READ THIS PAGE FIRST

1. **Howard-McCray would like to thank you for purchasing one of our units.**
   PLEASE READ THIS MANUAL CAREFULLY BEFORE PROCEEDING WITH THE INSTALLATION OR OPERATING OF THIS UNIT.

2. **Environment -** These display cabinets are made to operate at 75°F and 55% relative humidity. Temperature and/or humidity greater than the factory recommendations will hinder the performance of this cabinet.

3. **Cabinet Set-Up** – A qualified refrigeration mechanic should set-up this cabinet. Control settings are extremely critical to the proper operation of this unit. These settings are the responsibility of the customer and are not covered by factory warranties. Failure to have this unit installed by a qualified refrigeration mechanic may VOID all the warranties on this unit.

4. **Proper Loading** – Only pre-cooled foods should be placed in this unit.

5. **Location** – Because of the open area, this cabinet must not be located in the direct rays of the sun, near radiant heat sources, or in an area where it will be subjected to drafts or air disturbances of any type.

6. **Never spray water into the cabinet.** This will cause damage to the seals and cause the evaporator drain system to overflow.

7. **If additional assistance is required, please call us at 1-800-344-8222.**

READ THIS PAGE FIRST

90-010 Open Sandwich Series

Howard-McCray **A Division of HMC Enterprises, LLC.**
831 East Cayuga Street • Philadelphia, PA 19124 USA • (215) 464-6800 • (800) 344-8222
Fax (215) 969-4890 • E-Mail: techservice@howardmccray.com

Howard-McCray

Installation and Operating Instructions For

Open MULTI-PURPOSE 44"H Merchandisers

Important Instructions

Please Read carefully
Before attempting to
install or operate the cabinet

Keep this Book for Future Reference

90-010 Open Sandwich Series

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Engineering Specifications – SC-OS30E Models

Model No.	Cabinet Dimensions D x H x L*	Compressor HP	Electrical Voltage	Max. Amps	Power Cord Plug (NEMA)
SC-OS30E-3-LED	30 x 44 x 39	1/2	115/60Hz/1ph	12.0	5-15P
SC-OS30E-4-LED	30 x 44 x 51	1/2	115/60Hz/1ph	13.1	5-20P
SC-OS30E-5-LED	30 x 44 x 63	¾	115/60Hz/1ph	16.0	5-20P
SC-OS30E-6-LED	30 x 44 x 75	3/4	115/60Hz/1ph	16.0	5-20P

Engineering Specifications – R-OS30E Models

Model No.	Cabinet Dimensions D x H x L*	Btu/Hr @ +20F	Refrigeration Connections (Liq - Suct)	Electrical Voltage	Max. Amps
R-OS30E-3-LED	30 x 44 x 39	3100	1/4" - 1/2"	115/60Hz/1ph	0.7
R-OS30E-4-LED	30 x 44 x 51	4130	3/8" - 5/8"	115/60Hz/1ph	1.4
R-OS30E-5-LED	30 x 44 x 63	5165	3/8" – 5/8"	115/60Hz/1ph	1.4
R-OS30E-6-LED	30 x 44 x 75	6200	3/8" - 5/8"	115/60Hz/1ph	1.4

Engineering Specifications – SC-0S35E Models

Model No.	Cabinet Dimensions D x H x L*	Compressor HP	Electrical Voltage	Max. Amps	Power Cord Plug (NEMA)
SC-OS35E-3-LED	34.5 X 44 X 39	1/2	115/60Hz/1ph	12.0	5-15P
SC-OS35E-4-LED	34.5 X 44 X 51	1/2	115/60Hz/1ph	13.1	5-20P
SC-OS35E-5-LED	34.5 X 44 X 63	3/4	115/60Hz/1ph	16.0	5-20P
SC-OS35E-6-LED	34.5 X 44 X 75	3/4	115/60Hz/1ph	16.0	5-20P

Engineering Specifications – R-0S35E Models

Model No.	Cabinet Dimensions D x H x L*	Btu/Hr @ +20F	Refrigeration Connections (Liq - Suct)	Electrical Voltage	Max. Amps
R-OS35E-3-LED	34.5 X 44 X 39	3100	1/4" - 1/2"	115/60Hz/1ph	0.7
R-OS35E-4-LED	34.5 X 44 X 51	4130	1/4" - 1/2"	115/60Hz/1ph	1.4
R-OS35E-5-LED	34.5 X 44 X 63	5166	3/8" - 5/8"	115/60Hz/1ph	1.4
R-OS35E-6-LED	34.5 X 44 X 75	6200	3/8" - 5/8"	115/60Hz/1ph	1.4

* - Includes End Panels

These cabinets are designed to operate in an air conditioned location ONLY. Temperature not to exceed 75ºF and a relative humidity not to exceed 55%.

The following instructions are for the benefit of the new owner and the installing contractor. They should be studied carefully before attempting to install or operate the cabinet. This manual is the property of the owner and should remain in the owner's possession.

General Specifications and Features

Endless Installation

Cabinets can be lined-up. Cabinets are lightweight, making them easy to move into position. Alignment is exact as all Cabinets are foamed in place in a heavy air powered jig. Cabinet joining is bolt type and easily accessible.

Dimensions

Narrow 30-inch front to back dimension makes the cabinet ideal for convenient store installation. No need to remove the store's front glass to gain entry. All cabinets will easily slide through a 34-inch opening. Height is optimized for maximum storage and merchandising appeal.

Interior

Aluminum interior surface, aluminum shelving, aluminum interior end panels and heavy gauge galvanized coil housing. The interior has a special finish process that prevents rusting.

Exterior

Black acrylic exterior over durable aluminum. Easily cleanable. The standard is Black front panel, canopy and ends.

Refrigeration

Refrigeration is proven, Howard-McCray KOLDFLO. KOLDFLO is the properly engineered control of temperature, humidity and air flow throughout, resulting in the product being constantly enveloped by cold air.

Expansion Valve

The expansion valve is located at the left end of the cabinet and is readily accessible. There is no refrigeration tubing buried in the insulation.

Drain

The drain is a sink type with 1" Male NPT threads. Self-Contained models are factory connected to a drain pan and dissipation system. Remote models are provided with a 1" PVC adapter, Drain Trap, & elbow for customer connection to a external drainage system.

Color Band

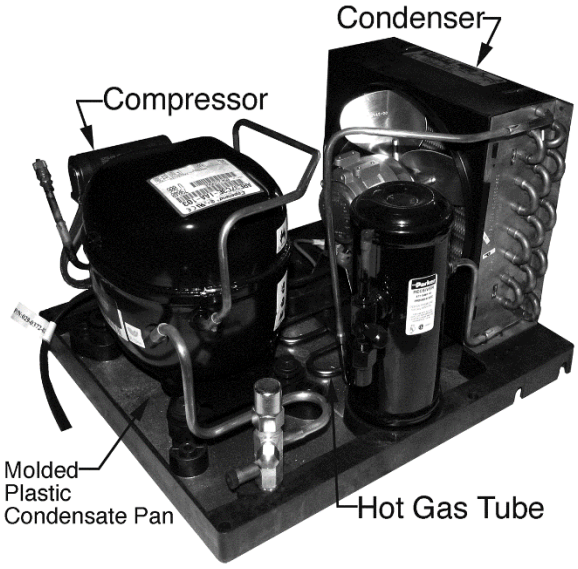
Color band available in a variety of colors. Standard is Black or White.

3-Step Shelf

3-tier vertical display invites maximum selection, placing the product right in front of customer. The shelf is manufactured from sturdy aluminum with a baked on enamel finish. The shelf is easily removable for cleaning.

Energy Efficient Condensate Evaporating Condensing Units

This Howard-McCray cabinet uses an energy efficient method of removing the condensate water. The base of the condensing unit has a very hot tube, from the compressor to the condenser that dissipates the water without any electrical connections. This system is not only fail safe but it is much more sanitary and virtually corrosion free.



Warning

The condensate disposal system of this case is designed to dispose of the water from the evaporator only. When additional water is injected into the cabinet, other arrangements must be made to dispose of this water.

NOTE: The condenser fan runs continuously, this increases the evaporation of the condensation water from the pan.

Notes: This cabinet is designed for AIR CONDITIONED LOCATIONS ONLY, not to exceed 75ºF and 55% RH.

Receiving and Inspection Procedure

1) The cabinet has been carefully operation tested and inspected before crating and has been determined to be in good operating condition before leaving the factory.

2) Upon arrival of the cabinet, the crate should be inspected thoroughly for any damage that may have occurred in transit. In the event that any damage is discovered, it should be noted on the delivery ticket or Bill of Lading and signed to that effect. An immediate claim should then be filed against the carrier giving them the description and amount of damage.

3) After the crate has been removed, the cabinet should be examined carefully for any damage. If there is any concealed damage, the carrier should be notified immediately. Make a request in writing with the carrier for an inspection within 15 days, and retain all packaging. The carrier will supply the inspection report and the required claim forms.

4) Our Company can assume no responsibility for filing freight claims as the cabinet was in good condition on a clear Bill of Lading, F.O.B. Philadelphia. However, the factory will assist, if required.

5) Shortages - Check your shipment for any possible shortages of material. If one exists and is found to be responsibility of Howard-McCray, notify the factory. Howard-McCray will acknowledge shortages within ten days from receipt of acknowledgement. If a shortage exists and it involves the carrier, notify the carrier immediately and request an inspection.

Installation

As with all open vertical display refrigerated cabinets, there are several very important requirements that must be complied with for proper operation. They are as follows:

1. This line of display cabinets are designed to operate in a location that is **FULLY AIR CONDITIONED**. Ambient temperatures must not exceed 75°F and the relative humidity must not exceed 55%. In addition, this cabinet should not be located in an area where it will be subjected to drafts or air disturbances of any type. Locations where the cabinet may be subjected to radiant heat from spot or flood lamps, sun rays or heat from suspended gas heating fixtures should be avoided.

2. After locating the cabinet, it must be leveled (using shims) from front to back as well as end-to-end. This will facilitate proper refrigeration at the evaporator and proper dissipation of the defrost water.

NEVER use a pry bar or jeep prongs on the bottom of end assemblies.

3. The minimum clearance allowed for the rear of the cabinet is 2 inches and the sides can have no clearance if need be.

4. All wiring must be installed by a competent electrician and conform to local codes. The incoming voltage must be maintained to within 5% of the voltage shown on the cabinet nameplate. The electrical service connection is located at the rear of the cabinet (see applicable Plan View drawing).

Electrical Service Connection

Self-Contained models are provided with a Service Power Cord, see the ***Engineering Specifications*** for the plug type of your cabinet. On Remote models the electrical connection is to be made in junction box located at the rear of the cabinet (see applicable Plan View drawing for exact location). The incoming voltage must be maintained to within 5% of 115 volts. Howard-McCray will not accept responsibility for the performance of the cabinet or malfunction of any component due to a lower voltage supply than that indicated on the serial rating plate. Use separate electrical supply lines connected to a fuse block or circuit breaker of proper capacity.

Sanitation

Sanitation code compliance is necessary in many localities. It is recommended that the cabinet be sealed to the floor. Use a NSF Approved sealant between the floor and the perimeter of the cabinet base.

Divider

A divider must be installed between self-contained cases when they are joined. This is also true when remote cases are joined and are on separate condensing units. The divider can be either a Plexiglas Divider or an Insulated Divider (similar to the cabinet End).

Remote Installations

Remote installation of these cabinets require an experienced and knowledgeable refrigeration mechanic. The proper location, connection, and control of the cabinet is crucial for the cabinet to operate as designed.

The following guidelines are strongly recommended to provide the proper operation of the cabinet.

- Good refrigeration connection practices, as outlined in the ***Refrigeration Connection*** section.

