

INSTALLATION, OPERATION, AND MAINTENANCE MANUAL

This manual provides general guidance for the receipt, installation, operation, and maintenance of the product. By following these instructions, the air cooler will perform as expected for many years. If you have specific questions about the product, please contact a company representative at +1 713-780-7184 or send an e-mail to support@eadscooling.com.

RECEIVING

Upon receipt of the equipment, a receiving inspection shall be conducted prior to unloading. Particular attention shall be focused on damage where the product is strapped or chained to the trailer. The lifting lugs shall be inspected to ensure that there is no damage that will compromise the integrity of the material. The top of the unit shall be inspected to verify that no damage has occurred, with particular attention to the finned tubes and louvers, if installed.

Any damage shall be identified on the shipping documents prior to signing and unloading.

Ship loose components identified in the shipping documents shall be verified upon receipt. Small parts are typically stored inside the plenum of the air cooler. Larger ship loose items will be identified with the OEM serial number and may be banded together and/or palletized.

LIFTING

If included, the lifting lugs are uniquely designed for the equipment on which they are installed. Do not attempt to use lifting lugs from another product.

Spreader bars are required. (**NOTE:** All spreader bars and rigging shall be supplied by others.)

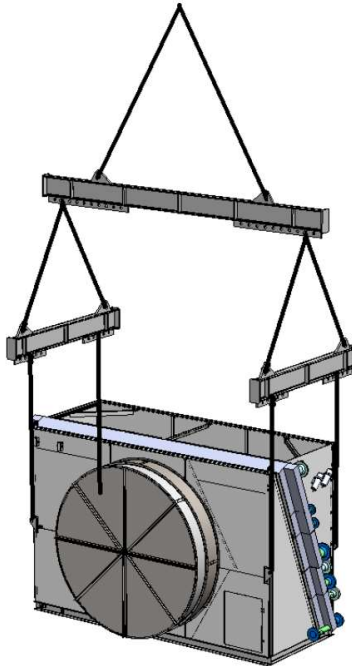
Refer to the specific general arrangement drawing for weight and dimensions of the air cooler.

CAUTION: IN CASES WHERE COOLING BUNDLE LIFTING LUGS ARE INSTALLED, THESE SHALL NOT BE USED TO LIFT THE ENTIRE AIR COOLER.

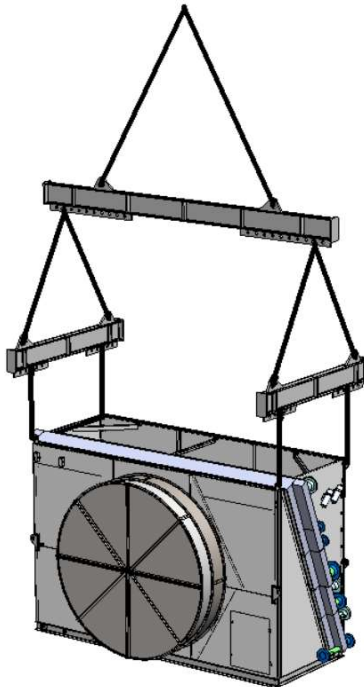
LIFTING DIAGRAM:

The following diagrams are typical for Eads Cooling Solutions:

Model EX

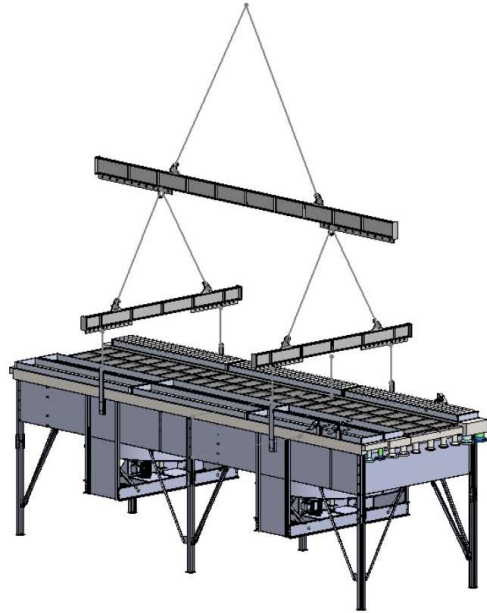


STANDARD LIFT FROM MID POINT – LIFTING LUGS SHALL BE USED FOR VERTICAL LIFT ONLY



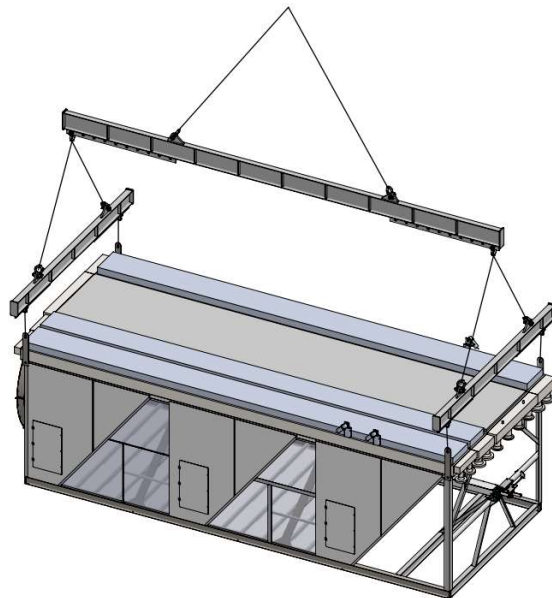
ALTERNATE LIFT FROM TOP – LIFTING LUGS SHALL BE USED FOR VERTICAL LIFT ONLY

Model 2ZX



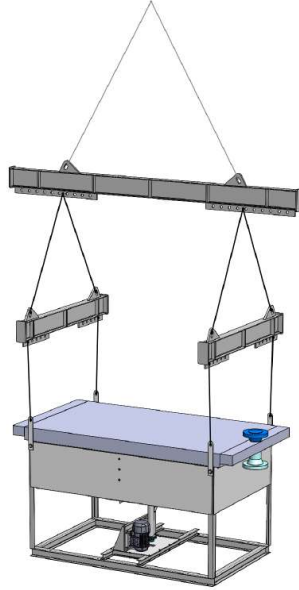
LIFTING LUGS SHALL BE USED FOR VERTICAL LIFT ONLY

Model FX



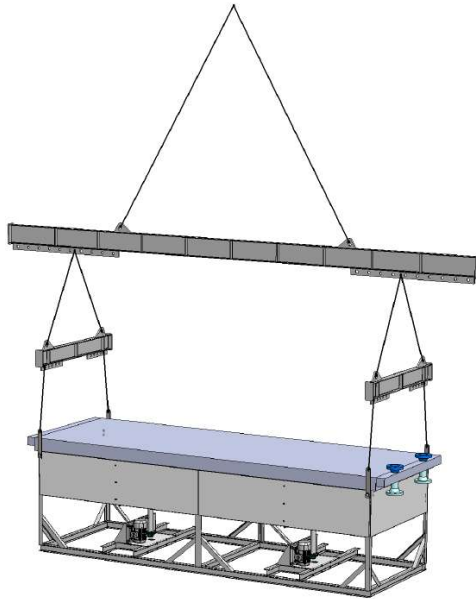
LIFTING LUGS SHALL BE USED FOR VERTICAL LIFT ONLY

Model HX



LIFTING LUGS SHALL BE USED FOR VERTICAL LIFT ONLY

Model 2HX



LIFTING LUGS SHALL BE USED FOR VERTICAL LIFT ONLY

INSTALLATION

Air coolers rely on an adequate amount of airflow during operation, so it is important to position each air cooler far enough away from nearby structures or other equipment so that airflow is not restricted and excessive air recirculation is not present.

When the air cooler is installed for operation, it is required to ensure that it is level. After installation and prior to operation, it is critical to verify that the structure has not been deformed causing interferences between rotating components, such as fans or shafts, and the structure.

STORAGE

If the air cooler will be stored for a period in excess of six (6) months, additional precautions shall be considered in order to adequately preserve the components.

Contact Eads Cooling Solutions to request the recommendations for a particular air cooler.

SAFETY PRECAUTIONS

All guards shall be installed prior to start-up and during operation.

Prior to removing or opening access panels or doors, the air cooler and engine, if used to operate the air cooler, shall be shut down, and a lockout / tagout procedure shall be followed.

The operating temperature for the cooling bundles may be excessive during and immediately after operation, so caution shall be taken to prevent operating and maintenance personnel from coming in contact with the hot surfaces.

Prior to attempting to tighten or loosen header plugs, all pressure shall be relieved from the cooling bundle to prevent harm to operating or maintenance personnel.

OPERATION

Prior to start-up, the operator shall conduct a thorough inspection to verify that all components are in satisfactory operating condition and to ensure that all fasteners are tight. Particular attention shall be applied to rotating components, such as fans, shafts, bearings, belts, and sheaves.

