MASTER-BILT®
Refrigeration Solutions

MRS / MRSW SERIES
CONDENSING UNIT
INSTALLATION & OPERATIONS MANUAL

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INTRODUCTION

Thank you for purchasing Master-Bilt® refrigeration equipment. This manual contains important instructions for installation, use and service. Read this entire manual carefully before installing or servicing your Master-Bilt® equipment.

NOTICE

Installation and service of the refrigeration and electrical components must be preformed by a refrigeration mechanic or licensed electrician.

DANGER

Equipment MUST be properly grounded.
Improper or faulty hook-up of electrical components of the refrigeration units can result in severe injury or death. All electrical wiring hook-ups must be done in accordance with all applicable local, regional or national standards.

NOTICE

Read this manual before installing your refrigeration equipment. Keep the manual and refer to it before doing any service. Failure to do so could result in personal injury or equipment damage.

The portions of this manual covering refrigeration and electrical components contain technical instructions intended only for persons qualified to perform refrigeration and electrical work.
This manual cannot cover every installation, use, or service situation. If you need additional information, call or write us:

Parts and Technical Service Department
Master-Bilt Products
908 Highway 15 North
New Albany, MS 38652
Phone (800) 684-8988
Email: service@master-bilt.com

WARNING LABELS AND SAFETY INSTRUCTIONS

This is the safety-alert symbol. When you see this symbol, be alert to the potential for personal injury or damage to your equipment.

Be sure you understand all safety messages and always follow recommended precautions and safe operating practices.

NOTICE TO EMPLOYERS

You must make sure that everyone who installs, uses, or services your refrigeration equipment is thoroughly familiar with all safety information and procedures.

Important safety information is presented in this section and throughout the manual. The following signal words are used in the warnings and safety messages:

DANGER: Severe injury or death WILL occur if you ignore the message.

WARNING: Severe injury or death CAN occur if you ignore the message.

CAUTION: Minor injury or damage to your refrigeration can occur if you ignore the message.

NOTICE: This is important installation, operation or service information. If you ignore the message, you may damage your refrigeration.

The warning and safety labels shown throughout this manual are placed on your Master-Bilt®. Products refrigeration at the factory. Follow all warning label instructions. If any warning or safety labels become lost or damaged, call your customer service department at (800) 684-8988 for replacements.

This Label is located on the condensing unit

MRS SERIES CONDENSING UNIT FEATURES

- Generously sized individual copper aluminum condenser for each compressor sized for high efficiency. Sized to operate efficiently in high Ambient
- Hermetic, semi-hermetic, and Scroll compressors in any combination the customer chooses
- Reliable Ball Bearing Fan Motors
- Spring Mounted Semi-Hermetic Compressors, Hermetic and Scroll Compressors use Vibration Absorbing Grommet Mounts
- Generously sized receivers with isolation valves
- Compressor Suction Service Valves with Access Ports, and Discharge Line Service Valves with Access Ports on Semi- Hermetic Compressors only
- Pre-wired and mounted Dual Pressure Controls with each Compressor
- Units leak and electrical tested
- U.L. listed
- Easy accessibility for service
- Pre-wired for easy installation with Single Point Electrical Connection with individual Circuit Breakers for each Compressor and Through Door Main Disconnect Switch and Circuit Breaker Installed
- Suction and discharge line vibration eliminators pre-piped and mounted (semi-hermetic only)
- Crankcase Heater Installed for each Compressor
- Refrigeration line pre-piped to edge of unit
- Pre-piped and mounted refrigerant sight glass and filter drier
- Pre-installed inverted traps on all roof top MRS series Condensing units
- Flooded Head Pressure Controls on each System
- Stainless Steel Housing
- Engineered Refrigeration Drawing Available for Specified Projects, or with Purchase Order (Contact Factory for Additional Details
- Master-Controller Electronic Refrigeration Controls for Maximum Energy Efficiency are Optional for most Systems. Patented Reverse Cycle Defrost Technology that saves up to 27% on Operational Energy Cost of the System it Controls Depending on Ambient Temperatures.

MRS POD SYSTEM NOMENCLATURE

C C H X OO5 B

C =Master-Bilt ®Rack System

Compressor Type
C = Semi-Hermetic
D = Discuss
H = Hermetic
S = Scroll

Temperature Range
H = High/Medium
M = Medium
L = Low (-40 - -25)ºF

Refrigerant Type
X = R-22
Z = R404a

Voltage Code
A = 115/60/1 V
B = 208-230/60/1 V
C = 208-230/60/3
D = 460/60/1
E = 460/60/3

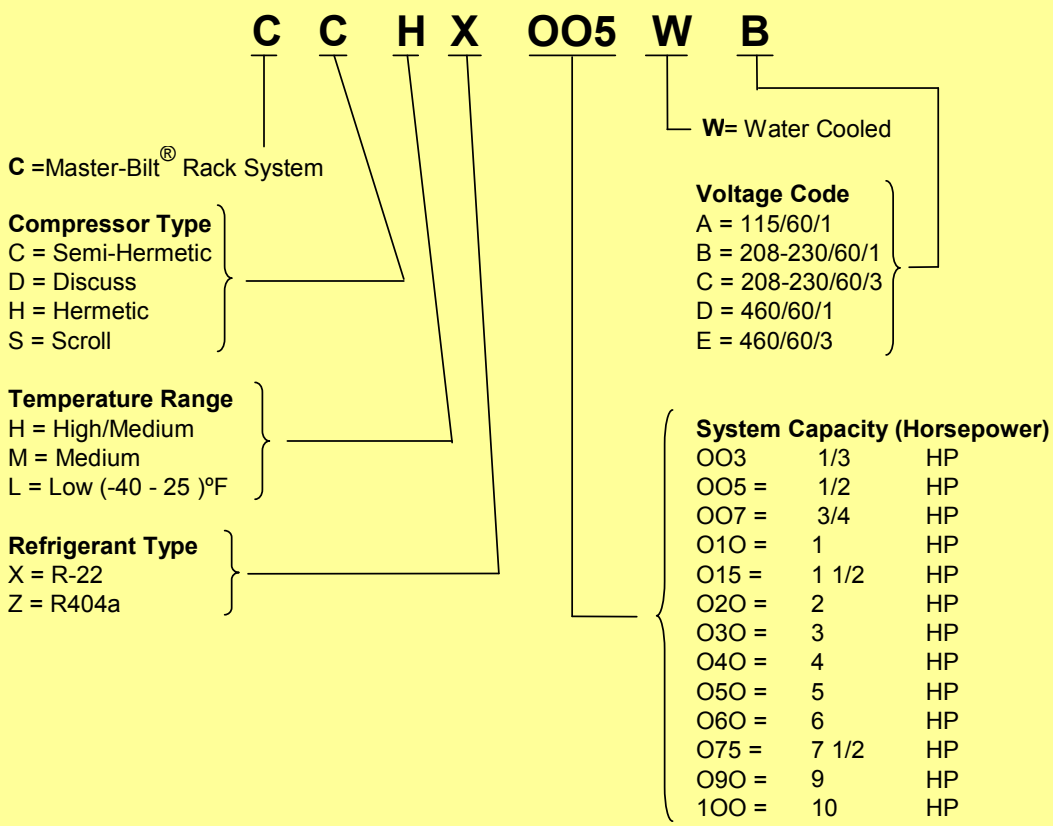
System Capacity (Horsepower)

OO3 =	1/3	HP
OO5 =	1/2	HP
OO7 =	3/4	HP
O1O =	1	HP
O15 =	1 1/2	HP
O2O =	2	HP
O3O =	3	HP
O4O =	4	HP
O5O =	5	HP
O6O =	6	HP
O75 =	7 1/2	HP
O9O =	9	HP
1OO =	10	HP

Options:

CAAA005A =	6" COIL	(REMOTE CIRCUIT)
CAAA010A =	12" COIL	(REMOTE CIRCUIT)
CAAA025A =	24" COIL	(REMOTE CIRCUIT)
CAAA035A =	36" COIL	(REMOTE CIRCUIT)
CAAA060A =	48" COIL	(REMOTE CIRCUIT)

MRSW POD SYSTEM NOMENCLATURE



PRE-INSTALLATION INSTRUCTIONS

I. GENERAL INFORMATION

Please read this manual prior to installing your Master-Bilt® equipment. This information is based on good refrigeration practice and should be used as a guide for installation and operation.

II. DELIVERY INSPECTION

You are responsible for filling all freight claims with the delivering truck line. Inspect all cartons and crates for damage as soon as they arrive. If damage is noted to shipping crates or cartons or a shortage is found, note this on the bill of lading (all copies) prior to signing.

If damage is discovered when the cabinet is uncrated, immediately call the delivering truck line and follow up the call with a written report indicating concealed damaged to your shipment. Ask for an immediate inspection of your concealed item. Crating material MUST be retained to show the inspector representing the truck line.

INSTALLATION INSTRUCTIONS

I. HANDLING AND PLACEMENT OF MULTIPLE RACK SYSTEM

To minimize damage to the unit housing, it is recommended that the crate not be removed until the rack system is moved to its final location.

There should be a minimum of 3 feet around the perimeter of the Rack System that should be unobstructed. This allows for proper air flow through the condenser. Likewise, this will also make servicing the equipment much easier.

Holes are provided in the base supports for mounting bolts and for bridle lift rods.

For indoor mounting, motor rooms should be provided with fans designed to move 100 CFM of air per one ton of refrigeration capacity.

II. HANDLING AND PLACEMENT OF WALK-IN EVAP(S)

To minimize damage to the evaporator coil, it is recommended that the carton (or crate) not be removed until the evaporator coil is moved close to its final location. When the container is removed from the evaporator coil, extreme care must be used when lifting and mounting to the ceiling, to prevent sheet metal damage

Evaporator coils will be mounted the appropriate distance from the cooler wall to allow proper air return to evaporator coils. Minimum distance shall be greater than or equal to the vertical height of the evaporator coil or as specified in applicable Installation and Operation Manuals.

III. ELECTRICALSPECIFICATIONS

Electrical power supply must match the condensing unit power requirements indicated on the unit data plate. **A WIRING DIAGRAM IS LOCATED ON THE INSIDE ON THE ELECTRICAL BOX COVER.** For best results, it is suggested that power supply for MRS Rack systems be applied as illustrated below in Figure 1. All field wiring should be done in a professional manner, in accordance with all governing codes. All wiring (including factory terminals) should be double checked before start-up

The refrigeration installer will be responsible for the inter-connect wiring between Medium temperature timers and solenoids and Low temperature evaporators and timers. **MASTER-BILT WILL GLADLY SHIP ANY TIMER LOOSE WITH PROPER ENCLOSURE SO THAT THEY MAY BE PLACED IN A MORE SUITABLE LOCATION IF REQUESTED AND APPROVED BY FEC OR CONSULTANT.**

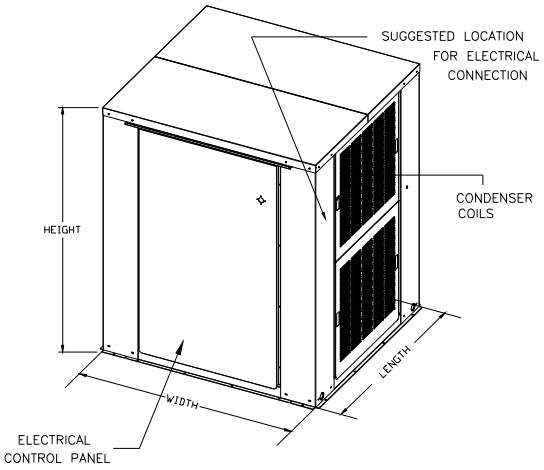


Figure 1: Suggested Field Wiring Location for MRS Units.

Evaporator drain line heaters will be installed on any application with a room temperature less than 34ºF. A 6 ft. drain line heater (208-230V) will be provided with each low temperature coil.

NOTICE!

Systems with scroll compressors must be checked for proper power phasing. Improper power phasing will result in improper compressor rotation causing compressor to pump incorrectly. An optional phase monitor may be purchased for this purpose.

Three phase scroll compressors are directional dependent, i.e., they will only compress in one rotational direction and will rotate in either direction depending on power phasing. Verification of proper rotational direction is made by observing that suction pressure drops and discharge pressure rises when the compressor is energized. Reverse rotation also results in an elevated sound level over correct rotation, as well as substantially reduced current draw compared to data tag values.

NOTICE!

Check phase alignment on all incoming power.

IV. REFRIGERANT PIPING

Use only refrigeration grade copper tubing, (ACR), type “L”, bright annealed, dehydrated, and properly sealed against contamination. Soft temper tubing may not be used for field interconnection of refrigeration components (condensing unit to evaporator assembly). Take extreme care to keep refrigeration tubing clean and dry prior to installation. Use an appropriate size tube cutter. Remove any burring that may occur when cutting the tubing. Use dry nitrogen to purge the system of any foreign objects that may have come about during any pipe cutting.

All suction lines will be insulated with not less than ¾” Armaflex or acceptable substitute as determined by Master-Bilt personnel. Armaflex insulation must be properly glued or taped as approved by insulation manufacturer to prevent refrigeration lines from “sweating”.

Appropriate oil must be added to systems with refrigeration line exceeding 50 ft horizontal or 10 ft vertical as per Compressor manufacturer specifications.

Suction lines should be sloped down ½” for each 10 feet of horizontal run towards the compressor. This will facilitate good oil return to the compressor.

Refrigeration lines will be sized appropriately to facilitate proper oil return to the compressor and reduce refrigerant line pressure drop. Table 1 and Table 2 depict proper line sizing options. Use this as a guideline for your selection. Any fittings used may be accounted for in the Table to the right.

Fitting Size	90º Ell	45º Ell	Tee (Line)	Tee (Branch)
1/2"	0.9	0.4	0.8	2
5/8"	1	0.5	1	2.5
7/8"	1.5	0.7	1.5	3.5
1-1/8"	1.8	0.9	1.5	4.5
1-3/8"	2.4	1.2	1.8	6
1-5/8"	2.8	1.4	2	7
2-1/8"	3.9	1.8	3.8	10

Equivalent Length Allowances for Pipe Fittings (length in feet)

