By Appointment to
Her Majesty Queen Elizabeth II
Suppliers of Commercial Refrigeration
Foster Refrigerator, King's Lynn

FDC Display Chillers

AD2-28 Controller & RU33 Display

Original Service Manual

English

01-552036-01 July 2018 Issue 1

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Content

Service Manual Information

The products and all information in this manual are subject to change without prior notice.
We assume by the information given that the person(s) working on these refrigeration units are fully trained and skilled in all aspects of their workings. Also that they will use the appropriate safety equipment and take or meet precautions where required.
The service manual does not cover information on every variation of this unit; neither does it cover the installation or every possible operating or maintenan ce instruction for the units.

Health &Safety Warnings & Information	
	Make sure the power supply is turned off before making any electrical repairs.
	To minimise shock and fire hazards, please do not plug or unplug the unit with wet hands
	During maintenance and cleaning, please unplug the unit where required.
	Care must be taken when handling or working on the unit as sharp edges may cause personal injury, we recommend the wearing of suitable PPE.
	Ensure the correct moving and lifting procedures are used when relocating a unit.
	Do NOT use abrasive cleaning products, only those that are recommended. Never scour any parts of the refrigerator. Scouring pads or chemicals may cause damage by scratching or dulling polished surface finishes.
	Failure to keep the condenser clean may cause premature failure of the motor/compressor which will NOT be covered under warranty policy.
	Do NOT touch the cold surfaces in the freezer compartment. Particularly when hands are damp or wet, skin may adhere to these extremely cold surfaces and cause frostbite.
	Please ensure the appropriate use of safety aids or Personnel Protective Equipment (PPE) are used for you own safety.

Environmental Management Policy

Product Support and Installation Contractors.
Foster Refrigerator recognises that its activities, products and services can have an adverse impact upon the environment.
The organisation is committed to implementing systems and controls to manage, reduce and eliminate its adverse environmental impacts wherever possible, and has formulated an Environmental Policy outlining our core aims. A copy of the Environmental Policy is available to all contractors and suppliers upon request.
The organisation is committed to working with suppliers and contractors where their activities have the potential to impact upon the environment. To achieve the aims stated in the Environmental Policy we require that all suppliers and contractors operate in compliance with the law and are committed to best practice in environmental management.

Product Support and Installation contractors are required to:

1. Ensure that wherever possible waste is removed from the client's site, where arrangements are in place all waste should be returned to Foster Refrigerator's premises. In certain circumstances waste may be disposed of on the client's site; if permission is given, if the client has arrangements in place for the type of waste.

2. If arranging for the disposal of your waste, handle, store and dispose of it in such a way as to prevent its escape into the environment, harm to human health, and to ensure the compliance with the environmental law. Guidance is available from the Environment Agency on how to comply with the waste management 'duty of care'.

3. The following waste must be stored of separately from other wastes, as they are hazardous to the environment: refrigerants, polyurethane foam, and oils.

4. When arranging for disposal of waste, ensure a waste transfer note or consignment note is completed as appropriate. Ensure that all waste is correctly described on the waste note and include the appropriate six-digit code from the European Waste Catalogue. Your waste contractor or Foster can provide further information if necessary.

5. Ensure that all waste is removed by a registered waste carrier, a carrier in possession of a waste management licence, or a carrier holding an appropriate exemption. Ensure the person receiving the waste at its ultimate destination is in receipt of a waste management licence or valid exemption.

6. Handle and store refrigerants in such a way as to prevent their emission to atmosphere, and ensure they are disposed of safely and in accordance with environmental law.

7. Make arrangements to ensure all staff who handle refrigerants do so at a level of competence consistent with the City Guilds 2079 Handling Refrigerants qualification or equivalent qualification.

8. Ensure all liquid substances are securely stored to prevent leaks and spill, and are not disposed of into storm drains, foul drain, or surface water to soil.

Disposal Requirements

If not disposed of properly all refrigerators have components that can be harmful to the environment. All old refrigerators must be disposed of by appropriately registered and licensed waste contractors, and in accordance with national laws and regulations.

General Electrical Safety

Foster Refrigerator recommends that the equipment is electrically connected via a Residual Current Device; such as a Residual Current Circuit Breaker (RCCB) type socket, or through a Residual Current Circuit Breaker with Overload Protection (RCBO) supplied circuit.

Start-Up and Operation

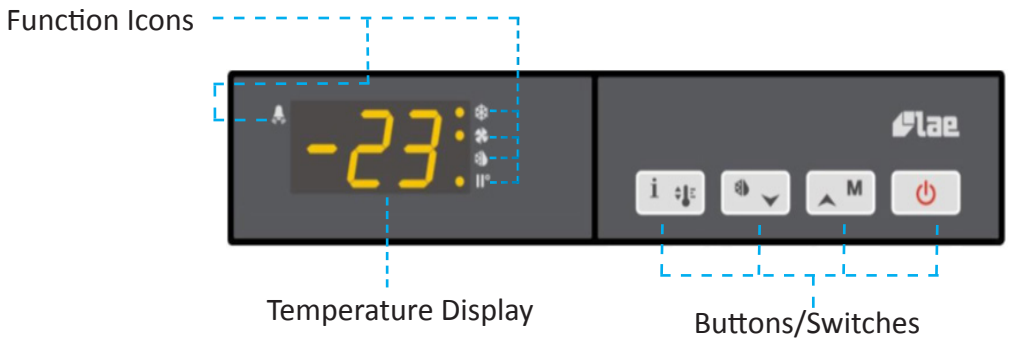
After unpacking leave to stand for 60 minutes and clean before turning on (cleaning directions are supplied within this manual). Position the display cabinet with care on a level, flat, solid surface area. Avoid cold air from air conditioning units & direct sunlight as these factors will affect the unit's performance.
Warm air is produced from the rear of the unit & for this reason please leave a breathing area around the unit as follows:

Gap Position	Gap Measurement	Relevant Models
Each Side of the Unit to Wall or next Unit.	10mm	All
Top of Unit to Top of Recess (No Rear Ventilation)*	80mm	Assisted Service Closed Front Only
Top of Unit to Top of Recess (With Rear Ventilation)	10mm	Assisted Service Closed Front Only
Units Rear Wall Spacer to Wall	80mm	Grab & Go Open Front Only

*When positioned into a recess or similar small area.

Insert the mains plug into the wall socket and switch on. Please do not plug or unplug the unit with wet hands. The display cabinet will start automatically, displaying the actual internal temperature of the unit (area where product is displayed). All models are preset at +4°C to +6°C, so no adjustments are required. Allow the cabinet to reach its normal operating temperature before loading.
With an interruption to the main power supply, the cabinet will re-start automatically after power is restored. The vaporiser tray (at the base of the unit) may overflow during a power cut but this is dependent on the length of time the power is off.

Controller Display Functions and Buttons



i	Info/Set Point Button	M	Increase Button/ Lights On/Off
	Manual Defrost/ Decrease Button		Exit/ Standby Button
	Compressor Output		Alarm
	Fan Output		Defrost Output
	Light Output		

Information Menu

	Instant Probe 1 Temperature		Maximum Probe 1 Temperature Recorded
	Instant Probe 2 Temperature		Minimum Probe 1 Temperature Recorded
	Instant Probe 3 Temperature		Keypad State Lock

Standby 

Pressing this button for 3 seconds will allow the unit to be turned on or put into standby.

User Adjustment Mode

Access to the menu and information displayed

Press and immediately release button  .

With buttons  or  select the data to be displayed.

Press and hold button  to display the value.

To exit from the menu, press button  or wait 10 seconds.

Reset of THI, TLO, CND recordings

With buttons  or  select the data to be reset.

Display the value with button  .

While keeping button  presssed, use button  .

Set point and other Mode Adjustments

Press button  for at least half a second to display the set point.

by keeping  button pressed, use button  or  to set the desired value (adjustment is within the minimum SPL and the maximum SPH limit)

When button  is released, the new value is stored.

Keypad Security Settings

Press & release  then use  to select “LOC”. Press and hold  to change from ‘YES’ to ‘NO’. Leave for 10 seconds or briefly press  to resume.

The keypad lock avoids undesired, potentially dangerous operations, which might be attempted when the controller is operating in a public place. In the INFO menu, set parameter LOC = YES to inhibit all functions of the buttons. To resume normal operation of the keypad, adjust setting so that LOC = NO.

Internal Light (Where Fitted) 

When pressed and released this button will switch on and off the display lights. This function will work with the cabinet turned on or in standby mode.

Defrost

The Multideck automatically defrosts at regular time intervals, lasting a maximum of 20 minutes during which dEF will show. Defrost can be manually activated by pressing and holding

Automatic Defrost.
Defrost starts automatically as soon as the time set with parameter DFT has elapsed.
Time Defrost With DFM = TIM defrost takes place at regular intervals when the timer reaches the value DFT. For example, with DFM = TIM and DFT = 04, defrost will take place every 4 hours.

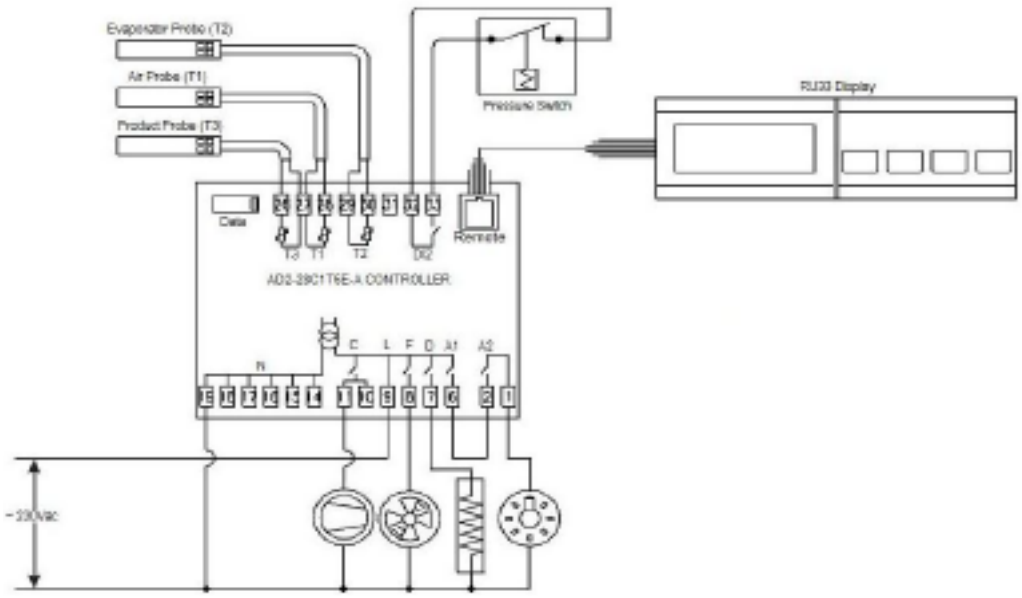
Defrost type
Once defrost has started, compressor and defrost outputs are controlled according to parameter DTY. If FID =YES, the evaporator fans are active during defrost.

