3rd June 1997

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TMC3 MANUAL - 12 SENSOR VERSION

Installation

POWER SUPPLY AND RELAY UNIT (900-794)

IMPORTANT - THIS UNIT MUST BE EARTHED

Refer to diagram 1, only connect the block connector shown, to a 230 V AC supply. The unit connects to the console via an 8 way socket on the side. Other connector blocks are assigned to the fan starter control circuit, louvre and refrigeration control circuits. Diagram 1 gives information about connections. Also check manual control switch for MODE HOPPING setting, switch 7. This selects automatic AMBIENT with REFRIGERATION operation.

CONSOLE (550-024)

Refer to diagram 2, the multi-core lead mounted socket connects to INTERFACE BOX 550-026. The console can either be mounted on the bracket supplied for wall fixing or can be directly mounted on to a control cabinet, to do this remove the bracket and use the two fixing studs provided, the template drawing 550-026 will aid accurate fixing.

INTERFACE BOX (550-026)

Refer to diagram 2, mount this box using either the fixing lugs provided or discard these if mounting directly to control panel, see template diagram 550-006 and connect to the console.
Connect any two sensors (10m types are shown on diagram) to the interface box, duct and ambient.

DUCT SENSOR

Any sensor provided in the kit can be duct sensor, connect to the interface box socket 2 (10M sensor shown in diagram). Mount the sensor itself away from any structure and where it will sense air that is downstream of the ventilating air (2M minimum).

AMBIENT SENSOR

Any sensor provided in the kit can be ambient air sensor, connect to the interface box socket 1 (10M sensor shown in diagram). Mount the sensor itself away from any structure and preferably on a northerly aspect of the store to avoid the direct effect of the sun. Additional shielding may be required in exposed situations.

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CROP SENSOR JUNCTION BOX (501-007)

Refer to diagram 2.
Mount the box using the lugs provided, if severe condensation is normal within the store mount in a vertical position. The box connects to the interface box via the 20M lead. A maximum of 4 crop sensors connect to this box.
Any sensor supplied can connect to the junction box.

Another junction box can be directly connected to the first junction box, in cascade; to add a further 4 crop sensors and so on up to 12 crop sensors.

CROP SENSORS

Crop sensors should be evenly distributed throughout the stored crop. Ensure connecting cables are mounted where they will not be walked on or damaged. The sensors should be inserted into the stored vegetables through rigid plastic tubing of at least 10mm internal diameter.

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How to use the system

WARNING

This product should only be used in conjunction with a crop conditioning and storage management regime.

If in doubt a qualified agronomist should be consulted.

POWER SUPPLY AND RELAY UNIT

The indicator lamps show power, fan and other control circuit status, the green lamp will be on at all times when power is present, whilst the red lamps will show when other circuits are running.

CONSOLE

Refer to the 8 keys on the front panel, from left to right shown on diagram 3.

1&2) The ARROW keys "up" and "down" are used to adjust settings.

3) SET POINT TEMPERATURE KEY

a) CROP SET - The target temperature within the stored crop, ventilation is initiated when any sensor exceeds this value

b) DUCT SET - Duct temperature by louvre or heater operation is controlled with this set-point; refer to Flow Chart MODE 1, boxes 16 through 19 and MODE 4, boxes 44 through 47.

c) DIFF SET - Ambient air temperature should be cooler than crop temperature for effective control. This difference is set on the differential setting.

e.g. Diff Set = 2°C
Crop Temperature = 9°C

Ventilation can occur when ambient temperature is 7°C or less

4) TEMPERATURE KEY

a) ACTUAL AMB - Temperature reading of the ambient air sensor.

b) ACTUAL DUCT - Temperature reading of the duct air sensor.

c) CROP 1-12 - Crop sensor temperature readings, continue to press this key to step through the readings, arrow keys can also be used to scan temperatures.

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5) CHECK

Know what the system is doing at any time, press this key to find out. As the console steps through each function on any of the flow charts (Modes 1 through 4) or operates under manual control the actions and decision making can be followed. Particularly useful when setting up the system or checking the operation during changing conditions.

6) MODE

Select any of the 4 operating modes available, use the arrow keys when the AUTOMODE message shows on the display, also refer to the flow charts to determine which operating mode is required.

a) MODE 1 - Fan and air mixing Louvre control; will hop to mode 3 if ambient air is too warm when refrigeration control (switch 7) is selected on the power supply and relay board.

b) MODE 2 - Fan control without air mixing.

c) MODE 3 - Fan with Refrigeration control; will hop to mode 1 if ambient air is cool enough for crop temperature reduction, see switch 7 on power and relay board for this method of operation.

d) MODE 4 - Heater/Fan Control

e) MANUAL OFF - Fan and other circuits are disabled at all times, select by pressing mode key.

f) MANUAL ON - Select by pressing mode key, use arrow keys to control refrigeration manually, fan is ON at all times, louvres are CLOSED at all times.
In MODE 1, fan is on at all times, louvres are controlled by arrow keys, refrigeration is OFF at all times.
In MODE 2, fan is on at all times, louvres are CLOSED at all times, refrigeration is OFF at all times.
In MODE 3, fan is on at all times, louvres are CLOSED at all times.
In MODE 4, fan is on at all times, louvres are CLOSED, arrow keys control heat ON/OFF.

