

ST100L -

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Block No. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

INSTRUCTIONS: To order an **ST100L**, please fill in each numbered block above by selecting required codes from the corresponding categories below. Use of any "W" or "*" codes requires prior approval from FCI. For special data, documentation, test reports or required quality reports, refer to FCI's Engineering and Quality Assurance Order Information Sheets (OIS).

Flow Element	
Code	[BLOCK 1] Flow Element: Temperature Service, Type and Materials of Construction
4	-F style, 316L stainless steel, to 250 °F [121 °C]
D	-F style, Hastelloy C276, to 250 °F [121 °C]
7	-S style, 316L stainless steel, to 250 °F [121 °C]
G	-S style, Hastelloy C276, to 250 °F [121 °C]
W	Agency approved, customer specified
*	Other, not agency approved
Code	[BLOCK 2] In-Line Body Material of Construction
3	316L Stainless steel; all welded connection of sensor element
4	Hastelloy C276 ^{15, 18} ; all welded connection of sensor element
Code	[BLOCK 3] In-Line Body Type / Diameter / Length
A	1 inch tubing ¹⁸ 9 inch [229 mm]
B	1 inch tubing with 1/8 inch injection tube reducer ¹⁸ 9 inch [229 mm]
C	1 inch tubing with 1/4 inch injection tube reducer ¹⁸ 9 inch [229 mm]
D	1 inch tubing with built-in Vortab flow conditioner ¹⁸ 9 inch [229 mm]
E	1 inch pipe, schedule 40 9 inch [229 mm]
F	1 inch pipe, schedule 40 with built-in Vortab flow conditioner 9 inch [229 mm]
L	1 inch pipe, schedule 80 9 inch [229 mm]
M	1 inch pipe, schedule 80 with built-in Vortab flow conditioner 9 inch [229 mm]
G	1 1/2 inch pipe, schedule 40 13 1/2 inch [343 mm]
H	1 1/2 inch pipe, schedule 40 with built-in Vortab flow conditioner 13 1/2 inch [343 mm]
J	2 inch pipe, schedule 40 18 inch [457 mm]
K	2 inch pipe, schedule 40 with built-in Vortab flow conditioner 18 inch [457 mm]
W	Agency approved, customer specified
*	Other, not agency approved
Code	[BLOCK 4] In-Line Body Type / Diameter
7	NPT, male
8	NPT, female
Table A	Flanged ¹⁵
Z	Butt weld preparation ¹⁹
W	Agency approved, customer specified
*	Other, not agency approved
Code	[BLOCKS 5-7]
BLOCK 5	Code
BLOCK 6	BLOCK 7
0	0
0	0
<i>Block 5, 6, 7 Codes are always "0" with Model ST100L</i>	
Code	[BLOCK 8] Pipe Mounting and Flow Direction
1	Horizontal, flow right-to-left or vertical up
2	Horizontal, flow left-to-right or vertical down

Transmitter and Electronics	
Code	[BLOCK 9] Transmitter Mounting, Enclosure Material and Cable Entry Threading
1	Integral mount, aluminum, NPT cable entries ⁶
A	Integral mount, aluminum, metric cable entries ⁶
2	Remote mount, aluminum, NPT cable entries ⁶
B	Remote mount, aluminum, metric cable entries ⁶
3	Integral mount, stainless steel; NPT cable entries ⁶
C	Integral mount, stainless steel; metric cable entries ⁶
4	Remote mount, stainless steel; NPT cable entries ⁶
D	Remote mount, stainless steel; metric cable entries ⁶
W	Agency approved, customer specified
*	Other, not agency approved

(continued next page)

Table A – Flange [BLOCK 4]			
CS ¹⁵	316L SS	Hast C	Material
	9		ANSI 3/4 inch 150 lb
D	1	C	ANSI 1 inch 150 lb
E	A	G	ANSI 1 inch 300 lb
F	2	H	ANSI 1 1/2 inch 150 lb
K	B	J	ANSI 1 1/2 inch 300 lb
P	3	M	ANSI 2 inch 150 lb
R	L	N	ANSI 2 inch 300 lb
	T		DIN DN25 PN40
	V		DIN DN40 PN40
	6		DIN DN50 PN16
	Y		DIN DN50 PN40
W			Agency approved, customer specified

Notes

6. See Notes, page 2
7. Remote cable in an ST100 Series model is 8-conductor; remote cable in an STP100 Series model is 10-conductor. For user-supplied cable, overall shielded conductor type is required and wire resistance must be less than 8 Ohms.
8. Cable suitable for conduit and some cable gland systems. For other cable gland system choices, see ST100 accessories list or contact FCI to supply separately. PVC cable maximum temperature 176 °F [80 °C]; Teflon cable maximum temperature 392 °F [200 °C].
15. Carbon steel flanges available only with 316L stainless steel body type (Block 2, Codes 1 or 3). Cannot select carbon steel flange when Hastelloy is selected in Block 2.
18. With 1" inch tubing:
 - a) Not available in Hastelloy; Block 2 must be Codes 1 or 3 only
 - b) If NPT selected in Block 4 (Code 7 or 8), NPT will be 3/4"
 - c) If flanged, connection must be 3/4" or 1" only and Block 4 Codes 9, D, 1, E or A
19. When welded into process piping, be aware that cutting or un-welding may be required to extract flow meter for service, repair and/or recalibration.

