



**SFC 1000PA P2DAAA**

The SFC 1000 P2DAAA is a dual meter run bi-directional flow computer with a built in Rosemount® 205 Multivariable Transmitter (DP, P, and TEMP) for the measurement of liquid & Gas products. Using orifice plate, Venturi, turbine/PD/ultrasonic mass meter, or wedge devices, it can meter a wide variety of products, such as crude, refined product, LPG/NGL products, products that use table 24C, ethylene, propylene, and water. Fifty days of previous daily data, fifty previous batch data, and fifty previous hourly data are stored in the full format type reports. The previous 100 audit trail reports and 100 alarm reports are stored. User formatted reports and user formatted ticket reports are available.

Sixteen different product files are user-configurable and stored in memory with an easy switch feature to enable the user to choose which product is being monitored at any given time. Product scheduling for batch operation is also available.

SFC 1000PA P2DAAA prover flow computers store data for up to 60 meters and can easily be configured from inside a vehicle with a laptop. With the push of a button proving is initiated for any of the 60 meters.

The flow computer controls the proving process and generates all the proving reports. When proving is complete a printed report is automatically generated to a serial printer port. The data can also be retrieved via a laptop at any time.

The SFC 1000PA P2DAAA can be mounted on a prover trailer, which can be moved from field to field to provide proving services.

### **Features**

- 32-bit processor
- Multiple I/O options
- Custody transfer accuracy
- Turbine diagnostics
- Battery backup/UPS

### **Prover (SFC1000PA P2DAAA)**

- Additional I/O options
- Stationary or portable systems
- Dual or single detectors
- Supports 4-way valve control

### **Communications**

- RS232 Modbus
- RS485 Modbus
- Analog and digital I/O

### **Applications**

- Liquid and gas measurement
- Wellhead measurement & automation
- Custody measurement and control
- Compressor stations
- Well optimization
- PID control

### **Reports/Storage**

- Daily
- Hourly
- Monthly
- Monthly day by day

### **Alternative Power**

- Extended length battery backup
- Solar powered

The SFC 1000 P2DAAA includes a factory integrated multivariable 3-in-1 digital transmitter manufactured by Rosemount® for the simultaneous measurement of temperature, pressure, and differential pressure. It can also control pneumatic or electrical valves (on-off or variable by means of analog outputs or process PID control).

The input/output assignment, flow equations, historical data storage, and other functions are carried out using Dynamic Flow Computers' DYNACOM® software. This software is Windows based, free of charge, and available for download/update at any time on our website.

**DYNACOM® Software Capabilities:**

- Flow computer diagnostics
- Configure inputs and outputs
- Configure PID control
- Personalize report time and content
- Configure and select the local LCD screen displayed parameters
- Reassign and customize MODBUS® registers and values
- Create and implement custom math and formulas
- Input and output calibration
- Automatic and periodic downloading of flow computer reports
- Obtain historic data for display, saving, exportation, or printing

Historic data is available in the memory of the flow computer for download or display.

**Maximum Report Storage:**

- Hourly reports: 1536 hours\*
- Daily reports: 64 \*
- Daily reports, hour by hour: 64\*
- Monthly reports: 6\*
- Monthly, day by day: 2 months\*
- Calibration reports: 20\*
- Audit reports: 100\*
- Alarm reports: 100\*
- Special reports: HTML, and others

\*The number of reports stored can vary according to application.

## Multivariable Transmitter



The Multivariable Sensor is a 3-in-1 model 205 transmitter manufactured by Rosemount® Inc. for Dynamic Flow Computers. This sensor measures static/ absolute pressure, differential pressure, and using an optional RTD, process temperature. These three process variables are available all the time and updates are sent to the flow computer up to NINE times per second.

The model 205 is a culmination of the vast technological experience that Rosemount® Inc. has in the multivariable field. It includes the well recognized and tested 3051C technology using capacitive cells for differential pressure as well as a patented piezoresistive/silicon sensors for measurement of absolute/ static pressures.

The digital technology utilized in the production of the 205 module is the most advanced measurement technology on the market, assuring maximum accuracy and rangeability. The extensive use of patented technology concerning the sensors internal circuitry significantly reduces the size and the weight of the 205 sensor.

