Unit Overview

Chiller Model	CGAM
Unit Nominal Tonnage	70 tons
Refrigeration Capacity	66.70 tons
Cooling Efficiency	9.944 EER (Btu/W-h)
IPLV.IP	15.54 EER (Btu/W-h)
NPLV.IP	15.43 EER (Btu/W-h)
Elevation	0.000 ft
Unit Frequency	60. hertz
Unit Voltage	460. volt 3 phases
Refrigerant Type	R410A
Number of compressor	4
Number of circuits	2
Number of capacity steps	4
Agency Listing	UL/CUL

Evaporator Information

Evaporator Application					
Std cooling					
Fluid Temperatures		**Flow Rate**			
Evaporator Leaving	44.00 F	**Design Flow**	175.0 gpm	**Freeze protection**	With freeze protection
Evaporator Entering	53.99 F	**Min Flow**	79.50 gpm	**Fouling factor**	0.000100 hr-sq ft-deg F/ Btu
Fluid Properties		**Max Flow**	238.6 gpm	**Flow switch set point**	Flow switch set point 35 cm/sec
Fluid Type	Ethylene glycol	**Fluid Pressure Drop**		**Water connection size**	3.000 in
Fluid Concentration	30.00 %	**Total PD evap+strainer**	23.1 ft H2O		
Freeze Point	6.92 F	**Design Evap PD**	13.0 ft H2O		
		Min PD	5.09 ft H2O		
		Max PD	42.0 ft H2O		

Condenser Information

Unit Application	Wide ambient	**Fin Material**	Lanced aluminum		
Ambient Air Temp.	95.0 F	**Total airflow**	55215 cfm	**Number of Fans**	6

Unit Electrical

Unit					RLA	LRA
Compressor Starter	Across the line	**Incoming Power Line Conn. Type**	Single point	**Compressor A**	25.80 A	160.00 A
Total Power	80.49 kW	**Short Circuit Current Option**	Default	**Compressor B**	33.00 A	215.00 A
Compressor Power	72.87 kW	**Short Circuit Current Rating**	5000.00 A	**Compressor D**	33.00 A	215.00 A
Fan Power	7.340 kW	**Single Point Power MCA**	147.80 A	**Compressor E**	25.80 A	160.00 A
Total Fan FLA	20.20 A	**Single Point Power MOP**	175.00 A			

Physical Information

Dimensions		Weights			Refrigerant Charge	Oil Charge
Length	149.800 in	**Operating Weight**	5120.8 lb	**Circuit 1**	48.0 lb	3.54 gal
Width	88.400 in	**Shipping Weight**	5045.3 lb	**Circuit 2**	48.0 lb	3.54 gal
Height	84.800 in					

Unit Acoustics (A-Weighted)

A-Weighted	Sound Power	Sound Pressure*	Unit Sound Package
100%	92 dBA	66 dBA	Super quiet

Note: In Accordance with AHRI 370

*Note: at 30 feet in free field

Warranty

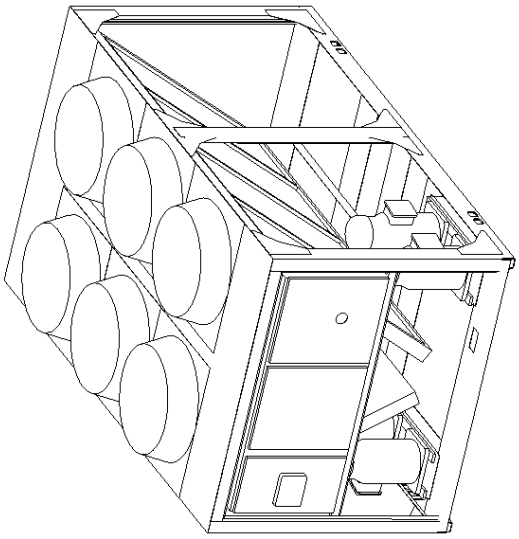
Standard Warranty

Information for LEED Projects

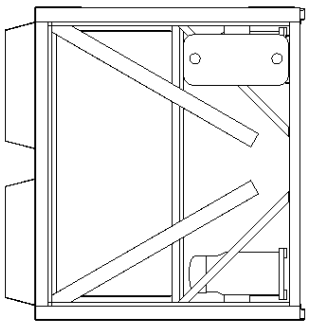
ASHRAE 90.1/CSA compliance	ASHRAE 2010
Rated refrigeration capacity (AHRI)	67.69 tons
IPLV.IP	15.54 EER (Btu/W-h)
Cooling Efficiency	9.944 EER (Btu/W-h)
Compress Power	72.87 kW
Fan Power	7.340 kW
Refrigerant (R410A) - ckt 1	48.0 lb
Refrigerant (R410A) - ckt 2	48.0 lb

Certified in accordance with the AHRI Air-Cooled Water-Chilling Packages Certification Program, which is based on AHRI Standard 550/590 (I-P) and AHRI Standard 551/591 (SI). Unit contains freeze protection fluids in the evaporator with a leaving chilled fluid temperature above 32°F [0°C] and is certified when rated per the Standard with water. Certified units may be found in the AHRI Directory at www.ahridirectory.org.

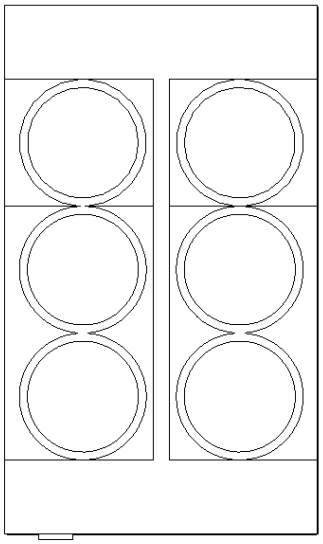
TOPSS Version Number: 226
Data Generation Date: 7/25/2019



