FOSTER RETARDER PROVERS
With RBC MK 3 CONTROLLER
SERVICE MANUAL

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1. *INTRODUCTION*

The cabinet and Modular DRP are designed to retard, recover and prove dough products. When utilised correctly the unit will enable a more consistent product quality to be achieved.

It is therefore important that prior to working on this equipment that this manual is read and understood.

During this manual various terminology is used. Correct interpretation can be found in the Glossary on page 19.

If any point of operation is unclear the engineer should contact Foster Refrigerator (UK) Ltd on (01553) 691122.

The controller contains both ‘User Parameters’ and also ‘Machine Operating Parameters’. Neither of these parameter sets are accessible to the store operators and as such should not be disclosed to any member of store personnel (including management).

Similarly the parameters are pre-set on commissioning to ensure consistent product quality and as such should not be adjusted under any circumstance without prior consent in writing from Head Office bakery personnel.

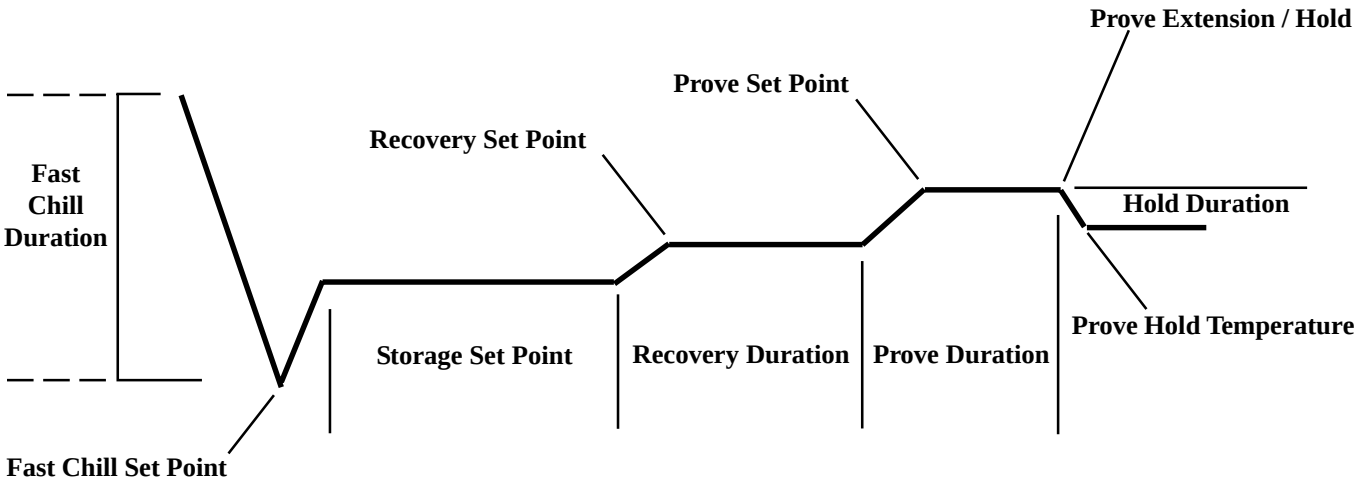
2. *CONTROLLER OPERATION*

2.1 *PROCESS CYCLE OVERVIEW*

2.1.1 The full automatic cycle consists of 4 stages. These are fast chill, storage, recovery and prove. The amount of time available between the bake time and current time will depend how much of each cycle is carried out.

For the purpose of this general overview it has been assumed that the controller has sufficient time with which to carry out a complete cycle.

Throughout paragraph 2.1.2 reference should be made to the process graph below.



2.1.2 Upon initiation of a complete cycle the controller will chill the chamber to a pre-set temperature (fast chill). When this temperature has been reached the machine will hold the chamber at a temperature (storage) for a time calculated by the controller. The controller calculates how long this temperature is maintained using the bake time and the remaining process times.

An illustration of this is;

Assuming that the current time is 09:00 and the bake time is 18:00 the total time for the cycle is 9 hours.

A program is selected where the recovery time added to prove time is 6 hours.

The controller would hold the chamber at the storage temperature for 3 hours.

When the time calculated for the next stage is reached the controller will change from the storage mode to the recovery mode. During the recovery mode the controller increases the temperature of the chamber linearly from the storage temperature to the recovery temperature over ¾ of the given period of time. If other parameters allow it steam may be introduced during the later parts of this stage.

Upon completion of the recovery cycle the prove cycle commences. The chamber is then increased to a higher temperature over ¾ of given set time period. During this stage steam is introduced into the chamber as required to maintain the required humidity.

When the prove part of the cycle is complete the operator is advised both audibly and visually that the current program is complete and is given an option to either extend the prove time or hold the product. Assuming that these options are not selected the cycle is complete and as such is halted.

If the product is not ready at the bake time then a prove extension can be selected. Similarly, if the product is ready but there is no oven capacity the product can be held. The duration of both prove extension and prove hold are governed by a number of machine parameters (see paragraph 3.2).

2.1.3 Parameters

The controller has 9 process operating programs of which 1 to 4 are active and 5 to 9 are inactive.
The active programs are selected automatically by the controller based on the bake time and the current time.

