

# Type F3.60/F3.63 <sup>New</sup> and F3.61

## Electromagnetic Flow Transmitters

Types F3.60, F3.63 and F3.61 are insertion type transmitters which generate a 4 to 20 mA analog output signal and a digital open collector output signal proportional to flow velocity. These units will handle solids, ferrous particles and higher viscosity fluids. They are not affected by ferrous particles which will foul the magnetic rotors of the paddle wheel type. The Type 3.60 and F3.60 are the standard installation versions. F3.61 is the hot-tap version of the F3.60. Hot-tap function allows sensor insertion and removal while the pipe is pressurized. The units may be connected to FlowX3 instruments).

<b>Body Materials:</b>	316L Stainless Steel, PVDF
<b>Electrodes:</b>	316L Stainless Steel
<b>Seals:</b>	EPDM or Viton®
<b>Pipe Sizes:</b>	1/2" to 24" (consult Chemline for larger pipe sizes)
<b>Installation Fittings:</b>	See pages 38 to 41

### ■ Unique Features

	F3.60	F3.63	F3.61
<b>Velocity</b>	0.05 to 8 m/s	0.15 to 8m/s	0.05 to 8 m/s
<b>Measurement Range</b>	(0.15 to 25 ft/sec.)	(0.5 to 25 ft/sec.)	(0.15 to 25 ft/sec.)
<b>Directional Flow Measurement</b>	Bidirectional	Monodirectional	Bidirectional
<b>Empty Pipe Detection</b>	Yes	No	Yes
<b>Hot-Tap Function</b>	No	No	Yes
<b>Installation Fittings</b>			
Tees:	1/2" to 1-1/2" PVC, PP, PVDF	1/2" to 1-1/2" PVC, PP, PVDF	–
Bolt-On Saddles:	2" to 12"	2" to 12"	–
Strap-On Saddles:	3" to 18"	3" to 18"	3" to 18"
Weld-On Adaptors:	1-1/2" to 24"	1-1/2" to 24"	16" to 24"
(Consult Chemline for larger pipe sizes.)			

### ■ Connectable FlowX3 Instruments

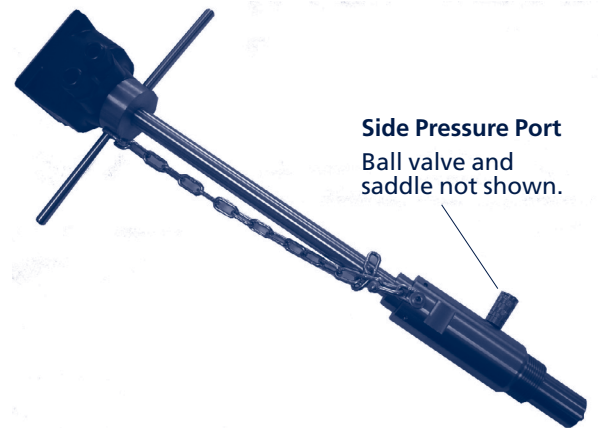
<b>Instrument Mounting</b>	<b>FlowX3 Instruments</b>
Panel or Wall	F9.01, F9.02, F9.03, F9.50, F9.51

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**FLOWX3**

F3.60/F3.63



F3.61 Hot-Tap Version



### ■ Common Features

- **Low maintenance** – No moving parts, no wear
- **Will handle slurries and high viscosity conductive and homogeneous fluids**
- **Easier to install and remove** compared to full port magmeters
- **Less costly** than full port magmeters
- **For both plastic and metal pipes**

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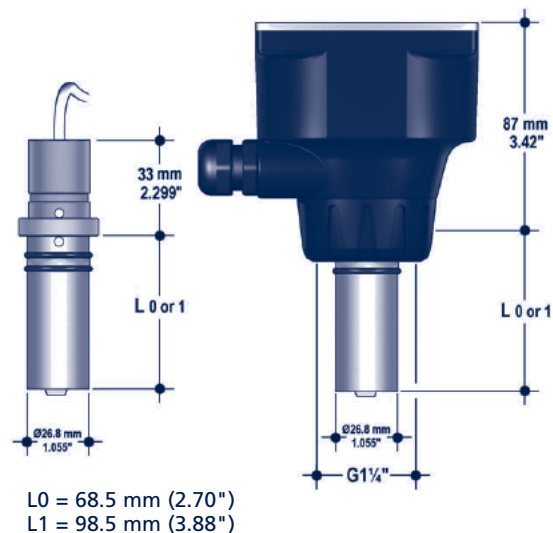
### ■ Technical

