

FCI ST50 Series Flow Meters

Low Cost, Low Maintenance
Air, Compressed Air and Nitrogen Flow Measurement
for Process and Plant Applications



Wastewater Treatment Aeration Control
Blower and Dryer Air Flow Control
Burner and Furnace Air Flow Control
Lake, Pond and Aquaculture Aeration
HVAC Duct/Damper Control
Compressed Air Distribution Measurements

FCI FLUID COMPONENTS
INTERNATIONAL LLC

FCI ST50 FLOW METER

ST50 Series Features

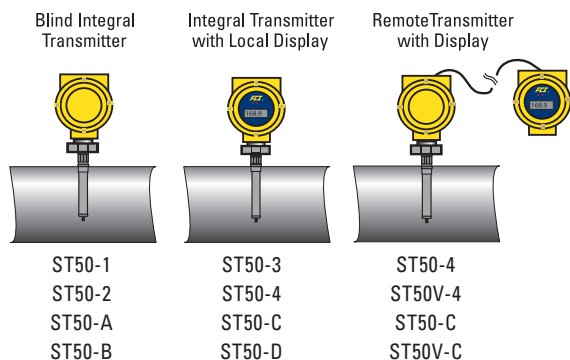
- **Direct mass, volumetric or velocity flow measurement**
- **Dual 4-20mA analog outputs**
- **Line/pipe sizes from 2 to 24 [51 mm to 610 mm]**
- **Non-clogging, no moving parts sensor**
- **RS232 communications**
- **4-digit digital display option**
- **Small, compact design**
- **Easy installation**

Easy to Install, Easy to Use

The ST50 Flow Meter is an accurate, easy to install, no moving parts solution for measuring and controlling air, compressed air or nitrogen flow. ST50 utilizes FCI proven thermal dispersion technology to provide direct mass flow measurement resulting in higher performance at a lower cost than orifice plates, DP, Vortex shedding and other thermal devices. The meter installs in line sizes ranging from 2 inches to 24 inches [51 mm to 610 mm] with 1/2" or 3/4" NPT.

ST50 uses precision, lithography structured platinum RTD sensors embedded in FCI's equal mass small diameter, all metal thermowells. Combined with microprocessor electronics and precision calibration, the ST50 achieves excellent accuracy, fast response and virtually maintenance free operation.

To serve a variety of application and installation requirements the ST50 is available in three standard configurations as shown below.



To provide convenient and easy access for wire-up and signal isolation, the instrument's enclosure features dual conduit ports in either NPT or M20 threads, as well as removable front and rear covers. ST50 can be ordered for DC (18V to 36V) or AC (85V to 265V) power.

The ST50 is available with four calibration and final set-up selections. Two are standard calibrations suitable for final ranging and set-up in the field and two are for factory custom calibration with factory performed final ranging and set-up. All final set-up and flow ranges are subject to 100:1 maximum and 3:1 minimum turndowns.

Two standard calibrations include one for air or nitrogen flow rates between 1.25 SFPS to 125 SFPS [0.4 NMPS to 38 NMPS] in service pressures between 10 psia to 50 psia [0.7 bar(a) to 3.5 bar(a)] and one for compressed air, air or nitrogen flows between 4 SFPS to 400 SFPS

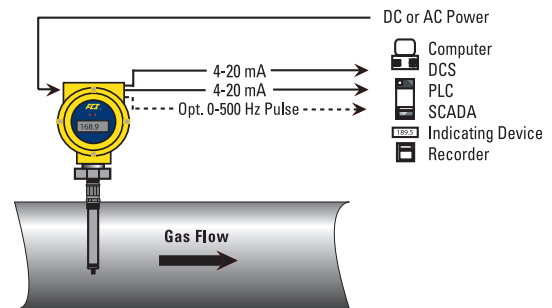
[1.2 NMPS to 122 NMPS] in service pressures between 50 psia to 165 psia [3.5 bar(a) to 11.4 bar(a)]. All final user configurations for flow range, specific line size, standard volumetric or mass flow and engineering units are easily set-up in the field with a PC, PDA or FC88 programmer.

Alternatively, custom factory calibration and set-up is available for air or nitrogen with flow between 0.8 SFPS to 150 SFPS [0.2 NMPS to 46 NMPS] at service pressure between 10 psia to 50 psia [0.7 bar(a) to 3.5 bar(a)] or compressed air, air or nitrogen flow between 2.5 SFPS to 400 SFPS [0.8 NMPS to 122 NMPS] with service pressure between 50 psia to 165 psia [3.5 bar(a) to 11.4 bar(a)]. Custom calibration applications are subject to validation by FCI's AVAL flow meter optimizer program and a submittal of a completed FCI Application Data Sheet.

