

**MODEL 5398-21**

**Sample Draw Panel**



## MODEL 5398-21

### Sample Draw Panel

#### APPLICABILITY & EFFECTIVITY

This manual provides instructions for the following Sierra Monitor products:

<u>Model</u>	<u>Description</u>
5398-21	Sample Draw Panel

The instructions are effective for the above models as of July 25, 1996

Instruction Manual Part Number T15005

## 1. Introduction

The Model 5395-21 Sample Draw Panel provides a method of drawing an air sample from a remote, or hostile area to a more convenient location for analysis. The integral sample pump draws the sample at a high flow rate to reduce sample time. The sample is delivered to the sensor up-stream from the pump to avoid negative pressure conditions. A bypass line exhausts excess sample volume to avoid high flow rates across the sensor. The sample draw assembly panel a completely self contained system with the pump, flow indication, valves to control sample draw and calibration span gas delivery, and the gas detection sensor and transmitter all housed in a NEMA 4X fiberglass enclosure. The flow systems' design will deliver the sample to the sensor with minimal pressure affecting the sensor as the excess flow and pressure are bled off via the bypass flow-meter.

The Sierra Monitor gas sensor transmitter is installed flush to the panel and adapted to a panel mounted sensor connector. This facilitates easy installation and removal of the sensor assembly which threads onto the sample delivery manifold.

The Sample Draw Panel is intended for installation in an area which is accessible by the user in order to perform routine inspection and periodic calibration. The panel requires 120 VAC input and provides local visual as well as remote indication of pump and flow status.



**5398-21 Sample Draw Panel**

## 2. Installation (Figure 1)

### 2.1 Mounting

1. Install on a permanent vertical surface at eye level for ease of operation and calibration.
2. The mounting feet spacing is 17.0" high by 15.0" wide (43.2 x 38.1 cm)

### 2.2 Tube Connections

1. Install the moisture filter (shipped unassembled) onto the sample inlet. The sample inlet is the rear port on the left side of the downward facing surface of the enclosure.
2. Connect the sample line to the moisture filter using a 1/4" OD Tube. (SS, PTFE, or other depending on installation requirements).
3. Calibration Span Gas input 1/4" tube connection. Left front port.

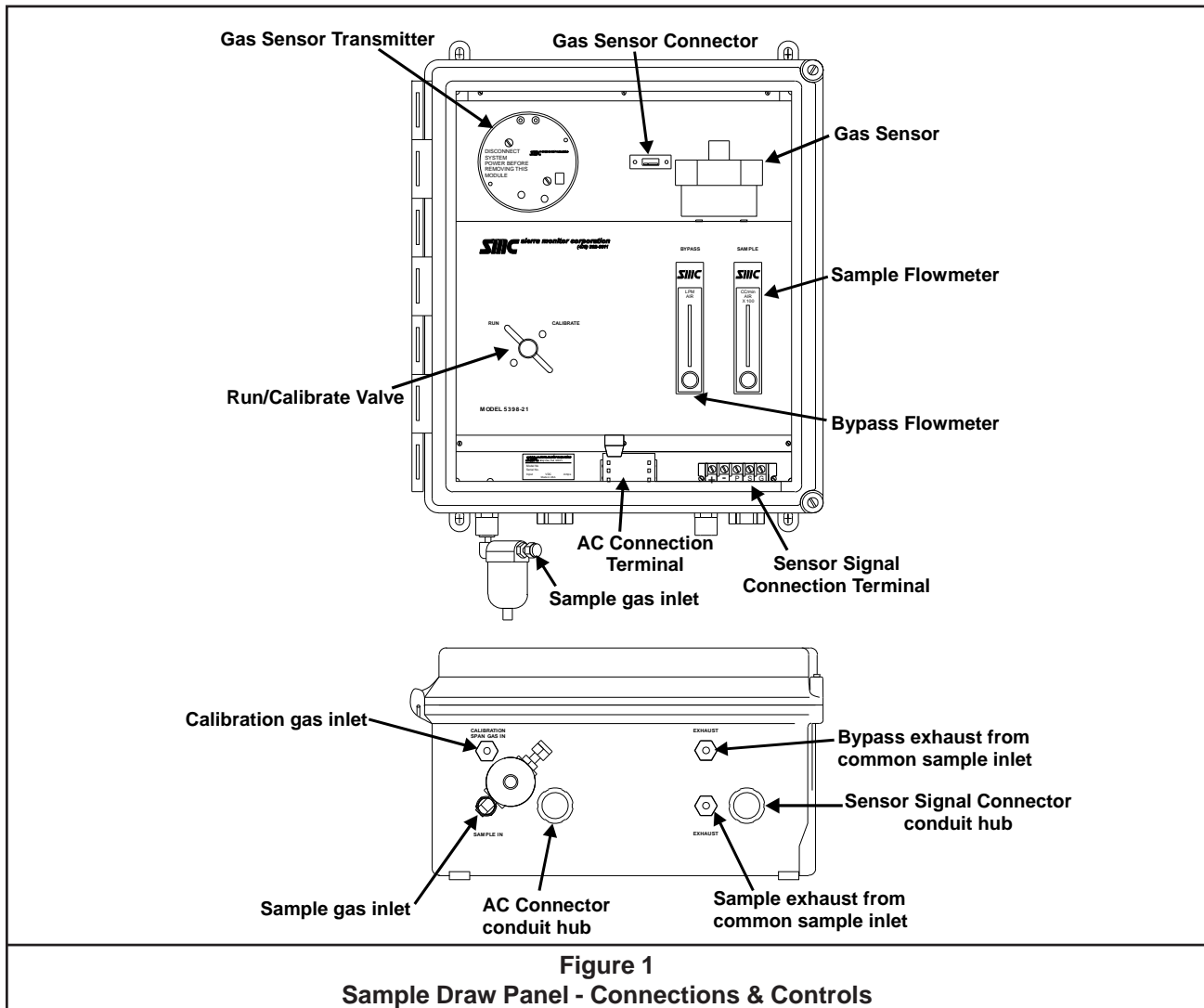
4. Bypass Flow Exhaust (vent to atmosphere). Middle front port.
5. Sample Flow Exhaust (vent to atmosphere). Middle rear port.

