



SPONSLER, INC.

SP4000: Multi-Function Flow Computer



Description:

The SP4000 Flow Computer satisfies the instrument requirements for a variety of flowmeter types in liquid, gas, steam and heat applications. Multiple flow equations are available in a single instrument with many advanced features. The alphanumeric display offers measured parameters in easy to understand format. Manual access to measurements and display scrolling is supported. The versatility of the Flow Computer permits a wide measure of parameters within the instrument package. The various hardware inputs and outputs can be “soft” assigned to meet a variety of common application needs. The user “soft selects” the usage of each input/output while configuring the instrument. Consider the following illustrative examples.

The isolated analog output can be chosen to follow the volume flow, corrected volume flow, mass flow, temperature, pressure, or density by means of a menu selection. Most hardware features are assignable by this method. The user can assign the standard RS-232 Serial Port for external data logging, transaction printing, or for connection to a modem for remote meter reading. A Service or Test mode is provided to assist the user during start-up system check out by monitoring inputs and exercising outputs. The system setup can also be printed.

- “EZ Setup”- Guided Setup for First Time Users
- Liquid, Gas, Steam and Heat Flow Equations
- Utility Metering
- Menu Selectable Hardware & Software Features
- Internal Data Logging Option
- Isolated Pulse and Analog Outputs Standard
- RS-232 Port Standard, RS-485 Optional
- Windows™ Setup Software
- NX19 Gas Equations, Stacked DP Transmitters
- DDE Server & HMI Software Available
- Remote Metering by Wireless or Modem
- NEW! - Attractive Wall Mount Enclosure

Specifications:

Environmental

- Operating Temperature: 0 to +50 C
- Storage Temperature: -40 to +85 C
- Humidity : 0-95% Non-condensing
- Materials: UL, CSA, VDE approved

Display

- Type: 2 lines of 20 characters, VFD
- Character Size: 0.3" nominal
- User selectable label descriptors and units of measure

Keypad

- Keypad Type: Membrane Keypad
- Keypad Rating: Sealed to Nema 4
- Number of keys: 16

Enclosure

- Enclosure Options: Panel, Wall, Explosion Proof
- Size: See Dimensions
- Depth behind panel: 6.5" including mating connector
- Type: DIN
- Materials: Plastic, UL94V-0, Flame retardant
- Bezel: Textured per matt finish

Power Input

The factory equipped power option is internally fused. An internal line to line filter capacitor is provided for added transient suppression. MOV protection for surge transient is also supported.

- Universal AC Power: 85 to 276 Vrms, 50/60 Hz
- DC Power Option: 24 VDC (16 to 48 VDC)
- Power Consumption
- AC Power: 6.5 V/A
- DC Power: 300 mA max





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Flow Meter Types:

- Linear: Vortex, Turbine, Positive Displacement, Magnetic, GilFlo, Laminar and others
- Square Law: Orifice, Venturi, Nozzle, V-Cone, Wedge, Averaging Pitot, Target and others
- Multi-Point Linearization: May be used with all flowmeter types.
- Including: 16 point, UVC and dynamic compensation.

Flow Inputs:

Analog Input:

- Accuracy: 0.01% FS at 20 C Ranges
- Voltage: 0-10 VDC, 0-5 VDC, 1-5 VDC
- Current: 4-20 mA, 0-20 mA, 4-20 mA stacked, 0-20 mA stacked
- Basic Measurement Resolution: 16 bit
- Update Rate: 4 updates/sec
- Automatic Fault detection: Signal over/under-range, Current Loop Broken
- Calibration: Operator assisted learn mode
- Extended calibration: Learns Zero and Full Scale of each range
- Fault Protection:
- Fast Transient: 500 V Protection (capacitive clamp)
- Reverse Polarity: No ill effects
- Over-Voltage Limit: 50 VDC Over voltage protection
- Over-Current Protection: Internally current limited protected to 24VDC

Pulse Inputs:

- Number of Flow Inputs: one
- Input Impedance: 10 k . nominal
- Trigger Level: (menu selectable)
- High Level Input
- Logic On: 2.5 to 30 VDC
- Logic Off: 0 to 2 VDC
- Low Level Input (mag pickup)
- Selectable sensitivity: 10 mV and 100 mV
- Minimum Count Speed: 0.25 Hz (to maintain rate display)
- Maximum Count Speed: Selectable: 0 to 50 kHz
- Overvoltage Protection: 50 VDC

Temperature, Pressure, Density Inputs

The compensation inputs usage are menu selectable for temperature, temperature 2, pressure, density or not used.

