



**Compressed Air System Products**

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INSTALLATION, OPERATION AND MAINTENANCE  
INSTRUCTIONS FOR  
AIR-COOLED AFTERCOOLERS

8/2002

**IMPORTANT!!**

When crate is removed from your air-cooled aftercooler carefully inspect the cabinet and finned coil surface for damage. IMMEDIATELY report any damage to the transportation company's agent who should make a notation to that effect on the bill. The bill should then be forwarded to the distributor from which the equipment was purchased. If possible, include the invoice number of all orders.

## **ASSEMBLY**

Assemble legs (if required) to the aftercooler with bolts, nuts, lock washers or screws provided. Be careful not to damage the finned coil surface during assembly and installation of the aftercooler.

## **GENERAL SAFETY INFORMATION**

1. Do not operate aftercooler at pressures greater than indicated maximum working pressure.
2. Do not touch compressor discharge line or aftercooler inlet manifold while compressor is in operation. Serious burns could result.
3. Release all pressure from the system prior to installing aftercooler or servicing components after installation.
4. Do not operate the aftercooler with fan guard(s) removed. Disconnect power/air supply prior to removing fan guard(s).
5. Fuse, wire and disconnect sizes listed on electric units are in accordance with the current NEC. All wiring must, however, comply with all local codes. Unit MUST be grounded with appropriately sized ground wire. Connect to ground wire located inside watertight junction box located on outside of cabinet.
6. A pressure relief valve with a relieving capacity greater than the compressor capacity MUST be installed between the compressor discharge and all bypass piping valves.

## **INSTALLATION**

All models may be installed indoors or outdoors. Where outdoor temperatures fall below freezing (32°F), a low ambient fan control kit is required.

For units installed outdoors where ambient temperatures fall below freezing (32°F), special low ambient fan control kits are required. These kits include temperature-sensing thermostats to cycle fan motors off when predetermined ambient temperatures are reached. **IMPORTANT!! CUSTOMER MUST SUPPLY SELF REGULATING HEAT TAPE TO WRAP INLET/OUTLET HEADERS AND SEPARATORS TO PREVENT FREEZING. HEAT TAPE MUST HAVE SEPARATE POWER SUPPLY!!**

Install the aftercooler as close to the compressor discharge as possible.

**Be sure to** install the aftercooler in a well ventilated area. The ambient airflow enters the back of the finned coil and exhausts through the fan guard at the front of the aftercooler. (On vertical draft models air enters the bottom and exits through the fan guards at the top.) The clearance between the finned coil

inlet and nearest obstruction (wall, floor, etc.) should be, as a minimum, equal to the diameter of the fan(s) \*(see specifications for fans diameter size). The air discharge must not be obstructed to permit continuous circulation of cool ambient air through the finned coil.

For indoor installation adequate ventilation of the location MUST be provided to prevent heat build up when the aftercooler is in operation. Remember, the aftercooler is designed to cool the compressed air to within 5°F to 30°F of the ambient air entering the finned coil. As the ambient air temperature increases, so does the temperature of the compressed air leaving the aftercooler. Outdoor installations are recommended, wherever possible to insure adequate ventilation.

All piping must, as a minimum, be equal to the inlet-outlet size of the aftercooler. Bypass piping to include isolation valves and safety valves must be installed to permit maintenance on the aftercooler and/or separator-drain.

A flexible line type vibration absorber must be installed at the aftercooler inlet to prevent damage to the aftercooler manifolds and finned coil or the unit warranty will be voided.

A separator must be installed at the aftercooler outlet to remove water condensed from the compressed air as it is cooled or the unit warranty will be voided.

Remember, a floor drain must be provided to collect this water as it is ejected from the drain discharge.

The aftercooler cabinet and supporting legs are designed to support only the weight of the aftercooler. DO NOT support piping with braces attached to the legs of cabinet. All piping MUST be supported from the floor or ceiling as illustrated.

Mounting holes are provided in each leg base for bolting to a LEVEL floor or structural steel support.

**Note: For units with air motors - Adjust motor(s) using regulator(s) between 60 - 100 psig.**

### **WIRING (electric motors only)**

All motors have built-in thermal overload protection and are suitable for outdoor installation. All motor wiring is terminated inside a NEMA 3R (watertight) junction box mounted on the outside of the cabinet for easy access. A ground wire connection is provided. If the unit is to be installed outdoors use "Sealtite" conduit with watertight electrical connectors.

It is recommended a separate fused disconnect switch be provided for the aftercooler to enable all power to the unit to be disconnected in the event maintenance is required and it is necessary to operate the compressor during this period of time.

The aftercooler fan motors may be interlocked with the air compressor starter if desired. Smaller units with a total current draw less than 10 amperes may be wired through a normally open contact located on the air compressor magnetic starter.

Larger units with a greater current draw or with single-phase motors (230V or 460V) wired for connection to a three-phase power supply may be wired through a contactor of suitable size.

The contactor holding coil may then be wired in parallel with the air compressor starter holding coil or connected to a normally open auxiliary contact located inside the air compressor magnetic starter.

This procedure ensures the aftercooler fan motors will operate only when the air compressor operates.

For units installed outdoors where ambient temperatures fall below freezing (32°F), special low ambient fan control kits are required. These optional kits include temperature-sensing thermostats to cycle fan motors off when predetermined ambient temperatures are reached.

All aftercoolers with 460 volt phase motors include contactors to control fan motors and a transformer to provide power to the heat tape (460 volt heat tape not available).

Remember, all aftercoolers with two or more 230 or 460 volt motors may be ordered with fan motors wired for connection to three phase 230 or 460 volt power supplies.