Defrost termination
The actual defrost duration is influenced by a sensor T2 and defrost termination parameter DTO. So if the sensor T2 measures the temperature DLI before the time DTO elapses, defrost will be terminated.

Resuming Thermostatic Cycle
When defrost is over, if DRN is greater than 0, all outputs will remain off the DRN minutes, in order for the ice to melt completely and the resulting water to drain. Also, as probe T2 is active (T2=YES), the fans will re-start when the evaporator gets to a temperature love than FDD; or after FTO minutes have elapsed.

Note: During a high pressure alarm, defrost is suspended. During defrost, high temperature alarm is by-passed.

AD2-28 Controller Connection Drawing



AD2-28 Technical Display

Power Supply
230Vac±10%, 50/60Hz, 3W **Relay Output**

Compressor	16A Resistive 8 FLA 48 RLA
Evap. Fan	8A Resistive
Defrost	2 FLA 12 RLA
Auxiliary Loads 1	16A Resistive
Auxiliary Loads 2	7A Resistive
Input	7A Resistive

NTC 10KΩ@25°C

Measurement Range
-50 /-9.9…19.9 / 80°C (NTC 10K Only) **Measurement Accuracy**
<0.5°C within the measurement range

Operating Conditions
-10...+50°C; 15%...80%r.H
Controller Approvals
EN60730-1;
EN60730-2-9
EN55022 (Class B)
EN50082-1
SDFY2.SA32385
UL60730-1

Configurations of Parameters

Parameters should not be changed unless you have an understanding of their purpose and the following instructions are fully understood.

To get access to the parameter configuration menu, press + for 5 seconds.

With buttons or selectthe parameter to be modified.

Press button and hold briefly to display the value. On releasing the button the controller will then show the next parameter.

By keeping button pressed, use button or to set the desired value. On releasing the button the controller will store the ammended value and then show the next parameter.

To exit from the setup, press button or wait for 30 seconds.

AD2-28 Controller Default & Model Specific Parameter Values

Parameter	Range	Description	Default AD2-28
SCL		Readout Scale:	2ºC
	1ºc	Range-50/-9.9.... 19.9/80°C (With INP = SN4 Only)	
	2ºc	Range-50 .... 120°C	
	ºF	Range-55 .... 240°F	
SPL	-50 ... SPH	Minimum limit for SP setting	1
SPH	SPL ... 120º	Maximum limit for SP setting	3
SP	SPL ... SPH	Temperature set point to be achieved	1
C-H		Temperature Control mode:	REF
	REF	Refrigeration	
	HEA	Heating	
HYS	1 ... 10º	Off/On thermostat differential	4
CRT	0 ... 30min	Compressor rest time	2
CT1	0 ... 30min	Thermostat run time with faulty T1 probe. (CT1 = 0 output with faulty T1 will always be off)	6
CT2	0 ... 30min	Thermostat off time with faulty T1 probe. (CT2=0 & CT1 =>0 output with faulty T1 will always be on)	4
CSD	0 ... 30min	Compressor stop delay after door has been opened (Only if DS = YES)	1
DFM		Defrost Start Mode:	TIM
	NON	Defrost function is disabled	
	TIM	Regular time defrost	
	FRO	Defrost time elapses only in condition of frost accumulation	
DFT	0 ... 99 Hrs	Time interval between defrosts	6
DFB		Defrost timer clock	YES
	YES	Following mains interruption, timer resumes count	
	NO	Following mains interruption, timer restarts from zero	

Parameter	Range	Description	Default AD2-28
DLI	-50 ... 120º	Defrost end temperature (Only if T2 = EPO)	20
DTO	1 ... 120min	Maximum defrost duration	20
DTY		Defrost Type:	OFF
	OFF	Timed off cycle defrost (compressor and heater off)	
	ELE	Electric heater defrost (compressor off, heater on	
	GAS	Hot gas defrost (compressor and heater on	
DPD	0 ... 240sec	Evaporator pump down. Timed pause at start of defrost	0
DRN	0 ... 30mins	Drain down period	2
DDM		Deforst Display Mode:	DEF
	RT	Real (actual) air temperature	
	LT	Last temperature display before start of defrost	
	SP	The current set point value.	
	DEF	"DEF"	
DDY	0 ... 60min	Defrost display delay period Time DDM is shown following defrost termination	10
FID		Fans in defrost:	YES
	YES	Fans run during defrost	
	NO	Fans do not run during defrost	
FDD	-50 ... 120º	Evaporator fan restart temperature following defrost (Only if T2 = EPO)	5
FTO	0 ... 120min	Maximum evaporator fan stop period following defrost	3
FCM		Evaporator fan mode during thermostatic control:	TIM
	NON	Fan(s) run continuously	
	TMP	Temperature based control. When compressor is on, fans are on. When compressor is off, fans run as long as temperature difference Te-Ta > FDT. Fans on again with FDH	
	TIM	Time based control. When compressor is on, fans are on. When compressor is off, fans in accordance to parameters FT1, FT2 and FT3.	
FDT	-120 ... 00	Te-Ta difference for fans to turn off after compressor stopped. (Only if T2 = EPO and FCM = TMP)	-1
FDH	1 ... 120	Temperature differential for evaporator fan restart. (Only if T2 = EPO and FCM = TMP)	3
FT1	0 ...180sec	Fan stop delay after compressor stop	15
FT2	0 ... 30min	imed fan stop following FT1 (With FT2 = 0 the fans remain on all the time).	3
FT3	0 ... 30min	Timed fan run following FT2 (With FT3 = 0 and FT2 >0 the fans remain off all the time.	2
ATM		Alarm threshold configuration:	REL
	NON	All temperature alarms are inhibited	
	ABS	The value set in ALA and AHA represent actual alarm set points	
	REL	The values set in ALR and AHR are alarm differentials which relate to SP and SP + HYS	

