

Original Instructions

Installation, Operation & Maintenance Manual

Sentry MBP Sampler Low Emission Samplers

S-MS-IOM-00408-9 12-18

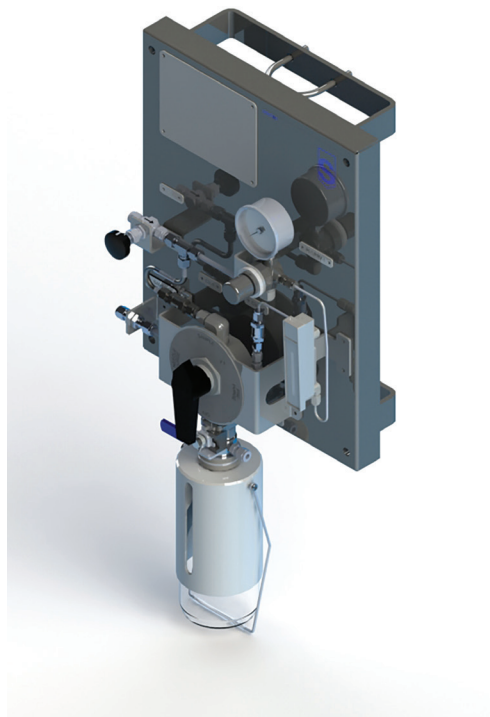


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Do not install, maintain, or operate this equipment without reading, understanding, and following the appropriate Sentry Equipment Corp instructions. Otherwise, injury, damage, or both may result.

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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. All drive guards and doors must be secured in place when this machine is being operated. Follow proper local, state and federal regulations for proper installation and operational requirements.

The Sentry® MBP manual low-emission sampler is designed to extract a representative fluid sample from a non-recirculating source. The complete sampling operation includes purging of the sample line and sampler along with capturing and containing the sample obtained. To minimize exposure of personnel and the environment, the sample is injected into a sealed bottle using a Sentry needle assembly or tube stub. A second needle vents gases from the bottle and prevents pressure buildup in the sample bottle.

The sampler uses two valves to provide for process line and sampler purge and sample capture. Both valves are shutoff valves, providing additional safety. The first valve is a multi-port valve that directs the purge gas and the sample to the appropriate port based on the cycle of operation. The second valve (closest to the sample receiver) controls the flow of the sample to the needle assembly and is spring loaded for additional safety. It also controls the post purge of the sample needle assembly. The sampling assembly has a vent connection where the gaseous vapors can be diverted to a recovery system.

The sample needle assembly is supplied with a bottle shroud that secures the bottle to the needle interface during the sampling operation. The shroud is matched to the sample bottle to ensure the bottle is properly aligned for septum penetration. This alignment minimizes the chance of puncture in the septum and provides for reduced bending loads on the needles.

Specifications

specifications	
materials	All process wetted parts - 316L SS O-rings - Viton®, Kalrez® Shroud/bottle adapter - Nylon
pressure rating	Sample - 250 psig (17.3 barg) MOP at 150°F (65°C) Purge gas - 20% above sample pressure, not to exceed 300 psig (20.7 barg)
needle purge	Purge gas regulator: 5–50 psig (0.3–3.5 barg) adjustable Rotameter: 0–2 SCFH, valved
mounting	Pipe or wall

Installation

⚠ DANGER

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

The Sentry MBP sampler is mounted on a 12-inch x 12-inch stainless steel back plate suitable for wall or pole mounting. The panel should be mounted so that the operator can easily access the valves and see the sample in the bottle as it fills. Connections are as follows:

- Sample Inlet – 1/4 in compression
- Purge Inlet – 1/4 in compression
- Vent – 1/4 in compression

Nitrogen supply should be regulated to 5-10 psig (0.3-0.7 barg) greater than the reactor/vessel pressure to assure the proper purging of the sample line.

The sample line should be 1/4 in tubing to minimize purge volume and should be installed in such a way as to avoid any sharp bends or kinks. Tubing should be properly supported and insulated if necessary based on operating conditions.