2.2 Tesco Program 1 Default Parameters

		Tesco / Mod / Pack		Tesco / Mod / Integral		Tesco Donut Upright		Tesco Donut Bench	
		Parameter	Access Level	Parameter	Access Level	Parameter	Access Level	Parameter	Access Level
Program 1 Active		Yes	3	Yes	3	Yes	3	Yes	3
Program 1 Name		Program 1	3	Program 1	3	Program 1	3	Program 1	3
FAST CHILL	Fast Chill Active	No	3	No	3	No	3	No	3
	Fast Chill Duration High Limit	1.30	3	1.30	3	1.30	3	1.30	3
	Fast Chill Duration Low Limit	0.30	3	0.30	3	0.30	3	0.30	3
	Fast Chill Duration	1.00	2	1.00	2	1.00	2	1.00	2
	Fast Chill Temperature Active	Yes	3	Yes	3	Yes	3	Yes	3
	Fast Chill Temperature Limit High Limit	-3	3	-3	3	-3	3	-3	3
	Fast Chill Temperature Limit Low Limit	-7	3	-7	3	-7	3	-7	3
	Fast Chill Temperature	-5	2	-5	2	-5	2	-5	2
STORAGE	**Storage Temperature High Limit**	**12**	**3**	**12**	**3**	**12**	**3**	**12**	**3**
	Storage Temperature Low Limit	0	3	0	3	0	3	0	3
	Storage Temperature	10	2	10	2	10	2	10	2
RECOVERY	Recovery Active	Yes	3	Yes	3	Yes	3	Yes	3
	Recovery Temperature High Limit	22	3	22	3	22	3	22	3
	Recovery Temperature Low Limit	15	3	15	3	15	3	15	3
	Recovery Temperature	20	2	20	2	20	2	20	2
	Recovery Duration Active	Yes	3	Yes	3	Yes	3	Yes	3
	Recovery Duration High Limit	07:00	3	07:00	3	07:00	3	07:00	3
	Recovery Duration Low Limit	04:00	3	04:00	3	04:00	3	04:00	3
	Recovery Duration	06:00	2	06:00	2	06:00	2	06:00	2
	Recovery Humidity Active	Yes	3	Yes	3	Yes	3	Yes	3
	Recovery Humidity High Limit	95	3	95	3	95	3	95	3
	Recovery Humidity Low Limit	75	3	75	3	75	3	75	3
	Recovery Humidity	82	2	82	2	82	2	82	2
	Recovery Plateau Time High Limit	50	3	50	3	50	3	50	3
	Recovery Plateau Time Low Limit	10	3	10	3	10	3	10	3
	Recovery Plateau Time	25	3	25	3	25	3	25	3
PROVE	Prove Active	Yes	3	Yes	3	Yes	3	Yes	3
	Prove Temperature High Limit	30	3	30	3	30	3	30	3
	Prove Temperature Low Limit	25	3	25	3	25	3	25	3
	Prove Temperature	28	2	28	2	28	2	28	2
	Prove Duration Active	Yes	3	Yes	3	Yes	3	Yes	3
	Prove Duration High Limit	02:30	3	02:30	3	02:30	3	02:30	3
	Prove Duration Low Limit	00:30	3	00:30	3	00:30	3	00:30	3
	Prove Duration	01:30	2	01:30	2	01:30	2	01:30	2
	Prove Humidity Active	Yes	3	Yes	3	Yes	3	Yes	3
	Prove Humidity High Limit	95	3	95	3	95	3	95	3
	Prove Humidity Low Limit	75	3	75	3	75	3	75	3
	Prove Humidity	87	2	87	2	87	2	87	2
	Prove Plateau Time High Limit	50	3	50	3	50	3	50	3
	Prove Plateau Time Low Limit	10	3	10	3	10	3	10	3
	Prove Plateau Time	25	3	25	3	25	3	25	3
EXTRA PROVE	Extra Prove Active	Yes	3	Yes	3	Yes	3	Yes	3
	Extra Prove Time Active	Yes	3	Yes	3	Yes	3	Yes	3
	Extra Prove Time High Limit	00:20	3	00:20	3	00:20	3	00:20	3
	Extra Prove Time Low Limit	00:01	3	00:01	3	00:01	3	00:01	3
	Extra Prove Time	00:10	2	00:10	2	00:10	2	00:10	2
	Extra Prove Maximum Time High Limit	00:30	3	00:30	3	00:30	3	00:30	3
	Extra Prove Maximum Time Low Limit	00:10	3	00:10	3	00:10	3	00:10	3
	Extra Prove Maximum Time	00:15	2	00:15	2	00:15	2	00:15	2
	Extra Prove Temperature High Limit	40	3	40	3	40	3	40	3
	Extra Prove Temperature Low Limit	25	3	25	3	25	3	25	3
	Extra Prove Temperature	30	2	30	2	30	2	30	2
	Extra Prove Humidity Active	Yes	3	Yes	3	Yes	3	Yes	3
	Extra Prove Humidity High Limit	95	3	95	3	95	3	95	3
	Extra Prove Humidity Low Limit	75	3	75	3	75	3	75	3
	Extra Prove Humidity	87	2	87	2	87	2	87	2

Go to the next page.