Parameter	Range	Description	Default AD2-28
ALA	-50 ... 120°	Low temperature alarm threshold	-2
AHA	-50 ... 120°	High temperature alarm threshold	8
ALR	-12 ... 0°	Low temperature alarm differential (With ALR = 0 the low temperature alarm is excluded)	-5
AHR	0 ... 12°	High temperature alarm differential (With AHR = 0 the low temperature alarm is excluded)	5
ATI		Alarm Probe:	T1
	T1	Air temperature probe used for alarm detection	
	T2	Evaporator temperature probe used for alarm detection	
	T3	Third temperature probe used for alarm detection	
ATD	0 ... 120min	Delay before alarm temperature warning	90
ADO	0 ... 30min	Delay before door open alarm warning	8
AHM		Operation in case of high condenser alarm (T3 = CND)	NON
	NON	High condenser temperature alarm inhibited	
	ALR	Condenser warning – 'HC' displayed, alarm sounds	
	STP	As 'ALR' with compressor stopped and defrosts suspended	
AHT		Condenser alarm temperature (T3 = CND)	65
ACC		Condenser cleaning period. (With ACC = 0 condenser cleaning is disabled)	0
IISM		Switchover method to second parameter set:	HDD
	NON	Second parameter set is excluded	
	MAN	Second parameter set is activated/ deactivated by Button 	
	HDD	Second parameter activated by 'heavy' usage	
	DI2	Second parameter set activated by D12 input (D12 = IISM)	
IISL	-50 ... IISH	Minimum limit for IISP setting	1
IISH	IISL ... 120°	Maximum limit for IISP setting	1
IISP	IISP ... IISH	Temperature set point to be achieved in 'Mode 2'	1
IIHY	1 ... 10°	Off/On thermostat differential in 'Mode 2'	4
		Evaporator fan mode during 'Mode 2' hermostatic control:	NON
	NON	Fans(s) run continuously	
	TMP	emperature based control. When compressor is on, fans are on. When compressor is off, fans run as long as temperature difference Te-Ta>FDT. Fans on again with FDH	
	TIM	Time based control. When compressor is on, fans are on. When compressor is off, fans in accordance to parameters FT1, FT2 and FT3.	
HDS	1 ... 5	Controller sensitivity for switch over between 'Modes' and 2. (1 = minimum, 5 = maximum)	3
IIDF	0 ... 99hrs	Time interval between defrosts in 'Mode 2'.	6

Parameter	Range	Description	Default AD2-28
SB		Standby button operation:	YES
	YES	Standby button enabled	
	NO	Standby button disabled	
DS		Door switch operation (switch made when door closed):	YES
	YES	Door switch enabled	
	NO	Door switch disabled	
DI2		Configuration digital input operation:	NON
	NON	Digital input 2 not activated	
	HPS	High pressure alarm when contact opens	
	IISM	'Mode 2' parameters active when contact closes	
	RDS	Defrost initiated when contact closes	
	DSY	Defrost Synchronisation	
LSM		Light Control Mode:	NON
	NON	Light input is excluded	
	MAN	Light output operation is activated/deactivated by button M (With OA1 = LGT)	
	DOR	Light output is switched on when door is opened (With OA1 = LGT and DS = YES)	
OA1		Auxiliary relay operation:	0- 1
	NON	Output disabled (always off)	
	0- 1	Contacts open/close with standby/on mode	
	LGT	Output enabled for light control	
	2CU	Control of electric defrost of an auxiliary compressor	
	2EU	Control of an electric defrost of second evaporator	
	AL0	Contacts open when an alarm condition occurs	
	AL1	Contacts close when an alarm condition occurs (Relay contacts open when in standby mode)	
OA2		Auxiliary relay operation:	0- 1
	NON	Output disabled (always off)	
	0- 1	Contacts open/close with standby/on mode	
	LGT	Output enabled for light control	
	2CU	Control of electric defrost of an auxiliary compressor	
	2EU	Control of an electric defrost of second evaporator	
	AL0	Contacts open when an alarm condition occurs	
	AL1	Contacts close when an alarm condition occurs (Relay contacts open when in standby mode)	
2CD	0 ... 120sec	AUXHILLARY Compressor Start Delay	0
		Temperature sensor(s) type:	SN4
	SN4	10k NTC type thermistor (red writing)	
	ST1	1k PTC type thermistor (Black Writing)	

Parameter	Range	Description	Default AD2-28
INP		**Temperature Sensor(s) Type:**	SN4
	SN4	10k NTC type thermistor (Red writing).	
	ST1	1K PTC type thermistor (Black writing).	
OS1	-12.5 ... 12.5°C	Air temperature probe (T1) offset.	0
T2		**T2 Probe Enabling:**	NON
	YES	T2 probe enabled..	
	NO	T2 probe disabled.	
OS2	-12.5 ... 12.5°C	T2 probe temperature offset.	0
T3		**T3 Probe Function:**	NON
	NON	T3 probe disabled.	
	DSP	T3 temperature displayed.	
	CND	Condenser temperature measurement.	
	2EU	Second evaporator temperature measurement.	
OS3	-12.5 ... 12.5°C	T3 probe temperature offset.	0
TLD	1 ... 30min	Delay for min (TLO) and max. (THI) temperature logging	10
SIM	0 ... 100	Display slowdown	5
ADR	1 ... 255	AD2-28 address for PC communication	1

