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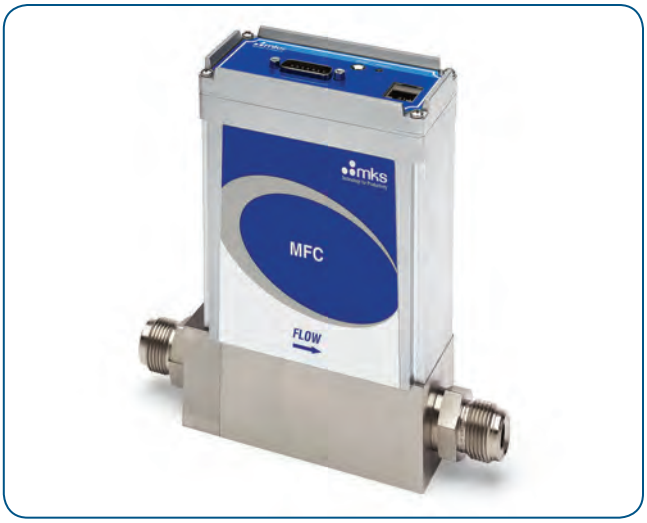



Flow Solutions

WWW.MKSINST.COM

# GE300A

## MULTI-GAS/MULTI-RANGE MASS FLOW CONTROLLER FLOW RATES UP TO 300 SLM

The GE300A is a general purpose, elastomer sealed MFC well suited for a wide variety of applications requiring flow control capability from 150 slm to 300 slm FS, $N_2$ equivalent. The GE300A incorporates the latest in digital flow control electronics along with a well proven, patented thermal sensor and mechanical design. This MFC is available with either analog or digital I/O. The digital control electronics utilize the latest in MKS control algorithms provide fast and repeatable response to set point.

Settling times of 1 to 2 seconds and set point accuracies below 1% of set point outperform those of other typical high flow MFCs. Precise control is maintained down to 2% of the GE300A configured Full Scale flow range. The multi-gas/multi-range capability, along with tight performance specifications for accuracy, control range, and transient response allow users to minimize inventory of high flow MFC part numbers.

The multi-gas/multi-range feature (along with other custom controls) is accessed through the MFCs embedded diagnostic interface, which requires no special software or hardware to operate. A standard Ethernet cable and JAVA-enabled HTML browser, widely available, are all the tools needed. The critical gas parameters for typical high flow rate gases are already stored on the device. Configuring the device is simply a matter of selecting the gas from a drop down menu and specifying the desired full scale flow range. The diagnostic interface also allows the user to perform routine device health checks, plot flow response, and store operating data for offline analysis.

## Features & Benefits

### Improved Performance

- Fast response to set point change reduces flow stabilization time for short process steps, enhancing process throughput
- Tightly controlled flow accuracy of process gas enables improved process matching
- Reduced inlet pressure (pressure drop) requirement simplifies gas supply regulation from a single source

### Reduces Overall Costs

- Reduces MFC inventory through its multi-gas/multi-range capability
- Accurate flow control over a wide dynamic range, even when down ranged, reduces need for an additional low range MFC

### Easy to Integrate and Operate

- Device configuration and diagnostics made simple through standard Ethernet interface
- Uses a standard web browser with no special software required

## Performance

| | |
|---|---|
| **Full Scale Flow Ranges** *($N_2$ equivalent)* | 150 to 300 slm |
| **Maximum Inlet Pressure** | 150 psig<br>(cannot exceed pressure differential requirement across MFC) |
| **Normal Operating Pressure Differential**<br>*(with atmospheric pressure at the MFC outlet)* | 30 to 55 psid (dependent on fitting type) |
| **Burst Pressure** | 1500 psig |
| **Control Range** | 2% to 100% of F.S. (range on mech.) |
| **Typical Accuracy** | ± 1% of set point for > 20% to 100% F.S.<br>± 0.25% of F.S. for 5% to 20% F.S. |
| **Repeatability** | ± 0.5% of Reading |
| **Resolution** | 0.1% of Reading |
| **Temperature Coefficients** | |
| Zero | < 0.05% of F.S./°C |
| Span | < 0.08% of Rdg./°C |
| **Inlet Pressure Coefficient** | < 0.03% of Rdg./psi or less |
| **Typical Controller Settling Time** | 1 to 2 seconds typical above 10% F.S. @ 50 psi |
| **Warm-up Time** | one (1) hour |
| **Operating Temperature Range** *(Ambient)* | 10°C to 50°C |
| **Storage Humidity** | 0 to 95% relative humidity, non-condensing |
| **Storage Temperature** | -20° to 65°C (-4° to 149° F) |

