Original Service Manual

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

FlexDrawer

FFC6-2, 3-1, 4-2 & 2-1 Models

FD2-10 Controller & LCD5S Display

English

ISO 9001 ISO 14001

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United Kingdom

Contents

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 maintenance 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.

Cleaning and Maintenance

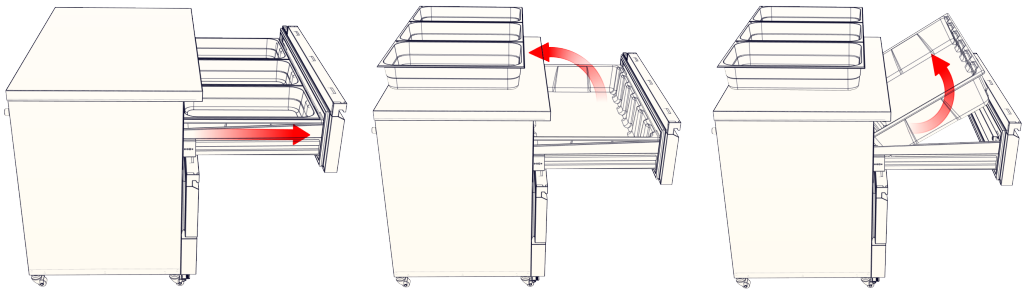
Important: Before cleaning, the unit should be put into standby and then the power supply should be turned off at the mains. Please do not plug or unplug the unit with wet hands. Only when cleaning has been completed and the unit is dry should the counter be turned back on at the mains.

Suitable P.P.E (Personnel Protective Equipment) should be worn at all times.

Regular Maintenance:

- As and when required remove all product from the unit. Clean exterior and interior surfaces with mild liquid detergent, following the directions on the pack at all times. Rinse surfaces with a damp cloth containing clean water. Never use wire wool, scouring pads/powders or high alkaline cleaning agents i.e bleaches, acids and chlorines as these may cause damage.

- **Bin Removal**



- **Condenser Cleaning**:
  This should take place on a regular basis (4 to 6 weeks) or as and when required only by your supplier (this is normally chargeable). Failure to maintain the condenser may invalidate the warranty of the condensing unit and cause premature failure of the motor/compressor.

- All gaskets should be inspected on a regular basis and replaced if damaged. To clean, wipe with a warm damp soapy cloth followed by a clean damp cloth. Finally thoroughly dry**.**

- Drawers and their bins should be removed to clean. All should be cleaned with warm soapy water then rinsed and dried before refitting to the counter.

- If fitted, the overshelf should be wiped down regularly with warm soapy water, rinsed and then dried as a worktop would be.

- If fitted, the can opener should be maintained as any other kitchen utensil, be aware of possible sharp parts when carrying out this maintenance on this part.

Troubleshooting

Before calling your supplier please make sure that:

a. None of the plugs have not come out of the socket and the mains power supply is on i.e. are the controller displays illuminated?
b. Check to see if the unit is in standby
c. The fuse has not blown
d. The counter is positioned correctly – controllable cold or warm air sources are not affecting the performance
e. The condenser is not blocked or dirty
f. The products are placed in the unit correctly
g. Defrost is not in progress or required
h. The temperature is set to the desired set point for either fridge or freezer temperatures.

If the reason for the malfunction cannot be identified, and the troubleshooting section on the following pages cannot resolve any issue, please disconnect the electrical supply to the unit and contact your supplier. When requesting a service call, please quote the model and serial number which can be found on the silver label located on the outside right hand side of the unit (starts E.....).

Problem	Possible Cause	Solution
Audible & Visual Alarms/ Warnings	Lo > Low temperature alarm	> Cancel audible alarm and investigate cause.
	hi > High temperature alarm	> Cancel audible alarm and investigate cause.
	E1 > T1 Air probe failure	> Check and replace the air probe
	E2 > T2 Evaporator probe failure #	> Check and replace the evaporator probe
	do > Drawer open alarm #	> Press ⏻ to silence alarm and close the drawers. If the alarm persists and the drawers are closed check and replace the drawer switches. (Also see 'Drawer Adjustment' instructions page 10).
	# only displayed if applicable to model and enabled through parameters	
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 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 set point too high	> Set controller to lower temperature (see pages 8 & 9 for instruction)
	> Cabinet in defrost cycle	> Wait for defrost cycle to finish
The temperature is too cold	> Controller set point too low	> Set to warmer position and check if the compressor stops according to controllers operating range (see pages 8 & 9 for instruction)
	> Controller does not disconnect the condensing unit	> Check the insulation of the controller If problem persists, change the controller
	> 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 set point too high	> Set controller to lower temperature (see pages 8 & 9 for instruction)
		> Condenser is dirty	> Clean condenser (see page 3)
		> The refrigerator has been placed in an inappropriate 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/ another refrigeration system fault	> 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.
		> Too many drawer 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 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. (See page 10 for evaporator fan clearance guide)
		> 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 (see pages 8 & 9 for instruction)
		> 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 drawer won't shut completely	> Check the drawer and/or the magnetic gasket. Adjust the drawer (as shown in 'Drawer Adjustment' instructions page 10); replace the gasket if broken.
		> The refrigerator had been placed in an inappropriate 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 drawer opening or drawer ajar	> Advise user to ensure drawers are closed when not in use and to avoid opening drawers for long periods of time
		> Drawer 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 (Also see 'Drawer Adjustment' instructions page 10)
		> Dirty condenser coil	> Clean condenser coil (see page 3)
		> Evaporator coil iced over	> Unplug unit and allow coil to defrost. Make sure controller is not set too cold (see page 8 & 9). Ensure that drawer gasket(s) are sealing properly (see page 10). Select manual defrost and ensure system works (see page 9)

Start-Up and Operation

After unpacking, clean and allow the counter to stand for 2 hours before turning on (cleaning directions supplied within this manual). Ensure, where possible that the counter is situated away from both hot and cold air sources, as this will affect its performance. Make sure effective ventilation around the unit is available for optimum operation. Connect the unit to a suitable mains power outlet and turn the supply on. Do not plug or unplug the unit with wet hands.

Counters are supplied ready for operation.
After connecting the unit to the mains the displays will briefly show a dash in the centre of the screen. This will then show oFF.

