Original Instructions

Installation, Operation & Maintenance Manual

Sentry MVS Sampler

Low Emission Samplers

S-MS-IOM-00261-5 01-21

COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV GL = ISO 9001 =

SENTRY

Table of Contents

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

Copyright

Limit of Liability

Sentry Equipment Corp, its employees, agents, and the authors and contributors to this document specifically disclaim all liabilities and warranties, express or 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.

Note

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

Safety Information

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 and/or equipment damage.

Use of Hazard Information

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

Definitions

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

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

⚠ CAUTION

CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to personal injury.

➲ NOTE

Information that requires special emphasis.

➲ TIP

Alternate techniques or clarifying information.

SHALL: This word is understood to be mandatory.

SHOULD: This word is understood to be advisory.

General Safety Precautions

Product Selection, Installation, and Use

⚠ WARNING

Improper selection, installation, or use can cause personal injury or property damage. It is solely the responsibility of users, through their own analysis and testing, to select products suitable for their specific application requirements, ensure they are properly maintained, and limit their use to their intended purpose.

Follow proper local, state, and federal regulations for proper installation and operational requirements.

Always use caution and common sense when working with any chemical. Read the product label and Material Safety Data Sheets (MSDS) carefully and follow the instructions exactly.

Potential Equipment Hazards

⚠ 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.**

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 depressurized, the contents have been drained, and the equipment is cool.**

Moving parts! **This equipment may contain moving parts. All drive guards and doors must be secured in place when this machine is being operated.**

General Description

⚠ WARNING

Read these instructions completely before proceeding to assemble, install or operate this machine. This machine should be installed, operated and serviced by qualified individuals. Follow proper local, state and federal regulations for proper installation and operational requirements.

The Sentry® MVS manual low-emission sampler is specifically designed to collect process samples without emissions to the atmosphere or exposure to the operator. Dead volume is minimized by using a close-coupled ball valve specifically designed to provide low dead volume.

The MVS sampler uses our patented side-discharge dual needle assembly that ensures septum integrity and full venting of process vapors. This non-coring needle design punctures the septum without coring it, allowing for full resealing of the septum when the sample bottle is removed. The tapered bottle shroud enables proper septum and needle alignment, preventing accidental spillage or needle breakage. A variety of needle arrangements and sample bottle sizes are available to meet most sampling requirements. Additionally, a tube stub option is available for high viscosity fluids or those that contain particulates.

Since operator safety is of the highest concern, the sampling valve interface features an adjustable throttle stop and spring return (deadman's) handle. This provides proper sample control and quick closure upon release of the sampling valve.

Needle Type

The Sentry MVS manual low-emission sampler is a single valve assembly, and the valve is a shut-off valve. The sampling assembly is provided with a vent connection where vapors can be diverted to a flare or vessel. The sample is injected into a sealed bottle using a Sentry needle assembly. A second needle on this assembly vents gases from the bottle and prevents pressure buildup in the bottle.

The valve on the MVS is a spring-return redundant stop valve, with what is commonly called a deadman's handle. The handle is rotated to begin sample flow into the bottle. Once the operator lets go of the handle, the valve will close, stopping flow into the bottle.

The valve assembly is supplied with a bottle shroud with a wire retainer that secures the bottle to the valve during the sampling operation. The shroud is matched to the sample bottle to ensure the bottle is properly aligned for septum penetration. The shroud features a slot that allows the operator to view the sample bottle and filling process.

Tube Stub Type

The Sentry MVS also has a tube stub option, which works in a similar fashion to the needle style; however, the sample is injected into the bottle via a tube stub in lieu of needles. A vent hole in the tube stub assembly vents gases from the bottle and prevents pressure buildup in the sample bottle.

The valve assembly is supplied with a bottle adapter with a threaded connection that secures the bottle to the valve during the sampling operation. As with the needle type, the adapter is matched to the sample bottle to ensure the bottle is properly aligned.

