



QUALITY MANAGEMENT SYSTEM  
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== ISO 9001:2008 ==

# Installation, Operation and Maintenance Manual

## COOLING WATER ISOLATION SKID (CWIS) 35, 80, and 140 GPM

SPD 8.1.12 Rev. 10 10/13

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**REVISION HISTORY**

<b>Rev. ID</b>	<b>Date</b>	<b>Notes</b>
5	08/04	Added safety precautions to Rev. 4.
6	12/05	Updated to reflect Alfa Laval PHE.
7	12/08	Corrected Address, replaced P&ID figures with new versions, removed material lists, Corrected Drawing number chart
8	2/09	Miscellaneous text changes
9	2/10	Changed Programming document number in Procedures Section
10	10/13	Text changes to page 10

**WARNING** notices as used in this manual apply to hazards or unsafe practices, which could result in personal injury or death.

**CAUTION** notices apply to hazards or unsafe practices which could result in minor personal injury or property damage.

**NOTES** highlight procedures and contain information which assists the operator in understanding the information contained in this manual.

**WARNING**

Do not install, maintain, or operate this equipment without reading, understanding and following the proper Sentry Equipment Corp. instructions. Otherwise, injury or damage or both may result.

**NOTICE**

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

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## SAFETY PRECAUTIONS

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 or equipment damage.

### Use of Hazard Information

If multiple hazards exist, the signal word corresponding to the greatest hazard shall be used.

### Definitions



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



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



Indicates a potentially hazardous situation, which if not avoided, may result in minor or moderate injury.



CAUTION used without the safety alert symbol indicates a potentially hazardous situation, which if not avoided, may result in property damage.

### NOTE

Information that requires special emphasis

### SHALL

This word understood to be mandatory

### SHOULD

This word understood to be advisory

**▲WARNING**

It is solely the responsibility of the user, through its own analysis and testing, to select products suitable for their specific application requirements, ensure they are properly installed, ensure that they are safely applied, ensure they are properly maintained, and limit their use to their intended purpose.

Improper selection, installation, or use can cause personal injury or property damage.

Sentry does not warrant against erosion and corrosion. Sentry makes no claims regarding suitability for specific use, and provides no warrantee regarding material compatibility of elastomers in specific services.

**▲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.

**▲WARNING**

**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 de-pressurized, the contents have been drained and the equipment is cool.

## 1.0 General Information

The Sentry Cooling Water Isolation Skid (CWIS) is a compact, skidded heat exchange system. The CWIS is designed to provide a continuous flow of recirculating water at a specific temperature (generally 77°F) for process cooling applications. The CWIS controls the temperature of the recirculating water by exchanging heat with a secondary circuit of (generally) low quality service water. A centrifugal pump is sized to deliver the required flow of recirculating water to the process.

This manual covers 35, 80, and 140 GPM cooling water isolation skids. Consult Sentry for information on special features.

### SPECIFICATIONS

#### **CWIS - 35**

- 500,000 BTU/hr of cooling
- Complete isolation from cooling water
- Loss of flow alarm
- Optional close temperature control
- Optional dual pump
- Optional dual plate heat exchanger

#### **CWIS - 80**

- 1,000,000 BTU/hr of cooling
- Complete isolation from cooling water
- Loss of flow alarm
- Optional close temperature control
- Optional dual pump
- Optional dual plate heat exchanger

#### **CWIS – 140**

- 1,800,000 BTU/hr of cooling
- Complete isolation from cooling water
- Loss of flow alarm
- Optional close temperature control
- Optional dual pump
- Optional dual plate heat exchanger

#### ***Pump Specifications***

Centrifugal pump with direct connected 3 phase TEFC motor. Pumps are provided with inlet and outlet isolation valves and unions/flanges to facilitate pump maintenance.

**Table 1**

Model Number	Pump Horsepower	Supply	Full Load (KVA)	Recirculating Water (GPM) <sup>(1)</sup>	Cooling Water (GPM)
CWIS - 35	2.0 HP	480/3ø/60Hz or 380/3ø/50Hz	1.3	35	53
CWIS - 80	3.0 HP	480/3ø/60Hz or 380/3ø/50Hz	3.6	80	120
CWIS - 140	5.0 HP	480/3ø/60Hz or 380/3ø/50Hz	5.8	140	210

(1) Recirculating water flow based on 20 psid external pressure drop

**Temperature Control**

Temperature control is achieved by diverting flow around the plate heat exchanger using one of two methods; standard and close.

