Sense FSC Series Digital Flow Sensors



Features

- Up to 50 GPM sensing range
- 4-digit, two-color digital display
- Immune to rapid media temperature changes
- Measures media temperature in addition to flow
- Two outputs selectable for switch, frequency, or analog signals
- <10ms response time
- 3/4", 1" or 1-1/2" FNPT process connections
- Suitable for horizontal or vertical mounting orientations
- 4-pin M12 quick-disconnect
- IP65/IP67 protection rating
- 2-year warranty





Overview

ProSense FSC series digital flow sensors monitor liquid media and provides two outputs that can be configured for switching, frequency, or analog signals for either flow rate or temperature.

Output OUT1 selection options:

· Frequency or switching output for flow or temperature

Output OUT2 selection options

 Analog or switching output for flow or temperature

Configuration and process variable monitoring are accomplished with the push buttons and a 4-digit, two-color digital display. The ProSense FSC series sensing principle is based on differential pressure which ensures an extremely fast response time and allows for a precise flow measurement.

The ProSense FSC series flow transmitters are ideal for applications with rapid temperature changes or where fast response time is required, such as:

- · Machine tool coolant flow
- · HVAC cooling water flow
- Injection molding cooling water flow



See www.AutomationDirect.com for wiring options.

P	ProSense FSC Series Digital Flow Sensors Technical Specifications					
Model	FSC75-00-42-6H	FSC75-00-42-10H	FSC1-00-42-27H	FSC15-00-42-50H		
Price	\$260.00	\$260.00	\$270.00	\$370.00		
Drawing	<u>PDF</u>	PDF	PDF	PDF		
Weight	TBA	TBA	TBA	TBA		
Range	0 to 6 GPM	0 to 10 GPM	0 to 27 GPM	0 to 50 GPM		
Process Connection	3/4" FNPT	3/4" FNPT	1" FNPT	1-1/2" FNPT		
		Electrical				
Operating Voltage		18 to 30 VDC	(SELV/PELV)*			
Electrical Connection	M12 (note: tightening torque < 0.6 Nm based on cable)					
Connection Pin Material	Gold-plated					
Current Consumption	<50mA					
		Output Functions				
Output Type / Function	OUT1: switch (N.O. or N.C. / PNP or NPN) or frequency OUT2: switch (N.O. or N.C. / PNP or NPN) or analog					
Switch/Pulse/Frequency Outputs	PNP / NPN Selectable; N.O. / N.C. Selectable					
Analog Output	4-20 mA ,max 22mA					
Digital Outputs	2					
Output Function	Normally open / normally closed					
Max. Voltage Drop Switching Output DC	2V					
Current Rating of Switching Output DC	150mA; (per output 2 x 200 (140 °F); 2 x 250 (104 °F))					
Switching cycles (mechanical)	10 million					
Analog Outputs	1					
Analog Output	4-20 mA (sourcing)					
Maximum Load	500Ω					
Short-Circuit Protection	Yes					
Overload Protection	Yes					
Output Frequency	0 to 10 kHz					

^{*} Voltage Supply According to EN50178 SELV (Safety Extra-Low Voltage) / PELV (Protected Extra-Low Voltage)

