



## Portable Air Conditioners Models HKW-20, 25, and 30

**SETUP, OPERATION, AND MAINTENANCE MANUAL  
20–30 TON PORTABLE TRAILER AIR CONDITIONING UNIT**



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HKWTR20–30G\*ATA\*\*-TR  
REV — 01/28/20

# Koldwave

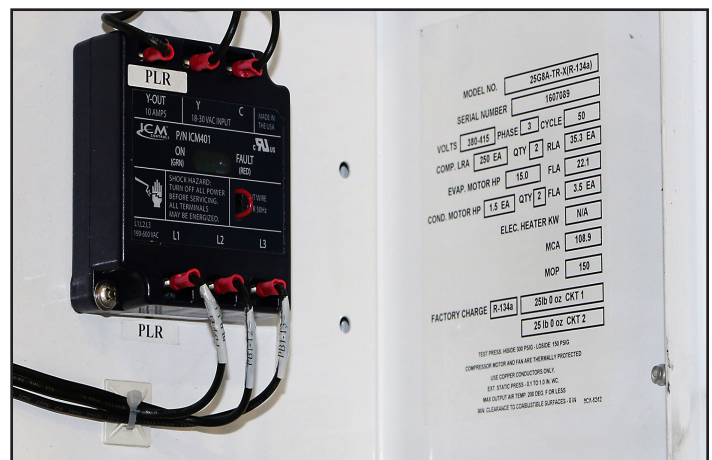
MODEL NO.	HKW30G3ATA60-TR		
SERIAL NUMBER	1610057		
VOLTS	208/230	PHASE	3
		CYCLE	60
COMP. LRA	351 EA	QTY	2
		RLA	53.6 EA
EVAP. MOTOR HP	15.0	FLA	35
COND. MOTOR HP	3.0 EA	QTY	2
		RLA	8.6 EA
ELEC. HEATER KW	60		
MCA	240.8		
MOP	250		
FACTORY CHARGE	R-410A	46 lb 0oz CKT1	
		46 lb 0oz CKT2	

TEST PRESS. HISIDE 500 PSIG - LOSIDE 250 PSIG  
 COMPRESSOR MOTOR AND FAN ARE THERMALLY PROTECTED  
 USE COPPER CONDUCTORS ONLY.  
 EXT. STATIC PRESS - 0.1 TO 1.0 IN. WC.  
 MAX OUTPUT AIR TEMP. 200 DEG. F OR LESS  
 MIN. CLEARANCE TO COMBUSTIBLE SURFACES - 0 IN

9CA-6242

## IDENTIFICATION OF YOUR PORTABLE UNIT

The Data Tag contains important information on how identify your Koldwave Unit. See Figure 1 for more information on locating tag.



**TABLE of CONTENTS**

**IDENTIFICATION OF YOUR PORTABLE UNIT** ..... 2

**SPECIFICATIONS – HKW20G\*ATA\*\*-TR** ..... 4

**SPECIFICATIONS – HKW25G\*ATA\*\*-TR** ..... 5

**SPECIFICATIONS – HKW30G\*ATA\*\*-TR** ..... 6

**GENERAL INFORMATION** ..... 7

**UNIT INSPECTION** ..... 7

**UNIT SETUP** ..... 8

**CONDENSATE DRAIN** ..... 9

**POWER CONNECTIONS** ..... 9

**OPERATING INSTRUCTIONS** ..... 10

**UNIT COMPONENTS** ..... 11

**ROUTINE MAINTENANCE** ..... 13

**TROUBLESHOOTING GUIDE** ..... 15

**APPENDIX – DRAWINGS AND SCHEMATICS**

**Outline** ..... CA12877A

<b>WARNING: HIGH VOLTAGE – DISCONNECT POWER BEFORE SERVICING</b>	
<p><b>DISCONNECT POWER</b></p> <p>Failure to disconnect power before servicing could lead to severe personal injury or death.</p>	<p><b>RE-CONNECT ALL GROUNDS</b></p> <p>All parts of this product capable of conducting electrical current are grounded. If grounding wires, screws, straps, clips, nuts, or washers used to complete a path to ground are removed for servicing, they must be reconnected at their original location.</p>

## SPECIFICATIONS – HKW20G\*ATA\*\*-TR

TECHNICAL DATA		HKW20G*ATA[KW]	
Total Capacity [1]	BTUH	260,000	
Sensible Capacity [1]	BTUH	182,000	
Cooling Operating Range [8]		65° F - 115° F	
Refrigerant Type		R-410a	
Compressor Type (Qty)		Scroll (2)	
Filter	Type	Cleanable	
	Size	19.9 X 27.9	
	Qty	8	
Evaporator Coil Face Area	Sq. Ft.	20.56	
Evaporator Coil Rows Deep		3	
Evaporator	CFM	8,000	
	ESP	1.5	
	HP	7.5	
Condenser Coil Face Area	Sq. Ft.	26	
Condenser Coil Rows Deep		4	
Condenser	CFM	12,000	
	ESP	NA	
Condenser Air Movement Type		Direct Drive - Propeller	
Condenser Motor HP (Qty)		3.0 (2)	
208/230-3-60		Cooling Only	
	FLA	107.4	
	MCA	116.2	
	kW [3]	35.4	
460-3-60	FLA	56.8	
	MCA	61.6	
	kW [4]	39.3	
Heater Type (Optional)		Finned Tubular	
		Heating Only	
Available Electric Heat	kW / Stages	45 / 2	60 / 2
208/230-3-60 [6]	FLA	137.9	177.3
	MCA	172.4	221.6
	kW [3]	51	66
460-3-60 [7]	FLA	66.3	85.1
	MCA	82.9	106.4
	kW [4]	51	66
Unit Dimensions	Inches	91.6" L x 36" W x 94.1" H	
Approximate Net Unit Weight	Lbs.	2580 [5]	

[1] Entering Air 80° F DB / 67° F WB with 95° F Outdoor Ambient

[2] Voltage Codes (\*):  
2 = 208/230-3-60  
4 = 460-3-60

[3] kW at 0.8 Power Factor and 208 Volts

[4] kW at 0.8 Power Factor and 460 Volts

[5] Does not include options.

