

NORLAKE®

Installation & Operations Manual for ANGLED MERCHANDISERS



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INTRODUCTION

Thank you for purchasing an Angled Ice Cream Merchandisers cabinet. This manual contains important instructions for installing, using, and servicing a this case. A parts list is included with this manual. Read all these documents carefully before installing or servicing your equipment.

STORE CONDITIONS

The merchandsiers are designed to operate in the controlled environment of an air-conditioned store. The store temperature should be at or below 75°F and a relative humidity of 55% or less. At higher temperature or humidity conditions, the performance of these cases may be affected and the capacity diminished.

Cabinet should not be positioned where it is directly exposed to rays of sun or near a direct source of radiant heat. This will adversely affect the case and will result in poor performance.



NOTICE

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



DANGER

Improper or faulty hook-up of electrical components on 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

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

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, contact the cabinet's customer service department.

WARNING LABELS AND SAFETY INSTRUCTIONS



This symbol is the safety-alert symbol. When you see this symbol on your cabinet or in this manual, 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 cabinet 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:

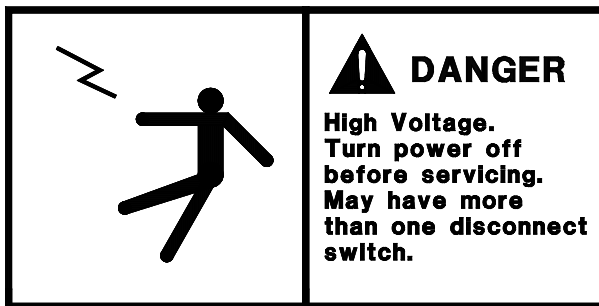
DANGER: Severe injury or death will occur if you ignore the message.

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

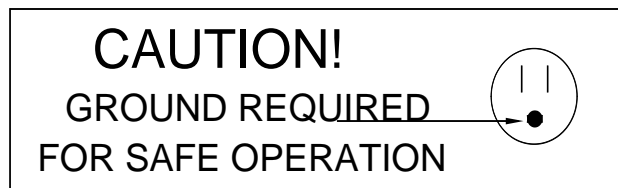
CAUTION: Minor injury or damage to your cabinet can occur if you ignore the message.

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

The warning and safety labels shown throughout this manual are placed on your cabinet at the factory. Follow all warning label instructions. If any warning or safety labels become lost or damaged, call our customer service department for replacements.



This label is located on top of the electrical control label and on the wiring channel.



This label is attached to the cabinet power cord on models with a power cord.

PRE-INSTALLATION INSTRUCTIONS

INSPECTION FOR SHIPPING DAMAGE

You are responsible for filing 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 if 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 damage to your shipment. Ask for an immediate inspection of your concealed damage item. Crating material must be retained to show the inspector from the truck line.

INSTALLATION INSTRUCTIONS

GENERAL INSTRUCTIONS

1. Be sure the equipment is properly installed by competent service people.
2. Keep the equipment clean and sanitary so it will meet your local sanitation codes. Clean the cabinet with a mild detergent and water, then rinse.
3. Rotate your stock so that older stock does not accumulate. This is especially important for ice cream. A "First-In, First-Out" rotation practice will keep the products in good salable condition.
4. Do not place product in the case when it is soft or partially thawed. Also, product should not be put in the case for at least 6 hours after it is started.
5. Stock cases as quickly as possible, exposing only small quantities to store temperatures for short periods of time.
6. When replacing light bars, be sure that the electrical power to the lighting circuit is turned off.

MECHANICAL

Remove front grille and check refrigeration lines to see that they are free (not touching each other or compressor). Spin condenser fan blade to see that it is free.

LOCATION

Remove cabinet from crate base and slide into location. Cabinet must be level from side to side and front to back for correct draining of coil pan and for self-closing doors to operate correctly.

To comply with Sanitation requirements the cabinet must be sealed to the floor with a N.S.F. listed silicone sealant, mounted on casters, or with 6" minimum legs. 0" air space is required for the front and each side. The top and back of the cabinet must be left open for compliance.

Remove shipping supports from bottom edge and top edge of doors.

CABINET CLEANING PROCEDURES



WARNING!

To avoid electrical shock, disconnect main power supplies to the cabinet before beginning this procedure. May have more than one disconnect switch.

