FLUID COMPONENTS INTERNATIONAL LLC

Air & Gas Mass Flow Meters
Gas & Liquid Flow Switches, Level Switches

CONTENTS

FCI® FLUID COMPONENTS INTERNATIONAL LLC

Flow and Level Instrumentation Solutions for Industrial Processes

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- **Analog and Digital Bus Communications**
- **Exclusive Flow Conditioners Solve Installation Constraints**

Fluid Components International solves flow and level measurement applications for industrial process and plant applications using patented thermal dispersion flow measurement technologies. With more than five decades of experience and the world's largest installed base of thermal dispersion instruments, you can count on FCI to know your application and have proven solutions that will save you time and expense. From off-the-shelf products to custom engineered products and systems, FCI has the selection and an unequalled record of innovations to supply the optimal product for your application. From single-point to multi-point flow meters, from basic air flow to complex mixed, variable flare gas compositions, from water to the harshest of chemicals, FCI products will deliver superior accuracy, repeatability and long-term reliability at the lowest installed cost.

Chemical

Wastewater Treatment

Power & Energy

Oil & Gas

Petroleum

Pulp & Paper

Metals

Nuclear Power

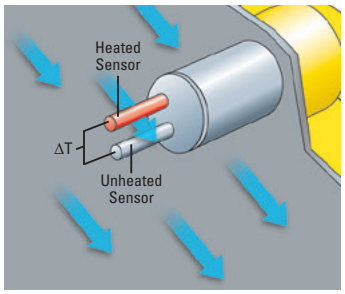
Mining

Food & Beverage

Mass Flow Meters—Thermal Dispersion

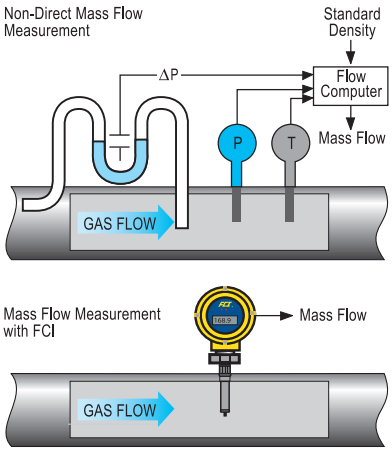
- Air and Gas Applications
- Direct Mass Flow Measuring
- No Moving Parts
- Low Cost Solution for Large Line Sizes
- Wide Turn-Down Ratio, to 1000:1
- Apply in Air / Gases to 850 °F [454 °C]
- SIL1 and SIL 2 Compliance

Thermal dispersion provides a gas flow measuring solution that is easy to install and virtually maintenance-free to save you time and costs. It has no moving parts and is inherently multivariable, measuring both flow and temperature. Insertion styles are particularly well suited for larger line size applications because probe length and the number of sensors are easily and economically added. Thermal dispersion technology places two thermowell protected platinum RTD temperature sensors in the process stream. One RTD is heated while the other senses the actual process temperature. The temperature difference between these sensors is measured and is proportional to the mass flow rate of the fluid.



FCI Air / Gas Mass Flow Meter Solution

FCI flow meters feature a patented no-moving parts flow element design that provides direct mass flow measurement with just a single process penetration. This saves space and eliminates unnecessary installation, expense, and performance degradation associated with separate temperature and pressure sensors, and density calculation devices needed with inferred mass flow techniques. With no moving parts to plug or foul, FCI flow meters deliver extensive cost savings over alternative high maintenance technologies. The result is an accurate and highly repeatable mass flow measurement at the lowest total installed cost. In today's complex process control schemes, FCI flow meters provide accurate gas flow measurements essential for process consistency, quality and safe plant operation.



Flow Switches

- Air, Gas, Liquid, Slurry Applications
- Dual and Single Relay Output Models
- No Mechanical Parts to Maintain
- Apply in Fluids to 850 °F [454 °C]
- Easy to Install and Set-up
- SIL 2 Compliance

FCI flow switches utilize thermal dispersion technology to provide fast response, accurate fluid flow sensing. FCI's FLT® Series and FS10 flow switch products provide an extensive selection for performance, features, functions and environmental packaging options to meet a wide range of flow applications and installation requirements. The Model FS10A is specifically designed for flow monitoring in analyzers and sampling systems.

