Original Instructions

Installation, Operation & Maintenance Manual

Sentry DCCP Reboiler
Single Line Conditioning Module

S-SW-IOM-00255-17 07-19

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

SENTRY

Table of Contents

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.

This symbol, when noted on a product, indicates a potential hazard that could cause serious personal injury and/or death. The user should reference this instruction manual for operation and/or safety information.

This symbol, when noted on the product, identifies the location of the connection for protective earth (ground).

Electrical equipment marked with this symbol may not be disposed of in European public disposal systems. In conformity with European local and national regulations, European electrical equipment users must now return old or end-of-life equipment to the manufacturer for disposal at no charge to the user.

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 Safety Data Sheets (SDS) 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.**

General Description

⚠ WARNING

Do not install or use this equipment in any manner other than that which is specified in this manual, otherwise the protection provided by this equipment could be impaired.

The Sentry® DCCP Reboiler Degassed Cation Conductivity Panel is designed to optimize the analytical results for degassed cation conductivity of high purity water. Any other use, or use not mentioned here, that is incompatible with the technical specifications is deemed inappropriate. The operator is solely responsible for any damage arising from such use.

Other prerequisites for appropriate use include:

- Observing the instructions, notes and requirements set out in this or updated instruction manuals.
- Observing all local safety regulations.
- Observing all warnings and cautions in the documentation regarding all products used in this system.
- Observing the prescribed environmental and operational conditions.
- Observing chemical compatibility with all wetted materials.

The Sentry DCCP Reboiler is available in various configurations with and without conductivity cells and cation exchange column depending on each customer's individual requirements. Panels without the conductivity cells before the reboiler and without the exchange column are designed to be used in conjunction with an analysis panel which contains these components.

Regenerative Cooling Option

The Sentry DCCP reboiler has the option for designated cooling water or regenerative cooling. With the regenerative cooling option, cooling water is not required. Instead, the sample flow path is altered so that the sample cools itself while running through the DCCP panel. The overall dimensions of the two versions are the same.

For best performance when using regenerative cooling, sample temperatures should not exceed 113°F (45°C) or the analyzer sensor temperature limit designated in the analyzer manual). Sample flow should not exceed 150 cc/min when using regenerative cooling.

➲ NOTE

Sentry Equipment recommends using a temperature-controlled cooling water source for sample cooling, controlled to 77 F (25 C) for best CO2 removal performance. This recommendation is consistent with applicable EPRI, ASME and ASTM guidance. If regenerative cooling is selected the user should understand the DCC analyzer temperature compensation performance and limits.

Please refer to the P&ID Layouts of both designs below.

Figure 1. Standard P&ID

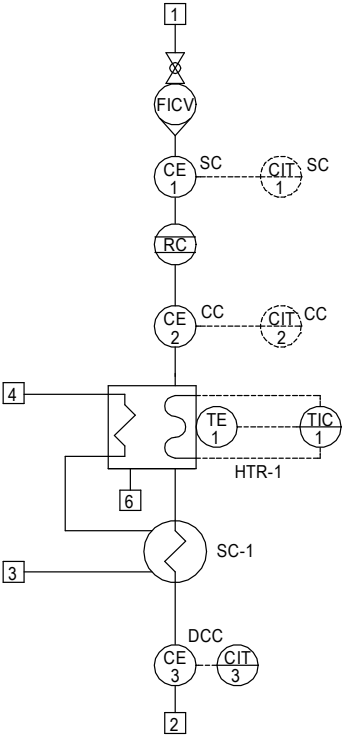
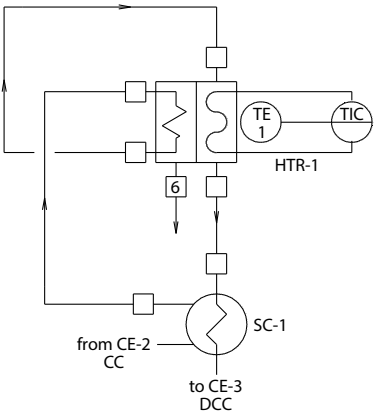


Figure 2. Regenerative Cooling Option



Specifications

Dimensions
- Folded Backplate: 36 in x 17.5 in x 14.9 in (91.2 cm x 44.5 cm x 37.8 cm)
- Flat Backplate: 32 in x 22 in x 11.2 in (81.3 cm x 55.9 cm x 28.4 cm)