R-22 Suction and Liquid line sizes

System Capacity BTU/Hr.	20F suction temperature						10F suction temperature						-15F suction temperature						-25F suction temperature						All
	50' suction line		100' suction line		200' suction line		50' suction line		100' suction line		200' suction line		50' suction line		100' suction line		200' suction line		50' suction line		100' suction line		200' suction line		liquid line
	horiz.	vert.	horiz.	vert.	horiz.	vert.	horiz.	vert.	horiz.	vert.	horiz.	vert.	horiz.	vert.	horiz.	vert.	horiz.	vert.	horiz.	vert.	horiz.	vert.	horiz.	vert.	
1500	5/16	5/16	5/16	5/16	3/8	5/16	3/8	5/16	3/8	5/16	3/8	5/16	3/8	3/8	1/2	3/8	1/2	3/8	1/2	3/8	1/2	3/8	5/8	3/8	1/4
2000	3/8	5/16	3/8	5/16	1/2	5/16	3/8	3/8	1/2	3/8	1/2	3/8	1/2	3/8	1/2	3/8	5/8	3/8	1/2	3/8	5/8	3/8	5/8	3/8	1/4
3000	3/8	3/8	3/8	3/8	1/2	3/8	1/2	3/8	1/2	3/8	5/8	3/8	1/2	1/2	5/8	1/2	5/8	1/2	5/8	1/2	5/8	1/2	3/4	1/2	1/4
4000	1/2	3/8	1/2	3/8	5/8	3/8	1/2	3/8	1/2	3/8	5/8	3/8	5/8	1/2	5/8	1/2	3/4	1/2	5/8	5/8	3/4	5/8	3/4	5/8	1/4
5000	1/2	3/8	1/2	3/8	5/8	3/8	1/2	3/8	5/8	3/8	5/8	3/8	5/8	5/8	3/4	5/8	3/4	5/8	3/4	5/8	3/4	5/8	7/8	5/8	1/4
6000	1/2	3/8	5/8	3/8	5/8	3/8	5/8	1/2	5/8	1/2	3/4	1/2	5/8	5/8	3/4	5/8	7/8	5/8	3/4	3/4	7/8	3/4	7/8	3/4	5/16
7000	1/2	1/2	5/8	1/2	5/8	1/2	5/8	1/2	5/8	1/2	3/4	1/2	3/4	5/8	3/4	5/8	7/8	5/8	3/4	3/4	7/8	3/4	1 1/8	3/4	5/16
8000	5/8	1/2	5/8	1/2	5/8	1/2	5/8	1/2	3/4	1/2	3/4	1/2	3/4	3/4	7/8	3/4	7/8	3/4	3/4	3/4	7/8	7/8	1 1/8	7/8	5/16
9000	5/8	1/2	5/8	1/2	5/8	1/2	3/4	5/8	3/4	5/8	7/8	5/8	3/4	3/4	7/8	3/4	1 1/8	3/4	7/8	7/8	1 1/8	7/8	1 1/8	7/8	5/16
10000	5/8	5/8	3/4	5/8	3/4	5/8	3/4	5/8	3/4	5/8	7/8	5/8	3/4	3/4	7/8	7/8	1 1/8	7/8	7/8	7/8	1 1/8	7/8	1 1/8	7/8	5/16
12000	5/8	5/8	3/4	5/8	3/4	5/8	3/4	3/4	3/4	3/4	7/8	3/4	7/8	7/8	1 1/8	7/8	1 1/8	7/8	7/8	7/8	1 1/8	7/8	1 1/8	7/8	3/8
14000	3/4	5/8	3/4	5/8	7/8	5/8	7/8	3/4	7/8	3/4	1 1/8	3/4	7/8	7/8	1 1/8	7/8	1 1/8	7/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	3/8
16000	3/4	3/4	7/8	3/4	7/8	3/4	7/8	3/4	7/8	3/4	1 1/8	3/4	7/8	7/8	1 1/8	7/8	1 1/8	7/8	1 1/8	1 1/8	1 1/8	1 1/8	1 3/8	1 1/8	3/8
18000	3/4	3/4	7/8	3/4	1 1/8	3/4	7/8	7/8	7/8	7/8	1 1/8	7/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 3/8	1 3/8	1/2
20000	3/4	3/4	7/8	7/8	1 1/8	7/8	7/8	7/8	7/8	7/8	1 1/8	7/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 3/8	1 3/8	1/2
25000	7/8	7/8	1 1/8	7/8	1 1/8	7/8	7/8	7/8	1 1/8	7/8	1 1/8	7/8	1 1/8	1 1/8	1 3/8	1 1/8	1 3/8	1 1/8	1 1/8	1 1/8	1 3/8	1 3/8	1 5/8	1 3/8	1/2
30000	7/8	7/8	1 1/8	7/8	1 1/8	7/8	1 1/8	1 1/8	1 1/8	1 1/8	1 3/8	1 1/8	1 1/8	1 1/8	1 3/8	1 3/8	1 5/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 5/8	1 5/8	1/2
35000	7/8	7/8	1 1/8	7/8	1 3/8	7/8	1 1/8	1 1/8	1 1/8	1 1/8	1 3/8	1 1/8	1 3/8	1 3/8	1 3/8	1 3/8	1 5/8	1 3/8	1 3/8	1 3/8	1 5/8	1 5/8	2 1/8	1 5/8	5/8
40000	1 1/8	1 1/8	1 1/8	1 1/8	1 3/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 3/8	1 1/8	1 3/8	1 3/8	1 3/8	1 3/8	1 5/8	1 5/8	1 3/8	1 3/8	1 5/8	1 5/8	2 1/8	1 5/8	5/8
45000	1 1/8	1 1/8	1 1/8	1 1/8	1 3/8	1 1/8	1 1/8	1 1/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 5/8	1 5/8	1 5/8	1 5/8	1 3/8	1 3/8	1 5/8	1 5/8	2 1/8	1 5/8	5/8
50000	1 1/8	1 1/8	1 3/8	1 1/8	1 3/8	1 1/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 5/8	1 5/8	2 1/8	1 5/8	1 5/8	1 5/8	1 5/8	1 5/8	2 1/8	2 1/8	5/8
60000	1 1/8	1 1/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 5/8	1 3/8	1 3/8	1 3/8	1 5/8	1 5/8	2 1/8	1 5/8	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	3/4
70000	1 1/8	1 1/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 5/8	1 5/8	1 5/8	1 5/8	1 5/8	1 5/8	1 5/8	2 1/8	2 1/8	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	3/4
80000	1 3/8	1 3/8	1 3/8	1 3/8	1 5/8	1 5/8	1 3/8	1 3/8	1 5/8	1 5/8	2 1/8	1 5/8	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8	3/4
90000	1 3/8	1 3/8	1 5/8	1 5/8	1 5/8	1 5/8	1 3/8	1 3/8	1 5/8	1 5/8	2 1/8	1 5/8	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8	3/4
100000	1 3/8	1 3/8	1 5/8	1 5/8	2 1/8	1 5/8	1 3/8	1 3/8	1 5/8	1 5/8	2 1/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8	3/4
110000	1 3/8	1 3/8	1 5/8	1 5/8	2 1/8	1 5/8	1 5/8	1 5/8	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8	2 1/8	2 1/8	2 5/8	2 5/8	2 5/8	2 5/8	7/8
120000	1 3/8	1 3/8	1 5/8	1 5/8	2 1/8	1 5/8	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8	2 1/8	2 1/8	2 5/8	2 5/8	2 5/8	2 5/8	7/8
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150000	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	3 1/8	3 1/8	7/8
160000	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	1 5/8	1 5/8	2 1/8	2 1/8	2 5/8	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	3 1/8	3 1/8	7/8

Table 1

R-404a Suction and Liquid line sizes

System Capacity	20F suction temperature						10F suction temperature						-15F suction temperature						-25F suction temperature						-35F suction temperature						All
	50' suction line		100' suction line		200' suction line		50' suction line		100' suction line		200' suction line		50' suction line		100' suction line		200' suction line		50' suction line		100' suction line		200' suction line		50' suction line		100' suction line		200' suction line		
BTU/Hr.	horiz.	vert.	horiz.	vert.	horiz.	vert.	horiz.	vert.	horiz.	vert.	horiz.	vert.	horiz.	vert.	horiz.	vert.	horiz.	vert.	horiz.	vert.	horiz.	vert.	horiz.	vert.	horiz.	vert.	horiz.	vert.	horiz.	vert.	liquid line
1500	3/8	5/16	3/8	5/16	1/2	5/16	3/8	5/16	1/2	5/16	1/2	5/16	1/2	3/8	1/2	3/8	5/8	3/8	1/2	3/8	5/8	3/8	5/8	3/8	1/2	1/2	5/8	1/2	3/4	1/2	1/4
2000	3/8	5/16	1/2	5/16	1/2	5/16	3/8	3/8	1/2	3/8	1/2	3/8	1/2	3/8	5/8	3/8	5/8	3/8	1/2	1/2	5/8	1/2	3/4	1/2	5/8	1/2	5/8	1/2	3/4	1/2	1/4
3000	1/2	3/8	1/2	3/8	5/8	3/8	1/2	3/8	1/2	3/8	5/8	3/8	5/8	1/2	5/8	1/2	3/4	1/2	5/8	1/2	3/4	1/2	3/4	1/2	5/8	5/8	3/4	5/8	7/8	5/8	5/16
4000	1/2	3/8	1/2	3/8	5/8	3/8	1/2	3/8	5/8	3/8	5/8	3/8	5/8	1/2	3/4	1/2	3/4	1/2	5/8	5/8	3/4	5/8	7/8	5/8	3/4	3/4	7/8	3/4	7/8	3/4	5/16
5000	1/2	3/8	5/8	3/8	5/8	3/8	5/8	1/2	5/8	1/2	3/4	1/2	5/8	5/8	3/4	5/8	7/8	5/8	3/4	3/4	7/8	3/4	7/8	3/4	3/4	7/8	7/8	7/8	1 1/8	7/8	3/8
6000	5/8	1/2	5/8	1/2	5/8	1/2	5/8	1/2	5/8	1/2	3/4	1/2	3/4	5/8	3/4	5/8	7/8	5/8	3/4	3/4	7/8	3/4	1 1/8	3/4	7/8	7/8	1 1/8	7/8	1 1/8	7/8	3/8
7000	5/8	1/2	5/8	1/2	3/4	1/2	5/8	1/2	3/4	1/2	3/4	1/2	3/4	3/4	7/8	3/4	1 1/8	3/4	7/8	7/8	7/8	7/8	1 1/8	7/8	7/8	7/8	1 1/8	7/8	1 1/8	7/8	3/8
8000	5/8	1/2	3/4	1/2	3/4	1/2	5/8	5/8	3/4	5/8	7/8	5/8	3/4	3/4	7/8	3/4	1 1/8	3/4	7/8	7/8	1 1/8	7/8	1 1/8	7/8	7/8	7/8	1 1/8	7/8	1 1/8	7/8	3/8
9000	5/8	1/2	3/4	1/2	3/4	1/2	5/8	5/8	3/4	5/8	7/8	5/8	7/8	7/8	7/8	7/8	1 1/8	7/8	7/8	7/8	1 1/8	7/8	1 1/8	7/8	1 1/8	1 1/8	1 1/8	1 1/8	1 3/8	1 1/8	3/8
10000	5/8	5/8	3/4	5/8	7/8	5/8	3/4	5/8	3/4	5/8	7/8	5/8	7/8	7/8	1 1/8	7/8	1 1/8	7/8	7/8	7/8	1 1/8	7/8	1 1/8	7/8	1 1/8	1 1/8	1 1/8	1 1/8	1 3/8	1 1/8	3/8
12000	3/4	5/8	3/4	5/8	7/8	5/8	3/4	3/4	7/8	3/4	1 1/8	3/4	7/8	7/8	1 1/8	7/8	1 1/8	7/8	1 1/8	1 1/8	1 1/8	1 1/8	1 3/8	1 1/8	1 1/8	1 1/8	1 3/8	1 1/8	1 3/8	1 1/8	1/2
14000	3/4	3/4	7/8	3/4	7/8	3/4	3/4	3/4	7/8	3/4	1 1/8	3/4	1 1/8	7/8	1 1/8	7/8	1 3/8	7/8	1 1/8	1 1/8	1 1/8	1 1/8	1 3/8	1 1/8	1 1/8	1 1/8	1 3/8	1 3/8	1 3/8	1 3/8	1/2
16000	3/4	3/4	7/8	3/4	1 1/8	3/4	7/8	7/8	7/8	7/8	1 1/8	7/8	1 1/8	1 1/8	1 1/8	1 1/8	1 3/8	1 1/8	1 1/8	1 1/8	1 3/8	1 1/8	1 3/8	1 1/8	1 1/8	1 1/8	1 3/8	1 3/8	1 5/8	1 3/8	1/2
18000	3/4	3/4	7/8	3/4	1 1/8	3/4	7/8	7/8	1 1/8	7/8	1 1/8	7/8	1 1/8	1 1/8	1 1/8	1 1/8	1 3/8	1 1/8	1 1/8	1 1/8	1 3/8	1 3/8	1 5/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 5/8	1 3/8	1/2
20000	7/8	7/8	7/8	7/8	1 1/8	7/8	7/8	7/8	1 1/8	7/8	1 1/8	7/8	1 1/8	1 1/8	1 3/8	1 1/8	1 3/8	1 1/8	1 1/8	1 1/8	1 3/8	1 3/8	1 5/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 5/8	1 5/8	1/2
25000	7/8	7/8	1 1/8	7/8	1 1/8	7/8	1 1/8	7/8	1 1/8	7/8	1 3/8	7/8	1 1/8	1 1/8	1 3/8	1 3/8	1 5/8	1 3/8	1 1/8	1 1/8	1 3/8	1 5/8	1 5/8	1 5/8	1 3/8	1 3/8	1 5/8	1 5/8	2 1/8	1 5/8	5/8
30000	7/8	7/8	1 1/8	7/8	1 3/8	7/8	1 1/8	1 1/8	1 1/8	1 1/8	1 3/8	1 1/8	1 3/8	1 3/8	1 3/8	1 3/8	1 5/8	1 3/8	1 3/8	1 3/8	1 5/8	1 5/8	2 1/8	1 5/8	1 3/8	1 3/8	1 5/8	1 5/8	2 1/8	1 5/8	5/8
35000	1 1/8	1 1/8	1 1/8	1 1/8	1 3/8	1 1/8	1 1/8	1 1/8	1 3/8	1 1/8	1 3/8	1 1/8	1 3/8	1 3/8	1 5/8	1 5/8	1 5/8	1 5/8	1 3/8	1 3/8	1 5/8	1 5/8	2 1/8	1 5/8	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	5/8
40000	1 1/8	1 1/8	1 1/8	1 1/8	1 3/8	1 1/8	1 1/8	1 1/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 5/8	1 5/8	2 1/8	1 5/8	1 5/8	1 5/8	1 5/8	1 5/8	2 1/8	1 5/8	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	3/4
45000	1 1/8	1 1/8	1 3/8	1 1/8	1 3/8	1 1/8	1 3/8	1 3/8	1 3/8	1 3/8	1 5/8	1 3/8	1 3/8	1 3/8	1 5/8	1 5/8	2 1/8	1 5/8	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	3/4
50000	1 1/8	1 1/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 5/8	1 3/8	1 5/8	1 5/8	1 5/8	1 5/8	2 1/8	1 5/8	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8	3/4
60000	1 1/8	1 1/8	1 3/8	1 3/8	1 5/8	1 3/8	1 3/8	1 3/8	1 5/8	1 5/8	1 5/8	1 5/8	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8	7/8
70000	1 3/8	1 3/8	1 3/8	1 5/8	1 5/8	1 5/8	1 3/8	1 3/8	1 5/8	1 5/8	2 1/8	1 5/8	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8	2 1/8	2 1/8	2 5/8	2 5/8	2 5/8	2 5/8	7/8
80000	1 3/8	1 3/8	1 5/8	1 5/8	1 5/8	1 5/8	1 3/8	1 3/8	1 5/8	1 5/8	2 1/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8	2 1/8	2 1/8	2 5/8	2 5/8	2 5/8	2 5/8	7/8
90000	1 3/8	1 3/8	1 5/8	1 5/8	2 1/8	1 5/8	1 5/8	1 5/8	1 5/8	1 5/8	2 1/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8	2 1/8	2 1/8	2 5/8	2 5/8	2 5/8	2 5/8	2 1/8	2 1/8	2 5/8	2 5/8	3 1/8	3 1/8	7/8
100000	1 3/8	1 3/8	1 5/8	1 5/8	2 1/8	1 5/8	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8	2 1/8	2 1/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	3 1/8	3 1/8	7/8
110000	1 5/8	1 5/8	1 5/8	1 5/8	2 1/8	1 5/8	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8	2 1/8	2 1/8	2 5/8	2 5/8	3 1/8	3 1/8	2 5/8	2 5/8	2 5/8	2 5/8	3 1/8	3 1/8	7/8
120000	1 5/8	1 5/8	2 1/8	1 5/8	2 1/8	1 5/8	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	3 1/8	3 1/8	2 5/8	2 5/8	2 5/8	2 5/8	3 1/8	3 1/8	1 1/8
130000	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	3 1/8	3 1/8	2 5/8	2 5/8	3 1/8	3 1/8	3 5/8	3 5/8	1 1/8
140000	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8	3 1/8	3 1/8	2 5/8	2 5/8	2 5/8	2 5/8	3 1/8	3 1/8	2 5/8	2 5/8	3 1/8	3 1/8	3 5/8	3 5/8	1 1/8
150000	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8	2 1/8	2 1/8	2 5/8	2 5/8	3 1/8	3 1/8	2 5/8	2 5/8	3 1/8	3 1/8	3 1/8	3 1/8	2 5/8	2 5/8	3 1/8	3 1/8	3 5/8	3 5/8	1 1/8
160000	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	3 1/8	3 1/8	2 5/8	2 5/8	3 1/8	3 1/8	3 1/8	3 1/8	2 5/8	2 5/8	3 1/8	3 1/8	3 5/8	3 5/8	1 1/8

Table 2

All vertical risers will have an appropriate “P” trap at the beginning of the riser and every 20 ft above this point. If the total rise is less distance than can be evenly divided by 20, the P-traps will be located at the beginning and in the center of the distance so that the total distance between any two traps does not exceed 20 ft.

Keep the refrigeration lines as short as possible and use as few fittings as practicable, being especially careful not to “kink” the lines. Keep the layout as simple as possible and properly support the piping to absorb vibration and the normal expansion and contraction caused by temperature changes.

Liquid line filter driers, TXV, and solenoids will be installed on all systems that are single compressor per single evaporator coil and Master-Bilt has provided the evaporator coil.

The TXV sensing Bulb must be properly mounted on the horizontal portion of the refrigerant suction line and properly insulated. For systems with a suction line 7/8” OD or larger, surface temperature may vary slightly around the circumference of the tube. Because of this, Sporlan recommends that sensing bulbs be mounted at the 4 or 8 o’clock position. For smaller lines, the bulb may be mounted at any point **(other than the bottom)** on the horizontal suction line.

Add appropriate amount of oil per compressor manufacturer recommendations to compensate for longer refrigeration line runs.

When brazing, dry nitrogen **MUST** be passed through the lines at low pressure to prevent scaling and oxidation inside the tubing and fittings. All flux will be removed from the joints when brazing is complete.

MINIMIZE the amount of flux used to prevent internal contamination of the refrigeration system.
Silver brazing wire is to be utilized (high temperature alloy of minimum of 5% silver content on all copper connections, and high temperature alloy of 45% silver content on all dissimilar metal connections.

The refrigeration contractor will be responsible for providing and installing the liquid line solenoid valve and coil for all systems where multiple evaporator coils are used or for “multiplexed” systems.

V. LEAK CHECK

When all refrigeration line connections have been made, the complete system, including factory connections, should be checked.

Add the proper refrigerant to 60 psig, and then boost the 175 psig with dry nitrogen. Leak checks should be done on all joints with an electronic leak detector or halide torch. If leaks are found, relieve the pressure and make repairs as necessary and recheck.

VI. EVACUATION, DEHYDRATION, AND START-UP

A vacuum of 500 microns or less must be pulled to properly dehydrate the refrigeration system. This requires a two-stage vacuum pump with an electronic vacuum indicator.

Do not use the system compressor as a vacuum pump.

Do not operate compressor while system is in a vacuum.

