HUSSMANN®

NSF C UL US LISTED

MD

Medium Temperature Self Contained Open Vertical Merchandisers

MD-14

MD-10

Installation & Service Manual

IMPORTANT
Keep in store for future reference!

P/N 2402646_B
December 2010

ATTENTION

Merchandiser must operate for 24 hours before loading product!

Regularly check merchandiser temperatures.

Do not break the cold chain. Keep products in cooler before loading into merchandiser.

These merchandisers are designed for pre-chilled products only.

IMPORTANT
KEEP IN STORE FOR FUTURE REFERENCE
Quality that sets industry standards!

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REVISION HISTORY

REVISION *B* — *DECEMBER 2010*

1. Added self contained location drawings, page 1-2
2. Added Remote Line Sizing, Koolgas, page 2-2
3. Added Electronic Control, Section 3
4. Added Technical Data, Appendix A

ORIGINAL ISSUE — *AUGUST 2005*

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ANSI Z535.5 DEFINITIONS

• **DANGER –** Indicate[s] a hazardous situation which, if not avoided, will result in death or serious injury.

• **WARNING –** Indicate[s] a hazardous situation which, if not avoided, could result in death or serious injury.

• **CAUTION –** Indicate[s] a hazardous situation which, if not avoided, could result in minor or moderate injury.

• **NOTICE –** *Not related to personal injury –* Indicates[s] situations, which if not avoided, could result in damage to equipment.

INSTALLATION

CERTIFICATION

These merchandisers are manufactured to meet ANSI / National Sanitation Foundation (NSF®) Standard #7 requirements. Proper installation is required to maintain certification. Near the serial plate, each case carries a label identifying the type of application for which the case was certified.

ANSI/NSF-7 Type I - Display Refrigerator / Freezer
Intended for 75°F / 55% RH Ambient Application

ANSI/NSF-7 Type II - Display Refrigerator / Freezer
Intended for 80°F / 55% RH Ambient Application

ANSI/NSF-7 - Display Refrigerator
Intended for Bulk Produce

HUSSMANN PRODUCT CONTROL

The serial number and shipping date of all equipment is recorded in Hussmann's files for warranty and replacement part purposes. All correspondence pertaining to warranty or parts ordering must include the serial number of each piece of equipment involved. This is to ensure the customer is provided with the correct parts.

SHIPPING DAMAGE

All equipment should be thoroughly examined for shipping damage before and during unloading. This equipment has been carefully inspected at our factory. Any claim for loss or damage must be made to the carrier. The carrier will provide any necessary inspection reports and/or claim forms.

Apparent Loss or Damage

If there is an obvious loss or damage, it must be noted on the freight bill or express receipt and signed by the carrier's agent; otherwise, carrier may refuse claim.

Concealed Loss or Damage

When loss or damage is not apparent until after equipment is uncrated, retain all packing materials and submit a written response to the carrier for inspection within 15 days.

LOCATION

These merchandisers are designed for displaying products in air conditioned stores where temperature is maintained at or below the ANSI / NSF-7 specified level and relative humidity is maintained at or below 55%.

Recommended operating ambient temperature is between 65°F (18°C) to 75°F (23.9°C). Maximum relative humidity is 55%.

Placing refrigerated merchandisers in direct sunlight, near hot tables or near other heat sources could impair their efficiency. Like other merchandisers, these merchandisers are sensitive to air disturbances. Air currents passing around merchandisers will seriously impair their operation. Do NOT allow air conditioning, electric fans, open doors or windows, etc. to create air currents around the merchandiser.

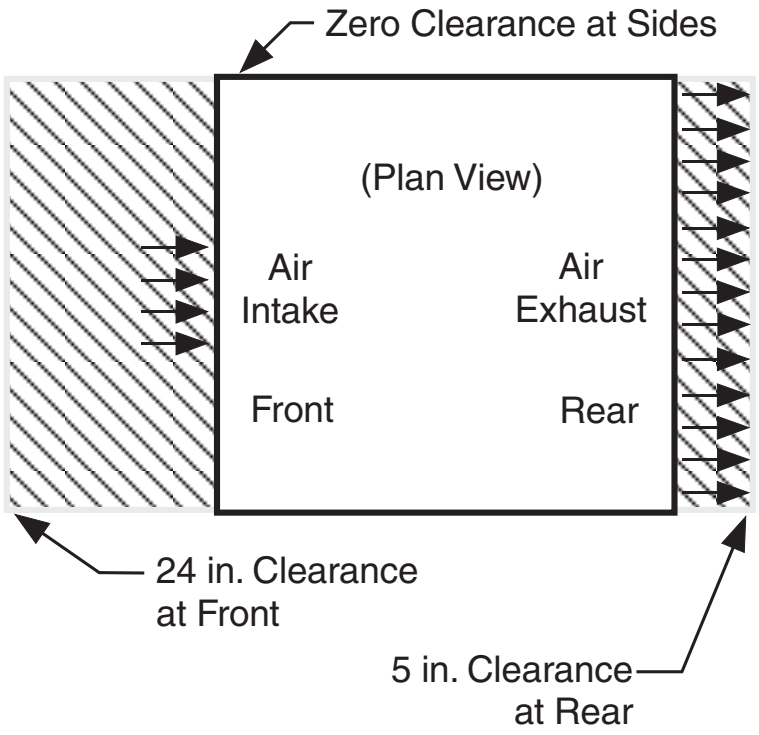
SELF CONTAINED (LOCATION)

Product should always be maintained at proper temperature. This means that from the time the product is received, through storage, preparation and display, the temperature of the product must be controlled to maximize the life of the product.

BE SURE TO POSITION SELF CONTAINED MERCHANDISERS PROPERLY.

SELF CONTAINED models have vented base panels to allow air circulation through the condensing unit.

Allow for a minimum 5 in. clearance from walls, merchandisers, and any other large objects near the merchandiser's vented base panels (for self contained models). Blocking or restricting air flow will adversely affect performance and may damage the refrigeration system.



MODEL DESCRIPTION

The MD models are open, vertical, medium temperature display merchandisers. They are self contained merchandisers with their own condensing unit. Each self contained model will have its own condensing unit, factory installed beneath the display area of the case ready for operation when electrical service is connected.

⚠ CAUTION

Do not walk or put heavy objects on case.

UNLOADING

Unloading from Trailer:
Lever Bar (also known as a Mule, Johnson Bar, J-bar, Lever Dolly, or Pry Lever)

Move the merchandiser as close as possible to its permanent location and remove all packaging. Check for damage before discarding packaging. Remove all separately packed accessories such as kits and shelves.

Improper handling may cause damage to the merchandiser when unloading. To avoid damage:

1. Do not drag the merchandiser out of the trailer. Use a Johnson bar (mule).

2. Use a forklift or dolly to remove the merchandiser from the trailer.

EXTERIOR LOADING

Do NOT walk on top of merchandisers or damage to the merchandisers and serious personal injury could occur.

MERCHANDISERS ARE NOT STRUCTURALLY DESIGNED TO SUPPORT EXCESSIVE EXTERNAL LOADING such as the weight of a person. Do not place heavy objects on the merchandiser.

SHIPPING SKID

Each merchandiser is shipped on a skid to protect the merchandiser's base, and to make positioning the case easier.

Remove the top of the crate and detach walls from each other. Lift crate from the skid. Unscrew the case from the skid. The fixture can now be lifted off the crate skid. ***Lift only at base of skid!*** Remove any braces and/or skids attached (blanket wrapped merchandiser may have skids).

DO NOT TILT MERCHANDISER ON ITS SIDE OR END WHEN REMOVING SKID.

Once the skid is removed, the merchandiser must be lifted —NOT PUSHED— to reposition. To remove the skid, remove screws attaching skid to the merchandiser.

Check floor where cases are to be set to see if it is a level area. Determine the highest part of the floor.

⚠ WARNING

Do NOT remove shipping crate until the merchandiser is positioned for installation.

MERCHANDISER LEVELING

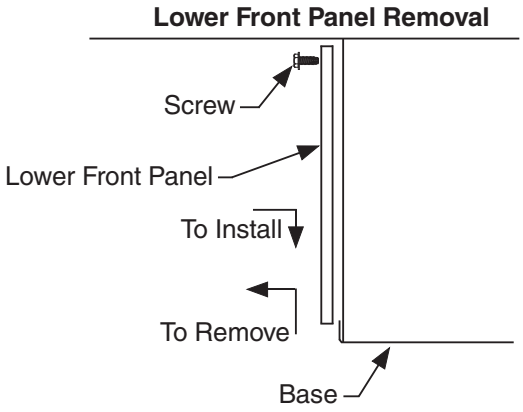
BE SURE TO POSITION MERCHANDISERS PROPERLY. Level the merchandiser by all four corners. Merchandiser(s) must be installed level to ensure proper operation of the refrigeration system, and to ensure proper drainage of defrost water.

SERIAL PLATE LOCATION

The serial plate is located at the interior top left end. It contains all pertinent information such as model, serial number, amperage rating, refrigerant type and charge.

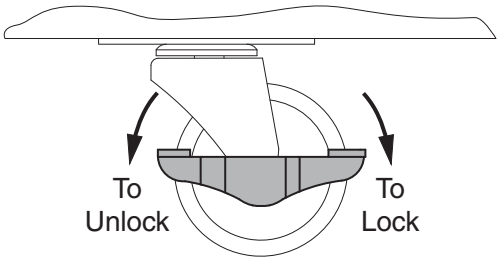
REFRIGERATION UNIT ACCESS

The lower front panel may be removed by lifting the panel straight upward and over the tabs on which it is hanging. In a self contained merchandiser, two screws will have to be removed from either end of the panel. The panel is installed by reversing the above procedure. Ensure lower front panel is flat against the floor when installed to prevent air circulation problems on self contained merchandisers.



CASTERS

The merchandiser may be equipped with optional casters. If the merchandiser has optional casters as shown below, use the brake to lock the merchandiser in place.



SEALING MERCHANDISER TO FLOOR

If required by local sanitary codes, or if the customer desires, merchandisers may be sealed to the floor using a vinyl cove base trim. The size needed will depend on how much variation there is in the floor, from one end of the merchandiser to the other. Sealing of the lower front and rear panels on self contained models may hamper their removal for servicing or maintenance of the condensing unit.

NOTE: Do not allow trim to cover any intake or discharge grilles located in the lower front panel.

ELECTRICAL / REFRIGERATION

MERCHANDISER ELECTRICAL DATA

Refer to merchandiser serial plate for electrical information.

FIELD WIRING

Field wiring must be sized for component amperes stamped on the serial plate. Actual ampere draw may be less than specified.

ALWAYS CHECK THE SERIAL PLATE FOR COMPONENT AMPERES

ELECTRICAL CONNECTIONS

All wiring must be in compliance with NEC and local codes. Self contained models are electrical cord connected at the electrical box.

ELECTRICAL OUTLET:

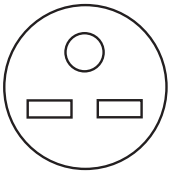
Before the merchandiser is connected to any wall circuit, use a voltmeter to check that the outlet is at 100% of the rated voltage. The wall circuit must be dedicated for the merchandiser. Failure to do so voids the warranty. **Do not use an extension cord.** Never plug in more than one merchandiser per electrical circuit.

- Always use a dedicated circuit with the amperage stated on the unit.
- Plug into an outlet designed for the plug.
- Do not overload the circuit
- Do not use long or thin extension cords. Never use adapters.
- If in doubt, call an electrician.

⚠ WARNING

— LOCK OUT / TAG OUT —

To avoid serious injury or death from electrical shock, always disconnect the electrical power at the main disconnect when servicing or replacing any electrical component. This includes, but is not limited to, such items as doors, lights, fans, heaters, and thermostats.



NEMA 6-15R
Receptacle
MD

Self-contained models have factory-installed power cords attached at the electrical box.

POWER SWITCH

The main power switch is located in the electrical box. This switch controls all power to the case. This switch must be in the OFF position, and the electrical cord must be unplugged before starting any cleaning or service work.

⚠ CAUTION

Risk of Electric Shock. If cord or plug becomes damaged, replace only with a cord and plug of the same type.

⚠ WARNING

Merchandiser must be grounded. Do not remove the power supply cord ground.

REFRIGERATION
(Self Contained Models)

Each self contained model is equipped with its own condensing unit and control panel located beneath the display area. The correct type of refrigerant will be stamped on each merchandiser's serial plate. The merchandiser refrigeration piping is leak tested. The unit is charged with refrigerant, and shipped from the factory with all service valves open.

⚠ WARNING

Refrigeration lines are under pressure. Refrigerant must be recovered before attempting any connection or repair.

⚠ CAUTION

When brazing pipes, be sure to use the insulation blanket shipped with the merchandiser to prevent damage to the metal merchandiser bottom.

WATER OUTLET AND WATER SEAL

The condensate water outlet is located at the front corners of the evaporator coil area. The outlet has a factory installed, external water seal.

For self contained models, this water seal drains into the condensate evaporator pan located beneath the merchandiser.

NOTE: All lower base panels must be in place when the refrigerator is operating. If not, airflow from the condenser will be directed over the evaporator pan and defrost water in the pan may overflow.

⚠ WARNING

Product will be degraded and may spoil if allowed to sit in a non-refrigerated area.

START UP / OPERATION

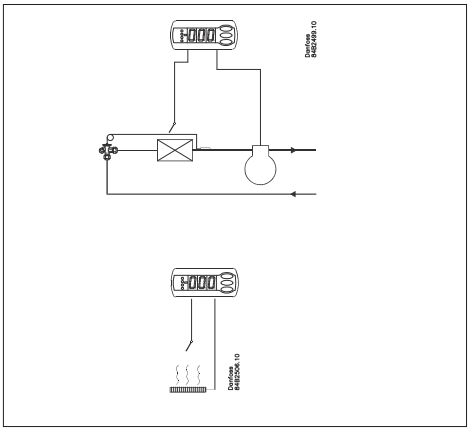
START UP

Check all electrical and refrigeration connections thoroughly for tightness. Make sure the refrigeration unit is not rubbing or chafing against itself or other components. Electrical connections should be tight.

Condenser fan motor blades should spin freely. Install all protective covers. Start the merchandiser, and wait for the merchandiser to pull down in temperature.

Your refrigerated merchandiser uses a Danfoss electronic controller for temperature control.

Danfoss EKC102A temperature controller has one relay output and one temperature sensor. Temperature control at start and stop of the compressor. Natural defrost occurs at stop of compressor.



DEFROST

Defrost is set up for 8 minutes every hour: When the defrost starts, the defrost timers are set to zero.

⚠ WARNING

Product will be degraded and may spoil if allowed to sit in a non-refrigerated area.

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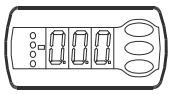
Operation

Display
The values will be shown with three digits, and with a setting you can determine whether the temperature are to be shown in °C or in °F.



Light-emitting diodes (LED) on front panel
There are LED's on the front panel which will light up when the belonging relay is activated.
= Refrigeration
= Defrost

The light-emitting diodes will flash when there is an alarm.
In this situation you can download the error code to the display and cancel/sign for the alarm by giving the top button a brief push.

Defrost
During defrost a –d- is shown in the display. This view will continue up till 15 min. after the cooling has resumed. However the view of –d- will be discontinued if:
- The temperature is suitable within the 15 minutes
- The regulation is stopped with "Main Switch"
- A high temperature alarm appears

The buttons
When you want to change a setting, the upper and the lower buttons will give you a higher or lower value depending on the button you are pushing. But before you change the value, you must have access to the menu. You obtain this by pushing the upper button for a couple of seconds - you will then enter the column with parameter codes. Find the parameter code you want to change and push the middle buttons until value for the parameter is shown. When you have changed the value save the new value by once more pushing the middle button

Examples

Set menu

1. Push the upper button until a parameter r01 is shown
2. Push the upper or the lower button and find that parameter you want to change
3. Push the middle button until the parameter value is shown
4. Push the upper or the lower button and select the new value
5. Push the middle button againt to enter the value.

Cutout alarm relay / receipt alarm / see alarm code
• Push briefly the upper button
If there are several alarm codes they are found in a rolling stack. Push the uppermost or lowermost button to scan the rolling stack.

Set temperature
1. Push the middle button until the temperature value is shown
2. Push the upper or the lower button and select the new value
3. Push the middle button to select the setting

Manual start or stop of a defrost
• Push the lower button for four seconds.

100% tight
The buttons and the seal are imbedded in the front.
A special moulding technique unites the hard front plastic, the softer buttons and the seal, so that they become an integral part of the front panel. There are no openings that can receive moisture or dirt.

Menu survey

EKC 102A

SW = 1.1x

Parameters		Min.-value	Max.-value	Factory setting	Actual setting
Function	**Codes**				
Normal operation					
Temperature (set point)	---	-50°C	99°C	2°C	0
Thermostat					
Differential	r01	0,1 K	20 K	2 K	1
Max. limitation of setpoint setting	r02	-49°C	99°C	99°C	15
Min. limitation of setpoint setting	r03	-50°C	99°C	-50°C	-10
Adjustment of temperature indication	r04	-20 K	20 K	0 K	0
Temperature unit (°C/°F)	r05	°C	°F	°C	°F
Correction of the signal from Sair	r09	-10 K	10 K	0 K	0
Manual service (-1), stop regulation (0), start regulation (1)	r12	-1	1	1	1
Compressor					
Min. ON-time	c01	0 min	30 min	0 min	3
Min. OFF-time	c02	0 min	30 min	0 min	3
Compressor relay must cutin and out inversely (NC-function)	c30	OFF	On	OFF	OFF
Defrost					
Defrost method (0=none / 1=natural)	d01	0	1	1	1
Defrost stop temperature	d02	0°C	25°C	6°C	N/A
Interval between defrost starts	d03	0 hours	48 hours	8 hours	1
Max. defrost duration	d04	0 min	180 min	45 min	8
Displacement of time on cutin of defrost at start-up	d05	0 min	240 min	0 min	45
Defrost sensor (0=time, 1=Sair)	d10	0	1	0	0
Defrost at start-up	d13	no	yes	no	NO
Miscellaneous					
Delay of output signals after start-up	o01	0 s	600 s	5 s	180
Access code	o05	0	100	0	0
Used sensor type (Pt /PTC/NTC)	o06	Pt	ntc	Pt	PTC
Refrigeration or heat (rE=refrigeration, HE=heat)	o07	rE	HE	rE	RE
Display step = 0.5 (normal 0.1 at Pt sensor)	o15	no	yes	no	ND
Save the controllers present settings to the programming key. Select your own number.	o65	0	25	0	0
Load a set of settings from the programming key (previously saved via o65 function) (Can only be set when regulation is stopped (r12=0)	o66	0	25	0	0
Replace the controllers factory settings with the present settings	o67	OFF	On	OFF	Off
Service					
Status on relay Can be controlled manually, but only when r12=-1	u58				

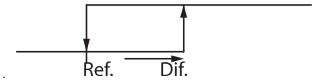
Regulation starts when voltage is applied.

Factory setting
If you need to return to the factory-set values, it can be done in this way:
- Cut out the supply voltage to the controller
- Keep upper and lower button depressed at the same time as you reconnect the supply voltage

Fault code display	
A45	Standby mode
Alarm code display	
E1	Fault in controller
E29	Sair sensor error
Status code display	
S0	Regulating
S2	ON-time Compressor
S3	OFF-time Compressor
S11	Refrigeration stopped by thermostat
S14	Defrost sequence. Defrosting
S20	Emergency cooling
S32	Delay of output at start-up
non	The defrost temperature cannot be displayed. There is no sensor
-d-	Defrost in progress / First cooling after defrost
PS	Password required. Set password

Functions

Here is a description of the individual functions.
A controller only contains this part of the functions. Cf. the menu survey.

Function	No.
Normal display	
Normal display shows the temperature value from the thermostat sensor Sair.	
Thermostat	
Set point Regulation is based on the set value plus a displacement, if applicable. The value is set via a push on the centre button. The set value can be locked or limited to a range with the settings in r02 and r 03. The reference at any time can be seen in "u28 Temp. ref"	
Differential When the temperaure is higher than the reference + the set differential, the compressor relay will be cut in. It will cut out again when the temperature comes down to the set reference.  	r01
Setpoint limitation The controller's setting range for the setpoint may be narrowed down, so that much too high or much too low values are not set accidentally - with resulting damages.	
To avoid a too high setting of the setpoint, the max. allowable reference value must be lowered.	r02
To avoid a too low setting of the setpoint, the min. allowable reference value must be increased.	r03
Correction of the display's temperature showing If the temperature at the products and the temperature received by the controller are not identical, an offset adjustment of the shown display temperature can be carried out.	r04
Temperature unit Set here if the controller is to show temperature values in °C or in °F.	r05
Correction of signal from Sair Compensation possibility through long sensor cable.	r09
Start / stop of refrigeration With this setting refrigeration can be started, stopped or a manual override of the outputs can be allowed. 1 = regulation 0 = regulation is stopped -1 = regulation is stopped - override allowed. Stopped regulation will give a "Standby alarm".	r12
Compressor	
The compressor relay works in conjunction with the thermostat. When the thermostat calls for refrigeration will the compressor relay be operated.	
Running times To prevent irregular operation, values can be set for the time the compressor is to run once it has been started. And for how long it at least has to be stopped. The running times are not observed when defrosts start.	
Min. ON-time (in minutes)	c01
Min. OFF-time (in minutes)	c02
Reversed relay function for compressor relay 0: Normal function where the relay cuts in when refrigeration is demanded 1: Reversed function where the relay cuts out when refrigeration is demanded (this wiring produces the result that there will be refrigeration if the supply voltage to the controller fails). (When two compressors are cut in and out the two relays will operate in opposite directions).	c30
Defrost	
The controller contains a timer function that is zeroset after each defrost start. The timer function will start a defrost if/when the interval time is passed. The timer function starts when voltage is connected to the controller, but it is displaced the first time by the setting in d05. Defrost start can also be accomplished via manual start-up. Defrost is accomplished with natural defrost. The actual defrost will be stopped based on time or temperature with a signal from a temperature sensor.	
Defrost method Here you set whether defrost is to be accomplished with electricity, natural or "non". A:"natural" = 1, "non" = 0 During defrost the defrost relay will be cut in. When gas defrosting the compressor relay will be cut in during defrost.	d01
Defrost stop temperature The defrost is stopped at a given temperature which is measured with a sensor (the sensor is defined in d10). The temperature value is set.	d02
Interval between defrost starts The function is zeroset and will start the timer function at each defrost start. When the time has expired the function will start a defrost. The function is used as a simple defrost start, or it may be used as a safeguard if the normal signal fails to appear. When there is defrost with clock function on the DI input the interval time must be set for a somewhat longer period of time than the planned one, as the interval time will otherwise start a defrost which a little later will be followed by the planned one. The interval time is not active when set to 0.	d03
Max. defrost duration This setting is a safety time so that the defrost will be stopped if there has not already been a stop based on temperature. (The setting will be the defrost time if d10 is selected to be 0)	d04

Time staggering for defrost cutins during start-up The function is only relevant if you have several refrigeration appliances or groups where you want the defrost to be staggered in relation to one another. The function is furthermore only relevant if you have chosen defrost with interval start (d03). The function delays the interval time d03 by the set number of minutes, but it only does it once, and this at the very first defrost taking place when voltage is connected to the controller. The function will be active after each and every power failure.	d05
Defrost sensor Here you define the defrost sensor. 0: None, defrost is based on time EKC 102A: 1=Sair	d10
Defrost during start-up (follow after d05 function) Here you can set if the controller is to start with a defrost if the power has been cut.	d13
Miscellaneous	
Delay of output signal after start-up After start-up or a power failure the controller's functions can be delayed so that overloading of the electricity supply network is avoided. Here you can set the time delay.	o01
Access code 1 (Access to all settings) If the settings in the controller are to be protected with an access code you can set a numerical value between 0 and 100. If not, you can cancel the function with setting 0. (99 will always give you access).	o05
Sensor type Normally a Pt 1000 sensor with great signal accuracy is used. But you can also use a sensor with another signal accuracy. That may either be a PTC sensor (1000 ohm at 25°C) or an NTC sensor (5000 Ohm at 25°C). **All** the mounted sensors must be of the same type.	o06
Function options The thermostat's function is defined, as follows: rE: Refrigeration. The relay cuts in when lower temperatures are required. HE: Heating. The relay cuts in when higher temperatures are required (remember to cancel defrost functions and compressor functions). With this function the thermostat's differential will lie below the setpoint (the relay will cut in at setpoint minus differential).	o07
Display step Yes: Gives steps of 0.5° No: Gives steps of 0.1°	o15
Copy the controller's present settings With this function the controller's settings can be transferred to a programming key. The key can contain up to 25 different sets. Select a number. When copying has started the display returns to o65. After two seconds you can move into the menu again and check whether the copying was satisfactory. Showing of a negative figure spells problems. See the significance in the Fault Message section.	o65
Copy from the programming key This function downloads a set of settings earlier saved in the controller. Select the relevant number. When copying has started the display returns to o66. After two seconds you can move back into the mennu again and check whether the copying was satisfactory. Showing of a negative figure spells problems. See the significance in the Fault Message section.	o66
Save as factory setting With this setting you save the controller's actual settings as a new basic setting (the earlier factory settings are overwritten).	o67

Operating status
The controller goes through some regulating situations where it is just waiting for the next point of the regulation. To make these "why is nothing happening" situations visible, you can see an operating status on the display. Push briefly (1s) the upper button. If there is a status code, it will be shown on the display. The individual status codes have the following meanings:
S0: Regulating
S2: When the compressor is operating it must run for at least x minutes.
S3: When the compressor is stopped, it must remain stopped for at least x minutes.
S10: Refrigeration stopped by main switch. Either with r12 or a DI-input
S11: Refrigeration stopped by thermostat
S14: Defrost sequence. Defrost in progress
S20: Emergency cooling
S25: Manual control of outputs
S32: Delay on outputs during start-up
Other displays:
non: The defrost temperature cannot be displayed. There is no sensor
-d-: Defrost in progress. /First cooling after defrost
PS: Password required. Set password
Fault message
In an error situation the LED's on the front will flash and the alarm relay will be activated. If you push the top button in this situation you can see the alarm report in the display. If there are several, you can continue pushing to see them. There are two kinds of error reports - it can either be an alarm occurring during the daily operation, or there may be a defect in the installation. A-alarms will not become visible until the set time delay has expired. E-alarms, on the other hand, will become visible the moment the error occurs. (An A alarm will not be visible as long as there is an active E alarm). Here are the messages that may appear:
A45: Standby position (stopped refrigeration via r12 or DI input)
E1: Faults in the controller
E29: Sensor error on Sair
When copying settings to or from a copying key with functions o65 or o66, the following information may appear: 0: Copying concluded and OK 4: Copying key not correctly mounted 5: Copying was not correct. Repeat copying 6: Copying to EKC incorrect. Repeat copying 7: Copying to copying key incorrect. Repeat copying 8: Copying not possible. Order number or SW version do not match 9: Communication error and timeout 0: Copying still going on The information can be found in o65 or o66 a couple of seconds after copying has been started).

Power supply
230 V a.c.

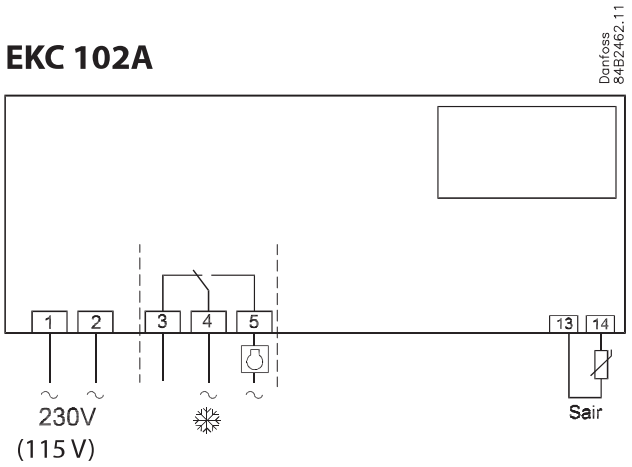
Sensors
Sair is thermostat sensors.

Digital On/Off signals
A cut-in input will activate a function. The possible functions are described in menu o02.

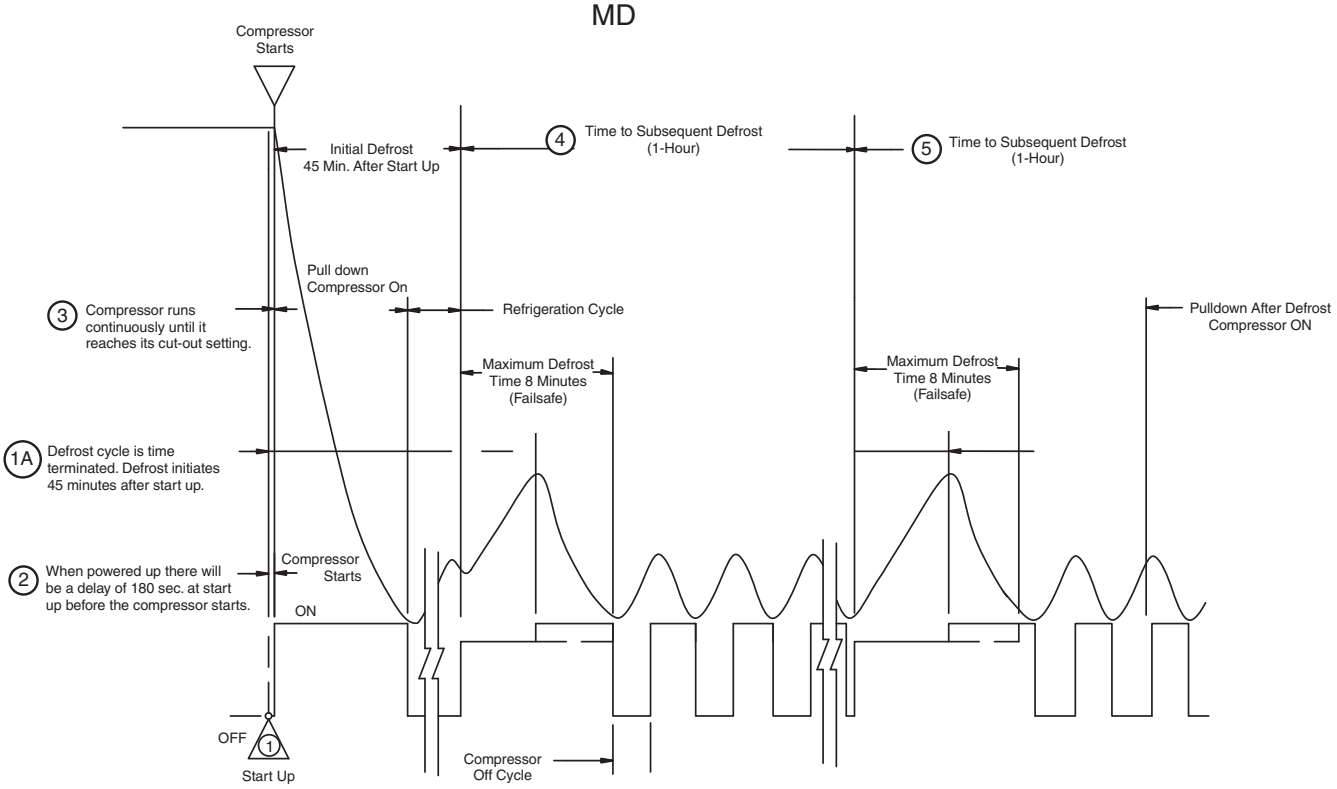
Relays
The general connections are:

Relay 1
Refrigeration. The contact will cut in when the controller demands refrigeration

Electric noise
Cables for sensors and DI inputs must be kept separate from other electric cables:
- Use separate cable trays
- Keep a distance between cables of at least 10 cm
- Long cables at the DI input should be avoided



SEQUENCE OF OPERATION
MD



1. The compressor will start after a 180 seconds delay once power is applied.

2. The compressor will continue to run until it reaches its cut-out temperature (Pulldown).

3. The refrigeration cycle will continue for the next subsequent scheduled (1-hour).

4. The above process will repeat (steps 3 and 4) until the power is interrupted.

5. If power stops, the process will start over at step 1, and the time to subsequent defrost will reset.

CONTROLS and ADJUSTMENTS

	Refrigeration Controls		Defrost Controls			
Model	Product Application	Discharge Air Temperature	Defrost Frequency (per day)	Type of Defrost	Termination Temperature	Failsafe Time (Minutes)
MD-10 MD-14	Medium Temp. (Dairy, Deli)	24° F to 32° F	24	Off Time	Time	8 min.

1. The EKC controller controls refrigeration temperature. This is factory installed in the control panel mounted on the merchandiser's fascia. Measure discharge air temperatures at the center of the louvers.

Defrosts are time initiated and terminated for self contained models. The defrost setting is factory set as shown above.

It is the contractor's responsibility to install merchandiser(s) in accordance with all local building and health codes.

WARNING

— LOCK OUT / TAG OUT —

To avoid serious injury or death from electrical shock, always disconnect the electrical power at the main disconnect when servicing or replacing any electrical component. This includes, but is not limited to, such items as doors, lights, fans, heaters, and thermostats.

SHELVES

MD models are equipped with four shelves. Heights are adjustable in one-inch increments. Product shelves should be loaded so that the product does not extend over the front edge of the shelf. Product loaded over the edge will interfere with air circulation in the cabinet. It is also desirable to leave a small space between the rear interior wall and the product on the shelves, to allow air to enter the cabinet interior through the perforations in the rear wall. The shelves are rated for **130 pounds each load capacity.**

Install the shelf support brackets first to the desired height before installing each shelf. Place the rear of the bracket in the desired slot. Raise the front of the brackets towards the rear of the cabinet. Once the ends are in the slot, rotate the bracket forward, locking it in place. Place the shelf on the bracket. **The shelves are not to be slanted. They must remain in the horizontal position.**

LOAD LIMITS

Each merchandiser has a load limit decal. Shelf life of perishables will be short if load limit is violated.

LOAD LIMIT

AT NO TIME SHOULD MERCHANDISERS BE STOCKED BEYOND THE LOAD LIMITS INDICATED.

DO NOT BLOCK DISCHARGE AIR LOUVERS.

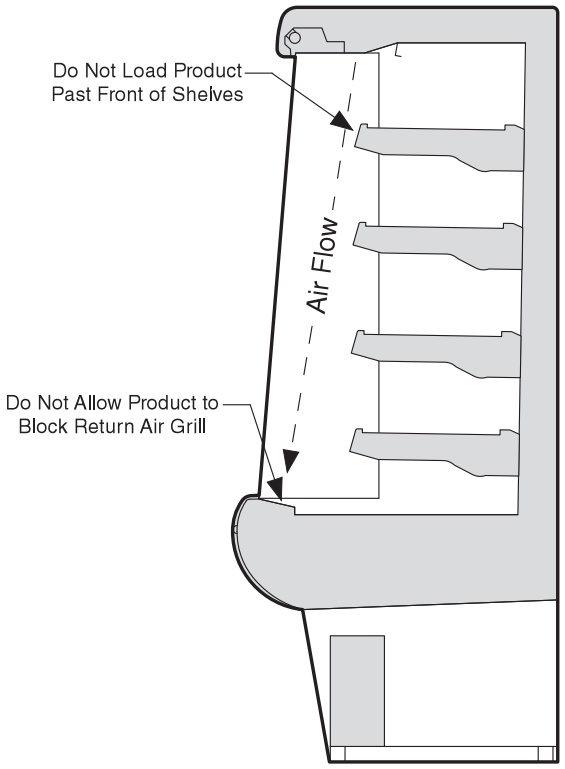
STOCKING

Product should NOT be placed inside the merchandisers until merchandisers are at proper operating temperature.

Allow merchandiser 24 hours to operate before loading product.

Proper rotation of product during stocking is necessary to prevent product loss. Always bring the oldest product to the front and set the newest to the back.

AIR DISCHARGE AND RETURN FLUES MUST REMAIN OPEN AND FREE OF OBSTRUCTION AT ALL TIMES to provide proper refrigeration and air curtain performance. Do not allow product, packages, signs, etc. to block these grilles. Do not use non-approved shelving, baskets, display racks, or any accessory that could hamper air curtain performance.



Do Not Block Merchandiser Air Flow

THERMOMETER

The thermometer is located next to the discharge in the middle of the merchandiser. The reading is in Cº / Fº.

⚠ WARNING

Product will be degraded and may spoil if allowed to sit in a non-refrigerated area.

LIGHTING

Interior lighting is provided by a cool, white fluorescent bulb. The bulb is sleeved to maintain proper heat around the bulb for maximum light intensity and to protect the product in case of breakage. The bulb can be replaced without removing shelves or product. To replace the bulb, twist the bulb and slide the prongs clear of the lamp holder. Remove the shield from the old bulb, and put it on the new bulb. Make sure the prongs on the bulb twist and lock into place when placing the bulb back in the holders.

NIGHT COVER

All MD models come equipped with a night cover as a standard feature. The handle for the cover is located near the lamp, grasp the handle and pull downward until enough of the cover has been exposed, allowing the handle to be placed over the retainer located on the lower panel. If a night cover must be replaced, follow these steps: disconnect power to the cabinet. On the top exterior of the cabinet, there is a perforated metal cover. Lower the lamp fixture as if you were replacing the ballast. Lift the left retainer. Pull the night cover towards you, and slide to left. Install the new cover in reverse order.

MAINTENANCE

CARE AND CLEANING

Long life and satisfactory performance of any equipment is dependent upon the care it receives. To ensure long life, proper sanitation and minimum maintenance costs, these merchandisers should be thoroughly cleaned, all debris removed and the interiors washed down, weekly.

Exterior Surfaces
The exterior surfaces must be cleaned with a mild detergent and warm water to protect and maintain their attractive finish. **NEVER USE ABRASIVE CLEANSERS OR SCOURING PADS.**

Interior Surfaces
The interior surfaces may be cleaned with most domestic detergents, ammonia based cleaners and sanitizing solutions with no harm to the surface. Self contained models empty into a limited capacity evaporation pan, which will overflow if excess water is used in cleaning.

Do NOT Use:

•Abrasive cleansers and scouring pads, as these will mar the finish.

•Coarse paper towels on coated glass.

•Ammonia-based cleaners on acrylic parts.

•Solvent, oil or acidic based cleaners on any interior surfaces.

•Do not use high pressure water hoses.

⚠ WARNING

Product will be degraded and may spoil if allowed to sit in a non-refrigerated area.

Do:

•Remove the product and all loose debris to avoid clogging the waste outlet.

•Store product in a refrigerated area such as a cooler. Remove only as much product as can be taken to the cooler in a timely manner.

•Disconnect electrical power before cleaning.

•Thoroughly clean all surfaces with soap and hot water. **DO NOT USE STEAM OR HIGH WATER PRESSURE HOSES TO WASH THE INTERIOR.** THESE WILL DESTROY THE MERCHANDISERS' SEALING CAUSING LEAKS AND POOR PERFORMANCE.

•Take care to minimize direct contact between fan motors and cleaning or rinse water.
•Do NOT flood merchandiser with water. **NEVER INTRODUCE WATER FASTER THAN THE WASTE OUTLET CAN REMOVE IT.**

⚠ WARNING

Do NOT allow cleaning agent or cloth to contact food product.

SELF CONTAINED MODELS EMPTY INTO A CONDENSATE EVAPORATION PAN THAT WILL OVERFLOW IF TOO MUCH WATER IS INTRODUCED DURING CLEANING.

•Allow merchandisers to dry before resuming operation.

•After cleaning is completed, turn on power to the merchandiser.

⚠ WARNING

Do NOT use HOT water on Cold glass Surfaces. This can cause the glass to shatter and could result in personal injury. Allow glass fronts, to warm before applying hot water.

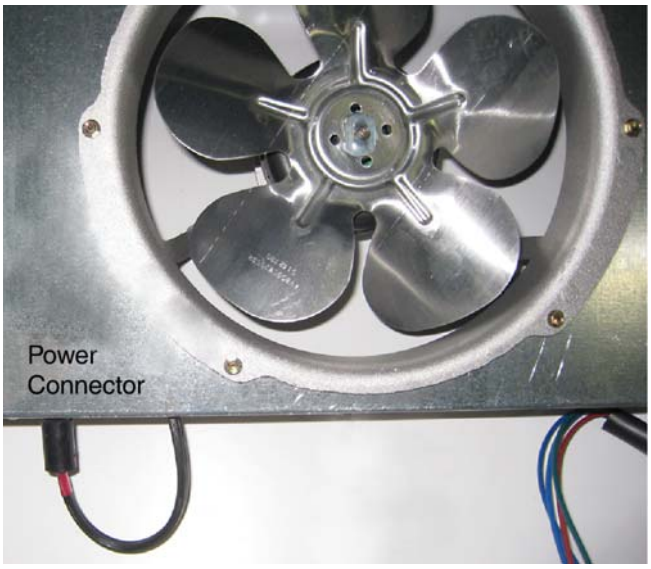
CLEANING UNDER FAN PLENUM

To facilitate cleaning, the fan plenum is hinged.

After cleaning be sure the plenum is properly lowered into position OR PRODUCT LOSS WILL RESULT due to improper refrigeration.

⚠ WARNING

SHUT FANS OFF DURING CLEANING PROCESS.



CLEANING STAINLESS STEEL SURFACES

Use non-abrasive cleaning materials, and always polish with grain of the steel. Use warm water or add a mild detergent to the water and apply with a cloth. Always wipe rails dry after wetting.

Use alkaline chlorinated or non-chlorine containing cleaners such as window cleaners and mild detergents. Do not use cleaners containing salts as this may cause pitting and rusting of the stainless steel finish. Do not use bleach.

⚠ CAUTION

DO NOT FLOOD!

Use only enough water necessary to clean surface. Water must not drip down the case!

Never use ammonia based cleansers, abrasive cleansers, or scouring pads.

⚠ WARNING

— LOCK OUT / TAG OUT —

To avoid serious injury or death from electrical shock, always disconnect the electrical power at the main disconnect when servicing or replacing any electrical component. This includes, but is not limited to, such items as doors, lights, fans, heaters, and thermostats.

CLEANING COILS

Condenser coils should be cleaned at least once per month. Additional cleaning may be needed depending on the operational environment. A dirty condenser blocks normal airflow through the coils.

Airflow blockage increases energy consumption and reduces the merchandiser's ability to maintain operating temperature.

To clean the coils, use a vacuum cleaner with a wand attachment and a soft (non-metallic) brush to remove dirt and debris. Do not bend coil fins. Always wear gloves and protective eye wear when cleaning near sharp coil fins and dust particles.

CLEANING EVAPORATION PAN
(SELF CONTAINED ONLY)

The condensate water outlet for self contained models empties into a limited capacity evaporation pan.

Debris or dirt accumulation inside the condensate evaporation pan or on the heater coil will reduce the pan's evaporation capacity and cause premature heater failure. The evaporation pan waste water will overflow and spill onto the floor if the heater is not properly operating.

Remove accumulated debris from the evaporation pan. Wipe down heater coil with a cloth and warm water. Be sure to remove any dirt, debris or liquids from the heater coil.

Water introduced during cleaning will cause the evaporation pan to overflow.

⚠ CAUTION

Evaporation Pan is Hot!

and poses risk of bodily injury – Always Wear gloves and protective eye wear when servicing. Turn off evaporation pan heater, and allow pan to cool.

PRECAUTION

CLEANING PRECAUTIONS

When Cleaning:
- Do not use high pressure water hoses
- Do not introduce water faster than waste outlet can drain
- NEVER INTRODUCE WATER ON SELF CONTAINED UNIT WITH AN EVAPORATION PAN
- NEVER USE A CLEANING OR SANITIZING SOLUTION THAT HAS OIL BASE (these will dissolve the butyl sealants) or an AMMONIA BASE (this will corrode the copper components of the merchandiser)
- TO PRESERVE THE ATTRACTIVE FINISH:
- Use a water and a mild detergent for the exterior only
- Do NOT use a chlorinated cleaner on any surface
- Do NOT use abrasives or steel wool scouring pads (these will mar the finish)

REMOVING SCRATCHES FROM BUMPER

Most scratches and dings can be removed using the following procedure.

1. Use steel wool to smooth out the surface area of the bumper.

2. Clean area.

3. Apply vinyl or car wax and polish surface for a smooth glossy finish.

SERVICE

REPLACING FAN MOTORS AND BLADES

Should it ever be necessary to service or replace the fan motors or blades be certain that the fan blades are reinstalled correctly. **THE BLADES MUST BE INSTALLED WITH RAISED EMBOSSING (PART NUMBER ON PLASTIC BLADES) POSITIONED AS INDICATED ON THE PARTS LIST.**

For access to these fans:

1. Remove product and place in a refrigerated area. Turn off power to the merchandiser.
2. Remove bottom display pans.
3. **Disconnect fan from wiring harness.**
4. Remove fan blade.
5. Lift fan plenum and remove screws holding bottom of motor to fan basket.
6. Replace fan motor and blade.
7. Lower fan plenum.
8. Reconnect fan to wiring harness.
9. Turn on power.
10. Verify that motor is working and blade is turning in the correct direction.

⚠ WARNING

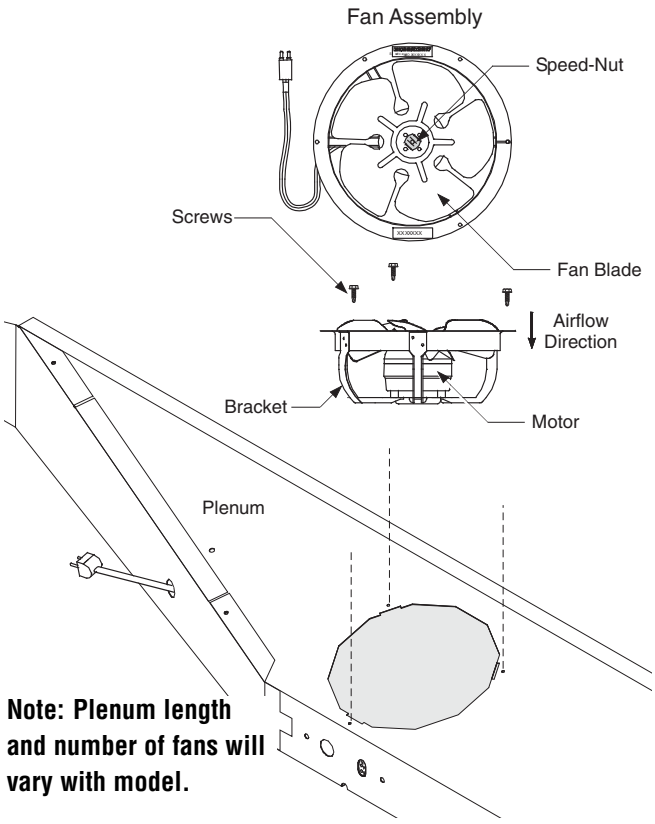
Product will be degraded and may spoil if allowed to sit in a non-refrigerated area.

⚠ WARNING

— LOCK OUT / TAG OUT —

To avoid serious injury or death from electrical shock, always disconnect the electrical power at the main disconnect when servicing or replacing any electrical component. This includes, but is not limited to, such items as doors, lights, fans, heaters, and thermostats.

11. Close air gaps under fan plenum. Warmer air moving into refrigerated air reduces effective cooling. If the plenum does not rest against the case bottom without gaps, apply foam tape to the bottom of the fan plenum to reduce improper air movement. Use silicone sealant to close other gaps.
12. Reinstall display pans. Bring merchandiser to operating temperature before restocking.



Note: Plenum length and number of fans will vary with model.

REPLACING ELECTRONIC BALLASTS

Canopy Ballast
The canopy ballast is located in the electrical box on top of the merchandiser.

To gain access:
1. **DISCONNECT THE ELECTRICAL POWER TO THE MERCHANDISER.**

2. Remove screws attaching the raceway cover, then remove cover.

3. Service or replace ballast as required. Reassemble items as they were originally installed.

4. Reconnect the electrical power.

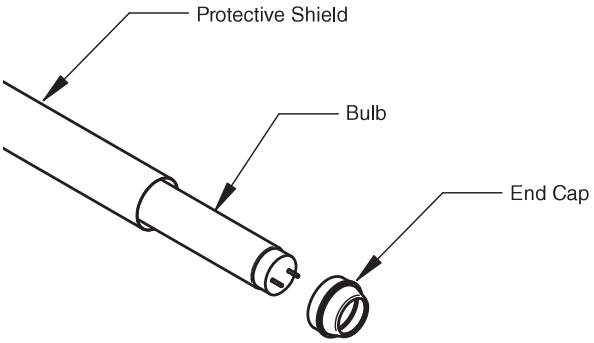
⚠ WARNING

— LOCK OUT / TAG OUT —
To avoid serious injury or death from electrical shock, always disconnect the electrical power at the main disconnect when servicing or replacing any electrical component. This includes, but is not limited to, such items as doors, lights, fans, heaters, and thermostats.

REPLACING FLUORESCENT LAMPS

Fluorescent lamps have a plastic shield. When the lamp is replaced, keep the lamp shield to install over the new lamp.

The switch under the display lamp cover operates the display lamp.



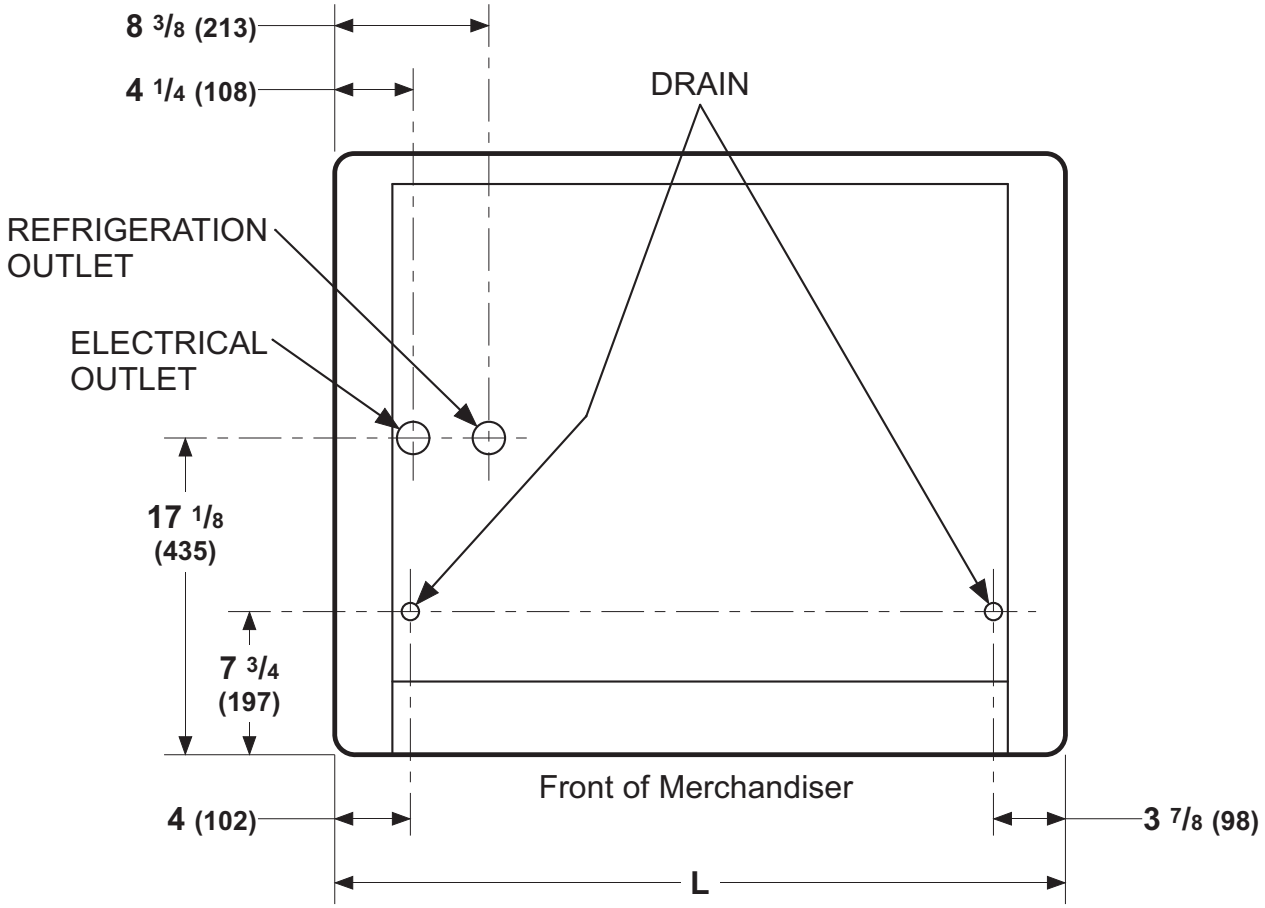
Remove Plastic Pins Attaching Display Lamp

Item	Part #	Description
FAN ASSEMBLIES AND THERMOSTATS		
	5W Standard Fan Assembly	
	MO.4411019	Fan Motor, 115V (with blade)
	FI.4613274	Electronic Control, MD
	EP.4441283	Power Cord, 15A 208-230V
HEATERS		
	DP.4919020	Condensate Pan Heater 1000W 208-230V
CONTROL PANEL		
	RL.4441382	Compressor Relay

Item	Part #	Description
REFRIGERATION		
	CU.4200701	Compressor, MD-14
	CU.4200700	Compressor, MD-10
	FI.4613274	Drier
	BR.4916662	Condenser Fan Motor, 16W
	FB.4780650	Condenser Fan Blade
	RC.4671505	MD-14 Cap Tube Assembly
	RC.4671505	MD-10 Cap Tube Assembly
LAMPS AND BALLASTS		
	BA.4480870	Ballast, Lamp
	BU.4481664	Lamp
	SW.4440542	Switch, Lamp
	Fluorescent Lamps: Replace with Like Fixtures	

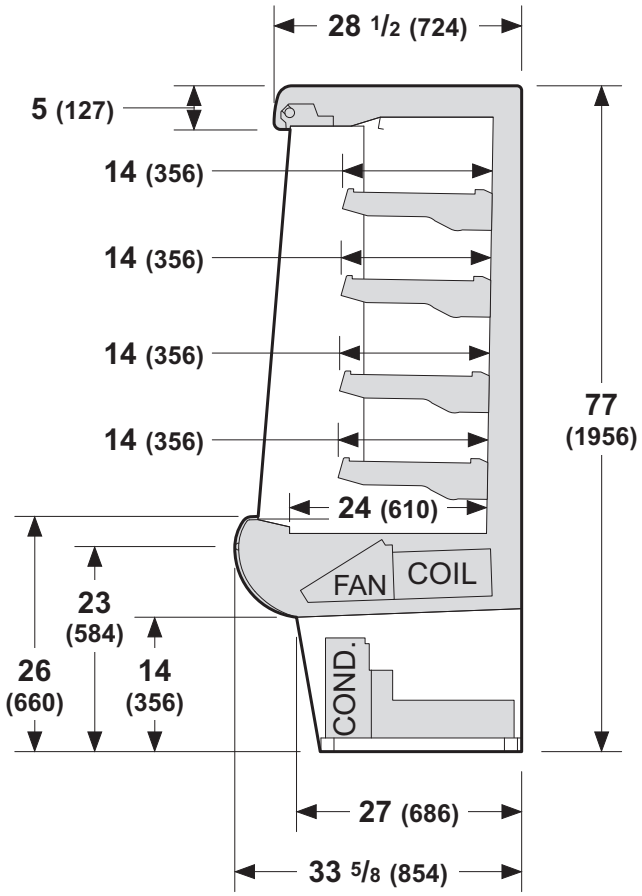
MD — Plan View

Dimensions shown as inches and (mm).



Model	Length
MD-10	39"
MD-14	52"

MD — Cross Section



REFRIGERATION DATA

Note: This data is based on store temperature and humidity that does not exceed 75°F and 55% R.H. unless otherwise stated. Schedule defrost at night while lights are off.

MD

Thermostat Setting CI/CO (°F)	34 / 32
Condensing Unit (hp)	
MD-10	3/4
MD-14	1
Condensing Unit Capacity	
MD-10	4813
MD-14	7376

(Btu/hr at std. rating conditions)

DEFROST DATA

Frequency (hr)	1
OFFTIME	
Failsafe (minutes)	8
Defrost Termination	Time

PHYSICAL DATA

Refrigerant Charge

MD-10 (R134a)	25.5 oz	0.723 kg
MD-14 (R134a)	30.25 oz	0.857 kg

Electrical Data

Note: These are rated values for individual components and should not be added together to determine total merchandiser electrical load.

	MD
Number of Fans – 5W	**2**

	Amperes	Watts
Evaporator Fans		
208-230V 60Hz Standard	0.6	10
Condensate Pan Heaters (230V)	4.8	1000

Condensing Unit (208/230V, 1Ph, 60Hz) Standard

	MD-10	MD-14
Compressor LRA	42	41
Compressor RLA	10.3	9.5

Product Data

MD-10

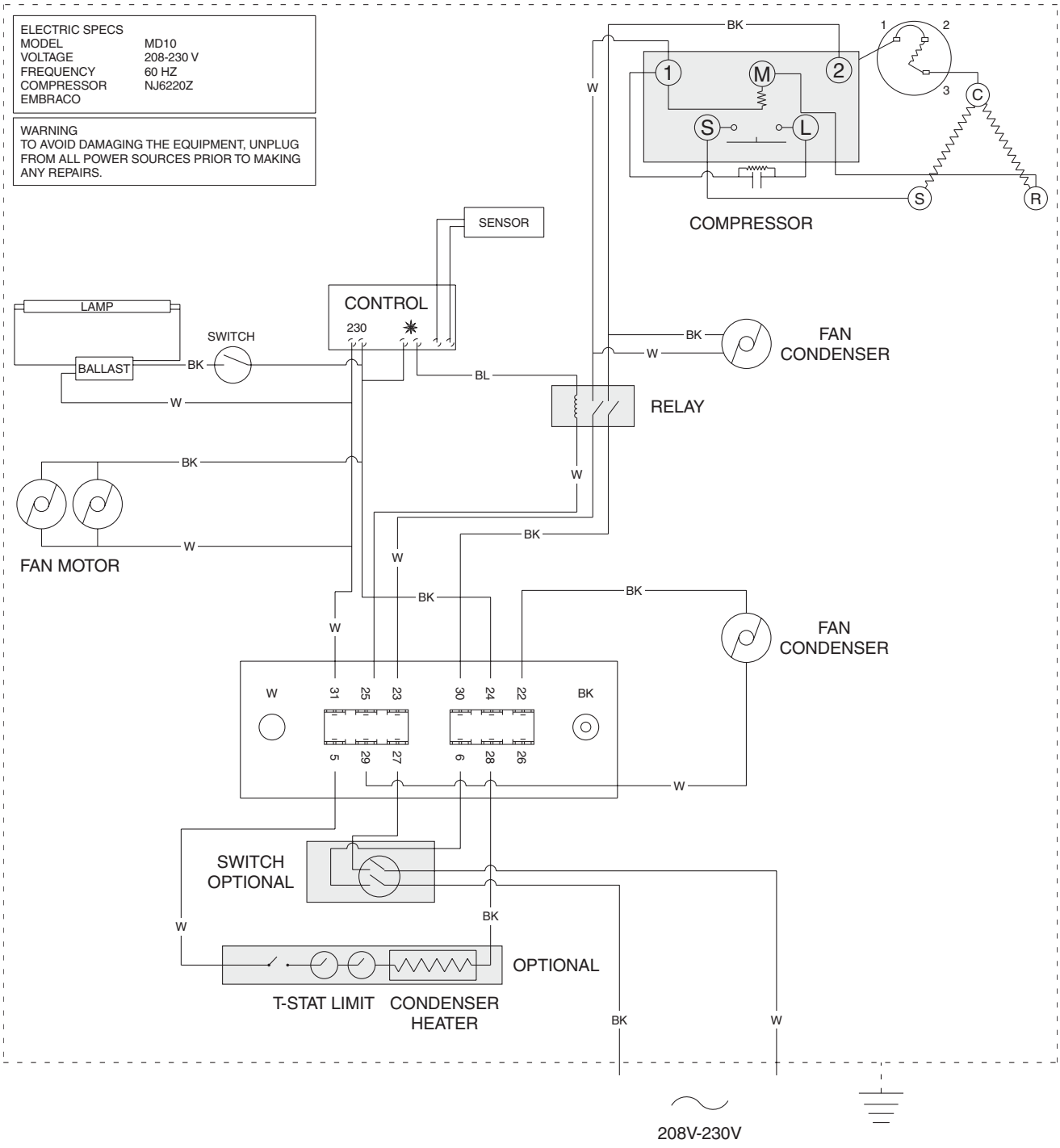
AHRI Total Display Area [1] **(*Sq Ft/Case*)** 18.42 ft^2 /case (1.711 m^2 /case)

MD-14

AHRI Total Display Area [1] **(*Sq Ft/Case*)** 15.97 ft^2 /case (1.483 m^2 /case)

[1] Computed using AHRI 1200 standard methodology:
Total Display Area, ft^2 [m^2] / Unit of Length, ft [m]

MD-10



WARNING

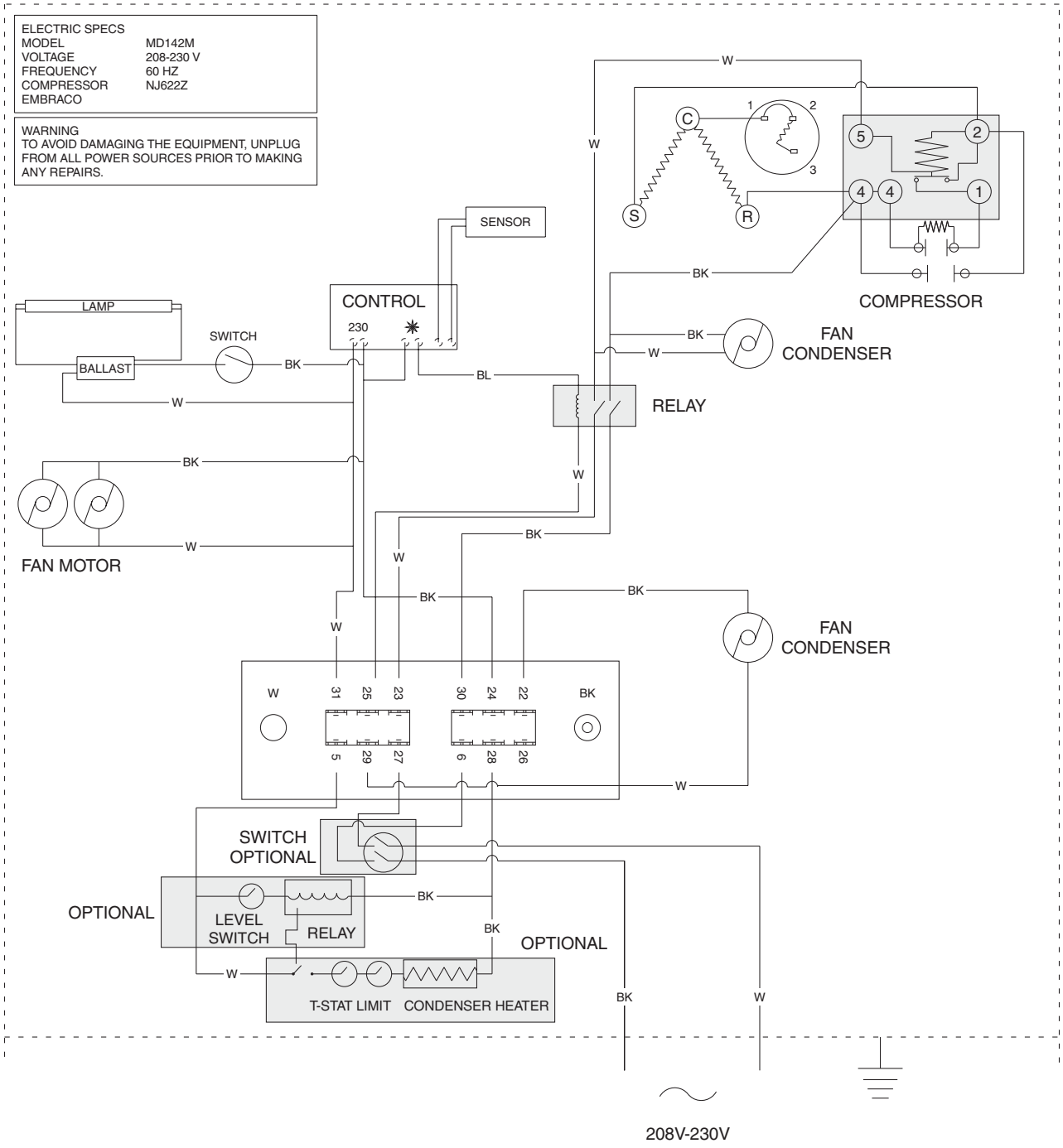
All components must have mechanical ground, and the merchandiser must be grounded.

CIRCLED NUMBERS = PARTS LIST ITEM NUMBERS

R = Red Y = Yellow G = Green BL = Blue BK = Black W = White

● = 120V POWER ○ = 120V NEUTRAL ⏚ = FIELD GROUND = CASE GROUND

MD-14



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Please include the model and
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