The Micro MV P2DAAA is a four meter bi-directional field mounted flow computer with a built in Rosemount® 205 Multivariable Transmitter (DP, P, and TEMP) which can be used for all liquid and gas applications, including custody or non-custody measurements. The Micro MV P2DAAA flow computer is the most powerful flow computer of its kind and represents one of the latest advancements in operation, performance, and modularity.

The Micro MV P2DAAA has been designed to meet the requirements of a wide variety of specialized industries using a single hardware platform thus reducing spare parts requirements, training and calibration costs, and lowers the overall cost of ownership.

With over 5,000 units in worldwide operation, the Micro MV P2DAAA is indicative of Dynamic Flow Computers' intense commitment to our customer's needs and expectations.

The Micro MV P2DAAA flow computer can be found operating under the most extreme conditions: the hot Saudi Arabian desert, the humid forests of Colombia, the snow-covered valleys of Canada, and the corrosive salt air of offshore platforms. You can be assured that the Micro MV will be reliable under the rigors of any environmental conditions that you can imagine.

All the standards of measurement for liquids or gas (API, AGA, ISO, NIST, etc.) are available in the Micro MV P2DAAA. We also include special equations at the request of our clients. Here are just a few of the ways we have you covered:

Features
- Ultra low power (0.5 watts)
- 32-bit processor
- Touch screen interface
- Turbine diagnostics
- Battery backup/UPS
- Multiple I/O options
- Wireless Radio/Modem ready
- Gas chromatograph interface
- Custody transfer accuracy
- Built-in multivariable 3-in-1 transmitter

Communications
- RS232 Modbus
- RS485 Modbus
- Analog and digital I/O
- Zigbee wireless radio
- FreeWave wireless radio
- DNP3
- Bluetooth

Applications
- Liquid and gas measurement
- Wellhead measurement & automation
- Custody measurement and control
- Compressor stations
- Well optimization
- PID control
- Liquid and gas pipelines
- Injection index testing

Reports/Storage
- Daily
- Hourly
- Monthly
- Monthly day by day
- Calibration and audit

Alternative Power
- Extended length battery backup
- Solar powered

The Micro MV P2DAAA flow computer has the capacity to handle up to FOUR bi-directional gas or liquid measurement trains. Multiple equations are included among which are AGA3/API14.3, API5.7, API2540, AGA7, AGA9, with more being added continuously. The Micro MV P2DAAA accepts any type of primary element: Venturi, Annubar, Turbine, PD, Ultrasonic, V-Cone, Wedge, Vortex, etc. Additionally, it can carry out density calculations according to the following standards: 5A,B; 6A,B,C; 23A,B,C; 24A,B,C; 53A,B; 54A,B,C; 23 and 24; API12, AGA8, NBS1048 for hydrogenate and oxygenate, NBS for steam, NBS1045 for ethylene, saturated and supersaturated steam, etc. Contact our offices or visit our website for available equation updates.

The Micro MV P2DAAA includes a factory integrated multivariable 3-in-1 digital transmitter manufactured by Rosemount® for the measurement of temperature, pressure, and differential pressure. Another exceptional characteristic of the Micro MV P2DAAA is its ability to communicate directly with a gas chromatograph via MODBUS® or proprietary protocol for highly precise flow measurements. It can also control pneumatic or electrical valves (on-off or variable by means of analog outputs or process PID control).

The display screen of the Micro MV P2DAAA is four lines of twenty characters each. Process parameter values that are displayed on the screen are user-selectable and are alternately displayed, up to three at a time, at user-defined intervals.

The front of the Micro MV P2DAAA includes four non-intrusive touch keys for configuration and operation of the flow computer. This design avoids violation of the area classification by allowing the user to interact with the flow computer without having to remove the cover.

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

Electrical/Conduit Connections	Two 3/4" NPT.
Process Connection	Two ¼' -18 NPT (multivariable)
Housing (Flow Computer)	Material: copper free aluminum Painting: epoxy or polyurethane. Classification: NEMA 4X class 1 div. 1 – IP66
RTD Connection	To flow computer terminal block or directly to multivariable
Multivariable	3-in-1 (pressure, differential pressure, and temperature), manufactured by Rosemount® Inc.
Display	Plasma; 4 lines x 20 characters each line. With back light; four non-intrusive keys for configuration, operation, and calibration
Certifications	CSA for class 1, div. 1, groups B, C and D UL for class l, zone 1, AEx d IIB+H2
Temperature Limits	Operation: -40 to 185 °F (-40 to 85 °C) Storage: -50 to 190 °F (-46 to 87 °C)
Humidity	100%

ELECTRICAL SPECIFICATIONS

Voltage	7 to 28 VDC
Power Consumption	0.5 watt
Solar Board (Optional)	10/20 watts, 12 volts
UPS (Optional)	2 day operation
Polarity	Reverse polarity protected
Processor	32 bits @ 16.7Mhz
Memory	2 MB, 35 day storage
Extended Memory (Optional)	128 MB virtual hard disk
Real Time Clock	Years/Months/Days/Hours/Minutes
Internal Battery	Lithium ion

