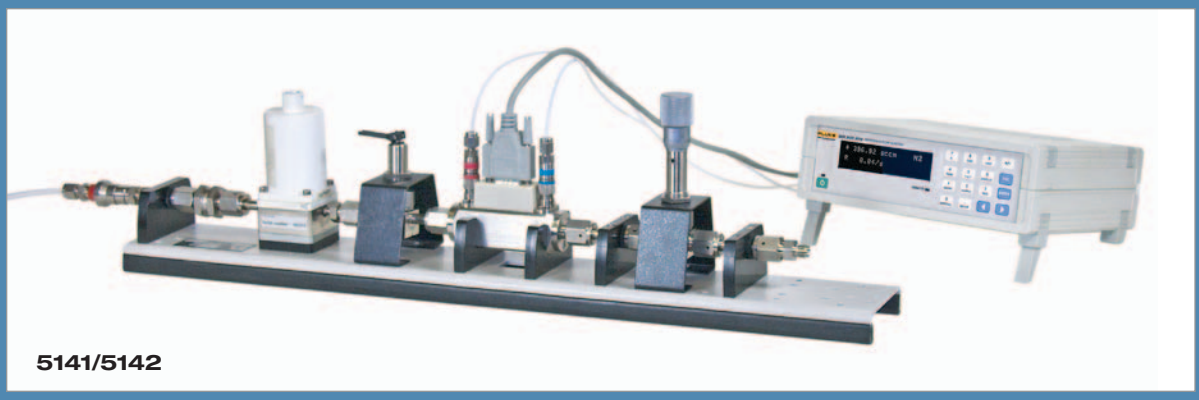
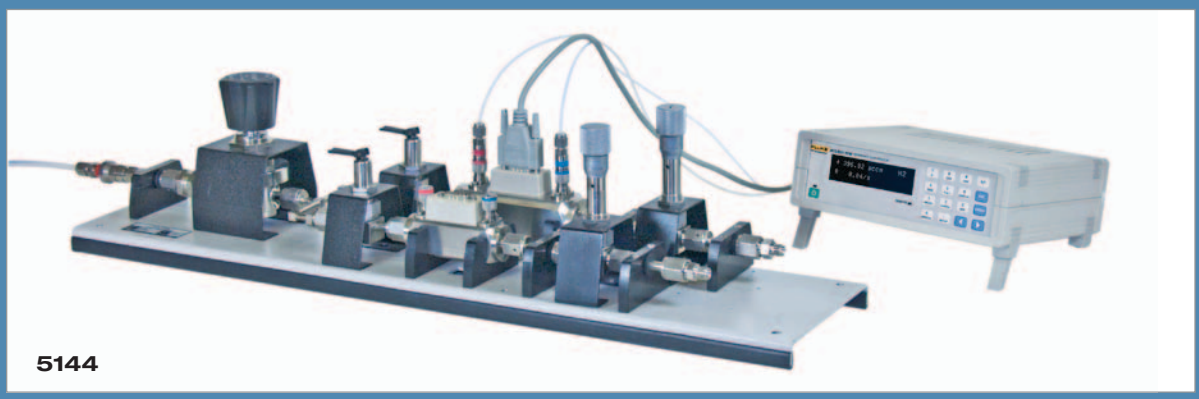
FLUKE®
Calibration

5141, 5142 and 5144
molbox RFM Gas Flow Calibrator Kits

Technical Data



5141/5142



5144

- Flow ranges cover from 1 sccm to 50 slm
- ± 0.5 % of reading total one-year accuracy
- Measures mass and volume flow with user settable reference pressure and temperature conditions
- Reference standard is upstream of the device under test, eliminating cross contamination and expensive damage to the flow elements
- Integrated gas flow regulation and adjustment hardware
- Expandable to over 5000 slm with additional molbloc flow elements and control hardware
- Includes traceable calibration for operation in N2 and Air, with corrections for other gases
- Gas supply and test adapters included for 1/4 in tube, 1/4 in NPT and 1/4 in BSP
- Includes advanced functions such as totalize, average, hi/lo, deviation, on-board purge, leak test and tare, available from the front control panel or by RS-232 and IEEE-488 remote interfaces

A new standard in high end gas flow calibration

Fluke Calibration revolutionized high end gas flow calibration with the introduction of molbox/molbloc mass flow standards. molbox/molbloc systems have replaced large, inflexible, error prone volumetric piston provers and bell provers with a compact, easy to use, versatile digital standard. molbox/molbloc systems are the standard of choice for high end calibration labs and mass flow device manufacturers around the world. Improvements offered by molbox/molbloc include:

- True mass flow calibration and traceability—no corrections from volumetric to mass
- Real-time digital mass flow indication, loaded with features—easily automated
- No moving parts—uninterrupted gas flow measurement, no fluctuations from piston stroke
- Flexibility to be positioned upstream or downstream—can calibrate at many line pressures
- Modular components allows future upgrade and expansion
- Very wide range with small footprint—no flow straightening hardware required

Whether your requirement is manual calibration of a simple variable area flow meter (rotameter) or fully automated calibration of a mass flow controller (MFC), molbox/molbloc systems offer the ideal solution. A molbox RFM with one or more molbloc flow elements can cover a wide range of flow calibration devices with total one-year measurement uncertainty of ± 0.5 % of reading. If your needs change, molbloc flow elements can be added, with models covering flows from 1 sccm to over 5000 slm (175 scfm). If better measurement uncertainty is needed, the same flow elements can be used with molbox1+ to achieve accuracy as good as ± 0.0125 % of reading. Learn more about molbox and molbloc at **http://us.flukecal.com/products/flow-calibration/gas-flow-standards.**

