Flo-tech
Hydraulic Diagnostic Products

Turbine Flow Sensors

Activa, Ultima, Classic and Quad

Badger Meter

SEN-UM-00987-EN-02 (March 2015)

User Manual

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INTRODUCTION

Flo-tech turbine flow sensors measure the flow rate of hydraulic fluid and compatible liquids. Built to withstand rigorous hydraulic applications, these flow sensors are available in anodized aluminum and zinc plated Stressproof® steel bodies. Port types vary by body material, but include a choice of SAE, BSPP, Code 61 and Code 62, 4-bolt flanged options.

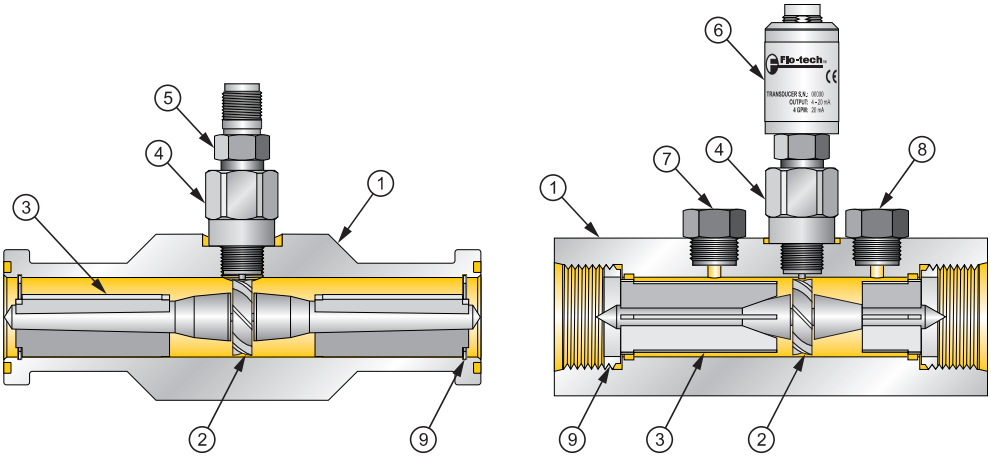
Typical applications for the turbine flow sensors include:

- Fluid characteristic measurement on test stands
- Stationary hydraulic system monitoring
- Feedback for hydraulic system control
- Advance warning of impending component failure
- Mobile hydraulic system diagnosis

Flo-tech offers four different flow sensor models. Each of these models is available in a wide selection of flow ranges and port sizes.

Activa Sensor Array	Classic Flow Sensor
Features: • Four flow ranges • Four port sizes • Accuracy of ±1% reading @ 32 cSt • Pressures up to 5800 psi (400 bar) • Temperatures up to 300° F (150° C) • 4…20 mA or 0…5V DC output for flow • 4…20 mA output for pressure and temperature	**Features:** • Eight flow ranges • Eight port sizes • Accuracy of ±1% full scale • Pressures up to 6000 psi (414 bar) • Temperatures up to 300° F (150° C) • Frequency output for flow
Ultima Sensor Array	**Quad Flow Sensor**
Features: • Four flow ranges • Four port sizes • Accuracy of ±1% full scale • Pressures up to 5800 psi (400 bar) • Temperatures up to 300° F (150° C) • Frequency output for flow • 4…20 mA output for pressure and temperature	**Features:** • Four flow ranges • Two port sizes • Accuracy of ±1% full scale • Pressures up to 6000 psi (414 bar) • Temperatures up to 300° F (150° C) • Frequency output for flow

OPERATING PRINCIPLE



1	Housing	**6**	Signal Converter (analog output)
2	Turbine Rotor	**7**	Pressure Port Adapter
3	Rotor Supports	**8**	Temperature Port Adapter
4	Lock Nut	**9**	Retaining Rings
5	Magnetic Pickup (frequency output)		

Turbine flow sensors measure the flow rate of hydraulic fluid and compatible liquids. As fluid flows through the sensor it turns the turbine rotor, and as the turbine blades pass the magnetic pickup a frequency signal is generated. This frequency signal is proportional to the flow rate and can be transmitted to Flo-tech's digital displays or converted to an analog output. Optional sensors allow measurement of pressure and temperature.

INSTALLATION

⚠CAUTION

THIS PRODUCT SHOULD BE INSTALLED AND SERVICED BY TECHNICALLY QUALIFIED PERSONNEL TRAINED IN MAINTAINING INDUSTRIAL CLASS FLOW INSTRUMENTATION AND PROCESSING EQUIPMENT.

⚠CAUTION

READ INSTRUCTIONS THOROUGHLY BEFORE INSTALLING THE FLOW SENSOR. IF YOU HAVE ANY QUESTIONS REGARDING PRODUCT INSTALLATION OR MAINTENANCE, CALL YOUR LOCAL SUPPLIER OR THE FACTORY FOR MORE INFORMATION.

