

TURMOIL

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INSTALLATION, MAINTENANCE and OPERATION MANUAL

MODEL OC-150 R

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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.

UNPACKING & 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

All *OC-R* coolers are designed for indoor operation in a clean industrial environment. The units are air cooled. Air intake is at the front of the unit and warm air discharge is at the rear. The unit must be placed in an area where air intake and discharge are not impeded. Lack of adequate cool air will cause a reduction in cooling capacity and/or completely shutdown the refrigeration compressor. The cooler is provided with an air intake filter. This filter must be kept clean.

DESCRIPTION

TURMOIL *OC-R* coolers are designed to provide a continuously circulating supply of clean, water based coolant. The *OC-R* is a completely self-contained cooler consisting of a reservoir, digital temperature controller, circulating pump and air cooled refrigeration system. After the cooler is filled coolant and the proper electrical and plumbing connections are made, the *OC-R* will operate virtually maintenance free, supplying cooling fluid at constant temperature and pressure.

OC-R coolers are designed for use indoors in a clean industrial environment. Ambient temperature should not fall below 55° F (13° C) or rise above 100° F (38° C).

PLUMBING HOOK-UP

Make hose connections to the 1/2" FPT fittings on the rear panel tagged DISCHARGE and RETURN. Coolant flow will be out the DISCHARGE connection. Assemble the connector fitting to the 1/2" FPT Discharge/Return fittings using thread sealing tape.

COOLANT

A mixture of distilled water and glycol should be used in the coolant system. A coolant conditioner is also recommended to protect the machine tool and coolant system from corrosive attack and mineral scale deposits. A mixture of 30% ethylene glycol to 70% distilled water is suggested. Check with the machine tool manufacture for source and type of coolant. ***DO NOT USE AUTOMOTIVE ANTI-FREEZE AS COOLANT.***

SYSTEM FILLING

Remove the fill port cap located on the top panel and fill the reservoir with clean cooling fluid. Fill the tank to the top of the level gauge. The coolant tank holds 8 gallons of coolant. Do not overfill. After the cooler has operated for a few minutes, add more coolant as necessary to fill the tank.

ELECTRICAL HOOK-UP

See electrical diagram attached. Check nameplate tan for proper voltage, hertz and phase. The supply voltage must be within 10% of the rated voltage on the tag. Make power connections to the terminals tagged L1 and L2 provided on the fuse block in the electrical enclosure at the rear of the cooler. Connect ground to the grounding terminal provided. This cooler is supplied with a HIGH TEMPERATURE interlock (terminals #20 and #21), a LOW FLOW fault interlock (terminals #22 and #23) and a LOW LEVEL interlock (terminals #24 and #25). The interlock contacts open on fault. Check for loose wires.

TEMPERATURE CONTROLLER

This cooler is supplied with a digital temperature controller (CTC-106) mounted on the front panel. The controller is factory adjusted to maintain a coolant reservoir temperature of 24°C (75°F). The set point is not adjustable. The controller will alternate flashing the set point temperature (S) and the actual temperature (C). See the attached instruction sheet for operating this controller.

START-UP

Once the cooler has been filled with coolant and the proper plumbing and electrical connections have been made and the rotary disconnect switch turned to the ON position, it can be started by turning the PUMP ON/OFF switch on the front panel to the ON position. When the switch is turned to the ON position, an internal green PUMP ON light will energize and the pump, compressor and fan will start and run continuously.

Immediately upon start-up, check the pump prime by viewing the discharge pressure gauge. If the pump is primed and pumping coolant the gauge should show pressure. If the gauge does not show pressure, Vent the DISCHARGE line to allow trapped air to escape. Do not run the pump for more than 15 seconds without flow. After operating the pump for several minutes to allow the coolant to fill the complete coolant loop, add more coolant as necessary to fill the coolant tank.

OPERATION

When the PUMP ON/OFF switch on the front panel is turned to the ON position, the pump, compressor and fan will start and run continuously. The temperature controller will also energize and alternately display the set point and coolant temperatures (See controller instructions).

