

**ECOSAIRE<sup>®</sup>**

***INSTALLATION  
OPERATION &  
MAINTENANCE  
INSTRUCTIONS***

**AIR COOLED CONDENSER**

**SERIES: KCG-KMG-KVG**

**FLUID COOLER**

**SERIES: GCD-GMD-GLD-GVD**



## **INSTALLATION**

### **INSPECTION**

If the unit has been damaged in transit, notify the carrier and file a claim with the carrier as soon as possible.

### **APPLICATION**

- Air Cooled Condensers series CCD, CMD, CLC, and CID are designed for refrigerant condensing of refrigeration and air conditioning systems. They can be manufactured for single or multiple circuits for single or multiple compressors.
- Fluid coolers series FCD, FMD, FLD and FID are designed to cool glycol, oil or any other fluid that is not corrosive to copper and will not let the leaving air temperature exceed 140°F (60°C).
- Heat recovery unit series HCD and HMD are designed to recover heat from refrigeration system in warehouse or shipping area.

### **HANDLING**

Attention: Do not use forklift truck to handle units. Use only chains with hooks and spread bars to lift units.

When a unit is shipped on its side, two or three hangers are installed. Use them to unload the unit from the truck. A lift truck can be used with the wood base in that position only to lower the unit on the ground.

Two other hangers, four, six or eight legs (depending on the unit) and the required hardware are supplied attached to the cabinet.

#### Lifting method 1

- Install all the legs on the same side as hangers.
- Gently lower the unit on those legs.
- Install hangers on opposite side.
- Raise the other side and install other legs.
- Install chains and spread bars to raise the unit to its final position.

#### Lifting method 2

- Gently lower the unit on a flat surface.
- Install hangers on opposite side.
- Install chain and spread bars to raise the unit.
- Lift the unit and install all the legs.
- Lift the unit to its final position.

### **LOCATION**

Condensers and fluid coolers are installed outside on the roof or ground level. If a unit is installed on the ground it must be fenced to prevent possible damage. Heat recovery units are installed inside at the ceiling level. Check loading capacity of the roof, the ceiling or the floor before installation.

When selecting the site of the unit, make sure to provide enough space to provide adequate air circulation and avoid air recirculation. Provide reasonable distance to electrical supply. Provide convenient and safe accessibility for maintenance.

If a unit is to be placed close to a wall the minimum distance should be 24 inches for single row of fans and 48 inches for double row of fans. If units are to be placed side by side, the minimum distance should be 48 inches for single row of fans and 96 inches for double row of fans.

Units are usually placed on a steel frame on the roof. They must be bolted down using all the holes provided on the supply legs. The frame must be straight and level for proper operation of the units.

### **WIRING**

All wiring must be done in accordance with national and local codes. Check the nameplate with the current characteristics to be used for wiring the unit. Internal wiring connections of the fan motors, optional controls and contactors has been completed at the factory.

All wiring connections terminate on a single terminal block in the control panel. The terminals are clearly labeled and correspond to the wiring diagram supplied. The unit must be grounded. Disconnect switch at the unit must be provided.

On air cooled condensers with flooding valve, one fan (single width unit) or one pair of fans (double width unit) must operate when a compressor is operating to avoid internal damage to the condenser coil.

### **PIPING**

All refrigerant or fluid system components must be installed in accordance with applicable local and national codes and in accordance with good engineering practice required for proper operation.

The unit has not been designed to carry the weight of any external piping or valves. The piping must be well supported.

Air-cooled condensers must be provided with inverted "P" traps with a purge connection. A separate sub cooling circuit may be necessary if liquid line must rise to a level higher than the unit.

Vibrations in the discharge or liquid line must be corrected immediately to avoid piping and/or header breakage and refrigerant loss.

Fluid cooler must be provided with expansion tank to handle the variation of the fluid volume at all external temperature.

## **AIR COOLED CONDENSER CONTROLS**

### **OPERATION**

For a refrigeration system to function properly, the condensing pressure and temperature must be maintained within certain limits.

To prevent excessive low head pressure during winter operation, two basic control methods are used, (1) refrigeration side control and (2) air side control.