Specifications

<table>
<tr><th></th><th></th></tr>
<tr><td>wetted materials</td><td>316 stainless steel, PTFE, Viton®, Kalrez®</td></tr>
<tr><td>bottle shroud</td><td>nylon</td></tr>
<tr><td>customer interface connection</td><td>1/4 in compression, 3/8 in compression or 1/2 in compression</td></tr>
<tr><td>standard pressure rating</td><td>2200 psi at 100°F (150 bar at 38°C); 450°F at 100 psi (232°C at 7 bar)</td></tr>
<tr><td>sampler interface</td><td>
<table>
<tr><th colspan="2">needle assembly (OD)*</th></tr>
<tr><th>Process</th><th>Vent</th></tr>
<tr><td>0.065 in</td><td>0.065 in</td></tr>
<tr><td>0.083 in</td><td>0.083 in</td></tr>
<tr><td>0.110 in</td><td>0.110 in</td></tr>
</table>
<table>
<tr><th colspan="2">tube stub assembly (OD)*</th></tr>
<tr><th>Process</th><th>Vent</th></tr>
<tr><td>3/16 in</td><td>9/64 in</td></tr>
</table>
*other needle/tube stube arrangements available
<table>
<tr><th colspan="2">bottle size and type</th></tr>
<tr><th>Boston Round</th><th>Schott</th></tr>
<tr><td>2 oz (60 ml)</td><td>50 ml</td></tr>
<tr><td>4 oz (125 ml)</td><td>100 ml</td></tr>
<tr><td>8 oz (250 ml)</td><td>250 ml</td></tr>
<tr><td>16 oz (500 ml)</td><td>500 ml</td></tr>
<tr><td>32 oz (1000 ml)</td><td>2000 ml</td></tr>
</table>
Boston Round bottle cap/thread interfaces per GPI finish standards. Schott bottle cap/thread interfaces per ISO 4796.

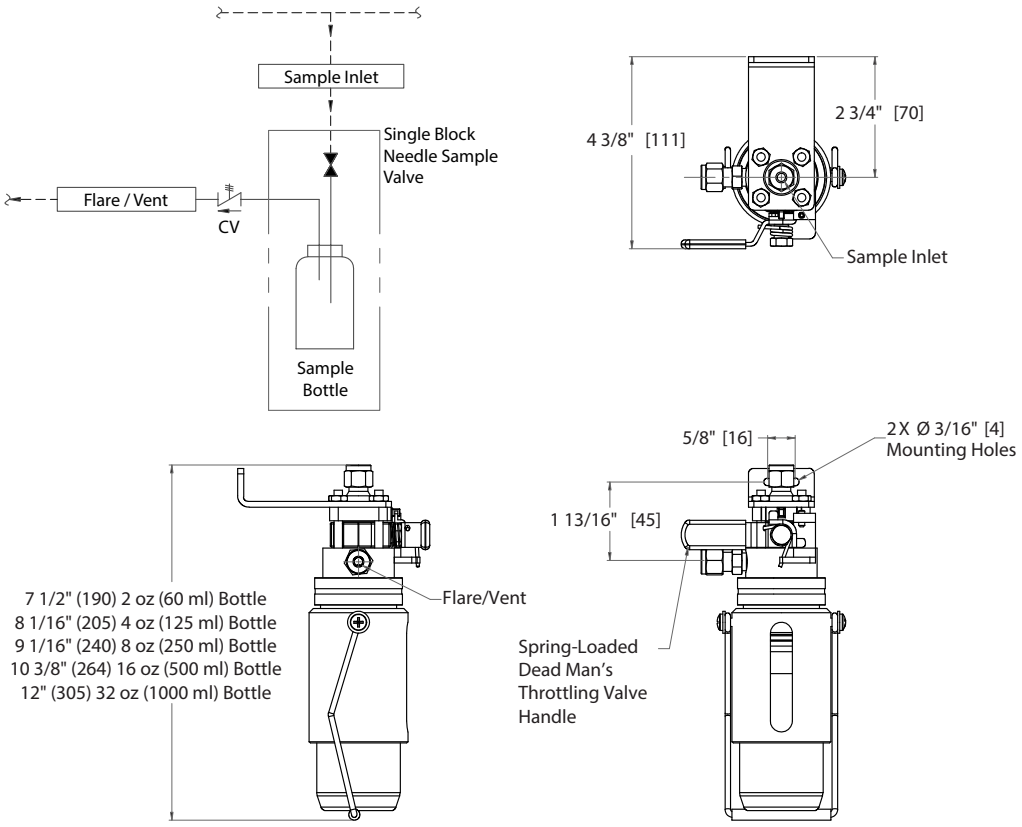
Standard septum material is Teflon-coated silicone.

