Flow Computers

Series 1900 Flow Computer

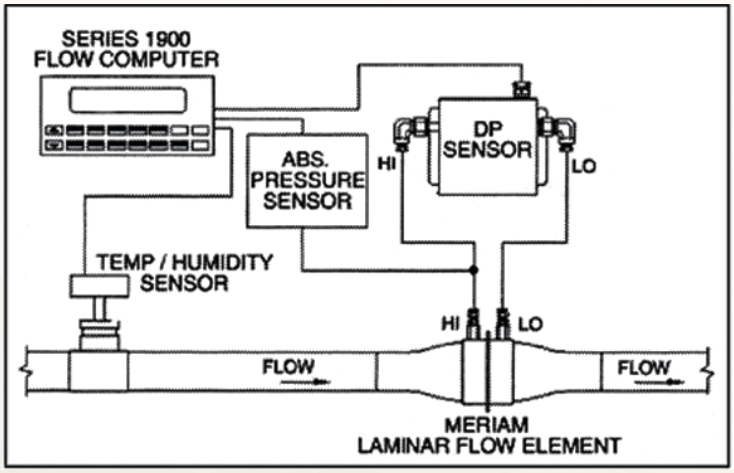
Our Series 1900 Flow Computer is a handy, all-in-one device that can be incorporated into many facets of your projects. It is perfect for a variety of flowmeter types in applications such as liquid, gas, steam and heat. Not only is it convenient, it has the ability to log data for approximately 1,000 transactions - information that can be used for uploading or printing later.

WEBINARS

Meriam is proud to offer a series of Webinars (Online Seminars) to help you master skills on our products and their applications in the industry. All of these seminars are FREE and can be "attended" from the convenience of your office! Simply log in and follow along. The sessions are typically completed within 25 to 30 minutes and include a Q & A period at the end. Contact Meriam today to learn how to sign up.

The Series 1900 Flow Computer is a versatile unit with many advanced features.

- Use with Laminar Flow Elements, Accutube® averaging pitot tubes, Orifice Plates, Venturis, Vortex, Turbines or other flow meters
- Corrects for density and viscosity changes based on pressure and temperature inputs
- Windows set up
- Calculates corrected or actual flow rate and total
- Analog, relay and digital outputs



EASTERN ENERGY SERVICES PTE LTD.
METERING AND INDUSTRIAL PRODUCTS

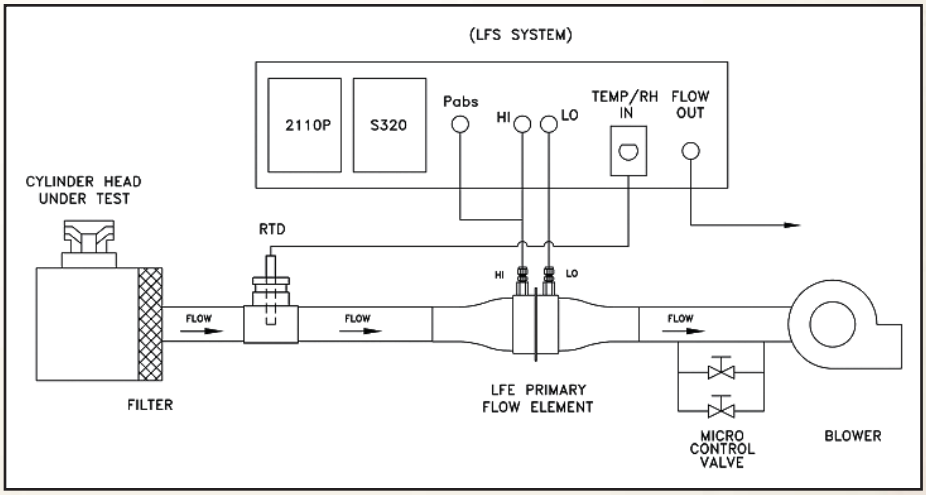
EASTERN ENERGY SERVICES PTE LTD.
60 Kaki Bukit Place #02-19 Eunos Tech Park Singapore, SG 415979 Singapore
Telephone: +65-6748 6911 Fax: +65-6748 6912
Email: info@eesgroup.com Website: www.eesgroup.com

S320 Flow Computer

The modular design of the S320 (with a wide range of available analog slot cards and included digital I/O) provides the flexibility necessary to easily adapt this powerful system to your specific application. Transducer signal conditioning and power is provided by the dual channel slot cards. A broad variety of voltage, current, counter, frequency and pulse inputs and outputs may be employed. Most cards use advanced sigma delta and A/D techniques with conversions having a resolution of 12 to 24 bits for best precision.

