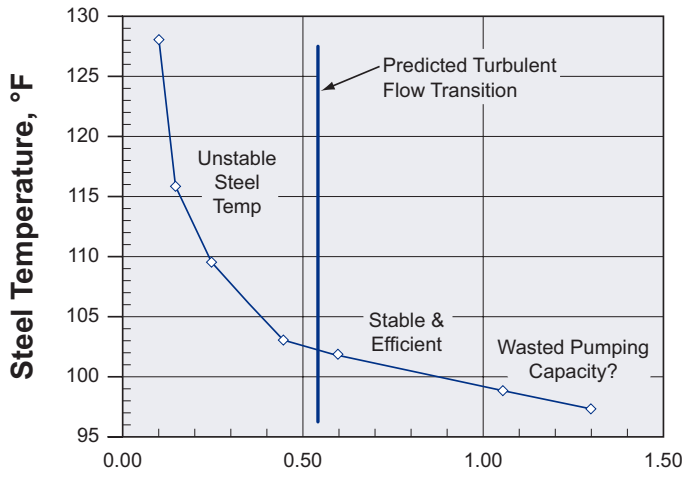
SMARTFLOW® Flow Regulators

Why use *SMARTFLOW* Flow Regulators?

- **Create Repeatable and Balanced Processes**
  Multiple circuits within an injection mold often have different cooling requirements. Cooling water will normally follow the path of least resistance leaving some circuits starved for water in manifolds without regulators. Individual circuit control allows the operator to direct the process cooling water where needed to produce repeatable finished part quality.
- **Optimize Cooling Capacity**
  By applying the principles of Turbulent Flow, cooling circuits can be optimized for efficient cooling, conserving water and electricity. Additional water flow rate beyond turbulent flow condition provides diminishing returns illustrated by the chart below.



Try our On-Line Calculators for Injection molders accessible from the home page:

www.SMARTFLOW-USA.com

Scientific Cooling Calculator extracts cooling water flow rate, heat transfer, processing temperatures, and overall cooling requirements based on polymer type, processing temperature, shot weight and other variables.

Turbulent Flow Calculator flow rate needed to achieve turbulence based on the Reynolds Number, cooling water temperature and inside diameter of the cooling channel.

- **Implement Scientific Cooling℠**
  Flow Regulators help injection molders use the three R's of Scientific Cooling: Reveal, Record, Repeat.

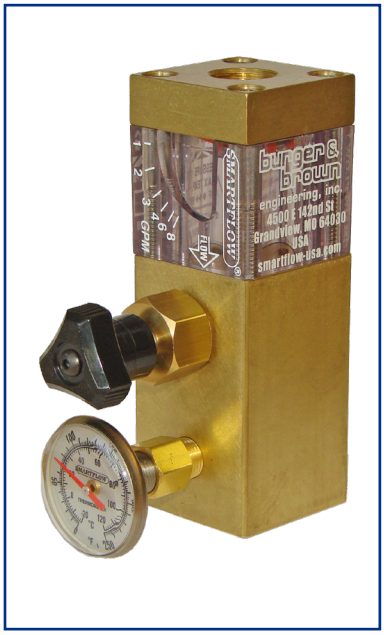
Burger & Brown Engineering recommends placing flow regulators on the return side of the cooling water loop. This position ensures that the cooling lines are full of cooling water. Regulators placed on the supply side may provide only a small stream of water to the cooling lines. The water may not come in contact with all internal cooling surfaces providing inconsistent part cooling.

Using Smartflow Flow Regulators to apply the principles of Turbulent Flow and Scientific Cooling, injection molders optimize cooling water and energy efficiency while providing the best possible environment to make repeatable parts.

For 3D CAD files of Custom Manifold Assemblies and Standard Components Visit

ManifoldBuilder.com

SMARTFLOW® Brass Flow Regulators



General Description

Smartflow flow regulators provide a unique, leak-free, single-point manual flow control. This regulator incorporates the proven mechanical flowmeter and integral needle valve in a compact design. Very few moving parts improve reliability and leak-free operation.