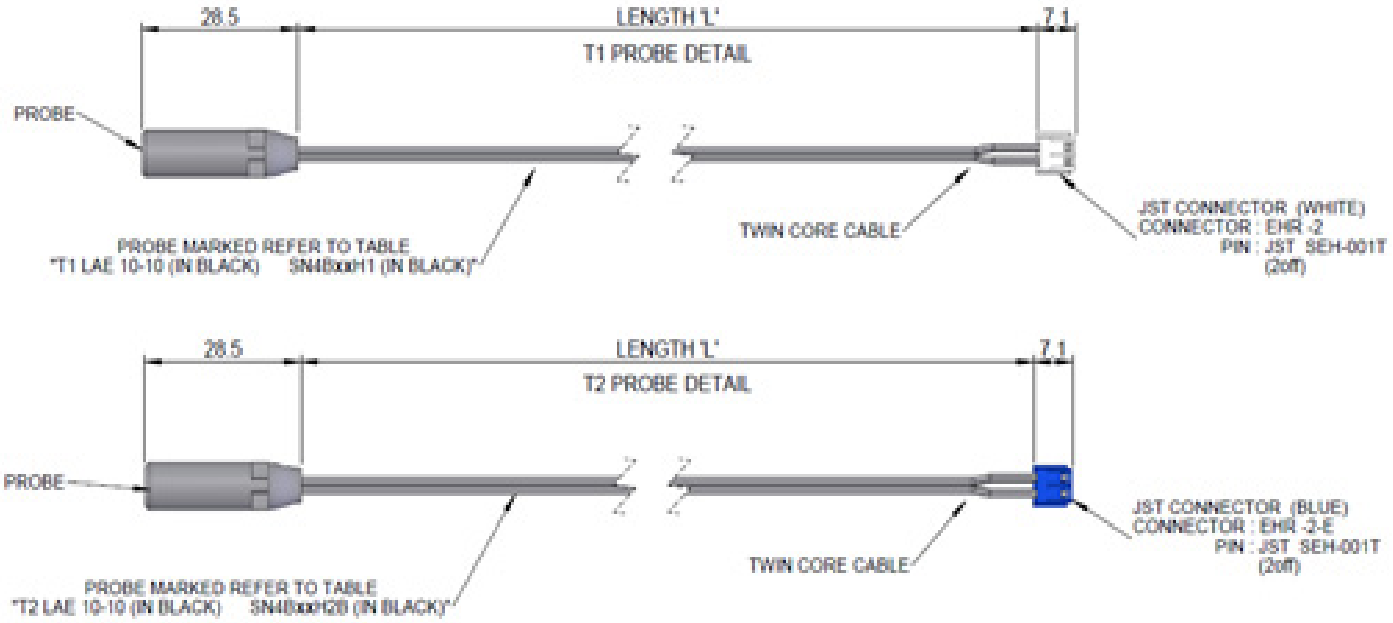
Model parameter Vaues.

	AD2-28 De-fault	FDC600C Closed Front	FDC600 Open Front	FDC900C Closed Front	FDC900 Open Front	FDC1200C Closed Front	FDC1200 Open Front	FDC1500C Closed Front	FDC1500 Open Front
Parameter									
SCL	2°C	2°C	2°C	2°C	2°C	2°C	2°C	2oC	2oC
SPL	1	-2	-2	-2	-2	-2	-2	-2	-2
SPH	3	5	5	5	5	5	5	5	5
SP	1	1	1	1	1	1	1	1	1
C-H	REF	REF	REF	REF	REF	REF	REF	REF	REF
HYS	4	3	3	3	3	3	3	3	3
CRT	2	1	1	1	1	1	1	1	1
CT1	6	6	6	6	6	6	6	6	6
CT2	4	2	2	2	2	2	2	2	2
CSD	1	1	1	1	1	1	1	1	1
DFM	TIM	TIM	TIM	TIM	TIM	TIM	TIM	TIM	TIM
DFT	6	3	3	3	3	3	3	3	3
DFB	YES	YES	YES	YES	YES	YES	YES	YES	YES
DLI	20	10	10	10	10	10	10	10	10
DTO	20	20	20	20	20	20	20	20	20