HART REGISTERED PROFIBUS FOUNDATION MODBUS

Level Switches

- High Reliability, No Moving Parts
- Dual Function, Level and Temperature
- AC, DC and Loop Powering Options
- 3-Phase Detection
- Interface Between Two Non-Miscible Fluids
- SIL 2 Compliance

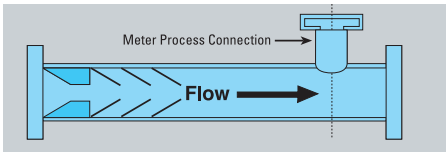
FCI liquid level and interface switches provide fast responding and accurate fluid level alarm or setpoint control. They sense the temperature difference between a heated sensor and an unheated reference sensor, where the difference is greatest in the absence of liquid and decreases proportionally as the elements are submerged in various fluids with varying thermal conductivities. When submerged the heated sensor cools as it dissipates heat and in turn, a change in magnitude of the temperature difference. Because all fluids exhibit different heat transfer characteristics FCI's highly sensitive level switch technology can detect historically difficult interface applications between fluids such as liquids, gases, emulsions, slurries and foam, regardless of their physical properties.

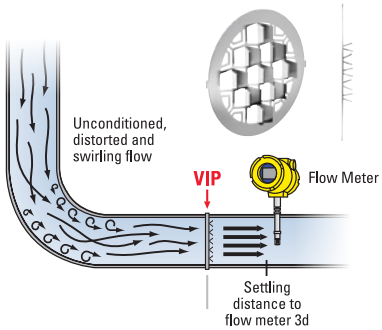
OEM and Custom Solutions

For unique applications or installation conditions, FCI has the technology, engineering capabilities and production capability to meet your needs. Whether you need a slight modification to a standard FCI product or a totally unique product solution designed from the ground up, FCI will work closely with you on a solution. FCI has produced an extensive array of OEM flow and level measuring solutions.

Exclusive Flow Conditioners Solve Tough Installations

For plant conditions with limited piping straight-run or significant flow disturbances, FCI ensures accurate and repeatable flow measurements using Vortab and patented Vortab VIP flow conditioners. Proven Vortab technology is widely recommended by industry experts, to be the single most effective solution for flow conditioning and flow straightening. FCI is the only thermal dispersion flow technology supplier authorized to provide Vortab flow conditioners with its products.





Beyond and Behind the Products

Included in your investment in FCI products are certifications, agency approvals, pedigrees and quality validations to meet and exceed your expectations. FCI products carry "full instrument" approvals for HazEx installations and are certified to regional standards throughout the world. For Safety Instrumented Systems (SIS), per IEC 61508 and 61511, FCI has more independently validated SIL compliant thermal dispersion technology solutions than any other manufacturer. FCI manufacturing is certified to the latest ISO-9001 standards, and your instrument will be calibrated on flow stands with equipment traceable to NIST and ISO/IEC 17025 (also see page 10). Certified material test reports, NACE certification, Oxygen cleaning, air or hydro pressure testing, dye penetrant or radiography test, positive material identification reports and more, are available as you may require. FCI post-sale support includes start-up assistance and site services, performed by thermal dispersion technology experts, FCI service technicians stationed throughout the world, depot service, repair and recalibrations. FCI goes beyond the product to ensure the most reliable, safe and longest service life solutions available.

Got an application challenge?

You will find FCI offers an extensive array of options and special solutions that ensure an optimal product for your installation or conditions. Examples include:

- *Extended temperature service*
- *Packing glands and ball valves for hot tap installations and easy retractability*
- *Exotic wetted materials and protective coatings*
- *VeriCal™, industry exclusive in-situ calibration verification system available for ST100A Series*
- *Nuclear qualified products*

