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0130

GVC3
STANDARD PRODUCT

15/3/97

ISSUE 5

29/05/97

Manuals: 96091304.sam

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GVC3 MANUAL

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 and heater control circuit. Diagram 1 gives information about connection configuration for 3 different types of heater.

Note the INTERLOCK connection - this signal input must be only connected to VOLT FREE CONTACTS.
Use this to monitor heater status; closed N/O contacts are heater OK, open will prevent system operation in Fan Heat mode.
Check diagram 1 for details on set up.

CONSOLE

Refer to diagram 2, the 8 way lead mounted socket connects to the short, inter-connecting RH lead (550-014). 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 will aid accurate fixing.

RH AND TEMPERATURE SENSOR

Refer to diagram 2, connect the 10m sensor lead (200-013) to the short RH connecting lead (550-014), then connect up the RH sensor itself after it has been mounted in a suitable position.

The RH sensor should be mounted near the air intake to the fan and where the ventilating duct air can be "bled" onto the sensor, with a tube or pipe of at least 30mm in diameter but where it will still sense ambient air without the fan running.

The sensor should not be exposed to the direct effects of the weather, eg. sun and rain.

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GVC3 MANUAL

29/05/97

How to use the system

WARNING

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

Reference to bulk grain drying and conditioning leaflet will assist, but if in doubt a qualified agronomist should be consulted.

POWER SUPPLY AND RELAY UNIT

The indicator lamps show power, fan and heater 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) % RH KEY

a) ACTUAL rH - This is the value of relative humidity on air at the sensor.

b) Target rH - Is set-point high to control fan heater operation. Refer to the equilibrium charts on page 4 of the leaflet "Bulk Grain Drying and Conditioning".

c) LOW LIMIT rH - the set point low, use to prevent overdrying in the later stages of the process, also refer to the leaflet in b).

d) OFFSET rH - used exclusively in Mode 4, fan and heater control for crop drying. The % value set here represents the heater systems ability to reduce rH. To test this run the FAN for approximately 10 minutes and then note the ACTUAL rH reading. Turn the heater system to MAXIMUM and after approximately 10 minutes note the new, lower value of rH. The difference between the two values is the OFFSET value. Example: Fan runs for 10 minutes; reading 75% rH. Heaters set to MAXIMUM for 10 minutes, reading is 60% rH. 75-60 = 15, therefore OFFSET is 15% rH.
Set value on the console to 1 or 2% points less, say 13%. Refer to flow chart for Mode 4, see box 32.

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GVC3 Manual continued.

4) TEMPERATURE KEY

a) ACTUAL TEMP - This is the value of temperature in degrees C, of the air at the sensor.

b) CROP 1 through to CROP 4

Continue to press the key to check crop temperature if the additional sensors and connecting loom are fitted (GVC3 system 2 to 4). Use these readings to check the effect of differential cooling, refer to the leaflet "Bulk Grain Drying and Conditioning" to see the benefits of crop cooling on page 2.

Temperature key 4

c) TARGET TEMP

The function of this set point changes depending upon which operating mode is selected.
MODE 1 - No function.
MODE 2 - Will prevent FAN operation if air temperature at the sensor (ACTUAL) exceeds the set point.
MODE 3 - The TARGET now refers to the CROP TARGET temperature, see boxes 20 and 22; used as part of the differential (ACTUAL/CROP) cooling operation when connected to crop sensors in GVC3 system 2-4.
MODE 4 - No function.
MODE 5 - Controls the heater(s) with respect to the duct (downstream of fan) temperature, see boxes 61 and 64. Used for applications in crop heating (onions).

d) DIFF SET

Only has a function in Mode 3, DIFFERENTIAL COOLING, where the system includes crop sensors (GVC3 system 2-4), also refer to the leaflet "Bulk Grain Drying and Conditioning". The advantage of cooling stored grain to below 10°C are to allow for long term, safe storage without fear of insect, mite and mould infestation.

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 - 5) 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.

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GVC3 Manual continued.

6) MODE

Select any of the 5 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 only control with respect to ACTUAL rH; CROP DRYING.

b) MODE 2 - Fan only control with respect to ACTUAL rH and ACTUAL ambient air temperature: CROP DRYING WITH TEMPERATURE CONTROL.

c) MODE 3 - Fan only control with respect to ACTUAL (ambient) rH, temperature and CROP temperature; CROP COOLING with cooler ambient air.

d) MODE 4 - Fan and heater control with respect to ACTUAL rH; CROP DRYING with AUTOMATIC HEATER selection and control, ie. will operate in Fan only mode until ACTUAL rH rises above the TARGET rH. Heaters will be automatically switched in to reduce the value of rH in the ventilating air. Conversely heat output will be reduced as ambient RH (ACTUAL) reduces. Note box 50 in the flow chart, if heaters continue to be incremented in the "More HEAT" loop for more than WAIT 1 time the system shuts down since rH cannot be reduced sufficiently.

e) MODE 5 - Fan and Heater control with respect to DUCT air; CROP/AIR WARMING. Useful for dual purpose stores for other crops.

f) MANUAL OFF - Fan and Heaters are disabled.

g) MANUAL ON - Use in conjunction with the arrow keys to increment and decrement heaters manually. Useful when setting the system up.

7) CLOCK

Step through each setting in turn to access time clock functions. The first display is ACTUAL time, use the arrow keys to adjust; up key will change the HOURS upwards, down key will change the MINUTES downwards. Hold the key until desired setting is reached.

a) Once altered the time clock will only RESTART if the TIME key is pressed or if any other key (except arrows) is used.

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

c) OFF PEAK ON - When electric heaters are used, the controller will only run heat when the ON time arrives, set this to coincide with the availability of OFF PEAK electricity. The system will run in FAN ONLY mode during no off peak times.

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d) OFF PEAK OFF - This marks the end of the off peak period, after which Fan only operation continues without heater operation.

e) SYSTEM ON - The complete system (Fan and Heaters) will only operate after this time arrives. Use this to allow the system to run at a specific time of day.

f) SYSTEM OFF - This will shut the whole system down after this time.

NOTE: Setting OFF PEAK and/or SYSTEM times to the same time will negate the operation ie. 00:00 off peak ON and 00:00 off peak OFF.

8) SECRET SET-UP

Set these values BEFORE using the system normally. They effect various parts of the operation of the system. Also refer to flow charts, MODES 1 - 5.
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 WAIT 1 time.

a) WAIT 1 - Mainly used to negate excessive fan on/off operation, to prevent more then 4 starts per hour set to 15 minutes. It is also used to stabilise heater operation.
Refer to WAIT 1 boxes in flow charts.

b) WAIT 2 - Used to fine tune heater performance, set to 2 - 10 seconds. Refer to flow charts, Modes 4 and 5.

c) WAIT 3 - As in (b) above, set to 20 - 60 seconds.

d) DEAD BAND T - In degrees C, refer to flow charts, Modes 3 and 5 only. This setting will prevent heaters or fan "hunting" when heating air or cooling grain.

e) DEAD BAND rH - Refer to flow charts, Modes 4 and 5, heater control, boxes 43 and 61 respectively. This setting determines heater operation, if rH is within the target + dead band value the heater output will remain the same because no adjustment will be made. Conversely if rH is outside this band then adjustment up or down will take place.