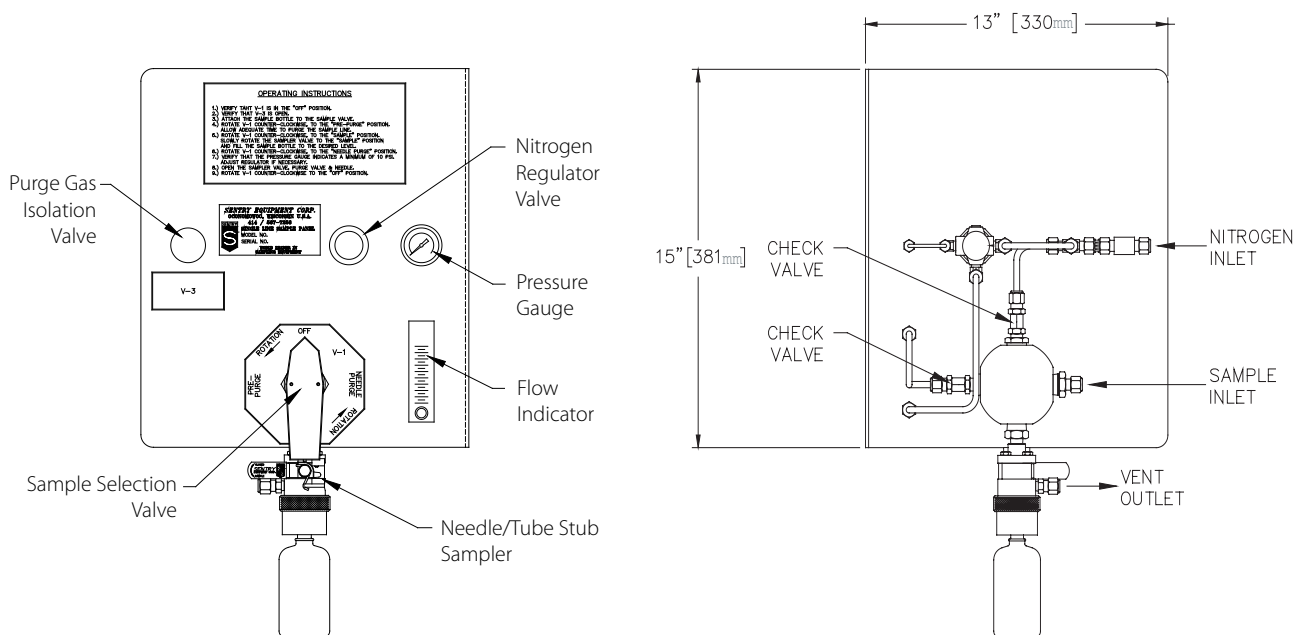
The sample vent line should be 1/4 in tube or larger to allow for the free flow of the vent gases to their recovery/exhaust location.

⚠ CAUTION

Do not put any back pressure on the sampler vent line. Back pressure can interrupt the flow of the sample and cause leakage or pressurization of the sample bottle. The sample bottle is not rated for pressure operation. Test all connections for leak integrity prior to operation.

↻ NOTE

Figures in this manual may differ from actual purchased equipment. Please refer to your job drawings for specific connection information.



Operation

When not actually sampling, the valve should be in the off 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 or screw the bottle to the bottle adapter.

The sampler has four operation cycles: Off, Back Purge, Sample, and Needle Purge. In the Off mode, the sampler and the nitrogen source are isolated and the multi-port valve ports are connected to the two nitrogen sources (low and high pressure) in a deadheaded arrangement.

In the Back Purge mode, the nitrogen source is open and is fed to the sample line via the multi-port valve. Nitrogen pushes sample out of the sample line and into the reactor/vessel to purge the line.

In the Sample mode, the multi-port valve connects the sample line to the tube stub assembly through the throttling valve. The throttling valve is used to fill the sample bottle with the motive force coming from the reactor/vessel.