Evacuation Procedure

A. Open all condensing unit service valves and relieve system pressure. Also, open any line valves installed in the system and energize all solenoid valves to facilitate evacuation.
B. Connect the vacuum pump to the high and low sides of the system using ¼" or larger copper lines or ¼" ID hoses with high vacuum design.
C. Leaks or moisture will be indicated if the system pressure rises when the vacuum line is closed off.
Pull a vacuum of 1500 microns, close vacuum line and "break" vacuum to 5 psig, maximum, with refrigerant to be used in the system.
E. Repeat step D.
F. A final vacuum of 250 microns should be pulled before charging. When 250 microns is reached, close vacuum line and charge system with the proper refrigerant through the high side. See **Table 4** (pp.17-19) for proper pre-charge for respective pod. More refrigerant will be required depending upon the lengths of refrigeration lines required. Refer to **Table 5** for additional charge requirements for a given length of refrigeration line. Gradually add refrigerant until recommended superheat values are obtained. **(See Table 3 below)**

NOTE: Never add liquid refrigerant to the suction side of the compressor.

Table 3

Applicable Temperature	Recommended Superheat
Medium	6ºF - 12ºF
Low	5ºF - 10ºF

Finishing Charging Procedures

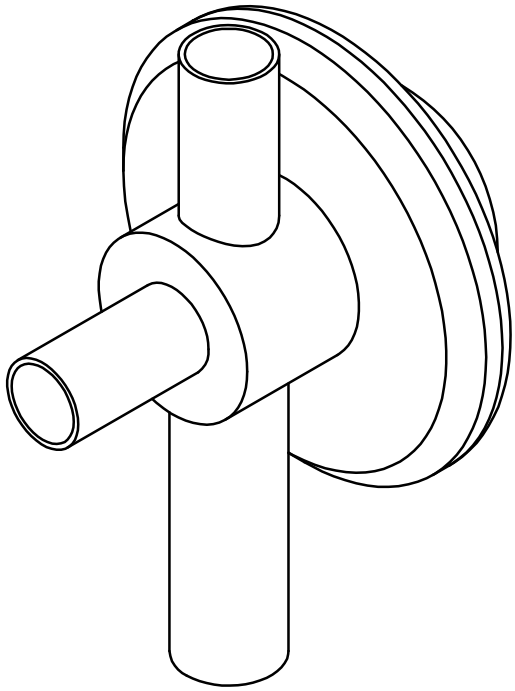
A. Preliminary

1. Be sure all service valves are "open".
2. Loosen the compressor hold-down bolts and remove shipping clips to allow compressor to float freely on the springs. (Semi-hermetic only)
3. Check evaporator fan motors, after start-up. Medium temperature, air defrost fans run continuously, low temperature fans and coolers provided with electric defrost will be delayed by the fan control.
4. Check phase alignment of incoming power on all refrigeration systems as noted in the Electrical Specifications section of this manual.
5. Start by "flipping on" the circuit breaker or circuit breakers in the unit electrical box.
6. Preset all room thermostats to the proper temperature.
7. Check operating pressures while charging and on initial pull down, to prevent damage if a problem occurs. If system "floods" back to the compressor, adjust thermostatic expansion valve as required for proper operation. There should be at least +30º F superheat entering the compressor. Master-Bilt recommendations for superheat values seen at the evaporator are given in Table 3.
8. For scroll compressors, verify power phasing and rotational direction as noted in the Electrical Specifications section of this manual.
9. Observe compressor amperage draw and compare to compressor nameplate to prevent damage due to high amperage. The oil sight glass, when equipped, should be between ½ and ¾ full during normal operation.

B. Low Ambient Charging Procedure

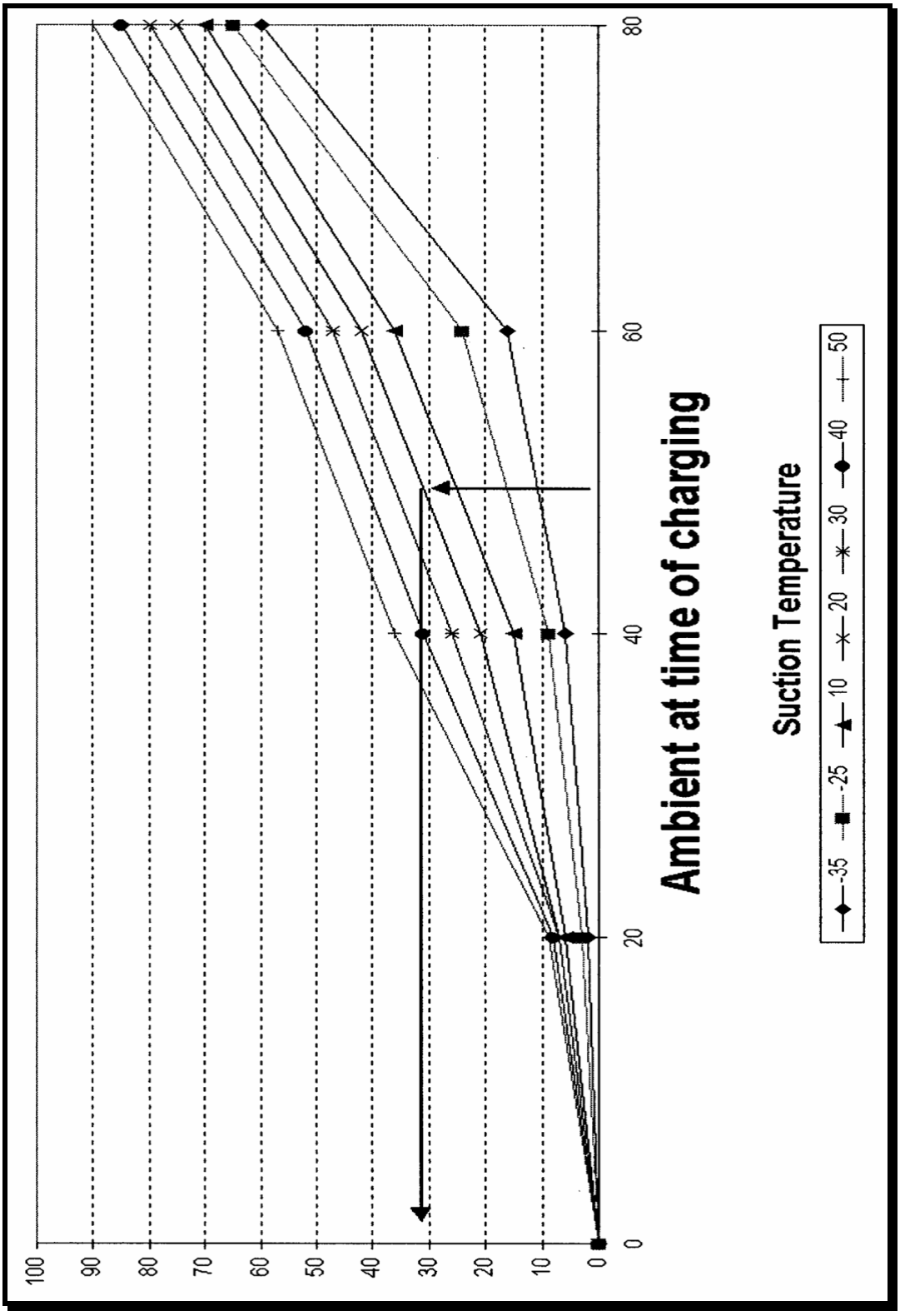
All **standard** air cooled condensers on the MRS Rack System are equipped with a head pressure control valve to maintain proper head pressure during winter conditions. These valves function by reducing the effective condenser area by flooding or “backing up” refrigerant in the condenser to reduce the amount of surface available for condensing. To operate properly, more charge is required during this flooding condition. This valve is not necessary when applying systems with the **Master Controller** and winter charges are negligible. Please contact our Customer Service Department for more about Master-Controller Technology.

To use the chart, multiply the pounds of recommended pre-charge obtained by adding the recommended pre-charge (Table 4) with the additional refrigerant required for line set length (Table 5) by the percent flooding required in Chart A to arrive at the additional charge required.



Typical Head Pressure Control Valve

Chart A:


Ambient at time of charging
Suction Temperature
-35
-25
10
20
30
40
50
0
10
20
30
40
50
60
70
80
90
100
0
20
40
60
80

Example of Low Ambient Charging

Determine the additional charge to operate a CHHX035C at suction temp +20ºF and the unit is charged at +50ºF. Assume a 100 ft. line set (horizontal).

1. Capacity for CHHX035C @ +20ºF = 24,800 BTUH
2. Choose the proper refrigeration lines base on capacity from Table 1, suction line = 1 1/8", liquid line = ½".
3. Look up the recommended pre-charge from Table 4 for CHHX035C (8.5 lbs of R-22).
4. From Table 5, find the additional refrigerant (R-22 in this case) required for a ½" liquid line of length 100 ft. (7.6 lb of R-22)
5. Add these two values to get 16.1 lbs of R-22.
6. Look at Chart A to obtain multiplier. The horizontal axis of Chart A yields the ambient charging temperature (50º). The vertical axis of Chart A yields the multiplier. Notice there are several graphs in this chart. Select the graph corresponding to your desired suction temperature. In this case, 20ºF. One can now see that the condenser should be flooded at 32% to operate correctly.
7. Multiply 16.1 lbs of R-22 by 32% to get 5.15 lbs of additional charge.
8. Again, finish charging until desire superheat settings are obtained.

TABLE 4: MRS POD CONDENSING UNIT SPECIFICATIONS

208-230/60/1 Volt Applications

R-22 Refrigerant

Master-Bilt Model	Compressor Model	********** BTU/HR Capacity ********** At Room Temp. With a 10° TD, 90° Ambient							HP	Receiver Tank 90%/90°F	Connections		Compressor		Recommended Pre-Charge (lb) R-22
		-20	-10	0	20	30	35	40			Liquid	Suction	RLA	LRA	
CCHX005B	HAG2-0050-CAV				2760	3600	4110	4620	0.50	5.74	3/8	5/8	4.0	22.0	3.19
CHHX003B	AKA9428EXD				2747	3908	4489	4779	0.33	5.74	1/4	3/8	3.7	23.0	3.19
CHHX005B	ART69C1-IAV				3470	4460	5075	5690	0.50	5.74	3/8	5/8	6.4	34.0	3.19
CCHX007B	KAN2-0075-CAV				4270	5580	6360	7140	0.75	5.74	3/8	5/8	6.1	36.0	3.19
CHHX007B	RS47C2-IAV				4200	5680	6530	7380	0.75	5.74	3/8	5/8	7.1	35.5	3.19

R-404a Refrigerant

Master-Bilt Model	Compressor Model	********** BTU/HR Capacity ********** At Room Temp. With a 10° TD, 90° Ambient							HP	Receiver Tank 90%/90°F	Connections		Compressor		Recommended Pre-Charge (lb) R-404a
		-20	-10	0	20	30	35	40			Liquid	Suction	RLA	LRA	
CCLZ005B	KANB-005E-CAV	1070	1690	2460					0.50	4.95	3/8	5/8	3.6	24.0	2.75
CHLZ005B	AFT22C1E-CFV	1200	1830	2460					0.50	4.95	3/8	5/8	3.5	34.0	2.75
CHLZ007B	AFT29C1E-CFV	1640	2540	3440					0.75	4.95	3/8	5/8	4.4	38.7	2.75
CCLZ007B	KAMB-007E-CAV	2180	3100	4300					0.75	4.95	3/8	7/8	5.6	36.0	2.75
CCLZ010B	KAJB-010E-CAV	2970	4200	5600					1.00	4.95	3/8	7/8	6.9	40.0	2.75
CSLZ050B	ZF15K4E-PFV	13300	17800	22300					5.00	16.9	1/2	1-1/8	31.8	169.0	9.39
CHHZ003B	AKA9427ZXD				2417	3424	3928	4179	0.33	4.95	1/4	3/8	3.8	23.0	2.75
CCHZ005B	HAJB-005E-CAV				3500	4500	5000	5500	0.50	4.95	3/8	5/8	3.7	22.0	2.75
CHHZ005B	RS43C1E-CAV				3600	4860	5490	6120	0.50	4.95	3/8	5/8	5.4	24.1	2.75
CCHZ007B	KANB-007E-CAV				4400	5800	6500	7200	0.75	4.95	3/8	7/8	5.4	36.0	2.75
CHHZ007B	RS55C1E-CAV				4200	6180	7170	8160	0.75	4.95	3/8	7/8	6.7	33.5	2.75
CHHZ010B	RS70C1E-PFV				5520	7960	9180	10400	1.00	4.95	3/8	7/8	7.0	34.2	2.75
CHHZ050B	CS33K3E-PFV				25100	36500	42200	47900	5.00	16.9	5/8	1-3/8	30.7	125.0	9.39

MRS POD CONDENSING UNIT SPECIFICATIONS (CONTINUED)

208-230/60/3 Volt Applications

R-22 Refrigerant

Master-Bilt	Compressor	********** BTU/HR Capacity ********** At Room Temp. With a 10° TD, 90° Ambient								Receiver Tank	Connections		Compressor		Recommended
Model	Model	-20	-10	0	20	30	35	40	HP	90%/90°F	Liquid	Suction	RLA	LRA	Pre-Charge (lb) R-22
CCHX010C	KAR1-0100-TAC				6080	7790	8795	9800	1.00	5.74	3/8	5/8	4.3	27.0	3.19
CHHX010C	RS70C1E-TFC				6170	8330	9565	10800	1.00	5.74	3/8	5/8	4.7	31.0	3.19
CCHX015C	KAGA-0150-TAC				7710	10100	11450	12800	1.50	11.4	3/8	7/8	5.5	35.5	6.33
CHHX015C	CRA1-0150-TFC				7300	10100	11750	13400	1.50	11.4	3/8	7/8	9.3	58.0	6.33
CCHX020C	ERA1-0200-TAC				6890	11800	14400	17000	2.00	11.4	1/2	7/8	6.6	46.0	6.33
CHHX020C	CRD1-0200-TF5				9680	13440	15730	18020	2.00	11.4	1/2	7/8	8.7	50.0	6.33
CSHX020C	ZB15KCE-TF5				9600	14800	17400	20000	2.00	11.4	5/8	7/8	9.3	55.0	6.33
CHHX022C	CRE1-0225-TF5				11090	15360	17970	20580	2.25	11.4	1/2	7/8	10.6	60.0	6.33
CSHX025C	ZB19KCE-TF5				13600	18000	20200	22400	2.50	15.3	5/8	7/8	9.7	63.0	8.50
CHHX025C	CR33KQ-TF5				14100	19400	22400	25400	2.50	11.4	1/2	7/8	10.6	69.0	6.33
CHHX030C	CR37KQ-TF5				16200	22100	25550	29000	3.00	15.3	1/2	7/8	11.1	85.0	8.50
CSHX030C	ZB21KCE-TF5				17500	23300	26200	29100	3.00	15.3	5/8	7/8	11.1	77.0	8.50
CCHX030C	ERF1-0310-TAC				18400	23900	27150	30400	3.00	15.3	1/2	7/8	12.4	82.0	8.50
CHHX035C	CR41KQ-TF5				18600	24800	28350	31900	3.50	15.3	1/2	7/8	13.1	90.0	8.50
CSHX035C	ZB26KCE-TF5				20800	27200	30400	33600	3.50	17.2	5/8	7/8	13.6	88.0	9.56
CSHX040C	ZS30K4-TF5				25500	31600	35050	38500	4.00	17.2	5/8	1-1/8	15.0	99.0	9.56
CSHX034C	ZB30KCE-TF5				24200	31800	35600	39400	4.00	17.2	5/8	1-1/8	15.0	99.0	9.56
CCHX040C	NRB2-0400-TFC				24100	32600	37450	42300	4.00	17.2	5/8	1-1/8	21.8	141.0	9.56
CSHX050C	ZB38KCE-TF5				29700	39100	43800	48500	5.00	17.2	5/8	7/8	21.4	123.0	9.56
CCHX050C	NRA2-0500-TFC				29200	38700	44200	49700	5.00	17.2	5/8	1-1/8	19.2	141.0	9.56
CHHX050C	CRN5-0500-TF5				29100	38800	44200	49600	5.00	17.2	5/8	1-1/8	21.4	130.0	9.56
CSHX060C	ZB45KCE-TF5				36000	47000	52500	58000	6.00	17.2	7/8	1 1/8	21.4	123.0	9.56