Extensive Outputs Ensure Application Compatibility

The ST50 includes dual 4-20 mA analog outputs which are field assignable as flow rate or temperature. Flow rate is selectable for reading in standard volumetric or mass flow engineering units. Optionally available as a third output, is a 0-500 Hz pulse output of total flow.

In all models a standard RS232C serial I/O link is provided for instrument configuration, service/troubleshooting data, and measured readings.



Designed and Built to Last

The all stainless steel element with Hastelloy-C tips, provides protection from invasive conditions within the pipe and ensures long service life. The electronics are housed in an all metal NEMA 4X (IP67) rated enclosure for ruggedness and dust/weather proof service in industrial plant installations.

Whether adding flow measurement to improve the process or replacing high-maintenance flow meters, the ST50 provides an accurate, fast response and no-maintenance solution for air, compressed air and nitrogen flow measurement.

Precision Calibration in FCI Flow Laboratory

To ensure optimum accuracy, performance and quality, FCI owns and operates a best-in-class test and NIST traceable calibration laboratory. FCI product developments are subject to rigorous testing and calibration integrity validation using high-speed data acquisition systems and precision flow calibration equipment.

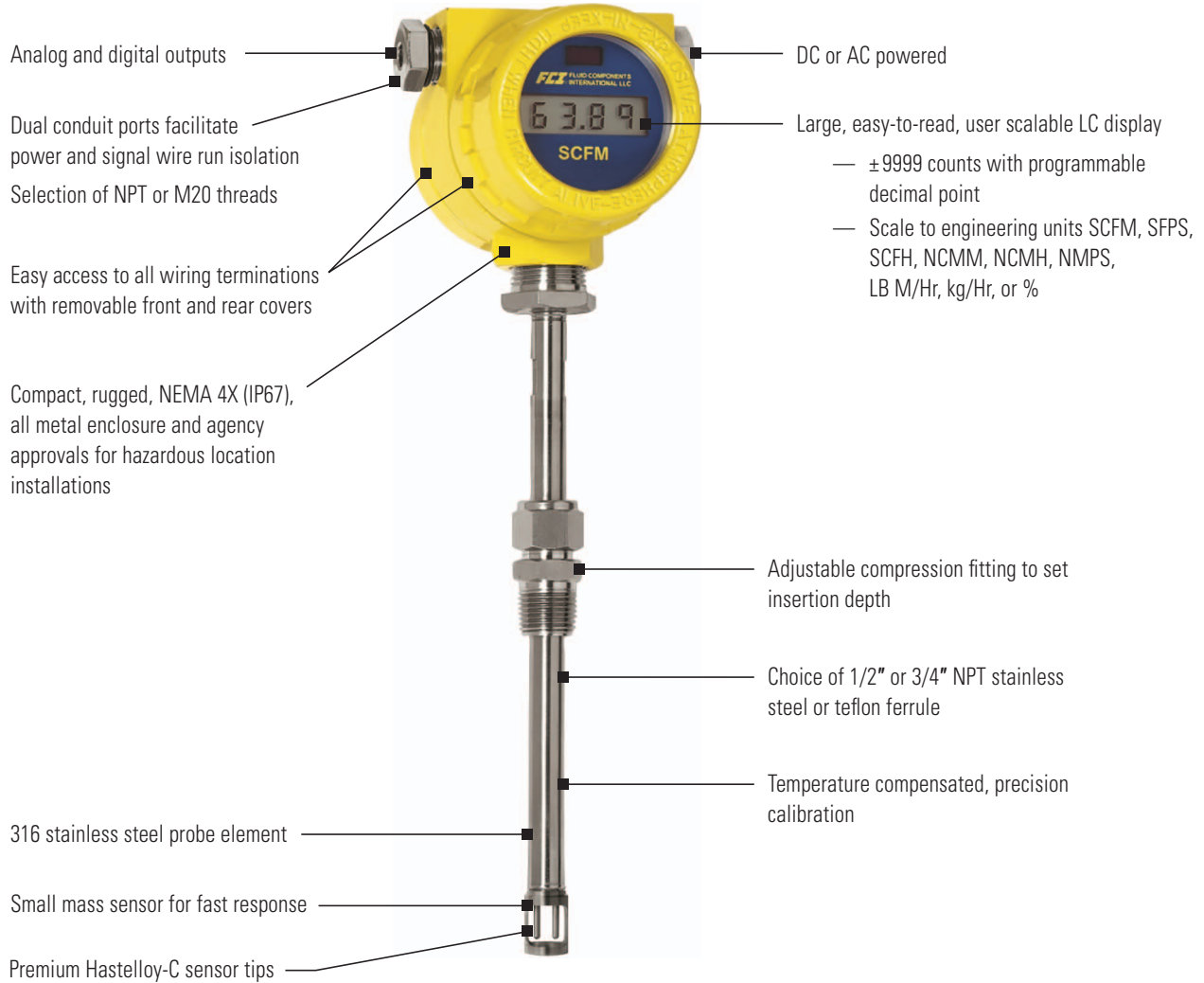
Every FCI flow meter is also extensively tested and then calibrated using actual gases under customer conditions to assure their quality and performance.