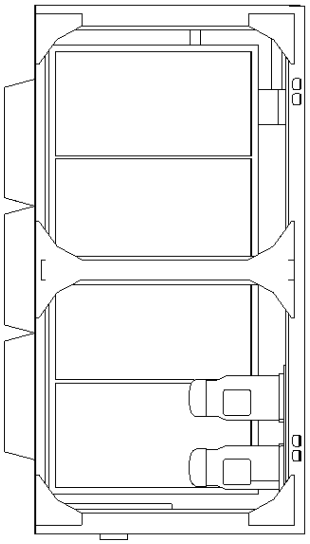
ISOMETRIC VIEW



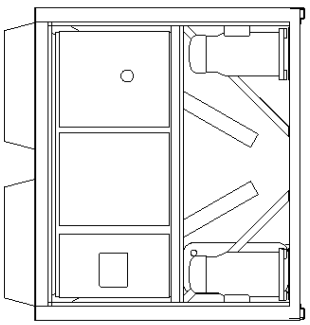
BACK VIEW



TOP VIEW



RIGHT SIDE VIEW



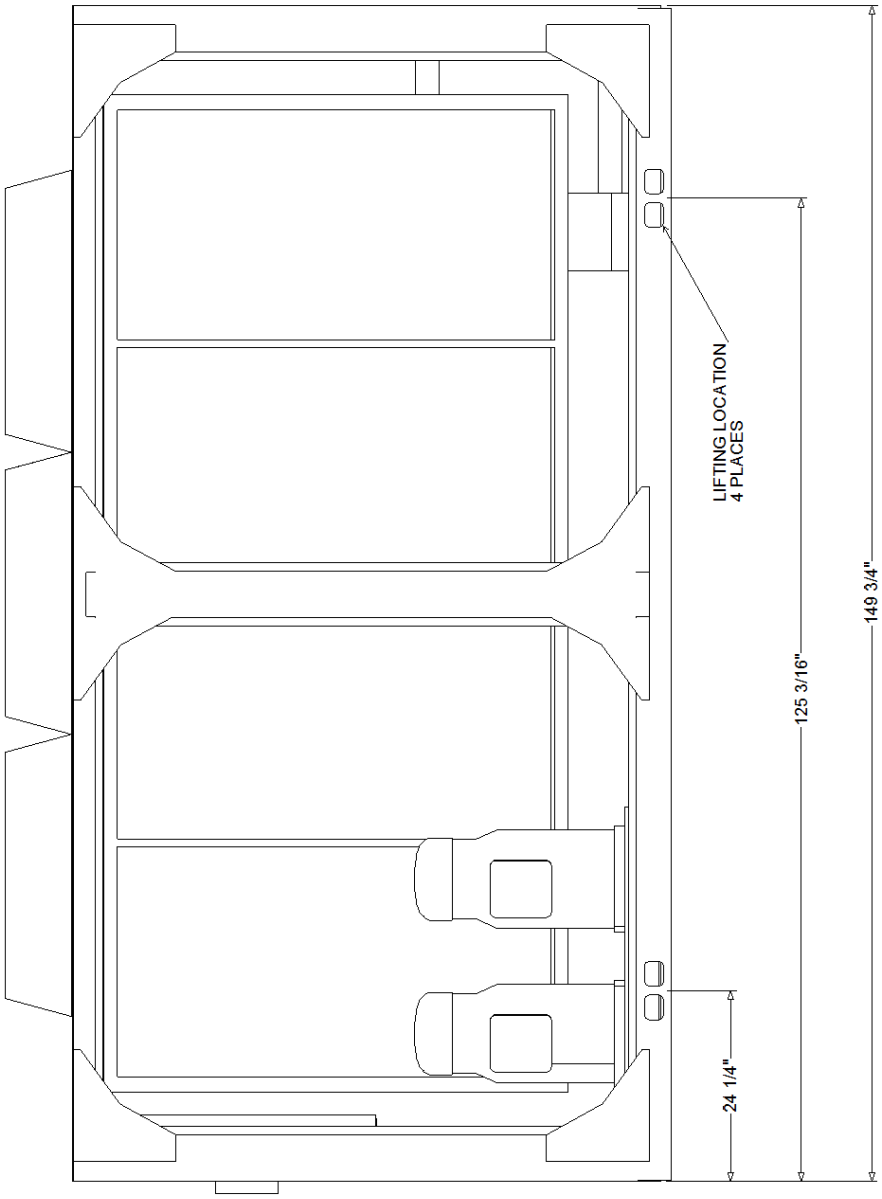
FRONT VIEW

INLET/OUTLET WATER CONNECTION SIZE

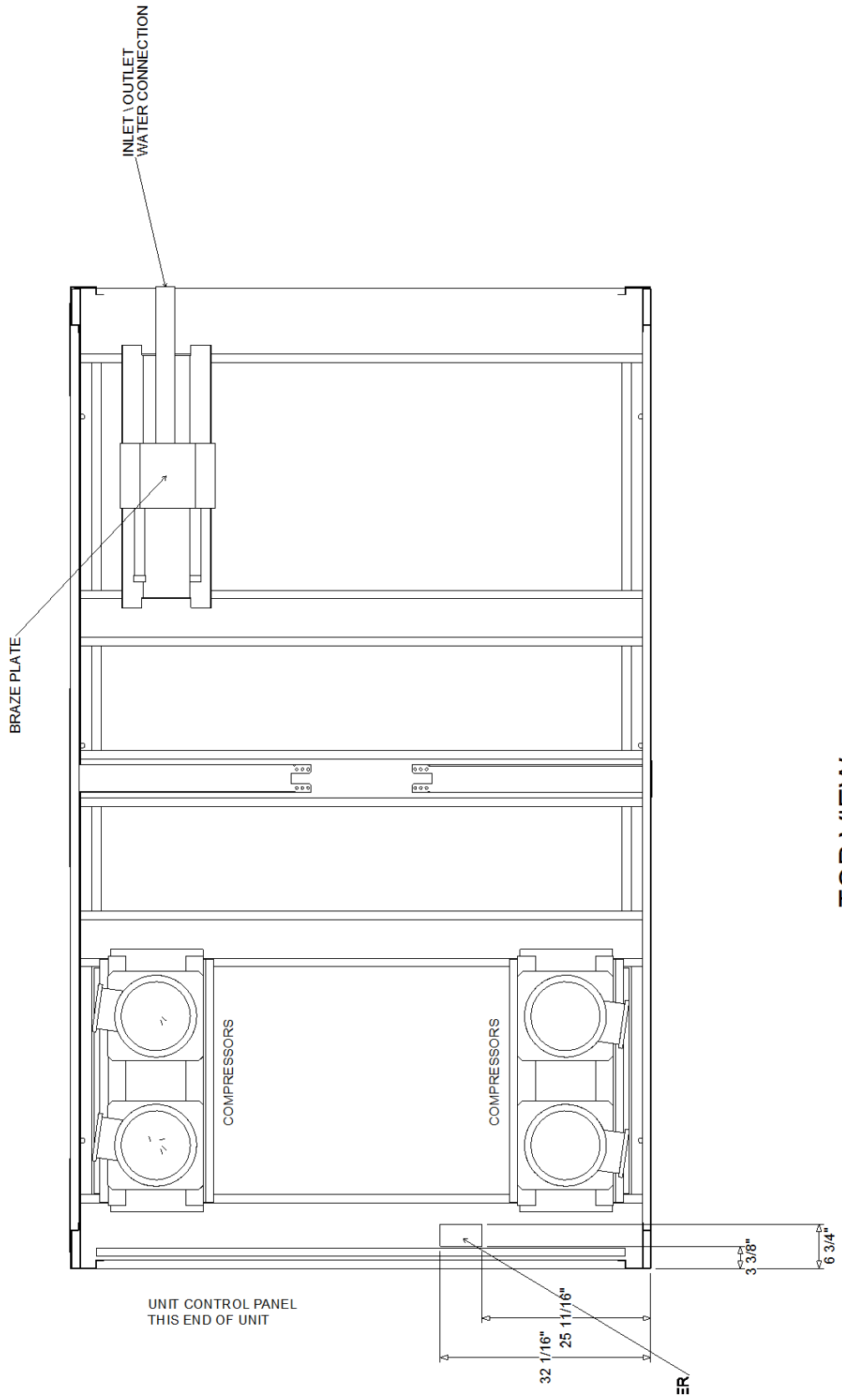
3" (80mm)

BRAZE PLATE WATER VOLUME/STORAGE

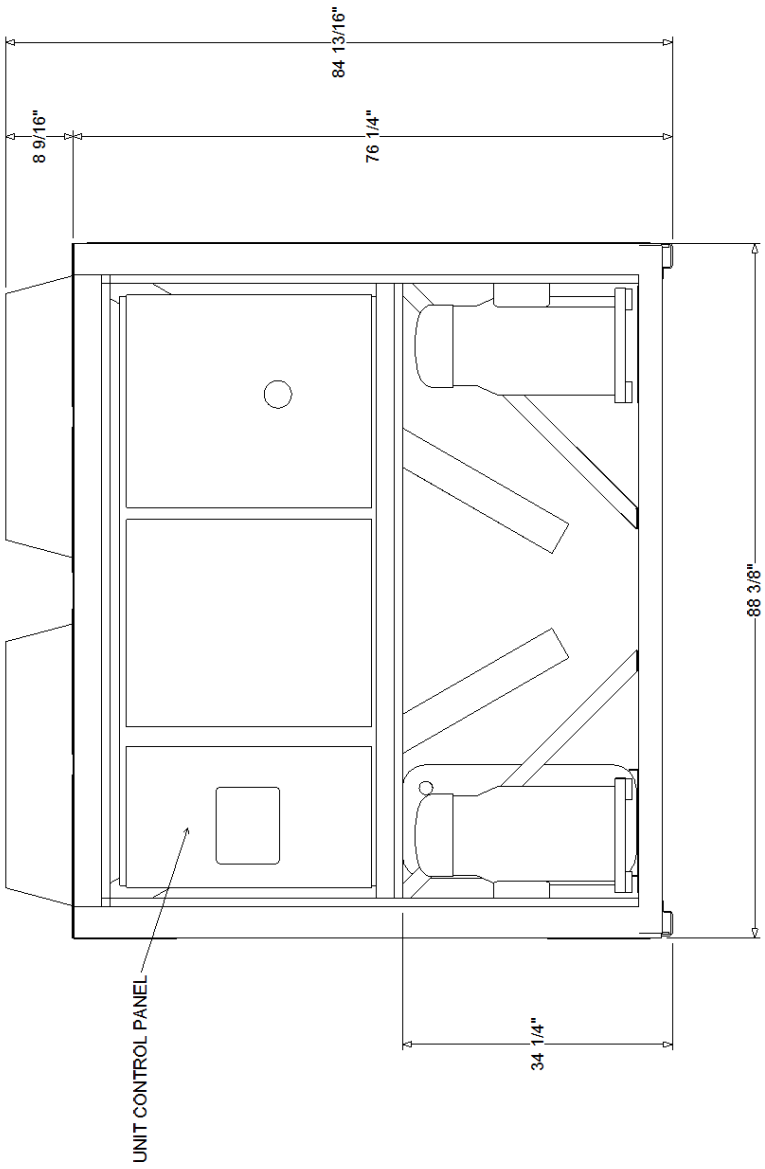
7.5 GAL (28.4 LITERS)