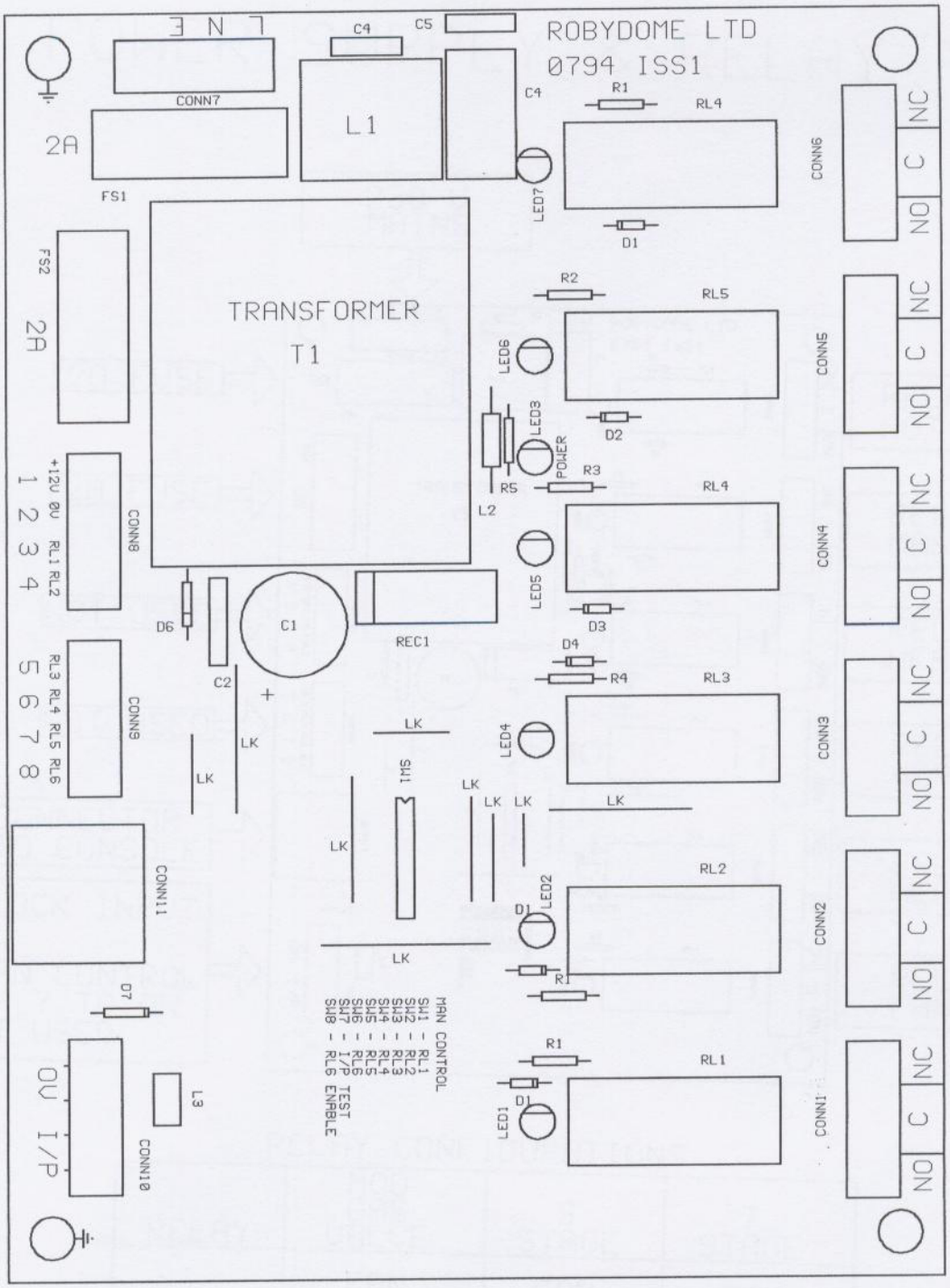
f) MOD PULSE - Only used in conjunction with a fully modulating gas valve mode of operation. The time, in seconds, set here determines valve operating time. If the system is operating other heater types set to 2 seconds.

g) HEATER TYPE - Select which type of heater unit is going to be controlled.

Heater Type 1 - Modulating gas valve.
Heater Type 2 - 3 Stage heater (electric).
Heater Type 3 - 7 Stage heater (electric/gas).

NOTE: Manual heater control will only work in MODE 4 and 5. Use this to check that the correct heater mode of operation has been selected; ie. set heater type in Secret Set-Up, select MANUAL ON 4 or 5, use the up/down keys to increment/decrement heater relays.

h) To exit Secret Set-Up press any other key (except arrow) or switch power OFF. Either way normal operation is restored.



RELAY CARD 900-794 ACTUAL SIZE

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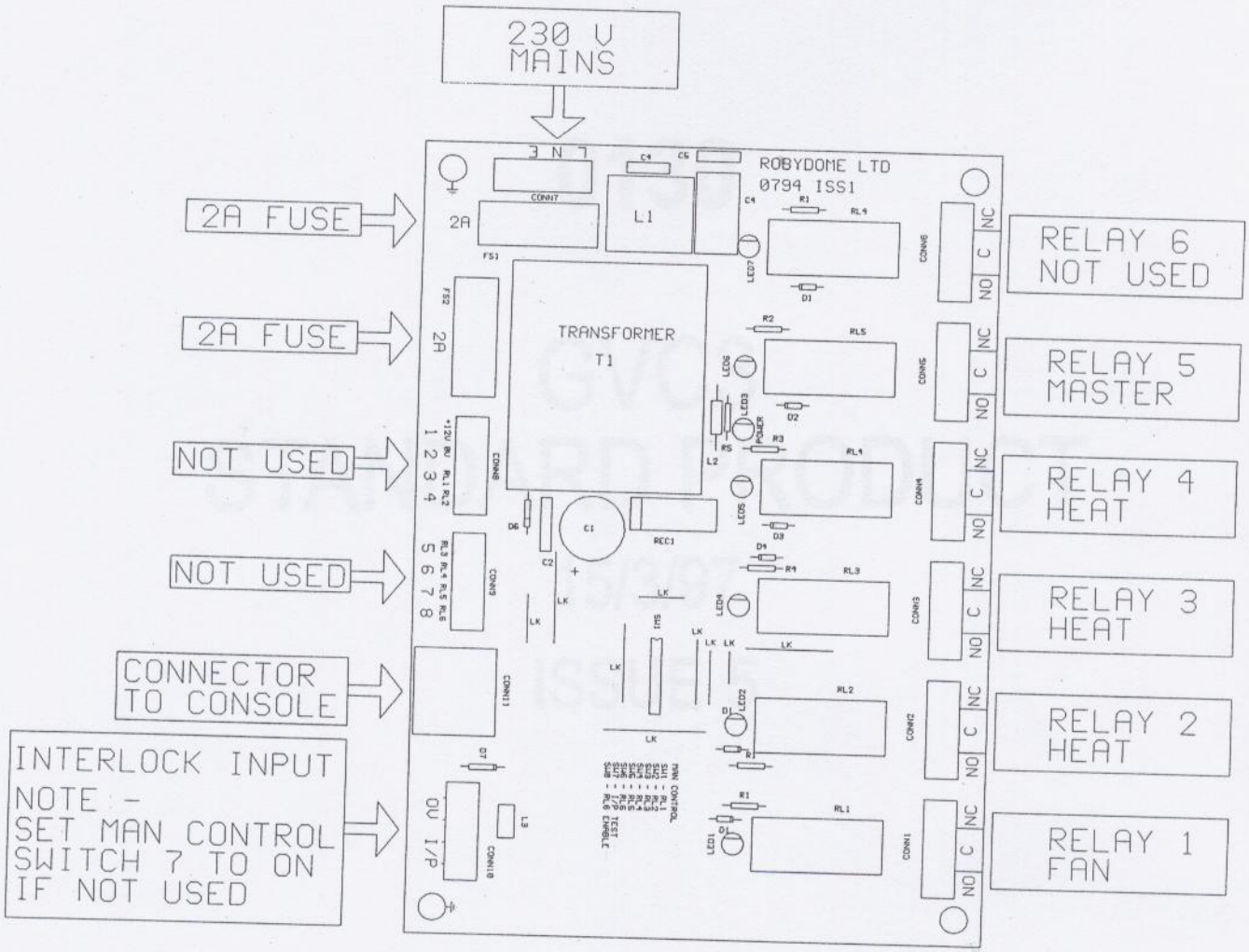
DIAGRAM 1
PART No 900-794
GVC POWER SUPPLY & RELAY P C B



