

Praxair / Miller Thermal 3620/3610 **Certificate of Calibration**

Form Number: F-335-057 Rev. AD 14-Feb-12

Work Instructions: WI-057 Rev.

A 15-Feb-10

Certificate Number:	2023-544						Page: 1 of 10
Customer:	Universal Thermal	Console	Miller Thermal 3620				
Address:	217 Center St	Serial Number:	KC260043				
City:	Manawa	Device ID Number:	None				
State:	WI	Booth Number:	Plasma				
Zip:	54949	Calibration	as Received:				
Name:	Allen Hildebrand	With in 5%:	Yes				
Phone Number:	920-596-2983	Adjustments:	No				
		N.	I.S.T. Instrur	ments Used fo	r This Calibra	tion	
Test Instrument:	Press. Transducer	Test Instrument:	Multi Meter	Test Instrument:	Amp Clamp Meter		
Make:	Fluke	Make:	Fluke	Make:	Fluke		
Model:	PV350	Model:	87V	Model:	i1010		
Serial Number:	PM-27	Serial Number:	MM-13	Serial Number:	AC-44		
Next Calibration Due:	12-May-24	Next Calibraiton Due:	24-May-24	Next Calibration Due:	24-May-24		
Test Instrument: Low Flow	Mass Flow Meter	Test Instrument: Med.					
Make:	Alicat 75 scfh	Make:	Alicat 400 scfh				
Model:	PCU50SLPM	Model:	PCU250SLPM				
Serial Number:	282154	Serial Number:	282155				
Next Calibration Due:	7-Sep-24	Next Calibration Due:	1				
				pment Specific	cations		
Gas Orifices:	Sizes	Gas	Flow [FS]			n Column of Each Sheet After This Sheet IsThe	
Primary Gas:	#56	Argon	511.1		Manufacture Speci	ifications, or Better, For The Individual Device	
Primary Gas:	#80	Helium	110.3			0-3% Green is Acceptable	
Secondary Gas:	#97 or #103	Hydrogen	31.4 or 7.3			3.1-5% Orange is Alert	
Powder Carrier Gas:	#77	Argon	46.2			5.1% - > Red Is Fail	
					Door Switch Safety Te	est:	Pass
					Argon Supply Test:		Pass
					Carrier Gas Back PSI	#1 & #2	Pass
					System Checked for G		Pass
					Water Flow Switch		Pass
Notes:							
				1	18/20		
Calibrated By:	Jeremy Bailey			Up.	10/20		
Calibrated Date:	14-Nov-23	Calibration Due:	14-Nov-24	Signature:			



Universal Thermal **Customer:**

Amperage Display

Form Number: F-335-057 Rev. AD 14-Feb-12

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Certificate Number: 2023-544 Console:

Miller Thermal 3620

Serial Number: **Booth Number:**

KC260043 Plasma

Device ID Number: Device Under Test: Amp Meter

Multi Meter

Serial Number: MM-13

Testing Instrument: Amp Clamp Meter i1010 Serial Number: AC-44

Pressure Full Scale [FS] =

Testing Instrument:

1500 Amps

Amps Set Point	Amp Meter Display Reading	As Found NIST Meter	As Found Amps Deviation	As Found Amps % Deviation	Tolerences Pass/Fail	As Left NIST Meter	As Left Amps Deviation	As Left Amps % Deviation	Tolerences Pass/Fail
			•				•	•	
500	500	495	-5.0	-0.3	Pass	495	-5.0	-0.3	Pass
600	600	583	-17.0	-1.1	Pass	583	-17.0	-1.1	Pass
700	700	680	-20.0	-1.3	Pass	680	-20.0	-1.3	Pass
800	800	780	-20.0	-1.3	Pass	780	-20.0	-1.3	Pass
900	900	882	-18.0	-1.2	Pass	882	-18.0	-1.2	Pass
1000	1000	983	-17.0	-1.1	Pass	983	-17.0	-1.1	Pass

