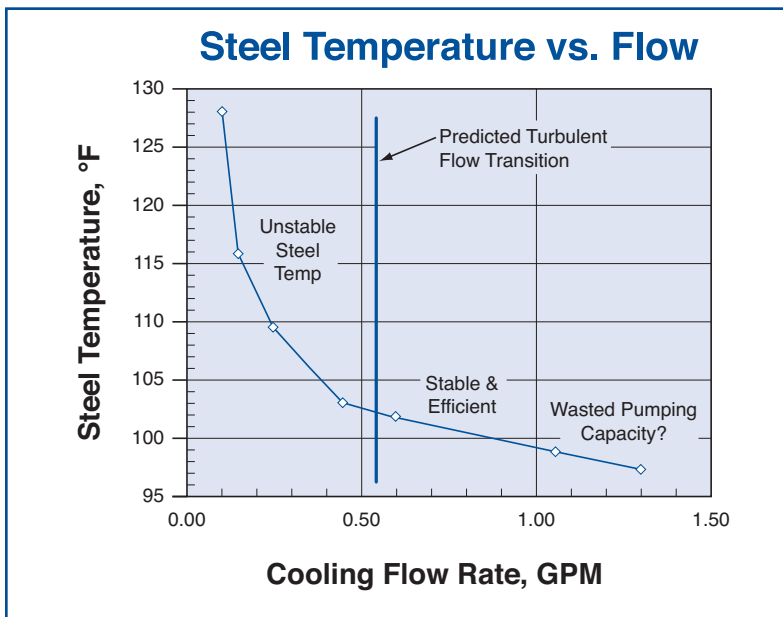


# SMARTFLOW® Flow Regulators

## 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.



- ◆ **Implement Scientific Cooling<sup>SM</sup>**  
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.



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

[www.SMARTFLOW-USA.com](http://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.

# 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	Model	Flow Range
1/4" NPT (F)	FR2	15 0.2 - 1.5 gpm (gallons per minute)
1/4" BSPP (F)	FR2B	25 0.5 - 2.5 gpm
3/8" NPT (F)	FR3	80 1 - 8.0 gpm
3/8" BSPP (F)	FR3B	100 2 - 10 lpm (liters per min.)
1/2" NPT (F)	FR4	200 5 - 20 lpm
1/2" BSPP (F)	FR4B	300 4 - 30 lpm

### Accessories

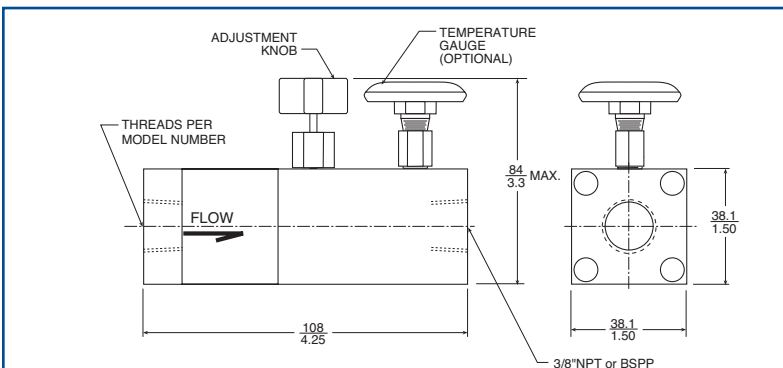
- A** Flow regulator only
- B** Thermometer
- E** Thermometer and Quick Change Socket and Plug (NPT only)