Other bottle or septum arrangements are available.
</td></tr>
</table>

Installation

The MVS manual low-emission sampler can be supported directly by the top 1/4 in (or optional 3/4 or 1/2 in) compression connection or mounted to a panel using the bracket provided. When installing the valve assembly, verify that adequate space has been provided for the removal of the bottle from the shroud or bottle adapter.

The sample inlet connection is located at the top of the valve. The vent connection is located on the left side of the valve assembly. This line should be directed to a charcoal canister, flare or other sub-atmospheric region for collection and treatment of sample vapors. Line and fitting size from the isolation valve to the purge port should be minimized to prevent the formation of "dead legs".



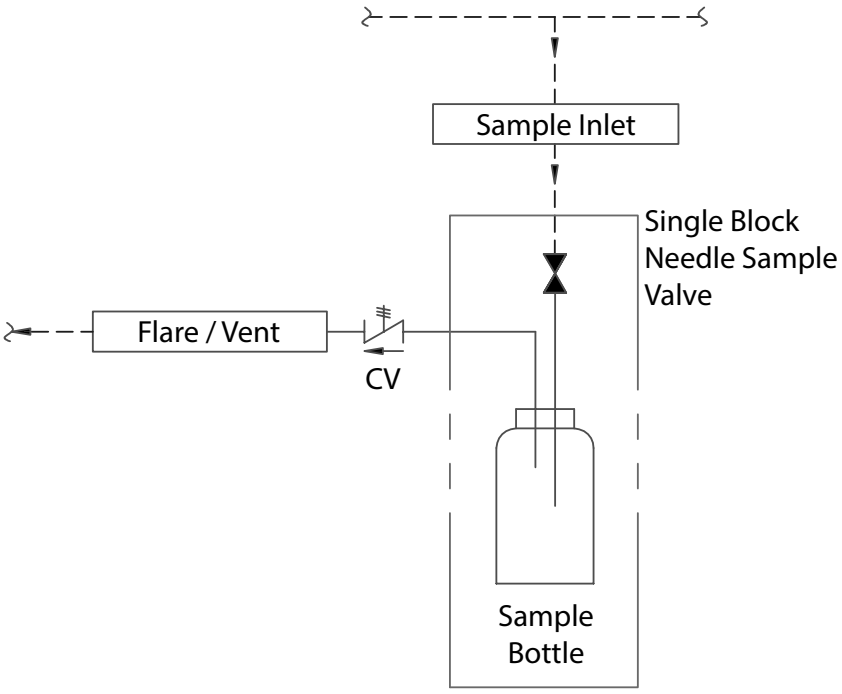
Operation

When not actually sampling, the valve should be in the off position with the valve handle in the vertical position.

Prior to initiating sampling, insert the bottle inside the shroud until the bottle cap bottoms against the keeper nut. Secure the bottle within the shroud using the bottle support bracket. Sample flow enters the valve at the top connection. Gradually open the valve by lowering the valve handle. The valve stop provided should be adjusted so the bottle fills slowly with minimum turbulence or frothing. After the desired sample is obtained, close the valve. Allow a few seconds for vapors to exit the vent connection before removing the bottle from the shroud.

Before initially sampling a high pressure fluid, it is advisable to turn the valve stop in as far as possible. This will prevent the fluid from spurting out due to the valve being open too far. While fluid is flowing, the screw can be backed out slowly while the valve is opened to establish the desired fill rate.

Please refer to the job-specific drawings of the instruction placard for specific operating instructions.

