

1E5 molbloc™

100 slm
Mass Flow Element



DESCRIPTION

The 1E5 molbloc extends the range of the molbloc/molbox system using molbloc-L elements to 100 slm (nominal, N2, see range chart on overleaf).

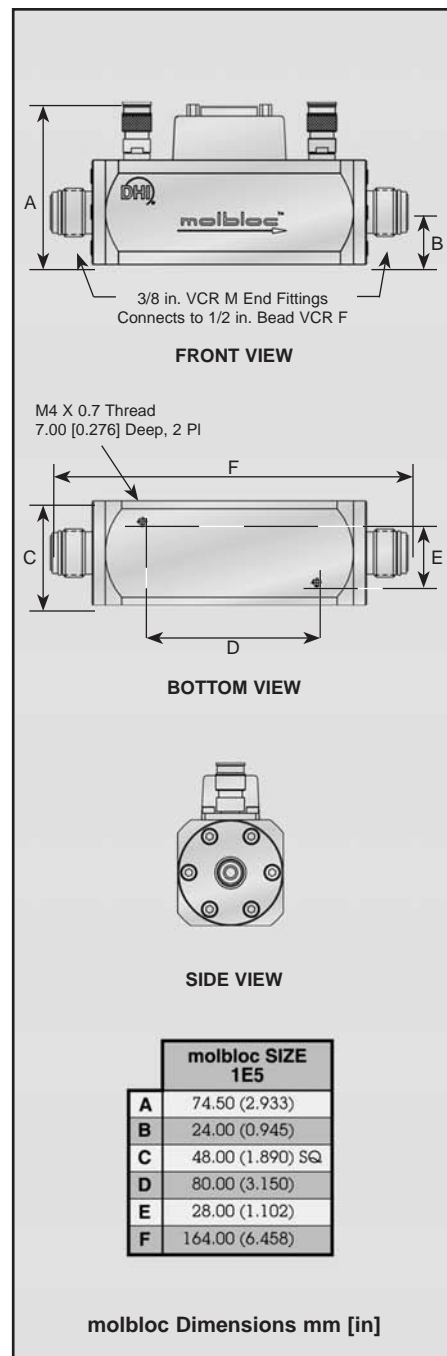
Though the 1E5 molbloc external dimensions are similar to the 3E4 and 1E4 molblobs, it differs from all other molblobs in a number of ways that should be considered when configuring a new molbloc/molbox system or adding a 1E5 molbloc to an existing system. Characteristics unique to the 1E5 molbloc include:

- Low differential pressure range (0 to 10 kPa nominal) relative to other molblobs.

- Measurement uncertainty with molbox1 of $\pm 0.5\%$ of reading from 25 to 100% FS, $\pm 0.125\%$ FS under 25%. Best results are obtained with molbox RFM microrange, use with molbox RFM without microrange is not recommended (see specifications on overleaf).
- High pressure calibrations are not available (full mod, upstream or single P, low pressure or downstream calibrations only).
- End fittings are 3/8 in. VCR male to accommodate 1/2 in. bead VCR female hardware. All other molbloc-L sizes are 1/4 in. VCR male.
- Uses a special, hi flow, molstic designed for the 1E5 molbloc.

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1E5 molbloc™ 100 slm Mass Flow Element

molbloc/molbox SPECIFICATIONS

molbox1™ (A700k or molbox1 A350k)

molbox RFM™ (with microrange option)

FLOW MEASUREMENT

Measurement Update Rate: 1 second
Range: 0 to 100 slm depending on gas (see molbloc Ranges Table)
Resolution: 0.04% FS
Linearity: ± 0.25 % of reading from 25 to 100 % FS,
± 0.025 % FS under 25 % FS
Repeatability: ± 0.2 % of reading from 25 to 100 % FS,
± 0.02 % FS under 25 % FS
Precision¹: ± 0.32 % of reading from 25 to 100 % FS,
± 0.032 % FS under 25 % FS
Predicted Stability²(One Year): ± 0.1 % of reading from 25 to 100 % FS,
± 0.01% FS under 25 % FS