2.2 Tesco Program 1 Default Parameters Continued

		Tesco / Mod / Pack		Tesco / Mod / Integral		Tesco Donut Upright		Tesco Donut Bench	
		Parameter	Access	Parameter	Access	Parameter	Access	Parameter	Access
Program 1 Active		Yes	3	Yes	3	Yes	3	Yes	3
Program 1 Name		Program 1	3	Program 1	3	Program 1	3	Program 1	3
HOLD	Hold Active	Yes	3	Yes	3	Yes	3	Yes	3
	Hold Time Active	Yes	3	Yes	3	Yes	3	Yes	3
	Hold Time High Limit	00:15	3	00:15	3	00:15	3	00:15	3
	Hold Time Low Limit	00:01	3	00:01	3	00:01	3	00:01	3
	Hold Time	00:10	2 ``	00:10	2	01:00	2	01:00	2
	Hold Maximum Time High Limit	00:30	3	00:30	3	01:00	3	01:00	3
	Hold Maximum Time Low Limit	00:01	3	00:01	3	00:01	3	00:01	3
	Hold Maximum Time	00:20	2	00:20	2	01:00	2	01:00	2
	Hold Temperature High Limit	20	3	20	3	20	3	20	3
	Hold Temperature Low Limit	12	3	12	3	12	3	12	3
	Hold Temperature	15	2	15	2	15	2	15	2
	Hold Humidity Active	Yes	3	Yes	3	Yes	3	Yes	3
	Hold Humidity High Limit	95	3	95	3	95	3	95	3
	Hold Humidity Low Limit	75	3	75	3	75	3	75	3
	Hold Humidity	87	2	87	2	87	2	87	2
MINIMUM PROVE	Minimum Prove Time Active	Yes	3	Yes	3	Yes	3	Yes	3
	Minimum Prove Time High Limit	02:00	3	02:00	3	02:00	3	02:00	3
	Minimum Prove Time Low Limit	00:30	3	00:30	3	00:30	3	00:30	3
OVEN CONTACT	Oven Contact Active	No	3	No	3	No	3	No	3
	Oven Contact High Limit	1.00	3	1.00	3	1.00	3	1.00	3
	Oven Contact Low Limit	0.30	3	0.30	3	0.30	3	0.30	3
	Oven Contact	0.45	2	0.45	2	0.45	2	0.45	2

2.3 OPERATING PROGRAM SELECTION

The controller automatically selects the program it requires by calculating the total time between the start time and the bake time. The program it selects is governed by the 'Automatic Program Selection' parameters.
In the event of a program being selected which does not have sufficient time to run completely the controller will operate as much of the program as possible.
For example if the bake time was set to finish at 1500 hrs with the product being loaded at 1200 hrs the controller will calculate the time required and start the program so that the product is proved sufficiently for baking.

3 PARAMETER AND PROGRAM ACCESS

To access the parameter and program press the left hand and right hand green buttons with the downward pointing arrow simultaneously and then follow the on screen instructions. Should further help be required press the '?' for further assistance.

3.1 PARAMETER DEFINITIONS

PROGRAMS

PROGRAM 'x' ACTIVE

Switches the particular program number off or on. If the program is 'On' then all parameters are then governed by their own individual parameters. If the program is 'Off' then none of the parameters other than the program name and program active are visible and cannot be operated.

PROGRAM 'x' NAME

The pre-defined name of the program.

FAST CHILL

FAST CHILL ACTIVE

UNITS - Yes / No

Switches the Fast Chill function in the relevant program on or off. If the function is switched off then the program starts at the first active program function.

FAST CHILL DURATION HIGH LIMIT

UNITS - hrs:mins

The maximum time to which the 'Fast Chill Duration' can be set.

FAST CHILL DURATION LOW LIMIT
UNITS - hrs:mins
The minimum time to which the 'Fast Chill Duration' can be set.

FAST CHILL DURATION
UNITS - hrs:mins
The time at which the fast chill cycle terminates regardless of whether the Fast Chill has been reached.

FAST CHILL TEMPERATURE ACTIVE
UNITS - Yes / No
Switches the 'Fast Chill Temperature' termination on or off. If on, the Fast Chill cycle will terminate if this temperature is reached before the Fast Chill Duration has elapsed. If off the Fast Chill will terminate on time only.

FAST CHILL TEMPERATURE HIGH LIMIT
UNITS - °C
The maximum temperature to which the 'Fast Chill Temperature' can be set.

FAST CHILL TEMPERATURE LOW LIMIT
UNITS - °C
The minimum time to which the 'Fast Chill Temperature' can be set.

FAST CHILL TEMPERATURE
UNITS - °C
The temperature at which the chamber will be controlled at during the fast chill cycle until the Fast Chill Duration time has been reached.

STORAGE

STORAGE TEMPERATURE HIGH LIMIT
UNITS - °C
The maximum temperature to which the 'Storage Temperature' can be set.

STORAGE TEMPERATURE LOW LIMIT
UNITS - °C
The minimum temperature to which the 'Storage Temperature' can be set.

STORAGE TEMPERATURE
UNITS - °C
Following the Fast Chill cycle this is the temperature that the chamber is controlled at prior to the start of the Recovery cycle. The duration of the Storage cycle is determined by the formula 'End Time' – ('Prove Duration' + 'Recovery Duration'). The chamber is maintained at the 'Storage Temperature' within the constraints of the 'Storage Temperature +Differential' and 'Storage Temperature –Differential' parameters.

RECOVERY

RECOVERY ACTIVE
UNITS - Yes / No
Switches the Recovery function in the relevant program on or off. If the function is switched off then the program moves from storage to Prove at the relevant time based on the Prove Duration.

RECOVERY TEMPERATURE HIGH LIMIT
UNITS - °C
The maximum temperature to which the 'Recovery Temperature' can be set.

RECOVERY TEMPERATURE LOW LIMIT
UNITS - °C
The minimum temperature to which the 'Recovery Temperature' can be set.

RECOVERY TEMPERATURE
UNITS - °C
The maximum temperature to which the 'Recovery Temperature' can be set.

RECOVERY DURATION ACTIVE
UNITS - Yes / No
Switches the Recovery Duration on or off in the selected program. If the function is switched off the 'Recovery Tempera ture' is reached in as short time as possible and it is maintained until the prove cycle is required to start.

RECOVERY DURATION HIGH LIMIT
UNITS - hrs:mins
The maximum duration to which the 'Recovery Duration' can be set.

RECOVERY DURATION LOW LIMIT
UNITS - hrs:mins
The minimum duration to which the 'Recovery Duration' can be set.