Properties Digital Flow Sensors

temperature: +71.6 °F ± 4K) Flow Monitoring (Repeatability) Temperature Monitoring Temperature Monitoring Response Times Response Times Response Times Response Times Damping process value dAP Damping for the analogue output dAA Dynamic response To5 / To9 Parameter Setting Options Temperature Monitoring Display unit Switching status Programming Switching status Alphanumeric display, red/green 4-digit Alphanumeric display, 4-digit Operating Conditions Ambient Temperature Medium Temperature Flow Monitoring Temperature: +71.6 °F ± 4K) NEW NEW NEW NEW NEW NEW NEW NE						
Measuring Range		ProSense FSC Series Digital Flow Sensors Technical Specifications			ns en	
Measuring Range	Model	FSC75-00-42-6H	FSC75-00-42-10H	FSC1-00-42-27H	FSC15-00-42-50H	
Display Range		Measuring / Setting Range				
Resolution	Measuring Range	0.1 to 6 GPM	0.2 to 10 GPM	0.5 to 27 GPM	1 to 50 GPM	
Set Point, SP	Display Range	0 to 7.2 GPM	0 to 12 GPM	0 to 32.4 GPM	0 to 60 GPM	
Reset Point, rP	Resolution	0.05 GPM	0.1 GPM	0.1 GPM	0.2 GPM	
Temperature Monitoring Accuracy Temperature Monitoring Accuracy Acc	Set Point, SP	0.05 to 6 GPM	0.1 to 10 GPM	0.2 to 27 GPM	0.4 to 50 GPM	
In Steps Of 0.05 GPM	Reset Point, rP	0 to 5.95 GPM	0 to 9.9 GPM	0 to 26.8 GPM	0 to 49.6 GPM	
Temperature Monitoring Fequency at the End Point, FEP Fequency Start Point, FEP Fequency End Point, Fep	Frequency End Point, FEP	0.4 to 6 GPM	0.67 to 10 GPM	1.8 to 27 GPM	3.4 to 50 GPM	
Measuring Dynamics	In Steps Of	0.05 GPM	0.1 GPM	0.1 GPM	0.2 GPM	
			10 to 1	0,000 Hz		
Messuring Range 14 to 212°F (-10 to 100°C)*	Measuring Dynamics		1	:50		
Resolution 2°F (-16.7°C) 16 to 21°F (-32.3 to 122.2°C)		Temperature Monitoring				
Resolution 2°F (-16.7°C)	Measuring Range	14 to 212°F (-10 to 100°C)*				
Reset Point SP	Display Range	-26 to 252°F (-32.3 to 122.2°C)				
Reset Point rP 14 to 210°F (-10 to 98.9°C) In Steps of 2°F (-16.7°C)	Resolution	2°F (-16.7°C)				
	Set Point SP	16 to 212°F (-8.9 to 100°C)				
Frequency Start Point, FSP 14 to 172°F (-10 to 77.8°C)	Reset Point rP	14 to 210°F (-10 to 98.9°C)				
Frequency End Point, FEP Frequency at the End Point, FRP Frequency at the End Point, FRP Flow Monitoring (Accuracy) Flow Monitoring (Accuracy) Temperature: +71.6 "F ± 4K) Temperature Monitoring Response Times Response Times Response Times Response Times Accuracy Repeatability Temperature Monitoring Response Times Response Times Response Times Damping for the analogue output dAA Damping for the analogue output dAA Dynamic response T05 / T09 Parameter Setting Options Display Measured values Programming Ableature Temperature 14 to 212°F (-10 to 60°C) Accuracy Accuracy Accuracy Accuracy Accuracy Accuracy Alphanumeric display, 4-digit Operating Conditions Ambient Temperature 14 to 212°F (-15 to 80°C) Protection 10 to 10,000 Hz £ 4(% MW + 1 % MEW); £ 4(% MW + 1 % MEW); £ 4(% MW + 1 % MEW); Accuracy Accu	In Steps Of	2°F (-16.7°C)				