## Mechanical

| | |
|---|---|
| **Fittings** *(compatible with)* | 8 VCO® male, ½" NPT female, ½" Compression, 8 VCR® male |
| **Leak Integrity** | |
| External (scc/sec He) | < 1 x $10^{-9}$ |
| Through closed valve | < 1.0% F.S. at 40 psia to vac (<500 mTorr)<br>(To assure no flow-through, a separate positive shut-off valve is required.) |
| **Wetted Materials** | |
| Standard | 316 S.S., 17-7 S.S., Elgiloy, 430FR |
| **Seal Options** | Viton®, Buna, Neoprene, EPDM |
| **Surface Finish** | 16 µinch average Ra |
| **Weight** | less than 4.5 lbs. (2.05 kg) |

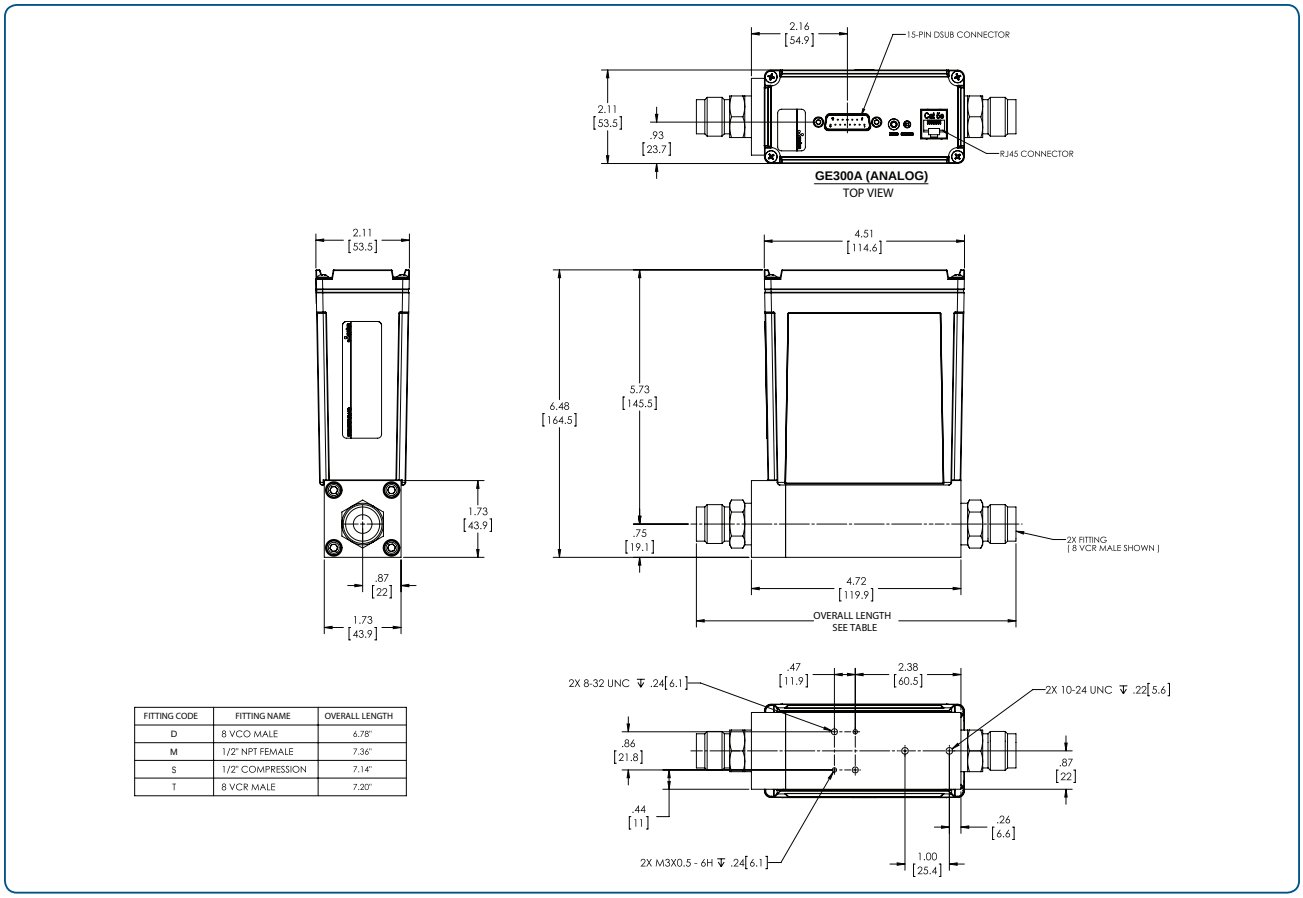
## Electrical Analog I/O

| | |
|---|---|
| **Input Power Required** | +15 to +24 VDC @ (< 4 watts) |
| **Flow Input/Output Signal** | |
| Voltage (0 to 5 VDC) | 15-pin Type “D” male |
| Current (4 to 20 mA) | 15-pin Type “D” male |
| **Compliance** | CE |

