

# Classic Turbine Flow Sensor

Measures Flow Rate Providing Frequency or Analog Output



- Choice of high strength aluminum or Stressproof® steel bodies
- Turbine flow measurement
- Flow accuracy  $\pm 1\%$  of full scale
- Repeatability  $\pm 0.2\%$
- Pressures up to 6000 PSI (414 Bar)
- Temperatures up to 300 °F (150 °C)
- Optional IFC converter provides analog output

Flo-tech's Classic Turbine Flow Sensors measure the flow rate of hydraulic fluids and other compatible liquids. Offered in a choice of high strength anodized aluminum or Stressproof® steel bodies, these durable flow sensors are capable of withstanding pressures up to 6000 PSI (414 Bar).

The Classic Series with the standard magnetic pick-up provides a frequency signal that is proportional to flow rate and can be transmitted to Flo-tech's F6600/F6650 Series digital displays. If an analog output is preferred, these sensors are also available with the IFC (Intelligent Frequency Converter) which offers either a 4-20 mA or 0-5 VDC output signal, allowing easy integration with Flo-tech's F6700/F6750 Series digital displays, PCs, PLCs or other data acquisition devices.

## SPECIFICATIONS

### Performance

#### Forward Flow Accuracy:

Magnetic pick-up  $\pm 1\%$  of full scale ( $\pm 1\%$  of rate when used with F6600/F6650 display)

IFC option  $\pm 1\%$  of reading @ 32 cSt

#### Repeatability:

$\pm 0.2\%$

#### Turbine Response:

$\leq 200\text{ms}$

#### Temperature:

Fluid -4 to +300 °F (-20 to +150 °C)  
Ambient -4 to +131 °F (-20 to +55 °C)

#### Operating Pressure:

FSC, FSB Series 5000 PSI (345 Bar) maximum  
FSD Series 6000 PSI (414 Bar) maximum

#### Pressure Drop:

See  $\Delta P$  charts on page 24

#### Magnetic Pick-up, Standard:

Electrical Output Signal Self-generating alternating pulse  
100 mV RMS (100 Hz) minimum

FSC-375 Series 10 mV RMS (200 Hz) minimum

#### IFC Signal Converter, Optional: F to I

**Power:** Loop powered, 6V insertion loss max  
10 to 30 VDC supply range

#### Inputs:

	F to I	F to V
Frequency	Magnetic Pick-up 0 to 3500 Hz	Magnetic Pick-up 0 to 3500 Hz
Trigger Sensitivity	30 mV p-p	30 mV p-p
Frequency Measurement Accuracy	$\pm 1\%$	$\pm 1\%$

#### Analog Output:

	F to I	F to V
Resolution	4-20 mA current loop 1:4000	0-5 VDC 1:4000
Temperature Drift	50 ppm / °C max	50 ppm / °C max
Response	1.6 seconds min	1.6 seconds min

#### Environmental:

	F to I	F to V
Ambient Temperature	-22 to +158 °F (-30 to +70 °C)	-22 to +158 °F (-30 to +70 °C)
Humidity	0-90%, non-condensing	0-90%, non-condensing

#### Material

#### Housing:

FSD Series 6013-T651 Aluminum; anodized Stressproof® steel; zinc plate, dichromate finish

#### Turbine Rotor:

T416 Stainless steel

#### Bearings:

FSD Series 440C Stainless steel ball bearings  
Tungsten carbide journal bearings

#### Rotor Shaft:

T303 Stainless steel

#### Rotor Supports:

FSC-375, 500, 750 6061-T6 Aluminum alloy  
FSD Series CA360 Brass

#### Hub Cones:

FSC-500, 750, 1000, 1005 6061-T6 Aluminum alloy  
& FSB-1250, 1500 only

#### Retaining Rings:

FSC-375 Series Steel; zinc plate  
T303 Stainless steel

#### Seals:

Buna N standard;  
Viton® and EPR optional

#### Magnetic Pick-up, Standard:

Body 12L14 Steel; electroless nickel plate  
Nut 12L14 Steel; electroless nickel plate

#### IFC (includes magnetic pick-up), Optional:

Case 6061-T6 Aluminum; nickel plate  
Connector Brass; nickel plate

#### Ports

SAE J1926/1,  
Code 61 and Code 62: SAE J518

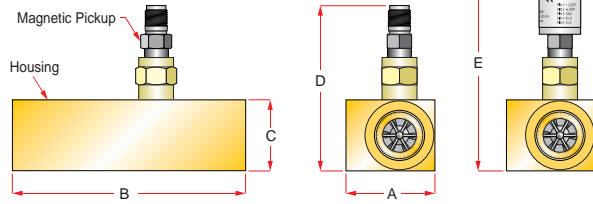
Viton is a registered trademark of DuPont Dow Elastomers.  
Stressproof is a registered trademark of Niagara LaSalle Corporation.