LCD5S Display Icons and Buttons

Indicators and Buttons

Symbol	Reason	Button	Use
	Alarm		Info/ Set Point Button
	Thermostat Output		Manual Defrost/ Decrease Button
	Fan Output		Increase Button/Manual Activation
	Defrost Output		Standby Button
II°	Activation of 2nd Parameter Set		

Display & Information Icons

During normal operation, the display shows either the temperature measured or one of the following indications:

Information User Icons

Symbol	Reason	Button	Use
dEF	Defrost In Progress	hi	Room High Temperature Alarm
oFF	Controller in Standby	Lo	Room Low Temperature Alarm
cL	Condenser clean warning	E1	Probe T1 Failure
do	Door open alarm	E2	Probe T2 Failure

Service User Icons

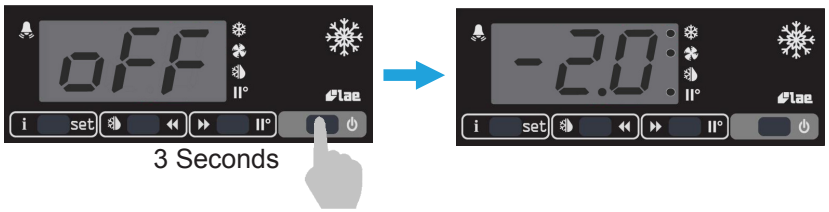
Symbol	Reason	Button	Use
t1	Instant probe 1 temperature	tLo	Minimum probe 1 temperature recorded
t2	Instant probe 2 temperature*	cnd	Compressor working weeks **
thi	Maximum probe 1 temperature recorded	Loc	Keypad state lock

* Displayed only if enabled (see configuration parameters)
** Displayed only if ACC> 0

Start Sequence

Activate the controller

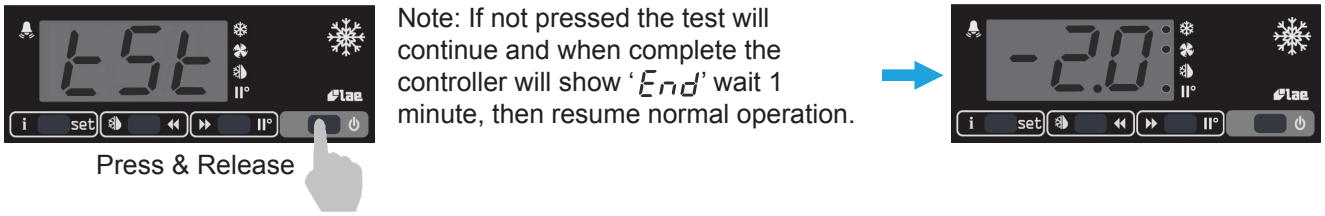
Per drawer display:



Note: If pressed and held for 5 seconds then released a 'Test Sequence' will start (see below instructions).

Cancel Test Sequence

Per drawer display:



Note: If not pressed the test will continue and when complete the controller will show '*End*' wait 1 minute, then resume normal operation.

The test function is a defined sequence of events that will follow a prescribed pattern (dependent upon parameter values) that will operate all electrical elements of the system, simulating a short operating pattern. It should enable an engineer to carryout basic function operations checks of all system parts including refrigeration.

This sequence can take, and the display will count up to, a maximum of 935 seconds before showing '*End*'. The length of time the test is run will be dependent on the model type and conditions the unit is placed in.

Access the menu and information

> Press and immediately release the **i** button.
> Using the ◀ and or ▶ buttons select the data you wish to display
> Press the **i** button to display the current value.
> To exit press the ⏻ button or wait 10 seconds.

To reset the THI and TLO:

> Use the ◀ and or ▶ buttons to select the data to be reset
> Display the value with the **i** button
> While keeping the **i** button pressed, press the ⏻ button to reset.

User Adjustments

Check Storage Temperature Set Point

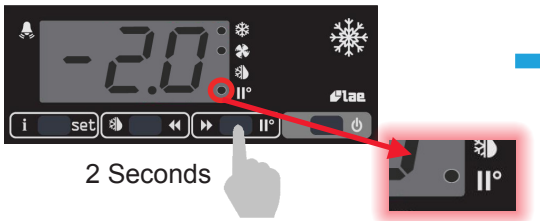
Per drawer display:

By keeping button **i** pressed, use ◀ and or ▶ buttons to set the desired value (adjustment is within the minimum SPL and the maximum SPH limit)
When button **i** is released, the new value is stored.

Temperature Settings

The factory default temperature is -18˚C/-21˚C (freezer). To amend the drawer temperature from the factory default to a +1˚C/+4˚C (fridge) follow the instructions below.

Freezer -18˚C/-21˚C



Fridge +1˚C/+4˚C

Repeat above instruction to reset from fridge to freezer.

When changing drawer temperatures please ensure that all product has been unloaded and that the counter is left for a minimum period of 1 hour to acclimatise to the new temperature.
For freezer temperatures only place already frozen product inside. This unit is not designed to freeze down product.

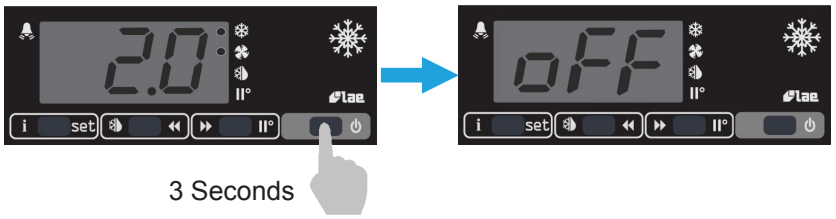
To avoid accidental changes to the above settings we highly recommend that the keypads be locked after setting drawer temperatures.

Keypad Security Settings

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 button. To resume normal operation of keypad, adjust setting so that Loc = NO.

Standby

Per drawer display:



This will show while the unit is not operating but still has mains power applied to it. This mode may be used for interval cleaning regimes and short periods when the unit is not required. For extended periods of inactivity the mains supply should be isolated.

If already in standby and then this action will energise the controller to show the current unit temperature.