### 2.3 Electrical Connections

1. The AC power connection terminals are located in the back of the enclosure immediately below the control panel. Provide a reliable, uninterrupted 120 VAC source. This is for the sample pump only. Use the left hand 3/4" conduit hub to deliver AC wires to the HNG terminal strip.
2. Connect sensor channel wiring to **P**ower (+24VDC), **S**ignal (4-20mA or Digital), and **G**round (DC Common) connections located to the right of the AC terminal strip. Refer to the sensor and controller instruction manuals for instructions regarding controller connections and wire gauge selection. Use the right hand 3/4" conduit hub to deliver wires to the PSG terminal strip.
3. To use the contact closure for pump flow failure (24AWG minimum) connect to the "+" and "-" terminals on the sensor connection terminal strip. The flow alarm will be connected to user supplied control or alarm devices.

**2.4 Sensor Module**

1. If the sensor module, transmitter and head, are not already installed:
2. Thread the sensor assembly onto the delivery head
3. Connect the sensor's 6 position connector to the panel mounted connector to the left of the delivery head.
4. Locate the three wire sensor cable which will be inside the 3" round transmitter compartment. Attach the 3 wire cable to the input terminal block on the transmitter using the following convention: **P**ower: red, **S**ignal: white, **G**round: black..
5. Place the transmitter over the standoffs and secure them by hand-tightening the thumb screws on the cover plate.



**Figure 1**  
**Sample Draw Panel - Connections & Controls**

### 3. Operation

#### 3.1 Power Setup

1. Provide power to the gas sensor module by powering up the gas detection controller
2. Provide AC power to start the pump.

#### 3.2 Flow Setup

1. Set the Run (Normal)/ Calibrate (Calibration) valve to the Run position.
2. Refer to the instruction manual for the specific gas detection module to determine the recommended flow rate for calibration of the module and use that flow rate for normal sample delivery to the sensor. Set the flow on the sample flowmeter
3. Adjust the pointer flag to indicate the desired flow.
4. Set the bypass flow to approximately 3 LPM.
5. Slightly increase the bypass flow step by step until the sample flow begins to drop below the desired level, then reduce the bypass to the prior step and make a final adjustment to the sample flow. This process results in the fastest sample transport time and the least amount of excess pressure on the sensor.

#### 3.4 Flow Switch Setup

1. Confirm that the flow switch is operating by checking for continuity between the "+" and "-" connections on the terminal strip while the sample flow is running.
2. If there is no continuity while the pump is running and there is flow, reduce the bypass flow until continuity is achieved.