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TMC3 Manual continued.

7) CLOCK

Step through each setting in turn to access clock functions; the first display is ACTUAL time; the up key will change HOURS upwards, down key will change the MINUTES downwards. Hold the key until desired setting is reached. Once altered the time clock will only RESTART if the CLOCK key is pressed or if any other key (except arrows) is used.

a) Time is kept running even during long power downs.

b) START - determines when RECIRCULATION begins, will work in AUTO modes 1 and 3, this mode forces fan ON until time reaches the STOP time setting. Refer to recirculation flow chart.

c) RUN TIME - logs up the total time the system is operating.

8) SECRET SET-UP

Set these values BEFORE using the system normally. They effect various parts of the operation of the console. Also refer to flow charts, MODES 1 through 4.
To access this set-up mode switch power OFF; hold the secret key to the right of CLOCK located beneath the ROBYDOME logo; switch power ON and hold the key for 3 seconds; the display will show DEAD BAND.

a) DEAD BAND - In degrees C, refer to flow charts, MODES 1 through 3, will prevent the system "hunting" when cooling the crop. See boxes 20, mode 1; 5, mode 2; 36, mode 3.

b) LOUVRE PULSE - In seconds, sets the ON time for louvres operation.

c) FAN ON - In minutes, setting is typically 15 mins to prevent more than 4 fan start-ups per hour.

d) FAN OFF - Used in MODES 1 and 2 when duct temperature is below set duct, to stop ventilation for set time in minutes.

e) FROST LIMIT - In degrees C, sets the absolute lowest temperature allowable in the DUCT; see MODES 1 and 2, boxes 21 and 6. Minimum setting is 0 °C.

f) MAX SENSORS - Set for number of crop sensors connected.

g) LANGUAGE - Language option.

h) To exit SECRET mode press any other key except arrow keys.

DIAGRAM 1

PART NO: 900-794

TMC3 POWER SUPPLY & RELAY PCB

RELAY CONFIGURATIONS

1 - FAN
2 - LOUVRE OPEN
3 - LOUVRE CLOSE
4 - REFRIGERATION

230 V
MAINS

2A FUSE

2A FUSE

NOT USED

NOT USED

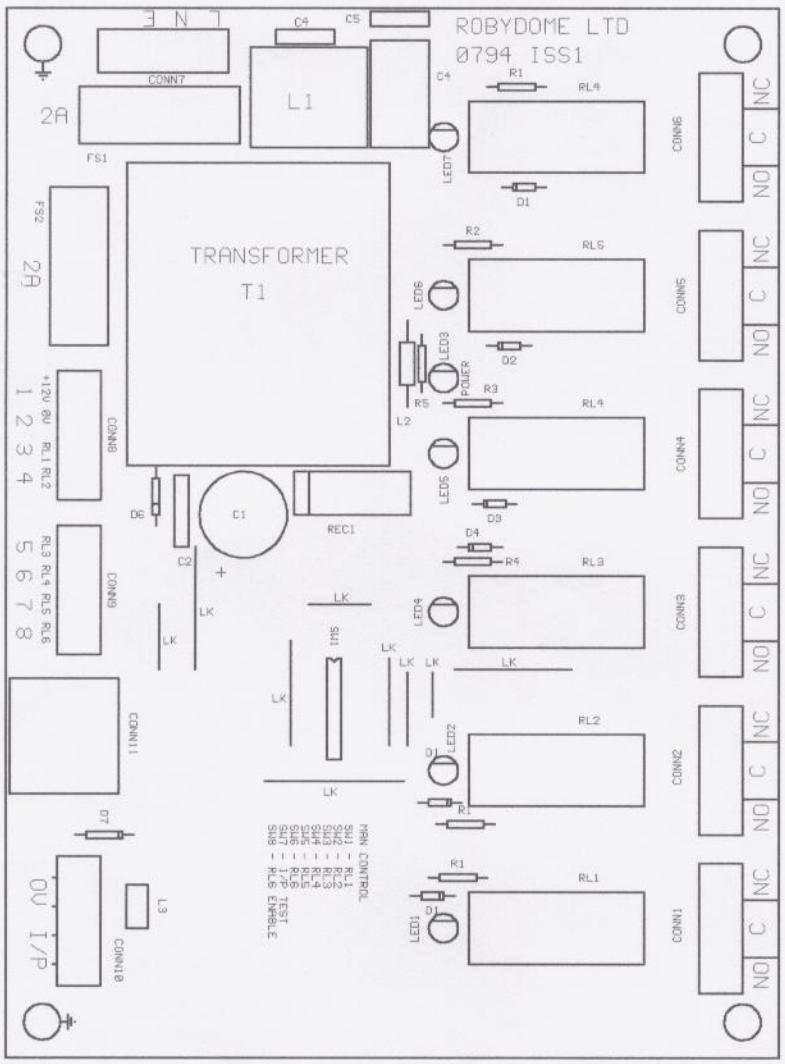
CONNECTOR TO
CONSOLE

INTERLOCK INPUT

Note:

Set man control switch 7 to on if mode hopping is required.