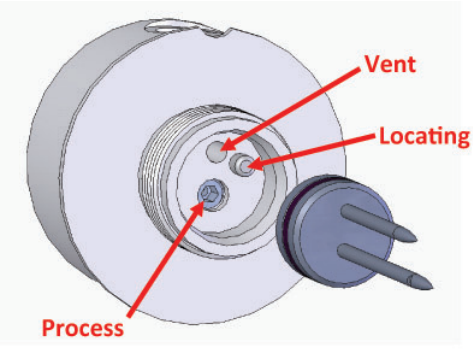


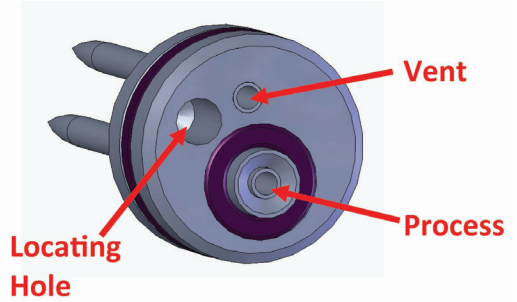
Piping & Instrument Diagram

⚠ DANGER

Sharp objects! The needles in the needle assembly are sharp and present a risk of injury due to penetration and/or laceration. The needles are in direct contact with the 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. The area between the seals is vented to the assembly vent connection. 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.

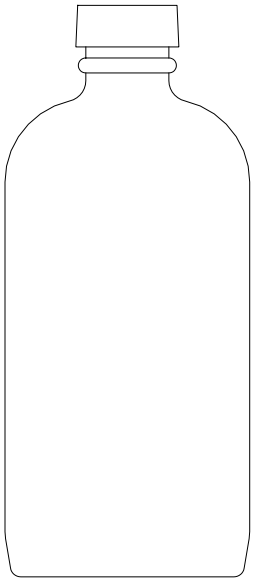




Needle Assembly

The locating pin must fit into the locating hole.

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



Bottle Assembly

Maintenance

Needle Valve

Any blockages normally can 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 startup or restart of the sample panel, the low pressure/high pressure inlet isolation valve packing may 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, please see the Parts & Accessories list in this manual.

Sample Cooler

For installation and operating instructions for the sample cooler, please see the Installation, Operation & Maintenance manual for Sentry sample coolers.

Carbon Canister

An optional Sentry carbon canister is available. The carbon canister assembly is designed to absorb hydrocarbon gases vented from Sentry manual low-emission samplers.

The gas vent of the sampler panel is connected to the inlet of the carbon canister assembly. The gases then pass through a volume of activated carbon, where hydrocarbons, such as benzene, are absorbed. Often, there are specific gases, such as H_2S – hydrogen sulfide – that also are carried in the vented gas. To remove these, specially designed products such as impregnated activated carbon are used.

Both activated carbon and impregnated activated carbon have a finite ability to remove hydrocarbons and other gases. The life of the product is dependent on concentrations and volumetric flow of the gas. An optional "tell tale" assembly can be provided with the carbon canister assembly to provide a visual indication of when the carbon canister assembly requires recharging. The carbon canister assembly is designed for easy recharging. Instructions are below.

Carbon Canister Recharging

1. Remove clamp from carbon canister, allowing the container to be removed from the base assembly.

2. Fill the container with activated carbon (or impregnated activated carbon) to about 1 in from the top of the container.
3. Place approximately 2 in (uncompressed thickness) of glass wool (Sentry part number 4-04825A) at the bottom of the container.
4. Replace the container.
5. Reinstall the clamp.
6. Place the unit into operation.

Detailed, panel-specific operating instructions are included with this manual.

Troubleshooting

symptom	possible problem(s)	remedy
Elevated sample temperature (For cooler option)	▪ Loss of cooling water flow ▪ Increase in cooling water inlet temperature ▪ Scaled cooler ▪ Increased sample flow	▪ Check cooling water supply ▪ Reduce cooling water temperature or increase flow ▪ Chemically clean (see cooler maintenance) ▪ Adjust sample flow rate
Reduced sample flow	▪ Plugged line	▪ Blowdown line and exercise flow control valve
Leaking valve stems	▪ Loose or worn packing	▪ Tighten packing nut or replace packing
Leaking cooler (For cooler option)	▪ Loose housing from thermal shock or worn gasket	▪ Tighten bolts on head assembly or replace gasket if cut or worn

