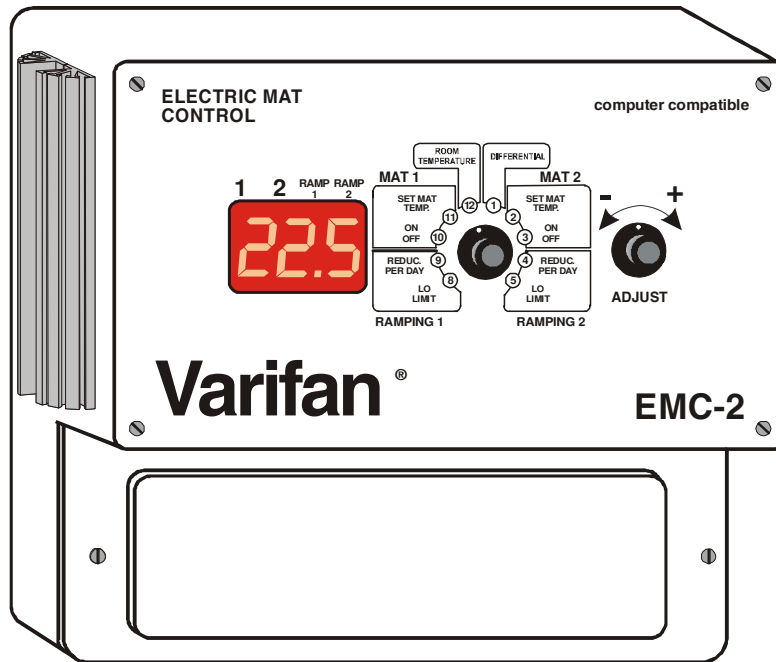


EMC-2

USER'S MANUAL



Although the manufacturer has made every effort to ensure the accuracy of the information contained herein, this document is subject to change without notice due to ongoing product development.

WARNINGS AND PRECAUTIONS

Equipment , probe failure, blown fuses and/or tripped breakers may prove harmful to the contents of the building. Therefore it is strongly recommended to install backup devices and alarm or warning devices. Spare equipment should also be available at the owner's site. Equipment manufactured by the manufacturer is protected against normal line surges. High surges caused by thunder storms or power supply equipment may damage this equipment. For added security against line voltage surges it is recommended that surge and noise suppression devices be installed at the electrical distribution panel. Use of shielded cable for probes is recommended for protection against lightning. These devices are available from most electrical supply distributors.

RECOMMENDATIONS

The manufacturer recommends that all installation procedures described herein be performed by a qualified electrician or installation technician. Further more the manufacturer recommends to test all the functions and equipment connected to the EMC-2, including the alarm system and backup devices, after installation, after change to the installation and twice a year.

Fuse verification and replacement, as well as the proper setting of control values shall be the responsibility of the owner of this equipment.

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1. GENERAL

This document provides a description of the EMC-2 control panel.

This document is organized as follows:

- Introduction
- Installation
- User's Guide
- Appendix

1.1 DESCRIPTION

Congratulations on the purchase of your EMC-2 electric mat control system. The EMC-2 provides you with full control over heat mat temperature resulting in a comfortable environment for your livestock.

The EMC-2 is designed to drive 2 groups of heat mat. For each group of heat mat, the EMC-2 will measure the actual room temperature and will constantly adjust the electric power delivered to the mats in order to maintain the surface temperature at the selected value. Further security may be obtain by connecting all EMC-2 controls in a network configuration to a computer via the use of an optional RCM-40 remote monitoring unit.

All control panel variable outputs are fused, and all programmable settings are maintained whether or not the EMC-2 is powered.

The EMC-2 provides an automatic constant temperature reduction (ramping) feature for your maturing livestock. A built in low temperature safety factor prevents temperatures reaching dangerous values.

With an EMC-2 in control of your heat mat, you are assured of optimal living conditions for your livestock.

DEFINITION OF TERMS

ROOM TEMPERATURE

The actual temperature of the room.

RAMPING

An automatic daily reduction of the set points.

DIFFERENTIAL

Temperature range where mat heats up as temperature decreases.

CHAPTER 2 - INSTALLATION

The manufacturer recommends that the installation instructions which follow be adhered to as closely as possible, and all work be performed by a certified electrician. Failure to do so may void the warranty!

2.1 UNPACKING

Unpack the EMC-2 from its box and inspect content for damage. Should the content appear to be damaged, contact your local distributor for return material procedures.

The package should contain the following standard items:

- 1 EMC-2 control .
- 1 installed temperature probe (model number 2004-1K).
- 3 cable fasteners or fuses.
- 1 user's manual.

2.2 MOUNTING

To limit the unit's exposure to noxious gases, install the unit in a hallway.

Make sure the unit is mounted right side up with the cable entry holes facing down.

The EMC-2 operate in a temperature range of 13.5°F - 105°F (-9.5°C - 41°C).