Measurement Uncertainty³ (N₂ and Any molbox Supported Gas for Which the molbloc is Calibrated):
± 0.5 % of reading from 25 to 100 % FS,
± 0.125 % FS under 25 % FS

1 second
0 to 100 slm depending on gas (see molbloc Ranges Table)
0.01% FS
± 0.25 % of reading from 5 to 100 % FS,
± 0.0125% FS under 5% FS
± 0.2% of reading from 5 to 100% FS,
± 0.01% FS under 5% FS
± 0.32% of reading from 5 to 100% FS,
± 0.016% FS under 5% FS
± 0.2% of reading from 5 to 100% FS,
± 0.01% FS under 5% FS
± 0.5% of reading from 5 to 100% FS,
± 0.025% FS under 5% FS

¹ Precision: Combined linearity, hysteresis, repeatability.

² Stability: Maximum change in zero and span over specified time period for typical molbox and molbloc used under typical conditions. As stability can only be predicted, stability for a specific molbox and molbloc should be established from experience.

³ Measurement Uncertainty: Maximum deviation of the molbox flow indication from the true value of the flow through the molbloc including precision, stability and DHI calibration standard accuracy. Measurement uncertainty is sometimes referred to as "accuracy".

RANGES WITH LOW PRESSURE CALIBRATIONS

• FULL MOD,
LOW PRESSURE

• DOWNSTREAM

• SINGLE P,
LOW PRESSURE

			molbloc SIZE AND FULL SCALE FLOW (sccm)
GASES			SIZE 1E5
INERT	Nitrogen	N ₂	100 000
	Argon	Ar	80 000
	Helium	He	100 000
	Sulfur Hexafluoride	SF ₆	-- --
	Xenon	Xe	30 000 20 000
FLAMMABLE	Butane	C ₄ H ₁₀	-- --
	Ethane	C ₂ H ₆	60 000 50 000
	Ethylene	C ₂ H ₄	70 000 40 000
	Hydrogen	H ₂	200 000
	Methane	CH ₄	120 000 40 000
	Propane	C ₃ H ₈	-- --
FLUORO- CARBONS	Carbon Tetrafluoride	CF ₄	36 000 25 000
	Hexafluoroethene	C ₂ F ₆	-- --
	Trifluoromethane	CHF ₃	38 000 30 000
OTHER	Air	Air	100 000
	Carbon Dioxide	CO ₂	60 000 30 000
	Carbon Monoxide	CO	100 000
	Nitrous Oxide	N ₂ O	60 000 30 000
	Octafluorocyclobutane	C ₄ F ₈	-- --
	Oxygen	O ₂	80 000

RANGES TABLES LEGEND

A bold value indicates that the maximum flow is limited by the maximum Reynolds number value of 1 200 which is reached before the normal 1E5 differential pressure range is reached. In that case, the second value gives the minimum flow for which measurement uncertainty is ± 0.5% of reading (both molbox1 and molbox RFM). With the molbox RFM microrange option, this value is divided by 5.

Where there is no value in the table (--), this indicates that the maximum Reynolds number is reached before the differential pressure reaches 1 kPa, therefore calibration with that gas is not useful.

PRESSURE DEPENDENT CALIBRATION TYPES

CALIBRATION TYPE	OPERATING PRESSURE*	NOMINAL DIFFERENTIAL PRESSURE AT MAX FLOW
Full mod, low pressure	250 to 325 kPa absolute (36 to 48 psia) upstream of molbloc	10 kPa (1.45 psi)
Downstream	Atmospheric pressure downstream of molbloc	18 kPa (2.6 psi)
Single P, low pressure (non-N ₂ gases only)	Any specified single molbloc upstream pressure between 250 and 325 kPa absolute (36 to 48 psia)	10 kPa (1.45 psi)

ORDERING INFORMATION

DESIGNATOR	DESCRIPTION	PART NO.
1E5 VCR-V-Q	molbloc Mass Flow Element	401638

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