- Good drain connection practices, as outlined in the ***Drain Installation*** section.

- Good temperature control & settings.
  If a Low Pressure Control is utilized follow the settings outlined in the ***Temperature Control*** section.
  If a Temperature Sensing Control is utilized, locate the sensing bulb in the Discharge Airstream, and adjust the control to operate at the temperatures outlined in the ***Temperature Control*** section.

- Timely Defrosting of the evaporator coil is absolutely necessary to the proper operation of the cabinet. It is recommended that a timer with a similar operational configuration to the one supplied on a Self-Contained model be installed and configured with the settings outlined in the ***Defrost Time Clock*** section.

Drain Installation
(Remote Models)

Properly installed drains are extremely important in ensuring satisfactory cabinet operation, and protection from product loss. The drains on these models must be pitched down a minimum of 1/4" per foot away from the cabinet. Never reduce the drain line size. Maintain the 1" pipe size for the entire length. Never double trap drain lines. If two or more cabinets are joined together, each must be trapped and their outlets connected to a common drain. Be sure that the drain lines are installed to comply with local codes. A 1" PVC drain trap is supplied with each Howard-McCray cabinet.

NEVER connect drain lines before the drain trap from cabinet to cabinet on multiple hook-ups.

Refrigeration Connection
(Remote Models)

The refrigeration tubing is located in left side of the cabinet in the underneath section. The liquid and suction line size can be found in the ***Engineering Specifications*** section for your model. These line sizes should not be reduced under any circumstances. Refrigeration tubing location is shown on the Plan View drawing.

Points to remember when making the refrigeration connection:

1. Suction lines will sweat, therefore any lines not run in trenches or drained areas should be covered with Armaflex sleeving or equal.

2. When brazing tubing within the cabinet, use a piece of heat protective sheet to protect the galvanized pan from the heat. Heat applied to a galvanized pan will melt the insulation below it.

3. All copper tubing used should be of a refrigeration grade (type L or K), clean, dehydrated and sealed.

4. Always use a tubing cutter, never a hack saw or file. Remove the burrs from the inside of the tube.

5. Long radius fittings are preferable over short radius fittings.

6. Keep fittings and elbows to an absolute minimum.

7. All tubing runs should be free of kinks and restrictions and must be properly supported.

8. Silphos or equivalent silver alloy material is recommended for brazing copper to ferrous or brass connections.

9. The use of 50 - 50 solder for refrigeration piping is not recommended.

10. All tubing entrance holes must be properly sealed on the inside and outside of the cabinet before start up.

NEVER pipe suction and liquid lines from one system thru refrigerated areas of other systems.

NEVER direct a torch flame against the drain pan when brazing tubing, direct the torch flame away from the drain pan. The insulation will melt if exposed to high temperatures.

NEVER use the compressor as an evacuation pump. It is important that upon completion of the installation of the suction and liquid lines that the entire system be evacuated with a proper vacuum pump. Never use the compressor for this purpose and always evacuate the complete system in accordance with approved methods and procedures.

CHECK-LIST FOR USE BEFORE START-UP

The following items should be checked when applicable to these cabinets:

Make sure that the gaskets at the joints of all cabinets make a proper seal between the cabinets.

Make sure that all fan motors are properly plugged in.

Make sure that all fan blades are tight on all fan motor shafts.

Make sure that the expansion valve sensing bulb is properly positioned and is tightly secured.

Make sure that all expansion valve flare nuts are tight.

Make sure that tubing entrance holes both inside and outside the cabinet are properly sealed.

Make sure that all SEALANT MATERIAL that was removed from position in the cabinet during installation and piping is correctly replaced and seals in a satisfactory manner.

Make sure that all the loose debris in the cabinet that might plug the drain is removed.

Tighten the attaching bolts on all end assemblies after the cabinets are installed. The ends are factory installed and the attaching bolts might loosen in shipment.

Make sure the interior bottom pans are properly positioned.

Make sure that external drain traps will not become frozen by contact with suction lines.

Make sure the condensate drain trap (self-contained models) drains into the auxiliary stainless steel pan, located on the condensing unit base.

Start-Up

1. Electrically energize the cabinet. Check the supply voltage, must be within +/- 5%. Check the evaporator fan motors to ensure all are operating and rotating in the correct direction.

2. Electrically energize the refrigeration system. Check the supply voltage, must be within +/- 5%. Check the Thermostatic Expansion Valve Setting (as outlined in the ***Thermostatic Expansion Valve Setting*** section below), and adjust if necessary.

3. Set and check the Temperature Control settings (as outlined in the ***Temperature Control*** section below).

4. Set the Defrost Time clock to the correct time-of-day (as outlined in the ***Defrost Time Clock*** section).

Thermostatic Expansion Valve Setting

The expansion valve is located at the left end of the evaporator. The valve must be adjusted so that the coil is fully flooded, this will result in a superheat setting of approximately 5ºF at the expansion valve sensing bulb.

Temperature Control
(Self Contained Models)

Temperature in the cabinet is controlled with a Digital Electronic Controller located in the machine compartment. Control settings are 32ºF cut-out and 38ºF cut-in. This should result in air temperatures of 32ºF to 38ºF at the top discharge jet.

It must be remembered that the cut-in setting must be high enough to permit the coil to completely clear itself of frost and ice during the off cycle. It is strongly recommended that all cabinets be fully loaded or carry a simulated load for at least 24 hours before any control adjustments are made.

ELECTRONIC DIGITAL CONTROLLER TEMPERATURE & DEFROST

This cooler employs an Electronic Controller which controls the cabinets' temperature and defrosts period.

Temperature Control - Electronic

The control is programmed to cycle based on discharge air temperature between 32ºF to 38ºF.at. The sensor for the control is located in Top Discharge Jet on the left side attached to the flue ceiling. The controller is located in the machine compartment behind the front grille on the left side. The display on the controller is indicating the temperature at the Top Discharge Jet in the flue.

Warning

This control has been calibrated and set at the factory to maintain the proper temperature. Before attempting to change this setting, the cabinet should be put into operation for a minimum of 16 hours.

If needed to change the setting of the controller follow these steps:

1. Push the [SET] key on the controller for more than 2 seconds to change Set point value.
2. The value of the set point will be displayed and the ºF LED starts blinking.
3. To change the set value, push the [UP] or [DOWN] arrow to raise or lower set point.
4. To confirm the new set point value, push the [SET].

Once the control has been reset, allow the cabinet to run for 4 hours to stabilize.

Defrost Controller - Electronic

The cabinet goes into defrost every 4 hours. From the initial start up. If you want to set the defrost period to start during closing hours simply push the [MELTING SNOW FLAKE] key for more than 2 seconds and a manual defrost will start. Now the next defrost will be 4 hours from that point. Defrost will terminate based on the evaporator coil temperature. The sensor to terminate defrost period is located in the evaporator coil on the left side, rear of the cabinet. When the coil temperature reaches 50F the defrost period will terminate. Remember the Defrost Termination Temperature setting must be high enough to allow the coil to completely clear itself of frost and ice during the off cycle.

Loading Procedures

When loading the cabinet, product should be pre-cooled. Do not load cabinet beyond shelf size limits; this will disturb the air curtain designed to keep the product cool. Do not allow any of the product to obstruct the return air grille, this will have a negative effect on the cabinet's cooling capability.

DO NOT LOAD BEYOND THE "SAFE LOAD LINE".

Parameter	Description	Edit
SEt	Set point	32
Hy	Differential	6
LS	Minimum set point	20
US	Maximum set point	45
ot	Thermostat probe calibration	0
P2P	Evaporator probe presence	y
oE	Evaporator probe calibration	0
P3P	Third probe presence	n
o3	Third probe calibration	0
P4P	Fourth probe presence	n
o4	Fourth probe calibration	0
odS	Outputs delay at start up	1
AC	Anti-short cycle delay	1
rtr	P1-P2 percentage for regulation	100
CCt	Continuous cycle duration	00:00
CCS	Set point for continuous cycle	0
Con	Compressor ON time with faulty probe	12
CoF	Compressor OFF time with faulty probe	8
CF	Temperature measurement unit	F
rES	Resolution	in
Lod	Probe displayed	P1
dLy	Display temperature delay	01:00
dtr	P1-P2 percentage for display	50
tdF	Defrost type	EL
dFP	Probe selection for first defrost	P2
dtE	Defrost termination temperature first defrost	50
idF	Interval between defrost cycles	4
MdF	(Maximum) length for first defrost	60
dSd	Start defrost delay	0
dFd	Displaying during defrost	SEt
dAd	Max display delay after defrost	10
Fdt	Draining time	0
dPo	First defrost after start-up	n
dAF	Defrost delay after fast freezing	00:00
ALC	Temperature alarms configuration	Ab
ALU	Maximum temperature alarm	45
ALL	Minimum temperature alarm	20
AFH	Differential for temperature alarm recovery	1
ALd	Temperature alarm delay	60
dAo	Delay of temperature alarm at start up	02:00

AP2	Probe selection for condenser temperature alarms	P4
AL2	Condenser low temperature alarm	-40
AU2	Condenser high temperature alarm	230
AH2	Differ. for condenser temp. alarm recovery	10
Ad2	Condenser temperature alarm delay	15
dA2	Delay of condenser temper. alarm at start up	01:30
bLL	Compressor off for condenser low temperature alarm	n
AC2	Compressor off for condenser high temperature alarm	n
i1P	Digital input polarity	CL
i1F	Digital input configuration	EAL
did	Digital input alarm delay	5
nPS	Number of activation of pressure switch	15
OdC	Compress and fan status when open door	no
rrd	Regulation restart with door open alarm	y
HES	Differential for Energy Saving	0
Adr	Serial address	1
PbC	Kind of probe	ntC
OnF	On/off key configuration	nu
dP1	Room probe display	0
dP2	Evaporator probe display	0

Maintenance Suggestions

An attractive operation can be a very profitable. Dirty and poorly merchandised cabinets are offensive to most discriminating customers, so a clean attractive cabinet will pay dividends. Weekly or more often, if necessary, the display area should be cleaned and attractively stocked.

Important Notice

1. ALWAYS disconnect the power to the cabinet before attempting to clean it with any liquid.

2. NEVER under any circumstances should a water hose be sprayed into this cabinet.

3. NEVER use ammonia or solutions with ammonia on this cabinet.

4. The use of abrasive cleaning materials on this cabinet will VOID all cabinet warranties.

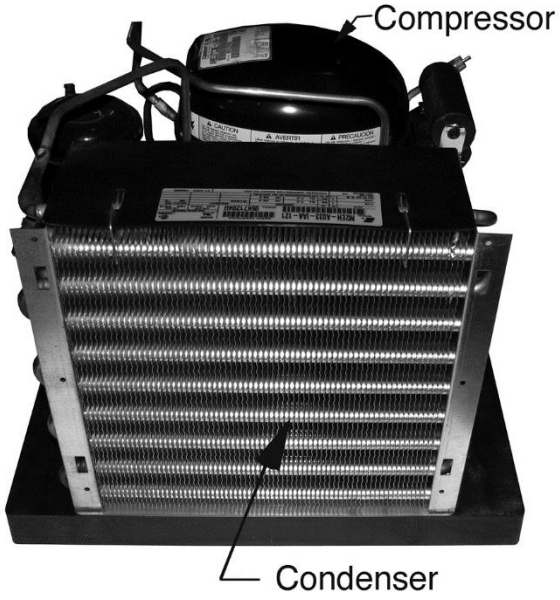
The Cleaning Process

1. Turn the power off from the source.
2. Remove all merchandise from the cabinet and store in a refrigerated area. Then remove all shelves and floor pans.
3. This cabinet can be hand cleaned internally with a mild soap detergent and hot water. Diluted non-chlorine bleach and hot water is a good sanitizer. The cleaning cloth should be just wet enough to get a reasonable cleaning action but should not be wet to a point where it will emit a large amount of water which will flow through the drain system causing it to overflow.
4. After the cabinet is cleaned, any remaining water in the cabinet can be soaked up with the use of a sponge and dried out with a dry cloth completely before resuming operations.
5. Make sure that the internal drain is open and remove all scraps, paper, and lint.
6. All external panels may be cleaned with a damp cloth, and then they may be polished with a dry lint free cloth. This will preserve the luster of the cabinet.

