The MKS Type 1179 is a general purpose mass flow controller designed to measure and control the flow of gases in a wide variety of applications. Type 1179 Mass-Flo® Controllers are available with Full Scale ranges from 10 sccm to 20 slm, providing fast, repeatable flow control to as low as 0.2 sccm. It can also be used as a pressure controller when connected to a suitable pressure transducer.

The 1179 is a direct form-fit-function replacement for the most common MFC’s on the market today. The standard 3-inch footprint enables the 1179 to drop directly into the same space without modifying existing gas lines. Electrical connectors are the same PC card edge or Type “D” connectors, with the same pin-outs, signals, and functions as their industry counterparts, so no cable or connector rewiring is necessary. The 1179 is compatible with MFC power supply and display electronics from MKS or other manufacturers.

Features & Benefits

For Demanding Processes

- Patented¹ sensor design provides exceptional zero stability
- Full scale flow ranges from 10 sccm to 20 slm for precise and repeatable flow measurement and control
- Percent of full scale accuracy for analog configurations
- Fast warm-up time minimizes expensive production downtime
- Compatible with earlier MKS MFC and power supply/readout modules

Robust, Reliable Design

- Rigorous design and testing includes MTBF analysis and STRIFE testing to ensure long-term performance
- Surface finish of wetted stainless surfaces, cleanroom processing, and minimal use of elastomer seals enable use in demanding clean processes
- CE Mark compliant – meets requirements for European Union
- Two year warranty ensures quality and customer satisfaction

¹U.S. Patent No. 5461913. Foreign Patents Pending.
The MKS Type 1179 employs the latest design thermal sensor for mass flow measurement, with a fast acting proportioning valve and control circuitry, in a compact industry-standard package. The 1179 is constructed of 316L stainless steel finished to <32 max. microinches Ra, with minimal use of elastomer seals, for the more demanding clean applications. The control valve is normally closed. Security against accidental damage is provided by a proof pressure of 500 psig, and a burst pressure rating of 1500 psig.

Power required for the 1179 is minimal: the nominal ±15 VDC unit consumes only 100 mA during operation (200 mA at initial turn-on). Fast warm-up (<2 minutes) makes the 1179 ideal for production applications where MFC replacement often results in expensive downtime.

Performance and reliability have been designed into the 1179, and ensured through rigorous MTBF analysis and extensive STRIFE testing. The 1179 complies with IEC-801 specifications for tolerance to ESD (electro static discharge) and RFI (radio frequency interference) environments. Zero and span drift are minimal with MKS' new patented sensor, as shown by the graph below. The 1179 also complies with European CE Mark requirements. As a statement of our confidence in the performance of the 1179, it carries a two-year warranty.

Size, compatibility, cleanliness, reliability, and low cost make the MKS Type 1179 MFC the ideal choice for the more demanding flow control applications.

Flow Accuracy and Repeatability —

The above graph shows the typical flow accuracy and repeatability of analog MFCs in the 1179 family. Measurements were made using the MKS Instruments Califlow® Primary Standard Flow Calibrator over a 10 day period.

Zero Stability —

The above graph shows the excellent zero and span stability of the Type 1179 sensor used in the 1179 family. The instruments were powered on and randomly tested for zero and span drift over a 19 month period.
Specifications

Full Scale Ranges ($N_2$ equivalent)
10, 20, 50, 100, 200, 500, 1000, 2000, 5000, 10000, 20000 sccm

Maximum Inlet Pressure
150 psig

Normal Operating Pressure Differential
(with atmospheric pressure at the MFC outlet)
10 to 5000 sccm
10000 to 30000 sccm
10 to 40 psid
15 to 40 psid
2% to 100% of F.S.

Control Range
Accuracy (analog)
(including non-linearity, hysteresis, and non-repeatability referenced to 760 mmHg and 0°C)
±1.0% of F.S.

Repeatability
±0.2% of F.S.

Resolution
0.1% of F.S.

Temperature Coefficients
Zero
<0.05% of F.S./°C

Span
<0.08% of Rdg./°C

Warm-up Time (to within 0.2% of F.S. of steady state performance)
<2 min

Controller Settling Time (per SEMI Guideline E17-91)
<2 sec

Pressure Coefficient
<0.02% of Rdg./psi

Normal Operating Temperature Range
0°C to 50°C

Input Voltage Required
Max. current at start-up (first 2 sec)
±15 VDC (±5%) @ 200 mA
±15 VDC (±5%) @ 100 mA

Typical current at steady state
0 to 5 VDC from <20K Ω

Input Impedance
0 to 5 VDC into >10K Ω
<1 Ω

Set Point Command Signal
9-pin or 15-pin Type “D”, 20-pin card edge
(The 15-pin Type “D” and card edge connectors are electronically compatible with other MKS flow controllers. Consult Applications Engineering for details.)