The exterior of the cabinet should simply be wiped clean with a Warm damp cloth daily. This will be sufficient to keep the merchandiser looking its finest. **Do not use a brush, scouring pad, or any abrasive material on the painted surfaces!**

To clean the interior of the cabinet, the condensing unit and power to the cabinet lights should be shut off. **Disconnect all power before cleaning!** All product in the cabinet should be removed and stored in an appropriate facility. All shelving, trays, Pans, etc. should be removed and cleaned separately.

The interior (as well as the exterior) of the cabinet may be cleaned with a germicidal detergent at the manufacturer's recommended concentration. **Do not use any ammonia-based products as this may damage components in the cabinet.** Again, do not use a brush, scouring pad, or any abrasive material on the painted surfaces. Use a soft brush or cleaner pad for built-up dirt, stains, or spills. Care should be taken not to unnecessarily soak fan motors, electrical connections, controls, or any wire raceway. Wipe all surfaces with a damp cloth. A sanitizer should then be thoroughly sprayed onto the surfaces and again wiped with a damp cloth.

Remove only the necessary mechanical parts to access the condenser coil and compressor housing. Care should again be taken not to unnecessarily soak fan motors, electrical connections, time clock, or any wire raceway. Check the condenser coil to insure that it is not clogged with dirt, dust, or lint. A dirty or clogged condenser coil will result in diminished performance of the cabinet. Use compressed air to blow the dirt through the condenser coil. Do not let dust or dirt accumulate on the fan blades. If dust or dirt is noticeable, simply wipe the fan blades with a damp cloth as with other surfaces. After cleaning, replace any equipment that was previously removed and start the condensing unit and return power to the lights and fans.

CLEANING: As a regular maintenance routine, the condenser coil should be cleaned approx every 6 to 12 months, depending on store conditions.

Keep the equipment clean and sanitary so it will meet your local sanitation codes. Wipe up all spills, clean with water and a mild detergent, then rinse with clean water. Wipe the exterior and gasket area as needed.

SERVICE INSTRUCTIONS

ELECTRICAL



WARNING

Before servicing any electrical component in the cabinet make sure all power to case is off and always use a qualified technician.

It is recommended that a separate circuit be run for each cabinet to prevent another appliance blowing the fuse or HAC&R circuit breaker, causing loss of product. This circuit should be sized according to the amp rating on the cabinet data label.



WARNING Before making any change, the technician should disconnect power to the cabinet



For models with LED lamp(s) without ballast only!

The light fixture is designed and only suitable for specified self-ballasted LED only. In no circumstance, should any florescent tube light be used in this fixture.

WARNING

- These lamp should be installed by licensed electricians per local code.
- These lamps are to be used in indoor dry and damp location only.
- Not suitable for wet locations
- Risk of fire or electric shock
- These product is intended to be used with only the specific LED lamp. It is dangerous to use any other lamp which is not specified here.

LIGHTED SIGN IN CANOPY INSTALLATION

1. Disconnect the power to the cabinet
2. Slide the finger below the canopy lens as shown and push the lens up till it disengages from the lip of the canopy.
3. Then slide down to take it out for service
4. While installing the lens please follow the instruction as shown in the pictures.
5. Make sure the top of the lens is securely positioned in the slot between the top retainer and top deck.
6. Once it is in between the top slot, push the lens up to make sure it is securely placed in the groove created by the hem structure of the lip of the the front deck canopy area.



SPECIAL SERVICE SITUATION:

- A. There are rare occasions when the refrigerant charge must be evacuated from a cabinet in order to perform service work. In those situation, it is recommended that a refrigerant reclaimer be used according to the EPA guidelines to eliminate the possibility of refrigerant being released to the atmosphere.
- B. If moisture or liquid is observed around or under this cabinet, an immediate investigation should be made by qualified personnel to determine the source of the moisture or liquid. The investigation should determine if the cabinet is malfunctioning or if there is a simple housekeeping problem. Moisture or liquid around or under a cabinet is a potential slip/fall hazard for persons walking by or working in the general area of the cabinet. Any cabinet malfunction or housekeeping problem that creates a slip/fall hazard around or under a cabinet should be corrected immediately.