(continued from previous page)

Code	[BLOCK 10] Interconnecting Cable Length for Remote Configuration
0	Not required <i>Specify with integral configurations, user supplied cable, or if cable ordered as separate line item from ST100 series accessories</i> ^{7,16}
A	10 feet [3 meters] PVC jacketed ⁸
B	25 feet [7,6 meters] PVC jacketed ⁸
C	50 feet [15 meters] PVC jacketed ⁸
D	100 feet [30 meters] PVC jacketed ⁸
1	10 feet [3 meters] Teflon jacketed ⁸
2	25 feet [7,6 meters] Teflon jacketed ⁸
3	50 feet [15 meters] Teflon jacketed ⁸
4	100 feet [30 meters] Teflon jacketed ⁸
W	Other
*	Non agency approved cable type or length other than above

Code	[BLOCK 11] Transmitter Power Supply and Display
A	24 Vdc power (19.2 Vdc to 28.8 Vdc); no digital display
B	24 Vdc power (19.2 Vdc to 28.8 Vdc); with display
C	85 Vac to 265 Vac power; no display
D	85 Vac to 265 Vac power; with digital display

Code	[BLOCK 12] Transmitter Outputs and Communications
1	(3) 4-20 mA outputs, one with HART; (1) frequency/pulse output
F	FOUNDATION™ fieldbus H1 ⁹
M	Modbus 485 ⁹
P	PROFIBUS-PA ⁹
W	Other
*	Other, not agency approved

Code	[BLOCK 13]
E	Always "E"

Calibration^{10, 11, 12}

Code	[BLOCK 14] Calibration Application <i>Description for reference only; actual Code must be obtained using FCI AVAL</i> ^{10, 11, 12}
B	Air, standard
C	Custom, specific gas equivalency (digester gas, flue gas, etc.)
E	Nitrogen, helium, CO ₂ , nitrous oxide
1	Natural gas (90% or greater methane content)
2	Natural gas (90% or greater methane content); line sizes smaller than 1 1/2 inch
F	Hydrocarbon (methane, ethane, propane)
G	Hydrogen or hydrogen mixture
H	Air, standard
J	Custom, specific gas equivalency (digester gas, flue gas, etc.)
K	Nitrogen, argon
L	CO ₂ , ethelene, argon
M	Propylene or propane to 100 psig [7 bar (g)] maximum
N	Butane, pentane to 15 psig [1 bar (g)] maximum
P	Helium or methane
R	Hydrogen
W ⁸	Agency approved, customer specified

Code	[BLOCK 15] Calibrations, Setup and Conditions
0	Standard
A	Extended temperature compensation
B	Extended range (> 100:1 turndown)
C	Vortab
E	Extended temperature compensation and extended range
F	Extended temperature compensation and Vortab
H	Extended range and Vortab
K	Extended temperature compensation, extended range and Vortab

Code	[BLOCKS 16-17] Second Calibration
0 0	Not required
<input type="checkbox"/> <input type="checkbox"/>	Select from Codes shown in Blocks 14-15

Code	[BLOCK 18] Additional Calibration Groups
0	Not required
3	Three (3) calibration groups; two as specified in Blocks 14-17, plus one additional ¹⁴
4	Four (4) calibration groups; two as specified in Blocks 14-17, plus two additional ¹⁴
5	Five (5) calibration groups; two as specified in Blocks 14-17, plus three additional ¹⁴

General

Code	[BLOCK 19] Agency Approval
<i>CE Mark always included</i>	
0	Not required
1	FM
2	FMc, CRN
3	ATEX, IECEx ¹⁶
5	EAC (TRCU) <i>Russia</i>
6	Inmetro
7	NEPSI
*	Other <i>Contact FCI for other approvals and conditions of use</i>

Notes

6. Transmitter enclosure has four (4) female conduit ports, NPT = 1/2", metric = M20 x 1.5. With remote mount, the local enclosure's conduit port (attached to the flow element) varies by type of process connection and enclosure material specified:

Model	Process Connection	Aluminum		Stainless Steel	
		NPT	Metric	NPT	Metric
ST100, ST102A	Block 3 = C, D, G, M, N, J, F*	(2) 1/2"	(2) M20 x 1.5	(1) 1/2"	(1) M20 x 1.5
ST100, ST102A	Block 3 = P, H, Q, K, R, L, T, V, Y, F**	(1) 1/2"	(1) M20 x 1.5	(1) 1/2"	(1) M20 x 1.5
ST100L	Block 3 = Any	(2) 1/2"	(2) M20 x 1.5	(1) 1/2"	(1) M20 x 1.5
ST110, ST112A, and all STP	Block 3 = Any	(1) 1/2"	(1) M20 x 1.5	(1) 1/2"	(1) M20 x 1.5

* with 1" or DN25 flange

** with flange size larger than 1" or DN25

- Cable suitable for conduit and some cable gland systems. For other cable gland system choices, see ST100 accessories list or contact FCI to supply separately. PVC cable maximum temperature 176°F [80°C]; Teflon cable maximum temperature 392°F [200°C].
- No analog, frequency/pulse, or other digital bus communications.
- FCI standard conditions are 14.7 psia [1,01 bar(a)] and 70°F [21.1°C].
- Calibration codes must be selected using FCI's proprietary AVAL application evaluation software.
- Transmitter setup, changes to factory supplied standard settings, verification or modification to calibration parameters or diagnostics requires external source communication with the transmitter.
- Customer specified calibration must not exceed temperature and pressure limitations of the ST100 Series product specifications.
- May specify up to three (3) additional calibrations for a total of five (5). Contact FCI for instructions on how to specify third, fourth and/or fifth calibration.
- ATEX/IECEx rated remote requires cable glands or conduit fittings which meet or exceed the installation area's required rating. When rated cable glands, armored cables and non-armored cable supplied are user supplied or selected from ST100 accessories list and ordered separately, enter Code 0 in Block 10.

Accessories

Part Number	Description
Sun Shield Kits Shades main transmitter, electronics, and/or display from direct sunlight; 316L stainless steel; attached directly to housing; kit includes shield, all hardware for attachment and instruction sheet	
023241-01	For use with integral mount transmitter
023237-01	For use with remote mount transmitter

Refer to separate ST100 Series Accessories List for a complete listing of all accessories such as cabling, ball valves, documentation test and QA documents and certificates, and spare parts.