Flow Meters





	FS10i	ST50	ST51 A	ST80	ST100 Series
Air/Gases	■	■	■	■	■
Insertion Type	■	■	■	■	■
In-line (Spool Piece)	■				
Model/Series	**FS10i**	**ST50**	**ST51/ST51A**	**ST80**	**ST100A Series**
Line Size Compatibility	1", 2", >2" to 20" [25mm, 51mm, >51 mm to 510 mm]	>2" to 24" [>51 mm to 610 mm]	>2" to 24" [>51 mm to 610 mm]	>2" to 99" [>51 mm to 2500 mm]	>2" to 99" [>51 mm to 2500 mm]
Key Features and Applications	• Small, compact • Air, compressed air, natural gas • Analog output and relay • SIL 2 rated • 10-segment LED	• Easy to install • Easy to specify • Small, compact package • Air and nitrogen applications • Dual analog outputs • Ideal for aeration and larger compressed air lines	• Easy to install • Easy to specify • Small, compact package • Biogas, digester gas, methane, natural gas applications • Dual analog outputs • Division 1 [Zone 1] approved	• High accuracy • HART, FOUNDATION™ Fieldbus, PROFIBUS, Modbus RS-485 • Graphical display • Up to 2 unique calibrations • Adaptive Sensing Technology • Fast response • Wet gas solution • 3-point calibration test	• Highest accuracy • HART, FOUNDATION™ Fieldbus, PROFIBUS, Modbus RS-485 • Graphical display • Up to 5 unique calibrations • Dual-element systems • VeriCal • Adaptive Sensing Technology • 3-point calibration test
Flow Rate	■	■	■	■	■
Total Flow		■ (opt)	■	■	■
Temperature Measurement		■	■	■	■
Pressure Measurement					■ (opt)
Flow Range [1,2]	1.25 SFPS to 400 SFPS [0,4 NMPS to 122 NMPS]	0.75 SFPS to 400 SFPS [0,2 NMPS to 122 NMPS]	0.3 SFPS to 400 SFPS [0,08 NMPS to 122 NMPS]	0.25 SFPS to 1,000 SFPS [4] [0,08 NMPS to 305 NMPS]	0.25 SFPS to 1,000 SFPS [4] [0,08 NMPS to 305 NMPS]
Turndown Ratio	100:1	100:1	100:1	100:1 to 1000:1	100:1 to 1000:1
Accuracy	±1.5% rdg, 0.5% FS	±1% rdg, 0.5% FS	±1% rdg, 0.5% FS	1.0% rdg, ±0.5% FS	0.75% rdg, ±0.5% FS
Repeatability	±0.5% rdg	±0.5% rdg	±0.5% rdg	±0.5% rdg	±0.5% rdg
Temp (max operating)	-40 °F to 250 °F [-40 °C to 121 °C]	0 °F to 250 °F [-18 °C to 121 °C]	0 °F to 350 °F [-18 °C to 177 °C]	-40 °F to 850 °F [-40 °C to 454 °C]	-40 °F to 850 °F [-40 °C to 454 °C]
Pressure (max operating) [3]	500 psig [34 bar (g)]	500 psig [34 bar (g)]	500 psig [34 bar (g)]	1,000 psig [70 bar (g)]	1,000 psig [70 bar (g)]
Flow Element Wetted Materials	Stainless steel with Hast-C tips	Stainless steel with Hast-C tips	Stainless steel with Hast-C tips	Stainless steel, Hast-C276	Stainless steel, Hast-C276
Transmitter Outputs (standard)	4-20 mA; SDPT Relay (1A)	(Dual) 4-20 mA; RS232C	(Dual) 4-20 mA; 0-500 Hz pulse of total flow; RS232C	(Dual) 4-20 mA with HART and Modbus, USB	(Triple) 4-20 mA with HART, Modbus 0-1kHz or 0-10 kHz, USB, Ethernet
Outputs (optional)		0-500 Hz pulse of total flow	HART (ST51 A) Modbus (ST51 A)	FOUNDATION Fieldbus; PROFIBUS-PA, PROFIBUS-DP, Modbus	FOUNDATION Fieldbus; PROFIBUS-PA
Integral or Remote Mounting	■ (integral only)	■	■	■	■
Digital Display Option		■	■	■	■
Power Supply	24 Vdc	AC, DC	AC, DC	AC, DC	AC, DC
Enclosure	Metal, NEMA 4X, IP64-66	Metal, NEMA 4X, IP66/67	Metal, NEMA 4X, IP66/67	Metal, NEMA 4X, IP67	Metal, NEMA 4X, IP67
Hazardous Location and Other Agency Approvals	FM, FMc, ATEX, IECEx, EAC, (ECAS, UKCA pending), CE *Refer to product brochure for approval details*	FM, CSA EAC, (ECAS, UKCA pending), CPA, CE, PED *Refer to product brochure for approval details*	FM, FMc, ATEX, IEC EAC, (ECAS, UKCA pending), NEPSI, CE, PED *Refer to product brochure for approval details*	FM, FMc, ATEX, IECEx, EAC, (ECAS, UKCA pending), NEPSI, CE *Refer to product brochure for approval details*	FM, FMc, ATEX, IECEx, EAC, (ECAS, UKCA pending), CPA, NEPSI, CE, Inmetro CRN, PED; *Refer to product brochure for approval details*
Other Features, Options	• Div 2/Zone 2 approvals • SIL 2 compliance • M12 or watertight cable connection • Namur NE43 fault output • Hysteresis and time delays		• Namur NE43 fault output • SIL compliance (ST51A)	• Namur NE43 fault output • Optical keypad option • SIL compliance	• Namur NE43 fault output • VeriCal in-situ calibration verification • Dual-element averaging • On-board data logger • Optical keypad • SIL compliance

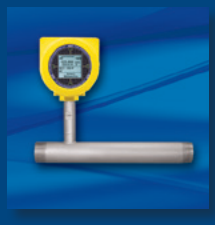
Thermal Dispersion Flow Meters

FCI offers the widest selection of thermal dispersion technology flow meters to provide solutions for industrial measurement of air and virtually any gas. They are direct mass flow measuring that will save you cost and installation time over other flow devices, that require installation of additional temperature and/or pressure sensors to merely "infer" mass flow. The meters are inherently dual-function, flow and temperature, to provide the lowest cost, best value for applications where fluid temperature is also required. With no moving parts or orifices to clog, these FCI flow meters provide long life with minimal maintenance.