Parts & Accessories

Description	Part Number	Quantity
Needle Assembly, .065 in (#16 ga) Needles	2-05513F	1
Needle Assembly, .083 in (#14 ga) Needles	2-05513H	1
Needle Assembly, .110 in (#12 ga) Process and .083 in (#14 ga) Vent Needles	2-05513K	1
Needle Assembly, .083 in (#14 ga) Process and .110 in (#12 ga) Vent Needles	2-05513J	1
Needle Assembly, .065 in (#16 ga) Process and .083 in (#14 ga) Vent Needles	2-05513G	1
Orifice, .062 in	2-05515A	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
Sample Bottle, 2 oz (60 ml), Glass with Cap and Septum	4-00775C	1

Sample Bottle, 4 oz (118 ml), Glass with Cap and Septum	4-04930A	1
Sample Bottle, 8 oz (237 ml), Glass with Cap and Septum	4-04931A	1
Sample Bottle, 16 oz (473 ml), Glass with Cap and Septum	4-04921A	1
Sample Bottle, 32 oz (946 ml), Glass with Cap and Septum	4-04926A	1
Bottle Septums for 2 oz (60 ml) Bottles, Pkg. of 50	4-04963A	1
Bottle Septums for 4 oz (118 ml) Bottles, Pkg. of 50	4-04963B	1
Bottle Septums for 8 oz (237 ml) Bottles, Pkg. of 50	4-04963C	1
Bottle Septums for 16 oz (473 ml) Bottles, Pkg. of 50	4-04963D	1
Bottle Septums for 32 oz (946 ml) Bottles, Pkg. of 50	4-04963E	1
Shroud with 2 oz (60 ml) Bottles	6-04081B	1
Shroud with 4 oz (118 ml) Bottles	6-04081H	1
Shroud with 8 oz (237 ml) Bottles	6-04081A	1
Shroud with 16 oz (473 ml) Bottles	6-04081D	1
Shroud with 32 oz (946 ml) Bottles	6-04081C	1

Standard Warranty

Sentry Equipment Corp ("Seller") warrants products manufactured by it and supplied hereunder ("Products") to be free from defects in workmanship and, to the extent materials are selected by Seller, to be free from defects in materials, in each case for a period as defined in the table below:

Product Line	Product Category	Warranty Period
Sentry®	1. Automatic Sampling 2. Corrosion Monitoring 3. Manual Sampling 4. Sample Conditioning 5. Sampling & Analysis Systems 6. Replacement Parts (without expiration dates)	Eighteen months from date of shipment or twelve months from startup, whichever occurs first
Waters Equipment	1. Sampling & Analysis Systems 2. Replacement Parts (without expiration dates)	Twelve months from date of shipment

To view the full warranty, go to www.sentry-equip.com/warranty.

Customer Support

With proven sampling expertise since 1924, Sentry products and services provide business operations the critical insights to optimize process control and product quality. We deliver true representative sampling and analysis techniques to customers around the globe, empowering them to accurately monitor and measure processes for improved production efficiency, output, and safety. Standing behind our commitments, we are determined to tackle any application, anywhere.

We know that running an efficient operation isn't easy. It requires thorough, careful analysis of controlled, real-time data achieved through reliable, accurate, and repeatable process monitoring, and measuring. By effectively conditioning, sampling, and measuring gas, liquid, slurry, powder, solids, steam, or water within their production environments, our customers obtain the critical insights they need to control and optimize their processes.

Yet, controlling your processes also means reliable customer support throughout the life cycle of your equipment.

- Customer Service—General information, warranty claims, order management.
- Installation Service—For systems that require specialized expertise upon installation.
- Technical Support—Troubleshooting, training, and technical manuals.
- Field Service & Retrofits—When a problem needs immediate attention.
- Replacements Parts & Consumables—Order your replacement parts and consumables.
- Sentry ProShield Services – select from four ProShield Guardian service plans providing different levels of support to protect your large system investments with regularly scheduled maintenance.

To learn more, go to www.sentry-equip.com/support.

This page is intentionally left blank.

Serving customers
in more than 50 countries
across six continents worldwide.

Sample. Monitor. Measure.

SENTRY

Any Application. Anywhere.

sentry-equip.com

966 Blue Ribbon Circle North, Oconomowoc, WI 53066 U.S.A. | +1-262-567-7256 | support@sentry-equip.com