Flow Monitoring (Accuracy) Flow Monitoring (Accuracy) Flow Monitoring (Accuracy) Temperature Monitoring Response time Damping process value dAP Damping for the analogue output dAA Damping for the analogue output dAA Damping for the analogue output dAA Damping brown output; display can be rotated and switched off; standard unit of measurement; process value color Display unit Setting / Programming Hysteresis / window; normally open / normally closed; switching logic; current output; medium selection; damping for the switching output / analooutput; display can be rotated and switched off; standard unit of measurement; process value color Display unit Setting Conditions Ambient Temperature MeW 10 to 10,000 Hz 4 (4 % MW + 1 % MEW); (Q > 2 l/min; medium and operating temperature: +71.6 "F ± 4K) (Q > 2 l/min; medium and operating temperature: +71.6 "F ± 4K) MEW 8 (Q > 2 l/min; medium and operating temperature: +71.6 "F ± 4K) MEW 8 (Q > 2 l/min; medium and operating temperature: +71.6 "F ± 4K) MEW 8 (Q > 2 l/min; medium and operating temperature: +71.6 "F ± 4K) MEW 8 (Q > 2 l/min; medium and operating temperature: +71.6 "F ± 4K) MEW 8 (Q > 2 l/min; medium and operating temperature: +71.6 "F ± 4K) MEW 8 (Q > 2 l/min; medium and operating temperature: +71.6 "F ± 4K) MEW 8 (Q > 2 l/min; medium and operating temperature: +71.6 "F ± 4K) MEW 8 (Q > 2 l/min; medium and operating temperature: +71.6 "F ± 4K) NEW; (Q > 2 l/min; medium and operating temperature: +71.6 "F ± 4K) MEW 8 (Q > 2 l/min; medium and operating temperature: +71.6 "F ± 4K) NEW; (Q > 2 l/min; medium and operating temperature: +71.6 "F ± 4K) NEW; (Q > 2 l/min; medium and operating temperature: +71.6 "F ± 4K) NEW; (Q > 2 l/min; medium and operating temperature: +71.6 "F ± 4K) NEW; (Q > 1 l/min; medium and operating temperature: +71.6 "F ± 4K) NEW; (Q > 1 l/min; medium and operating temperature: +71.6 "F ± 4K) NEW; (Q > 1 l/min; medium and operating temperature: +71.6 "F ± 4K) NEW; (Q > 1 l/min; medium and operating t	Frequency Start Point, FSP	14 to 172°F (-10 to 77.8°C)				
### Accuracy Committering Committering Emperature	Frequency End Point, FEP	54 to 212°F (-12.2 to 100°C)				
## Separature Monitoring (Accuracy) \$\pmu(9.0.5\text{l/min, medium and operating temperature: +71.6\text{ 'F ± 4K'})} \ \$\pmu(9.5\text{l/min, medium and operating temperature: +71.6\text{ 'F ± 4K'})} \ \$\pmu(9.5\text{l/min, medium and operating temperature: +71.6\text{ 'F ± 4K'})} \ \$\pmu(9.5\text{l/min, medium and operating temperature: +71.6\text{ 'F ± 4K'})} \ \$\pmu(9.5\text{l/min, medium and operating temperature: +71.6\text{ 'F ± 4K'})} \ \$\pmu(9.5\text{l/min, medium and operating temperature: +71.6\text{ 'F ± 4K'})} \ \$\pmu(9.5\text{l/min, medium and operating temperature: +71.6\text{ 'F ± 4K'})} \ \$\pmu(9.5\text{l/min, medium and operating temperature: +71.6\text{ 'F ± 4K'})} \ \$\pmu(9.5\text{l/min, medium and operating temperature: +71.6\text{ 'F ± 4K'})} \ \$\pmu(9.5\text{l/min, medium and operating temperature: +71.6\text{ 'F ± 4K'})} \ \$\pmu(9.5\text{l/min, medium and operating}} \ \$\pmu(9.5l/min, medium and opera		10 to 10,000 Hz				
Color Simin; medium and operating temperature; +71.6 °F ± 4K) Color Simin; medium and operating temperature; +71.6 °F ± 4K) Color Simin; medium and operating temperature; +71.6 °F ± 4K) Color Simin; medium and operating temperature; +71.6 °F ± 4K) Color Simin; medium and operating temperature; +71.6 °F ± 4K) Color Simin; medium and operating temperature; +71.6 °F ± 4K) Color Simin; medium and operating temperature; +71.6 °F ± 4K) Color Simin; medium and operating temperature; +71.6 °F ± 4K) Color Simin; medium and operating temperature; +71.6 °F ± 4K) Color Simin; medium and operating temperature; +71.6 °F ± 4K) Color Simin; medium and operating temperature; +71.6 °F ± 4K) Color Simin; medium and operating temperature; +71.6 °F ± 4K) Color Simin; medium and operating temperature; +71.6 °F ± 4K) Color Color Simin; medium and operating temperature; +71.6 °F ± 4K) Color Color Simin; medium and operating; temperature; +71.6 °F ± 4K) Color Color Simin; medium and operating; temperature; +71.6 °F ± 4K) Color Co		Accuracy				