Defrost

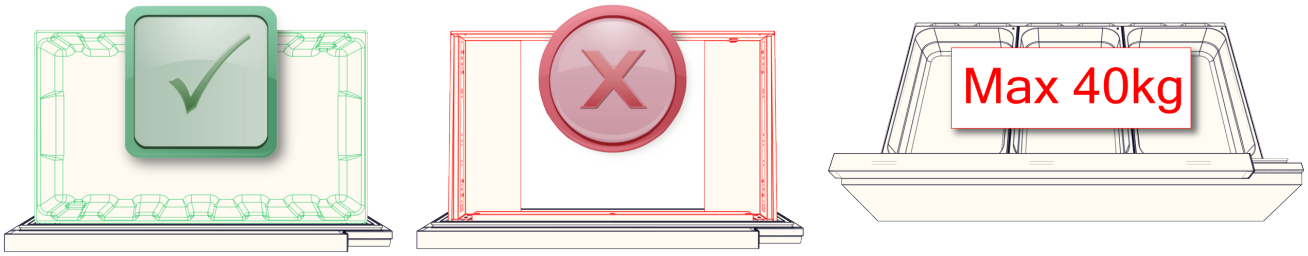
Automatic -All temperture models have a totally automatic defrost system that ensures the evaporator coil is clear from ice.
As standard when set to fridge there will be a defrost every 6 hours and as a freezer every 4 hours.

Manual Defrost - If required on either fridge or freezer temperatures a manual defrost can be initiated on each drawer display.

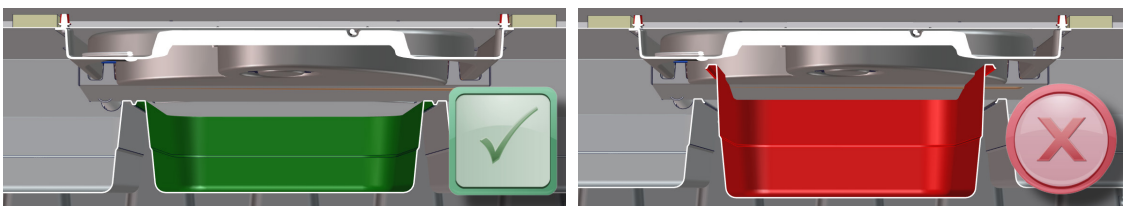
Drawers

Loading

Product should be placed in a way that ensures air can circulate around/through it and only when the bin is in situ.

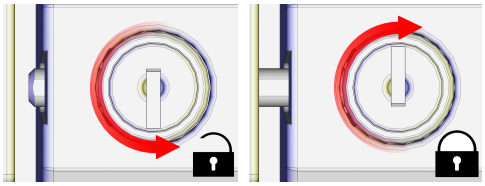


Evaporator Fan Protection

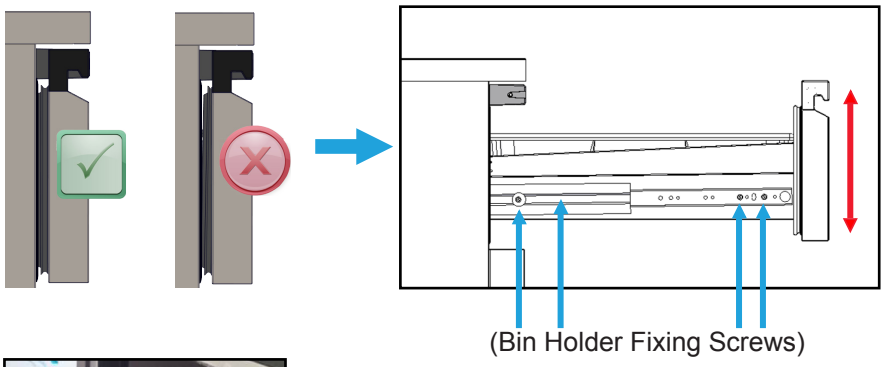


Do **NOT** block the fan airflow

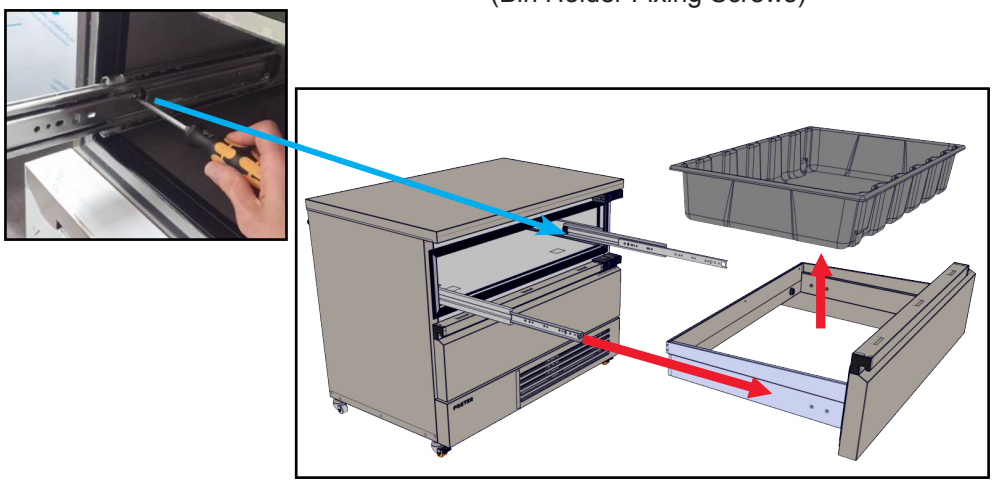
Locking (per drawer)



How to Adjust a Drawer to Rectify a Poor Gasket Seal



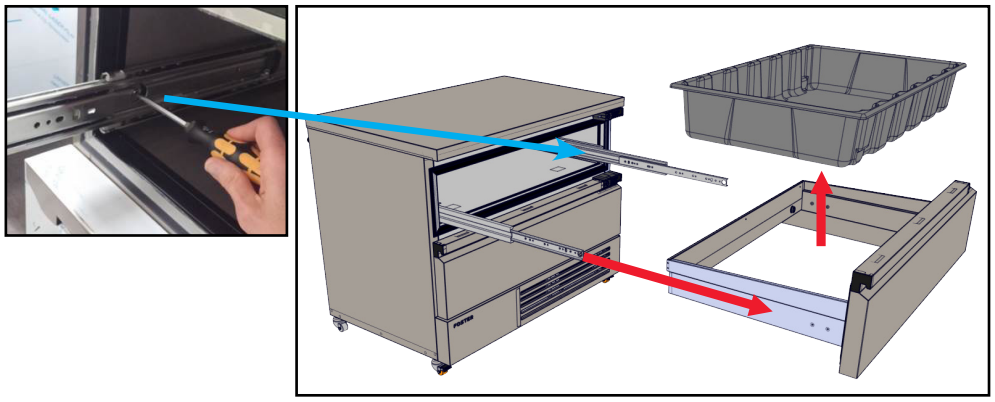
Drawer Adjustment - Minor
Loosen the fixing screws and adjust the body up (for bad seal at the top) or down (bad seal at the bottom).
Repeat both sides until the gasket seals correctly.
If there is not sufficient adjustment proceed to the second adjustment instruction.

