COLW Series

CORE ASSEMBLY/ MOTOR SERVICE

Installation

The satisfactory use of this heat exchange equipment is dependent upon precautions which must be taken at the time of the installation.

1. Connect and circulate the hot fluid in the shell side (over small tubes) and the cooling water in the tube side (inside small tubes). Note piping diagrams.
2. If an automatic water regulating valve is used, place it on the INLET connection of the cooler. Arrange the water outlet piping so that the exchanger remains flooded with water, but at little or no pressure. The temperature probe is placed in the hydraulic reservoir to sense a system temperature rise. Write the factory for water regulating valve recommendations.
3. There are normally no restrictions as to how this cooler may be mounted. The only limitation regarding the mounting of this equipment is the possibility of having to drain either the water or the oil chambers after the cooler has been installed. Both fluid drain plugs should be located on the bottom of the cooler to accomplish the draining of the fluids. Drains are on most models.
4. It is possible to protect your cooler from high flow and pressure surges of hot fluid by installing a fast-acting relief valve in the inlet line to the cooler.
5. It is recommended that water strainers be installed ahead of this cooler when the source of cooling water is from other than a municipal water supply. Dirt and debris can plug the water passages very quickly, rendering the cooler ineffective. Write the factory for water strainer recommendations.
6. Fixed bundle heat exchangers are generally not recommended for steam service. For steam applications, a floating bundle exchanger is required. Note: When installing floating bundle unit, secure one end firmly and opposite end loosely to allow bundle to expand and contract. Consult factory for selection assistance.
7. Piping must be properly supported to prevent excess strain on the heat exchanger ports. If excessive vibration is present, the use of shock absorbing mounts and flexible connectors is recommended.

Service

Each heat exchanger has been cleaned at the factory and should not require further treatment. It may be well to inspect the unit to be sure that dirt or foreign matter has not entered the unit during shipment. The heat exchanger should be mounted firmly in place with pipe connections tight.

Caution

If sealant tape is used on pipe threads, the degree of resistance between mating parts is less, and there is a greater chance for cracking the heat exchanger castings. Do not overtighten. When storing the unit, be sure to keep the oil and water ports sealed. If storage continues into cold winter months, the water chamber must be drained to prevent damage by freezing.

Performance information should be noted and recorded on newly installed units so that any reduction in effectiveness can be detected. Any loss in efficiency can normally be traced to an accumulation of oil sludge, or water scale.

Recommendations

Replace gaskets when removing end castings. It is recommended that gaskets be soaked in oil to prevent corrosion and ensure a tight seal.

Salt water should not be used in standard models. Use salt water in special models having 90/10 copper-nickel tubes, 90/10 tube sheets, bronze bonnets and zinc anodes on the tube side. Brackish water or other corrosive fluids may require special materials of construction.

When zinc anodes are used for a particular application, they should be inspected two weeks after initial startup.

At this time, by visual inspection of the anode, determination of future inspection intervals can be made, based on the actual corrosion rate of the zinc metal.

The zinc anodes must be replaced when 70% of the zinc volume has been consumed.

It may be necessary to drain the water chambers of the exchanger to protect it from damage by freezing temperatures. Drains are provided in most standard models.

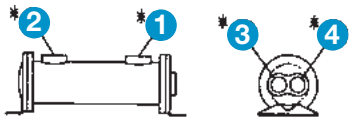
The oil chamber of the exchanger may become filled with sludge accumulation and require cleaning. It is recommended that the unit be flooded with a commercial solvent and left to soak for one-half hour. Backflowing with the solvent or regular oil will remove most sludge. Repeated soaking and backflowing may be required, depending on the degree of sludge buildup.

It may be necessary to clean the inside of the cooling tubes to remove any contamination and/or scale buildup. It is recommended that a 50/50 percent solution of inhibited muriatic acid and water may be used. For severe problems, the use of a brush through the tubes may be of some help. Be sure to use a soft bristled brush to prevent scouring the tube surface causing accelerated corrosion. Upon completion of cleaning, be certain that all chemicals are removed from the shellside and the tubeside before the heat exchanger is placed into service.

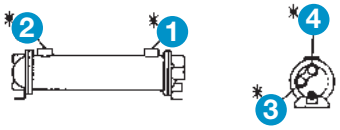
When ordering replacement parts or making an inquiry regarding service, mention model number, serial number, and the original purchase order number.

