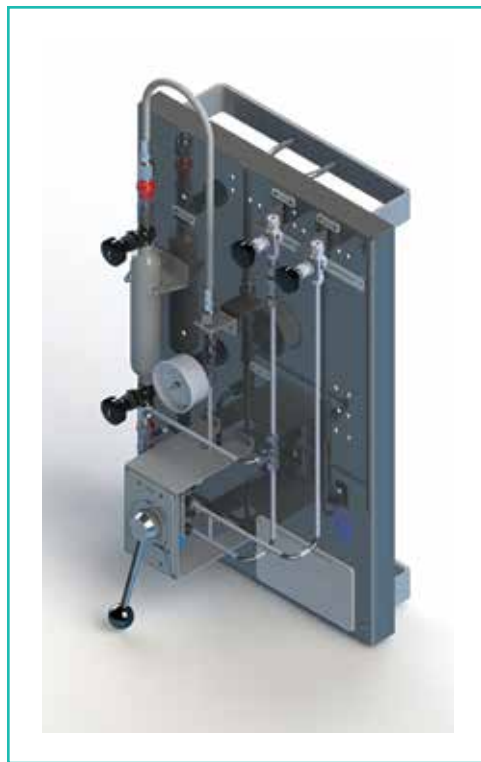


-  Gas
-  Liquid & Slurry
-  Solid & Powder
-  Steam & Water

Installation, Operation & Maintenance Manual

Original Instructions

Gas Sampling Manual Low-Emission Samplers Sentry MCG



S-GA-IOM-00404-7 11-17



Installation, Operation & Maintenance



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.

Before Using

Immediately after receipt, examine the crate and all contents for any shipping damage. Take pictures of any suspected damage. Report damages to the delivery company at once. This is the responsibility of the consignee.

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Note

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

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



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



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



NOTICE: Used to address practices not related to personal injury.

NOTE: Information that requires special emphasis.

SHALL: This word is understood to be mandatory.

SHOULD: This word is understood to be advisory.

Product Selection, Installation & Use



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 MSDS carefully and follow the instructions exactly.

Potential Equipment Hazards



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

The Sentry® MCG manual low-emission sampler is a closed loop cylinder sampler, which is the most effective way to sample and transport gaseous 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 MCG provides low-emission collection of a defined volume of gas in a sample cylinder at process pressures. Sampling of hazardous or toxic chemicals requires that the sample be representative of the gas, be obtained without risk to personnel, and minimize the potential of leakage to the environment. The complete sampling operation includes routing of the process gas 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.

The MCG manual low-emission 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 MCG manual low-emission 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.

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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 Corp for more details.

Installation

Mounting

The MCG manual low-emission 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.

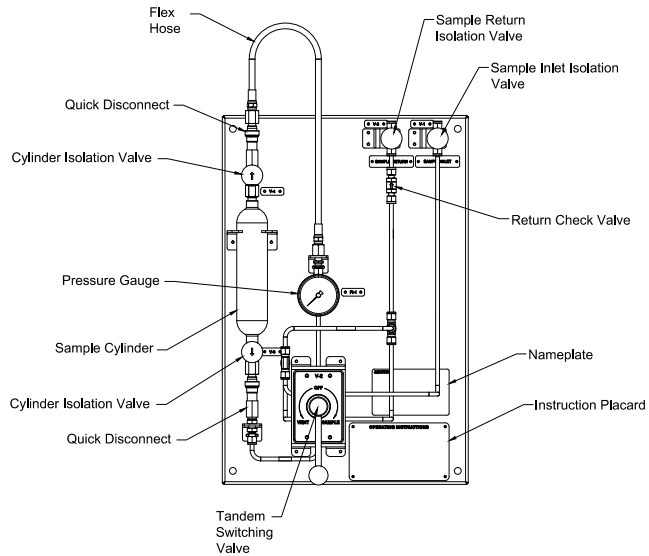
Piping

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

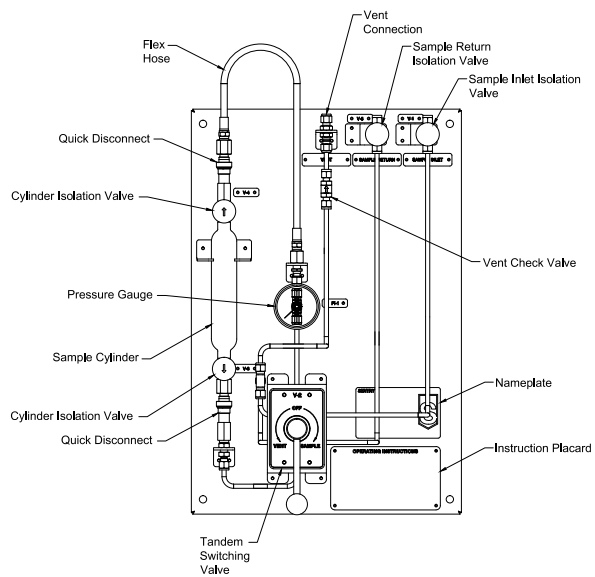


Dangerous gas! The gases emitted from the vent line may be hazardous and toxic upon exposure. The vent line should be directed to a charcoal canister, flare or other subatmospheric region for collection and treatment of sample vapors.

