



**CUSTOM AIR PRODUCTS & SERVICES, INC.**

*35 Southbelt Industrial Drive • Houston, Texas 77047*

*(713) 460-9009 • Fax (713) 460-9499*

*www.customairproducts.com*

## HERC RENTALS

80 TON INDUSTRIAL A/C UNIT-NEMA 4-NON-CLASSIFIED

-

17F-0873

HOT DIPPED SKID AND CAGE

SS CONDENSER AND AHU CONSTRUCTION

-

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460V/3PH/60HZ

GENERAL PURPOSE

8/6/2018

INSTALLATION & OPERATION MANUAL

BOOK ASSEMBLED BY: JONATHAN O'MALLEY

DATE: 8/6/2018

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17F-0873**

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SECTION

01

JOB SCOPE



Quote No:	DW17-11-08-09
Quote Date:	11-08-2017
Project Type:	(2) 80 Ton Industrial AC Unit-100% Outside Air-NEMA 4 Non-Classified
Drawing Delivery:	2 weeks after receipt of order
Equipment Delivery:	12-14 weeks After Receipt of Approved Drawings (ARAD)
Freight Terms:	FOB HERC
Payment Terms:	<i>Net 45</i> <i>*100% upon completion</i>

Item	Qty	Description
1.	2	<p>CAPS Model #: <b>PPKH-80TD-0NN0NN-5E5-P2-S1CEUP</b></p> <p>Provide the labor and material to manufacture one (1) custom built air condition unit as follows:</p> <ul style="list-style-type: none"> <li>The certified skid shall be fabricated from 3/16" thick, 8" X 4" rectangular steel tube. The skid size is to be constructed in length and width plus piping headers so that no part of the unit is outside of the rack. The fork truck lifting slots are made of the same material (12" x 6" rectangular steel tube) and are incorporated into the design on centers and are 60" apart. The skid components are continuously welded at all joints. All tubing ends are capped and continuously welded. Weep holes are drilled into the skid as necessary for the complete skid to be hot-dipped galvanized per industry standards. All serial numbers are laser cut from 10 gauge stainless steel plate and attached with permanent fasteners on the skid at corner locations.</li> <li>The lifting frame material shall be 4" X 4" square steel tubing. This rack is designed for certified overhead lifting and stacking of the units. All tubing ends are capped and continuously welded. The tubing is cut and fit to the height, width, and length of the unit. All corners have a 45 degree, 3/8" steel plate gusset. The top of the rack has a 3/8" steel plate gusset welded to the horizontal tubing and incorporates a 1/2" eyebolt application.</li> <li>The entire certified skid/lifting frame assembly shall be hot dipped galvanized before component installation.</li> <li>The AHU will be double wall construction. The exterior skin shall be formed from 16 gauge type 304 stainless steel. The inner wall shall be fabricated from 20 gauge type 304 stainless steel. The floor shall be fabricated from the same material.</li> </ul>

Item	Qty	Description
		<ul style="list-style-type: none"> <li>• The insulation for the unit shall be 1", 3-pound density liner. An adhesive is applied to all metal surfaces to be insulated and the insulation is fitted to match.</li> <li>• The condenser section will be single wall construction. The exterior casing shall be formed from 14 gauge type 304 stainless steel.</li> <li>• The hardware shall be from non-corrosive material to include: Stainless steel TEK-screws, piano-type door hinges and positive acting compression latches.</li> <li>• The doors shall be double-wall construction using 16 gauge type 304 stainless steel on the outer wall and 20 gauge type 304 stainless steel on the inner wall. "Close Cell" ¼" neoprene gasket is installed on the door frames for air sealing.</li> <li>• The drain pan shall be formed and continuously welded using T-304 stainless steel. The coil hat sections shall be formed and welded using T-304 stainless steel and designed to allow for easy coil removal. All coil drain lines and P traps shall be fitted from 1-½" galvanized steel fittings. Two (2) condensate drains shall be provided on opposite ends of the evaporator.</li> <li>• The return air section on the unit shall have a stainless steel inlet panel with four (4) 20" return air duct collars provided with 2"-30% filters in slide racks. The duct connections are provided with hinged covers that can be secured in the closed position using "Jeep Latch" style clamps. Provide four (4) stainless steel friction lock duct clamps on each collar.</li> <li>• Each unit shall have three (3) 20" stainless steel discharge collars that fit to the interior liner and welded to the exterior wall. Supply air duct connections are provided with hinged covers that can be secured in the closed position using "Jeep Latch" style clamps. Provide four (4) stainless steel friction lock duct clamps on each collar.</li> <li>• The fan shall be a Class II, Arrangement 3, belt-drive, plenum fan as manufactured by Greenheck (or equal). The fan is sized for 10,000 CFM at 6.0" of total static pressure. The fan bearings are warranted for 80,000 hours of operation. The drive shall be a double-belt system rated for a 1.5 service factor.</li> <li>• The evaporator fan motor shall be an explosion proof 15 horsepower, 460-3-60.</li> <li>• The evaporator coils shall be sized to condition air at an entering temperature of 95F db, 80F wb, and a leaving air temperature of 53.1F db, 52.8F wb. The coil shall be 8 rows, 14 fins per inch, with aluminum fins and copper tubes. The total capacity of the system shall be rated at 978,200 Btu/hr with a sensible capacity of 454,900 Btu/hr. Evaporator coils will be provided with EnergyGuard protective coatings.</li> </ul>

Item	Qty	Description
		<ul style="list-style-type: none"> <li>• Main high voltage panel (for all electrical components greater than 50 volts)-contactors, controls, and all electric panels shall be installed in a NEMA 4 enclosure. Power on and phase incorrect pilot lights and a Off/On 2 position switch shall be incorporated into the high voltage control panel. Four (4) single pole cam style connectors will be provided for power connections in a separate NEMA 4 enclosure. A NEMA 4 panel shall contain the main circuit breaker including linkage for external operation.</li> <li>• All electrical wiring and tubing is to be installed per industry standards.</li> <li>• All refrigerant specialties are to be installed per industry standards.</li> <li>• Condenser coils shall have copper tubes and aluminum fins with 4 rows and 16 fins per inch sized to match evaporator specifications. Condenser coils will be provided with EnergyGuard protective coatings.</li> <li>• Six (6) direct drive propeller fans are provided to include 24" anti-static fiberglass condenser fan blades, galvanized wall housing and TEFC 2HP motors, 460-3-60. Each refrigerant circuit to have (3) dedicated fans and each fan to have partitions installed for each section of the condenser coil to help provide good condenser pressure control.</li> <li>• The compressors shall be scroll type designed especially for R-410A refrigerant along with all refrigeration specialties and piping as required per industrial standards with hot gas bypass on both circuits for superior capacity control.</li> <li>• Main low voltage panel (for all electrical components less than 50 volts)-Carel Controller, entering and leaving temperature selector switch contained in this NEMA 4 enclosure.</li> <li>• All stainless steel is scotch-brited by hand to provide a uniform grain finish.</li> <li>• Unit is primarily constructed of stainless steel and a galvanized skid. There is a requirement for painting compressors, exposed refrigerant piping and some electrical components. All painting of these components to be Herc specified color.</li> <li>• CAPS will provide and install the Herc decal package as per provided layout drawing by Herc.</li> <li>• Herc Representatives will also have full access to schedules and production progress as units are being manufactured</li> <li>• Unit to be tested and verified for proper operation at Custom Air Products &amp; Services prior to shipment.</li> </ul>



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SECTION

02

EVAPORATOR FAN & MOTOR SELECTION

Performance	
Quantity	1
Volume (CFM)	10,250
External SP (in. wg)	6
Total SP (in. wg)	6
Operating Power (hp)	14.45
Start-Up Power (hp)	14.45
Fan RPM	2213
Max Fan RPM	2,433
Oper. Frequency (Hz)	60
Elevation (ft)	105
Start-up Temp.(F)	70
Operating Temp.(F)	70

Fan Configuration	
Size	22
Class	II
Arrangement	3
Rotation	CW
Orientation	Horizontal

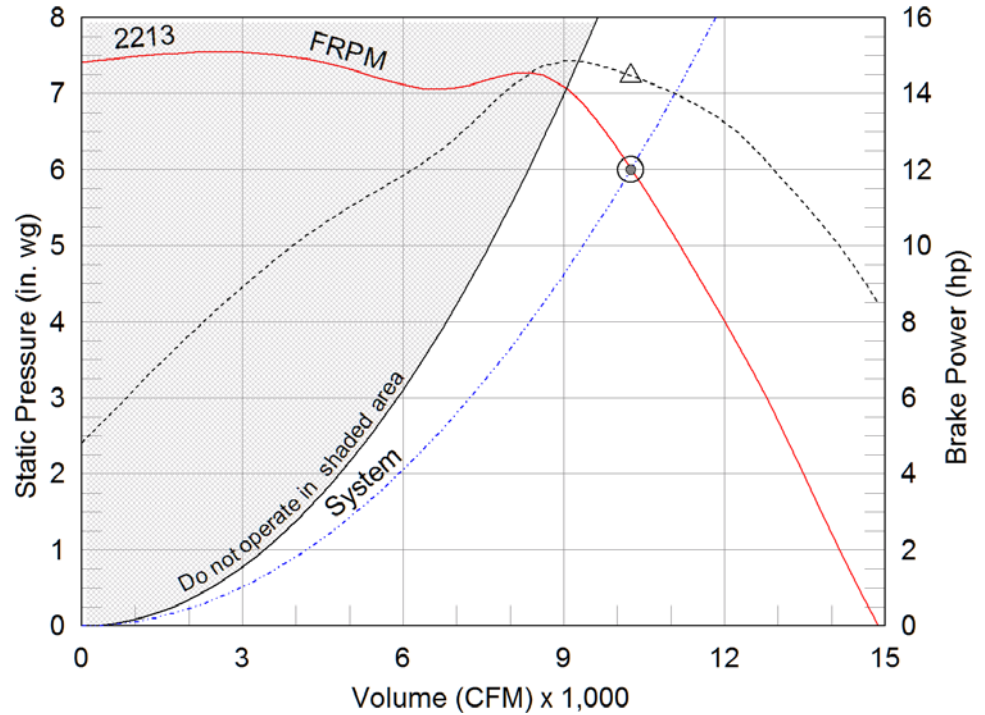
Equipment Weights	
Fan (LMD)(lb)	221
Motor/Drive (lb)	22
Accessories (lb)	255

Misc Fan Data	
Outlet Velocity (ft/min)	2,719
Static Efficiency (%)	69
Tip Speed (ft/min)	12,891
Corner Weight A (lb)	65
Corner Weight B (lb)	187
Corner Weight C (lb)	63
Corner Weight D (lb)	182

Motor and Drives	
Motor Supplier	Greenheck
Size (hp)	15
RPM	1725
Enclosure	TEFC
Voltage	460
Cycle	60
Phase	3
Frame Size	182T
Max Frame Size	215
Location	Right Side
Pulley Type	Constant
Drive Loss (%)	3.4

Model: 22-APH-3-II-150  
Plenum Fan

Operating Performance



- △ Operating Bhp point
- Operating point at Total SP
- Operating point at External SP
- Fan curve
- - - System curve
- - - Brake horsepower curve



Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
Inlet	83	85	89	91	85	83	79	76	92	80	32
Outlet	92	92	93	96	93	90	85	82	98	86	48

LwA - A weighted sound power level, based on ANSI S1.4

dBA - A weighted sound pressure level, based on 11.5 dB attenuation per octave band at 5 ft. dBA levels are not licensed by AMCA International  
Sones - calculated using AMCA 301 at 5 ft

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## Model: 22-APH-3-II-150

Plenum Fan

### Standard Construction Features:

HOUSING: Heavy gauge, welded steel mounting frame with die formed flanges - Inlet panel is heavy gauge steel with die formed flanges with welded corners - Steel components are phosphatized and coated - Corrosion resistant fasteners BEARINGS, SHAFT, AND WHEEL: Heavy duty, concentric locking, self-aligning ball or roller pillow block bearings - Polished, solid steel shafts - Welded, aluminum centrifugal wheel - 12 bladed construction- Airfoil blade profile

### Selected Options & Accessories:

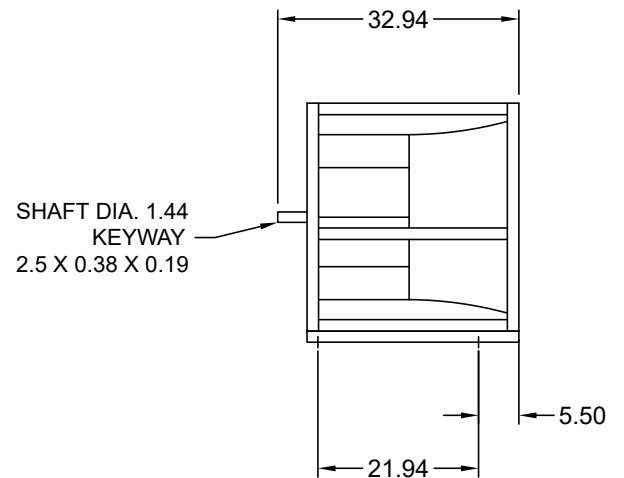
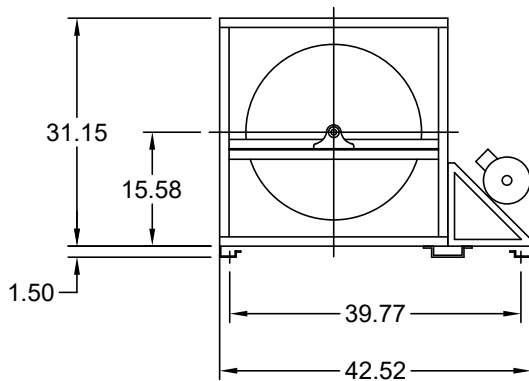
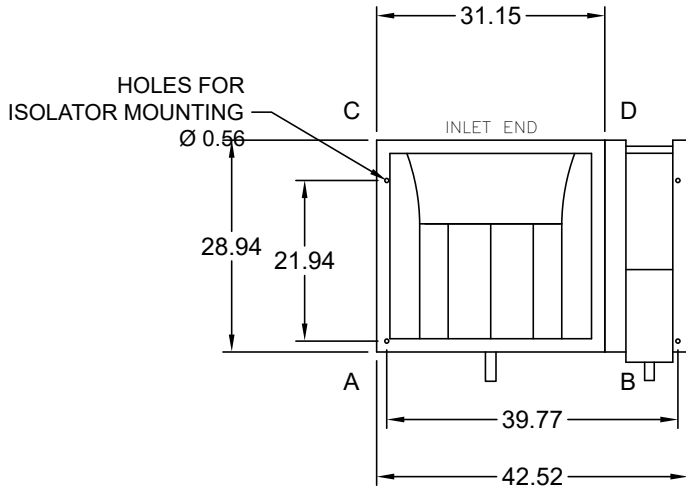
NEMA Premium Efficient Motor - meets NEMA Table 12-12  
Motor VFD Rated without Shaft Grounding Protection  
Motor with Minimum 40 Degree C Ambient Temperature  
Motor with Class F Insulation  
Arrangement - 3  
Bearings - L(10) Life of 80,000 Hours, L(50) avg. life 400,000 Hours  
Coated with Permator, Concrete Gray-RAL 7023, Fan and Attached Accessories, Mill Finish on Aluminum Wheel  
Factory Vibration Test, 0.15 in/sec, peak, filter-in as measured at the fan RPM  
15HP, 1725RPM, 460/60/3 (T1502512)