Used singly or in combination with a water manifold, the flow regulator allows manual control of individual cooling water lines.

Features and Benefits

- Compact size works well in restricted-space locations.
- Rugged construction provides years of dependable service.
- 210°F (99°C) Temperature Rating allows installation into a wide range of applications.
- Optional Temperature Gauge displays additional process information.
- No Mounting Restrictions ease installation in any position without extra brackets or hardware.

Model Number

FR3 - B - 25

Inlet Size	
1/4"NPT	**FR2**
1/4"BSPP	**FR2B**
3/8"NPT	**FR3**
3/8"BSPP	**FR3B**
1/2"NPT	**FR4**
1/2"BSPP	**FR4B**

Flow Range	
15	0.2 - 1.5 gpm (gallons per minute)
25	0.5 - 2.5 gpm
80	1 - 8 gpm
100	2 -10 lpm (liters per min.)
200	5 - 20 lpm
300	4 - 30 lpm

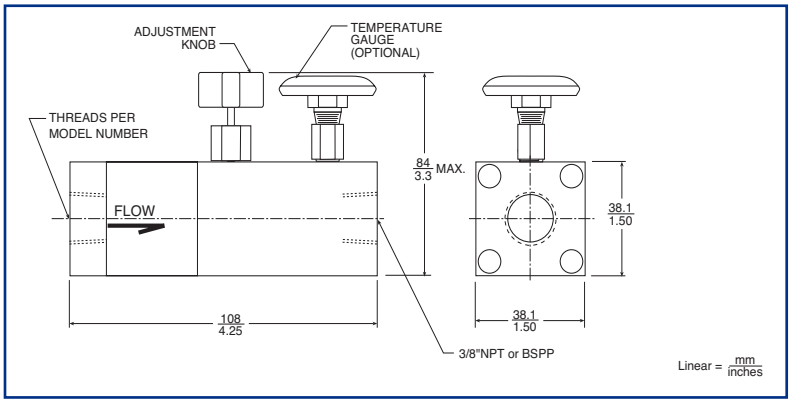
Accessories	
A	Flow regulator only
B	Thermometer
E	Thermometer with quick-connect socket and plug (NPT only)

Wetted Parts and Materials

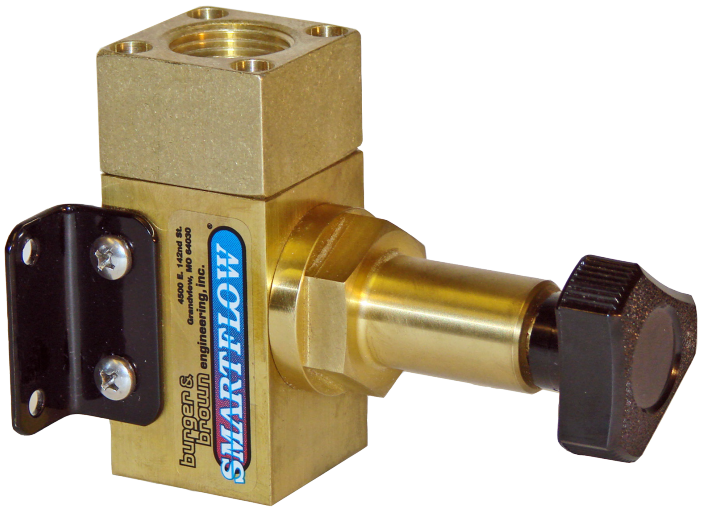
Flow Out Thread Size	3/8"NPT or BSPP
End Caps & Regulator Body	Brass
Valve Stem & Seat	Brass
Flow Body	Polysulfone
Vane	Nylon
Spring	Stainless Steel
O-Rings	EPDM
Cap Screws	Stainless Steel
Optional Quick-Connect Fittings	Brass