RECOVERY DURATION
UNITS - hrs:mins
The time period over which the 'Recovery Temperature' will be reached with temperature rise based on the formula Temperature Rise ÷ ('Recovery Duration' – 'Recovery Plateau Time') where 'Temperature Rise' = 'Recovery Tempera ture' – 'Storage Temperature'. The Recovery cycle terminates when the 'Recovery Duration' time has elapsed. The 'Re covery Temperature' is reached when the time 'Recovery Duration' – ' Recovery Plateau Time' has elapsed. Following the 'Recovery Temperature' being reached the chamber is maintained at the 'Recovery Temperature' for the remainder of the 'Recovery Duration' within the constraints of the 'Recovery Temperature +Differential' and 'Recovery Temperature – Differential' parameters.

RECOVERY HUMIDITY ACTIVE
UNITS - Yes / No
Switches the Humidity function on or off during the recovery cycle in the selected program.

RECOVERY HUMIDITY HIGH LIMIT
UNITS - %
The maximum humidity to which the 'Recovery Humidity' can be set.

RECOVERY HUMIDITY LOW LIMIT
UNITS - %
The minimum humidity to which the 'Recovery Humidity' can be set.

RECOVERY HUMIDITY
UNITS - %
This is the percentage humidity at which the chamber is maintained during the Recovery cycle after the 'Humidity Temperature Threshold' temperature has been reached within the constraints of the 'Humidity +Differential' and 'Humidity –Differential' parameters.

RECOVERY PLATEAU TIME HIGH LIMIT
UNITS - %
The maximum percentage of 'Recovery Duration' to which the 'Recovery Plateau Time' can be set.

RECOVERY PLATEAU TIME LOW LIMIT
UNITS - %
The minimum percentage of 'Recovery Duration' to which the 'Recovery Plateau Time' can be set.

RECOVERY PLATEAU TIME
UNITS - %
Expressed as a percentage from the end of the 'Recovery Duration', the time during the recovery cycle when the 'Recovery Temperature' is reached.

PROVE

PROVE ACTIVE
UNITS - Yes / No
Switches the Prove function in the relevant program on or off. If the function is switched off then the program moves from the preceding function to the next based on the relevant parameters of the active cycle.

PROVE TEMPERATURE HIGH LIMIT
UNITS - °C
The maximum temperature to which the 'Prove Temperature' can be set.

PROVE TEMPERATURE LOW LIMIT
UNITS - °C
The minimum temperature to which the 'Prove Temperature' can be set.

PROVE TEMPERATURE
UNITS - °C
The temperature which the chamber will achieve during the Prove cycle over the time period 'Prove Duration' - 'Prove Plateau Time'. The temperature rise can be related to the formula Temperature Rise ÷ ('Prove Duration' – 'Prove Plateau Time') where 'Temperature Rise' = 'Prove Temperature' – 'Storage Temperature'. Following the achievement of the 'Prove Temperature' the chamber is maintained at the 'Prove Temperature' within constraints of the 'Prove Temperature +Differential' and 'Prove Temperature -Differential' parameters.

PROVE DURATION ACTIVE
UNITS - hrs:mins
Switches the Prove Duration on or off. If the function is switched off the 'Prove Temperature' is reached in as short time as possible and it is maintained until either Extra Prove or Hold are required to start based on 'Bake Time'.

PROVE DURATION HIGH LIMIT
UNITS - hrs:mins
The maximum duration to which the 'Prove Duration' can be set.

PROVE DURATION LOW LIMIT
UNITS - hrs:mins
The minimum duration to which the 'Prove Duration' can be set.

PROVE DURATION
UNITS - hrs:mins
The time period over which the 'Prove Temperature' will be reached with temperature rise based on the formula Tempera ture Rise ÷ ('Prove Duration' – 'Prove Plateau Time') where 'Temperature Rise' = 'Prove Temperature' – 'Storage Temperature'. The Prove cycle terminates when the 'Prove Duration' time has elapsed. The 'Prove Temperature' is reached when the time 'Prove Duration' – 'Prove Plateau Time' has elapsed. Following the 'Prove Temperature' being reached the chamber is maintained at the 'Prove Temperature' for the remainder of the 'Prove Duration' within the constraints of the 'Prove Temperature +Differential' and 'Prove Temperature –Differential' parameters.

PROVE HUMIDITY ACTIVE
UNITS - Yes / No
Switches the humidity function on or off during the prove cycle in the selected program.

PROVE HUMIDITY HIGH LIMIT
UNITS - %
The maximum humidity to which the 'Prove Humidity' can be set.

PROVE HUMIDITY LOW LIMIT
UNITS - %
The minimum humidity to which the 'Prove Humidity' can be set.

PROVE HUMIDITY
UNITS - %
This is the percentage humidity at which the chamber is maintained during the Prove cycle after the 'Humidity Tempera ture Threshold' temperature has been reached within the constraints of the 'Humidity +Differential' and 'Humidity –Differential' parameters.

PROVE PLATEAU HIGH LIMIT
UNITS - %
The maximum percentage of 'Prove Duration' to which the 'Prove Plateau Time' can be set.

PROVE PLATEAU LOW LIMIT
UNITS - %
The minimum percentage of 'Prove Duration' to which the 'Prove Plateau Time' can be set.

PROVE PLATEAU TIME
UNITS - %
Expressed as a percentage from the end of the 'Prove Duration', the time during the recovery cycle when the 'Prove Temperature' is reached.

EXTRA PROVE

EXTRA PROVE ACTIVE
UNITS - Yes / No
Switches the Extra Prove function off and on in the selected program.

EXTRA PROVE TIME ACTIVE
UNITS - Yes / No
Switches the Extra Prove Time on or off in the selected program.

EXTRA PROVE TIME HIGH LIMIT
UNITS - hrs:mins
The maximum time to which 'Extra Prove Time' can be set.