[6] Electric heater FLA listed at 220 volts.

[7] Electric heater FLA listed at 460 volts.

[8] Operating range can be extended lower by adding a low ambient option.

## SPECIFICATIONS – HKW25G\*ATA\*\*-TR

TECHNICAL DATA	HKW25G*ATA[KW]		
Total Capacity [1]	BTUH	288,250	
Sensible Capacity [1]	BTUH	206,350	
Cooling Operating Range [8]		65° F - 115° F	
Refrigerant Type		R-410a	
Compressor Type (Qty)		Scroll (2)	
Filter	Type	Cleanable	
	Size	16.875 X 27.875	
	Qty	8	
Evaporator Coil Face Area	Sq. Ft.	20.6	
Evaporator Coil Rows Deep		3	
Evaporator	CFM	10,000	
	ESP	1.5"	
	HP	15	
Condenser Coil Face Area	Sq. Ft.	26.04	
Condenser Coil Rows Deep		4	
Condenser	CFM	14,000	
Condenser Air Movement Type		Direct Drive Prop	
Condenser Motor HP (Qty)		3 (2)	
208/230-3-60		Cooling Only	
	FLA	150.3	
	MCA	162.3	
	kW [3]	49.5	
460-3-60	FLA	67.9	
	MCA	73.3	
	kW [4]	46.7	
Heater Type		Finned Tubular	
		Heating Only	
Available Electric Heat	kW / Stages	45 / 2	60 / 2
208/230-3-60 [6]	FLA	157.0	196.4
	MCA	196.2	245.5
	kW [3]	57	71
460-3-60 [7]	FLA	74.0	92.8
	MCA	92.5	116.0
	kW [4]	56	71
Unit Dimensions	Inches	89 L X 94 W X 58.25 H	
Approximate Net Unit Weight	Lbs.	3000 [5]	

[1] Entering Air 80° F DB / 67° F WB with 95° F Outdoor Ambient

[2] Voltage Codes (\*):                    3 = 208/230-3-60  
     4 = 460-3-60

[3] kW at 0.8 Power Factor and 220 Volts

[4] kW at 0.8 Power Factor and 460 Volts

[5] Includes electric heat

[6] Electric heater FLA listed at 220 volts.

[7] Electric heater FLA listed at 460 volts.

[8] Operating range can be extended lower by adding a low ambient option.

## SPECIFICATIONS – HKW30G\*ATA\*\*-TR

TECHNICAL DATA		HKW30G*A(410)	
Total Capacity [1]	BTUH	362,000	
Sensible Capacity [1]	BTUH	255,000	
Cooling Operating Range [8]		65°F - 115°F	
Refrigerant Type		R-410A	
Compressor Type (Qty)		Scroll (2)	
Filter	Type	Cleanable	
	Size	16.875 X 27.875	
	Qty	8	
Evaporator Coil Face Area	Sq. Ft.	20.6	
Evaporator Coil Rows Deep		4	
Evaporator	CFM	11,000	
	ESP	1.5"	
	HP	15	
Condenser Coil Face Area	Sq. Ft.	26.04	
Condenser Coil Rows Deep		4	
Condenser	CFM	14,000	
Condenser Air Movement Type		Direct Drive Prop	
Condenser Motor HP (Qty)		3 (2)	
208/230-3-60		Cooling Only	
	FLA	166.8	
	MCA	180.8	
	kW [3]	48.1	
460-3-60	FLA	79.4	
	MCA	86.1	
	kW [4]	50.6	
Heater Type		Open Wire	
		Heating Only	
Optional Electric Heat	kW / Stages	45 / 2	60 / 2
208/230-3-60 [6]	FLA	162.9	204.5
	MCA	203.6	255.6
	kW [3]	56	71
460-3-60 [7]	FLA	73.5	92.3
	MCA	91.9	115.4
	kW [4]	56	71
Unit Dimensions	Inches	89 L X 94 W X 58.25 H	
Approximate Net Unit Weight	Lbs.	4200 [5]	

[1] Entering Air 80° F DB / 67° F WB with 95° F Outdoor Ambient

[2] Voltage Codes (\*): 3 = 208/230-3-60

4 = 460-3-60

[3] kW at 0.8 Power Factor and 208 Volts

[4] kW at 0.8 Power Factor and 460 Volts

[5] Includes electric heat

[6] Electric heater FLA listed at 208 volts.

[7] Electric heater FLA listed at 460 volts.

[8] Operating range can be extended lower by adding a low ambient option.

## **GENERAL INFORMATION**

The HKW30G\* is a portable air conditioning unit designed for air conditioning of spaces such as tents, construction sites and remote buildings. This product may also have optional electric heaters. If supplied with the electric heat option, refer to the specifications and operating sections provided for the electric heaters.

**IMPORTANT** – Read this instruction manual carefully before attempting to setup, operate, or perform preventive maintenance on this unit. This unit must be installed and maintained by qualified service technicians.

