## **Features**

- Compatible with Thermal Mass Flowmeters
- Rate/Total and Batching Functions
- User Definable Units of Measure
- Menu Selectable Hardware & Software Features
- Auxiliary Power for Thermal Mass Flowmeters
- Monitoring and Report Generation
- Advanced Batching Features: Overrun Compensation, Autobatch Start, Print End of Batch, Slow Fill, 2 Stage **Batching**
- Isolated Outputs Standard
- RS-232 Port Standard, RS-485 Optional Advanced Printing Capabilities Windows™ Setup Software
- DIN Panel Mount Enclosure with Two Piece Connectors
- On Board Data Logging
- DDE Server & HMI Software Available
- Enhanced Modern Features for Remote Metering
- Attractive Wall Mount Enclosure Option
- Bench Top Enclosure Option

## **Description:**

The MS720 is a special purpose flow computer intended for use with Thermal Mass Flowmeters. The units of measure for flow rate and total can be entered by the user. An auxillary, internal, high current, DC power supply is provided to power the Thermal Mass Flowmeters. Several DC power supply voltages are available.

The MS720 accepts analog input from Thermal Mass Flowmeter and provide linearization for the sensor and scaling to the flowrate and totalizer indicators. A variety of pulse output, analog outputs, control inputs, relay alarms, and RS232 outputs are provided standard. RS485 Modbus RTU is also an ordering option.

Enclosures are available suitable for panel, wall (Nema 4), benchtop, and explosion proof enclosure (Class 1 Div 1 Groups C+D) mounting schemes.

# **Multi-Function Flow Computer** for Thermal Mass Flowmeters



## Specifications:

## **Flow Meters and Computations**

Meter Types: Thermal Mass flowmeters plus all linear and square law meters supported including: vortex, turbine, magnetic, PD, target, orifice, venturi, v-cone and many others Linearization: Square root, 16 point table or UVC table Computations: Volume, Corrected Volume & Mass Fluid Computations: Temperature, Density, Viscosity and API 2540 for petroleum.

## **Environmental**

Operating Temperature: 0°C to +50°C Storage Temperature: -40°C to +85 C Humidity: 0-95% Non-condensing

Materials: U.L. approved

Listing: UL/CUL Listed (File No. E192404), CE Compliant,

## Display

Type: 2 lines of 20 characters

Types: Backlit LCD, OLED and VFD ordering options

Character Size: 0.2" nominal

User programmable label descriptors and units of measure

## Keypad

Keypad Type: Membrane Keypad with 16 keys

## Enclosure (Panel Mount Standard)

Size: See Dimensions

Depth behind panel: 6.5" including mating connector

Type: DIN

Materials: Plastic, UL94V-0, Flame retardant

Bezel: Textured per matt finish

## **Real Time Clock**

The MS-720 is equipped with a battery backed real time clock with display of time and date.

Format:

12 or 24 hour time display Day, Month, Year date display

## **Power Input**

The factory equipped power option is internally fused. An internal line to line filter capacitor and MOV are provided for added transient suppression.

110 VAC Power: 85 to 127 Vrms, 50/60 Hz (11.0 VA) 220 VAC Power: 170 to 276 Vrms, 50/60 Hz (11.0 VA) 24 VDC Power: (14 to 28 VDC); 300 mA max.





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 Basic Measurement Resolution:

16 bit

Update Rate: 4 updates/sec

Automatic Fault detection: Signal over/under-range,

Current Loop Broken

Calibration: Software Calibration (no trimmers) and

Auto-zero Continuously

Extended calibration:

Learns Zero and Full Scale of each range using

special test mode. Fault Protection:

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 with or without quadrature

Input Impedance: 10 KΩ nominal

Pullup Resistance: 10 K $\Omega$  to 5 VDC (menu selectable)

Pull Down Resistance: 10 KΩ to common

Trigger Level: (menu selectable)

High Level Input

Logic On: 3 to 30 VDC Logic Off: 0 to 1 VDC Low Level Input (mag pickup) Sensitivity:

10 mV or 100 mV

Minimum Count Speed:

Menu selectable

Maximum Count Speed:

Menu Selectable: 40Hz, 3000Hz or 20 kHz

Overvoltage Protection: 50 VDC

**Auxiliary / Compensation Input** 

The auxiliary/compensation input is menu selectable for temperature, density or not used. This input is used for the compensated input when performing compensated flow calculations. It can also be used as a general

purpose input for display and alarming.

Operation: Ratiometric Accuracy: 0.01% FS at 20° C Basic Measurement Resolution:

16 bit

Update Rate: 1 update/sec minimum

Automatic Fault detection:

Signal Over-range/under-range

Current Loop Broken

RTD short RTD open

Fault mode to user defined default settings

Fault Protection:

Reverse Polarity: No ill effects

Over-Voltage Limit (Voltage Input): 50 VDC

Available Input Ranges

Voltage: 0-10 VDC, 0-5 VDC, 1-5 VDC

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

**Control Inputs** 

Switch Inputs are menu selectable for Start, Stop, Reset, Lock, Inhibit, Alarm Acknowledge, Print or Not Used.

Control Input Specifications

Input Scan Rate: 10 scans per second

Logic 1: 4 - 30 VDC Logic 0: 0 - 0.8 VDC Input Impedance: 100 K $\Omega$ 

Control Activation:

Positive Edge or Pos. Level based on product

definition for switch usage.