<b>Power Supply:</b>	24 VDC ± 10% regulated
<b>Maximum Current Consumption:</b>	150 mA
<b>Analog Output Signal:</b>	4 to 20 mA Maximum loop resistance (load): 600Ω Positive or negative flow indication
<b>Frequency Output:</b>	Open Collector NPN Maximum Current: 50 mA Maximum Voltage: 24 VDC Frequency output can be fed to FlowX3 F9.01, F9.02, F9.03, F9.50 or F9.51 instruments
<b>Digital Output Signal:</b> (for F3.60M & F3.61M)	Open Collector NPN Maximum Current: 50 mA Maximum Voltage: 24 VDC Frequency (0 to 500 Hz) Flow Direction: 0 VDC arrow-wise + VDC anti arrow-wise Empty Pipe: 0 VDC for normal working condition + VDC for empty pipe alarm
<b>Enclosure:</b>	NEMA 4, 4X (IP65), PC and PVC materials
<b>Accuracy/Linearity:</b>	2% of measured value + flow rate value at +0.004m/s (0.013 ft./sec.)
<b>Repeatability:</b>	0.5% of measured value
<b>Velocity Range:</b>	F3.60 & F3.61: 0.05 to 8 m/s (0.15 to 25 ft./sec.) F3.63: 0.15 to 8 m/s (0.5 to 25 ft./sec.)
<b>Standard Full Scale Setting:</b>	5 m/s (16 ft./sec.) factory settings up to 8 m/s AWS available
<b>Liquid:</b>	Conductive and homogeneous liquids or slurries
<b>Conductivity of Fluids:</b>	Minimum 20 μS (microSiemens)
<b>Ambient Temperature:</b>	0 to 60°C (32 to 140°F)
<b>Working Temperature:</b>	-10 to 70°C (14 to 148°F)
<b>Maximum Pressure:</b>	230 psi at 77°F (16 bar at 25°C) 124 psi at 158°F (8.6 bar at 70°C)
<b>Ground Protection:</b>	Low impedance ground required - below 10Ω
<b>Standards &amp; Approvals:</b>	Manufactured under ISO 9001 (Quality), ISO 14001 (Environmental), CE

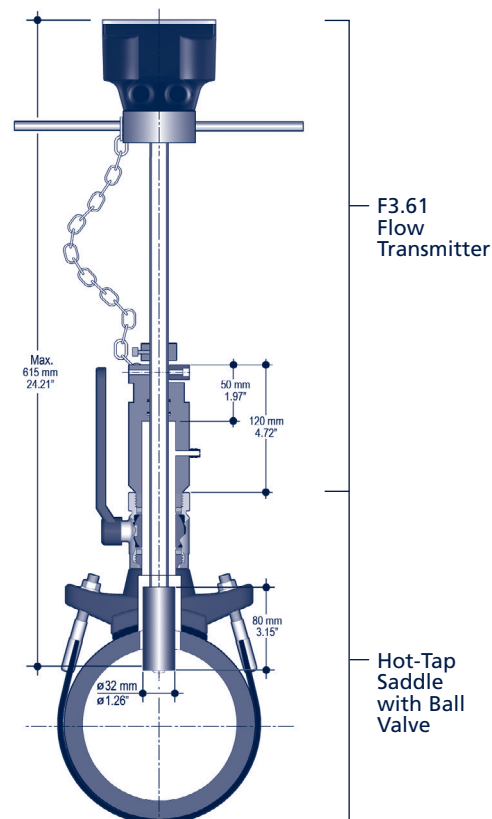
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### ■ Dimensions