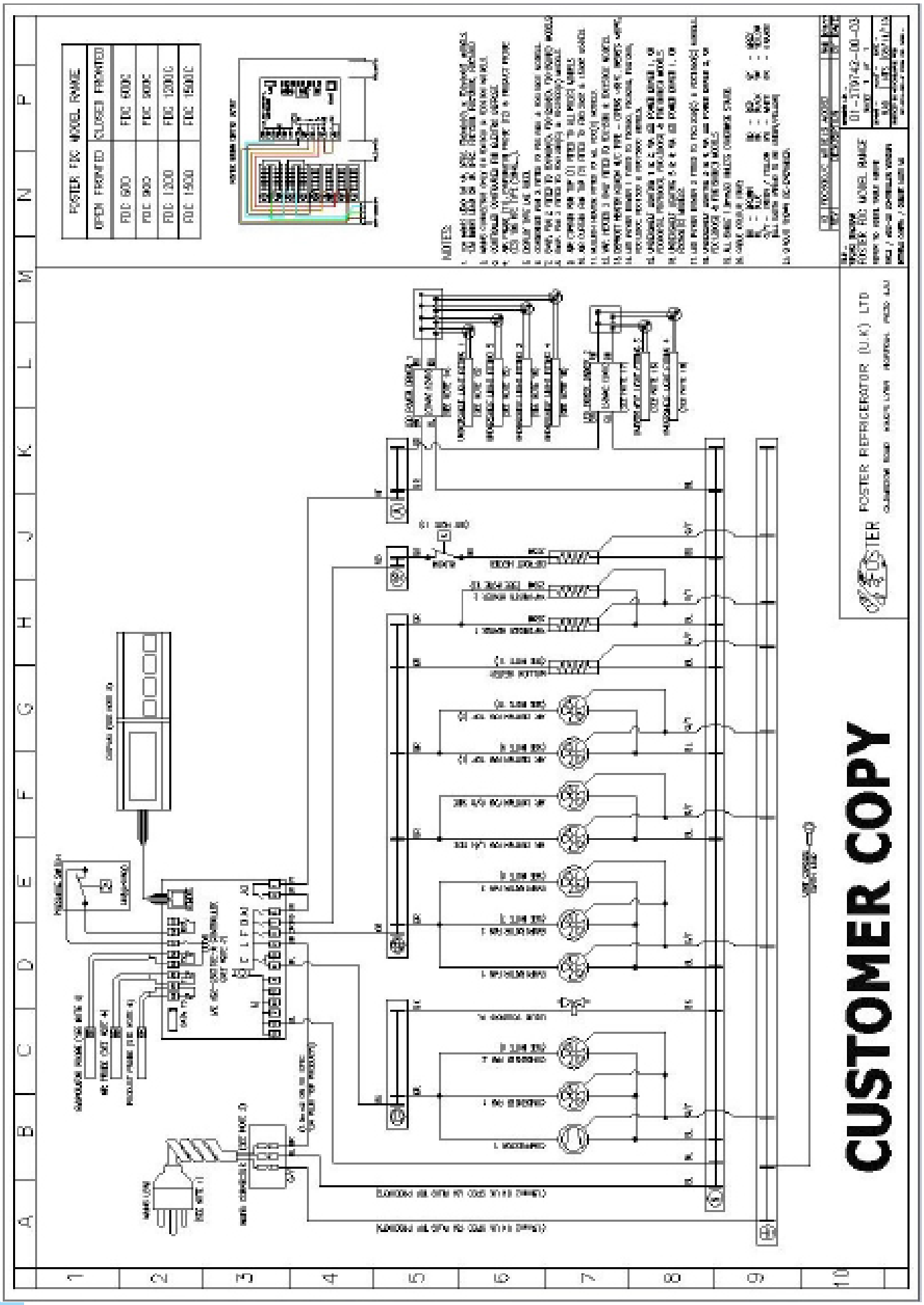
	AD2-28 Default	FDC600C Closed Front	FDC600 Open Front	FDC900C Closed Front	FDC900 Open Front	FDC1200C Closed Front	FDC1200 Open Front	FDC1500C Closed Front	FDC1500 Open Front
Parameter									
DTY	OFF	ELE	ELE	ELE	ELE	ELE	ELE	ELE	ELE
DPD	0 sec	0	0	0	0	0	0	0	0
DRN	0 min	1	1	1	1	1	1	1	1
DDM	RT	SP	SP	SP	SP	SP	SP	SP	SP
DDY	0 min	10	10	10	10	10	10	10	10
FID	NO	YES	YES	YES	YES	YES	YES	YES	YES
FDD	-50°	5	5	5	5	5	5	5	5
FTO	0 min	2	2	2	2	2	2	2	2
FCM	NON	NON	NON	NON	NON	NON	NON	NON	NON
FDT	-120°	-1	-1	-1	-1	-1	-1	-1	-1
FDH	1°	3	3	3	3	3	3	3	3
FT1	0 sec	15	15	15	15	15	15	15	15
FT2	0 min	3	3	3	3	3	3	3	3
FT3	0 min	2	2	2	2	2	2	2	2
ATM	NON	REL	REL	REL	REL	REL	REL	REL	REL
ALA	-50°	-2	-2	-2	-2	-2	-2	-2	-2
AHA	-50°	8	8	8	8	8	8	8	8
ALR	-12°	-5	-5	-5	-5	-5	-5	-5	-5
AHR	0°	8	8	8	8	8	8	8	8
ATI	T1	T3	T3	T3	T3	T3	T3	T3	T3
ATD	0 min	90	90	90	90	90	90	90	90
ADO	0 min	8	8	8	8	8	8	8	8
AHM	NON	ALR	ALR	ALR	ALR	ALR	ALR	ALR	ALR
AHT	-50°	65	65	65	65	65	65	65	65
ACC	0 weeks	0	0	0	0	0	0	0	0
IISM	NON	NON	NON	NON	NON	NON	NON	NON	NON
IISL	-50°	1	1	1	1	1	1	1	1
IISH	IISL	1	1	1	1	1	1	1	1
IISP	IISL	1	1	1	1	1	1	1	1
IIHY	1°	4	4	4	4	4	4	4	4
IIFC	NON	NON	NON	NON	NON	NON	NON	NON	NON
HDS	1	3	3	3	3	3	3	3	3
IIDF	0 hours	6	6	6	6	6	6	6	6
SB	NO	YES	YES	YES	YES	YES	YES	YES	YES
DS	NO	NO	NO	NO	NO	NO	NO	NO	NO

