1.

FLOW SENSOR AND CONTROLLER

GEORG FISCHER

QTY. 1: 3-8900 (CONTROLLER BASE UNIT)
QTY. 1: 3-8900.401-1 (DUAL INPUT)
QTY. 1: 3-8900.402-1 (110/220 VAC POWER MODULE)
QTY. 1: 3-8050.392 (PANEL ADAPTER)
QTY. 1: 3-2540-3-S (FLOW SENSOR)
QTY. 1: P51589 (CONDUIT ADAPTER KIT)
QTY. 1: SCE-1212CHNF (ENCLOSURE)
QTY. 1: SCE-12P12 (SUBPANEL)

FLOW SENSOR & TRANSMITTER FT700/FE700

+GF+

8900 Multi-Parameter Controller

Member of the ProcessPro® Family of Instruments

Customize the unit to suit any process requirement.

Features

- **Measures Flow, pH, ORP, Conductivity, Pressure, Level and Temperature**
- **Multi-language display**
- **1/4 DIN enclosure**
- **Up to 4 analog outputs**
- **Up to 8 relays**
- **12 to 24 VDC or 85 to 264 VAC Power**
- **Digital Communication for extended cable lengths and easy wiring**
- **Accepts 4 to 20mA output devices when used with 8058 signal converter**
- **Available with 2, 4 or 6 channels**
- **Two BTU calculations**

Description

The Signet 8900 Multi-Parameter Controller takes the concept of modularity to the extreme. Each 8900 is field commissioned with the users specified combination of inputs, outputs, and relays using simple-to-install modular boards into the base unit. To assemble a controller, there is a choice of two base units offered with a choice of back-lit LCD or vacuum fluorescent display. Then, continue building with a selection of plug-in modules for either two, four, or six input channels which accepts any of the Signet sensors listed below, and/or other manufacturer's sensors via a 4 to 20mA signal converter (Signet Model 8058). To complete your unit, choose a power module with universal AC line voltage or 12 to 24 VDC.
If more features are needed, analog output and relay modules are available and easily installed. Plus, the 8900 will support up to four additional relays via an external relay module.

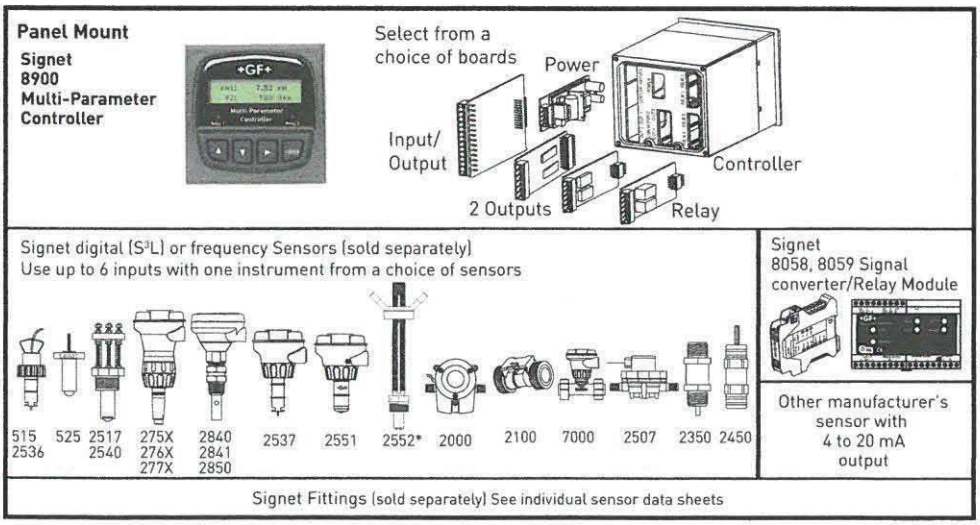
There are other notable features that the 8900 offers. For instance, digital input to the 8900 enables longer cable runs and simplified wiring with minimal noise interference. Advanced relay logic provides operators an "and/or" logic to produce high/low alarms. Derived measurements include difference, sum, ratio, percent recovery, percent rejection, and percent passage - and now with BTU. The menu system can be programmed to display in multi-languages including English, German, French, Spanish, Italian, and Portuguese.

Applications

- **RO/DI System Control**
- **Media Filtration**
- **Pure Water Production**
- **Demineralizers**
- **Chemical Processing**
- **Metal & Plastics Finishing**
- **Fume Scrubbers**
- **Proportional Chemical Addition**
- **Cooling Tower & Boiler Protection**
- **Wastewater Treatment**
- **Aquatic Animal Life Support Systems**
- **Rinse Tank**

CE c UL us E171559

System Overview



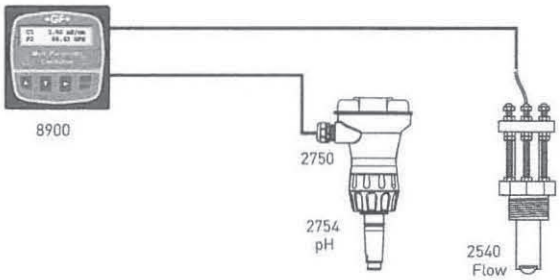
* Check local Georg Fischer sales office for availability.

SPECIFICATION SECTION 2.3.1

System Overview (continued)

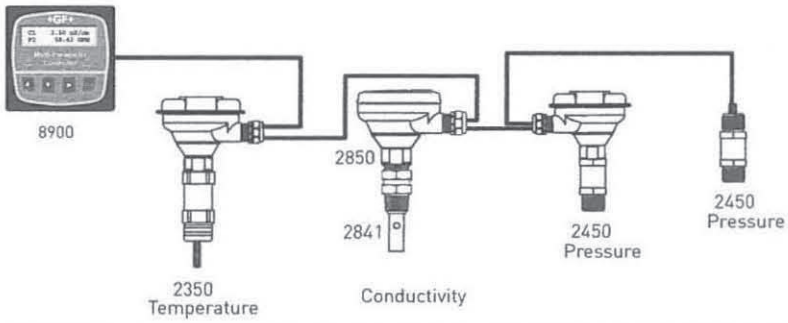
There are hundreds of system types that can be set up with the 8900. The examples below illustrate various sensors in different installation schemes. Wiring topology for point-to-point, daisy-chain, multi-drop, or a combination of these are listed in each example. Digital sensor outputs allow for long cable runs with high noise immunity. See Wiring section for allowable cable lengths.

Example 1:
- 8900 input module: Two inputs
- Sensors connected: Signet 2540 flow (frequency) and 2750 with 2754 pH sensors
- Wiring configuration: Point-to-point

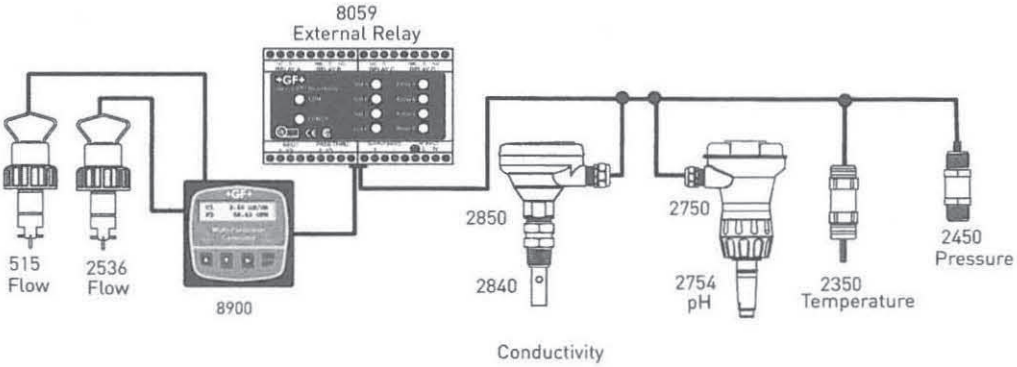


Notes:
1. External relays can be used with any input module and does not consume a sensor input channel (Model 8059)
2. Model 8058 Signal Converter can be used with any input module.