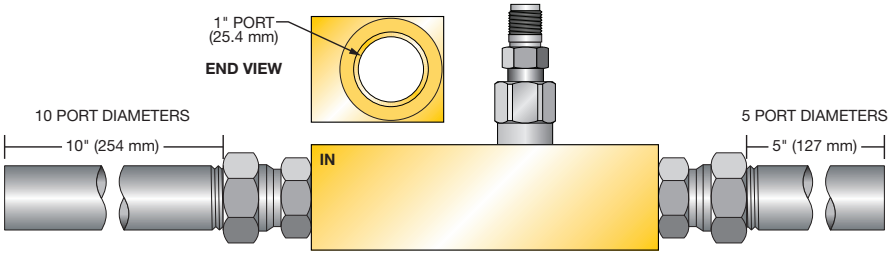
⚠WARNING

DO NOT USE MALE PIPE THREADS (NPT) INTO SAE STRAIGHT THREAD PORTS. USING MALE PIPE THREADS (NPTF) WITH A FLOW SENSOR POSSESSING SAE STRAIGHT THREAD O-RING PORTS WILL NOT CREATE A PROPER SEAL AND IS POTENTIALLY DANGEROUS. PIPE THREADS INSERTED INTO AN SAE STRAIGHT THREAD PORT ONLY ALLOW THE ENGAGEMENT OF ONE OR TWO THREADS. NO AMOUNT OF TIGHTENING OR THREAD SEAL WILL STOP THE LEAKING OR MAKE THE INSTALLATION SAFE. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY OR DEATH AND/OR DAMAGE TO THE EQUIPMENT.

Installation Recommendations

The in-line flow sensor is a simple device to install. However, the following measures are recommended for reliable, trouble-free operation:

1. Provide at least 10 port diameters of upstream straight pipe with no obstructions to the flow sensor and at least 5 diameters of downstream pipe. The pipe should be of the same diameter as the nominal port size.

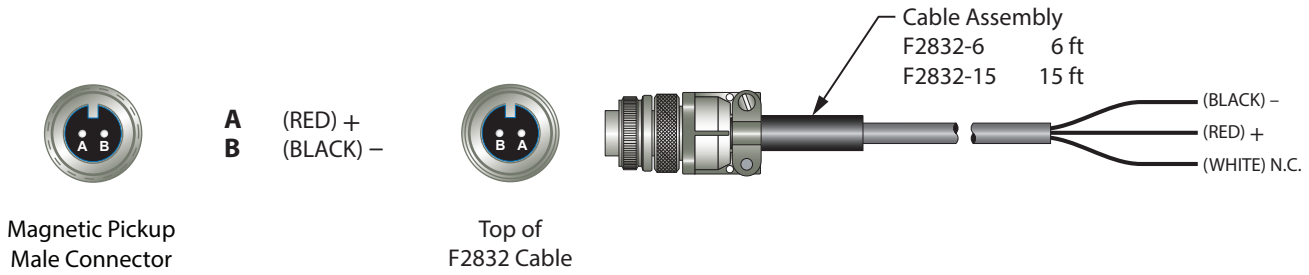


Example:
An FSC-1000 has a 1 in. (25.4 mm) port. The unobstructed upstream length should be at least 10 in. (254 mm) and the downstream length should be at least 5 in. (127 mm).

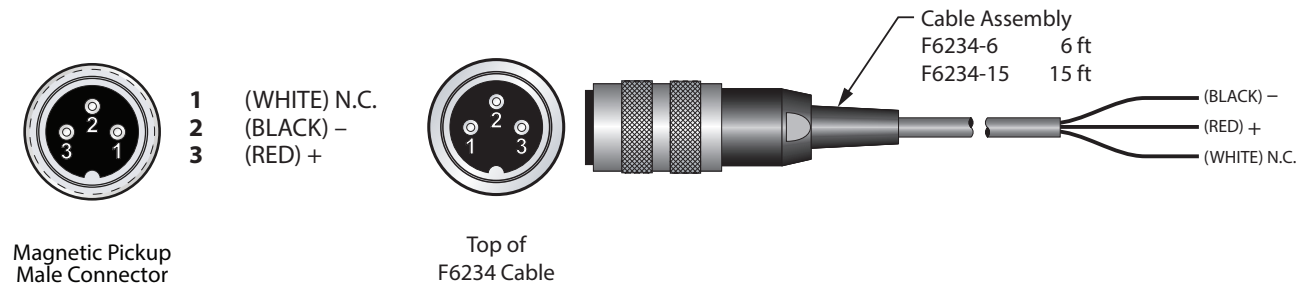
2. Choose a position for the flow sensor that is not at the lowest level in the system. Placing the flow sensor at a higher elevation in the system will avoid collection of debris, sediment and dirt in the flow sensor.
3. Use a filter. All applications should be filtered to at least 40 micron.
4. Do not install a flow sensor directly in-line with the outlet of a pump, as pressure pulsations can react with the turbine. Install the sensor after another component, observing the 10 port diameter rule.
5. Do not adjust the magnetic pickup on the flow sensor. This is calibrated at the factory. Further adjustment will cause a decrease in performance or damage to the sensor.
6. Do not exceed the working temperature range of –4…300° F (–20…150° C). Higher temperatures will damage the magnetic pickup and lower temperatures will limit the rotation of the turbine.

