Data Sheet F33/901
Supersedes F33/200

Model F33 Flow Monitor/Totalizer

(accepts four GLI or non-GLI sensors; calculated measurement capability)

Panel-mount
1/4 DIN Style

WE'VE GOT HART ABILITY

CE

Certified Compliant to
European Community Standards

■ **Versatile Sensor Capability.** The analyzer has four sensor inputs (A, B, C, and D) to independently measure up to four flow rates and related volumes. Any combination of GLI impeller flow sensors and non-GLI flow sensors with a 0-2000 Hz. output can be used. This includes paddle wheel, turbine, vortex, and other flow sensors.

■ **Backlit Liquid Crystal Display.** The two-line, 16 character backlit LCD provides excellent viewing contrast under all lighting conditions.

■ **Multiple Measurement Readouts.** Separate flow rate and volume readouts are provided for each sensor. Additional measurement readouts show various sensor flow rate/volume combinations. A calculated measurement can also be made for any two sensors. The calculation can be X/Y, X-Y, X+Y, or [X/Y x 100] with selectable X and Y variables representing specific sensor flow rates or volumes.

■ **Passcode-protected Access.** A security passcode restricts access to configuration settings to only authorized personnel.

■ **Multiple Language Capability.** All screens can be selected for display in English, French, German, or Spanish. (Other available languages can be substituted.)

■ **Menu-guided Operation.** The simple keypad and logical menu structure make this analyzer easy to use. Menu screens guide you through setup, operation, calibration, and test/maintenance functions.

■ **Auto/Manual Totalizer Modes.** The totalizer for each sensor can be set for automatic reset (resets displayed volume to zero after reaching maximum limit, and starts a new count) or manual reset. At any time, the volume of any sensor can be manually reset to zero.

■ **Panel-mount 1/4 DIN Case with NEMA 4X Front Panel.** The plastic case minimizes required panel space and facilitates mounting.

■ **Simple Interactive Diagnostics.** Built-in diagnostics continuously tests analyzer and sensor operation.

■ **Electromagnetic Conformance.** The F33 exceeds U.S. and meets European standards for EMI and RFI emissions and immunity.

■ **Batch Control Capability.** Simple batch control is possible by using the analyzer's two control relays which are independently configurable.

■ **Two 0/4-20 mA Analog Outputs.** Each isolated analog output can be assigned to represent the flow rate or volume of any sensor, or a calculated measurement.

■ **Two Pulsed Outputs.** Two SPDT pulsed contact closure outputs are provided to enable remote counting or pumping. Each pulse output can represent any measured volume, and activate at a desired volume increment for a preset time duration.

■ **Two Configurable Relays.** Each relay can be set to operate as a control, dual-alarm, or system status relay. They can be independently assigned to represent any sensor flow rate or volume, or a preset two-sensor calculation. Front panel red LEDs indicate relay "on/off" status.

■ **OEM Versions Available.** The F33 analyzer can be manufactured to accommodate OEM-specific needs.

Specifications

Operational:

Display.....Two-line by 16 character backlit LCD

NOTE: *Separate measurement readouts for flow rate and volume, and combined flow rate/volume readouts are provided for each sensor (A, B, C, and D). Additional readouts include Sensor A and B flow rates, Sensor A and B volumes, Sensor C and D flow rates, Sensor C and D volumes, and Analog Output 1 and 2 mA values. If set, a calculated measurement can also be displayed.*

Measurement	Selectable Ranges
Flow Rate (all sensors)	0-9999, 0-999.9, or 0-99.99 with selectable flow rate units and multiplier
Volume (all sensors)	0-999,999,999 with selectable volume units
Calculation (X and Y are selectable):	
X-Y: Flow	0-9999, 0-999.9, or 0-99.99 with selected multiplier
Volume	0-999,999,999 in preset volume units
X+Y: Flow	0-9999, 0-999.9, or 0-99.99 with selected multiplier
Volume	0-999,999,999 in preset volume units
X/Y (flow or volume)	0-9999, 0-999.9, or 0-99.99 (no units)
[X/Y] x 100	0-999% pass ratio
Analog Outputs (1 and 2)	0.00-20.00 mA or 4.00-20.00 mA