R-404a Refrigerant

Master-Bilt	Compressor	********** BTU/HR Capacity ********** At Room Temp. With a 10° TD, 90° Ambient								Receiver Tank	Connections		Compressor		Recommended
Model	Model	-20	-10	0	20	30	35	40	HP	90%/90°F	Liquid	Suction	RLA	LRA	Pre-Charge (lb) R-404a
CHLZ010C	CF04K6E-TF5	1860	3050	4610					1.00	4.95	3/8	7/8	6.4	52.0	2.75
CCLZ010C	KAJA-011E-TAC	2900	4000	5400					1.00	4.95	3/8	7/8	4.6	27.0	2.75
CHLZ015C	CF06K6E-TF5	3270	5190	7660					1.50	4.95	3/8	1-1/8	7.0	52.0	2.75
CCLZ015C	KALA-016E-TAC	4360	6100	8000					1.50	4.95	3/8	7/8	6.6	50.0	2.75
CHLZ020C	CF09K6E-TF5	5230	8060	11500					2.00	11.3	1/2	1-1/8	9.9	65.1	6.28
CCLZ020C	EAVA-021E-TAC	5290	7800	10900					2.00	11.3	1/2	7/8	7.4	50.0	6.28
CSLZ020C	ZF06K4E-TF5	5330	7090	8850					2.00	11.3	3/8	7/8	9.3	55.0	6.28
CCLZ030C	3ABA-031E-TAC	6260	9300	13000					3.00	15.1	1/2	7/8	10.0	82.0	8.39
CHLZ030C	CF12K6E-TF5	7010	10500	14500					3.00	15.1	1/2	1-1/8	11.9	85.0	8.39
CSLZ030C	ZF09K4E-TF5	7600	10100	12600					3.00	15.1	3/8	7/8	11.1	77.0	8.39
CCLZ032C	LAHA-032E-TAC	8290	12500	17600					3.50	15.1	1/2	1-1/8	12.8	112.0	8.39
CSLZ040C	ZF13K4E-TF5	10300	14200	18100					4.00	15.1	1/2	7/8	15.0	99.0	8.39
CCLZ040C	NRD1-032E-TFC	11210	15600	20700					4.00	15.1	1/2	1-1/8	16.3	82.0	8.39
CSLZ050C	ZF15K4E-TF5	13100	17700	22300					5.00	16.9	1/2	1-1/8	21.4	123.0	9.39
CSLZ060C	ZF18K4E-TF5	15800	21200	26600					6.00	16.9	1/2	1-1/8	23.9	156.0	9.39
CDLZ040C	2DL3-040E-TFC	15930	21800	28800					4.00	15.1	1/2	1-1/8	26.3	161.0	8.39
CSLZ075C	ZF24K4E-TWC	18800	25300	31800					7.50	16.9	1/2	7/8	30.9	189.0	9.39
CDLZ060C	2DB3-060E-TFC	19840	27000	35400					6.00	16.9	5/8	1-3/8	28.2	161.0	9.39
CCHZ005C	HAJA-005E-TAC				3300	4100	4700	5300	0.50	4.95	3/8	5/8	3.5	19.9	2.75
CCHZ007C	KANA-007E-TAC				4200	5500	6300	7100	0.75	4.95	3/8	5/8	3.5	19.9	2.75
CHHZ010C	RS70C1E-TFC				5520	7960	9180	10400	1.00	4.95	3/8	7/8	4.7	31.0	2.75
CCHZ010C	KARA-010E-TAC				6500	8200	9300	10400	1.00	4.95	3/8	5/8	4.3	27.0	2.75
CHHZ015C	CS10K6E-TF5				8700	11900	13500	15100	1.50	11.3	1/2	7/8	7.5	51.0	6.28
CCHZ015C	KAKA-020E-TAC				10600	13600	15000	16400	1.50	11.3	1/2	7/8	6.6	46.0	6.28
CHHZ020C	CS12K6E-TF5				9900	13900	15900	17900	2.00	11.3	1/2	1-1/8	7.5	51.0	6.28
CSHZ020C	ZB15KCE-TF5				13100	16300	18150	20000	2.00	11.3	5/8	7/8	9.3	55.0	6.28
CHHZ022C	CS14K6E-TF5				12000	16200	18300	20400	2.50	11.3	1/2	1-1/8	9.1	55.0	6.28
CCHZ020C	ERCA-021E-TAC				13600	17400	19500	21600	2.00	11.3	1/2	1-1/8	8.8	46.0	6.28
CSHZ025C	ZB19KCE-TF5				16600	20400	22600	24800	2.50	15.1	5/8	7/8	9.7	63.0	8.39
CSHZ030C	ZB21KCE-TF5				20000	24500	27150	29800	3.00	15.1	5/8	7/8	11.1	77.0	8.39
CHHZ030C	CS20K6E-TF5				14700	23100	27300	31500	3.00	15.1	5/8	1-1/8	11.4	75.0	8.39
CCHZ030C	ERFA-031E-TAC				19900	25300	28400	31500	3.00	15.1	5/8	1-1/8	12.4	82.0	8.39
CSHZ035C	ZB26KCE-TF5				23300	28600	31700	34800	3.50	16.9	5/8	7/8	13.6	88.0	9.39
CHHZ040C	CS27K6E-TF5				20600	30000	34700	39400	4.00	16.9	5/8	1-3/8	15.6	82.0	9.39
CSHZ040C	ZS30K4E-TF5				27100	33500	37050	40600	4.00	16.9	5/8	1-1/8	15.0	99.0	9.39
CCHZ040C	NRB2-040E-TFC				26500	34400	38900	43400	4.00	16.9	5/8	1-3/8	21.8	141.0	9.39
CHHZ050C	CS33K3E-TF5				24100	35700	41500	47300	5.00	16.9	5/8	1-3/8	20.7	90.0	9.39
CDHZ050C	2DC3-050E-TFC				30500	39100	44200	49300	5.00	16.9	5/8	1-3/8	22.3	120.0	9.39
CSHZ050C	ZB38KCE-TF5				33400	40900	45250	49600	5.00	16.9	5/8	1-1/8	21.4	123.0	9.39
CSHZ055C	ZB38KCE-TF5				33300	40900	45300	49700	5.00	16.9	5/8	7/8	21.4	123.0	9.39
CSHZ060C	ZB45KCE-TF5				39600	48600	53800	59000	6.00	16.9	7/8	1 1/8	21.4	123.0	9.39
CSHZ058C	ZB45KCE-TF5				40200	49000	54150	59300	6.00	16.9	5/8	1-1/8	23.9	156.0	9.39

MRS POD CONDENSING UNIT SPECIFICATIONS (CONTINUED)

460/60/3 Volt Applications

R-22 Refrigerant

Master-Bilt	Compressor	********** BTU/HR Capacity ********** At Room Temp. With a 10° TD, 90° Ambient								Receiver Tank	Connections		Compressor		Recommended
Model	Model	-20	-10	0	20	30	35	40	HP	90%/90°F	Liquid	Suction	RLA	LRA	Pre-Charge (lb) R-22
CHHX030E	CR37KQ-TFD				16200	22100	25550	29000	3.00	15.3	1/2	7/8	5.6	39.0	8.50
CSHX030E	ZB21KCE-TFD				17500	23300	26200	29100	3.00	15.3	5/8	7/8	6.1	39.0	8.50
CCHX030E	ERF1-0310-TAD				18400	23900	27150	30400	3.00	15.3	1/2	7/8	6.4	41.0	8.50
CHHX035E	CR41KQ-TFD				18600	24800	28350	31900	3.50	15.3	1/2	7/8	5.9	42.0	8.50
CSHX035E	ZB26KCE-TFD				20800	27200	30400	33600	3.50	17.2	5/8	7/8	7.1	44.0	9.56
CSHX040E	ZB30KCE-TFD				25500	31600	35050	38500	4.00	17.2	5/8	1-1/8	7.5	47.5	9.56
CSHX034E	ZB30KCE-TFD				24200	31800	35600	39400	4.00	17.2	5/8	1-1/8	7.5	47.5	9.56
CCHX040E	NRB2-0400-TFD				24100	32600	37450	42300	4.00	17.2	5/8	1-1/8	11.3	62.5	9.56
CSHX050E	ZB38KCE-TFD				29700	39100	43800	48500	5.00	17.2	5/8	7/8	9.6	63.0	9.56
CCHX050E	NRA2-0500-TFD				29200	38700	44200	49700	5.00	17.2	5/8	1-1/8	9.6	62.5	9.56
CHHX050E	CRN5-0500-TFD				29100	38800	44200	49600	5.00	17.2	5/8	1-1/8	9.6	65.0	9.56
CSHX060E	ZB45KCE-TFD				36000	47000	52500	58000	6.00	17.2	7/8	1 1/8	11.5	70.0	9.56

R-404a Refrigerant

Master-Bilt	Compressor	********** BTU/HR Capacity ********** At Room Temp. With a 10° TD, 90° Ambient								Receiver Tank	Connections		Compressor		Recommended
Model	Model	-20	-10	0	20	30	35	40	HP	90%/90°F	Liquid	Suction	RLA	LRA	Pre-Charge (lb) R-404a
CCLZ030E	3ABA-031E-TAD	6260	9300	13000					3.00	15.1	1/2	7/8	5.1	41.0	8.39
CHLZ030E	CF12K6E-TFD	7070	10700	14800					3.00	15.1	1/2	1-1/8	6.6	42.0	8.39
CSLZ030E	ZF09K4E-TFD	7600	10100	12600					3.00	15.1	3/8	7/8	5.7	39.0	8.39
CCLZ032E	LAHA-032E-TAD	8290	12500	17600					3.50	15.1	1/2	1-1/8	6.0	56.0	8.39
CSLZ040E	ZF13K4E-TFD	10300	14200	18100					4.00	15.1	1/2	7/8	8.2	49.5	8.39
CCLZ040E	NRD1-032E-TFD	11210	15600	20700					4.00	15.1	1/2	1-1/8	8.4	41.0	8.39
CSLZ050E	ZF15K4E-TFD	13100	17700	22300					5.00	16.9	1/2	1-1/8	9.6	62.0	9.39
CSLZ060E	ZF18K4E-TFD	15800	21200	26600					6.00	16.9	1/2	1-1/8	9.3	70.0	9.39
CDLZ040E	2DL3-040E-TFD	15930	21800	28800					4.00	15.1	1/2	1-1/8	10.2	60.0	8.39
CSLZ075E	ZF24K4E-TWD	18800	25300	31800					7.50	16.9	1/2	7/8	15.7	94.0	9.39
CDLZ060E	2DB3-060E-TFD	19840	27000	35400					6.00	16.9	5/8	1-3/8	13.3	80.0	9.39
CSHZ030E	ZB21KCE-TFD				20000	24500	27150	29800	3.00	15.1	5/8	7/8	6.1	39.0	8.39
CHHZ030E	CS20K6E-TFD				14700	23100	27300	31500	3.00	15.1	5/8	1-1/8	5.1	40.0	8.39
CCHZ030E	ERFA-031E-TAD				19900	25300	28400	31500	3.00	15.1	5/8	1-1/8	5.8	41.0	8.39
CSHZ035E	ZB26KCE-TFD				23300	28600	31700	34800	3.50	16.9	5/8	7/8	7.1	44.0	9.39
CHHZ040E	CS27K6E-TFD				20600	30000	34700	39400	4.00	16.9	5/8	1-3/8	7.7	52.0	9.39
CSHZ040E	ZB30KCE-TFD				27100	33500	37050	40600	4.00	16.9	5/8	1-1/8	7.5	47.5	9.39
CCHZ040E	NRB2-040E-TFD				26500	34400	38900	43400	4.00	16.9	5/8	1-3/8	9.0	62.5	9.39
CHHZ050E	CS33K3E-TFD				24100	35700	41500	47300	5.00	16.9	5/8	1-3/8	9.9	45.0	9.39
CDHZ050E	2DC3-050E-TFD				30500	39100	44200	49300	5.00	16.9	5/8	1-3/8	10.4	60.0	9.39
CSHZ050E	ZB38KCE-TFD				33400	40900	45250	49600	5.00	16.9	5/8	1-1/8	9.6	63.0	9.39
CSHZ055E	ZB38KCE-TFD				33300	40900	45300	49700	5.00	16.9	5/8	7/8	9.6	63.0	9.39
CSHZ060E	ZB45KCE-TFD				39600	48600	53800	59000	6.00	16.9	7/8	1 1/8	11.5	70.0	9.39
CSHZ058E	ZB45KCE-TFD				40200	49000	54150	59300	6.00	16.9	5/8	1-1/8	11.5	70.0	9.39
CDLZ075E	3DB3F33KE-TFD	23100	36200	46900					7.50	27.62	5/8	1 3/8	15.7	83.0	15.34

MRSW POD CONDENSING UNIT SPECIFICATIONS

208-230/60/3 Volt Applications

R-22

Master-Bilt	Compressor	********** BTU/HR Capacity ********** At Room Temp. With a 10° TD, 90° Ambient								Receiver Tank	Connections		Compressor		Recommended	Required GPM
Model	Model	-20	-10	0	20	30	35	40	HP	90%/90°F	Liquid	Suction	RLA	LRA	Pre-Charge (lb) R-22	For a 10ºF TD
CCHX005WC	HWJ1-0050-TAC				3470	4480	5030	5580	1/2	4.0	3/8	1/2	2.2	13.0	2.22	1.27
CCHX007WC	KWE1-0075-TAC				5550	7115	8040	8965	3/4	6.2	3/8	5/8	3.4	19.9	3.44	2.03
CCHX010WC	KWM1-0100-TAC				7520	9810	11100	12390	1	6.2	3/8	5/8	4.5	27.0	3.44	2.80
CCHX015WC	KWKA-0200-TAC				11300	14700	16600	18500	1 1/2	11.9	3/8	7/8	6.8	50.0	6.61	4.18
CCHX020WC	KWKA-0200-TAC				10860	13040	14130	15220	2	11.9	3/8	7/8	6.8	50.0	6.61	3.56
CCHX030WC	3RA1-0310-TAC				23500	30000	33600	37200	3	40.6	1/2	1 1/8	13.1	82.0	22.56	8.47
CCHX040WC	NRB2-0400-FTC				26000	34900	40100	45300	4	68.4	1/2	1 1/8	21.8	141.0	38.00	10.11
CCHX050WC	NRA2-0500-TFC				31290	41350	47170	52990	5	68.4	1/2	1 1/8	19.2	141.0	38.00	11.89
CCHX075WC	2DA3-750-TFC				53060	67240	76005	84770	7 1/2	128.7	5/8	1 3/8	32.0	169.0	71.50	19.15
CCHX100WC	3DB3A1000-TFC				75990	96610	108520	120430	10	144.0	7/8	1 3/8	43.6	215.0	80.00	27.35

R-404A

Master-Bilt	Compressor	********** BTU/HR Capacity ********** At Room Temp. With a 10° TD, 90° Ambient								Receiver Tank	Connections		Compressor		Recommended	Required GPM
Model	Model	-20	-10	0	20	30	35	40	HP	90%/90°F	Liquid	Suction	RLA	LRA	Pre-Charge (lb) R-404A	For a 10ºF TD
CCHZ005WC	HWJA-005E-TAC				3880	4980	5550	6120	1/2	3.5	3/8	1/2	2.2	13.0	1.94	1.40
CCHZ007WC	KWNA-007E-TAC				4940	6450	7280	8110	3/4	10.9	3/8	5/8	3.0	19.9	6.06	1.83
CCHZ010WC	KWRA-010E-TAC				7210	9090	10280	11470	1	12.3	3/8	5/8	4.3	27.0	6.83	2.59
CCHZ015WC	KWGA-010E-TAC				8640	11000	12400	13800	1 1/2	10.3	3/8	7/8	4.3	27.0	5.72	3.12
CCHZ020WC	KWKA-020E-TAC				12300	15400	17400	19400	2	10.3	3/8	7/8	6.8	50.0	5.72	4.38
CCHZ030WC	ERFA-031E-TAC				22000	27800	31200	34600	3	35.2	1/2	1 1/8	12.4	82.0	19.56	7.86
CCHZ050WC	2DC3-050E-TFC				33610	43100	48510	53920	5	59.3	1/2	1 3/8	22.3	120.0	32.94	12.22
CCHZ075WC	2DA3-075E-TFC				58900	73700	82100	90500	7 1/2	111.5	5/8	1 3/8	32.0	169.0	61.94	20.69
CCHZ100WC	3DB3-100E-TFC				82590	102750	114200	125650	10	124.8	7/8	1 3/8	43.6	215.0	69.33	28.78
CCHZ150WC	3DS3A150E-TFC				11310	140900	156800	172700	15	174.7	1 1/8	1 5/8	59.6	275.0	97.06	39.51
CCLZ005WC	KWNA-006E-TAC	1290	1990	2860					1/2	5.4	1/4	1/2	2.1	13.2	3.00	0.59
CCLZ007WC	KWMA-007E-TAC	2240	3250	4460					3/4	5.4	3/8	5/8	3.2	19.9	3.00	0.97
CCLZ010WC	KWJA-011E-TAC	3360	4660	6250					1	5.4	3/8	5/8	4.6	27.0	3.00	1.39
CCLZ015WC	KWLA-016E-TAC	4900	6750	8870					1 1/2	10.3	3/8	7/8	6.6	50.0	5.72	2.01
CCLZ020WC	EAVA-021E-TAC	6580	9170	12300					2	21.1	3/8	7/8	7.4	50.0	11.72	2.73
CCLZ028WC	NRD1-0302E-TFC	12500	17300	22900					2 1/2	35.2	1/2	1 1/8	16.3	82.0	19.56	5.16
CCLZ030WC	2DF3-030E-TFC	14440	19810	26130					3	59.3	1/2	1 1/8	16.8	102.0	32.94	5.90
CCLZ040WC	2DL3-040E-TFC	17660	24020	31640					4	59.3	1/2	1 3/8	26.3	161.0	32.94	7.16
CCLZ060WC	2DA3-060E-TFC	20680	27710	36090					6	59.3	1/2	1 3/8	28.8	161.0	32.94	8.26
CCLZ075WC	3DB3A075E-TFC	29750	39440	51090					7 1/2	111.5	5/8	1 3/8	31.5	161.0	61.94	11.75
CCLZ090WC	3DF3A090E-TFC	36130	48130	62620					9	124.8	7/8	1 3/8	39.0	215.0	69.33	14.34
CCLZ100WC	3DS3A100E-TFC	41090	54480	70250					10	124.8	7/8	1 3/8	42.0	215.0	69.33	16.24
CCLZ150WC	4DL3-150E-TSK	57400	74700	94800					15	152.9	1 1/8	1 5/8	52.6	278.0	84.94	22.26