Piping Hook-up

COLW-20, 40, 20W, 40W, 80



COLW-100



1 Hot Fluid In **3 Cooling Water In**

2 Cooled Fluid Out **4 Cooling Water Out**

*Note: For all two pass and four pass heat exchangers:

connections 1 and 2 may be reversed, and

connections 3 and 4 may be reversed

with no effect on performance.

Maximum Tubeside Flow Rates Allowed

COLW 20/20W	12 GPM
COLW 40/40W	12 GPM
COLW-80	28 GPM
COLW-100	116 GPM

ttp-sales@apiheattransfer.com 1.877.274.4328

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Electrical

1. CAUTION to prevent possible electrical shock, it is important to make sure this unit is properly grounded.
2. Connect motor only to a power supply of the same characteristics as shown on the motor nameplate. Be sure to provide proper fusing to prevent possible motor burnout. Before starting motor, follow manufacturer's recommendations. Turn fan manually to eliminate possible motor burnout in the event the fan has been damaged in shipment. Observe operation after motor is started for the first time.

Maintenance

Inspect the unit regularly for loose bolts and connections, rust and corrosion, and dirty or clogged heat transfer surfaces (cooling coil).

Motor

Keep outside surface free of dirt and grease so motor will cool properly. All motors use sealed shaft bearings. As a result, they do not require greasing.

Repair or Replacement of Parts

When ordering replacement parts or making inquiry regarding service, mention model number, serial number and the original purchase order number. Any reference to the motor must carry full nameplate data.

FILTER

Installation

- Check that the pressure value of the selected filter is higher than the system's maximum operating pressure (the maximum pressure value is shown on the data plate).
- Check that the filter body contains the filter cartridge.
- Check that the operating fluid is compatible with the material of the body, cartridge, and seals.
- Secure the filter using the relevant threaded holes, to rigid brackets. Rigid installation makes it possible to unscrew the housing without introducing flexing of the hydraulic fittings, limiting any points of stress transfer. Install the filter in an accessible position for correct and trouble-free maintenance and visibility.
- Start the machine and check for the absence of oil leaks from the filter and relative fittings.
- Repeat the visual inspection when the system arrives at the operating temperature of the oil.

Maintenance

- All maintenance operations must be performed only by suitably trained personnel.
- The hydraulic system must be depressurized before performing maintenance operations (except in the case of LMD duplex filters)
- Maintenance must be carried out using suitable tools and containers to collect the fluid contained in the filter body. Spent fluids must be disposed of in compliance with statutory legislation.
- Do not use naked flames during maintenance operations.
- Use the utmost caution in relation to the temperature of the fluid. High temperatures can lead to residual pressure with resulting undesirable movements of mechanical parts.

Changing the Filter Element

- The date on which the filter elements are changed must be entered in the machine datasheet.
- Spare parts installed must be in compliance with the specifications given in the machine operating and maintenance manual.
- Filter bodies and tools must be thoroughly cleaned prior to each maintenance operation.
- After having opened the filter to change the filter element, check the condition of the seals and renew them if necessary. Clean thoroughly before reassembling.

Changing the Filter Procedure

- Depressurize the system and clean the filter.
- Unscrew the oil drain plug collecting the fluid in a suitable container. When the operation is terminated, screw the plug by tightening it fully down and check the condition of the seal. Unscrew housing using the appropriate tools and extract the filter element.
- Collect the spent oil and cartridge in a suitable container and dispose of them in compliance with statutory legislation
- ***WARNING!*** To avoid damaging the components, clean seals, surfaces, and threads of the housing and the head.
- Lubricate the filter element seal with the operating fluid. Insert the filter element in the filter housing. Insert the cartridge in the head spigot.
- Check the condition of seals if renewing, lubricate the new seals with the operating fluid before installing.
- Screw the housing onto the head using the correct tool. WARNING: Screw the housing fully home into the head. DO NOT APPLY EXCESSIVE TIGHTENING TORQUE.
- Start the machine and check for the absence of leaks. Repeat the check when the machine has reached its operating temperature.

PUMP SERVICE

Corrosion

Fretting: To reduce the corrosion due to fretting effect we recommend to grease the motor shaft with dedicated products (samples: lubricants based on MoS2, Loctite® 8008, Molykote® G-n plus, Turmopast® MA2).

Fretting: To reduce the corrosion due to fretting effect, we recommend to check the electric motor ground connection and to check that the shaft residual currents are within the norms.