- NIST traceability
- Automated data acquisition
- ISO 9001 certified
- Flow, pressure and temperature calibrations

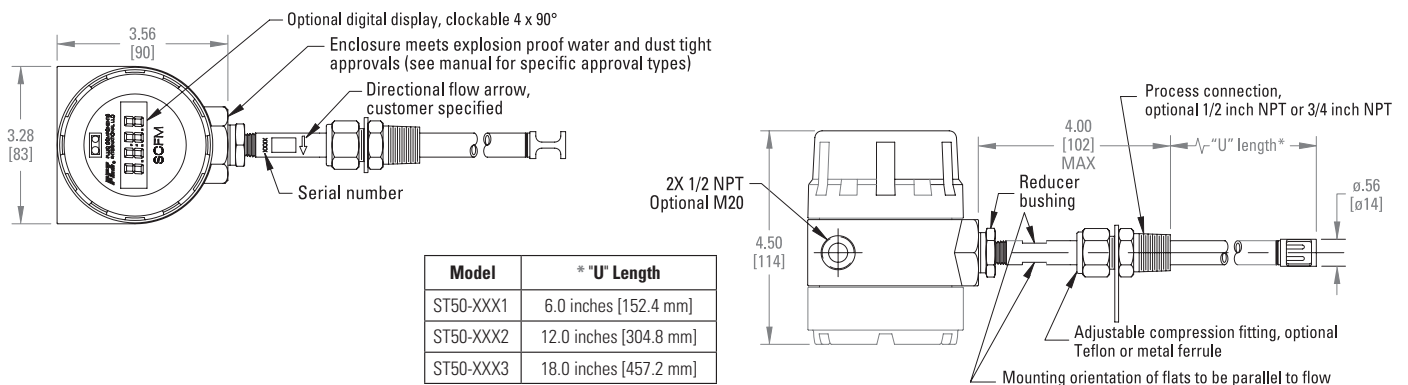
ST50 Series Features

Single Insertion Point, Mass Flow Measurement

With premium components and attention to detail FCI's ST50 series provides long-lasting flow meter quality and value. It's features and functions ensure application compatibility, maximum installation convenience, superior industrial durability and lowest maintenance.



ST50 Series Flow Meter Dimension Drawing



ST50 Series Flow Meter General Specifications

Instrument

- **Media Compatibility:** Air, Compatibility: Air, compressed air, and nitrogen
- **Pipe/Line Size Compatibility:** 2" to 24" [51 mm to 610 mm]
- **Range:** Air, compressed air, or nitrogen; 0.75 SFPS to 400 SFPS [0.23 MPS to 122 MPS]
- **Accuracy**
Standard: $\pm 2\%$ of reading, $\pm 0.5\%$ of full scale
Optional: $\pm 1\%$ of reading, $\pm 0.5\%$ of full scale
- **Repeatability:** $\pm 0.5\%$ of reading
- **Temperature Compensation**
Standard: 40 °F to 100 °F [4 °C to 38 °C]
Optional: 0 °F to 250 °F [-18 °C to 121 °C]
- **Turndown Ratio:** 3:1 to 100:1
- **Agency Approvals**¹
FM/CSA: Nonincendive for use in Class 1, Division 2, Groups A, B, C and D T4 Ta = 60 °C Indoor Hazardous (Classified) Locations
ATEX: II 3 G EEx nA II T6; II 3 D T65 °C (DC input power only)
GOST-R, CPA, BelGIM (Belarus)
Other: CE Marking, CRN, PED
- **Warranty:** One year

Flow Element

- **Installation:** Insertion, variable length with 1/2" or 3/4" MNPT compression fitting
- **Type:** Thermal dispersion
- **Material of Construction:** 316 stainless steel body with Hastelloy C thermowell sensors, 316 stainless steel compression fitting with Teflon or stainless steel ferrule