## Wetted Parts and Materials

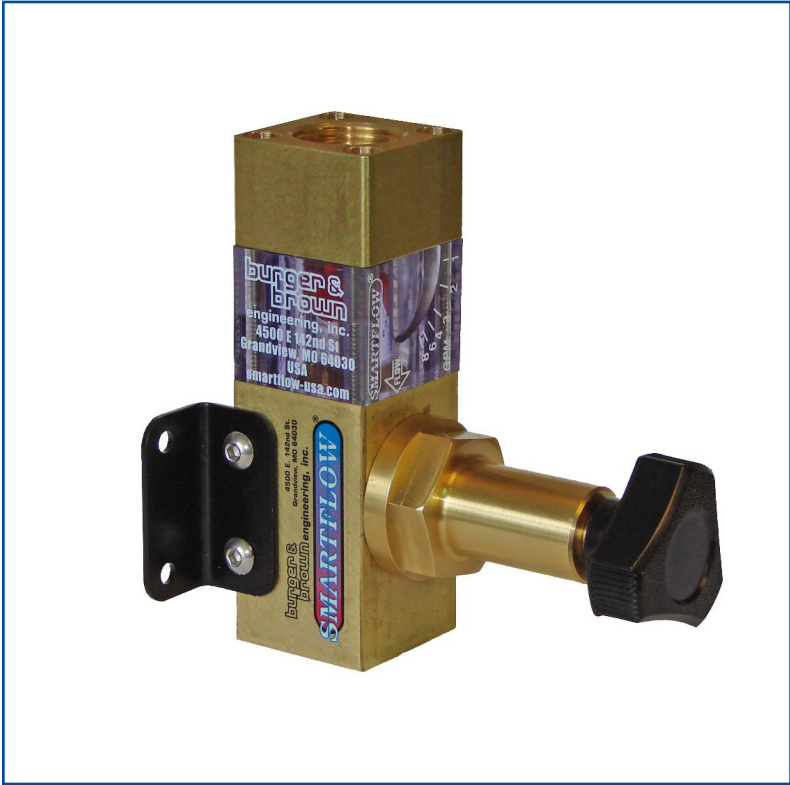
Flow Out Thread Size ..... 3/8" NPT or BSPP  
 End Caps & Regulator Body ..... Brass  
 Valve Stem & Seat ..... Brass  
 Flow Body ..... Polysulfone  
 Vane ..... Nylon  
 Spring ..... Stainless Steel  
 O-Rings ..... EPDM  
 Cap Screws ..... Stainless Steel  
 Optional Quick-Connect Fittings ..... Brass

## 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" Brass Flow Regulators



## General Description

The large size of this flow regulator is unique in the industry for precise control of 3/4" cooling water lines. Brass body, valve stem and seat with EPDM o-rings are compatible with most process liquids. The flow regulator can be used in combination with a 3/4" mechanical flow meter to add flow, temperature or pressure indication. IceCube™ flow body with 8 gpm or 30 lpm scale may be added to display flow rate.

Mounting Brackets are included for mechanical support.

## Wetted Parts and Materials

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

## Optional Flow Indicator Parts

Flow Body .....Polysulfone  
 Vane .....Nylon  
 Spring .....Stainless Steel

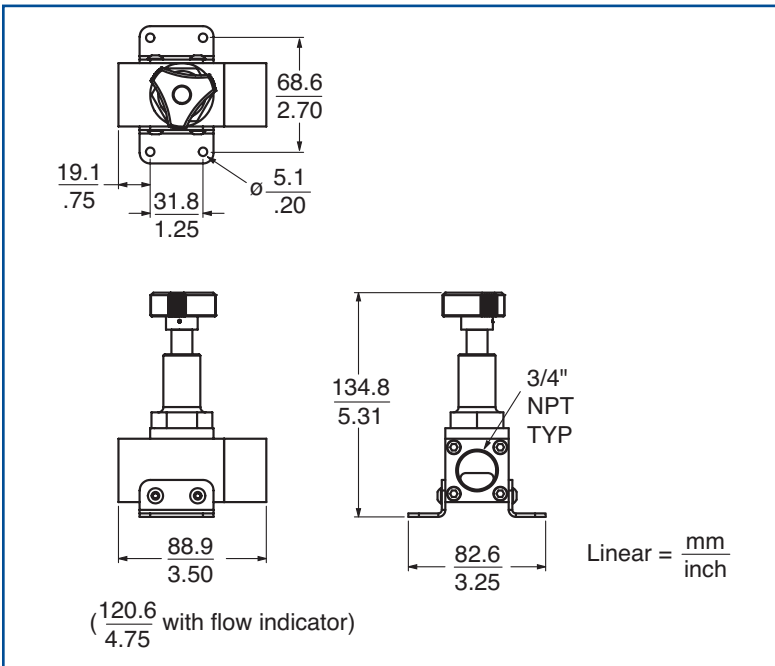
## Specifications

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

## Model Number

**FR6-A-80** .....with 1 - 8 gpm flow indicator

**FR6-A-300** .....with 4 - 30 lpm flow indicator



**3/4" Mechanical Flowmeters and Tracer Electronic Flowmeters can be attached to this flow regulator for added functionality.**



# 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<sup>SM</sup> 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.