RELAY CONFIGURATIONS

RELAY	MOD GAS VALVE	3 STAGE	7 STAGE
1	FAN	FAN	FAN
2	CLOSE	HEAT 1	HEAT 01
3	OPEN	HEAT 2	HEAT 11
4	NOT USED	HEAT 3	HEAT 111
5	MASTER	MASTER	MASTER

WARNING THIS PCB MUST BE MOUNTED WITHIN A SUITABLE ENCLOSURE

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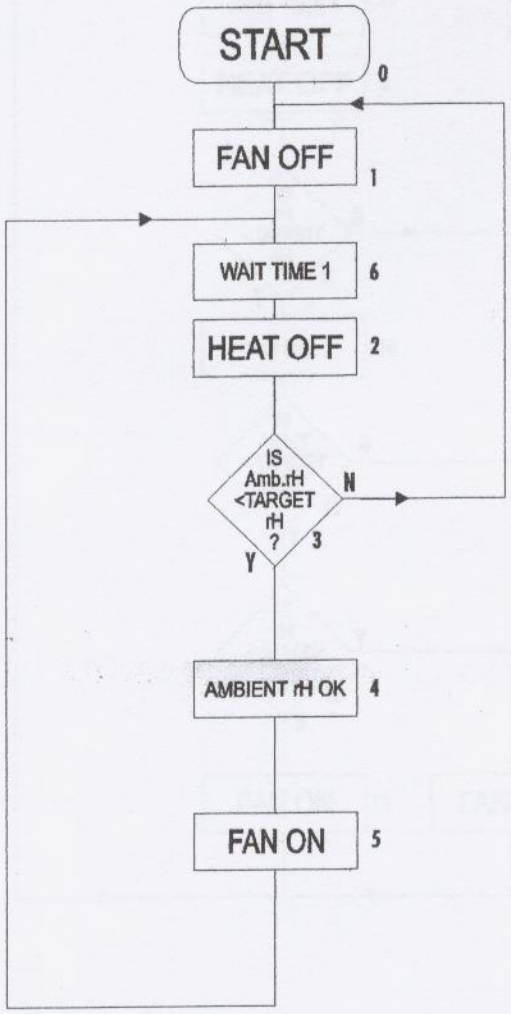
GVC3 MODE 1

15/3/97
ISSUE 5

FAN
rH CONTROL



READINGS:
AMBIENT rH [1]
[n]sensor number

VARIABLES:
TARGET rH (%rH)
WAIT 1 (mins)

OUTPUTS:
FAN

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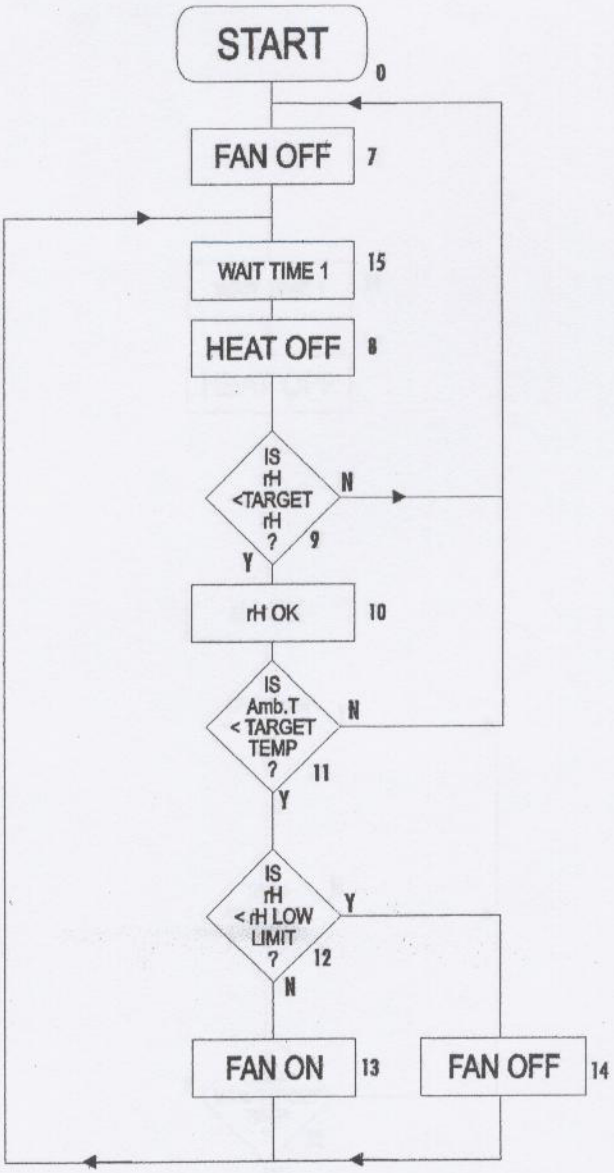
GVC3 MODE 2

15/3/97
ISSUE 5

FAN
rH & TEMPERATURE
CONTROL



READINGS:

AMBIENT rH [1]
[n]sensor number

VARIABLES:

TARGET rH (%rH)
rH LOW LIMIT (%rH)
WAIT TIME 1 (mins)

OUTPUTS:

FAN

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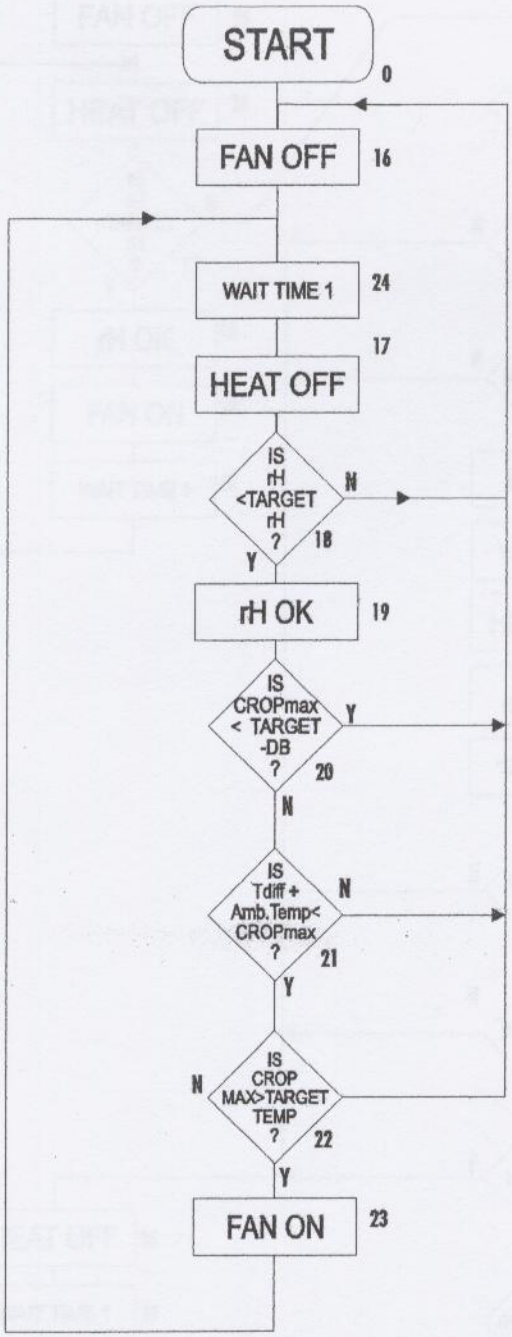
GVC3 MODE 3