EXTRA PROVE TIME LOW LIMIT
UNITS - hrs:mins
The minimum time to which 'Extra Prove Time' can be set.

EXTRA PROVE TIME
UNITS - hrs:mins
An optional extension to the Prove cycle up the a maximum time in the 'Extra Prove Maximum Time' parameter. For example if the 'Extra Prove Time' is to 00:05 and the 'Extra Prove Maximum Time' is to 00:15 then 3 periods of extra prove are allowed.

EXTRA PROVE MAXIMUM TIME HIGH LIMIT
UNITS - hrs:mins
The maximum time to which 'Extra Prove Maximum Time' can be set.

EXTRA PROVE MAXIMUM TIME LOW LIMIT
UNITS - hrs:mins
The minimum time to which 'Extra Prove Minimum Time' can be set.

EXTRA PROVE MAXIMUM TIME
UNITS - hrs:mins
The maximum amount of time that the Prove cycle can be extended using 'Extra Prove Time'.

EXTRA PROVE TEMPERATURE HIGH LIMIT
UNITS - °C
The maximum temperature to which 'Extra Prove Temperature' can be set.

EXTRA PROVE TEMPERATURE LOW LIMIT
UNITS - °C
The minimum temperature to which 'Extra Prove Temperature' can be set.

EXTRA PROVE TEMPERATURE
UNITS - °C
The temperature at which the chamber is maintained during the Extra Prove period within the constraints of the 'Extra Prove Time Temperature +Differential' and 'Extra Prove Time Temperature –Differential' parameters.

EXTRA PROVE HUMIDITY ACTIVE
UNITS - %
Switches the Humidity in the Extra Prove function in the selected program on or off.

EXTRA PROVE HUMIDITY HIGH LIMIT
UNITS - %
The maximum humidity to which 'Extra Prove Humidity' can be set.

EXTRA PROVE HUMIDITY LOW LIMIT
UNITS - %
The minimum humidity to which 'Extra Prove Humidity' can be set.

EXTRA PROVE HUMIDITY
UNITS - %
The percentage humidity at which the chamber is maintained during the Extra Prove cycle after the 'Humidity Temperature Threshold' temperature has been reached within the constraints of the 'Humidity +Differential' and 'Humidity –Differential' parameters.

HOLD

HOLD ACTIVE
UNITS - Yes / No
Switches the hold function on or off in the selected program.

HOLD TIME ACTIVE
UNITS - Yes / No
Switches the hold time on or off for the selected program.

HOLD TIME HIGH LIMIT
UNITS - hrs:mins
The maximum time to which 'Hold Time' can be set.

HOLD TIME LOW LIMIT
UNITS - hrs:mins
The minimum time to which 'Hold Time' can be set.

HOLD TIME
UNITS - hrs:mins
An optional hold to the Prove cycle up the a maximum time in the 'Hold Maximum Time' parameter. For example if the 'Hold Time' is to 00:05 and the 'Hold Maximum Time' is to 00:15 then 3 periods of Hold are allowed.

HOLD MAXIMUM TIME HIGH LIMIT
UNITS - hrs:mins
The maximum time to which 'Hold Maximum Time' can be set.

HOLD MAXIMUM TIME LOW LIMIT
UNITS - hrs:mins
The minimum time to which 'Hold Minimum Time' can be set.

HOLD MAXIMUM TIME
UNITS - hrs:mins
The maximum amount of time that the Hold cycle can be operated using 'Extra Prove Time'.

HOLD TEMPERATURE HIGH LIMIT
UNITS - °C
The maximum temperature to which 'Hold Temperature' can be set.

HOLD TEMPERATURE LOW LIMIT
UNITS - °C
The minimum temperature to which 'Hold Temperature' can be set.

HOLD TEMPERATURE
UNITS - °C
The temperature at which the chamber is maintained during the Hold period within the constraints of the 'Hold Temperature +Differential' and 'Hold Temperature –Differential' parameters.

HOLD HUMIDITY ACTIVE
UNITS - Yes / No
Switches the Hold humidity on or off for the selected program.

HOLD HUMIDITY HIGH LIMIT
UNITS - %
The maximum humidity to which 'Hold Humidity' can be set.

HOLD HUMIDITY LOW LIMIT
UNITS - %
The minimum humidity to which 'Hold Humidity' can be set.

HOLD HUMIDITY
UNITS - %
The percentage humidity at which the chamber is maintained during the Hold cycle after the 'Humidity Temperature Threshold' temperature has been reached within the constraints of the 'Humidity +Differential' and 'Humidity – Differential' parameters.

MINIMUM PROVE TIME

MINIMUM PRODUCT LOAD TIME ACTIVE
UNITS - Yes / No
Switches the Final Product Load Time on or off in the selected program.

MINIMUM PRODUCT LOADED TIME HIGH LIMIT
UNITS - hrs:mins
The maximum time to which 'Final Product Loaded Time' can be set.

MINIMUM FINAL PRODUCT LOADED TIME LOW LIMIT
UNITS - hrs:mins
The minimum time to which 'Final Product Loaded Time' can be set.

MINIMUM FINAL PRODUCT LOAD TIME
UNITS - hrs:mins
The last time prior to the end time that product should be loaded into the chamber. When this time has passed the display indicates the no further product is to be loaded.

OVEN CONTACT

OVEN CONTACT ACTIVE
UNITS - Yes / No
Switches the Oven Contact function on or off in the selected program.

OVEN CONTACT HIGH LIMIT
UNITS - hrs:mins
The maximum time to which 'Oven Contact' can be set.

OVEN CONTACT LOW LIMIT
UNITS - hrs:mins
The minimum time to which 'Oven Contact' can be set.

OVEN CONTACT
UNITS - hrs:mins
The time prior to the end time at which the oven contact operates for 1 second.