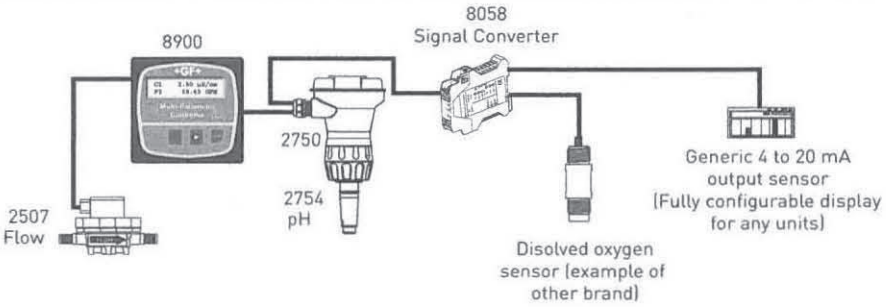
Example 2:
- 8900 input module: Four inputs
- Sensors connected: Signet 2350 temp. sensor, 2850 with 2841 conductivity, and two 2450 pressure sensors
- Wiring configuration: Daisy-chain



Example 3:
- 8900 input module: Six inputs
- Sensors connected: Signet 2350 temp. sensor, 2850 with 2840 conductivity, 2450 pressure, 2750 with 2754 pH, and 515 and 2536 flow (frequency) sensors
- External Devices: Signet 8059 external relay module
- Wiring configuration: Combination of Point-to-point and Multi-drop



Example 4:
- 8900 input module: Four inputs
- Sensors connected: Signet 2507 flow (frequency) and 2750 with 2754 pH sensors; Other manufacturers dissolved oxygen and level sensors with 4 to 20 mA output
- External Devices: Signet 8058 signal converter - 4 to 20 mA to digital (S^3L))
- Wiring configuration: Combination of Point-to-point and Daisy-chain



Wiring Options:

- **Point-to-point** wiring is direct wiring of individual devices into the controller. This wiring topology is applicable for all inputs.
- **Daisy-chain** wiring allows sequential connection from one device to the next by using junction boxes. This wiring topology is applicable for digital (S^3L) inputs only.
- **Multi-drop** wiring allows drops from a single bus cable. Junction boxes can be used for the 3-way junctions that are formed with this wiring scheme. This wiring topology is applicable for digital (S^3L) inputs only.

Specifications

General

Configurability: Modular (completely field-commissionable)
No. of input channels: 2, 4, or 6
Compatible sensors: See System Overview
Input signal types:
- Digital (S^3L): Serial ASCII, TTL level 9600 bps
- Frequency: 0 to 1500 Hz
  Accuracy: 0.5% of reading

Measurement types:
Flow, pH, ORP, Conductivity/Resistivity, Pressure, Temperature, Level, or any device with 4 to 20mA output
Derived measurements:
Sum, Difference, Ratio, % Recovery, % Reject, % Passage, Power (BTU)
No. of relays supported:
Available in pairs: 2, 4, 6 or 8 (8 Dry-Contact and/or 4 Solid State)
No. of analog outputs:
Available in pairs: 2 or 4 (active and/or passive 4 to 20mA; and/or 0 to 5/10 VDC)

Enclosure and Display

- Enclosure Rating:
  NEMA 4X/IP65 (front face only)
- Case material: PBT
- Panel Gasket: Silicone Sponge
- Window:
  Self-healing polyurethane-coated polycarbonate
- Keypad:
  4-buttons, highly tactile and audible
  Injection-molded silicone rubber seal

Display:
- Alphanumeric 2 x 16 back-lit LCD or
- Vacuum Fluorescent (VF) versions
- Update rate: 1 second
- Accuracy: Sensor dependent
- VF Brightness: 4 intensity levels
- LCD Contrast: 4 settings
- Languages Available:
  English, French, Spanish, German Italian, and Portuguese

Display ranges (see sensor specifications for actual measurement limits):
- pH: -2.00 to 15.00 pH
- pH Temp.:
  -40°C to 150°C (-40°F to 302°F)
- ORP: -9999 to +9999 mV
- Flow rate:
  0.0000 to 999999 units per second, minute, hour or day
- Totalizer: 0.00 to 99999999 units
- Conductivity:
  0.0000to 999999 µS, mS, PPM & PPB (TDS), kΩ, MΩ
- Cond. Temp.:
  -99.9°C to 250°C (-148°F to 482°F)
- Temperature:
  -99.9°C to 999.9°C (-148°F to 999.9°F)
- Pressure: -99.99 to 9999 psi, kPa, bar

Display ranges (continued)
- Level:
  -99999 to 99999 m, cm, ft, in., %
- Volume:
  -99999 to 999999 m^3, ft^3, in^3, cm^3, gal, L, kg, lb, %
- Other (4 to 20mA):
  -99999 to 999999 user selectable units

Environmental

Ambient Operating Temperature:
- Back-lit LCD:
  -10°C to 55°C (14°F to 131°F)
- VF Display:
  -10°C to 50°C (14°F to 122°F)

Storage Temp.:
-15°C to 80°C (5°F to 176°F)
Relative Humidity:
0 to 95%, non-condensing
Maximum Altitude:
- 2,000m (6,560 ft.)
- 4,000m (13,123 ft.); use only DC power supply and, if applicable, solid state relays to maintain UL safety standard up to this altitude .

Electrical

Power Requirements (AC or DC via Power Modules)
- Universal AC: 85 to 240 VAC, 50-60 Hz, 24 VA max.
- DC: 9.9 to 26.4 VDC unregulated, 7 Watts max.

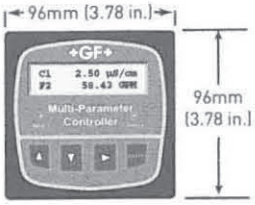
Output Power to Sensors:
5VDC up to 40mA total
Terminal type:
Screw-clamp, removable via plug-in modules.

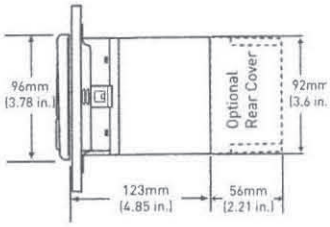
Analog Outputs (via I/O Modules and Output Modules) All analog outputs are freely assignable to any channel

4 to 20mA Output:
Endpoints are adjustable and reversible:
- Minimum default:
  4.0 mA; user adjustable from 3.8 to 5.0 mA
- Maximum default:
  20.00 mA; user adjustable from 19.0 to 21.0 mA

Test mode:
Produces an adjustable 4 to 20mA signal for functional verification of each output circuit
Isolation: Up to 48 V AC/DC
Error condition:
22.1 mA (default state when output source not configured)
Update rate: 100ms
Accuracy:
±32µA over entire operating temperature range

Dimensions





Specifications (continued)

Analog Outputs (Continued)

Passive 4 to 20mA
- Voltage: 12 to 24VDC ±10%
- Max. Impedance:
  250Ω @ 12 VDC
  500Ω @ 18 VDC
  750Ω @ 24 VDC
- Active 4 to 20mA
- Max. Impedance: 650Ω

0 to 5/10 VDC Output:
Output range:
0 to 5 VDC or 0 to 10 VDC, software selectable
Endpoints are adjustable and reversible:
- Minimum default:
  0 VDC; user programmable from 0 to 0.5 VDC
- Maximum default:
  5 VDC; user programmable from 4.5 to 5.5 VDC, or 9.5 to 10.5 VDC

Output load: 10kΩ minimum
Test mode:
Produces an adjustable signal for functional verfication of each output circuit
Isolation: Up to 48 V AC/DC
Error condition:
0 VDC (default state when output source not configured)
Update rate: 100mS
Accuracy:
±20mV over entire operating temperature range
Resolution: 5mV
Power Supply Rejection: 0.5 mV/V

Relay Modules

All relays are freely assignable to any channel.
- Internal relay modes of operation:
  Off, Low, High, Window, Pulse, Pulse Width Modulation, USP, Volumetric, Pulse, Totalizer Volume, Advanced, % Rejection

- External relay modes of operation:
  Off, Low, High, Window, Pulse Width Modulation, USP, Totalizer Volume, Advanced, % Rejection

Hysterisis: User adjustable
Time Delay: 0 to 6400 seconds

- Advanced relay:
  Use "AND/OR" logic along with relay sources to trigger a relay.
  High/Low modes available for each of the 3 sources.