Electrical Connections for Standard Magnetic Pickup

Standard Magnetic Pickup with Frequency Output, 2-pin Connector

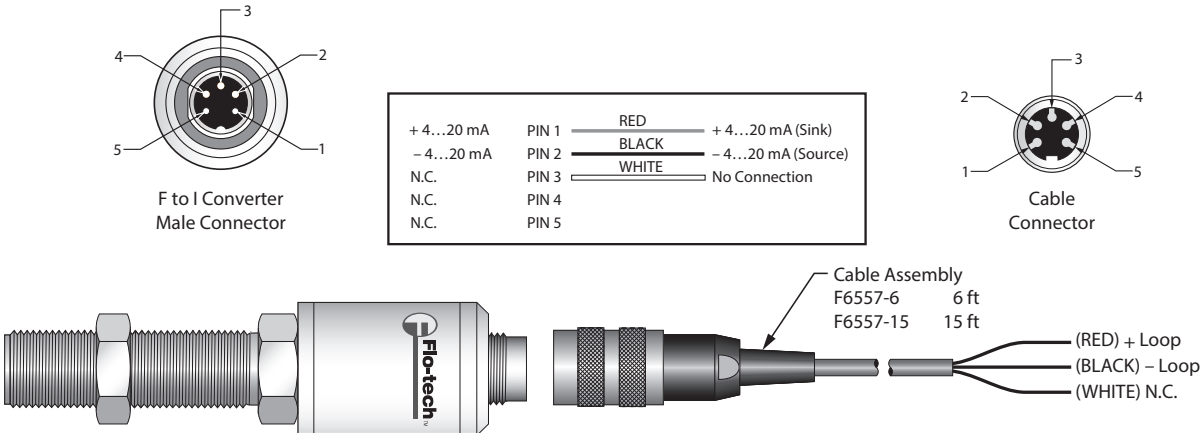


Standard Magnetic Pickup with Frequency Output, 3-pin Connector



Electrical Connections for IFC (Intelligent Frequency Converter)

IFC with 4…20 mA Output (F to I), 5-pin Connector



The 4…20 mA output can drive auxiliary devices (resistive loads) such as displays, recorders and computers, provided that the voltage supplied by the power supply is adequate. Devices must be wired in series with the F to I converter and power supply. The voltage drop across the load(s) and the 6V DC minimum needed to drive the F to I converter determine the minimum voltage required from the power supply.

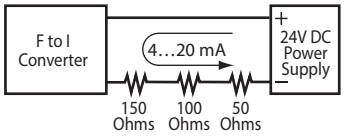
Determine the necessary voltage required to adequately drive the F to I converter and auxiliary device(s).

The F to I converter acts as a current controlling device keeping the current output the same even if the power supply voltage fluctuates or the load resistance changes. The current varies only with respect to the flow rate from the turbine flow sensor, as long as the voltage drop across the F to I converter is at least 6V DC.

The load(s) in the circuit will generally have some electrical resistance, 100 Ohms for this example. The 4…20 mA loop current will produce a voltage drop across each load. The maximum voltage drop across a load(s) will exist when the loop current is 20 mA. The power supply must provide enough voltage for the load(s) plus the 6V DC minimum insertion loss of the F to I converter.

Example 1

Sufficient Power Supply Voltage

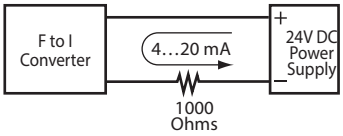


Total Load Resistance = 300 Ohms
At 20 mA loop current, the voltage drop across the load(s) is 6 volts:
300 Ohms × 20 mA = 6000 mV or 6 volts

Subtract 6 volts from the 24 volt source to determine that 18 volts is available to power the F to I converter. The 18 volts is within the specified 10…30 volt range and is sufficient to power the F to I converter.