Refer to manual.



RELAY 6
NOT USED

RELAY 5
HEATER

RELAY 4
FRIDGE

RELAY 3
LOUVRE

RELAY 2
LOUVRE

RELAY 1
FAN

WARNING: THIS PCB MUST BE MOUNTED WITHIN A SUITABLE ENCLOSURE.
230V AC IS SUPPLIED TO THIS ASSEMBLE. IT MUST BE CORRECTLY EARTHED. IF IN DOUBT ASK YOUR SUPPLIER.

DIAGRAM 2

TMC3-12 SYSTEM

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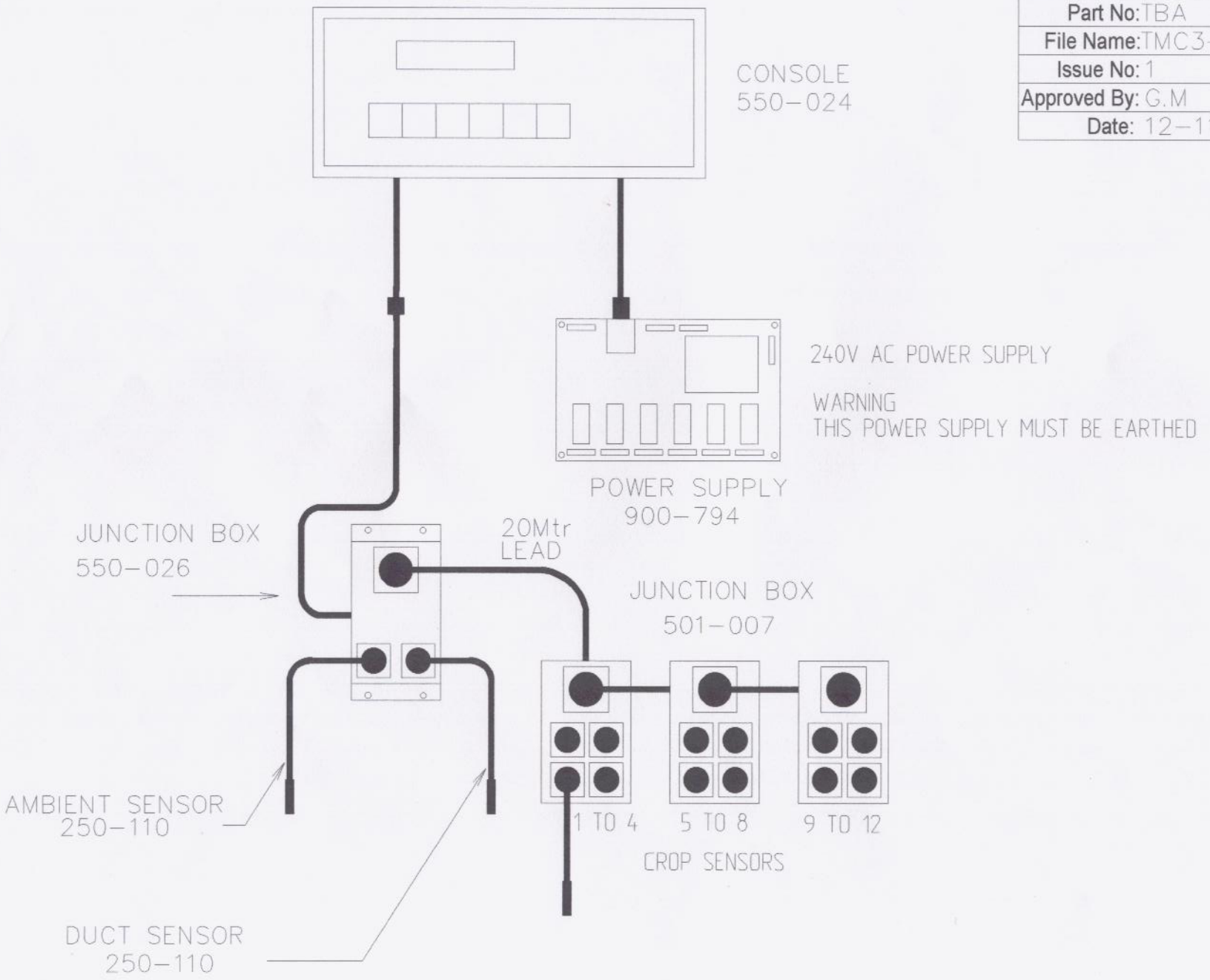
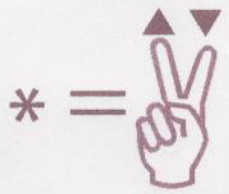
Title:	TMC3-12 SYSTEM
Part No:	TBA
File Name:	TMC3-12.SKD
Issue No:	1
Approved By:	G.M
Date:	12-11-96