There are seven core models with features, functions and packaging designed to optimize measurements in an array of applications and conditions. For line sizes greater than 2 inches [50 mm], FCI's "insertion" styles provide the economical, easy-to-install solution via a single tap point. For smaller lines, 2 inches [50 mm] or smaller, select the "in-line" styles.

FS10i is a small, light-duty economy meter for air, compressed air, or natural gas flow in line sizes from 1 inch to 20 inches [25 mm to 510 mm] in Div 2/Zone 2 and/or SIL 2 rated installations.

ST50, ST51, and ST51 A are compact and economical, yet full-featured insertion meters that are easy to install and specify. Model ST50 is designed for air, compressed air and nitrogen applications requiring Division 2 [Zone 2] or lower ratings. Model ST51A is designed for biogas, digester gas and other methane composition gases, or air and compressed air applications in Division 1 [Zone 1].

	MT100 Series	ST75 Series	ST80L	ST100L
				
	■	■	■	■
	■			
		■	■	■
	MT100 Series	**ST75 Series**	**ST80L**	**ST100AL**
	Large diameter pipes, stacks, and rectangular ducts	1/4" to 2" [6 mm to 51 mm]	1" to 2" [25 mm to 51 mm]	1" to 2" [25 mm to 51 mm]
	• Flow and temperature • Multiple flow elements • HART, FOUNDATION™ Fieldbus, PROFIBUS, Modbus • Up to eight (8) points per system • CEMS and AMS/QAL1 reporting	• NPT or tubing connections • Easy to specify • Small, compact package • Rate and total flow outputs • Ideal for fuel gas and gas injection applications • Natural gas submetering	• High accuracy • HART, FOUNDATION Fieldbus, PROFIBUS, Modbus RS-485 • Adaptive Sensing Technology • Graphical display • Up to 2 unique calibrations • Fast response • 3-point calibration test	• Highest accuracy • HART, FOUNDATION Fieldbus, PROFIBUS PA, Modbus RS-485 • Graphical display • Up to 5 unique calibrations
	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
	0.25 SFPS to 1,000 SFPS [0,08 NMPS to 305 NMPS]	0.01 SCFM to 839 SCFM[5] [0,01 NCMH to 1425 NCMH]	0.006 SCFM to 838 SCFM[4,5] [0,01 NCMH to 1425 NCMH]	0.006 SCFM to 838 SCFM[4,5] [0,01 NCMH to 1425 NCMH]
	100:1	100:1	100:1 to 1000:1	100:1 to 1000:1
	1.75 % rdg, ±0.5% FS	±1% rdg, 0.5% FS	±1.0% rdg, ±0.5% FS	0.75 % rdg, ±0.5% FS
	±0.5% rdg	±0.5% rdg	±0.5% rdg	±0.5% rdg
	-50 °F to 850 °F [-45 °C to 454 °C]	0 °F to 250 °F [-18 °C to 121 °C]	-40 °F to 257 °F [-40 °C to 125 °C]	-40 °F to 257 °F [-40 °C to 125 °C]
	1,000 psig [70 bar (g)]	600 psig [41 bar (g)]	3,000 psig [207 bar (g)]	3,000 psig [207 bar (g)]
	Stainless steel	Stainless steel with Hast-C tips	Stainless steel, Hast-C276	Stainless steel, Hast-C276
	(Dual) 4-20 mA with HART, Modbus, 0-1kHz, USB, Ethernet	(Dual) 4-20 mA, 0-10 Vdc & 0-500 Hz pulse; RS232C	(Dual) 4-20 mA with HART and Modbus, USB	(Triple) 4-20 mA with HART, Modbus 0-1kHz or 0-10 kHz, USB, Ethernet
	FOUNDATION Fieldbus; PROFIBUS-PA, Modbus	HART (ST75 A, ST75 AV) Modbus (ST75 A, ST75 AV)	FOUNDATION Fieldbus; PROFIBUS-PA, PROFIBUS-DP	FOUNDATION Fieldbus; PROFIBUS-PA
	■ (remote)	■	■	■
	■	■	■	■
	AC, DC	AC, DC	AC, DC	AC, DC
	Metal, NEMA 4X, IP66	Metal, NEMA 4X, IP66/67	Metal, NEMA 4X, IP67	Metal, NEMA 4X, IP67
	FM, FMc, ATEX, IECEx, EAC, (ECAS, UKCA pending), CEMS, AMS/QAL1, CRN (MT100S) *Refer to product brochure for approval details*	FM, FMc, ATEX, IECEx EAC, (ECAS, UKCA pending), NEPSI, CE, PED, CRN *Refer to product brochure for approval details*	FM, FMc, ATEX, IECEx, EAC, CRN, (ECAS, UKCA pending), NEPSI *Refer to product brochure for approval details*	FM, FMc, ATEX, IECEx, EAC, CRN, (ECAS, UKCA pending), CPA, NEPSI, CE, Inmetro *Refer to product brochure for approval details*
	• Namur NE43 fault output • Calibration self-test • On-board data logger • LCD readout with touch-type screen	• Built-in Vortab flow conditioner (ST75AV) • Namur NE43 fault output • SIL compliance (ST75 A, ST75 AV)	• Namur NE43 fault output • Built-in Vortab flow conditioner • Optical keypad option • SIL compliance	• Namur NE43 fault output • Built-in Vortab flow conditioner • On-board data logger • Optical keypad • SIL compliance • 4-20 mA input