<b>Standard</b>	Self-contained thermostatic element 3-way mixing valve
<b>Close</b>	Electronically actuated 3-way ball valve.

**Accuracy**

Standard	± 4°F (± 2.2°C)
Close	± 1°F (± 0.5°C)

**Heat Exchanger**

Plate and frame type with 316 stainless steel plates. Isolation valves are standard on the recirculating water and external cooling water sides of the heat exchanger. Vent and drain fittings are provided for both sides of the heat exchanger.

**Expansion Tank**

Bladder type with relief valve

**Make-Up Water**

The CWIS includes a provision for make-up water to the recirculating water closed-loop. A pressure-reducing valve is installed which is designed for filling the chilled water closed-loop to a properly controlled pressure after CWIS installation or for system servicing. The pressure reducing valve is factory set at 45 PSIG (3.1 Bar-g); however, is easily adjusted if the make-up water supply pressure is less than the factory setting. The valve is adjustable from 25 to 60 PSIG (1.7 to 4.1 Bar-g). Refer to the **Pressure Reducing Valve Pressure Setting** section for adjustment. The pressure reducing valve is also equipped with a built-in strainer and low inlet pressure check valve.

**Dimensions**

Model Number	Approximate Overall Dimensions
CWIS - 35	60" L x 60" W x 44" H (152 cm L x 152 cm W x 91 cm H)
CWIS - 80	60" L x 60" W x 46" H (152 cm L x 152 cm W x 91 cm H)
CWIS - 140	80" L x 60" W x 60" H (203 cm L x 152 cm W x 152 cm H)

**Cooling Water**

Cooling water should be provided at a minimum flow rate of 1.5 times the recirculating water flow rate. At the minimum cooling water flow rate, the unit will maintain within 10°F (5.5°C) of the cooling water temperature.



***Electrical***

480VAC  $\pm$  10%, 3 phase, 60 Hz

380VAC  $\pm$  10%, 3 phase, 50 Hz

NEMA 4 enclosure with disconnect switch

***Instrumentation***

Pump Suction pressure gauge and recirculating water outlet temperature.

***Options***

- Close temperature control
- Dual pumps with automatic or manual switchover on loss of flow.
- Dual plate heat exchangers.

## 2.0 Principle of Operation

Figure 1 is a demonstration of a CWIS in use. The primary sections of the CWIS are the heat exchanger, temperature control, and the make-up water. Figure 2 is the process and instrumentation diagram of a Sentry designed CWIS. The component abbreviations in the following sections can be found in Fig. 2.

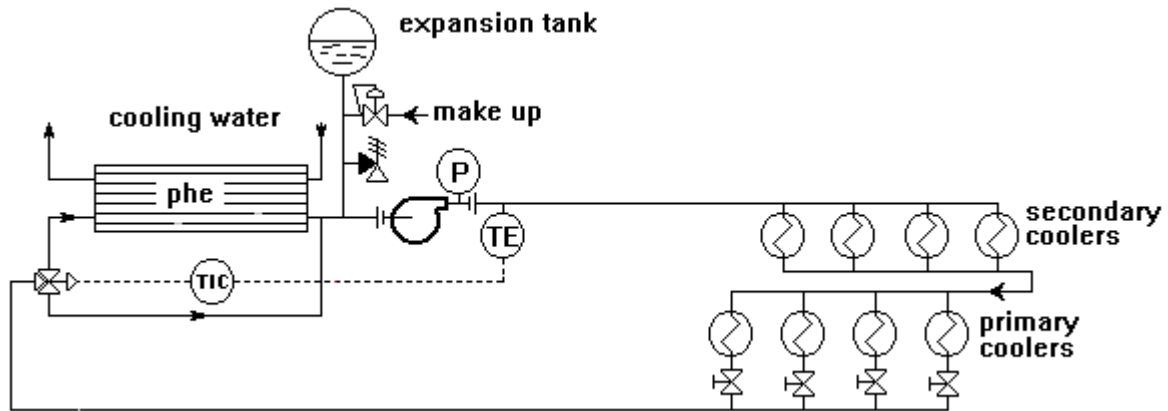


Figure 1 An example of a cooling water isolation skid in service.

### NOTE

These systems are designed to provide recirculating water to a closed loop cooling system. If the cooling system is to be open loop (atmospheric), consult factory for evaluation.

