

EcoPac350 EP-1-5-100 & EcoPac175 EP-1-5-50 Ecocool Chill Stand Temperature Controller

Installation, Operation and Maintenance Manual

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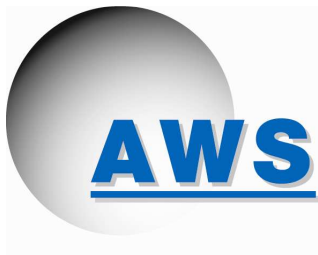


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Foreword

The AWS EcoPac provides temperature control for an Ecocool chill roll stand. It consists of a temperature control loop separated from the chilled water source by a plate and frame heat exchanger.

This manual is to serve as a guide for placing your Ecopac in service and operating and maintaining it properly. It is supplemented by drawings specific to your equipment.

Installation

Receiving Inspection

Each unit is skid mounted and boxed or crated to protect it during shipping. Before accepting delivery, check the box or crate for visible damage. If damage is evident, it should be properly documented on the delivery receipt, and the box or crate should be immediately removed to allow for detailed inspection of the unit. Any sign of damage should be recorded and a claim filed immediately with the shipping company. In order to expedite payment for damages it is important to record and document damage. An excellent way to do this is by taking pictures. Our Customer Service Department will provide assistance with the preparation and filing of your claims, including arranging for an estimate and quotation on repairs.

Rigging, Handling, and Locating Equipment

Proper rigging methods must be followed to prevent damage to components. Avoid impact loading caused by sudden jerking when lifting or lowering the unit. Use pads where abrasive surface contact is anticipated.

Electrical Power Connections

Power Connections are made in the Service Enclosure. See Appendix 1 for details.

Electrical Interlock Connections

The Ecopac is controlled externally by the Omnicon controller. All interlocks are to be connected in the Service Enclosure located at front left of the Ecopac. See Electrical Schematic for interlock details.



NOTE: Both Temperature Control Valves (TCV-1 and TCV-2) will remain powered (24VAC) even when Ecopac power is disconnected.

Water and Air Connections

All connections are female NPT and should be clearly labeled. Reference the attached specification drawing for connection locations.

Principle of Operation

Normal Operation

In the temperature control zone, the circulating pump maintains the design flow rate through the chill rolls. Heat from the chill rolls is removed by the heat exchanger. The zone water flow through the heat exchanger is controlled with a 3-way modulating valve (TCV-1). The 3-way modulating valve controls zone water flow rate through the heat exchanger to maintain proper temperature at the chill stand.

The modulating valve moves too slowly to adjust to a sudden loss of cooling load, such as occurs upon a web break. To prevent excessive cooling of (and possible sweating at) the chill rolls, the air-operated antisweat valve (AOV-1) closes quickly upon loss of the press 10% speed point signal. It remains closed for 1 minute, or until the speed point signal is regained. This allows the modulating valves time to adjust to the new, lower cooling load.

The chill roll temperature control loop is a closed loop. It is equipped with an expansion tank and air separator. This closed loop needs to be pressurized by a permanent makeup water source. The makeup water line has a solenoid valve on it that opens when there is power to the equipment and the run signal is given.

Start-Up

Note: Refer to system piping diagram.

1. Ensure all electrical and mechanical connections have been made properly.
2. Fill the chill roll loop using the following procedures:
 - a. Close the external valves to the chill stand to isolate the EcoPac. Be sure all internal valves are open. Unscrew the red plastic cap on the automatic vent to allow venting.
 - b. Open all valves in the chill roll loop piping. Close valve MV-1. Open MV-4. Provide signal or jumper to open AOV-2 to fill the chill roll loop piping. Listen for air escaping from the Automatic Vent and MV-4. When venting has stopped and water is seen exiting MV-4, close MV-4. The pump is now primed and the system is filled.
3. Open MV-1. Turn the EcoPac on by pressing the ON button. The circulating pump should turn on.
4. Run the pump continuously for several hours to ensure complete venting of entrapped air.
5. When the system is filled and vented, turn power off and remove any jumpers put in place.
6. Be sure that chilled water is connected to the equipment and the valves on the supply and return are open.

The EcoPac is now ready for use. Turn power on and normal operation should begin.

Interlocks

Remote Start

The EcoPac is started remotely by the EcoCool Omnicon Controls. The EcoPac starter interlocks must be wired as indicated on the electrical schematic.

10% Speed Point

The EcoPac antisweat feature is controlled by a 24VDC 10% speed point signal from the press.

Temperature Control Signals

The EcoPac temperature modulating valve receives power (24VAC) and control signals (0-10VDC) from the Omnicon controller.

Components

Relief Valve (PVR-1)

A relief valve is located on the chill stand supply line. This prevents damage to equipment and danger to personnel in the event of overpressurization of the supply lines. The relief valves open at 75psi, and should be connected to a drain.

Pump

The pump is a close-coupled, centrifugal pump, equipped with a mechanical seal. The pump motor meets NEMA specifications and industry standards.

Pressure Gauges

Pressure gauges are located on the zone return and supply lines, as well as at the chilled water return and supply.

Y-Strainer

A Y-strainer with a 200-mesh screen is installed in the water line to help protect the system from particulates. It has a flush port that can also be connected to a drain.

Temperature Gauges

Temperature gauges are located on the zone return and supply lines, as well as at the chilled water return and supply.

