

Customer: MESA LABORATORIES
12100 WEST 6TH AVE
LAKEWOOD, CO 80228

PO Number: PO-011090



LAB CODE
AC-2489.02

Certificate/SO Number: 5-B4L8D-20-1 Revision 0

Manufacturer: Ruska Instruments Corp.
Model Number: 7250i
Description: Pressure Calibrator
Serial Number: 69541
ID: TE10704

As-Found: In Tolerance
As-Left: In Tolerance

Calibration Date: Oct 25, 2017
Due Date: Oct 25, 2018

Calibrated To: Manufacturer Specification
Calibration Procedure: 1-AC77428-2

Transcat Calibration Laboratories have been audited and found in compliance with ISO /IEC 17025:2005. Accredited calibrations performed within the Lab's Scope of Accreditation are indicated by the presence of the Accrediting Body's Logo and Certificate Number. Any measurements on an accredited calibration not covered by that Lab's Scope of Accreditation are listed in the notes section of the certificate. SCC, NRC, CLAS or ANAB do not guarantee the accuracy of an individual calibration by accredited laboratories.

Transcat calibrations, as applicable, are performed in compliance with the requirements of the Transcat Quality Manual QAC -P01-000 Revision 1.0, the customer's Purchase Order and/or Quality Agreement requirements, ISO 9001:2008, ANSI/NCSL Z540.1-1994 (R2002). Complete records of work performed are maintained by Transcat and are available for inspection. Laboratory standards used in the performance of this calibration are listed below.

Transcat documents the traceability of measurements to the SI units through the National Institute of Standards and Technology (NIST), or the National Research Council of Canada (NRC), or other national measurement institutes (NMI) that are signatories to the CIPM Mutual Recognition Arrangement, or accepted fundamental and/or natural physical constants, or by the use of specified methods, consensus standards or ratio type measurements. Documentation supporting traceability information is available for review upon written request at a Transcat facility. The measured quantity and the measurement uncertainty are required for further dissemination of traceability.

Uncertainties are reported with a coverage factor k=2, providing a level of confidence of approximately 95%. All calibrations have been performed using processes having a TUR of 4:1 or better (3:1 for mass calibrations), unless otherwise noted. The Test Uncertainty Ratio (TUR) is calculated in accordance with NCSL International RP-18. For mass calibrations: Conventional mass referenced to 8.0 g/cm³.

The results in this report relate only to the item calibrated or tested. Recorded calibration data is valid at the time of calibration within the stated uncertainties at the environmental conditions noted. The determination of compliance to the specification is specific to the model/serial no./ID no. referenced above based on the tolerances shown; these tolerances are either the original equipment manufacturers (OEM's) warranted specifications or the client's requested specifications. This certificate may not be reproduced except in full, without the written approval of Transcat. Additional information, if applicable may be included on separate report(s).

Notes:

As-Found: In-Tolerance, No Adjustment Performed. All readings were Normalized.