Installation



With Sample Inlet and Return/Vent

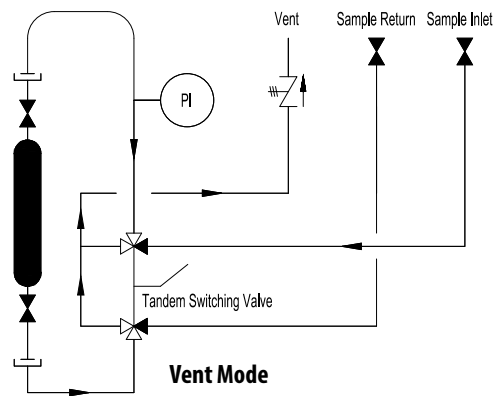
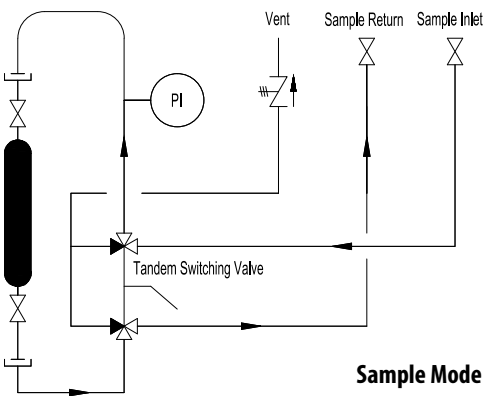
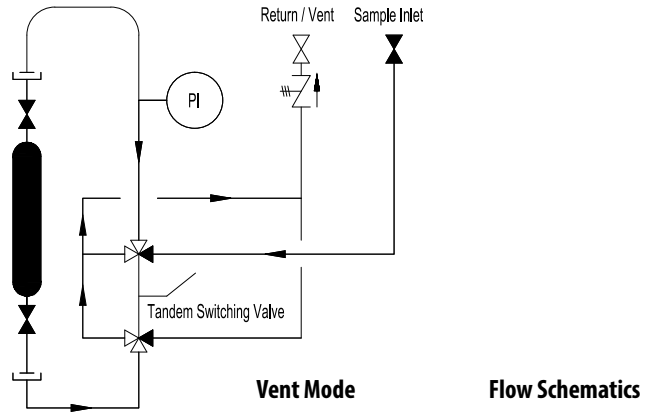
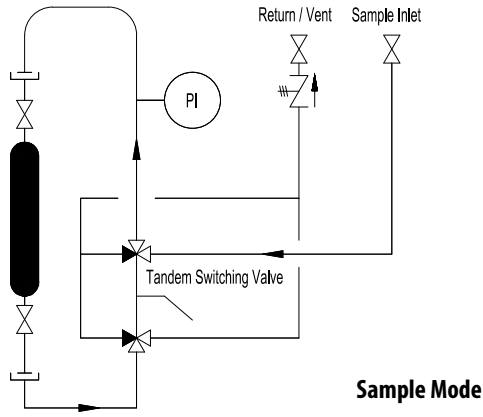


With Sample Inlet, Return and Vent

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

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Operation



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 outlet cylinder valve (bottom 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 QDCs without contamination to the operator or the environment.

As the MCG manual low-emission sampler is a closed loop cylinder sampler intended for collecting gas samples, it is plumbed to provide flow into the sample cylinder from the top down. 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 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, 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. 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. 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. Replace the container.
5. Reinstall the clamp.
6. Place the unit into operation.

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

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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">- Blowdown 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

The following parts are recommended spares for the MCG manual low-emission 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:

Brand	Product Line	Warranty Period
Sentry®	Steam & Water Sampling Products and Systems Solid & Powder Sampling Products and Systems Gas Sampling Products and Systems Liquid & Slurry Sampling Products and Systems Pipeline Integrity Products	Eighteen months from date of shipment or twelve months from startup (whichever occurs first)
Waters Equipment™	Steam & Water Sampling Products and Systems	Twelve months from date of shipment

If within such period the original purchaser ("Customer") proves, to Seller's satisfaction, that any such Products are defective, such Products shall be repaired or replaced at Seller's option. Seller's sole obligation and Customer's exclusive remedy hereunder shall be 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, FOB Sentry Equipment Corp or provision of evidence (e.g., photographs) of such defect satisfactory to Seller.