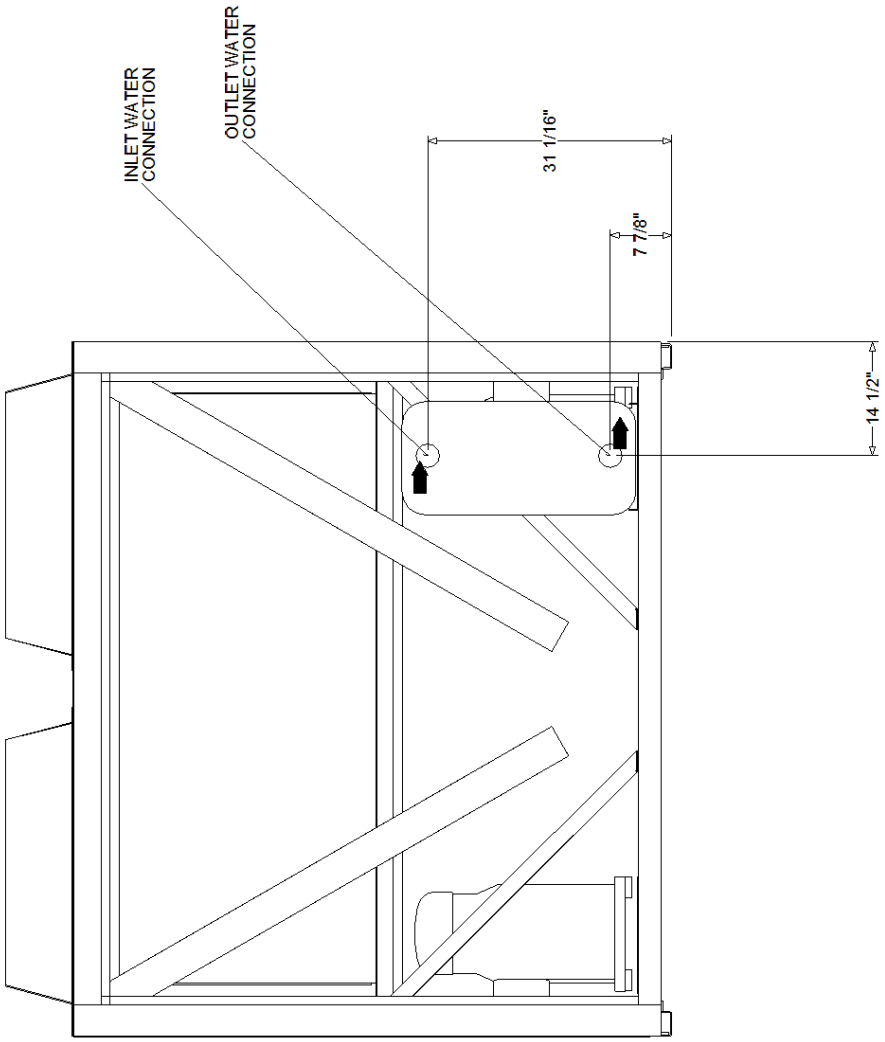
RIGHT SIDE VIEW



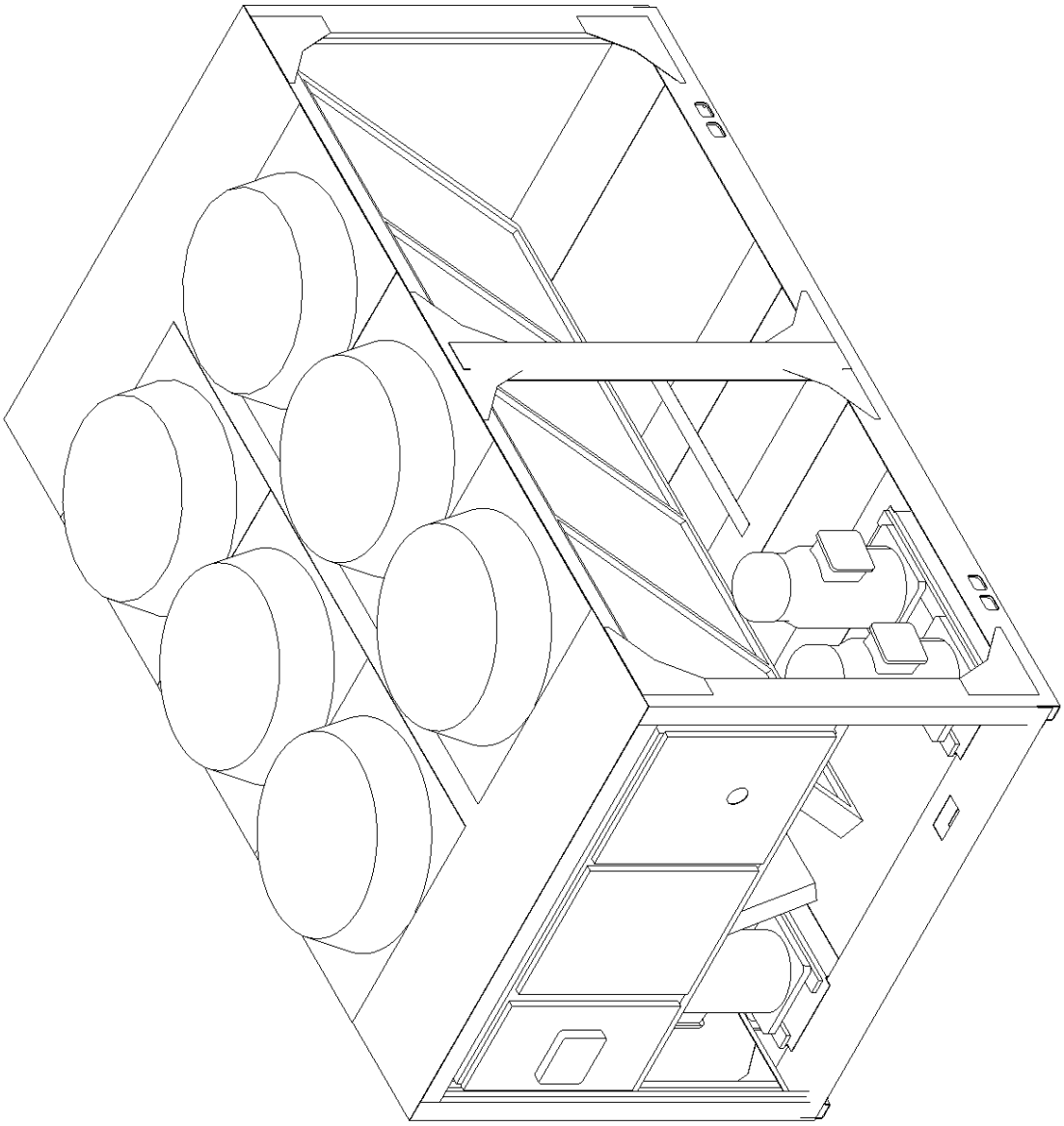
TOP VIEW
CONDENSER, CONTROL PANEL AND
VSD (WHEN ORDERED) REMOVED FOR CLARITY



FRONT VIEW


INLET WATER CONNECTION
OUTLET WATER CONNECTION
31 1/16"
7 7/8"
14 1/2"