Specifications

Flow Accuracy	±10% full scale
Operating Temperature max.	210°F (99°C)
Operating Pressure max.	100 psi (6.9 bar)
Dial Thermometer	0 to 250°F (-20° to 120°C) ±2% accuracy (full scale)

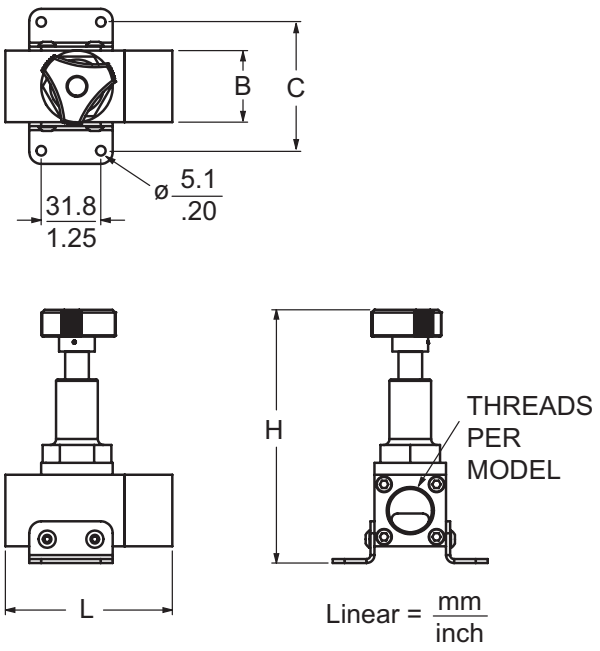


SMARTFLOW® 3/4" & 1" Brass Flow Regulators



3/4" or 1" Mechanical Flowmeters or Tracer® Electronic Flowmeters may be attached to this flow regulator for added functionality.

Contact Customer Service for details.



General Description

The large size of this flow regulator is unique in the industry for precise control of 3/4" or 1" cooling water lines. Brass body, valve stem and seat with EPDM o-rings are compatible with most process liquids. The 3/4" flow regulator can be used in combination with a mechanical IceCube™ flow body to add 8 gpm or 30 lpm flow indication. Additional IceCube™ flow body is not available for use with 1" flow regulator.

Mounting Brackets are included for mechanical support.

Wetted Parts and Materials

Body ..... Brass
Valve Stem & Seat ..... Brass
O-Rings ..... EPDM
Mounting Brackets ..... Powder Coated Steel

Optional Flow Indicator Parts (3/4" only)
Flow Body ..... Polysulfone
Vane ..... Nylon
Spring ..... Stainless Steel

Specifications

Thread Size ..... 3/4" or 1" NPT(F)
Operating Temperature max. ..... 240°F (115°C)
Operating Pressure max. ..... 150 psi (10.3 bar)

Model Number

FR6-A ..... 3/4"NPT, no flow indicator
FR8-A ..... 1"NPT, no flow indicator

FR6-A-80 ..... with 1-8 gpm flow indicator
FR6-A-300 ... with 4-30 lpm flow indicator

Dimensions (mm/inches)

Model	FR6-A	FR6-A-XX	FR8-A
B	38.1 / 1.5	38.1 / 1.5	44.5 / 1.75
C	68.6 / 2.7	68.6 / 2.7	74.9 / 2.95
H	134.9 / 5.31	134.9 / 5.31	146.3 / 5.76
L	88.9 / 3.5	120.7 / 4.75	101.6 / 4.0

Precision Flow Regulator Only

General Description

Delta-Q is a durable and economical precision flow regulator module that can be used in conjunction with other ***SMARTFLOW*** components such as:

- Threaded End Caps
- IceCube™ Flowmeters
- Temperature and Pressure Gauges
- Dr. Eddy® Flowmeter/Turbulent Flow Indicators
- Tracer® Electronic Flowmeters
- Cooling Water Manifolds

The Delta-Q Regulator allows full adjustability of flow volume from unrestricted flow to complete shut off using the manual flow control knob.
The modular design allows users to customize models meeting Scientific Cooling℠ requirements for each application. The glass-filled nylon body is lightweight and durable. Internal stainless steel components are resistant to corrosion.