0136 KEYPAD OPERATION ROBYDOME TMC3N

ISSUE 1
4th Nov 1996



FLOW DIAGRAM

MANUAL OFF

AUTO MODE n *

MANUAL ON

OPEN or FRIDGE ON or HEAT ON

CLOSE or FRIDGE OFF or HEAT OFF

TIME nn.nn *

START nn.nn *

STOP nn.nn *

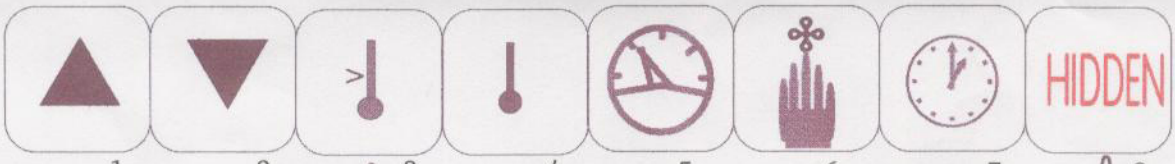
RUN TIME nn.nn *

ACTUAL AMB.nn.n

DUCT TEMP.nn.n

CROP 1 = nn.n

CROP xx = nn.n



CROP SET nn.n *

DUCT SET nn.n *

DIFF.SET=n.n *

DEAD BAND n.n *

LOUVRE PULSE nns *

FAN ON nn mins *

FAN OFF nn mins *

FROST LIMIT n.n *

No.SENSORS xx *

LANGUAGE *

NOTE: DISPLAY REMAINS IN LAST MODE UNTIL ANOTHER KEY IS PRESSED

ACCESSIBLE ONLY DURING POWER UP

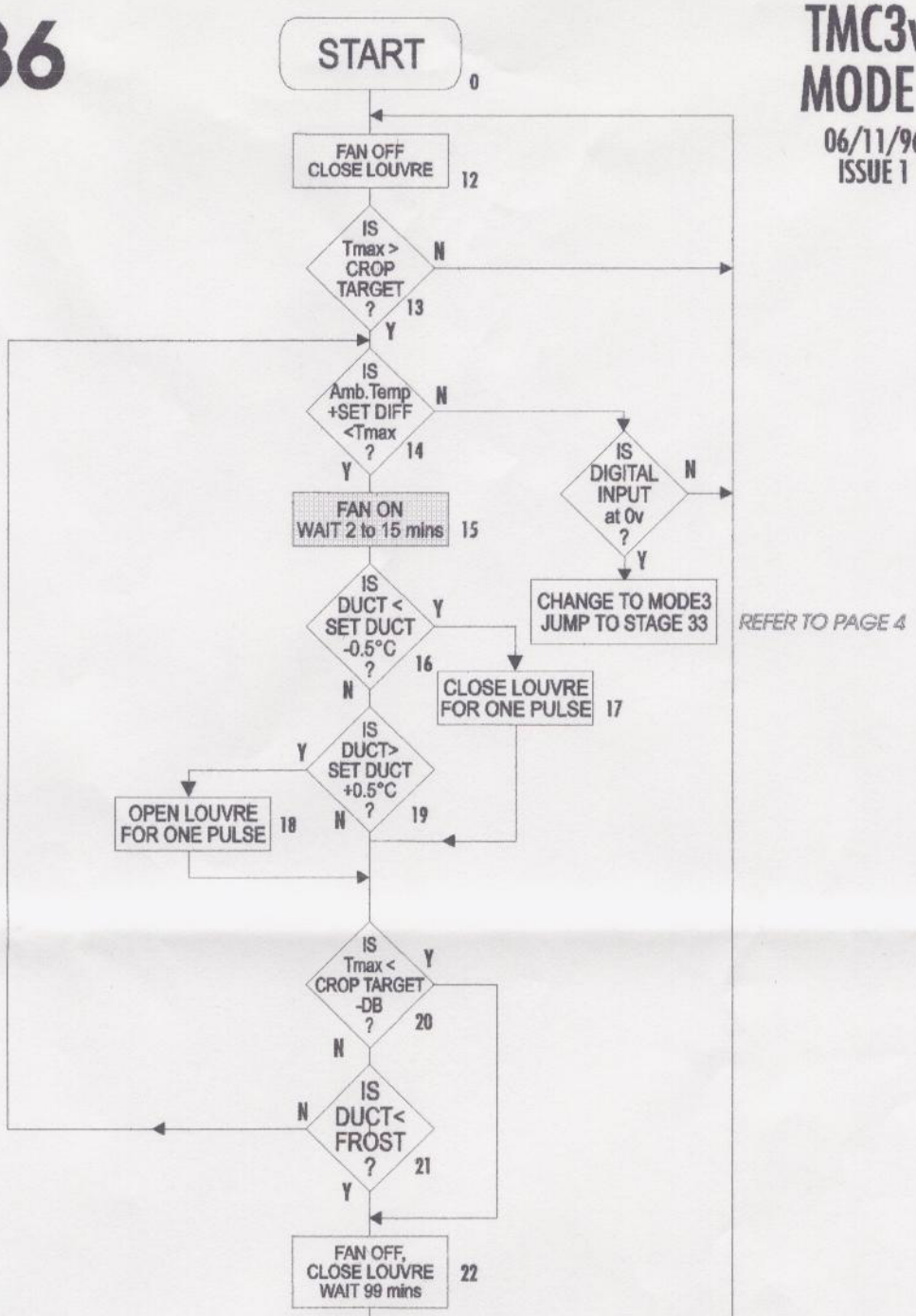
INITIAL POWER UP DISPLAY MODE

ROBYDOME\TMC3N.WSD

0136

TMC3vs MODE 1

06/11/96
ISSUE 1



READINGS:

AMBIENT TEMPERATURE (1)[1]
DUCT TEMPERATURE (1)[2]
CROP TEMPERATURES (4 to 14)[3 to 16]