OPERATING CONDITIONS AND PRESSURES

With room ambient temperature of +80 F and cold cabinet (unit cycling on control):

Suction Pressure 2 to 10 psig
Head Pressure 240 to 260 psig

TEMPERATURE SENSOR, DEFROST HEATER, AND FAN MOTOR REPLACEMENT



WARNING Before making any change, the technician should disconnect power to the cabinet.

To change a temperature sensor (cabinet zone sensor or defrost termination sensor), simply disconnect the sensor wires from the controller and replace the new sensor in the original position. Use plastic tie to tighten the zone sensor. Insert the sensor for defrost termination firmly into the evaporator coil, in between the fins. Make sure the sensor wires do not touch or are not close to any heater rods.

To change defrost heater – remove screws from drain pan and pull down – remove screws from coil mounting straps – spring straps open – remove heater shield – pull heater out of slots in coil fins.

To change fan motor – disconnect fan motor leads – remove screws from fan guards and motor mounts.

ELECTRONIC REFRIGERATION CONTROL

DESCRIPTION



INDICATIONS

- Thermostat output
- Fan output
- Auxiliary output
- Activation of 2nd parameter set
- Alarm

OPERATION

DISPLAY

During normal operation, the display shows either the temperature measured or one of the following indications:

DEF	Defrost in progress	HI	Room high temperature alarm
REC	Recovery after defrost	LO	Room low temperature alarm
OFF	Controller in stand-by	E1	Probe T1 failure
CL	Condenser clean warning	E2	Probe T2 failure
DO	Door open alarm		

INFO MENU

The information available in this menu is:

T1	Instant probe 1 temperature	TLO	Minimum probe 1 temperature recorded
T2	Instant probe 2 temperature	CND	Compressor working weeks
THI	Maximum probe 1 temperature recorded	LOC	Keypad state lock

Compressor When power is first turned on the controller will go through the start-up. After the start-up delay the compressor comes on. The LED indicator stays on while compressor relay is energized. Display will show actual box temperature. Picture above is the display layout. The compressor will be cycled off when the actual box temperature reaches its set point. The COMP indicator will be off..






Fan The fans will run in FTC mode except when a defrost is initiated, or when the evaporator temp is above the 30°F. When in defrost mode the fan is off until the end of the defrost and the 2 minute drip time has passed. There is 2 minutes delay after a defrost before the fan comes on. If the Evaporator temperature is 35 °F or below the controller will override the fan delay. FAN LED indicator is on while FAN relay is energized.

Defrost The control uses time defrost with 2 defrost per day. Two defrost per day means it will occur every 12 hours. The defrost scheme can be re-set the for special applications. During defrost, the display will show dEF. The control begins timing the defrost when power is turned on.











MANUAL DEFROST

Defrosting may also be induced manually by keeping the defrost button pushed for 3 seconds. Once defrost has started, the defrost will go through a defrost and drip time pull down cycle.

HOW TO CHANGE THE SETPOINT

- Press button  for at least half second, to display the setpoint value.
- By keeping button  pressed, use button  or  to set the desired value (adjustment is within the minimum **SPL** and the maximum **SPH** limit).
- When button  is released, the new value is stored.

HOW TO CHANGE a parameter value

- The setup menu is accessed by pressing button + for 5 seconds.
- With button  or  select the parameter to be modified.
- Press button  to display the value.
- By keeping button  pressed, use button  or  to set the desired value.
- When button  is released, the newly programmed value is stored and the following parameter is displayed.
- To exit from the setup, press button  or wait for 30 seconds.

LIST OF PARAMETERS

Here is a list of the parameters the value of which can be changed in the programming mode, as well as their ranges.

Display Symbol	Parameter	Range	Setting
SP	Temperature Set Point	SPL...SPH	-10°F
HYS	Temperature Differential	1 to 255°F	10°
SPL	Minimum Temperature limit setpoint	-50...SPH	-15°F
SPH	Maximum Temperature limit setpoint	SPH...120°	30°F
AHA	High Temperature alarm	-50...120°	30°F
ALA	Low Temperature Alarm	50...120°	-40°F
ATD	Temperature Alarm Delay	0...120min	30min
DFR	Number of Defrost Cycle per 24hr	0...24	2/day
DLI	Defrost Termination Temperature	-50...120°	55°F
DTO	Maximum Defrost Duration	1...120min	30min

CONTROLLER ELECTRICAL CONNECTION

The controller is provided with screw terminal block to connect cables with a cross section up to 2,5 mm². Before connecting cables make sure the power supply complies with the control's requirements. Separate the probe cables from the power supply cables, from the outputs and the power connections. Do not exceed the maximum current allowed on each relay, in case of heavier loads use a suitable external relay or contactor's.