Cleaning the Condenser

It is crucial that the condenser face be cleaned weekly. Due to the condensing unit's location near the floor, the condenser will quickly accumulate any dust or dirt from the location. A dirty condenser will diminish the cooling ability of the system, thus resulting in longer operational times and warmer product temperatures.

The condenser face can be cleaned with the use of a hose/brush attachment on a vacuum cleaner. Take care to avoid bending the condenser fins, It is of vital importance that the condenser gets the proper amount of air through the fins and around the tubes, therefore all dirt, lint, and dust needs to be removed



Cleaning the Machine Compartment

At intervals of four to six months, or before if necessary, it is recommended that the Machine Compartment be cleaned out. It should be accomplished in the following order:

1. Shut down the cabinet electrically.

2. Remove the front grille. Using a hose/brush attachment on a vacuum cleaner, all dirt, store lint and dust can be removed from the machine compartment.

3. If any traces of oil are found contact your Refrigeration Service person as soon as possible.

4. Before reloading the cabinet with merchandise, allow an hour for refrigeration pull-down. Make sure that all merchandise is in a good salable and refrigerated condition when re-loading the cabinet.

Trouble Chart

A. Compressor will not start - no hum

Possible Causes:
1. Disconnect switch open
2. Blown fuse
3. Defective wiring
4. Overload protector tripped
5. Open control contacts (control may be defective, or unit location may be too cold)
6. Defective overload protector

B. Compressor will not start - hums but cycles on overload

Possible Causes:
1. Low voltage
2. Unit wired incorrectly
3. Starting capacitor defective
4. Starting relay contact not closing
5. Compressor motor defective
6. High head pressure
7. Bearings on pistons tight - low oil charge

C. Compressor starts, but starting winding remains in circuit

Possible Causes:
1. Low voltage
2. Unit wired incorrectly
3. Starting capacitor weak
4. Running capacitor defective
5. Starting relay defective
6. Compressor motor defective
7. High head pressure

D. Compressor starts and runs but cycles on overload

Possible Causes:
1. Low voltage
2. Running capacitor defective
3. Overload protector defective
4. High head pressure
5. Fan motor, pump, etc., wired to wrong side of overload protector
6. Compressor motor partially grounded
7. Unbalanced line voltage (3 phase models)
8. Bearing or pistons tight - low oil charge

E. Compressor short cycles

Possible Causes:
1. Control differential set too close
2. Refrigerant undercharge
3. Refrigerant overcharge
4. Discharge valve leaking
5. Expansion valve leaking
6. Cutting out on high pressure control
7. Cutting out on overload protector because of tight bearings, stuck piston, high head pressure or restricted air cooled condenser

F. Compressor tries to start when thermostat closes but cuts out on overload, starts after several attempts

Possible Causes:
1. Low voltage
2. Thermostat differential too close (lower than 4°)
3. Thermostat bulb not in tight contact with evaporator

G. Running cycle too long, or unit operated continuously

Possible Causes:
1. Insufficient refrigerant charge
2. Dirty or restricted condenser
3. Unit: location too hot
4. Control contacts stuck
5. Air or other non-condensable gases in system
6. Expansion valve plugged or defective
7. Cabinet doors left open too long
8. Insufficient, defective or water - logged insulation
9. Evaporator coil plugged with ice or dirt

H. Evaporator temperature too high

Possible Causes:
1. Shortage of refrigerant, or leak on system
2. Restricted capillary tube, strainer or drier
3. Control setting too high
4. Expansion valve restricted
5. Expansion valve too small
6. Evaporator coil plugged with ice or dirt
7. Evaporator oil logged

I. Noisy Unit

Possible Causes:
1. Compressor oil charge low
2. Fan blade bent causing vibration
3. Fan motor bearings loose or worn
4. Tube rattle
5. Loose parts on condensing unit

J. Liquid line hot

Possible Causes:
1. Unit undercharged or leak in system
2. Expansion valve opened too far

K. Liquid line frosted

Possible Causes:
1. Restriction in drier
2. Shut off valve on receiver either partially closed or restricted

L. Suction line sweating or frosted

Possible Causes:
1. Expansion valve open too wide
2. Evaporator iced up
3. Evaporator fan motors not operating

Parts List

Refrigeration Components

Part #	Description	Usage
1SH6521	Evaporator Fan Assembly	ALL Models
21-321-200L	200L 120v Condensate pans	ALL SC-Models
21-376-XR40CX-A	Digital Controller XR40CX	ALL SC- Models
51-240-ERJ02C	Expansion Valve (1/4 Ton R513a)	ALL 3' Models
51-240-ERJE05C	Expansion Valve (1/2 Ton R513a)	ALL 4' & 5' & 6' Models
71-093	Condensing Unit R-513A	ALL 3' & 4' Models
71-095	Condensing Unit R-513A	ALL 5' & 6' Models

Grille Assemblies

Part #	Description	Usage
3FM7763	Front Grille (& Optional Rear Grille)	ALL 3' Models
4FM7763	Front Grille (& Optional Rear Grille)	ALL 4' Models
5FM7763	Front Grille (& Optional Rear Grille)	ALL 5' Models
6FM7763	Front Grille (& Optional Rear Grille)	ALL 6' Models

Fan Panel Assemblies

Part#	Description	Usage
3WMH6515	Fan Panel Assembly (2-FAN)	ALL 3' Models
4WMH6515	Fan Panel Assembly (3-FANS)	ALL 4' Models
5WMH6515-3	Fan Panel Assembly (3-FANS)	ALL 5' Models
6WMH6515	Fan Panel Assembly (4-FANS)	ALL 6' Models

LED Light Components

21-400-34	LED Light Strip 34"	ALL 3' Models
21-400-45	LED Light Strip 45"	ALL 4' Models
21-400-56	LED Light Strip 56"	ALL 5' Models
21-400-67	LED Light Strip 67"	ALL 6' Models
21-387-PS016	24v 16-Watt LED Power Supply	ALL Models
21-387-CP	Mini-Orion Light Clip	ALL Models

NOTE: Additional parts not included in this list are available from the factory. Contact the Parts & Service department at the phone numbers at the bottom of the page.

Keep this Page for Your Records:

Dear Customer:

We wish to congratulate you on your judgment. We are very proud to have been privileged to serve you with Howard-McCray equipment to fill your requirements.

Howard-McCray equipment is the product of a company dedicated in producing products of quality, incorporating progressive features on a timely basis and backed by a warranty which provides confidence.

Should you have any questions regarding features, operation, or service, call the Howard-McCray Assistance Center toll free. (800-344-8222)

Thank you,

Howard-McCray

Customer Installation Record:

Cabinet Model Number _____

Serial Number _____

Condensing Unit Model Number and Horsepower _____

Type of Control _____

Refrigerant _____

Thermostat _____

Other _____

_____

_____

Defrost Period _____

Date of Start-Up _____

Other Remarks _____

_____

_____

_____

Installing Contractor _____

_____

Address _____

_____

_____

_____

Phone Number _____

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Fax (215) 969-4890 • E-Mail: techservice@howardmccray.com

Limited Warranty Guidelines

Issued 01/01/25

The warranty does not cover product loss or consequential damages.
TO ACTIVATE THE WARRANTY, THE FOLLOWING MUST BE COMPLETE:

1. Payment in full to Howard McCray.
2. Installed by a Qualified Refrigeration Company (1)

Warranty includes, but is not limited to, Refrigerators, Freezers and display cases sold in the Continental United States to the original Dealer and the respective customer. The warranty must be activated before any claims can be processed. This warranty cannot be transferred under any circumstances. Howard McCray products are made for commercial use only, any warranty claim for residential use will be denied and void immediately.

(1) A Qualified Refrigeration Company is defined as a fully licensed and insured refrigeration company that handles food service equipment.

Warranty for Self-Contained Equipment:

Compressor - 1 Year from Date of Installation or 15 Months from Date of Shipment, whichever comes first.

Parts - 1 Year from Date of Installation or 15 Months from Date of Shipment, whichever comes first.

Labor - 90 Calendar days from Date of Installation or 120 days from Date of Shipment, whichever comes first.

Extended Warranty for Self-Contained Equipment
Compressor - 4 additional years - 5 years from the date of installation or 5 years 3 months from Date of Shipment - whichever comes first. Compressor age will be prorated according to

Schedule A. - COMPRESSORS

Warranty for Remote Cases
The above Labor & Parts warranty apply to Remote units, for items that are installed by the factory (Howard McCray). Expansion valves and related components involved in the installation of these units is not covered nor any part affected by the installation. Refrigerant loss is not covered.

FAILURE TO CLEAN THE CONDENSER WEEKLY WILL VOID THE FACTORY WARRANTY

All Warranty Claims must include the following or they will not be processed.

The required information is as follows:

1. Service Authorization Number (SA#) – Provided by Howard McCray
2. Date of service
3. Model number of unit being serviced
4. Serial number of unit being serviced
5. Copy of wholesaler receipt for all parts replaced including compressor.

Please fill out Request for Warranty Reimbursement Form – **Schedule D**
The Recommended Service Allowances by HMC is listed on **Schedule B**

ITEMS NOT COVERED BY WARRANTY

Product Loss

Expansion Valves on Remote units

Light bulbs of any type except LED – **See Schedule C**

Adjustments of any type including thermostats, time clocks, expansion valves, hinges or controls - electronic or manual

Broken or cracked glass

Improper installation

Electrical surges which cause components to burn out

Damages due to spraying water into the unit

Claims not submitted within 60 days of date of service

Equipment that has experienced other stress or hazards such as floods, fire or other acts of nature.

One call per unit per problem

All Howard McCray equipment is intended for indoor use with ambient temperatures not exceeding 75 degrees and 55% relative humidity.

SCHEDULE A – COMPRESSOR REPLACEMENTS

FAILURE TO CLEAN THE CONDENSOR COIL ON A WEEKLY BASIS WILL VOID THE WARRANTY

First 15 months: the compressor must be exchanged at the local refrigeration wholesaler.
The Factory reserves the right to supply the replacement compressor if the compressor is older than 16 months.

Months 16-36: 100% reimbursement from factory provided the factory is provided the Compressor plate (photo will be permitted) and copy of actual invoice from the local refrigeration wholesaler.

Months 37-48: 75% reimbursement from factory provided the factory is provided the compressor plate (photo will be permitted) and copy of actual invoice from the local refrigeration wholesaler.

Months 49-60: 50% reimbursement from factory provided the factory is provided the compressor plate (photo will be permitted) and a copy of the actual invoice from the local refrigeration wholesaler.

