

TURMOIL

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INSTALLATION, MAINTENANCE and OPERATION MANUAL

MODEL OCO-150 RO-ILH

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WARNING

DO NOT ATTEMPT TO START UP THIS COOLER UNTIL YOU HAVE READ THROUGH THE INSTRUCTIONS COMPLETELY. IMPROPER START-UP WILL VOID THE COOLER WARRANTY AND DAMAGE THE MACHINE.

UNCRATING & INSPECTION

Rough handling during shipment may cause obvious and/or concealed damage. Upon arrival, the cooler should be inspected carefully and claims for damage must be filed immediately with the trucker.

When uncrating the cooler, inspect it thoroughly for signs of concealed damage. Coolers that have been dropped or shipped on their side may not show external damage. If damages are found, a claim must be filed with the carrier within 30 days of delivery.

COOLER PLACEMENT

Place the cooler in a level location where it is accessible from the front and with enough room to make electrical and hose connections on the right side.

The cooler will draw air in through the air filter at the front and will exhale air through the top. It is imperative that these vents remain open to permit the free movement of air (a minimum of two feet of open space on air intake and discharge sides).

PLUMBING HOOK-UP

Make your hose connections to the 1" FNPT fittings on the right side tagged DISCHARGE and RETURN. Flow will be out the DISCHARGE connection. Be sure that the hoses from the sump to the RETURN connection allow for downhill or level flow and do not cause air traps. Hoses to and from the sump should be as short as possible. All hose and fittings should have a minimum inside diameter of 1",

This cooler is designed to cool a clean, oil based coolant. If there is a possibility that foreign particles could get into the coolant, a 50 mesh strainer should be installed in the RETURN line to protect the pump and evaporator from clogging.

ELECTRICAL HOOK-UP

See the electrical diagram attached. The cooler is wired for 230 volt, 60 hertz, 3 phase power supply. Check the nameplate tag on the side of the cooler to verify voltage. The supply voltage must be within 10% of the rated voltage on the tag. The power connection should be made to the terminals provided on the rotary disconnect in the electrical enclosure on the side panel. Make ground connection to the grounding screw provided. Check for loose wires.

Make connections for High Temperature interlock to terminals #20 and #21. Make connections for LOW FLOW interlock to terminals #22 and #23. The contacts across the interlock terminals will open on fault.

TEMPERATURE ADJUSTMENT

This cooler is supplied with a digital temperature controller (CTC-106) mounted on the front panel. See the attached instruction sheet for operating this controller. The controller works to maintain the coolant temperature within $\pm 0.5^{\circ}\text{F}$ of the adjustable set point. The coolant sensor is mounted in the RETURN line and effectively senses the sump coolant temperature. The controller will alternate flashing the set point temperature (S) and the actual coolant temperature (F).

START-UP

Once the cooler has been installed and the proper plumbing and electrical connections have been made, it can be powered up by turning the rotary disconnect switch to the ON position. The white POWER ON light will energize as will the display on the temperature controller and the red LOW FLOW light. Start the cooler by turning the PUMP ON/OFF switch on the front panel to the ON position. The green PUMP ON light will come on and the pump will start and run continuously. The red LOW FLOW light will only go out after the pump starts pumping coolant through the cooler. If the red LOW FLOW light does not go out, check immediately that the pump is primed and rotating in the proper direction. Do not run the pump for more than 30 seconds with the red LOW FLOW light on. The pump should rotate in a counter-clockwise direction when viewed from the motor end. The lower front panel can be removed to check pump rotation. If the pump is rotating in the wrong direction, disconnect the power to the cooler and exchange any two of the power leads to the disconnect switch. The pump is a self-priming gear pump. Once the red LOW FLOW light goes out, the compressor and fan will come (after a 2 minute delay) if the controller is calling for cooling. The compressor is protected from short cycling by an on-delay relay and will come on minutes after the pump is turned on, the red LOW FLOW light is out and the controller is calling for cooling.

OPERATION

When the ON/OFF switch on the front panel is pushed to the ON position, the pump will start and run continuously. If the red LOW FLOW light goes out and the controller is calling for cooling, the compressor and fan will also come on after a 2 minute on delay and cycle as needed to maintain the desired coolant temperature. Set the controller to the desired coolant temperature.