### **Heat Exchange**

The recirculating water is pumped to the process where it absorbs heat removed from the sample. The recirculating water enters the inlet side of the CWIS, passes through the mixing valve (TCV-1), and enters the inlet of the plate heat exchanger. The heat exchanger is a barrier between clean recirculating water and poor quality water used for cooling. The recirculating water is kept clean to reduce corrosion and clogging of components, extending their life. To size the plate heat exchanger, Sentry assumes a cooling water flow 1.5 times the recirculating water flow. When this condition is met, the recirculating water temperature can approach within 10°F (5.5°C) of the cooling water temperature. Isolation valves are provided for easy removal of the heat exchanger for periodic cleaning. An expansion tank accounts for temperature induced volume differences. The recirculating water piping has a 100 PSIG (6.9 Bar-g) relief valve for safety.

### **Temperature Control**

Temperature control of the recirculating water is achieved by bypassing a portion of the inlet flow around the heat exchanger and remixing the hot water with the outlet flow. Two types temperature control are available; standard temperature control or close temperature control.

A self-contained thermostatic element 3-way mixing valve (TCV-1) is used for standard temperature control (see Figure 2). The valve utilizes a temperature dependent volume of wax to control the movement of a stainless steel sliding valve. Standard control holds the recirculating water within  $\pm 4^{\circ}\text{F}$  of  $77^{\circ}\text{F}$  ( $\pm 3^{\circ}\text{C}$  of  $25^{\circ}\text{C}$ ).

An electronically actuated 3-way ball valve (TCV-146 coupled with TIC-148) is used for close

temperature control (see Figure 3). Temperature sensor, TE-154, continuously monitors the temperature of the recirculating water. TIC-148 displays the temperature, and produces an analog output to control the mixing valve. The recirculating water will be within  $\pm 1^{\circ}\text{F}$  of the  $77^{\circ}\text{F}$  ( $\pm 0.5^{\circ}\text{C}$ ) of the  $25^{\circ}\text{C}$  setpoint. Temperature control is dependent on the temperature and cooling water flow.

**Make-up Water**

High quality make-up water must be supplied to the CWIS at a minimum of 45 psig. The make-up water passes through a pressure control valve filling the system at startup and keeping a constant volume of water in the closed loop. A plug valve is installed at the outlet of the heat exchanger for filling the heat exchanger after maintenance or replacement.