Weight
- varies by model
- 61 lb (28 kg) for model DCCP-013100 (pictured on cover)

Pressure rating
- 100 psig (7 barg)

Temperature rating
- 130°F (54°C) with RC-100 before degas

Sample flow
- 100–150 cc/minute

Sample inlet/outlet connections
- 1/4 inch tube fitting

Sample cooler type
- DTC-DCCP

Cooler cooling water connections
- 1/4 inch tube fitting

Cooling water consumption
- 0.2 gpm (0.8 Lpm) at 22°C (71.6°F)

Input power
- DCCP-x1xxx: 110–120 VAC, 1 phase, 50/60 Hz
- DCCP-x2xxx: 220–240 VAC, 1 phase, 50/60 Hz

Power consumption
- 1.6 KVA

Cell holders (optional)
- 3/4 inch FNPT, 316 SS

Resin column (optional)
- Sentry RC-100

Indoor/outdoor use
- Altitude: Up to 6,561 ft (2,000 m)
- Ambient temperature: 36°F to 122°F (2°C to 50°C)
- Relative humidity: 0% to 85% RH
- Pollution degree 2
- Overvoltage Category II
- Main supply voltage fluctuations up to ±10% of the nominal voltage

Installation

⚠ WARNING

Sharp Edges! Wear gloves when lifting and carrying the panel as edges could be sharp.

To ensure proper alignment and safe installation, lifting and carrying should be completed by at least two people.

This instrument should be installed by qualified technical personnel to ensure adherence to all applicable codes.

Use proper connection sizing to avoid an unsafe condition. This product comes standard with 1/4" compression fittings for the sample inlet/outlet, and 1/4" compression connections for the cooling water inlet/outlet. Never attempt to install a metric equivalent tube, pipe, or fittings into these connection points.

Lift unit by the stainless steel backplate. Do not lift using mounted components as these could break, damaging the equipment and possibly causing personal injury.

Choosing a Mounting Location

Before installation, select a mounting location that provides the following:

- Floor or wall must have adequate structural capability.
- Anchor location and design is adequate.
- Operation and maintenance space is sufficient.
- Cooling water is available.
- Floor drain is accessible if required.
- Mounting surfaces are flat/level and at appropriate height.
- There is adequate light for operation and maintenance.

For optimum equipment reliability and installation, the area should:

- Be free from mechanical vibration.
- Be free from corrosive media.
- Have a normal ambient temperature near 75-80°F (24-27°C) with minimal variation.
- Be free from strong heat radiation.

Provide adequate support and anchoring to minimize gravity and thermal loads on the connections and to minimize any vibration effect.

If installing over drywall, the panel must be secured to the wood studs using 3/8 inch (M10) hardware.

Connecting Sample Lines

⚠ WARNING

Improper connection sizing will result in an unsafe condition.

NOTICE

Improper cell holder locations can adversely affect the operation of the unit.

Connect the sample inlet and outlet at the bottom of the panel. Both connections are 1/4" tube compression fittings. Clean and deburr all connecting pipe and tubing before installing.

➲ NOTE

Samples supplied to the DCCP should be cooled to 77°F (25°C) and pressure controlled by either a backpressure regulator or head cup to maintain a constant sample flow rate.

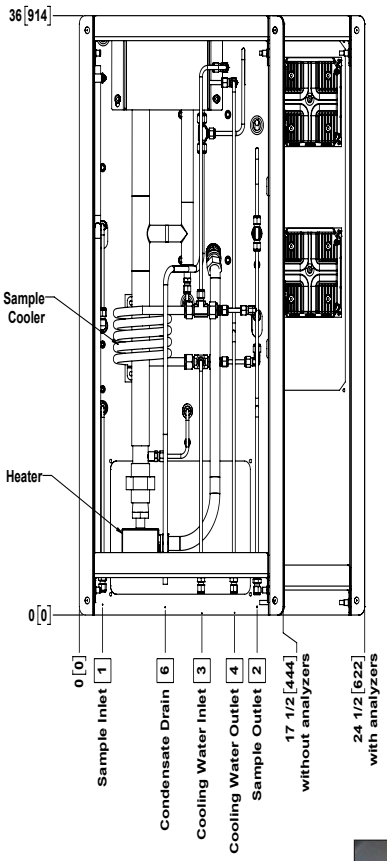
If you have purchased the DCCP without factory mounted cell holders, refer to Figure 3 for proper cell mounting and drain piping configurations. Cell holder(s) must be installed in an orientation that maintains the water level in the degas chamber near the cross over section of the degas chamber. To accomplish this, the sample outlet from the panel must be even with the cross over section of the degas chamber. It is important to follow these instructions to obtain accurate conductivity measurements.