- Solid State Relays: (non-mechanical switches)

Normally open/closed operation:
Software selectable
Maximum pulse rate:
- 600 pulses/min.
  (volumetric pulse & PWM modes)
- 400 pulses/min. (prop. pulse mode)

Maximum voltage rating:
30 VDC or 42 VAC p-p
Current rating:
50mA DC or 50mA AC RMS
On-state impedance: 30Ω or less
Off-state leakage: 400nA or less, AC or DC
Isolation: Up to 48 V AC/DC
Transient protection:
Embedded, up to 48 V over-voltage

- Dry-contact Relays: (mechanical contacts)

Type: SPDT
Form: C
Maximum pulse rate:
- 600 pulses/min.
  (volumetric pulse & PWM modes)
- 400 pulses/min. (prop. pulse mode)

Maximum voltage rating:
30 VDC or 250 VAC
Current rating: 5A

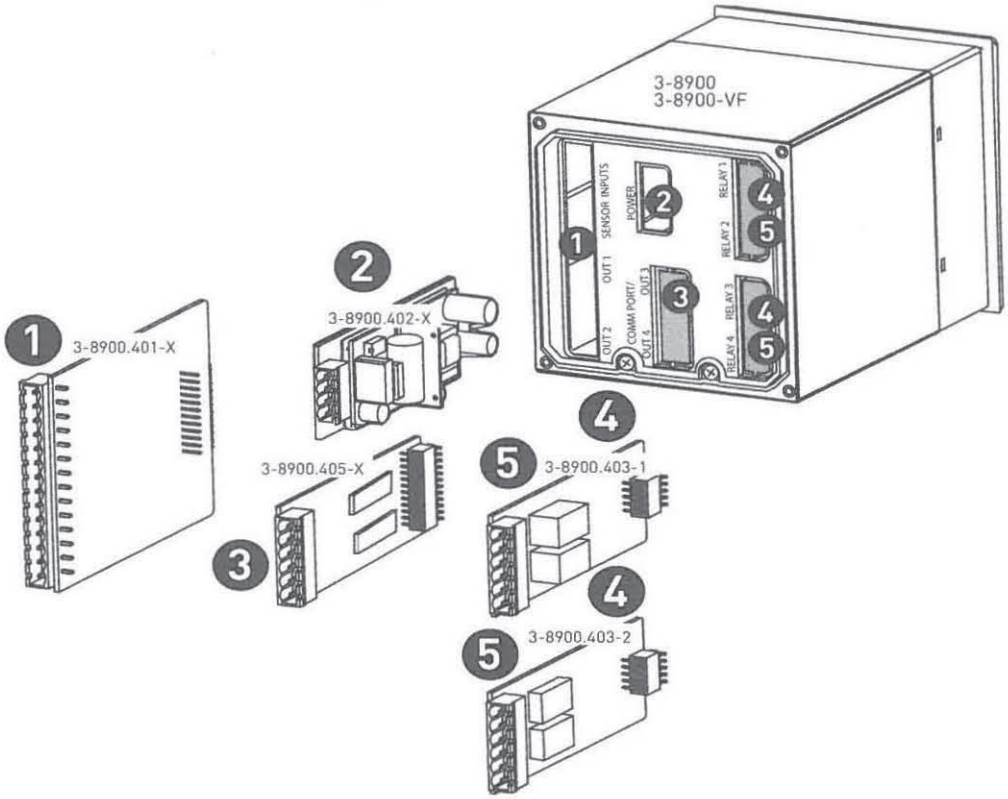
Shipping Weights:
- Base unit: 1.0 kg (2.25 lb.)
- Power Module: 0.12 kg (0.25 lb.)
- I/O Module: 0.12 kg ((0.25 lb.)
- Output Module: 0.12 kg (0.25 lb.)
- Relay Module: 0.12 kg (0.25 lb.)

Standards and Approvals
- CE, UL
- Manufactured under ISO 9001: 2000 for Quality and ISO 14001:2004 for Environmental Management

Installation of Modules with the base unit

3-8900/3-8900-VF

One base unit is required to build a functional 8900. It is offered with a backlit LCD or a Vacuum Fluorescent Display. Programming the unit is done simply via the push-button keypad. The unit can be tailored to display in English, German, French, Spanish, Italian, and Portuguese. The two line display allows for easy programming, navigation, and viewing of each channel.



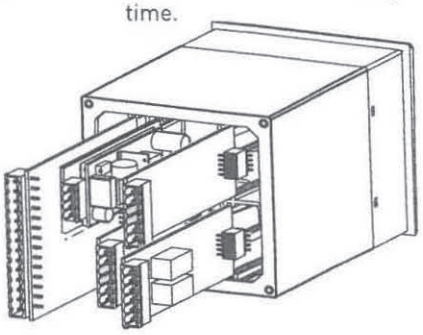
1. I/O module
One I/O module is required to build a functional 8900. I/O modules are offered for 2, 4, or 6 sensor inputs, with or without 2 milliamp or voltage outputs. Users can select two additional outputs via the output module.

2. Power module
One power module is required to build a functional 8900. The power module is offered for universal 110/220 VAC or 12 to 24 VDC (This module can be powered by optional external relays (see ordering information for more details).

3. Output module
Output modules are optional when building an 8900. This module can be used in addition to other outputs that are availble in the I/O modules. Active current and voltage outputs are powered by the 8900. Passive outputs require an outside 12 - 24 VDC power supply. All outputs are assignable to any input channel.

4 & 5. Relay modules
Relay modules are optional when building an 8900. Relay modes of operation include off, low, high, window, USP, totalizer volume, advanced, pulse, pulse width modulation and volumetric pulse. The advanced relay option for "AND/OR" logic is used for up to 3 conditions. For instance, a relay will go to high/low if "a" is true and "b" or "c" is false. One or two relay modules can be installed into the 8900. One additional external relay module can also be used at the same time (See optional external relay ordering information.) All relays are assignable to any input channel.

Installation of Modules: Modules simply plug in by sliding into the base unit on rails. They are held securely in place by the rear panel. Changes and upgrades can be made in the field at any time.



Model 8900

Ordering Notes:

1) Building a functional unit requires a base unit, I/O module, and power module.

2) Output options are available on I/O modules and additional output modules can be used. The 8900 can support up to four outputs.

3) Up to two internal relay modules can be used simultaneously; additional external relays can also be used. The 8900 can support up to eight relays.

4) A maximum total of two frequency sensors can be used with any input card.

5) A total of six digital inputs or four digital with two frequency inputs can be used.

6) The 8900 boards can be removed or inserted at any time to add /remove inputs, outputs, and relays.

7) The 8900 can be reconfigured with new sensor types by simple reprogramming.

Please refer to Wiring, Installation, and Accessories sections for more information.

Ordering Information

To build a functional 8900 controller, choose a base unit, power module, and input/output (I/O) module. Additional outputs and relays are available, if needed.

