Flowmetrics, Inc.

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"Where Quality is Measurable"

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924-ST2

- "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, Modbus RTU RS-485
 Optional
- Windows[™] Setup Software
- NX19 Gas Equations, Stacked DP Transmitters
- DDE Server & HMI Software Available

Multi-Function Flow Computer



 Remote Metering by Wireless or Modem and TROLlink Remote Metering Software Available

Description:

The 924-ST2 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 versatility 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.

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 Types: Backlit LCD and VFD ordering options 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 (6.5W) DC Power: 300 mA max.

Flow Meter Types:

- Linear: Vortex, Turbine, Positive Displacement, Magnetic, GilFlo, GilFlo 16 point, ILVA 16 Point 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: 0.02% 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: $10 \text{ k} \Omega$ 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 Update Speed: 1 update/sec.

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 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 Accuracy: 0.02% FS at 20° C 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: 0.1°C Temperature Accuracy: 0.5°

Stored Information (ROM) Steam Tables (saturated & superheated),

Fluid Properties: Water, Air, Natural Gas, A Variety of User Entered Industrial Fluids or Generic.

User Entered Stored Information (EEPROM / Nonvolatile RAM)

Transmitter Ranges, Signal Types Fluid Properties

(reference density, 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 with self resetting fuse)

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 (Form A with 3 relay option)

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, Pressure or Delta Temperature.

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

Listing: CE Compliant, UL/C-UL Pending

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: (optional 2nd COM port) 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 5000 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 pseudo nonvolatile real time clock with display of time and date. Format:

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

Fig. 1: Standard Dimensions

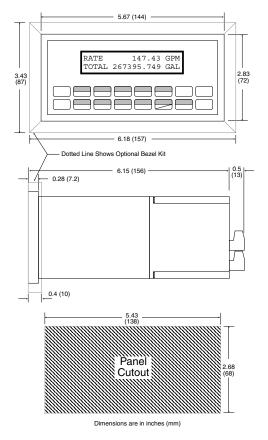
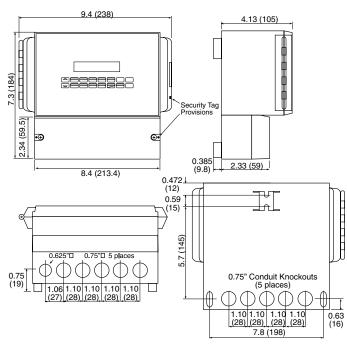


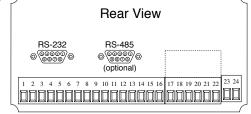
Fig. 2: Wall Mount ("W" mounting option) Dimensions



Terminal Designations

		lin (+) IIV		TEMPERATURE	Z	lin (+)		PRESSURE	(TEMP 2)	lin (+) IN	(+)	(-)	IT 1 (+)	IT 2 (+)								(+) POWEB IN	
DC OUTPUT	PULSE IN		COMMON	RTD EXCIT (+)	RTD SENS (+)	RTD SENS (-)	DC OUTPUT	RTD EXCIT (+)	RTD SENS (+)	RTD SENS (-)	PULSE OUTPUT (+)	PULSE OUTPUT (-)	ANALOG OUTPUT	ANALOG OUTPUT	ANALOG OUTPUT	ON	COM RLY1	NC	NC	COM RLY2	NO	AC LINE DC (+)	AC LINE DC (-)
-	N	ო	4	2	9	7	8	6	10	÷	12	13	14	15	16	17	18	19	20	2	22	23	24

Terminal Layout



Ordering Information

Example 924-ST2 L	1 ()	Ρ	10
Series:				
924-ST2 = Flow Computer				
Display Type:				
L= LCD				
V= VFD				
Input Type:				
1 = 85 to 276 VAC				
3= 24 VDC				
Network Card:				
0 = None				
1= RS-485/Modbus				
Mounting:				
P= Panel Mount				
N= NEMA 4 Wall Mount				
W= NEMA 12/13 Wall Mou	nt w/ Clea	r Cover		
E= Explosion Proof (No Bu	tton Acces	ss)		
X= Explosion Proof (with E	utton Acce	ess)		
Options:				
1 = Peak Demand				
2 = AGA NX-19 calculation	for natura	l gas		
3 = Three Relays				
4 = Stacked DP option 5 = Datalogger option				
6 = Stack Emissions Contr	oller ontio	n		
7 = Manifold Flowmeter Co				
9 = 3 Relay Super Chip (o				
10 = 2 Relay Super Chip (options 1, 2	2, 4, 6,7))	
13 = Superchip; 2 relay, Po				
14 = Superchip; 3 relay, Po	sitive hea	t only		
Accessories: KEPS-KEP1-32 = 32 Bit		Convert	~ ~	
KEP RS-232 Protoc		Server	01	
KEPS-MBS-32 = 32 Bit M				server
TWP = Industrial Two Way				
MPP200N = Industrial Wal	•			
P1000 = Hand Held Printe				
CA-285 = RS-232 to RS-4	35 Conver	ter		