**General Purpose Mass-Flo® Controller**

**Type 1179A**

**Features and Benefits**

**For Demanding Processes**

- Patented sensor design provides exceptional zero stability
- Full scale flow ranges from 10 sccm to 20 slm for precise and repeatable flow measurement and control
- Available in both Analog and Digital (RS-485 and DeviceNet™) versions
- Percent of full scale accuracy for analog configurations
- Percent of reading accuracy with digital 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
- Three year warranty ensures quality and customer satisfaction

**Description**

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 MFCs on the market today. The standard 3-inch footprint.

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1 U.S. Patent No. 5461913. Foreign Patents Pending.
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. Digital models include both DeviceNet and RS-485. See DeviceNet and RS-485-7/97 Bulletins for more information.

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 three-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.
Full Scale Ranges (N₂ 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 10 to 40 psid
- 10000 to 30000 sccm 15 to 40 psid

Control Range 2% to 100% of F.S.

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 Rgd./°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 Rgd./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
- Typical current at steady state ± 15 VDC (± 5%) @ 100 mA

Set Point Command Signal 0 to 5 VDC from < 20K Ω

Output Signal 0 to 5 VDC into > 10K Ω

Output Impedance < 1 Ω

Connector Types
- Analog 9-pin or 15-pin Type “D”, 20-pin card edge
- Digital RS-485, DeviceNet

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.)

Fittings (compatible with)
- Swagelok® 4 VCR®, Swagelok 4 VCO®, ¼” Swagelok®

Electromagnetic Compatibility Fully CE Compliant to EMC Directive 89/336/EEC when used with an overall metal braided shielded cable, properly grounded at both ends (except edge card version)

Specifications are subject to change without notice.
Mass-Flo® is a registered trademark of MKS Instruments, Inc., Andover, MA.
Viton®, Neoprene®, and Kalrez® are registered trademarks of E.I. Du Pont Co., Inc., Wilmington, DE.

DeviceNet®, VCR®, and VCO® are registered trademarks of Swagelok Marketing Co., Solon, OH.
DeviceNet™ is a trademark of the Open DeviceNet Vendor Association, Coral Springs, FL.
### Type 1179A Mass-Flo Controller

**Model Number Example:**

- Type Number: 1179A

**Flow Range Full Scale (sccm of N₂):**

<table>
<thead>
<tr>
<th>Flow Rate</th>
<th>11C</th>
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<tbody>
<tr>
<td>10</td>
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<tr>
<td>20</td>
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<tr>
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<td>51C</td>
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</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 R
- 1/4" Swagelok S
- Swagelok 4 VCO G

**Valve:**

- Normally Closed: 1

**Connector:**

<table>
<thead>
<tr>
<th>Type</th>
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<tbody>
<tr>
<td>Analog</td>
<td>A</td>
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<tr>
<td>9-pin Type &quot;D&quot;</td>
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<tr>
<td>15-pin Type &quot;D&quot;</td>
<td>B</td>
</tr>
<tr>
<td>20-pin edge card</td>
<td>C</td>
</tr>
<tr>
<td>Digital (see supplemental Bulletins DeviceNet and RS-485-7/97 and consult Applications Engineering before ordering)</td>
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<td>RS-485</td>
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<td>DeviceNet</td>
<td>6</td>
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</tbody>
</table>

**Seal Materials:**

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

**Firmware Revision:**

- Unless otherwise specified, MKS will ship the current firmware revision

**Optional Accessories:**

- Type 246 single-channel power supply/readout/set point control: 246B
- Type 167 single-channel readout/set point control (external PS required): 167A
- Type 247C four-channel power supply/readout/set point control: 247C
- Type 647B four-channel power supply/readout/set point control/RS-232: 647B-4-R-0-N
- Type 647B eight-channel power supply/readout/set point control/RS-232: 647B-8-R-0-N
- Type PR4000A one-channel power supply/readout/set point control/RS-232: PR4000AS
- Type PR4000A two-channel power supply/readout/set point control/RS-232: PR4000AP
- Type 146C four-channel power supply/readout set point control/RS-232: 146C
- Type 186B eight-slot displayless process controller/RS-232: 186B

**Cabling for 1179A:**

- Type CB147-12-10 to connect 1179 9-pin Type "D" to PR4000, 146, 186, 246, 247, 167, 647
- Type CB259-5-10 to connect 1179 15-pin Type "D" to 246, 247
- Type CB147-1-10 to connect 1179 15-pin Type "D" to PR4000, 146, 186, 167, 647
- Type CB259-10-10 to connect 1179 20-pin edge card to 246, 247
- Type CB147-7-10 to connect 1179 20-pin edge card to PR4000, 146, 186, 167, 647

Contact Applications Engineering for shielded cables required for CE Compliance.