Connector Types
Analog

Wetted Materials
Standard
316L S.S., Viton®, nickel
Optional (seals and valve seat)
Buna-N, Neoprene®, Kalrez®

Leak Integrity
External (scc/sec He)
<1 x 10^-9
Through closed valve
<1.0% of F.S. at 40 psig inlet to atmosphere
(To assure no flow-through, a separate positive shut-off valve is recommended.)

Swagelok® 4 VCR®, Swagelok 4 VCO®, ¼” Swagelok®

Fittings (compatible with)

Electromagnetic Compatibility
Fully CE Compliant to EMC Directive 2004/108/EC when used with an overall metal braided shielded cable, properly grounded at both ends (except edge card version)
**SEMI Gas Codes**

<table>
<thead>
<tr>
<th>SEMI Gas Code</th>
<th>Name</th>
<th>Symbol</th>
<th>Maximum Flow Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>Helium</td>
<td>He</td>
<td>30,000</td>
</tr>
<tr>
<td>004</td>
<td>Argon</td>
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<td>007</td>
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<tr>
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<td>Nitrogen</td>
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<tr>
<td>019</td>
<td>Chlorine</td>
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<td>025</td>
<td>Carbon Dioxide</td>
<td>CO₂</td>
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</tr>
<tr>
<td>028</td>
<td>Methane</td>
<td>CH₄</td>
<td>10,000</td>
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<tr>
<td>029</td>
<td>Ammonia</td>
<td>NH₃</td>
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<tr>
<td>039</td>
<td>Silane</td>
<td>SiH₄</td>
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<tr>
<td>042</td>
<td>Acetylene</td>
<td>C₂H₂</td>
<td>10,000</td>
</tr>
<tr>
<td>110</td>
<td>Sulfur HexaFluoride</td>
<td>SF₆</td>
<td>5,000</td>
</tr>
</tbody>
</table>

**Gas To Be Calibrated For**

- Helium: 001
- Argon: 004
- Hydrogen: 007
- Nitrogen: 013
- Oxygen: 015

**Flow Rate To Be Calibrated for SCCM**

Maximum 20000 SCCM N₂ Equivalent

<table>
<thead>
<tr>
<th>Flow Rate</th>
<th>Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>11C</td>
</tr>
<tr>
<td>20</td>
<td>21C</td>
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<tr>
<td>50</td>
<td>51C</td>
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<tr>
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<td>12C</td>
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<td>200</td>
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<td>500</td>
<td>52C</td>
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<td>13C</td>
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<td>5000</td>
<td>53C</td>
</tr>
<tr>
<td>10000</td>
<td>14C</td>
</tr>
<tr>
<td>20000</td>
<td>24C</td>
</tr>
</tbody>
</table>

**Fittings (compatible with)**

- Swagelok® 4 VCR® male: R
- Swagelok® 4 VCO® male: G
- Swagelok 1/8" Swagelok: S
- Length adapter w/4 VCR fittings*: L
- Length adapter w/1/4" Swagelok fittings**: W

**Valve**

- Normally closed: 1

**Connector**

- Analog 9-pin Type “D”: A
- Analog 15-pin Type “D”: B
- Analog 20-pin edge card: C

**Seal Materials**

- Viton®: V
- Buna-N: B
- Neoprene®: N
- Kalrez®: K

**Optional Accessories**

- Type 246 single-channel power supply/readout/set point control: 246C
- Type 247C four-channel power supply/readout/set point control: 247D
- Type 647C four-channel power supply/readout/set point control/RS-232: 647C4R0N
- Type 647C eight-channel power supply/readout/set point control/RS-232: 647C8R0N
- Type PR4000B one-channel power supply/readout/set point control RS232: PR4000BS
- Type PR4000B two-channel power supply/readout/set point control RS232: PR4000BF

**Cabling for 1179A**

- CB147-12-10 to connect 1179 9-pin Type “D” to PR4000, 246, 247, 647
- CB259-5-10 to connect 1179 15-pin Type “D” to PR4000, 246, 247
- CB147-1-10 to connect 1179 15-pin Type “D” to PR4000, 647
- CB259-10-10 to connect 1179 20-pin edge card to PR4000, 246, 247
- CB147-7-10 to connect 1179 20-pin edge card to PR4000, 647

Contact Applications Engineering for shielded cables required for CE Compliance.

* Matches length of 1259C-XXXXX-RX
** Matches length of 1259C-XXXXX-SX