Connecting Cooling Water

⚠ WARNING

Improper connection sizing will result in an unsafe condition.

Connect the cooling water inlet and outlet piping (3/8″) to the bottom of the panel.



Connecting Electrical Wiring

Connect plant electrical supply wiring of ample rating as indicated on the Electrical Wiring Diagram (see drawing in back).

- Supply wire must be between AWG 12 (3.31 mm^2) and AWG 4 (21.15 mm^2).
- Supply wire must be rated to 230°F (110°C) or higher

- The free length of supply wire inside the electrical enclosure must be at least 6 inches (150 mm).
- When connecting external supply voltage to the electrical enclosure, installer must select appropriate hardware to maintain NEMA 4x rating.
- Panel must be connected to a properly grounded electrical supply.
- An electrical disconnect must be provided for the panel:
  - It must be suitably located (e.g., close to the panel) and easily reached.
  - It must be marked as the disconnecting device for the panel.

Operation

⚠ CAUTION

Unit will be hot during normal operation.

Starting Up

1. Establish cooling water flow.
2. Initiate sample flow through the reboiler.
3. Adjust sample flow to 100–150 cc/min.
4. Turn the heater power switch SW-1, to "ON."
5. Verify that the indicator lamplight and the display on the controller are functioning.
6. Allow sample to flow through the unit to stabilize (about 10 to 15 minutes).

➲ NOTE

The indicator light cycles on and off with the heater.

Adjusting the Controller

The controller has been preprogrammed at the factory. If additional trimming of the controller is required, the heat range setting should be between 223°F and 226°F (106°C and 108°C) based on sample flow rate.

When the heater and flow rate are set properly, condensed water should trickle out from the condensate drain.

- If no condensate is seen, reduce the sample flow rate or increase the temperature setpoint until the rate of condensation is constant.
- If droplets of hot boiling water are seen venting from the condensate drain, either reduce the temperature setpoint or increase the flow rate.
- Adjustments should be within the specified ranges for flow rate and temperature

settings—never go below or above the design parameters.
- flow rate: 100–150 cc/min
- temperature: 223°F to 226°F (106°C to 108°C)

If the heater begins to overheat, an alarm indicates and shuts off the heater. Heating resumes when the heater has cooled below the alarm setpoint.

Shutting Down the System

⚠ WARNING

When servicing the reboiler or any electrical device, main power must be turned off to eliminate the possibility of personal injury.

1. Turn off heater power switch, SW-1.
2. Close the sample inlet valve.
3. Shut down the cooling water supply to the unit.

Adjusting Temperature Unit

Left Display:
In the Operations Menu, displays the process value, otherwise displays the value of the parameter shown in the right display.

Advance key:
Press to select the menu or parameter shown in the display.

Right Display:
Indicates the set point or output power value during operation, or the parameter whose value appears in the left display.

Infinity key:
Press to return to previous menu level.

Up and Down Arrow keys:
Press to view available menus or menu prompts.

The temperature unit displayed by the controller can be changed between °F and °C by adjusting the controller settings as described below:

1. Initiate power to the controller.
2. Adjust the temperature unit of measure:
   a. Press the up and down keys simultaneously for six (6) seconds, or until **SEt** (setup parameters menu) appears on the right display; the first submenu shown in the left display is **Ai**.
   b. Press the up or down key to scroll through the available submenus; when the **gLbL** submenu appears in the left display, select it by pressing the green advance key (circle arrows). **C_F** (temperature unit of measure parameters) appears in the right display; the current temperature unit of measure is shown in the left display.
   c. Use the up or down arrow key to select the desired temperature unit of measure: C for Celsius scale or F for Fahrenheit scale.
   d. Press the gray infinity key for two (2) seconds to return to the Home Page.