### **DANGER:**

BODILY INJURY CAN RESULT FROM HIGH VOLTAGE ELECTRICAL COMPONENTS AND FAST MOVING FAN DRIVES. FOR PROTECTION FROM INHERENT HAZARDS DURING INSTALLATION AND SERVICING, THE ELECTRICAL SUPPLY MUST BE DISCONNECTED. IF CHECKS MUST BE PERFORMED WITH THE UNIT OPERATING, IT IS THE RESPONSIBILITY OF THE TECHNICIAN TO RECOGNIZE THESE HAZARDS AND PROCEED WITH EXTREME CAUTION.

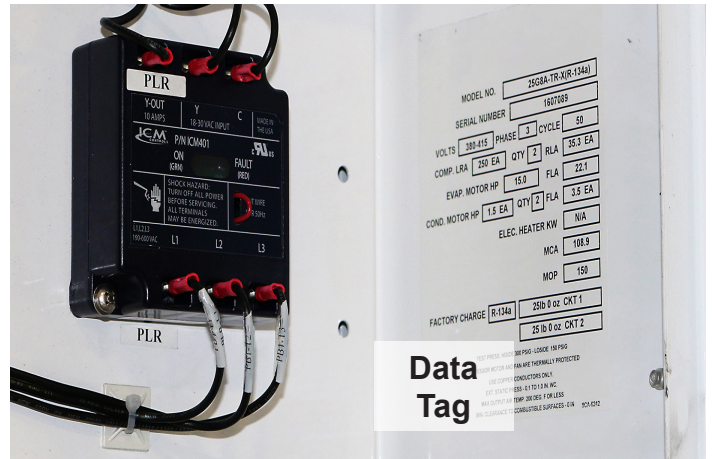
### **CAUTION:**

NEVER OPERATE THE UNIT WITHOUT DUCTING ATTACHED TO THE SUPPLY AIR BLOWER OUTLET FLANGE.

**Note:** “Warnings and Cautions” appear at the appropriate places throughout this user manual. Your personal safety and the proper operation of this unit require that you follow them carefully. The manufacturer assumes no liability for installations or servicing performed by non-qualified personnel.

## **UNIT INSPECTION**

Upon receiving the unit, inspect for damage to the unit’s structural interior and exterior components which may have happened during transit. Immediately notify the carrier of damage to the unit. Verify the unit is the correct unit ordered by looking at the unit’s data plate. Figure 1 – Data Plate is located on both the exterior side of the control access panel as well as inside the electrical control box. The electrical box section is located behind the control access panel door. Figure 2 – Control Panel.



**Figure 1 – Data Tag**

The main power source must be capable of delivering the required amount of power to the unit. Refer to the Installation section for connection details.



**Figure 2 – Control Panel**

## **UNIT SETUP**

Location, Movement, & Rigging Each unit is trailer mounted and must be towed to the location of installation. Select a location which will not obstruct air flow into and out of the unit. Always Chock the trailer wheels and raise the front tow hitch so that the unit is sitting as level as possible.

## **Clearances**

Air enters the unit through the lower duct collar connections and is drawn through the cleanable air filter then across the evaporator coil. For the most optimum performance of the manufactured equipment, make sure the location of unit has a minimum four (4) feet of clearance on all sides and six (6) to eight (8) feet of clearance above the condenser fan section.

The location of setup must permit unobstructed airflow into the unit's refrigeration coils and corresponding condenser air inlet and outlet grilles. This location must also provide a minimum eight (8) feet of clearance in the area surrounding the ducted return and supply air outlets to allow gradual transitioning of the flexible ducting to the place of attachment.

## **Duct Connections**

**CAUTION:** This unit as built was designed for a high amount of External Static Pressure. It will maintain air flow based upon the amount of ducting that is connected to the supply and return air collars. If shorter duct runs are attached, the Evaporator Motor's may trip on safeties.

**NOTE:** For best results, the ducting will require minimal transitions to the location of connection. If this is not observed, pinching of the ducting may occur that will also cause a restriction in air flow as well as reduced performance of the unit. It is extremely important to keep the supply ducting as straight as possible.

1. Connect 20" Insulated Round Flexible Ducting from the Return Inlets of the space being conditioned. Refer to Figure 3 – Duct Connections.
2. If fresh outdoor air is required, the return air collars may need to be partially restricted / blocked until the evaporator motor current is operating just under the FLA rating of the motor. Check the data tag for the Rated Evaporator Motor FLA.
3. Connect 20" Insulated Round Flexible Ducting from the Supply Outlets (top duct collars) of the unit to the supply air outlets of the space being conditioned. Connect 20" Insulated Round Flexible Ducting from the Supply Outlets (top duct collars) of the unit to the supply air outlets of the space being conditioned.
4. When routing the ducting, do not make turns greater than 45 degrees if possible.





**Figure 3 – Duct Connections**

**CAUTION:** Do not under any circumstances allow the ducting to pinch during installation or during unit startup as system performance will be severely reduced. When pinching occurs on start-up of the blower, it is highly recommended to disconnect power from the unit and adjust the ducting or unit then re-apply power.

### **CONDENSATE DRAIN**

The Condensate Drain is set up as a free drain to ground system. A Kazoo Tube is factory provided but must be field installed on the outlet of the Condensate Drain Connection. Even though the Kazoo Tube is a flat piece of rubber, it is designed to break the internal static of the blower to prevent water being held into the drain pan. The Kazoo tube functions just like a condensate drain trap. Make sure that it does not become pinched in order for the condensate to drain correctly. Before unit startup, fill the drain pan with approximately 1 bucket of water so that the water drains into the Kazoo tube which will create a seal to promote drainage.