MAINTENANCE

To prevent untimely shutdowns and to increase the longevity of the air cooler, it is critical to periodically monitor and maintain the air cooler and its components. These items include but are not limited to the following:

HEADER PLUGS:

Header plugs are typically installed opposite each tube of the cooling bundle.

Some header plugs include tapered threads in which case the threads seal the plug hole. In cases of minor plug leaks with this type of header plug, this can normally be resolved by tightening the plug. If this is unsuccessful, contact Eads Cooling Solutions for further guidance. (**CAUTION:** DO NOT ATTEMPT TO REMOVE OR TIGHTEN HEADER PLUGS WHILE THE COOLING BUNDLE IS UNDER PRESSURE.)

In other cases, the header plugs include straight threads, and a gasket is installed between the head of the plug and the header. The gasket, not the threads, seals the plug hole. In cases of minor leaks with this type of header plug, this can normally be resolved by tightening the plug. If this is unsuccessful, it may be necessary to replace the gasket and plug. (**CAUTION:** DO NOT ATTEMPT TO REMOVE OR TIGHTEN HEADER PLUGS WHILE THE COOLING BUNDLE IS UNDER PRESSURE.)

If a header plug (with straight threads) is removed, the header plug, plug hole threads, and spot face on the header shall be visually inspected for excessive damage. Damage to the threads in the plug hole can normally be resolved by chasing the threads with a tap. If excessive damage is present on the threads on the plug or on the surface in contact with the gasket (on the underside of the head of the plug), the plug should be replaced. If the spot face on the header includes excessive damage, it may be addressed by re-machining the spot face. (**NOTE:** A new gasket shall be installed on any plug that has been removed. Additionally, the threads of the header plug shall be coated with a thread lubricant or anti-seize compound prior to reinstallation of the header plug.)

Contact Eads Cooling Solutions for questions concerning torque requirements.

TUBES:

In most cases the tubes in the cooling bundles are sealed into the header by a mechanical expansion of the tube wall. If a leak develops in the tube to tube sheet joint, this may be resolved by additional expansion of the tube wall. (**CAUTION:** SPECIAL CARE SHALL BE TAKEN TO PREVENT OVER EXPANSION OF THE TUBE WALL.)

If this is unsuccessful or if a leak develops in the tube wall, a seal pin may be installed in each end of the tube to seal the joint and prevent fluid from entering that tube. (**CAUTION:** TO PREVENT SIGNIFICANT CONSEQUENCES FOR THE COOLING CAPABILITY, THE QUANTITY OF SEAL PINS SHOULD BE LIMITED.)

Contact Eads Cooling Solutions for instructions for properly installing seal pins.

Tubes should be inspected periodically for internal corrosion. If tubes begin to corrode, the user should consider replacing the tubes or entire cooling bundle.

Tubes should be inspected periodically for fouling. The internals may be cleaned by mechanical means, with the use of an appropriate chemical, or by pressure washing.

FINS:

The external fins on the tubes of the cooling bundles shall be visually inspected periodically for damage. Minor damage can be addressed by utilizing a fin comb to straighten the fins.

The fins should also be inspected periodically for excessive dirt and other debris.

Contact a local contractor for cleaning options.

HEADERS:

Headers are installed on each end of each cooling bundle and are designed for a specific pressure and temperature.

Each header should be inspected periodically for corrosion. If corrosion is apparent, the operator shall ensure that the corrosion does not exceed the amount specified on the specific data sheet. When the corrosion exceeds that of the design, the cooling bundle shall be replaced.

In cases where there are multiple design conditions, the nameplate will identify the maximum allowable pressure with a corresponding temperature, corrosion allowance, etc., as applicable. The operator shall ensure that the product is not operated in excess of any of the design conditions.

When an ASME stamp is included, any modification to a header shall be conducted by a company that is certified for repairs and alterations.

STRUCTURE:

The structure shall be visually inspected periodically to ensure that all bolts and nuts are tight.

The structure shall be visually inspected periodically for damage or other defects that develop over time.

FANS:

Fans shall be inspected prior to start-up to verify that all bolts, nuts, and set screws are tight and that there is proper clearance between each fan blade and the fan ring. The fan blade angle (or pitch) should also be verified. (Refer to the specific data sheet for the fan blade pitch.) After start-up, additional inspections should be conducted according to the fan manufacturer's instructions.