3. Adjust the temperature setpoint:

   a. Press the up and down keys simultaneously for three (3) seconds, or until **oPEr** (operations) menu appears on the right display; the first submenu shown in the left display is **Ai**.

   b. Press the up or down key to scroll through the available submenus; when the **LooP** submenu appears in the left display, press the green advance key (circle arrows) several times until the **C.SP** submenu is shown in the right display.

   c. Use the up or down arrow key to set the desired temperature set point. Standard factory set points are 226°F and 108°C.

   d. Press the gray infinity key for two (2) seconds to return to the Home Page.

4. Adjust the temperature alarm setpoint:

   a. Press the up and down keys simultaneously for three (3) seconds, or until **oPEr** (operations) menu appears on the right display; the first submenu shown in the left display is **Ai**.

   b. Press the up or down key to scroll through the available submenus; when the ALM submenu appears in the left display, press the green advance key (circle arrows) several times until the **A.hi** submenu is shown in the right display.

   c. Use the up or down arrow key to set the desired alarm set point. Factory recommended alarm setpoints are 230°F and 110°C.

   d. Press the gray infinity key for two (2) seconds to return to the Home Page.

⚠ WARNING

Potential Fire Hazard! Replace fuses only with the same fuse type and ratings.

Electrical Shock Hazard! Disconnect all power before servicing.

Burn Hazard! Isolate sample and allow unit to cool before servicing. Degas chamber could be full of water and burn operator when servicing.

General

Before every use:

- Check all connectors, valves, fittings, and other components for signs of leakage. Repair as required, using only the connections referenced in the installation section.
- Check the resin column and note whether the color change has passed the line on the column. If the color change has passed the line, replace the column or recharge with new resin.

Replacing and Cleaning Analyzer Electrodes

Establish a routine schedule to replace and/or clean analyzer electrodes (refer to manufacturer's literature).

Cleaning may alleviate problems; however, replacement is recommended as frequent attention may be required to calibrate and maintain a marginal electrode.

Replacing Fuses

If a fuse has failed, follow these instructions:

1. Shut down the system.
2. Disconnect panel from the electrical supply.
3. Remove cover from fuse block (no tools required).
4. Note which direction the nub on the fuse is facing, and then remove the fuse using a medium-sized flat head screwdriver.
5. Install a new fuse; be sure to align the nub in the same direction as the fuse that was just removed.
6. Reinstall fuse cover.
7. Reconnect electrical supply.
8. Restart the system if returning it to service.

Spare Parts List

Tag No.	Qty.	Description	Part No.
HTR-1	1	Heater, 120V, CSA Version Heater, 240V	4-05935A 4-05935B
FU-1	1	Fuse, Controller, 1/2A	4-01235F
FU-2	1	Fuse, Heater 120V, 15A Fuse, Heater 240V, 8A	4-01235E 4-01235Z
TIC-1	1	Controller, Temperature	6-03012N

Drawings

Figure 3. DCCP General Arrangement (standard)