The S320 allows you to process large amounts of data, at high speeds, without a degradation in performance… cost effectively!

- Gas flow measurement, leak detection and control
- Suitable for any flow input or primary element
- High speed 32-bit floating point digital signal processor
- Battery backed RAM, Flash ROM, real time clock
- Advanced high resolution A/D converters
- Serial interfaces for control and data exchange



This illustration is an example of a typical LFS system utilizing an LFE as well as the S320 Flow Computer from Meriam.

EASTERN ENERGY SERVICES PTE LTD.
METERING AND INDUSTRIAL PRODUCTS

EASTERN ENERGY SERVICES PTE LTD.
60 Kaki Bukit Place #02-19 Eunos Tech Park Singapore, SG 415979 Singapore
Telephone: +65-6748 6911 Fax: +65-6748 6912
Email: info@eesgroup.com Website: www.eesgroup.com

Series 1900 Flow Computer

The Series 1900 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 Series 1900 Flow Computer is compatible with Meriam Laminar Flow Element, Orifice, Venturi and AccuTube® Averaging Pitot flowmeter types. The alphanumeric display offers measured parameters in easy to understand format. Manual access to measurements and display scrolling is supported.

The Series 1900 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.

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.

Listing

CE Approved, UL/CSA Pending

EASTERN ENERGY SERVICES PTE LTD.
METERING AND INDUSTRIAL PRODUCTS

EASTERN ENERGY SERVICES PTE LTD.
60 Kaki Bukit Place #02-19 Eunos Tech Park Singapore, SG 415979 Singapore
Telephone: +65-6748 6911 Fax: +65-6748 6912
Email: info@eesgroup.com Website: www.eesgroup.com

Series 1900

Flow Computer

Flow Inputs

Analog Input:

Accuracy: 0.01% FS at 20°C
Update Rate: 4 updates/sec

Temperature, Pressure, Density / Relative Humidity Inputs

The compensation inputs usage are menu selectable for temperature, temperature 2, pressure, density/ relative humidity 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
Voltage: 0-5 VDC, 0-10VDC on RH Input only
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: 0.01ºC

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 Flow 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	240V, 5 amp

Stored Information (ROM)

Steam Tables (saturated & superheated),
Fluid Properties: Water, Dry Air, Humid Air, Argon, CO_2, Ethylene, Helium, Hydrogen, Nitrogen, Oxygen, Methane, Natural Gas, Propane. Additional selections for dry or humid generic gas for general use.

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

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 20ºC
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

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

Ordering Information

To order Meriam's Series 1900 Flow Computer custom-made to your specifications, please contact your Meriam sales representative with the following information:

- Display: Standard LCD or Optional Vacuum Fluorescent
- Power input: Standard Universal AC power (85 – 276 VAC) or 24 VDC
- Network Card: RS485/Modbus or none
- Optional Mounting: Panel, NEMA 4 Wall Mount, NEMA 12/13 Wall Mount with Clear Cover or Explosionproof (specify with or without buttons)
- Optional Outputs: 3-relays or datalogger

Specifications	
Environmental	Operating Temperature: 0 to +50ºC Storage Temperature: -40 to +85ºC 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: 5.6" x 2.8" x 6.65" Depth behind panel: 6.5" including mating connector Type: DIN Materials: Plastic, UL94V-0, Flame retardant Bezel: Textured per matt finish

EASTERN ENERGY SERVICES PTE LTD.
METERING AND INDUSTRIAL PRODUCTS

EASTERN ENERGY SERVICES PTE LTD.
60 Kaki Bukit Place #02-19 Eunos Tech Park Singapore, SG 415979 Singapore
Telephone: +65-6748 6911 Fax: +65-6748 6912
Email: info@eesgroup.com Website: www.eesgroup.com

S320 Flow Computer

for Precise Measurement and Control

The Meriam Model S320 is a high quality industrial process flow computer designed for precise measurement and control applications. Extraordinary performance is attributable to a 32-bit floating point digital signal processor integrated into a well planned platform utilizing state-of-the-art hardware and software.

Programmed in a high level language, the S320 comes with an extensive library of standard application functions and examples. Units are configured to your specific requirements. If you choose to modify the unit, programs can be written on any PC (using included software development tools) and downloaded via a dedicated serial link. The operating system may be DOS, Windows '95, NT or OS2.

In addition to the programming link, three serial interfaces are included for control, data collection, calibration and configuration. This allows communication with other computers and S320 units. The two standard RS485 ports can communicate with many devices using a single cable. This reduces wiring costs, improves signal quality and eliminates analog signal cards where field devices have RS485 capability.