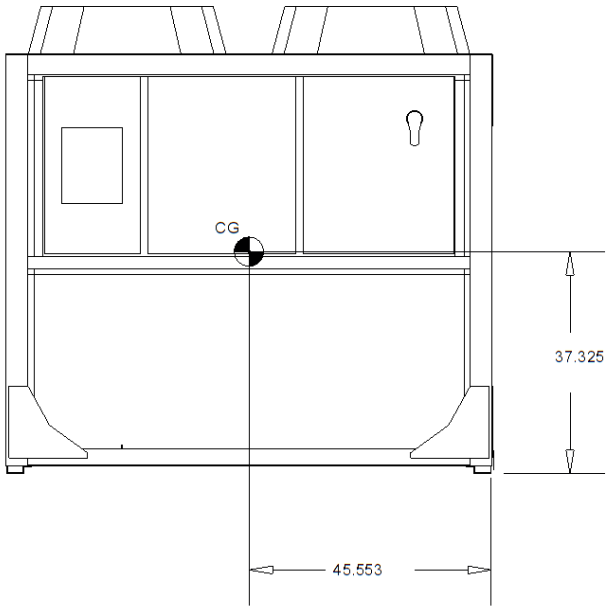
BACK VIEW



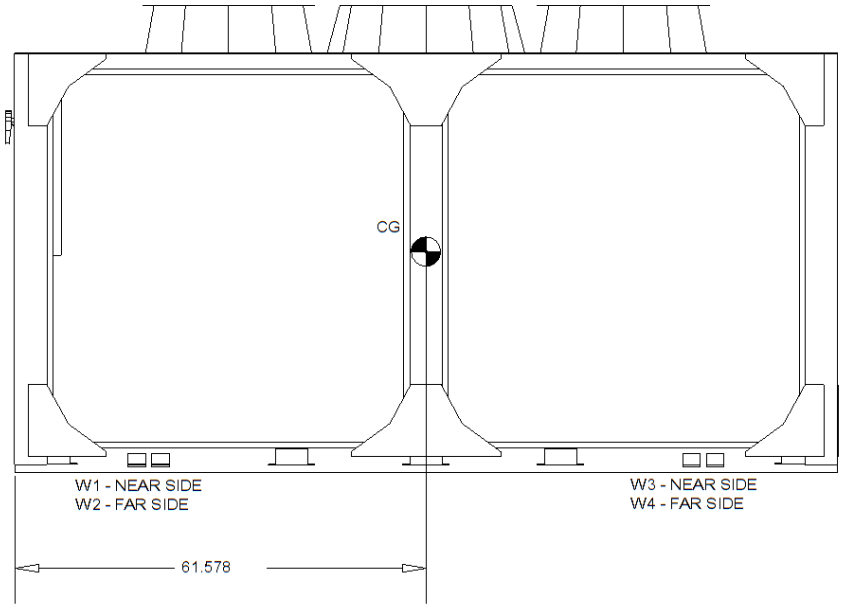
ISOMETRIC VIEW

UNIT CENTER OF GRAVITY

LIFTING WEIGHTS				
W1	W2	W3	W4	SHIPPING WEIGHT
1,529.2	1,594.5	894.6	932.8	5,045.3



FRONT VIEW
CONTROL PANEL END

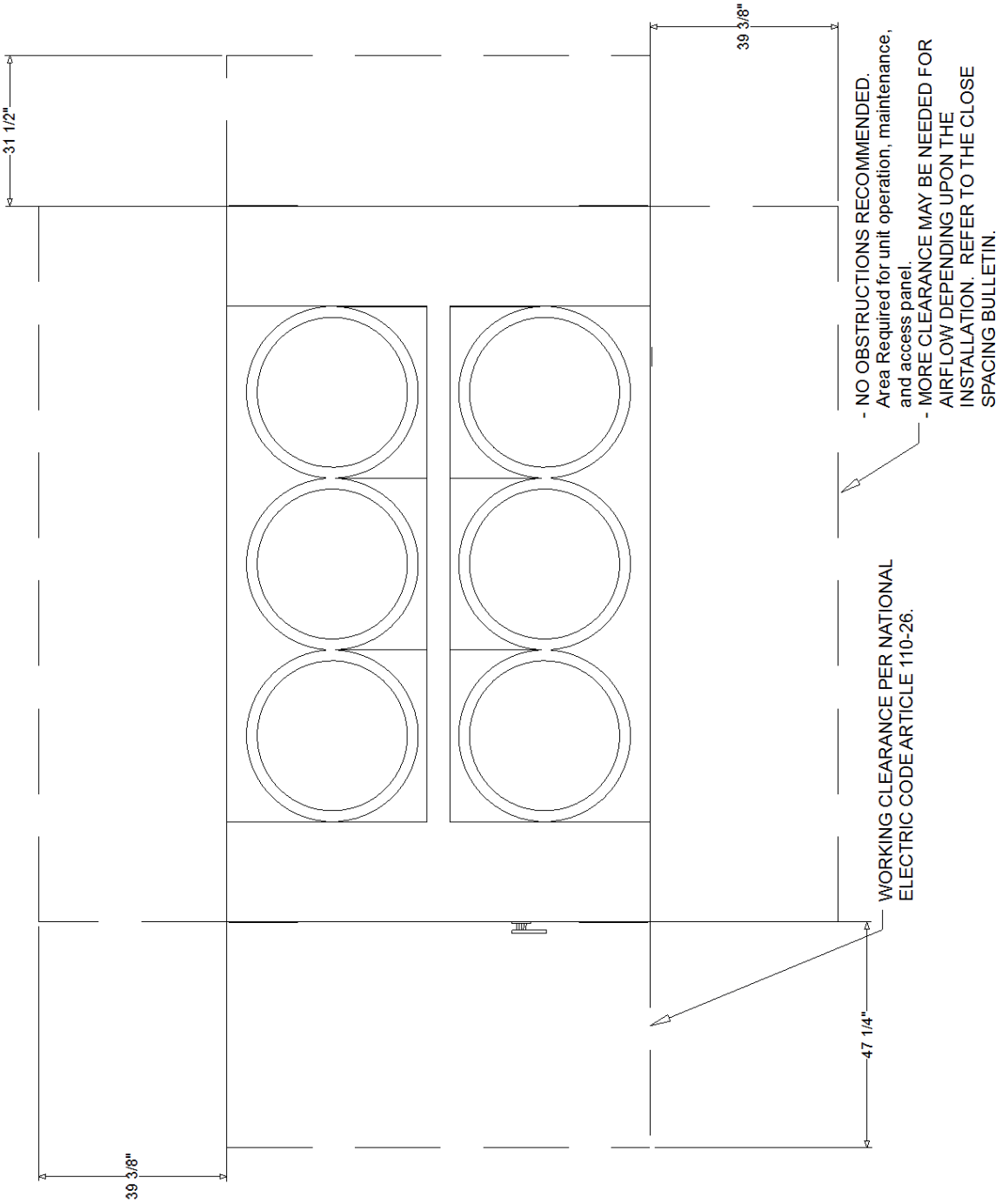


SIDE VIEW

UNIT CLEARANCE

NO OBSTRUCTIONS ABOVE THE CONDENSER

TOP VIEW



UNIT RIGGING

LIFTING A UNIT WITH EQUAL LENGTH STRAPS WILL NOT PRODUCE A LEVEL UNIT DURING THE LIFT BECAUSE THE CG WILL NOT BE AT THE MIDPOINT BETWEEN THE BASE LIFTING HOLES. THE FOLLOWING ADJUSTMENTS MUST BE MADE TO PRODUCE A LEVEL LIFT:

- SINGLE SPREADER BAR LIFTING METHOD
IF THE UNIT CG IS CLOSER TO THE CONTROL PANEL, THE STRAPS ON THE CONTROL PANEL SIDE OF THE SPREADER BAR MUST BE ADJUSTED TO BE SHORTER THAN THOSE ON THE OPPOSITE SIDE OF THE SPREADER BAR, ALLOWING THE SPREADER BAR TO MOVE TOWARD THE CONTROL PANEL AND OVER THE UNIT CG. SEVERAL ADJUSTMENTS OF THE STRAP LENGTH MAY BE REQUIRED TO PRODUCE A LEVEL UNIT DURING LIFT.

- H-TYPE SPREADER BAR LIFTING METHOD
IF THE STRAPS FROM THE H BAR TO THE UNIT BASE ARE THE SAME LENGTH, THE CRANE LIFTING POINT ON THE CENTER WEB OF THE H BAR MUST BE ADJUSTED TO PRODUCE A LEVEL UNIT LIFT.

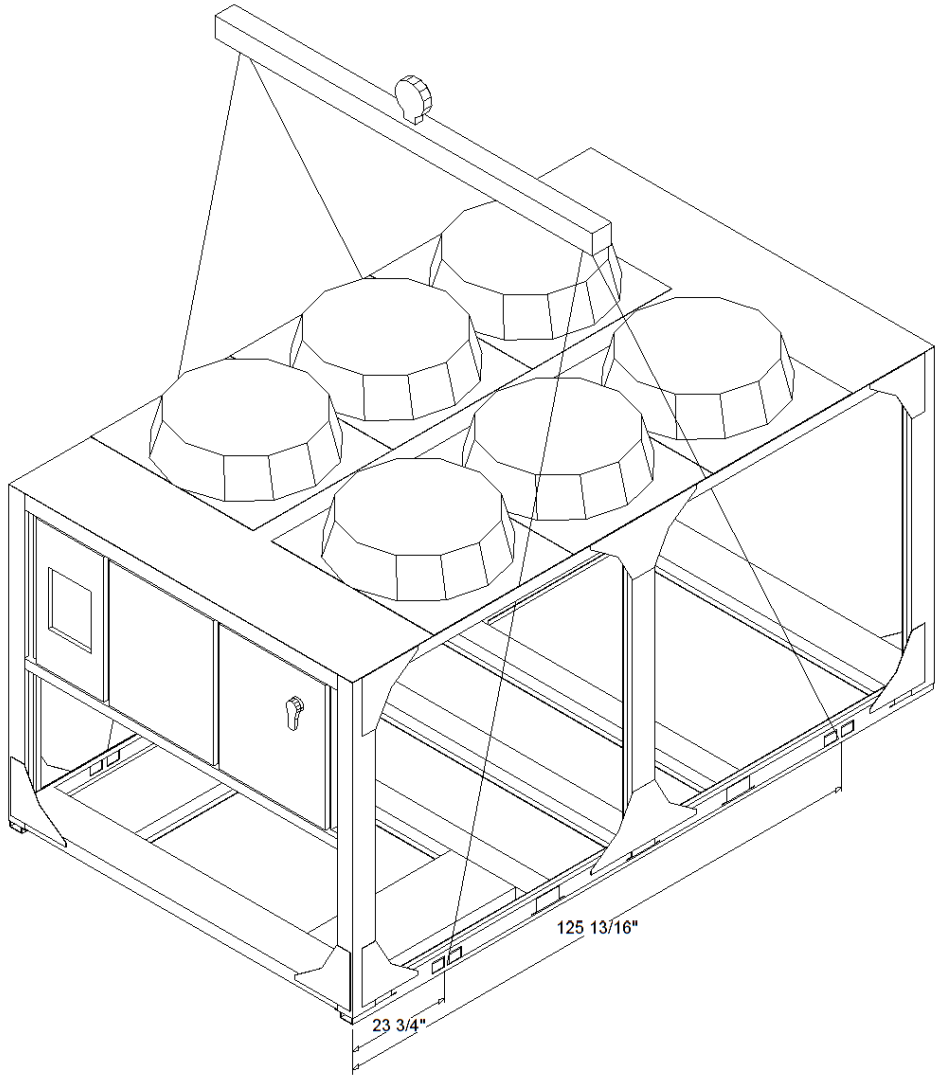
WARNING

IMPROPER LIFTING AND MOVING!