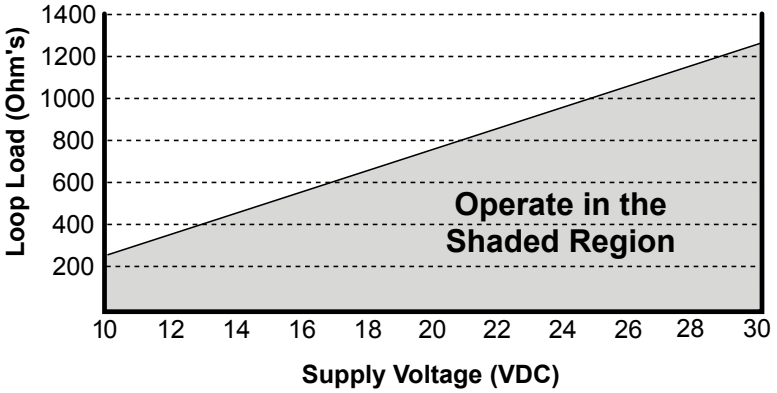
Example 2

Insufficient Power Supply Voltage

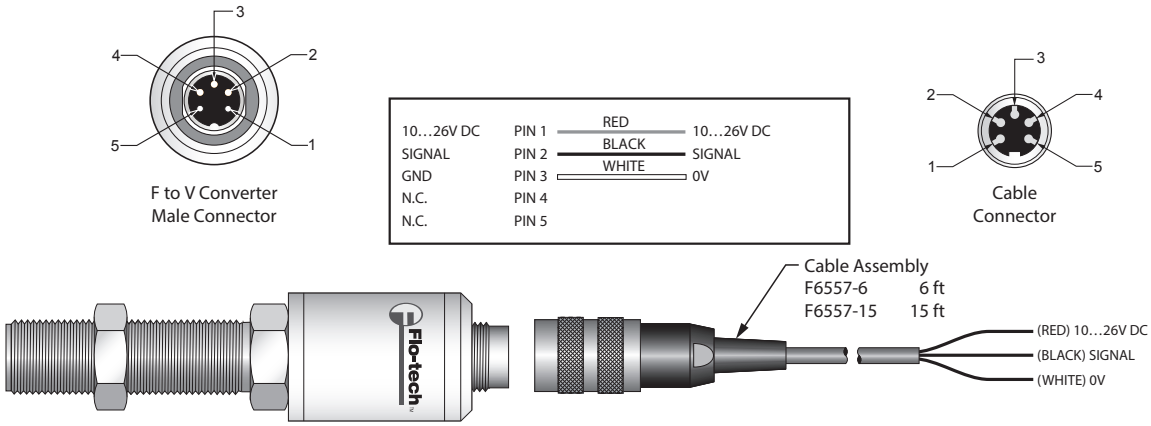


Total Load Resistance = 1000 Ohms
At 20 mA loop current, the voltage drop across the load(s) is 14 volts:
1000 Ohms × 20 mA = 20,000 mV or 20 volts

Subtract 20 volts from the 24 volt source to determine that 4 volts is available to power the F to I converter. The 4 volts is below the specified 10…30 volt range and is not adequate to power the F to I converter. If for example, the power supply voltage was 30 volts instead of 24 volts, the voltage available to power the F to I converter would be 10 volts and within the specified range.

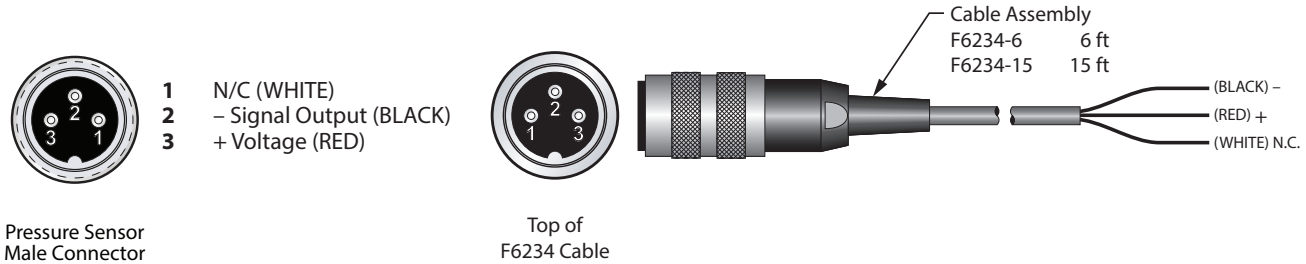


IFC with 0…5V DC Output (F to V), 5-pin Connector

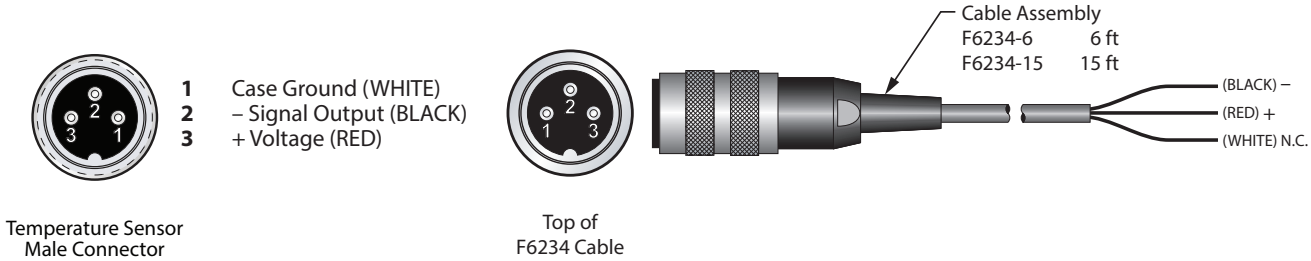


Electrical Connections for Optional Pressure and Temperature Sensors

Pressure Sensor, Optional, 3-pin Connector



Temperature Sensor, Optional – 3-pin Connector



OPERATION

General

⚠WARNING

DO NOT EXCEED ALLOWABLE PRESSURE RATINGS. PRESSURE IN EXCESS OF THE MAXIMUM ALLOWABLE RATINGS MAY CAUSE THE TURBINE BODY TO FAIL. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY OR DEATH AND/OR DAMAGE TO THE EQUIPMENT.

1. Allow fluids to warm to operating temperatures before critical measurements are taken.
2. Maintain a flooded condition in the flow sensor at all times. Air and turbulence will result in erroneous readings.
3. Do not exceed the working temperature range of –4…300° F (–20…150° C). Higher temperatures will damage the magnetic pickup and lower temperatures will limit the rotation of the turbine.

Flow Sensors with IFC Option

As soon as power is applied, the IFC will begin to output an analog value representative of the measured frequency from the turbine meter. See the wiring diagram that corresponds to the IFC being used.

MAINTENANCE

⚠WARNING

ALWAYS DISCONNECT THE PRIMARY POWER SOURCE BEFORE INSPECTION OR SERVICE. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY OR DEATH AND/OR DAMAGE TO THE EQUIPMENT.

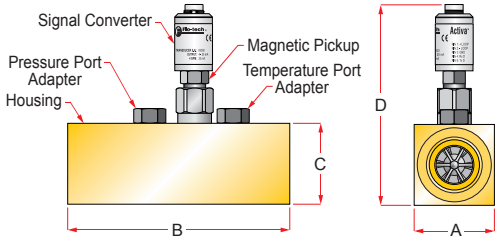
1. A schedule for maintenance checks should be determined based on environmental conditions and frequency of use. Inspect the sensors at least once a year.
2. Perform visual, electrical and mechanical checks on all components.
   a. Visually check for undue heating evidenced by discoloration of wires or other components, damaged or worn parts, or excessive corrosion of the device.
   b. Electrically check to make sure that all connections are clean and tight and that the device is operating properly.