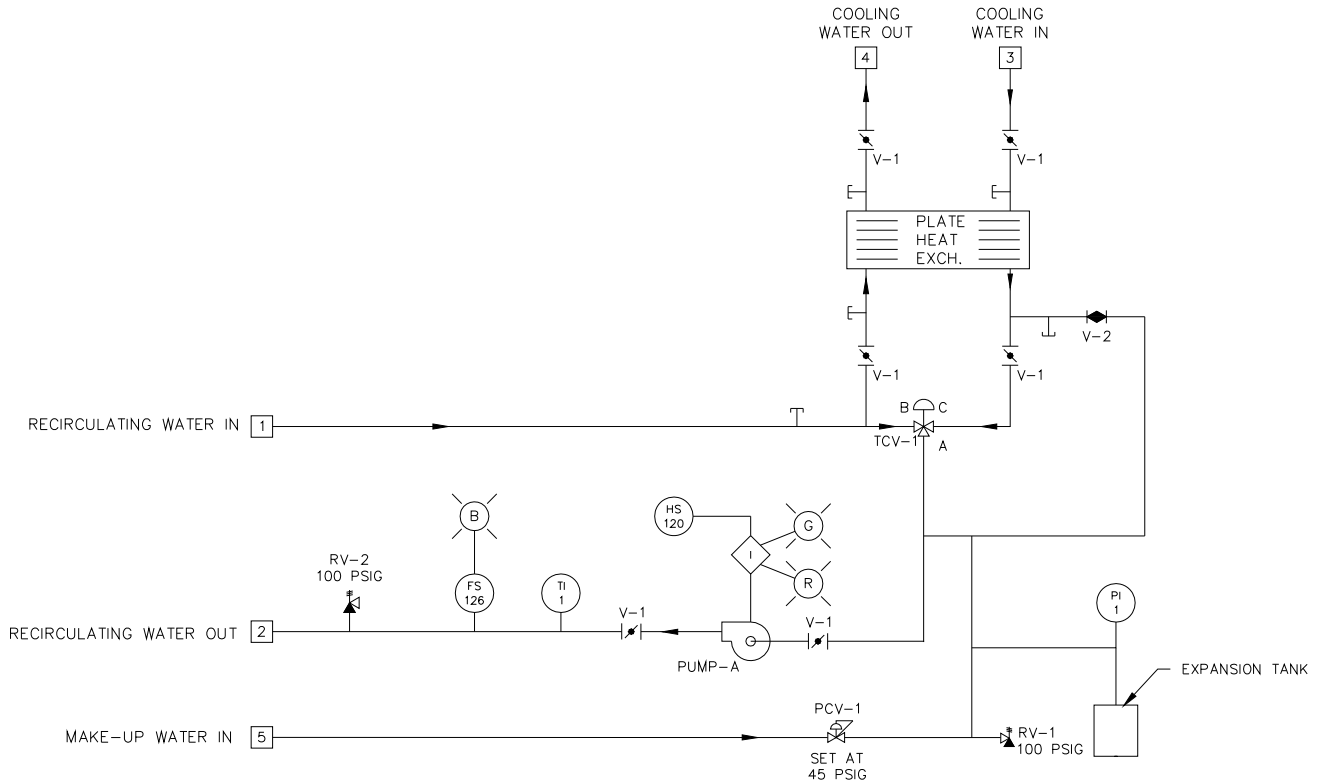


Figure 2 The process and instrumentation diagram for a single pump single heat exchanger cooling water isolation skid with standard temperature control.

**Options**

As options to the basic single pump/single heat exchanger CWIS, Sentry provides the ability to incorporate redundant pumps and heat exchangers. Figure 3 is a process and instrumentation diagram showing an optional dual pump and dual heat exchanger system. The dual heat exchanger configuration includes isolation valves. One heat exchanger may be removed and cleaned without interrupting operation. The dual pump configuration includes isolation valves for easy removal and service of one pump and check valves to eliminate back flow. An additional dual pump option is automatic or manual pump switchover. The pumps are controlled manually by a hand switch (HS-120). With manual switchover, a second hand switch (HS-121) selects which pump to operate. With automatic switchover, the flow switch (FS-126) senses low flow, shuts off online pump, and starts the offline pump. In the case of no flow after pump switchover, the CWIS will shut down.