USE SPREADER BAR AS SHOWN IN DIAGRAM. REFER TO INSTALLATION MANUAL OR NAMEPLATE FOR UNIT WEIGHT. REFER TO INSTALLATION INSTRUCTIONS LOCATED INSIDE CONTROL PANEL FOR FURTHER RIGGING INFORMATION.

OTHER LIFTING ARRANGEMENTS COULD RESULT IN DEATH, SERIOUS INJURY OR EQUIPMENT DAMAGE.

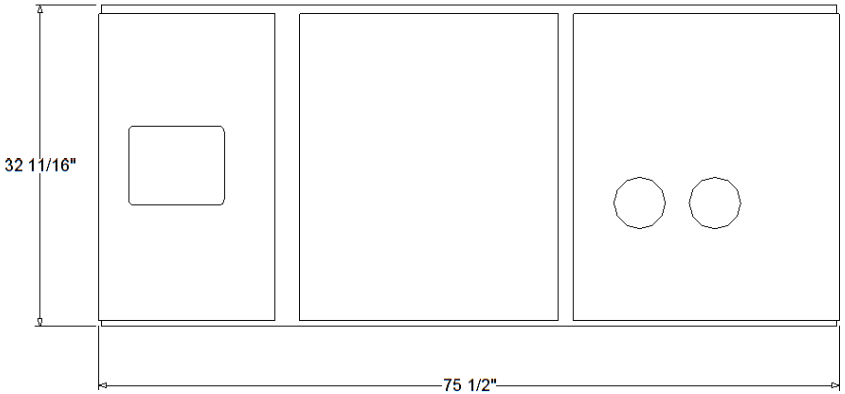
DO NOT ALLOW LIFTING STRAPS TO CONTACT UNIT DURING LIFT!



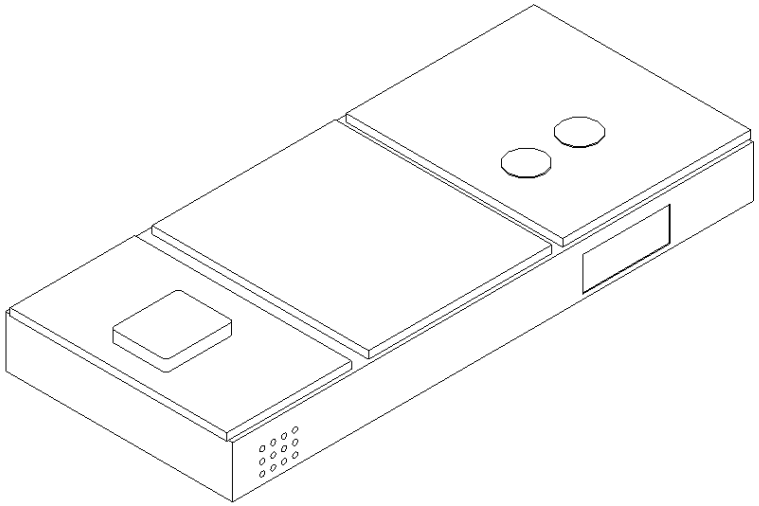
ISOMETRIC VIEW

CUSTOMER WIRE SELECTION TABLE			
POWER WIRE CONNECTION TO TERMINAL BLOCK (1X1)			
UNIT SIZE	UNIT EFF	VOLTAGE	CIR 1 & 2 (SINGLE POINT POWER) LUG WIRE SIZE RANGE (PER PHASE)
070	HIGH	460	(1 MAX conductor per phase) 4 AWG - 500 MCM