Volts Display

Console: Miller Thermal 3620 Device ID Number: N/A

Serial Number: **Booth Number:**

Plasma

87V

87V

Volt Meter Multi Meter

Serial Number: MM-13

Testing Instrument: Volts Full Scale [FS] =

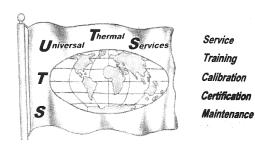
Device Under Test:

200 Volts

Volt Meter	Volt Meter	As Found	As Found	As Found	Tolerences	As Left	As Left	As Left	Tolerences
Set Point	Display Reading	NIST Meter	Volts Deviation	Volts % Deviation	Pass/Fail	NIST Meter	Volts Deviation	Volts % Deviation	Pass/Fail
27.5	27.5	27.4	-0.1	-0.1	Pass	27.4	-0.1	-0.1	Pass
28.2	28.2	28.0	-0.2	-0.1	Pass	28.0	-0.2	-0.1	Pass
32.4	32.4	32.3	-0.1	-0.1	Pass	32.3	-0.1	-0.1	Pass
34.5	34.5	34.4	-0.1	-0.1	Pass	34.4	-0.1	-0.1	Pass
36.5	36.5	36.3	-0.2	-0.1	Pass	36.3	-0.2	-0.1	Pass
38.5	38.5	38.2	-0.3	-0.1	Pass	38.2	-0.3	-0.1	Pass

Calibrated By: Jeremy Bailey 14-Nov-23 Calibrated Date:

Calibration Due: 14-Nov-24 Signature:



Customer: Universal Thermal Arc Gas Gauge [P1]

Form Number: F-335-057 Rev. AC 31-Dec-13

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Certificate Number: 2023-544

Miller Thermal 3620

Serial Number:

KC260043

Device ID Number: N/A **Device Under Test:** Arc Gas P1

Booth Number:

87V

87V

Plasma

Testing Instrument:

Console:

Multi Meter

Serial Number:

MM-13

Testing Instrument: Press. Transducer

PV350

Serial Number:

PM-27

Pressure Full Scale [FS] =

300 PSI

Pressure (PSI) Set Point	As Found Gauge Setting	As Found NIST Pressure	As Found PSI Deviation	As Found PSI % of Deviation	Tolerance Pass / Fail	As Left NIST Pressure	As Left PSI Deviation	As Left PSI % Deviation	Tolerance Pass / Fail
10	10	11.0	1.0	0.3	Pass	11.0	1.0	0.3	Pass
30	30	31.0	1.0	0.3	Pass	31.0	1.0	0.3	Pass
50	50	51.2	1.2	0.4	Pass	51.2	1.2	0.4	Pass
70	70	70.9	0.9	0.3	Pass	70.9	0.9	0.3	Pass
90	90	91.5	1.5	0.5	Pass	91.5	1.5	0.5	Pass
110	110	111.4	1.4	0.5	Pass	111.4	1.4	0.5	Pass
130	130	131.5	1.5	0.5	Pass	131.5	1.5	0.5	Pass

Arc Gas Pressure [P2]

Console: Miller Thermal 3620

Device ID Number: N/A Device Under Test:

Serial Number: **Booth Number:** KC260043

Plasma

Testing Instrument:

Arc Gas P2 Multi Meter

Serial Number:

MM-13

Testing Instrument: Press. Transducer PV350

Serial Number:

PM-27

Pressure Full Scale [FS] =

160 PSI

Pressure (PSI) Set Point	As Found Gauge Setting	As Found NIST Pressure	As Found PSI Deviation	As Found PSI % of Deviation	Tolerance Pass / Fail	As Left NIST Pressure	As Left PSI Deviation	As Left PSI % Deviation	Tolerance Pass / Fail
10	10	10.9	0.9	0.6	Pass	10.9	0.9	0.6	Pass
30	30	31.0	1.0	0.6	Pass	31.0	1.0	0.6	Pass
50	50	51.0	1.0	0.6	Pass	51.0	1.0	0.6	Pass
70	70	71.5	1.5	0.9	Pass	71.5	1.5	0.9	Pass
90	90	91.5	1.5	0.9	Pass	91.5	1.5	0.9	Pass
110	110	110.9	0.9	0.6	Pass	110.9	0.9	0.6	Pass
130	130	131.0	1.0	0.6	Pass	131.0	1.0	0.6	Pass

