

Basic Flow Computers

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IS THERE ANYTHING BASIC? WHAT IS BEYOND BASIC?

Major Components

- 1) Enclosure
- 2) Main Electronic Board
- 3) Local Display
- 4) Communications
- 5) Transducer
- 6) Charging Source/ Solar Panel
- 7) Battery
- 8) RTD Probe
- 9) Wiring Termination Strip
- 10) Programmer

Enclosure

Determination of location plays an important role in the type of enclosure used. Electrical classification areas must be considered when purchasing a flow computer. The three different types of enclosures are general purpose, class 1 div 2, and class 1 div 1.

Main Electronic Board

The main electronic board houses the microprocessor, memory, A to D converter, the charger/regulator/power supply and the lithium battery.

Microprocessor The microprocessor regulates all functions of the flow computer.

Memory The memory EPROM's are random access memory (RAM) and Programmable Read-Only Memory (ROM). The RAM EPROM maintains both internal and external events of the flow computer. The ROM EPROM stores calibration data and flow data. It also stores the characteristics of the flow computer set up.

A to D Converter The A to D converter converts the analog signal from the transducer to a digital signal from which flow data can be calculated. The static, differential and temperature signals received by the main electronics board (motherboard) are normally analog. This conversion from analog to digital takes place

on the main electronics board. The latest flow computers have AMU's (Analog Measurement Units) which contains circuitry for processing all analog measurements. The mathematical flow computations are processed on the main electronics board.

Charger/regulator/power supply The Charger/ regulator/power supply regulates the amount of "charging" power the battery will receive.

Lithium Battery The lithium battery provides voltage that will keep stored data in the main electronics board if the flow computer main battery fails.

Display

The liquid crystal display gives the user local feedback. It allows the technician to view the calibration while taking place or current flow conditions.

Communications

Most flow computers have some type of communication "card/module" that can be attached to allow for remote communications. Types of communications used are cellular phones, local phone lines, satellite and radio.

Transducer

Some transducers have dual elements measuring differential and static pressure in one unit. Some are attached to the orifice fitting directly while others are attached by the use of stainless steel tubing from the orifice fitting to the transducer. Transducers provide input to the flow computer's main electronics board that will be used to calculate volumes. Some transducers can be temperature compensated at various ambient temperatures and are considered to be "smart" transducers.

Charging source/ Solar Panel

Solar panels are the most common form of power supplied to the flow computer. Solar panels should be sized with regard to the battery size in the flow computer. Other considerations are the amount of sun available, location and surroundings. Other types of charging sources/power supplies are AC to DC power supplies (110 v AC to 12vdc) and DC to DC power supplies (24 vdc to 12 vdc).

Battery

The main battery is normally located in the flow computer. It can be located externally at a remote location. The size of the battery is important. The size will determine the amount of autonomy. Autonomy is the number of days the battery will allow the flow computer to operate properly without being charged. The flow computer will shut down when it registers a predetermined "low voltage". As a rule, most batteries used in flow computers should be changed every two years. All flow computer batteries are unserviceable.

RTD

The RTD (resistive temperature detector) provides real-time flowing temperature for the calculation of volume. RTD ranges vary and are normally quite high. RTD lengths also vary to accommodate the flow computer the distance between the FCU and the orifice fitting.

Field to Wiring Termination Strip

This termination strip is used to bring in field wiring such as communications, RTD, charging voltage, etc. to the flow computer.

Programmer

The programmer provides a local means of communicating with the flow computer. The programmer is use for calibrating the flow computer, locally collecting data from the flow computer and troubleshooting.

IS THERE ANYTHING BASIC THESE DAYS?

The answer is no.

Some of the “basic” flow computers have the ability to bring in a limited number of Analog Inputs, Digital Inputs, Pulse Inputs.

WHAT IS BEYOND BASIC?

Here is “beyond basic”. Flow computers can do much more than just calculate volumes. Here are just some of the many functions a flow computer can perform.

- Sampler control
- Standard valve control
- Nominations valve control
- Gas lift valve control
- Plunger lift valve control
- Remote hurricane control and shut in
- Tank monitoring and control
- Remote well control
- LACT control
- MMBtu control
- Telemetry

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