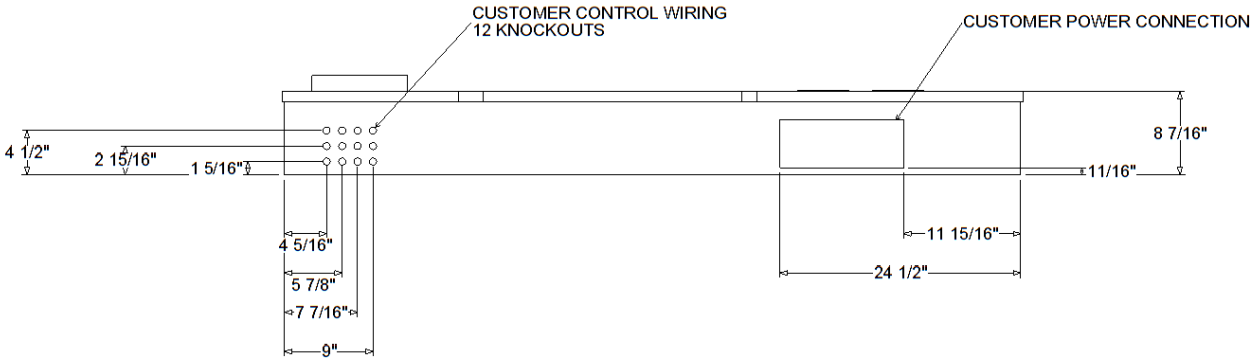
SHORT CIRCUIT RATING	5kA



FRONT VIEW



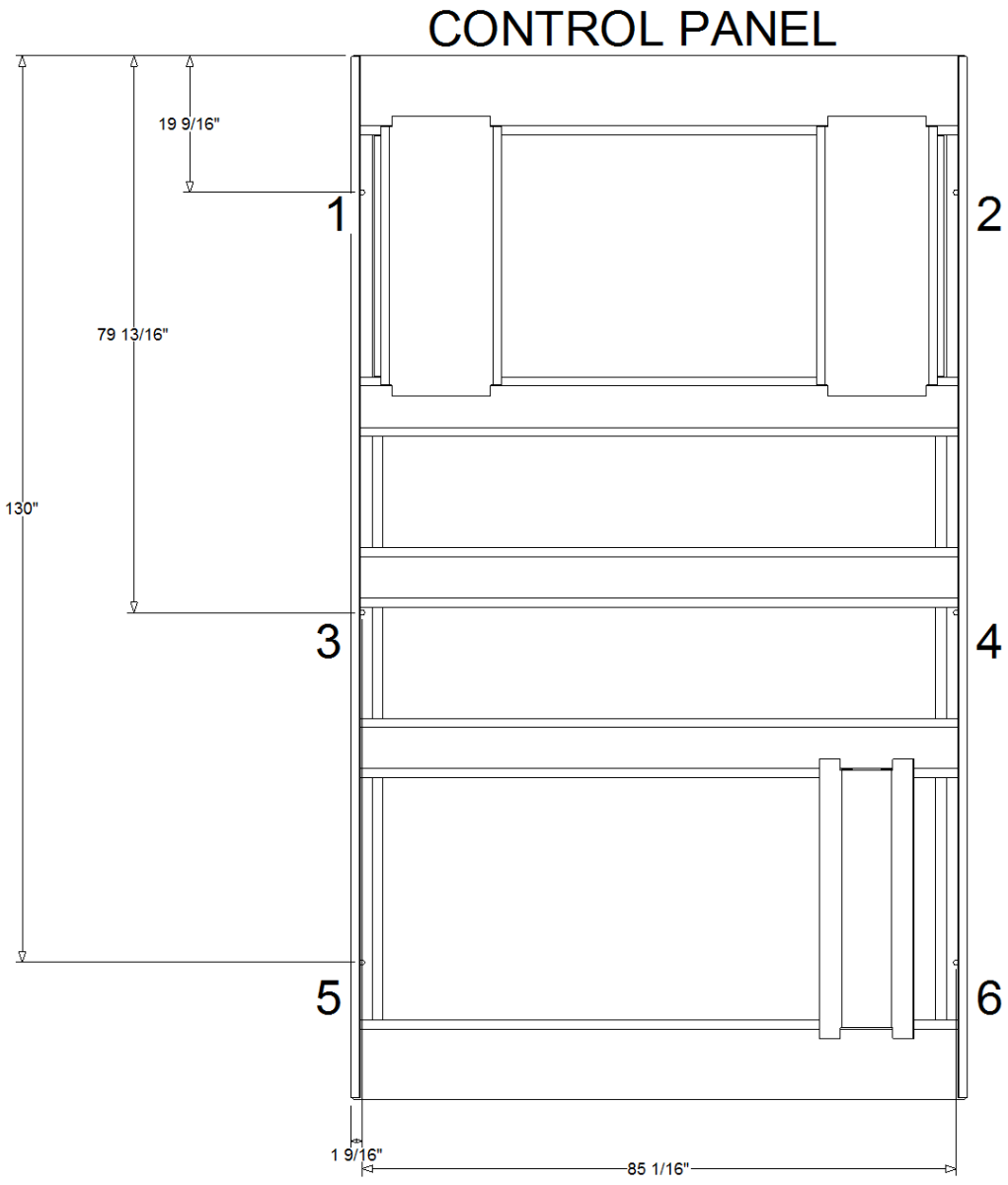
ISOMETRIC VIEW



BOTTOM VIEW

UNIT SIZE	MOUNTING LOCATIONS & POINT LOAD WEIGHTS						TOTAL OPERATING WEIGHT
	1	2	3	4	5	6	
070	1,117.3	1,210.0	781.3	849.3	511.1	557.4	5,120.8

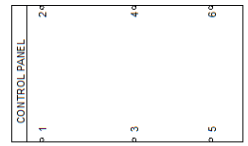
MOUNTING HOLE DIAMETER 3/4"



TOP VIEW

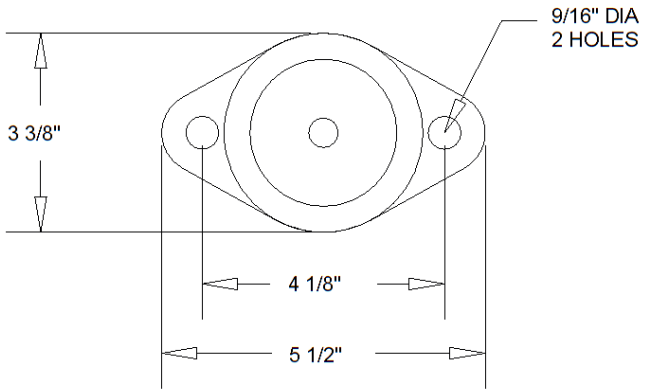
DIMENSIONS ARE REFERENCED FROM
THE END AND SIDE OF THE UNIT BASE

UNIT SIZE	MOUNTING LOCATIONS AND ISOLATOR NUMBER					
	1	2	3	4	5	6
070	RDP-4 BRICK RED	RDP-4 BRICK RED	RDP-3 CHARCOAL	RDP-4 BROWN	RDP-3 CHARCOAL	RDP-3 CHARCOAL

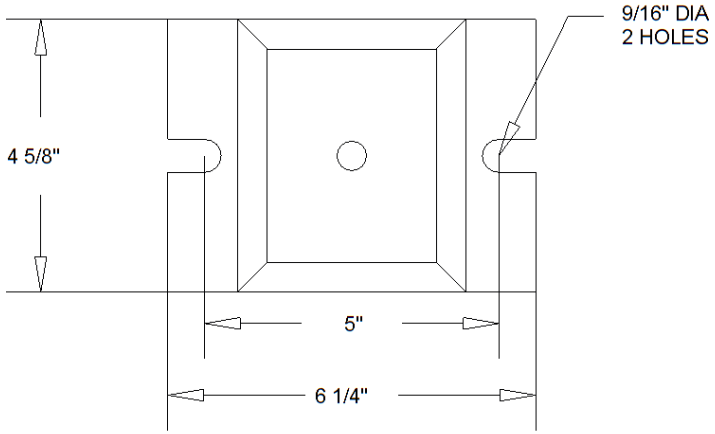


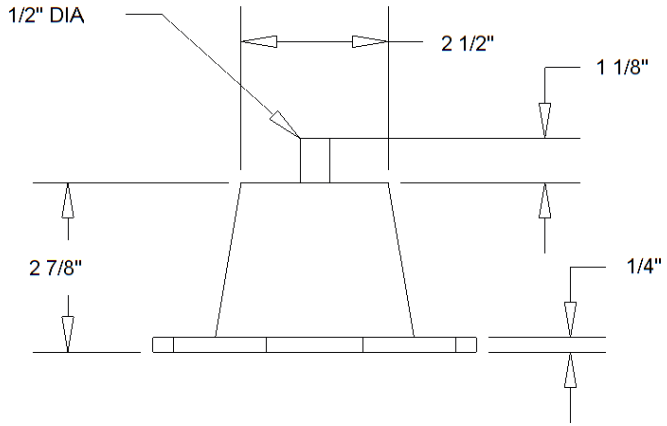
SEE ISOLATOR POINT LOADS FOR DETAILED INFORMATION ON ISOLATOR LOCATIONS.

