

Installation, Operation & Maintenance Manual

Sentry W9000 Series Sample Coolers

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sentry-equip.com

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


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®	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.



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 this 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.

Freezing Temperatures! This equipment may have very cold surfaces. If an operator contacts a cold surface, injury may occur. Use protective clothing to prevent injury. If other equipment comes in contact with a cold surface, damage to the equipment may occur. Ensure the area around this equipment is kept clear to prevent this damage from occurring.

NOTICE

Freezing of fluids in tube can lead to rupture of the tube wall and coil failures. Take precautions to avoid freezing, such as draining the equipment when out of service or installing the equipment in an environment protected from temperatures below the freezing point of the fluids used.

Installation

The Sentry W9000 Series sample cooler is provided with 1/4" NPT connections for sample fluid and 3/8" NPT connections for cooling water.

⚠ WARNING

Use 3/8" fitting for cooling water only. Never connect hot or high pressure samples to the 3/8" fitting as injury or damage to equipment can result.

The sample cooler should be installed in the vertical position. The direction of flow(s) are indicated on the permanently attached label located on the coil shell.

Proper installation requires valves on sample inlet and cooling water inlet for hot water service. An additional valve must be installed on the sample outlet for all vapor or steam to obtain required operating pressures in the coil.

Proper installation in the superheated steam service also requires pre-cooling the sample to 750°F, the maximum design operating temperature on the sample cooler. Pre-cooling can be accomplished by installing a pipe between the main steam header and the sample cooler to radiate excess heat. The length of the pipe is determined by the chart at the bottom right-hand side of page.

Operating Conditions

The cooling water should have a constant temperature and flow at a constant, uninterrupted rate. In order to prevent the formation of mineral deposits in the shell, softened water is recommended; otherwise, periodic acid cleaning will be necessary.

Operation

To start up, open cooling water valve "A" to normalize the temperature of the cooler prior to starting the sample flow. With valve "C" closed, open valve "B". Then, open valve "C" until desired sample temperature is achieved. Sample temperature will be dependent upon the temperature of the cooling water and the amount of sample produced. If sufficient quality of sample cannot be produced at the desired temperature, a larger cooler or two coolers in series may be required.

To place in service:

Open valve "A"
Open valve "B"

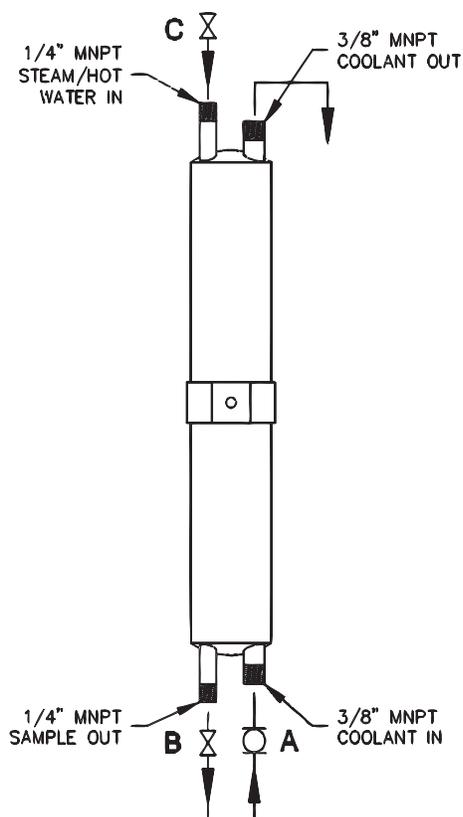
To remove from service:

Close valve "B"
Close valve "A"

REMEMBER: Cooling water on before sample on. Sample off before cooling water off.

⚠ WARNING

Operating cooler without cooling water can result in damage to the cooler or injury to the operator.



Performance

Assuming a coolant inlet of approximately 55°F (12°C) and exit of 120°F (50°C) and a sample exit of approximately 110°F (43°C), the cooler will perform at approximately the ranges described:

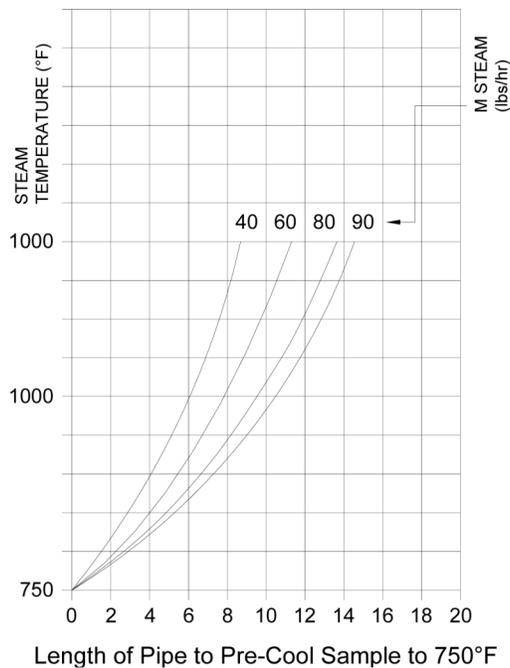
Hot Water Samples

- At 250°F (120°C), approximately 1500 cc/min of sample will be produced using 1 gallon per minute of coolant.
- At 700°F (370°C), approximately 950 cc/min of sample will be produced using 2.5 gallon per minute of coolant.

Saturated Steam Vapor

The sample inlet and exit valves can be used to create various operating pressures in the cooler in order to produce samples from saturated steam vapor.

- At 175 psia operating pressure, 640 cc/min of sample can be produced using approximately 3 gallons per minute of coolant.
- At 25 psia operating pressure, 300 cc/min of sample can be produced using approximately 1.5 gallons per minute of coolant.



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.