#### F3.60/F3.63



#### F3.61

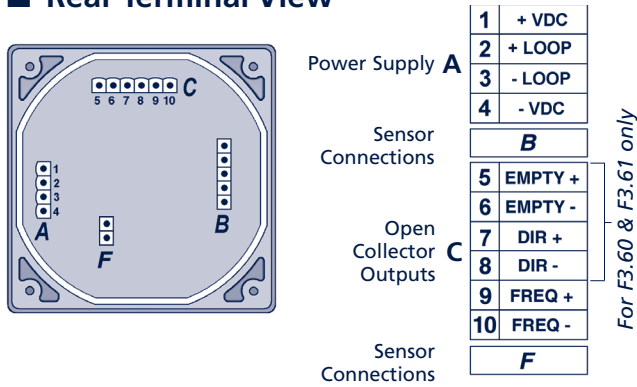


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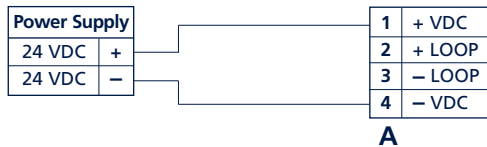


### ■ Rear Terminal View

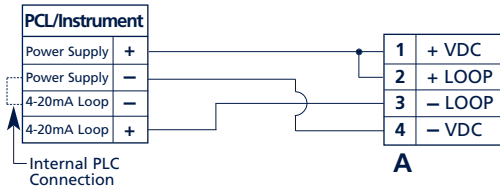


### ■ Power/Loop Wiring Diagrams

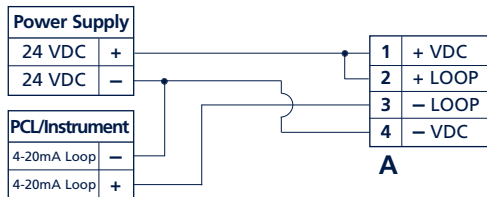
#### Connection Only Frequency Output Version



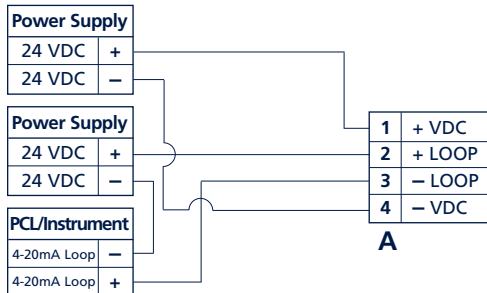
#### Connection with a built-in Power Supply (3-Wire Connection)



#### Connection to a PLC/Instrument with ONE Separate Power Supply

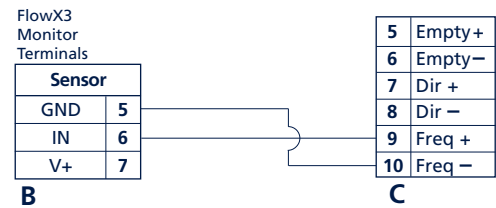


#### Connection to a PLC/Instrument with TWO Separate Power Supplies

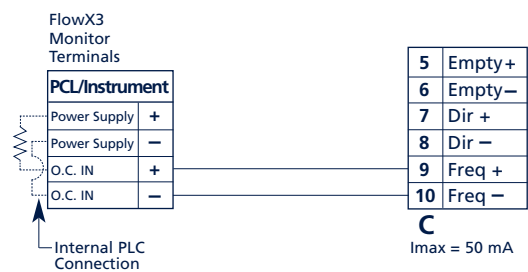


### ■ Open Collector Wiring Diagrams

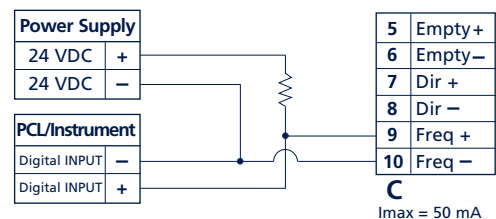
#### Connection to FlowX3 Instruments (Only with Frequency Output)



#### Connection to PLC NPN Open Collector Input



#### Connection to PLC/Instrument Digital Input with Separate Power Supply



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## Electromagnetic Flow Transmitters

### ■ Principle of Operation

Two magnetic coils in the body of the instrument generate a magnetic field perpendicular to the flow direction. The magnetic field **B** and the flow velocity **V** induce a voltage **E** between the two electrodes. The voltage **E** is directly proportional to the flow velocity **V**:

$$E = K \times B \times V$$

**K** = instrument constant

**B** = intensity of magnetic field

**V** = flow velocity of fluid

The voltage across the electrode terminals is transmitted to an integral converter and converted into an output signal of 4 to 20 mA or frequency output signal.

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**FLOW X3**

