



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

Controlled Thaw

Surf Navigation Click Wheel Controller

English



March 2014 Version 1



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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 and 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.

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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

SYSTEM TEST

SIMPLE +

When mains electrical power is first applied to the controller it will carry out a selftest function, for approximately 3 seconds. During this period the display will show.

Software Revision 1b By LAE ELECTRONIC

On completion of the self-test, the controller will revert to the last chill program that was run (STORAGE, Programme 1, Programme 2, Programme 3)

Controller Information

Surf Navigation Click Wheel



Display (00-556022)

Click Wheel (00-556020)

Probes

Air Probe SN2K25P1 (00-556293) Overtemp Probe BC Man-101-0005 (15247510) Food Probe (00-554451) T-Handle Probe (from Feb 2000) 6mmx150mm

Controller Use



Press and release the centre button to start the program Press and hold for 2 seconds to stop the Program



Operation

Upon starting the selected 'Thaw' cycle the controller will increase the internal air temperature in a controlled manner throughout the time period determined by the Phase 1 time and temperature parameters e.g. programme 1= default time setting 5hours 30 minutes, default temperature setting $+10^{\circ}$ C. On reaching the cabinet air temperature of $+10^{\circ}$ C the controller will cycle between heat and refrigeration relative to the phase 1 parameter settings.

This will be followed by the second timed period, Phase 2, which will lower the cabinet temperature to avoid any surface damage to the product. Default time setting 1 hour, default temperature setting + 7 °C. On reaching the cabinet air temperature of +7°C the controller will cycle between heat and refrigeration relative to the phase 2 parameter settings. **NOTE:** This phase is **not** used by KFC, see separate parameter list.

Finally on completion of the phase 2 time period the controller will enter an indefinite period holding the cabinet temperature at + 1 °C to + 4 °C. refrigeration only





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NOTE: the above are for guidance only as the programme times may vary for different products. There is a fourth programme on the controller but this does not have a set programme.



NOTE: For KFC models it is not recommended to alter the time.

After one minute the display will change to show the screen in the middle showing the time remaining plus the cabinet temperature displayed in the left hand corner of the display.

With one hour remaining on the programme the display will change to show the screen second from the right displaying time and temperature.

On completion of the programme the display will change to display the screen on the right indicating temperature has been achieved and will hold the temperature at plus 2°C until the dial is pressed for 2 seconds terminating the programme.



If a programme is not run for 20 minutes the display will change to show the controller in 'sleep' mode.



The 'sleep' mode will be maintained until the dial is pressed, rotated or the door opened when the display will revert to showing the 'User Menu'.

Defrost

Defrosting is only activated during the Storage mode.

The interval between defrosts is 6 hours, this means that over a twenty four hour period, whilst in the storage mode, it will defrost 4 times.

Alarms and Warning

Door Open Alarm

If the door is opened during a programme or storage phase the evaporator fan will stop and screen will change, see below.



After 1 minute the condensing unit will stop, if the door is left open for more than 5 minutes the alarm will sound. The alarm can be cancelled by closing the door

High Temperature Alarm

The alarm will sound and high temperature alarm will be displayed if the storage temperature rises too high for too long.

Causes for this alarm could be:

Is the airflow restricted? Does the condenser filter require cleaning?

Is the evaporator fan running?

If the problem persists call your Foster Authorised Service Company.

Power Fail:

The alarm will sound in the event of power failure to the machine. If the power is off for less than five minutes the unit will re-start on the resumption of the power supply without affecting the selected cycle. If the power is off for longer than five minutes the controller will enter the storage mode on the resumption of the power.

To re-start press and release the dial, the screen will return to the hold screen. L Press and hold the dial for two seconds the display returns to the program selection.





Air Probe:

If this alarm occurs the programme will stop with the screen displayed left. The alarm will sound and can be cancelled by pressing and releasing the dial or it will stop after a set period but resound again after a pre-set time. The controller will automatically enter the storage phase until the cycle is stopped but it will not be possible to start further cycles until your Foster Authorised Service Company has rectified the fault.





Service Settings

Access to Settings

Whilst in the program selection screen press and hold the dial for 2 seconds, the information screen will be displayed continue pressing the dial for a further 2 seconds to display the 'SERVICE MENU'. LANGUAGE will be highlighted.

SERVICE				
LANGUAGE	ENG			
DIAGNOSTICS	1-COMP			
FOOTPRINT				
CODE	0			
Press 2 seconds for Exit				

Changing Text Language

With LANGUAGE highlighted, press and release the dial, 'ENG' (English) will be highlighted. Note: English is the only language available for this controller.

Settings and Parameters

Passcode

Rotate the dial until you reach 'PASSCODE', below left, press and release the dial to highlight the code, below right.

Rotate the dial until you reach the code `131'. Once achieved press and release the dial to acknowledge.