Temperature Monitoring	Flow Monitoring (Accuracy)	(Q > 0.5 l/min; medium and operating	(Q > 1 l/min; medium and operating	(Q > 2 l/min; medium and operating	± (4 % MW + 1 % MEW); (Q > 1 l/min; medium and operating temperature: +71.6 °F ± 4K)	
Temperature Monitoring Temperature drift Accuracy Tesponse Times Response Times Response Times Response Times Response Times O.01s Damping process value dAP Damping for the analogue output dAA Toto 5 s Temperature Monitoring Dynamic response T05 / T09 Parameter Setting Options Tesponse Times Nisplay Hysteresis / window; normally open / normally closed; switching logic; current output; medium selection; damping for the switching output / analooutput; display can be rotated and switched off; standard unit of measurement; process value color Switching status Display Measured values Alphanumeric display, red/green 4-digit Programming Alphanumeric display, 4-digit Operating Conditions Ambient Temperature Medium Temperature 14 to 212°F (-10 to 100°C) Storage Temperature From Monitoring Storage Temperature Storage Temperature Passons Times 0.01s Storage Temperature Ones Torage Temperature Storage Temperature Passons Times Ones Storage Temperature Storage Temperature Passons Times Ones Storage Temperature Storage Temperature Passons Times Ones Storage Temperature Ones Torage Temperature Storage Temperature Temperature Storage Temperature T			±1% MEW			
Response time 0.01s		Temperature drift 0.9802 °F / K				
Response time 0.01s	Temperature Monitoring	Accuracy		3 K (77 °F; Q > 1 l/min)		
Damping process value dAP 0 to 5 s			Response Times			
Damping for the analogue output dAA 0 to 5 s Temperature Monitoring Dynamic response T05 / T09 T09 = 120 (Q > 1 l/min) Setting / Programming Parameter Setting Options Hysteresis / window; normally open / normally closed; switching logic; current output; medium selection; damping for the switching output / analogoutput; display can be rotated and switched off; standard unit of measurement; process value color Display Unit 3 x LED, green Switching status 2 x LED, yellow Measured values Alphanumeric display, red/green 4-digit Programming Alphanumeric display, 4-digit Operating Conditions Ambient Temperature 32 to 140°F (0 to 60°C) Medium Temperature 14 to 212°F (-10 to 100°C) Storage Temperature 5 to 176°F (-15 to 80°C) Protection IP 65 / IP 67						
Temperature Monitoring Dynamic response T05 / T09 Setting / Programming Hysteresis / window; normally open / normally closed; switching logic; current output; medium selection; damping for the switching output / analo output; display can be rotated and switched off; standard unit of measurement; process value color Display unit Switching status 2 x LED, green Switching status Alphanumeric display, red/green 4-digit Programming Alphanumeric display, 4-digit Operating Conditions Ambient Temperature Medium Temperature 14 to 212°F (-10 to 100°C) Storage Temperature Fortection Togs = 120 (Q > 1 I/min) Setting / Programming Alphanum selection; damping for the switching output / analo output / analo output; display can be rotated and switched off; standard unit of measurement; process value color 3 x LED, green 2 x LED, yellow Alphanumeric display, 4-digit Operating Conditions Ambient Temperature 14 to 212°F (-10 to 100°C) Storage Temperature Fortection	Flow Monitoring					
