

Variable Area Flowmeters

Model 28

Model 28 Series high capacity flowmeters offer a means of measuring gas greater than our other variable area flowmeters. They are suitable for both plant and laboratory use.

Benefits/Features

Large diameter flow tubes permit flows up to 15 standard cubic feet per minute (SCFM) of air.

Ribbed tubes stabilize float and improve accuracy and readability.

Borosilicate glass tubes allow operating temperatures up to 200°F (93°C).

Brass or stainless steel construction allows use in corrosive or noncorrosive gas service.

Specifications

Operating Pressure: 200 psig (14 bar) maximum

Operating Temperature: 200°F (93°C) maximum

Accuracy: ±10% full-scale from 10% to 100% of range

Repeatability: Within 0.5% full-scale

Tube Graduations: Standard cubic feet per minute (SCFM) of air

Scale Length: 75 mm

Inlet and Outlet Connections: 3/8" NPT Female

Materials of Construction

Tubes: Borosilicate glass

Float and Float Stops: 316 Stainless Steel

End Blocks: See Table I

Inlet/Outlet Adapters: See Table I

Side Plates: Aluminum

Back Plate: White plastic

Front Plate: Clear plastic

Seals and Packing: Viton®

Valve: See Table I



Table III – Gas Conversion Factors for Flowmeters

To select the proper tubes for gases other than air, multiply the flowrate values in Table II by the factors below. Use these values to select appropriate tube numbers.

Gas	Factor
Acetylene	1.04
Ammonia	1.30
Argon	0.85
Butane	0.70
Carbon Dioxide	0.81
Carbon Monoxide	1.01
Ethane	0.98
Ethylene	1.02
Helium	2.69
Hydrogen	3.81
Methane	1.35
Neon	1.20
Nitrogen	1.01
Oxygen	0.95
Propane	0.80
Sulfur Dioxide	0.66

* Conversion factors are approximately equal to the square root of the reciprocal of the specific gravity of the gas ($\sqrt{1/SG}$).

Table I – Model 28 Series Flowmeters

Model Number	Description
Q2-28B-(*)	Chrome-Plated Brass Metering Valve, End Blocks and Inlet/Outlet Adapter Material
Q2-28S-(*)	316 Stainless Steel Metering Valve, End Blocks and Inlet/Outlet Adapter Material

* Insert applicable tube number from Table II (i.e. Q2-28B-1 which has a flow range of 0.3 to 3 SCFM). Order by complete part number.

Table II – Tube Selection

Model Number	Tube Number	Range SCFH Air at 70°F (21°C) and 14.7 psia (1 bar)
Q2-28-T-1	1	0.3 – 3 SCFM
Q2-28-T-2	2	0.6 – 6 SCFM
Q2-28-T-3	3	1 – 12 SCFM
Q2-28-T-4	4	2 – 15 SCFM

65 mm Variable Area Flowmeters

Model 30

Model 30 Series variable area flowmeters have a 65 mm flow tube and a single float. The flow tubes read directly in standard cubic feet per hour (SCFH), standard cubic centimeters per minute (SCCM) or standard liters per minute (SLPM) of air. The flow tubes are replaceable. These flowmeters are available in aluminum or stainless steel construction with a stainless steel metering valve. Select your model from the table below.



Specifications

Operating Pressure: 200 psig (14 bar) maximum
 Operating Temperature: 200°F (93°C) maximum
 Accuracy: ±10% full-scale
 Repeatability: 1% full-scale
 Scale Length: 65 mm direct reading standard
 Connection: 1/8" NPT Female rear outlet fitting

Materials of Construction

Metering Tubes: Borosilicate glass
 Floats: Glass, stainless steel, carboly – depending upon flow range selected
 Tube Packing and O-Rings: Viton-A®
 Float Stops: PTFE