BEARINGS:

Bearings shall be inspected prior to start-up to verify that all bolts, nuts, and set screws are tight.

Although the lubrication lines and bearings were filled by the OEM, add fresh grease prior to start up until grease shows at each bearing seal. Refer to the bearing manufacturer's instructions for recommendations for the type of lubrication.

At a minimum, lubricate bearings monthly unless conditions require more frequent lubrication. Refer to the bearing manufacturer's instructions to determine if more frequent lubrication is needed.

During long idle periods, rotate the shaft at least once a month to distribute the grease and add fresh grease as needed.

SHAFT COUPLINGS, IF INCLUDED:

Shaft couplings shall be inspected prior to start-up to verify that all bolts, nuts, and set screws are tight. If a shaft coupling with a rubber element is utilized, the rubber element should be visually inspected periodically to ensure that no visible damage or excessive wear is present. When installing a replacement shaft coupling, refer to the shaft coupling manufacturer's instructions.

ELECTRIC MOTORS, IF INCLUDED:

In some cases, electric motors are utilized for operating the fan on the air cooler. Refer to the specific general arrangement drawing to determine if an electric motor is included. If so, the electric motor manufacturer's instructions will provide details on wiring, operation, and maintenance.

Refer to the electric motor manufacturer's instructions for recommendations for the type of lubrication and guidance for determining the lubrication schedule.

(CAUTION: ELECTRIC MOTORS ARE SUSCEPTIBLE TO DETERIORATION AND DAMAGE DUE TO MOISTURE AS A RESULT OF CONDENSATION AND/OR PRECIPITATION DURING STORAGE OR IDLE PERIODS. IN THESE SITUATIONS, PRECAUTIONS SHALL BE TAKEN TO ENSURE THAT ELECTRIC MOTORS ARE PROPERLY PRESERVED.)

BELTS AND SHEAVES (OR SPROCKETS), IF INSTALLED:

Prior to start-up, the belt tension shall be verified according to the drive selection data sheet. After a run-in period, normally 24 hours, the belt tension shall be re-verified.

The drive system shall be inspected in intervals not to exceed three (3) months. Belt tension shall be verified and adjusted, as needed. Sheaves or sprockets shall be inspected for excessive wear and proper alignment.

RIGHT ANGLE GEARBOX, IF INCLUDED:

In some cases, right angle gearboxes are utilized to operate the fan. Refer to the specific general arrangement drawing to determine if a gearbox is included.

Refer to the gearbox manufacturer's instructions for recommendations for the type of oil and guidance for storage and maintenance of the gearbox.

VIBRATION SENSING DEVICES (OPTIONAL):

The OEM has not set the vibration sensing device shutdown conditions for the air cooler. Refer to the vibration sensing device manufacturer's instructions for properly setting the device.

(CAUTION: VIBRATION SENSING DEVICES ARE SUSCEPTIBLE TO DETERIORATION AND DAMAGE DUE TO MOISTURE AS A RESULT OF CONDENSATION AND/OR PRECIPITATION DURING STORAGE OR IDLE PERIODS. IN THESE SITUATIONS, PRECAUTIONS SHALL BE TAKEN TO ENSURE THAT THE DEVICES ARE PROPERLY PRESERVED.)

LOUVERS (OPTIONAL):

In some cases, louvers are installed at the air intake or discharge of the cooling bundles. The louvers may operate either manually or automatically. Refer to the specific general arrangement drawing to determine if louvers are included and whether they are manual or automatic.

In cases where the louver operator is removed for shipment, louvers are typically secured in the closed position with a locking mechanism that is attached to the louver torque rod. The locking mechanism shall be removed prior to reinstallation of the operator and operation of the louvers.

Although the louver operation was tested by the OEM, verify proper operation and make adjustments to the linkage prior to start-up if required.

ACTUATORS / OPERATORS (OPTIONAL):

In some cases, actuators / operators are utilized for operation of louvers. Unless otherwise specified on the general arrangement drawing, the actuator / operator is set up to open the louvers upon air failure.

Refer to the actuator / operator manufacturer's instructions for additional information.

REPLACEMENT OR SPARE PARTS

Typical recommended spare parts include the following:

- Fan
- Motor, when applicable
- Bearings
- Belts, when applicable
- Header Plugs
- Header Plug Gaskets

To ensure that the air cooler operates to its full potential, it is recommended that any replacement part is acquired from the OEM. For inquiries for replacement or spare parts, please contact Eads Cooling Solutions at +1 713-780-7184.