FAILURE TO CLEAN THE CONDENSOR COIL ON A WEEKLY BASIS WILL VOID THE WARRANTY

SCHEDULE B – LABOR RATES

Item	Allowable Labor hours	Part must be returned
REPAIR MATERIAL/TOOLS NOT EXCEED $200.00		
Compressor Replacement	4.0	Exchange
Compressor components	1.0	No
Replace Evaporator Coil	4.0	Yes
Replace Expansion valve	2.5	Yes
Replace Condenser Fan Motor	2.0	Exchange
Diagnose & repair refrigerant leak, replace sight glass & drier	2.5	No
Diagnose & repair door gasket	1.0	Yes
Diagnose & replace door	1.0	Yes
Electrical Components		
GFCI Light switch	1.0	No
LED Driver	1.0	Yes
Evaporator Fan Motor		
Electronic controller	2.0	Yes
Electronic controller sensor	1.0	No
Low pressure switch	2.5	No
Condensate pan	1.0	Yes

Sight glass reimbursement total = $40.00

Filter drier reimbursement total = $40.00

Travel time - Not to exceed 1 hour max charge is $ 125.00

Labor hours - Overtime is not permitted

Reclaim fee - Maximum allowance is $ 50.00 Allowances

SCHEDULE C - PARTS WARRANTY

Some Parts are covered by 1 year Original factory warranty. These parts will be replaced by the original factory supplying these parts or a designated wholesaler as listed.

Glass doors on RIF,RIN,GR or GF series are covered by Anthony International. Claims must contain Anthony Work order number

Hot Wells are covered by APW and all claims must contain APW serial number

Outdoor Condensing units are covered by the refrigeration company supplying the condensing units. These claims must include the condensing unit serial number.

Compressor Components including starter components, relays, condensing fan motors and other related components must be exchanged at the local refrigeration wholesaler within 12 months of date of service or 15 months from factory shipment.

Refrigerant – only the factory specified charge amount will be accepted. The charges are
listed on the serial plate. The current rates are
R134a - $ 16.00 LB
R404A - $ 20.00 LB

Electronics Controls must be returned to factory for reimbursement.

LED lights & drivers (ballast) must be returned to factory for reimbursement.
It is the responsibility of the repairing refrigeration company to return these parts to HMC

in order for the claim to be processed. The part must be MARKED with:
Service Authorization # (SA#)
Model#
Serial #

All reimbursement requests for parts must include wholesaler invoice copy except for Sight Glass & Filter Driers. The current reimbursement rates for these parts are:

Sight Glass - $ 15.00
Filter Drier - $ 15.00

SCHEDULE D - Request for Warranty Reimbursement

Howard/McCray
HMC Enterprises LLC
831 E. Cayuga St
Philadelphia, PA 19124

For questions related to warranty
Warranty@howardmccray.com
for Technical Service
Tsc@howardmccray.com

Today's Date: _____ Date of Service: _____

Service Authorization Number (SA#): _____

Model Number: _____

Serial Number: _____

Service Company: _____

Address: _____

City: _____ State/Province: _____

Zip Code: _____ Contact Phone Number: _____

Email Address: _____

Service Performed: _____

Labor Rate per hour: _____

Labor Hours to perform service: _____

Travel Time: _____

Checklist: _____

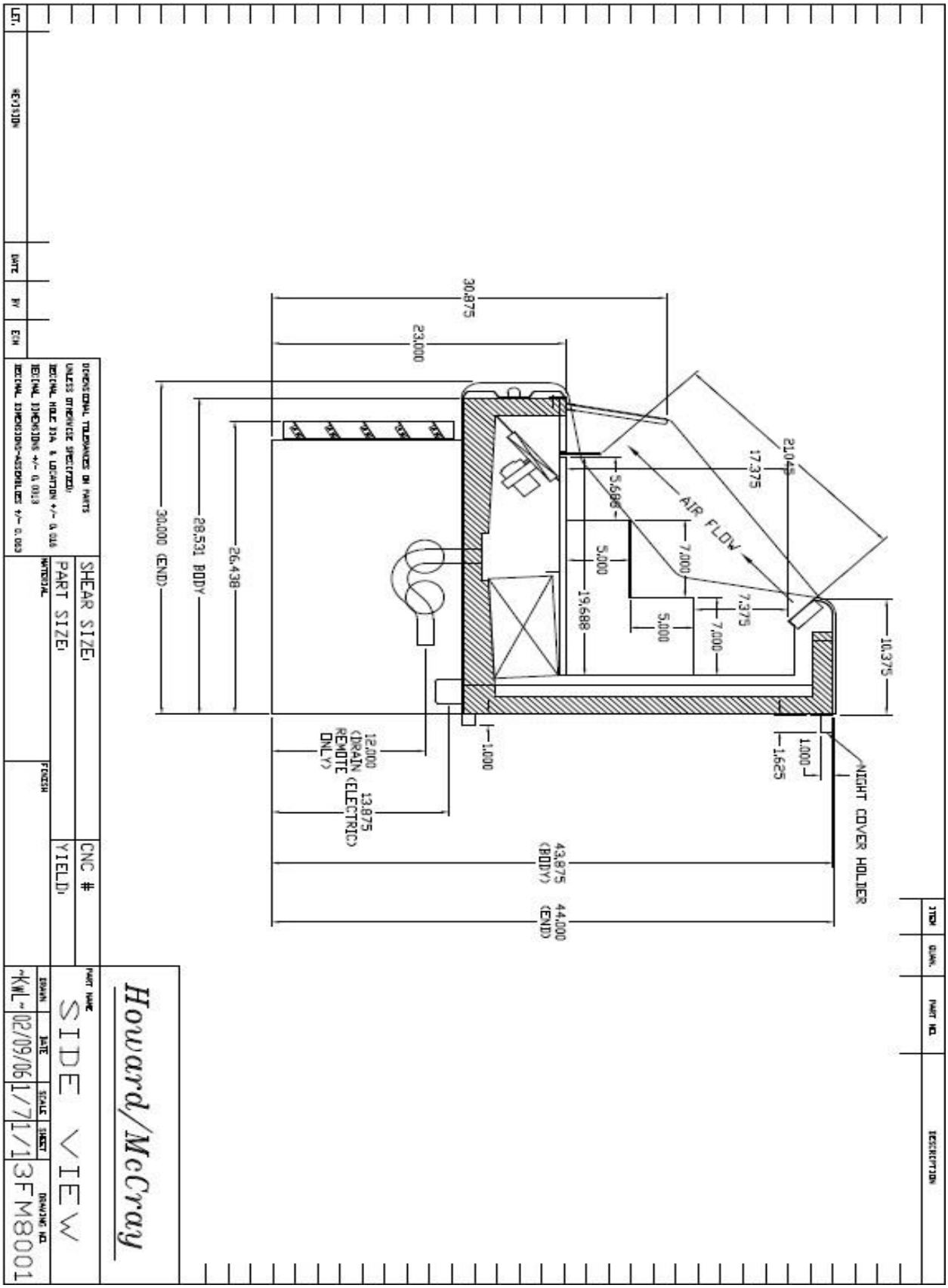
Copy of refrigeration wholesaler invoices for all parts used: _____

Original Service invoice from your company: _____

Copy or Photo of Compressor Tag: _____

Service Authorization on all documents: _____

Name & Contact Number: _____



OS30E CROSS SECTION VIEW

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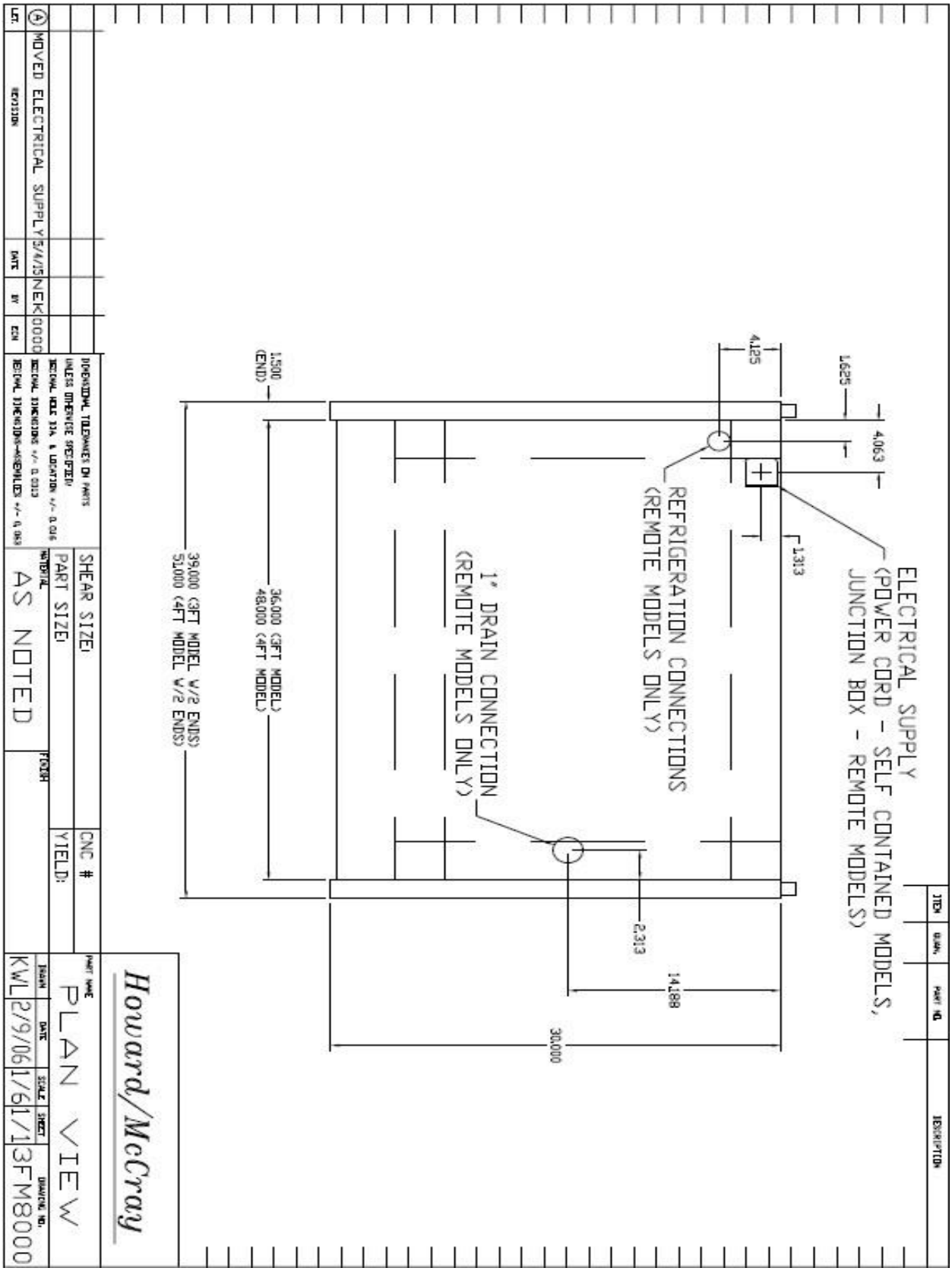