The standard software permits the use of calibration data to characterize the primary flow elements and transducers. This allows less expensive devices to be applied, while meeting your system performance objectives.

EASTERN ENERGY SERVICES PTE LTD.
METERING AND INDUSTRIAL PRODUCTS

EASTERN ENERGY SERVICES PTE LTD.
60 Kaki Bukit Place #02-19 Eunos Tech Park Singapore, SG 415979 Singapore
Telephone: +65-6748 6911 Fax: +65-6748 6912
Email: info@eesgroup.com Website: www.eesgroup.com

S320 Flow Computer

for Precise Measurement and Control

Applications

Flow Measurement: The S320 Flow Computer can be used with nearly all differential pressure producing primary flow elements such as orifice plates, nozzles, venturis, annular averaging pitot tubes and laminar flow elements. Devices that are essentially (but not absolutely) linear like LFE, turbine, vortex, impeller, positive displacement meters, etc. may be used with appropriate transducers. Regardless of sensor type, all flow devices will benefit from the S320's capability to characterize the flow element and transducers from test/calibration data. System and component offset and gain errors (sometimes overlooked in the data acquisition chain) are easily corrected. Non-linearity, frequently associated with the primary flow sensor, may be reduced by interpolation, spline or polynomial methods with the S320.

Compensation or correction for variations in process gas pressure, temperature and humidity will improve the accuracy of the flow calculations. The S320 equations consider the effects of measured operating condition changes on gas properties such as viscosity and density. Precise calculations are made using stored gas property data for 14 common gases. Actual, standardized volume and mass flows are calculated using ideal or real gas laws. Calculation results are displayed and available for analog of digital transmission, data collection or control.

Leak Detection: When combined with Meriam's laminar flow elements, leaks as small as 1 SCCM are easily measured. The speed and precision at which the LFE/S320 system quantifies the leak rate makes it the best choice for high volume parts testing. It is superior to pressure decay, mass meters or other flow testing techniques.

Control: The S320 is an elegant, scalable and configurable control system. Capabilities include PI or PID algorithms, 8 digital inputs and 8 digital outputs, timer/counter functions and as many as 5 analog voltage, current, frequency or pulse width modulation outputs form any of the measured or calculated perimeters. The S320 can stand alone or be easily integrated into your process control, PC or PLC system providing localized signal processing, control and digital multi-drop bus communication.

Meriam will provide primary flow elements, transducers and S320 Flow Computers as components or complete systems with standard software and services specific to your application requirements.

Signal Processing Slot Cards

(as many as 5 series 100, 200, 300 or 500 cards may be used)

Type 100 (2) analog inputs; sigma delta A/D
Type 110 (2) analog inputs; integrating A/D
Type 200 (2) analog outputs; sigma delta A/D
Type 310 (1) analog in and out; flash-converter
Type 400 digital I/O expansion bus for modules below
- Module 410 (16) digital inputs; DIN Rail mount
- Module 420 (16) digital outputs; DIN Rail mount
- Module 430 (8) each digital in/out; DIN Rail mount
- LEDIG diagnostic adapter for digital I/O with status LEDs

Type 510 (2) frequency and duty cycle inputs

Ordering Information

To order Meriam's S320 Flow Computer custom-made to your specifications, please contact your Meriam sales representative with the following information:

- Number of Analog and Digital Inputs Required
- Application type: Laminar Flow Element, Accutube Averaging Pitot Tube, Orifice plate, Flow nozzle or Leak Detection
- Number of Analog and Digital Outputs Required
- Power Supply: 2, 3, or 4 Amp

Specifications	
Basic Electronic Components	32 Bit floating point digital signal processor; Real time clock Flash ROM; Battery backed RAM 256kb RAM memory, 512kb option
Display, Keypad	Three 6 digit numeric LED Three 4 digit alphanumeric LED Three parameter function keys Two arrow keys
Power Requirements	24 volts DC, approx. 8 watts
Enclosure	DIN front panel 96x96mm (3.78" x 3.78") Depth 185mm (7.28") with connectors Cutout 92x92mm (3.62"x3.62")

EASTERN ENERGY SERVICES PTE LTD.
METERING AND INDUSTRIAL PRODUCTS

EASTERN ENERGY SERVICES PTE LTD.
60 Kaki Bukit Place #02-19 Eunos Tech Park Singapore, SG 415979 Singapore
Telephone: +65-6748 6911 Fax: +65-6748 6912
Email: info@eesgroup.com Website: www.eesgroup.com