15/3/97
ISSUE 5

FAN DIFFERENTIAL COOLING



READINGS:

rH [1]
AMBIENT Temp.[2]
Tmax [3,4,5,6]
[n] sensor number

VARIABLES:

TARGET rH (%rH)
TARGET Temp. (°C)
DIFF SET (Tdiff)(°C)
DEAD BAND Temp.(DB)(°C)
WAIT 1 (mins)

OUTPUTS:

FAN (RLY1)

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GVC3\MODE3.CDR

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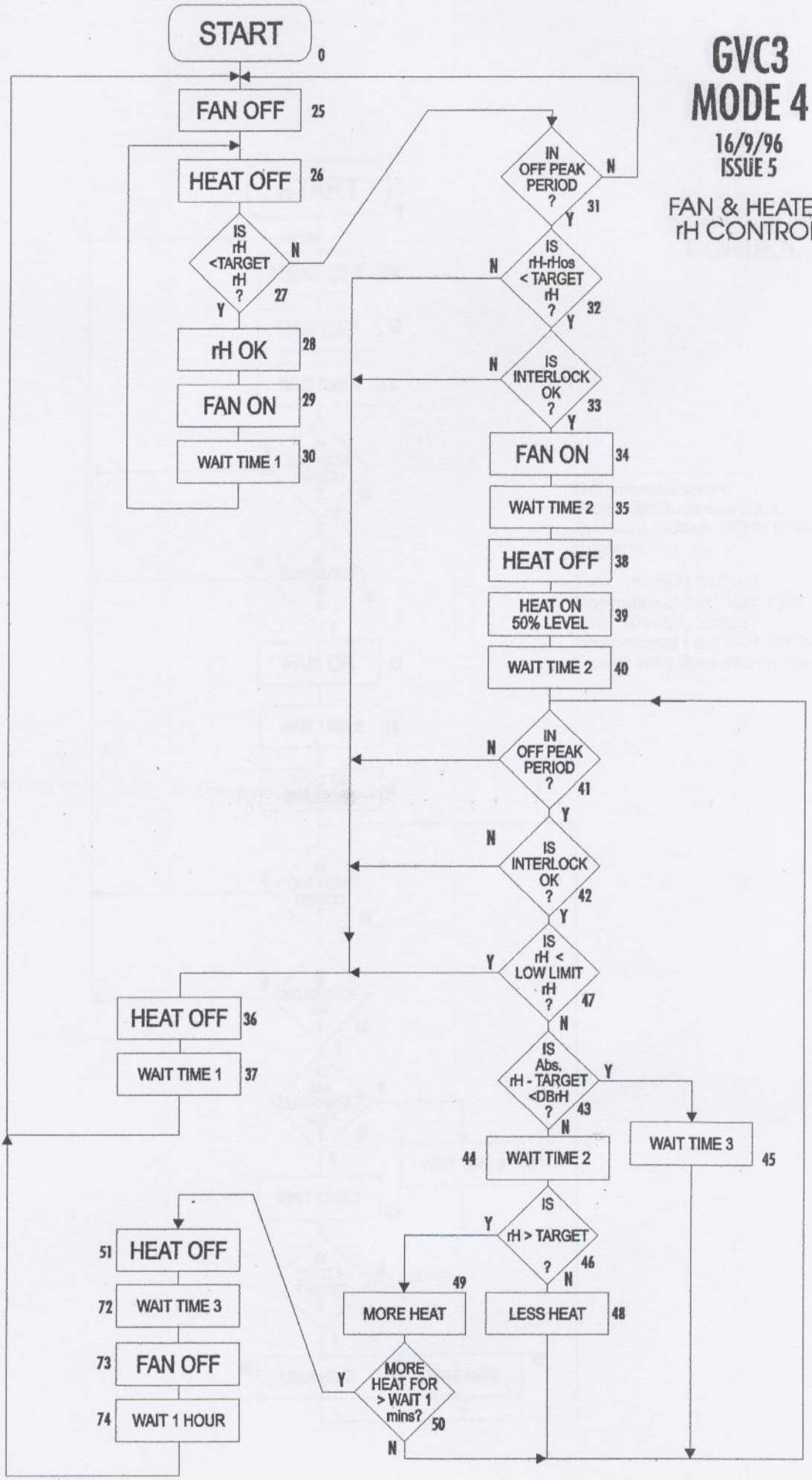
GVC3 MODE 4

16/9/96
ISSUE 5

FAN & HEATER rH CONTROL



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GVC3\MODE4.CDR

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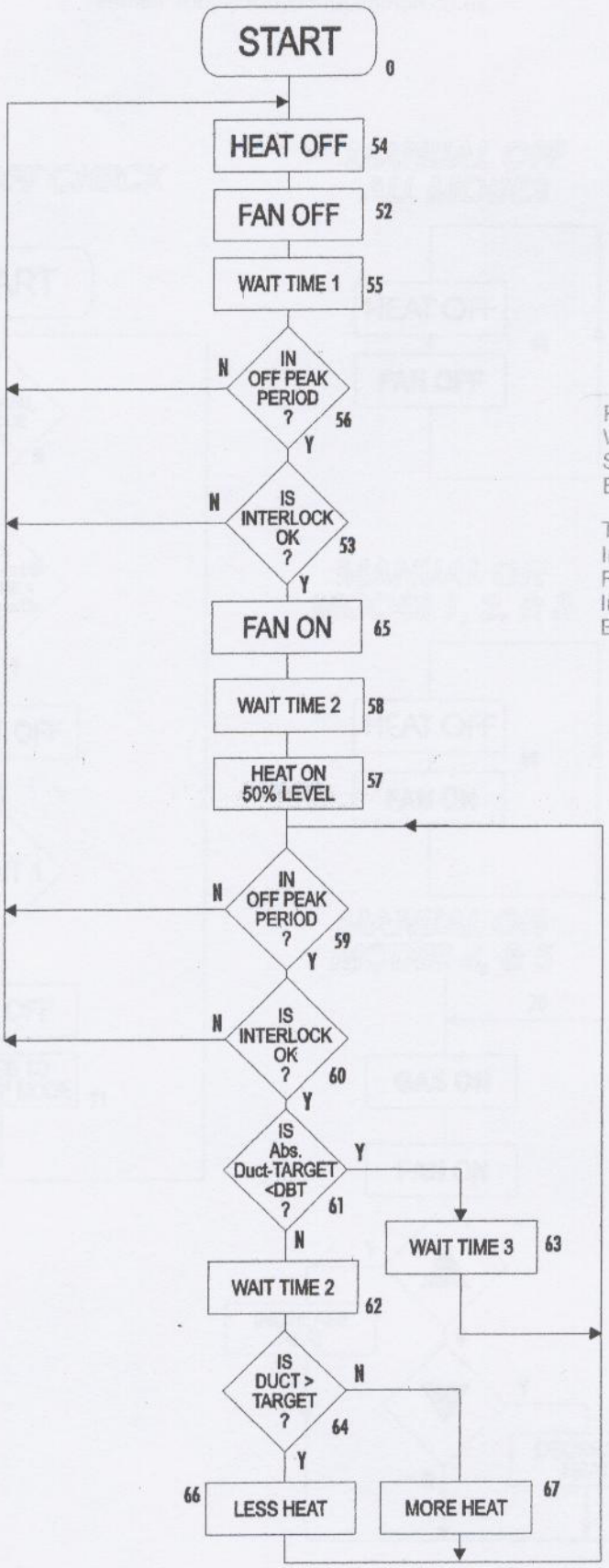
GVC3 MODE 5

15/3/97
ISSUE 5

FAN & HEATER TEMPERATURE CONTROL



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GVC3\MODE5.CDR

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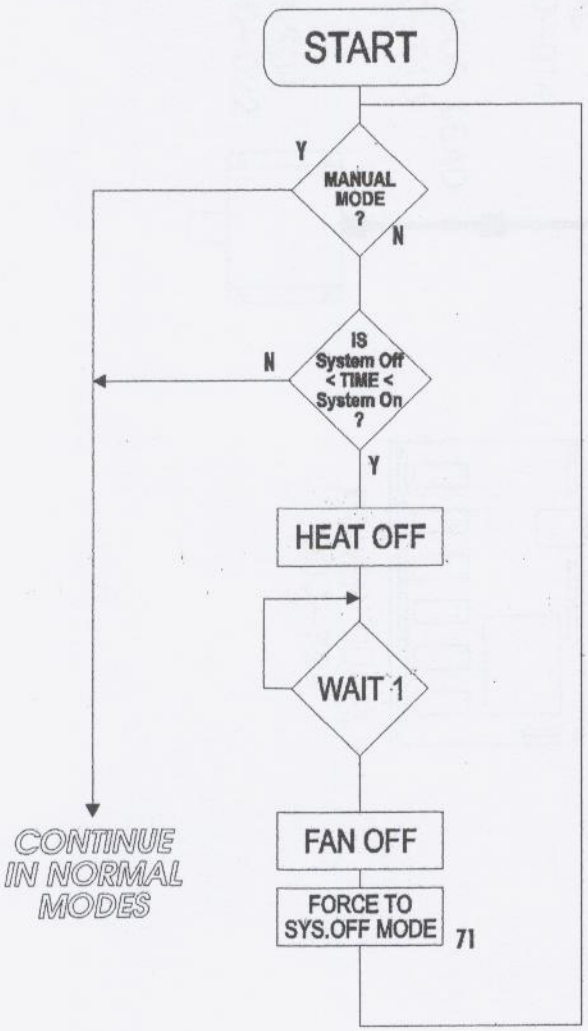
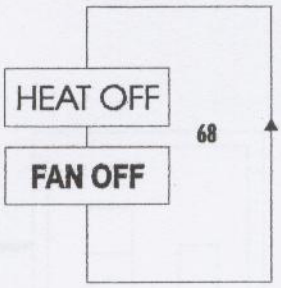
GVC3 SYSTEM OFF & MANUAL CONTROLS

6/9/96
ISSUE 4

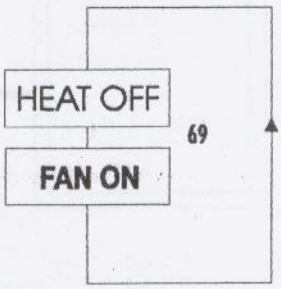
SYSTEM OFF CHECK



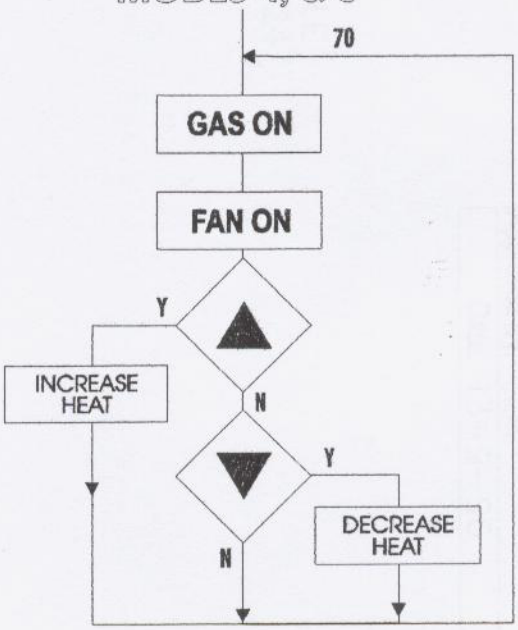
MANUAL OFF ALL MODES



MANUAL ON MODES 1, 2, & 3



MANUAL ON MODES 4, & 5



GVC3\RECIRC.CDR

DIAGRAM 2a

GVC3 SYSTEM 1 200-025

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Title:	GVC3 SYSTEM 1
Part No:	200-025
File Name:	200-025A.SKD
Issue No:	1
Approved By:	G.M
Date:	13-9-96

