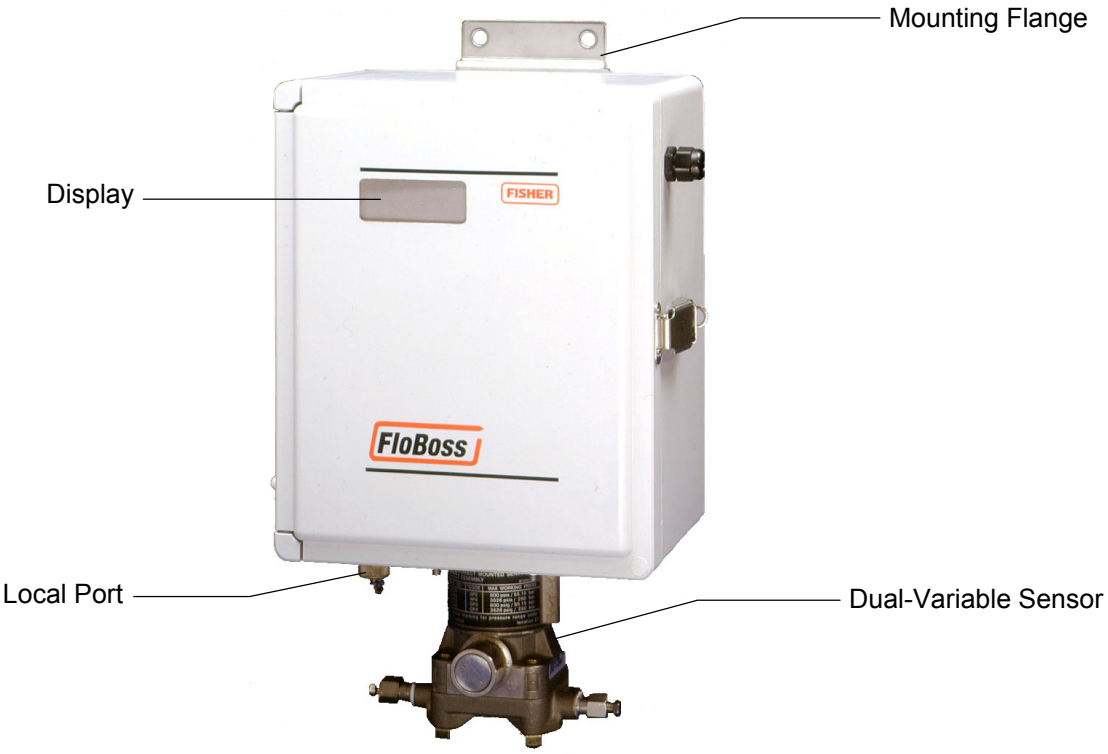
FloBoss™ 553 Flow Manager

The FloBoss 553 Flow Manager measures, monitors, and manages gas flow for a single meter run using orifice plate (differential pressure) techniques. It is an economical flow computer that reliably and accurately performs gas flow calculations and data archival. It is approved as an intrinsically safe device for Class I, Division 1 hazardous locations (i.e. where ignitable concentrations of flammable gas are normally present).

The FloBoss has a fiberglass-reinforced plastic enclosure with a window for viewing the LCD display. The enclosure contains a processor circuit board with built-in I/O. The built-in I/O consists of a Dual-Variable Sensor (DVS) port, a 4-wire RTD interface, and a discrete output capable of controlling a sampler or odorizer. Diagnostic inputs provide dedicated monitoring of input power and enclosure temperature.

The FloBoss 553 consists of the following components and features:

- A 32-bit microprocessor, with 512K of flash ROM and 512K of static RAM storage.
- Dual-Variable Sensor (DVS) for static pressure and differential pressure measurement.
- Built-in input for RTD temperature sensor.
- Built-in discrete output for sampler or odorizer.
- Extensive applications firmware.
- Weather-tight, corrosion-resistant enclosure, designed to meet NEMA 4X.
- Ports for local interface (built-in) and host interface (with optional communications card).
- All circuit cards have a protective coating.



FloBoss 553 Flow Manager

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The FloBoss contains a 32-bit CMOS microprocessor, which has multiple low-power operating modes. The FloBoss comes standard with 512K of built-in static random access memory (SRAM) for storing data and history. Backup power for the SRAM is supplied by a super capacitor, which normally never needs replacing. The FloBoss also has 512K of programmable read-only memory (flash ROM) for storing operating system firmware, configuration parameters, and applications firmware.