See page 16 for custom assembly specification onto manifolds.

FP3-F3-Q

Model Number

F3 - A - Q

Brass End Caps	
1/4"NPT	F2
1/4"BSPP	F2B
3/8"NPT	F3
3/8"BSPP	F3B
1/2"NPT	F4
1/2"BSPP	F4B

Nylon End Caps	
1/4"NPT	FP2
1/4"BSPP	FP2B
3/8"NPT	FP3
3/8"BSPP	FP3B
1/2"NPT	FP4
1/2"BSPP	FP4B

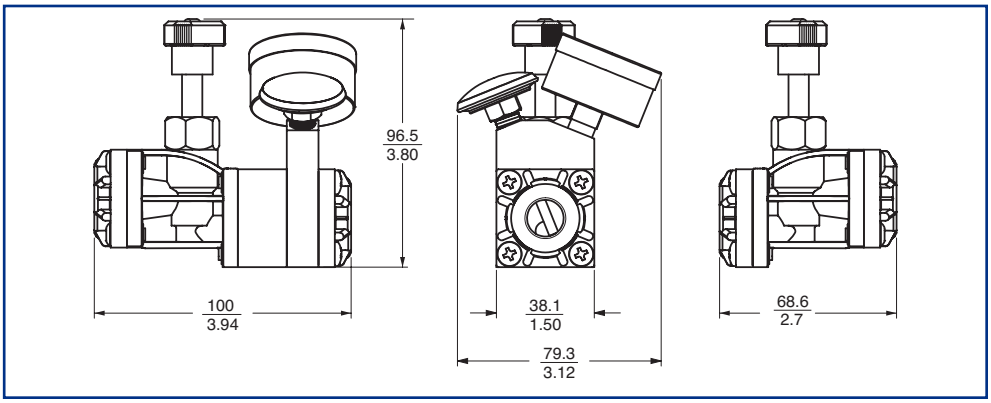
Accessories	
A	Flowmeter only
B	Thermometer
C1	Thermometer and 30 psi Pressure Gauge
C2	Thermometer and 60 psi Pressure Gauge
C3	Thermometer and 100 psi Pressure Gauge
CL	Thermometer and Liquid-Filled Pressure Gauge (100 psi)
F1	30 psi Pressure Gauge
F2	60 psi Pressure Gauge
F3	100 psi Pressure Gauge
FL	Liquid-Filled Pressure Gauge (100 psi)

Wetted Parts and Materials

End Caps..... Brass or Glass-Filled Nylon
Body .....Glass-Filled Nylon
O-Rings .....EPDM
Regulator Stem..... Stainless Steel
Cap Screws ..... Stainless Steel
Optional Gauge Block.....Brass
Optional Quick-Connect Fittings.....Brass

Specifications

Operating Temperature max.....210°F (99°C)
Operating Pressure max.....100 psi (6.9 bar)
Dial Thermometer..... 0 to 250°F (-20° to 120°C)
±2% accuracy (full scale)
Pressure Gauge .....0 to 100 psi (0 to 700Kpa)
±3% accuracy (full scale)



For customized assembly onto Smartflow Manifolds, see page 16 or visit www.manifoldbuilder.com