4 SERVICE SETTINGS

HUMIDITY

HUMIDITY TYPE
UNITS - Pulse / Tank
Sets the humidity type between Pulse and Tank. When to 'Tank' the humidity is controlled by the Humidity 1 relay which is on until the Humidity for the relevant program cycle is reached. When set to 'Pulse' the Humidity 1 relay is on all the time while the Humidity is below the Humidity required humidity 2 relay is pulsed on and off based on the 'Humidity (Pulse Only) On Time' and 'Humidity (Pulse Only) Off Time'.

HUMIDITY HYSTERESIS +DIFFERENTIAL
UNITS - %
The positive hysteresis allowed from the relevant humidity point.

HUMIDITY HYSTERESIS –DIFFERENTIAL
UNITS - %
The negative hysteresis allowed from the relevant humidity point.

HUMIDITY TEMPERATURE THRESHOLD
UNITS - °C
The temperature before which no humidity should operate.

HUMIDITY (PULSE ONLY) ON TIME
UNITS - ss:ss
When 'Humidity Type' is to pulse this is the on time of the Humidity 2 relay.

HUMIDITY (PULSE ONLY) OFF TIME
UNITS - ss:ss
When 'Humidity Type' is to pulse this is the off time of the Humidity 2 relay.

HUMIDITY PROBE OFFSET
Allows the humidity probe to be calibrated by applying a positive or negative value to the value registered by the controller. If the offset is set to +1 and the probe is registering 80% the display will show and the controller will assume that the actual humidity is 81%.

FAN SPEEDS

FAST CHILL / STORAGE COOLING ON
UNITS - %
The fan speed shown as a percentage of full speed during the Fast Chill and Storage cycles while the refrigeration is on.

FAST CHILL / STORAGE COOLING OFF
UNITS - %
The fan speed shown as a percentage of full speed during the Fast Chill and Storage cycles while the refrigeration is off.

RECOVERY COOLING ON
UNITS - %
The fan speed shown as a percentage of full speed during the Recovery cycle while the refrigeration is on.

RECOVERY HEATING ON
UNITS - %
The fan speed shown as a percentage of full speed during the Recovery cycle while the heating is on.

RECOVERY FANS ONLY
UNITS - %
The fan speed shown as a percentage of full speed during the Recovery cycle while neither heating or cooling are on.

PROVE COOLING ON
UNITS - %
The fan speed shown as a percentage of full speed during the Prove cycle while the refrigeration is on.

PROVE HEATING ON
UNITS - %
The fan speed shown as a percentage of full speed during the Prove cycle while the heating is on.

PROVE FANS ONLY
UNITS - %
The fan speed shown as a percentage of full speed during the Prove cycle while neither heating or cooling are on.

EXTRA TIME COOLING ON
UNITS - %
The fan speed shown as a percentage of full speed during the Extra Time while the refrigeration is on.

EXTRA TIME HEATING ON
UNITS - %
The fan speed shown as a percentage of full speed during the Extra Time while the heating is on.

EXTRA TIME FANS ONLY
UNITS - %
The fan speed shown as a percentage of full speed during the Extra Time while neither heating or cooling are on.

HOLD COOLING ON
UNITS - %
The fan speed shown as a percentage of full speed during the Hold while the refrigeration is on.

HOLD HEATING ON
UNITS - %
The fan speed shown as a percentage of full speed during the Hold while the heating is on.

HOLD FANS ONLY
UNITS - %
The fan speed shown as a percentage of full speed during the Hold while neither heating or cooling are on.

TEMPERATURE

STORAGE TEMPERATURE +DIFFERENTIAL
UNITS - °C
The positive differential allowed from the required Storage Temperature which if exceeded the refrigeration is switched on under the relevant controls to reduce the temperature to the required Storage Temperature.

STORAGE TEMPERATURE -DIFFERENTIAL
UNITS - °C
The negative differential allowed from the required Storage Temperature which if exceeded the heating is switched on under the relevant controls to reduce the temperature to the required Storage Temperature.

REFRIGERATION TEMPERATURE THRESHOLD
UNITS - °C
When this temperature has been exceeded the refrigeration system will not be activated until the temperature is greater than the set point by the temperature set in the parameter 'Refrigeration Temperature Overrun'.

REFRIGERATION TEMPERATURE OVERRUN
UNITS - °C
This temperature is the maximum deviation from the set point that is allowed before the refrigeration is activated after the temperature has risen above the temperature set in the 'Refrigeration Temperature Threshold' parameter.

AIR PROBE OFFSET
UNITS - °C
Allows the air probe to be calibrated by applying a positive or negative value to the value registered by the controller. If the offset is set to +1 and the probe is registering 10°C the display will show and the controller will assume that the actual air temperature is 11°C.

COIL PROBE OFFSET
UNITS - °C
Allows the coil probe to be calibrated by applying a positive or negative value to the value registered by the controller. If the offset is set to +1 and the probe is registering 10°C the display will show and the controller will assume that the actual coil temperature is 11°C.

AUTO HOLD ON/OFF
UNITS - Yes / No
Switches the Auto Hold function on and off. If the function is on and no response is received at the end of cycle, the machine will maintain the temperature and humidity set in the 'Auto Hold Temperature' and 'Auto Hold Humidity' parameters until the cycle is stopped.

AUTO HOLD TEMPERATURE
UNITS - °C
If the 'Auto Hold' function is active this is the temperature that the chamber will be held at if the 'Auto Hold' function is activated.

AUTO HOLD HUMIDITY
UNITS - %
If the 'Auto Hold' function is active this is the humidity that the chamber will be held at if the 'Auto Hold' function is activated.