When the controller calls for cooling, the compressor and fan come on and the liquid line solenoid valve opens. Refrigerant flows through the expansion valve to absorb heat as it evaporates in the evaporator/heat exchanger. When the coolant temperature reaches the set point, the compressor and fan stop and the liquid line solenoid valve closes. The heater simultaneously comes on to warm the coolant up to the set point temperature. The controller sensor is mounted in the RETURN line and is thus effectively sensing the sump temperature. The cooler should now be ready for continuous operation.

SAFETY INTERLOCKS

HIGH/LOW PRESSURE

The compressor is protected from excessively high discharge pressure or low suction pressure by a HIGH/LOW pressure switch mounted inside the cabinet. High head pressure can be caused by a dirty air filter or condenser or by blocking off air flow through the condenser. High head pressure can also be caused by a faulty solenoid valve. Low suction pressure can be caused by loss of refrigerant charge, operating at too low a coolant temperature (below 50° F), a faulty solenoid valve, or low coolant flow.

The High/Low pressure switch is factory set as follows:

High Pressure Cut Out	360 #
Suction Pressure Cut In	60 #
Differential	30 #

If the cooler shuts down on the Low Pressure switch, it will come back on after the pressure has built back up. If the cooler continuously cycles on the Low Pressure switch, it most likely is operating at too low a coolant temperature or flow or has a low refrigerant charge.

If the cooler shuts down on the High Pressure switch, it will stay off until the head pressure has dropped to about 300 psi. If the cooler goes out on High Pressure, most likely the condenser or the condenser filter is clogged or blocked.

LOW FLOW INTERLOCK

The cooler is supplied flow switch mounted in the DISCHARGE line. If the coolant flow drops below 5 GPM, the compressor and heater will not run, the contacts across terminals #22 and #23 will open and the red LOW FLOW light will come on.

HIGH TEMPERATURE INTERLOCK

The cooler is supplied with a High temperature interlock switch (K2) built into the controller. If the coolant temperature exceeds a preset limit, the contacts across terminals #20 and #21 will open. See the ATC controller instructions attached for setting the high limit.

HEATER THERMOSTAT

The cooler is supplied High Temperature thermostat (TAS) mounted inside the cabinet. This thermostat is factory set at 100F and will shut off the heater if the coolant temperature rises above 100F for any reason.

MAINTENANCE

Every Turmoil cooler is carefully assembled from the finest components by skilled craftsmen. Each cooler is thoroughly tested and inspected before it leaves the factory. However, in order to obtain efficient service and long life from this cooler, it must be given proper care as with any other piece of mechanical equipment.

Model OC-150 RO continued

AIR FILTER: Keep Clean.

CONDENSER: Condenser fins should be cleaned of dust and dirt regularly.

PUMP: See attached pump instructions.

TROUBLE SHOOTING

PROBLEM	CAUSE	SOLUTION
Cooler operative but not cooling	A. Dirty Air Filter B. Blocked Air Flow C. Condenser Clogged D. Low or No Coolant Flow Through Cooler E. Faulty Thermostat F. Cooler Undersized G. Low Refrigerant Charge H. Faulty Compressor I. Incorrect Expansion Valve setting	Clean Remove Blockage Clean Wrong pump rotation, evaporator or lined blocked Repair/Replace Check Heat Load Repair* Repair/Replace* Adjust Expansion Valve to proper setting*
Cooler inoperative	A. Faulty Power Source B. Faulty PUMP ON/OFF switch C. Pump contactor overload tripped D. Blown fuse	Check and correct Replace Reset & check amps Check amps and correct
Pump runs but compressor and fan do not come on or short cycle.	A. Faulty Thermostat B. Cooler OFF on High Head Pressure C. Cooler OFF on Low Suction Pressure <i>Do not proceed with this step if the evaporator is frozen. The compressor could be damaged beyond repair.</i>	Repair/Replace Push Blue Reset Button on Pressure Switch. Check for: Dirty Air Filter, Dirty Condenser Bad Fan Motor or Incorrect Expansion Valve Setting* Use Screwdriver to Push Up Manual Toggle on Pressure Switch to Restart Compressor. Check for: No or Low Coolant Flow, Low Ambient or Wrong Setting on Pressure Switch If Compressor Does Not Continue to Run after Screwdriver is Removed, Check for: Low or Lost Refrigerant Charge* Incorrect Expansion Valve Setting*
No Coolant Flow	A. Wrong Pump Rotation B. Faulty Pump C. Obstruction in line D. Pump overload tripped	Correct Repair or replace Check for clogged evaporator Check pump to find cause of overload

- Actions designated with * should only be done by a **Qualified Refrigeration Service Person**. Check with factory for proper settings.