### Notes:

Drive - 2283 RPM

Model: 22-APH-3-II-150

Plenum Fan



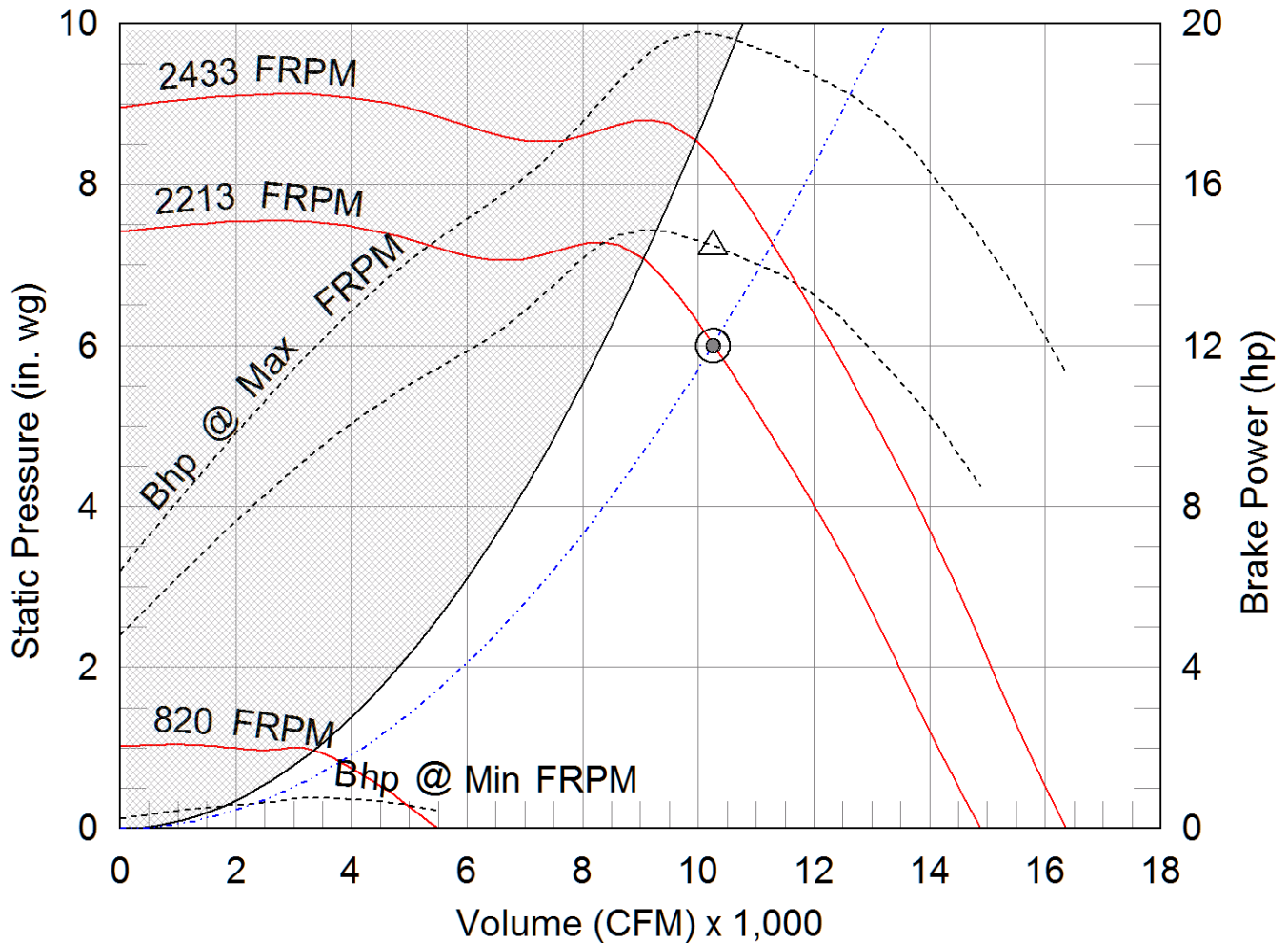
Notes: All dimensions shown are in units of in.  
Drawings are not to scale. Drawings are of standard unit and do not include dimensions for accessories or design modifications.

22-APH-3-II-150

Min/Max Fan Curve

**Performance**

Requested Volume (CFM)	Actual Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	Fan RPM	Operating Power (hp)
10,250	10,250	6	6	2213	14.45



- △ Operating Bhp point
- Operating point at Total SP
- Operating point at External SP
- Fan curve
- System curve
- Brake horsepower curve



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SECTION

03

EVAPORATOR COIL

Customer:	Custom Air Products	Date:	2/9/2016
Contact:		From:	Larry Novak
Telephone:		Company:	Custom Air Products
Cell:		Return Tel:	(713) 460-9009
Fax:		Return Fax:	
Job:	80 Ton Jetson	Email:	larryn@customairproducts.com
Quote #:			

**Construction**

Item:	80 Ton Jetson - Evap
Coils Per Bank:	1
Tube OD IN:	1/2
Style:	EJ
Fins Per Inch:	11
Rows:	8
Fin Surface:	B
Fin Height (IN):	30.00
Finned Length (IN):	109.0
Tubing Mat. (IN):	0.016 Copper Rifled
Fin Mat. (IN):	0.0075 Aluminum
Circuiting:	-48
Face Area (SQ FT):	22.71

**Air Side**

Air Flow (Sft^3/min)	10250.0
Altitude FT:	0.00
Ent. Air DB/WB °F:	95.00 / 80.00
Lvg. Air DB/WB °F:	0.00 / 0.00
Total / Sensible MBH:	984.0 / 0.00
Max Air PD "H2O:	0.00

**Refrigerant Side**

Refrigerant:	410A
Super Heat °F:	20.00
Saturated Suction Temp °F:	45.00
Liquid Temp °F:	109.8

OUTPUT DATA			OPTIONS	
Model Number:		4EJ1108B	Casing Material:	Galvanized
Air Velocity:	(Sft/min)	451.4	Casing Type:	Flanged
Total Capacity:	MBH	988.8	Hand:	Right
Sens. Capacity:	MBH	476.0	Connection Material:	Copper
Lvg. Air DB:	°F	52.00	ByPass Kit Quantity:	2
Lvg. Air WB:	°F	52.00	ByPass Kit Size:	0.875
Standard APD	"H2O	0.74	Label Kit:	No
Code 18/19:		8048/40	Coating: None	
Code 18/19_2:		N/A	Mounting Holes:	No
Suction Conn.:	IN	(2) 2.125	Drain Headers:	No
Distributor Conn 1:	IN	(2) 1.625	Boxed Headers:	No
Distributor Conn 2:	IN	N/A		
Refg. PD:	lbf/in^2	4.96		
Refg. Velocity:	ft/min	1664.1		
Internal Volume:	in^3	3991.9		
Weight:	lbm	493.9		
Notes:		CJMUW		

**Notes:**

- C) Coil is NOT certified by AHRI.
- J) Coil Will Be Supplied With Multiple Distributors.
- M) Coil rating valid for Heatcraft coils only.
- U) User-entered circuiting. Check circuiting for dropped tubes or opposite-end connections
- W) Expansion Valve may require coupling for distributor size selected. Consult Expansion Valve manufacturer for available sizes.



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SECTION

04

CONDENSOR FAN & MOTOR SELECTION



**Fan specification:**

Fan article number	FP00001M77100	
Customer article numer	CND63	
Voltage	265/460	V
Frequency	60	Hz
Fan speed	1745	RPM
Minimum ambient temperature	-25 (-13)	°C (°F)
Maximum ambient temperature	55 (131)	°C (°F)
Frequency control	YES	
Insulation class	CL.F	
IP Class Fan	IP55	

**Motor specification:**

Motor article number	FM0457M7G0100	
Approvals	cURUs	
Shaft power	1.5	kW
Shaft power	2.0	HP
Voltage	265/460	V
Frequency	60	Hz
Minimum ambient temperature	-25 (-13)	°C (°F)
Maximum ambient temperature	55 (131)	°C (°F)
Frequency control	YES	
Insulation class	CL.F	
IP Class Fan	IP55	

**Impeller specification:**

Impeller type number	624/4-4/P4ZL/37,5/PACAS	
Diameter	624 (24.6)	mm (inch)
No. of blades	4	
Hub size	4	
Blade profile	P4Z	
Rotation direction	L	
Pitch angle	37.5	°
Blade material	PACAS	
Shaft diameter	19 (0.75)	mm (inch)
Key width	6 (0.24)	mm (inch)
Hub length	42 (1.65)	mm (inch)
Assembly form	A	



**Fan performance:**

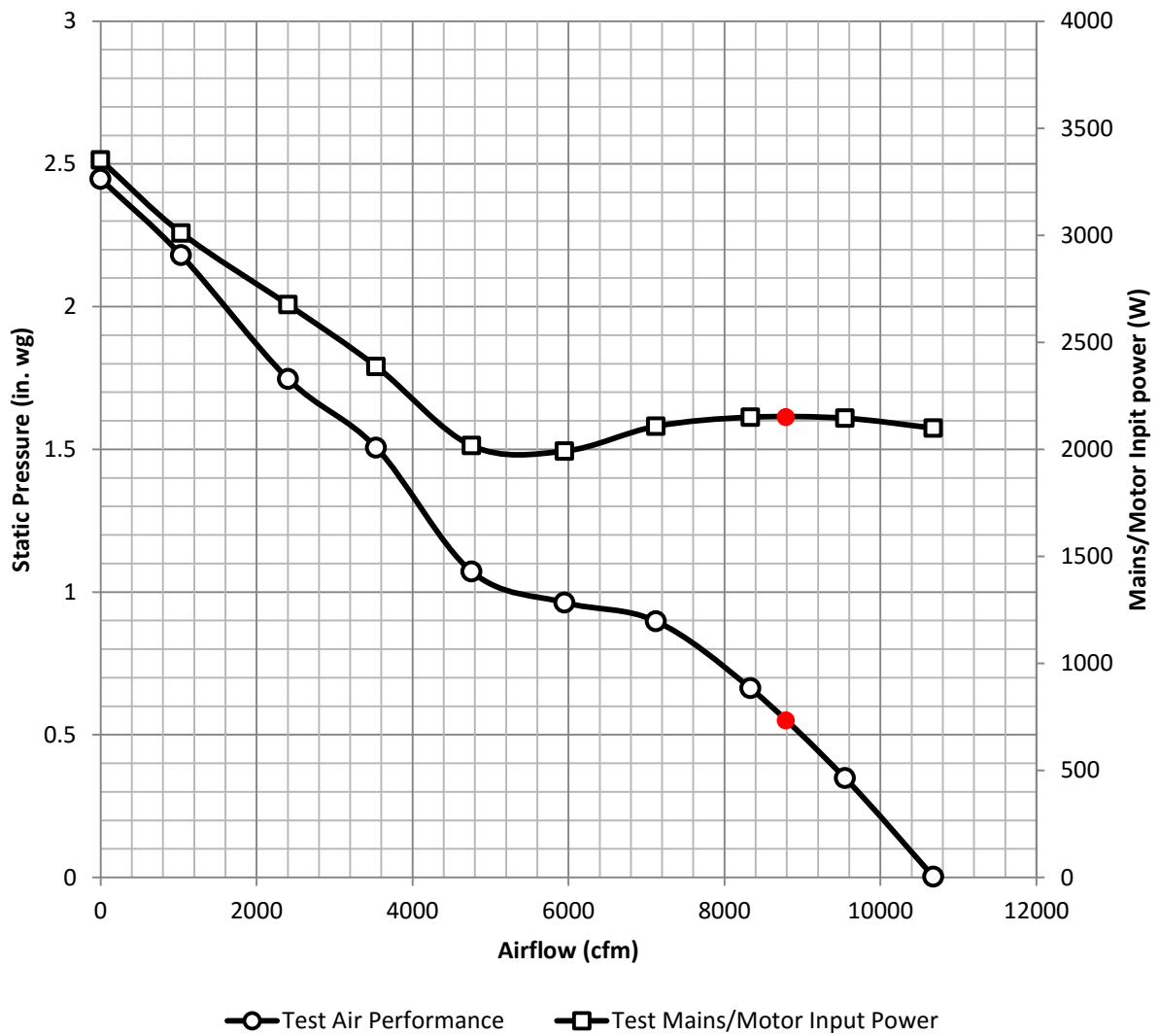
Test institute	AMCA	
Test method	ANSI / AMCA 210-16	
Installation Type	A	
Test number	34743-A1	
Test date	09/13/2017	

**Results at Standard Air:**

<b>Det. No.</b>	<b>Pt</b> (in. wg)	<b>Pv</b> (in. wg)	<b>Ps</b> (in. wg)	<b>Q</b> (cfm)	<b>W</b> (W)
1	0.616	0.613	0.003	10679	2099
2	0.837	0.489	0.348	9546	2145
3	1.036	0.372	0.663	8332	2150
4	1.170	0.272	0.898	7120	2107
5	1.153	0.190	0.963	5951	1992
6	1.193	0.121	1.072	4756	2017
7	1.573	0.067	1.506	3534	2387
8	1.778	0.031	1.747	2403	2676
9	2.185	0.006	2.18	1033	3011
10	2.447	0.000	2.447	0	3351