www.ManifoldBuilder.com

Precision Flow Regulator with IceCube™ Flowmeter

Model Number

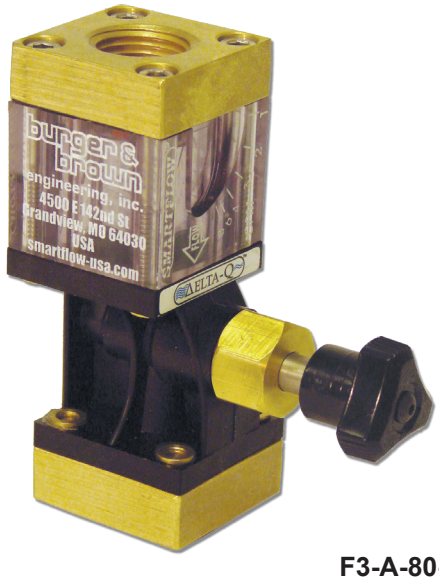
F3 - A - 25 - Q

Brass End Caps	
1/4"NPT	**F2**
1/4"BSPP	**F2B**
3/8"NPT	**F3**
3/8"BSPP	**F3B**
1/2"NPT	**F4**
1/2"BSPP	**F4B**

Nylon End Caps	
1/4"NPT	**FP2**
1/4"BSPP	**FP2B**
3/8"NPT	**FP3**
3/8"BSPP	**FP3B**
1/2"NPT	**FP4**
1/2"BSPP	**FP4B**

Accessories	
Flowmeter only	**A**
Thermometer	**B**
Thermometer and 30 psi Pressure Gauge	**C1**
Thermometer and 60 psi Pressure Gauge	**C2**
Thermometer and 100 psi Pressure Gauge	**C3**
Thermometer and Liquid-Filled Pressure Gauge (100 psi)	**CL**
30 psi Pressure Gauge	**F1**
60 psi Pressure Gauge	**F2**
100 psi Pressure Gauge	**F3**
Liquid-Filled Pressure Gauge (100 psi)	**FL**

	Flow Range
15	0.2 - 1.5 gpm (gallons per minute)
25	0.5 - 2.5 gpm
80	1 - 8 gpm
100	2 -10 lpm (liters per minute)
200	5 - 20 lpm
300	4 - 30 lpm



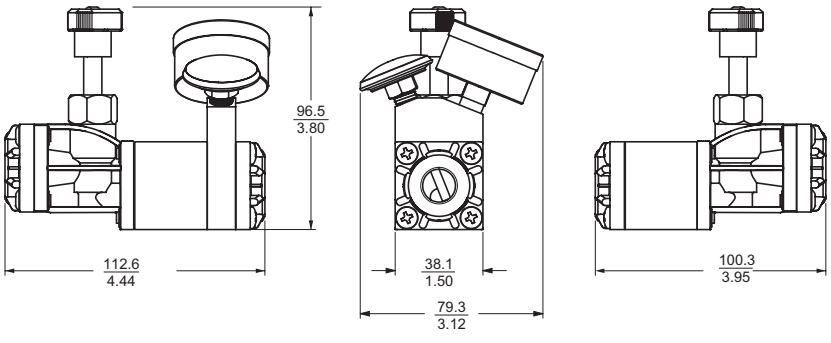
F3-A-80-Q

Wetted Parts and Materials

End Caps....Brass or Glass-Filled Nylon
Flow Body.....Polysulfone
Regulator Body..... Glass-Filled Nylon
Vane ..... Glass-Filled Nylon
Spring ..... Stainless Steel
O-Rings .....EPDM
Optional Gauge Block..... Brass

Specifications

Flow Accuracy ..... ±10% full scale
Operating Temperature max.....210°F (99°C)
Operating Pressure max.....100 psi (6.9 bar)
Dial Thermometer.....0 to 250°F (-20° to 120°C)
±2% accuracy (full scale)
Pressure Gauge .....0 to 100 psi (0 to 700Kpa)
±3% accuracy (full scale)