End Fittings		Metering Float Material	Range Air at 70°F (21°C) and 14.7 psia (1 bar)
Aluminum	Stainless Steel		
Q2-30A-1	Q2-30S-1	Glass	0.2 – 1 SCFH
Q2-30A-3	Q2-30S-3	Stainless Steel	0.5 – 5 SCFH
Q2-30A-7	Q2-30S-7	Stainless Steel	2 – 18 SCFH
Q2-30A-8	Q2-30S-8	Glass	5 – 45 SCFH
Q2-30A-9	Q2-30S-9	Stainless Steel	10 – 80 SCFH
Q2-30A-12	Q2-30S-12	Carboly	10 – 120 SCFH
Q2-30A-METRIC0	Q2-30S-METRIC0	Glass	8 – 50 SCCM
Q2-30A-METRIC1	Q2-30S-METRIC1	Glass	5 – 85 SCCM
Q2-30A-METRIC2	Q2-30S-METRIC2	Glass	40 – 440 SCCM
Q2-30A-METRIC3	Q2-30S-METRIC3	Stainless Steel	100 – 950 SCCM
Q2-30A-METRIC4	Q2-30S-METRIC4	Glass	0.2 – 2 SLPM
Q2-30A-METRIC5	Q2-30S-METRIC5	Stainless Steel	0.4 – 4 SLPM
Q2-30A-METRIC6	Q2-30S-METRIC6	Glass	0.5 – 7 SLPM
Q2-30A-METRIC7	Q2-30S-METRIC7	Stainless Steel	1 – 13 SLPM
Q2-30A-METRIC8	Q2-30S-METRIC8	Stainless Steel	6 – 24 SLPM
Q2-30A-METRIC9	Q2-30S-METRIC9	Carboly	4 – 44 SLPM

Option: Model No. Q2-31P-2, Tripod Baseplate

Replacement Parts

Model Number	Description
Q2-30P-1-(*)	Meter Tube with SCFH Scale. Includes Packing and Stops.
Q2-30P-1M-(**)	Meter Tube with Metric SCCM or SLPM Scale. Includes Packing and Stops.
Q2-31P-3L	Stainless Steel Needle Valve. Low-Flow for Tube Number 1, 3 or Metric Tube Number 0, 1, 2, 3, 4.
Q2-31P-3M	Stainless Steel Needle Valve. Medium-Flow for Tube Number 7, 8 or Metric Tube Number 5, 6.
Q2-31P-3H	Stainless Steel Needle Valve. High-Flow for Tube Number 9, 12 or Metric Tube Number 7, 8, 9.

* Specify tube number 1, 3, 7, 8, 9, 12

** Specify metric tube number 0, 1, 2, 3, 4, 5, 6, 7, 8, or 9

150 mm Variable Area Flowmeters

Model 31

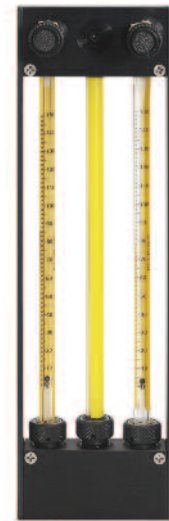
Model 31 Series flowmeters are an economical method of indicating and controlling gas and liquid flow for general plant and laboratory applications. Available models include a single-tube flowmeter, multi-tube flowmeter or a two tube gas blending system. Each version can be supplied with a metering needle valve to provide flow control.

Each flowmeter tube is provided with both a glass float and a stainless steel float within the same tube. The result is an extended flowrate range for each tube to a minimum of 18:1 rangeability. Floats of sapphire, carbonyl and tantalum are also available. Metering tubes are interchangeable and easily replaceable without removing the instrument from service. Panel mounting is included and bench mounting on a tripod stand is an optional feature.

General materials of construction are aluminum or stainless steel end fittings, borosilicate glass metering tubes, black anodized aluminum side plates, clear plastic window and plastic back shield. A standard scale of 0 to 150 mm is etched on the metering tube with a contrasting yellow background. A linear graduation scale of 0 to 100 with a reference air calibration curve and other special calibrations are available. Calibration charts for air at 70°F (21°C) and 14.7 psia (1 bar) are supplied with each metering tube.



