



# **Installation, Operation and Maintenance Manual**

## **Model MFV Fixed Volume Sample Panel For Liquid Samples**

SPD 1.5.12 Rev. 3 10/07

### **SENTRY EQUIPMENT CORP**

PO Box 127  
Oconomowoc, WI 53066 USA  
Phone: 262.567.7256  
Fax: 262.567.4523  
Email: [sales@sentry-equip.com](mailto:sales@sentry-equip.com)  
**[www.sentry-equip.com](http://www.sentry-equip.com)**

## TABLE OF CONTENTS

<b>SAFETY PRECAUTIONS.....</b>	<b>iii</b>
<b>1.0 General Description .....</b>	<b>1</b>
<b>2.0 Installation .....</b>	<b>2</b>
<b>3.0 Operation .....</b>	<b>3</b>
<b>4.0 Maintenance .....</b>	<b>6</b>
<b>5.0 Spare Parts List.....</b>	<b>7</b>
<b>6.0 Factory Assistance .....</b>	<b>8</b>
<b>7.0 Warranty.....</b>	<b>9</b>

**WARNING** notices as used in this manual apply to hazards or unsafe practices, which could result in personal injury or death.

**CAUTION** notices apply to hazards or unsafe practices which could result in minor personal injury or property damage.

**NOTES** highlight procedures and contain information which assists the operator in understanding the information contained in this manual.

**WARNING**

Do not install, maintain, or operate this equipment without reading, understanding and following the proper Sentry Equipment Corp. instructions. Otherwise, injury or damage or both may result.

**NOTICE**

The information contained in this document is subject to change without notice.

Sentry Equipment Corp, its employees, agents, and the authors of and contributors to this document specifically disclaim all liabilities and warranties, express and implied (including warranties of merchantability and fitness for a particular purpose), for the accuracy, currency, completeness, and/or reliability of the information contained herein and/or for the fitness for any particular use and/or for the performance of any material and/or equipment selected in whole or part with the user of/or in reliance upon information contained herein. Selection of materials and/or equipment is at the sole risk of the user of this publication.

This document contains proprietary information. No part of this document may be photocopied or reproduced without the prior written consent of Sentry Equipment Corp.

Sentry Equipment Corp  
966 Blue Ribbon Circle North  
PO Box 127  
Oconomowoc, WI 53066

Phone: 262.567.7256  
Fax: 262.567.4523

Normal business hours: 7:00 a.m. to 4:30 p.m. CST (U.S. Central Time), Monday through Friday

## SAFETY PRECAUTIONS

Please read the entire manual before attempting to unpack, set up or operate this product. Pay careful attention to all warnings, cautions and notes. Failure to do so could result in serious personal injury or equipment damage.

### Use of Hazard Information

If multiple hazards exist, the signal word corresponding to the greatest hazard shall be used.

#### Definitions



Indicates an imminently hazardous situation, which if not avoided, will result in death or serious injury.



Indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury.



Indicates a potentially hazardous situation, which if not avoided, may result in minor or moderate injury.



CAUTION used without the safety alert symbol indicates a potentially hazardous situation, which if not avoided, may result in property damage.

#### NOTE

*Information that requires special emphasis*

#### SHALL

*This word understood to be mandatory*

#### SHOULD

*This word understood to be advisory*

**▲WARNING**

It is solely the responsibility of the user, through its own analysis and testing, to select products suitable for their specific application requirements, ensure they are properly installed, ensure that they are safely applied, ensure they are properly maintained, and limit their use to their intended purpose.

Improper selection, installation, or use can cause personal injury or property damage.

Sentry does not warrant against erosion and corrosion. Sentry makes no claims regarding suitability for specific use, and provides no warranty regarding material compatibility of elastomers in specific services.

**▲WARNING**

**Hot Surfaces!** This equipment may have very hot surfaces. If an operator contacts a hot surface, injury may occur. Use protective clothing to prevent injury. If other equipment comes in contact with a hot surface, damage to the equipment may occur. Ensure the area around this equipment is kept clear to prevent damage from occurring.

**▲WARNING**

**High Pressures!** This equipment may contain fluids at very high pressures. Prior to installing, removing or maintaining this equipment, ensure that the equipment is isolated from all connecting piping, the equipment is de-pressurized, the contents have been drained and the equipment is cool.