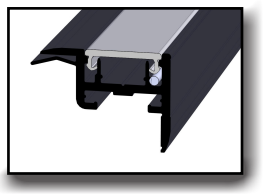


Re-alignment of the Drawer
Remove the bin and then the bin holder/ drawer frame (by removing x8 M5 machine screws).
Loosen the fixing screws and adjust up (for bad seal at the top) or down (bad seal at the bottom).
Repeat both sides and replace the bin holder/ drawer body until the gasket seals correctly.
(Note - Poorly fitting gaskets will result in excess condensation).

How to Replace the Drawer Mullion Heater Wire

1)





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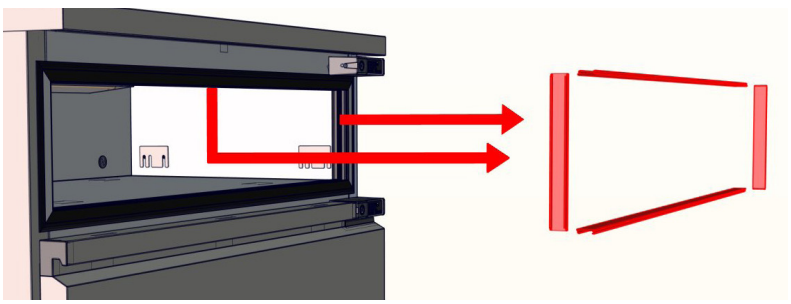

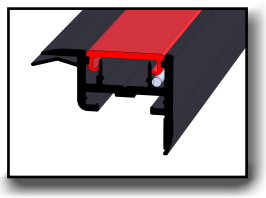

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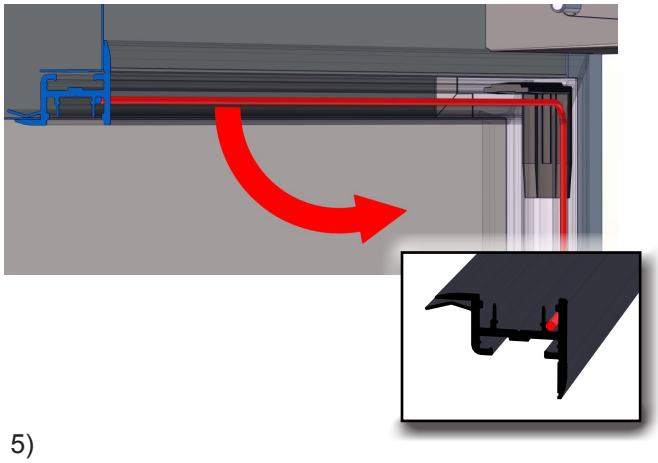

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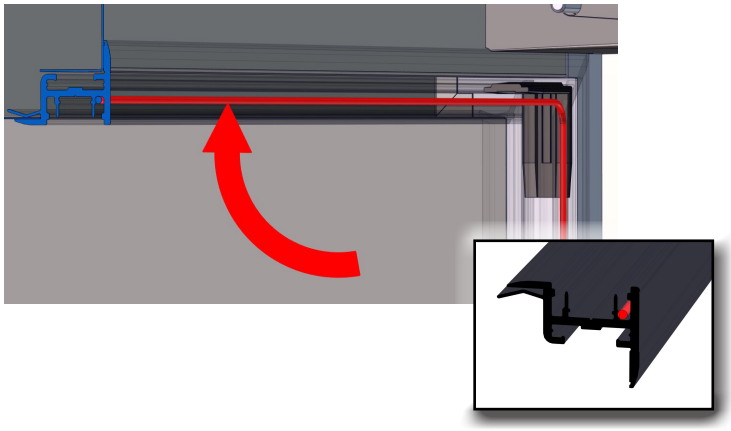

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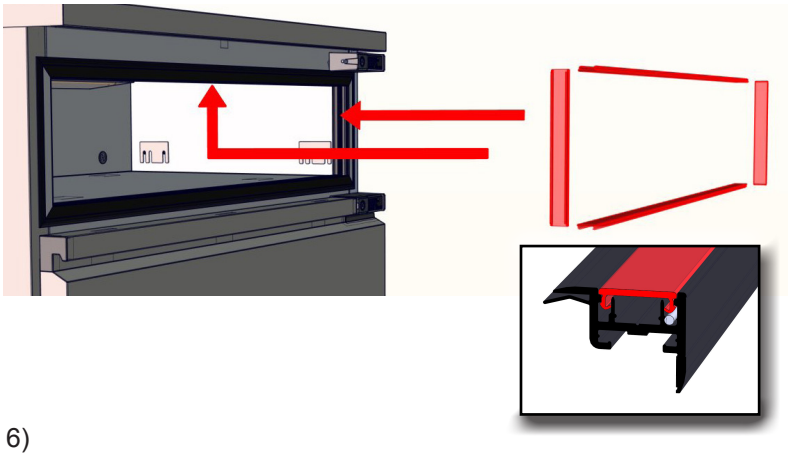

