STANDARD 2
ASSET #: 4259 **MFR:** Phillips

UNCERTAINTY BUDGET @ F.S.

description	value	divisor	std unc
UUT resolution	0.0005	1.73205	0.000289
UUT repeatability	0.004	1	0.004
Calibration standard 1	0.020048	1.73205	0.011574
Setability	0.003341	1.73205	0.001929
Calibration standard 2	0.0121	1.73205	0.006986
combined uncertainty			1.4E-02
expanded uncertainty	k = 2		2.8E-02

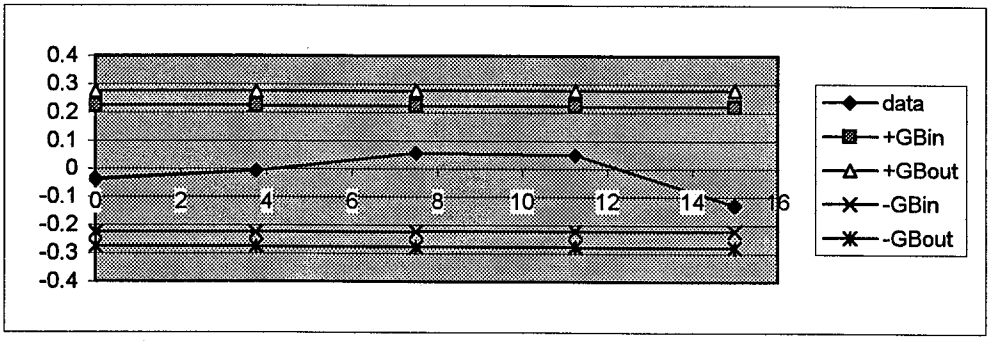
TAR= 10.7

TUR= 8.8

DATA

tolerance **0.25**

INPUT	IDEALout	READING	ERROR	UNCERT	GBin	GBout	PASS	FAIL
0	1.05386	1.016	-0.03786	0.02551	0.22449	0.27551	P	
3.75	26.11325	26.106	-0.00725	0.026059	0.223941	0.276059	P	
7.5	51.17265	51.229	0.056353	0.02675	0.22325	0.27675	P	
11.25	76.23204	76.283	0.050959	0.027574	0.222426	0.277574	P	
15	101.2914	101.162	-0.12943	0.028517	0.221483	0.278517	P	
11.25	76.23204	76.283	0.050959	0.027574	0.222426	0.277574	P	
7.5	51.17265	51.229	0.056353	0.02675	0.22325	0.27675	P	
3.75	26.11325	26.107	-0.00625	0.026059	0.223941	0.276059	P	
0	1.05386	1.02	-0.03386	0.02551	0.22449	0.27551	P	



*Instructions on Sheet 3 **LSQ Max Error (% Span):** 0.129429

PRESSURE CALIBRATION WORK SHEET

INPUT LRP	0	URP	15	R Span 15
OUTPUT LEP	0	UEP	100	EP Span 100

ANSI grade?	n/a	Or	Tol (% FS	1

Zero? y (y or n)

Tol in Engr units 1

		Tolerance			
INPUT	OUTPUT	Min Value	Ideal Out	Max value	P/F
0	1.016	-1	0	1	
3.75	26.106	24	25	26	
7.5	51.229	49	50	51	
11.25	76.283	74	75	76	
15	101.162	99	100	101	
11.25	76.283	74	75	76	
7.5	51.229	49	50	51	
3.75	26.107	24	25	26	
0	1.020	-1	0	1	

Exc
10.0001
10.0002
10.0002
10.0004
10.0004

repeatability
51.238
51.232
51.236
51.234
$\sigma_6 = 0.004$ mV
$\bar{X} = 51.233$
10.0005

1.023
1.022
1.023
1.021

Asset number 7122
Serial number 98D121
Date 6-15-01
Work Order # 44404400O
Resolution 0.001 mV

Calibration Standard 5259
Calibration Standard 4259
Setability of Std 0.0005

Etc
10.0003
$\sigma = 0.00015$
$2\sigma = 0.0003$ V

Notes:
@ 10PSI

History
Past EPso 100.128
Current EPso 100.146
0.02% change

Pwr Supply Sensitivity
PWR 9.9710
Out 67.807

10.0003 6.8.000
10.0257 68.166
Perf Corrected $m = 6.587153$ mV/V
m= 6.666667
b= 0

x 0.0003V = ±0.002mV *
6.6%/V
$b = 2.1265$

1 1

Combine Rep & PS. sens
$\sigma_{PS} = 0.001$ mV
$\sigma_{rep} = 0.004$ mV

RSS $\sigma = 0.004$ mV
Put In Rep Slot in Spreadsheet

CSQ data
m = 6.682505
b = 1.053857

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Certificate #
0972-01

Certificate of Calibration

15 June 2001

Issued to: RON GREEN DIV20 B57
Manufacturer/Model: OMEGA PX302-015GV
Description: PRESSURE TRANSDUCER
Serial Number: 980121
Asset Number: 007622
Work Order Number: 444044000

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.

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Ambient Conditions: Temperature: 68.0 Degrees Fahrenheit Humidity: 40 % RH

Calibration Date: 15 Jun 01 **Calibration Procedure:** CLCP-PI-001, 6/99

Condition as Received: SEE ATTACHED DATA

Condition as Released: SEE ATTACHED DATA

Remarks: CALIBRATION DATA ATTACHED

Approved by:

Walt Hill, Supervisor
Institute Calibration Laboratory

Measurements performed by:

Mack Wood, Technician