

Original Instructions

Installation, Operation & Maintenance Manual

Sentry MVD Sampler Low Emission Samplers

S-MS-IOM-00250-6 11-17




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

 SENTRY

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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® MVD manual low-emission sampler is specifically designed to collect process samples without emissions to the atmosphere or exposure to the operator. The double block valve configuration assures an extra degree of safety for operators. Dead volume is minimized with its unique design. The speed loop guarantees representative sample availability at the valve at all times.

The MVD 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 and spring-loaded (deadman's) throttling valve. This provides proper sample control and quick closure upon release of the sampling valve.

Needle Type

The Sentry MVD manual low-emission sampler is comprised of two valves separated by a spacer plate. The upper diversion valve is a three-way diversion valve that allows fluid to flow through the assembly to a controlled location, possibly returned to process. The lower valve 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. Packaging of the two valves into a common assembly minimizes the dead volume of sample. 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.

An optional purge port is available which allows the operator to use nitrogen or other similar gases to purge any sample which may remain in the needle assembly prior to bottle removal. The purge port is located in the spacer plate between the diversion valve and the stop valve.

The valve assembly is supplied with a bottle shroud with wire retainer which 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, which allows for the operator to view the sample bottle and filling process.

Tube Stub Type

The Sentry MVD 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.

Also available is an optional purge port, which allows the operator to use nitrogen or other similar gases to purge any sample that may remain in the needle assembly prior to bottle removal. The purge port is located in the spacer plate between the diversion valve and the stop valve.

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 for septum penetration, and the shroud features a slot that allows the operator to view the sample bottle and filling process.

Specifications

customer interface	valve material	pressure/temperature
1/4 inch compression	316 SS / Viton® / Teflon® / Kalrez®	1000 psi @ 250°F (70 bar @ 122°C)
3/8 inch compression	316 SS / Viton® / Teflon® / Kalrez®	1000 psi @ 250°F (70 bar @ 122°C)
1/2 inch compression	316 SS / Viton® / Teflon® / Kalrez®	1000 psi @ 250°F (70 bar @ 122°C)

Kalrez, Teflon and Viton are registered trademarks of E.I. Du Pont de Nemours and Company.

Sentry MVD Options					
nitrogen purge	fill needle (OD)	vent needle (OD)	bottle types	bottle sizes	septum type
optional	0.065 inch	0.065 inch	Boston round	2 oz (60 ml)	Teflon® coated silicone
	0.083 inch	0.083 inch	Schott	4 oz (118 ml)	
	0.110 inch	0.110 inch		8 oz (237 ml)	
	3/16 inch tube stub	9/64 inch orifice		16 oz (473 ml)	
				32 oz (946 ml)	

Options: Valves may be panel-mounted for floor-standing or wall-mounted installations. Special elastomers and NPT, SW and metric connections are available. Consult Sentry Equipment for more details.

Installation

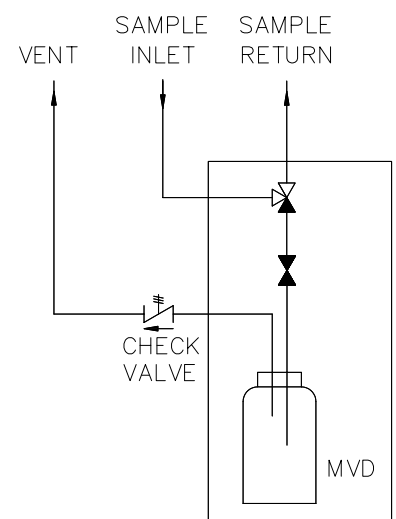
⚠ DANGER

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 MVD manual low-emission sampler can be supported directly by the top 1/4 in (or optional 3/8 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.