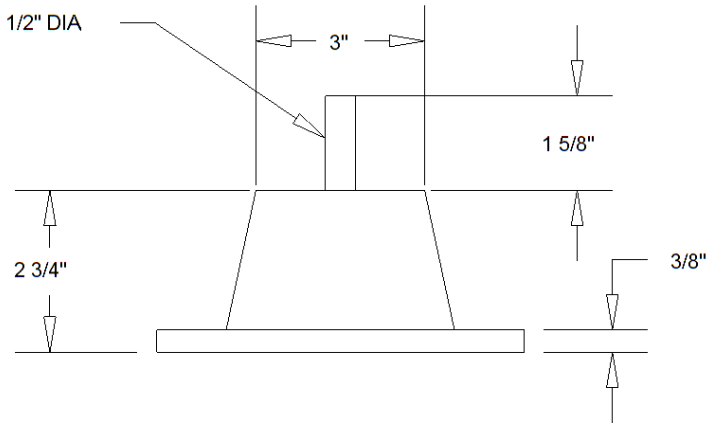
RDP-3 ISOLATORS



RDP-4 ISOLATORS

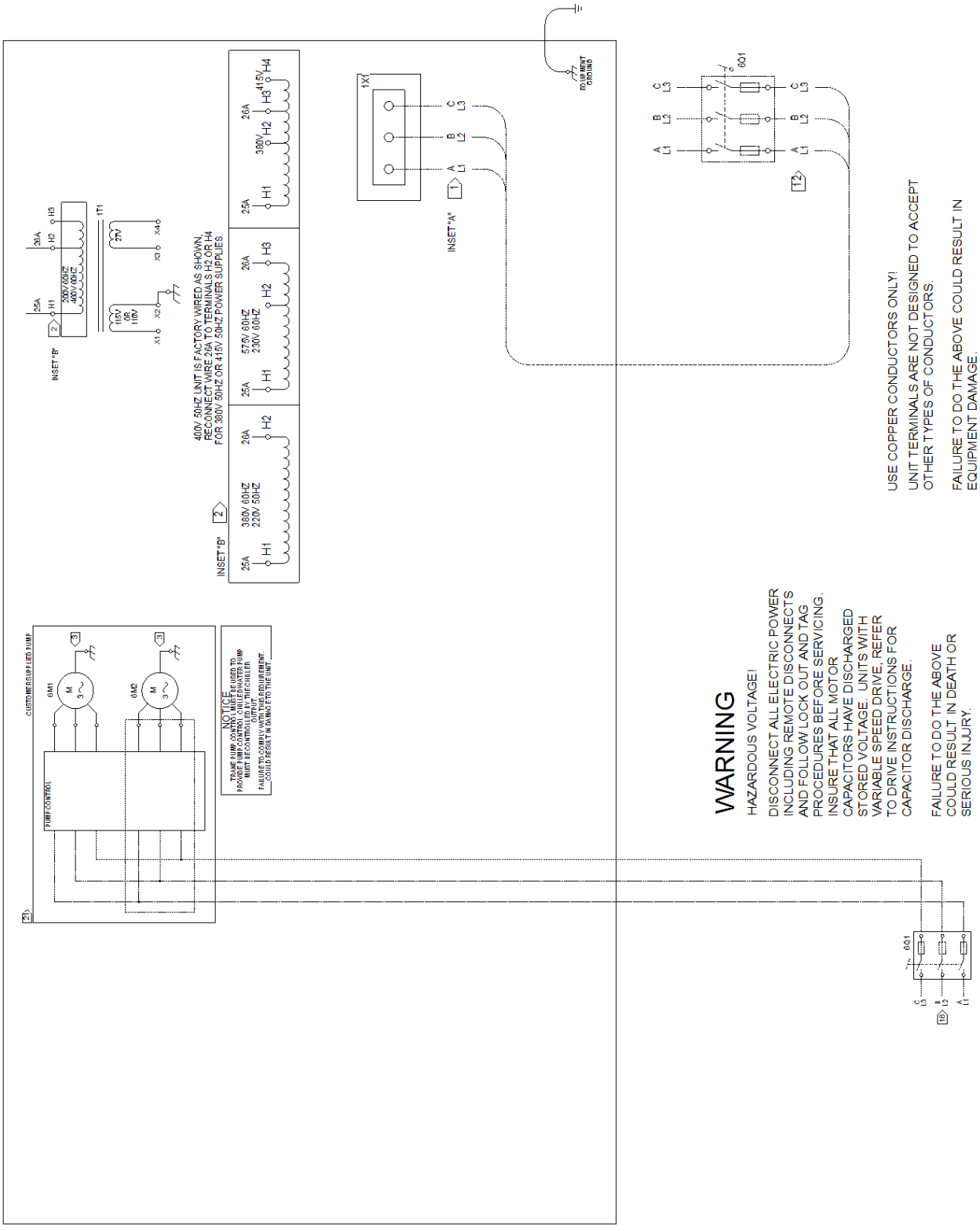


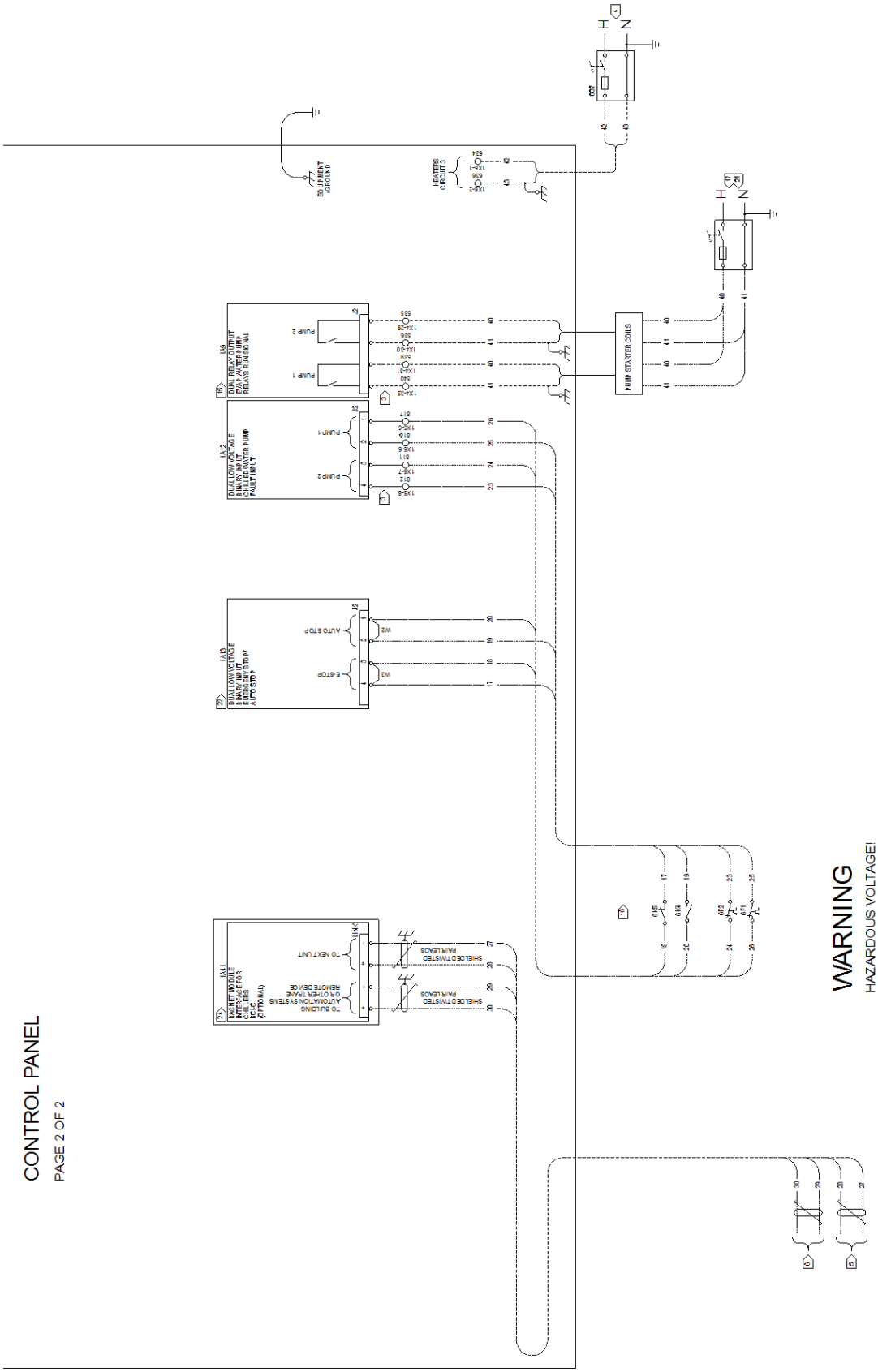




CONTROL PANEL

PAGE 1 OF 2





WARNING

HAZARDOUS VOLTAGE!

DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS AND FOLLOW LOCK OUT AND TAG PROCEDURES BEFORE SERVICING. INSURE THAT ALL MOTOR CAPACITORS HAVE DISCHARGED STORED VOLTAGE. UNITS WITH VARIABLE SPEED DRIVE, REFER TO DRIVE INSTRUCTIONS FOR CAPACITOR DISCHARGE.

FAILURE TO DO THE ABOVE COULD RESULT IN DEATH OR SERIOUS INJURY.

USE COPPER CONDUCTORS ONLY! UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS.

FAILURE TO DO THE ABOVE COULD RESULT IN EQUIPMENT DAMAGE.