The Multivariable Sensor measures three process variables at one time. It incorporates a capacitive differential pressure sensor, a piezoresistive absolute/static pressure sensor, and an optional connection for a two, three, or four wire RTD. The sensors convert the process variables to a digital format for direct communication with the flow computer.

### **PHYSICAL SPECIFICATIONS**

<b>Electrical/Conduit Connections</b>	Two 3/4" NPT.
<b>Process Connection</b>	Two 1/4" -18 NPT (multivariable)
<b>Housing (Flow Computer)</b>	NEMA 4X class 1 div. 1 – IP66
<b>RTD Connection</b>	To flow computer terminal block or directly to multivariable
<b>Multivariable</b>	3-in-1 (pressure, differential pressure, and temperature), manufactured by Rosemount® Inc.
<b>Display</b>	Plasma; 2 Lines x 16 characters each line.
<b>Temperature Limits</b>	Operation: -40 to 185 °F (-40 to 85 °C) Storage: -50 to 190 °F (-46 to 87 °C)
<b>Humidity</b>	100%

**ELECTRICAL SPECIFICATIONS**

<b>Voltage</b>	12 to 30 VDC
<b>Power Consumption</b>	4 watt
<b>Solar Board (Optional)</b>	10/20 watts, 12 volts
<b>Polarity</b>	Reverse polarity protected
<b>Processor</b>	32 bits @ 16.7Mhz
<b>FLASH ROM</b>	4 MB @ 70 NANO seconds
<b>ROM</b>	2 MB @ 30 NANO seconds
<b>Real Time Clock</b>	Years/Months/Days/Hours/Minutes

**INPUT SPECIFICATIONS**

<b>Optic Isolation</b>	Each input is optically isolated with $\pm 250$ VDC chassis isolation
<b>Analog Input</b>	Four 4-20mA (or 0-5V) inputs (expandable to 6 inputs) Resolution 24 bits
<b>Pulse/Frequency Input</b>	Three inputs (expandable to 4) 0 - 5000 HZ Signal must be > 70 mV for sine wave Signal must be > 6 volts for square wave <i>Input 3 is for square wave only</i>
<b>Digital/Switch Input</b>	Four inputs 7-24VDC 0.25 Amp rating
<b>RTD Input</b>	Two inputs (RTD input uses/disables 2 analog inputs) Direct connection to flow computer 4-Wire RTD, 24 bit resolution

**OUTPUT SPECIFICATIONS**

<b>Optic Isolation</b>	Each output is optically isolated with $\pm 250$ VDC chassis/ground isolation
<b>Digital/Switch Output</b>	Three outputs 7-24VDC 0.25 Amp rating
<b>Pulse Output</b>	Two outputs (can also be assigned as digital output for a total of 5 digital outputs) 7-24VDC 0.5 Amp rating On/Off or pulses (to 125 pulses/sec.)
<b>Analog Output</b>	Two outputs 4-20mA (external power required) For PID control or for data transmission Resolution 12 bits single ended

**COMMUNICATION SPECIFICATIONS**

<b>RS485</b>	Quantity 2 @ 1200 – 38400 bps
<b>RS232</b>	Quantity 1 @ 1200 – 19200 bps
<b>Protocol</b>	MODBUS® RTU / ASCII

**DIAGNOSTIC SPECIFICATIONS**

<b>Monitor/Alarm</b>	<p>Multivariable: P, DP, T</p> <p>Analog inputs/outputs</p> <p>Digital/switch inputs</p> <p>Digital/switch outputs</p> <p>Pulse/frequency inputs</p> <p>Internal temperature</p> <p>Battery voltage</p> <p>Internal power supply</p>
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**FLOW COMPUTATION SPECIFICATIONS**

<b>Number of Trains</b>	Two bi-directional (dependant on application)
<b>Flow Calculation</b>	Simultaneous gas and liquid
<b>Primary Elements</b>	<p>Differential: Orifice, V-Cone, Wedge, Annubar, Venturi, etc.</p> <p>Pulse/Frequency: Turbine, PD, Vortex, Ultrasonic, etc.</p>
<b>Engineering Units</b>	US and Metric
<b>Base Conditions</b>	<p>60 °F, 14.7 PSIA (15 °C and 1 Kg./Cm<sup>2</sup>)</p> <p>68 °F, 14.7 PSIA (20 °C and 1 Kg/Cm<sup>2</sup>)</p>
<b>Equations</b>	<p>AGA3, API14.3, AGA7, AGA9, API5.6, API5.7, AGA8 methods 1, 2, and detailed; API 2540; API11-2-1, 11-2-1M; 11-2,2, 11-2-2M; GPA15, 16; API2565; tables 5A,B; 6A,B,C; 23A,B,C; 24A,B,C; 53A,B; 54A,B,C; 23 and 24.</p> <p>Others added continuously, consult factory for complete list</p>