## Model Number

### F3 - A - Q

#### Brass End Caps

1/4"NPT(F)	<b>F2</b>
1/4"BSPP(F)	<b>F2B</b>
3/8"NPT(F)	<b>F3</b>
3/8"BSPP(F)	<b>F3B</b>
1/2"NPT(F)	<b>F4</b>
1/2"BSPP(F)	<b>F4B</b>

#### Nylon End Caps

1/4"NPT(F)	<b>FP2</b>
1/4"BSPP(F)	<b>FP2B</b>
3/8"NPT(F)	<b>FP3</b>
3/8"BSPP(F)	<b>FP3B</b>
1/2"NPT(F)	<b>FP4</b>
1/2"BSPP(F)	<b>FP4B</b>

#### Accessories

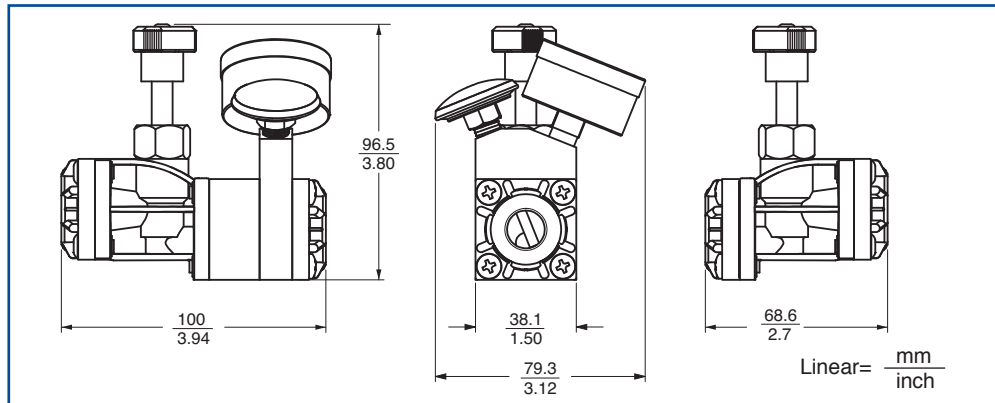
<b>A</b>	Regulator only
<b>B</b>	Thermometer
<b>C1</b>	Thermometer and 30 psi Pressure Gauge
<b>C2</b>	Thermometer and 60 psi Pressure Gauge
<b>C3</b>	Thermometer and 100 psi Pressure Gauge
<b>CL</b>	Thermometer and liquid-filled Pressure Gauge (100 psi)
<b>F1</b>	30 psi Pressure gauge
<b>F2</b>	60 psi Pressure gauge
<b>F3</b>	100 psi Pressure gauge
<b>FL</b>	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 700 Kpa)
	±3% accuracy (full scale)





# Precision Flow Regulator with Ice-Cube™ Flowmeter

## Model Number

**F3 - A - 25 - Q**

### Brass End Caps

- 1/4"NPT(F) **F2**
- 1/4"BSPP(F) **F2B**
- 3/8"NPT(F) **F3**
- 3/8"BSPP(F) **F3B**
- 1/2"NPT(F) **F4**
- 1/2"BSPP(F) **F4B**

### Nylon End Caps

- 1/4"NPT(F) **FP2**
- 1/4"BSPP(F) **FP2B**
- 3/8"NPT(F) **FP3**
- 3/8"BSPP(F) **FP3B**
- 1/2"NPT(F) **FP4**
- 1/2"BSPP(F) **FP4B**

### Flow Range

<b>15</b>	0.2 - 1.5 gpm (gallons per minute)
<b>25</b>	0.5 - 2.5 gpm
<b>80</b>	1 - 8.0 gpm
<b>100</b>	2 - 10 lpm (liters per minute)
<b>200</b>	5 - 20 lpm
<b>300</b>	4 - 30 lpm



**F3-A-80-Q**

### Accessories

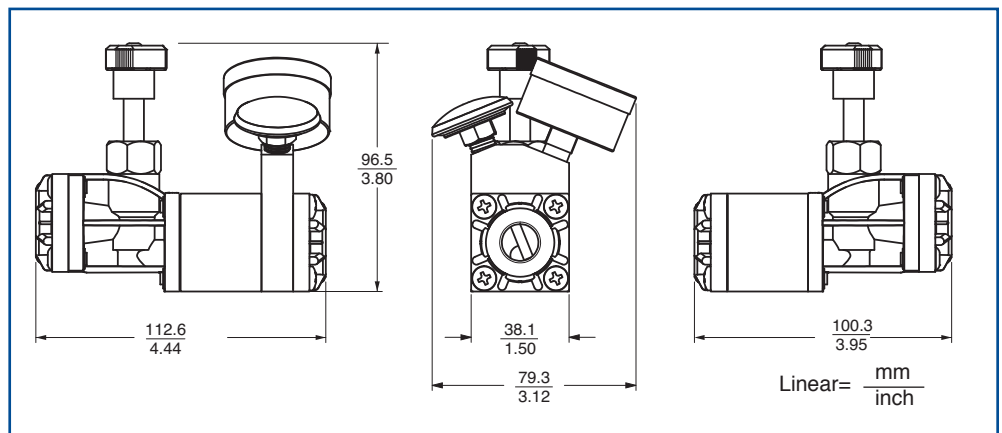
- Flow body only **A**
- Thermometer **B**
- Thermometer and 30 psi Pressure Gauge **C1**
- Thermometer and 60 psi Pressure Gauge **C2**
- Thermometer and 100 psi Pressure Gauge **C3**
- Liquid-Filled Pressure Gauge (100 psi) **CL**
- Thermometer and quick change socket and plug **E**
- 30 psi Pressure gauge **F1**
- 60 psi Pressure gauge **F2**
- 100 psi Pressure gauge **F3**
- Liquid-Filled Pressure Gauge (100 psi) **FL**