Ambient Conditions.....Operation: -4 to +140°F (-20 to +60°C); 0 to 95% relative humidity, non-condensing
Storage: -22 to +158°F (-30 to +70°C); 0 to 95% relative humidity, non-condensing

Relays:

Types/Outputs.....Two electromechanical relays; SPDT (Form C) contacts; U.L. rated 5A 115/230 VAC, 5A @ 30 VDC resistive

Operational Mode.....Each relay (A and B) can be assigned to be driven by <u>one</u> of these measurements:

- Sensor A flow rate
- Sensor B flow rate
- Sensor C flow rate
- Sensor D flow rate
- Sensor A volume
- Sensor B volume
- Sensor C volume
- Sensor D volume
- Calculated measurement

Function Modes: Control.....Settings for high/low phasing, setpoint, deadband, overfeed timer, off delay, and on delay

Alarm.....Settings for low alarm pt., low alarm pt. deadband, high alarm pt., high alarm pt. deadband, off delay, and on delay

Status:.....Not configurable; relay only activates when a sensor or analyzer diagnostic WARNING condition exists

Indicators.....Relay A and B LEDs indicate respective relay status

Sensor-to-Analyzer Distance.....GLI Impeller Sensors: 2000 ft. (610 m) maximum
Non-GLI Sensors: 300 ft. (91 m) maximum

Power Requirements.....90-130 VAC, 50/60 Hz. (10 VA max.) or 190-260 VAC, 50/60 Hz. (10 VA max.)

Calibration Adjust: Offset By.....Enter a "+" or "-" offset value that is respectively added to or subtracted from measured flow readings for a linear offset

Set To.....Enter measurement value (derived from reference instrument reading) to linearly offset measured flow readings

NOTE: *Calibration is actually achieved by independently configuring each sensor, which is a normal part of the initial setup.*

Analog Outputs.....Two isolated 0/4-20 mA outputs; each with 0.004 mA (12-bit) resolution and capability to drive up to 600 ohm loads; each output can be assigned to represent <u>one</u> of these measurements:

- Sensor A flow rate
- Sensor B flow rate
- Sensor C flow rate
- Sensor D flow rate
- Sensor A volume
- Sensor B volume
- Sensor C volume
- Sensor D volume
- Calculated measurement

NOTE: *Parameter (or calculated measurement) values can be entered to define the endpoints at which the minimum and maximum mA output values are desired.*

Pulse Outputs.....Two SPDT contact closures; each pulsed output can represent a selected measured volume, and activate at a user-set volume increment for a desired time duration

Communication: RS-232.....Used for factory operation checkout

HART Protocol.....Enables configuration and retrieval of measured data for multiple analyzers over a communication link using appropriate hand-held terminal or data system with HART software

Memory Backup (non-volatile).....All user settings are retained indefinitely in memory (EEPROM)

EMI/RFI Conformance.....Exceeds U.S. and meets European standards for conducted and radiated emissions and immunity; certified CE compliant for applications as specified by EN 50081-2 for emissions and EN 50082-2 for immunity

Electrical Certification.....UL General Purpose

Analyzer Performance (Electrical, Analog Outputs at 25°C):

Accuracy.....± 0.1% of span
Sensitivity.....± 0.1% of span
Repeatability.....± 0.05% of span
Temperature Drift.....Zero and Span: ± 0.02% of span per °C
Response Time.....1-60 seconds to 90% of value upon step change

Specifications (continued)

Mechanical:

Enclosure.....Polycarbonate with NEMA 4X front panel; general purpose; two zinc-plated steel brackets for panel mounting
Mounting Configuration.....Panel mounting
Net Weight.....1.7 lbs. (0.8 kg) approximately

Ordering Information

MODEL NUMBER

F33 Flow monitor/totalizer analyzer (with four sensor inputs, two relays, and two pulsed outputs) in 1/4 DIN panel mount case with NEMA 4X front panel. Includes two brackets with adjustable screws for panel mounting.