VeriCal is a patented in-situ flow meter calibration verification system exclusively offered by FCI in ST100A Series flow meters

FCI flow meters provide long life with minimal maintenance

Notes:

1. Actual measuring range may vary depending on specific model code and fluid
2. SFPS is 70 °F at 14.7 psia [NMPS is 0 °C at 1,01325 Bar (a)]
3. Higher pressure ratings available, contact FCI
4. Higher flow ranges may be possible depending on application specifics, contact FCI
5. Line size dependent

ST75 Series are compact, in-line meters with extensive standard features that is the economical, easy-to specify alternative to other maintenance-intensive flow technologies. Models with an "A" suffix (ST75A, ST75AV) include HART and SIL compliance. Models with a "V" suffix (ST75V, ST75AV) include built-in Vortab flow conditioners and have an extensive selection of process connections, including flanges.

ST80 and ST80 L, with outstanding accuracy, measuring range, and functions, are the "go to" solution to meet most applications. Their broad capabilities allow plants to standardize multiple application solutions utilizing dependable thermal flow meter technology throughout their operation.

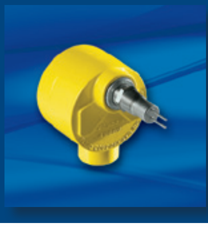
ST100 A Series and ST100 AL is industry's most comprehensive and feature-rich gas flow meter solution. Best accuracy, extensive selection of analog and digital bus outputs, best-in-class graphical readout, up to five calibrations, pressure measurement option, dual inputs and on-board data logging are all industry exclusives you will find in the ST100A family.

MT100 Series meters are designed specifically to measure flow rate in large diameter pipes, stacks and ducts. These multipoint air/gas flow meters deploy from 2 to 8 non-fouling, non-clogging sense points in one mast-type assembly or single-point arrays inserted into the flow stream and averaged together. The transmitter provides state-of-the-art features and functions in a rugged, highest quality stainless steel enclosure. Now TÜV Rheinland Certified AMS Compliant per DIN EN15267 with QAL1.