Precision Flow Regulator with Dr. Eddy Turbulent Flow Indicator

Model Number

FC3 - B - E - Q

Brass End Caps

1/4"NPT	**FC2**
1/4"BSPP	**FC2B**
3/8"NPT	**FC3**
3/8"BSPP	**FC3B**

Nylon End Caps

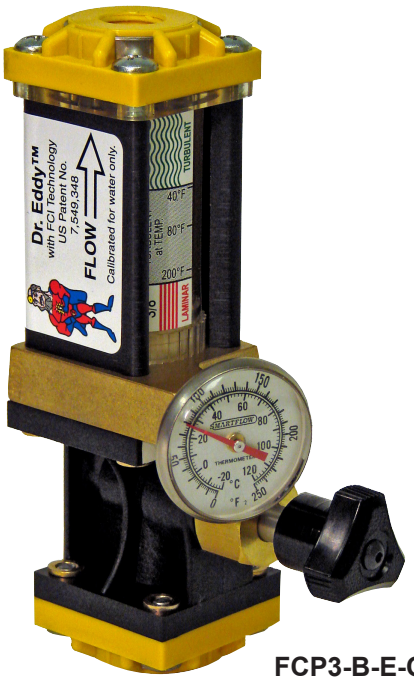
1/4"NPT	**FCP2**
1/4"BSPP	**FCP2B**
3/8"NPT	**FCP3**
3/8"BSPP	**FCP3B**

Scale Units

- **E** English (Temp in °F and Flow in GPM)
- **M** Metric (Temp in °C and Flow in LPM)

Accessories

- **B** Thermometer (standard)
- **E** Thermometer with quick-connect socket and plug



FCP3-B-E-Q

Wetted Parts and Materials

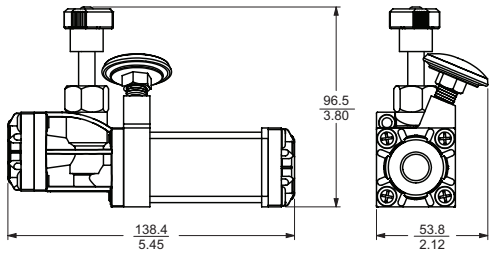
End Caps	Brass or Glass-Filled Nylon
Regulator Body	Glass-Filled Nylon
Flow Body	Polysulfone
Indicator Ring	Silicone Rubber
Piston	Acetal
Spring	Stainless Steel
O-Rings	EPDM
Optional Gauge Block	Brass
Optional Quick-Connect Fittings	Brass

Specifications

Flow Range	0.25 - 2 gpm 1 - 8 lpm
Accuracy	±10% full scale
Operating Temperature max.	210°F (99°C)
Operating Pressure max.	100 psi (6.9 bar)
Dial Thermometer	0 to 250°F (-20° to 120°C) ±2% accuracy (full scale)

Dr. Eddy is calibrated for use with water only. A 10% glycol scale is available on request.

The addition of glycol to cooling water can have a dramatic effect on Turbulent Flow, increasing the flow rate needed to achieve optimum cooling efficiency.



FLOW DIRECTION

Lorem ipsum

FCP3-B-E-Q

High Pressure and Temperature Stainless Steel Flow Regulators

General Description

Smartflow High Pressure and Temperature Stainless Steel Flow Regulators are designed for use in hot water or oil cooling systems up to 400°F (204°C) and 250 psi (17 bar).

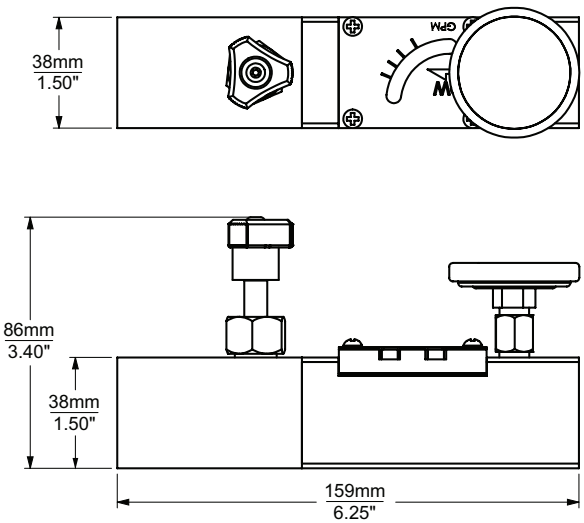
These regulators are ideal for connection to temperature control units in an injection molding environment. 1/2”NPT(F) threaded ends are standard. Temperature Gauge is optional.