TROUBLESHOOTING

Issue	Possible Cause	Remedy
Sensor indicates higher than actual flow rate	• Cavitation • Debris on straightening section • Build-up of foreign material on sensor bore • Gas in liquid	• Increase back pressure • Clean sensor • Clean sensor • Install gas eliminator ahead of sensor
Sensor indicates lower than actual flow rate	• Debris on turbine • Worn bearing	• Clean sensor and add filter • Have sensor serviced and add filter
Erratic indications on readout	• Any of the above • Ground loop problem • Turbulence in fluid stream	• Any of the above • Be sure only one system ground is present. Reroute cables away from electrical noise • Redo plumbing per instructions
Readout shows flow when pumps are not running	• Mechanical vibration or pump dither causes turbine to oscillate even though there is no flow	• Isolate flow sensor
No flow indication at any flow rate	• Foreign material stopping turbine rotation • Damaged turbine and/or bearing • Magnetic pickup stopping turbine rotation • Magnetic pickup shorted or open	• Clean sensor and add filter • Have sensor serviced • Readjust magnetic pickup away from turbine • Have magnetic pickup replaced
Erratic indications at low flows, but good indications at high flows	• Foreign material wrapped around turbine	• Clean sensor and add filter
System works except readings are lower than expected	• Flow is being bypassed • System has a leak	• Repair or replace faulty valves • Find and repair any system leaks
No current output	• Low or missing supply voltage • Broken / disconnected wires • Incorrect wiring polarity	• Check polarity of the current loop connections for proper orientation • Make sure receiving device is configured to provide loop current
Analog output reads a constant reading all the time	• Electrical noise in vicinity • Damaged electronics	• Make sure there is flow in the system • Verify that the rotor inside the turbine meter turns freely • Check shield • Remove noise producing device
Analog output is not stable	• Electrical noise in vicinity • Entrained gas in liquid • Damaged meter rotor • Foreign matter lodged in turbine	• External noise is being picked up by the sensor. Keep all AC wires separate from DC wires. • Check for radio antenna in close proximity. This usually indicates a weak signal. • Clean meter • Recalibrate meter

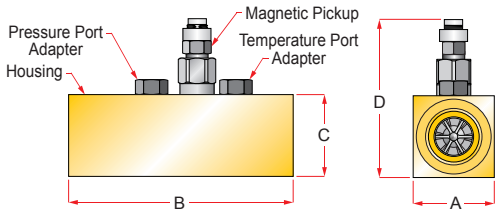
DIMENSIONS

Activa Series



Series	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	Weight lbs (kg)
F6202 / F6222	1.23 (31.2)	4.72 (120.0)	1.47 (37.3)	5.74 (145.6)	1.60 (0.73)
F6204 / F6224	1.48 (37.6)	5.08 (129.0)	1.80 (45.7)	6.04 (153.0)	1.90 (0.86)
F6206 / F6226	1.98 (50.3)	5.87 (149.0)	2.20 (56.0)	6.50 (164.0)	2.80 (1.27)
F6208 / F6228	2.46 (62.5)	6.81 (173.0)	2.48 (63.0)	6.74 (171.0)	4.20 (1.91)

Ultima Series



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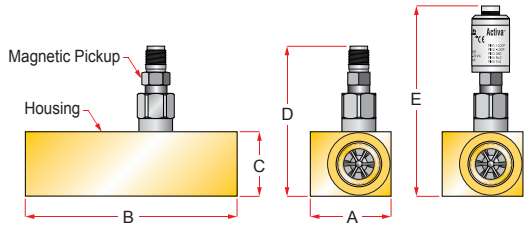
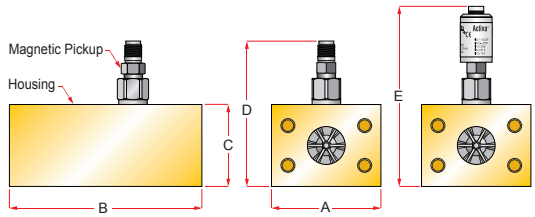
F6206 / F6226	1.98 (50.3)	5.87 (149.0)	2.20 (56.0)	6.50 (164.0)	2.80 (1.27)
F6208 / F6228	2.46 (62.5)	6.81 (173.0)	2.48 (63.0)	6.74 (171.0)	4.20 (1.91)

Classic Series

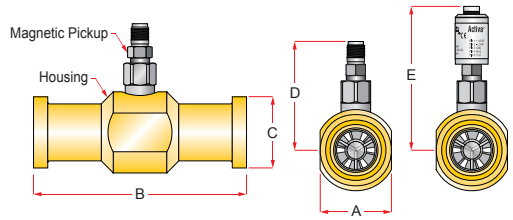
FSC



FSB

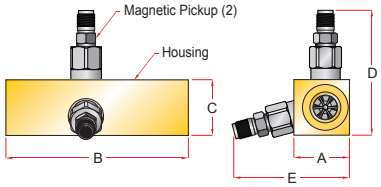


FSD



Series	A in. (mm)	B in. (mm)	C in. (mm)	D W/Mag in. (mm)	E W/IFC in. (mm)	Weight 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 (1.48)
FSC-1005	2.50 (64)	6.50 (165)	2.00 (51)	4.34 (110)	5.97 (152)	3.25 (1.48)
FSB-1250	4.00 (102)	7.00 (178)	3.00 (76)	4.94 (126)	6.43 (165)	7.75 (3.52)
FSB-1500	4.00 (102)	7.00 (178)	3.00 (76)	5.10 (130)	6.59 (167)	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)

