



# CERTIFICATE OF ACCREDITATION

*This is to attest that*

## **DICK MUNNS COMPANY**

11133 WINNERS CIRCLE  
LOS ALAMITOS, CALIFORNIA 90720, U.S.A.

### **Calibration Laboratory CL-122**

has met the requirements of AC204, *IAS Accreditation Criteria for Calibration Laboratories*, and has demonstrated compliance with ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories*. This organization is accredited to provide the services specified in the scope of accreditation.

Effective Date March 26, 2023

Expiration Date April 1, 2024



A handwritten signature in black ink, reading "Raj Nathan".

**President**

# SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

3060 Saturn Street, Suite 100, Brea, California 92821, U.S.A. | [www.iasonline.org](http://www.iasonline.org)

## DICK MUNNS COMPANY

**Contact Name** Pablo L. Acosta

**Contact Phone** +1-714-827-1215

*Accredited to ISO/IEC 17025:2017*

*Effective Date March 26, 2023*

### CALIBRATION AND MEASUREMENT CAPABILITY (CMC)\*

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY <sup>1,2</sup> (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
<i>Mechanical</i>			
Flowmeters by Volume (H <sub>2</sub> O or Hydrocarbon)	0.002 gal/min to 1.0 gal/min	0.17 %	DMC Standard A-6 Volume STD, by Comparison Procedure: T.O.33K6-4-3256-1
Turbine Meters	0.002 gal/min to 0.5 gal/min	0.17 %	DMC Standard A-7 Volume STD, by Comparison Procedure: NAVAIR 17-20MG-01 or 33K6-4-900-1
PD Meters	0.2 gal/min to 1.0 gal/min	0.10 %	DMC Standard A-10 Volume STD, by comparison Procedure: T.O.33K6-4-2882-1; NAVAIR 17-20MG-01,03,54
Mag Meters	0.3 gal/min to 5.0 gal/min	0.014 %	DMC Standard A-28 Volume Prover, by Comparison Procedure: NAVAIR 17-20MG-01,03,54
Rotometers	0.5 gal/min to 15 gal/min	0.10 %	DMC Standard A-33 Volume Prover, by Comparison Procedure: NAVAIR 17-20MG-01,03,54
Vortex Meters	5.0 gal/min to 25 gal/min	0.16 %	All by Comparison Procedures: NAVAIR 17-20MG-01, 03, 54 DMC Standard A-33 Volume Prover
	5.0 gal/min to 50 gal/min	0.15 %	DMC Standard A-14 Volume Prover
	10 gal/min to 100 gal/min	0.15 %	DMC Standard A-710 Transfer STD

\* If information in this CMC is presented in non-SI units, the conversion factors stated in NIST Special Publication 811 "Guide for the Use of the International System of Units (SI)" apply.

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Vortex Meters continued	100 gal/min to 600 gal/min	0.20 %	DMC Standard A-710 Transfer STD
Flow Rate Meters by Mass	Up to 4 kg/min	0.1 % FS	DMC Standard A-322 Transfer STD
	1.01 kg/min to 12 kg/min	0.23 %	DMC Standard A-70 Micro Motion
	10 lb/min to 250 lb/min	0.1 %	DMC Standard A-50 DAQ System
	100 lb/min to 1000 lb/min	0.08 % FS	DMC Standard A-264 Transfer STD
	500 lb/min to 10000 lb/min	0.07 lb	DMC Standard A350 Scale
Flow Rate Meters by Volume	10 gal/min to 100 gal/min	0.01 %	All by comparison, Procedures: NAVAIR 17-20MG-01,03,54  DMC Standard I to IV-A350 Scale, by comparison
	100 gal/min to 500 gal/min	0.012 %	
	600 gal/min to 1000 gal/min	0.015 %	
	1000 gal/min to 1500 gal/min	0.017 %	
	100 gal/min to 3000 gal/min	0.15 %	
Flow Rate Meters by Volume for Compressible Gas	2 cm <sup>3</sup> /min to 50000 cm <sup>3</sup> /min	0.12 %	All by comparison Procedures: T.O.33K6-4-179-1 NAVAIR 17-20MG-02, 20  DMC Standard A290 BIOS Prover
	0.005 ALPM to 0.090 ALPM	0.19 %	DMC Standard A-100 Volume prover
	0.060 ALPM to 1.2 ALPM	0.19 %	DMC Standard A-1 Volume prover
	0.200 ALPM to 12.0 ALPM	0.17 %	DMC Standard A-2 Volume prover

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Flow Rate Meter by Volume for Compressible Gas continued	12.1 ALPM to 25.0 ALPM	0.19 %	DMC Standard A-3 Volume prover
	0.200 ACFM to 10.0 ACFM	0.19 %	DMC Standard A-4 Volume prover
	10.0 ACFM to 25.0 ACFM	0.20 %	
	25.0 ACFM to 50.0 ACFM	0.23 %	
Flow Rate Meters by Volume (Transfer Standard)	2.0 ACFM to 150.0 ACFM	0.19 %	DMC Standard A-5 Volume prover
	160 ACFM to 250.0 ACFM	0.19 %	
	250 ACFM to 1200 ACFM	0.21 %	
Flow Rate Meters by Volume (Transfer Standard)	1 SCFM to 1036 SCFM	0.20 %	All by comparison, Procedures: NAVAIR 17-20MG-17L, MG21, MG54  DMC Standard A800 Mesa Labs DryCal 800 with 2 cells
	1 SCCM to 1800 SCCM	0.8 %	DMC Standard A-8 Max Machine
	5 SCCM to 500 SCCM	0.15 %	Mesa Labs DryCal 800 with 2 cells
	500 SCCM to 50000 SCCM	0.15 %	
	0.003 gal/min to 2.64 gal/min	0.8 %	DMC Standard A-78 Gear Meter
	0.020 gal/min to 9.25 gal/min	0.8 %	DMC Standard A-61 Gear Meter
	0.150 gal/min to 26.4 gal/min	0.8 %	DMC Standard A-58 Gear Meter
	0.500 gal/min to 50.0 gal/min	0.8 %	DMC Standard A-99 Gear Meter
	0.500 gal/min to 100.0 gal/min	0.8 %	DMC Standard A-69 Gear Meter
	10 gal/min to 600.0 gal/min	0.8 %	DMC Standard A-300 Turbine