MRSW POD CONDENSING UNIT SPECIFICATIONS (CONTINUED)

460/60/3 Volt Applications

R-22

Master-Bilt	Compressor	********** BTU/HR Capacity ********** At Room Temp. With a 10° TD, 90° Ambient								Receiver Tank	Connections		Compressor		Recommended	Required GPM
Model	Model	-20	-10	0	20	30	35	40	HP	90%/90°F	Liquid	Suction	RLA	LRA	Pre-Charge (lb) R-22	For a 10ºF TD
CCHX030WE	3RA1-0310-TAD				23500	30000	33600	37200	3	40.6	1/2	1 1/8	6.6	41.0	22.56	8.47
CCHX040WE	NRB2-0400-TFD				26300	34700	39650	44600	4	19.2	1/2	1 1/8	21.8	141.0	10.67	9.99
CCHX050WE	NRA2-0500-TFC				31290	41350	47170	52990	5	68.4	1/2	1 1/8	9.6	62.5	38.00	11.89
CCHX075WE	2DA3-750-TFC				53060	67240	76005	84770	7 1/2	128.7	5/8	1 3/8	14.1	85.0	71.50	19.15
CCHX100WE	3DB3A1000-TFC				75990	96610	108520	120430	10	144.0	7/8	1 3/8	20.0	106.0	80.00	27.35

R-404A

Master-Bilt	Compressor	********** BTU/HR Capacity ********** At Room Temp. With a 10° TD, 90° Ambient								Receiver Tank	Connections		Compressor		Recommended	Required GPM
Model	Model	-20	-10	0	20	30	35	40	HP	90%/90°F	Liquid	Suction	RLA	LRA	Pre-Charge (lb) R-404A	For a 10ºF TD
CCHZ030WE	ERFA-031E-TAC				22000	27800	31200	34600	3	35.2	1/2	1 1/8	5.8	41.0	3.08	7.86
CCHZ050WE	2DC3-050E-TFC				33610	43100	48510	53920	5	59.3	1/2	1 3/8	10.4	60.0	1.52	12.22
CCHZ075WE	2DA3-075E-TFC				58900	73700	82100	90500	7	111.5	5/8	1 3/8	14.1	85.0	1.69	20.69
CCHZ100WE	3DB3-100E-TFC				82590	102750	114200	125650	10	124.8	7/8	1 3/8	20.0	106.0	1.01	28.78
CCHZ150WE	3DS3A150E-TFC				11310	140900	156800	172700	15	174.7	1 1/8	1 5/8	29.0	138.0	1.26	39.51
CCLZ030WE	2DF3-030E-TFC	14440	19810	26130					3	59.3	1/2	1 1/8	8.1	52.0	0.31	5.90
CCLZ040WE	2DL3-040E-TFC	17660	24020	31640					4	59.3	1/2	1 3/8	10.5	60.0	9.88	7.16
CCLZ060WE	2DA3-060E-TFC	20680	27710	36090					6	59.3	1/2	1 3/8	10.2	60.0	9.88	8.26
CCLZ075WE	3DB3A075E-TFC	29750	39440	51090					7 1/2	111.5	5/8	1 3/8	16.1	83.0	18.58	11.75
CCLZ090WE	3DF3A090E-TFC	36130	48130	62620					9	124.8	7/8	1 3/8	16.9	106.0	10.90	14.34
CCLZ100WE	3DS3A100E-TFC	41090	54480	70250					10	124.8	7/8	1 3/8	18.6	106.0	5.32	16.24
CCLZ150WE	4DL3A150E-TSK	57400	74700	94800					15	152.9	1 1/8	1 5/8	26.3	139.0	3.91	22.26

TABLE 5:

Additional lb of Refrigerant for Length of Ref. Line																		
	25 Ft						50 Ft.						100 Ft.					
Line (OD)	3/8	1/2	5/8	7/8	1 1/8	1 3/8	3/8	1/2	5/8	7/8	1 1/8	1 3/8	3/8	1/2	5/8	7/8	1 1/8	1 3/8
R-22	1.0	1.9	3.0	6.1	10.4	15.9	2.0	3.8	6.0	12.2	20.8	31.8	4.0	7.6	12.0	24.4	41.6	63.6
R-404A	0.9	1.6	2.6	5.3	9.0	13.8	1.8	3.2	5.2	10.6	18.0	27.6	3.6	6.4	10.4	21.2	36.0	55.2

SALE AND DISPOSAL

If you sell or give away your refrigeration equipment system or components you must make sure that all safety labels and I&O Manuals are included. If you need replacement labels or manuals, contact the parts and technical service department at Master-Bilt at (800) 684-8988

The customer service department at Master-Bilt should be contacted at the time of sale or disposal of your equipment so records may be kept of its new location.

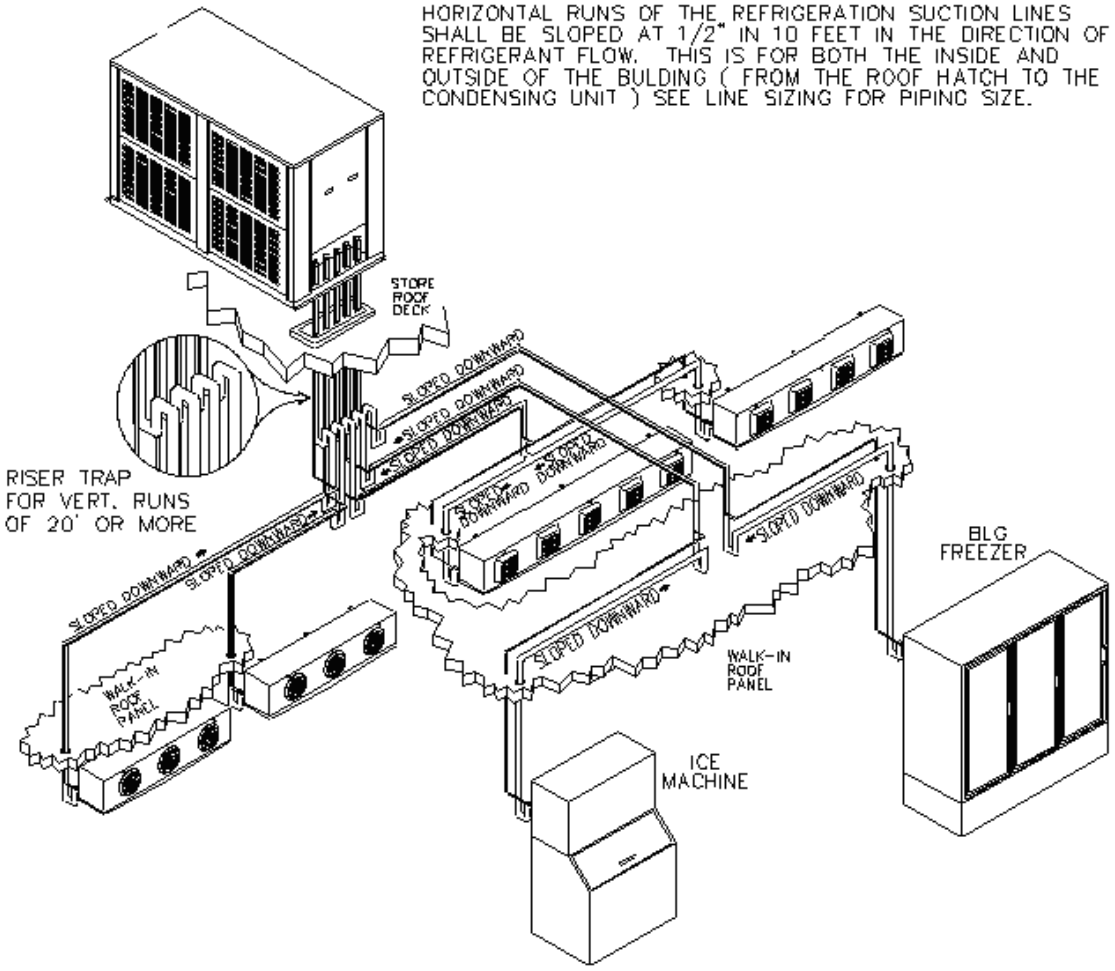
If you sell or give away your Master-Bilt® cabinet and you evacuate the refrigerant charge before shipping, you must evacuate the refrigerant into an approved recovery and reclaim system in order to satisfy all applicable federal and state regulations regarding release of refrigerant compounds into the atmosphere.

The release of refrigerant compounds into the atmosphere is a source of ozone depletion and regulated by state and federal laws.

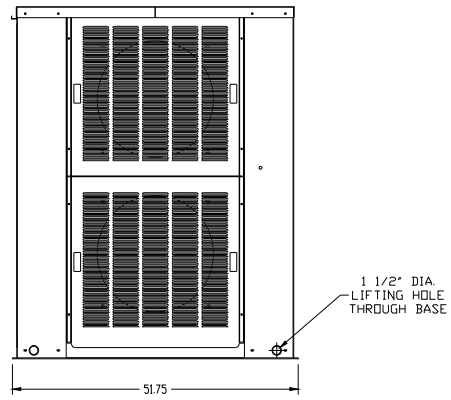
LABOR WARRANTY

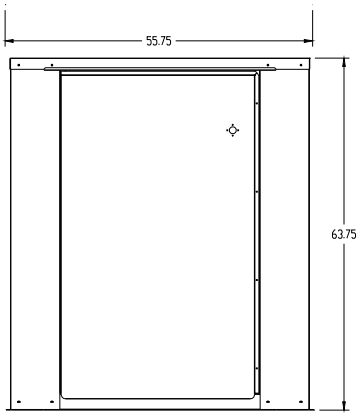
A. A 90 day labor warranty will be provided on all installer provided labor and installation.
B. A 1 year optional Labor warranty will be quoted separate from the installation.
C. Master-Bilt will provide a one year parts warranty on all parts that fail under normal operation conditions.

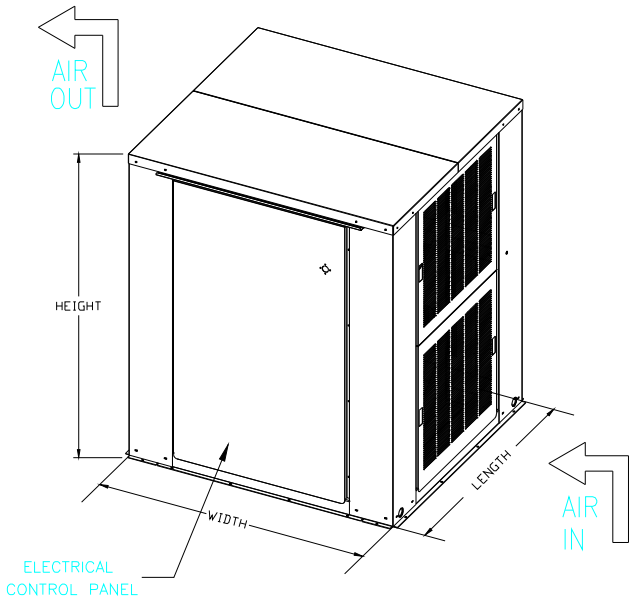
TYPICAL MRS SERIES PIPING SCHEMATIC

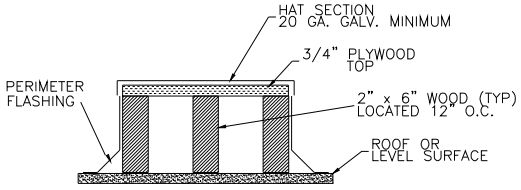


MRS-1B PHYSICAL DIMENSIONS



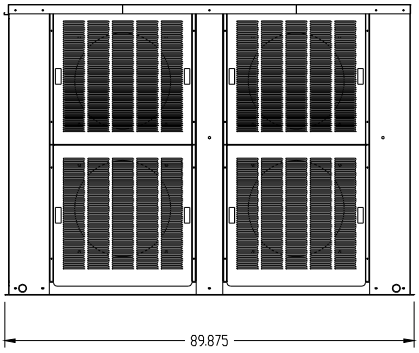


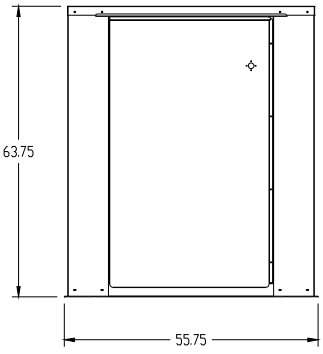


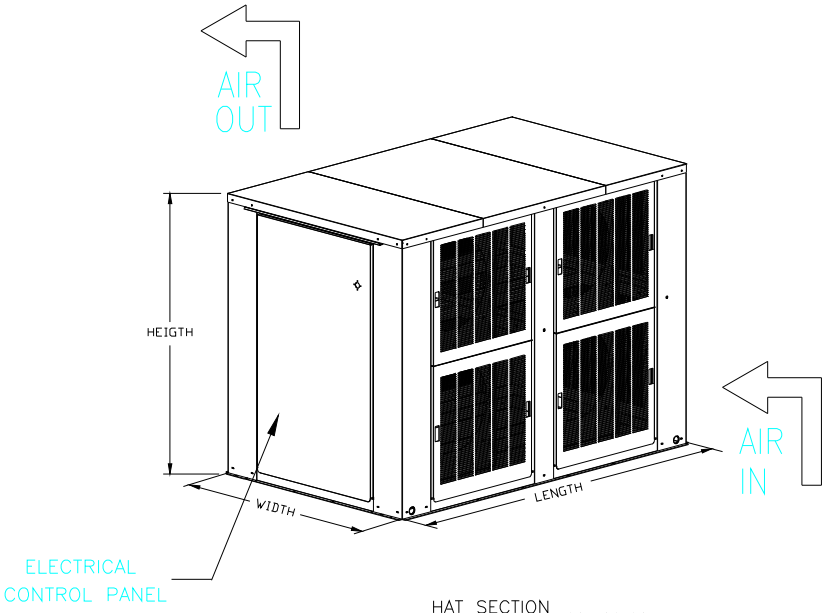


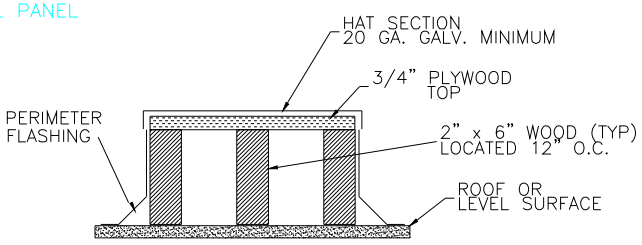
PLATFORM DETAIL (TYPICAL)

MRS-2B PHYSICAL DIMENSIONS



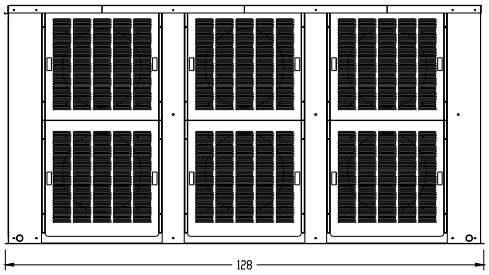


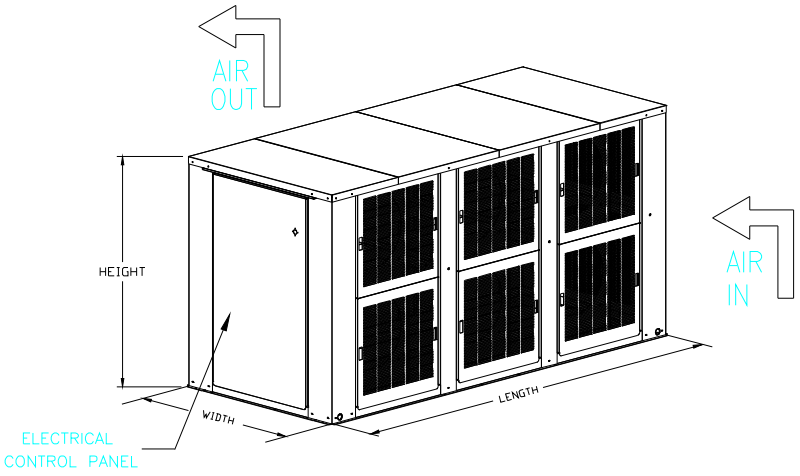


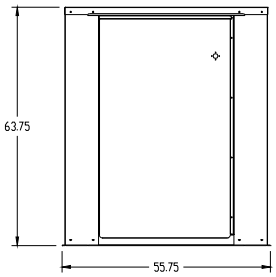


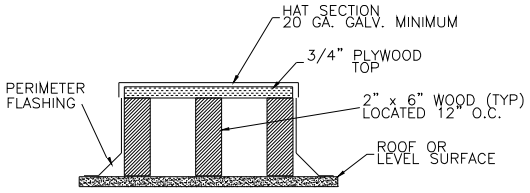
PLATFORM DETAIL (TYPICAL)