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As Found/As Left Data

Description	Setpoints	Accuracy	Low Limit	High Limit	As Found / As Left	O O T	Cal Process Uncertainty (k=2; ±)	Measurement Uncertainty (k=2; ±)	Units	TUR
Leak Test										
			P	P	P					
Pressure Linearity: 150psi Range										
	0.0000psi	±(0.00188 psi)	-0.0019	0.0019	0.0001 psi					
	4.6875psi	±(0.0407% Rdg)	4.6856	4.6894	4.6877 psi		7.5e-005	1.4e-004	psi	25.3 : 1
	14.0625psi	±(0.0153% Rdg)	14.0603	14.0647	14.0628 psi		2.3e-004	2.5e-004	psi	9.8 : 1
	23.4375psi	±(0.01097% Rdg)	23.4349	23.4401	23.4380 psi		3.8e-004	4.0e-004	psi	6.9 : 1
	32.8125psi	±(0.00943% Rdg)	32.8094	32.8156	32.8132 psi		5.3e-004	5.3e-004	psi	5.9 : 1
	46.8750psi	±(0.00901% Rdg)	46.8708	46.8792	46.8760 psi		7.5e-004	7.5e-004	psi	5.6 : 1
	65.6250psi	±(0.00901% Rdg)	65.6191	65.6309	65.6262 psi		1.2e-003	1.2e-003	psi	4.7 : 1
	93.7500psi	±(0.00901% Rdg)	93.7416	93.7584	93.7517 psi		1.8e-003	1.8e-003	psi	4.7 : 1
	131.2500psi	±(0.00901% Rdg)	131.2382	131.2618	131.2522 psi		2.5e-003	2.5e-003	psi	4.7 : 1
	150.0000psi	±(0.00901% Rdg)	149.9865	150.0135	150.0024 psi		2.9e-003	2.9e-003	psi	4.7 : 1
Pressure Hysteresis: 150psi Range										
	65.6250psi	±(0.00901% Rdg)	65.6191	65.6309	65.6275 psi		1.2e-003	1.2e-003	psi	4.7 : 1
	46.8750psi	±(0.00901% Rdg)	46.8708	46.8792	46.8763 psi		7.5e-004	7.5e-004	psi	5.6 : 1
	32.8125psi	±(0.00943% Rdg)	32.8094	32.8156	32.8136 psi		5.3e-004	5.3e-004	psi	5.9 : 1
Vacuum Linearity: 150psi Range										
	0.0000psi	±(0.0075 psi)	-0.0075	0.0075	0.0000 psi					
	-3.6250psi	±(0.20703% Rdg)	-3.6325	-3.6175	-3.6252 psi		5.8e-005	1.3e-004	psi	100.0 : 1
	-7.2500psi	±(0.10372% Rdg)	-7.2575	-7.2425	-7.2504 psi		1.2e-004	1.7e-004	psi	64.7 : 1
	-10.8750psi	±(0.06937% Rdg)	-10.8825	-10.8675	-10.8757 psi		1.7e-004	2.1e-004	psi	43.1 : 1
	-14.5000psi	±(0.05227% Rdg)	-14.5076	-14.4924	-14.5011 psi		2.3e-004	2.6e-004	psi	32.8 : 1
Vacuum Hysteresis: 150psi Range										
	0.0000psi	±(0.0075 psi)	-0.0075	0.0075	0.0000 psi					

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As Found/As Left Data

Description	Setpoints	Accuracy	Low Limit	High Limit	As Found / As Left	O O T	Cal Process Uncertainty (k=2; ±)	Measurement Uncertainty (k=2; ±)	Units	TUR
Barometric Reference Sensor Option										
	11.0000psia	±(0.002 psia)	10.9980	11.0020	11.0002 psia		1.8e-004	2.9e-004	psia	11.4 : 1
	13.0000psia	±(0.002 psia)	12.9980	13.0020	13.0001 psia		2.1e-004	3.1e-004	psia	9.6 : 1
	15.0000psia	±(0.002 psia)	14.9980	15.0020	14.9999 psia		2.4e-004	3.3e-004	psia	8.3 : 1
Evacuated Reference Option										
	0microns	±(10% Rdg , Min: 10 microns)	-10	10	Not Calibrated					
	50microns	±(10% Rdg , Min: 10 microns)	40	60	Not Calibrated					
	100microns	±(10% Rdg , Min: 10 microns)	90	110	Not Calibrated					
	150microns	±(10% Rdg , Min: 10 microns)	135	165	Not Calibrated					
	200microns	±(10% Rdg , Min: 10 microns)	180	220	Not Calibrated					
	250microns	±(10% Rdg , Min: 10 microns)	225	275	Not Calibrated					
	300microns	±(10% Rdg , Min: 10 microns)	270	330	Not Calibrated					
	350microns	±(10% Rdg , Min: 10 microns)	315	385	Not Calibrated					

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Traceable Standards

Asset	Manufacturer	Model Number	Description	Cal Date	Due Date	Traceability Number	Use
DW11BA	Fluke/DH Instruments	PG7601	Piston Gauge	12-Oct-16	31-Oct-17	5-&DW11BA-1-1	AF/AL
DW11LOW	Fluke/DH Instruments	PC-7100/7600-10-TC	Gas Piston-Cylinder Module	2-Mar-17	31-Mar-22	5-&DW11LOW-1-1	AF/AL
DW11MASS	Fluke/DH Instruments	MS-AMH-38	AMH Mass Set	2-Mar-17	31-Mar-18	5-&DW11MASS-1-1	AF/AL
DW11MID	Fluke/DH Instruments	PC-7100/7600-50	Gas Piston-Cylinder Module	2-Mar-17	2-Mar-22	5-&DW11MID-1-1	AF/AL

The use of the standard is defined as: AF - used for as-found readings, AL - used for as-left readings.