**Results at Standard Air:**



**Specific design point:**

Det. No.	Pt (in. wg)	Pv (in. wg)	Ps (in. wg)	Q (cfm)	W (W)
-	-	-	0.55	8790	2150



**Fan performance:**

Test institute	AMCA	
Test method	ANSI / AMCA 300-14	
Installation Type	A	
Test number	34743-S1	
Test date	09/13/2017	

**Test conditions:**

Det. No.	Pt (in. wg)	Pv (in. wg)	Ps (in. wg)	Q (cfm)	W (W)
3	-	-	0.549	8808	-

**Full Octave Band Analysis:**

Sound Power Level Lw in dB per Octave Band:

	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4kHz	8 kHz	
<b>Lw</b>	82.5	93.7	93.7	86.9	87.4	85.7	84.5	82.5	<b>dB</b>

Total Sound Power Level Lw in dB:

<b>Lw</b>	98.3	<b>dB</b>
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Sound Power Level LwA with A-weighting in dB(A) per Octave Band:

	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4kHz	8 kHz	
<b>LwA</b>	56.3	77.6	85.1	83.7	87.4	86.9	85.5	81.0	<b>dB(A)</b>

Total Sound Power Level LwA with A-weighting in dB(A):

<b>LwA</b>	93.3	<b>dB(A)</b>
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Calculated Sound Pressure Level LpA at 3 meters with A-weighting in dB(A) per Octave Band:

	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4kHz	8 kHz	
<b>LpA</b>	38.8	60.1	67.6	66.2	69.9	69.4	68.0	63.9	<b>dB(A)</b>

Total calculated Sound Pressure Level LpA at 3 meters with A-weighting in dB(A):

<b>LpA</b>	75.8	<b>dB(A)</b>
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*Note: Sound Pressure Level LpA at 3 meters was calculated using an ideal hemisphere under free field conditions, therefore LpA levels cannot be guaranteed in actual applications.*



# Technical data

Voltage	U	265/460	V
Current	I	5.1/3.0	A
Capacitor		0/0	μF/V
Cos phi		0.74	
P <sub>2</sub>		1.50	kW
P <sub>2</sub> (Horsepower)		2.00	Hp
Phase		3	~
Poles		4	
Frequency		60	Hz
Speed		1760	RPM
Ambient temperature	T <sub>amb</sub> min/max	-25...55	°C
Insulation Class		CL.F	
IP Class		IP55	
Weight		10.0	kg
Efficientie class		IE2	



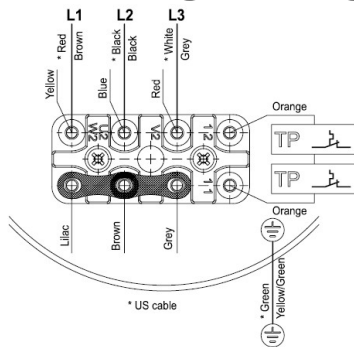
# Efficiency IE2

100% Load	85.7%
80% Load	85.1%
50% Load	82.0%

# Control options

Triac controller	No
Transformer	No
Frequency drive	Yes

# Wiring diagram



**CND50 and CND63 Condenser Fans**

**FOLLOW INSTALLATION INSTRUCTIONS CAREFULLY.  
DO NOT TAKE ANY SHORTCUTS!**

**CHECKLIST UPON RECEIPT OF GOODS**

1. Inspect for any damage that may have occurred in transit. Report any damage within 48 hours.
2. Check all bolts, screws, set screws etc. for looseness, and re-tighten if necessary.
3. Before installation, rotate the blade to make sure it moves freely. Adjust if necessary.
4. Before installation, please read the entire information sheet carefully.

**GENERAL SAFETY INFORMATION**

**WARNING!**

TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONNEL, OBSERVE THE FOLLOWING:

1. Use this unit only in the manner intended by the manufacturer. If you have any questions, contact the manufacturer.
2. Before servicing or cleaning the unit, switch the power off at the service panel. Lock the service panel to prevent the power from being accidentally switched on. If the service panel cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.
3. Installation work and electrical wiring must be done by qualified persons in accordance with all applicable codes and standards, including standards on fire-resistant construction.
4. Sufficient air is needed for proper combustion and exhausting of gases through the flue (chimney) of fuel burning equipment to prevent back drafting. Follow the heating equipment manufacturer's guideline and safety standards such as those published by the National Fire Protection Association (NFPA), and the American Society for Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), and the local code authorities.
5. When cutting or drilling into a wall or ceiling, do not damage electrical wiring and other hidden utilities.
6. Ducted fans must always be vented to the outdoors.

**CAUTION** - For general ventilation use only. Do not use to exhaust hazardous or explosive materials or vapors.

**LIMITED WARRANTY**

Vostermans Ventilation Inc. warrants the Multifan and MF Flex motors, to the original user, against defects in workmanship on materials, under normal use and service (rental use excluded) for the indicated period of guarantee after date of purchase. Any part which is determined to be defective in material or workmanship should be returned to the dealer from whom it was purchased. All shipping cost will be paid by the customer unless arranged differently prior to return. Parts will be repaired or replaced at the dealer's discretion.

**DISCLAIMER**

The warranties contained herein are made expressly in view of any and all other warranties expressed or implied. The liability of the seller is limited to the repair or replacement of any product which does not conform to the warranties expressly provided herein.

**GUIDELINES FOR INSTALLATION**

1. All moving parts should be guarded.
2. The unit should be securely installed in a rigid framework. **Caution:** *allowing the fan frame to bend or move will result in unwanted vibrations and possible premature motor or blade failure.*
3. Connect the power to the motor using an approved wiring method.
4. Before activating the fan, double check to ensure that there are no obstructions (framing, packaging, debris, cord, etc.) that can interfere with proper fan operation.
5. Ensure proper installation/removal of drain plug, see diagram.
6. Use liquid tight fittings and conduits.
7. If fan is used to inflate advertising tubes make sure that placement will not interfere with traffic flow, hinder visibility or makes contact with overhead power lines.
8. Do not use a three-phase fan with any solid-state speed control devices!
9. Three-phase fans require field-provided motor overload protection. The overload protection device shall be rated or selected in compliance with the applicable installation code as specified by the authority having jurisdiction.
10. Vostermans advises the use of a motor protection switch (MPS) with single-phase fans. **ALWAYS use an MPS with three-phase fans!**
11. Motor must be securely and adequately grounded.

**USE LIMITATIONS**

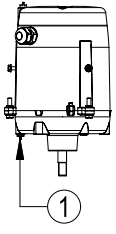
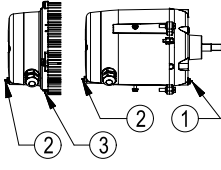
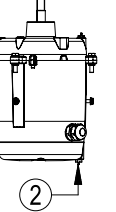
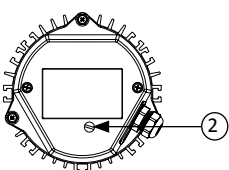
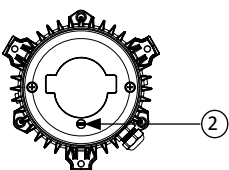
1. Verify that fan/motor is capable of variable speed operation before attaching speed control devices.
2. Installation instructions for fan and controller must be followed carefully. All warranty rights and conditions are rendered null and void if a low quality controller is used.
3. Assure sufficient air supply over the motor under all circumstances. Limits of operating ambient temperatures are -13 to 131 degrees F (-25 to 55° C).

**NOTE: DRAIN HOLES:**

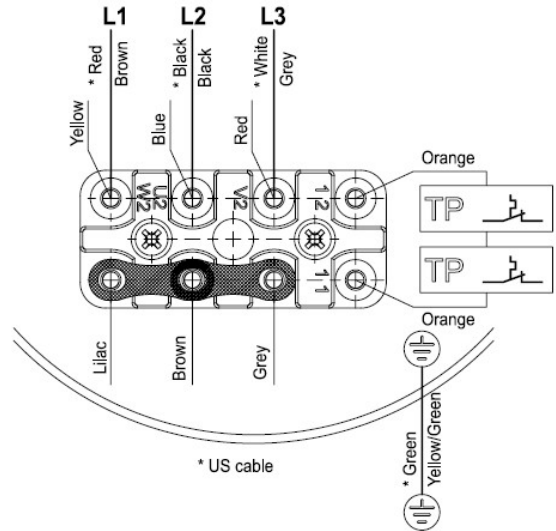
Each Vostermans motor has 2, 3 or 4 drain holes:

- 1 or 2 on the back cover.
- 1 or 2 on the front shield.

Depending on the installation angle, the drain hole at the **lowest point** needs to be open, the others plugged.

Motor Position	Action
	Remove Plug 1
	Remove Plug 1, 2 and 3
	Remove Plug 2
	An example of an old motor type with a different drain plug position. Remove Plug 2
	An example of an old motor type with a different drain plug position. Remove Plug 2

**3~ Motor Wiring Diagram**



**NOTE:**

ALL VOSTERMANS THREE-PHASE FANS ARE WIRED TO 460V. SEE WIRING DIAGRAMS FOR INSTRUCTIONS TO CHANGE THIS TO 240V.

\*Please check the motor label for the wiring diagram number (ex. WD: AA01) or contact Vostermans Ventilation Inc. for assistance.

**TO REVERSE MOTOR ROTATION:**

For 1~ motors, switch the red and brown wires.  
For 3~ motors, switch any two-line wires.

**MAINTENANCE**

1. Disconnect all sources of power before servicing.
2. When cleaning the motor, the drain holes have to be closed with a drain plug.
3. After wash down, it is recommended to run all motors for 2 hours to dry.
4. Periodically clean the wire guard for better efficiency and correct air movement.
5. Periodically clean the blades and motor to remove any excessive accumulation of dirt.
6. In all Multifan or MF FLEX motors, the bearings are sealed and do not require greasing.
7. The only field-serviceable parts in the motor are the capacitor(s) and the bearings, see [www.vostermansusa.com](http://www.vostermansusa.com).



Vostermans Ventilation Inc.  
2439 S.Main St. – USA  
Bloomington, IL 61704  
Tel. +1 309 827 - 9798  
Toll Free 800-458-5532  
Fax +1 309 829 - 1993  
[ventilation@vostermansusa.com](mailto:ventilation@vostermansusa.com)  
[www.vostermansusa.com](http://www.vostermansusa.com)





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**CUSTOM AIR PRODUCTS & SERVICES, INC.**

*35 Southbelt Industrial Drive • Houston, Texas 77047*

*(713) 460-9009 • Fax (713) 460-9499*

*www.customairproducts.com*

SECTION

05

CONDENSOR COIL

Customer:	Custom Air Products	Date:	2/9/2016
Contact:		From:	Larry Novak
Telephone:		Company:	Custom Air Products
Cell:		Return Tel:	(713) 460-9009
Fax:		Return Fax:	
Job:	80 Ton Jetson	Email:	larryn@customairproducts.com
Quote #:			

**Construction**

Item : 80 Ton Jetson - Cond  
 Coils Per Bank : 1  
 Duty : Condenser  
 Style : CF  
 Condensing Sections : 2  
 Tube OD IN: 1/2  
 Fins Per Inch: 16  
 Rows : 4  
 Fin Surface : A  
 Circuiting : 26  
 Fin Height IN: 67.50  
 Finned Length IN: 184.00  
 Tubing Material: 0.016 Copper Rifled  
 Fin Material: 0.0075 Aluminum  
 Face Area (SQ FT): 86.25

**Air Side**

Air Flow -S ft^3/min: 50,100.00  
 Altitude FT: 0  
 Ent. Air DB °F: 95.00  
 Lvg. Air DB °F: 0.00  
 Total Capacity MBH: 1,260.00  
 Max Air PD "H2O: 0.00

**Refrigerant Side**

Refrigerant Type: 410A  
 Condensing Temp. °F: 125.00  
 Vapor Temp. °F: 193.00  
 Subcooling Temp. °F: 15.00  
 % Condensing Load:

OUTPUT DATA		Most Economical			Specified Coil		
		Coil 1	Coil 2	Coil 3	Coil 4 ✓	Coil 5	Coil 6
Model Number					4CF1604A		
Air Velocity -S	ft/min				580.87		
Total Capacity	MBH				1263.78		
Leaving Air DB	°F				118.26		
Standard APD	"H2O				0.39		
Refrigerant PD	lbf/in^2				12.02		
Refg. Mass Flow	lbm/hr				13757.64		
Leaving Refg.	°F						
Circuits					26.00		
Subcooling Temp.	°F				15.27		
Fixed Subcool	MBH				0.00		
Liquid Conn. Size	IN				(2) 1.13		
Vapor Conn. Size	IN				(2) 1.38		
Tubes of Liquid					8.97		
Internal Volume					7322.19		
Weight	lbm				1078.35		
Notes					DM		

**Notes:**

D) Coil Has Opposite End Connections. M) Coil rating valid for Heatcraft coils only.