Stainless steel valve seat and high temperature seals provide long, trouble-free service.

Model Number

HFR4 - A - 60

Temperature Gauge		Flow Range	
No Temperature Gauge	**A**	**60**	2 - 6 gpm (gallons per minute)
With Temperature Gauge	**B**	**220**	5 - 22 lpm (liters per minute)



Wetted Parts and Materials

Body	Stainless Steel
Viewing Window	Glass
Vane	Stainless Steel
Spring	Stainless Steel
Hinge Pin	Stainless Steel
Gasket	Non-Asbestos Fiber
Magnet	Sintered Alnico 8GE
O-Rings	Viton

Specifications

Accuracy	±10% full scale
Operating Temperature max.	400°F (204°C)
Operating Pressure max.	250 psi (17.2 bar)
Dial Thermometer	0 to 600°F (-20° to 300°C)

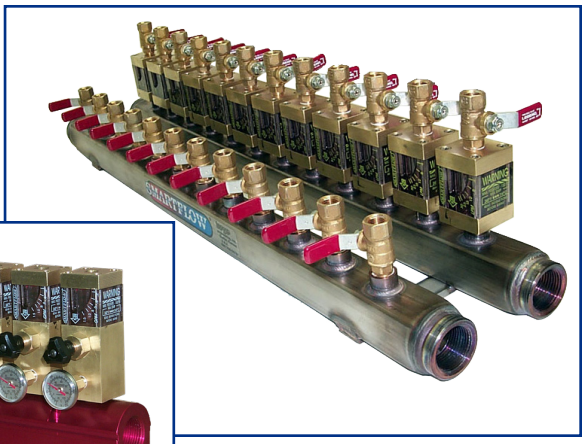
SMARTFLOW® Manifold/Flowmeter Assemblies

Assembly Specification

The Smartflow manifold line is the platform to control and direct cooling water in many types of industrial process cooling. Flowmeters, Flow Regulators, Ball Valves, Quick Disconnect Fittings and more can be added to manifolds to improve functionality and process control. Individual cooling lines can be accurately controlled according to the demands of each circuit.

Parallel Stainless Steel Manifold Assemblies are built with flowmeters on one half of the manifold pair only. Contact the factory if alternate configuration is needed.

Burger & Brown Engineering recommends placing flowmeters and regulators on the return side of the cooling loop for best performance.



Model Number

Manifold P/N **8SA - 8 - 3 - 2 - Y - F3-A-80 - B3Q3 - R**

Aluminum or Stainless Steel Manifold Consult Catalog Form #188

***Flowmeter/Regulator installed on each port of the manifold**

No additional flowmeter/regulator	**NA**
Mechanical Flowmeter	**F**
Brass Flow Regulator	**FR**
Delta-Q Precision Flow Regulator **(pages 3 thru 15)**	**F-Q**
Tracer® Electronic Flowmeter	**DD**
Tracer$_{VM}$ Electronic Flowmeter	**VM**

See Tracer Catalog number 190

Function

R	Return fluid flow entering the manifold (default)
S	Supply fluid flow exiting the manifold

Connection Type Brass Valves and Fittings

NA	No addtional valve or fitting
B2	Ball Valve 1/4"NPT
B3	Ball Valve 3/8"NPT
B4	Ball Valve 1/2"NPT
H2	Hose Barb 1/4"ID Hose
H3	Hose Barb 3/8"ID Hose
H4	Hose Barb 1/2"ID Hose
Q2	Quick Connect Plug 1/4"ID (200 Series)
Q3	Quick Connect Plug 3/8"ID (300 Series)
Q4	Quick Connect Plug 1/2"ID (500 Series)

ManifoldBuilder.com

On-Line Part Number Specification Assistance

3D Native CAD files for manifolds and assemblies are available for download 24/7 at ***www.manifoldbuilder.com***