

OPERATION and CARE MANUAL



Mobile Refrigerated Cart

Models: 1000-MR1

1000-MR2



COOK/HOLD/SERVE SYSTEMS

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Alto-Shaam Mobile Refrigerated Carts

1.0 INTRODUCTION

This technical manual provides information on the installation, operation, maintenance, and inspection of this unit. A complete parts breakdown is provided.

1.1 EQUIPMENT DESCRIPTION

The unit consists of the following:

Storage Compartment: The insulated food storage compartment is clear storage area. Included in this area are the adjustable shelves and cooling coil.

Doors: Access to the storage compartment is through a hinged-mounted insulated door.

Condensing Unit Compartment: This area contains the condensing unit along with the necessary controls.

Evaporator Coil: The evaporator coil is located in the storage compartment and is responsible for distributing the cold air associated with the refrigeration system.

Cabinet: The cabinet is the enclosure in which all of the above items are housed.

1.2 EQUIPMENT SUPPLIED

The unit is shipped from the factory fully assembled except the adjustable shelving that will require positioning on the side racks. The complete assembly is palletized and crated to reduce the possibility of damage in shipping and storage.

1.3 LEADING PARTICULARS

Refrigerant: 134a

Electrical:

1000-MR1

115VAC
60 Hz, 1ø
8.7 Amps



NEMA 5-15P
15A, 125V Plug

220-240VAC
50 Hz, 1ø
4.4 Amps



NEMA 6-15P
15A, 250V Plug

Weight:

Net 410 lb (186 kg)
Shipping 671 lb (304kg)

1000-MR2

115VAC
60 Hz, 1ø
10.8 Amps



NEMA 5-15P
15A, 125V Plug

220-240VA
50 Hz, 1ø
6.3 Amps



NEMA 6-15P
15A, 250V Plug

800 lb (363kg)
1210 lb (549kg)

2.0 FUNCTIONAL DESCRIPTION

This unit is a self-contained, automatically controlled, continuous duty perishable food storage system. It is designed with the intent and purpose of storing cold food items. The operating temperature is automatically monitored by controls that are factory-set to maintain a predetermined, adequate condition.

The unit consists of two basic compartment assemblies:

- Condensing Unit Compartment* which includes the condensing unit, the electrical control panel with power switch and terminal box, and a heated condensation evaporator.
- Storage Compartment* which consists of the insulated clear storage area for perishable food items requiring a temperature range of 37° to 40°F (3° to 4°C). The clear storage area includes adjustable shelving.

2.1 SYSTEM OPERATION

The primary focus for the design of the refrigerated cabinet is for the safe storage of food products which require refrigeration. Considerable engineering attention was placed on the qualities of function and serviceability.

The refrigeration system is a closed loop system. Unless the system develops a leak, adding additional refrigerant is not necessary.

3.0 START-UP PROCEDURE

The refrigeration system is completely factory-assembled, precharged and ready for operation. The control has been set to display temperature in degrees Fahrenheit or degrees Celsius as specified on the original order.

To energize the system, it is only necessary to locate the power supply cord and connect it to a proper electrical supply source. Once the supply cord has been connected to a power source, the unit can be started by switching the power control switch to the "ON" position.

3.1 SHUT-DOWN PROCEDURE

To shut-down, place the power control in the "OFF" position and open the door to allow the cabinet interior temperature to equalize with the room temperature.

Use a mild detergent diluted in warm water to wash the interior and exterior surfaces of the cabinet.

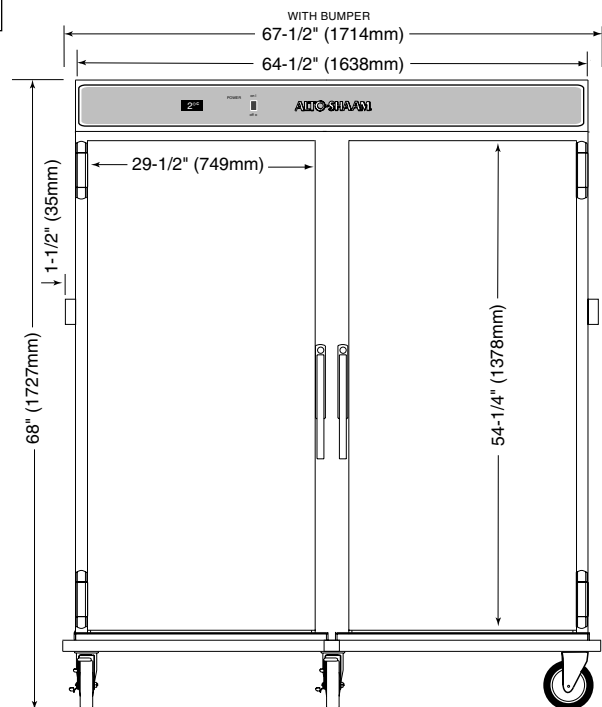
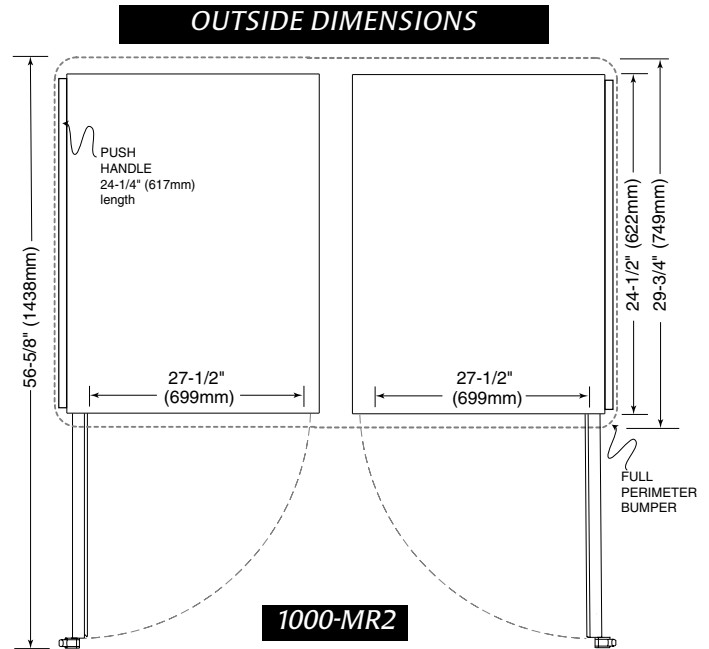
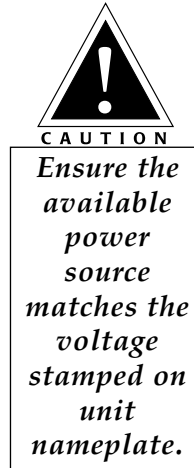
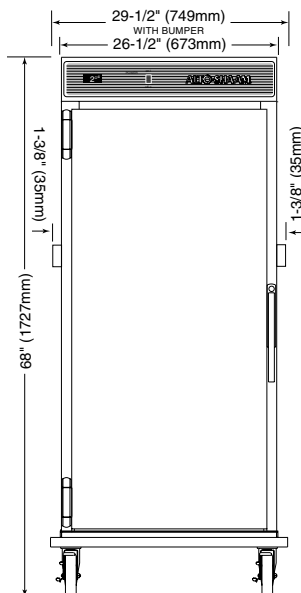
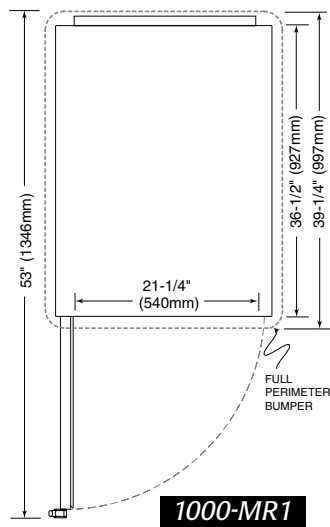
PROCEDURES

CONTROLS AND INDICATORS		
NAME	TYPE	FUNCTION
Thermostat	Contact Points	Cycles the refrigeration system (automatic)
Suction Valve	Service Valve	Isolate suction at the compressor.
Discharge Valve	Service Valve	Isolate discharge at the receiver.
Power Control Switch (ON/OFF)	Contact Points	Terminates power to the unit.
LCD Display		Indicates continuous cabinet temperature.

START-UP PROCEDURE	
OPERATION	RESULTS
Activate system by inserting electrical service cord into electrical supply source. Turn power switch to the "ON" position.	The compressor should immediately come on-line and the condenser fan and evaporator fan activate.
With the door closed and the storage area empty of product, wait for a period of 1 hour.	The temperature in the storage area will begin to decrease.
Verify correct operating temperature. Begin stocking the containment area when the proper operating temperature has been reached.	Cabinet will have reached the proper operating temperature of 36°F ±3°F (2°C, ±1°C).

3.3 EXTENDED PERIOD OF INACTIVITY

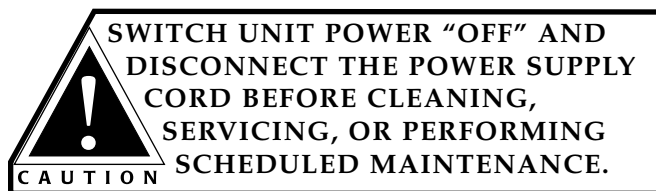
This unit is designed for continued use at automatically cycled intervals. In case of an extended shut-down, the food storage compartment must be cleaned and wiped dry to minimize the potential of odor build-up during shutdown.



4.0 OPERATING PROCEDURES

The purpose of this mobile refrigerator is to maintain cold foods at proper serving temperatures. The unit should be used for the intended purpose only.

- a. Adjust the position of the shelves to accommodate required storage needs.
- b. Switch the power to the "ON" position.
- c. Prechill the cabinet to the full, factory preset temperature of 36°F ±3°F (2°C).
- d. ***Load the refrigerator with chilled foods only.*** Before loading, use a food thermometer to make certain all products are at a temperature of 41°F (5°C) maximum or less. Cover foods to reduce moisture build-up on the inside wall of the cabinet. To maintain the proper refrigerated food temperature, open the door only when necessary. The mobile refrigerator door may be locked if required.



5.0 CLEANING and MAINTENANCE

A thorough, periodic maintenance schedule is required to ensure the longest and most trouble free operation. Maintenance schedules should be aimed at maximizing the efficient use of maintenance personnel, reducing down-time, and providing the orderly acquisition of spare parts support.

5.1 CLEANING

Follow appropriate state and local health (hygiene) regulations regarding all applicable cleaning and sanitation requirements for food service equipment.



DAILY:

Wipe all spills at once.

WEEKLY:

- a. Remove the wire shelves and side-rack shelf supports. Clean these items separately using a mild, non-abrasive detergent and soft cloth.
- b. With a mild, non-abrasive detergent and water, use a soft cloth to wipe the interior liner of the storage compartment. Begin at the top and work down. Wipe the gasket surrounding the storage compartment opening.
- c. Using a mild detergent and water, wipe the vinyl door gasket. Make certain to wipe under the gasket to remove any mildew or residue.
- d. Wipe interior surfaces with a clean cloth and sanitizing solution for use on metal and vinyl food contact surfaces. This is an important step to control the build-up of unwanted mildew and mold on the evaporator coil and fan.
- e. Vacuum right, left and back panel grill vents to maintain maximum air flow.
- e. Wipe the exterior of the unit with a mild detergent and water. Always wipe with the grain of the stainless steel to prevent scratching the finish.

6.0 MAINTENANCE

Remember to de-energize the unit by switching the toggle switch located on the control panel to the "OFF" position.

Disconnect the unit from the power source.

6.1 MONTHLY INSPECTION & SERVICE

CHECK THE INLET AND OUTLET ENDS OF THE DRAIN LINE to make certain there are no obstructions. If an obstruction is found:

Use compressed air to unblock an obstructed drain line in a forced air evaporator model. Remove the drain line at the evaporator coil and attach an air line using 60 pounds of pressure. *The use of chemicals to clear a clogged drain is not recommended.*

6.2 YEARLY INSPECTION & SERVICE

1. INSPECT THE DOOR GASKET for cracks, splits, and dryness.
2. INSPECT THE MOVING PARTS OF THE DOOR LATCH assembly for signs of wear. Check the screw tightness on both latch and strike.
3. CHECK THE HINGES by opening the door to a 90-degree angle to the cabinet. With minimum pressure, lift up on the outer edge of the door. Replace the hinges if there is an upward movement of 1/2-inch (12,7mm) or more.

6.3 THERMOSTAT ADJUSTMENT

Before making any adjustment to the thermostat, check the door gasket for proper seal. Proper adjustment can be tested by pulling a dollar bill through the gasket seal and feeling a slight resistance. If it is determined a proper seal is maintained around the full perimeter of the gasket, a thermostat adjustment may be necessary.

1. Remove all shelves and remove the left-hand side rack.
2. Remove the interior back wall of the unit by lifting up and out.

3. The thermostat is located behind the back wall in the upper left corner of the unit and is clearly marked for adjustment purposes. To adjust the temperature, turn the thermostat counter-clockwise one or two increments for colder operation. Turn the thermostat clockwise one or two increments for warmer operation. To avoid an unsafe temperature or freezing, make small adjustments only.
4. Replace back wall, side rack and wire shelves. Close the cabinet door and allow the unit to operate without interruption for a period of one hour.
5. At the end of one hour, check the temperature in the display. Repeat adjustment as necessary.

6.4 CONDENSER FAN & MOTOR REPLACEMENT

1. Disconnect all electrical power to the unit.
2. Remove the ventilation grill. Lift the grill vertically 1-inch (25mm) while pulling out on the bottom and lowering the grill from the retainer angles.
3. Remove the mounting bolts on the condensing unit base and slide the refrigeration assembly out.
4. Remove the protective shroud from around the motor.
5. Remove the mounting screws at the motor base.
6. Using an allen wrench, loosen the set screw on the blade hub and slide blade from the shaft.
7. Install the new condenser fan by reversing the process.
8. Install the motor by reversing the process.

6.6 DOOR HANDLE REPLACEMENT

NOTE: It may be necessary to remove the handle assembly in order to get the cabinet through a door opening.

1. Remove the three side mounting screws in latch.
2. Remove two screws in strike.
3. Replace in reverse order.

6.7 DOOR GASKET REPLACEMENT

NOTE: It is suggested that the door be removed from the cabinet and placed face down on a work table.

1. Remove the fasteners and pull old gasket from the retainer.
2. Clean gasket retainer and immediate area.
3. Start new gasket into retainer. After gasket is positioned, replace fasteners.

NOTE: Avoid cutting the gasket if possible.

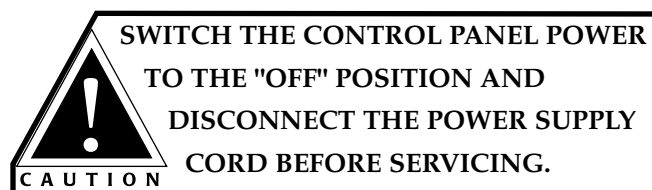
6.8 DOOR HINGE REPLACEMENT

NOTE: This procedure will require two people. One person to hold the door while the other removes the attachment screws.

1. Using a screwdriver, remove the three screws which attach the butt section of the hinges to the cabinet.
2. With the door detached from the cabinet, remove the screws which attach the second part of the hinge to the door.
3. To install the replacement hinge, reverse the process.

6.8 POWER SWITCH REPLACEMENT

1. Disconnect the unit from the power source.
2. Remove the silicone seal around the perimeter of the front control leader panel. Remove the panel by lifting straight up.
3. Using a flat blade screwdriver, remove the cover plate with switch attached.
4. Remove the wires connected to the switch.
5. Unscrew the lock washer and remove the switch.
6. Reverse the process to install the new switch.
7. Remount panel and reseal with silicone.



CORRECTIVE MAINTENANCE TROUBLESHOOTING GUIDE

SYMPTOM	POSSIBLE FAILURE	REMEDY
Unit does not cool.	Blown fuse. Bad connection at supply cord. Ill-fitting gasket. Low refrigerant.	Replace fuse. Check supply cord at outlet. Tighten strike on door latch. Check system for leaks and recharge.
Unit does not operate.	Control failure. Blown fuse. Incorrect voltage. Bad connection at supply cord. Failed compressor.	Adjust control or replace. Replace fuse. Correct. Replace or repair. Replace.
Unit runs continuously.	Low on refrigerant. Control failure. Bad TXV bulb contact. Restricted air flow or dirty condenser coil. Bad condenser fan motor. Expansion valve stuck open. Compressor failure. Ineffective door seal. Air circulation in storage restricted.	Leak-check system and recharge. Adjust control or replace. Check and secure TXV bulb to suction line. Rectify air flow problem and clean condenser. Check and replace if necessary. Replace. Replace. Adjust door strike. Redistribute food for even air flow.
Low head pressure.	Defective compressor. Low refrigerant. Ambient temperature too low.	Replace. Leak-check system and recharge. Raise room temperature.
High head pressure.	Blocked or dirty condenser. Ambient temperature too high. System contains air. Refrigerant overcharge.	Clean and remove any obstructions. Improve room temperature. Evacuate, change the filter dryer and recharge. Reduce refrigerant in the system.
Short cycling.	Maladjusted control.	Adjust control.

This chart is provided for the assistance of qualified technicians only and is not intended for use by untrained or unauthorized service personnel.



**SWITCH THE CONTROL PANEL POWER
TO THE "OFF" POSITION AND
DISCONNECT THE POWER SUPPLY
CORD BEFORE SERVICING.**

SERVICE



The components addressed in the section are considered acceptable for repair using standard procedures. The skill level required to perform these repairs vary. Some require specific training and are not intended for use by untrained or unauthorized service personnel.

Procedures requiring refrigerant handling require certification.

If your unit is not operating properly contact Alto-Shaam® for the nearest authorized service agent. These are the only service agents the company will authorize to repair Alto-Shaam® units. Repairs made by any other service agents without prior authorization by Alto-Shaam® will void the warranty on the unit.



FEDERAL LAWS REQUIRE PROPER HANDLING AND DISPOSAL OF REFRIGERANT.

IT IS UNLAWFUL TO VENT ANY REFRIGERANT INTO THE ATMOSPHERE

Alto-Shaam, Inc. urges all individuals responsible for training, teaching or advising installation mechanics and service personnel to emphasize proper handling and charging techniques and strict adherence to limiting refrigerant charge amount to those specifically recommended by the manufacturers of refrigeration, air conditioning or heat-pump systems.

7.0 REFRIGERANT LEAK

With the unit in a cooling cycle, use a flashlight to locate the liquid refrigerant sight glass. If the compressor has been operating for three minutes, no visible bubbles should appear within the sight glass. If bubbles appear in the sight glass, it will be necessary to determine if there is a refrigerant leak.

1. Make certain the unit is switched off and the power cord is disconnected. Using a halide or electronic leak detector, check all fittings and connections for a leak.
2. If a leak is found on a flared fitting, it can often be repaired by tightening the brass flare nut a quarter of a turn. If this does not resolve the problem, it may be necessary to reflare the tubing.
3. If a leak is found on a brazed joint, it will be necessary to pump-down the system refrigerant charge to repair the leak(s).

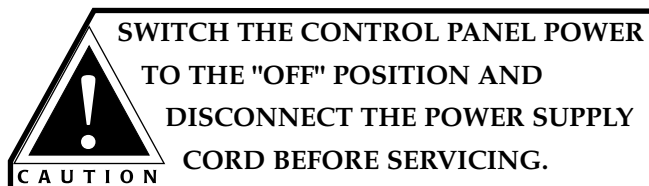
Connect service gauges to the system at the suction valve (ON THE COMPRESSOR) and liquid valve (ON THE RECEIVER) to pump the refrigerant into the receiver. To avoid contamination, purge the gauges

before opening the system valves. Front seat the liquid or high-pressure receiver valve to the maximum extent to prevent refrigerant from exiting the receiver. Start the unit and allow it to operate until the suction or low pressure gauge indicates 5 pounds. When 5 pounds is indicated, close the suction valve, de-energize the system and repair the leak(s).

7.1 EXPANSION VALVE REPLACEMENT

1. Shut liquid valve and run compressor until it pumps refrigerant into receiver (low-side service gauge will read 0 pounds). Close the suction line valve.
2. Disconnect the sensor bulb on the suction line.
3. Disconnect the 3/8" (9,5mm) liquid line along with the 5/8" (16mm) suction line. Remove valve.
4. Install new valve. Reconnect lines and refasten sensor bulb.

NOTE: The super-heat valve is preset at the factory, therefore, adjustment is NOT recommended.



SWITCH THE CONTROL PANEL POWER TO THE "OFF" POSITION AND DISCONNECT THE POWER SUPPLY CORD BEFORE SERVICING.

7.2 LOW PRESSURE CONTROL REPLACEMENT

1. Disconnect the unit from the power source.
2. Remove the control cover and disconnect the electrical terminals.
3. Disconnect the capillary tube.
4. Remove mounting fasteners from the control base and install a new control by reversing the procedure.

NOTE: The cabinet temperature (37° to 40°F — 3° to 4°C) is regulated by system pressure rather than actual cabinet compartment temperature.

5. To adjust the control, attach the service manifold to the suction. Discharge the valves by slightly opening one-fourth to one-half turn to all the gauges to clear.
6. Coarse-adjust the control with a standard screwdriver by turning the adjustment screws located on the top of the control. Preset the cut-in and cut-out at 68-pounds and 38-pounds, respectively.
7. Start the system. Allow the system to operate for 5 minutes. Monitor the low-side pressure. Fine adjustments will be required to achieve the required cycling pressures.

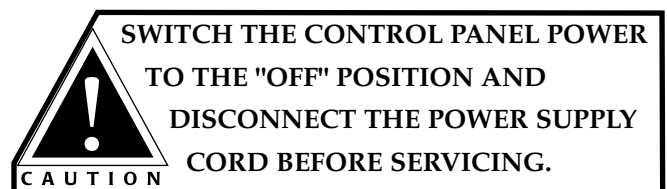
NOTE: The control adjustment process can be accelerated by running the suction valve *in* or *out* as required to effectively change the pressures.

7.3 FILTER DRYER REPLACEMENT

1. Close liquid line valve and run compressor until the low-side refrigeration gauge indicates 0 pounds. Close suction valve.
2. Remove filter dryer from system and replace with new dryer.
3. Purge system and add refrigerant if needed.

7.4 CHARGING THE REFRIGERATION SYSTEM

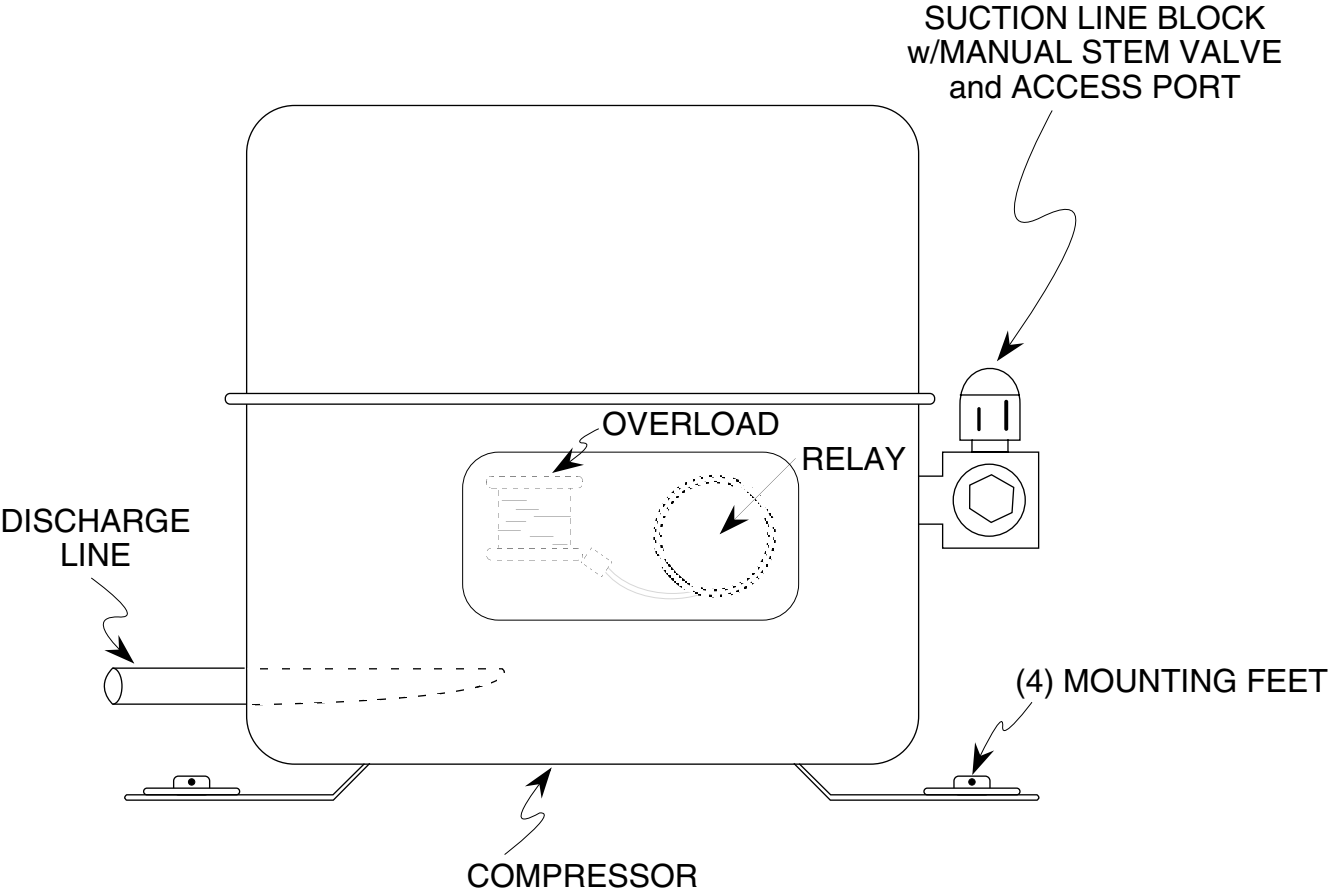
1. Connect service gauges to the suction and discharge service valves and open valves one full turn.
2. If the system is slightly pressurized, open both manifold gauge valves and purge the service gauge lines.
3. With manifold gauge valves closed, start the refrigeration system.
4. Attach a drum of 134a refrigerant to the suction service-side of the manifold gauges and add refrigerant through the suction side until the liquid sight glass is clear of bubbles.



Service Parts

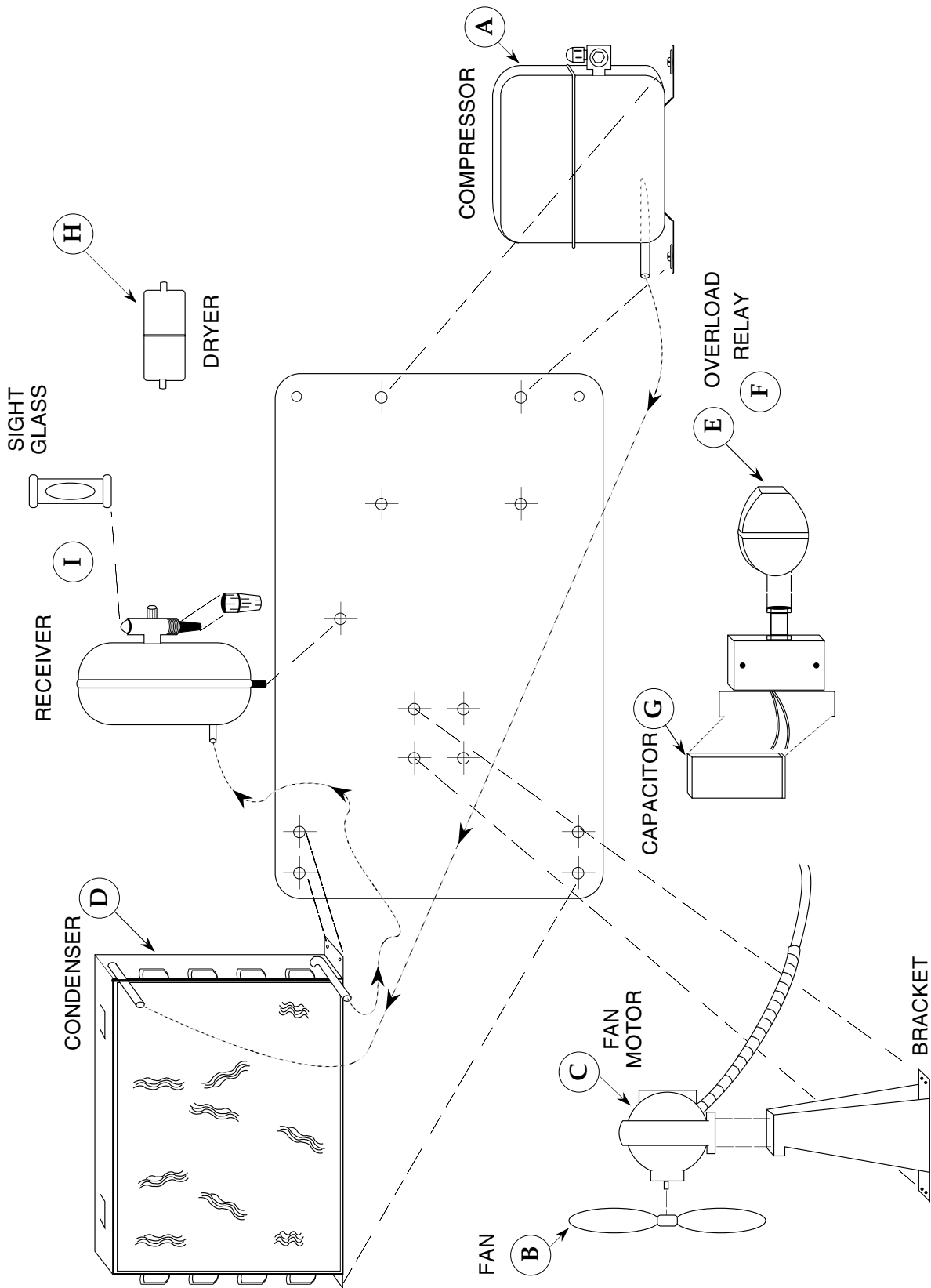
MR1				MR2				MR1				MR2					
DESCRIPTION		QUANTITY		PART NUMBER		DESCRIPTION		QUANTITY		PART NUMBER		DESCRIPTION		QUANTITY		PART NUMBER	
Caster, 6" (152mm), Rigid		2		2		CS-2042		Handle, Push		2		2		HD-2861			
Caster, 6" (152mm), Swivel w/Brake		2		4		CS-2231		Mullion Heater #1		- 115V		2		L1HR161			
Compressor		- 115V		1		RUT451				- 115V		1		L1HR149			
		- 115V		1		RUT271				- 220V		1		L2HR149			
		- 220V		1		CONTACT FACTORY		Overload		- 115V		1		CONTACT FACTORY			
Condensor		- 115V		1		RWCD37				- 115V		1		RWOVL17			
		- 115V		1		RWCD17				- 220V		1		CONTACT FACTORY			
		- 220V		1		CONTACT FACTORY		Power Control Switch		1		1		LRLS05			
Condenser Fan Blade		- 115V		1		RWFB08		Pressure Control		1		1		RWPL01			
		- 115V		1		RWFB20		Receiver		1				RWRT04			
		- 220V		1		CONTACT FACTORY						1		RWRT20			
Condenser Fan Motor		- 115V		1		RWCM24		Relay		- 115V		1		RWRLY02			
		- 115V		1		RWCM05				- 115V		1		RWRLY21			
		- 220V		1		CONTACT FACTORY				- 220V		1		CONTACT FACTORY			
Condensing Unit		- 115V		1		RUT440		Shelf #1		3				SEN21X27			
		- 115V		1		RUT270						6		SEN26BX21C			
		- 220V		1		RUX550		Shelf #2		1				SEN21X20			
Condensing Drip Pan				1		RWCE01		Side Racks		2				RWSG-1			
Door, Right-Hand		1		1		MRDB60SPL		Sight Glass		1		1		RWSG01			
Door, Left-Hand		N/A		1		MRDB60SPR		Start/Capacitor		- 115V		1		RWCP33			
Door Handle Sleeve		1		1		SL-2642				- 115V		1		RWCP48			
Door Hinge		2		4		HXHE02				- 220V		1		CONTACT FACTORY			
Door Latch Handle		1		2		HXLH06		Run Capacitor		- 115V		1		N/A		CONTACT FACTORY	
Door Lock, Key Set		2		2		LK-22567				- 220V		1		CONTACT FACTORY			
Evaporator Coil		1		1		RWE021		Terminal Box Assembly		1		1		LH053			
Evaporator Fan		1		2		RWFB02		Thermostat, Degrees Fahrenheit		1		1		RWTT15			
Evaporator Motor		115V		1		LWEM18		Thermostat, Degrees Celsius		1		1		CONTACT FACTORY			
		115V		2		LWEM18		Transformer		1		1		CONTACT FACTORY			
		220V		1		LWEM16		Thermometer		1				RWTM04			
Expansion Valve		1		1		RWEV24						1		RWE03			
Filter Dryer		1		1		RWFD02		Breaker Kit		1		1		MRBA60V2			
Fuse, 220V		1		1		CONTACT FACTORY											
Gasket		- 115V		2		GRC02MV											
		- 115V		1		GRC01MV											
		- 220V		1		GRC01V											

Parts Identification

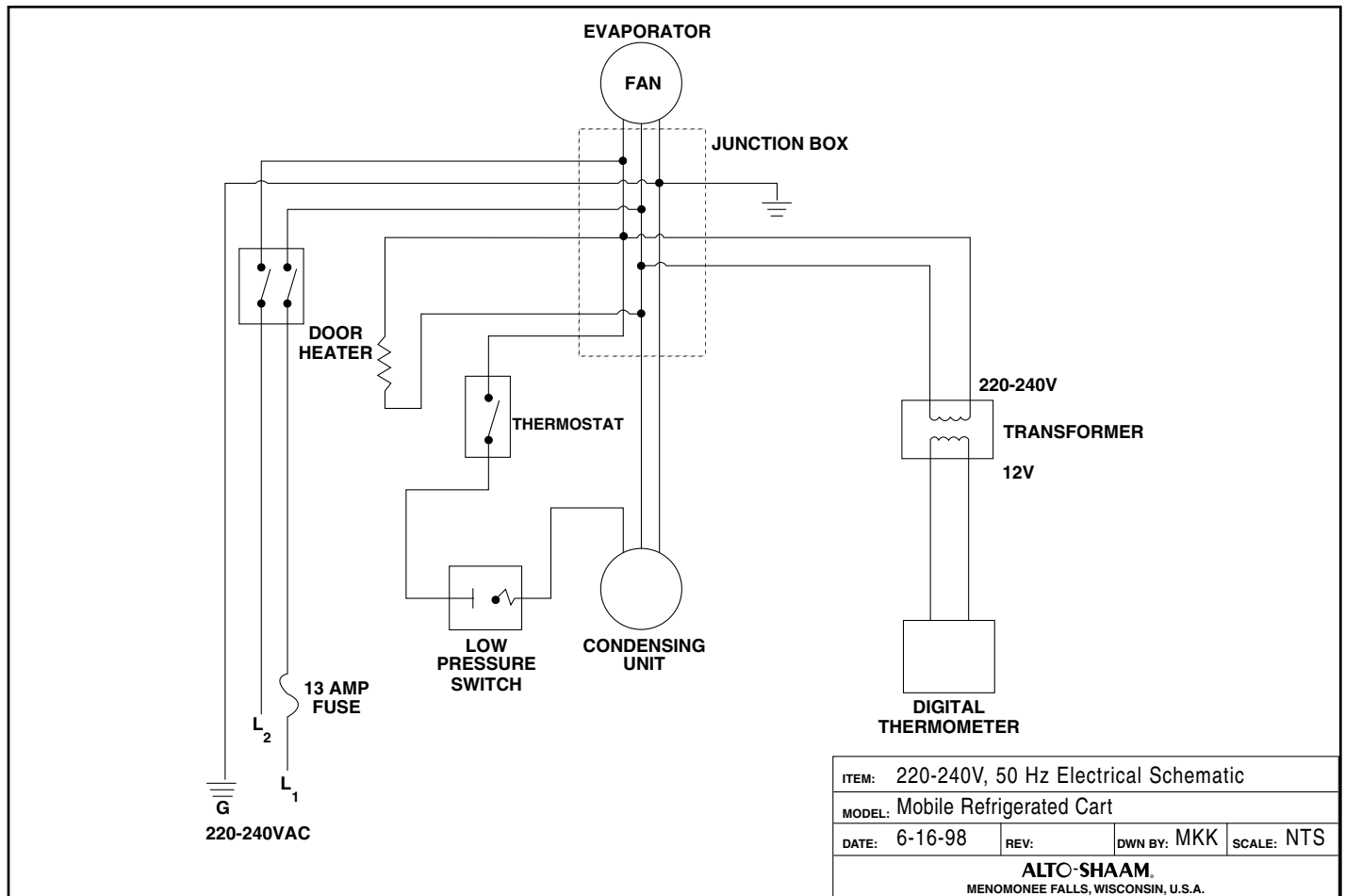
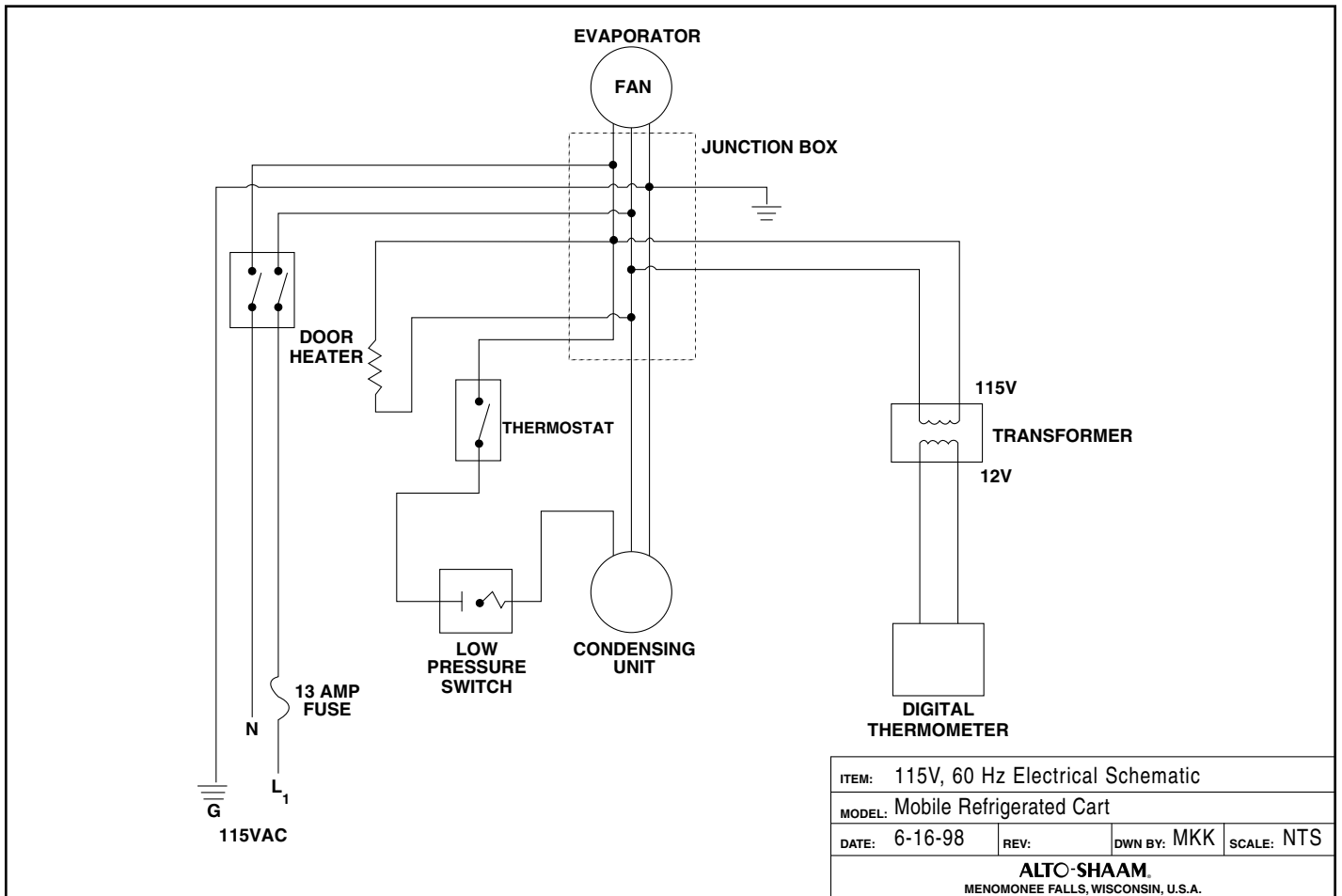


ITEM: Compressor			
MODEL: Mobile Refrigerated Cart			
DATE: 5-07-93	REV:	DWN BY: MKK	SCALE: NTS
ALTO-SHAAM® MENOMONEE FALLS, WISCONSIN, U.S.A.			

Parts Identification



ITEM: Condensing Unit Detail			
MODEL: Mobile Refrigerated Cart			
DATE: 5-06-93	REV:	DWN BY: MKK	SCALE: NTS
ALTO-SHAAM. MENOMONEE FALLS, WISCONSIN, U.S.A.			



TRANSPORTATION DAMAGE and CLAIMS



All Alto-Shaam equipment is sold F.O.B. shipping point, and when accepted by the carrier, such shipments become the property of the consignee.

Should damage occur in shipment, it is a matter between the carrier and the consignee. In such cases, the carrier is assumed to be responsible for the safe delivery of the merchandise, unless negligence can be established on the part of the shipper.

1. Make an immediate inspection while the equipment is still in the truck or immediately after it is moved to the receiving area. Do not wait until after the material is moved to a storage area.
2. Do not sign a delivery receipt or a freight bill until you have made a proper count and inspection of all merchandise received.
3. Note all damage to packages directly on the carrier's delivery receipt.
4. Make certain the driver signs this receipt. If he refuses to sign, make a notation of this refusal on the receipt.
5. If the driver refuses to allow inspection, write the following on the delivery receipt:
Driver refuses to allow inspection of containers for visible damage.
6. Telephone the carrier's office immediately upon finding damage, and request an inspection. Mail a written confirmation of the time, date, and the person called.
7. Save any packages and packing material for further inspection by the carrier.
8. Promptly file a written claim with the carrier and attach *copies* of all supporting paperwork.

We will continue our policy of assisting our customers in collecting claims which have been properly filed and actively pursued. We cannot, however, file any damage claims for you, assume the responsibility of any claims, or accept deductions in payment for such claims.

ALTO-SHAAM® LIMITED WARRANTY

Alto-Shaam, Inc. warrants to the original purchaser that any original part that is found to be defective in material or workmanship will, at our option, subject to provisions hereinafter stated, be replaced with a new or rebuilt part.

The labor warranty remains in effect one (1) year from installation or fifteen (15) months from the shipping date, whichever occurs first.

The parts warranty remains in effect one (1) year from installation or fifteen (15) months from the shipping date, whichever occurs first.

Exceptions to the one year part warranty period are as listed:

- A. Halo Heat cook/hold ovens include a five (5) year parts warranty on the heating element. Labor will be covered under the terms of the standard warranty period of one (1) year or fifteen (15) months.
- B. Alto-Shaam Quickchillers include a five (5) year parts warranty on the refrigeration compressor. Labor will be covered under the terms of the standard warranty period of one (1) year or fifteen (15) months.

This warranty does not apply to:

1. Calibration
2. Replacement of light bulbs and/or the replacement of display case glass due to damage of any kind.
3. Equipment damage caused by accident, shipping, improper installation or alteration.
4. Equipment used under conditions of abuse, misuse, carelessness or abnormal conditions.
5. Any losses or damage resulting from malfunction, including loss of product or consequential or incidental damages of any kind.
6. Equipment modified in any manner from original model, substitution of parts other than factory authorized parts, removal of any parts including legs, or addition of any parts.

This warranty is exclusive and is in lieu of all other warranties, expressed or implied, including the implied warranties of merchantability and fitness for purpose. In no event shall the Company be liable for loss of use, loss of revenue, or loss of product or profit, or for indirect or consequential damages. This warranty is in lieu of all other warranties expressed or implied and Alto-Shaam, Inc. neither assumes or authorizes any persons to assume for it any other obligation or liability in connection with Alto-Shaam equipment.

ALTO-SHAAM, INC.

Warranty effective January 1, 2000

Record the model and serial numbers of the unit for easy reference. Always refer to both model and serial numbers in your correspondence regarding the unit.

Model: _____
Serial Number: _____
Purchased From: _____
Date Installed: _____ Voltage: _____

COOK/HOLD/SERVE SYSTEMS BY ALTO-SHAAM®

W164 N9221 Water Street • P.O. Box 450 • Menomonee Falls, Wisconsin 53052-0450 • U.S.A.

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FAX: 262.251.7067 • 800.329.8744 U.S.A./CANADA
262.251.1907 INTERNATIONAL

WEBSITE:
www.alto-shaam.com