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SECTION

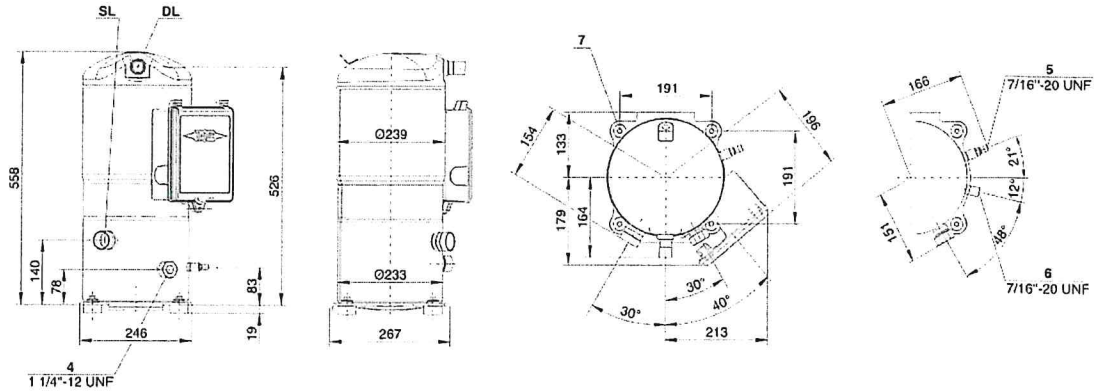
06

COMPRESSOR SELECTION



## Technical Data: GSD60235VA

### Dimensions and Connections



### Technical Data

#### Technical Data

Displacement (2900 RPM 50 Hz)	22,1 CFM
Displacement (3500 RPM 60 Hz)	26,7 CFM
Weight	198 lb
Max. pressure (LP/HP)	480 / 650 psi
Connection suction line	
Direct brazing connection	1 3/8 (Standard)
Connection discharge line	
Direct brazing connection	7/8 (Standard "B" version)
Oil type R410A	BVC32 (Standard)

#### Motor data

Motor voltage (more on request)	460V Y-3-60Hz UL
Max operating current	40.7 A
Starting current (Rotor locked)	211.0 A
MCC	50.0 A
RLA (MCC/1.40)	35.7 A
RLA (MCC/1.56)	32.1 A
Max. Power input	28.2 kW

#### Extent of delivery (Standard)

Oil charge	95 fl oz
Motor protection	SE-B3
Enclosure class	IP54

#### Available Options

Oil heater	90 W
Discharge gas temperature sensor	Option
Motor protection	SE-E1
Vibration dampers	Option

#### Sound measurement



## Scroll-Compressor

**Legend of connection positions according to "Dimensions":**

**ESH/ELH/ELA:**

- 1 High pressure measurement connection (HP) - Schrader
- 2 High pressure connection (HP) alternatively: connection for discharge gas temperature sensor
- 3 Low pressure connection (LP)
- 4 Sight glass
- 5 Oil maintenance connection
- 6 Connection for oil and gas equalization (parallel operation)
- SL Suction line
- DL Discharge line

Dimensions can show tolerances according to EN ISO 13920-B.

**GSD:**

- 1 -
- 2 High pressure connection (HP) alternatively: connection for discharge gas temperature sensor
- 3 -
- 4 Sight glass
- 5 Oil maintenance connection
- 6 Connection for oil and gas equalization (parallel operation)
- 7 Mounting position for vibration dampers
- 8 Mounting position for Tandem and Trio fixing rails
- SL Suction gas line
- DL Discharge gas line

Dimensions can show tolerances according to EN ISO 13920-B.

**GSD Rotalock:**

- 1 High pressure measurement connection (HP) - Schrader
- 2 High pressure connection (HP) alternatively: connection for discharge gas temperature sensor
- 3 Low pressure connection (LP)
- 4 Sight glass
- 5 Oil maintenance connection
- 6 Connection for oil and gas equalization (parallel operation)
- 7 Mounting position for vibration dampers
- 8 Mounting position for Tandem and Trio fixing rails
- SL Suction gas line
- DL Discharge gas line

Dimensions can show tolerances according to EN ISO 13920-B.



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## SECTION

07

## ELECTRICAL DRAWINGS



35 SOUTHBELT INDUSTRIAL DR., HOUSTON, TX. 77047  
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 TEXAS BOARD OF PROFESSIONAL ENGINEERS  
 FIRM NUMBER F-14008

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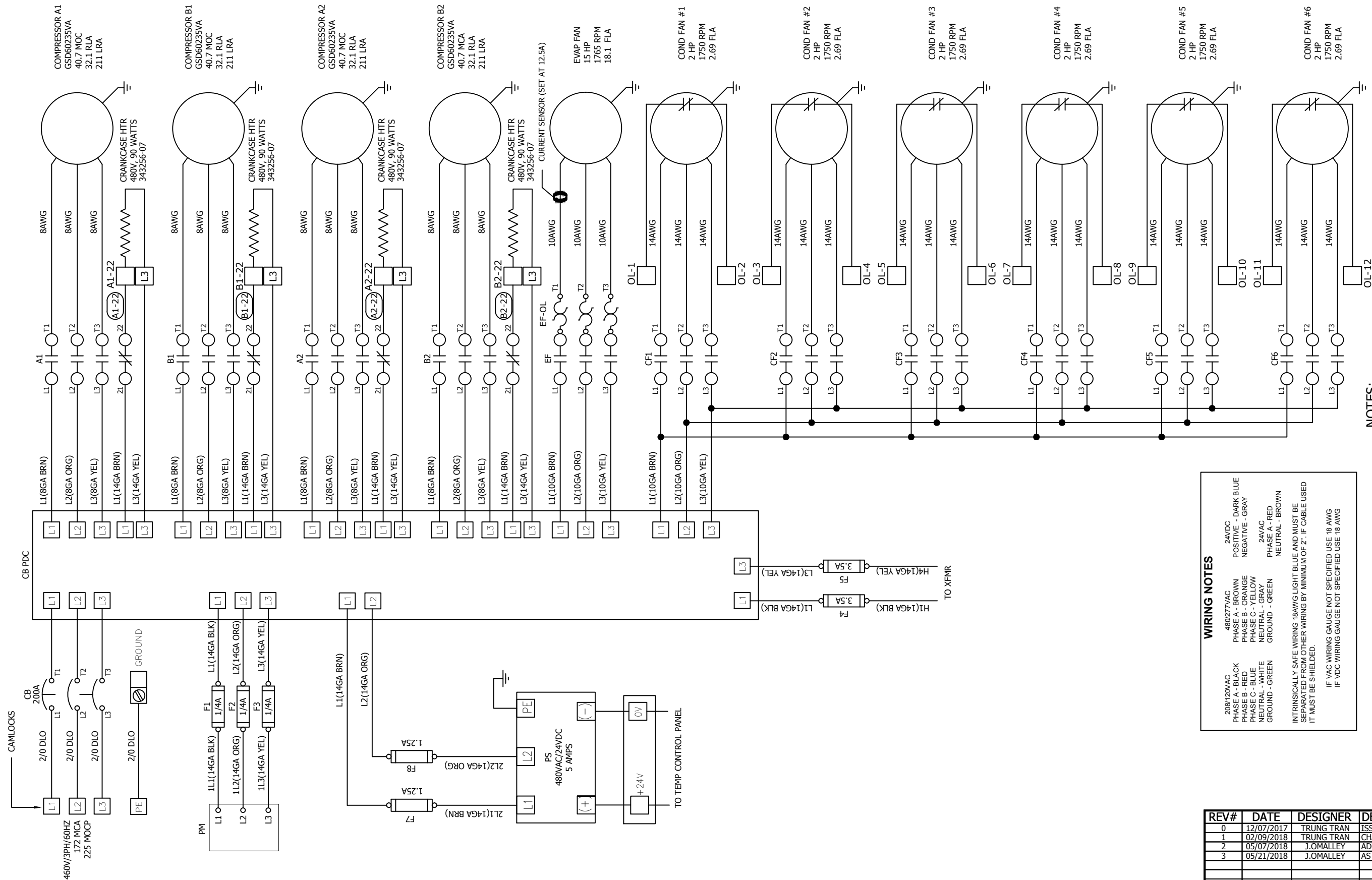
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17F-0873	AE1	TRUNG TRAN	12/07/2017
CUST. PO#:	SHEET:	CHECKED BY:	DATE:
	1 OF 5	DAVID NGUYEN	02/09/2018
SIZE:	REV:	APPROVED BY:	DATE:
B	3	DAVID NGUYEN	05/21/2018

REV#	DATE	DESIGNER	DESCRIPTION
0	12/07/2017	TRUNG TRAN	ISSUE FOR CONSTRUCTION
1	02/09/2018	TRUNG TRAN	CHANGE MAIN BREAKER W/MCA & MOP PER ECR# 00352
2	05/07/2018	J.OMALLEY	ADDED NUCO DRAWINGS ECN#00458
3	05/21/2018	J.OMALLEY	AS BUILT

CUSTOMER:	HERC RENTAL
80 TON INDUSTRIAL PACKAGE UNITS 100% OUTSIDE AIR; NEAM 4 480V/3P/60HZ ELECTRICAL DESIGN HVAC WIRING DIAGRAM - HIGH VOLTAGE	



**WIRING NOTES**

208/120VAC  
 PHASE A - BLACK  
 PHASE B - RED  
 PHASE C - BLUE  
 NEUTRAL - WHITE  
 GROUND - GREEN

480/277VAC  
 PHASE A - BROWN  
 PHASE B - ORANGE  
 PHASE C - YELLOW  
 NEUTRAL - GRAY  
 GROUND - GREEN

24VDC  
 POSITIVE - DARK BLUE  
 NEGATIVE - GRAY

24VAC  
 PHASE A - RED  
 NEUTRAL - BROWN

INTRINSICALLY SAFE WIRING 18AWG LIGHT BLUE AND MUST BE SEPARATED FROM OTHER WIRING BY MINIMUM OF 2". IF CABLE USED IT MUST BE SHIELDED.  
 IF VAC WIRING GAUGE NOT SPECIFIED USE 18 AWG  
 IF VDC WIRING GAUGE NOT SPECIFIED USE 18 AWG

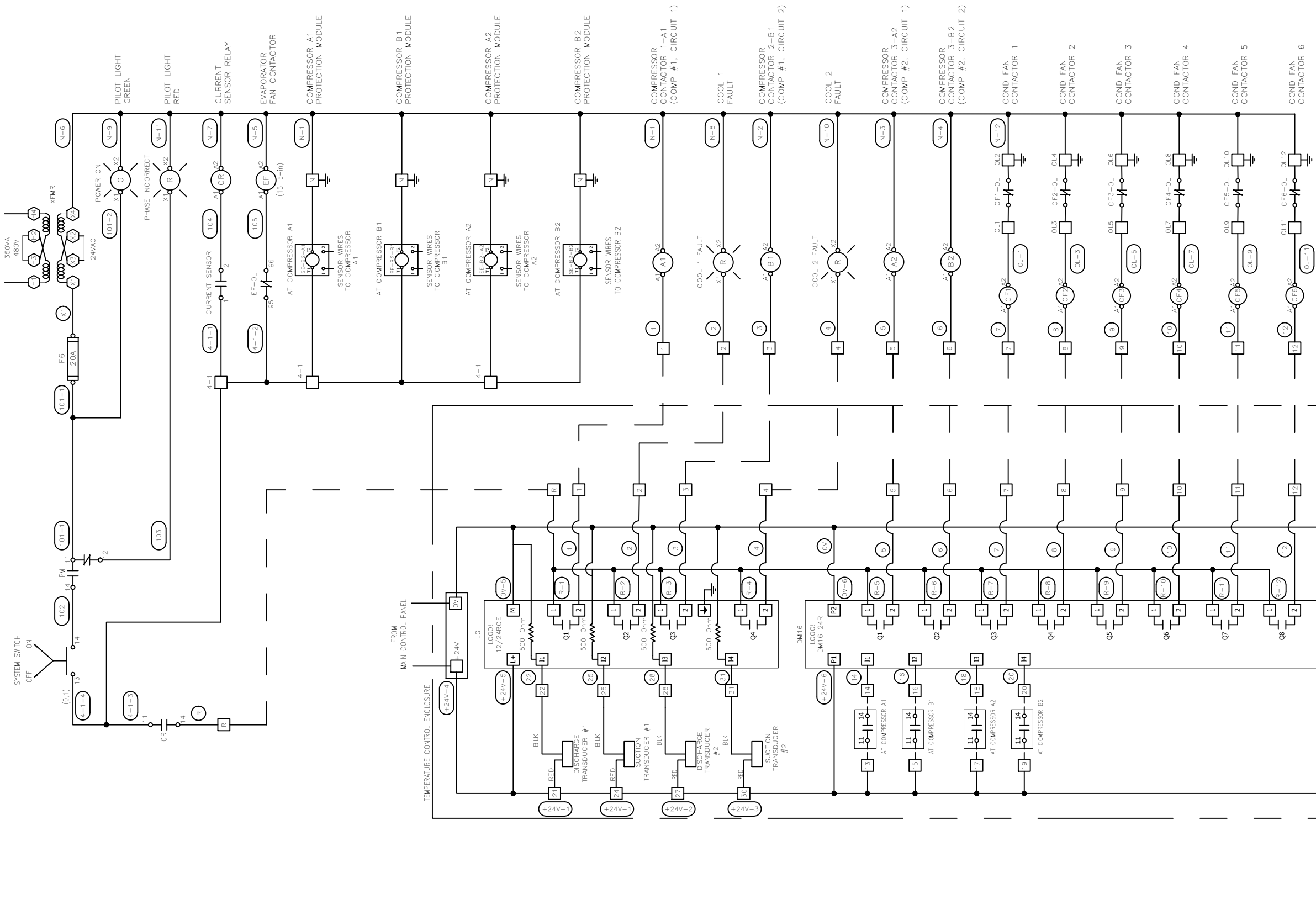
**LEGEND**

- EF - EVAPORATOR FAN CONTACTOR
- CF - CONDENSOR FAN CONTACTOR
- CC - COMPRESSOR CONTACTOR
- pC03 - CAREL MODULE
- PM - PHASE MONITOR
- PDB - POWER DISTRIBUTION BLOCK

**NOTES:**

- SEE NC-REF001-C001 FOR FIELD WIRING SPECIFICATION.
- ALL DEVICES SHOWN DE-ENERGIZED.
- WIRE POINT TO POINT PER WIRE CHART.
- EACH END OF EACH CONTROL AND POWER WIRE TO BE MARKED WITH HEAT SHRINK MARKERS.