Model 31



Model 31BA Gas Blender

Specifications

Operating Pressure: 200 psig (14 bar) max

Operating Temperature: 200°F (93°C) max

Accuracy: ±5% of maximum scale from 100% to 10% of scale reading

Repeatability: 0.5% full-scale

Graduation: 0 to 150 mm standard

Options: 0 to 100 linear scale with a reference to an air calibration chart. Direct reading scale.

Connection: 1/8" NPT Female rear outlet fitting, standard. Other fittings are available.

Materials of Construction

Metering Tubes: Borosilicate glass

Floats: Standard glass and stainless steel supplied with each tube. Carbonyl, Tantalum and Sapphire are optional.

Float Stops: PTFE

Tube Packing and O-Rings: Viton®

Calibration and Materials Selection

Calibration charts for air at 70°F (21°C) and 14.7 psia (1 bar) are supplied with each tube. Standard calibration charts are also available for the following gases:

Acetylene	Chlorine*	Hydrogen Sulfide**	Nitrous Oxide
Ammonia**	Ethane	Isobutane	Oxygen
Argon	Ethylene	Methane	Propane
Arsine†	Ethylene Oxide†	Methyl Chloride*	Silane†
Boron Trifluoride	Halocarbons	Neon	Sulfur Dioxide
Butane	Helium	Nitric Oxide†	Sulfur Hexafluoride
Carbon Dioxide	Hydrogen	Nitrogen	
Carbon Monoxide	Hydrogen Chloride**	Nitrogen Dioxide†	

* These gases require stainless steel end fittings.

** If your intended gas service is not listed, contact your local Air Liquide representative.

† CAUTION: For these gases, PTFE tube packing and Kalrez® O-Ring should be ordered.

150 mm Flowmeters continued

Model 31S Series Single-Tube Flowmeters

For indicating or controlling a single gas stream.

Model Number	End Fitting Material	Needle Valve
Q2-31S-1-(*)	Aluminum	None
Q2-31S-2-(*)	Aluminum	Stainless Steel
Q2-31S-3-(*)	Stainless Steel	None
Q2-31S-4-(*)	Stainless Steel	Stainless Steel

* Specify tubes (number of asterisks indicate number of tubes to select). See Table 1, page 323 for tube numbers.

Model 31D, 31T and 31Q Series Multi-Tube Flowmeters

Model 31D, 31T and 31Q Series multi-tube flowmeters with independent inlet and outlet connections for indicating or controlling two (Model 31D Series), three (Model 31T Series), or four (Model 31Q Series) separate gas streams.

Model Number	End Fitting Material	Needle Valve
Q2-31D-1-(**)	Aluminum	None
Q2-31D-2-(**)	Aluminum	Stainless Steel
Q2-31D-3-(**)	Stainless Steel	None
Q2-31D-4-(**)	Stainless Steel	Stainless Steel
Q2-31T-1-(***)	Aluminum	None
Q2-31T-2-(***)	Aluminum	Stainless Steel
Q2-31T-3-(***)	Stainless Steel	None
Q2-31T-4-(***)	Stainless Steel	Stainless Steel
Q2-31Q-1-(****)	Aluminum	None
Q2-31Q-2-(****)	Aluminum	Stainless Steel
Q2-31Q-3-(****)	Stainless Steel	None
Q2-31Q-4-(****)	Stainless Steel	Stainless Steel

* Specify tubes (number of asterisks indicate number of tubes to select). See Table 1, page 323 for tube numbers.

Model 31BA Series Gas Blender

For on-site blending of two separate gas streams into a gas mixture.

Model Number	End Fitting Material	Needle Valve
Q2-31BA-1-(**)	Aluminum	Stainless Steel
Q2-31BA-2-(**)	Stainless Steel	Stainless Steel

* Specify tubes (number of asterisks indicate number of tubes to select). See Table 1, page 323 for tube numbers.

Please note: These units are supplied with valves installed at the outlet of each tube (back-pressure compensated). A 50 psig (4 bar) inlet pressure is recommended. Calibration charts for 50 psig (4 bar) are supplied unless otherwise specified.