The enclosure is watertight, it is not splash proof or immersion proof. DO NOT WATER the control. Cover it carefully with plastic when cleaning the room.

It is prohibited to use overhead cables outside the building.

Mounting hardware is not included with the unit.

Use a screwdriver to remove the faceplate and the plate on the power compartment.

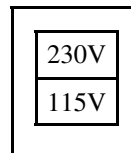
Once both faceplates are off, install the mounting screw on the wall and install the unit on it. Use two more screws to secure the EMC-2 in place using the bottom mounting holes.

2.3 SWITCH SETTINGS

The EMC-2 is configured for a variety of options via two switches as follows:

2.3.1 - Line Voltage Selector Switch





This switch is located on the surface of the main (bottom) board and adapts the control panel for 115 VAC or 230 VAC line voltage.



Refer to Figure 1.

2.3.2 - Software Settings Switch

This switch is located at the rear of the control panel faceplate and adjusts the following options.

OFF	ON
	1
	2
	3
	4

OFF	ON
Fahrenheit	Celsius
Settings locked	Setting unlocked
Adjust differential	Differential locked
Not used	Not used

Switch 1 Selects between a Fahrenheit or Celsius display on the front panel.

Switch 2 Locks/unlocks user settings.

Switch 3 To adjust differential, switch 3 must be at **OFF**.

Switch 4 Not used.

2.4 CONNECTION PROCEDURE

For the connection procedures which follow refer to Figure 1.

2.4.1 - Input power

Use a screwdriver to remove cable knock-outs for the installation of cabling to the control panel.

2.4.1.1 - 115 VAC

Make certain that the line voltage selector switch is set to 115 VAC. Connect the power cable to terminals 7 and 8 on the main (bottom) board, connect the ground wire to the terminal 9 on the main board .

Do not apply power to the EMC-2 until all connections have been completed!

2.4.1.2 - 230 VAC

Make certain that the line voltage selector switch is set to 230 VAC. Connect the power cable to terminals 7 and 8 on the main (bottom) board, connect the ground wire to terminal 9 on the main board.

Do not apply power to the EMC-2 until all connections have been completed!

2.4.2 - Heat Mat 1 (terminals 5 and 6)

Connect the two leads from Heat Mat 1 to terminals 5 and 6 on the main (bottom) board.

2.4.3 - Heat Mat 2 (terminals 3 and 4)

Connect the two leads from Heat Mat 2 to terminals 3 and 4 on the main (bottom) board.

2.5 TEMPERATURE PROBES

Temperature probes use a "Class 2" low voltage circuit. These cables (AWG #18min) can extend up to a distance of 492 feet (150 meters). Install the temperature probe approximately 3' (1m) above heat mat. Make sure that the probe is protected from operating machinery, animal bites or any other circumstances which may damage it. Connect the two leads and the shield of the temperature probe to the control panel terminals as indicated in Figure 1.

Use shielded cabling for probes . Connect the shields to "SHLD" terminal. Failure to do so may result in inaccurate readings!

2.6 POWERING UP

Before powering up the EMC-2, attach the faceplate to the casing of the control panel using the screws previously removed.

EMC-2

Set Selector knob to position (12).

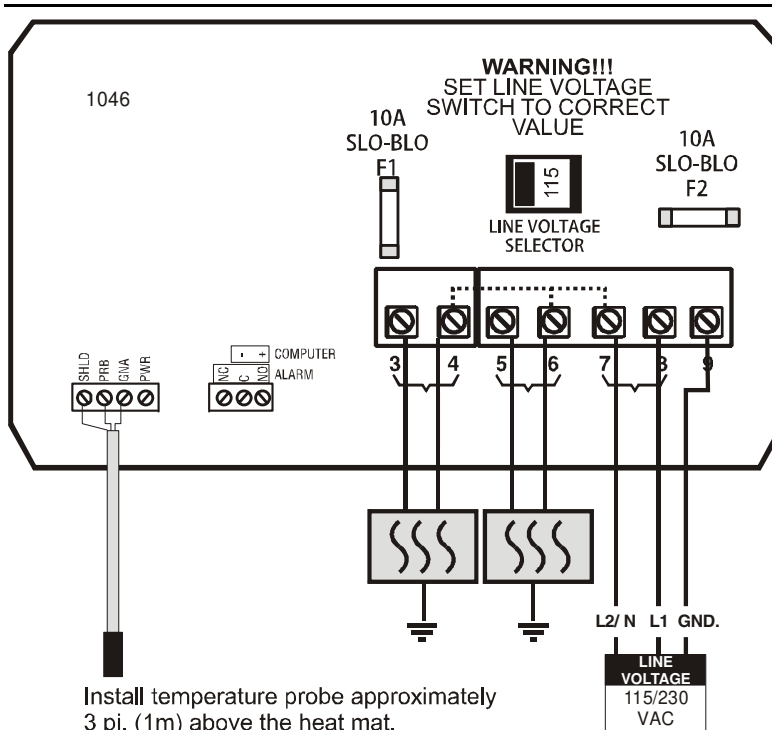
Upon power up, the unit will test its display by briefly lighting all the segments of its LED. Make certain that all segments light.