OS30E-3/4 PLAN VIEW

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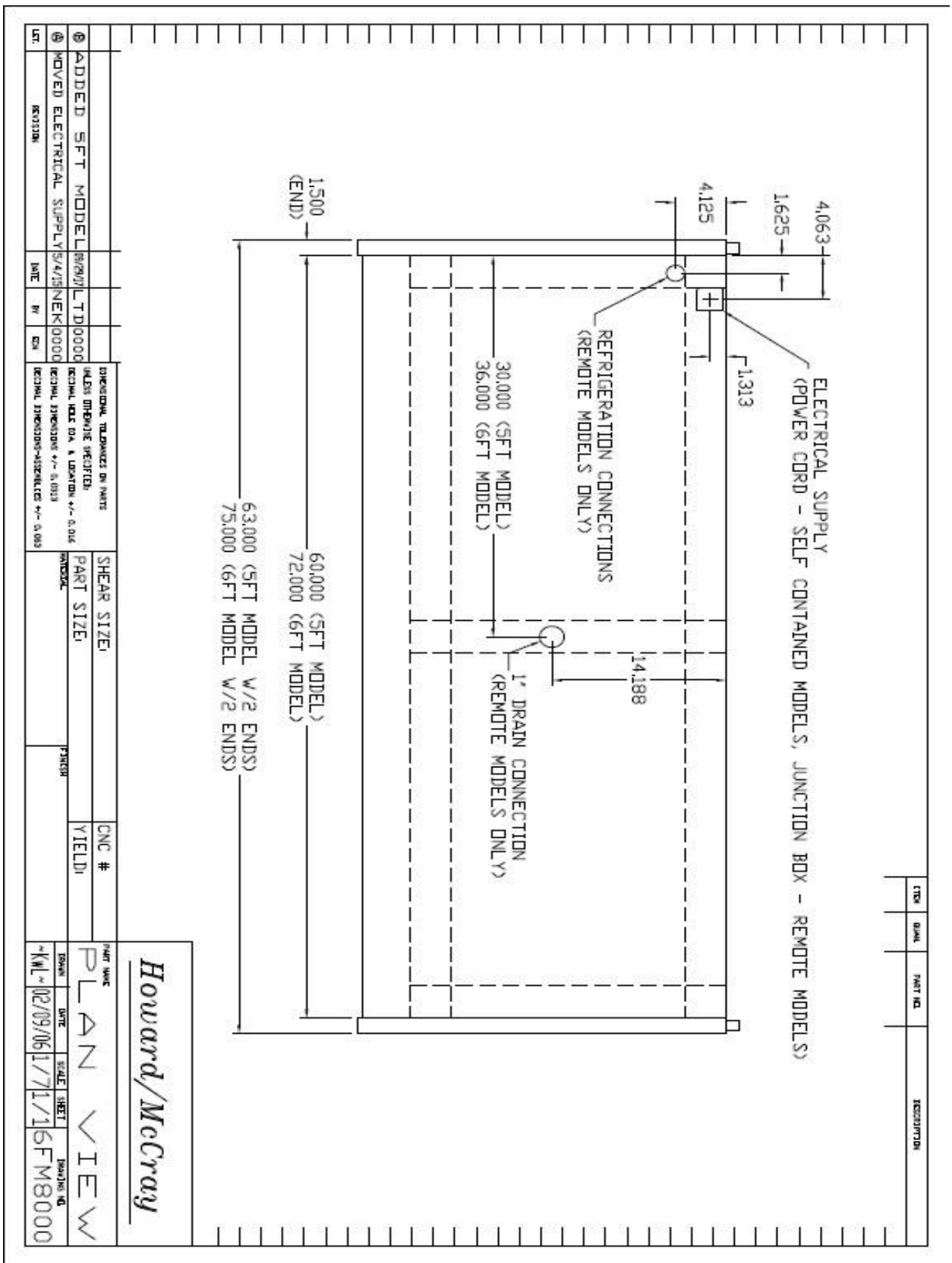
Fax (215) 969-4890 • E-Mail: techservice@howardmccray.com



OS30E-5/6 PLAN VIEW

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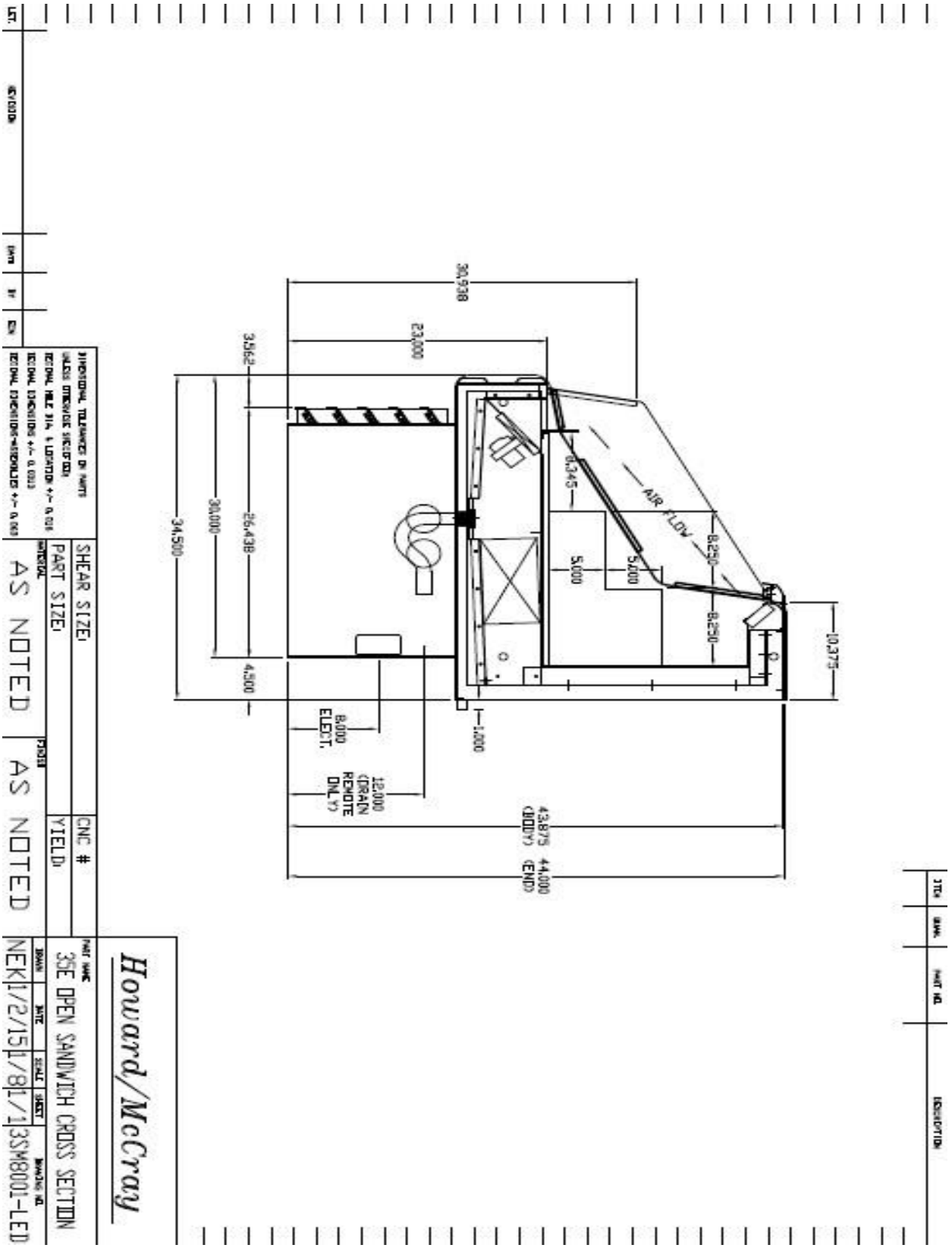
Fax (215) 969-4890 • E-Mail: techservice@howardmccray.com



OS35E CROSS SECTION VIEW

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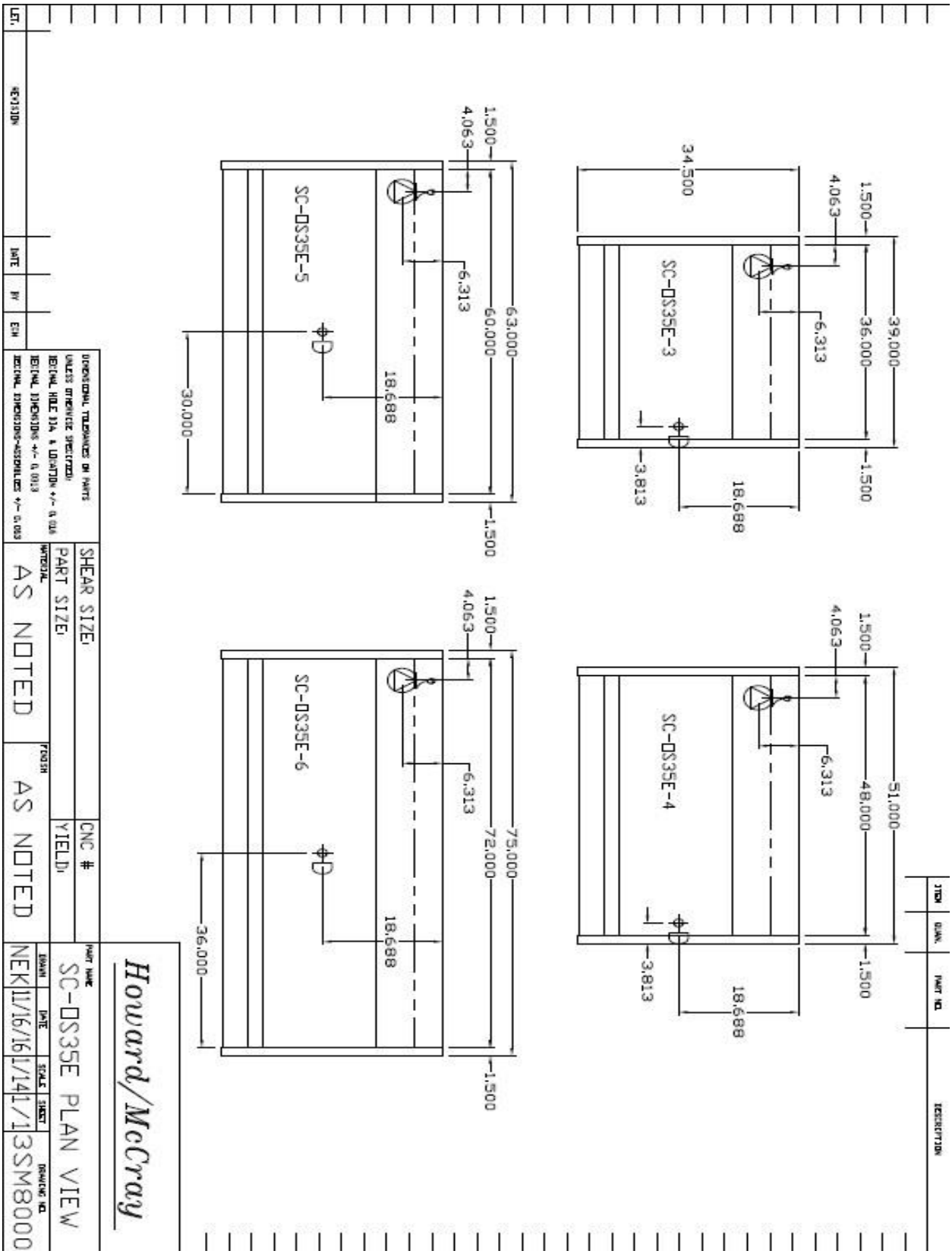
Fax (215) 969-4890 • E-Mail: techservice@howardmccray.com