Ordering Procedures for 150 mm Flowmeters

Select the flowmeter model (single-tube, multi-tube or gas blender) for the particular application (see tables to the left).

Choose the end fitting material which is compatible with the intended gas service.

If flow control is required, select a model with a needle valve.

Select the metering tube from Table I (see page 323) so that the required maximum flow falls between 75% to 100% of the meter's capability. Add tube code number after flowmeter model number (example: Q2-31S-1-4). Other float material, ranges and calibrations are available. For multi-tube models, specify tube code number in its relative position in the instrument from left to right (example: Q2-31T-1-2543 — four tube flowmeter with tube number 2 in the first position on left, followed by tube number 5 and tube number 4 in the center and tube number 3 on the right). The flowrate for each standard tube and float combination are listed in bold.

150 mm Flowmeters continued

Table 1 Gas Capacities for Model 31 Series Flowmeter Tubes

Maximum flowrate at 70°F (21°C) and 14.7 psia (1 bar). Minimum flowrate is 0.1 of maximum value.

Tube	Float Material	Water (SCCM)	Air (SLPM)	Argon (SLPM)	Carbon Dioxide (SLPM)	Helium (SLPM)	Hydrogen (SLPM)	Nitrogen (SLPM)	Oxygen (SLPM)	Needle Valve Part No.
1	Glass	0.537	0.0497	0.0404	0.058	0.0446	0.101	0.051	0.0435	Q2-31P-3L
	Sapphire	1.05	0.0772	0.0629	0.087	0.0704	0.160	0.079	0.068	
	Stainless Steel	2.49	0.148	0.120	0.158	0.144	0.322	0.152	0.132	
	Carboly	4.90	0.251	0.206	0.260	0.268	0.594	0.255	0.224	
	Tantalum	5.47	0.274	0.224	0.285	0.298	0.654	0.280	0.246	
2	Glass	1.11	0.088	0.079	0.108	0.083	0.184	0.099	0.086	Q2-31P-3L
	Sapphire	2.15	0.136	0.120	0.156	0.145	0.323	0.150	0.130	
	Stainless Steel	4.93	0.258	0.220	0.265	0.262	0.572	0.270	0.240	
	Carboly	9.33	0.439	0.355	0.415	0.533	1.12	0.440	0.390	
	Tantalum	10.40	0.478	0.385	0.450	0.588	1.23	0.475	0.425	
3	Glass	5.75	0.380	0.315	0.355	0.492	1.03	0.385	0.345	Q2-31P-3L
	Sapphire	10.5	0.518	0.43	0.475	0.747	1.48	0.52	0.475	
	Stainless Steel	20.6	0.832	0.69	0.74	1.28	2.52	0.84	0.76	
	Carboly	33.2	1.24	1.02	1.08	2.28	3.88	1.24	1.14	
	Tantalum	35.9	1.32	1.10	1.14	2.45	4.16	1.34	1.22	
4	Glass	16.6	0.833	0.69	0.73	1.55	2.62	0.84	0.77	Q2-31P-3L
	Sapphire	26.3	1.10	0.92	0.96	2.11	3.54	1.12	1.02	
	Stainless Steel	46.2	1.69	1.42	1.46	3.44	5.55	1.72	1.56	
	Carboly	70.8	2.44	2.04	2.10	5.16	8.20	2.45	2.28	
	Tantalum	75.9	2.60	2.18	2.22	5.50	8.74	2.60	2.40	
5	Glass	52.8	2.37	1.98	2.04	5.04	7.97	2.40	2.22	Q2-31P-3M
	Sapphire	79.7	3.08	2.55	2.65	6.66	10.5	3.10	2.85	
	Stainless Steel	133.0	4.66	3.90	3.95	10.3	15.9	4.7	4.35	
	Carboly	199.0	6.69	5.6	5.6	14.9	22.9	6.7	6.2	
	Tantalum	212.0	7.10	5.9	5.90	15.9	24.3	7.2	6.6	
6	Glass	84.6	3.89	3.25	3.35	8.02	12.90	3.95	3.60	Q2-31P-3M
	Sapphire	129.0	5.07	4.25	4.30	10.7	17.1	5.1	4.7	
	Stainless Steel	218.0	7.62	6.4	6.2	16.7	26.1	7.7	7.1	
	Carboly	326.0	10.6	8.9	8.7	24.4	37.7	10.6	10.0	
	Tantalum	349.0	11.3	9.4	9.2	26.0	40.1	11.2	10.4	
7	Glass	200.0	8.69	7.3	7.8	19.3	29.8	8.9	8.2	Q2-31P-3H
	Sapphire	297.0	11.2	9.4	9.4	25.2	39.0	11.4	10.4	
	Stainless Steel	493.0	16.6	13.8	13.8	38.4	58.2	16.8	15.4	
	Carboly	726.0	23.2	19.6	19.2	55.2	83.3	23.6	21.8	
	Tantalum	772.0	24.6	20.6	20.2	58.7	88.2	24.5	23.0	
8	Glass	573.0	23.9	20.0	19.4	55.4	84.9	24.0	22.2	Q2-31P-3H
	Sapphire	851.0	30.2	25.0	24.5	72.1	110.0	30.5	28.0	
	Stainless Steel	1350.0	43.8	36.5	36.0	109.0	160.0	44.0	41.0	
	Carboly	1950.0	61.2	51.0	50.0	152.0	222.0	61.0	57.0	
	Tantalum	2060.0	64.7	54.0	53.0	161.0	235.0	65.0	60.0	