Mfr. Part No.	Code	Description
Base units, required; choose one		
3-8900	159 000 868	Base unit with back-lit LCD
3-8900-VF	159 000 869	Base unit with Vacuum Fluorescent display
I/O (input/output) modules, required; choose one		
3-8900.401-1	159 000 870	Dual (2) Input (no outputs)
3-8900.401-2	159 000 871	Dual (2) Input with Two Passive* Loop Outputs
3-8900.401-3	159 000 872	Dual (2) Input with Two Active Loop Outputs
3-8900.401-4	159 000 873	Dual (2) Input with Two Voltage Outputs
3-8900.401-5	159 000 874	Quad (4) Input (no outputs)
3-8900.401-6	159 000 875	Quad (4) Input with Two Passive* Loop Outputs
3-8900.401-7	159 000 876	Quad (4) Input with Two Active Loop Outputs
3-8900.401-8	159 000 877	Quad (4) Input with Two Voltage Outputs
3-8900.401-9	159 000 968	Six Inputs (no outputs)
3-8900.401-10	159 000 969	Six Inputs with Two Passive* Loop Outputs
3-8900.401-11	159 000 970	Six Inputs with Two Active Loop Outputs
3-8900.401-12	159 000 971	Six Inputs with Two Voltage Outputs
Power modules, required; choose one		
3-8900.402-1	159 000 878	110/220 VAC Power Module
3-8900.402-2	159 000 879	12 to 24 VDC Power Module
Optional output modules - choose one		
3-8900.405-1	159 000 883	Two Passive* Current Loop Outputs
3-8900.405-2	159 000 884	Two Active Current Loop Outputs
3-8900.405-3	159 000 885	Two 0 to 5 and/or 0 to 10 VDC Outputs
Optional relay modules - choose one or two		
3-8900.403-1	159 000 880	Two Dry Contact Relays
3-8900.403-2	159 000 881	Two Solid State Relays
Optional external relays - choose one**		
3-8059-2	159 000 770	Two dry-contact relays; requires 12 to 24 VDC
3-8059-2AC	159 000 771	Two dry-contact relays; requires 100 to 240 VAC; supplies power to the 12 to 24 VDC power module
3-8059-4	159 000 772	Four dry-contact relays; requires 12 to 24 VDC
3-8059-4AC	159 000 773	Four dry-contact relays; requires 100 to 240 VAC; supplies power to the 12 to 24VDC power host device

* Passive outputs require an outside power source

** See individual product page for the 8059 External Relay Modules.

Accessories and Replacement Parts

Mfr. Part No.	Code	Description
Mounting		
3-8050.392	**159 000 640**	Panel adapter, 1/2 DIN to 1/4 DIN
3-8050.395	**159 000 186**	Splashproof rear cover
3-0000.596-1	**159 000 892**	1/4 DIN wall mount bracket, 6.5 in. (use if no rear cover is installed)
3-0000.596-2	**159 000 893**	1/4 DIN wall mount bracket, 9 in. (use if rear cover is installed)
3-5000.399	**198 840 224**	Panel adapter, 5 x 5 in. to 1/4 DIN
3-5000.598	**198 840 225**	Surface mount bracket
Power Supplies		
7300-7524	**159 000 687**	24 VDC Power Supply 7.5 W, 300mA
7300-1524	**159 000 688**	24 VDC Power Supply 15 W, 600mA
7300-3024	**159 000 689**	24 VDC Power Supply 30 W, 1.3 A
7300-5024	**159 000 690**	24 VDC Power Supply 50 W, 2.1 A
7300-1024	**159 000 691**	24 VDC Power Supply 100 W, 4.2 A
Miscellaneous		
3-8050.396	**159 000 617**	RC Filter kit (for relay use), 2 per kit

Signet 2540 Stainless Steel High Performance Paddlewheel Flow Sensor

+GF+

Standard Sensor

Hot-Tap Sensor

Features

- **Flow rate range 0.1 to 6 m/s (0.3 to 20 ft/s)**
- **Field replaceable electronics**
- **Non-magnetic RF detection**
- **Standard NPT or ISO process connections**
- **Hot-tap versions for installation/service without system shutdown**
- **For pipe sizes up to DN 900 (36 in.)**
- **Adjustable sensor - one size for entire pipe range**
- **7.6 m (25 ft.) cable**

Description

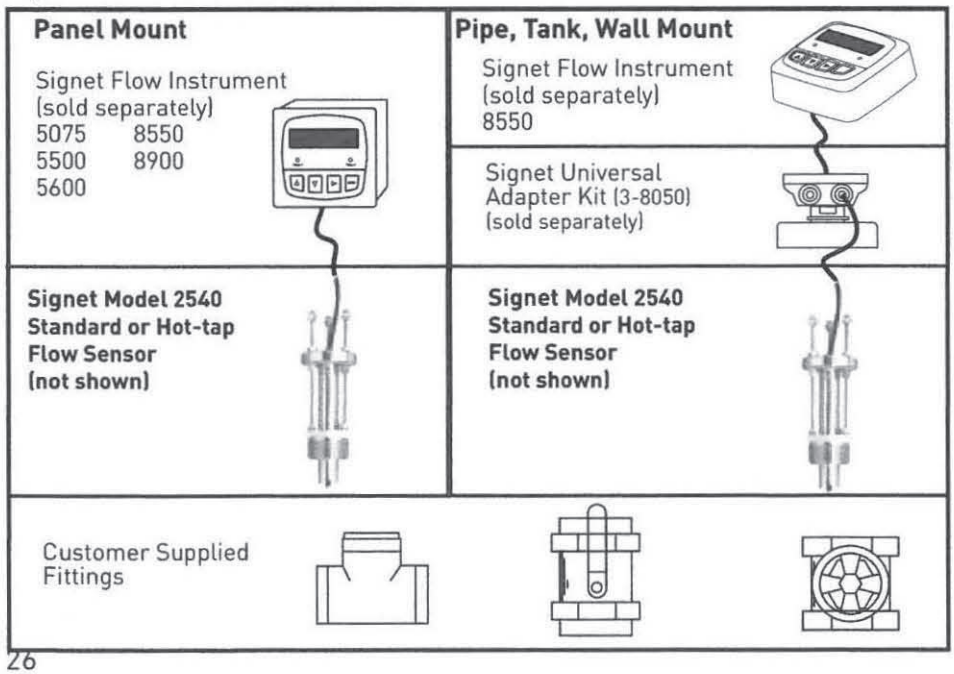
The Signet 2540 Paddlewheel Flow Sensor offers the strength and corrosion resistance of stainless steel for liquid applications with low velocity measurements. Unique internal circuitry eliminates the need for magnets in the process fluid, enabling flow measurement of 0.1 to 6 m/s (0.3 to 20 ft/s) while maintaining the advantages of insertion sensor design. Fluoroloy B®/PTFE bearings and Tungsten Carbide pin provide exceptional wear resistance. The model 2540 offers field replaceable electronics and transient voltage suppression (TVS) to provide greater immunity to large voltage disturbances (ie. lightning) sometimes encountered in field wiring. Sensors can be installed in DN40 to DN600 (1.5 to 24 inch) pipes using the 1.5 inch or ISO 7/1-R 1.5 threaded process connection. The sensors are also offered in a hot-tap configuration with a bleed valve service without process shutdown in pipes up to DN900 (36 in.). Both styles of sensors must be used in full pipes and can be used in low pressure systems.

