

Manor

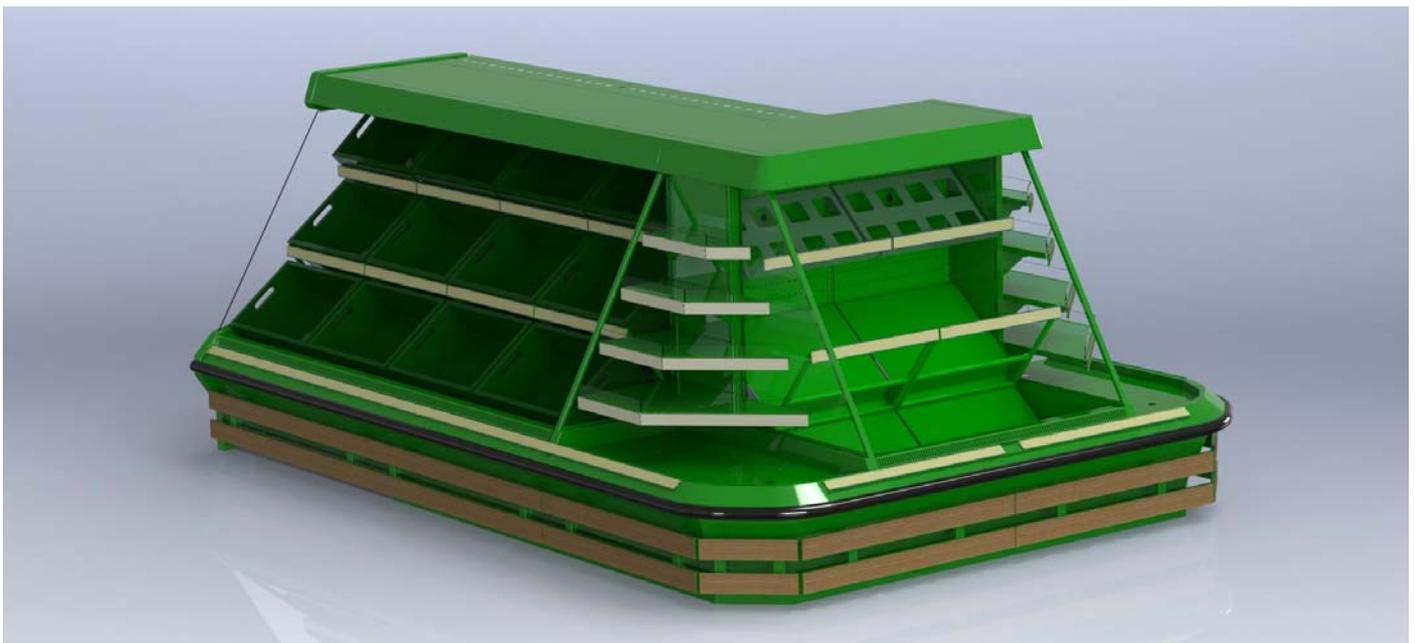
CONCEPTS

Refrigerated display specialists

MCL CAIMAN

LOW HEIGHT ENERGY EFFICIENT REFRIGERATED DISPLAY CABINET WITH A REMOTE
CONDENSING UNIT

RUNNING ON R404A



DATA, OPERATION AND MAINTENANCE MANUAL

Please note that all the information contained within this publication was correct at the time of issue, but it maybe revised or updated at a later date without prior notice. All images are for illustration purposes only.

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1) DOCUMENT AND CABINET INFORMATION

CABINET TYPE = Low Height Multi Deck.

CABINET MODEL NAME = MCL Caiman.

PRODUCT TEMPERATURE RANGE = M2 (+7°C / -1°C)

DEVELOPMENT NUMBER = 0068.

Issue No	Issue Date	Issued By	Notes
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O&M MANUAL ISSUE =	Number One /	23/09/2013 /	P.M /	First Issue
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Note

Before installing or operating this cabinet, make sure you read this instruction manual carefully.

This document should be made available to any person who is going to operate, clean or repair this display cabinet.

Note

Please follow all safety instructions and warning labels at all times.

Note

Please use this display cabinet in strict accordance with its specified purpose, it should only be used for the displaying and selling of fresh food products.

Note

Before placing any product in this display cabinet, please ensure that both the cabinet and the product are at the correct temperature.

This report and the information it contains is the private property of MANOR CONCEPTS Ltd and should not be copied or loaned to any third party without written permission.

SAFETY PRECAUTIONS

This cabinet is connected to a single-phase 230-volt electricity supply and contains moving parts. Please ensure that before any internal panels are removed or before any maintenance, service or cleaning work is carried out that the cabinet is turned off and isolated from the incoming electrical supply. The cabinet's electrical isolator can be found behind a flap located at the left hand end of the cabinet's kick plate. All maintenance and cleaning carried out on this display cabinet should only be undertaken by suitably trained and qualified personnel.

This display cabinet is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning the use of the appliance by a person responsible for their safety. Children should be supervised at all times to ensure that they do not play with the display cabinet.

At no time should the roof / top of the cabinet be used as a walkway, a working platform or for the storage of equipment or boxes. This applies during both the cabinet's installation and once it is in used by the store. Manor Concepts will not except reasonability for any damage done to the cabinet as a result of persons working or items being stored on the cabinet's roof / top.

Please note that the maximum shelf and deck tray weight load does not exceed 240 kg/m². Failure to comply with this weight limit could result in permanent and un-repairable damage to the cabinet. In extreme cases, excessively over loading the shelves could result in a shelf collapsing and the possible harm to both store employees and store customers alike.

Please ensure that any product placed with-in this display cabinet for sale is at its correct storage temperature at the time of entry. This cabinet is only designed to hold products at their correct core temperature. If products are placed with-in the cabinet above their required display temperature this cabinet may not be able to reduce their core temperature back below their intended storage temperature.

When lifting with a fork truck this cabinet should only be lifted from the rear. If there are warning signs on the rear of the cabinet concerning the lifting of the cabinet, these should be followed at all times. Manor Concepts will not except reasonability for any damage done to the cabinet as a result of the cabinet being lifted or moved incorrectly.

Once installed all care should be taken to ensure that the cabinet is not damaged during the rest of the store build or refit. Once again Manor Concepts will not except reasonability for any damage done to the cabinet following the sign off / completion of the cabinet install.

All warning labels attached to this cabinet should be followed and adhered to at all times. For more information on the cabinet's warning labels please refer to section one of this manual.

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2) WARNING LABELS.

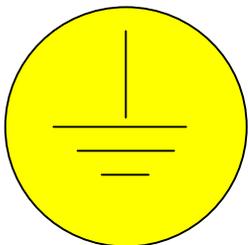


This label is found on all housings that contain a 230v electrical supply. Before removing the lid on the housing isolate the electrical supply to it first.

The electric isolator can be found behind a flap at the left hand end of the cabinet's kick plate.



This label is found on the lid of the electric box. Before removing the electric box lid make sure that the cabinet is isolated from the incoming 230v supply. The cabinet isolator is located at the right hand end of the electric box



This label is found at all the points around the cabinet where an earth cable / strap is located.

If an earth cable is disconnected during either a cabinet repair or clean it must be reconnected before the cabinet is turned back on.

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2) WARNING LABELS CONTINUED.



Caution
Do not walk

This label can be found on the roof or top of the cabinet.

At no time should the top of the cabinet be used as a walkway or work platform.

The top of the cabinet should not be used for storage.

This cabinet's evaporator has a holding charge of Oxygen free Dry Nitrogen (N₂). The holding charge is 50 psi.

This label is located on the rear of the cabinet. It is used to inform people that the evaporator has a holding pressure of 50 psi.

Before any work is carried out on the evaporator or its connecting pipe work the nitrogen creating the 50 psi of pressure will need to be released.



Do not fork here



If required this label is located at the bottom of the cabinet's rear insulated panel. It is used to highlight an area where the forks from a fork truck should not be used to lift or move the cabinet.

Failing to follow this warning sign could lead to serious damage occurring to the cabinet.

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3) INTRODUCTION.

The Manor Concepts MCL-Caiman refrigerated display cabinet has been designed, developed and tested to operate in a temperature and humidity controlled environment of less than 25°C and 60% relative humidity. Anything above these stated conditions could have a serious affect on the cabinet's ability to maintain its required product core temperature.

At the time of development this refrigerated display cabinet incorporated all of the current retail industries specifications and requirements for the cabinets indented application.

The MCL-Caiman cabinet has been developed to store and display fresh fruit, vegetables, pre pack salad and dairy products.

In order to maintain the correct product temperature and the continued operation of the display cabinet, it is important that the correct commissioning information is used, the commissioning setup details can be found on the cabinets data sheet in section three of this document.

There are many ways in which this display cabinet can be configured for merchandising. However this is not covered by this document, for information on the display profiles and requirements please refer to the stores planograms.

The construction of the MCL Caiman cabinets consists of a galvanised steel shell, which is then filled with a high density foam. The injection of the foam into the steel shell is carried out at high pressure to ensure the removal of all air pockets. The end result is an insulated sandwich construction that is the basic carcase of the cabinet. All the insulated foam used in the construction of these display cabinets from January 2003 is CFC free.

When the foam has cured the cabinet assembly can begin with the various foam sections being joined together. Next the feet, pilasters, evaporator, steel inner skins and electrical components are added. The end result being a free standing refrigerated display cabinet.

Once completed and before its delivery a cabinet is put through a series of electrical and refrigeration checks to ensure its integrity and to make sure it meets all its safety requirements.

Following delivery the cabinet's are configured on the sales floor to a drawing supplied by the main contractor. They are then multiplexed together or fitted free standing accordingly.

All the electrical and refrigeration connections required to run the cabinet should be carried out by qualified personnel appointed by the main contractor.

After the completion of the cabinet's installation on the sales floor, the merchandising profiles can be fitted. This should include all shelving, racking and product / system dividers to meet the particular requirements of the store and customer.

The MCL Caiman is a low height cabinet, which has been designed to be installed as an island. The island could consist of two end cabinets and then any number of run cabinets to make up the islands length. If required insulated end walls can be fitted to the ends of the run cabinets. These can be glazed or solid. **Please note that the two corner sections on the end display cabinets are for ambient product only.**

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4) MCL CAIMAN DATA SHEET.

MANOR CONCEPTS	MODEL :-	MCL CAIMAN			TECHNICAL DATA	
		R404A				
		LOW HEIGHT PRODUCE				
	Family :-	VC2				
GENERAL CONDITIONS OF TEST LABORATORY					Date Issued	
REFRIGERANT	TEMPERATURE	RELATIVE HUMIDITY	CROSS AIR SPEED	LAB LIGHTING	22nd May 2013 / No 1	
R404A	+25° C	60%	0.2 m/sec	600 lux fluorescent	Duty Method = EN-23953	
PRODUCT TYPE	PRODUCT TEMPERATURE BAND	DUTY RATINGS				EVAPORATING TEMP.
		KW / HOUR				
		-----	1250mm	1876mm	2500mm	3750mm
PRODUCE @ 25°C / 60% (ISO-3)	0 / + 5° C	-----	1.5	2.25	3.00	4.5
						- 5° C

NB For undershelf lighting add 2% of duty per tier of shelving.

Electrical loads at 230V / 50Hz.

MODULATION						
CABINET LENGTH (mm.)		1250	1875	2500	3750	
EC FAN MOTORS	Watts	8	12	16	24	----
	Amps	0.07	0.1	0.13	0.2	----
T5 CANOPY LIGHTS SINGLE ROW (28w & 21w)	Watts	30	45	59	89	----
	Amps	0.12	0.19	0.24	0.36	----
DEFROST HEATERS (OPTIONAL)	Watts	----	----	----	----	----
	Amps	----	----	----	----	----
TRIM HEATERS	Watts	----	----	----	----	----
	Amps	----	----	----	----	----
EVR SOLENOID VALVE AC COIL HEAD	Watts	10	10	10	10	----
	Amps	0.04	0.04	0.04	0.04	----
TOTAL	Amps	0.23	0.33	0.41	0.6	----

AKV 18w DC Coil = 0.13 amps
AKV 20w AC Coil = 0.14 amps

Optional Components

LED CANOPY LIGHTS SINGLE ROW		25	38	50	75	
	Watts	25	38	50	75	----
	Amps	0.12	0.18	0.24	0.36	----

EVAPORATOR CHARGE R404A (25% Liquid)	1.95	2.8	3.9	6.2	----	kg (±0,5)
---	------	-----	-----	-----	------	-----------

EXPANSION VALVES		R404A	AKV 10-3	AKV 10-4	AKV 10-5	AKV 10-6
	Danfoss	R404A	AKV 10-3	AKV 10-4	AKV 10-5	AKV 10-6
	Danfoss	R404A	TES-2 No 02	TES-2 No 02	TES-2 No 03	TES-2 No 04

EC FAN MOTORS	Watts	7 Each	7 Each	7 Each	7 Each	FAN SPEED	
	BLADE	integral	integral	integral	integral		900 rpm
	N° Off	2	3	4	6		

@ ENVIRONMENT		25° C / 60% RH	Store Settings
SET-UP INFORMATION		Produce	Produce
DEFROST TERM.	deg C	8	10
DURATION MIN.	minutes	20	20
DURATION MAX.	minutes	30	35
DRAIN DOWN	minutes	0	0
N° OF DEFROSTS IN	24hrs	8	8
CABINET CONTROL	deg C	100% AIR OFF	100% AIR OFF
CUT-IN TEMPERATURE	deg C	0	0
CUT-OUT TEMPERATURE	deg C	-3	-2

If you should encounter persistent problems with evaporator icing in individual stores the defrost duration should be extended to 45 mins. Please note that this should only be done were problems with ice occur and should not be applied as the norm. If you continue to experience problems then please contact Manor Concepts for further guidance. Please make sure that the correct product temperature is maintained.

CONDENSATE WATER LOSS	Environment	25°C & 60% RH	23°C & 50% RH	20°C & 50% RH
		Litres / Hour / Metre	0.65	

PIPE LINE SIZES	SUCTION LINE ON R404A = 7/8"	LIQUID LINE ON R404A = 3/8"	DRAIN = 1 1/4" (32mm)
------------------------	-------------------------------------	------------------------------------	------------------------------

Please Note That 25° C & 60% RH Settings are Based On Laboratory Tests
Please Note That Store Settings Are Based On A Store Environment Of 23° C & 50% RH

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5) MCL 3.75m CAIMAN DATA PLATE.

MANOR CONCEPTS LIMITED			
62, SUNDERLAND ROAD, SANDY, BEDFORDSHIRE, UK, SG19 1QY :- TELE 01767 222100			
This Cabinet Has Been Designed To Work In a Maximum Environment Of 25° C & 60% Relative Humidity (Climate Class 3)			
CABINET MODEL / LENGTH	MCL CAIMAN (3.750m)	CABINET SERIAL No	MCL ??????????
CABINET ELECTRIC SUPPLY	SINGLE PHASE 230v AC 50Hz	WEE No	WEE/HFO809UY
	VOLTS	WATTS	AMPS
CONTROLS	230v	10	0.04
EVAPORATOR FANS	230v	24	0.2
T5 CANOPY LIGHTS	230v	89	0.36
DOOR LIGHTS	230v	N/A	N/A
SHELF LIGHTS	230v	N/A	N/A
	TOTAL AMPS =		0.6
DEFROST TYPE	OFF CYCLE		
REFRIGERANT TYPE	R404A (Hydrofluorocarbon)		
MAXIMUM SHELF DEPTH	650mm	MAXIMUM SHELF WEIGHT LOAD	240 Kg PER M / SQUARED
DATE OF MANUFACTURE	????????	MANUFACTURED IN	UK
SAFE WORKING PRESSURE = 275 PSIG / TEST PRESSURE 350 PSIG			

The above MCL Caiman cabinet data plate is for a 3.75m cabinet. The data plates for the other cabinet lengths in the Caiman range are available upon request.

The data plate is located at the left hand end of the cabinet's inner roof panel.

The plate contains information on the cabinet's electricity supply and load.

Both the safe working pressure and test pressure.

The type of defrosts the cabinet has been designed to use.

The refrigerant type the cabinet is to run on.

The evaporator fan speed.

The maximum shelf size and weight load.

The cabinet's date and place of manufacture.

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6) INSPECTION.

Upon delivery of the refrigerated display cabinets a check should be made for any external damage, if any is found it should be reported straight away. At the same time a check should be made to make sure that all the loose profiling items sent with the cabinet are correct and accounted for. These should then be stored in a safe and controlled area until they are required. Most on site shortages are caused due to parts either being thrown away with the packaging materials or being damaged due to improper storage.

If fitted all shipping bars should be left fitted to the cabinet until the cabinets final positioning has taken place.

All cabinets and loose items should be stored in a dry environment until installed.

During installation any internal damage should be dealt with and repaired immediately. This will prevent any hold ups in the installation program and insure that the cabinet will be able to operate correctly.

If applicable, upon delivery and during installation all cabinet lighting components should be stored away from the cabinet to prevent breakage and injury to staff or contractors.

7) CABINET LOCATION.

The MCL-Caiman should not be placed anywhere that puts it at risk of getting wet. The cabinet should not be stored or sited where there is a risk of the cabinet being rained on or being under falling water. Every effort should be taken to ensure that no water can enter the cabinet's electric box. The electric box is located under the cabinet at the left hand end.

The MCL-Caiman refrigerated display cabinet if possible should not be placed in direct sunlight, or in areas of high temperature i.e. next to ovens or under spotlights that are not of a diachronic type.

The MCL-Caiman cabinets should also be placed where they are not going to be affected by draughts. Strong draughts blowing directly into the cabinet or along its front face will have a serious affect on the cabinet's ability to maintain its required product core temperature.

Draughts can come from open doors and air conditioning grills and vents.

A minimum of 25mm clearance should be left between the rear of a cabinet and a wall.

The 25mm cap is required to stop condensation from forming on the outside skins of the cabinet.

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8) INSTALLATION.

After the first cabinet has been positioned, if required remove the travel bars and again if required fix the cabinet to the floor, check that the cabinet is level, both left to right and front to back. This will ensure proper drainage of the water generated as a result of the cabinets defrost cycles. Repeat this procedure for all the cabinets being installed.

It is important that the cabinets are positioned on level and even floors. Doing so will assist with the cabinets performance and drainage.

All case multiplex joints must be filled with the sealing strips supplied. It is important that all case joints have a good airtight seal. Failure to ensure an airtight seal could result in the build up of condensation and frost. As a result of condensation and frost there is a risk of water ingress into the cabinet's main structure, this will shorten the cabinet's operational life span and lead to a break down in the insulation properties of the cabinet.

At no time should the top / roof of the cabinet be used as a walkway or for seating, this will apply during the installation of the refrigeration pipe work and the connection of the electrical services. It will also apply during any construction / maintenance work that is carried out on the store building. Also the shelves should not be used as a stepladder or for support. Only approved access and egress methods should be used to avoid possible injury to personnel or damage to the cabinet.

The cabinet is fitted with a standard type drain trap, which takes conventional plastic tubing. The drains should always be run with a fall away from the cabinet to the main drain. It is very important not to double trap this pipe as it will lead to drainage problems due to trapped air. The size and type of the drain fitting used on the MCL-Caiman is listed on the cabinet's data sheet, which can be found in section three of this document.

It is important to always ensure that the drains are protected from frost and that there is an air break immediately before the main drain connection, this will prevent both suction on the traps and odours being introduced into the cabinet and the sales area. Upon completion the drains should be checked for both leaks and function.

After the completion of the installation a check should be made to ensure that all removable parts are present and fitted correctly, the failure to fit or fit correctly the removable parts will have an affect on the cabinet's ability to function and maintain the correct product temperature.

A check should also be made to make sure that all the service entry points are correctly sealed and that no air can escape from within the cabinet.

It is important that when connecting the cabinet's income 230 volt electrical supply and the controllers cat-5 data cable, that a sufficient amount of cable is left under the cabinet to allow the cabinets electric box to be pulled forward the full distance required.

Only suitably trained and qualified electricians should carry out any electrical work on this display cabinet.

After installation a check should be made to the cabinets pipe work to ensure there are no rubbing parts and that no parts of the pipe work system are in contact with a shape or raw edge.

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9) COMMISSIONING.

This cabinet should only be commissioned by correctly trained engineers. The required commissioning information can be found on the cabinet's data sheet in section three of this document. The commissioning data provided is for guidance only. Depending on the cabinet's location and the stores environment, changes might be required in order to ensure the correct product temperature is maintained.

In order to ensure the total elimination of ice from the evaporator during a defrost it might be necessary to modify both the temperature and defrost control settings from the ones stated on the cabinets data sheet. All changes must be made so that the correct product temperature is maintained. The owner of the cabinet must give permission before any modifications are made to the operating parameters.

After the initial commissioning ensure all shelving, system dividers and light tubes are fitted. The cabinet should then be monitored for at least 24 hours to make sure that it is operating correctly and cycling on its thermostat. This should be carried out before it is handed over to the store.

10) CABINET WEIGHT.

No information on the cabinets weight was available at the time of compiling this O&M manual.

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11) MAINTENANCE AND HYGIENE.

To ensure good hygiene, long life and reliability the cabinet should be cleaned about every six weeks by suitably trained staff. Before any cleaning is carried out ensure that the cabinet is fully de-merchandised and that it is electrically isolated as stated in the current "Electricity At Work Regulations" or as per your firms guidelines.

When cleaning a refrigerated display cabinet always wear the correct personal protection equipment (PPE).

The MCL-Caiman cabinet has been designed to make it as maintenance friendly as possible. The cabinet can be taken apart for cleaning without the need for tools. Both the internal and external steel panels can be easily removed giving access to the evaporator, refrigeration valve and drain.

Each evaporator fan can be removed by unplugging it. When cleaning fan motors be careful not to damage the fan blade or alter its pitch, do not allow water to enter a fan motor.

The honeycomb must be removed and cleaned as part of the cabinet cleaning program, this can be done by loosing the thumb screws situated along the length of the honeycomb retainer, when the screws are all loose the retainer can be moved towards the rear of the cabinet, this will allow the honeycomb to be removed with ease. Once removed the honeycomb should be cleaned with warm soapy water only, when cleaning honeycomb always make sure that all the debris is removed from with-in the straws that make up the honeycomb, if they are not removed they can form a barrier to the air flow through the honeycomb and affect the cabinet performance. Once cleaned the honeycomb should be left to dry before being refitted, if the honeycomb is refitted when it is still wet there is a chance that the moisture will turn to ice and block the honeycomb. To refit the honeycomb use the reverse of the above procedure.

With all the cabinet panels removed the cleaning process can begin. Before the cleaning starts the drain should be sucked back using a wet vacuum cleaner, next the floor / base area should be vacuumed and cleaned to remove any debris and food particles. At this point the cabinet should be checked for any damage or evidence of moisture ingress. It is very important to make sure that all foreign bodies are removed from the internal air ducts.

Check and clean the cabinet's evaporator, when cleaning evaporators take care as the fins are very sharp and can cause injury. Make sure that no pipes are rubbing or in contact with a sharp edge.

When the cabinet's profiling has been removed it can be cleaned. This should only be carried out by trained personnel, using only cleaning products approved by their company. Only non-abrasive products should be used to ensure the long life of painted surfaces. Do not use steel wool or sharp tools during this task. When the cleaning process is complete the drain trap should be sucked back again to remove any debris dislodged during cleaning.

While the cabinet is stripped down an appointed service engineer should carry out leak checks on the cabinets refrigeration system. At this point the cabinet should also be electrically tested. Any problems should be resolved before the cabinet is reassembled.

Before the cabinet is turned back on you need to make sure that it is dry, clean and that all its internal parts are present and have been refitted correctly. Finally check the pipe-work for rubbing.

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12) TEMPERATURE CONTROL PROBE LOCATION DRAWING.

This drawing is confidential and is supplied on the express condition that it shall not be lent, copied, or disclosed to any other person or used for any purpose without the written consent of Manor Concept Ltd.

All probes are located in the left hand bay of all case lengths.
 To access the air off probe, remove the left hand back panel.
 To access the air-on, coil-in & coil-out probes remove left hand deck tray.
 These probe positions are applicable for all cabinet electronic controllers and probe types.

DANFROSS EK CC550
31 & 32 = S1 = Coil In
35 & 36 = S2 = Coil Out
37 & 38 = S3 = Air On
39 & 40 = S4 = Air Off
41 & 42 = S5 = Def Term
43 & 44 = S6 = Product

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	N/A	Mat. Finish.	Description
Scale:	N.T.S	G.B	Mcl Calman low height produce probe location
Tolerance	±0.5	Date:	27-09-13
1 DEC Place :-	±0.25	Date:	Date:
2 DEC Places :-	±0.25	Checked:	Job Number
Angular	±0.25	Job Number	Rev. A
Dims :-	MILLIMETRES	Date:	Rev. A

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14) CABINET FOOT PRINT DIAGRAM.

Drg. No. -----	DO NOT SCALE			This drawing is confidential and is supplied on the express condition that it shall not be lent, copied, or disclosed to any other person or used for any purpose without the written consent of Manor Concept Ltd.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>L = Length</td> <td>1250</td> <td>1875</td> <td>2500</td> <td>3750</td> </tr> <tr> <td>D = Drain Outlet</td> <td>885</td> <td>1038</td> <td>1085</td> <td>1875</td> </tr> <tr> <td>I = Isolator Switch</td> <td>248</td> <td>248</td> <td>248</td> <td>248</td> </tr> <tr> <td>F1 = Feet</td> <td>n/a</td> <td>872.5</td> <td>1185</td> <td>1185</td> </tr> <tr> <td>F2 = Feet</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> <td>1250</td> </tr> </table>	L = Length	1250	1875	2500	3750	D = Drain Outlet	885	1038	1085	1875	I = Isolator Switch	248	248	248	248	F1 = Feet	n/a	872.5	1185	1185	F2 = Feet	n/a	n/a	n/a	1250												
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F1 = Feet	n/a	872.5	1185	1185																																						
F2 = Feet	n/a	n/a	n/a	1250																																						
Note :- No 320mm pipe return on 1250mm		<p style="text-align: center;">Plan View</p>			<p style="text-align: center;">Consumer Side</p>																																					
Rev. B Date. 25-07-13 drg & matrix updated Gery B Approved.		MANOR CONCEPTS LTD 62 Sunder land Road Bandy S619 100 Tel. (01767) 222100 Fax. (01767) 222111			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Scale.</td> <td>N.T.S</td> <td>Mat.</td> <td>N/A</td> <td colspan="2">Description</td> </tr> <tr> <td>Tolerance</td> <td></td> <td>Finish.</td> <td>N/A</td> <td colspan="2" rowspan="4" style="text-align: center;"> Low Height Produce Foot Layout </td> </tr> <tr> <td>1 DEC Place :-</td> <td>±0.5</td> <td>Drawn.</td> <td>G.B.</td> <td>Date.</td> <td>17-07-13</td> </tr> <tr> <td>2 DEC Places :-</td> <td>±0.25</td> <td>Checked.</td> <td></td> <td>Date.</td> <td></td> </tr> <tr> <td>Angular :-</td> <td>±0.25</td> <td>Job Number</td> <td></td> <td>Drg. No.</td> <td>-----</td> </tr> <tr> <td>Dim's :-</td> <td>MILLIMETRES</td> <td></td> <td></td> <td>Rev.</td> <td>B</td> </tr> </table>		Scale.	N.T.S	Mat.	N/A	Description		Tolerance		Finish.	N/A	Low Height Produce Foot Layout		1 DEC Place :-	±0.5	Drawn.	G.B.	Date.	17-07-13	2 DEC Places :-	±0.25	Checked.		Date.		Angular :-	±0.25	Job Number		Drg. No.	-----	Dim's :-	MILLIMETRES			Rev.	B
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MANOR CONCEPTS LTD.

Refrigerated Display Specialists

15) CONTROLLER SETTING.

Danfoss AK-CC 550 Case Controller Parameter Listing For MCL CAIMAN						
SET POINT FOR FRESH PRODUCE = -2°C		ISSUE NUMBER - 1		ISSUE DATE = 12 JUNE 2012		
SET POINT FOR PRE PACKED SALAD = -2°C		ALL VALUES ARE IN DEGREE'S C UNLESS OTHERWISE STATED				
SET POINT FOR DAIRY = -2°C						
No	Parameters	Codes	Min Value	Max Value	Factory Setting	MCL CABINET
Function						
Normal Operation						
1	Temperature (Set Point) ----- (Cut-Out Temperature)	-----	-50.0	50.0	2.0	See Above
Thermostat						
2	Differential	r01	0.1 K	20.0 K	2.0 K	2
3	Max (Limitation of setpoint setting)	r02	-49	50	50	8
4	Min (Limitation of setpoint setting)	r03	-50	49	-50	-7
5	Adjustment of temperature indication	r04	-10	10	0	0
6	Temperature unit (°C / °F)	r05	0 = °C	1 = °F	0 = °C	0 = °C
7	Correction of the signal from S4	r09	-10 K	10 K	0.0 K	0
8	Correction of the signal from S3	r10	-10 K	10 K	0.0 K	0
9	Manual service, stop regulation, start regulation (-1, 0, 1)	r12	-1.0	1.0	0.0	1
10	Displacement of reference during night operation	r13	-25 K	25.0 K	0.0 K	0
11	Define thermostate function (1 = On/off & 2 = modulating)	r14	1	2	1	2
12	Definition and weighting, if applicable, of thermostat sensors -S4% (100%=S4, 0%=S3)	r15	0%	100%	100%	100%
13	Time between melt periods	r16	0 hrs	10 hrs	1	0
14	Duration of melt periods	r17	0 mins	10 mins	5	0
15	Temperature setting for thermostat band 2. As differential use r01	r21	-50%	50	2	2
16	Correction of signal from S6	r59	-10 K	10 K	0	0
17	Definition and weighting, if applicable, of thermostat sensors when night cover is on(100%=S4, 0%=S3)	r61	0%	100%	100%	100%
18	Heat function - neutral zone between refrigeration and heat function	r62	0 K	50 K	2	2
19	Time delay at switch between refrigeration and heat function.	r63	0 mins	240 mins	0	0
Alarm						
20	Delay for temperature alarm	A03	0 min	240 min	30 min	60
21	Delay for door alarm	A04	0 min	240 min	60 min	90
22	Delay for temperature alarm after a defrost	A12	0 min	240 min	90 min	90
23	High alarm limit for thermostat one	A13	-50	50	8	10
24	Low alarm limit for thermostat one	A14	-50	50	-30	-10
25	High alarm limit for thermostat two	A20	-50	50	8	15
26	Low alarm limit for thermostat two	A21	-50	50	-30	-15
27	High alarm limit for sensor S6 at thermostat one	A22	-50	50	8	10
28	Low alarm limit for sensor S6 at thermostat one	A23	-50	50	-30	-10
29	High alarm limit for sensor S6 at thermostat two	A24	-50	50	8	10
30	Low alarm limit for sensor S6 at thermostat two	A25	-50	50	-30	-10
31	S6 alarm time delay --- with setting = 240 the S6 alarm will be omitted	A26	0 mins	240 mins	240 mins	60
32	Alarm time delay or signal on the D11 input	A27	0 min	240 min	30 min	30
33	Alarm time delay or signal on the D12 input	A28	0 min	240 min	30 min	30
34	Signal for alarm thermostat, 54% (100% = 54, 0% = S3)	A36	0%	100%	100%	100%
35	Delay for S6 (product sensor alarm) after defrost	A52	0 min	240 min	90 min	90
Compressor						
36	Min, On time	c01	0 min	30 min	0 min	0
37	Min, Off time	c02	0 min	30 min	0 min	0
38	Time delay for cut-in of compressor 2	c05	0 sec	999 sec	5 sec	5
Defrost						
39	Defrost method = 0 = none, 1 = EL, 2 = Gas.	d01	0 / No	2 / Gas	1 / EL	EL
40	Defrost stop temperature	d02	0°C	25°C	6°C	8
41	Interval between defrost starts	d03	0 hrs/Off	48 hours	8 hours	3
42	Max. Defrost duration	d04	0 mins	360 mins	45 mins	20
43	Displacement of time on cut-in of defrost at start up	d05	0 mins	240 mins	0 mins	0
44	Drip off time	d06	0 mins	60 mins	0 mins	0
45	Delay for fan start after a defrost	d07	0 mins	60 mins	0 mins	0
46	Fan start temperature	d08	-50°C	0°C	-5°C	0
47	Fan cut-in during defrost. 0 = Stopped / 1 = Running / 2 = Running during pump down and defrost	d09	0 / No	1 / Yes	1 / Yes	1 / Yes
48	Defrost sensor (0 = time / 1 = S5 / 2 = S4)	d10	0	3	0	0
49	Pump down delay	d16	0 mins	60 mins	0 mins	0
50	Drain delay	d17	0 mins	60 mins	0 mins	0
51	Max. aggregate refrigeration time between two defrosts	d18	0 hours	48 hours	0 / Off	4
52	Heat in trip tray. Time from defrosting stops to heating in the drip tray is switched off	d20	0 min	240 min	30 min	0
53	Extra defrost with adaptive function allowed: 0 = none / 1 = monitoring only / 2 = day only / 3 = both day and night / 4 = night only.	d21	0	4	0	0
54	Reset of the adaptive defrosting function (starts a defrost and starts subsequent new tuning)	d22	0 / Off	1 / On	0 / Off	0 / Off
If you wish to see the temperature at the defrost sensor, push the controllers lower button.						
If you wish to wish to start an extra defrost, push the controllers lower button for 4 seconds.						
You can also stop a defrost in the same way.						
Injection Control Function						
55	Injection algorithm (Only for trained personnel)	n05	30 sec	600 sec	150	150
56	Max value of superheat reference	n09	3°C	20°C	12	12
57	Min value of superheat reference	n10	3°C	20°C	3	3
58	MOP temperature. Off if MOP temp = 15°C	n11	-50°C	15°C	15	15
59	Glide for Ezotrope refrigerant (at S1- measurement only)	n12	0 K	10 K	0	0
60	Period time of AKV pulsation (Only for trained personnel)	n13	3 sec	6 sec	6	6
61	Injection algorithm (Only for trained personnel)	n15	30 sec	600 sec	180	180
62	Injection algorithm (Only for trained personnel)	n16	10%	75%	30	30
63	Injection algorithm (Only for trained personnel)	n17	5%	70%	30	30
64	Injection algorithm (Only for trained personnel)	n18	0	1	0.4	0.4
65	Injection algorithm (Only for trained personnel)	n23	1	50	6	6
66	Injection algorithm (Only for trained personnel)	n24	100 sec	1800 sec	900	900
67	Selection of signal to superheat measurement: 1 = pressure transmitter AKS32R. 2 = Temp sensor S1	n57	1	2	1	2

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15) CONTROLLER SETTING.

No	Parameters	Codes	Min Value	Max Value	Factory Setting	MCL Cabinet
Fan						
68	Fan stop temperature (S5)	F04	-50°C	50°C	50	50
69	Pulse operation on fans. 0 = no pulse operation. 1 = at thermostat cuts out only 2 = only at thermostat cut outs during night operation.	F05	0	2	0	0
70	Period time for fan pulsation (on time + off time)	F06	1 mins	30 mins	5	5
71	On time in % of period time	F07	0%	100%	100	100
Real Time Clock						
72	Six start times for defrost. Setting of hours. 0 = Off	t01-t06	0 hours	23 hours	0 hours	0 hours
73	Six start times for defrost. Setting of minutes. 0 = Off	t11-t16	0 mins	59 mins	0 mins	0 mins
74	Clock- settings of hours	t07	0 hours	23 hours	0 hours	0 hours
75	Clock- settings of minute	t08	0 mins	59 mins	0 mins	0 mins
76	Clock- settings of date	t45	1 Day	31 Day	1	1
77	Clock- settings of month	t46	1 Month	12 Month	1	1
78	Clock- settings of year	t47	0 Year	99 Year	0	0
Miscellaneous						
79	Delay of output signals after start-up :-	o01	0 sec	999 sec	5 s	5 s
80	Input signal on D11 function:	o02	0	12	0	12
	0 = not used					
	1 = status on D11					
	2 = door function with alarm when open					
	3 = door alarm when open					
	4 = defrost start (pulse-signal)					
	5 = ext.main switch					
	6 = night operation					
	7 = thermostat band changeover (active r21)					
	8 = alarm function when closed					
	9 = alarm function when open					
	10 = case cleaning (pulse signal)					
	11 = forced cooling at hot gas defrost					
12 = night cover						
81	network address	o03	0	240	0	0
82	On / Off switch (service pin message) IMPORTANT o61 must be set prior to o04 (used at LON 485 only)	o04	0/OFF	1/ON	0/OFF	OFF
83	Access code 1 (all settings)	o05	0	100	0	0
84	Used sensor type : 0 = pt1000. 1 = ptc 1000	o06	0/pt	1/ptc	0/pt	0/pt
85	Max hold time after coordinated defrost	o16	0 mins	360 mins	20	20
86	Select signal for display view. S4% (100% = S4, 0% = S3)	o17	0%	100%	100%	100%
87	Pressure transmitter working range - max value	o20	-1 bar	5 bar	-1	-1 Bar
88	Pressure transmitter working range - min value	o21	6 bar	60 bar	12	25 Bar
89	Refrigerant setting :-	o30	0	31	0	19
	1 = R12					
	2 = R22					
	3 = R134a					
	4 = R502					
	5 = R717					
	6 = R13					
	7 = R13b1					
	8 = R23					
	9 = R500					
	10 = R503					
	11 = R114					
	12 = R142b					
	13 = User defined					
	14 = R32					
	15 = R227					
	16 = R401A					
	17 = R507					
	18 = R402A					
	19 = R404A					
	20 = R407C					
21 = R407A						
22 = R407B						
23 = R410A						
24 = R170						
25 = R290						
26 = R600						
27 = R600a						
28 = R744						
29 = R1270						
30 = R417A						
31 = R422A						
90	Input signal on D12 function :-	o37	0	13	0	10
	0 = not used					
	1 = status on D12					
	2 = door function with alarm when open					
	3 = door alarm when open					
	4 = defrost start (pulse signal)					
	5 = ext.main switch					
	6 = night operation					
	7 = thermostat band changeover (active r21)					
	8 = alarm function when closed					
	9 = alarm function when open					
	10 = case cleaning (pulse signal)					
	11 = forced cooling at hot gas defrost					
12 = night cover						
13 = coordinated defrost						
91	Configuration of light function :-	o38	1	4	1	2
	1 = light follows day/night operation.					
	2 = light control via data communication. Via o39					
	3 = light control with a D1 in-put					
4 = as 2 but light switch on and night cover will open if the network cut out for more than 15 minutes						

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Refrigerated Display Specialists

15) CONTROLLER SETTING.

No	Parameters	Codes	Min Value	Max Value	Factory Setting	MCL Cabinet
92	Activation of light relay (only if o38 = 2) on = light	o39	0/OFF	1/ON	0/OFF	1/ON
93	Rail heat on time during day operations	o41	0%	100%	100%	100%
94	Rail heat on time during night operations	o42	0%	100%	100%	100%
95	Rail heat period time (on time + off time)	o43	6 mins	60 mins	10 mins	10 mins
96	Case cleaning. 0 = No case cleaning / 1 = Fans only / 2 = All outputs off	*** o46	0	2	0	0
97	Selection of EI diagram. See overview page 12 and 13	* o61	1	10	1	1
98	Download a set of predetermined setting. See overview previous page 27	* o62	0	6	0	0
99	Access code 2 (partly access)	*** o64	0	100	0	0
100	Save the controllers present settings to the programming key (select your own number)	o65	0	25	0	0
101	Load a set of settings from the programming key (previously saved via o65 function)	* o66	0	25	0	0
102	Replace the controllers factory settings with the present settings	o67	0/OFF	1/ON	0/OFF	OFF
103	Input signal on D13. Function: (high voltage input) :- 0 = not used 1 = status on D12 2 = door function with alarm when open 3 = door alarm when open 4 = defrost start (pulse signal) 5 = ext. main switch 6 = night operation 7 = thermostat band changeover (active r21) 8 = not used 9 = not used 10 = case cleaning (pulse signal) 11 = forced cooling at hot gas defrost 12 = night cover 13 = not used 14 = refrigeration stopped (forced closing)	o84	0	14	0	
104	Rail heat control. 0 = not used / 1 = pulse control with timer function (o41 and o42) / 2 = pulse control with dew point function.	o85	0	2	0	
105	Dew point value where the rail heat is minimum.	o86	-10°C	50°C	8	
106	Dew point value where the rail heat is 100% on.	o87	-9°C	50°C	17	
107	Lowest permitted rail heat effect in %	o88	0%	100%	30	
108	Time delay from "open door" refrigeration is started.	o89	0 mins	240 mins	60	
109	Fan operation on stopped refrigeration (forced closing) no/0 = fans off / yes/1 = fans on	o90	0/no	1/yes	1/yes	1/yes
110	Definition of readings on lower button. 1 = defrost stop temp / 2 = S6 temp / 3 = S5_B temperature	o92		3	1	
Service						
111	Temperature measured with S5 sensor	u09				
112	Status on D1 input on/1 = closed	u10				
113	Actual defrost time (minutes)	u11				
114	Temperature measured with S3 sensor	u12				
115	Status on night operation (on or off) 1 = on	u13				
116	Temperature measured with S4 sensor	u16				
117	Thermostat temperature	u17				
118	Run time of thermostat (cooling time) in minutes	u18				
119	Temperature of evaporator inlet temp.	u19				
120	Temperature of evaporator outlet temp.	u20				
121	Superheat across the evaporator.	u21				
122	Referance of superheat control	u22				
123	Opening degree of AKV valve.	u23				
124	Evaporating pressure Po (relative)	u25				
125	Evaporator temperature To (calculated)	u26				
126	Temperature measured with S6 sensor (product temperature)	u36				
127	Status on D12 output on/1 = closed	u37				
128	Temperature shown on display	u56				
129	Measured temperature for alarm thermostat	u57				
130	Status on relay for cooling	** u58				
131	Status on relay for the fans	** u59				
132	Status on relay for defrost	** u60				
133	Status on relay for railheat	** u61				
134	Status on relay for alarm	** u62				
135	Status on relay for the lights	** u63				
136	Status on relay for valve in suction line	** u64				
137	Status on relay for compesser 2	** u67				
138	Temperature measured with S5B sensor	u75				
139	Status on relay for hot gas / drain valve	** u80				
140	Status on relay for heating element in trip tray	** u81				
141	Status on relay for night blinds	** u82				
142	Status on relay for defrost B	** u83				
143	Status on relay for heat function.	** u84				
144	Readout of the actual rail heat effect	u85				
145	1: Thermostat 1 operating / 2: thermostat 2 operating	u86				
146	Status on high voltage input D13.	u87				
147	Readout of thermostat s actual cut-in value	u90				
148	Readout of thermostat s actual cut-out value	u91				
149	Readout of status on the adapitive defrost :- 0 = off : function is not active. 1 = Error : A reset must be carried out using d22. 2 = Reset is activated : new tuning is in progress. 3 = Normal. 4 = Light build up of ice. 5 = Medium build up of ice. 6 = Heavy build up of ice.	U01				
*) Can only be set when regulation is stopped (r12 = 0)						
**) Can be controlled manually, but only when r12 = '1						
***) With access code 2 the access to these menus will be limited.						