(n)number of sensors, [n]sensor number

VARIABLES:

CROP TARGET (°C)
TARGET DEAD BAND (°C)
WAIT OFF (mins)
WAIT ON (mins)
REAL TIME
RECIRC. START TIME
RECIRC. STOP TIME
FROST LIMIT (°C)
SET DIFF. (°C)
PULSE TIME (SECS)

OUTPUTS:

FAN
OPEN LOUVRE
CLOSE LOUVRE
FRIDGE*
HEAT*
(*)forced off in this mode

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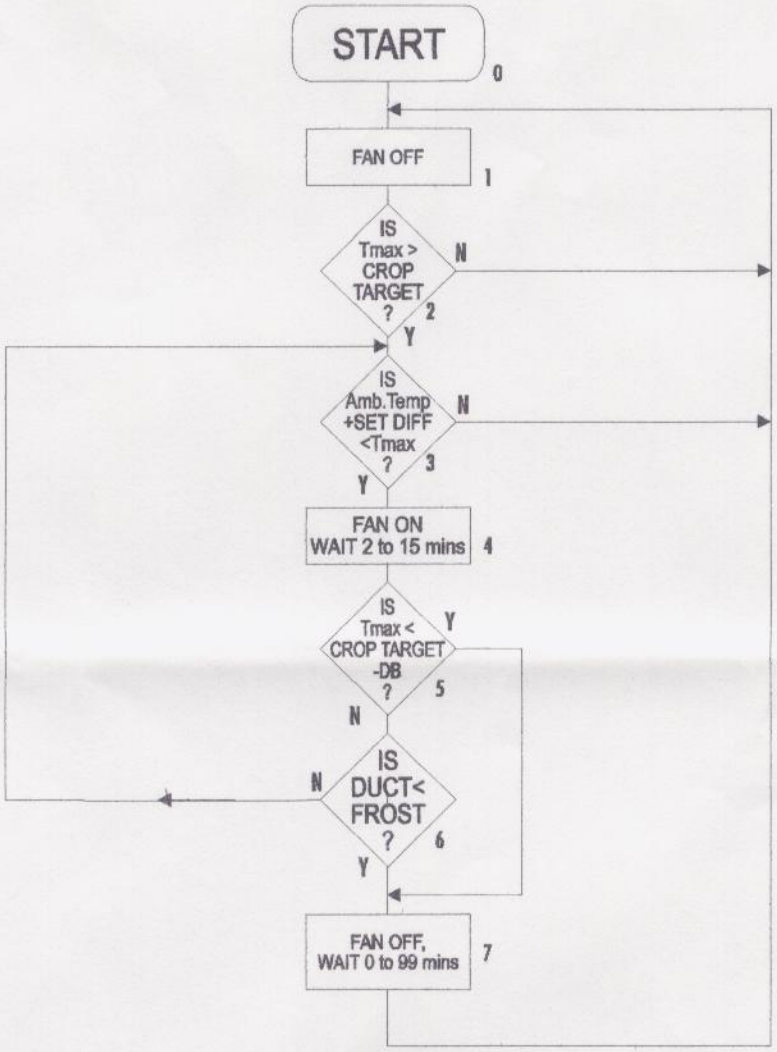
TMC3vs MODE 2
06/11/96
ISSUE 1
[FAN CONTROL]
(DIFF. COOLING)



READINGS:

AMBIENT TEMPERATURE (1)[1]
DUCT TEMPERATURE (1)[2]
CROP TEMPERATURES (4 to 14)[3 to 16]
(n)number if sensors, [n]sensor number

OUTPUTS:

FAN
OPEN LOUVRE*
CLOSE LOUVRE
FRIDGE*
HEAT*
(*)forced off in this mode

VARIABLES:

CROP TARGET (°C)
TARGET DEAD BAND (°C)
WAIT OFF (mins)
WAIT ON (mins)
REAL TIME
RECIRC. START TIME
RECIRC. STOP TIME
FROST LIMIT (°C)
SET DIFF. (°C)