TO F4, F5



**LEGEND**

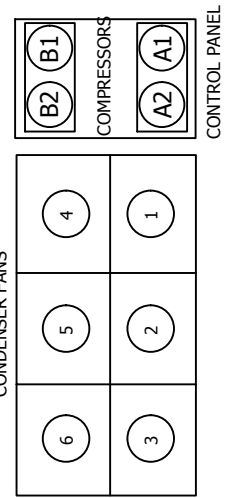
- EF - EVAPORATOR FAN CONTACTOR
- CF - CONDENSER FAN CONTACTOR
- CCO3 - CURRENT SENSOR MODULE
- PM - PHASE MONITOR
- PDB - POWER DISTRIBUTION BLOCK

**WIRING NOTES**

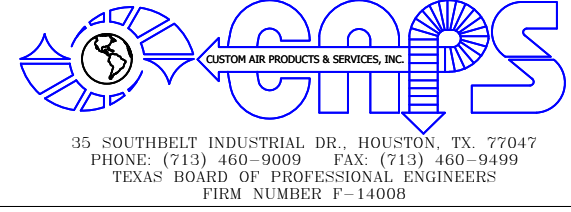
- 208V/230VAC
- 480/277VAC
- PHASE A - BROWN
- PHASE B - BLACK
- PHASE C - BLUE
- NEUTRAL - GRAY
- GROUND - GREEN
- 24VDC
- POSITIVE - DARK BLUE
- NEGATIVE - GRAY
- 24VAC
- NEUTRAL - BROWN
- GROUND - GREEN

INTRINSICALLY SAFE WIRING (ANSI LIGHT BLUE AND BAYNET BE SEPARATED FROM OTHER WIRING BY MINIMUM OF 2" IF CABLE USED IT MUST BE SHIELDED)

IF VAC WIRING GAUGE NOT SPECIFIED USE 18 AWG  
IF VDC WIRING GAUGE NOT SPECIFIED USE 18 AWG



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1	02/09/2018	TRUNG TRAN	CHANGE MAIN BREAKER W/MCA & MOP PER ECR# 00352
2	05/07/2018	J.OMALLEY	ADDED NUCO DRAWINGS ECR#00458
3	05/21/2018	J.OMALLEY	AS BUILT



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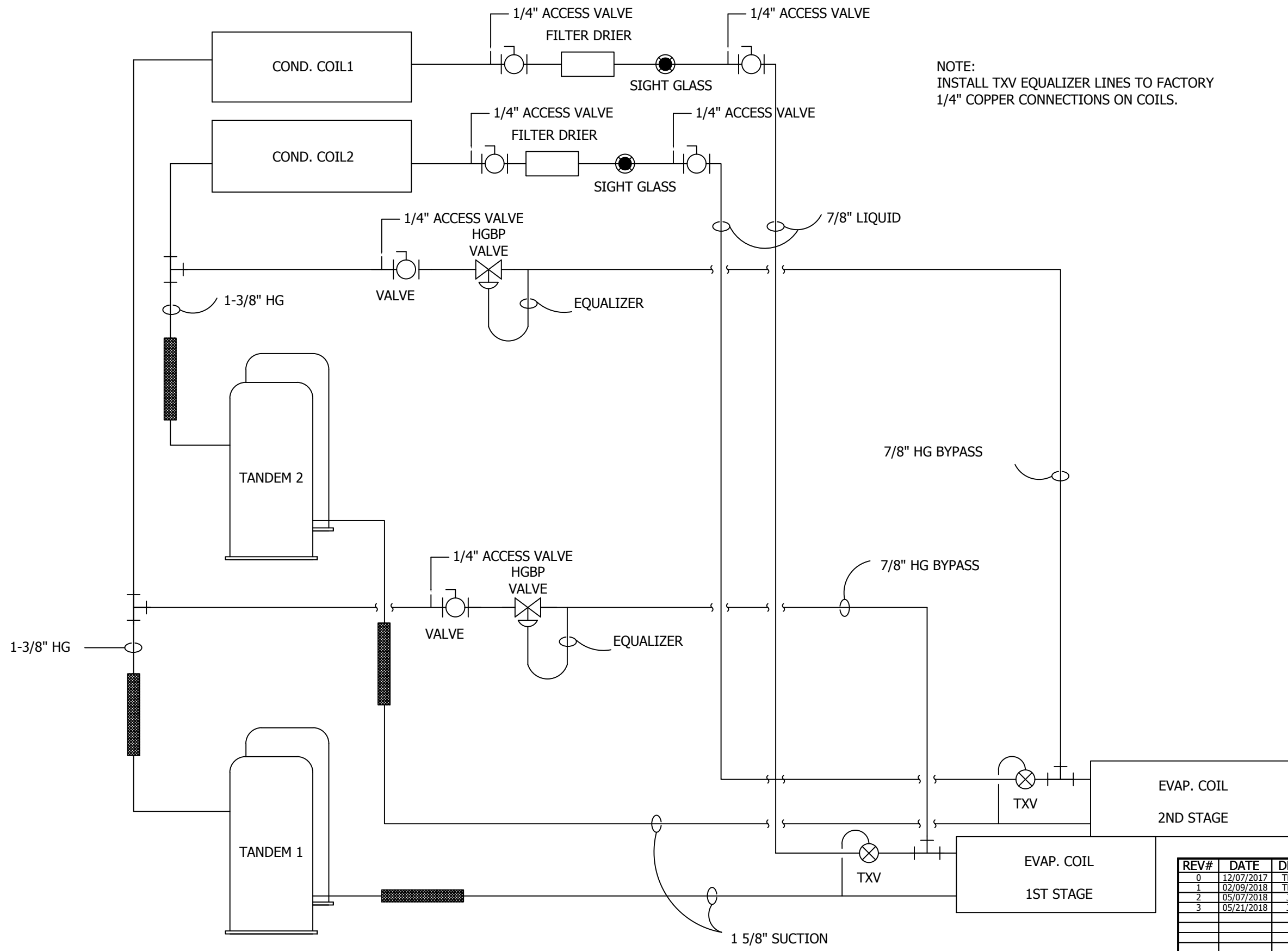
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CUST. PO#:	SHEET:	CHECKED BY:	DATE:
	2 OF 5	DAVID NGUYEN	02/09/2018
SIZE:	REV:	APPROVED BY:	DATE:
B	3	DAVID NGUYEN	05/21/2018

CUSTOMER: **HERC RENTAL**

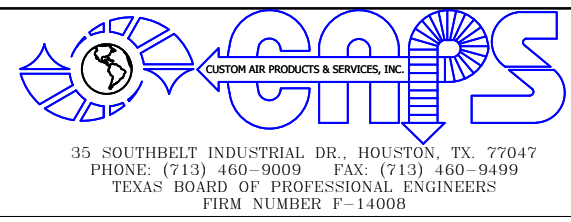
**80 TON INDUSTRIAL PACKAGE UNITS**  
**100% OUTSIDE AIR; NEAM 4**  
**480V/3P/60HZ**  
**ELECTRICAL DESIGN**  
**HVAC WIRING DIAGRAM - LOW VOLTAGE**





NOTE:  
 INSTALL TXV EQUALIZER LINES TO FACTORY  
 1/4" COPPER CONNECTIONS ON COILS.

REV#	DATE	DESIGNER	DESCRIPTION
0	12/07/2017	TRUNG TRAN	ISSUE FOR CONSTRUCTION
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2	05/07/2018	J.OMALLEY	ADDED NUCO DRAWINGS ECN#00458
3	05/21/2018	J.OMALLEY	AS BUILT



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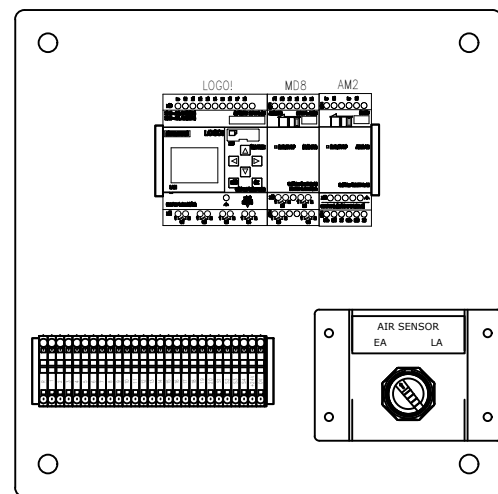
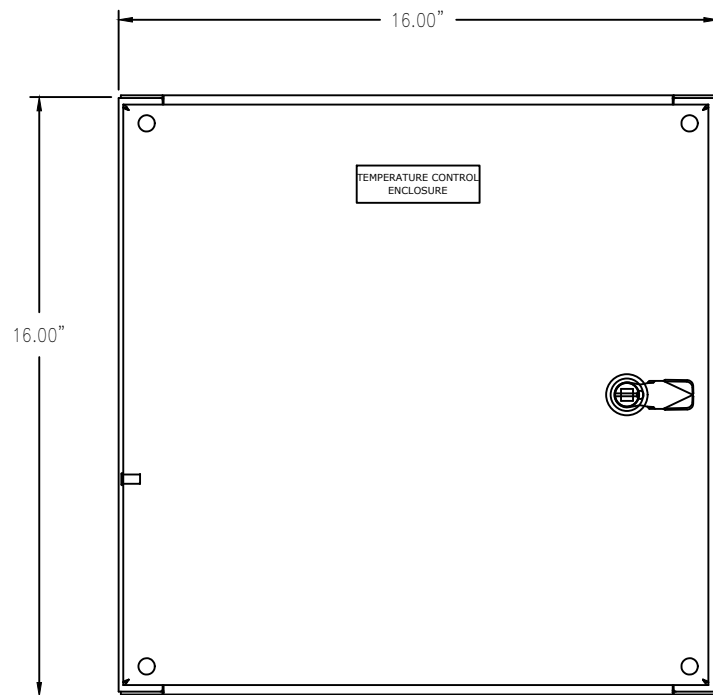
**CERTIFIED AS-BUILT**

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 APPROVER: \_\_\_\_\_ DATE: \_\_\_\_\_

CAPS NO.: 17F-0873	DRAWING: AE4	DRAWN BY: TRUNG TRAN	DATE: 12/07/2017
CUST. PO#:	SHEET: 4 OF 5	CHECKED BY: DAVID NGUYEN	DATE: 02/09/2018
SIZE: B	REV: 3	APPROVED BY: DAVID NGUYEN	DATE: 05/21/2018

CUSTOMER: **HERC RENTAL**

**80 TON INDUSTRIAL PACKAGE UNITS  
 100% OUTSIDE AIR; NEAM 4  
 480V/3P/60HZ  
 ELECTRICAL DESIGN  
 P&ID**



## SEQUENCE OF OPERATION

The system is placed into initial operation as follows:

- Turn System Switch to "OFF"
- Turn Circuit Breaker "ON"
  - If the "Phase Incorrect" light is on, turn off the circuit breaker; reverse two (2) phases of incoming power for proper phase sequencing then check the incoming power source to be sure the unit has a good power source - 460V/3P/60HZ
  - If the "Power On" light is on and the "Phase Incorrect" light is off, the unit is ready for operation
- Turn System Switch to "ON"
- Air Sensor Switch settings:
  - 1- Leaving: The HVAC is controlled by the leaving air temperature
  - 2- Entering: The HVAC is controlled by the return air temperature
- Thermostat field settings:
  - 1- Press PRG
  - 2- Press DOWN buttons to move down to next screen (temperature setpoint)
  - 3- Press ENTER to highlight temperature setting and use up and down arrows to change temperature.
  - 4 - Press Enter to accept the change
  - 5 - Press Escape to return to main screen.
- If a Compressor is failed, it will be turned off and locked out then its light alarm will be turned on.
- Only use System Switch to turn off the unit

NOTE: THIS UNIT IS "COOL" ONLY

REV#	DATE	DESIGNER	DESCRIPTION
0	12/07/2017	TRUNG TRAN	ISSUE FOR CONSTRUCTION
1	02/09/2018	TRUNG TRAN	CHANGE MAIN BREAKER W/MCA & MOP PER ECR# 00352
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3	05/21/2018	J.OMALLEY	AS BUILT



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 TEXAS BOARD OF PROFESSIONAL ENGINEERS  
 FIRM NUMBER P-14008

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CUST. PO#:	SHEET:	CHECKED BY:	DATE:
	5 OF 5	DAVID NGUYEN	02/09/2018
SIZE:	REV:	APPROVED BY:	DATE:
B	3	DAVID NGUYEN	05/21/2018

CUSTOMER:	HERC RENTAL
	80 TON INDUSTRIAL PACKAGE UNITS 100% OUTSIDE AIR; NEAM 4 480V/3P/60HZ ELECTRICAL DESIGN SEQUENCE OF OPERATION



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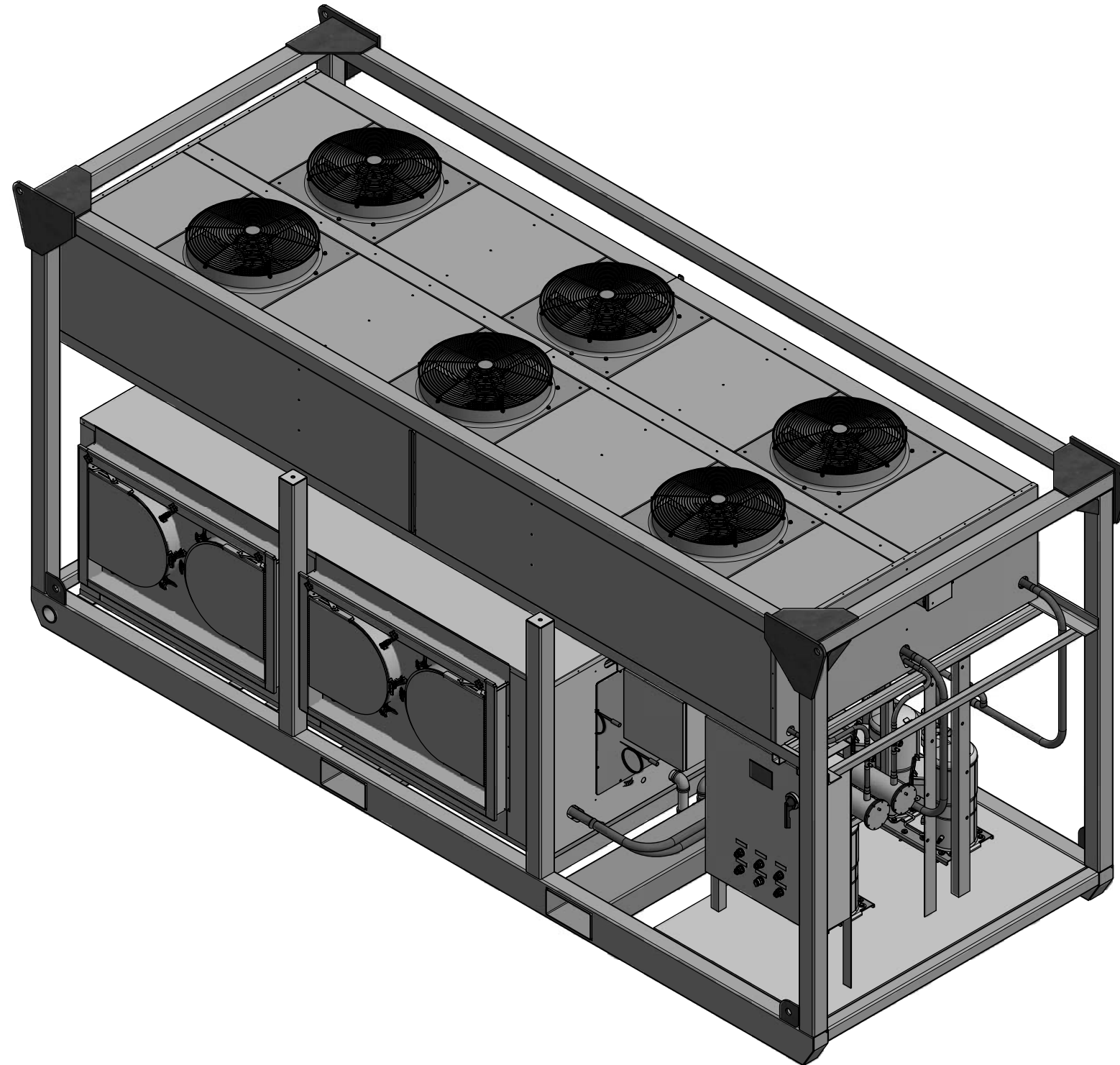
*www.customairproducts.com*