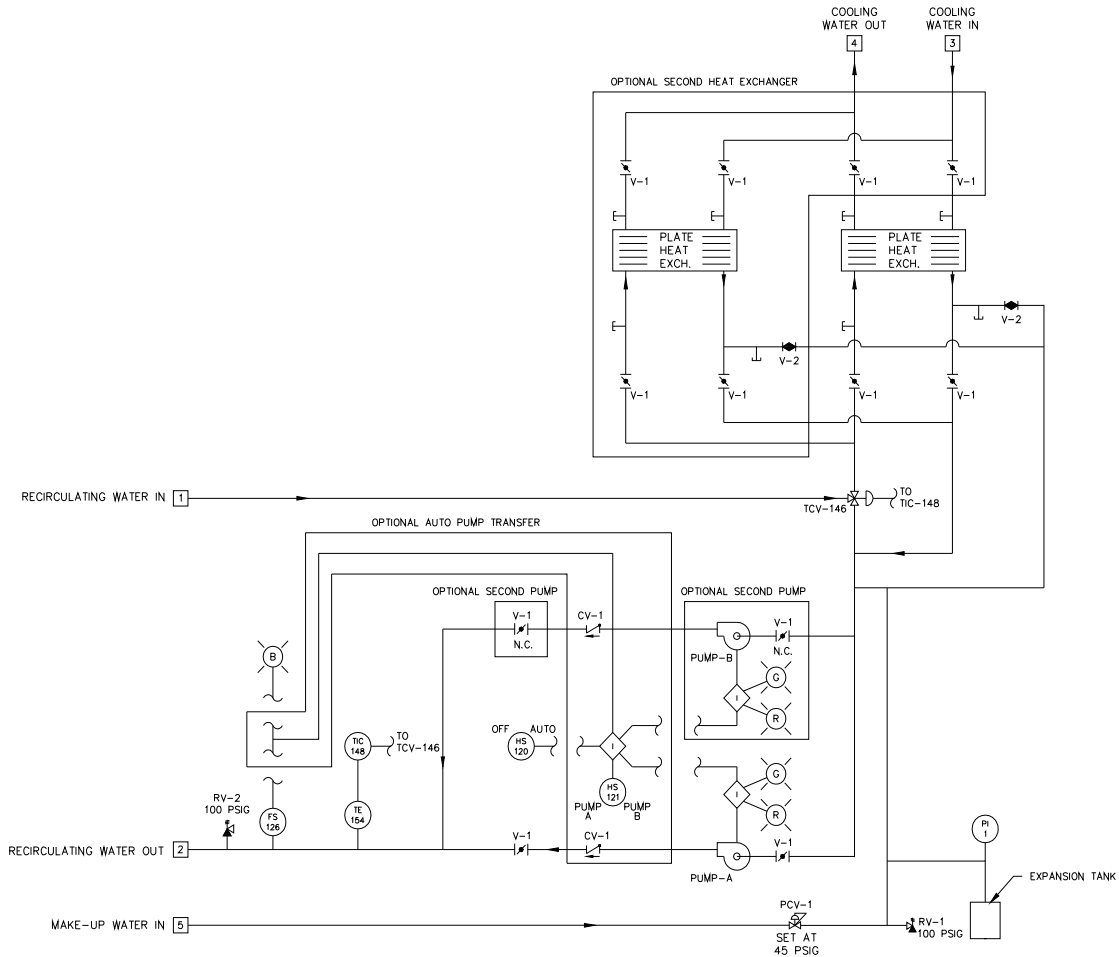


Figure 3 The process and instrumentation diagram for a dual pump dual heat exchanger cooling water isolation skid with close temperature control.

### 3.0 Installation

#### ⚠ WARNING

To ensure the protection provided by this equipment is not impaired, this equipment must not be installed or used in any manner other than that which is specified in this manual.

#### **Receiving, Flushing and Mounting**

- a. Examine the crate for any shipping damage. If in doubt, take photographs of the suspect area(s). Remove the CWIS and examine for any visible damage. Report damages to the freight handler immediately. This is the consignee's responsibility.
- b. Bolt the unit to the floor using ½" bolts, leave enough space around the unit for maintenance access.
- c. Refer to general arrangement drawing for piping connection locations and sizes.

#### **Piping**

Connect recirculating and cooling water piping between the process application and CWIS with minimum pipe sizes in table 2. Provide a vent fitting at the high point of the recirculating water piping. It is important to minimize the pressure drop in the external loop (max. 20 psid) as much as possible. Connect a clean water source to the makeup water connection.

	35 GPM	80 GPM	140 GPM
Recirculating water	1½"	2"	2½"
Cooling water	1½"	2"	3"
Make-up water	½"	½"	½"

**Table 2**

#### **Filling**

- a. Complete the piping. Vents, make-up water isolation valve, and any valves in the recirculating water piping must be opened. The CWIS skid includes a provision for make-up water to the recirculating water closed-loop. A pressure reducing valve (PCV-1) is installed which is designed for filling the recirculating water closed-loop to a properly controlled pressure after CWIS installation or for system servicing. The pressure reducing valve is factory set at 45 PSIG (3.16 kg/cm<sup>2</sup>); however, is easily adjusted if the make-up water supply pressure is less than the factory setting. Refer to the **Pressure Reducing Valve Pressure Setting** section that follows for adjustment. The pressure reducing valve is also equipped with a built-in strainer and low inlet pressure check valve.
- b. When water starts to come out of the cooler rack vent, close it. (This assumes the cooler rack vent is higher than the CWIS vent).

#### **Pressure Reducing Valve Pressure Setting**

The pressure setting of the pressure reducing valve **must be** adjusted when the make-up water supply pressure is less than 45 PSIG (3.16 kg/cm<sup>2</sup>). The valve is adjustable from 25 to 60 PSIG (1.76 to 4.22 kg/cm<sup>2</sup>). The pressure setting can be changed by conducting the following steps:

1. Turn the CWIS selector switch to the "OFF" position, which will de-energize the chilled water circulating pump (MOT-107).
2. Vent any high points in the chilled water closed-loop.
3. Ensure that the make-up water isolation valve (customer supplied) is open.

4. The pressure setting can be raised or lowered by loosening the jam nut on top of the pressure reducing valve and turning the slotted adjusting screw counterclockwise to lower the set pressure (clockwise to increase the set pressure). Turn the slotted adjusting screw counterclockwise until make-up water is passing through the valve.
5. Verify that make-up water is filling the system. The pressure reducing valve is passing make-up water if the copper tubing downstream is cold to the touch. Fill the chilled water closed-loop until water appears at the vents.
6. Close any high points in the chilled water closed-loop.
7. The pressure reducing valve set pressure can be observed on the pump discharge pressure gauge. Turn the slotted adjusting screw slowly to the desired pressure set point.