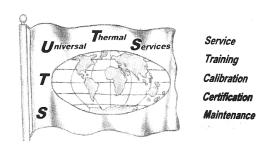
Calibrated By: Jeremy Bailey Calibrated Date:

14-Nov-23

14-Nov-24 Calibration Due:

Signature:

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Customer: Universal Thermal

Aux Gas Gauge [P1]

Form Number: F-335-057 Rev. AD 14-Feb-12

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Certificate Number: 2023-544

Console:

Testing Instrument:

Miller Thermal 3620

Multi Meter

Serial Number:

Serial Number:

KC260043

Device ID Number: N/A
Device Under Test: Aux Gas P1

87V

Booth Number: Plasma

MM-13

Testing Instrument: Press. Transducer PV350 Serial Number: PM-27

Pressure Full Scale [FS] = 300 PSI

Pressure (PSI) Set Point	As Set Gauge Setting	As Found NIST Pressure	As Found PSI Deviation	As Found PSI % of Deviation	Tolerences Pass/Fail	As Left NIST Pressure	As Left PSI Deviation	As Left PSI % Deviation	Tolerences Pass/Fail
10	10	10.3	0.3	0.1	Pass	10.3	0.3	0.1	Pass
30	30	30.2	0.2	0.1	Pass	30.2	0.2	0.1	Pass
50	50	50.4	0.4	0.1	Pass	50.4	0.4	0.1	Pass
70	70	70.4	0.4	0.1	Pass	70.4	0.4	0.1	Pass
90	90	90.6	0.6	0.2	Pass	90.6	0.6	0.2	Pass
110	110	111.3	1.3	0.4	Pass	111.3	1.3	0.4	Pass
130	130	131.3	1.3	0.4	Pass	131.3	1.3	0.4	Pass
150	150	151.3	1.3	0.4	Pass	151.3	1.3	0.4	Pass

Aux Gas Pressure [P2]

Console: Miller Thermal 3620

N/A

Serial Number: Booth Number: KC260043 Plasma

Device Under Test: Aux Gas P2

Testing Instrument:

Device ID Number:

.

87V

Serial Number: MM-13

Testing Instrument: Press. Transducer

PV350

Serial Number: PM-27

Pressure Full Scale [FS] =

160 PSI

Multi Meter

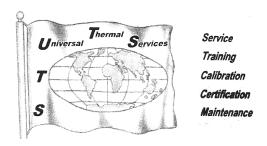
Pressure (PSI)	As Set	As Found	As Found	As Found	Tolerences	As Left	As Left	As Left	Tolerences
Set Point	Gauge Setting	NIST Pressure	PSI Deviation	PSI % of Deviation	Pass/Fail	NIST Pressure	PSI Deviation	PSI % Deviation	Pass/Fail
10	10	10.3	0.3	0.2	Pass	10.3	0.3	0.2	Pass
30	30	30.7	0.7	0.4	Pass	30.7	0.7	0.4	Pass
50	50	50.7	0.7	0.4	Pass	50.7	0.7	0.4	Pass
70	70	70.5	0.5	0.3	Pass	70.5	0.5	0.3	Pass
90	90	90.6	0.6	0.4	Pass	90.6	0.6	0.4	Pass
110	110	111.0	1.0	0.6	Pass	111.0	1.0	0.6	Pass
130	130	131.0	1.0	0.6	Pass	131.0	1.0	0.6	Pass
150	150	151.0	1.0	0.6	Pass	151.0	1.0	0.6	Pass

Calibrated By: Jeremy Bailey
Calibrated Date: 14-Nov-23

Calibration Due: 14-Nov-24

Signature:

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Customer: Universal Thermal

#1 Carrier Gas Gauge [P1]

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Certificate Number:

2023-544

Miller Thermal 3620

Serial Number:

Serial Number:

KC260043

Device ID Number: **Device Under Test:**

Testing Instrument:

Console:

N/A

87V

Booth Number:

Plasma

MM-13

#1 Carrier Gas P1

Testing Instrument: Press. Transducer PV350

Serial Number:

PM-27

Pressure Full Scale [FS] =

200 PSI

Multi Meter

Pressure (PSI) Set Point	As Set Gauge Setting	As Found NIST Pressure	As Found PSI Deviation	As Found PSI % of Deviation	Tolerences Pass/Fail	As Left NIST Pressure	As Left PSI Deviation	As Left PSI % Deviation	Tolerences Pass/Fail
20	20	20.4	0.4	0.2	Pass	20.4	0.4	0.2	Pass
30	30	30.7	0.7	0.4	Pass	30.7	0.7	0.4	Pass
40	40	40.7	0.7	0.4	Pass	40.7	0.7	0.4	Pass
50	50	50.9	0.9	0.4	Pass	50.9	0.9	0.4	Pass
60	60	61.0	1.0	0.5	Pass	61.0	1.0	0.5	Pass
70	70	71.0	1.0	0.5	Pass	71.0	1.0	0.5	Pass
80	80	81.0	1.0	0.5	Pass	81.0	1.0	0.5	Pass
90	90	91.0	1.0	0.5	Pass	91.0	1.0	0.5	Pass

#1 Carrier Gas Gauge [P2]

Console: Device ID Number: Miller Thermal 3620

Serial Number: **Booth Number:**

KC260043 Plasma

MM-13

Device Under Test:

Testing Instrument:

#1 Carrier Gas P2

Multi Meter 87V Serial Number:

Testing Instrument: Press. Transducer

PV350 Serial Number: PM-27

Pressure Full Scale [FS] =

100 PSI

Pressure (PSI) Set Point	As Set Gauge Setting	As Found NIST Pressure	As Found PSI Deviation	As Found PSI % of Deviation	Tolerences Pass/Fail	As Left NIST Pressure	As Left PSI Deviation	As Left PSI % Deviation	Tolerences Pass/Fail
10	10	11.0	1.0	1.0	Pass	11.0	1.0	1.0	Pass
20	20	21.0	1.0	1.0	Pass	21.0	1.0	1.0	Pass
30	30	31.0	1.0	1.0	Pass	31.0	1.0	1.0	Pass
40	40	41.0	1.0	1.0	Pass	41.0	1.0	1.0	Pass
50	50	51.1	1.1	1.1	Pass	51.1	1.1	1.1	Pass
60	60	61.1	1.1	1.1	Pass	61.1	1.1	1.1	Pass
70	70	71.1	1.1	1.1	Pass	71.1	1.1	1.1	Pass
80	80	81.1	1.1	1.1	Pass	81.1	1.1	1.1	Pass

Calibrated By: Jeremy Bailey 14-Nov-23 Calibrated Date:

14-Nov-24

Calibration Due:

Signature:

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Customer: Universal Thermal #2 Carrier Gas Gauge [P1]

Form Number: F-335-057 Rev. AD 14-Feb-12

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Certificate Number: 2023-544

Miller Thermal 3620

Multi Meter

Serial Number: **Booth Number:**

Serial Number:

Device ID Number:

Testing Instrument:

Console:

Device ID #:

KC260043 Plasma

MM-13

Device Under Test: #2 Carrier Gas P1

Testing Instrument: Press. Transducer PV350 Serial Number: PM-27

Pressure Full Scale [FS] = 200 PSI

Pressure (PSI) Set Point	As Set Gauge Setting	As Found NIST Pressure	As Found PSI Deviation	As Found PSI % of Deviation	Tolerences Pass/Fail	As Left NIST Pressure	As Left PSI Deviation	As Left PSI % Deviation	Tolerences Pass/Fail
20	20	19.7	-0.3	-0.2	Pass	19.7	-0.3	-0.2	Pass
30	30	30.1	0.1	0.1	Pass	30.1	0.1	0.1	Pass
40	40	41.0	1.0	0.5	Pass	41.0	1.0	0.5	Pass
50	50	51.0	1.0	0.5	Pass	51.0	1.0	0.5	Pass
60	60	61.0	1.0	0.5	Pass	61.0	1.0	0.5	Pass
70	70	71.2	1.2	0.6	Pass	71.2	1.2	0.6	Pass
80	80	81.2	1.2	0.6	Pass	81.2	1.2	0.6	Pass
90	90	91.2	1.2	0.6	Pass	91.2	1.2	0.6	Pass