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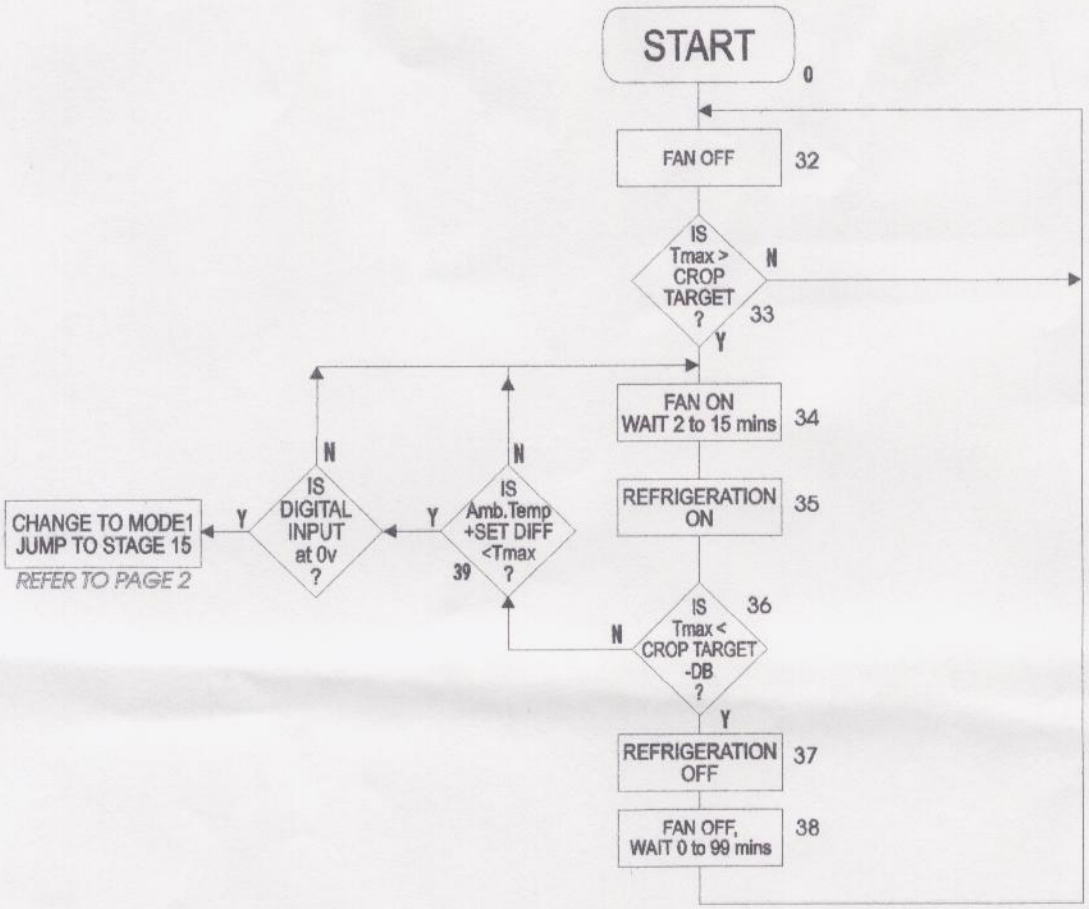
TMC3vs MODE 3
11/11/96
ISSUE 2
[FRIDGE]



READINGS:

CROP TEMPERATURES(4 to 14)[3 to 16]
(n)number of sensors, [n] sensor number

VARIABLES:

CROP TARGET (°C)
TARGET DEAD BAND (°C)
WAIT OFF (mins)
WAIT ON (mins)
REAL TIME
RECIRC. START TIME
RECIRC. STOP TIME

OUTPUTS:

FAN
LOUVRE OPEN *
LOUVRE CLOSE (forced on)
FRIDGE
HEAT*
(*)forced off in this mode

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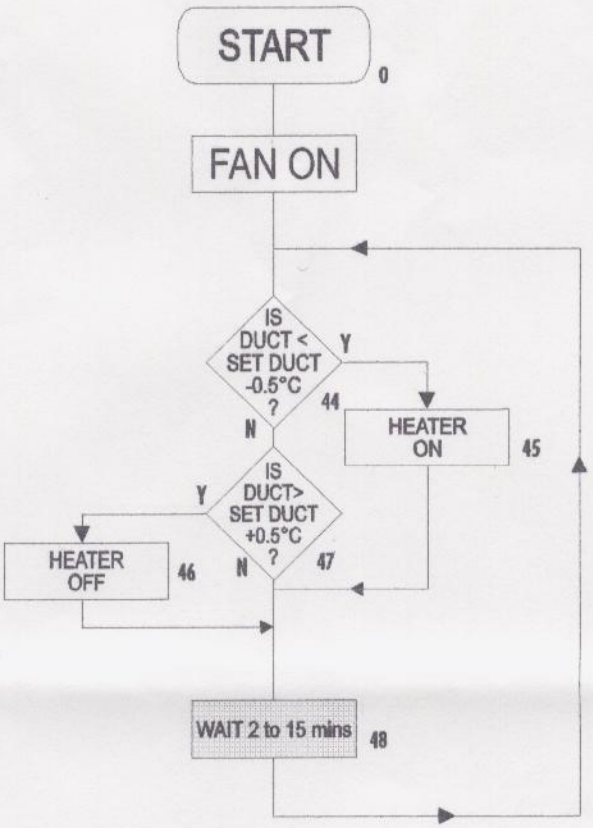
TMC3vs MODE 4
06/11/96
ISSUE 1