**NOTE:** Do not adjust pressure to less than 10 PSIG.

8. A screwdriver should be used to hold the adjusting screw stationary while the jam nut is tightened.
9. Once the chilled water closed-loop has been filled, properly vented, and the make-up water supply pressure has been set, close the make-up water isolation valve (customer supplied).



**Corrosion and eventual failure of system components can result from the constant addition of fresh make-up water. After the recirculating water closed-loop has been filled, the make-up water isolation valve (customer supplied) must be closed. This will prevent system leaks from being undetected by the constant replacement of lost water in the closed-loop. Failure to follow these instructions could result in property damage and/or moderate personal injury.**

10. The CWIS is now ready for service.

#### **Pressure Reducing Valve Service Instructions**

If the pressure reducing valve fails to fill to the set cold fill pressure, the built-in strainer may be clogged. The strainer can be serviced by conducting the following steps:

1. Ensure that the make-up water isolation valve (customer supplied) is closed.
2. Remove the pipe plug installed in the pipe tee upstream of the pressure reducing valve. Removal of the pipe plug will depressurize and drain the trapped volume of water between the make-up water isolation ball valve and the inlet portion of the pressure reducing valve. Remove the strainer nut located on the bottom of the pressure reducing valve. This valve is designed with low inlet pressure check valve which allows the operator to remove the strainer nut while the chilled water circulating pump (MOT-107) is operating.
3. Remove and clean or replace the strainer.
4. Reinstall the strainer nut with O-ring into the reducing valve and tighten to a torque of 10 in-lbs. Min. to 100 in-lbs. Max. Replace the strainer nut with O-ring if it is damaged.

Open the make-up water isolation valve (customer supplied). Ensure that all air is purged from the system

**Wiring**

**NOTE**

**Make all wiring connections in accordance with the National Electrical Code and all local regulations. Use copper conductors only. Do not exceed the equipments electrical rating.**

- a. Check to be sure the available power supply voltage and frequency agrees within 10% of CWIS electrical rating.



**Use Copper Conductors Only! Unit terminals are not designed to accept other types of conductors. Failure to use copper conductors may result in equipment damage.**

- b. Bring properly sized power leads from the customer supplied fused disconnect to the control box. Cut a cable hole at a convenient location in the control box. Route power leads to terminals L1, L2, L3 in the upper right corner. Dual element time delay fuse sizes recommended for different CWISs are in Table 3.
- c. The recirculating water pump must rotate in the proper direction (counterclockwise). If the pump is rotating in the wrong direction (clockwise), a low flow alarm will occur because the flow switch was not activated. Ensure the system is properly filled, vented, and initially pressurized to around 45 psig.
- d. Connect the ground wire to the lug in upper right corner of control panel.

CWIS Model Number	Fuse Size 480V/60 Hz	Fuse Size 380V/50 Hz	Pump Size
CWIS -35	6 Amp	8 Amp	1 HP
CWIS -80	8 Amp	10 Amp	3 HP
CWIS -140	10 Amp	15 Amp	5 HP

**Table 3 Recommended Fuse Sizes**



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

## 4.0 Operation



**Live Electrical Components!** It may be necessary to work with live electrical components when installing, testing, servicing, and troubleshooting this product. Have a qualified licensed electrician or other properly trained individual perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components can result in death or serious injury.

### ***Controls and Indicators***

- a. The selector switches and light on the control panel are:

Selector Switch: OFF / AUTO or OFF / ON  
Pump A / Pump B

Lights: Pump A ON (Red)  
Pump A OFF (Green)  
Pump B ON (Red)  
Pump B OFF (Green)  
Power ON (White)  
Alarm (Blue)

- b. Instruments on the CWIS are:

Digital LED display/temp controller: Recirculating water temperature (close control)

Analog Gauges: System Pressure  
Temperature Gauge (standard control)

### ***Start-up***

- a. Open all shutoff valves in the cooling water circuit and in the recirculating water circuit.
- b. Start the pump. Ensure there is not a flow alarm and check for leaks in the piping. Vent air from the high points in the system, such as the heat exchanger return port.



**Drawing-in Hazard!** The centrifugal pump has a rotating shaft that may create a drawing-in hazard of loose articles of clothing or maintenance equipment. The expanded metal cage and cover shall remain in place during operation of the equipment. Failure to keep the expanded metal cage and cover in place during operation of the equipment can result in death or serious injury.

- c. **Close temperature control only.** The temperature controller is mounted on the enclosure door. Control parameters are set at the factory. The temperature is factory set at 76.6°F (24.4°C). If the temperature setpoint needs to be adjusted, press the up or down arrow keys to change the setpoint. The temperature setpoint cannot be lower than the temperature of the cooling water.