150 mm Flowmeters continued

Replacement Parts

Model Number	Description
Q2-31P-1-(* Q2-31P-3L Q2-31P-3M Q2-31P-3H Q2-31P-42 Q2-31P-52 Q2-31P-62 Q2-31P-46 Q2-31P-56 Q2-31P-66	Meter Tube – Any Range with Glass and Stainless Steel Floats Installed Stainless Steel Needle Valve, Low-Flow Stainless Steel Needle Valve, Medium-Flow Stainless Steel Needle Valve, High-Flow Metering Float (1/8" Diameter) Sapphire (used with Tubes 1 – 6) Tantalum Carboloy Metering Float (1/4" Diameter) Sapphire (used with Tubes 7 and 8) Tantalum Carboloy

* Specify tube code number (Table 1, page 323).

Optional Equipment

Model Number	Description
Special Calibration Q2-31P1-AIR Q2-31P1-CG Q2-31P5-CG Q2-31P100-LS Q2-31P-2	±1% Full-Scale Calibration for Air with Detachable Direct Reading Scale ±1% Full-Scale Calibration for other Common Gases with Detachable Reading Scale ±5% Full-Scale Calibration for Common Gases at Temperatures and Pressures other than 70°F (21°C) and 14.7 psia (1 bar) mixtures at STP 0 to 100 Linear Scale with Reference to Air Calibration Tripod Baseplate
Connections Q5-91M-B22 Q5-91M-B42 Q5-91M-S22 Q5-91M-S42 Q5-93BH-B22 Q5-93BH-B24 Q5-93BH-SS22 Q5-93BH-SS24	Compression – Brass 1/8" NPT Male x 1/8 Compression Compression – Brass 1/8" NPT Male x 1/4 Compression Compression – Stainless Steel 1/8" NPT Male x 1/8 Compression Compression – Stainless Steel 1/8" NPT Male x 1/4 Compression Hose Adapter – Brass 1/8" NPT Male x 1/8 Hose Hose Adapter – Brass 1/8" NPT Male x 1/4 Hose Hose Adapter – Stainless Steel 1/8" NPT Male x 1/8 Hose Hose Adapter – Stainless Steel 1/8" NPT Male x 1/4 Hose
Tube Packing & O-Rings* Q2-31K-1 Q2-31K-2	Tubes 1 through 4 – PTFE Tube Packing and Kalrez® O-Rings Tubes 5 and 6 – PTFE Tube Packing and Kalrez® O-Rings

* For meters with a valve, add a "V" to the end of the model number. Please note: If installation is required, please specify.