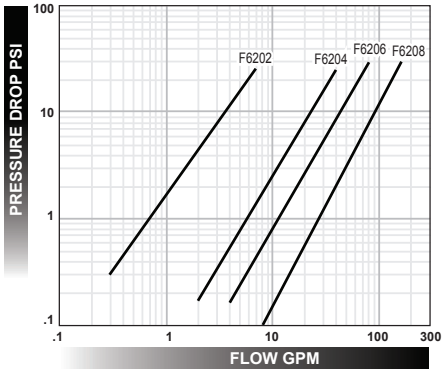
Quad Series

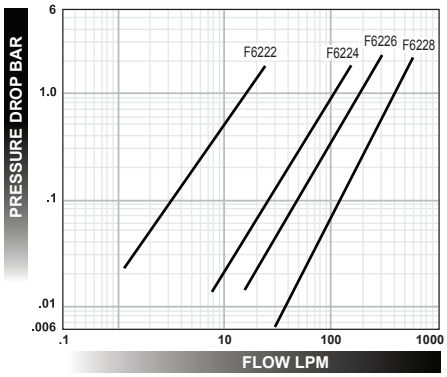


Series	A in. (mm)	B in. (mm)	C in. (mm)	D W/Mag in. (mm)	E W/Mag in. (mm)	Weight lbs (kg)
FSC-2005	2.00 (51)	6.50 (165)	2.00 (51)	4.16 (106)	4.05 (102)	2.75 (1.25)
FSC-2075	2.00 (51)	6.50 (165)	2.00 (51)	4.25 (108)	4.05 (102)	2.87 (1.30)
FSC-2100	2.50 (64)	6.50 (165)	2.00 (51)	4.34 (110)	4.59 (117)	3.25 (1.47)
FSC-2150	2.50 (64)	6.50 (165)	2.00 (51)	4.34 (110)	4.59 (117)	7.75 (3.52)