***Features***

- a. A CWIS with close temperature control utilizes a solid state controller to modulate recirculating water flow through or around the heat exchanger. The controller monitors the recirculating water outlet with thermal sensors. A PID control signal modulates the position of the mixing valve (TCV-146), and regulates the recirculating water flow through the heat exchanger.
- b. Flow switch (FS-1) is located in the recirculating water outlet piping. If recirculating water flow is lost, the flow switch closes turning on a time delay relay. After approximately six seconds, the time delay relay energizes, turning the pump off. After the time delay relay has energized, a local alarm light and customer alarm is activated. The unit then requires a manual restart.
- c. The heat exchangers and pump have isolation valves for easy maintenance and cleaning. A dual pump system can be purchased with either manual or automatic switchover. The automatic switchover option provides automatic pump switching with the loss of flow.

5.0 Maintenance



**Live Electrical Components!** It may be necessary to work with live electrical components when installing, testing, servicing, and troubleshooting this product. Have a qualified licensed electrician or other properly trained individual perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components can result in death or serious injury.



**Hazardous Voltage!** Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure power cannot be inadvertently energized. Failure to disconnect power before servicing can result in death or serious injury.

The plate heat exchanger needs to be cleaned periodically. Periodic cleaning of the heat exchanger in place by back flushing can prevent serious fouling. If the heat exchanger cannot maintain temperature or the pressure drop becomes too high after back flushing, it may be necessary to dismantle the heat exchanger for cleaning. The document “Alfa Laval Plate Exchanger Operational and Maintenance Manual” included at the end of this manual describes cleaning in place and dismantling the heat exchanger.

**Troubleshooting Checklist**

Condition	Cause	Correction
1. Cannot maintain temperature	a. Fouled heat exchanger	Follow the cleaning instructions in the manual
	b. Excessive cooling water temperature	Verify the temperature of the cooling water is 5°F below set point.
	c. Low cooling water flow	Check the pressure drop in the cooling water circuit. Clean the heat exchanger.
2. Excessive pump pressure (~70 psig)	a. Restricted water flow	Check for partially closed valves  Be sure all lines are properly sized.
	b. PCV-1 setpoint too high	Adjust setpoint of PCV-1 to a maximum of 45 psig.

**System Component Data**

<b>Component</b>	<b>Description</b>	<b>Set-Point</b>	<b>Comments</b>
P-A/B	Pump		TEFC motor. Flow rate based on an external 20 psig drop.
FS-126	Flow switch	approx 10 GPM	Low flow cutout. Factory set
TIC-148	Solid-State temperature controller	Variable	Available with close temperature control. Set controller 1°F less than desired sample temperature.
TE-154	Temperature sensor		Monitors recirculating water out. Provides temperature input to controller.
HS-120	Hand switch		OFF/AUTO
PI-1	Pressure gauge		Displays inlet system pressure.
TCV-146	Temperature controlled valve	Variable	Bypasses flow around the heat exchanger. Amount of mixing is controlled by analog signal from controller.
PCV-1	Pressure control valve	45 psig	
RV-1/RV-2	Relief valve	100 psig/100 psig	
TDR-126	Time delay relay	6 seconds	Eliminates false flow alarm preventing pump cycling.
TDR-128	Time delay relay	6.2 seconds	Used in a dual pump auto switchover configuration.
TDR-134	Time delay relay, Switchover	2 seconds	Used in a dual pump auto switchover configuration.
PHE	Plate heat exchanger		Provides a physical barrier between cooling water and process water.

## 6.0 Warranty

Seller warrants products manufactured by it and supplied hereunder to be free from defects in materials and workmanship for a period of eighteen months from date of shipment or twelve months from start up (whichever ever occurs first). If within such period any such products shall be proved to Seller's satisfaction to be defective, such products shall be repaired or replaced at Seller's option. Seller's obligation and Buyer's exclusive remedy hereunder shall be limited to 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, ex-works Sentry's factory.

The foregoing warranties are exclusive and in lieu of all other express and implied warranties except in title, including but not limited to implied warranties of merchantability and fitness for purpose. Seller shall not be subject to any other obligations or liabilities whatsoever with respect to products manufactured or furnished by it, or any undertakings, acts or omissions relating thereto.