READINGS:

AMBIENT TEMPERATURE (1)[1]
DUCT TEMPERATURE (1)[2]
CROP TEMPERATURES (4 to 14)[3 to 16]
(n)number of sensors, [n]sensor number

VARIABLES:

CROP TARGET (°C)
TARGET DEAD BAND (°C)
WAIT OFF (mins)
WAIT ON (mins)
REAL TIME
RECIRC. START TIME
RECIRC. STOP TIME
FROST LIMIT (°C)
SET DIFF. (°C)
PULSE TIME (SECS)

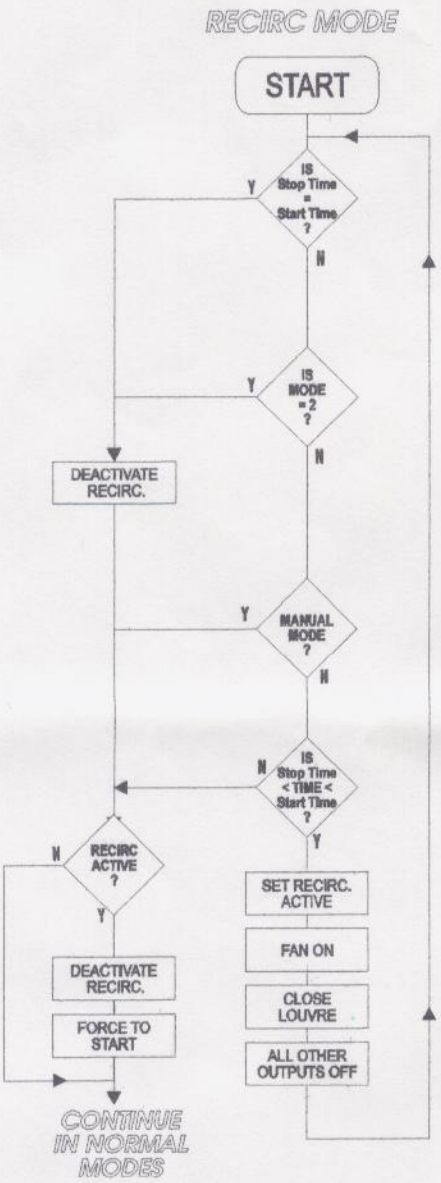
OUTPUTS:

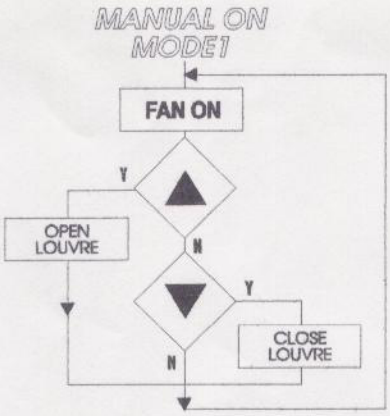
FAN
OPEN LOUVRE
CLOSE LOUVRE*
FRIDGE*
HEAT
(*)forced off in this mode

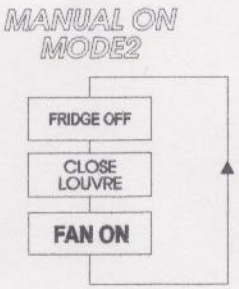
0136

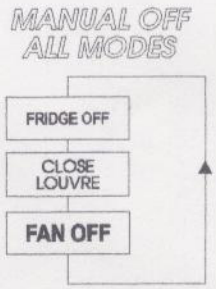
TMC3vs RECIRCULATION & MANUAL CONTROLS

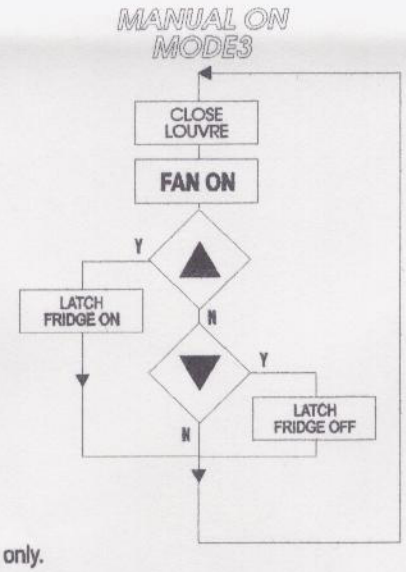
06/11/96
ISSUE 1

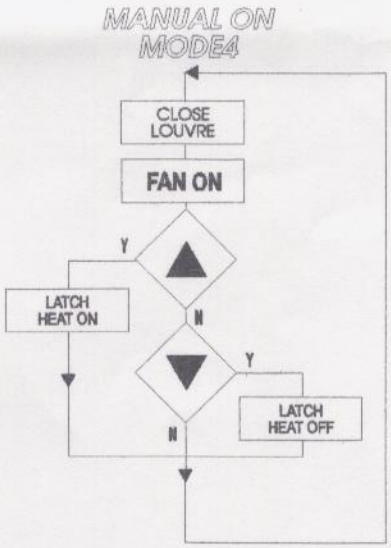












This is a background program that runs during MODES 2 & 3 only.
It takes priority over all other functions
and when complete (recirculation finished)
returns to the selected mode, at the START.