OS35E-3/4/5/6 PLAN VIEW

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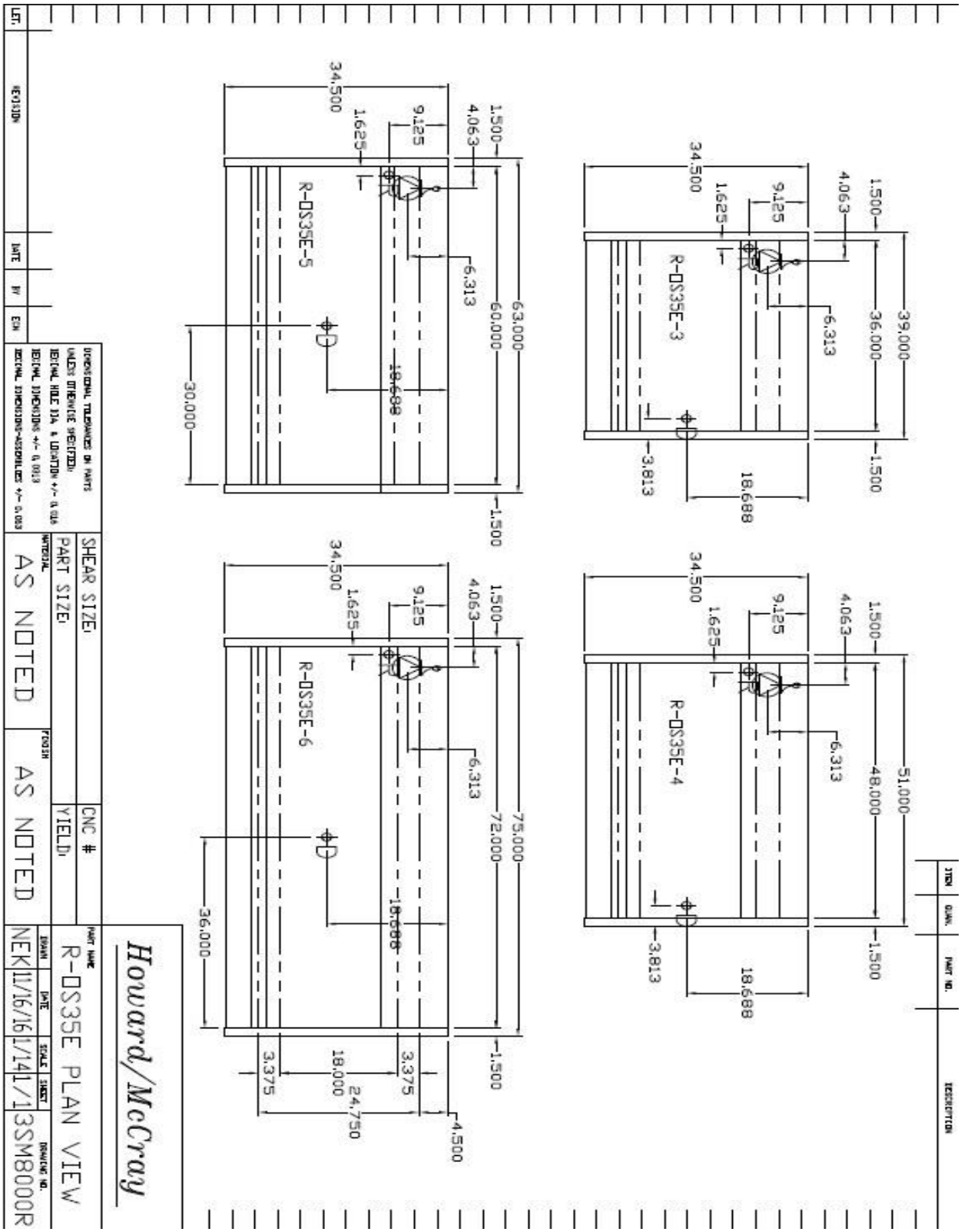

REMOTE OS35E-3/4/5/6 PLAN VIEW

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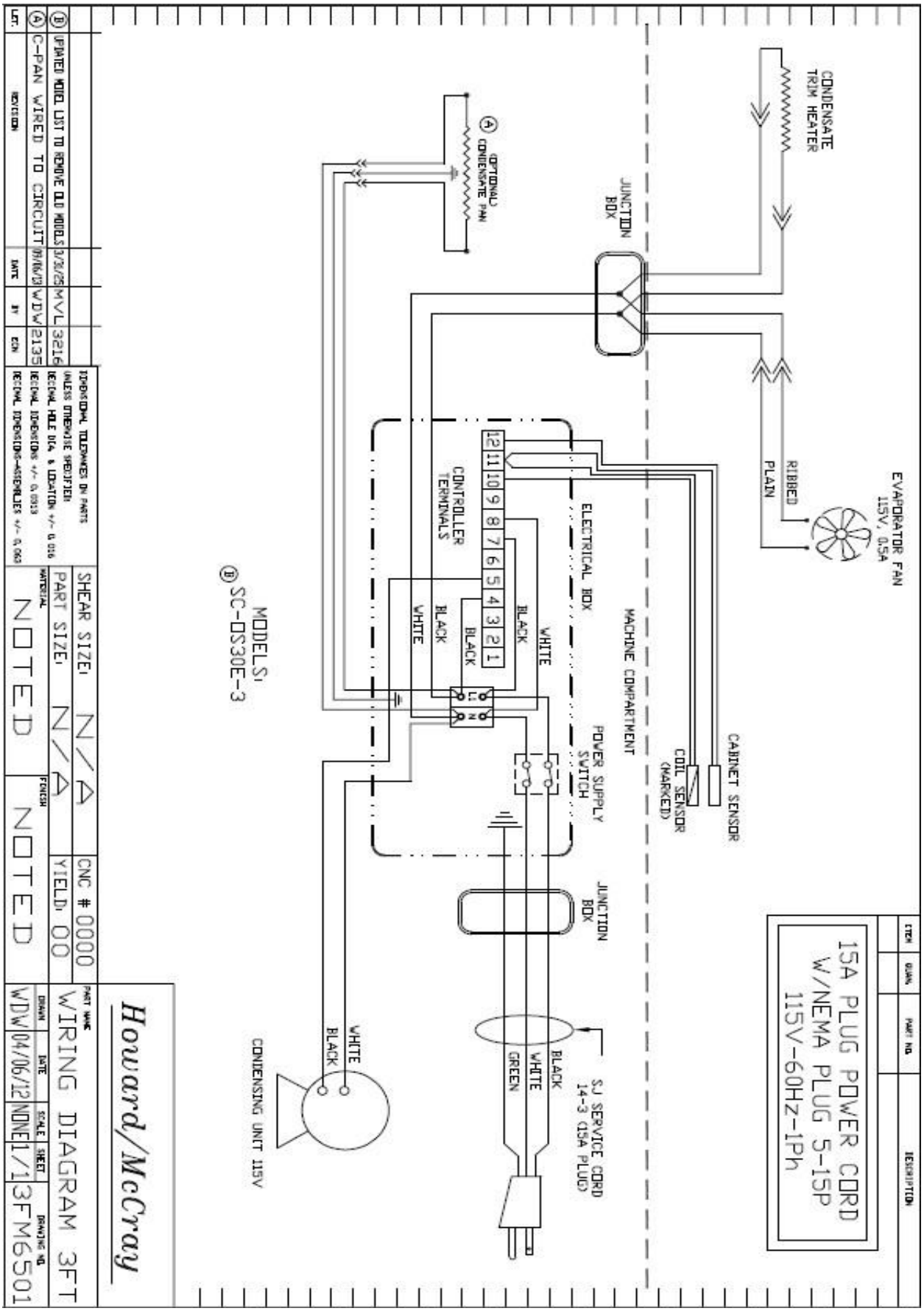

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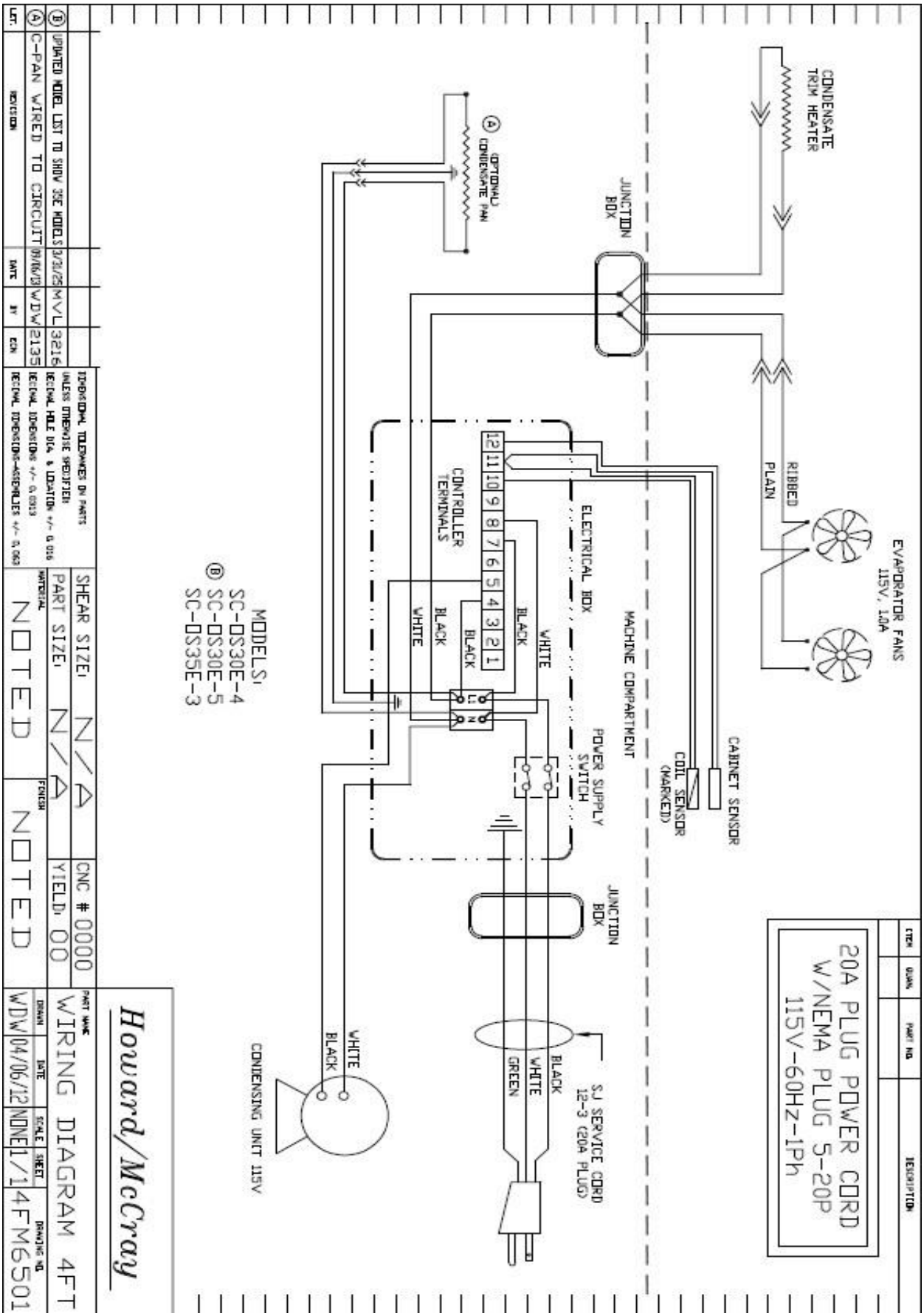
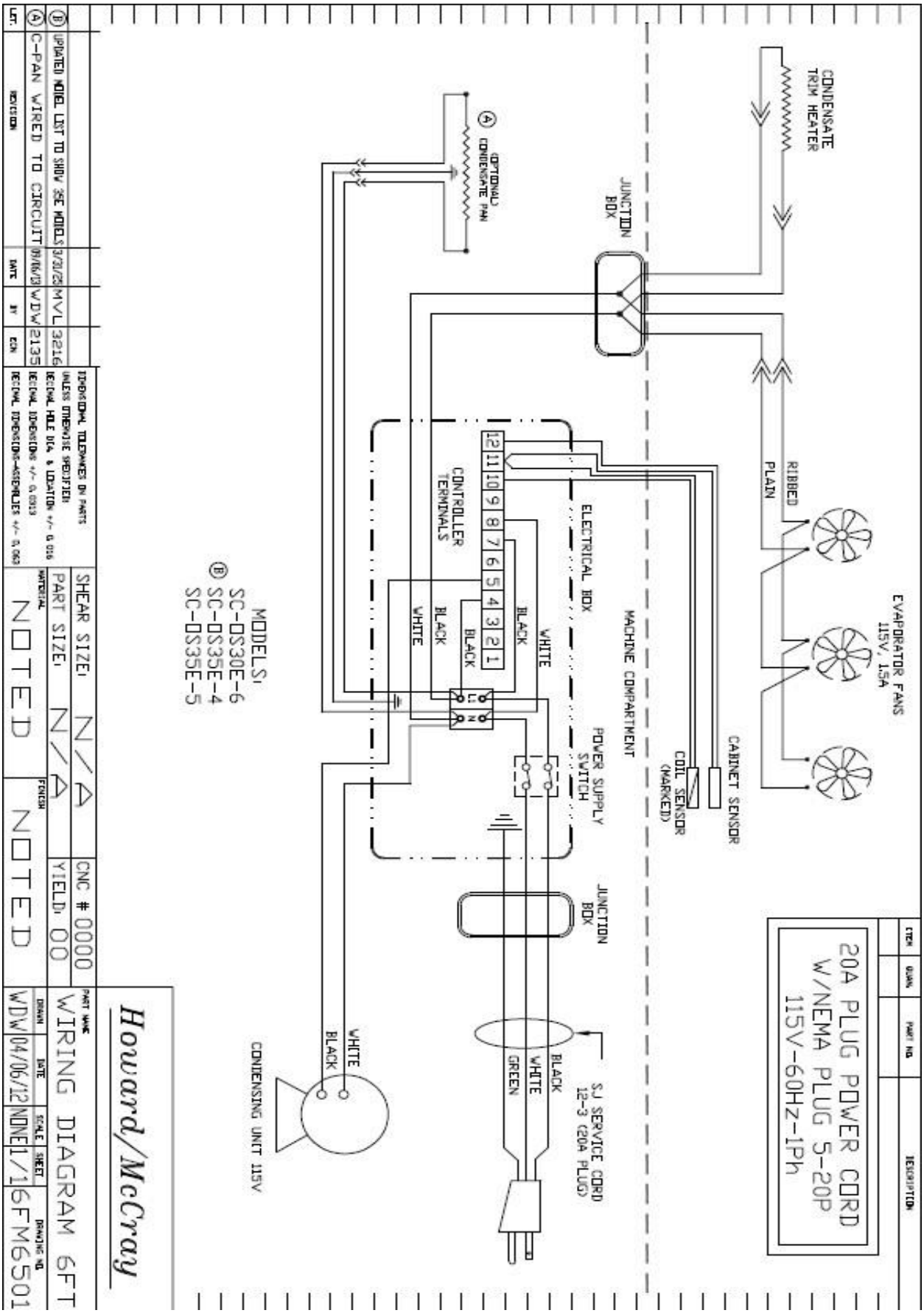