## 1.0 General Description

The Sentry Fixed Volume Sampler is designed to provide emission-free collection of a defined volume of liquid sample in a sample bottle.

Sampling of hazardous or toxic chemicals requires that the sample be representative of the fluid, be obtained without risk to personnel, and minimize the potential of leakage to the environment. The complete sampling operation includes routing of the process fluid to the sampling device along with the capture and containment of the sample obtained. Representative sampling requires that the device used for sampling can be flushed or purged to remove old material and that the flow path to the sampling device facilitate flows which can provide a current sample. To minimize exposure of personnel and the environment, the sample is injected into a sealed bottle using a Sentry needle assembly. A second needle vents gasses from the bottle and prevents pressure buildup in the sample bottle.

The Sentry Fixed Volume Sampler utilizes a tandem 3-way valve (V-2) switching assembly that allows the operator to make contemporary sample collections and purge the system with the minimum of operations.

In the OFF mode, fluid from the process stream circulates through the sampler.

By setting the valve (V-2) to the BYPASS mode, sample flows from the process stream through the sampler (which includes a cylinder that defines the fixed volume of sample to be collected).

Valve (V-2) should remain in the BYPASS mode until the operator is certain that the fluid circulating through the sample panel is representative of the fluid in the process stream (contemporized). The amount of time required to do this is a function of flow rate and distance from the sample panel to the sample source. Therefore, this time must be established by the user at installation.

When the sample is contemporized, the valve (V-2) may be set to the SAMPLE mode.

In the SAMPLE mode, flow from the process stream through the sample panel stops, and nitrogen displaces the sample collected in the fixed volume cylinder. The sample is forced by the nitrogen into a collection bottle.

A needle assembly is used to inject the sample through a septum into the collection bottle.

The sampling assembly is provided with a vent connection where the gaseous vapors can be diverted to an absorption vessel or a flare for combustion.

The valve assembly is supplied with a bottle shroud that secures the bottle to the valve during the sampling operation. This shroud is matched to the sample bottle to provide a smooth lead in while ensuring that the bottle is centered and oriented perpendicular to the needles prior to septum penetration. This alignment minimizes the puncture in the septum and provides for reduced bending loads on the needles. The shroud is provided with a slot, which allows the operator to view the sample bottle and watch the filling process. A wire retainer is provided to hold the sample bottle within the shroud.

Needles are provided with a side outlet to eliminate the possibility of coring the septum during needle penetration. The typical beveled end needle is sharpened to a razor edge that can cut out a small piece of the septum during needle penetration. This "core" can plug the needle and

provide a leakage path back through the septum when the needle is removed. Plugging of the needles can result in pressure build up in the sample bottle due to the inability to vent flashing vapors. These vapors will build up in the bottle and increase the likelihood of septum leakage.

The needles are arranged to minimize fluid carry-over to the vent needle. The inlet has the side port directed towards the back of the bottle. This results in the fluid flowing down the backside of the bottle with maximum operator visibility through the shroud slot. It also prevents discharge at the operator should the sampling operation be initiated while a bottle is not in place. The side port of the vent needle is directed forward to prevent splattering droplets from rebounding into the vent needle port. The needle orientation, combined with precise flow control from valve throttling will minimize overall turbulence in the bottle and reduce the possibility of liquid droplets entering the vent needle.

Since fluid properties can vary widely the sampling valve is available with numerous needle diameters and combinations. **An easily replaceable needle assembly allows changing of needle sizes.**

## 2.0 Installation

### a. Receiving

Examine the crate for any shipping damage. If in doubt, take pictures of the suspect area. Remove unit(s) from the crate and examine for any visible damage. Report damages to the trucker at once. This is the responsibility of the consignee.

### b. Mounting

Use attached General Arrangement Drawing – 10-03222C

The Fixed Volume Sample Panel for Liquid Samples is provided with a 2" diameter pipe stand (shipped separately). Clamps are provided for securing the panel to the pipe stand.

### c. Piping

(Use attached P&ID and General Arrangement Drawing – 10-03222C for connection locations.)

