Original Instructions

Installation, Operation & Maintenance Manual

Sentry MCL Sampler

Low Emission Samplers

S-MS-IOM-00249-8 05-19

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® MCL manual low-emission sampler is a closed loop cylinder sampler, which is the most effective way to sample and transport liquid or two-phase liquid samples safely. By purging the sample path and the sample panel during each sample cycle, representative sample is assured within the cylinder. Additionally, purging of the sample panel after the sample is secured provides for maximum operator safety and minimum loss of sample vapors to the environment.

The Sentry MCL sampler provides low-emission collection of a defined volume of liquid in a sample cylinder at process pressures. 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. Since operator safety is of the highest concern, to minimize exposure of personnel and the environment, the sample is contained in a sample cylinder.Specifications

The Sentry MCL sampler closed loop cylinder panel includes the following:

- 304 SS backplate with associated component mounting brackets
- Tandem three-way switching valve
- Sample cylinder assembly (with quick disconnects and isolation valves)
- Mating quick disconnects
- Flex hose
- Pressure gauge
- Sample inlet isolation valve
- Sample return isolation valve
- Sample vent line check valve

The Sentry MCL sampler may include the following optional items:

- Sample cooler (including temperature indicator & flow control valve)
- Cooling water inlet/outlet isolation valves
- Check valve (in sample return line)
- Sample inlet filter
- Charcoal canister in vent line
- Sample line nitrogen purge system

➲ NOTE

Please refer to your job drawings for specific information on your system.

Specifications

construction materials	standard pressure rating	standard temperature rating
304 SS backplate; 316 or 304 SS cylinders	1800 psi (125 bar)	up to 300°F (149°C)*
316 SS and PTFE wetted materials		

* Higher temperatures are available. Consult Sentry Equipment for more details.

Installation

⚠ DANGER

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

Mounting

The Sentry MCL sampler closed loop cylinder panel is equipped with four (4) 7/16 in (11 mm) diameter holes for surface mounting. The panel may be equipped with optional hardware for post mounting. Refer to the accompanying drawing for mounting details.

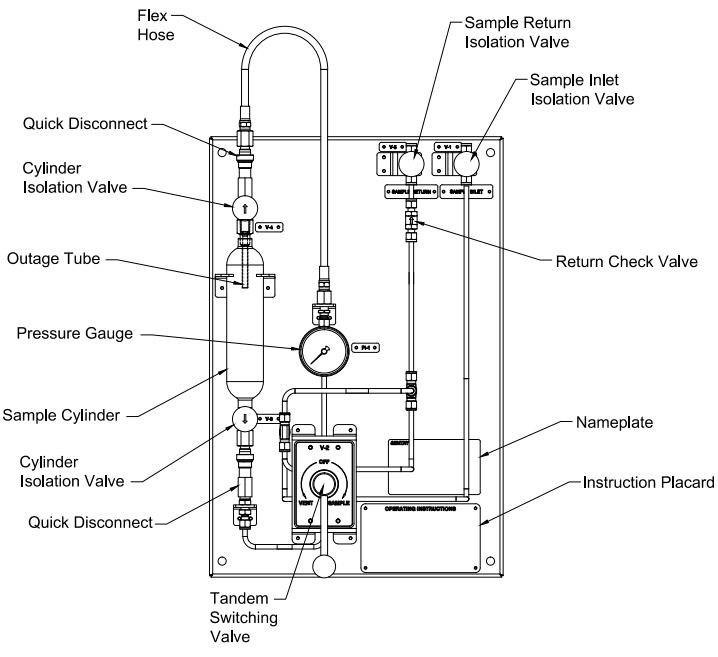
Piping

Refer to the accompanying drawing for connection sizes, types and locations.