CONDENSATE TRIM HEATER
EVAPORATOR FANS 115V, 1.0A
RIBBED
PLAIN
JUNCTION BOX
(OPTIONAL) CONDENSATE PAN
CONTROLLER TERMINALS
12 11 10 9 8 7 6 5 4 3 2 1
ELECTRICAL BOX
MACHINE COMPARTMENT
CABINET SENSOR
COIL SENSOR (MARKED)
POWER SUPPLY SWITCH
JUNCTION BOX
SJ SERVICE CORD 12-3 (20A PLUG)
BLACK
WHITE
GREEN
CONDENSING UNIT 115V
20A PLUG POWER CORD W/NEMA PLUG 5-20P 115V-60Hz-1Ph
MODELS:
SC-DS30E-4
SC-DS30E-5
SC-DS35E-3
UPDATED MODEL LIST TO SHOW 35E MODELS 3/31/25 MVL 3216
C-PAN WIRED TO CIRCUIT 09/06/03 WDW 2133
SHEAR SIZE: N/A
PART SIZE: N/A
YIELD: 00
CNC # 0000
NOTED
NOTED
Howard/McCray
WIRING DIAGRAM 4FT
WDW 04/06/12 NONE 1/1 4FM6501



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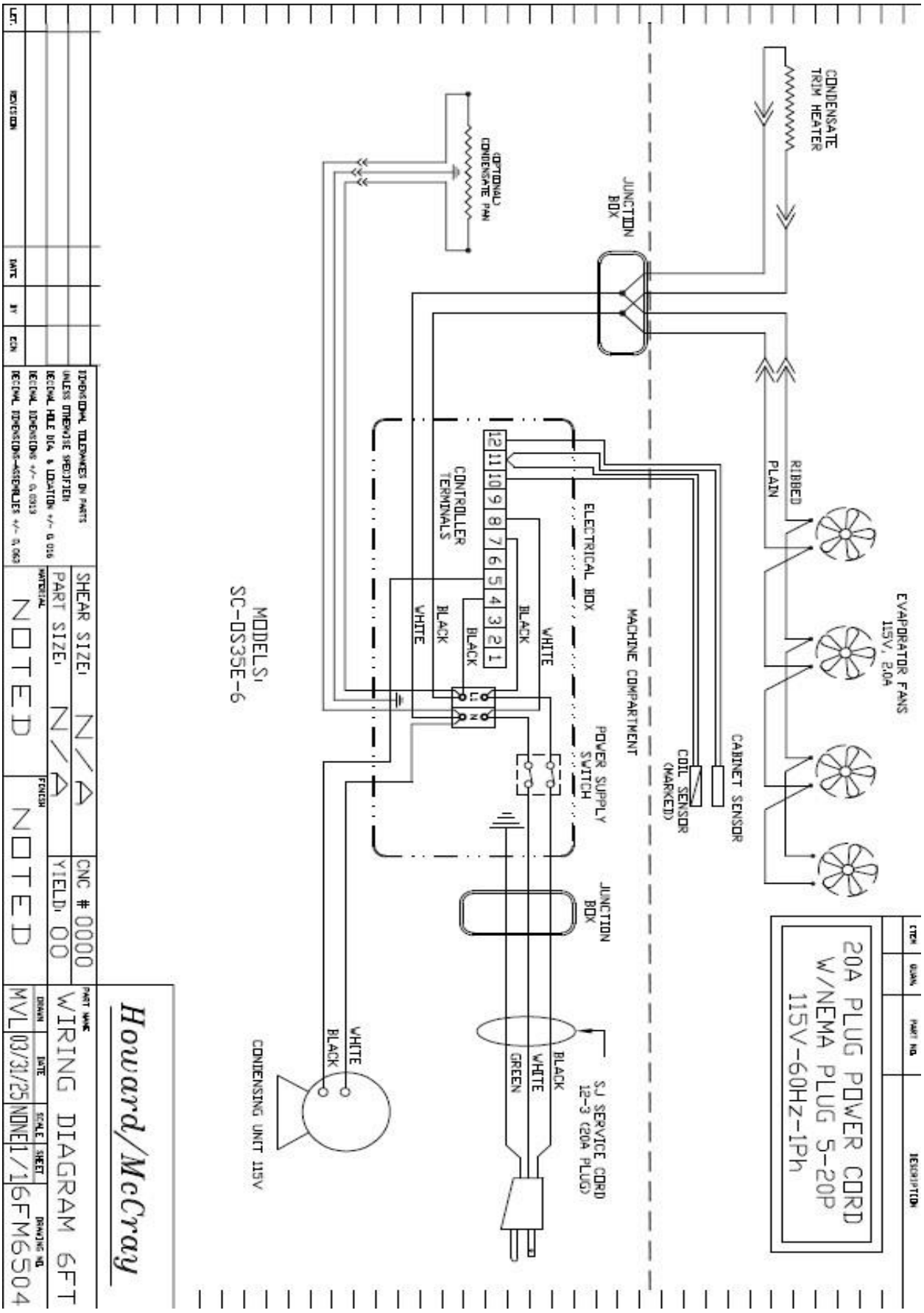
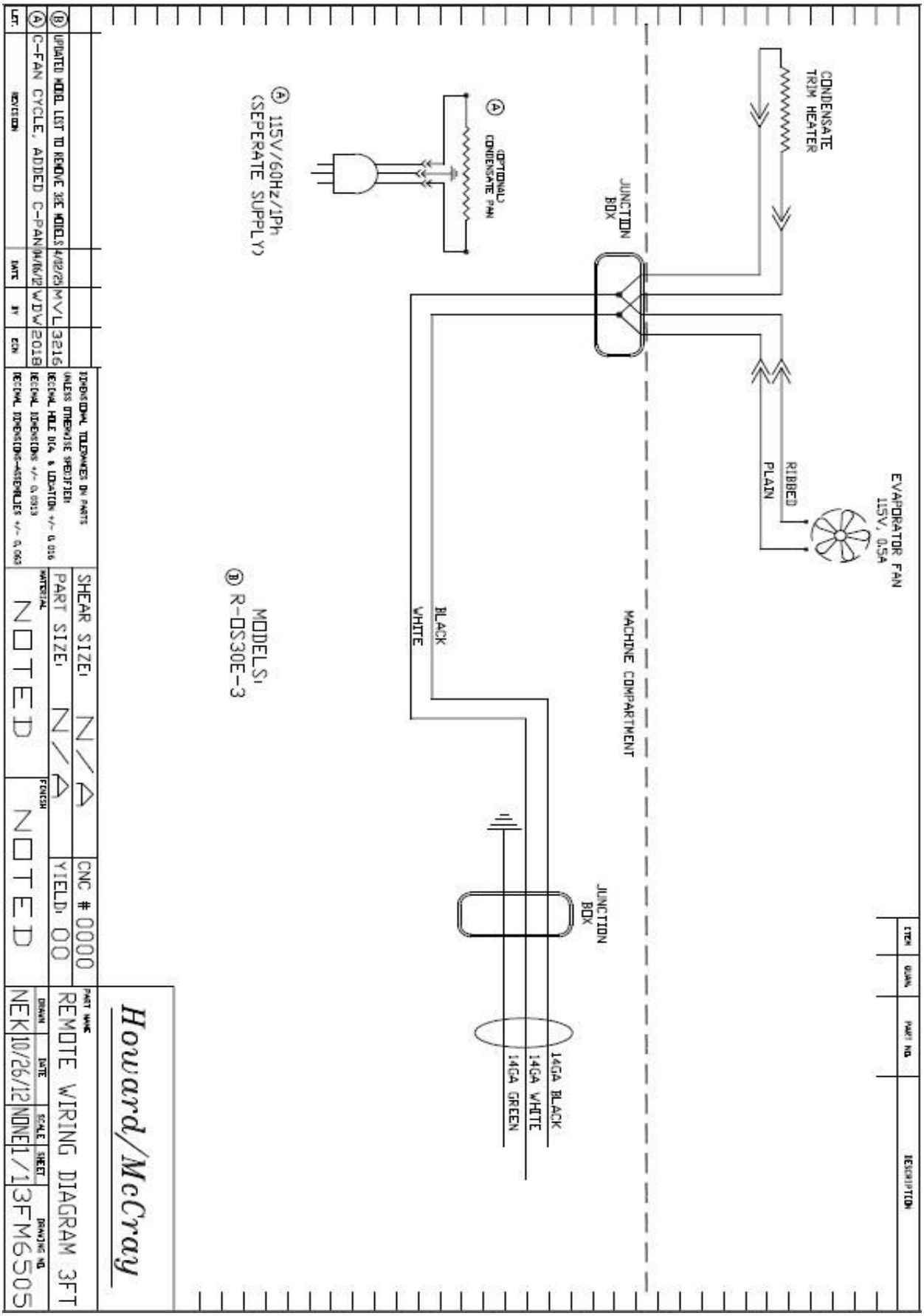