INPUT SPECIFICATIONS

Optic Isolation	Each input is optically isolated with ±250 VDC chassis isolation
Analog Input	Four 4-20mA (or 0-5V) inputs (expandable to 9 inputs) Resolution 24 bits
Pulse/Frequency Input	Three inputs Square wave frequency range 0 - 6000 HZ Sine wave frequency range 0 – 1200 HZ Signal must be > 40 mV for sine wave Signal must be > 3 volts for square wave *Input 3 is for square wave only*
Digital/Switch Input	Four inputs (4 mutual contacts software selectable to be input or output – see Digital Output*) 7-28Vdc 0.25 Amp rating
RTD Input	Direct connection to multivariable Direct connection to flow computer (Direct connection to flow computer uses two of the analog input channels) 24 bit resolution

OUTPUT SPECIFICATIONS

Optic Isolation	Each output is optically isolated with ±250 VDC chassis/ground isolation
Digital/Switch/Pulse Output	Four outputs (4 mutual contacts software selectable to be input or output – see Digital Input*) 7-28Vdc 0.25 Amp rating. On/Off or pulses (to 125 pulses/sec.)
Analog Output	One output (expandable to 4) 4-20mA (external power required) For PID control or for data transmission Resolution 16 bits

COMMUNICATION SPECIFICATIONS

RS485	Quantity 2 @ 1200 – 19200 bps
RS232	Quantity 1 @ 1200 – 19200 bps
Printer Port	Quantity 1
Protocol	MODBUS® RTU/ASCII, DPN3
Optional	Modem, Radio, Ethernet, Bluetooth

DIAGNOSTIC SPECIFICATIONS

Monitor/Alarm	Multivariable: P, DP, T Analog inputs/outputs Digital/switch Inputs Digital/switch outputs Pulse/frequency inputs Internal temperature Battery voltage Internal power supply

FLOW COMPUTATION SPECIFICATIONS

Number of Trains	Four bi-directional (dependent on application)
Flow Calculation	Simultaneous gas and liquid

Primary Elements	Differential:
	    Orifice, V-Cone, Wedge, Annubar, Venturi, etc.
	Pulse/Frequency:
	    Turbine, PD, Vortex, Ultrasonic, etc.

Engineering Units	US and Metric
Base Conditions	60 °F, 14.7 Psia (15 °C and 1 Kg. /Cm²) 68 °F, 14.7 Psia (20 °C and 1 Kg/Cm²)
Equations	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. Others added continuously Consult factory for complete list

MULTIVARIABLE SPECIFICATIONS

Function	Gas, oil, water, steam, and others
Differential Sensor Limits	Range 2: -250 to 250 in H2O (-0.622 to 0.622 bar) Range 3: -1000 to 1000 in H2O (-2.49 to 2.49 bar)
Absolute Sensor Limits	Range 3: 0.5 to 800 psia (3447 to 5516 kPa) Range 4: 0.5 to 3626 psia (3447 to 25000 kPa)
Gage Sensor Limits	Range C: 0 to 800 psig (0 to 5516 kPa) Range D: 0 to 3626 psig (0 to 25000 kPa)

Temperature Sensor (does not consider error from external RTD)	Compatible with any 100 Ohm Platinum RTD
	Range 3: -300 to 1200 °F (-184 to 649 °C)
	            accuracy ±1.0 °F (±0.56 °C)
	Range 4: 1200 to 1500 °F (649 to 816 °C)
	            accuracy ±0.5 °F by each 50 °F

Temperature Limits (applies to Multivariable Flange temperature. Does not apply to process temperature)	-40 to 250 °F (-40 to 121 °C) (Silicon fill) 0 to 185 °F (-17.8 to 85 °C) (Inert fill)
Environmental Temperature Limits	-40 to 185 °F (-40 to 85 °C) (Silicon fill) 0 to 185 °F (-17.8 to 85 °C) (Inert fill)
Storage Temperature Limits	-40 to 230 °F (-40 to 110 °C)
Humidity	0 –100% relative humidity

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

Differential Pressure	± 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
Pressure absolute/static	± 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
Temperature	Accuracy ±1.0 °F (±0.56 °C) from -300 to 1200 °F (-184 to 649 °C)

MULTIVARIABLE CONSTRUCTION MATERIAL

Process Connections	<u>Transmitter</u> 2 Coplanar ¼–18 NPT on 2⅛" centers ½–14 NPT on 2", 2⅛", or 2¼-in. centers with optional flange adapters <u>RTD</u> RTD dependent.
Wetted Parts	<u>Isolating Diaphragms</u> 316L SST or Hastelloy C-276® <u>Drain Vents / Valves</u> 316 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
Non-Wetted Parts	<u>Screws</u> Plated carbon steel per ASTM A449, Grade 5 or austenitic 316 SST <u>Fill Fluid</u> Silicone

Optional Accessories

Analog Output Expansion

Analog Input Expansion

RS-232 Elbow

SmartCone®

Armored RTD Cable

Shielded RTD Cable

Solar Panel

5-Valve Manifold

L-Shaped Mounting Bracket

Back-Up Battery