**IMPORTANT** all wiring diagrams are typical, consult the wiring diagram provided with each aftercooler for specific wiring instructions.

## **OPERATION**

Your air-cooled aftercooler has been designed to remove the heat of compression from the compressed air discharged from your air compressor(s) and remove approximately 70% of the moisture contained in the compressed air. The temperature of compressed air discharged from a two stage reciprocating compressor is approximately 350°F. Single stage compressor discharge temperatures may exceed 430°F.

Rotary screw and rotary vane compressors normally operate with a discharge temperature 100°F above ambient. These temperatures must be reduced to remove moisture from the compressed air. When air dryers (refrigeration, deliquescent or desiccant type) are included in a compressed air system it is mandatory to reduce the compressed air inlet temperature to the dryer to 100°F or less to permit the dryer to function properly.

Compressed air enters the aftercooler inlet and makes multiple passes through the copper tubes due to serpentine circuiting of the copper tubes. The copper tubes include multiple aluminum fins with full collars to insure a mechanical bond to the copper tubes. These fins provide a large amount of secondary surface to further improve the heat transfer from the compressed air to the ambient air.

This ambient air is pulled into the finned coil by an axial flow fan direct driven by the motor(s). Heat from the compressed air is transferred through the copper tubes and aluminum fins to the ambient air and discharged to the atmosphere. No cooling water, pump, etc. required.

Units with air motors require adjustment to the regulator to approximately 25 psig. The fans are designed to run between 1075 and 1140 RPM. Adjust the RPM by adjusting the airflow rate. This adjustment is made by adjusting the ball valve at the air motor discharge and reading the speed of the motor with a tachometer.

## **MAINTENANCE**

Little maintenance is required with an air-cooled aftercooler.

The most important maintenance consideration is keeping the cooling coil surface free from dirt. Large quantities of lint, dust, etc. will clog the aluminum fins and drastically impair heat transfer from the finned coil to the ambient air. Clean the coil on a REGULAR schedule using compressed air to "blow off" accumulated dust. DO NOT use stiff bristle brushes since the aluminum fins are easily damaged.

If finned surfaces become clogged with oil laden particles that are not easily removed, the finned coil may be steam cleaned. Remove all open type motors when this cleaning operation is performed.

The interior of the copper tubes may become dirty or clogged if large amounts of oil are present in the compressed air discharged from the compressor. These deposits may be removed by disconnecting inlet and outlet connections and pumping any degreasing grade solvent through the copper tubes. Be certain the solvent will not harm copper or aluminum and is safe for use by maintenance personnel. If it is not possible to clear tube interiors in this manner, the entire coil may be removed from the cabinet and taken to a radiator shop for cleaning. This should never be necessary if copper tubes are inspected on a regular basis to determine if clogging is a problem. If so, cleaning tube interiors with a degreasing grade solvent, also on a regular basis, will prevent complete clogging of the tubes.

Check separator drains on a daily basis to be certain they are operational. All automatic drains are highly susceptible to clogging in the presence of dirt and oil and should be cleaned regularly. If a drain clogs, all water separated from the compressed air will pass downstream.

Should a leak occur in one of the copper tubes within the coil or where copper tubes are connected to inlet-outlet manifolds they can be repaired using silver solder. Use of a flexible vibration absorber and proper installation in accordance with this manual will drastically minimize the possibility of leaks occurring.

All electric motors are permanently lubricated and require no maintenance. Filters, regulators, and lubricators on air motor units require periodic changes of the filter elements and refills of lubricant. Replacement fans, motors, and fan guards are available. When ordering parts always include the unit model and serial number which may be found on a nameplate attached to the outside of the cabinet. The product brochure will provide specifications and performance data for each model.

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#### **AIR/TAK WARRANTY POLICY**

***Air/Tak products will be warranted to be free from defects in materials and workmanship for a period of one year from date of shipment or up to one year from the verified date of installation not to exceed 15 months. Date of installation will be verified upon receipt of the completed Warranty Registration Card. All Air/Tak refrigerated dryers will additionally be warranted on parts only (excluding fan motors and drain valves) for a period of two years from the date of shipment. Also, deliquescent and regenerative air dryer***

*pressure vessels and refrigerated air dryer heat exchangers have a 5-year prorated warranty.*

*All damaged pressure vessels and heat exchangers returned to AIR/TAK for warranty consideration must be returned freight prepaid. Warranty will be determined after factory inspection. Failure to return a damaged heat exchanger or pressure vessel will result in warranty denial.*

*Repairs, adjustments, parts, etc. are limited to actual labor cost provided that such defects are promptly reported and approved following AIR/TAK's warranty procedures. In no event shall the cost of repairs exceed the actual cost of materials and labor.*

*AIR/TAK or its representatives reserve the right to decide which warranty items are authorized. AIR/TAK shall not be liable for incidental or consequential damages that may result from a breach of the warranty described above.*

*For more information on warranty policies and procedures, contact your authorized AIR/TAK Distributor.*

**COMPRESSED AIR SYSTEM FILTERS \* AIR-COOLED AFTERCOOLERS  
REFRIGERATED AIR DRYERS \* CAD COMBINATION AFTERCOOLER DRYER SYSTEMS  
RAD-PAK REFRIGERATED AIR DRYER/FILTER PACKAGES \* HEATLESS REGENERATIVE AIR DRYERS  
HLD-PAK HEATLESS REGENERATIVE AIR DRYER/FILTER PACKAGES  
BLOWER PURGE REGENERATIVE AIR DRYERS \* EXTERNALLY HEATED REGENERATIVE AIR DRYERS  
AIR CHILLERS \* FLUID CHILLERS**

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