- **Pressure (Maximum Operating without Damage):**
Stainless steel ferrule: 500 psig [34 bar(g)]
Teflon ferrule: 150 psig [10 bar(g)]
- **Temperature (Maximum Operation):**
Stainless steel ferrule: 0 °F to 250 °F [-18 °C to 121 °C]
Teflon ferrule: 0 °F to 200 °F [-18 °C to 93 °C]
- **Process Connection:** 1/2" MNPT or 3/4" MNPT with stainless steel or Teflon ferrule
- **Insertion Length:** Field adjustable lengths:
1" to 6" [25 mm to 152 mm]; 1" to 12" [25 mm to 305 mm];
or 1" to 18" [25 mm to 457 mm]

Transmitter

- **Enclosure:** NEMA 4X [IP67], aluminum, dual conduit ports with either 1/2" NPT or M20x1.5 entries. Epoxy coated.
- **Output Signal**
Standard: (2) 4-20 mA, user assignable to flow rate and/or temperature
Optional: 0-500 Hz pulse for total flow
- **Communication Port:** RS232C
- **Input Power**
DC: 18 Vdc to 36 Vdc (6 watt maximum)
AC: 85 Vac to 265 Vac (12 watt maximum)
(CE Marking Approval from 100 Vac to 240 Vac)
- **Operating Temperature:** 0 °F to 140 °F [-18 °C to 60 °C]
- **Digital Display:** ± 9999 Counts LCD, 0.45" H [11.4 mm] characters, user scalable to flow rate units or as 0-100%.¹

¹ For applications in Div. 1 / Zone 1 environments and/or for dual-line digital display with built-in totalizer display, see FCI Model ST51



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ST50
Air/Gas Flow Meter

INSTRUCTIONS: To order an **ST50**, please fill in the numbered Block above with the appropriate Code from the categories below. Once you have determined all specifications, contact an FCI representative or FCI directly for price information or additional options not shown. Consult FCI on the cost of special data and documentation. Final acceptance of the part number is subject to FCI's approval.