### 4. Calibration

#### 4.1 Preparation

1. Read and understand the calibration section in the instruction manual for the specific gas sensor module.
2. Set up the gas detection controller for calibration if necessary.

#### 4.2 Flow Setup

1. Set the Run/Calibrate valve to the Calibrate position.
2. The bypass flow rate will increase because all of the sample is now being redirected through this flowmeter. Let it run without adjustment to the flow meter.
3. During delivery of the zero and/or calibration span gas use the same flow rate as identified in the instruction manual for the gas sensor module. Control the flow using the sample flowmeter.

#### 4.3 Sensor Zero

1. If the calibration step requires a zero gas stimulus apply clean air to the calibration port. (Note that if the sample line is known to be clean it can be used as Zero Air. Switch the control valve to "Run" to Zero the sensor.)
2. If there is a need to zero the sensor with a different air sample, connect a pressure regulated compressed gas cylinder of air to the calibration port (See Figure 1).

#### 4.4 Sensor Span

1. Connect the a pressure regulated compressed gas cylinder of calibration span gas to the calibration port.
2. Adjust the gas sensor module span according to it's instruction manual.

#### 4.5 Calibration Completion

1. Set the Run/Calibrate valve to the Run position.
2. Readjust the sample flowmeter according to section 3.2. Close the calibration span gas cylinder valve(s).

**5. Service / Maintenance**

**5.1 Pump Maintenance**

- The pump runs at approximately 130° to 150° F and will be hot to the touch.
- If excessive noise is emitted from the pump check and tighten all bolts on the pump.
- The diaphragm will need to be replaced periodically depending on the load and corrosive content of the sample.

**5.2 Flow Meter**

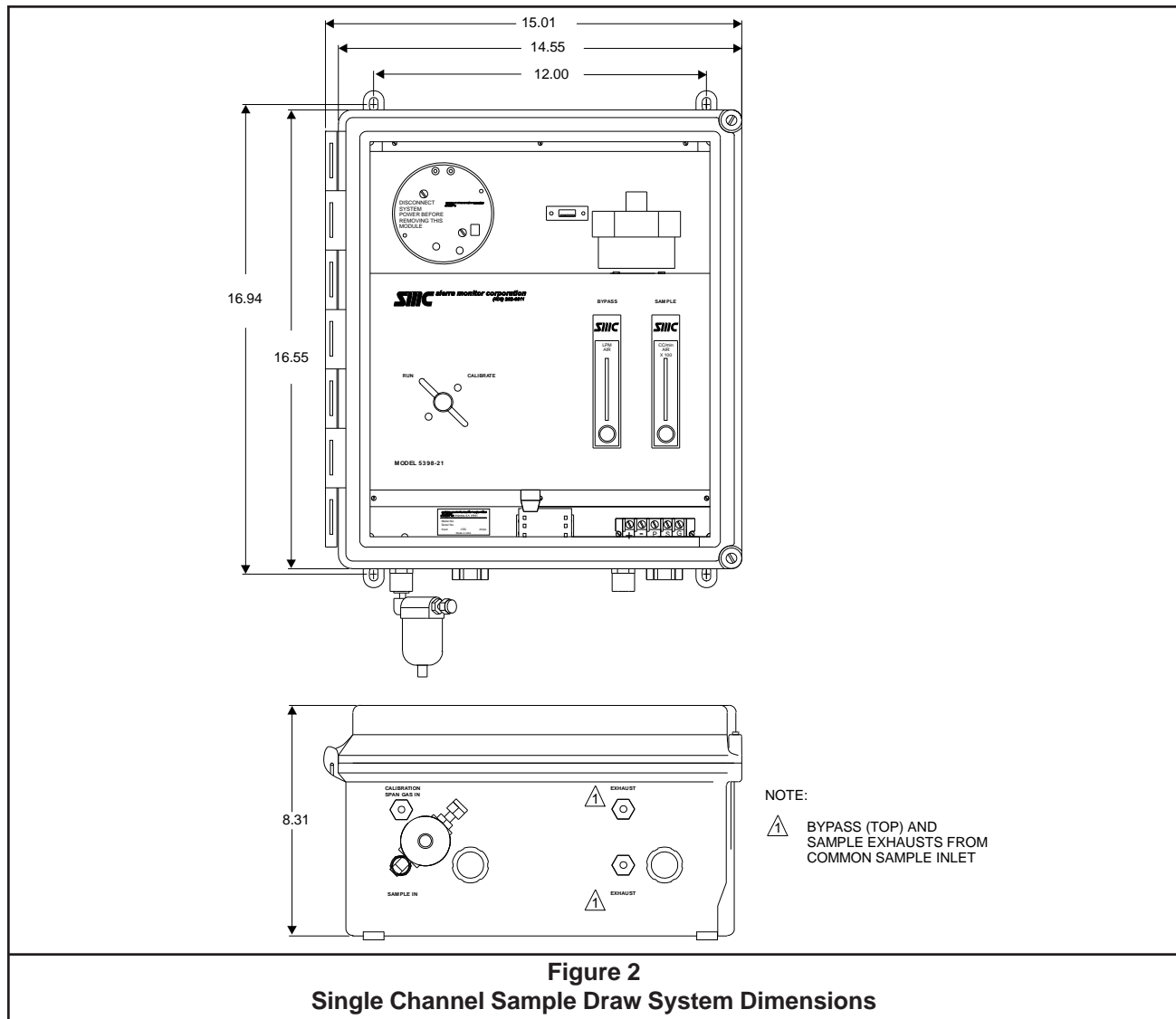
- Check visually and clean or replace as necessary.