- Calibration: Operator assisted learn mode
- Operation: Ratiometric
- Accuracy: 0.01% FS at 20 C
- Basic Measurement Resolution: 16 bit
- Update Rate: 2 updates/sec minimum
- Automatic Fault detection:
 - Signal Over-range/under-range
 - Current Loop Broken
 - RTD short
 - RTD open
- Reverse Polarity: No ill effects

- Over-Current Limit (current input) Internally limited to protect input to 24 VDC
- Available Input Ranges:
- Current: 4-20 mA, 0-20 mA
- Resistance: 100 Ohms DIN RTD 100 Ohm DIN RTD (DIN 43-760, BS 1904): Three Wire Lead Compensation
- Internal RTD linearization learns ice point resistance
- 1 mA Excitation current with reverse polarity protection
- Temperature Resolution: 0.01 C

Stored Information (ROM)

- Steam Tables (saturated & superheated),
- Fluid Properties: Water, Air, Natural Gas or Generic

User Entered Stored Information (EEPROM / Nonvolatile RAM):

- Transmitter Ranges, Signal Types
- Fluid Properties (specific gravity, expansion factor, specific heat, viscosity, isentropic exponent, combustion heating value, Z factor)
- Units Selections (English/Metric)
- Language Translations (optional)

Excitation Voltage

- 24 VDC @ 100 mA (fault protected)

Relay Outputs

The relay outputs usage is menu assignable to (Individually for each relay) Hi/Lo Rate Alarm, Hi/Lo Temperature Alarm, Hi/Lo Pressure Alarm, Pulse Output (pulse options), Wet Steam or General purpose warning (security).

- Number of relays: 2 (3 optional)
- Contact Style: Form C contacts
- Contact Ratings: 240 V, 5 amp

Analog Outputs

The analog outputs are menu assignable to correspond to the Uncompensated Volume Rate, Corrected Volume Rate, Mass Rate, Heat Rate, Temperature, Density, or Pressure.

- Number of Outputs: 2
- Type: Isolated Current Sourcing (shared common)
- Available Ranges: 0-20 mA, 4-20 mA (menu selectable)
- Resolution: 16 bit
- Accuracy: 0.05% FS at 20 Degrees C
- Update Rate: 5 updates/sec
- Temperature Drift: Less than 200 ppm/C
- Maximum Load: 1000 ohms
- Compliance Effect: Less than .05% Span
- 60 Hz rejection: 40 dB minimum
- EMI: No effect at 3 V/M
- Calibration: Operator assisted Learn Mode
- Averaging: User entry of DSP Averaging constant to cause a smooth control action

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Listing: CE Compliant

Serial Communication

The serial port can be used for printing, datalogging, modem connection, two way paging and communication with a computer.

RS-232:

Device ID: 01-99

- Baud Rates: 300, 600, 1200, 2400, 4800, 9600, 19200
- Parity: None, Odd, Even
- Handshaking: None, Software, Hardware
- Print Setup: Configurable print list and formatting

RS-485:

- Device ID: 01-247
- Baud Rates: 300, 600, 1200, 2400, 4800, 9600, 19200
- Parity: None, Odd, Even
- Protocol: Modbus RTU (Half Duplex)

Data Logging

The data logger captures print list information to internal storage for approximately 1000 transactions. This information can be used for later uploading or printing. Storage format is selectable for Comma-Carriage Return or Printer formats.

Isolated Pulse output

The isolated pulse output is menu assignable to Uncompensated Volume Total, Compensated Volume Total, Heat Total or Mass Total.

- Pulse Output Form (menu selectable): Open Collector NPN or 24 VDC voltage pulse
- Nominal On Voltage: 24 VDC
- Maximum Sink Current: 25 mA
- Maximum Source Current: 25 mA
- Maximum Off Voltage: 30 VDC
- Saturation Voltage: 0.4 VDC
- Pulse Duration: User selectable
- Pulse output buffer: 8 bit
- Fault Protection
- Reverse polarity: Shunt Diodes
- Over-current Protected
- Over-voltage Protected