MAINTENANCE

CONDENSER CLEAN ON/OFF
UNITS - Yes / No
Switches the condenser clean time on and off.

CONDENSER CLEAN TIME
UNITS - weeks
If the 'Condenser Clean Time' is active this is the time in days before the Condenser Clean service alarm is activated. This alarm is then reset using the 'Condenser Clean Reset' parameter.

STEAM TANK DE-SCALING TIME ON/OFF
UNITS - Yes/No
Switches the steam tank de-scaling time on and off.

STEAM TANK DE-SCALING TIME
UNITS - weeks
If the 'Steam Tank De-Scaling' is active this is the time in days before the Steam Tank De-Scaling service alarm is activated. This alarm is then reset using the 'Steam Tank De-Scaling Reset' parameter.

HEATERS CHECK TIME
UNITS - Yes / No
Switches the Heaters check time on and off.

HEATERS CHECK TIME
UNITS - weeks
If the 'Heater Check' is active this is the time in days before the Heater Check service alarm is activated. This alarm is then reset using the 'Heater Check Alarm Reset' parameter.

ROUTINE MACHINE CHECK ON/OFF
UNITS - weeks
Switches the Routine Machine check time on and off.

ROUTINE MACHINE CHECK TIME
UNITS - weeks
If the 'Routine Machine Check' is active this is the time in days before the Routine Machine Check service alarm is activated. This alarm is then reset using the 'Routine Machine Check Alarm Reset' parameter.

DEFROST

DEFROST TYPE
UNITS - Gas / Electric
Selects what type of defrost operation is active on the machine. If 'Gas' is selected then during defrost both the refrigeration and defrost relays are active. If 'Electric' is selected then only the defrost relay is active.

FINAL DEFROST TIME
UNITS - hrs:mins
The time prior to the start of the Recovery cycle when a defrost will take place unless the time is less than the 'Minimum Defrost Interval'.

MINIMUM DEFROST INTERVAL
UNITS – hrs:mins
The Minimum time between defrost operations.

DEFROST FREQUENCY
UNITS - hrs
The time between Defrost from when the Defrost Temperature is achieved.

DEFROST TEMPERATURE
UNITS - °C
The temperature below which the 'Defrost Frequency' starts during the Storage cycle

DEFROST TERMINATION TEMPERATURE
UNITS - °C
The evaporator temperature at which defrost is terminated is the 'Maximum Defrost Time' has not been exceeded.

MAXIMUM DEFROST TIME
UNITS - mins
The time after which the defrost will terminate regardless whether the 'Defrost Termination Temperature' has been reached.

DATA LOGGERS

AIR PROBE LOGGING ON/OFF
UNITS - On / Off
Switches the air probe data logger on and off.

AIR PROBE LOGGING INTERVAL
UNITS - mins:secs
Sets the logging interval for the air probe data logger.

COIL PROBE LOGGING ON/OFF
UNITS - On / Off
Switches the coil probe data logger on and off.

COIL PROBE LOGGING INTERVAL
UNITS - mins:secs
Sets the logging interval for the coil probe data logger.

HUMIDITY PROBE LOGGING ON/OFF
UNITS - On / Off
Switches the Humidity probe data logger on and off.

HUMIDITY PROBE LOGGING INTERVAL
UNITS - mins:secs
Sets the logging interval for the humidity probe data logger.

FUNCTION LOGGING ON/OFF
UNITS - On / Off
Switches the function data logger on and off.

PROGRAM SELECTTION

PROGRAM SELECTION AUTO/MANUAL
UNITS - Auto / Manual
Makes the program selection either manual from the active programs or automatic from the Program Selection times.

5 FAULT DIAGNOSIS

The following section details a number of faults which may occur and their possible causes. This list is not exhaustive.

TEMPERATURE

SLOW PROVING
Possible causes are prove heater failure or fan failure. The most likely would be heater related as a fan failure would also cause problems related to low humidity uneven proving and/or an over temperature fault.

TEMPERATURE FAULT ACTIVATED
There are a number of possible causes for this fault. The easiest method of diagnosis is to ascertain the time that the error occurred. It should also be determined the exact condition which causes the fault (see paragraph 3.4.2). From the time of occurrence it can be determined via the operating program parameters which condition the machine was in at the time. For example if the machine was in storage mode at the time the fault occurred the likely (although not certain) cause would refrigeration related. Similarly if the machine was in recovery, heaters would probably be a good place to start.

OVER TEMPERATURE TEMPERATUREFAULT ACTIVATED
In all probability it is almost certain that this fault would be caused by one or all of the fans being rendered inoperative. The cause would most probably be controller output or solid state relay failure.
Another cause may be a contactor ‘sticking’ on thus causing the heaters to operate continuously.

HUMIDITY

LOW OR NO HUMIDITY

This can be caused by a number of faults. First check that the water supply to the steam tank is operating. By energising the solenoid valve and ensuring that water is entering the tank (the later can usually be done audibly).

Confirm correct operation of the humidity sensor. As an initial indication use the display on the controller. For example if the room is obviously 'dry' but the display is showing 90% humidity the likely cause would be a humidity sensor failure. If everything appears normal use a calibrated hand held humidity device to compare the value indicated on the display with that on your meter. Small differences ±15% can be expected although more should be viewed with suspicion.

Ensure that the tank contains water (it may not be filling although water is connected). If this is the case check that the level controller is operating. Malfunction of the level controller is not necessarily an indication if a level controller failure (see water overfilling below) although failure to fill usually is.

Check the heater is operating correctly.

In all of the above prove negative ensure that the steam delivery pipes have not become scaled or the inside of the tank itself is not full of scale therefore preventing sufficient steam production.