#2 Carrier Gas Gauge [P2]

Console: Miller Thermal 3620

Serial Number: **Booth Number:**

KC260043 Plasma

Device Under Test: #2 Carrier Gas P2

Calibration Due:

87V

Testing Instrument: Multi Meter 87V Serial Number: MM-13 PV350 Serial Number: PM-27 Testing Instrument: Press. Transducer

Pressure Full Scale [FS] = 100 PSI

Pressure (PSI) Set Point	As Set Gauge Setting	As Found NIST Pressure	As Found PSI Deviation	As Found PSI % of Deviation	Tolerences Pass/Fail	As Left NIST Pressure	As Left PSI Deviation	As Left PSI % Deviation	Tolerences Pass/Fail
10	10	10.4	0.4	0.4	Pass	10.4	0.4	0.4	Pass
20	20	20.4	0.4	0.4	Pass	20.4	0.4	0.4	Pass
30	30	30.1	0.1	0.1	Pass	30.1	0.1	0.1	Pass
40	40	40.4	0.4	0.4	Pass	40.4	0.4	0.4	Pass
50	50	49.8	-0.2	-0.2	Pass	49.8	-0.2	-0.2	Pass
60	60	59.8	-0.2	-0.2	Pass	59.8	-0.2	-0.2	Pass
70	70	69.6	-0.4	-0.4	Pass	69.6	-0.4	-0.4	Pass
80	80	79.6	-0.4	-0.4	Pass	79.6	-0.4	-0.4	Pass

Calibrated By: Jeremy Bailey 14-Nov-23 Calibrated Date:

14-Nov-24 Signature: ansko



Customer: Universal Thermal

Miller Thermal 3620

N/A

Serial Number:

Booth Number:

Console:

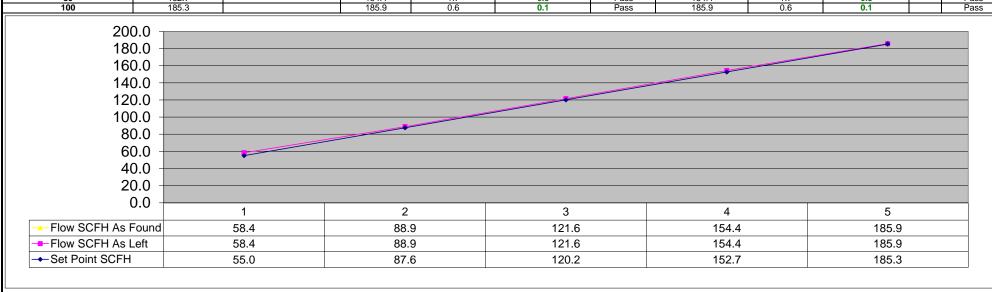
Device ID Number:

Argon Flow

Form Number: F-335-057 Rev. AD 14-Feb-12 **Certificate Number:** 2023-544

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Full Flow SCFH [FS]: 511.12 Device Under Test: #56 orifice Scale Rate: Flow is in SCFH Type of Gas: Argon Testing Instrument: Mass Flow Meter Alicat 400 scfh Serial Number: 282155 As Found SCFH **Primary Arc Gas Critical Orifices** As Found Actual As Left SCFH As Found Tolerences As Left As Left Tolerences **Gauge Set Point** SCFH Converted **NIST SCFH SCFH Deviation** % Deviation Pass/Fail **NIST SCFH SCFH Deviation** % Deviation Pass/Fail 58.4 3.4 Pass 58.4 Pass 40 87.6 88.9 1.3 0.3 Pass 88.9 1.3 0.3 Pass 60 120.2 121.6 1.4 0.3 Pass 121.6 1.4 0.3 Pass 80 152.7 154.4 0.3 Pass 154.4 1.7 0.3 Pass



ansko Calibrated By: Jeremy Bailey 14-Nov-23 Calibration Due: 14-Nov-24 Signature: Calibrated Date:

All instruments have been calibrated against standards traceable to NIST. This Certification Sheet must not be altered in any way!