PROBE CONNECTIONS

The probes shall be mounted with the bulb upwards to prevent damages due to casual liquid infiltration. It is recommended to place the thermostat probe away from air streams to correctly measure the average room temperature. Place the defrost termination probe among the evaporator fins in the coldest place, where most ice is formed, far from heaters or from the warmest place during defrost, to prevent premature defrost termination.

SENSOR PROBE TEMPERATURE AND RESISTANCE

NTC10K Temperature - Resistance

Temp (°C)	Temp (°F)	R-low (Kohm)	R-center (Kohm)	R-high (Kohm)
-30	-22	109.522	113.347	117.294
-25	-13	84.823	87.559	90.374
-20	-4	66.270	68.237	70.255
-15	5	52.229	53.650	55.104
-10	14	41.477	42.506	43.557
-5	23	33.147	33.892	34.651
0	32	26.678	27.219	27.767
5	41	21.630	22.021	22.417
10	50	17.643	17.926	18.210
15	59	14.472	14.674	14.877
20	68	11.938	12.081	12.224

FAN OPERATION AND VIBRATION; VOLTAGE CHECK

Check the operation of the fan blade and also check for vibration noises due to refrigerant lines rattling against one another. While the cabinet is in operation, check the voltage draw and the amperage draw versus this rating on the nameplate. Voltage should be checked at the compressor terminals while the compressor is initially starting. The Angled Ice Cream Merchandisers models are designed to operate at +/- 10% of 115/60/1. This means at time of start-up, the voltage should be between 103 volts and 126.5 volts at the compressor.

FINAL CHECK LIST

- A. Check operating pressures.
- B. Check electrical requirements of unit to supply voltage.
- C. Set temperature control for desired temperature range.
- D. Check system for proper defrost settings and operation.
- E. Check condensing unit for vibrating or rubbing tubing. Dampen and clamp as required.

PART LIST

The table below gives part numbers. Use this chart when ordering replacement parts for your cabinets. Always Advise Cabinet Serial Number When Ordering Parts.