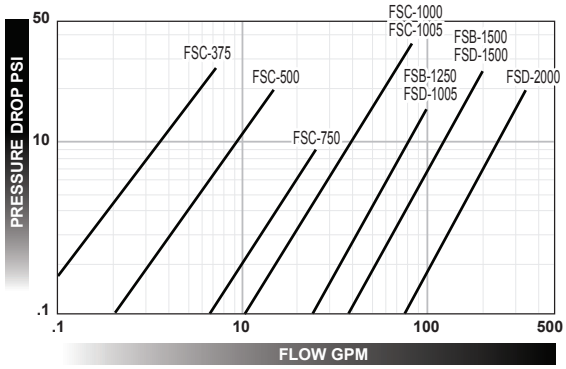
FLOW VS. PRESSURE DROP CHARTS

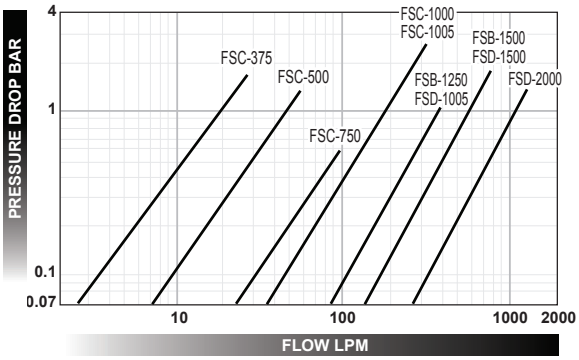
Activa and Ultima Series



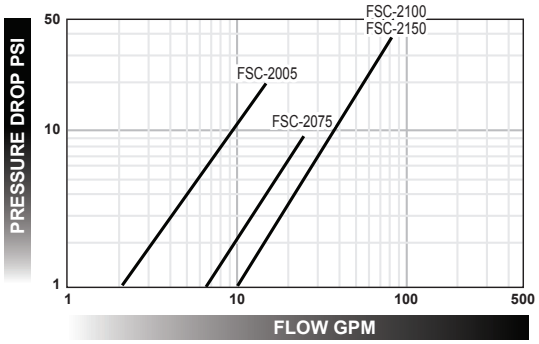


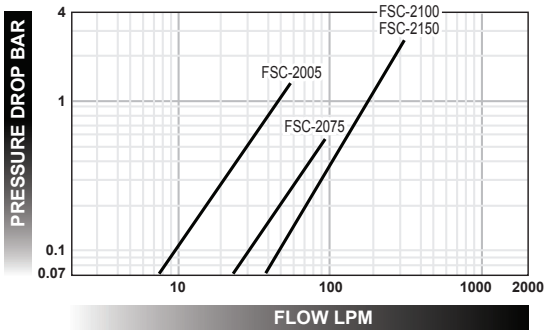
Classic Series





Quad Series





SPECIFICATIONS

Activa and Ultima Sensor Arrays

Material	Housing		6013-T651 Anodized aluminum			
	Turbine rotor		T416 Stainless steel			
	Rotor supports		6061-T6 Aluminum			
			C360 Brass for 1/4 in. models			
	Rotor shaft		T303 Stainless steel			
	Ball bearings		440 C Stainless steel			
	Hub cones		6061-T6 Aluminum alloy			
	Retaining rings		6061-T6 Aluminum alloy			
	Adapters/plugs		6061-T6 Anodized aluminum			
	Seals		Buna N standard			
			Viton® and EPR optional			
	Magnetic pickup		Body	T303 Stainless Steel		
			Nut	T303 Stainless Steel		
	IFC (Intelligent Frequency Converter) Activa only		Body	6061-T6 Aluminum, nickel plate		
			Connector	Brass, nickel plate		
	Temperature probe		12L14 Steel, electroless nickel finish			
	Pressure Sensor		Case	300 Series stainless steel		
			Diaphragm	17-4 PH stainless steel		
	Ports		SAE Straight thread O-ring boss, female, J1926/1; ISO1179 (BSPP)			
Performance	Flow accuracy		Activa	±1% of reading @ 32 cSt		
			Ultima	±1% of full scale		
	Repeatability		±0.2%			
	Pressure rating		5800 psi (400 bar) maximum, 5000 psi (345 bar) maximum for 1-1/4 in. models			
	Turbine response		≤200 ms			
	Fluid temperature		–4…300° F (–20…150° C)			
	Ambient temperature		–4…131° F (–20…55° C)			
Electrical	Activa	4…20 mA	Power	Loop-powered, 6V insertion loss max, 10…30V DC supply		
			Inputs	Mag pickup	Frequency	0…3500 Hz
					Trigger sensitivity	30 mV p-p
					Frequency measure accuracy	±1%
			Analog out	Resolution	1:4000	
				Temp Drift	50 ppm/° C max	
			Environmental		Ambient temp.	–22…158° F (–30…70° C)
					Humidity	0…90% non-condensing
		0…5V DC	Power	10…26V DC		
			Inputs	Mag pickup	Frequency	0…3500 Hz
					Trigger sensitivity	30 mV p-p
					Frequency measure accuracy	±1%
			Analog out	Resolution	1:4000	
				Temp. drift	50 ppm/°C max	
			Environmental		Ambient temp.	–22…158° F (–30…70° C)
					Humidity	0…90% non-condensing
	Ultima	Magnetic Pickup	Self-generating alternating pulse; 100 mV RMS (100 Hz) minimum.			
			F6202 & F6222 only	10 mV RMS (200Hz) minimum		
Calibration	Flow sensors are calibrated with 0.876 specific gravity, 140 SUS (32 cSt) hydraulic oil. Standard calibration is done using 3-points and is traceable to NIST, ISO 9001/ANSI Z540-1 & MIL-STD 45662A.					

Classic Flow Sensor

Materials	Housing		FSC, FSB	6013-T651 Anodized aluminum		
			FSD	Stressproof® steel, zinc plated		
	Turbine rotor		T416 Stainless steel			
	Rotor supports		FSC-375, 500, 750	C360 Brass		
			FSC-1000, 1005	6061-T6 Aluminum		
			FSD	Tungsten carbide		
	Rotor shaft		FSC, FSB	T303 Stainless steel		
			FSD	Tungsten carbide		
	Bearings		FSC, FSB	440 C Stainless steel ball bearings		
			FSD	Tungsten carbide		
	Hub cones		FSC, FSB	6061-T6 Aluminum alloy		
	Retaining rings		FSC	T303 Stainless steel		
			FSC-500, 750, 1000, 1005; FSB; FSD		Steel, zinc plate	
	Adapters/plugs		6061-T6 Anodized aluminum			
	Seals		Buna N standard, Viton® and EPR optional			
	Magnetic pickup		Body	T303 Stainless Steel		
			Nut	T303 Stainless Steel		
	IFC (Intelligent Frequency Converter):		Body	6061-T6 Aluminum, nickel plate		
			Connector	Brass, nickel plate		
	Ports:		SAE Straight thread O-ring boss, female, J1926/1; Code 61 and Code 62: SAE J518			
Performance	Flow accuracy		Standard magnetic pickup	±1% of full scale		
			IFC converter option	±1% of reading @ 32 cSt		
	Repeatability		±0.2%			
	Pressure rating		FSC, FSB	5000 psi (345 bar) maximum,		
			FSD	6000 psi (414 bar) maximum		
	Pressure drop		See *"Flow vs. Pressure Drop Charts" on page 14*			
	Turbine response		≤200 ms			
	Fluid temperature		–4…300° F (–20…150° C)			
	Ambient temperature		–4…131° F (–20…55° C)			
Electrical	Magnetic Pickup		Self-generating alternating pulse; 100 mV RMS (100 Hz) minimum.			
			FSC-375 only	10 mV RMS (200 Hz) minimum		
	IFC Converter	4…20 mA	Power	Loop-powered, 6V insertion loss max 10…30V DC supply		
			Inputs	Mag pickup	Frequency	0…3500 Hz
					Trigger sensitivity	30 mV p-p
					Frequency measure accuracy	±1%
			Analog out	4…20 mA current loop	Resolution	1:4000
					Temp. drift	50 ppm/°C max
			Environmental		Ambient temp.	–22…158° F (–30…70° C)
					Humidity	0…90% non-condensing
		0…5V DC	Power	10…26V DC		
			Inputs	Mag pickup	Frequency	0…3500 Hz
					Trigger sensitivity	30 mV p-p
					Frequency measure accuracy	±1%
			Analog out	0…5V DC	Resolution	1:4000
					Temp drift.	50 ppm/°C max
			Environmental		Ambient temp	–22…158° F (–30…70° C)
					Humidity	0…90% non-condensing
Calibration	Flow sensors are calibrated with 0.876 specific gravity, 140 SUS (32 cSt) hydraulic oil. Standard calibration is done using 3-points and is traceable to NIST, ISO 9001/ANSI Z540-1 & MIL-STD 45662A					