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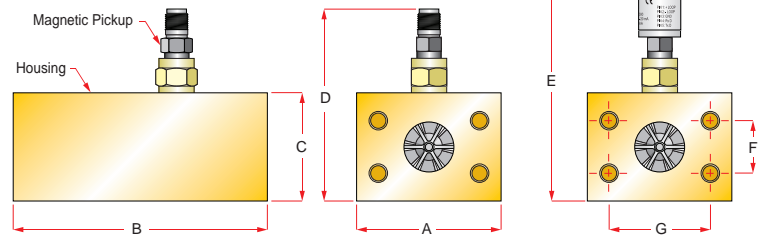
Measures Flow Rate Providing Frequency or Analog Output

## DIMENSIONS

### FSC



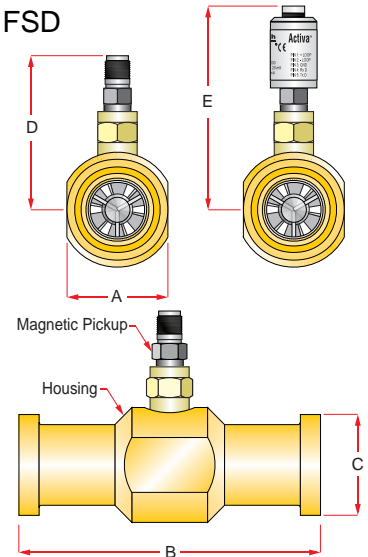
### FSB



SERIES	A WIDTH IN (mm)	B LENGTH IN (mm)	C HEIGHT IN (mm)	D w/MAG IN (mm)	E w/IFC IN (mm)	F IN (mm)	G IN (mm)	WEIGHT <sup>1</sup> LBS (KG)
FSC-375	1.25 (32)	5.00 (127)	1.50 (38)	3.91 (99)	5.48 (139)	-	-	1.25 (0.57)
FSC-500	2.00 (51)	6.50 (165)	2.00 (51)	4.16 (106)	5.84 (148)	-	-	2.75 (1.25)
FSC-750	2.00 (51)	6.50 (165)	2.00 (51)	4.25 (108)	5.93 (151)	-	-	2.87 (1.30)
FSC-1000	2.50 (64)	6.50 (165)	2.00 (51)	4.34 (110)	5.97 (152)	-	-	3.25 (1.47)
FSC-1005	2.50 (64)	6.50 (165)	2.00 (51)	4.34 (110)	5.97 (152)	-	-	3.25 (1.47)
FSB-1250	4.00 (102)	7.00 (178)	3.00 (76)	4.94 (126)	6.43 (165)	1.188 (30.1)	2.312 (58.7)	7.75 (3.52)
FSB-1500	4.00 (102)	7.00 (178)	3.00 (76)	5.10 (130)	6.59 (167)	1.406 (35.7)	2.75 (69.9)	7.40 (3.36)
FSD-1250	2.12 (54)	7.50 (190)	2.125 (54)	4.50 (114)	5.17 (131)	-	-	6.12 (2.78)
FSD-1500	2.50 (64)	7.50 (190)	2.500 (64)	4.85 (123)	5.34 (135)	-	-	6.75 (3.06)
FSD-2000	3.12 (79)	8.25 (209)	3.125 (79)	5.39 (137)	5.45 (138)	-	-	8.55 (3.88)

<sup>1</sup> Weight is for sensors with standard magnetic pick-up installed. For sensors with IFC add .10 lbs.

### FSD



## ORDERING INFORMATION

NOMINAL PORT SIZE	FLOW RANGE GPM (LPM)	SERIES	MODEL NUMBER Frequency Output	MODEL NUMBER 4-20 mA Output	MODEL NUMBER 0-5 VDC Output
SAE 8	0.4 - 7 (1.5 - 26)	FSC-375	F2945-ASCM <sup>2</sup>	F2945-ASCI	F2945-ASCV
SAE 12	1 - 15 (4 - 56)	FSC-500	F2082-ASCM	F2082-ASCI	F2082-ASCV
SAE 12	2 - 25 (7.5 - 94)	FSC-750	F2083-ASCM	F2083-ASCI	F2083-ASCV
SAE 16	3 - 60 (11.5 - 227)	FSC-1000	F2084-ASCM	F2084-ASCI	F2084-ASCV
SAE16	4 - 85 (15 - 321)	FSC-1005	F2084-ASCM8	F2084-ASCI8	F2084-ASCV8
SAE 20, Code 61, 4-Bolt Face	5 - 100 (20 - 378)	FSB-1250	F2085-ASBM	F2085-ASBI	F2085-ASBV
SAE 24, Code 61, 4-Bolt Face	7 - 200 (27 - 757)	FSB-1500	F2086-ASBM	F2086-ASBI	F2086-ASBV
SAE 20, Code 62, Flange Head	5 - 100 (20 - 378)	FSD-1250	F2085-SCDM	F2085-SCDI	F2085-SCDV
SAE 24, Code 62, Flange Head	7 - 200 (27 - 757)	FSD-1500	F2086-SCDM	F2086-SCDI	F2086-SCDV
SAE 32, Code 62, Flange Head	10 - 350 (37 - 1324)	FSD-2000	F2998-SCDM	F2998-SCDI	F2998-SCDV

<sup>2</sup> FSC-375 (F2945-ASCM) requires K-Factor Scaler, F5140 (see page 25), to amplify frequency signal to be compatible with Flo-tech's F6600/F6650 Digital Displays.

### Examples:

**F2084-ASCM** = SAE 16 ports  
3 - 60 GPM (11.5 - 227 LPM)  
Frequency output  
Buna N seals

**F2086-ASBI** = SAE 24, Code 61, 4-Bolt Face ports  
7 - 200 GPM (27 - 757 LPM)  
4-20 mA output  
Buna N seals

## ACCESSORIES

MODEL NUMBER	DESCRIPTION
F001109	5-Point Calibration Certificate <sup>3</sup>
F001110	10-Point Calibration Certificate <sup>3</sup>

<sup>3</sup> Certificates are traceable to NIST, ISO 9001.

For information about	Refer to
Digital Displays	Form No. 549
Pressure Sensors	Page 26
Temperature Sensor	Page 27
Cables	Pages 28 & 29



FIVE OR TEN POINT CALIBRATION AVAILABLE

Fax 800-245-3569 21

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