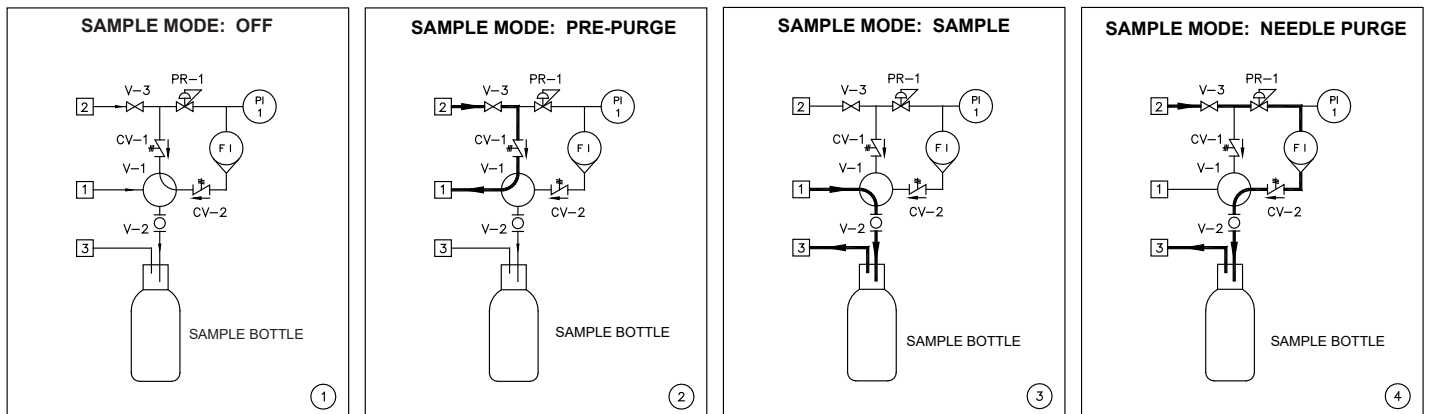
In the Needle Purge mode, the multi-port valve supplies nitrogen (low pressure) to the sample tube stub assembly through the throttling valve. This purges the multi-port valve, the throttling valve and the tube stub assembly of sample prior to the next operation. This is representative sample since it was part of the sampling mode.

Operating Sequence

WARNING

Do not overfill the sample bottle. Leakage can occur and the vent needle will become blocked.

Use proper protective equipment to obtain and transport the sample.



1. Mount the sample bottle onto the shroud and secure the bottle. When a tube stub is used, the bottle is threaded to the bottle adapter.
2. Verify that V-1 (multi-port valve) is in the Off position.
3. Verify that V-3 (nitrogen supply isolation valve) is in the Off position.
4. Verify that NV-1 (sample throttling valve) is in the Off position.
5. Open V-3 (nitrogen supply isolation valve).
6. Rotate V-1 counter-clockwise, to the Back Purge position. Allow a minimum of 30 seconds to purge the sample line.
7. Rotate V-1 counter-clockwise to the Sample position.
8. Slowly open NV-1 by pushing the toggle handle and fill the sample bottle to the desired level (maximum 50% or 2cc).

9. Rotate V-1 counter-clockwise to the Needle Purge position.
10. Verify that the pressure gauge indicates a minimum of 5 psi (0.3 bar). Adjust the regulator if necessary.
11. Slowly open NV-1 and the purge needle assembly into the sample bottle.
12. Rotate V-1 counter-clockwise to the Off position.
13. Secure V-3 by closing this valve.
14. Allow a few seconds for vapors to exit the vent connection before opening the enclosure and removing the bottle from the shroud.
15. In the Idle mode, keep the sample valve in the Off position and close the enclosure.

Maintenance

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 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 the vent rather than discharged to the atmosphere. The needle assembly has positive engagement to ensure that the needles are correctly positioned prior to insertion.

The needle adapter can be removed by removing the three (3) screws retaining it and pulling it down and out of the valve body. The adapter is equipped with redundant seals as supplied with the needle assembly. Both the needle assembly and the needle adapter can be removed and replaced without valve disassembly or disruption of any fluid tubing.

Packing kits are available for the multi-port valve, the throttling valve, nitrogen isolation valve and other parts. See the Parts & Accessories list.

Troubleshooting

symptom	possible problem(s)	remedy
Leaking valve stems	<ul style="list-style-type: none"> • Loose or worn packing 	<ul style="list-style-type: none"> • Tighten packing nut or replace packing

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.

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