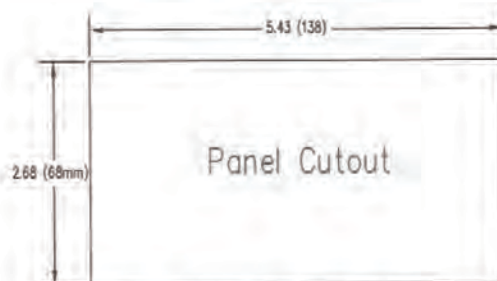
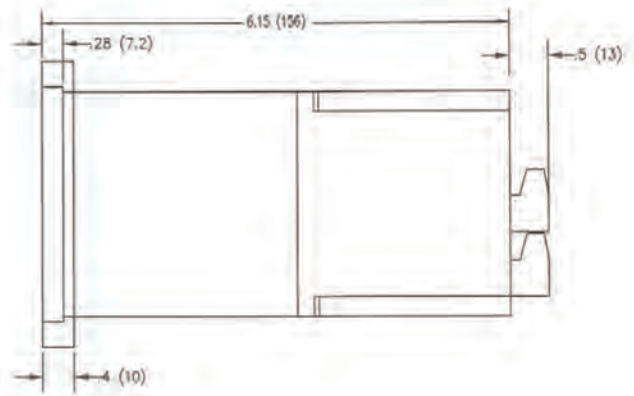
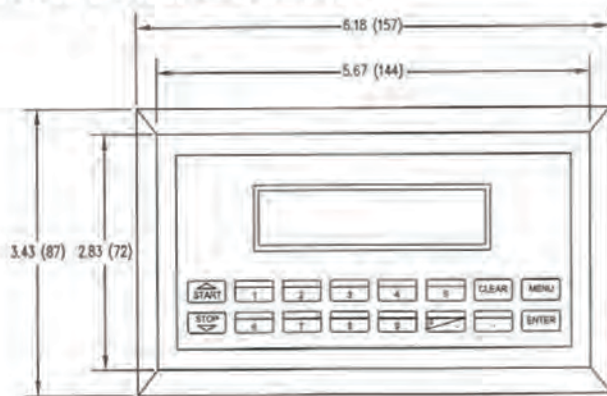
Real Time Clock

The Flow Computer is equipped with a non-volatile real time clock with display of time and date.

Format:

- 24 hour format for time
- Day, Month, Year for date

Dimensions: Panel Mount Standard



Dimensions are in inches (mm)

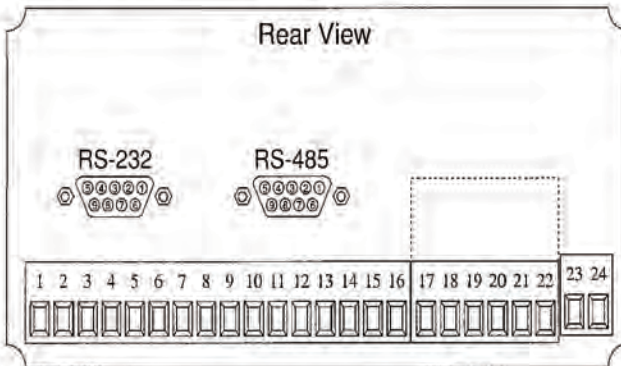
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Terminal Designations

Terminal	Designation
1	DC OUTPUT
2	PULSE IN
3	-----
4	COMMON
5	RTD EXCIT (+)
6	RTD SENS (+)
7	RTD SENS (-)
8	DC OUTPUT
9	RTD EXCIT (+)
10	RTD SENS (+)
11	RTD SENS (-)
12	PULSE OUTPUT (+)
13	PULSE OUTPUT (-)
14	ANALOG OUTPUT 1 (+)
15	ANALOG OUTPUT 2 (+)
16	ANALOG OUTPUT COMMON (-)
17	NO
18	COM RLY1
19	NC
20	NC
21	COM RLY2
22	NO
23	AC LINE
24	AC LINE

Terminal	Designation
1	DC OUTPUT
2	PULSE IN
3	-----
4	COMMON
5	RTD EXCIT (+)
6	RTD SENS (+)
7	RTD SENS (-)
8	DC OUTPUT
9	RTD EXCIT (+)
10	RTD SENS (+)
11	RTD SENS (-)
12	PULSE OUTPUT (+)
13	PULSE OUTPUT (-)
14	ANALOG OUTPUT 1 (+)
15	ANALOG OUTPUT 2 (+)
16	ANALOG OUTPUT COMMON (-)
17	NO
18	COM RLY1
19	NC
20	NC
21	COM RLY2
22	NO
23	AC LINE
24	AC LINE

Terminal Layout



Ordering Information

Example SP4000 AC A P L RS48

Series: _____

SP4000 = Flow Computer

Power Input: _____

AC= Universal AC Power 85-276VAC 50/60Hz *
DC= 24 VDC

Relay Output: _____

A= 2 Form C Relays *
B= 3 Form C Relays

Mounting: _____

P= Panel Mount *
F= NEMA 4X Fiberglass
E= Explosion Proof (No Button Access)
X= Explosion Proof (External Button Access)

Linearization (Optional): _____

L= Linearization

Network Card (Optional): _____

RS48= RS-485/Modbus

* Standard Options