SECTION

08

MECHANICAL DRAWINGS

**HERC RENTALS**  
**80 TON INDUSTRIAL PACKAGE UNIT**  
**GALV SKID, GALV CAGE, STAINLESS STEEL HOUSINGS**  
**DUCTED RETURN, 460V/3PH/60HZ, NEMA 4 CONSTRUCTION**  
**17F-0873**



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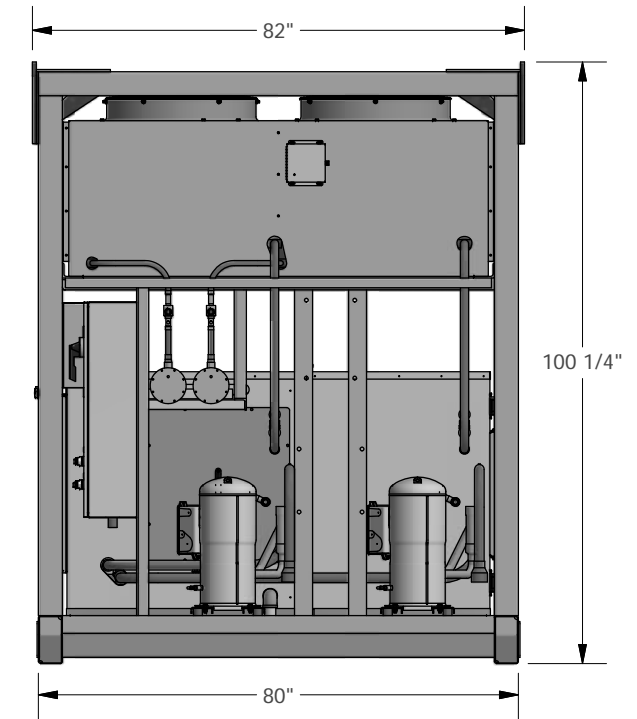
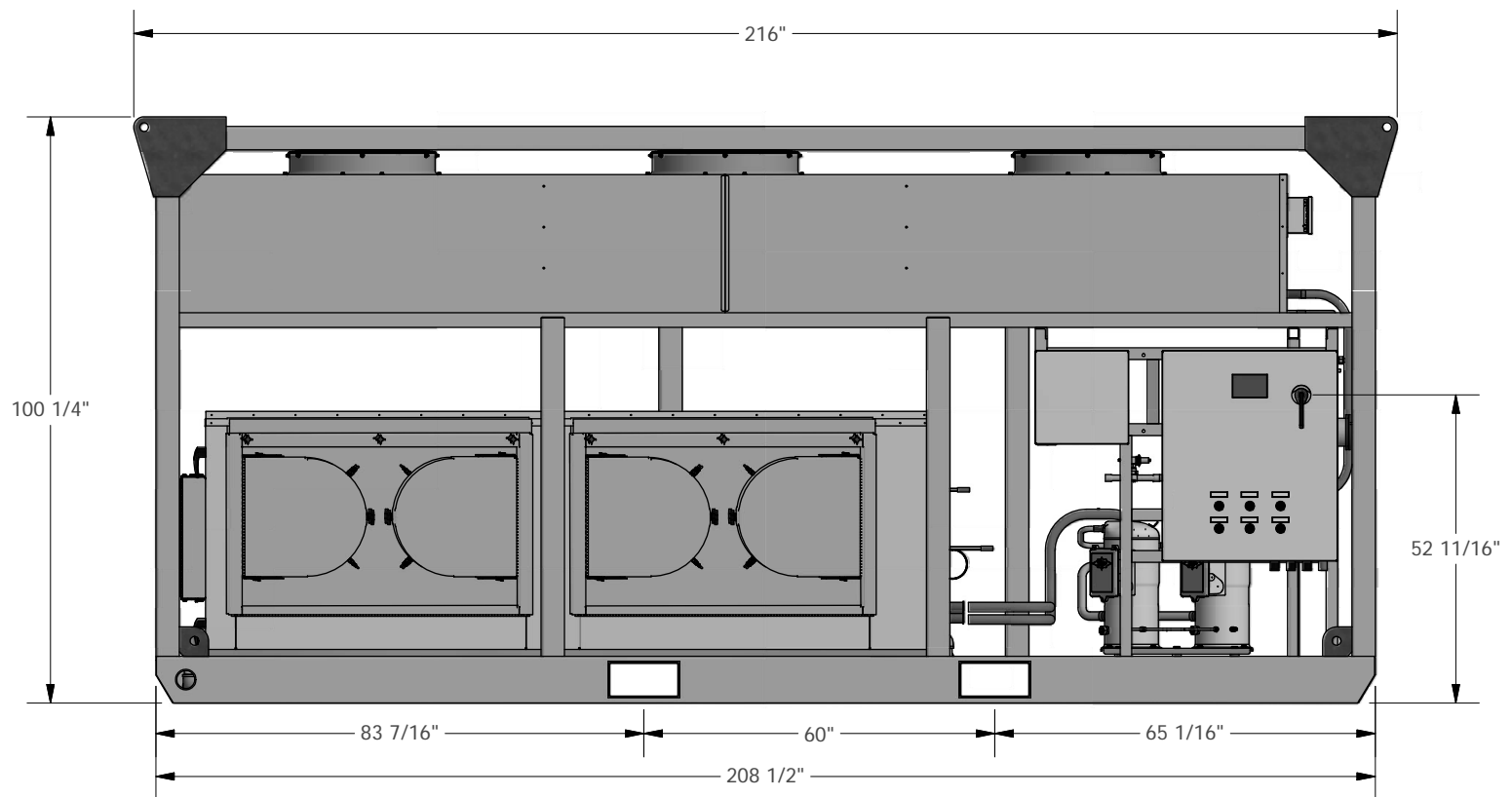
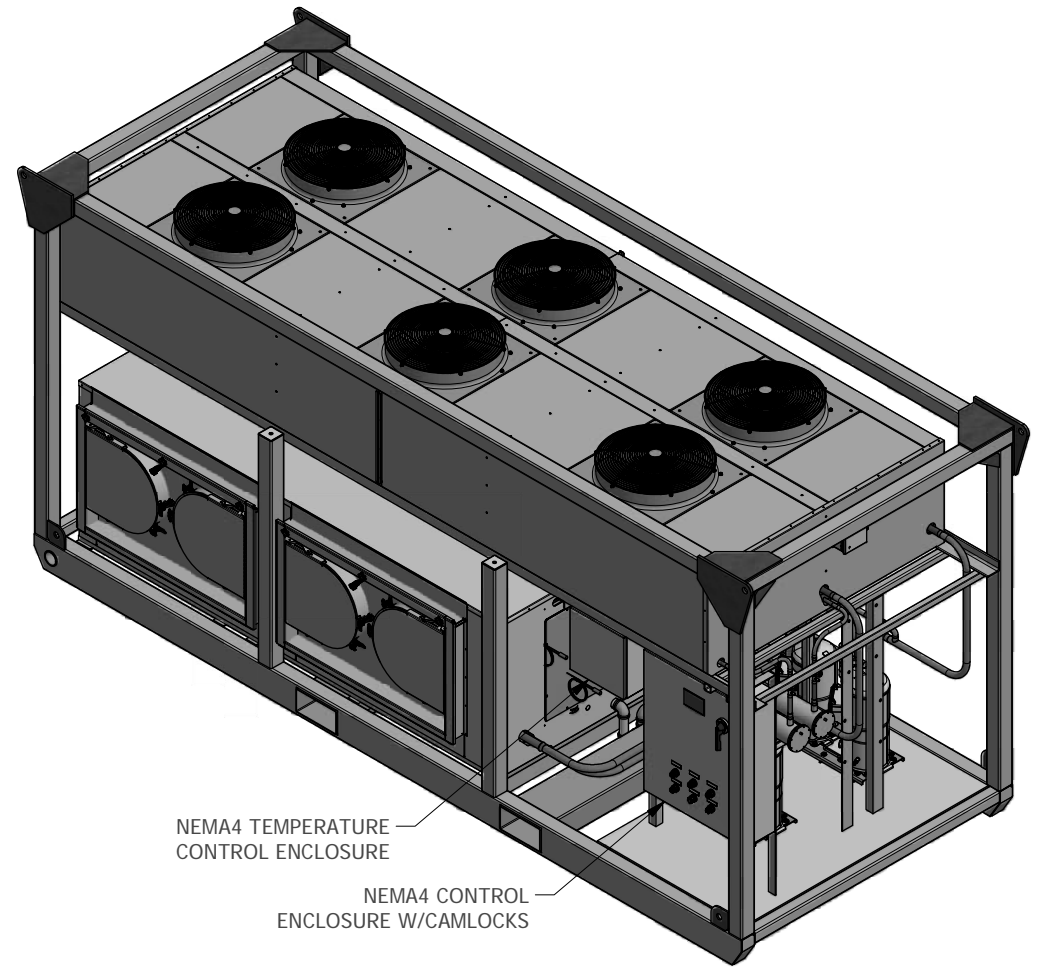
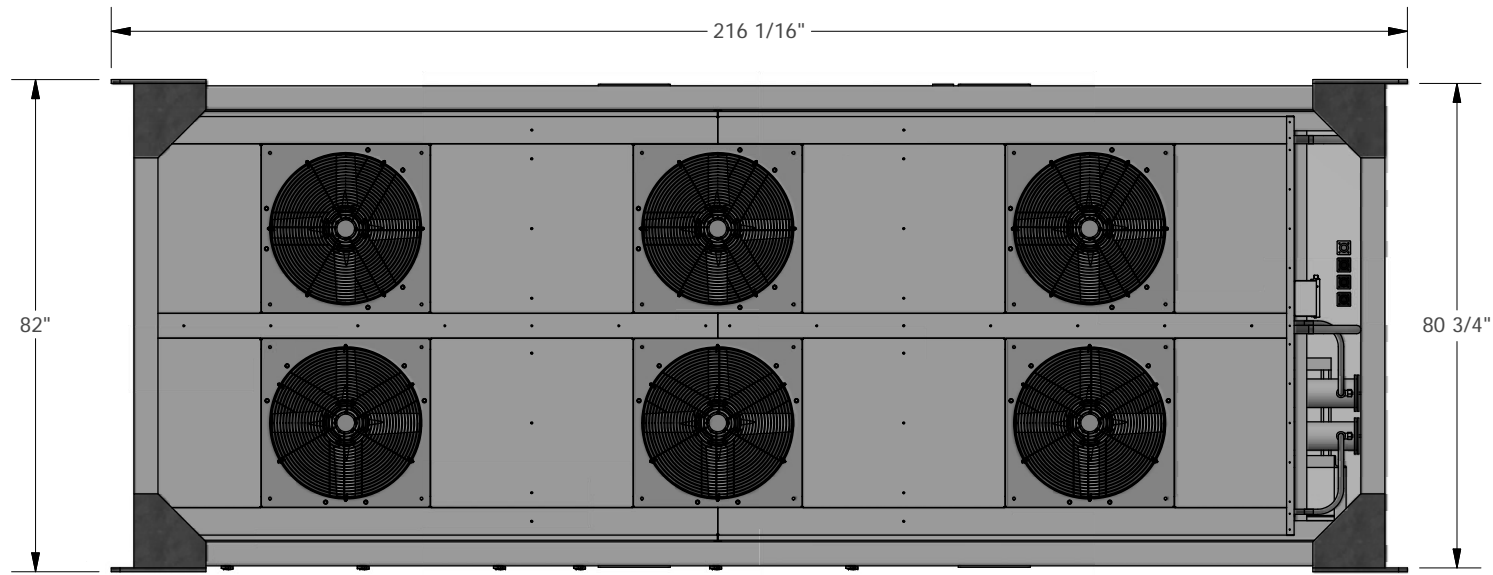
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APPROVER: \_\_\_\_\_ DATE: \_\_\_\_\_

CAPS NO.:	DRAWING:	DESIGNER:	DATE:
17F-0873	M1	TIEN NGUYEN	4/21/2011
CUST. PO#:	SHEET:	CHECKER:	DATE:
	1 OF 4	DAVID POTTS	12/20/2016
SIZE:	REV:	APPROVER:	DATE:
B	23	JOHN PHAN	12/12/2017

CUSTOMER: **HERC RENTALS**  
  
**80 TON INDUSTRIAL PACKAGE UNIT**  
**GALV SKID, GALV CAGE, STAINLESS STEEL HOUSINGS**  
**DUCTED RETURN, 460V/3PH/60HZ, NEMA 4 CONSTRUCTION**  
**PROJECT INFORMATION**  
**COVER SHEET**