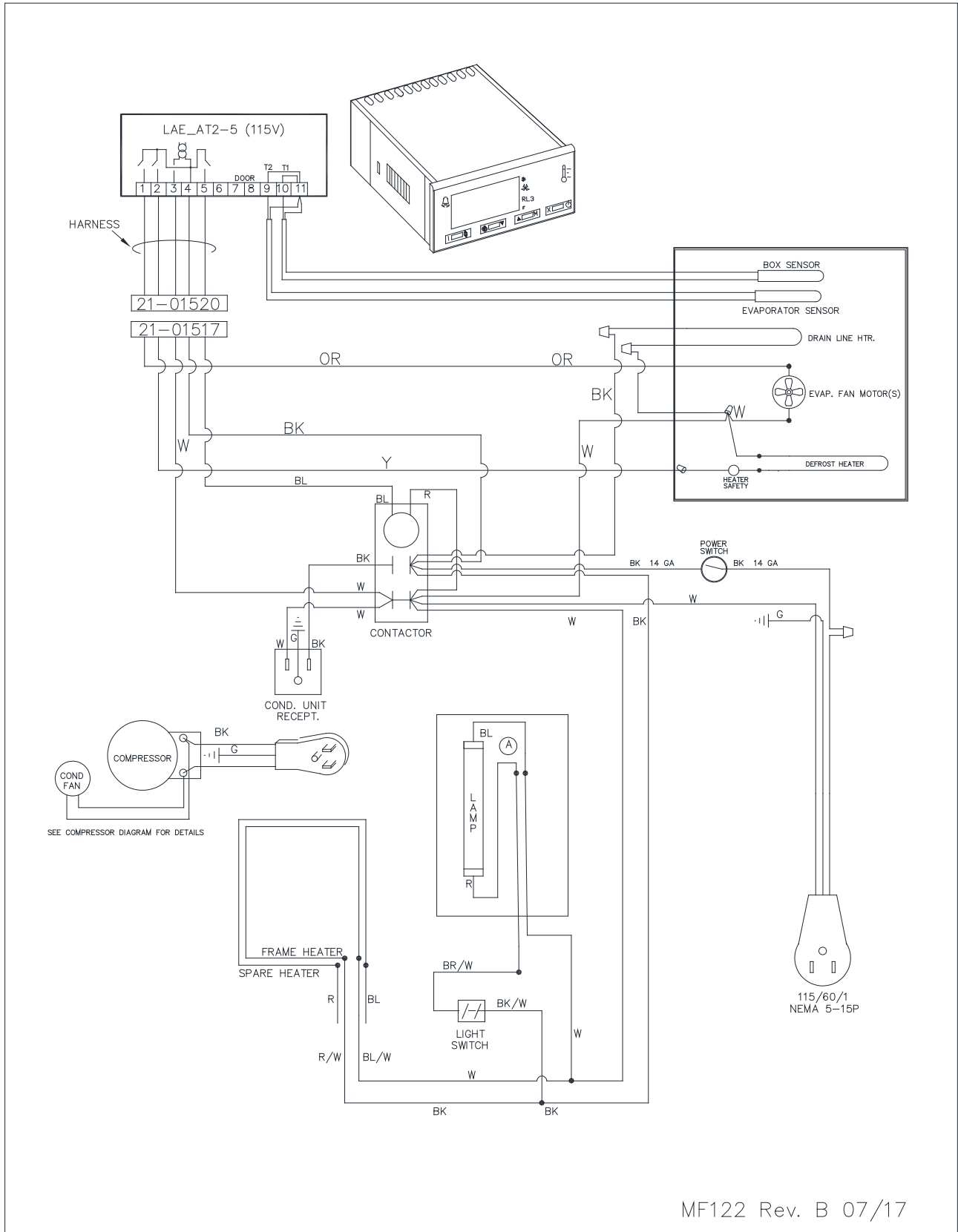
Description	MF122	Description	MF182
Coil Defrost Heater	166006	Coil Defrost Heater	166066
Compressor	166007	Compressor	166007
Condenser Coil	166008	Condenser Coil	166008
Condenser Fan Blade	149391	Condenser Fan Blade	149391
Condenser Fan Motor	159276	Condenser Fan Motor	159276
Cond. Fan Motor Bracket	166009	Cond. Fan Motor Bracket	166009
Contractor 115V	159277	Contractor 115V	159277
Front Grille	166010	Front Grille	166034
Rear Grille	166011	Rear Grille	166038
Door Gasket	166013	Door Gasket	166035
Door Hinge	166012	Door Hinge	166012
Drain Line Heater 115V	155698	Drain Line Heater 115V	155698
Drier	155743	Drier	155743
Door Handle	166014	Door Handle	166014
Electronic Controller 115V	166015	Electronic Controller 115V	166015
Box sensor (T1)	155747	Box sensor (T1)	155747
Evaporator Sensor (T2)	155748	Evaporator Sensor (T2)	155748
Evaporator Coil	166016	Evaporator Coil	166016
Evaporator Fan Guard	166017	Evaporator Fan Guard	166017
Evaporator Fan Motor	166018	Evaporator Fan Motor	166018
Expansion valve (FBSE-1/4-ZP-BP/05)	166019	Expansion valve (FBSE-1/4-ZP-BP/05)	166019
Self ballasted LED Lamp	166020	Self ballasted LED Lamp	166024
Front Glass	166021	Front Glass	166036
Heater Safety Control	149425	Heater Safety Control	149425
Lamp Switch (Toggle)	166022	Lamp Switch (Toggle)	166022
Leg Leveler, each 4 required	158718	Leg Leveler, each	158718
Pilaster 24"	166023	Shelf, Lower L.H	166032
Pilaster Clips	155760	Shelf, Upper L.H.	166033
Plastic Drain Assy	164650		164650
Power Cord	153740		153740
Rocker Switch	166037	Rocker Switch	166037
Shelf,	166031		
Caster Option (Set of (4) 2" Casters 1/2" x 13"Stud	143678	Caster Option (Set of (4) 2" Casters 1/2" x 13"Stud	143678