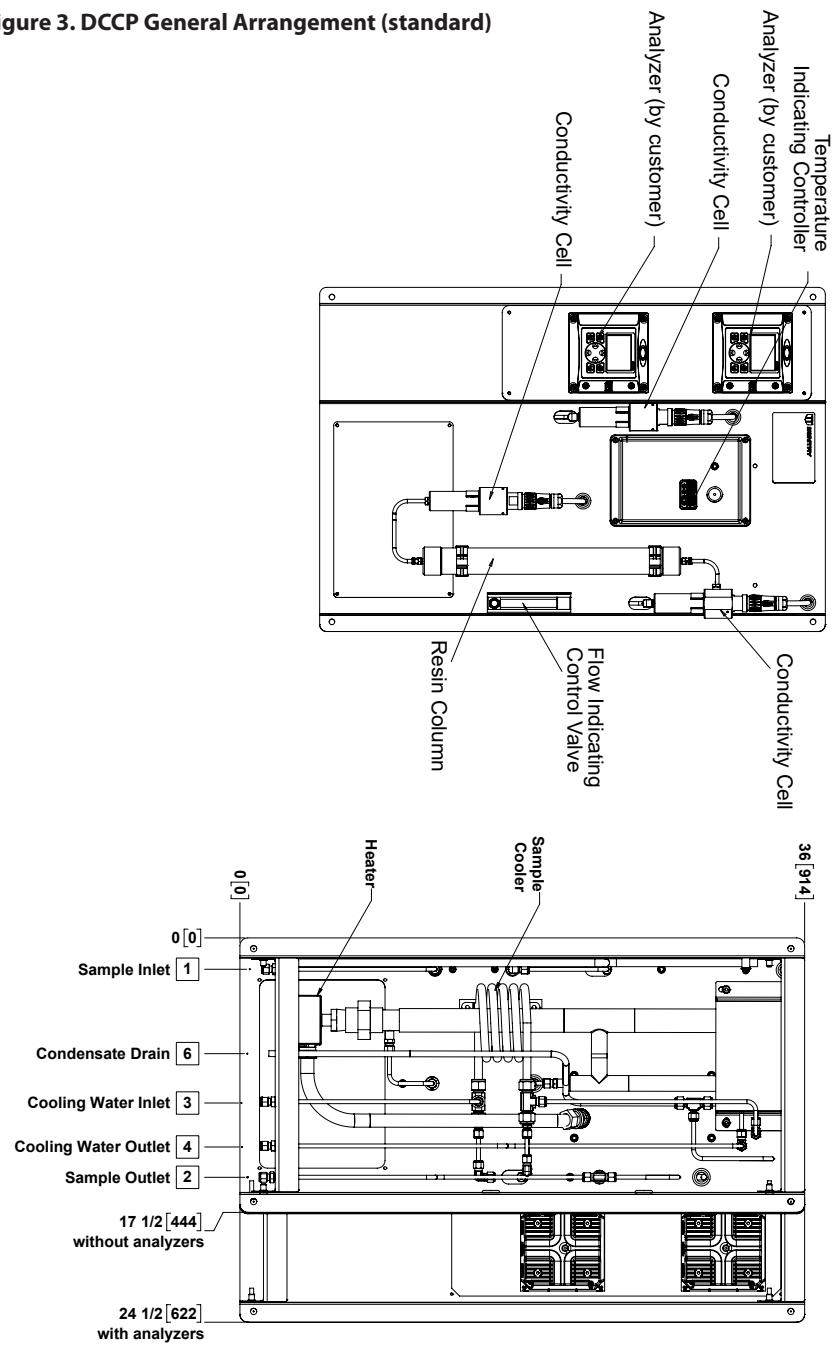


Figure 4. DCCP General Arrangement (regenerative cooling option)