Customer Information																																												
Customer Name: _____		P.O. No.: _____ Customer Order No.: _____																																										
Address: _____		Model Number Ordered																																										
Contact Name: _____		Calibration ¹																																										
Phone: _____ Fax: _____		<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Single-Point</td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> </tr> <tr> <td><input type="checkbox"/> ST100</td> <td>-</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>E</td> <td>-</td> </tr> <tr> <td><input type="checkbox"/> ST100L</td> <td>-</td> <td></td> <td>0</td> <td>0</td> <td>0</td> <td></td> <td></td> <td>E</td> <td>-</td> </tr> <tr> <td><input type="checkbox"/> ST110</td> <td>-</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>E</td> <td>-</td> </tr> </table>			Single-Point										<input type="checkbox"/> ST100	-	0						E	-	<input type="checkbox"/> ST100L	-		0	0	0			E	-	<input type="checkbox"/> ST110	-	0						E	-
Single-Point																																												
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Email: _____		<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Dual-Element²</td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> </tr> <tr> <td><input type="checkbox"/> ST102 A</td> <td>-</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> </tr> <tr> <td><input type="checkbox"/> ST112 A</td> <td>-</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>V</td> <td>0</td> </tr> </table>			Dual-Element ²										<input type="checkbox"/> ST102 A	-	0							-	<input type="checkbox"/> ST112 A	-	0						V	0										
Dual-Element ²																																												
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<input type="checkbox"/> ST112 A	-	0						V	0																																			
Process Details																																												
<p>¹ If more than one (1) calibration is required (excluding VeriCal™), provide <i>Process Details</i> for each calibration – attach additional sheet(s) as needed.</p> <p>² For all dual-element discrete type models, provide <i>Process Details</i> for both main (ST1X2D) and second (ST1X2E) element; for analog outputs, also specify which outputs to assign to each element³.</p>																																												
Application Description																																												
Describe type of application (example: flare, digester gas, aeration line, etc.): _____																																												
Process Media																																												
Include gas name and percent composition by volume (moles) or weight (mass). Please attach a gas composition list or fill in composition below. Total composition must add up to 100%.																																												
Gas Components: <input type="checkbox"/> % Volume (moles) <input type="checkbox"/> % Weight (mass) <table style="width:100%; border-collapse: collapse; margin-top: 5px;"> <tr><td style="width: 30%;">_____</td><td style="width: 10%;">_____</td><td style="width: 10%;">%</td></tr> <tr><td>_____</td><td>_____</td><td>%</td></tr> <tr><td>_____</td><td>_____</td><td>%</td></tr> <tr><td>_____</td><td>_____</td><td>%</td></tr> <tr><td>_____</td><td>_____</td><td>%</td></tr> <tr><td>_____</td><td>_____</td><td>%</td></tr> <tr><td>_____</td><td>_____</td><td>%</td></tr> </table>					_____	_____	%	_____	_____	%	_____	_____	%	_____	_____	%	_____	_____	%	_____	_____	%	_____	_____	%																			
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Process Conditions																																												
	Normal	Minimum	Maximum	Engineering Units																																								
Flow Rate:	_____	_____	_____	_____																																								
Temperature:	_____	_____	_____	_____																																								
Pressure:	_____	_____	_____	_____																																								
Required Dimensions (Include units of measure – inches, mm, etc.)																																												
1. Pipe Size: _____ or Duct Size: _____																																												
a) Outside Diameter: _____ Height: _____																																												
b) Inside Diameter: _____ Width: _____																																												
2. Length of mounting adapter/coupling from outside pipe surface: _____																																												
3. Length of straight-run available: _____																																												
4. Describe nearest upstream and downstream disturbance:																																												
a) Upstream: _____																																												
b) Downstream: _____																																												
Other notes about installation: _____																																												
Instrument Details																																												
Flow Element Mounting/Flow Direction																																												
Horizontal Pipe			Vertical Pipe																																									
<input type="checkbox"/> Horizontal pipe; side mount, flow left to right			<input type="checkbox"/> Vertical pipe; flow up																																									
<input type="checkbox"/> Horizontal pipe; side mount, flow right to left			<input type="checkbox"/> Vertical pipe; flow down																																									
<input type="checkbox"/> Horizontal pipe; top mount, flow left to right																																												
<input type="checkbox"/> Horizontal pipe; top mount, flow right to left			<input type="checkbox"/> Other: _____																																									
Transmitter Setup																																												
Input Power: <input type="checkbox"/> 115 Vac <input type="checkbox"/> 230 Vac <input type="checkbox"/> 24 Vdc																																												
Analog Signal Outputs	Output 1 4-20 mA	Output 2 4-20 mA	Output 3 4-20 mA																																									
Parameter:	<input type="checkbox"/> Flow (default) <input type="checkbox"/> Temperature	<input type="checkbox"/> Temp. (default) <input type="checkbox"/> Flow	<input type="checkbox"/> Flow (default) <input type="checkbox"/> Temperature																																									
Eng. Units:	_____	_____	_____																																									
Zero Value:	4 mA = _____	4 mA = _____	4 mA = _____																																									
Full Scale:	20 mA = _____	20 mA = _____	20 mA = _____																																									
³ Dual-Element: <input type="checkbox"/> ST1X2D <input type="checkbox"/> ST1X2E <input type="checkbox"/> ST1X2D <input type="checkbox"/> ST1X2E <input type="checkbox"/> ST1X2D <input type="checkbox"/> ST1X2E																																												
Signal Output 4 Frequency/Pulse Output: <input type="checkbox"/> 0-1 kHz (default) <input type="checkbox"/> 0-10 kHz																																												
Set as:																																												
<input type="checkbox"/> 1 pulse per flow engineering unit																																												
<input type="checkbox"/> Full scale frequency output proportional to full scale flow rate																																												
<input type="checkbox"/> Other: _____																																												
Bus Communications I/O																																												
<input type="checkbox"/> HART (included with analog outputs) <input type="checkbox"/> FOUNDATION™ fieldbus H1 (no analog outputs)																																												
<input type="checkbox"/> Modbus 485 (no analog outputs) <input type="checkbox"/> PROFIBUS PA (no analog outputs)																																												
<input type="checkbox"/> Other: _____																																												
Standard Temperature and Pressure																																												
<input type="checkbox"/> 70°F and 14.7 psia [21.1°C and 1,013 bar(a)] is the factory calibration default for standard temperature and pressure unless otherwise indicated below.																																												
<input type="checkbox"/> 0°C and 1013,25 mBar(a)																																												
<u>Temperature</u>			<u>Pressure</u>																																									
Other: _____																																												
Other Notes, Drawings or Details																																												
Vortab: <input type="checkbox"/> Yes <input type="checkbox"/> No																																												
Vortab Type: <input type="checkbox"/> VMR <input type="checkbox"/> VIS <input type="checkbox"/> VEL <input type="checkbox"/> VFK <input type="checkbox"/> VIP																																												