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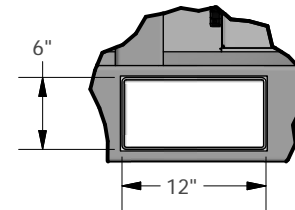
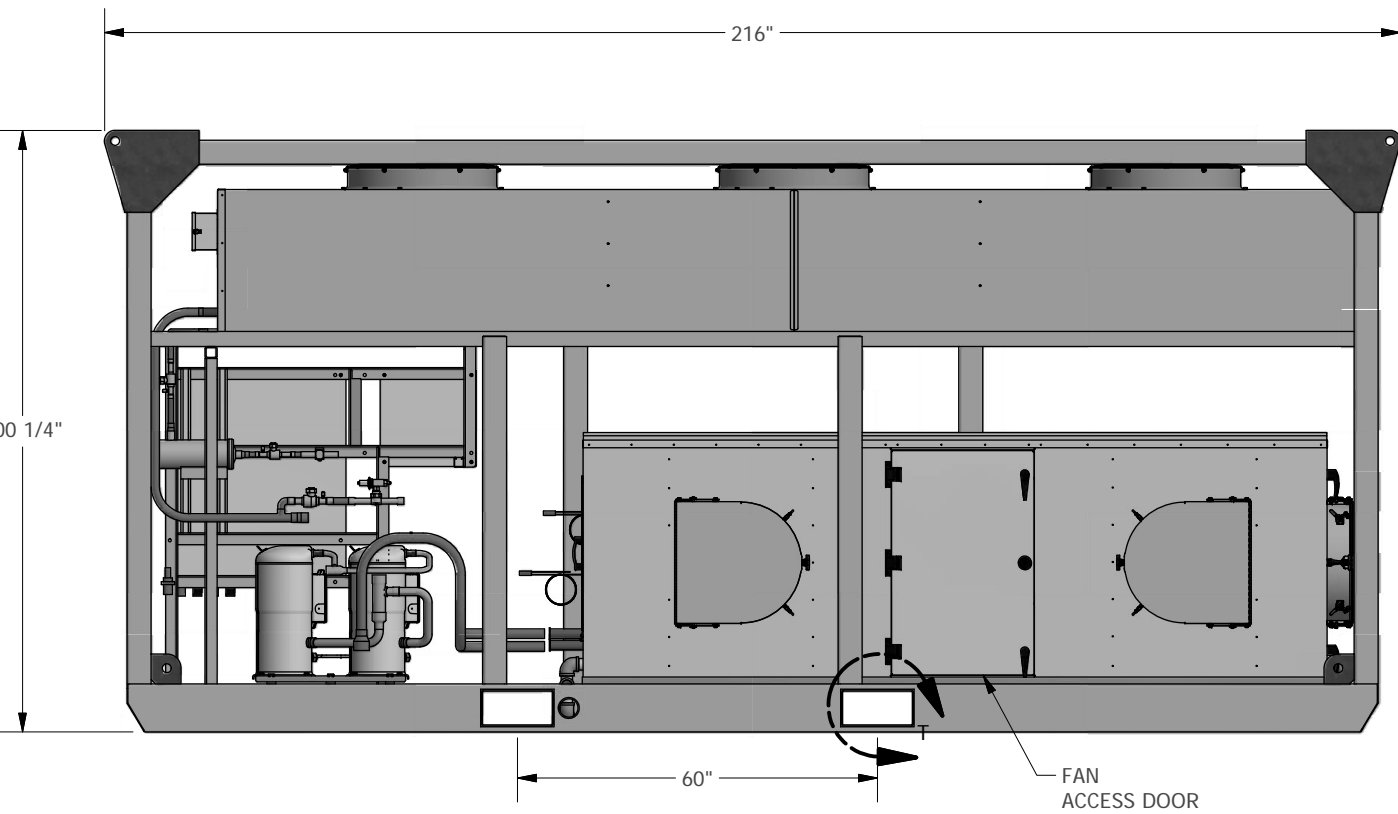
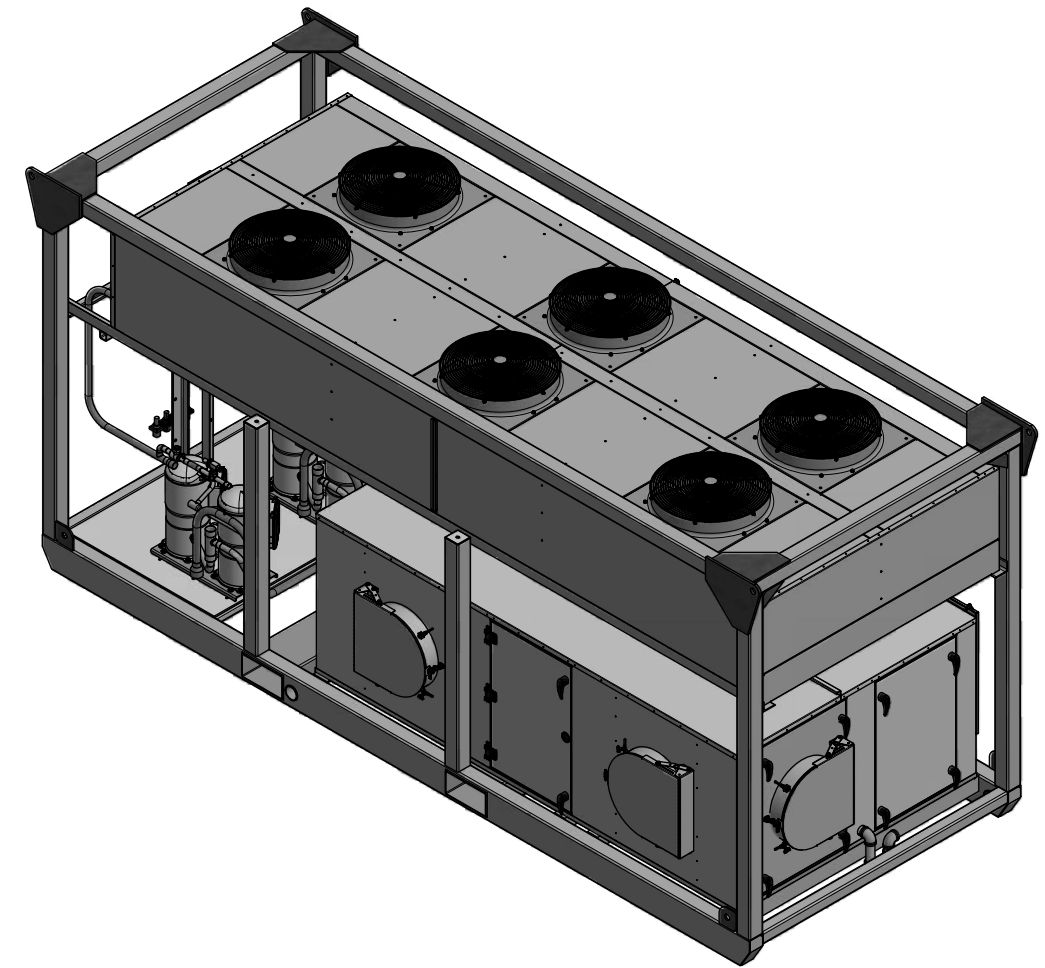
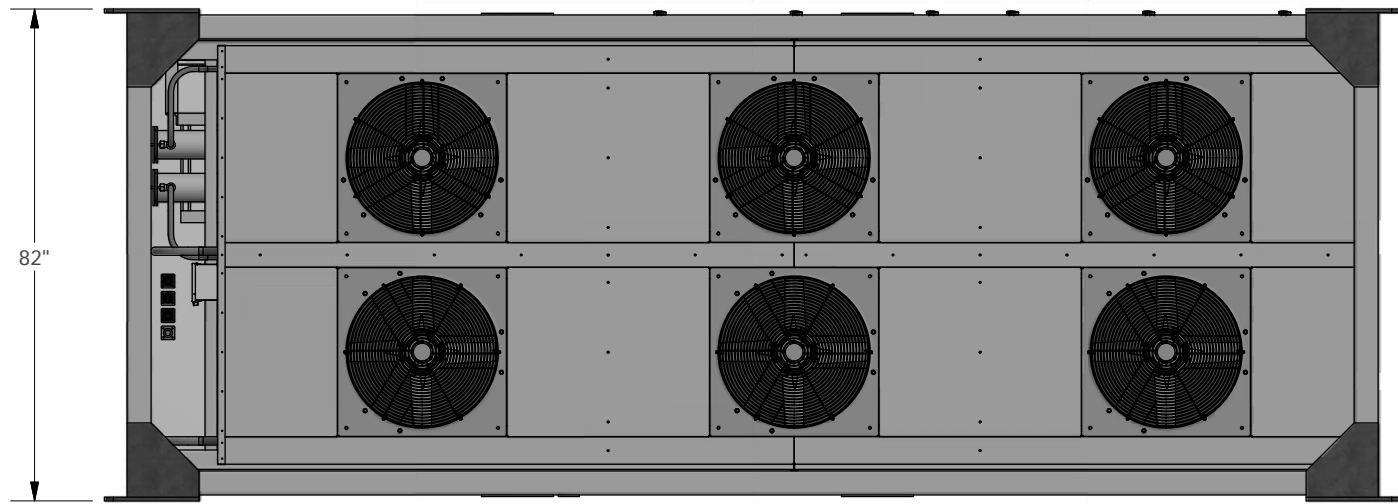
**CERTIFIED AS BUILT**

CHECKER: \_\_\_\_\_ DATE: \_\_\_\_\_

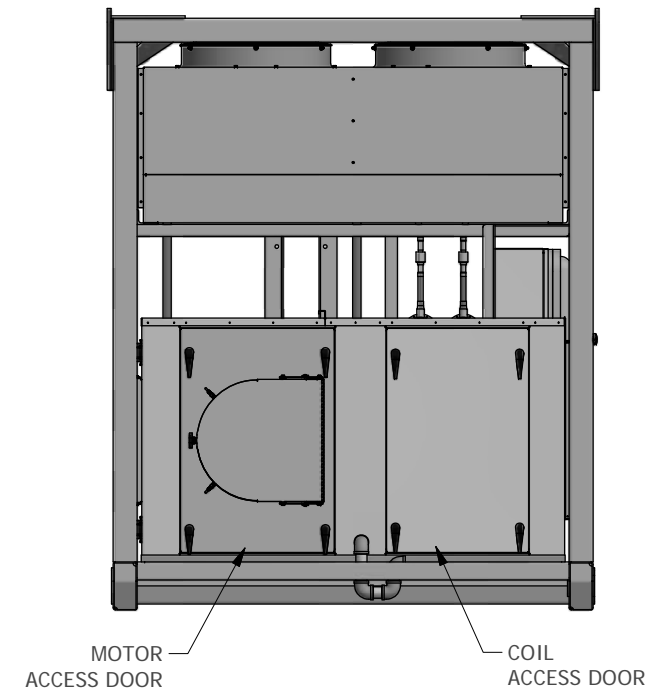
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CAPS NO.:	DRAWING:	DESIGNER:	DATE:	CUSTOMER:
17F-0873	M1	TIEN NGUYEN	4/21/2011	HERC RENTALS
CUST. PO#:	SHEET:	CHECKER:	DATE:	
	2 OF 4	DAVID POTTS	12/20/2016	
SIZE:	REV:	APPROVER:	DATE:	
B	23	JOHN PHAN	12/12/2017	

**80 TON INDUSTRIAL PACKAGE UNIT**  
 GALV SKID, GALV CAGE, STAINLESS STEEL HOUSINGS  
 DUCTED RETURN, 460V/3PH/60HZ, NEMA 4 CONSTRUCTION  
 GENERAL DESIGN  
 NEMA4 UNIT LAYOUT