Warranty Conditions & Limitations

This Warranty shall not apply to any Product which, in the opinion of Sentry Equipment Corp, has been (a) altered or repaired in a manner affecting the efficiency or 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.

Any materials required to be used by Seller as provided in Customer specifications or instructions are excluded from the foregoing warranty and Customer assumes sole responsibility for the selection of such materials. Customer further acknowledges and agrees that any Seller recommendations with respect to materials to be used in connection with Products will be based on published reference literature, that any third-party studies to which Seller refers may not correlate directly with the Customer's intended usage or process (i.e., chemical composition, concentrations, temperatures, etc.), and that Customer is solely responsible for the final determination with respect to which materials are to be used in connection with the Products.

EXCEPT FOR THE LIMITED WARRANTIES SET FORTH HEREIN, SELLER HEREBY DISCLAIMS ANY AND ALL WARRANTIES AND REPRESENTATIONS (EXPRESS OR IMPLIED, ORAL OR WRITTEN), INCLUDING ANY AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PURPOSE WHETHER OR NOT SELLER KNOWS, OR HAS REASON TO KNOW, HAS BEEN ADVISED, OR IS OTHERWISE IN FACT AWARE OF ANY SUCH PURPOSE, WHETHER ALLEGED TO ARISE BY LAW, BY REASON OF CUSTOM OR USAGE IN THE TRADE, OR BY COURSE OF DEALING OR PERFORMANCE.

Without limiting the generality of the foregoing, Seller makes no warranty regarding the ability of Products to withstand erosion or corrosion, or regarding material compatibility of elastomers in specific services, and no warranty made hereunder shall apply to Products which have been subjected to adverse storage.

Customer shall be responsible for maintenance of Products following delivery. Wear or damage caused by lack of normal maintenance or by misuse of Products shall not be considered as defective workmanship or material.

Sentry Equipment Corp, and its subsidiaries, 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.

Standard Warranty, continued

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 Customer's responsibility to file claim with the carrier for damage or loss.

Liability Limitation

IN NO EVENT, WHETHER FOR BREACH OF WARRANTY OR OTHER CONTRACT BREACH, NEGLIGENCE OR OTHER TORT, OR ON ANY STRICT LIABILITY THEORY, SHALL SENTRY EQUIPMENT CORP, ITS SUBSIDIARIES OR ITS SUPPLIERS BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES WHATSOEVER (INCLUDING BUT NOT LIMITED TO DAMAGES FOR LOSS OF PROFITS, BUSINESS INTERRUPTION, LOSS OF INFORMATION, OR OTHER PECUNIARY LOSS) ARISING OUT OF THE USE OF, OR INABILITY TO USE, THE PRODUCTS, EVEN IF SENTRY EQUIPMENT CORP OR ANY OF ITS SUBSIDIARIES HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Customer Actions for Claims on Products During the Warranty Period

1. Contact the Customer Service Department, Sentry Equipment Corp, Oconomowoc, WI, at +1-262-567-7256, 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. Seller will not process warranty claims until the Customer has properly accomplished the above items.
6. Sentry Equipment Corp may accept the entire claim, a part of the claim or none of the claim if Seller's inspection of returned parts proves that the failure was for reasons other than defective material or workmanship.

Important Notes

1. Sentry Equipment Corp will not be responsible for damage incurred during the return shipment.
2. All returns subject to inspection and a minimum \$100.00 evaluation fee for any products found not to be covered by this warranty.
3. An RMA is not authorization for credit. Repair and/or replacements will be issued upon evaluation of returned goods.
4. RMA is valid for thirty (30) days from issue date.

Customer Assistance

Sentry Equipment Corp engineers, manufactures and services equipment for sampling, monitoring, injection and analysis for worldwide customers in utility and process industries. Our equipment enables analytical and operational professionals to obtain safe, accurate and repeatable results. Recognized as a technology leader, Sentry Equipment Corp has been relied on by operational and analytical professionals since 1924, and we pride ourselves in offering exceptional technical support.

Sentry Equipment Corp offers experienced Customer Service associates to assist our valued customers. Please call us at +1-262-567-7256 for assistance with your application.

Please do not return any equipment before discussing your application issue with a Sentry representative and obtaining a Return Material Authorization (RMA) number.

We consider every customer a commitment, and we thank you for your business.



Sentry Equipment Corp is a global, employee-owned company that designs, engineers, manufactures, markets, distributes and services high-quality products for steam & water sampling, liquid & slurry sampling, solid & powder sampling, gas sampling, natural gas odorization systems, and pipeline corrosion monitoring & chemical injection equipment.

Our equipment enables analytical and operational professionals in the power and process industries to obtain safe, accurate and repeatable results.

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

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