1. a) Refrigerant-side control is accomplished by modulating the amount of active condensing surface available for condensing by flooding the coil with liquid refrigerant. This method requires a receiver and a large charge of refrigerant.
- b) Refrigerant-side control by going to one-half condenser operation. The condenser is initially resigned with two equal sections, each accommodating 50% of the load during normal operation.

During the winter an ambient controlled flow divider valve block off one section of the condenser and pump down the inactive section of the condenser in the suction. This saves the flooding overcharge and sometimes allows the shutdown of the fans on the inactive condenser side.

2. Air side control is accomplished by cycling fans in response to condensing pressure (single circuit) or outdoor ambient temperature (single or multiple circuits). To reduce stress on the condenser coil, one fan or one pair of fans must operate when a compressor is operating. Speed control on the

constant operating fan may be used to reduce motor cycling and stabilized the operating pressure.

For low ambient operation this method must be combined with refrigerant side control.

### **FAN MOTORS**

Attention: Disconnect all power before servicing.

The fan motors are permanently lubricated for service free operation. The motor may restart on automatic thermal protection. Motors are readily serviced by removing fan guards and fans. If a motor is inoperative or it cycles on thermal protection, check supply voltage at the motor leads. Fan motors may cycle on thermal protection if the coil is blocked.

### **FAN CYCLING**

Optional temperature or pressure controls are located in the control box. Air temperature sensors are located in the air flow and pressure controls and are directly connected to the circuit in a return bend.

Optional line duty controls are connected directly to the fan motors. Controls are double pole single throw, one line remains live on the motors. Units must be completely disconnected before servicing.

Optional pilot duty controls are connected to 3 pole motor contactors. If controls or contactors are defective, they must be replaced.

