500/600 Series II

Mass Flowmeters and Controllers

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

Parker Porter

ENGINEERING YOUR SUCCESS.

500/600 Series II Mass Flow

The original 500/600 Series Digital Mass Flow Products brought the Porter standard of quality, versatility and cost effectiveness to digital mass flow. The new 500/600 SERIES II instruments take the original concepts to an even higher level. The SERIES II products feature expanded flow ranges (from 0.014 - 0.7 ml/min up to 33 - 1670 l/min) and can be factory configured to include up to 8 gas type and flow range combinations. Models are available with maximum operating pressures up to 6000 PSIG. In addition to the standard analog I/O - signals and RS232 connection, DeviceNet™, Profibus - DP® and Modbus communication protocols are available. SERIES II Mass Flow Products can also be factory configured to include up to 8 gas type and flow range combinations.

Flow Parameter Adjustment

Series II instruments are available with Porter's new Flow Parameter Adjustment (FPA) feature. FPA offers increased flexibility by allowing user configuration of both flow range and gas type while maintaining high accuracy with more than 180:1 effective turndown range. Available software and connection hardware allows communication with the instrument via Laptop USB port.

With Porter Series II and Flow Parameter Adjustment, Original Equipment Manufacturers are able to significantly reduce the variety of spare instruments they keep on stock, thereby lowering cost of ownership. Users of MFCs in pilot plants or laboratories can rescale their instruments on site, saving time and cost.

Available Models

MFM Model Number	MFC Model Number	Flow Range
510C	600CV	0.014 - 0.7 ml/min up to 0.18 -9 ml/min
511B	601CV	0.16 - 8 ml/min up to 0.5 - 25 l/min
511AC	601AV	0.4 - 20 l/min up to 5 - 100 l/min
512AC	602AV	0.8-40 l/min up to 1.4-250 l/min
513AC	603AV	4 - 200 l/min up to 33 - 1670 l/min

Note: The flow ranges listed are the minimum and maximum nitrogen (N_2) flow ranges available for each given model. Intermediate flow ranges are available. For correct sizing when operating parameters are questionable, please consult the factory. All flow ranges are at standard conditions of 14.7 PSIG and 70°F (21.1°C)

Specifications

Measurement / Control System

Accuracy (incl. linearity) (based on actual calibration)	Standard: ±0.5% Reading plus ±0.1% Full Scale (±1% Full Scale for ranges 3-5 ml/min; ±2% Full Scale for ranges < 3 ml/min)
Turndown	1 : 50 (in digital mode up to 1 : 187.5)
Repeatability	<0.2% Reading
Settling Time (Controller)	Standard: 1-2 seconds
Control Stability	<±0.1% Full Scale (typical for 1 l/min N_2)
Operating Temperature	-10 to +70°C
Temperature Sensitivity	Zero: <0.05% Full Scale/°C; span: <0.05% Reading/°C
Pressure Sensitivity	0.1%/ATM typical N2; 0.01%/ATM typical H_2
Leak Integrity, outboard	Tested < 2 x 10-9 mbar l/s He
Attitude Sensitivity	Max. error at 90° off horizontal 0.2% at 1 ATM, typical N_2
Warm-Up Time	30 min. for optimum accuracy 2 min. for accuracy ±2% Full Scale

Mechanical Parts

Material (wetted parts)	Stainless steel 316L or equivalent
Surface Quality (wetted parts)	Ra= 0.8µm typical
Process Connections	Compression or face seal fittings
Seals	Standard: Viton Options: EPDM, Kalrez (FFKM)
Ingress Protection (housing)	IP40

Electrical Properties

Power Supply	+15-24 Vdc
Power Consumption	Meter: 70 mA; Controller: max. 320 mA; Add 50 mA for Profibus, if applicable
Analog Output/Command	0-5 (10) Vdc or 0 (4)-20 mA - specify - (Sourcing output)
Digital Communication	Standard: RS232 Options: Profibus-DP®, DeviceNet™, EtherCAT®, Modbus

Electrical Connection

Analog/RS232	9-pin D-connector (male)
Profibus-DP®	Bus: 9-pin D-connector (female) Power: 9-pin D-connector (male)
DeviceNet™	5-pin M12-connector (male)
EtherCAT®	2 x RJ45 modular jack (in/out)
Modbus-RTU/FLOW-BUS	RJ45 modular jack

Technical specifications and dimensions subject to change without notice.

Model Number and Description

6 0 1 A V H A A D 1 1 V

Product Type	
4	Valve Only
5	Meter
6	Controller

Pressure Rating	
0	960 PSIG
1	1500 PSIG
2	3000 PSIG
3	6000 PSIG

Flow Ranges (Flow Controllers)	
0CV	0.7/0-9 ml/min (960, 1.5K PSIG)
1CV	0-8 ml/min /0-25 l/min (960, 1.5K PSIG)
1AV	0-20/0-100 l/min (960, 1.5K PSIG)
2AV	0-40/0-250 l/min (960, 1.5K PSIG)
3AV	0-200/0-1670 l/min (960, 1.5K PSIG)
0M	0-10/0-500 ml/min (3K, 6K PSIG)
1M	0-.5/0-10 l/min (3K, 6K PSIG)
2M	0-10/0-100 l/min (3K, 6K PSIG)
Flow Ranges (Flow Meters)	
0C	0-.7/0-9 ml/min (906, 1.5K PSIG)
1B	0-8 ml/min/0-25 l/min (906, 1.5K PSIG)
1AC	0-20/0-100 l/min (906, 1.5K PSIG)
2AC	0-40/0-250 l/min (906, 1.5K PSIG)
3AC	0-200/0-1670 l/min (906, 1.5K PSIG)
0M	0-10/0-500 ml/min (3K, 6K PSIG)
1M	0-15/0-20,000 ml/min (3K, 6K PSIG)
2M	0-10/0-250 l/min (3K, 6K PSIG)
3M	0-200/0-1250 l/min (3K, 6K PSIG)

Nominal Range
Factory Selected

Communication (I/O)	
A	RS232 + Analog, N.C. Valve
B	RS232 + Analog, N.O. Valve
D	RS232 + DeviceNet, N.C. Valve
E	RS232 + DeviceNet, N.O. Valve
M	RS232 + Modbus, N.O. Valve
N	RS232 + Modbus, N.C. Valve
P	RS232 + Profibus, N.O. Valve
Q	RS232 + Profibus, N.C. Valve
R	RS232 + FlowBus, N.C. Valve
S	RS232 + FlowBus, I/O, N.O. Valve
T	RS232 + EtherCat I/O, N.C. Valve
U	RS232 + EtherCat I/O, N.O. Valve

Analog I/O	
A	0 to 5 Vdc
B	0 to 10 Vdc
F	0 to 20 mA Sourcing
G	4 to 20 mA Sourcing

Supply Voltage	
D	+15 to 24 Vdc

Connection (in/out)	
1	1/8” OD Compression
2	1/4” OD Compression
3	6 mm OD Compression
4	12 mm OD Compression
5	1/2” OD Compression
6	20 mm Compression
8	1/2” Compression
9	Other
0	None

Elastomers	
V	Viton
E	EPDM
K	Kalrez

Parker Porter

ENGINEERING YOUR SUCCESS.