MRS-3B PHYSICAL DIMENSIONS



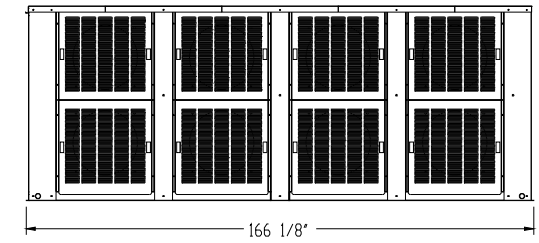


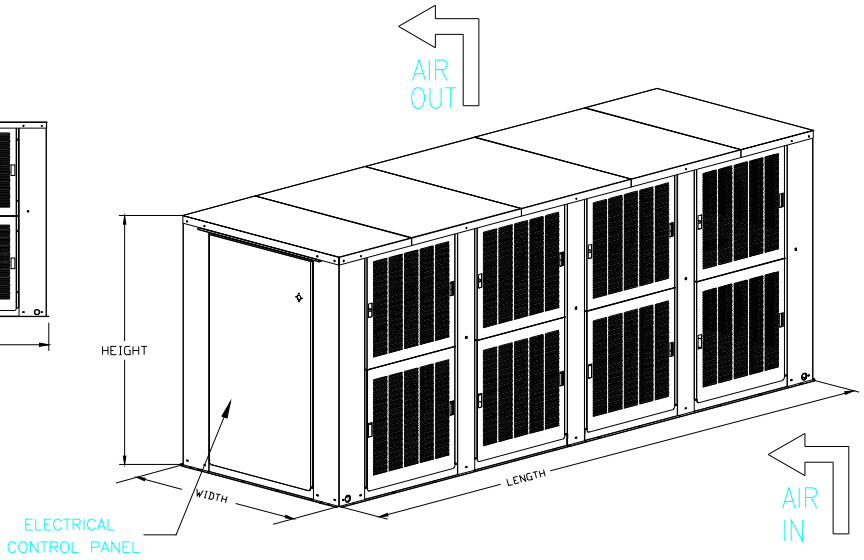


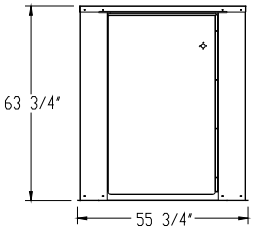


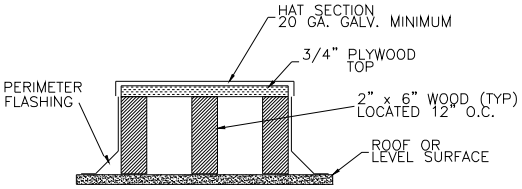
PLATFORM DETAIL (TYPICAL)

MRS-4B PHYSICAL DIMENSIONS



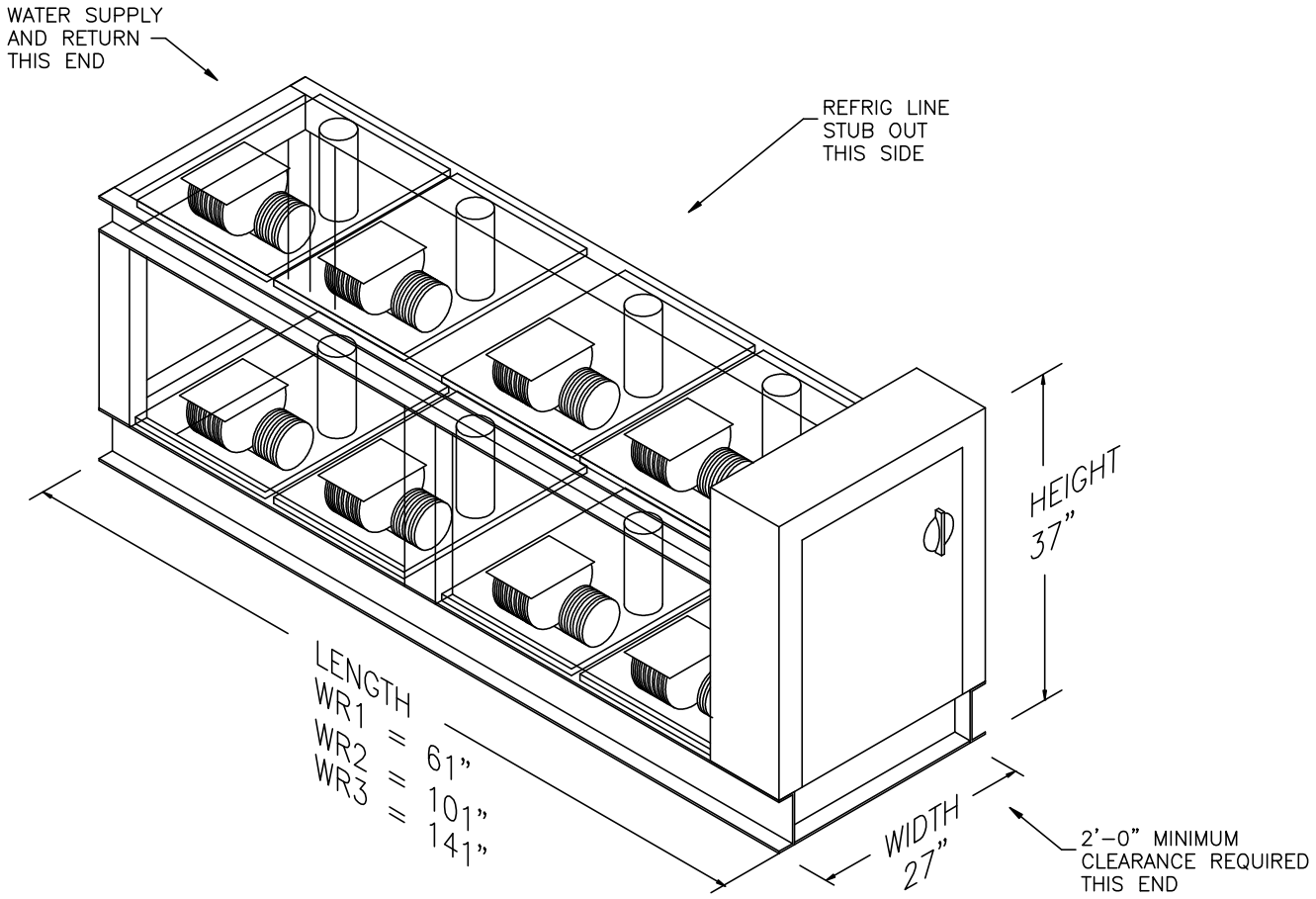


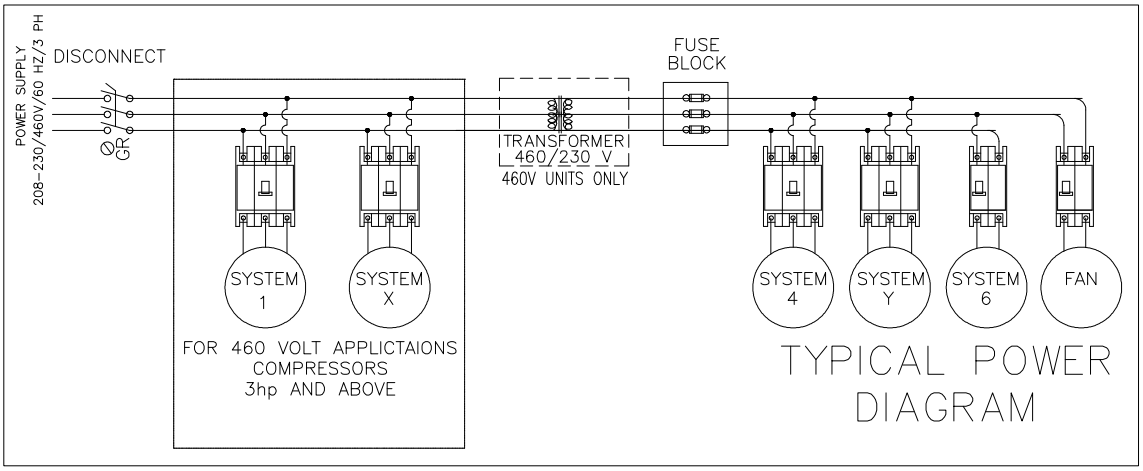


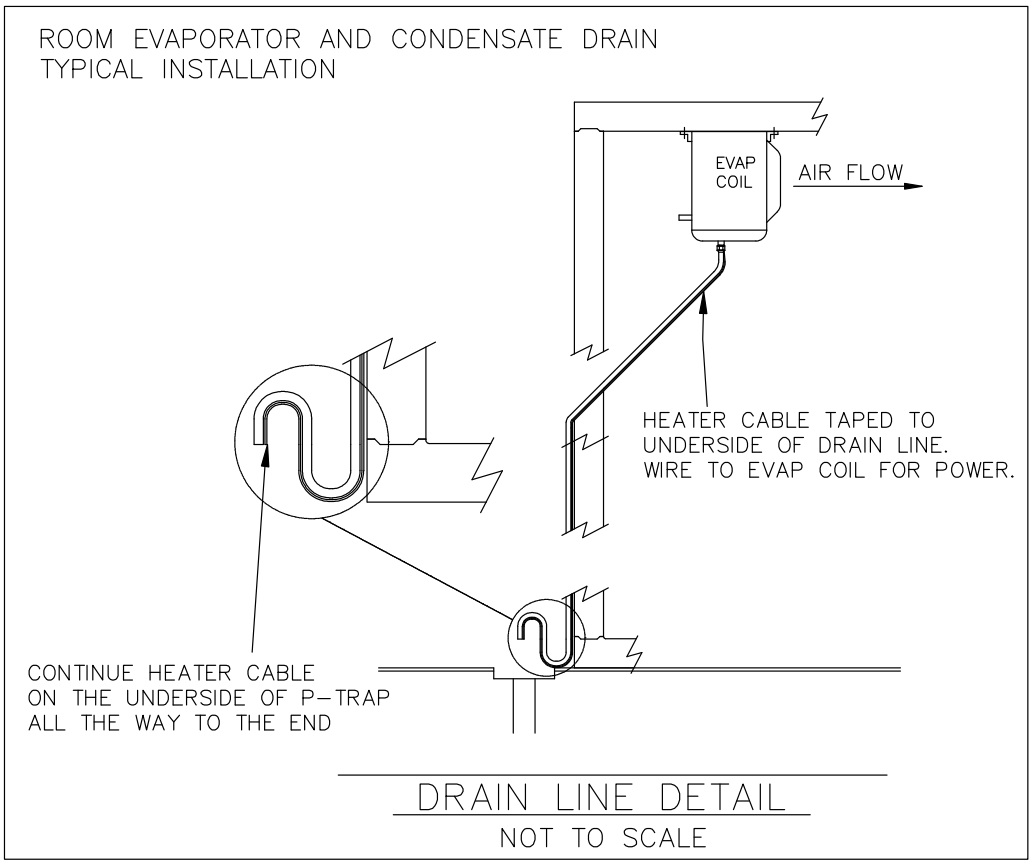


PLATFORM DETAIL (TYPICAL)

TYPICAL MRSW ENGINEERING DETAIL

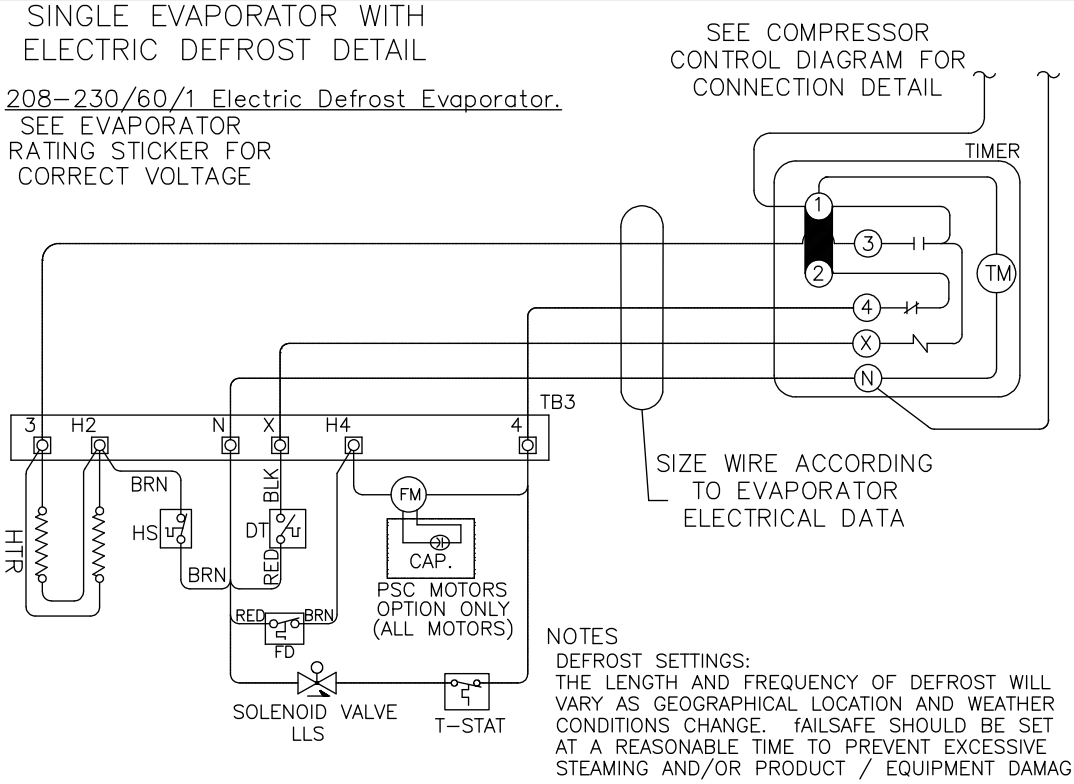



POWER SUPPLY
208-230/460V/60 HZ/3 PH
DISCONNECT
Ø Ø Ø
GR
FUSE
BLOCK
TRANSFORMER
460/230 V
460V UNITS ONLY
SYSTEM
1
SYSTEM
X
SYSTEM
4
SYSTEM
Y
SYSTEM
6
FAN
FOR 460 VOLT APPLICTAIONS
COMPRESSORS
3hp AND ABOVE
TYPICAL POWER
DIAGRAM


ROOM EVAPORATOR AND CONDENSATE DRAIN
TYPICAL INSTALLATION
EVAP COIL
AIR FLOW
HEATER CABLE TAPED TO UNDERSIDE OF DRAIN LINE. WIRE TO EVAP COIL FOR POWER.
CONTINUE HEATER CABLE ON THE UNDERSIDE OF P-TRAP ALL THE WAY TO THE END
DRAIN LINE DETAIL
NOT TO SCALE

SINGLE EVAPORATOR WITH ELECTRIC DEFROST DETAIL

208–230/60/1 Electric Defrost Evaporator.
SEE EVAPORATOR RATING STICKER FOR CORRECT VOLTAGE



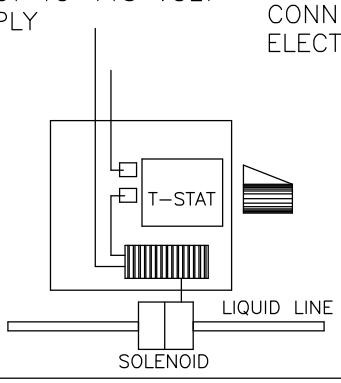
NOTES

DEFROST SETTINGS:
THE LENGTH AND FREQUENCY OF DEFROST WILL VARY AS GEOGRAPHICAL LOCATION AND WEATHER CONDITIONS CHANGE. fAILSAFE SHOULD BE SET AT A REASONABLE TIME TO PREVENT EXCESSIVE STEAMING AND/OR PRODUCT / EQUIPMENT DAMAGE.