Model Number	Description	Flowrate (maximum)
Control Valves Q2-31P-NRS1 Q2-31P-NRS2 Q2-31P-NRS3 Q2-31P-NRS4 Q2-31P-NRS5 Q2-31P-NRS6	Taper 1 – Stainless Steel Taper 2 – Stainless Steel Taper 3 – Stainless Steel Taper 4 – Stainless Steel Taper 5 – Stainless Steel Taper 6 – Stainless Steel	146 MLPM 285 MLPM 510 MLPM 2 LPM 7 LPM 64 LPM

Low-Flow Purge Meters

Model 32

The Model 32 Series purge meters are designed as a practical approach to low flowrate indication of noncorrosive gases at lowest possible cost. They offer an economical means of measuring gas at low pressures where $\pm 10\%$ accuracy is acceptable.

The metering tube for each flowmeter is molded directly into a clear, high impact polycarbonate plastic body. A direct reading scale for air in standard cubic feet per hour (SCFH) at 70°F and 14.7 psia is provided on the meter body. A unique valve design allows bubble-tight shutoff. An integral bezel and threaded mounting screw permits either flush or front panel mounting.

Make certain the gas you are using is compatible with the materials of construction.



Specifications

Operating Pressure: 100 psig (7 bar) maximum

Operating Temperature Range:
-20°F to 130°F (-28°C to 54°C)

Scale Length: 37 mm standard

Accuracy: $\pm 10\%$ full-scale

Repeatability: $\pm 1\%$ instantaneous reading

Connections: 1/8" NPT Female

Materials of Construction

Body and Tube: Polycarbonate plastic

Connections and Valve: 316 Stainless Steel

O-Ring Seal: Viton®

Model Number	Metering Float Material	Range SCFH Air at 70°F (21°C) and 14.7 psia (1 bar)
Q2-32A	Glass	0.3 – 3
Q2-32B	316 Stainless Steel	0.5 – 6
Q2-32C	Glass	1 – 10
Q2-32D	316 Stainless Steel	2 – 20
Q2-32E	Glass	5 – 50
Q2-32F	316 Stainless Steel	10 – 100

Acrylic Flowmeter Model A32

The SCOTT™ A32 Series flowmeter provides an exceptionally economical means to measure low flowrates of noncorrosive gases and liquids. Built to provide years of reliable service, this flowmeter measures flow at low pressures with $\pm 5\%$ accuracy.

Unlike flowmeters that are constructed of glass, the SCOTT A32 Series body and tube are machined from a clear acrylic block, making the meter virtually shatter proof. A direct reading scale for air in both standard liters per minute (sl/min) and standard cubic feet per hour (scfh) at 70°F (21°C) and 14.7 psia is provided on the meter body. A unique valve design allows for easy, precise flow control as well as bubble-tight shutoff.

Important Note: To avoid the possibility of personal injury or damage to equipment, be sure the gas or liquid you are measuring with this unit is compatible with acrylic.



Benefits/Features

- Single piece body and tube construction allow for easy disassembly and assembly for cleaning.
- Threaded fittings with hex nuts permit front panel mounting.
- Large numbers and graduations enhance readability.
- Dual-scale allows flowrate to be read in standard liters per minute (sl/min) and standard cubic feet per hour (scfh).
- Built-in needle valve allows bubble tight shutoff.

Specifications

Operating Pressure: 100 psig (7 bar) maximum

Operating Temperature: 150°F (66°C) maximum

Accuracy: $\pm 5\%$ of full scale from 10% to 100% of range (each tube)

Tube Graduations: standard liters per minute (sl/m) and standard cubic feet per hour (scfh) of air

Inlet Connection: 1/8" NPT female

Outlet Connection: 1/8" NPT female

Weight: 0.5 lbs. (0.23 kg)

Materials of Construction

Body and Tube: Machined acrylic

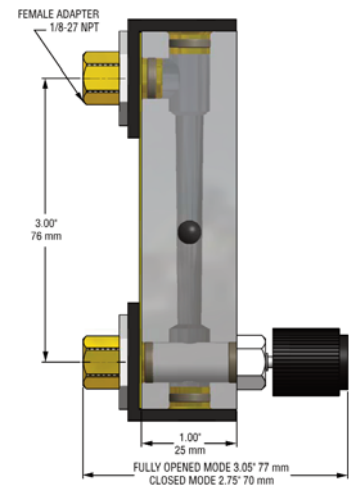
Float: As shown in table below

Connection Fittings and Valve: Brass

Seals: Viton®

Viton is a registered trademark of DuPont Performance Plastics
Carboloy is a registered trademark of SECO Tools, Inc.

Model Number	Float Material	Air Flowrate Range at 70°F and 14.7 psia Actual Graduations	
		scfh	sl/min
Q2-A32A	Glass	2.8	1.4
Q2-A32B	Stainless Steel	5.5	2.75
Q2-A32C	Carboloy®	7.0	3.5
Q2-A32D	Glass	18.0	8.5
Q2-A32E	Stainless Steel	32.5	16
Q2-A32F	Carboloy®	45	22
Q2-A32G	Stainless Steel	100	50



Mass Flow Controller

Model 36A

Model 36A Series mass flow controllers utilize the specific heat properties of gases to measure true mass flowrate. In addition these mass flow controllers have an electro-magnetic control valve at the outlet which additionally gives them the ability to control gas flows with a $\pm 1\%$ full-scale accuracy when coupled to our Model 36E Series secondary electronics (see page 327). Based on this control capability, they can also be used to perform gas blending operations.

Model 36A controllers are offered in ranges from 0.2 – 10 mL/min through 0.4 – 20 SLPM. They feature a 3-second response time with minimal overshoot and undershoot. In addition, these controllers are relatively attitude insensitive, allowing them to be installed in any mounting orientation with little effect on accuracy.

Benefits/Features

Accessible zero and range potentiometer.
Altitude insensitive.
High accuracy.
Wide flow ranges (up to 20 LPM N₂).
All solid state electronics.

Linear output signal.
Selectable soft start.
Selectable external valve override.
Selectable external valve control.
Normally closed valve.

Model Number	Flow Range in Air 20°C and 760 mm Hg
Q2-36A1V-1	0 – 10 mL/min
Q2-36A1V-2	0 – 20 mL/min
Q2-36A1V-5	0 – 50 mL/min
Q2-36A1V-10	0 – 100 mL/min
Q2-36A1V-20	0 – 200 mL/min
Q2-36A1V-50	0 – 500 mL/min
Q2-36A1V-1K	0 – 1000 mL/min
Q2-36A1V-2K	0 – 2000 mL/min
Q2-36A1V-5K	0 – 5000 mL/min
Q2-36A1V-10K	0 – 10,000 mL/min
Q2-36A1V-20K	0 – 20,000 mL/min

Optional Equipment

Model Number	Description
Q2-36-K	Kalrez® Seals
Q2-36-B	Buna-N Seals
Q2-36-VCO	VCO® Fittings
Q2-36-VCR	VCR® Fittings
Q2-36-HP	Special Calibration: Air above 200 psig (14 bar)
Q2-36-SS	Recommended Option: Inline Filter
Q2-36-SC	Calibration for Gases not Listed Above

* Contact nearest Air Liquide facility with intended gas service to determine additional cost.



Specifications

Performance: Accuracy: $\pm 1\%$ full-scale including linearity at calibrated conditions. $\pm 1.5\%$ full scale for flowrates greater than 20 SLPM.

Repeatability: 1.25% of rate

Response Time: Standard less than 3 seconds to within 2% full-scale of final value for a 0 to 100% command change.

Flow Ranges: 0 to 10, 20, 50, 100, 200, 500, 1000, 2000, 5000, 10,000 and 20,000 mL/min for air, nitrogen, hydrogen, oxygen, helium and argon

Programmable Input: 0 to 5 VDC or 1000 ohm potentiometer

Output: 0 to 5 VDC into 2000 ohm (or greater) load. Maximum ripple is 3 mV RMS.

Operating Pressure Ratings: 1500 psig (103 bar); 5 – 50 psig (0.3 – 3 bar) pressure drop maximum

Temperature: Ambient/gas 40°F to 150°F (4°C to 65°C)

Maximum Power: -15 VDC at 35 mA DC and -15 VDC at 180 mA DC; 3.5 watts power consumption

Electrical Connections: D-Type connector

Materials of Construction

Wetted: Stainless steel with Viton® seals standard

Connections: 1/4" stainless steel compression fittings standard

Mass Flow Secondary Electronics

Model 36E

Model 36E Series secondary electronics are designed to provide power, readout and control for Model 36A Mass Flow Controllers. In addition to these basic functions, features include resettable totalization, display of flowrate in engineering units, remote setpoint control and RS232 communications (optional with Model 36E-1). All of this is provided in a compact tabletop package with LCD display.

Models 36E-2 and 36E-4 can be operated with independent mass flow control channels, where flowrate is set through the setpoint push buttons, or with one or more channels slaved to the master (blending mode). Valve override functions are selectable. In valve override mode, the valve will be opened/closed independent of setpoint value. A RS-232 port is provided standard to control the Models 36E-2 and 36E-4 from a PC. This port enables connection of up to 4 analog or analog configured devices to a Model 36E-4. Local function is useful as backup of the customer's system configuration.



Benefits/Features

Provide power supply, readout and control functions.

Tabletop housing.

Display of flowrate in engineering units.

Resettable total in engineering units.

Front panel or remote valve override.

RS-232 communications (optional with Model 36E-1).

Multi-Channel Units (36E-2 and 36E-4):

- Programmable for setpoint selection, blending and local/remote control.

- High/low alarm selection.

- Remote I/O feature allows control from external system.

Specifications

Dimensions (H x W x D):

36E-1: 10.7" x 4.2" x 9.6"
(272 mm x 107 mm x 244 mm)

36E-2: 10.1" x 5.8" x 10.3"
(257 mm x 147 mm x 263 mm)

36E-4: 10.1" x 5.8" x 10.3"
(257 mm x 147 mm x 263 mm)

Certification: CE

Power Input: 110 Vac, 60 Hz/220 Vac, 60 Hz
(Model 36E-1 set via internal switch)

Power Output:

36E-1: +15 V/350mA, -15V/350 mA

36E-2, 36E-4: +15 V/2.9 A, -15V/1.4 A max.

Signal Input: 0-5 VDC (flowrate signal from flow controller)

Signal Output:

36E-1: 0-5 VDC isolated transmission.

Resolution: 10 bits

Accuracy: <0.1%

36E-2, 36E-4: 0-5 VDC, Impedance 1 kW
(minimum) or Impedance 750W (maximum)

Electrical:

36E-2, 36E-4:

- Two or four 15-pin D connectors for connecting the mass flow controller.

- One 25-pin D connector for combined remote setpoint input and output signal, up to 4 channels.

- One 15-pin D connector for connecting remote valve override control function.

Display Reading:

36E-1: 6 digit LCD, 0.7" high digits

36E-2: 2x 20 character display with back lighting.

36E-4: 4x 20 character display with back lighting.

Controls: Membrane push buttons

Enclosure:

36E-1: Polycarbonate facial and bezels with an extruded aluminum case

36E-2, 36E-4: Anodized aluminum and steel cover

Ambient Temperature: 32°F to 122°F
(0°C to 50°C)

Model Number	Description
Q2-36E-1	1-Channel
Q2-36E-2	2-Channel
Q2-36E-4	4-Channel

Connecting Cable Model 36A and Model 36E

For Model 36A Series mass flow controller and Model 36E secondary electronics.

Model Number	Description
Q2-36CD-10	10' (3 m)
Q2-36CD-25	25' (8 m)
Q2-36CD-50	50' (15 m)