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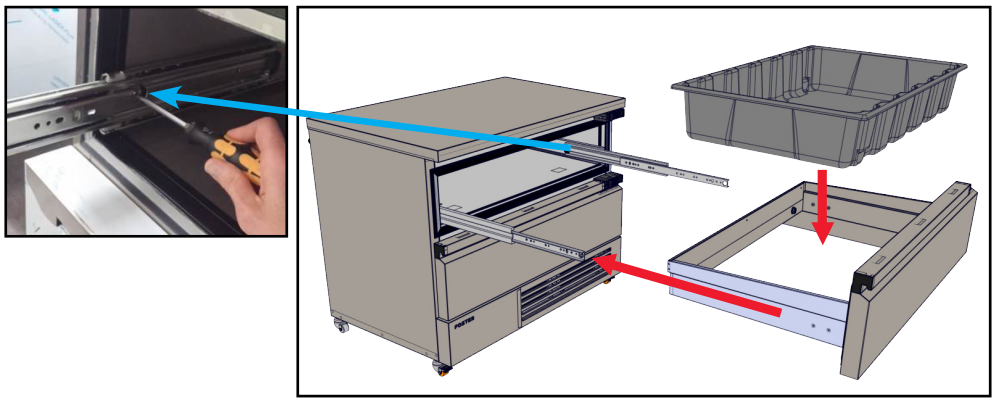
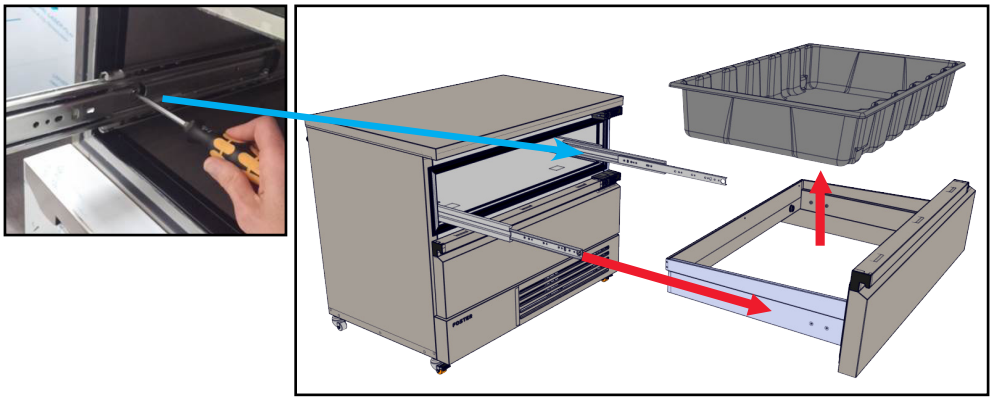


How to Replace a Drain Line Heater

1)



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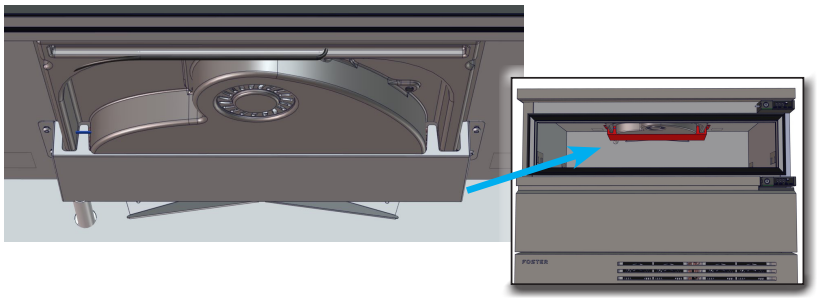

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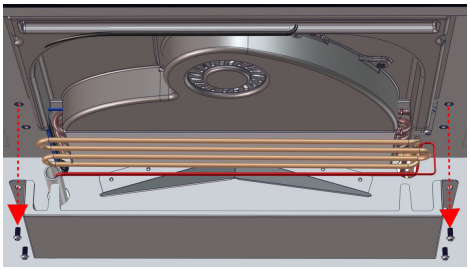

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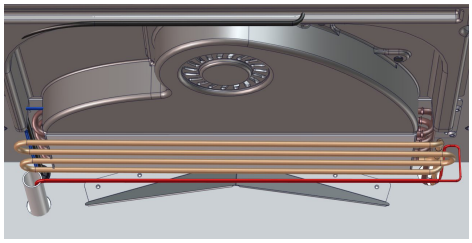

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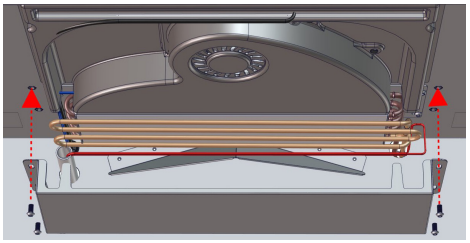

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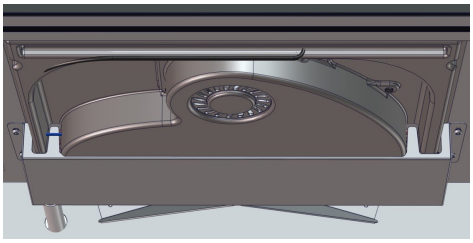

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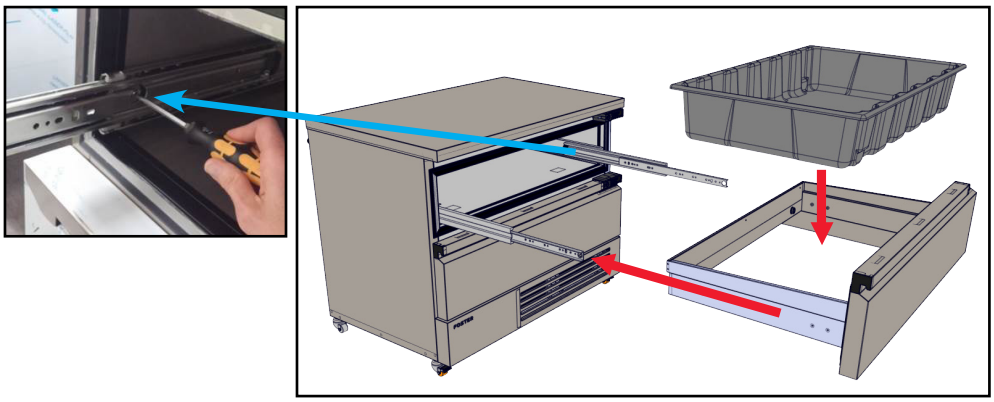


Overshelf and Can Opener (Optional)

Both the overshelf & can opener options are only supplied fitted to models from factory.
The overshelf should hold no more than 80kg evenly distributed.

Configuration of Parameters

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

> To gain access to the parameters access the configuration menu by pressing ⏻ + i together for 5 seconds.
> The first parameter will show on the display.
> Using the ◀ and or ▶ buttons select the required parameter.
> Press the i button to display its current value.
> While keeping i pressed, use the ◀ and or ▶ buttons to set the new desired value.
> On releasing i the new value will be stored and the next parameter will display.
> To exit this mode or revert to normal operating mode, press ⏻ or wait for 30 seconds.

If at any point no buttons are pressed for 30 seconds, without saving a new value, the display will return to the standard temperature display.