### 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  
 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)  
 Pressure Gauge .....0 to 100 psi (0 to 700 Kpa)  
 ±3% accuracy (full scale)







# Precision Flow Regulator with Dr. Eddy Turbulent Flow Indicator

## Model Number

**FC3 - B - E - Q**

### Brass End Caps

#### Inlet Size

1/4"NPT(F) FC2  
1/4"BSPP(F) FC2B  
3/8"NPT(F) FC3  
3/8"BSPP(F) FC3B

### Nylon End Caps

#### Inlet Size

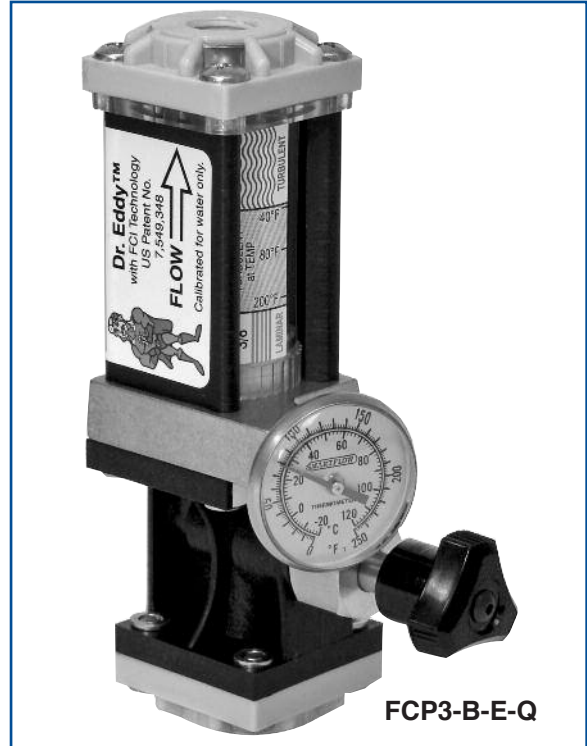
1/4"NPT(F) FCP2  
1/4"BSPP(F) FCP2B  
3/8"NPT(F) FCP3  
3/8"BSPP(F) FCP3B

### Accessories

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

### Scale Units

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



FCP3-B-E-Q

## Wetted Parts and Materials

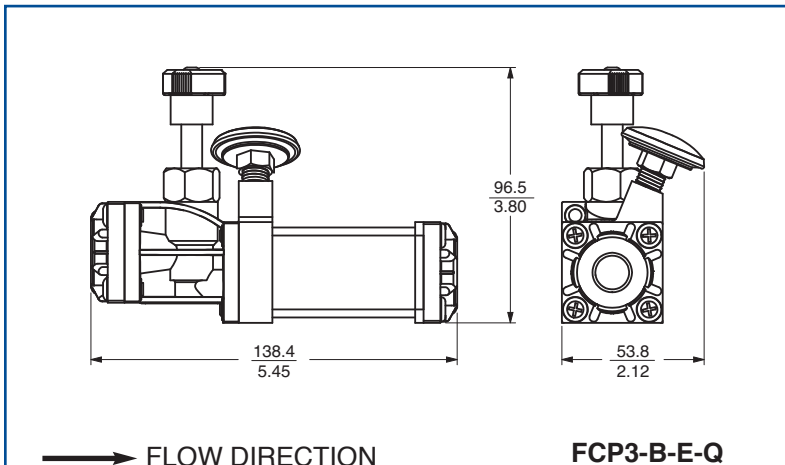
End Caps .....Brass or Glass-Filled Nylon  
Regulator Body.....Glass-Filled Nylon  
Flow Body .....Polysulfone  
Indicator Ring .....Silicone Rubber  
Piston.....Acetal  
Spring.....Stainless Steel  
O-Rings .....EPDM  
Gauge Block.....Brass  
Optional Quick-Connect Fittings.....Brass

## 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.



FCP3-B-E-Q

**SMARTFLOW**<sup>®</sup>

**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)