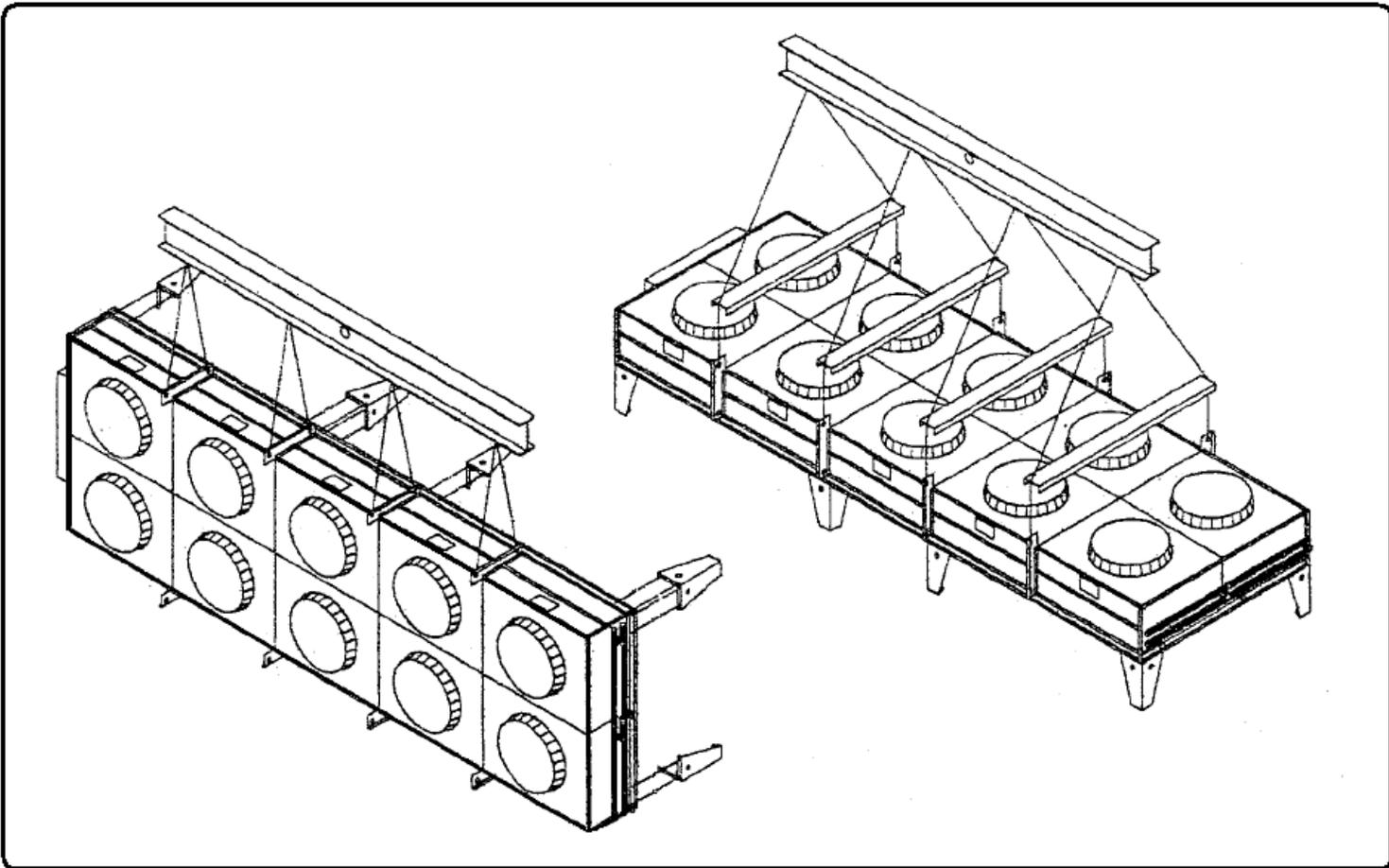
### **MAINTENANCE**

#### **CLEANING**

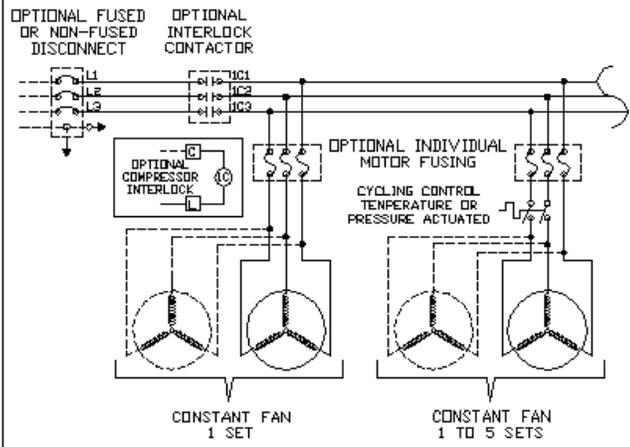
After one day of operation, check for any vibration that might have developed in the unit. It is recommended that the unit be inspected occasionally for dirt accumulation. Grease and dust should be removed from the fans, fan guards.

Periodical cleaning of finned surface can be done by washing down dust with warm water spray and a mild detergent. Do not use alkaline or acidic solution as it will attack the coil material.

The inner face of the coil may be cleaned by the access panel on the side of the units or by removing the fan guards.

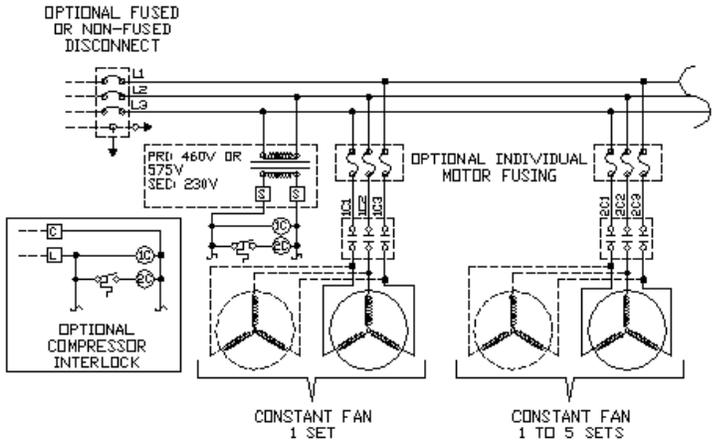


**LINE DUTY CONTROL**



WIRING DIAGRAM #1

**PILOT DUTY CONTROL**



WIRING DIAGRAM #2