**MULTIVARIABLE SPECIFICATIONS**

<b>Function</b>	Gas, oil, water, steam, and others
<b>Differential Sensor Limits</b>	<p>Range 2: -250 to 250 in H<sub>2</sub>O (-0.622 to 0.622 bar)</p> <p>Range 3: -1000 to 1000 in H<sub>2</sub>O (-2.49 to 2.49 bar)</p>
<b>Absolute Sensor Limits</b>	<p>Range 3: 0.5 to 800 psia (3447 to 5516 kPa)</p> <p>Range 4: 0.5 to 3626 psia (3447 to 25000 kPa)</p>
<b>Gage Sensor Limits</b>	<p>Range C: 0 to 800 psig (0 to 5516 kPa)</p> <p>Range D: 0 to 3626 psig (0 to 25000 kPa)</p>
<b>Temperature Sensor (does not consider error from external RTD)</b>	<p>Compatible with any 100 Ohm Platinum RTD</p> <p>Range 2: -40 to 1200 °F (- 40 to 649 °C) accuracy ±1.0 °F (±0.56 °C)</p> <p>Range 3: -300 to 1200 °F (-184 to 649 °C) accuracy ±1.0 °F (±0.56 °C)</p> <p>Range 4: 1200 to 1500 °F (649 to 816 °C) accuracy ±0.5 °F by each 50 °F</p>
<b>Temperature Limits (Applies to Multivariable Flange temp. Does not apply to process temp)</b>	<p>-40 to 250 °F (-40 to 121 °C) (Silicon fill)</p> <p>0 to 185 °F (-17.8 to 85 °C) (Inert fill)</p>

**MULTIVARIABLE SPECIFICATIONS (CONTINUED)**

<b>Environmental Temperature Limits</b>	-40 to 185 °F (-40 to 85 °C) (Silicon fill) 0 to 185 °F (-17.8 to 85 °C) (Inert fill)
<b>Storage Temperature Limits</b>	-50 to 230 °F (-46 to 100 °C)
<b>Humidity</b>	0 –100% relative humidity

**MULTIVARIABLE ACCURACY**

(Includes the combined effects of linearity, hysteresis and repeatability)

<b>Differential Pressure</b>	± 0.075% of the span for spans from 1:1 to 10:1 of the URL. For spans smaller than 10:1 calculate according to: Accuracy = ±[0.025 + 0.005 (URL/Span)]% of span
<b>Pressure absolute/static</b>	± 0.075% of the span for spans from 1:1 to 10:1 of the URL. For spans smaller than 10:1, calculate according to: Accuracy = ±[0.03 + 0.0075 (URL/Span)]% of span
<b>Temperature</b>	Accuracy ±1.0 °F (±0.56 °C) from -300 to 1200 °F (-184 to 649 °C)

**MULTIVARIABLE CONSTRUCTION MATERIAL**

<b>Process Connections</b>	<u>Transmitter</u> 1/4–18 NPT on 21/8" centers 1/2–14 NPT on 2", 2 1/8", or 2 1/4" centers with optional flange adapters <u>RTD</u> RTD dependent.
<b>Wetted Parts</b>	<u>Isolating Diaphragms</u> 316L SST or Hastelloy C-276® <u>Drain Vents / Valves</u> 316L SST or Hastelloy C-276® <u>Flanges</u> Plated carbon steel, 316 SST, or Hastelloy C-276 <u>Wetted O-Rings</u> Glass-Filled PTFE
<b>Non-Wetted Parts</b>	<u>Screws</u> Plated carbon steel per ASTM A449, Grade 5 or austenitic 316 SST <u>Fill Fluid</u> Silicone or halocarbon inert oil <u>O-Rings</u> Buna N

**Optional Accessories**

RS-232 Elbow



SmartCone®



Armored RTD Cable



Shielded RTD Cable



Solar Panel



5-Valve Manifold



L-Shaped Mounting Bracket