FD2-10 Controller Default Parameter Values & Descriptions

Parameter	Range	Description	Default Setting
SCL		Readout Scale:	2°C
	1°C	Range -50/-9.9…. 19.9/80°C (With INP = SN4 Only)	
	2°C	Range -50 …. 120°C	
	°F	Range -55 …. 240°F	
SPL	-50 ... SPH	Minimum limit for SP setting	1
SPH	SPL ... 120°	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 ... 10°	Off/On Thermostat differential	4
CRT	0 ... 30 Min	Compressor rest time	2
CT1	0 ... 30 Min	Thermostat run time with faulty T1 (CT1 = 0 output with faulty T1 will always be off)	6
CT2	0 ... 30 Min	Thermostat off time with faulty T1 probe (CT2=0 & CT1 = >0 output with faulty T1 will always be on)	4
CSD	0 ... 30 Min	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 Hours	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	
DLI	-50 ... 120°	Defrost end temperature (Only if T2 = EPO)	20
DTO	1 ... 120 Min	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 ... 240 Sec	Evaporator pump down. Timed pause at start of defrost	0
DRN	0 ... 30 Min	Drain down period	2
DDM		Defrost 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 ... 60 Min	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 ... 120°	Evaporator fan restart temperature following defrost (Only if T2 = EPO)	5
FTO	0 ... 120 Min	Maximum evaporator fan stop period following defrost	3
FDS	0 ... 120 Sec	Minimum evaporator fan stops (following door opening etc.)	20
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 > FD. 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 ... 0°	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 ... 180 Sec	Fan stop delay after compressor stop	15
FT2	0 ... 30 Min	Timed fan stop following T1 (With FT2 = 0 the fans remain on all the time)	3
FT3	0 ... 30 Min	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	
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
AT1		Alarm Probe:	T1
	T1	Air temperature probe used for alarm detection	
	T2	Evaporator temperature probe used for alarm detection	
ATD	0 ... 120 Min	Delay before alarm temperature warning	90
ADO	0 ... 30 Min	Delay before door open alarm warning	8
AHM		Operation In Case Of High Condenser Alarm (T2 = 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	-50 ... 120°	Condenser alarm temperature (T2 = CND)	65
ACC	0 ... 52 Weeks	Condenser cleaning period (With ACC = 0 condenser cleaning is disabled)	0
IISM		Switch over 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	
	D12	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
IIFC		Evaporator Fan Mode During 'Mode 2' Thermostatic Control:	NON
	NON	Fans(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	
HDS	1 ... 5	Controller sensitivity for switch over between 'Modes' and 2. (1 = minimum, 5 = maximum)	3
IIDF	0 ... 99 Hours	Time interval between defrosts in 'Mode 2'	6
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	
	DS2	Second door switch function (operated 'in series' with DS)	
LSM		Light Control Mode:	NON
	NON	Digital input 2 not activated	
	MAN	Light output operation is activated/deactivated by button ⏻ (With OA1 = LGT)	
	DOR	Light output is switched on when door is opened (With OA1 = LGT and DS = YES)	
	NDR	Light output is switched off 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	
	AL0	Contacts open when an alarm condition occurs	
	AL1	Contacts close when an alarm condition occurs	
		(Relay contacts open when in standby mode)	
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 Function:	NON
	NON	T2 Probe disabled	
	EPO	Evaporator temperature monitoring	
	CND	Condenser temperature monitoring	
OS2	-12.5...12.5°C	T2 probe temperature offset	0
TLD	1 ... 30 Min	Delay for min (TLO) and max. (THI) temperature logging	10
SIM	0 ... 100	Display Slowdown	5

ADR	1 ... 255	FD2-10 address for PC communication	1

Parameters ALA and AHA will not be visible when ATM is set at ABS.
ALR and AHR will not be visible if ATM is changed to REL.

FlexDrawer Parameter Values

Parameter	Description	Default	All Models
SCL	Readout Scale	2°C	2°C
SPL	Minimum Limit for SP setting	1	0
SPH	Maximum limit for SP setting	3	6
SP	Temperature set point to be achieved	1	1
C-H	Temperature Control mode	REF	REF
HYS	Off/On Thermostat differential	4	3
CRT	Compressor rest time	2	1
CT1	Thermostat run time with faulty T1	6	6
CT2	Thermostat off time with faulty T1 probe	4	4
CSD	Compressor stop delay after door has been opened (Only if DS – YES)	1	1
DFM	Defrost Start Mode	TIM	TIM
DFT	Time interval between defrosts	6	6
DFB	Defrost timer clock	YES	YES
DLI	Defrost end temperature (Only if T2 = EPO)	20	35
DTO	Maximum defrost duration	20	15
DTY	Defrost type	OFF	GAS
DPD	Evaporator pump down. Timed pause at start of defrost	0	0
DRN	Drain down period	2	2
DDM	Defrost display mode	DEF	DEF
DDY	Defrost display delay period	10	15
FID	Fans in defrost	YES	NO
FDD	Evaporator fan restart temperature following defrost (Only if T2 = EPO)	5	5
FTO	Maximum evaporator fan stop period following defrost	3	3
FDS	Minimum evaporator fan stops (following door opening etc.)	20	20
FCM	Evaporator fan mode during thermostatic control	TIM	NON
FDT	Te-Ta difference for fans to turn off after compressor stopped (Only if T2 = EPO and FCM = TMP)	-1	-1
FDH	Temperature differential for evaporator fan restart (Only if T2 = EPO and FCM = TMP)	3	3
FT1	Fan stop delay after compressor stop	15	15
FT2	Timed fan stop following T1 (With FT2 = 0 the fans remain on all the time)	3	3
FT3	Timed fan run following FT2 (With FT3 = 0 and FT2 >0 the fans remain off all the time	2	2
ATM	Alarm threshold configuration	REL	REL
ALA	Low temperature alarm threshold	-2	-2
AHA	High temperature alarm threshold	8	8
ALR	Low temperature alarm differential (With ALR = 0 the low temperature alarm is excluded)	-5	-5
AHR	High temperature alarm differential (With AHR = 0 the low temperature alarm is excluded)	5	5
AT1	Alarm probe	T1	T1
ATD	Delay before alarm temperature warning	90	90
ADO	Delay before door open alarm warning	8	5