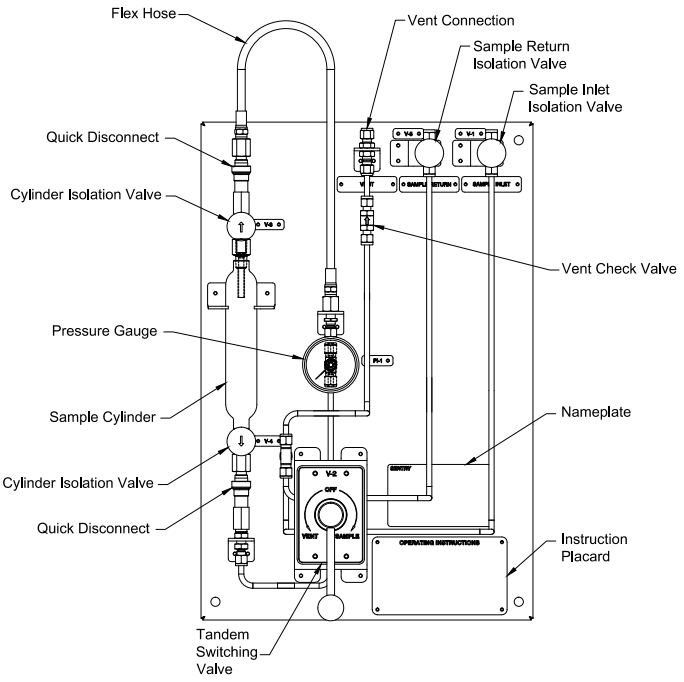
Operation

➲ NOTE

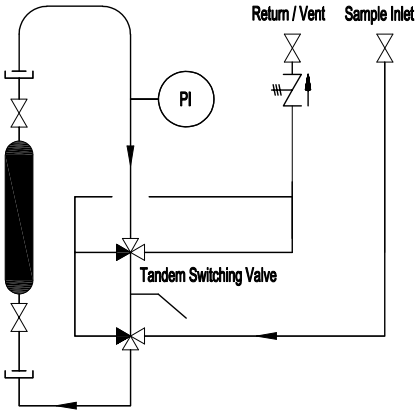
Figures in this manual may differ from actual purchased equipment. Please refer to your job drawings for specific connection information.

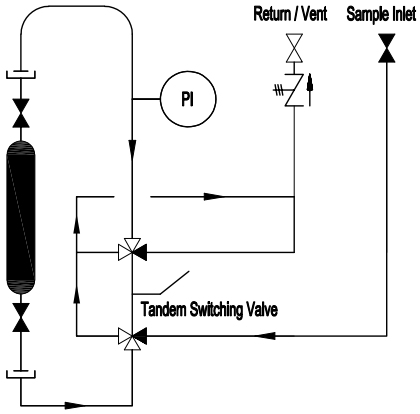


MCL With Sample Inlet and Return/Vent



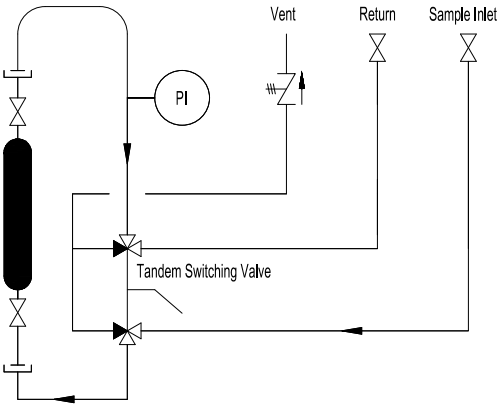
MCL with Sample Inlet, Sample Return and Dedicated Vent

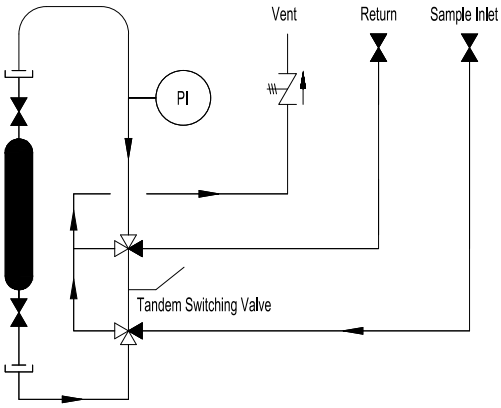




Sample Mode

Vent Mode





Sample Mode

Vent Mode

Off mode (insert cylinder) – The switching valve handle is turned to the off position, blocking both side ports on both three-way valves on the switching valve. There is no flow through the sampler.

Sample mode – The switching valve handle is turned to the sample position and sample now flows through the sampler and the connected sample cylinder. This is essentially a purging/filling process.

Isolate mode – Sample is isolated in the cylinder by closing the cylinder valves. The cylinder outlet valve (top valve) must be closed first if the sample needs to be maintained at system pressure.

Vent mode – The switching valve handle is turned to the vent/depressurize position and all sample gases in the sampler lines on either side of the sample cylinder are vented to a low pressure flare/vent header or local vapor recovery device.

Off mode (remove cylinder) – The switching valve handle is turned to the off position, blocking both side ports on both three-way valves on the switching valve. Since the sampler lines are vented, disconnecting the cylinder is safely accomplished at atmospheric or sub-atmospheric pressure at the quick disconnects without contamination to the operator or the environment.

As the MCL manual low-emission sampler is a closed loop cylinder sampler intended for collecting liquid samples, it is plumbed to provide flow into the sample cylinder from the bottom up. It also is equipped with outage tubes to prevent over-pressurization due to temperature increases. Panels can be equipped with either a combined vent and sample return line or separate vent and sample return lines. When the sample is returned to process pressures above 50 psig (3.45 bar), a separate vent line lower than 50 psig (3.45 bar) is required to allow for depressurization of the quick disconnects prior to removing the cylinder assembly. The separate vent connection should be routed to an absorption vessel or flare for combustion.

Please refer to your job drawings for specific information on your system.

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, tighten the packing nut. 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. In these instances, the carbon canister assembly is filled with impregnated activated carbon.

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 ▪ Inspect and/or replace needle assembly
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

The following parts are recommended spares for the Sentry MCL sampler. Please consult the accompanying job-specific drawings for exact part numbers and descriptions.

- Tandem valve
- Cylinder assembly
- Isolation valve
- Check valve

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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