Environmental Data

Temperature	Relative Humidity	Temp / RH Asset
68.70°F /20.39°C	36.60%	DewK1

Calibrated At:
1181 Brittmoore Road
Houston, TX 77043

Facility Responsible:
1181 Brittmoore Road
Houston, TX 77043
800-828-1470

Calibrated By:
 Electronically Signed By:
Michael Pennock

Reviewed By:
 Electronically Signed By:
Michael Valenzuela for

Michael Pennock Oct 25, 2017
Calibration Technician 06:11:10 -05:00

Scott D. Caine Oct 25, 2017
Lab Manager 08:04:09 -05:00



Date Received: October 19, 2017
Service Level: R9

Customer: MESA LABORATORIES

PO Number: PO-011090

Certificate/SO Number: 5-B4L8D-20-1 Revision 0

Manufacturer: Ruska Instruments Corp.	Service Type: R9
Model Number: 7250i	
Description: Pressure Calibrator	
Serial Number: 69541	Calibration Date: Oct 25, 2017
ID: TE10704	Date Due: Oct 25, 2018
	Calibration Procedure: 1-AC77428-2

Description	Setpoints	Accuracy	Low Limit	High Limit	As Found / As Left	O	Cal Process	Measurement	Units	TUR
						T	Uncertainty (k=2; ±)	Uncertainty (k=2; ±)		
Leak Test			P	P	P					

The column labeled Cal Process Uncertainty (CPU) does not include the short term component of the UUT. The column labeled Measurement Uncertainty includes both CPU and the short term component of the UUT. TUR is calculated using CPU.

Note: Reported resolution of the UUT does not represent calibration uncertainty or accuracy of the UUT.

Revision 0

Field not applicable. (P = Pass, F = Fail)

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Description	Setpoints	Accuracy	Low Limit	High Limit	As Found / As Left	O	Cal Process	Measurement	Units	TUR
						T	Uncertainty (k=2; ±)	Uncertainty (k=2; ±)		
Pressure Linearity: 150psi Range										
	0.0000psi	±(0.00188 psi)	-0.0019	0.0019	0.0001 psi					
	4.6875psi	±(0.0407% Rdg)	4.6856	4.6894	4.6877 psi		7.5e-005	1.4e-004	psi	25.3 : 1
	14.0625psi	±(0.0153% Rdg)	14.0603	14.0647	14.0628 psi		2.3e-004	2.5e-004	psi	9.8 : 1
	23.4375psi	±(0.01097% Rdg)	23.4349	23.4401	23.4380 psi		3.8e-004	4.0e-004	psi	6.9 : 1
	32.8125psi	±(0.00943% Rdg)	32.8094	32.8156	32.8132 psi		5.3e-004	5.3e-004	psi	5.9 : 1
	46.8750psi	±(0.00901% Rdg)	46.8708	46.8792	46.8760 psi		7.5e-004	7.5e-004	psi	5.6 : 1
	65.6250psi	±(0.00901% Rdg)	65.6191	65.6309	65.6262 psi		1.2e-003	1.2e-003	psi	4.7 : 1
	93.7500psi	±(0.00901% Rdg)	93.7416	93.7584	93.7517 psi		1.8e-003	1.8e-003	psi	4.7 : 1
	131.2500psi	±(0.00901% Rdg)	131.2382	131.2618	131.2522 psi		2.5e-003	2.5e-003	psi	4.7 : 1
	150.0000psi	±(0.00901% Rdg)	149.9865	150.0135	150.0024 psi		2.9e-003	2.9e-003	psi	4.7 : 1
Pressure Hysteresis: 150psi Range										
	65.6250psi	±(0.00901% Rdg)	65.6191	65.6309	65.6275 psi		1.2e-003	1.2e-003	psi	4.7 : 1
	46.8750psi	±(0.00901% Rdg)	46.8708	46.8792	46.8763 psi		7.5e-004	7.5e-004	psi	5.6 : 1
	32.8125psi	±(0.00943% Rdg)	32.8094	32.8156	32.8136 psi		5.3e-004	5.3e-004	psi	5.9 : 1