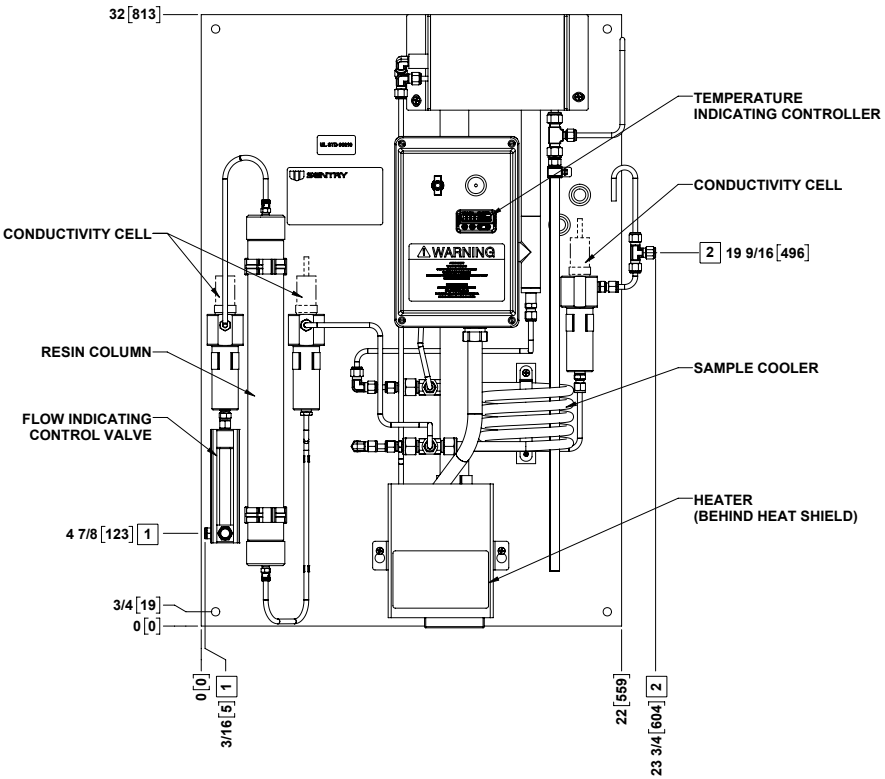
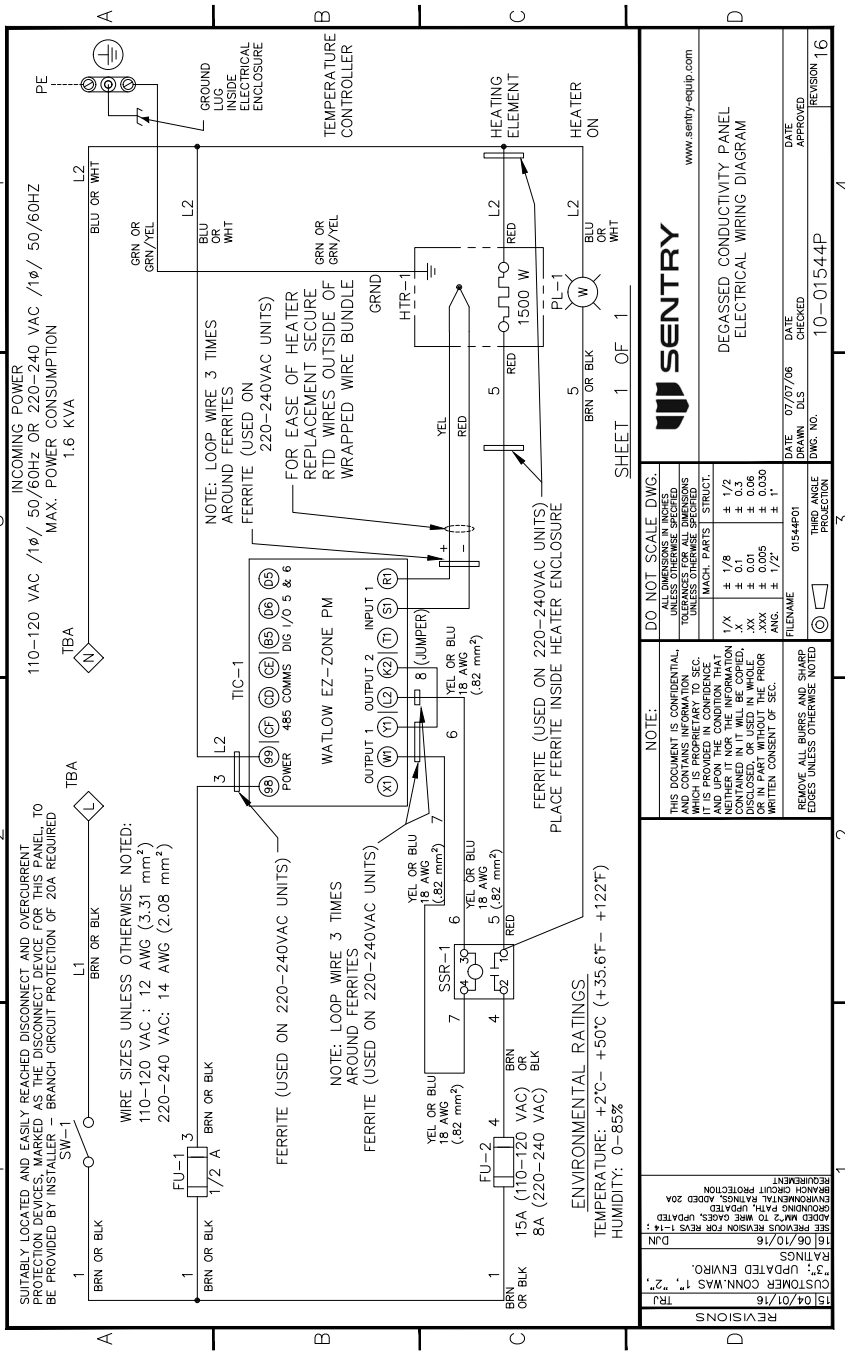


Figure 5. Electrical Wiring Diagram



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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