



Type GE50A

ELASTOMER SEALED, DIGITAL MASS FLOW CONTROLLER

The GE50A is a general purpose, elastomer sealed MFC well suited for a wide variety of applications requiring flow control capability from 10 sccm to 50 slm FS, N₂ equivalent. The GE50A incorporates the latest in digital flow control electronics along with a well proven, patented thermal sensor and mechanical design.

The GE50A digitally controlled MFC is available with either RS485 or DeviceNet I/O. The digital control electronics utilize the latest in MKS control algorithms providing fast and repeatable response to setpoint throughout the device control range. Typical response times are on the order of 500 milliseconds. Included is a digital calibration that yields 1% of setpoint accuracy on the calibration gas. The I/O protocols are designed so that the GE50A can easily replace the RS485 and DeviceNet versions of the 1179A with minor coding required.

The GE50A utilizes the standard 3-inch footprint most often used by MFCs in the 10 sccm to 50 slm flow rate range enabling its use without the need to modify existing gas line configurations. The design of the GE50A incorporates a minimal use of elastomers. There is only one external elastomer seal and elastomer valve plug. Otherwise, all wetted surfaces are of metal. The GE50A comes standard with Viton® seals along with options for Buna, Neoprene® or Kalrez® allowing for the device's use with gases requiring one of these alternatives.

Features & Benefits

- Patented thermal sensor design provides exceptional zero stability
- Percent of setpoint accuracy (calibration gas) enables precise process control
- Embedded user interface provides the ability to
 - Easily change device range and user gas reducing inventory requirements
 - Monitor device functionality and collect performance data in-situ
- Compatible RS485 and DeviceNet™ profiles allow the GE50A to replace its 1179A counterparts
- CE Mark and RoHS Compliance – meeting requirements for the European Union

US Patent No 5461913.



**Flow
& Control
Measurement**

W W W . M K S I N S T . C O M

Performance

Full Scale Flow Ranges (N_2 equivalent)	10 - 50000 sccm (consult factory for available flow ranges)
Maximum Inlet Pressure	150 psig (can not exceed pressure differential requirement across MFC)
Normal Operating Pressure Differential (N_2 F.S.) (with atmospheric pressure at the MFC outlet)	10 to 5000 sccm; 10 to 40 psid 10000 to 20000 sccm; 15 to 40 psid 30000 to 50000 sccm; 25 to 40 psid
Proof Pressure	1000 psig
Burst Pressure	1500 psig
Control Range	2% to 100% of F.S. (range on mech.)
Typical Accuracy (with N_2 calibration gas)	$\pm 1\%$ of setpoint for 20 to 100% F.S. $\pm 0.2\%$ of F.S. for 2 to 20% F.S.
Repeatability	$\pm 0.3\%$ of Reading
Resolution	0.1% of Full Scale
Temperature Coefficients	
Zero	< 0.05% of F.S./°C
Span	< 0.08% of Rdg./°C
Inlet Pressure Coefficient	< 0.02% of Rdg./psi
Typical Controller Settling Time (per SEMI Guideline E-17-0600)	< 500 msec., typical above 5% F.S.
Warm-up Time (to within 0.2% of F.S. of steady state performance)	< 30 min
Operating Temperature Range (Ambient)	10°C to 50°C
Storage Humidity	0 to 95% Relative Humidity, non-condensing
Storage Temperature	-20° to 80°C (-4° to 149° F)

Mechanical

Fittings (compatible with)	Swagelok® 4 VCR®, Swagelok VCO®, or Swagelok
Leak Integrity	
External (scc/sec He)	< 1×10^{-9}
Through closed valve	Up to 10K valve <0.1% of FS at 40 psig to atmosphere 20K - 50K valve <1.0% of FS at 40 psig to atmosphere (To assure no flow-through, a separate positive shut-off valve is required.)
Wetted Materials	
Standard	316L S.S. VAR (equivalent to 316 S.S. SCQ for semiconductor quality), 316 S.S., Elgiloy®, Nickel
Seals and Valve Seat	Viton, Buna-N, Neoprene
Surface Finish	16μ inch average Ra
Weight	less than 3 lbs (1.4kg)





Ordering Information

Ordering Code Example: GE50A013502R6V010		Code	Configuration
Type MFC Mass Flow Controller GE50A		GE50A	GE50A
Gas (Per Semi Standard E52-0703)			
For example:			
013 = Nitrogen = N ₂	013		013
029 = Ammonia = NH ₃	029		
110 = Sulfur Hexafluoride = SF ₆	110		
Flow Range Full Scale*			
10 sccm	101		502
20 sccm	201		
50 sccm	501		
100 sccm	102		
200 sccm	202		
500 sccm	502		
1000 sccm	103		
2000 sccm	203		
5000 sccm	503		
10000 sccm	104		
20000 sccm	204		
30000 sccm	304		
50000 sccm	504		
Fittings (compatible with)			
Swagelok 4 VCR male	R		R
Swagelok 4 VCO male	G		
¼" Swagelok	S		
Connector			
DeviceNet™	6		6
RS485 (uses 9 pin connector)	5		
Profibus™	4		
Seal Materials**			
Viton	V		V
Buna-N	B		
Neoprene	N		
Reserved for MKS Future Use			
Standard	0		0
Firmware			
Unless otherwise specified, MKS will ship firmware revision current to date	10		10

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

Example Flowrate code:

254 is 2.5 x 10⁴ or 25000 sccm

153 is 1.5 x 10³ or 1500 sccm

601 is 6.0 x 10¹ or 60 sccm

** The user should consult with their gas supplier on the appropriate elastomer which is compatible with the selected gas.



Global Headquarters

2 Tech Drive, Suite 201
Andover, MA 01810

Tel: 978.645.5500

Tel: 800.227.8766 (in U.S.A.)

Web: www.mksinst.com

GE50 - 8/12
© 2012 MKS Instruments, Inc.
All rights reserved.

MKS products provided subject to the US Export Regulations. Diversion or transfer contrary to US law is prohibited. Specifications are subject to change without notice. mksinst™ is a trademark of MKS Instruments, Inc., Andover, MA. Swagelok® and VCR® are registered trademarks of Swagelok Marketing Co., Solon, OH. Viton®, Neoprene, and Kalrez is a registered trademark of E.I. DuPont, Wilmington, DE. Elgiloy® is a registered trademark of Elgiloy Limited Partnership, Elgin, IL. DeviceNet™ is a trademark of the Open DeviceNet Vendor Association, Coral Springs, FL. Profibus™ is a trademark of Profibus International, Karlsruhe, Germany.