Application

- **HVAC**
- **Turf Irrigation**
- **Cooling Systems**
- **Filtration Systems**
- **Water Distribution**
- **Leak Detection**
- **Pump Protection**
- **Clarified Effluent Totalization**
- **Ground Water Remediation**
- **Gravity Feed Line**
- **Not suitable for gases**

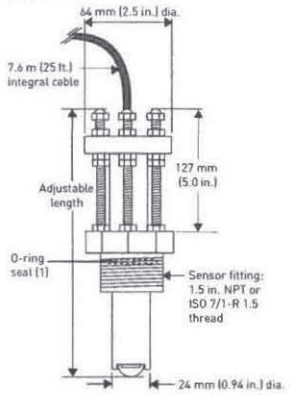
CE

System Overview

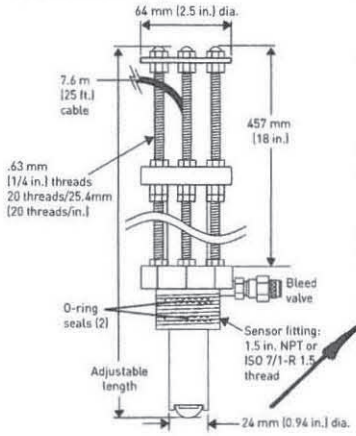


Dimensions

2540 High Performance Flow Sensor for 1.5 to 24 in. pipes



2540 Hot-Tap for 1.5 to 36 in. pipes



Model 2540 Ordering Notes:
Installation fittings and Hot-Tap valves are customer supplied.

Application Tips:
- For systems with components of more than one material, the maximum temperature/pressure specification must always be referenced to the component with the lowest rating.
- Use the Conduit Adapter Kit to protect the cable-to-sensor connection when used in outdoor environments.
- Sensor electronics can be easily replaced by 3-2541.260-1 or 302541.260-2.

Please refer to Wiring, Installation, and Accessories sections for more information.

Specifications

General
Flow Rate Range:
0.1 to 6 m/s (0.3 to 20 ft/s)
Linearity: ±1% of full range
Repeatability: ±0.5% of full range
Min. Reynolds Number Required: 4500
Pipe size range:
- Standard version: DN40 to DN600 (1.5 to 24 in.)
- Hot-Tap version: DN40 to DN900 (1.5 to 36 in.)

Sensor fitting options:
- 1.5in NPT threads
- ISO 7/1-R 1.5 threads

Wetted Materials
- Body: 316 Stainless Steel (1.4401)
- Fitting: 316 Stainless Steel (1.4401)
- Fitting O-rings: FPM, optional EPDM
- Rotor: CD4MCu stainless steel (1.4517)
- Rotor pin: Tungsten Carbide GRP 1 (standard) Stainless Steel (optional)
- Retainers (2): 316 stainless steel (1.4401)
- Rotor bearings (2): Fluoroloy B®/PTFE

Electrical:
Frequency: 15 Hz per ft/s nominal
Supply voltage: 5 to 24 VDC
Supply current: 1.5 mA max.
Output type: Open collector, sinking
Output current: 10.0 mA max.
Cable length: 7.6 m (25 ft.), can splice up to 300 m (1,000 ft.)
Cable type: 2-conductor twisted-pair with shield, 22AWG

Max. Pressure/Temperature Ratings:
- Sensor with standard FPM sensor fitting O-rings: 17 bar @ 100°C (250 psi @ 212°F)
- Sensor with optional EPDM sensor fitting O-rings: 17 bar @ 82°C (250 psi @ 180°F)

See Temperature and Pressure graphs for more information.

Shipping Weight:
3-2540-1, -2: 1.79 kg 3.9 lbs.
3-2540-3, -4: 2.15 kg 4.7 lbs.

Standards and Approvals
- CE
- Manufactured under ISO 9001:2000 for Quality and ISO 14001:2004 for Environmental Management

Ordering Information

Sensor Part Number			
3-2540	Stainless Steel High Performance flow sensor with removable electronics		
	Mounting option - choose one		
	-1	1.5 inch NPT thread	
	-2	1.5 inch ISO thread	
	-3	1.5 inch NPT thread, hot tap design*	
	-4	1.5 inch ISO thread, hot tap design*	
	Rotor Pin Material		
	-	Tungsten Carbide	
	-S	Stainless Steel	
3-2540	**-1**		**Example Part Number**

*Must use 3-1500.663 Hot-Tap installation tool (ordered separately)

Mfr. Part No.	Code	Mfr. Part No.	Code
3-2540-1	**198 840 035**	3-2540-1S	**159 001 501**
3-2540-2	**198 840 036**	3-2540-2S	**159 001 502**
3-2540-3	**198 840 037**	3-2540-3S	**159 001 503**
3-2540-4	**198 840 038**	3-2540-4S	**159 001 504**

Accessories and Replacement Parts

Mfr. Part No.	Code	Description
3-1500.663	**198 820 008**	Hot-Tap Installation Tool (see page 158 for more information)
1220-0021	**198 801 186**	O-ring, FPM
1224-0021	**198 820 006**	O-ring, EPDM
1228-0021	**198 820 007**	O-ring, Kalrez®
3-2540.320	**198 820 040**	Rotor Kit, 2540 Peek Bearing (old version)
3-2540.321	**159 000 623**	Rotor Kit, 2540 Tungsten Carbide Pin (new version since January 1, 2000)
3-2540.322	**159 000 864**	Rotor kit, Stainless Steel pin and rotor
P52504-3	**159 000 866**	Rotor pin, Tungsten Carbide
P52504-4	**159 000 867**	Rotor pin, 316 SST
3-2540.520	**159 000 648**	Bearing, Fluoroloy B®/PTFE
P52527	**159 000 481**	Retainers, SS (1.4401)
3-2541.260-1	**159 000 849**	Standard replacement electronics module
3-2541.260-2	**159 000 850**	Hot-Tap replacement electronics module
5523-0222	**159 000 392**	Cable, per ft.
P51589	**159 000 476**	Conduit Adapter Kit
P31934	**159 000 466**	Conduit Cap

Continuous Hinge Enclosures

Application -

Designed for use as electrical junction boxes, terminal wiring boxes, instrument housings, and electrical control enclosures. Provides protection from dust, dirt, oil and water. For installation information, consult our Installation Manual at www.saginawcontrol.com.

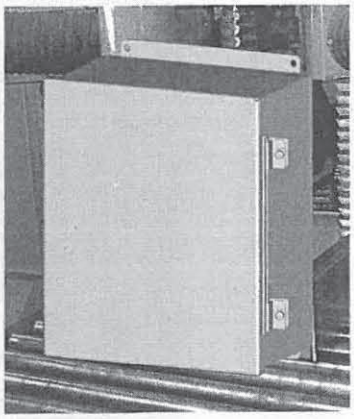
Construction -

- 0.075" carbon steel.
- Seams continuously welded and ground smooth, no holes or knockouts.
- Continuous hinge with stainless steel pin.
- Stainless steel external screw clamps are quick and easy to operate.
- Oil resistant gasket.
- Standoffs provided for mounting optional panels.
- Ground stud on door and body.

Finish -

ANSI-61 gray powder coating inside and out. Optional panels are powder coated white.

IS2 - Industry Standards -
NEMA Type 4, 12 & Type 13
UL Listed Type 4 & 12
CSA Type 4 & 12
IEC 60529 IP66