AHM	Operation in case of high condenser alarm (T2 = CND)	NON	NON
AHT	Condenser alarm temperature (T2 = CND)	65	65
ACC	Condenser cleaning period. (With ACC = 0 condenser cleaning is disabled)	0	0
IISM	Switch over method to second parameter set	HDD	MAN
IISL	Minimum limit for IISP setting	1	-25
IISH	Maximum limit for IISP setting	1	-10
IISP	Temperature set point to be achieved in 'Mode 2'	1	-21
IIHY	Off/On thermostat differential in 'Mode 2'	4	3
IIFC	Evaporator fan mode during 'Mode 2' thermostatic control	NON	TIM
HDS	Controller sensitivity for switch over between 'Modes' and 2 (1 = minimum, 5 = maximum)	3	3
IIDF	Time interval between defrosts in 'Mode 2'	6	4
SB	Standby button operation	YES	YES
DS	Door switch operation (switch made when door closed)	YES	YES
DI2	Configuration digital input operation	NON	NON
LSM	Light control mode	NON	NON
OA1	Auxiliary relay operation	0-1	0-1
INP	Temperature sensor(s) type	SN4	SN4
OS1	Air temperature probe (T1) offset	0	0
T2	T2 probe function	NON	EVP
OS2	T2 probe temperature offset	0	0
TLD	Delay for min (TLO) and max. (THI) temperature logging	10	10
SIM	Display Slowdown	5	5
ADR	FD2-10 address for PC communication	1	1

*Yellow highlight denotes a parameter different to that of the default setting
(Parameters sourced from FD2-10 01-268154 Revision 25 19.01.2015- Correct at time of print)

FD2-10 Technical Data

Power Supply
230Vac±10%, 50/60Hz, 3W

Measurement Range
-50…120°C, -55…240°F
-50 / -9.9…19.9 / 80°C (NTC 10K Only)

Relay Output Max Load (230Vac)
Compressor – 16(8) A 240Vac
Defrost - 16(4) A 240Vac
Evap. Fan - 16(4) A 240Vac
Auxiliary Loads 1 - 8(2) A 240Vac

Input – NTC 10KΩ @ 25°C

Measurement Accuracy
<0.5°C within the measurement range

Operating Conditions
-10 … +50°C; 15% … 80% r.H

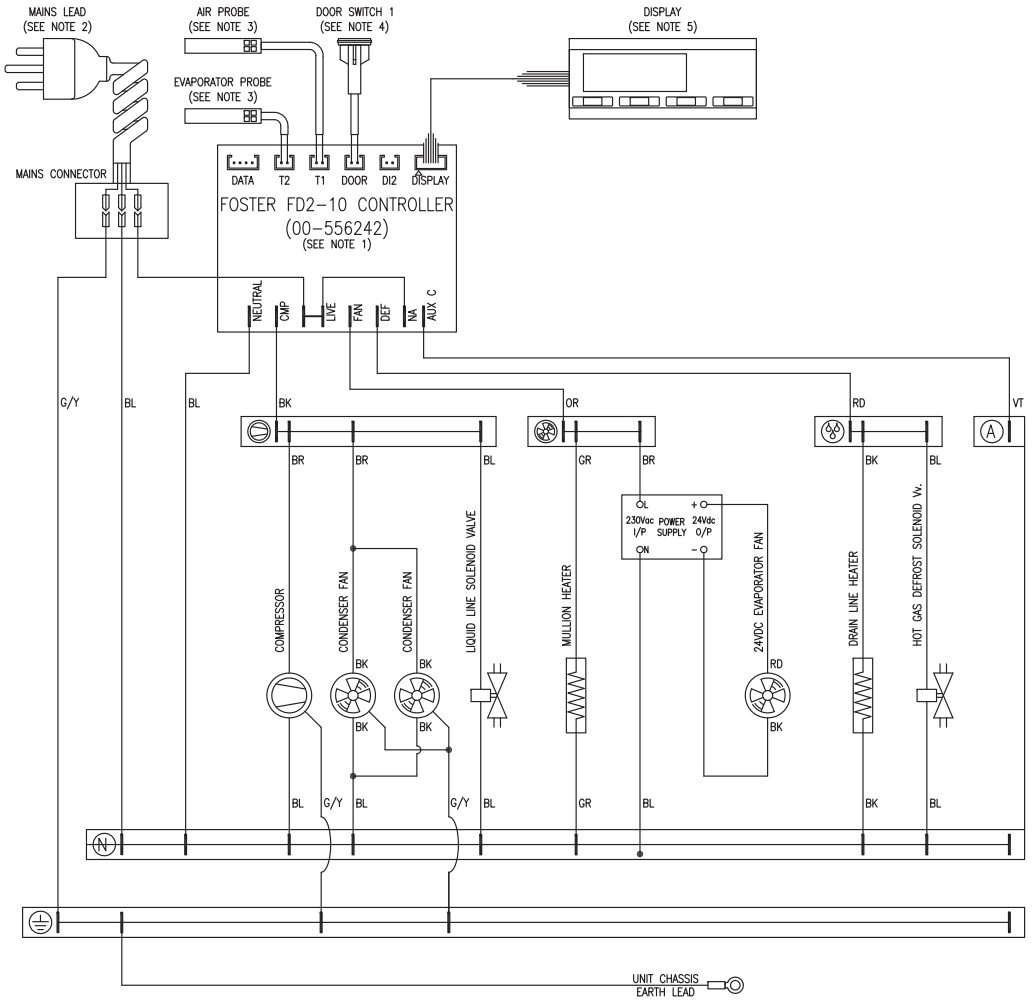
Controller Approvals
EN60730-1; EN60730-2-9
EN55022 (Class B)
EN50082-1

Technical Data of Individual Models

Model	Gas	Hertz	Gas Charge	Compressor	Capillary	Defrost Type	Power Consumption		Fuse Rating
							Watts	Amps	
FFC2-1	R290	230v 50Hz	65 grms	EMT2121U	0.042 IDx0.93”x 6m	Hot Gas	250	1.5	10
FFC3-1	R290	230v 50Hz	65 grms	EMT2121U	0.042 IDx0.93”x 6m	Hot Gas	250	1.5	10
FFC4-2	R290	230v 50Hz	2x 65 grms	2x EMT2121U	2x 0.042 IDx0.93”x 6m	2x Hot Gas	2x 250	2x 1.5	2x 10
FFC6-2	R290	230v 50Hz	2x 65 grms	2x EMT2121U	2x 0.042 IDx0.93”x 6m	2x Hot Gas	2x 250	2x 1.5	2x 10

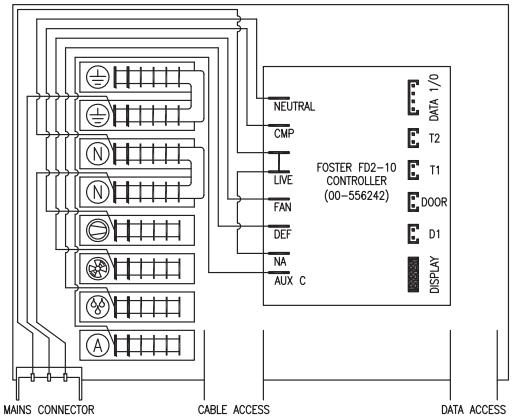
Note: The power consumption values referred to as tested are to the ECA test standard. Actual power consumption will be greatly affected by ambient temperature, loading, usage and cabinet maintenance.