SERVICE			
LANGUAGE	ENG		
DIAGNOSTICS	1-COMP		
FOOTPRINT			
CODE	0		
Press 2 seconds for Exit			

SERVICE				
LANGUAGE	ENG			
DIAGNOSTICS	1-COMP			
FOOTPRINT				
CODE	131			
Press 2 seconds for Exit				



Profiles

You are now in the program profiles. The controller has 5 operating programs – STORAGE, Program 1, Program 2, Program 3, and Program 4.

These programs are all available depending upon which of the profiles are selected, see below.

	Storage	Program 1	Program 2	Program 3	Program 4
SIMPLE	Х	\checkmark	\checkmark	\checkmark	Х
SIMPLE +	✓	\checkmark	✓	✓	Х
STANDARD	Х	✓	✓	✓	✓
STANDARD +	✓	\checkmark	✓	✓	✓
X = DISA	BLED	✓ = ENABLED			

To change the profile, rotate the dial to select program, press and release the dial to accept the change. The 3 chevrons in the box opposite the selected program confirm the change. The default operating profile is 'STANDARD+'.

The table identifies which programs are available from the profile selected.

9	SERVICE	
STANDARD		
STANDARD +		>>>>
EXPRESS		
EXPRESS +		
THAW		
THAW +		
	Press 2 seconds for E	xit

Parameter Access

From the profile screen once the selection has been made press and release the dial to access the parameter list. The screen will display the parameters as shown in the screen below left. To access the system parameters rotate the dial anticlockwise see below right.

計構	STANDARD +	
STORAGE		
MANUAL PROVE 1		
MANUAL PROVE 2		
MANUAL PROVE 3		
ADPR 1		
MANUAL THAW 1		
MANUAL THAW 2		
MANUAL THAW 3		
Pres	ss 2 seconds for E	xit

計構	STANDARD +			
AUTOMATIC THAW				
SYSTEM				
Press 2 seconds for Exit				

Selection is made by pressing and releasing the dial.

The table below contains the complete parameter list and includes the selectable range and default values.



Parameters

					STANDARD	
PARAMETER DESCRIPTION		VALUE	MINIMUM	MAXIMUM		KFC
STORAGE					SETTINGS	
PO1	Air Temperature	ംറ	-25	25	2	2
PROGRAM 1		C	25	25	2	2
002	P1 Temperature	0.0	0	45	0	0
PO2	Default	ະບ	0	45	8	8
PO3	P1 Time Default	MINUTES	PO4	PO5	270	330
PO4	P1 Time Minimum	MINUTES	0	900	60	330
PO5	P1 Time Maximum	MINUTES	0	900	600	330
PO6	P2 Temperature Default	°C	0	45	6	6
PO7	P2 Time Default	MINUTES	PO8	PO9	60	0
PO8	P2 Time Minimum	MINUTES	0	900	60	0
PO9	P2 Time Maximum	MINUTES	0	900	60	0
PROGRAM 2						Ū
P10	P1 Temperature Default	°C	0	45	8	8
P11	P1 Time Default	MINUTES	P12	P13	330	420
P12	P1 Time Minimum	MINUTES	0	900	60	420
P13	P1 Time Maximum	MINUTES	0	900	600	420
P14	P2 Temperature	°C	0	45	6	6
P15	P2 Time Default	MINUTES	P16	D17	60	0
P16	P2 Time Minimum	MINUTES	0	900	60	0
P17	P2 Time Maximum	MINUTES	0	900	60	0
PROGRAM 3		THROTES	0	500	00	Ū
	P1 Temperature			45	-	
P18	Default	°C	0	45	8	8
P19	P1 Time Default	MINUTES	P20	P21	540	540
P20	P1 Time Minimum	MINUTES	0	900	60	540
P21	P1 Time Maximum	MINUTES	0	900	60	540
P22	P2 Temperature Default	°C	0	45	6	6
P23	P2 Time Default	MINUTES	P24	P25	60	0
P24	P2 Time Minimum	MINUTES	0	900	60	0
P25	P2 Time Maximum	MINUTES	0	900	60	0
PROGRAM 4				·		
P26	P1 Temperature Default	°C	0	45	9	9
P27	P1 Time Default	MINUTES	P28	P29	720	0
P28	P1 Time Minimum	MINUTES	0	900	60	0
P29	P1 Time Maximum	MINUTES	0	900	900	0
P30	P2 Temperature	ଂ	0	45	6	6
	Default				-	-
P31	P2 Time Default	MINUTES	P32	P33	0	0
P32	P2 Time Minimum	MINUTES	0	900	60	0
P33	P2 Time Maximum	MINUTES	0	900	60	0