Flow Switches & Level Sensors

FLT93 B

FLT93 F



FLT93 S

FLT93 L

FLT93 C

	FLT Series				
Air/Gas Flow Switch	■	■	■	■	■
Liquid Flow Switch	■		■	■	■
Level/Interface Switch	■	■	■	■	■
Model/Series	**FLT93 B**	**FLT93 F**	**FLT93 S**	**FLT93 L**	**FLT93 C**
Line Size Compatibility (in flow applications)	1" to 100" [25 mm to 2500 mm]	1" to 100" [25 mm to 2500 mm]	1" to 100" [25 mm to 2500 mm]	1/4" to 1" [6 mm to 25 mm]	1" to 100" [25 mm to 2500 mm]
Key Features and Applications	• General Purpose • Dual, Heavy-duty Relay Outputs • SIL 2	• Fast Response • Small Process Connection • Dual, Heavy-duty Relay Outputs • SIL 2	• Heavy-duty • Highest Temperature Service • Retractable Packing Glands • Dual, Heavy-duty Relay Outputs • SIL 2	• In-line Style • Small Line Sizes • Superior Low Flow Detection • Dual, Heavy-Duty Relay Outputs • SIL 2	• Sanitary Applications • Meets 3A Requirements • Dual, Heavy-Duty Relay Outputs • SIL 2
Flow Capabilities[1,2]					
Range-Air/Gas	0.25 FPS to 120 FPS [0,08 MPS to 37 MPS]	0.25 FPS to 120 FPS [0,08 MPS to 37 MPS]	0.25 FPS to 120 FPS [0,08 MPS to 37 MPS]	0.6 cc/sec to 20,000 cc/sec	0.25 FPS to 120 FPS [0,08 MPS to 37 MPS]
Range-Liquids: Water/Water based	0.01 FPS to 3.0 FPS [0,003 MPS to 0,9 MPS]	n/a	0.01 FPS to 3.0 FPS [0,003 MPS to 0,9 MPS]	0.015 cc/sec to 50 cc/sec	0.01 FPS to 3.0 FPS [0,003 MPS to 0,9 MPS]
Range-Liquids: Hydrocarbon based	0.01 FPS to 5.0 FPS [0,003 MPS to 1,5 MPS]	n/a	0.01 FPS to 5.0 FPS [0,003 MPS to 1,5 MPS]	0.033 cc/sec to 110 cc/sec	0.01 FPS to 5.0 FPS [0,003 MPS to 1,5 MPS]
Accuracy	±5% rdg; ±2% of Setpoint	±5% rdg; ±2% of Setpoint	±5% rdg; ±2% of Setpoint	±5% rdg; ±2% of Setpoint	±5% rdg; ±2% of Setpoint
Repeatability	±0.5% rdg	±0.5% rdg	±0.5% rdg	±0.5% rdg	±0.5% rdg
Level Capabilities					
Accuracy	±0.25 inch ±[6,4 mm]	±0.1 inch ±[2,5 mm]	±0.25 inch ±[6,4 mm]	±0.25 inch ±[6,4 mm]	±0.25 inch ±[6,4 mm]
Repeatability	±0.125 inch ±[3,2 mm]	±0.05 inch ±[1,3 mm]	±0.125 inch ±[3,2 mm]	±0.125 inch ±[3,2 mm]	±0.125 inch ±[3,2 mm]
Temperature Compensation	■	■	■	■	■
Sensor Operating Temp Range	-40 °F to 350 °F [-40 °C to 177 °C]	-40 °F to 350 °F [-40 °C to 177 °C] opt: 100 °F to 500 °F [-73 °C to 260 °C]	-40 °F to 350 °F [-40 °C to 177 °C] opt: 100 °F to 500 °F [-73 °C to 260 °C] opt: -100 °F to 850 °F [-73 °C to 454 °C]	-40 °F to 350 °F [-40 °C to 177 °C] opt: 100 °F to 500 °F [-73 °C to 260 °C]	-40 °F to 350 °F [-40 °C to 177 °C] opt: 100 °F to 500 °F [-73 °C to 260 °C]
Sensor Operating Pressure[3]	2,350 psig [162 bar (g)]	2,350 psig to 3,500 psig [162 bar (g) to 241 bar (g)]	1,450 psig to 3,500 psig [100 bar (g) to 241 bar (g)]	2,350 psig to 3,500 psig [162 bar (g) to 241 bar (g)]	1,500 psig [103 bar (g)]
Flow Element Wetted Materials	Stainless Steel	Stainless Steel, SSI-Electro-polish, Hastelloy, Monel	Stainless Steel, Hastelloy, Monel, Titanium	Stainless Steel, Hastelloy, Monel, Titanium	Stainless Steel (20Ra Polished)
Transmitters					
Outputs/Control Circuit	Dual SPDT or Single DPDT Relays, 6A DC Voltage Output for Calibration, DC Voltage of Temperature	Dual SPDT or Single DPDT Relays, 6A DC Voltage Output for Calibration, DC Voltage of Temperature	Dual SPDT or Single DPDT Relays, 6A DC Voltage Output for Calibration, DC Voltage of Temperature	Dual SPDT or Single DPDT Relays, 6A DC Voltage Output for Calibration, DC Voltage of Temperature	Dual SPDT or Single DPDT Relays, 6A DC Voltage Output for Calibration, DC Voltage of Temperature
Remote Mountable Electronics		■	■	■	■
Power Supply	AC, DC	AC, DC	AC, DC	AC, DC	AC, DC
Enclosure	Metal, NEMA 4X, IP67	Metal, NEMA 4X, IP67	Metal, NEMA 4X, IP67	Metal, NEMA 4X, IP67	Metal, NEMA 4X, IP67
Hazardous Location and Other Agency Approvals	FM, FMc, ATEX, IECEx, Inmetro, EAC, (ECAS, UKCA pending), CE, CRN, PED, SIL 2; *Refer to product brochure for approval details*	FM, FMc, ATEX, IECEx, Inmetro, EAC, (ECAS, UKCA pending), CE, CRN, PED, SIL 2; *Refer to product brochure for approval details*	FM, FMc, ATEX, IECEx, Inmetro, EAC, (ECAS, UKCA pending), CE, CRN, PED, SIL 2; *Refer to product brochure for approval details*	FM, FMc, ATEX, IECEx, Inmetro, EAC, (ECAS, UKCA pending), CE, CRN, PED, SIL 2; *Refer to product brochure for approval details*	FM, FMc, ATEX, IECEx, Inmetro, EAC, (ECAS, UKCA pending), CE, CRN, PED, SIL 2; *Refer to product brochure for approval details*
Other Features, Options	• Precheck Fail Guard • RoHS Compliant • 3-Year Warranty	• Precheck Fail Guard • RoHS Compliant • Nuclear Qualified Versions • 3-Year Warranty	• Precheck Fail Guard • RoHS Compliant • Nuclear Qualified Versions • 3-Year Warranty	• Precheck Fail Guard • RoHS Compliant • Nuclear Qualified Versions • 3-Year Warranty	• Precheck Fail Guard • RoHS Compliant • Nuclear Qualified Versions • 3-Year Warranty