Leakage Prevention: In case of wear of shaft seal to avoid leakage, all pump flanges with hallow shaft have a threaded ¼" gas thread that can be used for drainage connection to the tank

Piping/Valves

- Piping connected to pump MUST be independently supported and not allowed to impose strains on pump casing including allowing for expansion and contraction due to pressure and temperature changes.
- To prevent foaming and air entrainment, all return lines in re-circulating systems should end well below liquid surface in reservoir. Bypass liquid from relief pressure and flow control valves should be returned to source (tank, reservoir, etc.), NOT to pump inlet line.
- Shut-off valves should be installed in both the suction and discharge lines so pump can be hydraulically isolated for service or removal. All new piping should be flushed clean before connecting to pump
- **Pipe strain will distort a pump. This could lead to pump and piping malfunction or failure.**
- **Return lines piped back to pump can cause excessive temperature rise at pump which could result in catastrophic pump failure.**
- Use relief valves to protect pumps from overpressure. They need to be connected to pump discharge lines as close to pumps as possible and with no other valves between pumps and relief valves. Relief valve settings should be set as low as practical.

COLW Series *continued*

- DO NOT set relief valve higher than maximum pressure rating of pump, including pressure accumulation at 100% bypass. Relief valve return lines should NOT be piped into pump inlet lines because they can produce a loop that will overheat pump. This pump is a positive displacement type. It will deliver (or attempt to deliver) flow regardless of back-pressure on unit. Failure to provide pump overpressure protection can cause pump or driver malfunction and/or rupture of pump and/or piping.

Suction Line/ Suction Strainer/Filter

- The suction line should be designed so pump inlet pressure, measured at pump inlet flange, is greater than or equal to the minimum required pump inlet pressure (also referred to as Net Positive Inlet Pressure Required or (NPIPR). Velocity in suction line should be kept within 1.6-4 ft/s (0,5-1,2 m/s). Suction line length should be as short as possible and equal to or larger than pump's inlet size. All joints in suction line must be tight and sealed. If pump cannot be located below liquid level in reservoir, it necessary either to position the suction or install a foot valve so liquid cannot drain from pump while it is shut down. When pump is mounted vertically with drive shaft upward, or mounted horizontally with inlet port opening other than facing upward, a foot valve or liquid trap should be installed in suction line to prevent draining. The suction line should be filled before pump start-up.
- DO NOT operate the pump without liquid or under severe cavitation
- Pump life is related to liquid cleanliness. Suction strainers or filters should be installed in all systems to prevent entry of large contaminants into pump.
- The purpose of a suction strainer or filter is for basic protection of internal pumping elements. It should be installed immediately ahead of inlet port. This location should provide for easy cleaning or replacement of strainer element. Appropriate gages or instrumentation should be provided to monitor pump pressure. Pressure drop across a dirty strainer must not allow inlet pressure to fall below NPIPR. The pressure drop across the strainer should preferably not exceed 1.45 PSIG (0,1 BAR) at maximum flow rate and normal operating viscosity. General guidelines for strainer sizing are as follows:
- When pumping relatively clean viscous liquids (over 1000 cSt), use 10 to 12 mesh screens or those with about 1/16 inch (1,5mm) openings.
- When pumping relatively clean light liquids such as distillate fuels, hydraulic oil and light lube oils, use suction strainers of 100 to 200 mesh.
- When pumping heavy crude oils, use 5 to 6 mesh strainer screens or those with or about 1/8 inch (3mm) openings.
- When pumping relatively clean distillate fuels in high pressure fuel supply systems, use 25 micron “absolute” filters for three screw pumps and 10 micron “absolute” filters for gear pumps.
- Make sure size/capacity of strainer or filter is adequate to prevent having to clean or replace elements too frequently.

Gauges

Pressure and temperature gauges are recommended for monitoring the pump’s operating conditions. These gauges should be easily readable and placed as close as possible to pump’s inlet and outlet flanges

Pumped Liquids

NEVER operate a pump with straight water (water/glycol is okay). The pump is designed for liquids having general characteristics of oil. In closed or re-circulating systems, check liquid level in tank before and after start-up to be sure it is within operating limits. If initial liquid level is low, or if it drops as system fills during start-up or pumping operations, add sufficient clean liquid to tank to bring liquid to its normal operating level. Only use liquid recommended or approved for use with the equipment. Regular checks should be made on the condition of the liquid. In closed systems, follow supplier’s recommendations for maintaining liquid and establishing when liquid is to be changed. Be sure temperature is controlled so liquid cannot fall below its minimum allowable viscosity which occurs at its maximum operating temperature. Also, ensure that maximum viscosity at cold start-up does not cause pump inlet pressure to fall below its minimum required value.

NEVER operate a pump without liquid in it!

Operate only on liquids approved for use with pump.