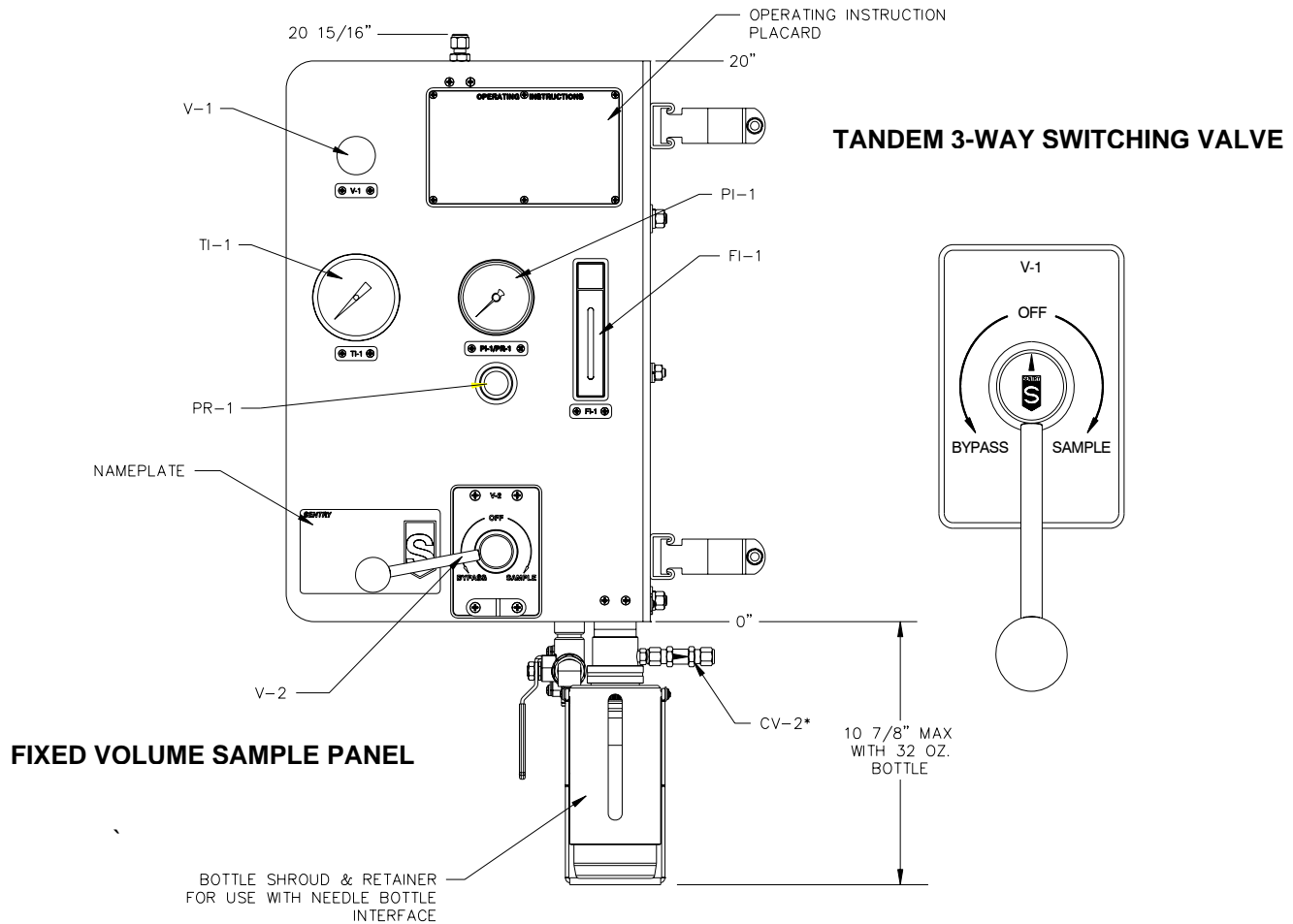
Run pipe/tube to the proper connection on the panel as follows:

Connection 1 = Sample Inlet, 1/4" Compression (316 SS)  
Connection 2 = Sample Return, 1/4" Compression (316 SS)  
Connection 3 = Nitrogen Inlet 1/4" Compression (316SS)



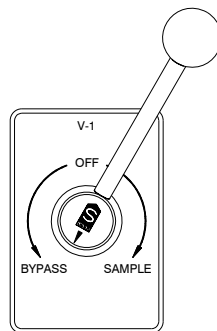
**Dangerous gas! The gases being emitted from the bottle vent may be hazardous and toxic upon exposure. The vent line should be directed to a charcoal canister, flare or other sub atmospheric region for collection and treatment of sample vapors.**

**3.0 Operation**



Insert sample bottle into shroud until the bottle cap bottoms against the keeper nut. Secure the bottle within the shroud using the bottle support bracket.

