

MB MASTER-BILT[®]

Refrigeration Solutions



IM-23-HGP

Installation & Operations Manual

LAE – AT2-5 Controller

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INTRODUCTION

Thank you for purchasing **Master-Bilt**[®] Ice Merchandiser IM-23-HGP. This manual contains important instructions for installing, using, cleaning, and servicing indoor Ice Merchandiser. A parts list is included with this manual. Read all documents carefully before installing or servicing your equipment.

STORE CONDITIONS

The Ice Merchandisers are designed to operate in a controlled environment. The temperature should be at 75°F or below for an indoor ice merchandiser, with relative humidity of 55% or less. At higher temperature or humidity conditions, the performance of these merchandisers may be affected and the capacity diminished.

The Ice Merchandiser should not be positioned where it is directly exposed to rays of the sun or near a direct source of radiant heat or airflow. This will adversely affect the ice merchandiser and will result in poor performance.

If this ice merchandiser is to be located against a wall, there should be at least 6" space between the wall and the back of the unit. This space will allow for the circulation of air behind the ice merchandiser, which will prevent condensation on the exterior surfaces.

WARNING LABELS AND SAFETY INSTRUCTIONS



This symbol is the safety-alert symbol. When you see this symbol on your ice merchandiser 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:

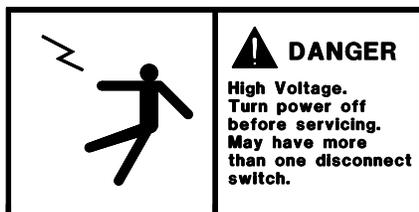
DANGER: Severe injury or death will occur if you ignore the message.

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 **Master-Bilt**[®] Products cabinet 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 attached on the cabinet back and in the machine compartment.



This label is located on the power cord.

NOTICE

Read this manual before installing, cleaning, or performing any maintenance on 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.

NEVER use an extension cord to power these units. 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, call or write us:

Customer Service Department
Master-Bilt Products
Highway 15 North
New Albany, MS 38652
Phone (800) 684-8988
Fax (866) 882-7629

GENERAL INSTRUCTIONS

1. Be sure the ice merchandiser is properly installed by competent service people.
2. Keep the ice merchandiser clean and sanitary so it will meet your local sanitation codes. Clean the unit with a mild detergent and water, then rinse.
3. Rotate your stock so that older stock does not accumulate.
4. Do not place product in the ice merchandiser when it is soft or partially thawed. Also, product should not be put in the ice merchandiser for at least 6 hours after it is started.
5. Stock ice merchandiser as quickly as possible, exposing only small quantities to condition temperatures for short periods of time.

NOTICE TO STORE OWNERS / MANAGERS

Moisture or liquid around or under the 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 the cabinet should be corrected immediately.

If moisture or liquid is observed around or under a **Master-Bilt**[®] Ice Merchandiser, an immediate investigation should be made by qualified personnel to determine the source of the moisture or liquid. The investigation should determine if the ice merchandiser is malfunctioning or if there is a drainpipe leaking.

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. Also insulate quick connects with pipe insulation to prevent condensation and/or ice accumulating.

The compressor is hermetic so it is internally spring mounted and ready to run.



ELECTRICAL



WARNING

Before servicing electrical components in the case or the doors or door frames make sure all power to case is off. Always use a qualified technician.

Check voltage and amps drawn on (Page 12-13) to determine proper line and fuse or circuit breaker size. Check power supply for low voltage. If voltage reads "115" with no load, and it drops below "100" when the compressor tries to start, it is an indication of too small supply wiring or too long to run.

It is recommended that a separate circuit be run for each ice merchandiser to prevent another appliance from blowing the fuse or breaker, causing loss of product.

MASTER-BILT® ELECTRONIC REFRIGERATION CONTROL

DESCRIPTION



Fig.1 — Front panel

- Info / Setpoint button.
- Manual defrost / Decrease button.

INDICATIONS

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

- Increase / manual activation button.
- Exit / Stand-by button.

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 constantly 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 4 defrost per day. The defrost scheme can be re-set the for special applications. During defrost the display will show dEF and the defrost LED indicator on. The control begins timing the defrost when power is turned on. Four defrost per day means it will occur every 6 hours. To have defrost occur at 8am, 2pm, 8pm, and 2am then power up at one of these four times.

MANUAL DEFROST

Defrosting may also be induced manually by keeping the defrost button 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	Master-Bilt® IM-23-HGP Setting
SP	Temperature Set Point	SPL...SPH	18°F
HYS	Temperature Differential	1 to 255°F	7°
SPL	Minimum Temperature limit setpoint	-50...SPH	16°F
SPH	Maximum Temperature limit setpoint	SPH...120°	50°F
AHA	High Temperature Alarm	-50...120°	32°F
ALA	Low Temperature Alarm	50...120°	0°F
ATD	Temperature Alarm Delay	0...120min	30min
DFR	Number of Defrost Cycle per 24hr	0...24	4
DLI	Defrost Termination Temperature	-50...120°	45
DTO	Maximum Defrost Duration	1...120min	30min

ELECTRICAL CONNECTIONS

The controller is provided with a 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, 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 damage due to casual liquid infiltration. It is recommended to place the thermostat probe at the warmest location of return 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.

SERVICE INSTRUCTIONS

1. High head pressure and high back pressure:
 - A. Condenser coil clogged or restricted
 - B. Condenser fan motor defective.
 - C. Air discharge in rear of cabinet restricted.
2. Low back pressure and low head pressure:
 - A. Restriction in system.
 - B. Refrigerant undercharged.
 - C. Leak in system
3. Pressure normal – cabinet warm:
 - A. Coil blocked with frost (see #4).
 - B. Refrigerant undercharged.
 - C. Control set too warm.
4. Ice merchandiser not cycling – coil blocked with frost:
 - A. Defective temperature controller, or improper settings.
 - B. Refrigerant overcharged.
 - C. Location too hot.
 - D. Condenser clogged.
 - E. Condenser fan motor defective.
 - F. For freezer, defrost heater not operating.
 - G. Air leakage into ice merchandiser due to open door or faulty door seal.
5. Compressor starts and runs – but cycles on overload:
 - A. Low voltage
 - B. Relay defective.
 - C. Overload defective.
 - D. High head pressure (see #1).

TROUBLE SHOOTING

Symptom-System Operates Long or Continuously		
Possible Problem	Possible Cause	Remedy
How Long do the doors stay open?	Door closer need adjust.	Adjust door closer and keep doors closed.
Is the condenser clean?	Dirty condenser.	Clean condenser
Are the condenser fans running?	Fans not running.	Repair or replace
Is the evaporator dirty or iced up?	Iced or plugged evaporator coil(s).	Defrost or clean (check control settings)
Are the evaporator fans running?	Fans not running.	Repair or replace
Have you checked the refrigerant level?	Shortage of refrigerant.	Repair leak and recharge.
Is there air or other non-condensables in the system?	Non-condensables in the system	Evacuate and recharge.
Are all controls functioning properly?	Control contacts or error codes.	Repair or adjust the control.
Checked expansion valve for Freezers?	Improper controls adjusted.	Clean or replace.
What is Evaporator Superheat?	Evaporator Superheat too high.	Adjust expansion valve to lower Superheat setting.
Where is condensing Unit located?	Location too warm. Air leaks or doors	Ventilate area or change to cooler location.
Is Box well sealed from air penetrations?	Wall panels not locked or wall penetrations not sealed.	Seal leaks, adjust doors or replace.
Is system capacity sufficient for product load?	Product load greater than system capacity.	add additional units or replace.

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 condensing unit for vibrating or rubbing tubing. Dampen and clamp as required.
- E. Replace all service valve caps and latch unit covers.
- F. Check that evaporator fan runs after initial pull down.

CABINET CLEANING PROCEDURES



WARNING!

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

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

To clean the interior of the ice merchandiser, the condensing unit and power to the merchandiser fans and heaters 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, etc. should be removed and cleaned separately.

The interior (as well as the exterior) of the ice merchandiser may be cleaned with a germicidal detergent at the manufacturer's recommended concentration. **Do not use any ammonia-based products as this may damage the electrical components in the unit.** 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. Remove only the necessary mechanical parts to access the evaporator coil and fan housing. 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, ballasts, 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. The condenser should be brushed with a plastic bristled brush. For dust or dirt that has accumulated deep inside the condenser, use compressed air to blow the dirt through the 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, fans, and heaters.

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.

ICE MERCHANDISER MONTHLY CHECKLIST

1. Check condenser coil, clean if necessary.
2. Check service valves for leaks evident by oil traces.
3. Check for obstruction restricting air flow over the evaporator coil and the condenser coil. Insure that the air intake is not obstructed.
4. Check for excessive noise.
5. Check for proper temperature, adjust if necessary.
6. Check door gaskets for proper seal against cabinet.
7. Check doors for self closing, adjust tension if necessary.
6. Check for proper operation sequence in normal refrigeration cycle and defrost cycle

PARTS LIST

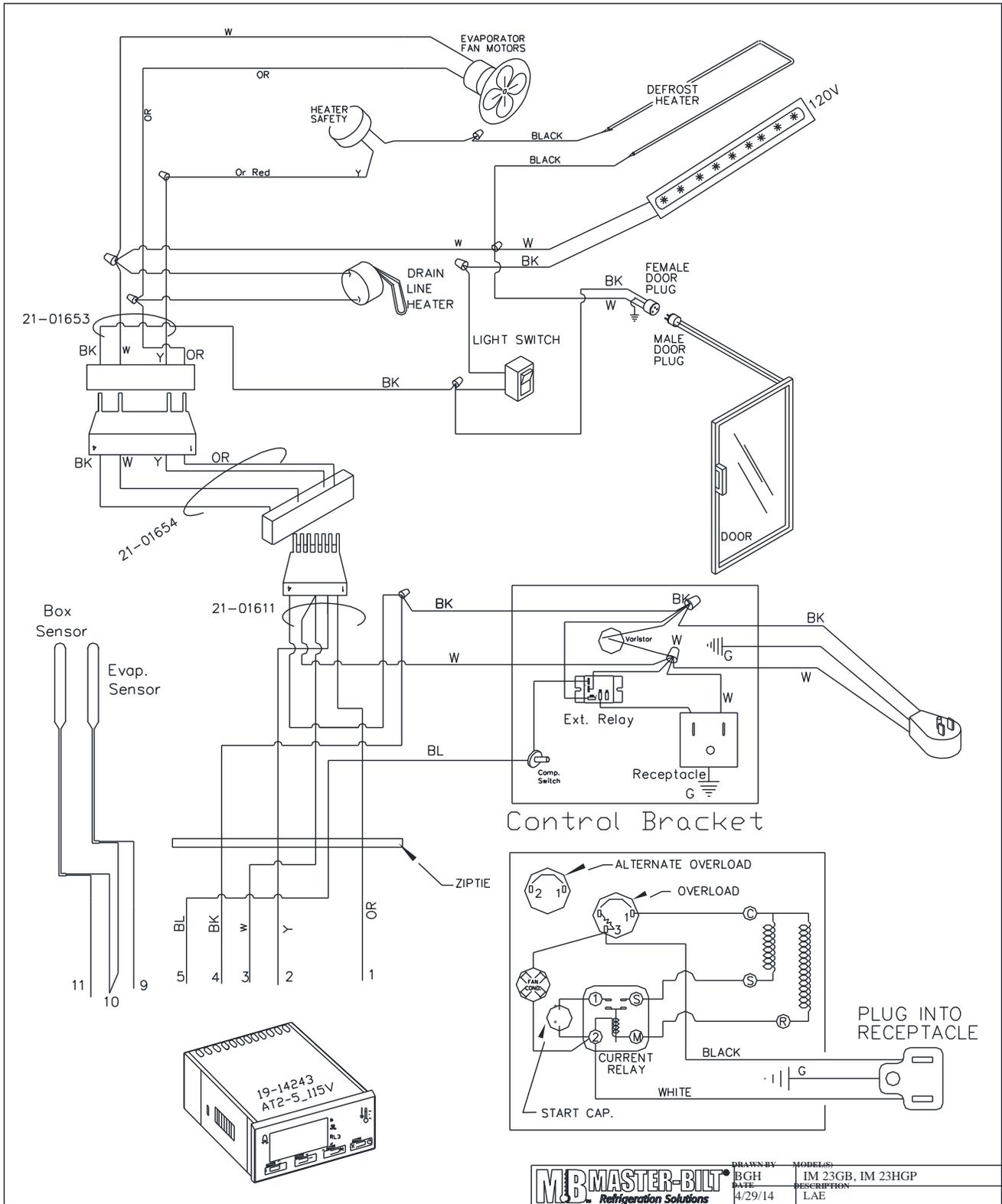
PART DESCRIPTION	IM-23-HGP
Condensing unit/1st run units	452-600Y
Compressor (AE4440Y-AA1ASK)	01-01877
Light Switch	23-50793
LED light bar (white=WS, black=BS)	478-1276-WS
LED bracket	23-01841
LED	23-01886
evaporator coil	07-14083
evaporator fan motor	13-13181
evaporator fan blade	15-13106
evaporator fan guard	25-01377
Wall Gard	25-01380
drain flanges with adapter	11-01895
drain line heater wire	17-00404
heater clip	17-09431
drier	09-09864
grill assembly (white=WS, black=BS)	486-280-WS
cap tube	11-01450
heater safety	19-01164
vinyl tube	11-00876
coil defrost heater	17-09568
electronic controller	19-14243
cabinet sensor T1	19-14244
evaporator sensors T2	19-14245
glass door (LH)	31-03331
leg leveler	27-00592
condensate pan	458-4501-SC
toggle switch	19-13118
condensate pan clip	21-01284
rear grille	456-2811-GH
Cap tube	11-01306

SALE AND DISPOSAL

OWNER RESPONSIBILITY

If you sell or give away your **Master-Bilt**[®] Ice Merchandiser you must make sure that all safety labels and the Installation - Service Manual are included with it. If you need replacement labels or manuals, **Master-Bilt** will provide them free. Contact the customer service department at **Master-Bilt** at **(800)-647-1284**.

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



MB MASTER-BILT Refrigeration Solutions	DRAWN BY: BGH	MODEL(S): IM 23GB, IM 23GHP
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