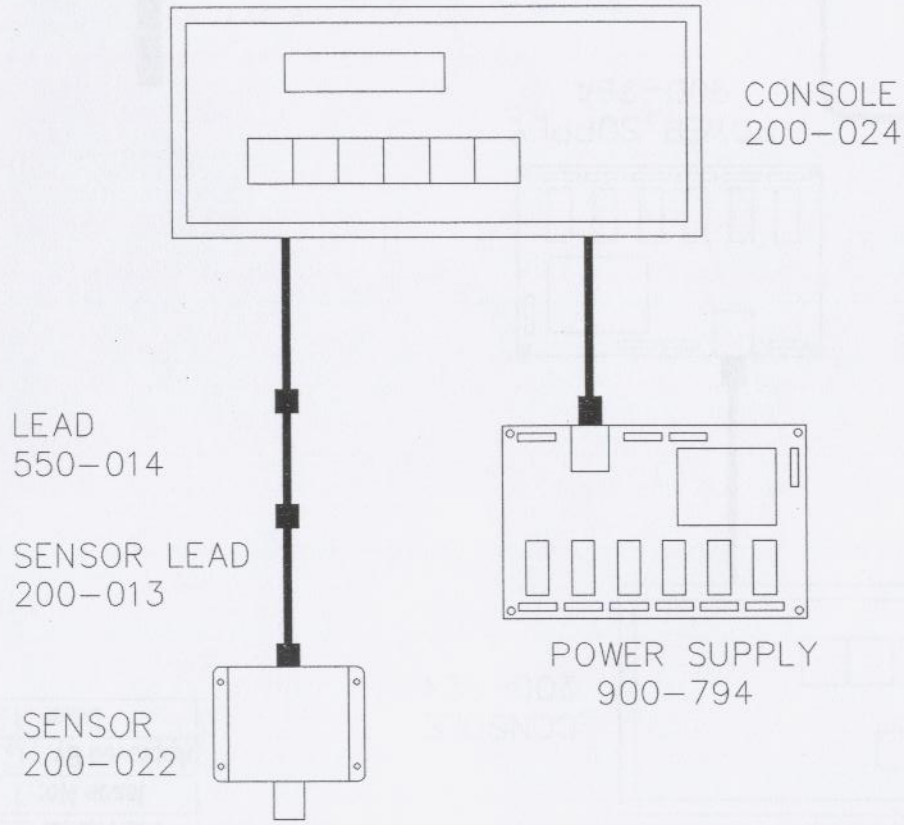

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DIAGRAM 2b

GVC3 SYSTEM 200-026

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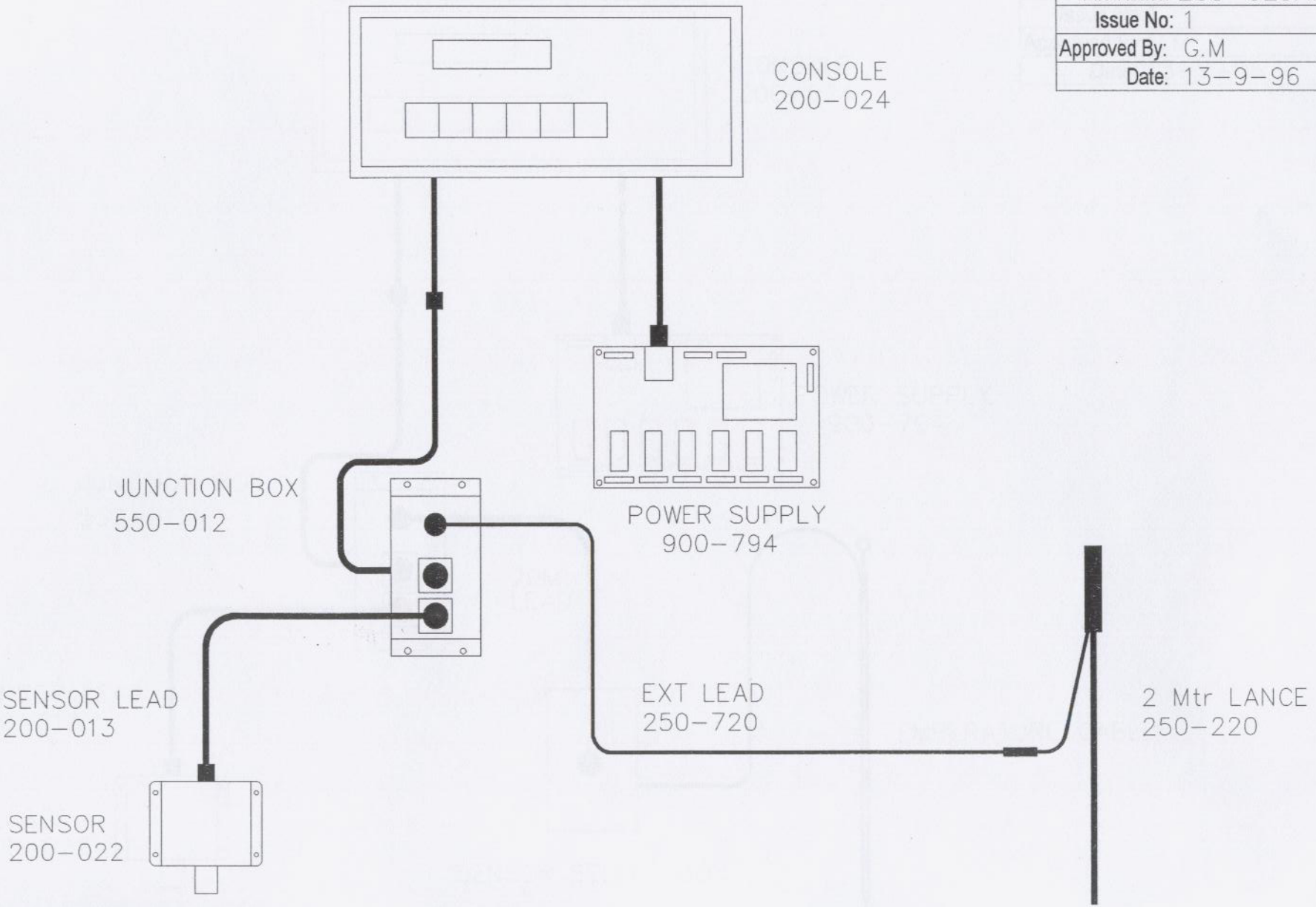
Title:	GVC3 SYSTEM 2
Part No:	200-026
File Name:	200-026A.SKD
Issue No:	1
Approved By:	G.M
Date:	13-9-96



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Title:	GVC3 SYSTEM 3
Part No:	200-027
File Name:	200-027A.SKD
Issue No:	1
Approved By:	G.M
Date:	13-9-96

GVC3 SYSTEM 3 Kongskilde

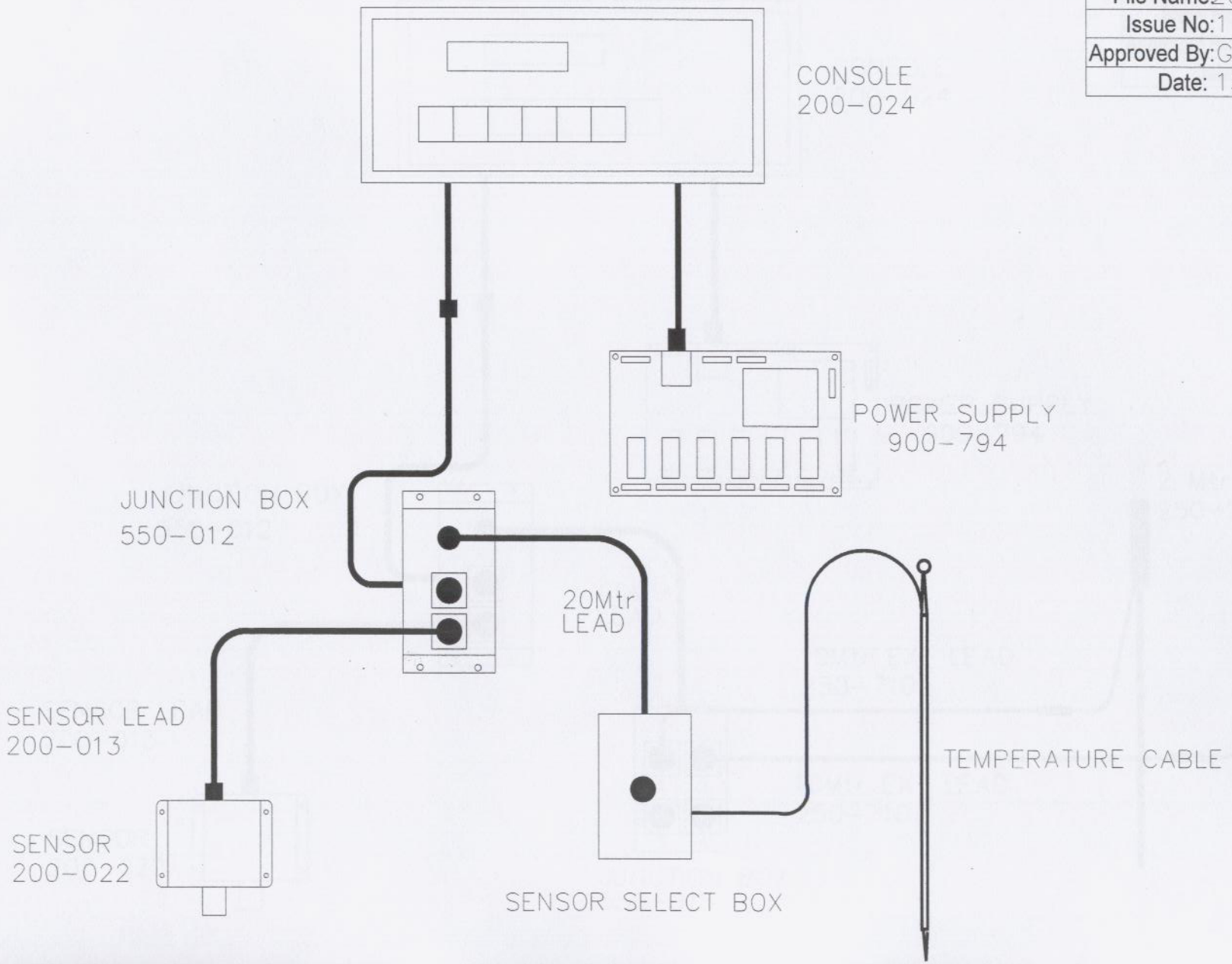

DIAGRAM 2C

GVC3 SYSTEM 3 200-027

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Title:	GVC3 SYSTEM 3
Part No:	200-027
File Name:	200-027A.SKD
Issue No:	1
Approved By:	G.M
Date:	13-9-96

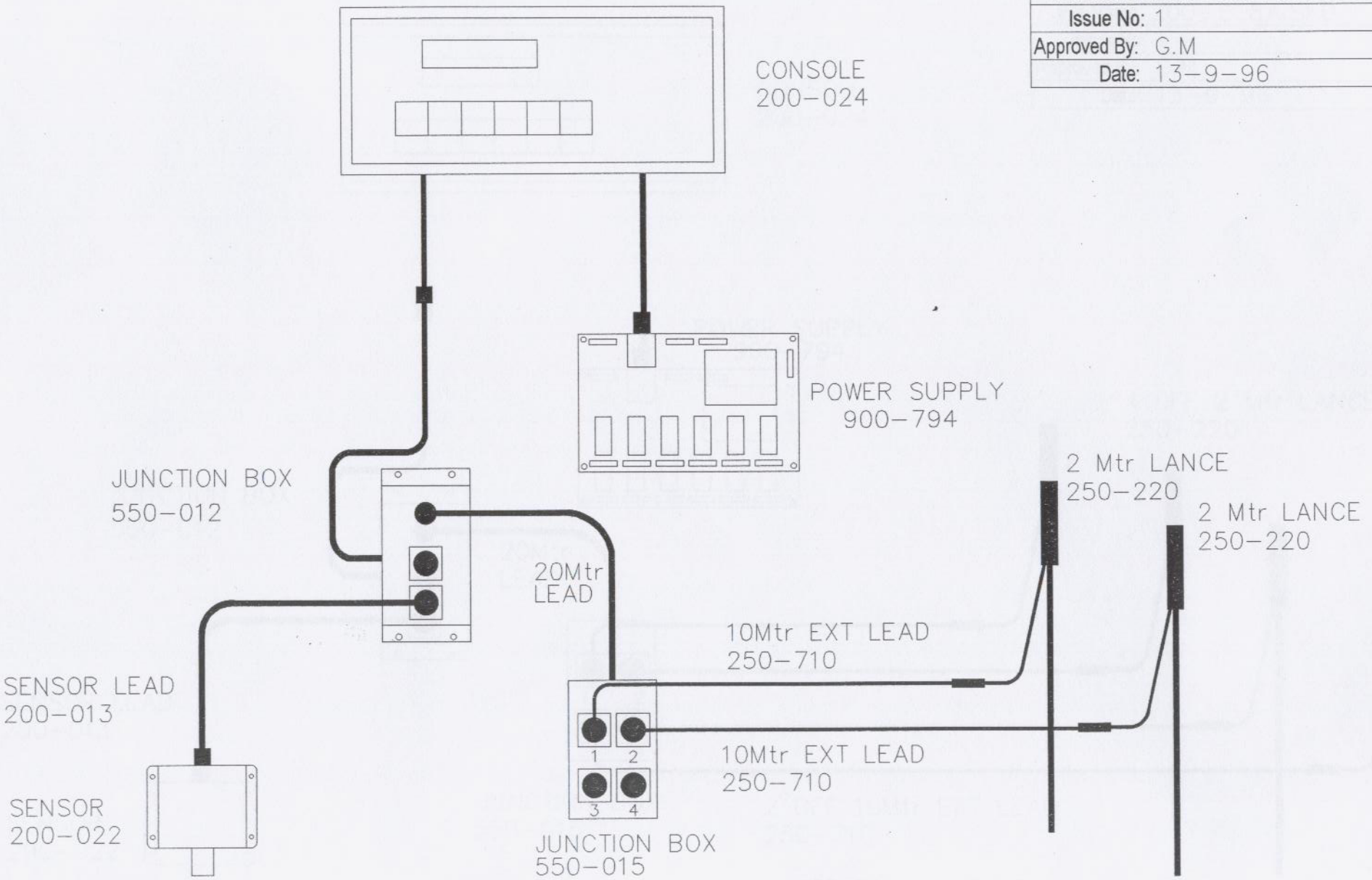

DIAGRAM 2d

GVC3 SYSTEM 4 200-028

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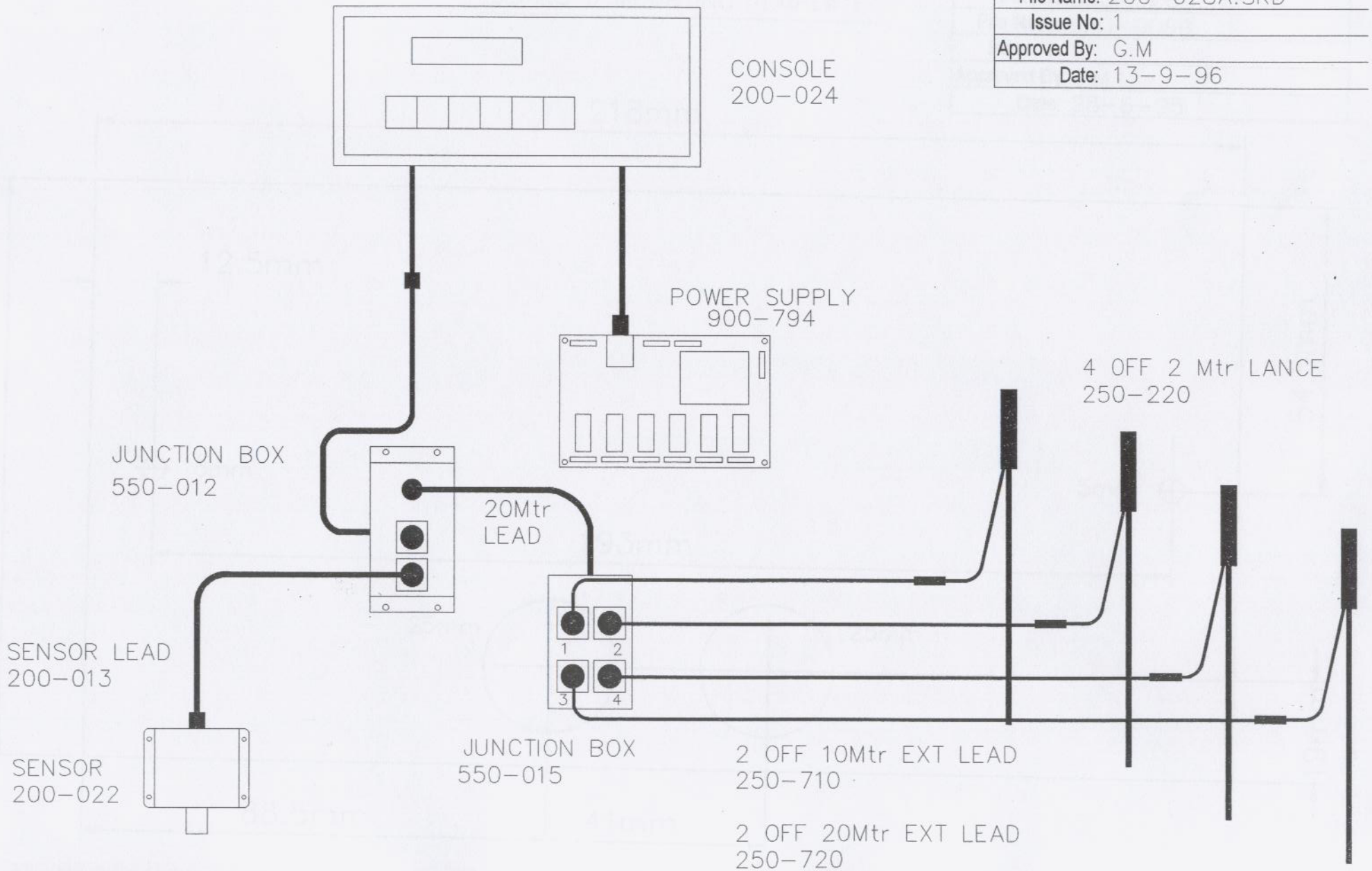
Title:	GV3 SYSTEM 4
Part No:	200-028
File Name:	200-028A.SKD
Issue No:	1
Approved By:	G.M
Date:	13-9-96