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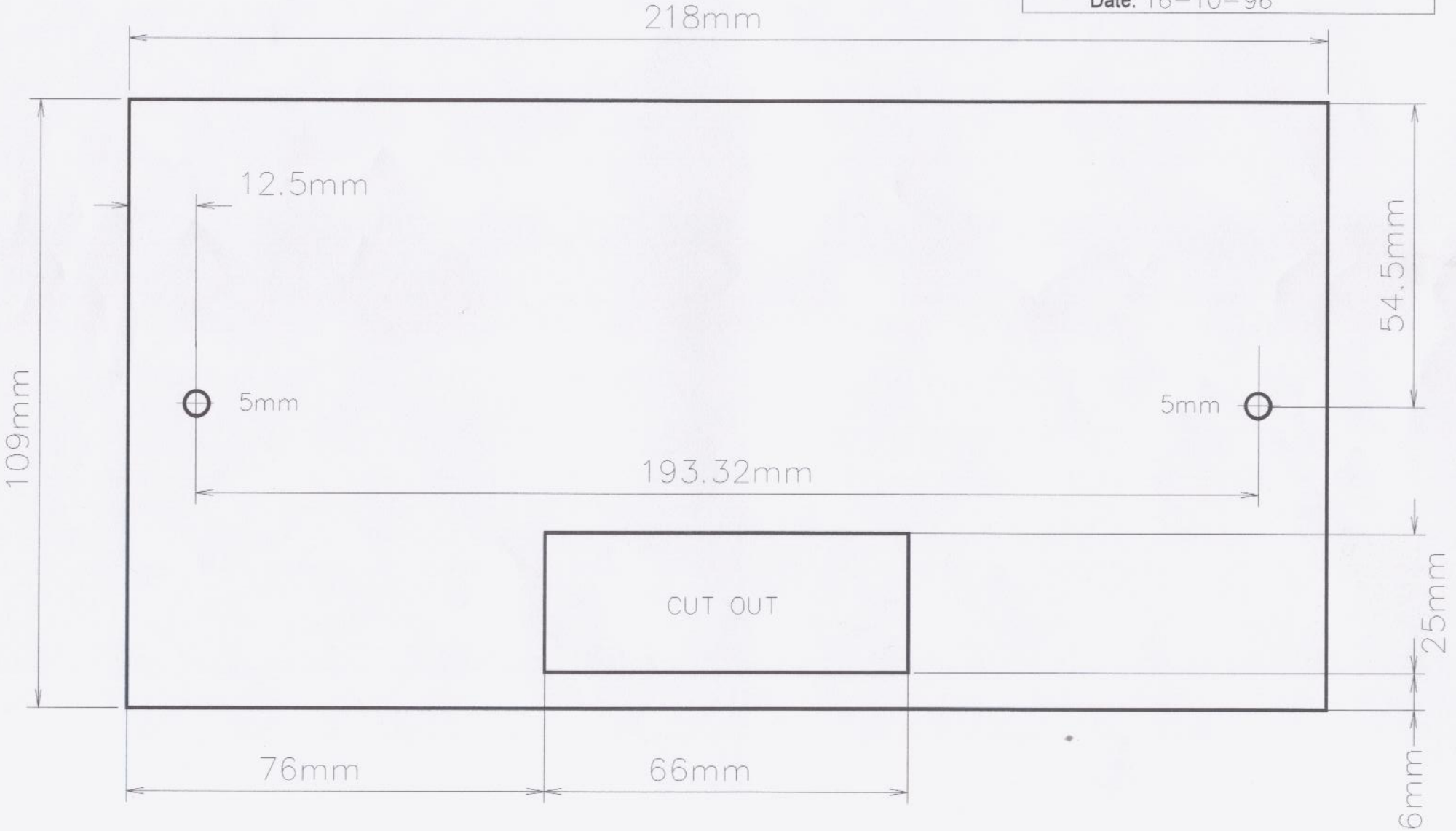
Title:	SERIES3 TEMPLATE
Part No:	550-006
File Name:	550-006C.SKD
Issue No:	1
Approved By:	G.M
Date:	16-10-96

SERIES 3 MOUNTING TEMPLATE



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Title:	J/BOX TEMPLATE
Part No:	550-026
File Name:	550-026B
Issue No:	1
Approved By:	G.M
Date:	8-11-96