DETAIL T  
SCALE 1 / 16



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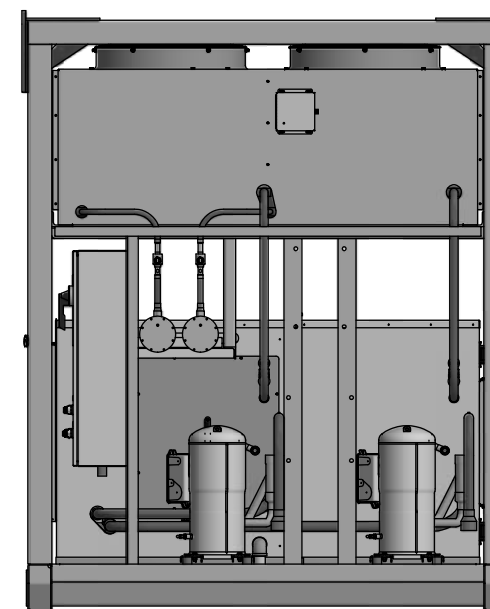
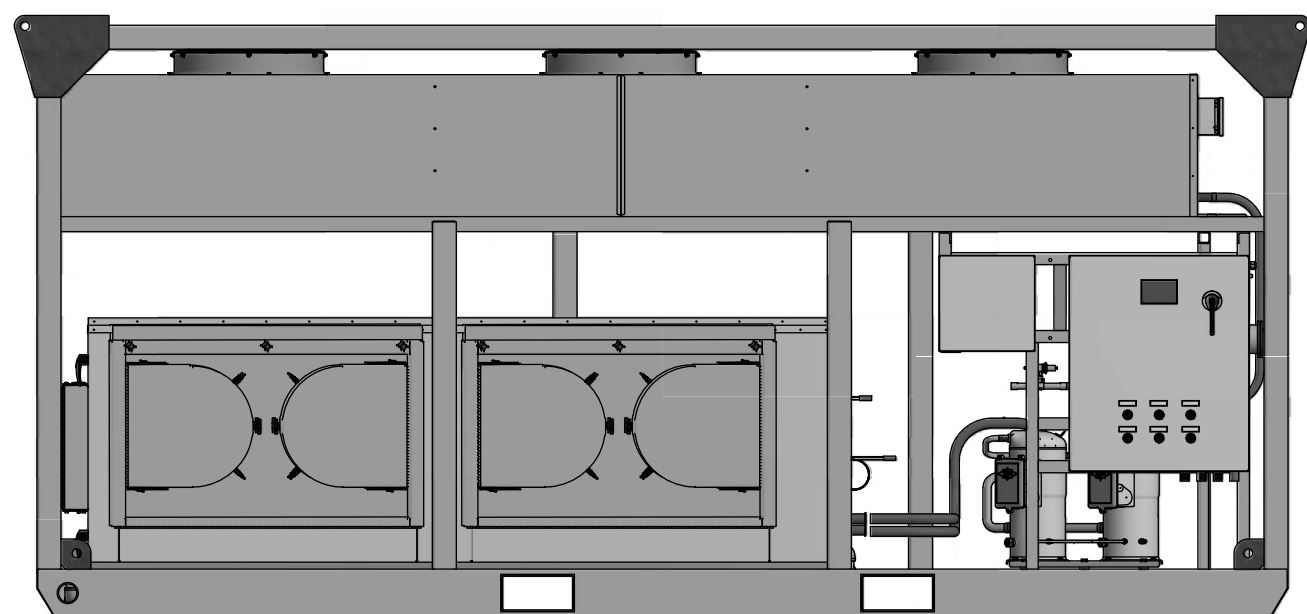
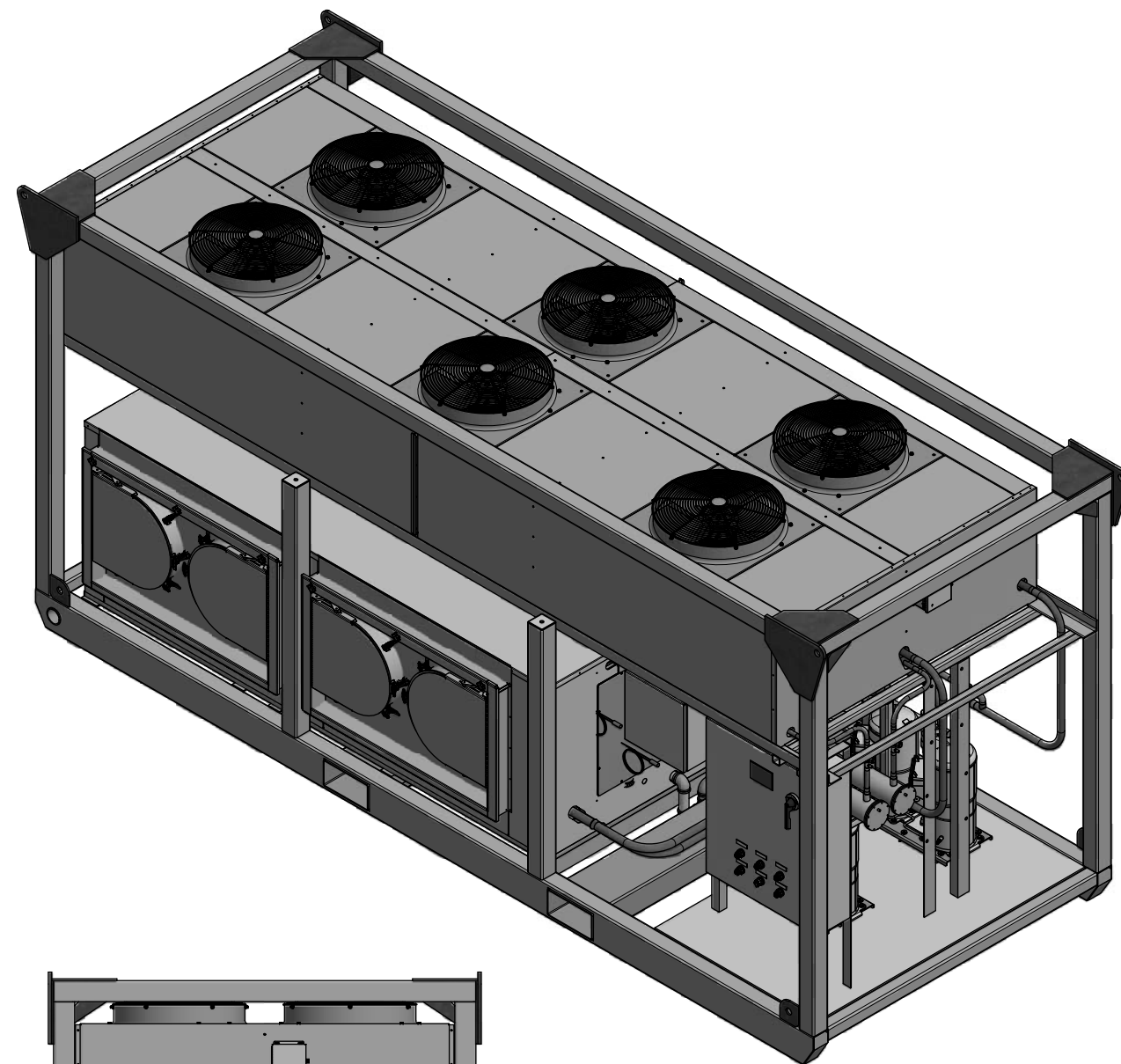
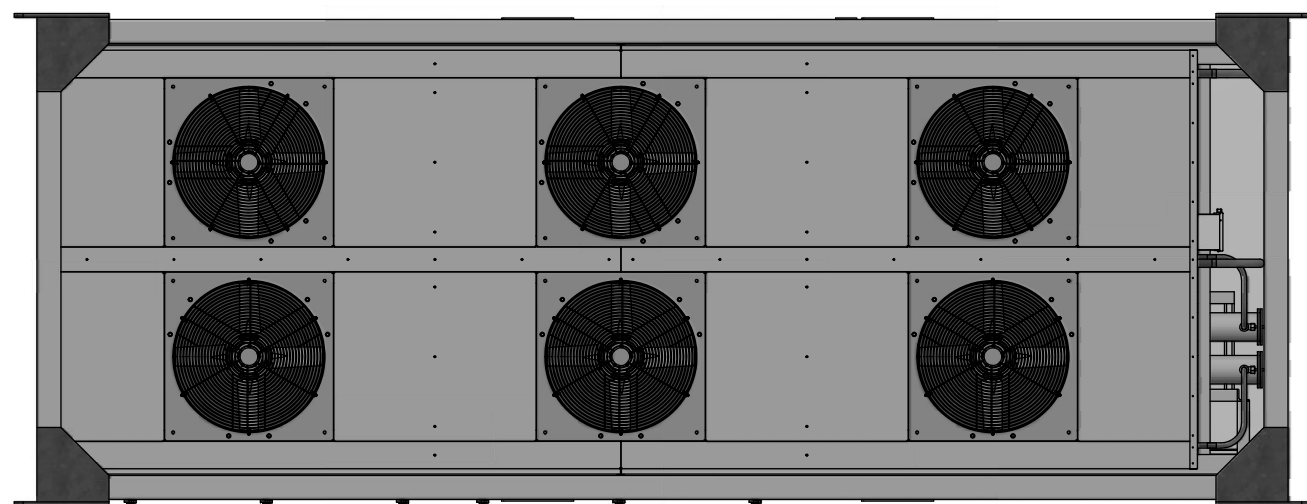
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CHECKER: \_\_\_\_\_ DATE: \_\_\_\_\_  
APPROVER: \_\_\_\_\_ DATE: \_\_\_\_\_

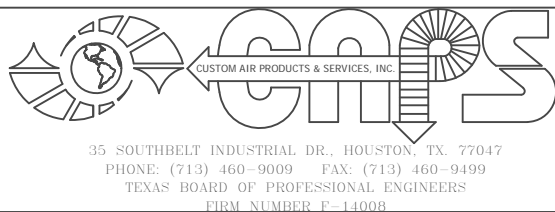
CAPS NO.:	DRAWING:	DESIGNER:	DATE:
17F-0873	M1	TIEN NGUYEN	4/21/2011
CUST. PO#:	SHEET:	CHECKER:	DATE:
	3 OF 4	DAVID POTTS	12/20/2016
SIZE:	REV:	APPROVER:	DATE:
B	23	JOHN PHAN	12/12/2017

CUSTOMER: HERC RENTALS

80 TON INDUSTRIAL PACKAGE UNIT  
GALV SKID, GALV CAGE, STAINLESS STEEL HOUSINGS  
DUCTED RETURN, 460V/3PH/60HZ, NEMA 4 CONSTRUCTION  
GENERAL DESIGN  
UNIT LAYOUT



TOTAL WEIGHT: 10,250 LBS.



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CERTIFIED AS BUILT

CHECKER: \_\_\_\_\_ DATE: \_\_\_\_\_  
 APPROVER: \_\_\_\_\_ DATE: \_\_\_\_\_

CAPS NO.:	DRAWING:	DESIGNER:	DATE:
17F-0873	M1	TIEN NGUYEN	4/21/2011
CUST. PO#:	SHEET:	CHECKER:	DATE:
	4 OF 4	DAVID POTTS	12/20/2016
SIZE:	REV:	APPROVER:	DATE:
B	23	JOHN PHAN	12/12/2017

CUSTOMER: HERC RENTALS

80 TON INDUSTRIAL PACKAGE UNIT  
 GALV SKID, GALV CAGE, STAINLESS STEEL HOUSINGS  
 DUCTED RETURN, 460V/3PH/60HZ, NEMA 4 CONSTRUCTION  
 GENERAL DESIGN  
 NEMA 4 UNIT LAYOUT



**CUSTOM AIR PRODUCTS & SERVICES, INC.**

*35 Southbelt Industrial Drive • Houston, Texas 77047*

*(713) 460-9009 • Fax (713) 460-9499*

*www.customairproducts.com*

SECTION

09

SPARE PARTS LIST

**SUGGESTED SPARE PARTS**

ITEM #	DESIGNATION	BRAND	MODEL/PART #	DESCRIPTION	QTY	CAPS#
<b>JOB #: 17F-0873</b>						
<b>REVISION #: 0</b>						
<b>CUSTOMER: HERC RENTALS</b>						
<b>PROJECT: 80 TON INDUSTRIAL A/C UNIT-NEMA 4-NON-CLASSIFIED</b>						
1	EVAPORATOR FAN	GREENHECK	22-APH-3-II-150	10,250 CFM-15HP-RPM1725, FAN GUARD	1	
2	CONDENSER FAN	VOSTERMANS	FM0457M7G0100	1800 RPM, 2HP (COMPLETED ASSEMBLY)	1	
3	COMPRESSOR	BITZER	GTD60470VAB421	40 TON TANDEM COMPRESSOR, SCROLL, GSD6, 460/3/60, NO ROTALOCK	1	
4	CRANKCASE HEATER	BITZER	343256-07	90W @ 460V CRANK CASE HEATER	1	
5	TXV	SPORLAN	OZE-35 ZGA	THERMAL EXPANSION VALVE, 1 1/8" IN / 1 3/8" OUT ODF	1	
6	HGBV	SPORLAN	HGB-8	HOT GAS BYPASS VALVE, 7/8" ODF	1	
7	FILTER DRIER	SPORLAN	C-967-G	FILTER DRIER, 7/8" ODF	1	
8	CORES	SPORLAN	RCW-48	HIGH CAPACITY CORE	1	
9	SIGHT GLASS	SPORLAN	SA-17S	SIGHT GLASS, 7/8" ODF	1	
10	LIQUID LINE VA	SPORLAN	EBVT-1070	BALL VALVE, 7/8" ODF	1	
11	HOT GAS LINE VA	SPORLAN	EBVT-1070	BALL VALVE, 7/8" ODF	1	
12	VIBRASORBER	PACKLESS	VAFS-10	SIZE, 1 3/8"	1	
13	VIBRASORBER	PACKLESS	VAFS-11	SIZE, 1 5/8"	1	
14	SYSTEM SWITCH	SQUARE D	9001KS11B	2 POSITION SWITCH	1	
15	CONTACT BLOCK	SQUARE D	9001KA2	CONTACT BLOCK (0-1)	1	
16	CONTACT BLOCK	SQUARE D	9001KA3	CONTACT BLOCK (1-0)	1	
17	A1, 2; B1, 2	SQUARE D	LC1D50AB7	CNTR, EVERLINK 50A, 3P, 24VAC	1	
18	EF	SQUARE D	LC1D32B7	CNTR, 32A, 3P, 24VAC	1	
19	EF-OL	SQUARE D	LRD22	OVERLOAD RELAY, 16-24 AMPS	1	
20	CF1 - CF6	SQUARE D	LC1D09B7	CONDENSER FAN CONTACTOR, 9A, 24VAC CONTROL	1	
21	TRANSFORMER	HPS	SP350QR	CCT, 350VA, 240/480 X 12/24V	1	
22	PM	SQUARE D	RM17TU00	PHASE MONITOR	1	
23	FUSE 1-3	MERSEN	ATQR1/4	1/4A FUSE, PHASE MONITOR	1	
24	FUSE 4-5	MERSEN	ATQR3.5	FUSE, 3.5A, 600V CLASS CC, TD	1	
25	FUSE 6	MERSEN	ATQR20	20A FUSE, TRANSFORMER, SECONDARY	1	
26	CB	SQUARE D	JDL36200	MCCB, 600V, 200A, SQ D	1	
27	PL	SQUARE D	9001KP35G31	PILOT LIGHT, GREEN, 24VAC	1	
28	PL	SQUARE D	9001KP35R31	PILOT LIGHT, RED, 24VAC	1	
29	POWER SUPPLY	PHX	2866462	PWR SPLY, TRIO-PS/3AC/24DC/5A	1	
30	FUSE 7-8	MERSEN	ATQR1-1/4	1-1/4A FUSE, POWER SUPPLY	1	
31	LOGO!	SIEMENS	6ED1052-1MD08-0BA0	LOGO! SMART RELAY, 12/24RCE, DISPLAY, 8DI, 4DO 12/24VDC	1	
32	LOGO! EXP	SIEMENS	6ED1055-1NB10-0BA2	LOGO! EXT MODULE, DM16 24R 8DI, 8DO, 24VDC	1	
33	LOGO! EXP AM2 PT100	SIEMENS	6ED1055-1MD00-0BA2	LOGO! 8 AM2 RTD EXPAN MODULE PU DC 12/24V, 2AI, -50-+200D, PT100/1000	1	
34	CURRENT SENSOR	SENA	C-1220	CURRENT SWITCH, N.O., 0.75-50A RANGE	1	
35	CURRENT SENSOR RELAY	WAGO	788-512	RELAY, 24VAC, DPDT, W/SOCKET & LATCH, 8A, 250V, PUSH IN CAGE CLAMP	1	
36	PDB	SQUARE D	9080LBA363106	POWER DISTRIBUTION BLOCK, (1) #6-500 MCM, (6) #14-#2 AWG	1	
37	TEMP SENSOR	ACI	A/100-2W-DO-4"-6" CL2P	SENSOR 100 OHM @ 32F (0 DEGREE C)	1	
38	TRANSDUCER	JOHNSON CONTROLS	P499ACP-107C	750PSI, 4-20mA TRANSDUCER	1	