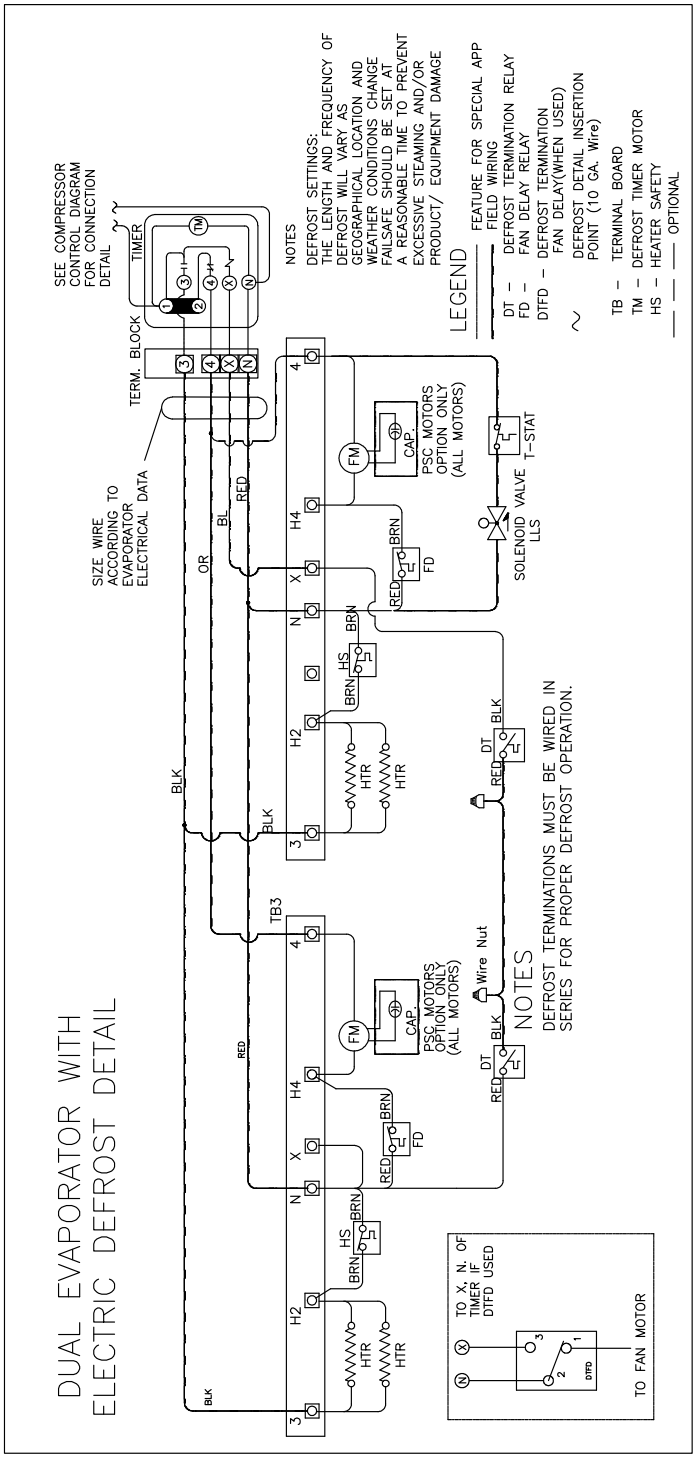
THERMOSTAT AND SOLENOID FOR AIR DEFROST COILS

ELECTRICAL CONTRACTOR TO INTERCONNECT TO 115 VOLT POWER SUPPLY

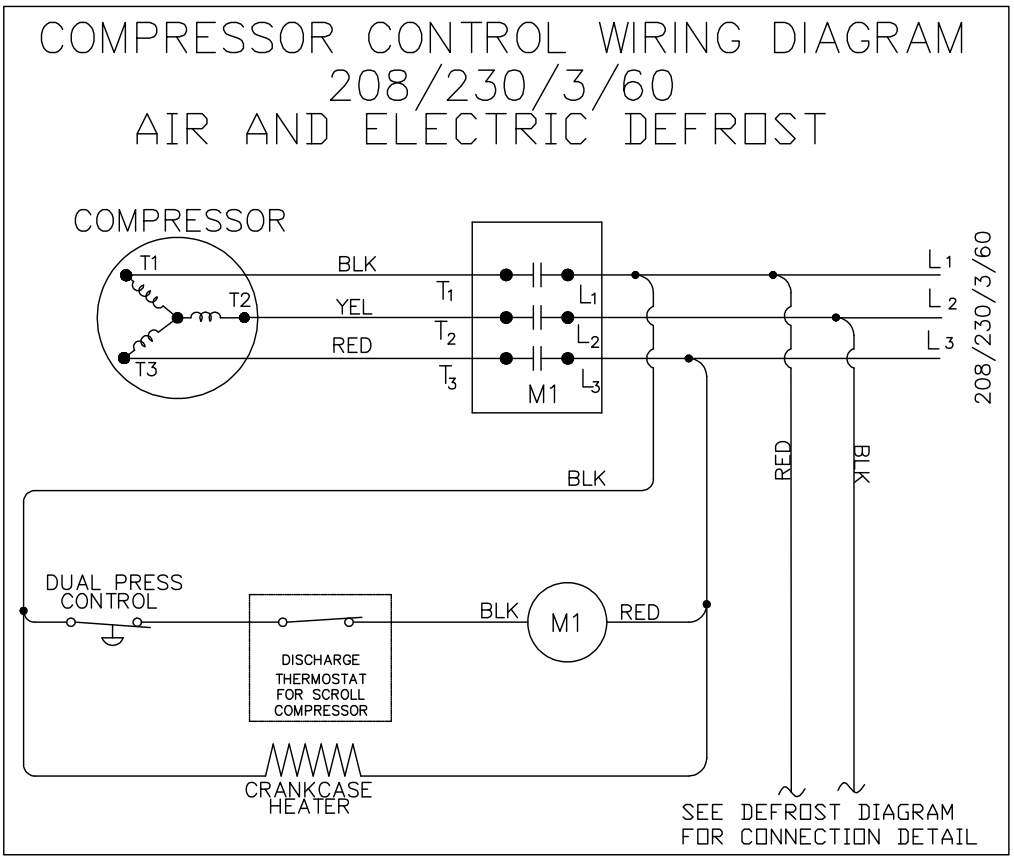
* T–STAT AND SOLENOID WILL BE INSTALLED BY REFRIGERATION CONTRACTOR. ALL ELECTRICAL CONNECTIONS WILL BE COMPLETED BY THE ELECTRICAL CONTRACTOR AS BY T–STAT

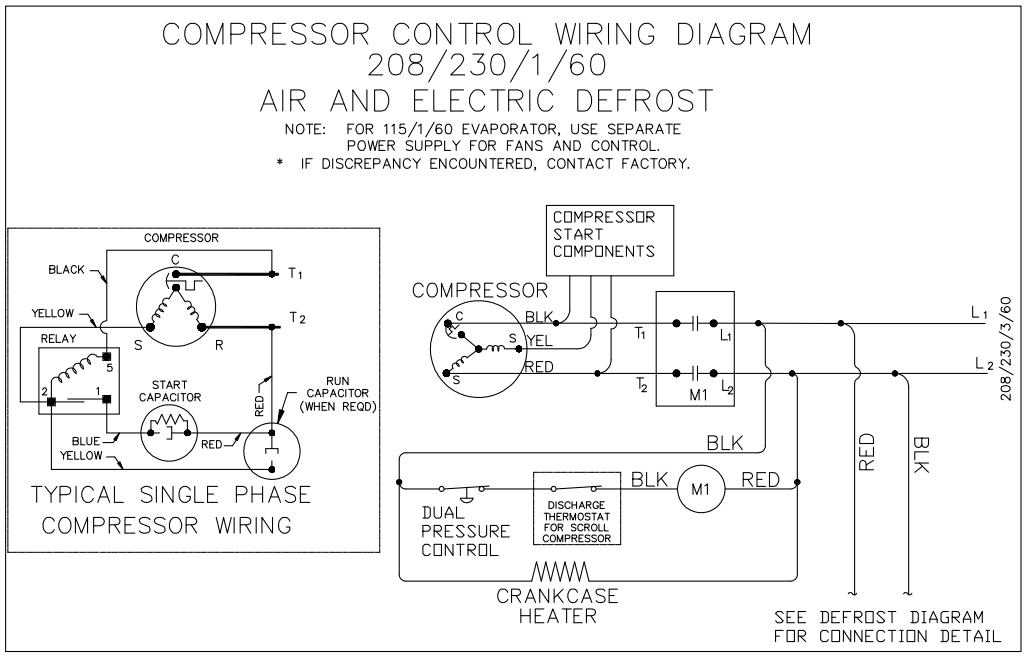


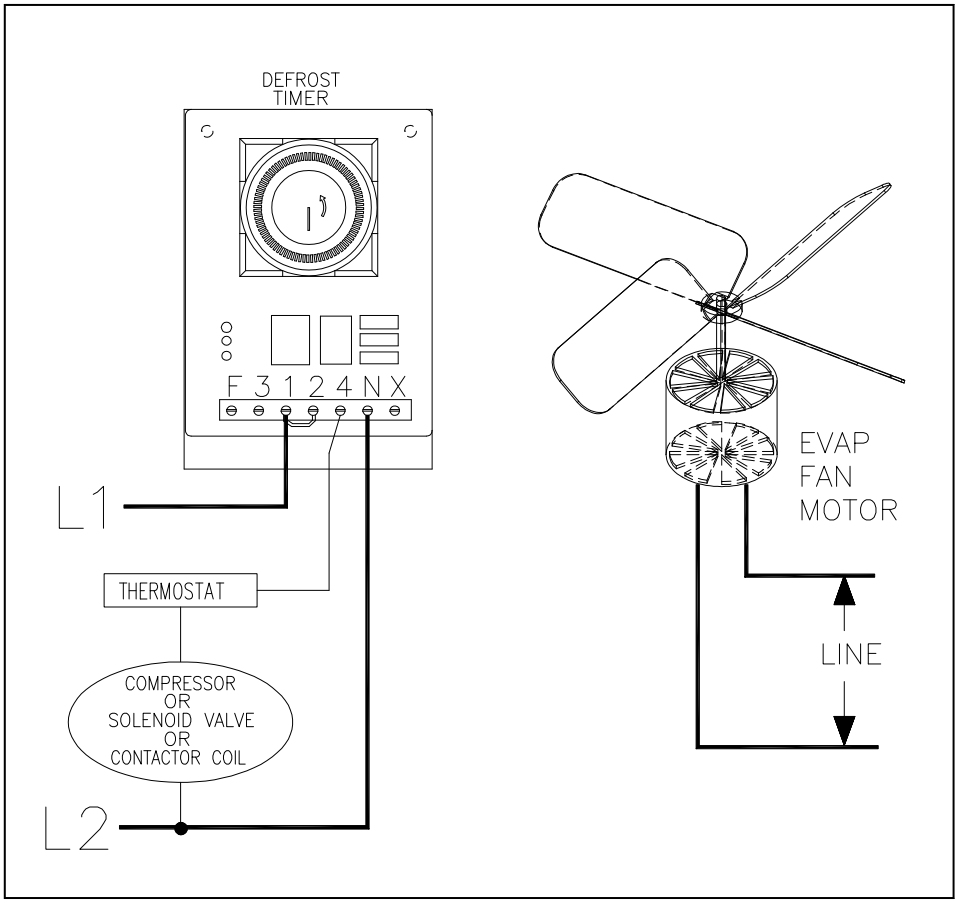
**** SEE ELECTRIC DEFROST DIAGRAMS FOR T–STAT AND SOLENOID CONNECTION DETAIL FOR ELECTRIC DEFROST EVAPORATORS


DUAL EVAPORATOR WITH
ELECTRIC DEFROST DETAIL
SEE COMPRESSOR CONTROL DIAGRAM FOR CONNECTION DETAIL
TIMER
TERM. BLOCK
SIZE WIRE ACCORDING TO EVAPORATOR ELECTRICAL DATA
NOTES
DEFROST SETTINGS: THE LENGTH AND FREQUENCY OF DEFROST WILL VARY AS GEOGRAPHICAL LOCATION AND WEATHER CONDITIONS CHANGE FAILSAFE SHOULD BE SET AT A REASONABLE TIME TO PREVENT EXCESSIVE STEAMING AND/OR PRODUCT/ EQUIPMENT DAMAGE
LEGEND
FEATURE FOR SPECIAL APP
FIELD WIRING
DT – DEFROST TERMINATION RELAY
FD – FAN DELAY RELAY
DTFD – DEFROST TERMINATION FAN DELAY(WHEN USED)
DEFROST DETAIL INSERTION POINT (10 GA. Wire)
TB – TERMINAL BOARD
TM – DEFROST TIMER MOTOR
HS – HEATER SAFETY
OPTIONAL
PSC MOTORS OPTION ONLY (ALL MOTORS)
SOLENOID VALVE LLS
T-STAT
HTR
HS
FD
DT
Wire Nut
NOTES
DEFROST TERMINATIONS MUST BE WIRED IN SERIES FOR PROPER DEFROST OPERATION.
TO X, N, OF TIMER IF DTFD USED
TO FAN MOTOR
DTFD

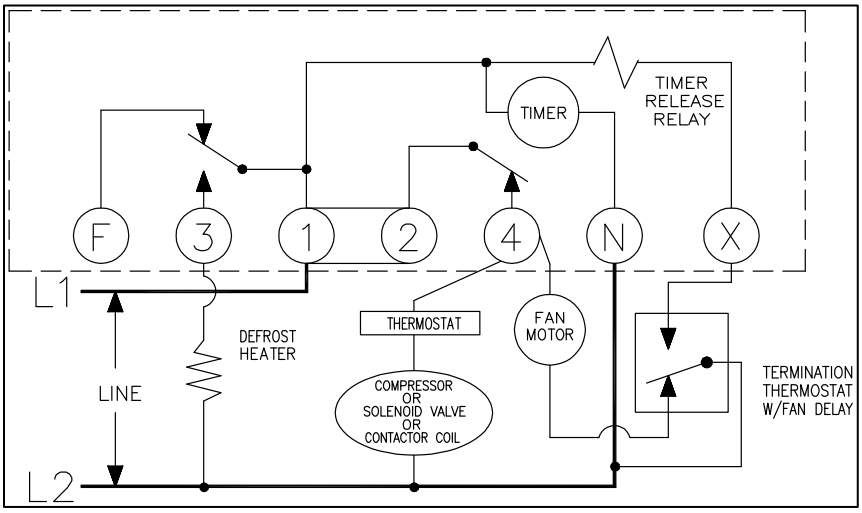
.


COMPRESSOR CONTROL WIRING DIAGRAM
208/230/3/60
AIR AND ELECTRIC DEFROST
COMPRESSOR
T1
T2
T3
BLK
YEL
RED
T1
T2
T3
L1
L2
L3
M1
208/230/3/60
BLK
RED
BLK
DUAL PRESS CONTROL
DISCHARGE THERMOSTAT FOR SCROLL COMPRESSOR
BLK
M1
RED
CRANKCASE HEATER
SEE DEFROST DIAGRAM FOR CONNECTION DETAIL

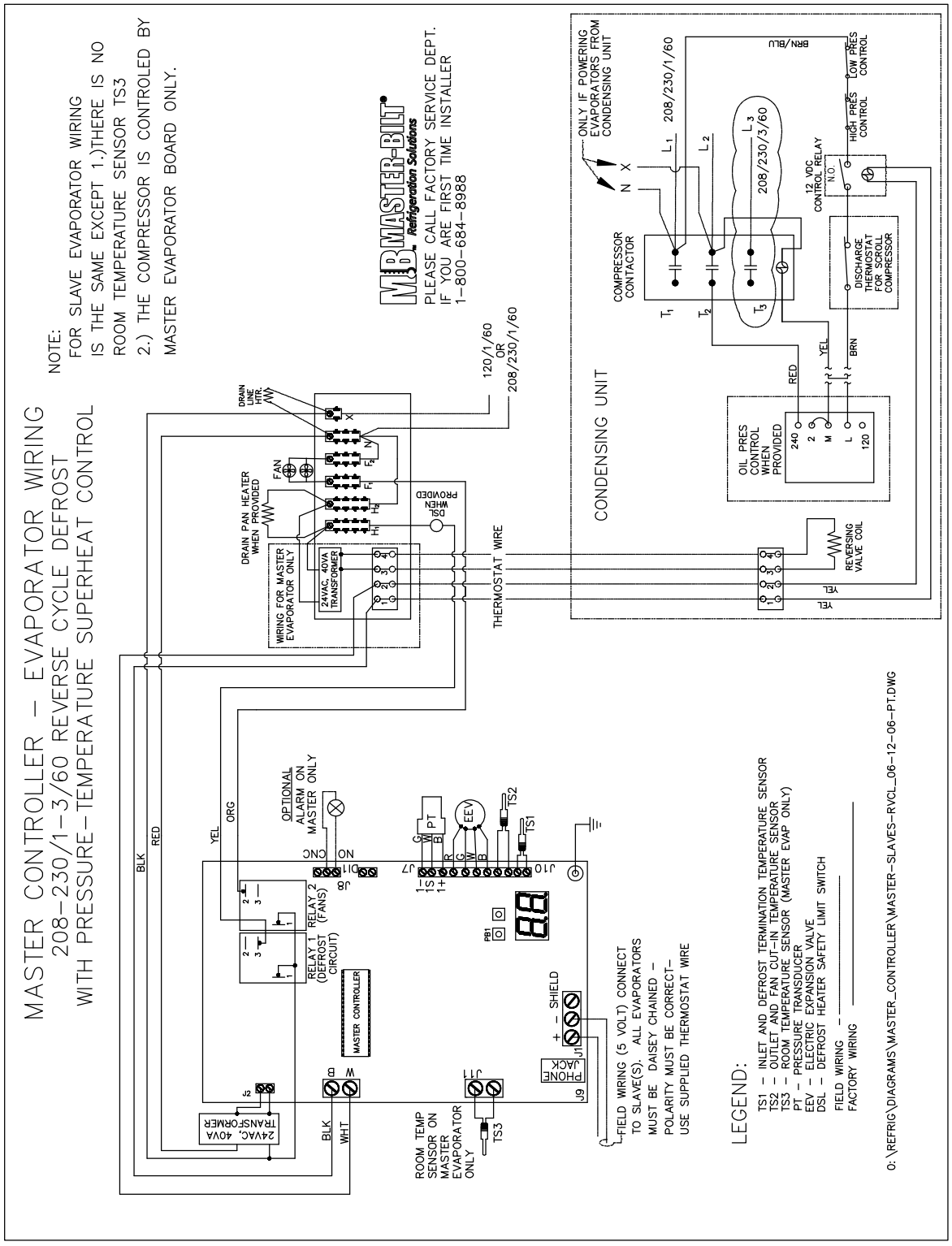

COMPRESSOR CONTROL WIRING DIAGRAM
208/230/1/60
AIR AND ELECTRIC DEFROST
NOTE: FOR 115/1/60 EVAPORATOR, USE SEPARATE POWER SUPPLY FOR FANS AND CONTROL.
* IF DISCREPANCY ENCOUNTERED, CONTACT FACTORY.
COMPRESSOR
BLACK
YELLOW
RELAY
START CAPACITOR
RUN CAPACITOR (WHEN REQD)
BLUE
YELLOW
RED
TYPICAL SINGLE PHASE COMPRESSOR WIRING
COMPRESSOR START COMPONENTS
COMPRESSOR
BLK
YEL
RED
M1
208/230/3/60
BLK
RED
BLK
DUAL PRESSURE CONTROL
DISCHARGE THERMOSTAT FOR SCROLL COMPRESSOR
CRANKCASE HEATER
SEE DEFROST DIAGRAM FOR CONNECTION DETAIL