### **POWER CONNECTIONS**

Before electrical power is applied to the unit, make sure the unit is connected to an earth ground. The circuit breaker should be in the “OFF” position.

Electrical power must be supplied to the unit from a power source (shore power or generator) via connecting cables, which terminate in a Camlock connection. See Figure 4. This supplies power to the entire unit. Make sure the power supplied matches the electrical data label provided in the unit. The power requirements are also listed relatively close to the Camlock and main unit circuit breaker.



**Figure 4 – Camlock & Circuit Breaker**

Turn on the power at the main power supply. Internal wiring connects the incoming power to the unit circuit breaker, which also serves as a service disconnect switch on the unit. Switch the circuit breaker to the “ON” position to supply power to the unit.

Once the power is on, proper sequencing of the three phase power input will be indicated by the Red Phase Indicator Light (PIL). If the Phase Indicator Light is illuminated, turn off power to the unit and change any two of the conductors (excluding the ground wire) at the **power source that connects to the standard terminal block** **Never change wiring internal to the unit!** This unit will not run unless the phasing is correct. Make one last check of the ducting to make sure there are no kinks or bends greater than 45 degrees and that it has not become disconnected from the connection point of the space being conditioned.

## **OPERATING INSTRUCTIONS**

Make one last check of the ducting to make sure there are no kinks or bends greater than 45 degrees and that it has not become disconnected from the connection point of the space being conditioned.

The main power supply's service disconnect or circuit breaker must be in the OFF position. The unit's main circuit breaker should be in the OFF position. Before applying power to the unit, select the desired mode of operation (FAN, COOL, or HEAT).

1. Switch the main power supply's service disconnect switch or circuit breaker to the ON position. Then set the unit's main circuit breaker to the ON position.
2. Set the desired Temperature Setting on the Ranco Temperature Controller.

**NOTE: The Thermostat senses the Return Air temperature to the unit.**

### **COOLING MODE**

1. Set the Mode Selector Switch to COOL.
2. Use the SET button to navigate through the settings and to initialize setting changes.
3. To adjust the Temperature Units (F or C) press the SET button and the Temperature Units screen will appear. Use the ↑ or ↓ to set the Units to F or C then press the SET button to move to the next parameter.
4. Using the ↑ or ↓ button, adjust the temperature setting then press the SET button again to move to the next parameter. This setting is main temperature set point desired for Cooling Mode and is known as the Stage 1 Setting.
5. Adjust the differential temperature setting using the ↑ or ↓ button and press the SET button to initialize the differential temperature. For Stage 1 of Cooling, the temperature must rise above the Stage 1 Temperature Setting plus Differential setting for Compressor 1 to start.

6. The next parameter will allow for adjustment of Stage 1 Cooling. Use the ↑ or ↓ button to verify the parameter reads C1 then press the SET button.
7. Using the ↑ or ↓ button, adjust the temperature setting then press the SET button again to move to the next parameter. This setting is Stage 2 temperature setting.
8. Adjust the differential temperature setting (for stage 2 of cooling) using the ↑ or ↓ button and press the SET button to initialize the differential temperature. For Stage 2 of Cooling, the temperature must rise above the Stage 2 Temperature Setting plus Stage 2 Differential setting for Compressor 2 to start.
9. The next parameter will allow for adjustment of Stage 2 Cooling. Use the ↑ or ↓ button to verify the parameter reads C2 then press the SET button.
10. Press the SET button one last time and the actual temperature will be displayed

When the space temperature rises approximately 1°F above the setting the system will turn "ON". The differential between stages is approximately 2°F. The equipment will not cycle more than 6 times per hour in the cooling mode.

### **HEATING MODE – OPTIONAL**

1. Set the Mode Selector Switch to HEAT.
2. Use the SET button to navigate through the settings and to initialize setting changes.
3. To adjust the Temperature Units (F or C) press the SET button and the Temperature Units screen will appear. Use the ↑ or ↓ to set the Units to F or C then press the SET button to move to the next parameter.
4. Using the ↑ or ↓ button, adjust the temperature setting then press the SET button again to move to the next parameter. This setting is main temperature set point desired for Heating Mode and is known as the Stage 1 Setting.

5. Adjust the differential temperature setting using the ↑ or ↓ button and press the SET button to initialize the differential temperature. For Stage 1 of Heating, the temperature must fall below the Stage 1 Temperature Setting minus Differential setting for Heater 1 to start.
6. The next parameter will allow for adjustment of Stage 1 Cooling or Heating. Use the ↑ or ↓ button to verify the parameter reads C1 then press the SET button.
7. Using the ↑ or ↓ button, adjust the temperature setting then press the SET button again to move to the next parameter. This setting is Stage 2 temperature setting.
8. Adjust the differential temperature setting (for stage 2 of heating) using the ↑ or ↓ button and press the SET button to initialize the differential temperature. For Stage 2 of Heating, the temperature must fall below the Stage 2 Temperature Setting minus Stage 2 Differential setting for Heater 2 to start.
9. The next parameter will allow for adjustment of Stage 2 Cooling or Heating. Use the ↑ or ↓ button to verify the parameter reads C2 then press the SET button.
10. Press the SET button one last time and the actual temperature will be displayed

**NOTE:** Since the electrical wiring through the thermostat is set up through a Mode Selector Switch to select the desired Mode of Operation, the thermostat must also be set to C1 and C2 for Heating Mode.

## **UNIT COMPONENTS**

### **Access Fittings**

The refrigerant circuit is provided with Schrader type access fittings. These fittings are used to check system operation and adjust the refrigerant charge if necessary.

### **Compressor**

The compressor is scroll hermetic type. The function of the compressor is to create a differential in refrigerant pressure. It converts low pressure, low temperature refrigerant vapor entering the suction side of the compressor into a high pressure, high temperature gas at the discharge side of the compressor. The function of the compressor also pumps the refrigerant through the piping and components within the refrigeration system.

### **Condenser Coil**

The condenser receives the high-pressure high-temperature gas from the compressor after it passes through the vibration eliminator. As the condenser blower draws the ambient air across the fins and tubes of the condenser coil and the high-pressure high-temperature gas enters the condenser coil, the gas starts to condense back into liquid state. At the outlet piping of the condenser coil, the gas has been turned back into liquid refrigerant.

**NOTE:** An increase or decrease in air temperature and humidity will directly affect the suction and discharge pressures as well as superheat and sub-cooling. This means total performance of the unit is affected.

### **Evaporator Coil**

Return and/or outdoor air is drawn through the evaporator coil. If the compressor is operating, the evaporator coil will transfer the heat energy from the air into the refrigerant. As this happens, the heat energy is now removed from the air passing through the evaporator coil. The cooler dehumidified air is then supplied to the space.

### **Filter Drier**

The unit contains a refrigerant filter drier to filter the liquid refrigerant as it passes through the liquid line to the thermostatic expansion valve. Any moisture in the refrigerant is captured and held in the desiccant drier material.

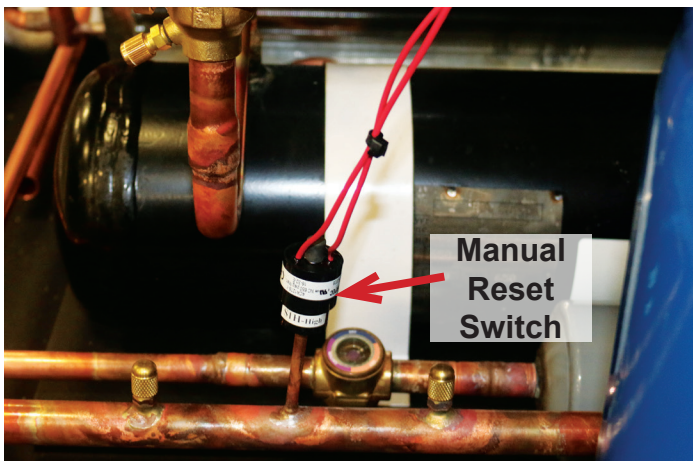
## Low Pressure Switch

The refrigerant circuit is provided with a Low Pressure safety switch. The low pressure switch is automatic reset type the compressor will temporarily de-energize and re-energize if the pressure rises above the reset pressure. If the pressure does not rise above the reset pressure, the compressor will remain off.

**NOTE:** If the Cool Light is illuminated and the compressor contactor is pulled in, the compressor may be off on low pressure.

## High Pressure Switch

The refrigerant circuit is provided with a High Pressure Safety Switch. The switch is a manual reset type. If the unit trips on high refrigerant pressure, the manual reset button on the high pressure safety switch must be pressed. Refer to Figure 5 – Combination High Pressure Switch.



**Figure 5 – High Pressure Reset**

## Sight Glass

The refrigerant circuits have liquid line sight glasses to determine that a liquid seal of refrigerant exists. One sight glass is located under the access panel over the Supply Air Blower outlet connection. The other sight glass is located behind the access panel to the immediate left of the control panel.

If constant bubbles appear in the sight glasses, the system is either undercharged with refrigerant

or there may be a restriction in the liquid line upstream of the sight glass.

**NOTE:** Bubbles will appear when the system is in hot gas bypass mode due to a drop in the amount of liquid refrigerant being fed to the expansion valve. The hot gas bypass valve feeds hot gas directly to the evaporator's distributor to maintain suction pressure during "Low Load" conditions.

Bubbles will also occur for a minute or two when the compressor system starts.

The sight glass also has a moisture indicator to detect the presence of moisture in the refrigerant. Refer to the color coding chart on the sight glass to determine if the indicator of the sight glass is indicating moisture within the refrigerant system.

## Thermostatic Expansion Valve

The liquid refrigerant enters and passes through the thermostatic expansion valve. This valve is a metering device that starts the cooling process. As the liquid refrigerant passes through the valve, it starts to change state by changing pressure.

The metering device will regulate the amount of refrigerant that passes into the evaporator coil and automatically adjust to try to maintain 12 – 15°F of superheat.

The thermostatic expansion valve has a refrigerant-filled bulb in contact with the suction line leaving the evaporator. This bulb senses the temperature of the refrigerant passing through the suction line at the point of contact and causing the expansion valve to regulate open or closed to adjust the amount of superheat.

## Condenser Motor Overloads

The condenser motors are protected by manual reset overload blocks located on the condenser motor contactors CCF1A and CCF2A. As stated, it is a manual reset overload so if the motor current rises above the Full Load Amp (FLA) as listed

on the unit's data plate, the overload will trip to protect the motor. If for any reason the condenser motor is not operating, disconnect power from the unit and check the manual reset buttons on the overload blocks.

Each compressor system has a manual reset high pressure switch. If the unit is not providing cooling and the Cool Indicator light does not illuminate when the Ranco Thermostat's cooling set point is set below the actual entering air temperature, the unit may have tripped on high pressure. Disconnect power using the unit's circuit breaker. Remove the Access Panel to the Compressor Compartment and locate the Manual Reset High Pressure Switch. Press the button downward to verify if the switch tripped. If the button clicks the unit tripped on high pressure. Replace the access panel then reapply power using the unit's circuit breaker. Set the unit to Cool Mode. Refer to the Troubleshooting section for causes and corrective actions.

Each compressor system has an automatic reset low pressure safety switch. If the unit trips on low pressure, the compressor will shut down but automatically restart once the switch resets. The low pressure switch shuts down the compressor system if the refrigerant pressure falls below 15 psig and automatically restarts the compressor once the pressure rises above 30 psig.

### **Compressor Overloads**

Each compressor has an internal motor overload to protect the motor against excessive heat and overloading conditions. If the overload trips, it may take up to one hour for the motor to cool down allowing the switch to reset. If the compressor does not start, wait at least one hour for the motor to cool before trying to restart the compressor. If the compressor starts, contact a local HVAC technician to troubleshoot the cause of overload. Reasons related to overloading of the compressor motor may be low applied voltage or low/lack of refrigerant to cool the windings.

### **Evaporator Coil**

As the liquid refrigerant passes through the expansion valve, the liquid refrigerant's pressure is regulated downward. This significant change in pressure causes a drop in temperature of the refrigerant and as the refrigerant enters the evaporator coil, the change in state causes a significant change in temperature of the evaporator coil. When the warmer ambient air is drawn over the cold evaporator coil, the warmer or latent heat is exchanged. As the heat is being exchanged, the exchange of heat energy causes the liquid refrigerant to boil into a vapor which greatly reduces the temperature of the air on the outlet side of the coil. The liquid refrigerant is converted into the lower temperature, lower pressure refrigerant causing it to changing into a vapor state.

### **Hot Gas Bypass Valve**

The hot gas bypass valve has a pressure port to monitor the compressor system's suction pressure. If the suction pressure falls below R-410a psig, the hot gas bypass valve mechanically modulates open to maintain the R-410a psig set point. This valve modulates under conditions such as low space load conditions such as non comfort cooling applications, low temperature applications, low volume comfort cooling applications (minimal occupants).

### **ROUTINE MAINTENANCE**

To keep the unit operating safely and efficiently, it is recommended that a qualified service technician check the entire system at least once a year. Check the system more frequently depending on use and surrounding conditions.

### **Filters**

If the unit is equipped with air filters, it is very important to keep the air filters clean. Be sure to inspect them at least once each month and replace them with the same type and size when required.

**NOTE:** Do not attempt to clean disposable air filters

## Condenser Coil

Inspect the condenser coil. If the condenser coil is dirty, clean with a stream of cold water, or pressurized air not exceeding 50 psig, or vacuum cleaner. Do not use hot water or steam, which can cause excessive high pressure in the refrigerant system. Clean the condenser coil in the opposite direction of the airflow.

## Condenser Motors

Each condenser motor is pre-greased and sealed and requires no lubrication.

## Evaporator Blower

The evaporator blower requires lubrication. Use of high quality lithium grease is recommended. There are a total of three grease locations on the evaporator blower. One Zerk Fitting is located directly on a pillow block bearing. The other two Zerk fittings are located directly on the blower assembly. See Figure 6 – Evaporator Blower Lubrication grease fittings location for reference. Rotate the blower by hand as grease is applied to force air pockets that may have developed from the bearings.

## Evaporator Motors

The Evaporator Motor requires lubrication. Use high quality lithium grease and apply grease through the Zerk Fittings located on the Evaporator Motors front and rear end housings.

Refer to Figure 7 – Evaporator Motor Grease Fittings. Rotate the motor as grease is applied to force air pockets that may have developed from the bearings. Stop applying grease once the bearing forces the grease to back up and push out of the Zerk Fitting at the grease gun connection. Wipe the excess grease from the exterior surface of the grease fitting.