Wiring Diagram for all FlexDrawer Models



FOSTER FLEX-DRAWER COUNTER MODELS	
FFC 2-1	FFC 3-1
FFC 4-2	FFC 6-2

FOSTER WIRING CENTRE LAYOUT



NOTES:

1. CONTROLLER CONFIGURED FOR HOT GAS DEFROST.
2. MAINS LEAD CONNECTED WITH IEC C14 TYPE CONNECTOR - PLUG & LEAD TYPE VARIES BY APPLICATION.
3. AIR PROBE (T1) & EVAPORATOR PROBE (T2) 10KNTC TYPE (SN4K....).
4. DOOR SWITCH ENABLED VIA CONTROLLER PARAMETERS.
5. CONTROLLER DISPLAY TYPE LCD 5S (00-555992).
6. ALL CABLE 1.0mmSQ UNLESS OTHERWISE STATED.
7. CABLE COLOUR CODE:
   BR - BROWN, RD - RED, GR - GREY
   BL - BLUE, BK - BLACK, VT - VIOLET
   G/Y - GREEN / YELLOW, WH - WHITE, OR - ORANGE
   (ALL EARTH WIRING TO BE GREEN/YELLOW)
8. CIRCUIT SHOWN DE-ENERGISED.

REV	DESCRIPTION	BY	DATE
02.	ADDITIONAL MODELS ADDED	NAD	19/01/15

CUSTOMER COPY

FOSTER REFRIGERATOR (U.K) LTD
OLDMEDOW ROAD KING'S LYNN NORFOLK PE30 4JU

TITLE -
WIRING DIAGRAM
FOSTER FLEX-DRAWER COUNTER
MODEL RANGE DETAILED ABOVE
INDIVIDUAL SECTION DRAWING
INTEGRAL CONFIGURATION

DRAWING NO. - 01-281676-00-02
SHEET 1 OF 1
DRAWN - NAD
SCALE - NTS
DATE - 06/01/'14
CHECKED IN ACCORDANCE WITH OP-070-DEV-E FORM NO. WD6 -

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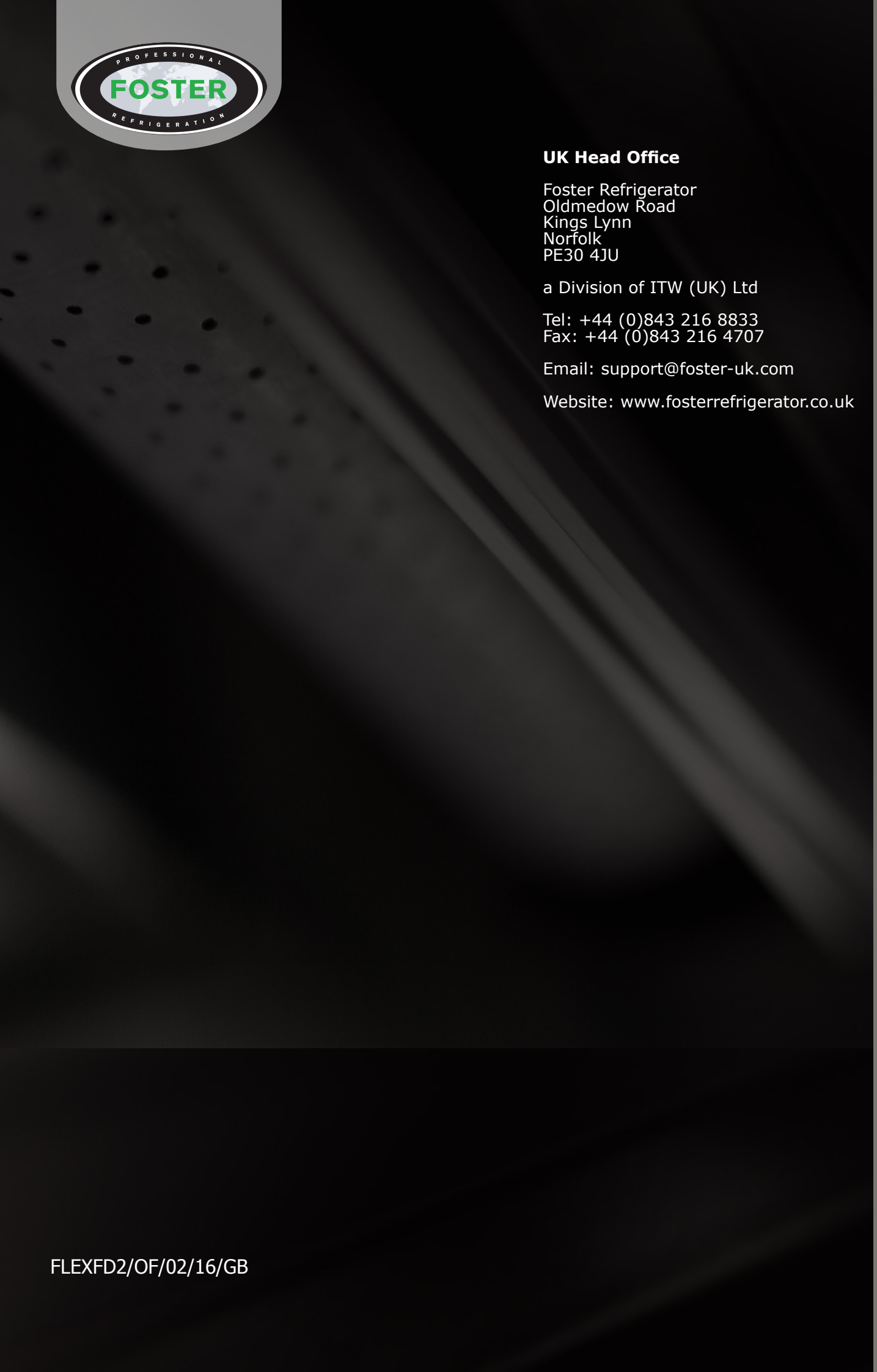

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