SALE AND DISPOSAL

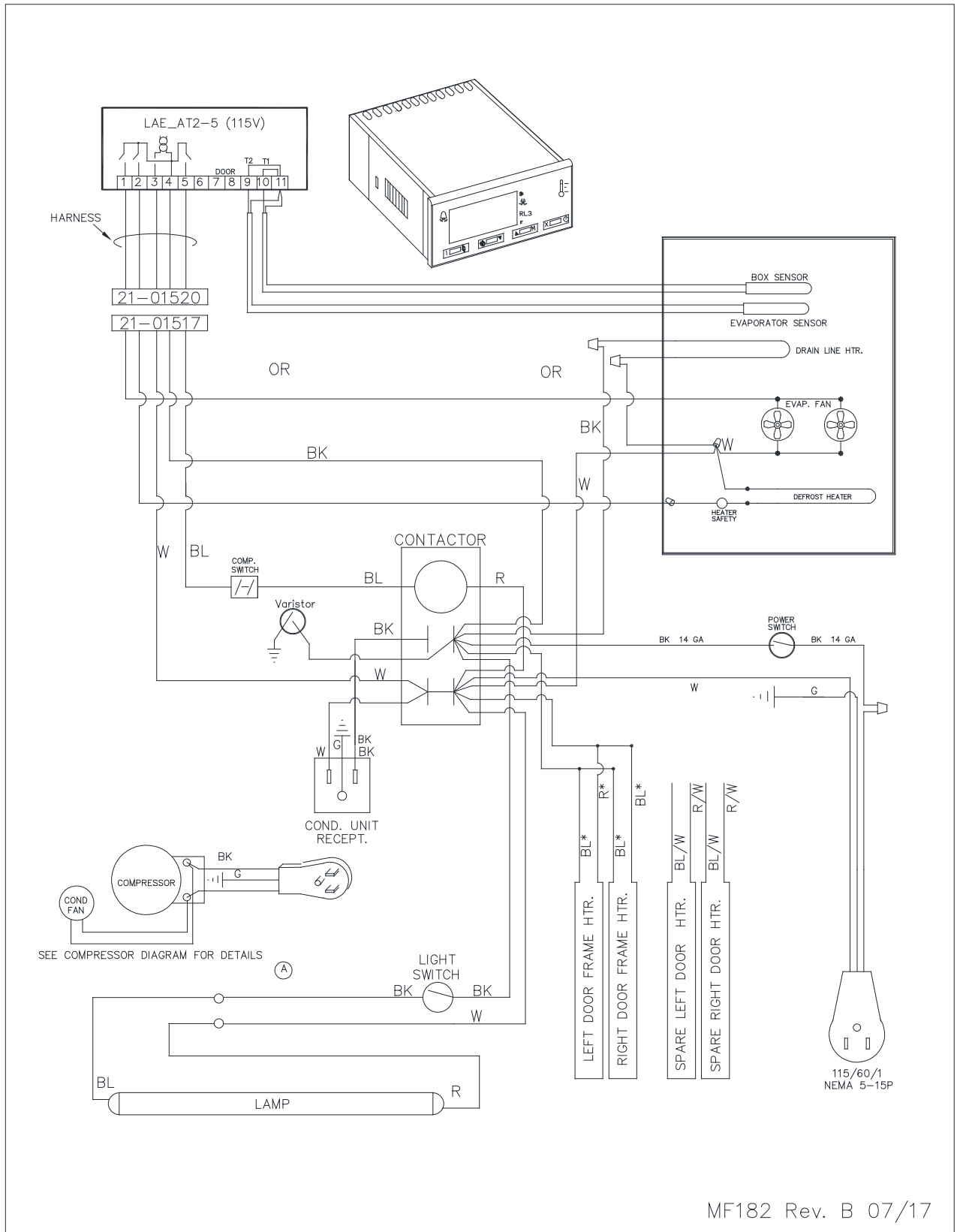
OWNER RESPONSIBILITY

If you sell or give away your cabinet you must make sure that all safety labels and the Installation - Service Manual are included with it. If you need replacement labels or manuals, the cabinet manufacturer will provide them for free.

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



MF122 Rev. B 07/17



MF182 Rev. B 07/17