SYSTEM

D24	D1 Host Hystoresis	01/	20	С	С	С
P34 D25	P1 Heat Hysteresis		-20	-2	-2	-2
	F2 Heat Hysteresis		-20	-2	-2	-2
			2	20	<u> </u>	<u>ゝ</u>
P37	Short Cycle Delay	MINUTES		30	2	2
P38		FUNCTION	CYCLE/AUTO/ON	UN	ON	
P39	Storage Fan OP.	FUNCTION	CYCLE/AUTO/ON	AUTO	ON	
P40	Defrost Type	FUNCTION	OFF/ELE/GAS	OFF	OFF	
P41	Defrost Per Day	INTEGER	0	24	4	4
P42	Defrost End Time	MINUTES	1	60	20	20
P43	Defrost End	°C	0	50	20	20
5.4.4	Temperature					
P44	Drain Time	MINUTES	0	30	1	1
P45	Fan Delay	°C	-15	15	5	5
	Temperature					-
P46	Duty Cycle	10x%	0	10	6	6
P47	Compressor Rest Time	MINUTES	0	30	1	1
P48	Door Switch 1	FUNCTION	NO	YES	YES	YES
P49	Door Stop	MINUTES	0	30	1	1
P50	Door Alarm Delay	MINUTES	0	30	5	5
P51	High Temperature Alarm	°K	0	50	10	10
P52	High Alarm Delay	MINUTES	0	120	30	30
P53	Alarm Time	SECONDS	0	120	20	20
P54	Alarm Repeat Interval	MINUTES	0	480	0	0
P55	Alarm Buzzer	FUNCTION	NO	YES	NO	NO
P56	Evaporator Probe Enable	FUNCTION	NO	YES	YES	YES
P57	Air Probe Offset	٥K	-15	15	0	0
P58	Evaporator Probe Offset	°K	-15	15	0	0
P59	Contrast	INTEGER	0	100	50	50
	Addross	INTEGER	1	255	1	1

NOTE: On early version of this model the P39 'Storage Fan OP' was set to 'AUTO' the setting should be changed to 'ON'.

Probes

Air and Evaporator Probes

The air and evaporator probes, type 2K NTC, are the same and are identified as T1 Air Probe and T2 Evaporator Probe. These are the thermistor type and are fully enclosed to make it completely waterproof and resilient to temperature variation within the limits of rapid cycling. The probe is capable of measuring temperature in excess of -30°C and 50°C with 1°K accuracy at 1°C and no more than 2°K at the upper and lower temperature ranges.

	per a care	1001040	liee raia						
°C	K ohm	°C	K ohm	°C	K ohm	°C	K ohm	°C	K ohm
-40	44.657	-5	7.198	30	1.651	65	0.497	100	0.189
-35	33.505	0	5.716	35	1.371	70	0.426	105	0.166
-30	25.388	5	4.571	40	1.143	75	0.367	110	0.142
-25	19.402	10	3.682	45	0.958	80	0.318	115	0.125
-20	14.961	15	2.987	50	0.807	85	0.276	120	0.111
-15	11.644	20	2.437	55	0.683	90	0.24	125	0.099
-10	8.133	25	2	60	0.582	95	0.21		

Probe temperature resistance values

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Wiring Diagram for CT75

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Troubleshooting		4074101147104
Problem 🗖	Possible Cause	Solution
Compressor will not start	 No voltage in socket Electrical conductor or wires may be cut Defective electrical component: 	 > Use voltmeter to check > Use ohmmeter to check for continuity > Replace defective component
14	thermostat, relay, thermal	
	 Compressor motor has a winding open or shorted 	 Measure ohmic resistance of main and auxiliary winding using ohmmeter. Compare with correct values
<u>A</u>	 Compressor stuck 	 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 unpluggedController set too high	> Plug in power cord.> Set controller to lower
	 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 problem 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	 Controller is set at a very warm position 	 Adjust to colder setting
(N)	Condenser is dirty	> Clean condenser
\mathbf{X}	 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
\wedge	 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



The refrigerator has been used improperly

- > Too many door openings
- Excessive heat load placed in cabinet
- The refrigerator has been overcharged with the refrigerant gas



The refrigerant gas is leaking



The evaporator and/or condenser fans are not working

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 Fuse blown or circuit breaker tripped

Electrical Shocks

Noise

- Wires or electrical components are in direct contact with metallic parts.
- > The refrigerator is not properly levelled
 - The condenser is not fastened correctly. Copper tubing is in contact with metal
 - The evaporator and/or condenser fans are loose
 - > Compressor has an internal noise
 - > Loose part(s)

- Locate exact point of restriction and correct
- 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.
- Advise user to decrease if possible
- Advise user not to put in products that are too hot.
- Check to see if condensation or ice crystals have formed on the suction line. If so, charge with the correct amount of gas.
- 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.
- Check electrical connections and make sure that the fan blade isn't stuck. Replace the fan motor if it doesn't work.
- Re-arrange product to allow for proper air flow. Make sure there is at least four inches of clearance from evaporator.
- Replace fuse or reset circuit breaker.
- Check for appropriate insulation on the connections of each component.
- Check if the noise goes away after you level the refrigerator
- > 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.
- Check if the fans are securely fastened. Also, check if the fan blades are loose, broken or crooked. If so, change the faulty blade.
- If the noise persists after all other measures have been taken, it may be originating from the compressor.
- Locate and tighten loose part(s)



> Set the controller to a warmer

the refrigerator		position		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
\wedge	>	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

> Controller is set at a very cold

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Extreme condensation inside

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 defrost and ensure system works.

Notes

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