Quad Flow Sensors

Material	Housing	6013-T651 Anodized aluminum	
	Turbine rotor	T416 Stainless steel	
	Rotor supports	6061-T6 Aluminum	
	Rotor shaft	T303 Stainless steel	
	Bearings	440 C Stainless steel ball bearings	
	Hub cones	6061-T6 Aluminum alloy	
	Retaining rings	Steel, zinc plate	
	Seals	Buna N standard, Viton® and EPR optional	
	Magnetic pickup	Body	T303 Stainless Steel
		Nut	T303 Stainless Steel
	Ports	SAE Straight thread O-ring boss, female, J1926/1	
Performance	Flow accuracy	±1% of full scale	
	Repeatability	±0.2%	
	Pressure rating	5000 psi (345 bar) maximum	
	Pressure drop	See *"Flow vs. Pressure Drop Charts" on page 14*	
	Turbine response	≤200 ms	
	Fluid temp.	–4…300° F (–20…150° C)	
	Ambient temp.	–4…131° F (–20…55° C)	
Electrical	Magnetic Pickup	Self-generating alternating pulse; 100 mV RMS (100 Hz) minimum	
Calibration	Flow sensors are calibrated with 0.876 specific gravity, 140 SUS (32 cSt) hydraulic oil. Standard calibration is done using 3-points and is traceable to NIST, ISO 9001/ANSI Z540-1 & MIL-STD 45662A.		

MODEL NUMBERS

Activa and Ultima Flow Sensors

Nominal Port Size	Flow Rate	Model	IFC Converter or Mag Pickup	Seals	Sensor Ports	
					Temperature	Pressure
SAE 8	0.4…7 gpm	F6202	**Activa Models:** **AI** 4…20 mA Out **AV** 0…5V DC Out **Ultima Models:** **F** Frequency Out	**B** Buna N **V** Viton **E** EPR	**T** with Sensor **N** 1/4 NPT(F) Plugged **S** SAE 2 Plugged **G** G 1/4 Plugged **D** SAE 4 Plugged	**1** 1000 psi **3** 3000 psi **5** 5000 psi **6** 6000 psi * **N** 1/4 NPT(F) Plugged **S** SAE 2 Plugged **F** G 1/4 Plugged
SAE 12	2…40 gpm	F6204				
SAE 16	4…80 gpm	F6206				
SAE 20	8…160 gpm	F6208				
G 1/4	1.5…26 lpm	F6222				
G 3/4	7.5…151 lpm	F6224				
G 1	15…302 lpm	F6226				
G 1-1/2	30…605 lpm	F6228				

* Not available with Models F6208 or F6228

Example

F6204-AIB-T6 =

- SAE 12 ports, 2…40 gpm flow range
- Buna N seals, Temperature sensor
- 6000 psi (414 bar) pressure sensor

F6208-FV-TN =

- SAE 20 ports, 8…160 gpm flow range
- Viton seals, Temperature sensor
- 1/4 NPT (F) plugged pressure port

Classic Flow Sensors

Nominal Port Size	Flow Rate	Series	Model with Frequency Out	Model with 4…20 mA Out	Model with 0…5V DC Out
SAE 8	0.4…7 gpm	FSC-375	F2945-ASCM	F2945-ASCI	F2945-ASCV
SAE 12	1…15 gpm	FSC-500	F2082-ASCM	F2082-ASCI	F2082-ASCV
SAE 12	2…25 gpm	FSC-750	F2083-ASCM	F2083-ASCI	F2083-ASCV
SAE 16	3…60 gpm	FSC-1000	F2084-ASCM	F2084-ASCI	F2084-ASCV
SAE 16	4…85 gpm	FSC-1005	F2084-ASCM8	F2084-ASCI8	F2084-ASCV8
SAE 20, Code 61	5…100 gpm	FSB-1250	F2085-ASBM	F2085-ASBI	F2085-ASBV
SAE 24, Code 61	7…200 gpm	FSB-1500	F2086-ASBM	F2086-ASBI	F2086-ASBV
SAE 20, Code 62	5…100 gpm	FSD-1250	F2085-SCDM	F2085-SCDI	F2085-SCDV
SAE 24, Code 62	7…200 gpm	FSD-1500	F2086-SDCM	F2086-SCDI	F2086-SCDV
SAE 32, Code 62	10…350 gpm	FSD-2000	F2998-SCDM	F2998-SCDI	F2998-SCDV

Quad Flow Sensors

Nominal Port Size	Flow Rate	Series	Model
SAE 12	1…15 gpm	FSC-2005	F2082-ASCQ4
SAE 12	2…25 gpm	FSC-2075	F2083-ASCQ4
SAE 16	3…60 gpm	FSC-2100	F2084-ASCQ4
SAE 16	4…85 gpm	FSC-2150	F2085-ASCQ4

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