	AD2-28 Default	FDC600C Closed Front	FDC600 Open Front	FDC900C Closed Front	FDC900 Open Front	FDC1200C Closed Front	FDC1200 Open Front	FDC1500C Closed Front	FDC1500 Open Front
Parameter									
DI2	NON	HPS	HPS	HPS	HPS	HPS	HPS	HPS	HPS
LSM	NON	MAN	MAN	MAN	MAN	MAN	MAN	MAN	MAN
OA1	0-1	LGT	LGT	LGT	LGT	LGT	LGT	LGT	LGT
OA2	0-1	AL0	AL0	AL0	AL0	AL0	AL0	AL0	AL0
2CD	0	0	0	0	0	0	0	0	0
INP	SN4	SN4	SN4	SN4	SN4	SN4	SN4	SN4	SN4
OS1	0	0	0	0	0	0	0	0	0
T2	NON	YES	YES	YES	YES	YES	YES	YES	YES
OS2	0	0	0	0	0	0	0	0	0
T3	NON	DSP	DSP	DSP	DSP	DSP	DSP	DSP	DSP
OS3	0	0	0	0	0	0	0	0	0
TLD	10	10	10	10	10	10	10	10	10
SIM	5	5	5	5	5	5	5	5	5
ADR	1	1	1	1	1	1	1	1	1

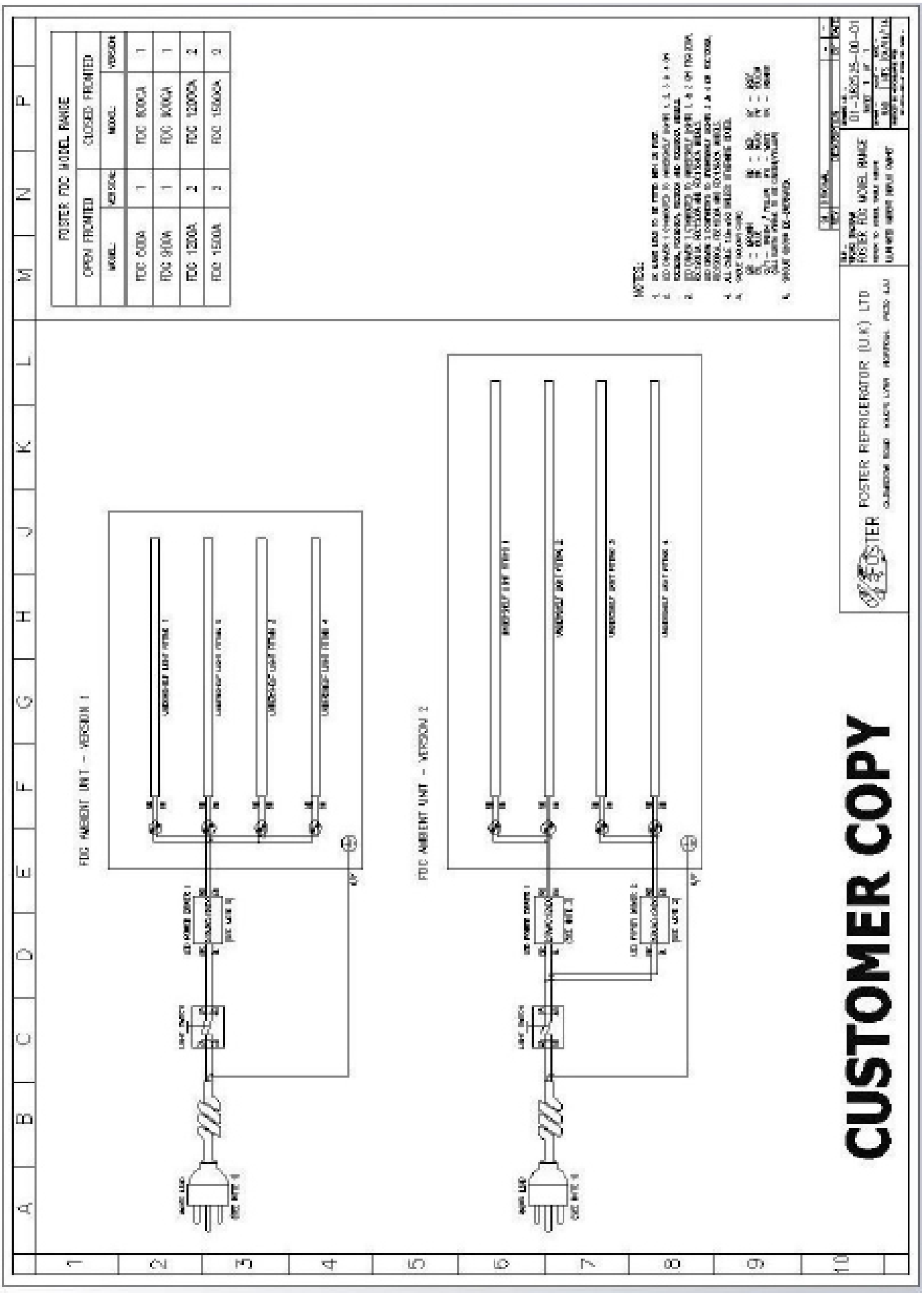
Air and Evaporator Probe Details / Diagram