Parameter Setting Options						
Hysteresis / window; normally open / normally closed; switching logic; current output; medium selection; damping for the switching output / analogoutput; display can be rotated and switched off; standard unit of measurement; process value color Display unit	Temperature Monitoring					
Output; display can be rotated and switched off; standard unit of measurement; process value color Display unit Switching status 2 x LED, green Switching status Alphanumeric display, red/green 4-digit Programming Alphanumeric display, 4-digit Operating Conditions Ambient Temperature 32 to 140°F (0 to 60°C) Medium Temperature 14 to 212°F (-10 to 100°C) Storage Temperature 5 to 176°F (-15 to 80°C) Protection		Setting / Programming				
Switching status Measured values Programming Alphanumeric display, red/green 4-digit Programming Alphanumeric display, 4-digit Operating Conditions Ambient Temperature 32 to 140°F (0 to 60°C) Medium Temperature 14 to 212°F (-10 to 100°C) Storage Temperature 5 to 176°F (-15 to 80°C) Protection IP 65 / IP 67	Parameter Setting Options	Hysteresis / window; normally open / normally closed; switching logic; current output; medium selection; damping for the switching output / analog output; display can be rotated and switched off; standard unit of measurement; process value color				
Measured values Programming Alphanumeric display, red/green 4-digit Alphanumeric display, 4-digit Operating Conditions Ambient Temperature 32 to 140°F (0 to 60°C) Medium Temperature 14 to 212°F (-10 to 100°C) Storage Temperature 5 to 176°F (-15 to 80°C) Protection IP 65 / IP 67		Display unit	3 x LED, green			
Measured values Programming Alphanumeric display, red/green 4-digit Operating Conditions Ambient Temperature 32 to 140°F (0 to 60°C) Medium Temperature 14 to 212°F (-10 to 100°C) Storage Temperature 5 to 176°F (-15 to 80°C) Protection IP 65 / IP 67	Display	Switching status	2 x LED, yellow			
Operating Conditions Ambient Temperature 32 to 140°F (0 to 60°C) Medium Temperature 14 to 212°F (-10 to 100°C) Storage Temperature 5 to 176°F (-15 to 80°C) Protection IP 65 / IP 67		Measured values	Alphanumeric display, red/green 4-digit			
Operating Conditions Ambient Temperature 32 to 140°F (0 to 60°C) Medium Temperature 14 to 212°F (-10 to 100°C) Storage Temperature 5 to 176°F (-15 to 80°C) Protection IP 65 / IP 67		Programming	Alphanumeric display, 4-digit			
Medium Temperature 14 to 212°F (-10 to 100°C) Storage Temperature 5 to 176°F (-15 to 80°C) Protection IP 65 / IP 67			Operating Conditions			
Storage Temperature 5 to 176°F (-15 to 80°C) Protection IP 65 / IP 67	Ambient Temperature					
Storage Temperature 5 to 176°F (-15 to 80°C) Protection IP 65 / IP 67	Medium Temperature	14 to 212°F (-10 to 100°C)				
	Storage Temperature		5 to 176°F	(-15 to 80°C)		
Pressure Rating 580nsi 360nsi	Protection	IP 65 / IP 67				
p rooter o rearing	Pressure Rating	580psi 360psi)psi	
	Medium Temperature Storage Temperature Protection	5 to 176°F (-15 to 80°C) IP 65 / IP 67				

