Technology For Solutions

GLI
International

Model F53 Flow Monitor/Totalizer
(four sensor inputs and calculated measurement capability)

WE'VE GOT
HART
ABILITY

$C\epsilon$

Certified Compliant to
European Community Standards

**Universal-mount
1/2 DIN Style**

■ **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.

■ **Large Backlit LCD Readout.**
The large backlit LCD shows measured values in 1/2-inch (13 mm) high numerals. 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.

■ **Universal-mount 1/2 DIN Enclosure.**
This epoxy-coated metal, NEMA 4X enclosure features a hinged front panel to provide easy wiring access. The supplied bracket and stainless steel hardware enable panel, surface, and pipe mounting.

■ **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 large display, simple keypad, and logical menu structure make the F53 easy to use. Menu screens, containing up to six text lines, 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.

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

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

■ **Batch Control Capability.**
Simple batch control is possible by using the analyzer's four 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.

■ **Four 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. Display screen annunciators indicate relay "on/off" status.

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

FLOW

Specifications

Operational:

Display..Graphic dot matrix LCD, 128 x 64 pixels with LED backlighting; 1/2 inch (13 mm) main character height; 1/8 inch (3 mm) auxiliary information character height; menu screens contain up to six text lines

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

Operational Modes.........................Each relay (A, B, C, and D) 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 annunciators (A, B, C, and D) 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 180-260 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 reading

> *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.*

Pulsed 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..................Enables configuration and retrieval of measured data for one analyzer using IBM-compatible PC and GLI optional software tool kit

                  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 50081-1 for emissions and EN 50082-2 for immunity

Electrical Certifications:

General Purpose.............................CSA/CSA_{NRTL} and FM (UL pending)

Class 1, Div. 2 (Groups A-D)..........CSA/CSA_{NRTL} and FM (UL pending)

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

Accuracy..± 0.1% of span
Sensitivity..± 0.1% of span
Repeatability......................................± 0.05% of span

Specifications (continued)

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

Mechanical:

Enclosure...NEMA 4X; polycarbonate face panel, epoxy-coated high-quality cast aluminum door and case with four 1/2 inch (13 mm) conduit holes, nylon mounting bracket, and stainless steel hardware
Mounting Configurations ....Panel, surface, and pipe (horizontal and vertical) mounting
Net Weight..3.5 lbs. (1.6 kg) approximately

Ordering Information

MODEL NUMBER

F53 Flow monitor/totalizer (with four sensor inputs, four relays, and two pulsed outputs) in 1/2 DIN, NEMA 4X enclosure with hardware for panel, surface or pipe mounting.

RESERVED CATEGORIES

COMMUNICATIONS OUTPUT
A1 None
B1 HART Protocol

EQUIPMENT TAGGING (specify tag data)
N None
P Paper
S Stainless steel

F53	A4		**Product Number**

Choose one from each category.