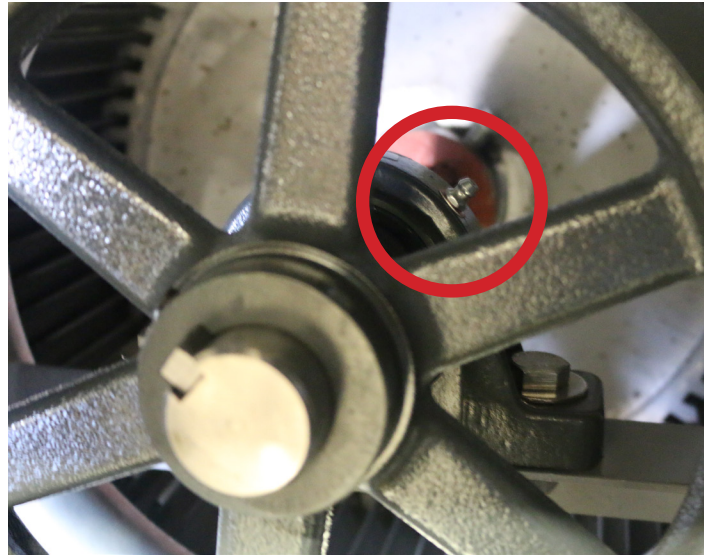


Figure 6 – Evaporator Blower Lubrication

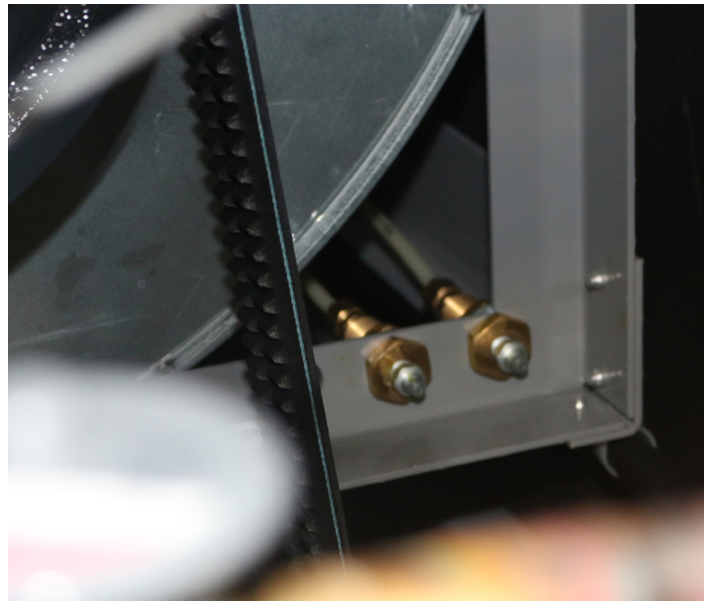


Figure 7 – Evaporator Motor Grease Fittings

## TROUBLESHOOTING GUIDE

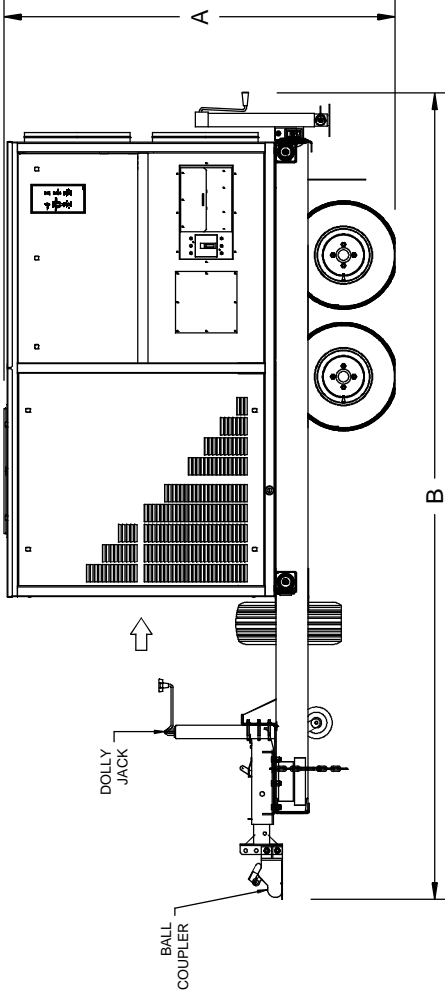
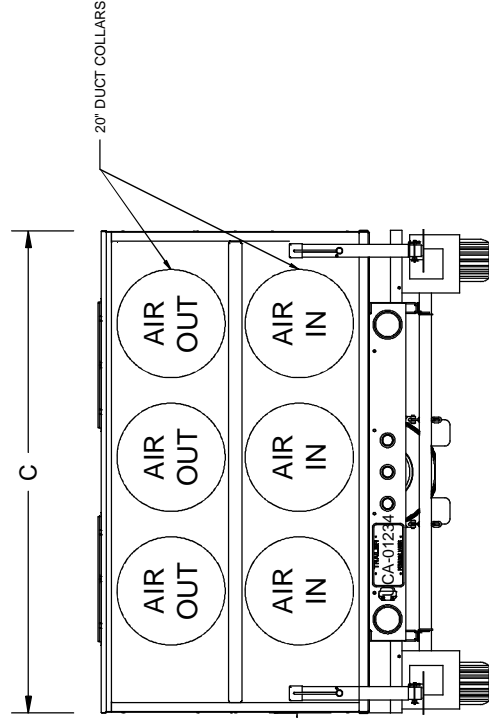
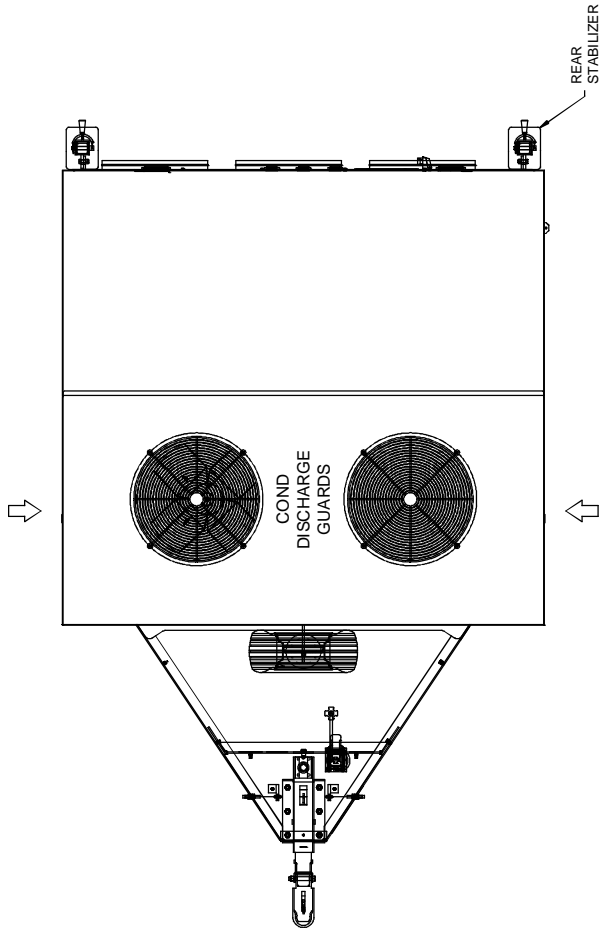
**WARNING: BEAWARE OF HIGH POWER SITUATIONS WHILE TROUBLESHOOTING. THERE ARE ALSO MOVING BELTS, BLOWERS, AND MOTORS WHILE POWER IS CONNECTED TO THE UNIT. WHEN REACHING INTO ANY OF THE UNIT SECTIONS TO MAKE ADJUSTMENTS TO THE UNIT, POWER MUST BE DISCONNECTED FROM THE UNIT.**