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Description	Setpoints	Accuracy	Low Limit	High Limit	As Found / As Left	O	Cal Process	Measurement	Units	TUR
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Vacuum Linearity: 150psi Range										
	0.0000psi	±(0.0075 psi)	-0.0075	0.0075	0.0000 psi					
	-3.6250psi	±(0.20703% Rdg)	-3.6325	-3.6175	-3.6252 psi		5.8e-005	1.3e-004	psi	100.0 : 1
	-7.2500psi	±(0.10372% Rdg)	-7.2575	-7.2425	-7.2504 psi		1.2e-004	1.7e-004	psi	64.7 : 1
	-10.8750psi	±(0.06937% Rdg)	-10.8825	-10.8675	-10.8757 psi		1.7e-004	2.1e-004	psi	43.1 : 1
	-14.5000psi	±(0.05227% Rdg)	-14.5076	-14.4924	-14.5011 psi		2.3e-004	2.6e-004	psi	32.8 : 1
Vacuum Hysteresis: 150psi Range										
	0.0000psi	±(0.0075 psi)	-0.0075	0.0075	0.0000 psi					
Barometric Reference Sensor Option										
	11.0000psia	±(0.002 psia)	10.9980	11.0020	11.0002 psia		1.8e-004	2.9e-004	psia	11.4 : 1
	13.0000psia	±(0.002 psia)	12.9980	13.0020	13.0001 psia		2.1e-004	3.1e-004	psia	9.6 : 1
	15.0000psia	±(0.002 psia)	14.9980	15.0020	14.9999 psia		2.4e-004	3.3e-004	psia	8.3 : 1

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Description	Setpoints	Accuracy	Low Limit	High Limit	As Found / As Left	O	Cal Process	Measurement	Units	TUR
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Evacuated Reference Option										
	0microns	±(10% Rdg , Min: 10 microns)	-10	10	Not Calibrated					
	50microns	±(10% Rdg , Min: 10 microns)	40	60	Not Calibrated					
	100microns	±(10% Rdg , Min: 10 microns)	90	110	Not Calibrated					
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	250microns	±(10% Rdg , Min: 10 microns)	225	275	Not Calibrated					
	300microns	±(10% Rdg , Min: 10 microns)	270	330	Not Calibrated					
	350microns	±(10% Rdg , Min: 10 microns)	315	385	Not Calibrated					

As Found and As Left Data recorded on October 25, 2017

Temperature 68.7°F / 20.4°C Relative Humidity 37% Temp/RH Asset DewK1

Asset	Manufacturer	Model	Description	Cal Date	Due Date	Traceability Numbers
DW11BA	Fluke/DH Instruments	PG7601	Piston Gauge	Oct 12, 2016	Oct 31, 2017	5-&DW11BA-1-1
DW11LOW	Fluke/DH Instruments	PC-7100/7600-10-TC	Gas Piston-Cylinder Module	Mar 02, 2017	Mar 31, 2022	5-&DW11LOW-1-1
DW11MASS	Fluke/DH Instruments	MS-AMH-38	AMH Mass Set	Mar 02, 2017	Mar 31, 2018	5-&DW11MASS-1-1
DW11MID	Fluke/DH Instruments	PC-7100/7600-50	Gas Piston-Cylinder Module	Mar 02, 2017	Mar 02, 2022	5-&DW11MID-1-1

Remarks

As-Found: In-Tolerance, No Adjustment Performed. All readings were Normalized.

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Note: Reported resolution of the UUT does not represent calibration uncertainty or accuracy of the UUT.

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