1. SINGLE SOURCE POWER IS PROVIDED AS STANDARD ON THESE PRODUCTS, FIELD CONNECTIONS ARE MADE TO 1X1, OR 1Q2.
2. FOR VOLTAGES 200V/60HZ, 220V/50HZ, 380V/60HZ, 460V/60HZ, WIRE 26A SHALL BE CONNECTED TO H2. FOR VOLTAGES 230V/60HZ & 575V/60HZ, WIRE 26A SHALL BE CONNECT TO H3. 400V/50HZ UNIT IS FACTORY WIRED WITH 26A CONNECTED TO H3 - RECONNECT WIRE 26A TO H2 FOR 380V/50HZ, OR H4 FOR 415V/50HZ. H4 IS ONLY AVAILABLE WITH 400V/50HZ PANELS.
3. FIELD CONNECTIONS ARE ONLY MADE IN A CUSTOMER PROVIDED PUMP (PTYP=NONE). THESE CONNECTIONS WILL BE MADE BY THE FACTORY WHEN THE PUMP IS PROVIDED BY THE FACTORY (PTYP=DHHP).
4. CUSTOMER SUPPLIED POWER 115/60/1 OR 220/50/1 TO POWER RELAYS. MAX. FUSE SIZE IS 20 AMPS. GROUND ALL CUSTOMER SUPPLIED POWER SUPPLIES AS REQUIRED BY APPLICABLE CODES. GREEN GROUND SCREWS ARE PROVIDED IN UNIT CONTROL PANEL.
5. WIRED TO NEXT UNIT. 22 AWG SHIELDED COMMUNICATION WIRE EQUIVALENT TO HELIX LF22P0014216 RECOMMENDED. THE SUM TOTAL OF ALL INTERCONNECTED CABLE SEGMENTS NOT TO EXCEED 4500 FEET. CONNECTION TOPOLOGY SHOULD BE DAISY CHAIN. REFER TO BUILDING AUTOMATION SYSTEM (BAS) COMMUNICATION INSTALLATION LITERATURE FOR END OF LINE TERMINATION RESISTOR REQUIREMENTS.
6. WIRED TO TRACER OR OTHER TRANE REMOTE DEVICE. 22 AWG SHIELDED COMMUNICATION WIRE EQUIVALENT TO HELIX LF22P0014216 RECOMMENDED. THE SUM TOTAL OF ALL INTERCONNECTED CABLE SEGMENTS NOT TO EXCEED 4500 FEET. CONNECTION TOPOLOGY SHOULD BE DAISY CHAIN. REFER TO BUILDING AUTOMATION SYSTEM (BAS) COMMUNICATION INSTALLATION LITERATURE FOR END OF LINE TERMINATION RESISTOR REQUIREMENTS.
7. WIRED TO CUSTOMER CHILLED WATER SET POINT 2-10V OR 4-20mA.
8. WIRED TO CUSTOMER EXTERNAL DEMAND LIMIT 2-10V OR 4-20mA.
9. WIRED TO CUSTOMER 2-10V OR 4-20mA % CAPACITY ANNUNICIATOR.
10. WIRED TO TRACER OR OTHER REMOTE DEVICE.
11. REFER TO CGAM ELECTRICAL SCHEMATIC FOR SPECIFIC ELECTRICAL CONNECTION INFORMATION AND NOTES PERTAINING TO WIRING INSTALLATION.
12. ALL UNIT POWER WIRING MUST BE 600 VOLT COPPER CONDUCTORS ONLY AND HAVE A MINIMUM TEMPERATURE INSULATION RATING OF 90 DEGREE C. REFER TO UNIT NAMEPLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION DEVICE. PROVIDE AN EQUIPMENT GROUND IN ACCORDANCE WITH APPLICABLE ELECTRIC CODES. REFER TO WIRE RANGE TABLE FOR LUG SIZES.
13. ALL FIELD WIRING MUST BE IN ACCORDANCE WITH NATIONAL ELECTRIC CODE AND LOCAL REQUIREMENTS.
14. ALL CUSTOMER CONTROL CIRCUIT WIRING MUST BE COPPER CONDUCTORS ONLY AND HAVE A MINIMUM INSULATION RATING OF 300 VOLTS. EXCEPT AS NOTED, ALL CUSTOMER WIRING CONNECTIONS ARE MADE TO CIRCUIT BOARD MOUNTED BOX LUGS WITH A WIRE RANGE OF 14 TO 18 AWG OR DIN RAIL MOUNTED SPRING FORCE TERMINALS.
15. UNIT PROVIDED DRY CONTACTS FOR THE CONDENSER/CHILLED WATER PUMP CONTROL. RELAYS ARE RATED FOR 7.2 AMPS RESISTIVE, 2.88 AMPS PILOT DUTY, OR $\frac{1}{3}$ HP, 7.2 FLA AT 120 VOLTS 60 HZ, CONTACTS ARE RATED FOR 5 AMPS GENERAL PURPOSE DUTY 240 VOLTS.
16. CUSTOMER SUPPLIED CONTACTS FOR ALL LOW VOLTAGE CONNECTIONS MUST BE COMPATABLE WITH DRY CIRCUIT 24 VOLTS DC FOR A 12 mA RESISTIVE LOAD. SILVER OR GOLD PLATED CONTACTS RECOMMENDED.
17. FIELD CONNECTIONS ARE ONLY MADE IN A CUSTOMER PROVIDED PUMP. THESE CONNECTIONS WILL BE MADE BY THE FACTORY WHEN THE PUMP IS PROVIDED BY THE FACTORY. CUSTOMER SUPPLIED POWER 115V, 60Hz, 1PH.
18. CUSTOMER SUPPLIED 3 PHASE POWER.
19. OPTIONAL FIELD ASSIGNED PROGRAMMABLE RELAYS (STAT=PRLY). CLASS 1 FIELD WIRED MODULE, RELAY AT 120V: 7.2A RESISTIVE 2.88A PILOT DUTY, 1/2 HP 7.2FLA; AT 240VAC: 5 AMPS GENERAL PURPOSE.
20. WIRED TO CUSTOMER 0-10 VDC PUMP SPEED SIGNAL.
21. WHEN FACTORY PROVIDED PUMP IS NOT SELECTED. CUSTOMER MUST SUPPLY SUITABLE PUMP SYSTEM. REFER TO PUMP MANUFACTURER FOR WIRING REQUIREMENTS.
22. THE CONTACTS FOR AUTO STOP AND EMERGENCY STOP SWITCHES ARE JUMPERED AT THE FACTORY BY JUMPERS W2 & W3 TO ENABLE UNIT OPERATION. IF REMOTE CONTROL IS DESIRED, REMOVED THE JUMPERS AND CONNECT TO THE DESIRED CONTROL CIRCUIT.
23. 1A15, LCI MODULE USED WHEN (COMM = LCI).
24. 1A41, BACNET INTERFACE MODULE USED WHEN (COMM = BCNT).

Validation Period
Product performance, mechanical specifications and submittal data is valid for a period of 4 months from the date of the submittal generation. If 4 months or more has elapsed between submittal generation and equipment release, the product and submittal will need to be verified. It is the purchaser's responsibility to request such verification.

Foundation
Provide rigid, non-warping mounting pads or a concrete foundation of sufficient strength and mass to support the applicable operating weight (i.e. including completed piping, and full operating charges of refrigerant, oil and water). Once in place, the unit must be level within 1/4" across the length of the unit. The Trane Company is not responsible for equipment problems resulting from an improperly designed or constructed foundation.

General
Units are constructed of a galvanized steel frame with galvanized steel panels and access doors. Component surfaces are finished with a powder-coated paint.

Each unit ships with full operating charges of refrigerant and oil.

Compressor and Motor
The unit is equipped with four hermetic, direct-drive, 3600 rpm 60 Hz suction gas-cooled scroll compressors. The simple design has only three major moving parts and a completely enclosed compression chamber which leads to increased efficiency. Overload protection is internal to the compressors. The compressor includes: centrifugal oil pump, oil level sight glass and oil charging valve. Each compressor will have compressor heaters installed and properly sized to minimize the amount of liquid refrigerant present in the oil sump during off cycles.

Unit-Mounted Starter
The control panel is designed per UL 1995. The starter is in an across-the-line configuration, factory-mounted and fully pre-wired to the compressor motor and control panel. Typically, Trane scroll compressors are up to full speed in one second when started across-the-line.

A factory-installed, factory-wired 820 VA control power transformer provides all unit control power (120 Vac secondary) and Trane CH530 module power (24 Vac secondary).

Power line connection type is standard with a terminal block.

Power Connection
Power connections include main three-phase power and one separate 115V, 20 amp customer provided single phase power connection is required to power the heaters (if used for freeze protection).

Short circuit current rating of 5 kA is provided.

Evaporator
Braze plate evaporator is made of stainless steel with copper as the braze material. It is designed to withstand a refrigerant side working pressure of 430 psig (29.6 bars) and a waterside working pressure of 150 psig (10.5 bars). Evaporator is tested at 1.1 times maximum allowable refrigerant side working pressure and 1.5 times maximum allowable water side working pressure. It has one water pass. A water strainer and a flow switch are factory installed.

Immersion heaters protect the evaporator to an ambient of -20°F (-29°C).

All evaporators have grooved pipe connections.

Note: An additional 115V, 20 amp field provided single phase power connection is required to power the heaters (if used for freeze protection).

Condenser
Air-cooled condenser coils have lanced aluminum fins mechanically bonded to internally-finned copper tubing.

The condenser coil has an integral sub-cooling circuit. The maximum allowable working pressure of the condenser is 650 psig (44.8 bars). Condensers are factory proof tested at 650 psig (44.8 bars).

Direct-drive vertical discharge condenser fans are balanced and individually protected. Three-phase condenser fan motors with permanently lubricated ball bearings and external thermal overload protection are provided.

A variable speed drive on the first fan of each circuit allows the unit to start and operate with ambient temperatures between 0.0 F and 125.0 F.

Refrigerant Circuits
The unit has dual refrigerant circuits. Each refrigerant circuit has Trane scroll compressors piped in parallel with a passive oil management system. A passive oil management system maintains proper oil levels within compressors and has no moving parts. Each refrigerant circuit includes filter drier, electronic expansion valve, liquid line and discharge service valves. Capacity modulation is achieved by turning compressors on and off. The unit has four capacity stages.

Unit Controls
The microprocessor-based control panel is factory-installed and factory-tested. The control system is powered by a pre-wired control power transformer, and will turn on and off compressors to meet the load. Microprocessor-based chilled water reset based on return water is standard. The unit comes with a factory installed flow switch.

The Trane CH530 microprocessor automatically acts to prevent unit shutdown due to abnormal operating conditions associated with low evaporator refrigerant temperature and high condensing temperature. If an abnormal operating condition continues and the protective limit is reached, the machine will shut down.

The panel includes machine protection for the following conditions: low evaporator refrigerant temperature and pressure, high condenser refrigerant pressure, critical sensor or detection circuit faults, lost communication between modules, phase loss, phase reversal, over temperature protection, external and local emergency stop, and loss of evaporator water flow.

When a fault is detected, the control system conducts more than 100 diagnostic checks and displays results. The display will identify the fault, indicate date, time, and operating mode at time of occurrence, and provide type of reset required and a help message.

Data contained in available reports includes: water and air temperatures, refrigerant pressures and temperatures, flow switch status, EXV position, and compressor starts and run-time. All necessary settings and setpoints are programmed into the microprocessor-based controller via the operator interface. The controller is capable of receiving signals simultaneously from a variety of control sources, in any combination, and priority order of control sources can be programmed.

Communications
BACNet Interface allows the user to easily interface using BACNet MS/TP via a single twisted-pair wiring to a factory-installed and tested communication board.

Architectural Louvered Panels
Louvered panels cover the complete condensing coil and service area beneath the condenser.

Isolators
Molded elastomeric isolators, sized to reduce vibration transmission to the supporting structure when the unit is installed, ship with the chiller.