Problem	Cause	Description
Power Fault Indicator Light	<ol style="list-style-type: none"> <li>1. Power wiring is out of phase.</li> <li>2. A Voltage condition exists.</li> </ol>	<ol style="list-style-type: none"> <li>1. Disconnect power a main power source and reverse any two of the Camlock Connectors "Red, Black, Blue" at the unit.</li> <li>2. DO NOT SWITCH THE GREEN WIRE GREEN IS GROUND</li> <li>3. Use a voltmeter to check for line to line and line to ground over/under voltage and unbalanced voltage.</li> </ol>
No Supply Air Blower	<ol style="list-style-type: none"> <li>1. Defective ON/OFF Power Switch.</li> <li>2. Defective Evaporator Motor Contactor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Select Mode of Operation (Thermostat or Manual Control, FAN, COOL, or HEAT) then set the ON/OFF Power Switch to ON position.</li> <li>2. Replace Evaporator Motor Contactor.</li> </ol>
No Cooling	<ol style="list-style-type: none"> <li>1. Selector Switch is not set to correct position.</li> <li>2. Temperature Controller not set correctly.</li> <li>3. Defective compressor contactor CCR.</li> <li>4. High Pressure Switch Tripped.</li> <li>5. Compressor motor thermal overload switch open.</li> <li>6. Compressor stops and starts on its own even though the Compressor Stage Toggle Switch is ON. Low Pressure Switch is tripping.</li> </ol>	<ol style="list-style-type: none"> <li>1. Set control switches according to desired operation.</li> <li>2. Set stage 1 and stage 2 cooling set points below the actual return air temperature.</li> <li>3. Replace defective compressor contactor.</li> <li>4. A high pressure condition occurred causing the high pressure switch to trip. Reset switch and contact a technician for troubleshooting.</li> <li>5. Allow the compressor to cool down for one hour. If the compressor restarts, then contact a refrigeration technician to troubleshoot the cause for thermal overload cutout.</li> <li>6. Have a qualified technician check refrigerant charge.</li> </ol>
No Heating (Optional)	<ol style="list-style-type: none"> <li>1. Control Switches are not set to correct positions.</li> <li>2. Defective heating contactor(s).</li> <li>3. Heater high limit switch(s) are defective or opening up due to lack of air flow.</li> </ol>	<ol style="list-style-type: none"> <li>1. Set control switches to according to desired operation.</li> <li>2. Replace heating contactor(s).</li> <li>3. Replace defective heater high limit switch.</li> </ol>

*Continued on Next Page*

Problem	Cause	Description
High Pressure Trips	<ol style="list-style-type: none"> <li>1. Condenser air inlet and/or outlets are restricted.</li> <li>2. High-pressure switch open but doesn't reset.</li> <li>3. Defective condenser blower motor.</li> <li>4. Defective condenser blower motor contactor CCRx.</li> <li>5. System is over-charged or has non-condensibles.</li> </ol>	<ol style="list-style-type: none"> <li>1. Re-locate unit to a place with unobstructed airflow.</li> <li>2. Replace high-pressure switch.</li> <li>3. Replace condenser blower motor.</li> <li>4. Replace defective condenser blower motor contactor CCRx.</li> <li>5. Remove some refrigerant. If the high side pressure doesn't start to drop, recover the refrigerant and re-charge with fresh R-134a to correct system charge.</li> </ol>
Low Pressure Trips	<ol style="list-style-type: none"> <li>1. Dirty evaporator coil or blocked air filters.</li> <li>2. Low-pressure switch open and does not reset.</li> <li>3. Defective evaporator blower motor.</li> <li>4. System low on refrigerant charge check sight glass and perform leak checks.</li> <li>5. Expansion valve is sticking or binding.</li> <li>6. Filter drier is dirty or plugged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean evaporator coil and/or replace air filter (if applicable).</li> <li>2. Replace low-pressure switch.</li> <li>3. Test motor and replace if required.</li> <li>4. If a leak is discovered, recover refrigerant, repair leaks, re-leak check, evacuate and re-charge to system operating charge.</li> <li>5. Replace expansion valve.</li> <li>6. Replace filter drier.</li> </ol>
No Condenser Blower Operation	<ol style="list-style-type: none"> <li>1. Tripped Condenser Motor Contactor Overload.</li> </ol>	<ol style="list-style-type: none"> <li>1. Condenser blower motor moving too much air due to no blower ducting attached. Close off damper slide plate.</li> <li>2. If access panels are off of unit, replace access panels.</li> </ol>





TONS	A	B	C
20-25	75	160	94
30	85	160	94

SUBJECT TO CHANGE WITHOUT NOTICE

**KOLDWAVE**

YORK, PA.

U.S.A.

TITLE:

**HKW20-30 TRAILER**

SCALE:

NOT TO SCALE

DWN BY:

JTP

APP. BY:

JTP

DATE:

02/15/11

DATE

11/06/13

BY

JTP

ECN#

JTP

DESCRIPTION

CHANGED B DIM FROM 155 TO 160

REV.

-

DESCRIPTION

NEW

REV.

-

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SHT: 1 OF 1

DWG. NO:

**CA12877**

DATE:

02/15/11

DATE

BY

JTP

DESCRIPTION

REV.

NEW

REV.

SHT: 1 OF 1

U.S.A.

REV. LEV.

**A**