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# Mass Flow Controllers

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## The Standard of Excellence in Mass Flow .....



### Principle of Operation

The sensing system utilizes a bypass sensing tube with a heater wound around the center of the tube, and precision temperature sensors equidistant upstream and downstream of the heater. A patented laminar flow element package in the main flowstream creates a pressure drop which forces a fixed percentage of total flow through the sensor tube for temperature differential detection.

At zero flow, temperature at both sensors is equal. As gas flows through the sensor tube, heat is displaced to the downstream sensor, creating a temperature differential between the two sensors. The resulting signal is amplified to a 0-5Vdc or 4-20mA dc output, which is directly proportional to Mass Flow rate. The flow controller circuit compares the output signal with a set point input, and generates a control voltage to a solenoid-operated control valve, forming a closed loop control system.

Key Benefits
Fast Response Time (2 sec)
Wide Flow Range (example: 0-100, 0-500, 0-1000 sccm, and higher)
Soft Recovery Valve Override
Stable Zero Control
Internal Voltage Regulation and Temperature Compensation Circuits
Insensitive to Mounting Position

<b>Stainless Steel Construction</b>
<b>Suitable for Air, Oxygen, Nitrogen, Methane, and other gases</b>

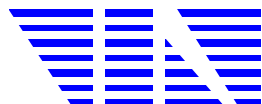
<b>Options</b>
<b>Buna, Neoprene, Viton, Kalrez Elastomers</b>
<b>Swagelok, VCR, VCO Fittings of 1/8" to 1/2"</b>

## SPECIFICATIONS

<b>Accuracy and Linearity</b>	+/- 1% full scale
<b>Repeatability</b>	+/- 0.2% full scale
<b>Control Range</b>	50:1 (2% - 100% full scale)
<b>Operating Temperature</b>	-10C to +70C
<b>Temperature Coefficient</b>	0.1% /Degree C
<b>Input Set point Voltage</b>	0-5 Vdc (for 0-5 Vdc output signal) or 1-5 Vdc (for 4-20mA dc output signal)
<b>Electrical Connector</b>	Card edge (20-pin) or D-type (9-pin)
<b>Power Requirements</b>	+15 Vdc for card edge connector -15 Vdc for D-9 connector
<b>Output Signal</b>	0-5 Vdc (2K ohm min load impedance) or 4-20 mAdc (non-floating/gnd-referenced)
<b>Mounting Orientation</b>	Any
<b>Warm-up Time</b>	10 minutes

### Display Units

Two-channel and four-channel, digital display Interface Modules are available for use with Mass Flow Controllers.



**VIN KAROLA INSTRUMENTS**

P.O. Box 922273  
Norcross, GA 30010-2273  
Tel: 770/409-1499  
Fax: 770/447-8045  
e-mail: info@vinkarola.com