Temperature Modulating Valve (TCV-1)

A Temperature Modulating Valve is supplied to control the temperature of the chill stand supply water by modulating the zone water flow through the heat exchanger. More zone water will bypass the heat exchanger as less cooling is required. The valve receives a control signal as well as 24VAC power from the Omnicon controller.

Antisweat Air-operated Valve (AOV-1)

An air operated ball valve is supplied in order to prevent chill roll sweating caused by sudden loss of cooling load. This valve is controlled by a 10% speed point signal supplied by the press. The valves will close for one minute upon loss of the 10% speed point signal, or until 10% speed is regained.

Preventive Maintenance

Establishing a preventive maintenance routine according to the recommendations below will help to prolong the life of the EcoPac as well as help to prevent unplanned press downtime. A checklist is provided at the end of this section which can be used to document the preventive maintenance performed.

Once a Week

1. Check the pump for leaks in the seal area. Replace pump seal if necessary.

Once a Month

2. Units are equipped with a Y-strainer. Flush strainer. The strainer basket should be removed and cleaned if necessary.

Every Three Months

3. With the main disconnect shut off and locked out, check the condition of electrical connections at all contactors, starters and controls. Check for loose or frayed wires.
4. Check the incoming voltage to make sure it is within 10% of the design voltage of the EcoPac.

Appendix 1

Electrical Power Connections

All wiring must comply with local codes and the National Electric Code (USA). Voltage must be within the voltage utilization range given in Table 1.

Table 1 - Voltage Utilization Range

Rated Voltage	Utilization Range
230	208 to 254
460	414 to 506
575	516 to 633

If the measured voltage on any leg is not within the specified range, notify the supplier and correct before operating the unit. Voltage imbalance must not exceed two percent. Excessive voltage imbalance between the phases of a three-phase system can cause motors to overheat and eventually fail. Voltage imbalance is determined using the following calculations:

$$\% \text{ Imbalance} = (V_{\text{avg}} \square V_x) \times 100 / V_{\text{avg}}$$

$$V_{\text{avg}} = (V_1 + V_2 + V_3) / 3$$

V_x = phase with greatest difference from V_{avg}

For example, if the three measured voltages were 442, 460, and 454 volts, the average would be:

$$(442 + 460 + 454) / 3 = 452$$

The percentage of imbalance is then:

$$(452 \square 442) \times 100 / 452 = 2.2 \%$$

This exceeds the maximum allowable of 2%.

A disconnect switch is provided for connection of the main power source. A separate fused disconnect is required at the power source (by others)

Electrical phase sequence must be checked at installation and prior to start-up. The phasing must be checked with a phase sequence meter prior to applying power. The proper sequence should read $\square ABC \square$ on the meter. If the meter reads $\square CBA \square$, open the main power fused disconnect, and switch two line leads on the disconnect on the Ecopac. All components requiring electric power are wired in-phase at the factory. Do not interchange any load leads that are from the unit contactors or the motor terminals.



WARNING: It is imperative that L1-L2-L3 are connected in the A-B-C phase sequence to prevent equipment damage due to reverse rotation.

Warranty

AWS, a Thermal Care Division warrants its equipment to be free from defects in material and workmanship when used under recommended operating conditions.

AWS, a Thermal Care Division's commitment is limited to replacement (not normal wear and maintenance) and/or repair (e.g. replace pump seal), F.O.B. Niles, IL, of any parts supplied by AWS, a Thermal Care Division found to be defective during the time period shown below. This commitment applies to the original purchaser from the date of start-up.

AWS, a Thermal Care Division is not responsible for any sales, use, excise or other applicable taxes associated with the replacement of parts under this warranty. The warranty does not extend to damage caused by accident, misuse, neglect, or failure to follow published operating procedures, and failures to perform routine maintenance procedures. This warranty shall not apply to equipment that is installed or used in operating conditions or environments deemed as hostile or unusual unless such operating conditions or environments are acknowledged and accepted in writing by AWS, a Thermal Care Division prior to equipment manufacture. This warranty is not transferable.

At no time will AWS, a Thermal Care Division be responsible for loss of prospective or contemplative profits, loss of time due to plant shutdown, or other consequential or special damages to persons or property.

All defective parts become the property of AWS, a Thermal Care Division and must be returned as advised by AWS, a Thermal Care Division

This warranty statement is the expressed warranty for AWS, Inc in its entirety. AWS, a Thermal Care Division assumes no liability for statements or agreements of its employees or others unless made in writing from authorized AWS, a Thermal Care Division personnel. There is an implied equipment warranty for merchantability and fitness for use. All other implied warranties and any liability not based upon contract are hereby disclaimed and denied. This warranty is part of our standard Terms and Conditions of sale (existing separately) for AWS, a Thermal Care Division equipment and services.

Products sold within the United States: One (1) year parts/One (1) year labor

Products sold outside the United States: One (1) year parts/One (1) year labor

Note: This warranty excludes travel expenses/per diem (i.e. air fare, hotel, car, meals). AWS, a Thermal Care Division will require a purchase order prior to onsite visits to cover travel expenses.

Schedule of Attached Documents

Document Number	Description
ECRP0004MPI1	Piping Flow Diagram
ECRP0009EEL1	Electrical Schematic
ECRP0009EPC1	Control Panel Compnents