CONTINUOUS HINGE ENCLOSURES

ENCLOSURE PRODUCT CODE A1						SUB-PANEL (P3)			
Catalog No.	Height (A)	Width (B)	Depth (C)	Industry Standard	List Price	Catalog No.	Panel Height (D)	Panel Width (E)	List Price
SCE-404CHNF	4.00	4.00	3.00	IS2	37.68	No Panel		N/A	
SCE-4044CHNF	4.00	4.00	4.00	IS2	38.97	No Panel		N/A	
SCE-604CHNF	6.00	4.00	3.00	IS2	42.36	SCE-6P4	4.88	2.88	3.01
SCE-6044CHNF	6.00	4.00	4.00	IS2	45.48	SCE-6P4	4.88	2.88	3.01
SCE-606CHNF	6.00	6.00	4.00	IS2	49.37	SCE-6P6	4.88	4.88	3.61
SCE-806CHNF	8.00	6.00	3.50	IS2	53.27	SCE-8P6	6.75	4.88	4.17
SCE-8066CHNF	8.00	6.00	6.00	IS2	62.66	SCE-8P6	6.75	4.88	4.17
SCE-808CHNF	8.00	8.00	4.00	IS2	59.78	SCE-8P8	6.75	6.88	4.89
SCE-8086CHNF	8.00	8.00	6.00	IS2	68.69	SCE-8P8	6.75	6.88	4.89
SCE-1008CHNF	10.00	8.00	4.00	IS2	69.39	SCE-10P8	8.75	6.88	5.70
SCE-1008CHSNF	10.00	8.00	4.00	IS2	73.30	SCE-10P8	8.75	6.88	5.70
SCE-10086CHNF	10.00	8.00	6.00	IS2	79.24	SCE-10P8	8.75	6.88	5.70
SCE-10106CHNF	10.00	10.00	6.00	IS2	80.55	SCE-10P10	8.75	8.88	6.73
SCE-12064CHNF	12.00	6.00	4.00	IS2	63.66	SCE-12P6	10.75	4.88	5.35
SCE-1210CHNF	12.00	10.00	5.00	IS2	87.29	SCE-12P10	10.75	8.88	7.72
SCE-1210CHSNF	12.00	10.00	5.00	IS2	89.33	SCE-12P10	10.75	8.88	7.72
SCE-12106CHNF	12.00	10.00	6.00	IS2	91.96	SCE-12P10	10.75	8.88	7.72
SCE-12108CHNF	12.00	10.00	8.00	IS2	98.74	SCE-12P10	10.75	8.88	7.72
SCE-1212CHNF	12.00	12.00	6.00	IS2	101.32	SCE-12P12	10.75	10.88	9.08
SCE-14086CHNF	14.00	8.00	6.00	IS2	87.06	SCE-14P8	12.75	6.88	7.39
SCE-1412CHNF	14.00	12.00	6.00	IS2	112.50	SCE-14P12	12.75	10.88	10.13
SCE-1412CHSNF	14.00	12.00	6.00	IS2	105.25	SCE-14P12	12.75	10.88	10.13
SCE-14128CHNF	14.00	12.00	8.00	IS2	119.01	SCE-14P12	12.75	10.88	10.13
SCE-16106CHNF	16.00	10.00	6.00	IS2	102.65	SCE-16P10	14.75	8.88	9.90
SCE-1614CHNF	16.00	14.00	6.00	IS2	131.71	SCE-16P14	14.75	12.88	19.95
SCE-1614CHSNF	16.00	14.00	6.00	IS2	123.42	SCE-16P14	14.75	12.88	19.95
SCE-16148CHNF	16.00	14.00	8.00	IS2	143.66	SCE-16P14	14.75	12.88	19.95
SCE-161410CHNF	16.00	14.00	10.00	IS2	150.70	SCE-16P14	14.75	12.88	19.95

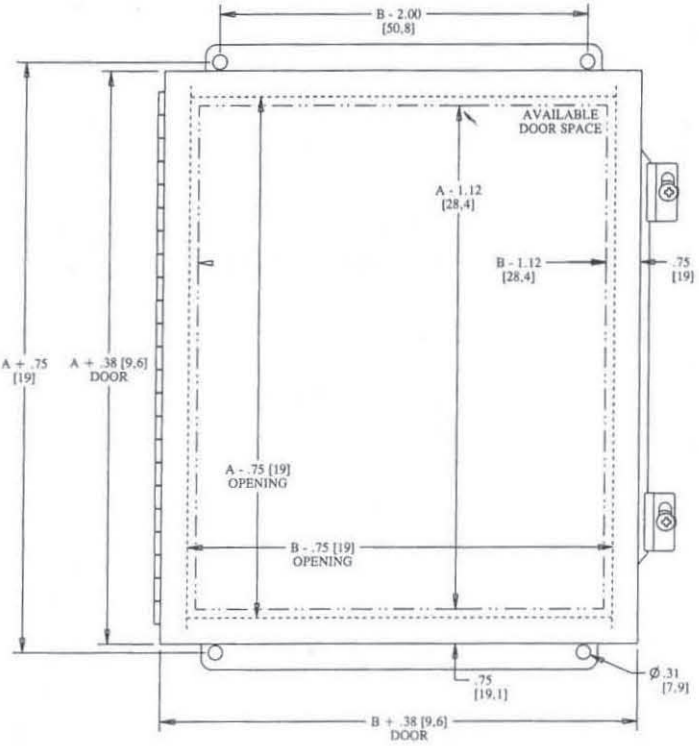
QTY. 1: SCE-1212CHNF (ENCLOSURE)
QTY. 1: SCE-12P12 (SUBPANEL)

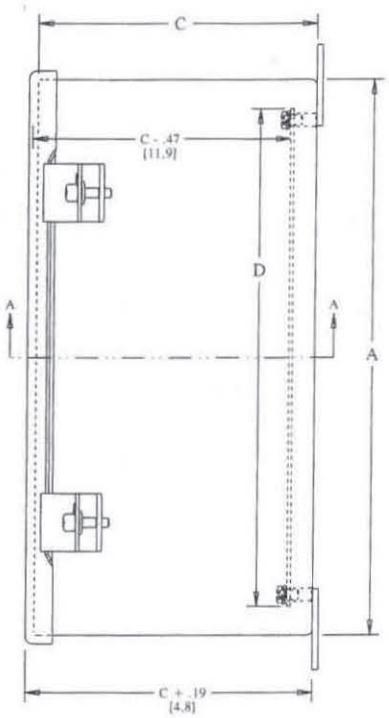
Catalog numbers which end in "S" are hinged on the short side.

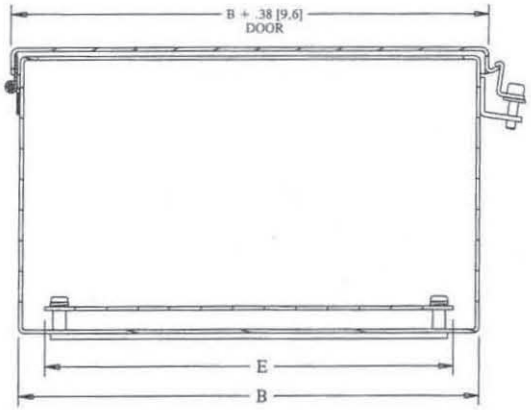
Phone (989) 799-6871
Fax (989) 799-4524
SCE SAGINAW CONTROL & ENGINEERING
Your Enclosure Source®

CONTINUOUS HINGE ENCLOSURES

TECHNICAL DATA







SECTION A-A

NOTE:
Sub-panel must be ordered separately

CLAMPING NOTE:
Enclosures < 10.00 [254] in height require one clamp centered vertically on door

2.

FLOW TRANSMITTER

FOXBORO

QTY. 1: IDP10-T22B21F-M1

EFFLUENT FLOW TRANSMITTER
FT-101 SPECIFICATION SECTION 2.3.3.2

IDP10

IDP10 I/A Series® Intelligent d/p cell® Transmitters

- Application Versatility
  - *316 ss Process Covers and 316L ss Sensor materials standard*
  - *Choice of Traditional or Low Profile Process Cover/Sensor Structures*
  - *Static Pressure Rating of 25 MPa, 3625 psi, 250 bar or kg/cm²; Options to 40 MPa, 5800 psi, 400 bar or kg/cm²*
- Installation Versatility
  - *Traditional "right angle" structure with process connections in horizontal plane*
  - *Low Profile "in line" structures with process connections in verticle plane*
- Two Low Profile Structures
  - *LP1 Structure — economical, small, light weight for direct manifold mounting in vertical or horizontal positions*
  - *LP2 Structure — designed for bracket or manifold mounting in vertical position*
- Superior Performance
  - *Accuracy to ±0.05% of span*
- Choice of Electronics Modules
  - *Intelligent HART, Foundation Fieldbus, Profibus, FoxCom and 4 to 20 mA versions*
  - *Economical 4 to 20 mA and 1 to 5 Vdc versions*
- LCD Indicator/Pushbutton Configurator
  - *Optional on Foundation Fieldbus, Profibus, FoxCom/4-20 mA, and HART/4-20 mA versions*
  - *Standard on 4-20 mA and 1-5 Vdc versio*
- Electrical Clasification:
  - *Various agency certifications for Zone and Division hazardous locations. Refer to Product Specification sheets for complete specifications.*
- Standard Warranty 5 Years

This transmitter measures the difference between two pressures and transmits a proportional or square root (flow) 4-20mA, 1-5Vdc, or digital output signal over a pair of wires.