The firmware provides: 1992 AGA flow calculations (orifice metering plus super-comp-ressibility factors) for a single meter run; memory logging of 240 alarms and 240 events; archival of data for up to 15 history points; Modbus slave protocol;alarm call-in to the host, known as RBX; and logic and sequencing control using a user-defined Function Sequence Table (FST) program. For more information on the firmware, see Specification Sheet 3:FB5FW.

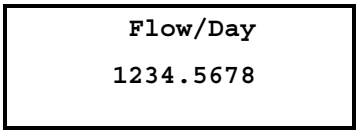
The DVS measures differential pressure and static (absolute or gauge) pressure for accurate orifice metering. The DVS uses Rosemount® capacitance cell technology to sense differential pressure and piezo-resistive silicon sensor technology to sense the static pressure. A dedicated microprocessor in the DVS linearizes and corrects the raw sensor signals using characterization data stored in non-volatile memory.

The bottom of the DVS consists of a Rosemount-designed Coplanar™ flange, which provides drain/vent valves and process connections. The DVS is factory-attached to the FloBoss enclosure using a flanged coupler.

The field I/O (including DVS inputs), flow calculation, FST programmability, and other features are configured and accessed using the ROCLINK™ Configuration Software (see Specification Sheet 4:RFW or 4:RL101).

The operator interface port (LOI), located on the bottom of the enclosure, provides a direct, local link between the FloBoss and a personal computer. With the personal computer running the ROCLINK software, you can configure the functionality of the FloBoss and monitor its operation. In addition, a host computer can remotely configure the FloBoss through the host communications port.

Through the display on the front panel, you can view selected data stored in the FloBoss. Up to 16 items can be configured for viewing. The display scrolls through the configured list of items.



Sample FloBoss Display

Screw terminals inside the unit provide terminations for input power, RTD input, and a discrete output. Refer to the instruction manual for details on connecting power and signal wiring to meet intrinsic safety requirements.

The fiberglass-reinforced plastic enclosure protects the electronics from physical damage and corrosive environments. The enclosure has a hinged and gasketed door secured by a lockable hasp. The enclosure has mounting flanges that allow it to be fastened to a wall or panel, or mounted on a pipestand. In addition, it can be direct-mounted to flange taps, typically with a manifold valve assembly in between.

Options

The FloBoss 553 supports the following option:

- 500-Series Communications Cards

The 500-series **Communication Cards** provide an interface for the host communications port on the FloBoss. Either of the following types of cards can be accommodated:

- EIA-232 (RS-232) for asynchronous serial communications.
- EIA-485 (RS-485) for asynchronous serial communications.

A socket and mounting standoffs on the FloBoss processor board allow the communications card to be easily added or replaced. Refer to Specification Sheet 3:COM for more information.

The firmware may be ordered with 1985 AGA flow calculations for single orifice metering applications.

Accessories

Accessory items available for the FloBoss 553 include RTD sensor assemblies and an operator interface cable (needed for local configuration). See your local sales representative for more information.

Main Specifications

PROCESSOR MEMORY

Motorola 32 bit, running at 14.7 MHz.

Program: 512 Kbyte flash ROM (electrically programmable) for firmware and configuration.

Data: 512 Kbyte SRAM, super capacitor-backed for up to 4 weeks.

Memory Reset: A reset jumper enables a cold start initialization when used during power-up.

TIME FUNCTIONS

Clock Type: 32 kHz crystal oscillator with regulated supply, super capacitor-backed. Year/Month/Day and Hour/Minute/Second, with Daylight Savings Time control.

Clock Accuracy: 0.01%.

Watchdog Timer: Hardware monitor expires after 1 second and resets the processor.

DIAGNOSTICS

These conditions are monitored and alarmed: SRAM validity/operation, DVS and RTD point fail, input voltages, and enclosure internal temperature.

COMMUNICATIONS PORTS

Local Operator Interface: EIA-232 (RS-232D) format. Software configured; 1200 to 19.2K baud selectable. Screw-cap protected connector.

Host Interface: Depends on the optional communications card installed (see Spec. Sheet 3:COM).

USER INTERFACE

2 line by 16 character LCD. Continually updates approximately every 3 seconds. See Environmental specification for operating temperature.

POWER

6.2 to 15 Vdc at 0.2 amp maximum.