Model Number								Description
Block No.	1	2	3	4	5	7	8	
ST50-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	↑	↑	↑	↑	↑	↑	[BLOCK 1] Base Unit, Enclosure Style, Power Supply <i>Enclosures: all aluminum, NEMA4X/IP67 rated, epoxy coated</i>
	2							Blind, integral transmitter with two 1/2" FNPT cable entries 18 Vdc to 36 Vdc powered
	3							Blind, integral transmitter with two 1/2" FNPT cable entries 85 Vac to 265 Vac powered
	4							Integral transmitter with local digital display, with two 1/2" FNPT cable entries 18 Vdc to 36 Vdc powered
	7							Integral transmitter with local digital display, with two 1/2" FNPT cable entries 85 Vac to 265 Vac powered
	8							Remote transmitter with two 1/2" FNPT cable entries and with digital display (specify cable length in Block 8) 18 Vdc to 36 Vdc powered
	A							Remote transmitter with two 1/2" FNPT cable entries and with digital display (specify cable length in Block 8) 85 Vac to 265 Vac powered
	B							Blind, integral transmitter with two M20x1.5 cable entries 18 Vdc to 36 Vdc powered
	C							Blind, integral transmitter with two M20x1.5 cable entries 85 Vac to 265 Vac powered
	D							Integral transmitter, with local digital display, with two M20x1.5 cable entries 18 Vdc to 36 Vdc powered
	E							Integral transmitter, with local digital display, with two M20x1.5 cable entries 85 Vac to 265 Vac powered
	F							Remote transmitter with two M20x1.5 cable entries and with digital display (specify cable length in Block 8) 18 Vdc to 36 Vdc powered
								Remote transmitter with two M20x1.5 cable entries and with digital display (specify cable length in Block 8) 85 Vac to 265 Vac powered
								[BLOCK 2] Pipe Installation, Display/Transmitter Mounting Orientation and Flow Direction
								Horizontal Pipe
								Code
								Top mount, display facing forward, flow left-to-right F
								Top mount, display facing forward, flow right-to-left G
								Side mount, display facing up, flow left-to-right H
								Side mount, display facing up, flow right-to-left J
								Side mount, display facing down, flow left-to-right K
								Side mount, display facing down, flow right-to-left L
								Vertical Pipe
								Code
								Side mount left, display facing forward, flow up M
								Side mount right, display facing forward, flow up N
								Side mount left, display facing forward, flow down P
								Side mount right, display facing forward, flow down R
								<i>For visual representation, refer to FCI drawing number 021263</i>
								[BLOCK 3] Process Connection/Ferrule Material
								1/2" male NPT/Teflon ferrule
								1/2" male NPT/metal ferrule
								3/4" male NPT/Teflon ferrule
								3/4" male NPT/metal ferrule
								[BLOCK 4] Insertion Length
								6" [152 mm] maximum "U" length
								12" [305 mm] maximum "U" length
								18" [457 mm] maximum "U" length
								[BLOCK 5] Gas Medium and Calibration ³
								Standard: air/nitrogen calibration 1.25 SFPS to 125 SFPS; 10 psia to 50 psia [0,4 NMPS to 38 NMPS; 0,7 bar (a) to 3,5 bar (a)] ²
								Customized: air/nitrogen calibration 0.75 SFPS to 150 SFPS; 10 psia to 50 psia [0,2 NMPS to 46 NMPS; 0,7 bar (a) to 3,5 bar (a)]
								Standard: air/nitrogen/compressed air calibration 4 SFPS to 400 SFPS; 50 psia to 165 psia [1,2 NMPS to 122 NMPS; 3,5 bar (a) to 11,4 bar (a)] ^{2,6}
								Customized: nitrogen/compressed air calibration 2.5 SFPS to 400 SFPS; 50 psia to 165 psia [0,8 NMPS to 122 NMPS; 3,5 bar (a) to 11,4 bar (a)] ⁶
								[BLOCK 6] Calibration⁴ and Calibration Conditions <i>Temperature, Vortab Flow Conditioner, Flat Flow Profile</i>
								Standard 2% accuracy calibration and conditions 40 °F to 100 °F [4 °C to 38 °C]
								Standard 2% accuracy calibration and extended temperature compensation: 0 °F to 250 °F [-18 °C to 121 °C]
								High accuracy 1% calibration and standard conditions 40 °F to 100 °F [4 °C to 38 °C]
								High accuracy 1% calibration and extended temperature compensation 0 °F to 250 °F [-18 °C to 121 °C]
								High accuracy 1% calibration with Vortab (VEL, VFK, VIS, VMR or VSR)
								High accuracy 1% calibration with Vortab (VIP)
								High accuracy 1% calibration and extended temperature compensation 0 °F to 250 °F [-18 °C to 121 °C] and Vortab (VEL, VFK, VIS, VMR or VSR)
								High accuracy 1% calibration and extended temperature compensation 0 °F to 250 °F [-18 °C to 121 °C] and Vortab (VIP)
								High accuracy 1% calibration, at flat flow profile
								High accuracy 1% calibration and extended temperature compensation 0 °F to 250 °F [-18 °C to 121 °C] and flat flow profile
								[BLOCK 7] Transmitter Options <i>All Standard</i>
								None
								Pulse Output
								[BLOCK 8] Interconnecting Cable Length for Remote Configurations ⁵
								Not required (specify with integral configurations)
								10' [3 m]
								25' [7,6 m]
								50' [15 m]
								Custom length (cannot exceed 50' [15 m])

Notes

- User configures line size, scaled flow range and engineering units in the field with PC, PDA or FCI FC88 Calibrator
- Must specify actual media (air, nitrogen, or compressed air), range, pipe size and engineering units when ordering Flow Range subject to maximum 100:1 and minimum 10:1 turndown. FCI application data sheet (ADS) must accompany order
- Calibration accuracy is ±% of reading, ± 0.5% of full scale.
- Fixed cable length with instrument calibrated together as matched set. Cable may be coiled but not cut.
- Flow element will be -FPC type with FCI patent-pending flow conditioner.

Options and Accessories

Part Number	Description
019819-01	Software Interface Package for PDA/PalmOS
020802-01	PDA, Palm® model Tungsten™ E2
FC88	Portable Hand-held Communicator
014108-02	PC Interface Communications Kit, For RS232 serial port connection
DM10-N	Digital Display/Readout, LCD, 4-20 mA loop powered
DM10-FC	DM10 with FM and CSA approvals

Part Number	Description
DM10-KIT1	Panel Mount Kit for DM10
DM10-KIT2	2" (52 mm) Pipe Mount Kit for DM10 (stainless steel)
DM15	Digital Display/Readout, LED 115/230 Vac powered
DM15-ALM	Same as DM-15 with user programmable alarm limit, relay output
DM20	Digital Display Readout, 8-digit LCD Pulse totalizer/counter