COMMUNICATIONS OUTPUT

A None
B HART Protocol

RESERVED CATEGORY

COMPANY ID NAMEPLATE

N GLI Nameplate
B Customer-specified Nameplate (see Note 1)
C No Nameplate

EQUIPMENT TAGGING (specify tag data)

N None
P Paper
S Stainless steel

F33	1				**Product Number**

Choose item from last category.

NOTE 1: *The nameplate cannot be printed with a company logo. Please specify the desired name which is printed in only capital letters.*

Accessories (order separately):

- **GLI Impeller Flow Sensors:** Refer to data sheet F1A11 for tee mount style flow sensors, or data sheet F1A13 for pipe thread and "hot tap" style flow sensors.

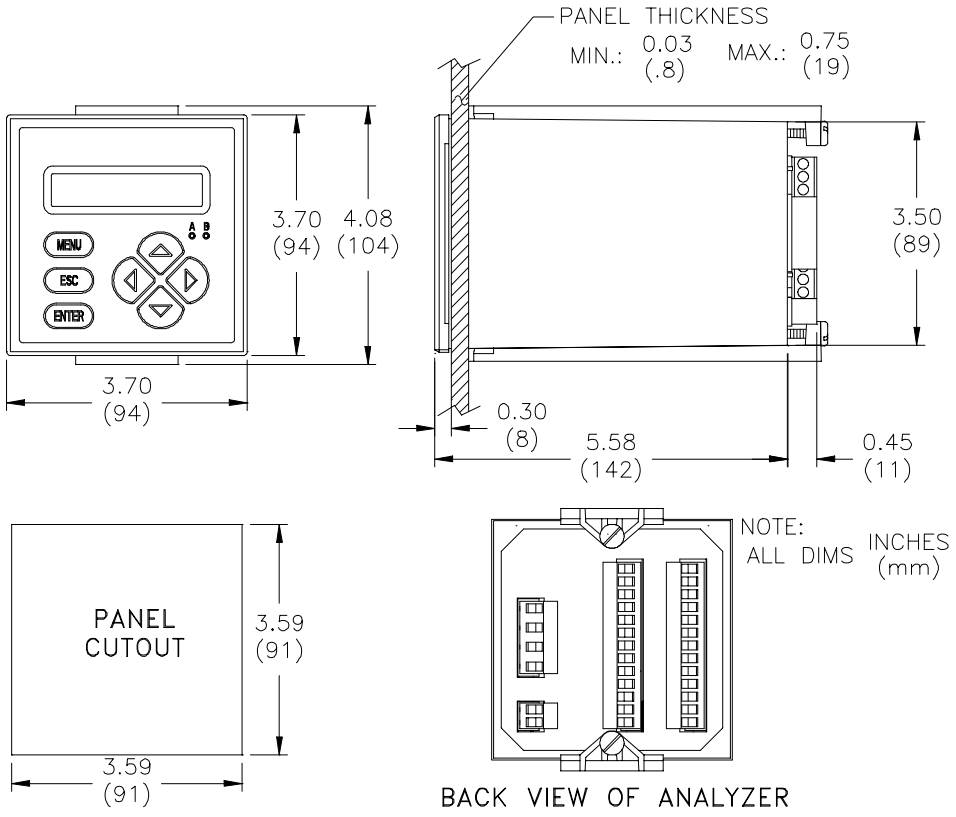
Engineering Specification

1. The microprocessor-based analyzer shall have four sensor inputs that shall accept any GLI impeller flow sensor, or non-GLI flow sensor with a 0-2000 Hz. output such as a paddle wheel, turbine, vortex, and other sensors.
2. The analyzer shall have a two-line by 16-character backlit LCD.
3. The analyzer shall provide separate flow rate and volume readouts for each sensor (A, B, C, and D). Additional measurement readouts shall include various sensor flow rate/volume combinations, and Analog Output 1 and 2 milliampere values. A calculated measurement readout (X-Y, X+Y, X/Y, or [X/Y] x 100) shall also be possible for any two sensors. The X and Y variables shall be selectable to represent any sensor flow rate or volume.
4. The analyzer shall be operable in various languages.
5. The analyzer shall have two selectable calibration adjustment methods to linearly offset the measured reading:
   a) Offset By -- enter a "+" or "-" offset value that is respectively added to or subtracted from the measured reading for a linear offset.
   b) Set To -- enter measurement value (derived from qualified reference instrument reading) to linearly offset measured flow readings.
6. The analyzer shall have a security passcode to restrict access to configuration settings to only authorized personnel.
7. The totalizer for each sensor volume (A, B, C, and D) shall have two selectable reset modes:
   a) Manual -- totalizer stops counting after reaching the maximum limit, and must be manually reset to zero.
   b) Automatic -- totalizer resets itself to zero after reaching the maximum limit, and starts a new count.

   At any time, regardless of the selected mode, each volume shall be capable of being manually reset to zero. Whenever power is interrupted, volume counting shall be suspended until power is restored when counting resumes.
8. The analyzer shall have two isolated 0/4-20 mA analog outputs. Each output shall be assigned to represent the flow rate or volume of any sensor (A, B, C, or D) or, if set, a calculated measurement. It shall be possible to enter parameter (or calculated measurement) values to define the endpoints at which the minimum and maximum mA output values are desired.
9. The analyzer shall have two SPDT pulsed contact closure outputs for remote counting or pumping. Each pulsed output can represent any measured volume (Sensor A, B, C, or D), and activate at a user-set volume increment for a desired time duration.
10. The analyzer shall have two relays that can be selected to operate as a control, dual-alarm, or system status relay. The relays can be independently assigned to represent any sensor flow rate or volume, or a preset two-sensor calculation.
11. The analyzer shall be capable of simple batch control by using the analyzer's two control relays, which are independently configurable.
12. The analyzer shall have user-test diagnostics for analog outputs, relays, pulsed outputs, and alarm LEDs without requiring special test equipment.
13. The analyzer shall be configurable through HART protocol.
14. The analyzer shall be GLI International, Inc. Model F33.

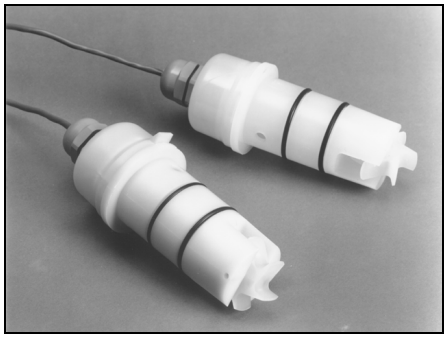
Dimensions

Inches (mm)



Model F1A11-series Tee Mount Style Impeller Flow Sensors

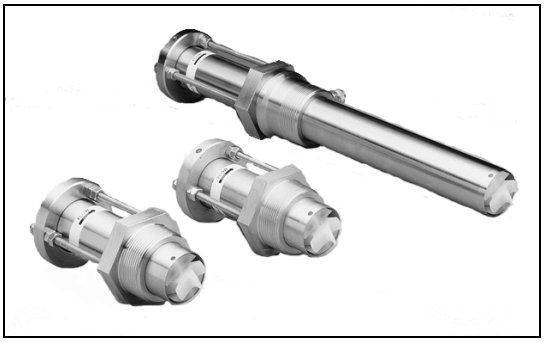
(for use with Model F33 Analyzer)



For complete details and specifications, refer to data sheet F1A11.

Model F1A12/13-series Pipe Thread and "Hot Tap" Impeller Flow Sensors

(for use with Model F33 Analyzer)



For complete details and specifications, refer to data sheet F1A13.