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Flow Rate Meters by Volume (Transfer Standard, Secondary Air Flow)	10 ACFM to 120 ACFM	0.38 %	By comparison, Procedure: NAVAIR 17-20MG20; T.O.33K6-4-179-1 DMC Standard A-297 Nozzle/Scale system
	20 CFM to 14000 CFM	0.50 %	DMC Standard A-197 Subsonic Venturi
Mass Velometers / Air Velocity Meters	50 ACFM to 8000 ACFM	0.20 %	DMC Standard A-220 (12 in Wind Tunnel) By comparison, Procedure: T.O.33.K6-4-1769-1
Anemometers	50 FPM to 8000 FPM	0.69 %	DMC Standard A-69 (12 in Wind Tunnel) By comparison Procedure: T.O.33.K6-4-1769-1
Pressure Measuring Instruments (Hydraulic and Pneumatic)	0 inH <sub>2</sub> O to 2 inH <sub>2</sub> O	0.002 inH <sub>2</sub> O	All by comparison Procedure: NAVAIR 17-20MP-03, MP-05 DMC Standard A135 Micro-manometer
	-760 mm HgA to -1 mm HgA	0.05 mmHg	DMC Standard A22 Standard Manometer
	-15 psia to 595 psia	0.011 %	DMC Standard A321 Dead Weight Tester
	0 psig to 10000 psig	0.03 %	DMC Standard A970 Fluke Digital Pressure
	0.01 inH <sub>2</sub> O to 10 inH <sub>2</sub> O	0.13 %	DMC Standard A484 Pressure Standard
Hydrometers	Specific Gravity: 0.7 to 1.95	0.0002 %	DMC Standard A219 By Comparison Procedure: NIST SP 250-78
Volume Measuring Instruments	99.9304 mL	0.00010 %	DMC Standard A799 Standard volume By comparison Procedure: NIST SP 250-1039

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Volume Measuring Instruments by Gravimetric Means	1.1 gal to 5 gal	0.00088 gal	DMC 5GAL.01 Load Cell By comparison Procedure: 33K6-4-2163-1
	5 gal to 50 gal	0.012 gal	DMC STD. A264 Platform Scale BY comparison Procedure: NIST SP 250-1039
	50 gal to 100 gal	0.022 gal	
	100 gal to 200 gal	0.056 gal	
200 gal to 1000 gal	0.12 gal		
Torque Measuring Instruments	4 lbf·in to 250 lbf·ft	0.25 %	Laboratory developed procedure Using Torque Standard, by comparison
Scales	0 g to 200 g	0.00020 g	DMC Standard A150 Digital Scale By comparison Procedure: 33K6-4-1204-1
<b>Thermal</b>			
Temperature Measuring Instruments	60 °F to 90 °F	0.019 °F	DMC Standard A24 Hart Scientific STD Thermometer
	-180 °C to 1150 °C	0.14 °C	DMC Standard A312 Hart Scientific STD Thermometer  By comparison Procedures: NAVAIR 17-20MP-03, MP23, 33K5-4-42-1
Relative Humidity Measuring Instruments	10 %RH to 95 %RH	1.2 %	Custom Wet/Dry Bulb Chamber – Procedure based on NAVAIR-17-20MH-32 - by comparison
<b>Optical Radiation</b>			
Light Meters	0 lx to 3100 lx	1.5 %	A905 STD Lamp By Comparison
Pyranometers	20.2 (µW/m <sup>2</sup> )/nm to 1.58 (mW/m <sup>2</sup> )/nm (350 nm to 1000 nm)	2.3 %	Procedure: T.O.33K4-4-475-1
<b>Chemical/Gas</b>			
Gas Detection Measuring Instruments	Mixes of O <sub>2</sub> , CO <sub>2</sub> , CO, Methane, Propane, H <sub>2</sub> S & ISO-Butylene 0 % to 100 %	0.19 %	Cal Gas Cylinder and DMC Standard A1-A3 Volume standards. By comparison Procedure: NAVAIR 17-20SY-22

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<sup>1</sup>The uncertainty covered by the Calibration and Measurement Capability (CMC) is expressed as the expanded uncertainty having a coverage probability of approximately 95 %. It is the smallest measurement uncertainty that a laboratory can achieve within its scope of accreditation when performing calibrations of a best existing device. The measurement uncertainty reported on a calibration certificate may be greater than that provided in the CMC due to the behavior of the calibration item and other factors that may contribute to the uncertainty of a specific calibration.

<sup>2</sup>When uncertainty is stated in relative terms (such as percent, a multiplier expressed as a decimal fraction or in scientific notation), it is in relation to instrument reading or instrument output, as appropriate, unless otherwise indicated.

FS = full scale

gal = gallon (US)

ALPM = actual liter per minute

ACFM = actual cubic foot per minute

SCFM = standard cubic foot per minute

SCCM = standard cubic centimeter per minute

HgA = Hg absolute

psi = pound-force per square inch

psia = pound-force per square inch – absolute pressure

psig = pound-force per square inch – gauge pressure