Typical Air Defrost Wiring Diagram

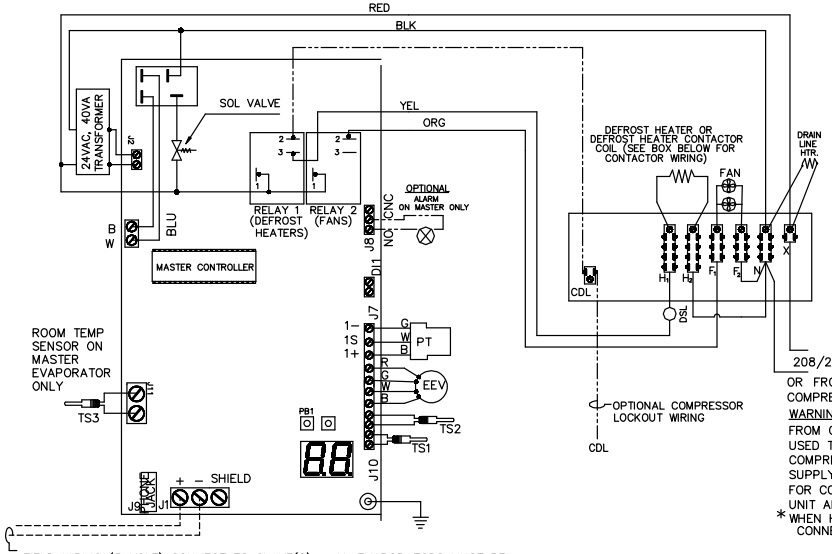


Typical Electric Defrost Wiring Diagram


MASTER CONTROLLER – EVAPORATOR WIRING
208–230/1–3/60 REVERSE CYCLE DEFROST
WITH PRESSURE–TEMPERATURE SUPERHEAT CONTROL
NOTE:
FOR SLAVE EVAPORATOR WIRING
IS THE SAME EXCEPT 1.)THERE IS NO
ROOM TEMPERATURE SENSOR TS3
2.) THE COMPRESSOR IS CONTROLED BY
MASTER EVAPORATOR BOARD ONLY.
MB MASTER-BILT
Refrigeration Solutions
PLEASE CALL FACTORY SERVICE DEPT.
IF YOU ARE FIRST TIME INSTALLER
1–800–684–8988
120/1/60
OR
208/230/1/60
CONDENSING UNIT
ONLY IF POWERING
EVAPORATORS FROM
CONDENSING UNIT
COMPRESSOR
CONTACTOR
208/230/1/60
208/230/3/60
12 VDC
CONTROL RELAY
N.O.
HIGH PRES
CONTROL
LOW PRES
CONTROL
DISCHARGE
THERMOSTAT
FOR CONTROL
COMPRESSOR
OIL PRES
CONTROL
WHEN
PROVIDED
REVERSING
VALVE COIL
THERMOSTAT WIRE
DRAIN
LINE
HTR.
DRAIN PAN HEATER
WHEN PROVIDED
FAN
WIRING FOR MASTER
EVAPORATOR ONLY
24VAC, 40VA
TRANSFORMER
DPS
WHEN
PROVIDED
OPTIONAL
ALARM ON
MASTER ONLY
RELAY 1
(DEFROST
CIRCUIT)
RELAY 2
(FANS)
MASTER CONTROLLER
PB1
PHONE
JACK
SHIELD
FIELD WIRING (5 VOLT) CONNECT
TO SLAVE(S). ALL EVAPORATORS
MUST BE DAISEY CHAINED –
POLARITY MUST BE CORRECT–
USE SUPPLIED THERMOSTAT WIRE
ROOM TEMP
SENSOR ON
MASTER
EVAPORATOR
ONLY
TS3
24VAC, 40VA
TRANSFORMER
LEGEND:
TS1 – INLET AND DEFROST TERMINATION TEMPERATURE SENSOR
TS2 – OUTLET AND FAN CUT–IN TEMPERATURE SENSOR
TS3 – ROOM TEMPERATURE SENSOR (MASTER EVAP ONLY)
PT – PRESSURE TRANSDUCER
EEV – ELECTRIC EXPANSION VALVE
DSL – DEFROST HEATER SAFETY LIMIT SWITCH
FIELD WIRING – _____
FACTORY WIRING – _____
C:\REFRIG\DIAGRAMS\MASTER_CONTROLLER\MASTER–SLAVES–RVCL_06–12–06–PT.DWG

MASTER CONTROLLER – EVAPORATOR WIRING
208–230/1–3/60 ELECTRIC DEFROST

NOTE: WIRING SAME FOR MASTER EVAPORATOR AND SLAVE EVAPORATORS EXCEPT NO ROOM SENSOR FOR SLAVE



WARNING: WHEN POWERING EVAPORATORS FROM CONDENSING UNIT, LOCKOUT MUST BE USED TO PREVENT DEFROST HEATERS AND COMPRESSOR FROM RUNNING AT THE SAME TIME. SUPPLY WIRING AND BREAKERS MUST BE SIZED FOR COMBINATION OF LOADS FROM CONDENSING UNIT AND EVAPORATORS.

* WHEN HEATER CONTACTOR USED, CONNECT X, N TO L1, L2 POWER SUPPLY.

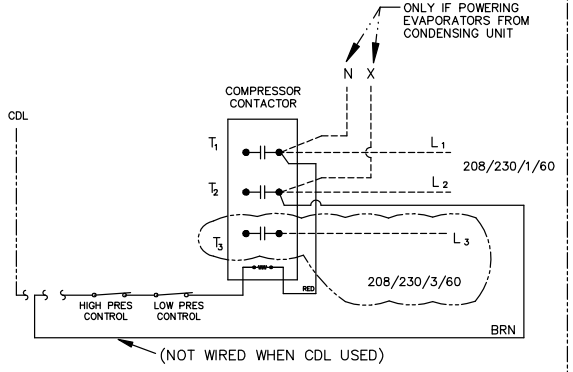
FIELD WIRING (5 VOLT) CONNECT TO SLAVE(S). aLL EVAPORATORS MUST BE DAISEY CHAINED – POLARITY MUST BE CORRECT – USE SUPPLIED THERMOSTAT WIRE.

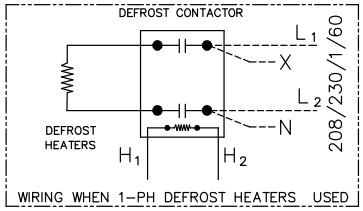
MASTER-BILT Refrigeration Solutions

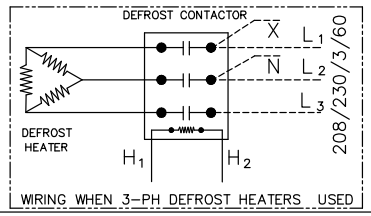
PLEASE CALL FACTORY SERVICE DEPT.
IF YOU ARE FIRST TIME INSTALLER
1–800–684–8988

NOTE:
FOR SLAVE EVAPORATOR WIRING
IS THE SAME EXCEPT 1.)THERE IS NO ROOM TEMPERATURE SENSOR TS3
2.) THE COMPRESSOR IS CONTROLED BY MASTER EVAPORATOR BOARD ONLY.

OPTIONAL COMPRESSOR LOCKOUT WIRING







PT – PRESSURE TRANSDUCER
TS1 – INLET AND DEFROST TERMINATION TEMPERATURE SENSOR
TS2 – OUTLET AND FAN CUT–IN TEMPERATURE SENSOR
TS3 – ROOM TEMPERATURE SENSOR (MASTER EVAP ONLY)
EEV – ELECTRIC EXPANSION VALVE
DSL – DEFROST HEATER SAFETY LIMIT SWITCH
CDL – (OPTIONAL) COMPRESSOR DEFROST LOCKOUT
FIELD WIRING
OPTIONAL WIRING
FACTORY WIRING

07/27/06
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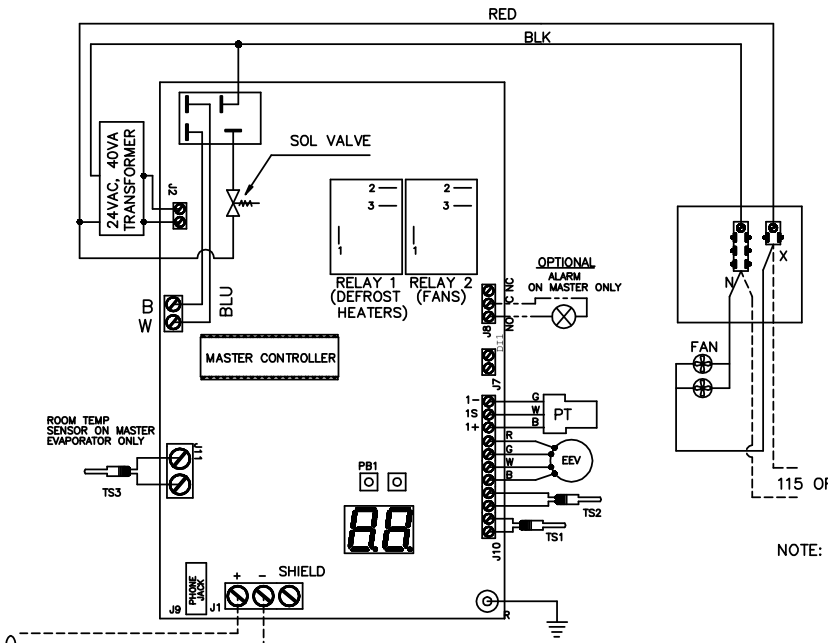
MASTER CONTROLLER – EVAPORATOR WIRING
115 OR 208–230/1–3/60 AIR DEFROST

NOTE: WIRING SAME FOR MASTER EVAPORATOR AND
SLAVE EVAPORATORS EXCEPT NO ROOM SENSOR FOR SLAVES

M.B. MASTER-BILT Refrigeration Solutions

PLEASE CALL FACTORY SERVICE DEPT.
IF YOU ARE FIRST TIME INSTALLER
1–800–684–8988



NOTE:
FOR SLAVE EVAPORATOR WIRING
IS THE SAME EXCEPT 1.)THERE IS NO
ROOM TEMPERATURE SENSOR TS3
2.) THE COMPRESSOR IS CONTROLED BY
MASTER EVAPORATOR BOARD ONLY.

NOTE: CHECK SOLENOID COIL VOLTAGE TO MATCH SUPPLY VOLTAGE

FIELD WIRING (5 VOLT) CONNECT
TO SLAVE(S). ALL EVAPORATORS
MUST BE DAISEY CHAINED –
POLARITY MUST BE CORRECT–
USE SUPPLIED THERMOSTAT WIRE

TS1 – INLET AND DEFROST TERMINATION TEMPERATURE SENSOR
TS2 – OUTLET AND FAN CUT–IN TEMPERATURE SENSOR
TS3 – ROOM TEMPERATURE SENSOR (MASTER EVAP ONLY)
EEV – ELECTRIC EXPANSION VALVE
PT – PRESSURE TRANSDUCER

FIELD WIRING ----------
OPTIONAL WIRING —·—·—·—·—·—·—·—
FACTORY WIRING ————————

NOTE: FOR MASTER CONTROLLER AIR DEFROST

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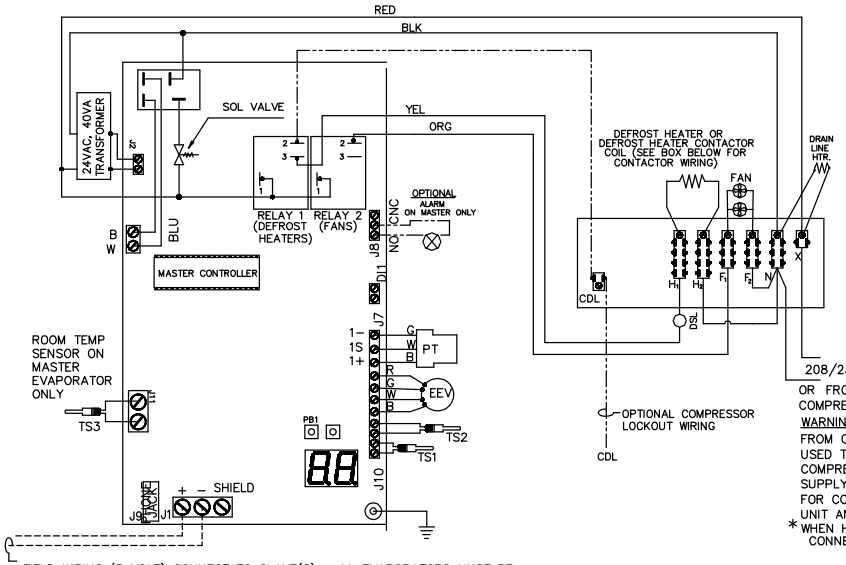
M.B. MASTER-BILT Refrigeration Solutions

MASTER CONTROLLER – EVAPORATOR WIRING
208–230/1–3/60 ELECTRIC DEFROST

NOTE: WIRING SAME FOR MASTER EVAPORATOR AND SLAVE EVAPORATORS EXCEPT NO ROOM SENSOR FOR SLAVE



FIELD WIRING (5 VOLT) CONNECT TO SLAVE(S). aLL EVAPORATORS MUST BE DAISEY CHAINED – POLARITY MUST BE CORRECT – USE SUPPLIED THERMOSTAT WIRE.

OR FROM CONDENSING UNIT IF OPTIONAL COMPRESSOR LOCKOUT IS USED.

WARNING: WHEN POWERING EVAPORATORS FROM CONDENSING UNIT, LOCKOUT MUST BE USED TO PREVENT DEFROST HEATERS AND COMPRESSOR FROM RUNNING AT THE SAME TIME. SUPPLY WIRING AND BREAKERS MUST BE SIZED FOR COMBINATION OF LOADS FROM CONDENSING UNIT AND EVAPORATORS.

* WHEN HEATER CONTACTOR USED, CONNECT X, N TO L1, L2 POWER SUPPLY.

MASTER-BILT Refrigeration Solutions

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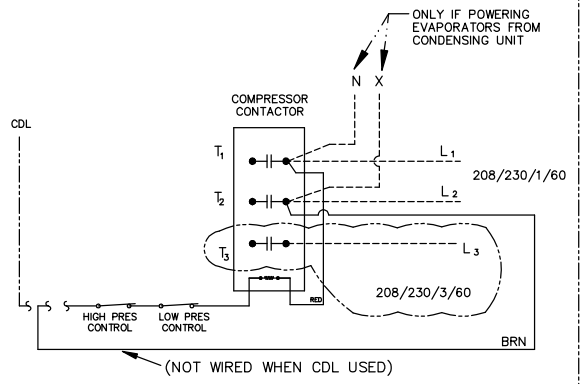
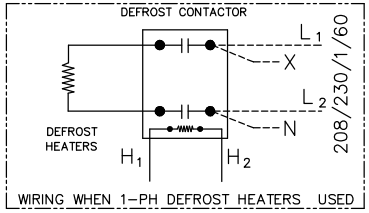
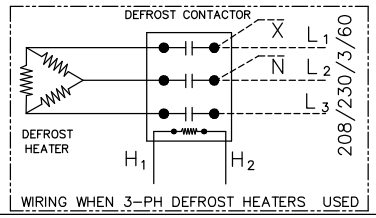
IF YOU ARE FIRST TIME INSTALLER
1–800–684–8988

NOTE:
FOR SLAVE EVAPORATOR WIRING IS THE SAME EXCEPT 1.)THERE IS NO ROOM TEMPERATURE SENSOR TS3
2.) THE COMPRESSOR IS CONTROLED BY MASTER EVAPORATOR BOARD ONLY.

OPTIONAL COMPRESSOR LOCKOUT WIRING







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07/27/06
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MASTER-BILT MRS/MRSW START-UP DATA

Project Name:_____ Requested by:_____

Project Location:_____ Requested by:_____

Expected Installation time: Year_____ Quarter (1,2,3,or 4) _____

Installing Company: _____ Installer Signature:_____

Sytstem	POD Description	Suction Pressure	Discharge Pressure	Refrigerant Type	Charge Amount (lbs)	Superheat

NOTES: