



TYPE 1559A

GENERAL PURPOSE MASS-FLO® CONTROLLER

The MKS Type 1559 Mass Flow Controller is designed for general purpose mass flow control applications covering the range from 20 slm (42.5 cfh) to 200 slm (425 cfh).¹ The Type 1559's unique control valve eliminates oscillation and offers better response time as compared to other flow controllers. This is possible through the use of a "balanced force" valve design that automatically neutralizes line pressure-induced imbalances within the control valve.

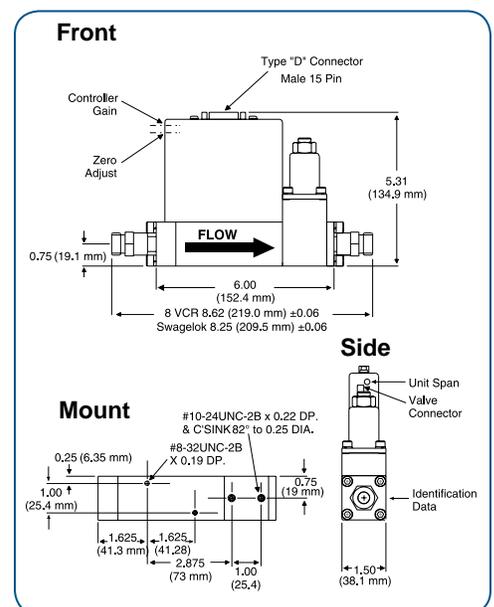
Important operational considerations include fast warm-up, fast response time and 1% F.S. accuracy (Nitrogen). These features are key in minimizing downtime and ensuring the correct gas flow is being delivered to your process at the correct time.

The Type 1559 has excellent RFI protection, and has a noise protection safety feature where the valve closes with a command signal of less than 0.2% of F.S. MKS also offers a complete line of compatible, stand-alone power supply/readout units, including Types 246, 247 and 647.

¹ Standard nitrogen equivalent. For flow rates above 200 slm, contact MKS Applications Engineering.

Features & Benefits

- Full scale ranges from 20 slm to 200 slm (nitrogen equivalent) for a wide variety of high flow applications
- "Balanced force" valve design to minimize oscillation due to line pressure fluctuations
- Fast 30 minute warm-up time to minimize expensive production downtime
- Fast 2 second settling time to achieve desired flows quickly
- Accepts an external pressure input signal (0 - 10 VDC) to allow pressure control mode



Dimensional Drawing —

Note: Unless otherwise specified, dimensions are nominal values in inches (mm referenced).



Flow

& Control Measurement

WWW.MKSINSTR.COM

Specifications and Ordering Information

Full Scale Ranges (N₂ equivalent)

Maximum Inlet Pressure

Normal Operating Pressure Differential
(with atmospheric pressure at the outlet)

Control Range

Accuracy

Repeatability

Resolution (measurement)

Temperature Coefficients

Zero

Span

Warm-up Time

(to within 0.2% of F.S. of steady state performance)

Controller Settling Time

Meter Response Time

Pressure Coefficient

Normal Operating Temp. Range

Input Voltage Required

Max. at Start-up (first 2 sec.)

Typical at Steady State

Set Point Command

Output Signal/Minimum Load

Output Impedance

Connector Type

Materials Wetted

Body

Seals

Leak Integrity

External (scc/sec He)

Through closed valve

Fittings

Electromagnetic Compatibility

20 slm to 200 slm (Denser gases, such as Argon, may be limited in terms of F.S.)

100 psig (For higher pressures consult Applications Engineering at 800-227-8766.)

Controller: For 20, 50, 100 slm N₂ – 15 to 40 psid; For 200 slm N₂ – 25 to 40 psid

1.0 to 100% of F.S.

±1.0% of F.S. (Includes non-linearity, hysteresis, and non-repeatability referenced to 760 mmHg/0°C.
For calibrations with Helium and Hydrogen gas, standard accuracy is 2.0% of F.S.)

±0.2% of F.S.

±0.1% of F.S.

< 0.05% of F.S./°C

< 0.10% of Rdg./°C

30 minutes

< 2 seconds (to within 2% of set point)

< 500 msec

0.005% of Rdg./psi

15°C to 40°C

Controller: ±15 VDC (±5%) @ 450 mA

Controller: ±15 VDC @ 350 mA

0-5 VDC from < 20K Ω

0-5 VDC into > 10K Ω

< 1 Ω

15-pin Type "D"

316L S.S., nickel

Standard: Viton® Optional: Neoprene®, Buna-N, Kalrez®

≤ 10⁻⁹

≤ 1% of F.S. (To ensure no flow-through, a separate shutoff valve is required.)

Standard: Swagelok® 8 VCR® male Optional: Swagelok 8 VCO® male, ½" Swagelok®

Fully EMC Directive 2004/108/EC when used with an overall metal braided shielded cable, properly grounded at both ends

SEMI Gas Codes

SEMI Gas Code	Name	Symbol	Maximum F.S. slm	Flow Rate Code
001	Helium	He	200	22L
004	Argon	Ar	200	22L
007	Hydrogen	H ₂	200	22L
008	Air	--	200	22L
013	Nitrogen	N ₂	200	22L
015	Oxygen	O ₂	200	22L
019	Chlorine	Cl ₂	100	12L
025	Carbon Dioxide	CO ₂	100	12L
028	Methane	CH ₄	100	12L
029	Ammonia	NH ₃	100	12L
039	Silane	SiH ₄	100	12L
042	Acetylene	C ₂ H ₂	100	12L
110	Sulfur HexaFluoride	SF ₆	50	51L

Cabling for 1559A:

CB259-5-10 to connect 1559 to 246, 247

(If connecting to more than 2 channels on the 247, an extra power supply like a 260PS is needed. Use CB1559-1-M1.)

CB147-1-10 to connect 1559 to PR4000, 146, 647

CB1559-1-M1 connects 1559, 247D and 260PS

Ordering Code Example: 1559A00421LR1BB

Code

Configuration

Type 1559 Mass-Flo® Controller

1559A

1559A

Gas To Be Calibrated For: (SEMI Gas Code) See table for additional options

Helium

001

Argon

004

Hydrogen

007

Nitrogen

013

Oxygen

015

004

Flow Rate To Be Calibrated For slm: (Maximum 200 slm N₂ equivalent) (*See Note)

20

21L

50

51L

100

12L

200

22L

21L

*Note: For flow rates above 200 slm, contact Applications Engineering.

Fittings

½" Swagelok

S

Swagelok 8 VCR male

R

Swagelok 8 VCO male

G

R

Valve

Normally Closed (controller)

1

1

Electrical/Communication Connector

Analog 15-pin D

B

B

Seals

Viton

V

Buna-N

B

Neoprene

N

Kalrez

K

B