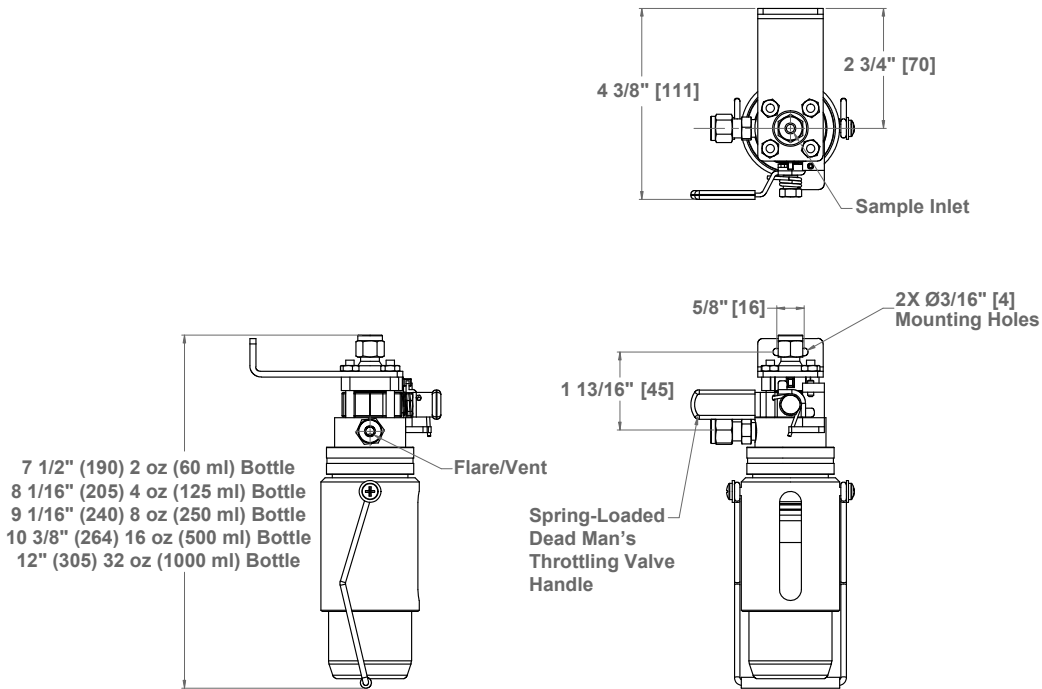
To obtain satisfactory flow rate in systems where the fluid is returned to the process, a sufficient pressure drop from the inlet connection to the return point must be provided. One method is to provide a throttling valve or orifice between the two connection points.

The sample inlet connection is located at the rear of the upper three-way valve and the bypass connection is located at the top of the three-way valve. This bypass connection should be piped to a suitable destination for handling process liquid. Frequently, the bypass material can be rerouted back to the system. 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. If the sampling valve is equipped with the optional purge connection (3/16 in tube stub), it will be located directly above the vent connection described above. It should be connected to a valve and regulated source of inert gas.



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 bypass position with the valve handle in the vertical position.

Prior to initiating sampling, insert the bottle inside the shroud and secure with the bottle retainer. For tube stub samplers, remove the bottle cap and thread the bottle into the bottle adapter. Sample flow enters the valve at the side connection. Initiate flow through the valve and flush the sample line until a representative sample is obtained at the sample valve. Then position the upper valve to the sample position by turning the handle 180 degrees counter-clockwise to the downward direction. Gradually open the lower "stop" valve by actuating the valve handle. The valve stop provided should be adjusted so the bottle fills slowly with minimal turbulence or frothing. After the desired sample is obtained, close the two-way valve. Return the three-way valve to the bypass position. 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.

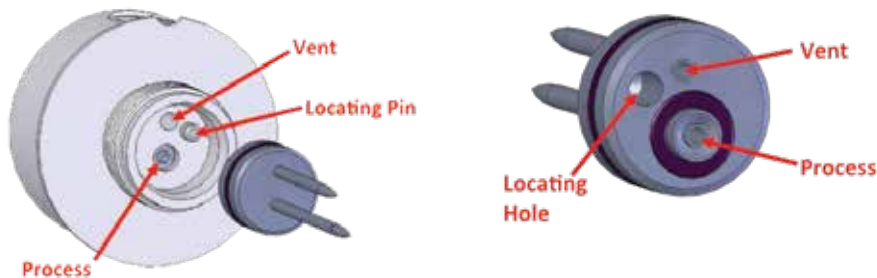
Please refer to the job-specific drawings of the instruction placard for specific operating instructions.

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 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 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 H₂S – 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. Place approximately 2 in (uncompressed thickness) of glass wool (Sentry part number 4-04825A) at the bottom of the container.
3. Fill the container with activated carbon (or impregnated activated carbon) to about 1 in from the top of the container.
4. Reinstall the container.
5. Reinstall the clamp.
6. Place the unit into operation.

Troubleshooting

symptom	possible problem(s)	remedy
Elevated sample temperature	<ul style="list-style-type: none">▪ Loss of cooling water flow▪ Increase in cooling water inlet temperature▪ Scaled cooler▪ Increased sample flow	<ul style="list-style-type: none">▪ Check cooling water supply▪ Reduce cooling water temperature or increase flow▪ Chemically clean (see cooler maintenance)▪ Adjust sample flow rate
Reduced sample flow	<ul style="list-style-type: none">▪ Plugged line▪ Plugged/damaged needles	<ul style="list-style-type: none">▪ Blow down line and exercise flow control valve▪ Inspect and/or replace needle assembly
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
Leaking cooler	<ul style="list-style-type: none">▪ Loose housing from thermal shock or worn gasket	<ul style="list-style-type: none">▪ 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.

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across six continents worldwide.



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