High end gas flow calibration made simple

Fluke Calibration 5141, 5142 and 5144 molbox RFM gas flow calibrator kits feature molbox RFM and molbloc-L configurations optimized to cover a very wide workload combined with molstic-L and other interconnect hardware needed for a complete calibration system. Simply supply 90 psi of pure N2 or air to the system. An included regulator delivers a stable regulated flow to the molbloc. Downstream of the molbloc, an included metering valve allows you to regulate the mass flow value required for the DUT. It's that simple; supply 90 psi gas upstream, tare the reading, and adjust the fine metering valve to deliver the desired mass flow rate with an accuracy of ± 0.5 % of reading. Fluke Calibration gas flow calibrator kits eliminate complication, but don't compromise molbox/molbloc best in class performance.

Kit model	molbox RFM and molbloc-L models included	0.5% reading accuracy from/to
5141-100	molbox RFM, molbloc 5E1-L	10 to 100 sccm
5141-1K	molbox RFM, molbloc 5E2-L	100 to 1,000 sccm
5141-10K	molbox RFM, molbloc 5E3-L	1 to 10 slm
5141-50K	molbox RFM, molbloc 3E4-L	5 to 50 slm
5142-1K	molbox RFM-M, molbloc 5E2-L	10 to 1,000 sccm
5142-10K	molbox RFM-M, molbloc 5E3-L	0.1 to 10 slm
5142-50K	molbox RFM-M, molbloc 3E4-L	0.5 to 50 slm
5144-50K	molbox RFM-M, molblocs 5E2-L and 3E4-L	10 sccm to 50 slm

Table shows 5141 and 5142 0.5 % of reading coverage for nitrogen gas (N2) and air. From zero to the minimum flow listed, accuracy is 0.5 % of the minimum flow.

Measurement specifications	
Gas calibration included	Nitrogen (N_2), Air
Maximum working measurement line pressure	600 kPa (87 psi) absolute
Measurement range	<1 sccm to 50 slm, depending on model. Flow ranges depend on test gas. Ranges indicated for N_2 and Air.

General specifications	
Power requirements	85 V ac to 264 V ac, 47 Hz to 440 Hz, 18 VA max consumption
Normal operating temperature range	15 °C to 30 °C (59 °F to 86 °F)
Storage temperature range	–20 °C to 70 °C (–4 °F to 158 °F)
Vibration	Meets MIL–T–28800D
molbox RFM weight and dimensions	2.55 kg (5.6 lb) max
	8 cm x 22.5 cm x 20 cm (3.1 in x 8.9 in x 7.9 in) approx.
molstic with molbloc weight and dimensions (max)	9 kg (20 lb)
	19 cm x 81.28 cm x 15.25 cm (7.5 in x 32 in x 6 in) approx.
Supply gas required	99.998 % pure N2 or Air regulated to 90 psig (600 kPa) **Note:** A fine pressure regulator is included, but an additional regulator (not included) may be required to reduce pressure supplied to the 514X kit to approximately 90 psi
Gas calculations reported	Nitrogen (N_2), Air, Argon (Ar), Carbon Monoxide (CO), Helium (He), Oxygen (O_2), Carbon Dioxide (CO_2), Carbon Tetrafluoride (CF_4), Ethane (C_2H_6), Ethylene (C_2H_4), Fluoroform (CHF_3), Hexafluoroethane (C_2F_6), Hydrogen (H2), Methane (CH_4), Nitrous Oxide (N_2O), Propane (C_3H8), Sulfur Hexafluoride (SF_6)
Flow connections for gas supply and device under test	1/4 in tube with adapters included for 1/4 in NOT and 1/4 in BSP

FLUKE®
Calibration

Ordering information

5141-100 molbox RFM, molbloc 5E1-L 10 to 100 sccm
5141-1K molbox RFM, molbloc 5E2-L 100 to 1,000 sccm
5141-10K molbox RFM, molbloc 5E3-L 1 to 10 slm
5141-50K molbox RFM, molbloc 3E4-L 5 to 50 slm
5142-1K molbox RFM-M, molbloc 5E2-L 10 to 1,000 sccm
5142-10K molbox RFM-M, molbloc 5E3-L 0.1 to 10 slm
5142-50K molbox RFM-M, molbloc 3E4-L 0.5 to 50 slm
5144-50K molbox RFM-M, molblocs 5E2-L and 3E4-L10 sccm to 50 slm

Each kit contains:

- molbox RFM (5141 kits) or molbox RFM-M (5142 and 5144 kits) reference flow monitor with quick connect molbloc pressure lines, molbloc communication cable, line cord and user manual
- molbloc-L laminar flow element (2 elements in 5144 kit)
- molstic-L mounting system, with fine pressure regulator and an isolation valve and precise flow metering valve for each molbloc-L
- Tubing and adaptors to connect gas supply and device under test, including 1/4 in tube fitting, 1/4 in NPT female, 1/4 in NPT male, 1/8 in NPT male and 1/4 in BSP male

Accessories

RFM-RMK (401465) Rack mount kit
MFC-CB Analog MFC interface system (see mfc-CB brochure)
COMPASS for Flow Software

Fluke Calibration. *Precision, performance, confidence.™*

Electrical | RF | Temperature | Pressure | Flow | Software

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Printed in U.S.A. 2/2013 4264529A_EN
Pub-ID: 12002-eng