**5.3 Sensor**

- The sensor may fail if it is exposed to corrosive gas or dirt.
- Replacement is according to sensor module instruction manual.

**5.4 Coalescing Filter**

- Empty the bowl frequently by pressing the relief valve at the bottom of the filter assembly.
- Replace the filter when it becomes discolored or is clogged preventing flow.



## 6. Specifications

<b>Power:</b>	110 VAC @ 1 Amp
<b>Pump:</b>	Oil Free, Diaphragm Type
<b>Maximum Sample Draw:</b>	600 Feet with 1/4" tubing. Contact factory for longer transport distances
<b>Flow Rates:</b>	0-500 cc/min. adjustable sample to sensor 0-10 LPM adjustable Bypass Flow Control
<b>Maximum Operating Pressure:</b>	50 PSIG
<b>Controls:</b>	3-way valve for Run and Calibration
<b>Outputs:</b>	Dry Contact Pump Flow Failure Switch (Contacts closed when flow is detected, open for alarm)
<b>Filter:</b>	Coalescing Filter for moisture knock-out
<b>Tubing Connections:</b>	1/4" Tube Fittings for connection of: <ul style="list-style-type: none"><li>- sample line</li><li>- calibration gas</li><li>- sample exhaust</li><li>- bypass exhaust</li></ul>
<b>Electrical Hubs:</b>	3/4" hubs for electrical connections
<b>Enclosure Type:</b>	NEMA 4X Fiberglass with window
<b>Dimensions (H x W x D):</b>	16.9 x 15.0 x 8.3 inches (42.9 x 38.1 x 21.1 cm)
<b>Weight:</b>	17.6 lbs (8.0 Kg.) - without gas sensor module
<b>Sensor/Transmitter:</b>	Mounting provisions for all standard Sierra Monitor Corporation Sentry and Analog gas sensor modules

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## 7. Limited Warranty

SIERRA MONITOR CORPORATION warrants its products to be free from defects in workmanship or material under normal use and service for one year after date of shipment. SMC will repair or replace without charge any equipment found to be defective during the warranty period. Final determination of the nature and responsibility for defective or damaged equipment will be made by SMC personnel.

All warranties hereunder are contingent upon proper use in the application for which the product was intended and do not cover products which have been modified or repaired without SMC approval or which have been subjected to accident, improper maintenance, installation or application, or on which original identification marks have been removed or altered. This Limited Warranty also will not apply to interconnecting cables or wires, consumables (ie.

calibration gases, batteries), nor to any damage resulting from battery leakage. In all cases SMC's responsibility and liability under this warranty shall be limited to the cost of the equipment. The purchaser must obtain shipping instructions for the pre-paid return of any item under this warranty provision and compliance with such instruction shall be a condition of this warranty.

Except for the express warranty stated above, SMC disclaims all warranties with regard to the products sold hereunder including all implied warranties of merchantability and fitness and the express warranties stated herein are in lieu of all obligations or liabilities on the part of SMC for damages including but not limited to consequential damages arising out of/or in connection with the use or performance of the product.