### Warranty Conditions & Limitations

This Warranty shall not apply to any Sentry product which, in the opinion of Sentry Equipment Corp, has been (a) altered or repaired in a manner affecting the efficiency of 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 proposed to be used by Sentry Equipment Corp. ("Seller") are based on published reference literature and/or customer recommendations, and customer assumes sole responsibility for the selection of such materials. Any references are based on third-party studies, and may not correlate directly with the end user's intended usage or process (i.e. chemical composition, concentrations, temperatures, etc.).

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 ability of products sold hereunder 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

The owner shall be responsible for maintenance of his equipment. Wear or damage caused by lack of normal maintenance or by misuse of the equipment shall not be considered as defective workmanship and material.

Sentry 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.

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

**Customer Actions For Claims on Products During the Warranty Period**

1. Contact the Customer Service Department, Sentry Equipment Corp., Oconomowoc, WI, Telephone: 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. The factory will not process warranty claims until the customer has properly accomplished the above items.
6. The Sentry factory may accept the entire claim, a part of the claim or none of the claim if our inspection of returned parts proves the failure was for reasons other than defective material or factory workmanship.

**Important Notes:**

1. Sentry will not be responsible for damage incurred during the return shipment.
2. All returns subject to inspection and a minimum \$100.00 evaluation fee.
3. This RMA is not authorization for credit. Credits and/or replacements will be issued upon evaluation of returned goods.
4. RMA is valid for thirty (30) days from issue date.

**7.0 Procedures**

“Alfa Laval Plate Exchanger Operational and Maintenance Manual”

Configuration of a Watlow EZ-Zone PM Controller for use in  
Sentry Cooling Water Skids (CWIS/CWMS) (Document No. 16-05072A).

## 8.0 Drawings

## CWIS-35

Temperature control	Pump/Heat Exchanger	P&ID	GA	EWD
Standard	Single/Single	10-01304A	10-01312P	10-01304M
	Single/Dual	10-01304A	10-01312Q	10-01304M
	Dual/Single	10-01304A	10-01312M	10-01304P (Manual Transfer) 10-01304V (Auto Transfer)
	Dual/Dual	10-01304A	10-01312N	10-01304Q (Manual Transfer) 10-01304V (Auto Transfer)
Close	Single/Single	10-01304G	10-01312V	10-01304N
	Single/Dual	10-01304G	10-01312W	10-01304N
	Dual/Single	10-01304G	10-01312R	10-01304Q (Manual Transfer) 10-01304S (Auto Transfer)
	Dual/Dual	10-01304G	10-01312T	10-01304Q (Manual Transfer) 10-01304S (Auto Transfer)

## CWIS-80

Temperature control	Pump/Heat Exchanger	P&ID	GA	EWD
Standard	Single/Single	10-01304A	10-01313E	10-01304M
	Single/Dual	10-01304A	10-01313F	10-01304M
	Dual/Single	10-01304A	10-01313C	10-01304P (Manual Transfer) 10-01304V (Auto Transfer)
	Dual/Dual	10-01304A	10-01313D	10-01304P (Manual Transfer) 10-01304V (Auto Transfer)
Close	Single/Single	10-01304G	10-01313K	10-01304N
	Single/Dual	10-01304G	10-01313L	10-01304N
	Dual/Single	10-01304G	10-01313H	10-01304Q (Manual Transfer) 10-01304S (Auto Transfer)
	Dual/Dual	10-01304G	10-01313J	10-01304Q (Manual Transfer) 10-01304S (Auto Transfer)

## CWIS-140

Temperature control	Pump/Heat Exchanger	P&ID	GA	EWD
Standard	Single/Single	10-01304A	10-01304E	10-01304M
	Single/Dual	10-01304A	10-01304F	10-01304M
	Dual/Single	10-01304A	10-01304C (Manual Transfer) 10-01304W (Auto Transfer)	10-01304P (Manual Transfer) 10-01304V (Auto Transfer)
	Dual/Dual	10-01304A	10-01304D (Manual Transfer) 10-01304X (Auto Transfer)	10-01304P (Manual Transfer) 10-01304V (Auto Transfer)
Close	Single/Single	10-01304G	10-01304K	10-01304N
	Single/Dual	10-01304G	10-01304L	10-01304N
	Dual/Single	10-01304G	10-01304H (Manual Transfer) 10-01304Y (Auto Transfer)	10-01304Q (Manual Transfer) 10-01304S (Auto Transfer)
	Dual/Dual	10-01304G	10-01304J (Manual Transfer) 10-01304Z (Auto Transfer)	10-01304Q (Manual Transfer) 10-01304S (Auto Transfer)