^{*} Note for ambient temp: 32 to 140°F (0 to 60°C) when medium temp is less than 176°F (80°C). When medium temp is 176 to 212°F (80 to 100°C), the ambient temp is limited to 32 to 104°F (0 to 60°C).



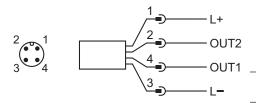
Note: Check the chemical compatibility of the sensor's wetted parts with the medium to be measured.

www.automationdirect.com Flow Sensors tFLS-47

Orsense FSC Series Digital Flow Sensors

ProSense FSC Series Digital Flow Sensors Technical Specifications							
Model	<u>FSC75-00-42-6H</u>	FSC15-00-42-50H					
	Mechanical Data						
Medium	Liquids (water, glycol solutions, oils), use of 200 micron filter recommended						
Housing Material	Stainless steel (1.4404 / 316L); PBT+PC-GF30; PBT-GF20; PC; brass chemically nickel-plated						
Materials (wetted parts)	Stainless steel (316 / 1.4401); stainless steel (1.4404 / 316L); brass (2.0371); brass chemically nickel-plated; brass (2.0371); brass chemically nickel-plated; pPS; O-ring: FKM Spacer: POM						
Process Connection	3/4" FNPT 1" FNPT 1-1/2" F		1-1/2" FNPT				
	Tests / Approvals						
EMC	DIN EN 61000-6-2; DIN EN 61000-6-3						
Shock Resistance	DIN EN 60068-2-27: 20g (11ms)						
Vibration Resistance	DIN EN 60068-2-6: 5g (10 to 2000 Hz)						
MTTF	145 Years 170 Years						
Agency Approvals	cULus (#E320431), CE						

Wiring Diagrams



Cable Assembly Wiring Colors:

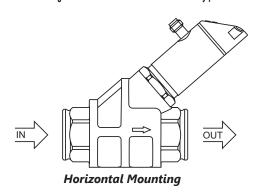
Pin 1 - Brown Pin 2 - White Pin 3 - Blue Pin 4 - Black

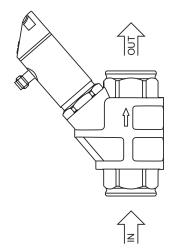
Note: Wiring colors are based on AutomationDirect CD12L and CD12M 4-pole cable assemblies.

Installation*:

For proper operation, please observe the flow direction arrows on the body of the sensor. The mounting orientation does not effect the operation of the unit.

* Integral check valve design allows the sensor to be mounted in any position.





Vertical Mounting



- 1. Ferromagnetic materials in the surrounding environment should be at least 50mm from the housing of the unit.
- 2. Ferromagnetic piping may be used on the inlet and outlet connections.
- 3. Do not operate the unit in the vicinity of magnetic constant and alternating fields (e.g. welding systems).
- 4. If the sensors are installed side by side, observe a minimum distance of 50mm between the sensor axes.
- 5. Avoid downward flow in unpressurized pipes.

Orsense FSC Series Digital Flow Sensors

Operation

The flow sensor utilizes a spring-supported piston that is lifted by the flowing medium. The flow rate is determined by monitoring the piston position and converting it to an analog output signal. The spring resistance forces the piston to return to its original position with decreasing flow, preventing backflow. This allows the sensor to be mounted in any position (horizontally or vertically) and function as a check valve.

Part Number	Flow Measuring Range (Gallons/Minute)	
FSC75-00-42-6H	0 to 6	
FSC75-00-42-10H	0 to 10	
FSC1-00-42-27H	0 to 27	
FSC15-00-42-50H	0 to 50	





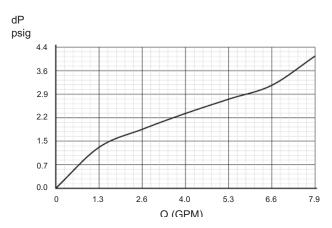
Click or scan the above QR code to be taken to the installation insert for the FSA Series Flow Transmitters

Function

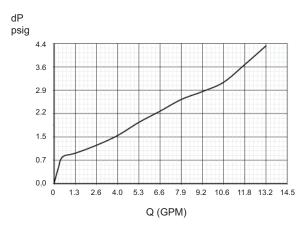
The analog signal for water $(20^{\circ}\text{C }[68^{\circ}\text{F}])$ is linear from 4.3 mA to 20mA (4mA = no flow). For an output signal >20mA the flow rate is above the final value of the measuring range.

Pressure Loss/Flow Rate*

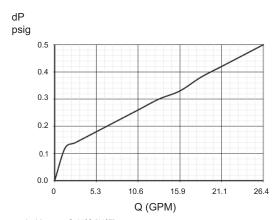
FSC75-00-42-6H



FSC75-00-42-10H



FSC1-00-42-27H



* when used with water @ 20°C [68°F]

FSC15-00-42-50H