Wiring Diagram for FDC600, 900, 1200 &1500 Open Front & Closed Front Models



Illumanited Ambient Display Wiing Diagram for FDC600, 900, 1200 & 1500 Open front & Closed Front Models



PROBLEM	Possible Cause	Solution
Audible & Visual Alarms / Warning	 Low temperature alarm	Cancel audible alarm and investigate cause.
	 High temperature alarm	Cancel audible alarm and investigate cause.
	 T1 Air probe failure	Check and replace the air probe.
	 T2 Evaporator probe failure	Check and replace the evaporator probe.
	 Probe T3 failure (Product)	Check and replace the product probe.
	 High pressure alarm	Check ambient temperature and refrigeration system.
	 Defrost in Progress	Wait for defrost cycle to finish
Compressor will not start	No voltage in socket	Use voltmeter to check
	Electrical conductor or wires may be cut	Use ohmmeter to check for continuity
	 Defective electrical component: thermostat, relay, thermal protector etc.	Replace defective component
	Compressor motor has a winding open or shorted	Measure ohmic resistance of main and auxiliary winding using ohmmeter. Compare with correct values
	 Compressor stuck/seized	Change compressor
	Temperature control contacts are open	Repair or replace the contacts
	Incorrect wiring	Check wiring diagram and correct
	Fuse blown or circuit breaker tripped.	Replace fuse or reset circuit breaker
	Power cord unplugged	Plug in power cord.
	Controller temperature set too high	Set controller to lower temperature.
	Cabinet in defrost cycle	Wait for defrost cycle to finish

The Temperature is too cold	>	Controller is set at a very cold position	> Set to warmer position and check if the compressor stops according to controllers operating range.
	>	Controller does not disconnect the condensing unit	> Check the insulation of the thermostat. If problems persists, change the thermostat
	>	Control contacts are stuck closed	> Change the control. Check amperage load
	>	Defective or incorrect temperature control	> Determine correct control and replace
The Temperature is not cold enough	>	Controller is set at a very warm position	> Adjust controller to colder setting
	>	Condenser is dirty	> Clean condenser
	>	The refrigerator has been placed at an inadequate location	> The unit must not be near stoves, walls that are exposed to the sun, or places that lack sufficient air flow.
	>	Compressor is inefficient or there is a high pressure due to the air in the system	> If there is air in the system, purge and recharge
	>	Iced up evaporator coil	> Check temperature control, refrigerant charge, and defrost mechanism. Remove all ice manually and start over.
	>	Restriction in system	> Locate exact point of restriction and correct
	>	The refrigerator has been used improperly	> The shelves must never be covered with any type of plastic or other material that will block the circulation of cold air within the refrigerator.
	>	Too many door openings	> Advise user to decrease if possible
	>	Excessive heat load placed in cabinet	> Advise user not to put in products that are too hot.
	>	The refrigerator has been overcharged with the refrigerant gas	> Check to see if condensation or ice crystals have formed on the suction line. If so, charge with the correct amount of gas.
	>	The refrigerant gas is leaking	> Find the location of gas leak in order to seal and replace the defective component. Change the drier. Perform a good vacuum and recharge unit.
	>	The evaporator and/or condenser fans are not working	> Check electrical connections and make sure that the fan blade isn't stuck. Replace the fan motor if it doesn't work.

		>	Blocking air flow	> Re-arrange product to allow for proper air flow. Make sure there is at least four inches of clearance from evaporator.
		>	Fuse blown or circuit breaker tripped	> Replace fuse or reset circuit breaker.
Electrical Shocks		>	Wires or electrical components are in direct contact with metallic parts.	> Check for appropriate insulation on the connections of each component.
Noise		>	The refrigerator is not properly levelled	> Check if the noise goes away after you level the refrigerator
		>	The condenser is not fastened correctly. Copper tubing is in contact with metal	> While the compressor is working, check to see if metal parts are in contact with one another and/or if the screws that fasten the condenser are tightened.
		>	The evaporator and/or condenser fans are loose	> Check if the fans are securely fastened. Also, check if the fan blades are loose, broken or crooked. If so, change the faulty blade.
		>	Compressor has an internal noise	> If the noise persists after all other measures have been taken, it may be originating from the compressor.
		>	Loose part(s)	> Locate and tighten loose part(s)
Extreme condensation inside the refrigerator		>	Controller is set at a very cold position	> Set the controller to a warmer position & check to see if compressor stops as should.
		>	The outside environment's relative humidity is very high (over 75%)	> This type of occurrence is caused by local climatic conditions and not by the refrigeration unit.
		>	The refrigerator door won't shut completely	> Check the door and/or the magnetic gasket. Adjust the door hinges if needed; replace the gasket if broken.
		>	The refrigerator had been placed at an inadequate location	> The unit must not be near sources that produce too much heat.
Condensing unit runs for long periods of time		>	Excessive amount of warm product placed in cabinet	> Advise user to leave adequate time for products to cool down
		>	Prolonged door opening or door ajar	> Advise user to ensure doors are closed when not in use and to avoid opening doors for long periods of time.

> Door gasket(s) not sealing properly	> Ensure gaskets are snapped in completely. Remove gasket and wash with soap and water. Check condition of gasket & replace if necessary
> Dirty condenser coil	> Clean condenser coil
> Evaporator coil iced over	> Unplug unit and allow coil to defrost. Make sure thermostat is not set too cold. Ensure that door gasket(s) are sealing properly. Select manual de-frost and ensure system works.

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