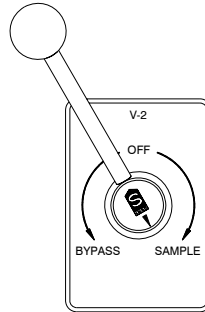
1. Verify that cooling water is flowing.
2. Verify that the nitrogen pressure is set. The pressure is adjusted using the pressure regulator (PR-1). The pressure is indicated by (PI-1). The desired pressure setting is dependent on the sample viscosity and the desired bottle fill rate.
3. Rotate sample valve (V-1) to the BYPASS position.



**TANDEM 3-WAY SWITCHING VALVE  
BYPASS MODE**

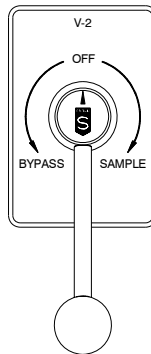


4. Allow sample to flow until contemporized. The amount of time to achieve this is dependent on the sample flow rate and distance from the sample source and the sample panel.
5. Rotate sample valve (V-1) to the SAMPLE position.



TANDEM 3-WAY SWITCHING VALVE  
**SAMPLE MODE**

6. After bottle has filled, return sample valve (V-1) to the OFF position.



TANDEM 3-WAY SWITCHING VALVE  
**OFF MODE**

7. Remove sample bottle from shroud.

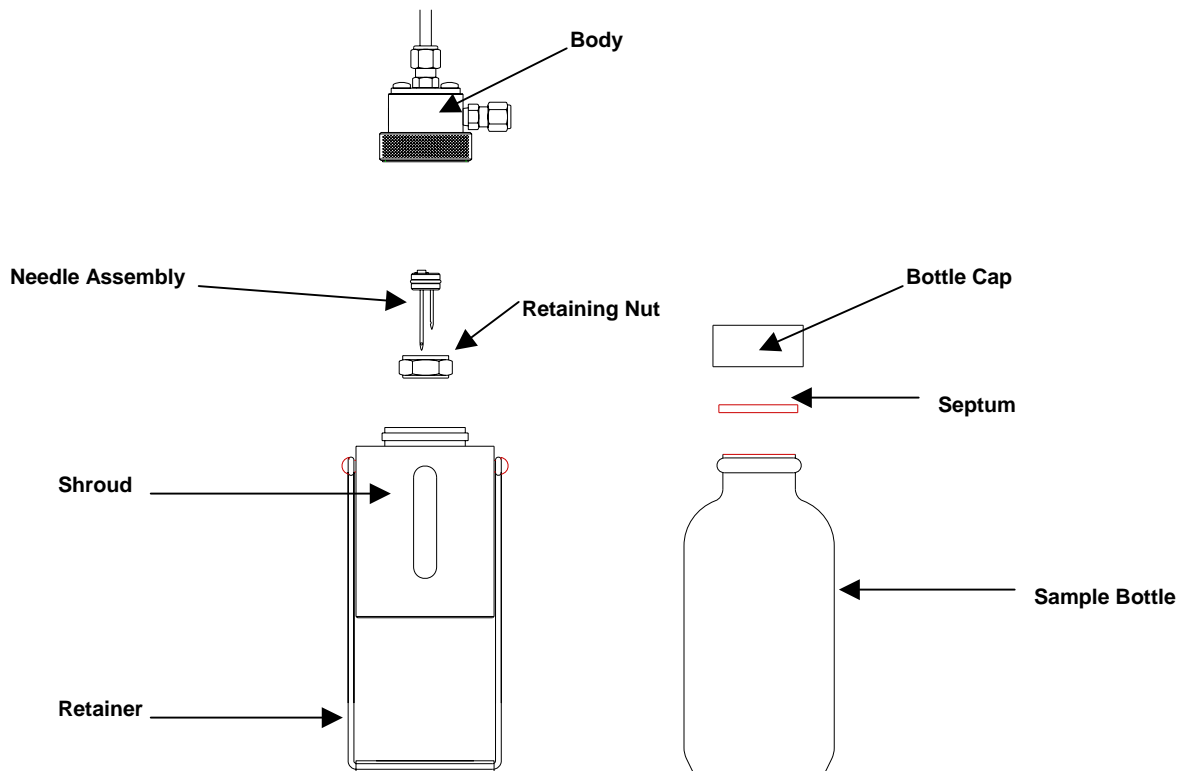
## Needle Assembly



**Sharp Objects!** The needles in the needle assembly are very sharp and present a risk for injury due to penetration and/or laceration. The needles are in direct contact with process media and may have residual substances on their surfaces. These substances may exacerbate an injury.

The needle assembly can be removed and replaced by removing the shroud and a single retaining nut. The needle assembly is equipped with "O"-ring seals around the fluid inlet port and the needle assembly. This arrangement provides maximum protection from potential leakage as fluid leakage resulting from a defective inlet seal is diverted to vent rather than discharge to the atmosphere. The needle assembly has positive engagement to insure that the needles are correctly positioned prior to insertion.

The needle assembly can be removed and replaced without valve disassembly or disruption of any fluid tubing.



**Sample Cooler**

For Installation and Operating Instructions for the sample cooler, please see the accompanying Document **SD 1741**.