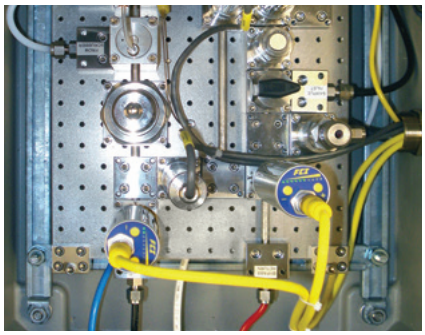
FLT Series

FCI's FLT93 family sets the standard for industrial flow and level switch performance, reliability and value. FLT93 combines all-welded, thermal dispersion sensors with precision electronics protected in a robust industrial enclosure to ensure superior flow or level sensing and long life in the rigors of industrial plant installations. All FLT93 Series switches feature field configurable, dual setpoints for any combination of high and low trip points or as a dual function flow (or level) and temperature switch. All applications encounter temperature variations and unlike other thermal dispersion switches, all FLT93s include temperature compensation to ensure proper switch operation regardless of fluid or ambient temperature changes. Further, all FLT93s uniquely feature analog voltage outputs to set and validate trip points as well as FCI's exclusive pre-check circuit which allows the user to verify system setpoint/trip operation at anytime via a simple contact closure.

FS10A

FS10A is a flow switch/monitor specially designed for gas or liquid analyzer sampling systems. FS10A has simple screw-in installation in standard tube tee or NeSSI (SP76) manifolds. The line is small in size

	FS10 A	FS10 i
		
	■	■
	■	■
	FS10 A	**FS10 i**
	1/4" to 1/2" [6 mm to 13 mm]	1" to 100" [25 mm to 2500 mm]
	• For Analyzer and Sampling Systems • Tube Tee or SP76 • LED Array • Relay, Open Collector, 4-20 mA • SIL 2	• For High/Low Flow Rate Detection • NPT fixed or compression • LED Array • Relay, Open Collector, 4-20 mA • SIL 2
	0.02 SCFH to 200 SCFH [5] [10 cc/min to 100,000 cc/min] 0.01 GPH to 12 GPH [5] [0.7 cc/min to 750 cc/min] 0.01 GPH to 12 GPH [5] [0.7 cc/min to 750 cc/min] ± 1% rdg, ± 0.5% FS *Gas* ± 5% rdg, ± 0.5% FS *Liquids* ±0.5% of reading	0.25 FPS to 400 SFPS [0,076 MPS to 122 MPS] 0.01 FPS to 0.5 FPS [0,003 MPS to 0,15 MPS] 0.01 FPS to 0.5 FPS [0,003 MPS to 0,15 MPS] ± 1% rdg, ± 0.5% FS *Gas* ± 5% rdg, ± 0.5% FS *Liquids* ±0.5% of reading
	n/a n/a	n/a n/a
	■	■
	-40 °F to 250 °F [-40 °C to 121 °C] opt: -40 °F to 500 °F [-40 °C to 260 °C]	-40 °F to 200 °F [-40 °C to 93 °C] opt: -40 °F to 250 °F [-40 °C to 121 °C]
	500 psig [35 bar (g)]	150 psig to 2000 psig [10 bar(g) to 138 bar (g)]
	316L Stainless Steel with Hast-C thermowells, all Hastelloy	316L Stainless Steel with Hast-C thermowells
	Open Collector, SPDT Relay 1A, 4-20 mA, RS232C	Open Collector, SPDT Relay 1A, 4-20 mA, RS232C
	■	■
	24 Vdc	24 Vdc
	Metal, NEMA 4X, IP64	Metal, NEMA 4X, IP64-IP67
	FM, FMc, ATEX, IEC, EAC, (ECAS, UKCA pending), CE, SIL 2; *Refer to product brochure for approval details*	FM, FMc, ATEX, IEC, EAC, (ECAS, UKCA pending), CE, SIL 2; *Refer to product brochure for approval details*
	• Push button set-up • LED display • M12 or watertight cable connection • Hysteresis and time delays	• Push button set-up • LED display • M12 or watertight cable connection • Hysteresis and time delays