When the controller calls for cooling, the solenoid valve on the liquid line is open and refrigerant flows through the expansion valve to absorb heat and evaporate in the evaporator heat exchanger. When the controller calls for heating, the solenoid valve on the liquid line

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closes, stopping the flow of refrigerant to the expansion valve. The compressor keeps pumping refrigerant out of the evaporator causing the suction pressure to drop. When the suction pressure drops to about 25 psi, the hot gas bypass valve opens, allowing hot refrigerant gas to bypass the condenser and enter directly into the evaporator where it is cooled by the circulating coolant. The cooler should now be ready for continuous operation.

PUMP PRESSURE

The coolant is circulated at a rate of 6 GPM by a regenerative turbine type pump. An adjustable pressure relief bypass valve has been installed in the discharge line to limit the maximum pump pressure that can be developed. The factory set pressure limit is 60 psi. To adjust the discharge pressure, turn the adjustment stem on the relief valve clockwise to increase pressure and counterclockwise to decrease pressure.

HIGH/LOW PRESSURE SWITCH

The compressor is protected from excessively high discharge pressure or low suction pressure by a High/Low pressure switch (H/L PS) mounted inside the cabinet. High head pressure can be caused by a dirty condenser or by too little air flow through the condenser. Low suction pressure can be caused by loss of refrigerant charge, operating at too low an outlet temperature (below 50° F), a faulty solenoid valve, or too little flow of oil through the evaporator.

The High/Low Pressure Switch is factory set as follows:

Head Pressure - Cut Out	250 psi
Low Pressure - Cut In	35 psi
Differential	25 psi

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 oil temperature or has a low refrigerant charge.

If the cooler shuts down on the High Pressure switch, it will stay off until the Blue reset button on the High/Low pressure switch is pushed in. If the cooler goes out on High Pressure, most likely the condenser or the condenser filter is clogged or blocked.

INTERLOCKS

The cooler is supplied with safety interlocks to prevent damage to the spindle if there is a malfunction with the cooler. The interlocks are contacts that open on fault.

HIGH TEMPERATURE INTERLOCK

The temperature controller is factory set to open K2 contacts across terminals #20 and #21 when the coolant temperature exceeds 10° F above the set-point. The High Temperature limit differential is adjustable. See controller instructions.

LOW FLOW INTERLOCK

The cooler is supplied with a flow switch mounted in the RETURN line. If the flow of coolant returning to the cooler drops below 2 GPM, the contacts across terminals #22 and #23 will open

LOW LEVEL INTERLOCK

The cooler is supplied with a level switch (LS) mounted in the side of the coolant tank. If the coolant level in the tank drops below the switch, the contacts across terminals #24 and #25 will open.

MAINTENANCE

Air cooled OC-R coolers pull substantial amounts of air through the front panel and across a fin coil refrigerant to air heat exchanger. A cleanable air filter has been provided but a build up of dust or debris on the heat exchange fins will interfere with the transfer of heat and prevent proper operation of the system. Normally, periodic vacuuming of the front condenser fins will prevent a loss of cooling capacity. It is recommended that a visual inspection be made monthly after initial installation. Vacuum accumulated dust when necessary. Clean the air filter when needed.

Once each week check the coolant level in the system reservoir. Replenish as required any loss to evaporation. The coolant must be kept clean, and should be changed every 2000 hours of operation or at least once a year.

TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
Cooler runs excessively	A. Dirty Air Filter B. Blocked Air Flow C. Low Refrigerant Charge D. Cooler Undersized	Clean Remove Blockage Repair (Call Factory) Check Heat Load
Cooler operative but not cooling	A. Condenser Clogged B. Low Refrigerant Charge C. Flow Blockage D. Faulty pump	Clean Repair (Call Factory) Repair Repair / Replace
Cooler inoperative	A. Faulty Power Source B. Faulty compressor C. Faulty controller D. Faulty Switch	Check & Correct Replace Replace Replace
Coolant leaking	A. Loose connection B. Faulty pump seal	Repair Repair
No Coolant Flow	A. Faulty pump B. Pump bypass set too low C. Obstruction in lines	Repair or Replace Adjust to 38 psi Repair