WATER

WATER OVERFILLING

The water system is controlled by the level controller situated in the control panel. The first check to make however is to ensure that no debris from the water supply has passed through the water strainer and become lodged in the solenoid valve, thus preventing the valve from closing completely.

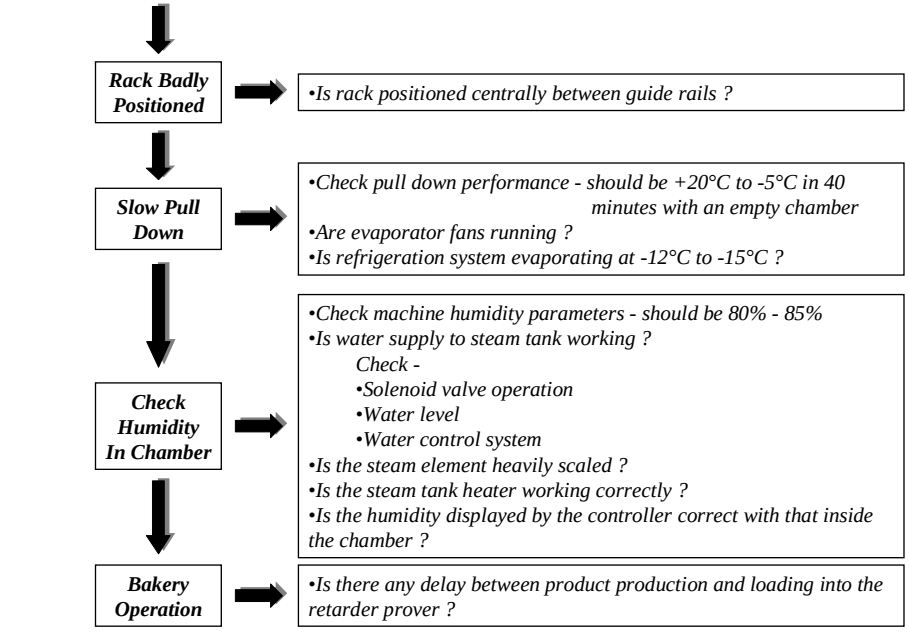
If the valve is permanently energised this can only be caused by the level controller. However this does not necessarily indicate a level controller fault. The level controller uses conductivity between the probes and the tank case to determine water level. If the probes have become scaled due to water softening being inoperative this will prevent conductivity causing the controller to assume low level thus causing the solenoid valve to remain open. It should also be ensured that the earth connection between the level controller and tank has not been disrupted in any way as this will cause the same scenario.

WATER OVERFLOWING DRAIN PAN

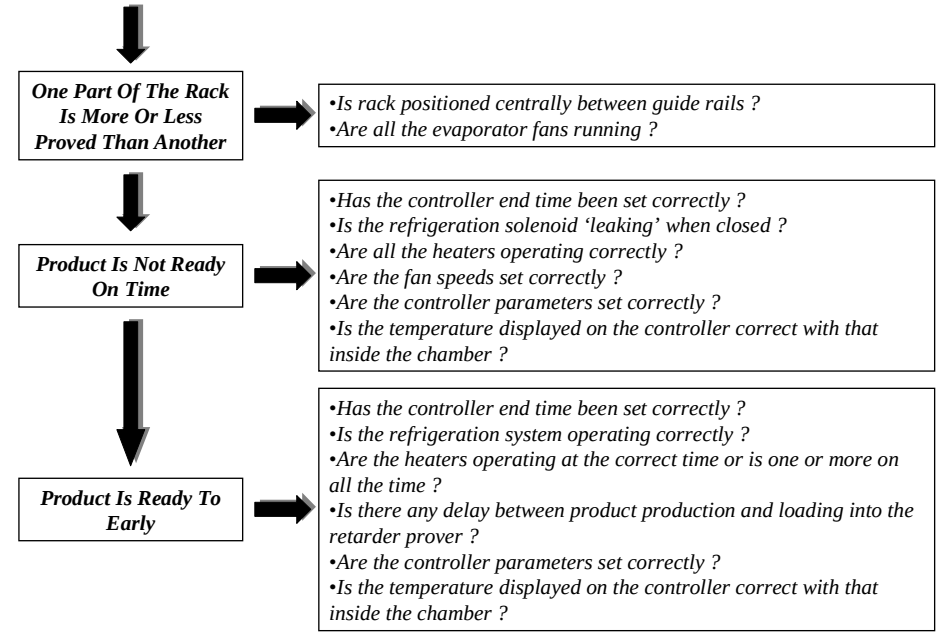
Most likely caused by a drain pipe blockage although this could be a symptom over water overfilling.

PRODUCT

DOUGH SKINNING



UNEVEN PRODUCT DEVLOPMENT



6 GLOSSARY

BAKE DAY The day on which the product is required baking.

BAKE TIME The time on the bake day at which the product is required for baking.

DOWN ARROW The operator button on the controller facia used to adjust parameters.

FAST CHILL The time at the start of a cycle during which the temperature of the chamber is lowered quickly to a lower temperature than that of storage.

LIGHT SWITCH Operator button used to switch on the interior light (where fitted)

MACHINE PARAMETERS Parameter set containing settings common to all programmes.

OPERATING PARAMETERS The operating programme parameters sets. Used to run the automatic cycles.

PROVE The period following recovery where the temperature of the chamber is increased linearly to the prove temperature.

RECOVERY The period following storage during which the chamber temperature is increased linearly from storage temperature to recovery temperature.

START BUTTON Operator button on the controller facia used to start and select the automatic programme.

STOP BUTTON Operator button used to halt the cycle currently operating.

STORAGE The time prior to recovery commencing.

THE CHAMBER The inside of the machine which is controlled in temperature.

UP ARROW The operator button on the controller facia used to adjust parameters.