## Digital I/O

| | **DeviceNet™** | **Profibus®** |
|---|---|---|
| **Input Power Required** | +11 to +25 VDC per (< 4 watts) | +15 to +24 VDC (< 4 watts) |
| **Connector** | 5 pin micro connector<br>(power and comm.) | 9 pin Type D male (power)<br>9 pin Type D female (comm.) |
| **Data Rate Switch/Selection** | 4 positions: 125, 250, 500K, (Default)<br>(programmable over network) | No switch<br>Set data rate via Profibus |
| **Comm. Rate(s)** | 125 Kbps, 250 Kbps, 500 Kbps | 9.6 Kbps to 12 Mbps |
| **MAC ID Switches/Addresses** | 2 switches, 10 positions; 0,0 to 6,3<br>1 to 254 | 2 switches, 10 positions |
| **Network Size** | Up to 64 nodes | Up to 99 nodes |
| **Visual Indicators** | LED Network (green/red)<br>LED Module (green/red) | LED Comm (green/red)<br>LED Error (green/red) |
| **Compliance** | CE | CE |

# Dimensional Drawing




| FITTING CODE | FITTING NAME | OVERALL LENGTH |
|---|---|---|
| D | 8 VCO MALE | 6.78" |
| M | 1/2" NPT FEMALE | 7.36" |
| S | 1/2" COMPRESSION | 7.14" |
| T | 8 VCR MALE | 7.20" |

## Dimensional Drawing

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

# Ordering Information

| Ordering Code Example: GE300A013305TBV0020 | Code | Configuration |
|---|---|---|
| MFC High Flow Mass Flow Controller (multigas, multi-range) GE300A | | GE300A |
| **Gas*** | | |
| For example:<br>001 = Helium = He<br>004 = Argon = Ar<br>007 = Hydrogen = $H_2$<br>013 = Nitrogen = $N_2$ | <br>001<br>004<br>007<br>013 | 013 |
| **Flow Range Full Scale**** | | |
| 300 slm (300,000 sccm) | 305 | 305 |
| **Fittings** *(compatible with)* | | |
| 8 VCR male<br>8 VCR male (1559 replacement)<br>8 VCO male<br>12 mm tube compression<br>1/2" tube compression<br>1/2" tube compression (1559 replacement)<br>3/8" tube compression<br>1/2" NPT female | T<br>L<br>D<br>F<br>S<br>W<br>J<br>M | T |
| **Connector (Power & Control I/O)** | | |
| 15 pin D (Analog 0 to 5 VDC I/O)<br>15 pin D (4 to 20 mA I/O)<br>Profibus<br>RS-485<br>DeviceNet | B<br>H<br>4<br>5<br>6 | B |
| **Seal Materials** | | |
| Viton<br>Buna-N<br>Neoprene<br>EPDM | V<br>B<br>N<br>E | V |
| **Valve Type** | | |
| Normally closed<br>Meter | 0<br>3 | 0 |
| **Reserved for MKS Future Use** | | |
| Standard | 0 | 0 |
| **Firmware** | | |
| Unless otherwise specified, MKS will ship firmware revision current to date | 20 | 20 |

* For gases not listed in the standard products gas table, please contact the MKS applications department for assistance.

| Gas Table | | | |
|---|---|---|---|
| **Gas Name*** | **Semi Gas Code** | **Gas Formula** | **Min - Max FS (slm)** |
| Helium | 001 | He | 210 to 300 |
| Argon | 004 | Ar | 210 to 300 |
| Hydrogen | 007 | $H_2$ | 150 to 300 |
| Air | 008 | Air | 150 to 300 |
| Nitrogen | 013 | $N_2$ | 150 to 300 |

** The Full Scale flow rate is designated by a 3 digit number. The first two digits represent the significant digits of the Full Scale flow rate separated by a decimal point. The third digit is the exponent of the power of ten.

**Example flow rate code:**
255 is 2.5 x $10^5$ sccm or 250 slm
105 is 1.0 x $10^5$ sccm or 100 slm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