**Excitation Voltage** 

Menu Selectable: 5, 12 or 24 VDC @ 100 mA (fault

protected)

**Auxillary DC Supply with High Current Capability** 

24 VDC 420 mA (600 mA Peak) (Other voltages on request)

**Relay Outputs** 

The relay outputs are menu assignable to (Individually for each relay) Low Rate Alarm, Hi Rate Alarm, Prewarn Alarm, Preset Alarm or General purpose warning (security), low temperature/high temperature.

Number of relays: 2 (4 optional) Contact Style: Form C contacts

Contact Ratings: 5 amp, 240 VAC or 30 VDC

**Serial Communication** 

The serial port can be used for printing, datalogging, modem connection 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. Print Out: Custom form length, print headers,

print list.

Print Initialization: Print on end of batch, key depression, interval, time of day or

remote request.

RS-485:

Device ID: 01-247

Baud Rates: 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 aproximately 1000 transactions. This information can be used for later uploading or printing. Storage format is selectable for Comma-Carriage Return or Printer formats.



## **Isolated Analog Output**

The analog output is menu assignable to correspond to the Uncompensated Volume Rate, Corrected Volume Rate, Mass Rate, Temperature, Density, Volume Total, Corrected Volume

Total or Mass Total.

Type: Isolated Current Sourcing Available Ranges: 4-20 mA, 0-20 mA

Resolution: 12 bit

Accuracy: 0.05% FS at 20° C Update Rate: 1 update/sec minimum Temperature Drift: Less than 200 ppm/C

Maximum Load: 1000 ohms (at nominal line voltage)

Compliance Effect: Less than .05% Span

60 Hz rejection: 40 dB minimum

Calibration: Operator assisted Learn Mode

User entry of damping constant to cause a Averaging:

smooth control action

### **Isolated Pulse output**

The isolated pulse output is menu assignable to Uncompensated Volume Total, Compensated Volume Total

or Mass Total

Pulse Output Form: Open Collector Maximum On Current: 25 mA Maximum Off Voltage: 30 VDC Saturation Voltage: 1.0 VDC Maximum Off Current: 0.1 mA

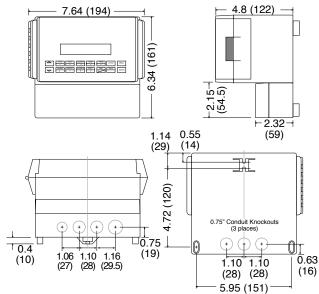
Pulse Duration: 10 mSec or 100 mSec(user selectable)

Pulse output buffer: 256

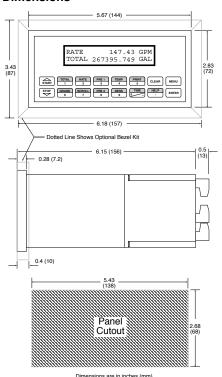
Fault Protection

Reverse polarity: Shunt Diode

## **Wall Mount Dimensions**



## **Standard Dimensions**



## **Terminal Designations**

DC OUTPUT FLOW PULSE IN 1 Vin + IN PULSE IN 2 lin +	COMMON	Vin +	RTD EXCIT + COMP	RTD SENS + IN N	CNTR IN 1	CNTR IN 2 SEE USER	CNTR IN 3 MANUAL	COMMON	PULSE OUTPUT +	PULSE OUTPUT -	ANALOG OUTPUT + 4-20 mA			COM RLY1 26 COM RLY3		28 NC	COM RLY2 29 COM RLY4	30 NO	AC LINE POWER IN	AC NEUTRAL	+ 24 VDC DC POWER IN - 24 VDC
DC OI PULS PULS	COM		RTD	RTD	CNTR	CNTR	CNTR	COMIN	PULS	PULS	ANAL	ANAL	2	COM	Q Q	S	COM	9	AC LII	AC NE	+ 24 \ - 24V
1 2 3	4	2	9	<b>ν</b> α	6	10	Ξ	12	13	4	15	16	17	48	19	20	21	22	23	24	31

Ordering Information	
Example MS720 L 1 A 0 P 24	
Series:	
MS720 = Special Supertrol-1	
Display Type: ———	
L= LCD	
O= OLED	
V= VFD	
Input Type:	
1= 110 VAC 2= 220 VAC	
4= 24 VDC (14 to 28 VDC)	
Relays: ————————————————————————————————————	
A= 2 SPDT Relays	
B= 4 SPDT Relays	
C= 2 Form A Solid State Relays	
Network Card:	
0= None (STD)	
2= RS485/Modbus	
Mounting:	
P= Panel Mount	
N= NEMA 4 Wall Mount	
W= NEMA 12/13 Wall Mount w/ Clear Cover	
E= Explosion Proof (No Button Access)	
B= Bench Top	
V= Field, Skid, Vehical Mount	
Sensor Excitation Voltage:	
24= 24 VDC (standard)	
15- 15 VDC	

15= 15 VDC

12= 12 VDC

## Accessories:

OPC/DDE Server for RS232 Port available, see EX5-UCOND-NA00 OPC/DDE Server for Modbus Suite

available, see EX5-MDBUS-NA00 P1000 Printer (see Accessories)

MPP2400N = Port Powered Modem in NEMA4 enclosure