KC260043

Plasma



Pass

Customer: Universal Thermal

53.8

60.9

140

160

Helium Flow

AD 14-Feb-12 Form Number: F-335-057 Rev. **Certificate Number:** 2023-544 Page: 8 of 10

Console: Miller Thermal 3620 Serial Number: KC260043 Device ID Number: N/A **Booth Number:** Plasma Device Under Test: #80 orifice Scale Rate: Flow is in SCFH Full Flow SCFH [FS]: 110.28 Type of Gas: Helium

53.5

60.3

Testing Instrument:	Mass Flow Meter	Alicat 75 scfh	Serial Number:	282154						
Set Point	Critical Orifices		As Found	As Found Actual	As Found SCFH	Tolerences	As Left	As Left	As Left SCFH	Tolerences
Pressure	SCFH Converted		NIST SCFH	SCFH Deviation	% Deviation	Pass/Fail	NIST SCFH	SCFH Deviation	% Deviation	Pass/Fail
20	11.5		11.7	0.2	0.2	Pass	11.7	0.2	0.2	Pass
40	18.5		18.4	-0.1	-0.1	Pass	18.4	-0.1	-0.1	Pass
60	25.6		25.3	-0.3	-0.3	Pass	25.3	-0.3	-0.3	Pass
80	32.6		32.4	-0.2	-0.2	Pass	32.4	-0.2	-0.2	Pass
100	39.7		39.4	-0.3	-0.3	Pass	39.4	-0.3	-0.3	Pass
120	46.8		46.5	-0.3	-0.2	Pass	46.5	-0.3	-0.2	Pass

-0.3

-0.5

-0.3

-0.6

53.5

60.3

-0.3

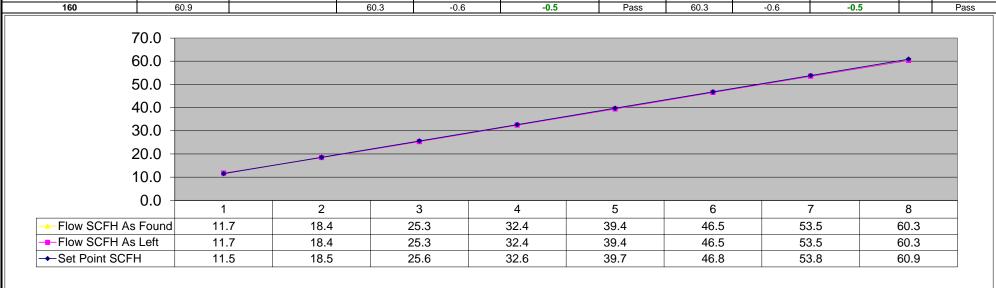
-0.6

-0.3

-0.5

Pass

Pass



and sky Calibrated By: Jeremy Bailey Calibrated Date: 14-Nov-23 Calibration Due: 14-Nov-24 Signature:



Universal Thermal **Customer:**

Argon Carrier Flow #1

Form Number: F-335-057 Rev. 14-Feb-12 AD

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Certificate Number: 2023-544

Console:

Device ID Number:

Device Under Test:

#77 orifice

N/A

Miller Thermal 3620 Serial Number: **Booth Number:** Scale Rate:

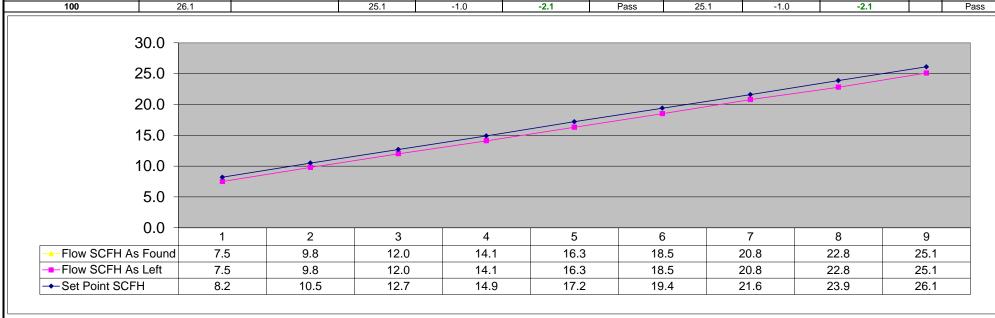
KC260043 Plasma

Flow is in SCFH

Full Flow SCFH [FS]: 46.22

Type of Gas: Argon

Testing Instrument:	Mass Flow Meter	Alicat 75 scfh	Serial Number:	282154						
Carrier Gas #1 Gauge Set Point PSI	Critical Orifices SCFH Converted		As Found NIST SCFH	As Found Actual SCFH Deviation	As Found SCFH % Deviation	Tolerences Pass/Fail	As Left NIST SCFH	As Left SCFH Deviation	As Left SCFH % Deviation	Tolerences Pass/Fail
20	8.2		7.5	-0.7	-1.4	Pass	7.5	-0.7	-1.4	Pass
30	10.5		9.8	-0.7	-1.4	Pass	9.8	-0.7	-1.4	Pass
40	12.7		12.0	-0.7	-1.4	Pass	12.0	-0.7	-1.4	Pass
50	14.9		14.1	-0.8	-1.6	Pass	14.1	-0.8	-1.6	Pass
60	17.2		16.3	-0.9	-1.9	Pass	16.3	-0.9	-1.9	Pass
70	19.4		18.5	-0.9	-1.9	Pass	18.5	-0.9	-1.9	Pass
80	21.6		20.8	-0.8	-1.6	Pass	20.8	-0.8	-1.6	Pass
90	23.9		22.8	-1.1	-2.2	Pass	22.8	-1.1	-2.2	Pass
100	26.1		25.1	-1.0	-2.1	Pass	25.1	-1.0	-2.1	Pass



Calibrated By: Jeremy Bailey Signature: 14-Nov-23 Calibration Due: 14-Nov-24 Calibrated Date:



Customer: Universal Thermal

Argon Carrier Flow #2

Form Number: F-335-057 Rev. AD 14-Feb-12

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Certificate Number: 2023-544
Console: Miller Therma

Device Under Test:

Console: Miller Thermal 3620
Device ID Number: N/A

#77 orifice

Serial Number: KC260043 Booth Number: Plasma

Scale Rate:

Flow is in SCFH Full Flow SCFH [FS]: 46.22 Type of Gas: Argon

Testing Instrument: Mass Flow Meter Alicat 75 scfh Serial Number: 282154 Critical Orifices Carrier Gas #2 As Found As Found Actual As Found SCFH Tolerences As Left As Left As Left SCFH Tolerences **SCFH Converted NIST SCFH** SCFH Deviation NIST SCFH **SCFH Deviation Gauge Set Point** % Deviation Pass/Fail % Deviation Pass/Fail 20 8.2 8.3 0.1 0.2 Pass 8.3 0.1 0.2 Pass 30 10.5 10.5 0.0 0.0 Pass 10.5 0.0 0.0 Pass 40 12.7 12.8 0.1 0.2 12.8 0.1 0.2 Pass Pass 50 14.9 15.3 0.4 15.3 0.4 0.8 0.8 Pass Pass 60 17.2 17.7 0.5 1.0 Pass 17.7 0.5 1.0 Pass 70 19.4 20.3 0.9 1.9 Pass 20.3 0.9 1.9 Pass 80 21.6 22.6 1.0 2.1 Pass 22.6 1.0 2.1 Pass 23.9 25.1 1.2 2.5 25.1 1.2 2.5 90 Pass Pass 100 26.1 27.3 1.2 2.5 27.3 Pass