DVS (BUILT-IN)

Interface: High-speed digital interface with power for DVS. **Inputs and Physical Characteristics:** See DVS Specifications table.

WEIGHT

18.0 lb. (8.2 kg) nominal, including DVS and coupler.

RTD INPUT (BUILT-IN)

Quantity/Type: Single input for a 2, 3, or 4-wire RTD element.

Terminals: "Ref" current source, "+" positive signal input, "-" negative signal input, and "Ret" return.

Sensing Range: -50 to 100°C (-58 to 212°F).

Accuracy (includes linearity, hysteresis, and repeatability): ±0.56°C (1.0°F) over sensing range.

Ambient Temperature Effects per 28°C (50°F): ±0.50°C (0.90°F) for process temperatures from -40 to 100°C (-40 to 212°F).

Filter: Band-pass hardware filter.

Resolution: 16 bits.

Conversion Time: 100 µsec.

Sample Period: 1 sec minimum.

DISCRETE OUTPUT (BUILT-IN)

Quantity/Type: 1 sourced, high-side switched output.

Terminals: "+" positive output, "-" negative (common).

Voltage: Nominal 5 volts.

Frequency: 1.5 Hz maximum.

Sample Period: 200 ms minimum.

Typical Source Current: 25 mA, with auto reset.

ENVIRONMENTAL

Operating Temperature: -40 to 75°C (-40 to 167°F), excluding LCD display, which is -25 to 70°C (-13 to 158°F).
Storage Temperature: -50 to 85°C (-58 to 185°F).

Operating Humidity: 5 to 95%, non-condensing.

Vibration: Meets ISA-S75.13-1989, Section 4.2 and 5.3.5.

ESD Immunity: Meets IEC 801-2 in accordance with EN 50082-2.

RFI Immunity: Meets IEC 801-3 in accordance with EN 50082-2.

EFT Immunity: Designed to meet IEC 801-4 in accordance with EN 50082-2.

Voltage Surge Immunity: Designed to meet IEC 801-5 in accordance with EN 50082-2.

Main Specifications (Cont'd)

DIMENSIONS

Overall: 425 mm H by 264 mm W by 170 mm D (16.75 in. H by 10.38 in. W by 6.69 in. D). Height includes top mounting flange and DVS.

Wall Mounting: 71 mm W by 318 mm H (2.81 in. W by 12.50 in. H) between mounting hole (9.65 mm/0.38 in. diameter) centers.

Pipestand Mounting: Mounts on 2-inch pipe with U-bolt mounting kit (supplied).

Process Connections: See DVS Specifications.

CLASSIFICATION

FCC Class A and CISPR 22 computing device.

ENCLOSURE

Construction: Fiberglass-reinforced plastic with lockable hasp and gasketed door. Internal structural metal is low-copper aluminum alloy. All exposed metal is stainless steel. Meets CSA Type 4X rating (NEMA 4X equivalent).

Wiring access: One hole in right side; two 22.4 mm (0.88 in.) pre-punched holes in bottom.

APPROVALS

Approved as Model W40076 by CSA for hazardous locations Class I, Division 1, Groups C and D, intrinsically safe.

Dual-Variable Sensor (DVS) Specifications

DIFFERENTIAL PRESSURE INPUT

Range: 0 - 250 in. H_2O (0 - 62.2 kPa).

Reference Accuracy: ±0.075% of span with 10:1 turndown (includes linearity, hysteresis, and repeatability effects).

STATIC PRESSURE INPUT

Range*: Either Absolute or Gauge:
0 - 800 psia/psig (0 - 5516 kPa)
0 - 3626 psia/psig (0 - 25,000 kPa)
Reference Accuracy: ±0.075% of span with 5:1 turndown (includes linearity, hysteresis, and repeatability effects). For spans with less than 5:1 turndown, contact factory.
Stability: ±0.1% of upper range limit for 12 months.

PROCESS CONNECTIONS

1/4-18 NPT on 2-1/8 in. centers, located on bottom of Coplanar flange.

CONSTRUCTION

316 SST*. Wetted O-rings are glass-filled TFE. Coupler is stainless steel (CF8M).

ENVIRONMENTAL

Operating Temperature: -40 to 65°C (-40 to 149°F).

Meets the other environmental specifications described in the Main Specifications table.

*Consult factory for special ranges and materials that may be available.

Emerson Process Management

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