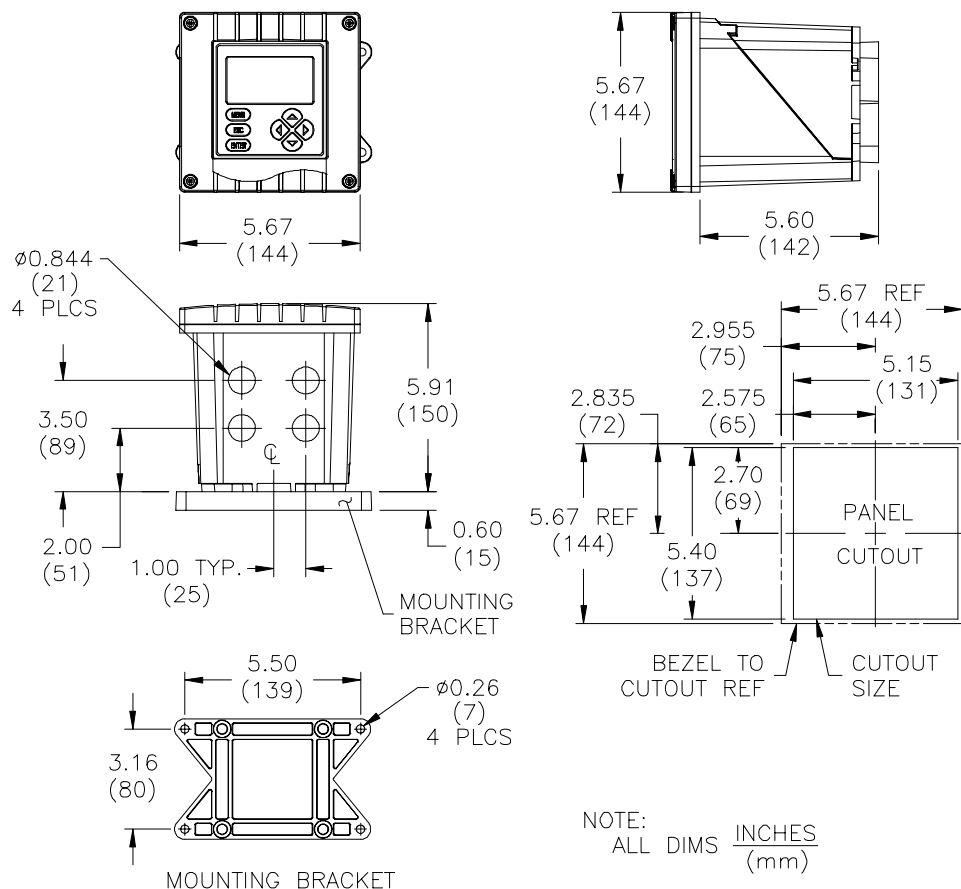## Accessories (order separately):

- **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.

- **Sun Shield 1000G3088-001:** Aluminum shield provides additional protection from harmful effect of direct sunlight.

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 graphical dot matrix LCD display with 128 x 64 pixels and LED backlighting. The main display character height shall be 1/2 inch (13 mm). Auxiliary information character height shall be 1/8 inch (3mm).

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 an offset value ("+" or "-") which is added to or subtracted from the measured reading.

   b) Set To -- enter a measured value (derived from qualified reference instrument reading).

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 four 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 four control relays which are independently configurable.

12. The analyzer shall have user-test diagnostics for analog outputs, relays, and pulsed outputs without requiring special test equipment.

13. The analyzer shall be configurable using its RS-232 port and GLI's optional software tool kit, or through HART protocol.

14. The analyzer shall be GLI International, Inc. Model F53.

Dimensions

Inches (mm)

Ø0.844 (21) 4 PLCS

5.67 (144)

5.60 (142)

5.91 (150)

3.50 (89)

2.00 (51)

1.00 TYP. (25)

0.60 (15)

MOUNTING BRACKET

5.67 REF (144)

2.955 (75)

5.15 (131)

2.835 (72)

2.575 (65)

2.70 (69)

PANEL CUTOUT

5.67 REF (144)

5.40 (137)

BEZEL TO CUTOUT REF

CUTOUT SIZE

5.50 (139)

Ø0.26 (7) 4 PLCS

3.16 (80)

MOUNTING BRACKET

NOTE:
ALL DIMS $\frac{INCHES}{(mm)}$

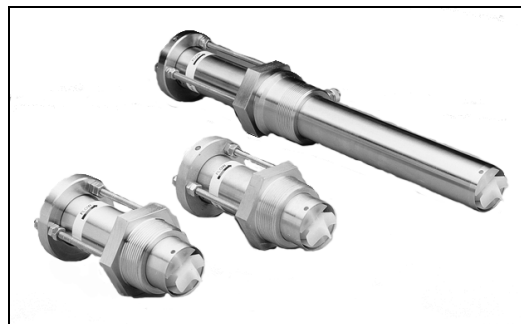### Model F1A11-series Tee Mount Style Impeller Flow Sensors

(for use with Model F53 Analyzer)
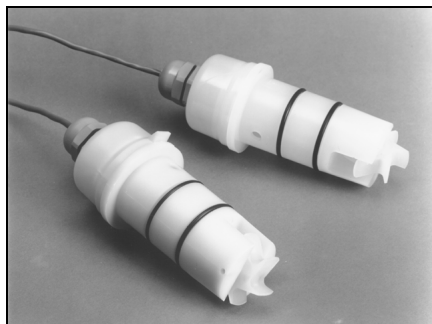
For complete details and specifications, refer to data sheet F1A11.

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

(for use with Model F53 Analyzer)

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

Data Sheet F53