For complete specifications, refer to Product Specification Sheet PSS 2A-1C14 A, B, & C, and PSS 2A-1C13 D, E, and J.

Output signal and configuration:

Version	Output Choices	Configure From
-D	✓ FoxCom Digital ✓ FoxCom/4 to 20 mA	✓ I/A Series Workstation ✓ Hand-Held Terminal ✓ Personal Computer ✓ Optional Pushbuttons
-T	✓ Hart/ 4 to 20mA	✓ Communicator ✓ Workstation ✓ Personal Computer
-F	✓ Foundation Fieldbus	✓ Workstation
-P	✓ Profibus	✓ Workstation
-A,	✓ 4 to 20mA	✓ Standard Pushbuttons
-V	✓ 1-5 Vdc	✓ Standard Pushbuttons

Span and Range Limits:

Span Limits Code	Span Limits		
A	0.12 & 7.5 kPa	0.5 & 30 inH_2O	1.2 & 75 mbar
B	0.87 & 50 kPa	3.5 & 200 inH_2O	8.7 & 500 mbar
C	7 & 210 kPa	28 & 840 inH_2O	70 & 2100 mbar
D	0.07 & 2.1 MPa	10 & 300 psi	0.7 & 21 bar or kg/cm²
E	0.7 & 21 MPa	100 & 3000 psi	7 & 210 bar or kg/cm²

	Range Limits(1)		
A	-7.5 & +7.5 kPa	-30 & +30 inH_2O	-75 & +75 mbar
B	-50 & +50 kPa	-200 & +200 inH_2O	-500 & +500 mbar
C	-210 & +210 kPa	-840 & +840 inH_2O	-2100 & +2100 mbar
D	-0.21 & +2.1 MPa	-30 & +300 psi	-2.1 & +21 bar or kg/cm²
E	-0.21 & +21 MPa	-30 & 3000 psi	-2.1 & +210 bar or kg/cm²

Maximum Static and Overrange Pressures

Transmitter Configuration (See Model Code for Description of Options)	Pressure Rating		
	MPa	psi	bar or kg/cm2
Standard or with Option -B2, -D3, or -D7	25	3625	250
With Option -B3	20	2900	200
With Option -D1	16	2320	160
With Option -B1 or -D5	15	2175	150
With Option -D2, -D4, -D6, or -D8	10	1500	100
With Structure Codes 78 and 79 (pvdf insert)	2.1	300	21
With Option -D9 or -Y	40	5800	400

Performance Specifications

Accuracy (Includes Linearity, Hysteresis, and Repeatability):

Version	Output	Signal Accuracy in % of Calib. Span
-D or -T	Digital	±0.05
	4 to 20 mA	±0.075
-F or -P	Digital	±0.05
-A	4 to 20 mA	±0.20
-V	1 to 5 Vdc	±0.10

Refer to PSSs for accuracies at small spans (less than 10% of URL) and with square root output

Physical Specifications

Material Combination & Value Package: Refer to How To Order for material versions available. For exceptional value and corrosion resistance, the standard material combination with the lowest price is 316 ss Process Covers with 316L ss Sensor.

Enclosure Classification: Meets IEC IP66 and NEMA Type 4X.

Sensor Fill Fluid: Dow Corning dimethylsiloxane (DC 200) or fluorinated hydrocarbon (3M Fluorinert FC 77), as specified.

How to Order — Specify Model Number IDP10

Electronic Versions and Output Signals

4-20 mA/FoxCom . . . . . D
4 to 20 mA/HART . . . . . T
Foundation Fieldbus . . . . . F
Profibus . . . . . P
4 to 20 mA . . . . . A
1 to 5 V dc V

Structure Code — Select from one of the following eight groups:

1. Transmitter With Traditional Structure

Process Covers	Sensor	Fill Fluid	
Steel	Co-Ni-Cr	Silicone	10
Steel	Co-Ni-Cr	Fluorinert	11
Steel	316L ss	Silicone	12
Steel	316L ss	Fluorinert	13
Steel	Hastelloy C	Silicone	16
Steel	Hastelloy C	Fluorinert	17
316 ss	Co-Ni-Cr	Silicone	20
316 ss	Co-Ni-Cr	Fluorinert	21
316 ss	316L ss	Silicone	22
316 ss	316L ss	Fluorinert	23
316 ss	316L ss, Gold Plated	Silicone	2G
316 ss	Monel	Silicone	24
316 ss	Monel	Fluorinert	25
316 ss	Hastelloy C	Silicone	26
316 ss	Hastelloy C	Fluorinert	27
Monel	Monel	Silicone	34
Monel	Monel	Fluorinert	35
Hastelloy C	Hastelloy C	Silicone	46
Hastelloy C	Hastelloy C	Fluorinert	47
Hastelloy C	Tantalum	Silicone	48
Hastelloy C	Tantalum	Fluorinert	49
pvsf Insert (Kynar)	Tantalum	Silicone (Used w/Process Connector Type 7)	78
pvsf Insert (Kynar)	Tantalum	Fluorinert (Used w/Process Connector Type 7)	79

2. Transmitter With Low Profile Structure LP1 (No Seals)

Process Covers	Sensor	Fill Fluid	
316 ss	316L ss	Silicone	LL
316 ss	316L ss	Fluorinert	LM
316 ss	Hastelloy C	Silicone	LC
316 ss	Hastelloy C	Fluorinert	LD

3. Transmitter With Low Profile Structure LP2 (No Seals)

Process Covers	Sensor	Fill Fluid	
316 ss	316L ss	Silicone	52
316 ss	316L ss	Fluorinert	53
316 ss	Hastelloy C	Silicone	56
316 ss	Hastelloy C	Fluorinert	57

4. Transmitter (Traditional Structure) Prepared for Foxboro Model Coded Seals(2)

Direct Connect Seal on HI Side; 1/2 NPT Process Connector LO Side; Silicone Fill in Sensor(3)	F1
Direct Connect Seal on HI Side; 1/2 NPT Process Connector LO Side; Fluorinert Fill in Sensor(3)	F2
Direct Connect Seal on HI Side; Remote Seal with Capilary LO Side; Silicone Fill in Sensor(3)	F3
Direct Connect Seal on HI Side; Remote Seal with Capilary LO Side; Fluorinert Fill in Sensor(3)	F4
Remote Seals on Both HI and LO Sides, Silicone Fill in Sensor(4)	S1
Remote Seals on Both HI and LO Sides, Fluorinert Fill in Sensor(4)	S2
Remote Seal HI Side, ½ NPT Connector LO Side, Silicone Fill in Sensor(4)	S3
Remote Seal HI Side, ½ NPT Connector LO Side, Fluorinert Fill in Sensor(4)	S4
Remote Seal LO Side, ½ NPT Connector HI Side, Silicone Fill in Sensor(4)	S5
Remote Seal LO Side, ½ NPT Connector HI Side, Fluorinert Fill in Sensor(4)	S6

5. Transmitter (Traditional Structure) Prepared for non-Foxboro Seals

Remote Seal on High and Low Sides; Silicone Fill in Sensor	SA
Remote Seal on High and Low Sides; Inert Fill in Sensor	SB
Remote Seal on High Side and ½ NPT Connector on Low Side, Silicone Fill in Sensor	SC
Remote Seal on High Side and ½ NPT Connector on Low Side, Inert Fill in Sensor	SD
Remote Seal on Low Side and ½ NPT Connector on High Side, Silicone Fill in Sensor	SE
Remote Seal on Low Side and ½ NPT Connector on High Side, Inert Fill in Sensor	SF