**4.0 Maintenance****Needle Valve**

In the event of a blockage, it can normally be cleared by fully opening the valve. Care must be taken to ensure that temperature and pressure limits are not exceeded during this process.

**Valve Packing**

Occasionally during initial start-up or restart of the sample panel, the low pressure/high pressure inlet isolation valve packing will leak. If this occurs, remove the handle, tighten the packing nut, and then replace the handle. If the packing continues to leak or other valves or O-rings require maintenance.

**5.0 Spare Parts List**

<u>DESCRIPTION</u>	<u>SEC P/N</u>	<u>QTY/ASS'Y</u>
Needle Assembly .065" (#16 GA) Needles	2-05467H	1
Needle Assembly .083" (#14 GA) Needles	2-05467K	1
Needle Assembly .110" (#12 GA) Process and .083" (#14 GA) Vent Needles	2-05467M	1
Needle Assembly .083" (#14) Process and .110" (#12 GA) vent	2-05467L	1
Needle Assembly .065" (#16 GA) Process and .083" (#14 GA) Vent	2-05467J	1
Fluid Inlet Port O-Ring, Viton	4-04820M	1
Fluid Inlet Port O-Ring, Kalrez	4-04820X	1
Needle Assembly O-Ring, Viton	4-04820L	1
Needle Assembly O-Ring, Kalrez	4-04820Y	1
Shroud for 2 oz. Bottles	2-04015C	1
Shroud for 4 oz. Bottles	2-04015G	1
Shroud for 8 oz. Bottles	2-04015E	1
Shroud for 16 oz. Bottles	2-04015J	1
Shroud for 32 oz. Bottles	2-05523T	1

**Documents****10- 03222C** – Fixed Volume Sample Panel General Arrangement

<b>Sentry Ref.</b>	<b>Qty.</b>	<b>Description</b>	<b>Manufacturer</b>	<b>Sentry P/N</b>
V-1	1	Valve and Gearbox, Tandem 3-Way, 1/4" C	Sentry	7-02915B
PR-1/PR-1	1	Valve, pressure regulator, with gauge	Norgren	4-05209S
PI-1	1	Indicator, Pressure, 63mm, 0-30 psi	Ashcroft	4-05621P
Shroud	1	Body, Ring, Shroud and retainer, 16oz/500ml	Sentry	2-05523A
Needle	1	Assembly, needle, Viton, #12 process, #14 vent	Sentry	2-05513K
CYL-1	1	Cylinder, 500cc 1800 PSI 316 Stn 1/4" FNPT	Hydrospin	4-05690E
CV-1	1	Valve, check	Parker	4-04625V

## 6.0 Factory Assistance

Sentry Equipment Corp. has been a pioneer in sampling equipment. From single point sampling to complex multifunction, automated sampling control systems, Sentry has been at the forefront to assist utilities and industry.