FS10A in analyzer sampling system; integral mounting on SP76 platform

Industry relies on rugged FLT Series for critical flow applications

and lightweight, with a choice of outputs to match any application.

FS10i

FS10i is an insertion flow sensing instrument that provides a highly accurate, repeatable and fast-responding flow trip point or alarm setting. The FS10i comes standard with both a 1A relay output for alarm/trip point setting, a 4-20 mA analog output for trending and monitoring, and a 10-segment LED display. The trip point can be set as high or low, and can be adjusted with hysteresis and/or time delay. The FS10i is easily set-up in the field using either the two-button keypad, or with a PC connection to the FS10i's serial port.

Notes:

1 Actual measuring range may vary depending on specific model code and fluid

2 SFPS is 70 °F at 14.7 psia [NMPS is 0 °C at 1,01325 Bar (a)]

3 Higher pressure ratings available, contact FCI

5 Line size dependent

Calibrated To Your Application

More than 19 precision flow stands to match fluids, fluid conditions, flow rates and line sizes with your application

FCI Calibration Ensures Installed Accuracy

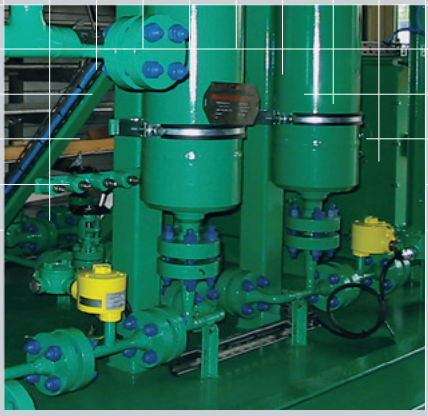
All FCI products are tested and calibrated to rigorous standards to ensure you get the instrument that does the job you specified. To design and produce the highest quality flow instrumentation, FCI operates a world-class, flow calibration laboratory with calibrations performed on more than 19 different flow stands, using equipment traceable to NIST (US National Institute of Standards and Technology), and ISO/IEC 17025 (International Standards for test lab quality systems) and that is certified to meet such stringent standards as MIL-STD 45662A and ANSI/NCSL Z-540. Other suppliers are often limited to air and water calibrations then rely on un-validated theoretical equivalencies for other fluids. FCI has proven this procedure to be inadequate and may result in installed errors well outside published specifications. For most fluids, FCI thermal dispersion flow meters are calibrated using the actual fluid, as well as the actual temperature and process conditions of your application. The result is a flow meter you can install with total confidence and assurance that it meets your application. For other suppliers to perform an actual gas calibration equal to FCI's, they typically must send their final product to an outside laboratory that will result in extra charges and shipment delays to you.

Choosing FCI is Easy

- Pre-Sale Support Gets You the Right Product
- Post-Sale Service to Ensure Continuous Operation
- Product Training Workshops

In addition to the broad range of products and superior calibration you can count on FCI to provide superior pre-sale and post-sale service and support to ensure the right product and long-term operation. With FCI you get pre-sale support and applications assistance by qualified, trained and process experienced engineers. And FCI takes the guess work out of specifying the right flow meter for your applications. AVAL is FCI's exclusive program that ensures our sales engineering representatives select and recommend optimum solutions, as well as advise of engineering and installation considerations for your flow meter applications.

FCI's post-sale support is unmatched. On site field service, field start-up assistance, recalibration, 24-hour service and technical support hot line, instrument maintenance plans and FCI sponsored product knowledge workshops are all available to you as an FCI customer.



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