CONDENSATE TRIM HEATER
(OPTIONAL) CONDENSATE PAN
JUNCTION BOX
EVAPORATOR FANS 115V, 2.0A
RIBBED
PLAIN
CABINET SENSOR
COIL SENSOR (MARKED)
MACHINE COMPARTMENT
ELECTRICAL BOX
CONTROLLER TERMINALS
12 11 10 9 8 7 6 5 4 3 2 1
BLACK
WHITE
BLACK
WHITE
BLACK
L1
N
L2
POWER SUPPLY SWITCH
JUNCTION BOX
WHITE
BLACK
GREEN
WHITE
BLACK
SJ SERVICE CORD 12-3 (20A PLUG)
CONDENSING UNIT 115V
MODELS: SC-DS35E-6
20A PLUG POWER CORD
W/NEMA PLUG 5-20P
115V-60Hz-1Ph
ITEM
QUAN.
PART NO.
DESCRIPTION
LET.
REVISION
DATE
BY
ECN
DIMENSIONAL TOLERANCES ON PARTS
UNLESS OTHERWISE SPECIFIED:
DECIMAL HOLE DIA & LOCATION +/- 0.010
DECIMAL DIMENSIONS +/- 0.030
DECIMAL DIMENSIONS ASSEMBLIES +/- 0.060
SHEAR SIZE: N/A
CNC # 0000
PART SIZE: N/A
YIELD: 00
MATERIAL
NOTED
FINISH
NOTED
PART NAME
WIRING DIAGRAM 6FT
DRAWN
MVL
DATE
03/31/25
SCALE
NONE
SHEET
1/1
DRAWING NO.
6FM6504
Howard/McCray



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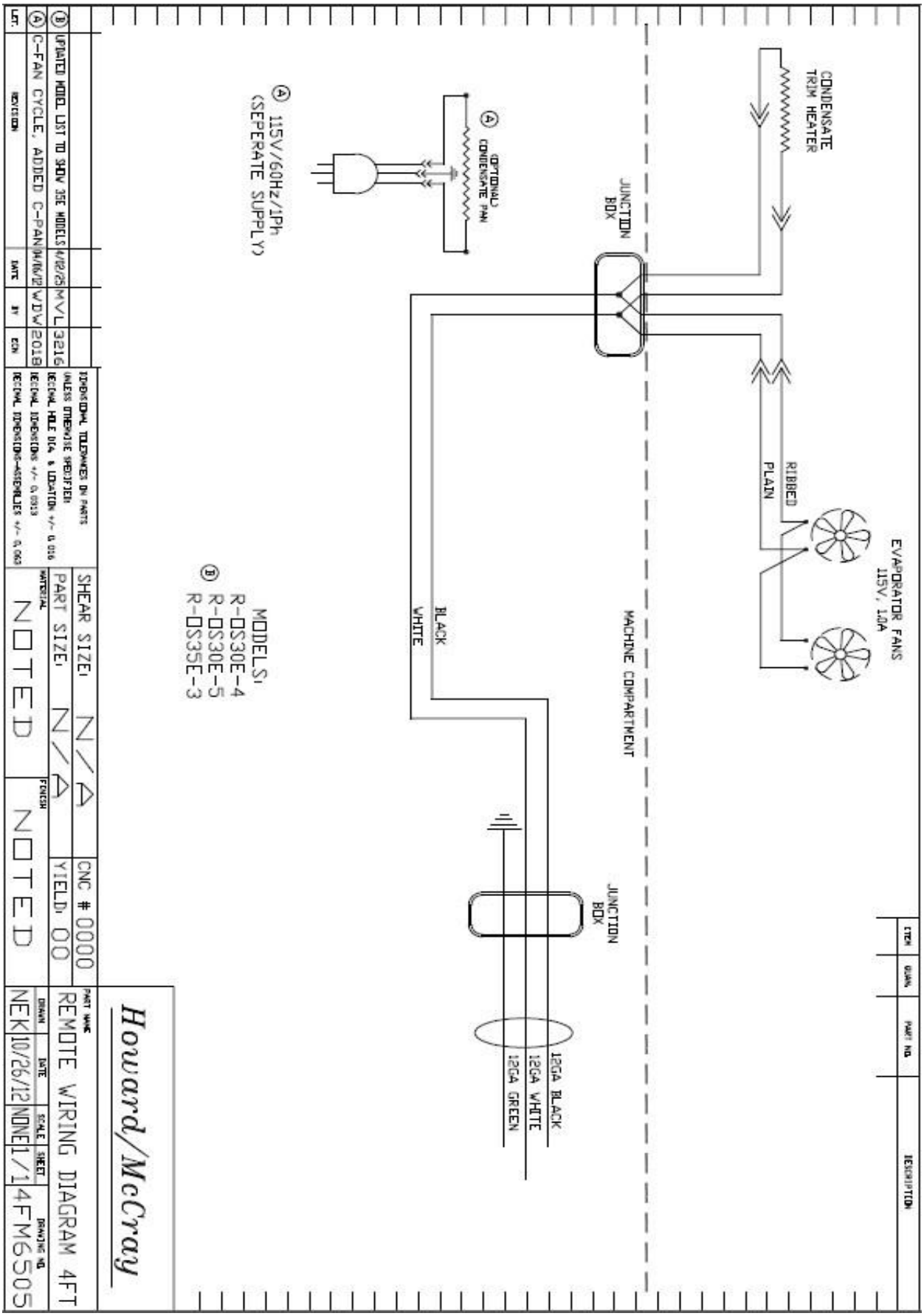

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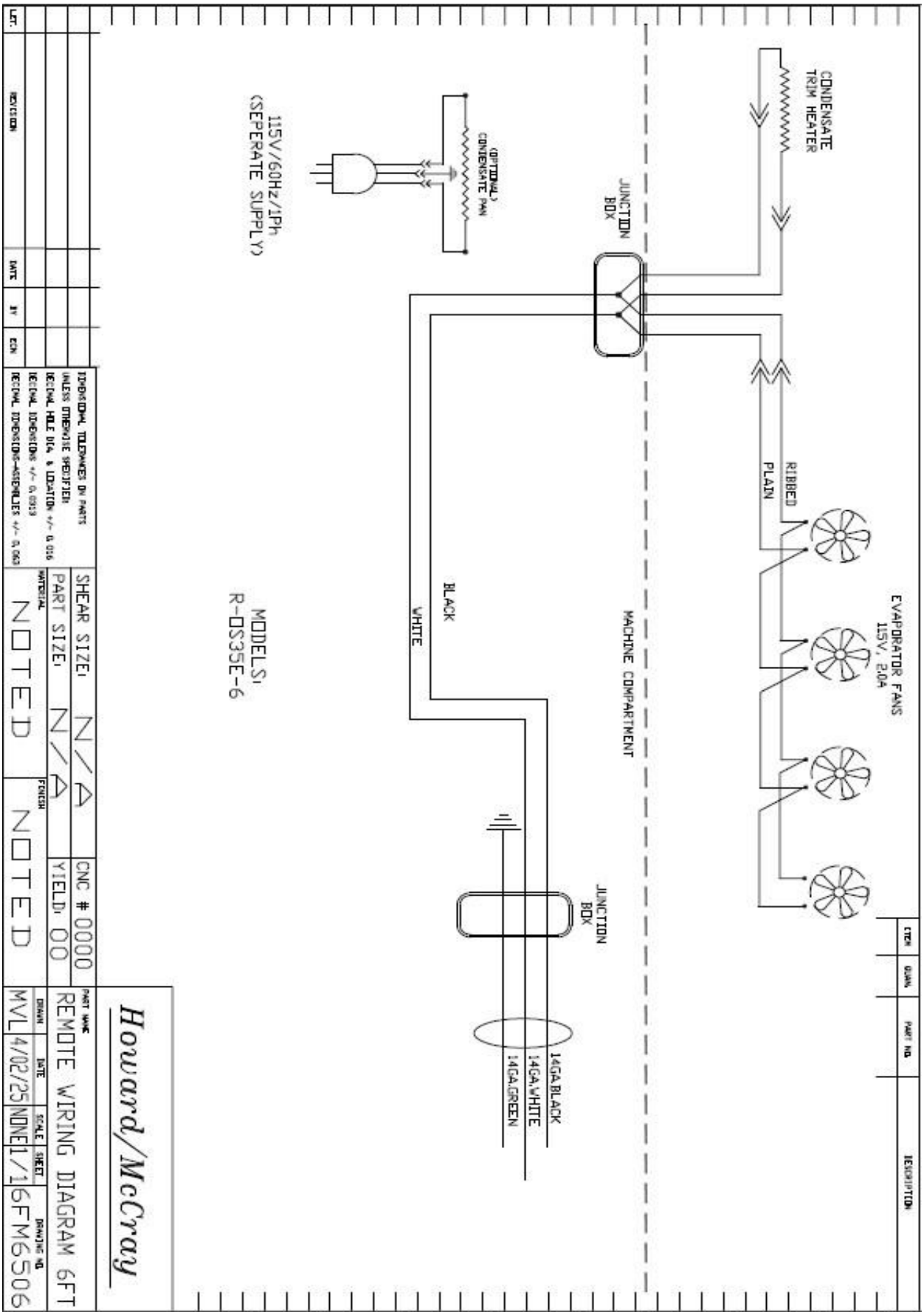
Fax (215) 969-4890 • E-Mail: techservice@howardmccray.com

CONDENSATE TRIM HEATER
JUNCTION BOX
(OPTIONAL) CONDENSATE PAN
115V/60Hz/1Ph (SEPERATE SUPPLY)
RIBBED
PLAIN
EVAPORATOR FANS 115V, 1.5A
MACHINE COMPARTMENT
BLACK
WHITE
JUNCTION BOX
14GA.BLACK
14GA.WHITE
14GA.GREEN
MODELS:
R-DS30E-6
Ⓐ R-DS35E-4
R-DS35E-5
ITEM
QUAN.
PART NO.
DESCRIPTION
UNLESS OTHERWISE SPECIFIED:
DECIMAL HOLE DIA. & LOCATION +/- 0.016
DECIMAL DIMENSIONS +/- 0.010
DECIMAL DIMENSIONS-ASSEMBLIES +/- 0.063
SHEAR SIZE: N/A
PART SIZE: N/A
CNC # 0000
YIELD: 00
MATERIAL
FINISH
NOTED
NOTED
Howard/McCray
PART NAME
REMOTE WIRING DIAGRAM 6FT
DRAWN
DATE
SCALE
SHEET
DRAWING NO.
NEK
10/26/12
NONE
1/1
6FM6505
Ⓐ UPDATED MODEL LIST TO SHOW 3SE MODELS
4/22/25
MVL
3216
LET.
REVISION
DATE
BY
ECN


CONDENSATE TRIM HEATER
JUNCTION BOX
(OPTIONAL) CONDENSATE PAN
115V/60Hz/1Ph (SEPERATE SUPPLY)
MODELS: R-DS35E-6
EVAPORATOR FANS 115V, 2.0A
RIBBED
PLAIN
MACHINE COMPARTMENT
BLACK
WHITE
JUNCTION BOX
14GA.BLACK
14GA.WHITE
14GA.GREEN
ITEM
QUAN.
PART NO.
DESCRIPTION
REVISION
DATE
BY
ECN
LET.
UNLESS OTHERWISE SPECIFIED:
DECIMAL HOLE DIA. & LOCATION +/- 0.010
DECIMAL DIMENSIONS +/- 0.030
DECIMAL DIMENSIONS-ASSEMBLIES +/- 0.063
SHEAR SIZE: N/A
PART SIZE: N/A
CNC # 0000
YIELD: 00
MATERIAL
NOTED
FINISH
NOTED
Howard/McCray
PART NAME
REMOTE WIRING DIAGRAM 6FT
DRAWN
DATE
SCALE
SHEET
DRAWING NO.
MVL
4/02/25
NONE
1/1
16FM6506