Please do not return any equipment or system components before discussing your application problem with a Sentry representative and obtaining a return authorization. The Service Department at Sentry Equipment or your Sentry representative is available for your assistance.

For other sampling applications, your Sentry representative or Sentry Equipment Corp. is eager to help you. Please feel free to call your representative or the number below to discuss our application.

Sentry Equipment Corp  
 966 Blue Ribbon Circle North  
 PO Box 127  
 Oconomowoc, WI 53066  
 Phone: 262.567.7256  
 Fax: 262.567.4523  
 E-mail: [sales@sentry-equip.com](mailto:sales@sentry-equip.com)

## 7.0 Warranty

Seller warrants products manufactured by it and supplied hereunder to be free from defects in materials and workmanship for a period of twelve months from date of shipment. If within such period any such products shall be proved to Seller's satisfaction to be defective, such products shall be repaired or replaced at Seller's option. Seller's obligation and Buyer's exclusive remedy hereunder shall be limited to such repair and replacement and shall be conditioned upon Seller's receiving written notice of any alleged defect within 10 days after its discovery and, at Seller's option, return of such product to Seller, ex-works Sentry's factory.

The foregoing warranties are exclusive and in lieu of all other express and implied warranties except in title, including but not limited to implied warranties of merchantability and fitness for purpose. Seller shall not be subject to any other obligations or liabilities whatsoever with respect to products manufactured or furnished by it, or any undertakings, acts or omissions relating thereto.

### **Warranty Conditions & Limitations**

This Warranty shall not apply to any Sentry product which, in the opinion of Sentry Equipment Corp, has been (a) altered or repaired in a manner affecting the efficiency of performance of the unit or (b) incorrectly installed or operated or (c) damaged in shipment or (d) damaged by flood or fire or (e) if the serial number is missing, altered or defaced.

The owner shall be responsible for maintenance of his equipment. Wear or damage caused by lack of normal maintenance or by misuse of the equipment shall not be considered as defective workmanship and material.

Sentry reserves the right to make product design changes or improvements without notice and without imposing any obligation upon itself to install these changes or improvements on its products previously manufactured.

This warranty is for the sole benefit of the original purchaser and is not transferable unless agreed to in writing by Sentry Equipment Corp.

### **Receiving Shipments (including loss or damage by transportation)**

It is the customer's responsibility to check for missing cartons and sign of damage to cartons. If found, customer should note missing and/or damaged cartons on the delivery receipt and have delivery receipt signed by the representative of the transportation company. If unpacking discloses concealed damage from rough handling, the customer should request a concealed damage inspection from the transportation company.

The Sentry Customer Service Department will aid your organization in any claim proceeding for shortages or damages in shipment, but it is the receiver's responsibility to file claim with the carrier for damage or loss.

**Customer Actions For Claims on Products During the Warranty Period**

1. Contact the Customer Service Department at Sentry Equipment Corp, Oconomowoc, WI, Telephone: 262-567-7256, to obtain a Return Material Authorization (RMA) number.
2. You will be sent an "RMA" and a "Decontamination Statement" that is required to be filled out and **returned with the equipment**.
3. The following information must appear on the outside of the package:
  - a. RMA number marked on outside of box.
  - b. Decontamination Statement filled out and attached to outside of box.
4. Return defective equipment **FREIGHT PREPAID**. Collect shipments will be refused.
5. The factory will not process warranty claims until the customer has properly accomplished the above items.
6. The Sentry factory may accept the entire claim, a part of the claim, or none of the claim if our inspection of returned parts proves the failure was for reasons other than defective material or factory workmanship.

**Important Notes:**

1. Sentry will not be responsible for damage incurred during the return shipment.
2. All returns subject to inspection and a \$50.00 evaluation fee.
3. This RMA is not authorization for credit. Credits and/or replacements will be issued upon evaluation of returned goods.
4. RMA is valid for thirty (30) days from issue date.