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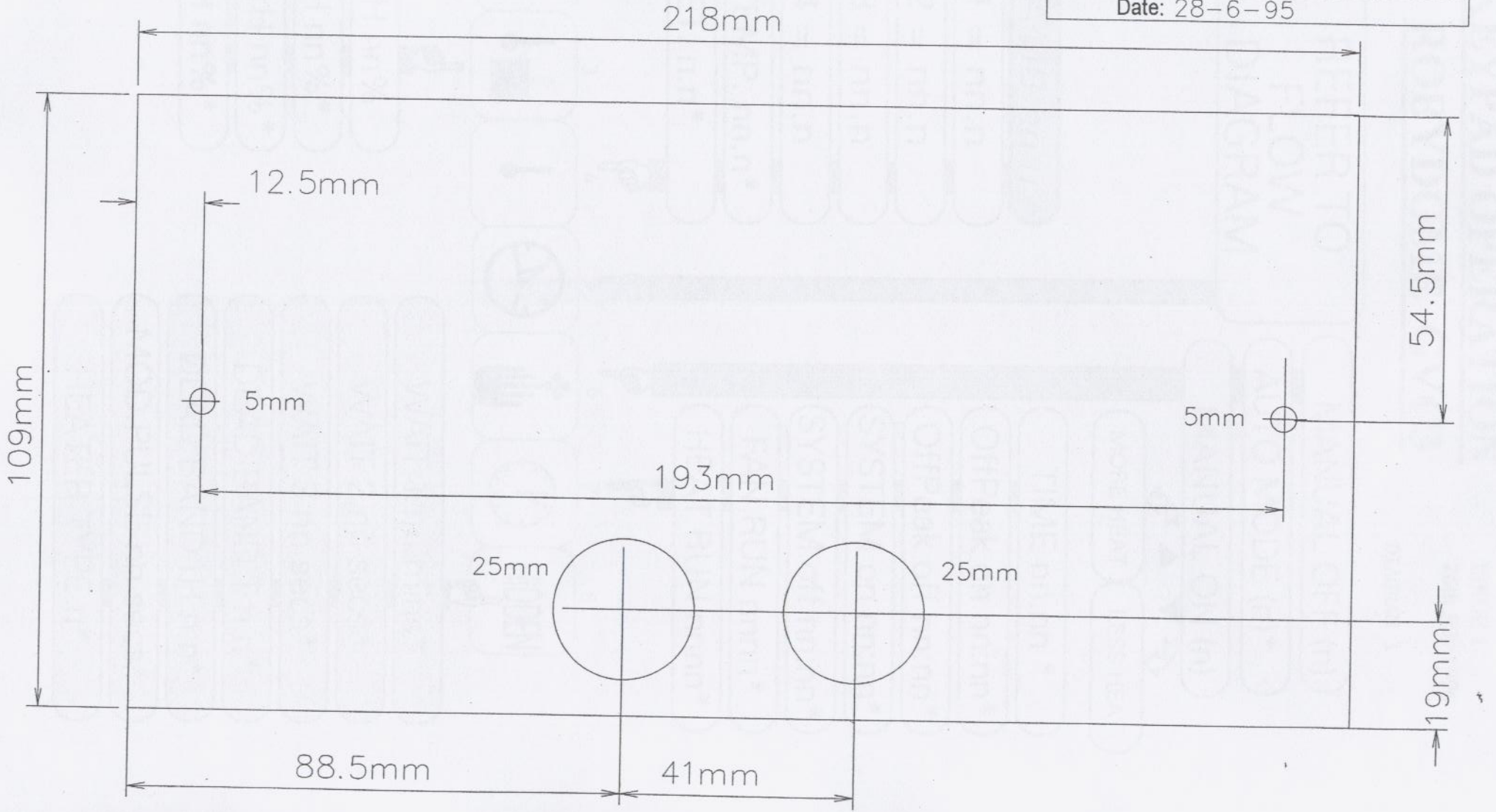
Title: SERIES3 TEMPLATE
Part No: 550-006
File Name: 550-006B
Issue No: 1
Approved By: G.M
Date: 28-6-95

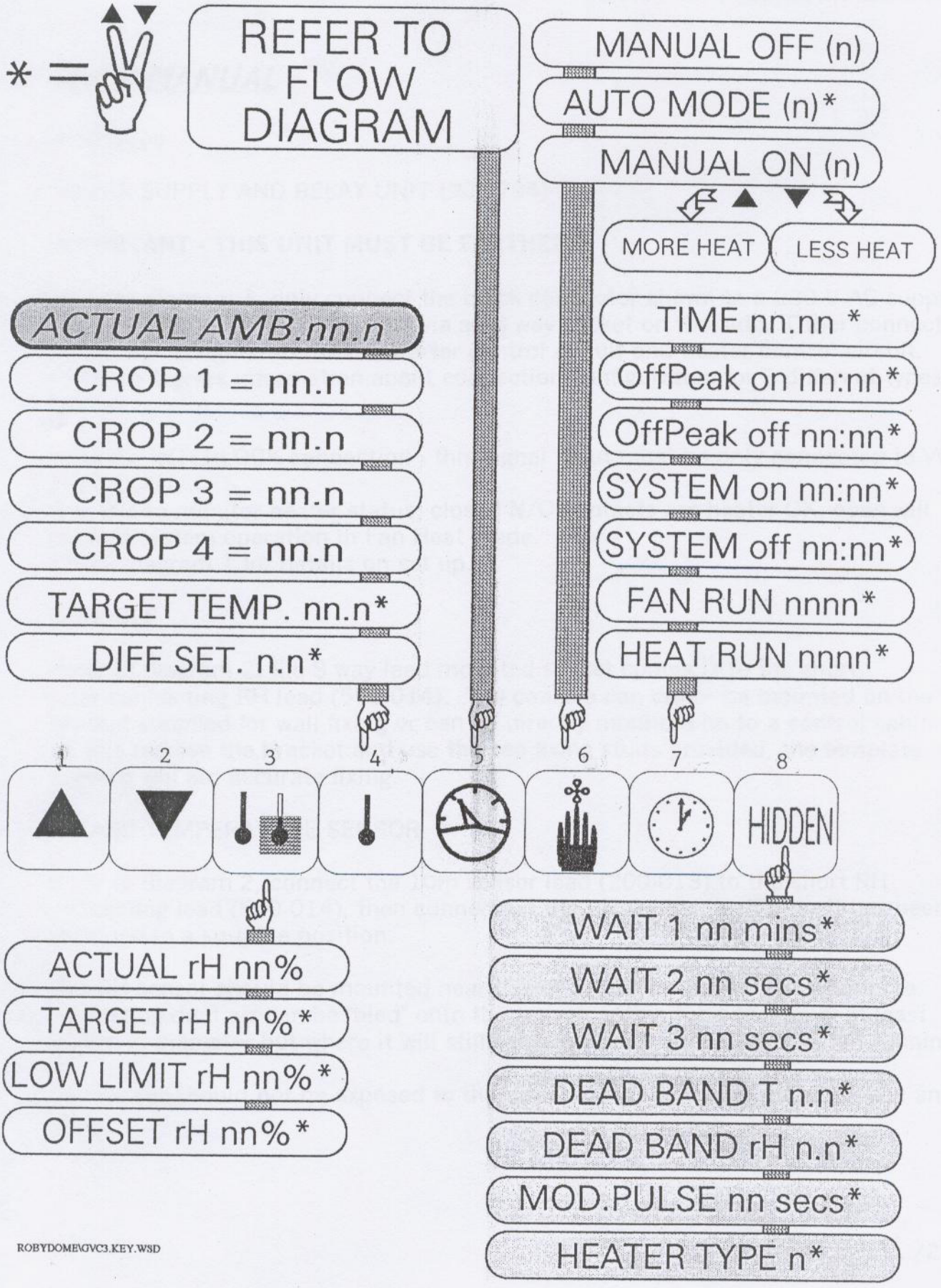
SERIES 3 MOUNTING TEMPLATE



0130 KEYPAD OPERATION ROBYDOME GVC3

ISSUE 1
26th July 1996

DIAGRAM 3



ROBYDOME\GVC3.KEY.WSD