Span Limits — Differential Pressure Units

kPa	inH_2O	mbar	
0.12 and 7.5	0.5 and 30	1.2 and 75	A
0.87 and 50	3.5 and 200	8.7 and 500	B
7 and 210	28 and 840	70 and 2100	C
MPa	**psi**	**bar or kg/cm²**	
0.07 and 2.1	10 and 300	0.7 and 21	D
0.7 and 21	100 and 3000	7 and 210	E

Process Connector Type (Material Same as Process Cover Material)

None, Covers Tapped for 1/4 NPT	0
¼ NPT	1
½ NPT	2
Rc ¼	3
Rc ½	4
½ Schedule 80 Welding Neck	6
None, pvdf (Kynar) insert tapped for ½ NPT (used with Structure Codes 78 & 79)	7

Conduit Connection and Housing Material

½ NPT Conduit Connections, Aluminum Housing	1
PG 13.5 Conduit Connections, Aluminum Housing	2
½ NPT Conduit Connections, 316 ss Housing	3
PG 13.5 Conduit Connections, 316 ss Housing	4
M20 Conduit Connection, Both Sides, Aluminum Housing	5
M20 Conduit Connection, Both Sides, 316 ss Housing	6

Electrical Safety (See PSS for Description and Restrictions)

ATEX II GD, EEx ia IIC, or II ½ GD, EEx ib IIC . . . . . E
ATEX Flameproof; II 2 GD, EEx d IIC, Zone 1 . . . . . D
ATEX II 3 GD, EEx nL IIC . . . . . N
ATEX Multiple Certifications (E, D, and N) . . . . . M
CSA Certified C
CSA Certified (including Flameproof Zones) . . . . . B
FM approved . . . . . F
FM approved (including Flameproof Zones) . . . . . G
IECEx Intrinsically Safe, Ex ia IIC T4 . . . . . T
IECEx Intrinsically Safe, Protection n; Ex nL IIC T4 . . . . . U

Optional Selections

Mounting Bracket Set—Specify Only One

Painted Steel Bracket with Plated Steel Bolts . . . . . -M1
Stainless Steel Bracket with Stainless Steel Bolts . . . . . -M2
Universal Stainless Steel Bracket with Stainless Steel Bolts . . . . . -M3

Indicator with Internal Pushbuttons

Digital Indicator, Pushbuttons, and Window Cover for IGP20-D, -T, -P, and -F only[5] . . . . . -L1
Blind (solid) cover over the std. LCD on -A, or -V . . . . . -L2

DIN 19213 Construction — Specify Only One and Specify Process Connector Code 0

Single Ended Process Cover with M10 Bolting . . . . . -D1
Double Ended Process Cover with M10 Bolting (Blind Kidney Range on Back) . . . . . -D2
Single Ended Process Cover with 7/16 inch Bolting . . . . . -D3
Double Ended Process Cover with 7/16 inch Bolting (Blind Kidney Flange on Back) . . . . . -D4
Single Ended Process Covers with 316 ss 7/16 inch Bolting . . . . . -D5
Double Ended Process Covers with 316 ss 7/16 inch Bolting (Blind Kidney Flange on Back) . . . . . -D6
Single Ended Process Covers with 17-4 ss 7/16 inch Bolting . . . . . -D7
Double Ended Process Covers with 17-4 ss 7/16 inch Bolting (Blind Kidney Flange on Back) . . . . . -D8
Single Ended Process Covers with 17-4 ss 7/16 inch Bolting an 40 MPa (400 bar or kg/cm2, 5800 psi) static pressure rating . . . . . -D9

Cleaning and Preparation—Specify Only One

Unit Degreased (not for Oxygen/Chlorine Service)[6] . . . . . -X1
Cleaned and Prepared for Oxygen Service[7] . . . . . -X2
Cleaned and Prepared for Chlorine Service[7] . . . . . -X3

Bolting for Process Covers and Process Connectors — Specify Only One

316 ss Bolts and Nuts (Maximum Static Pressure 150 bar or kg/cm^2, 2175psi) . . . . . -B1
17-4 ss Bolts and Nuts . . . . . -B2
B7M Bolts and Nuts (NACE) (Pressure de-rated, refer to table) . . . . . -B3

Conduit Thread Adapters — Specify Only One

Hawk-Type ½ NPT Cable Gland for use with Conduit Connection Codes 1 & 3 . . . . . -A1
Plastic PG 13.5 Connector for use with Conduit Connection Codes 2 & 4 . . . . . -A2
M20 Connector for use with Conduit Connection Codes 1 & 3 . . . . . -A3
Trumpet shaped PG 13.5 Cable Gland (Nickel Plated Brass) for use with Conduit Connection Codes 2 & 4 . . . . . -A4

Electronic Housing Features—Specify Only One

External Zero Adjustment . . . . . -Z1
Custody Transfer Lock & Seal . . . . . -Z2
External Zero Adjustment and Custody Transfer Lock & Seal . . . . . -Z3

Ermeto Connectors—Specify Only One

Steel, Connecting 6 mm Tubing to ¼ NPT Process Connector . . . . . -E1
Steel, Connecting 12 mm Tubing to ½ NPT Process Connector . . . . . -E2
316 ss, Connecting 6 mm Tubing to ¼ NPT Process Connector . . . . . -E3
316 ss, Connecting 12 mm Tubing to ½ NPT Process Connector . . . . . -E4

Factory Configuration—Specify Only One

Digital Output (FoxCom only) . . . . . -C1
Full Factory Configuration (Requires Configuration Form) . . . . . -C2

Instruction Book Options

Without Instruction Book & CD . . . . . -K1

Vent Screw in Process Cover

Supply Vent Screw in Side of Each Process Cover
(Available only on Traditional Process Cover Structure Codes 22 to 47) . . . . . -V
Omit Vent Screw in Side of Each Process Cover
(Available only on Type LP1 Low Profile Process Cover Structures Codes LL, LM, LC, and LD) . . . . . -V1

Adapters for Direct Mount to Competitive Manifolds (See Product Specification Sheet for manifold compatibility)

Adapter plate, Bolts, and Gaskets for Coplanar Manifolds . . . . . -P1
Not available with:
Bolting Options -B1, -B2, and -B3;
DIN 19213 Construction Options -D1, -D2, -D4, -D5, -D6, -D7, and -D8

Miscellaneous Optional Selections

Five Year Warranty . . . . . -W
Supplemental Customer Tag . . . . . -T
High Static Pressure Rating (40 MPa, 5800 psi, 400 bar or kg/cm^2) . . . . . -Y
Low Temperature Operative Limit of -50C (-58F) for Entire Transmitter . . . . . -J
Gasket for Vacuum Service with Pressure Seals[8] . . . . . -G1

Specify calibrated differential pressure range

Specify information for instrument tag

Notes

1 Upper Range Limit is the lower of the values in this table and in the Maximum static and Overrange Table, which lists the derated pressures associated with various options.
2 Refer to Section "Pressure Seals and Industry-Specific Sonnection" for additional information
3 Direct Mount seals that may be specified are models PSFLT, PSSCT, and PSSST.
4 Remote Mount seals that may be specified are models PSFPS, PSFES, PSFAR, PSTAR, PSISR, PSSCR, and PSSSR.
5 Standard equipment on IGP20-A, and –V.
6 Available only with Structure Codes having Silicone Fill Fluid.
7 Available only with Structure Codes having Fluorinert Fill Fluid and not available with carbon steel Process Cover.
8 Option -G1 is required when pressure seal (Structure Codes F1-F4, S1-S6, or SA-SF) will be used on vacuum applications. This option substitutes vacuum service metal gaskets for the standard ptfe Process Cover Gasket.