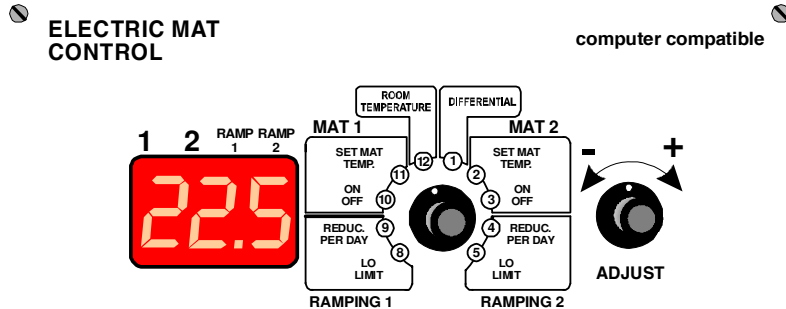
Following the LED display test, the unit displays the ambient temperature of the room.

If the temperature is not displayed, refer to the Trouble Shooting section in the appendix of this document.

* It is prohibited to use overhead cables outside the building.

Fig. 1
EMC-2 Installation wiring diagram





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EMC-2

CHAPTER 3 - USER'S GUIDE

The EMC-2 front panel shown above features a LED status window and two control dials which are used to select functions and adjust settings.

LED STATUS WINDOW

The LED status window features a 3 digit LED readout for the display of temperature in Fahrenheit or Celsius and programmable settings.

In addition, the LED status window displays the operational status of the heat mats and the ramping status via four additional LEDs (shown above in LED window). When illuminated, each LED indicates that its associated mat or ramping is operating.

CONTROL DIALS

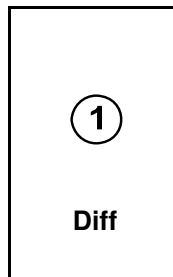
The left dial is the Selector dial and is used to select one of the control panel's 9 functions. The dial located to the right of the Selector dial is the Adjustor dial and is used to adjust the setting of each function.

The 10 functions are:

- (1) Mat 1 & 2 Differential
- (2) Set Mat 2 Temperature
- (3) Mat 2 On / Off
- (4) Reduc. Per Day Ramping Mat 2
- (5) Lo Limit Ramping Mat 2
- (8) Lo Limit Ramping Mat1
- (9) Reduc. Per Day Ramping Mat 1
- (10) Mat 1 On / Off
- (11) Set Mat 1 Temperature
- (12) Room Temperature

FUNCTIONS DESCRIPTION

MAT 1 & 2 DIFFERENTIAL



The Mat 1 & 2 differential setting establishes the temperature at which mat reaches maximum power. The value is a temperature **difference** from the mat set point.

The Mat differential is adjusted in 0.5 degree increments from a minimum setting of 0.5°F (0.5°C) to a maximum setting of 33.0°F (18.0°C).

Adjusting the Mat differential:

- rotate the Selector dial to position (1),
- rotate the Adjustor dial counterclockwise to decrease the differential, clockwise to increase it.

Dip switch 3 must be at OFF to change the differential setting. If Dip switch is set to ON “- - -” is displayed, but the differential setting stays at the previously setting value.

SET MAT 2 TEMPERATURE

②

SET MAT
TEMP.

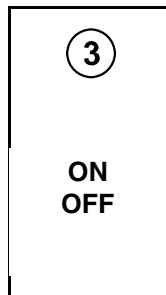
This set point establishes the target temperature for the mat 2. It is adjusted in 0.5 degree increments from a minimum setting of 13.5°F (-9.5°C) to a maximum setting of 105.0°F (41.0°C).

Adjusting the Mat 2 temperature:

- rotate the Selector dial to position (2),
- rotate the Adjustor dial counterclockwise to decrease the temperature setting, clockwise to increase it.

Note: The ramping feature for mat 2 (function 4) must be (OFF) to adjust the mat 2 temperature set point.

SET MAT 2 ON / OFF



This function set each group of Mat, active or non active. When it is active, the mat turns on at the mat set point.

Adjusting Mat 2 On / Off:

- rotate the Selector dial to position (3),
- rotate the adjustment dial counterclockwise to deactivate mat (OFF is displayed),
- rotate clockwise to activate mat (ON is displayed).

REDUC. PER DAY RAMPING MAT 2

④

**REDUC.
PER DAY**

The ramping function automatically reduces the mat temperature setting by the set amount every 24 hours. The ramping is adjusted in 0.1 degrees decrements from a minimum setting of OFF -0.1°F (0.1°C) to a maximum setting of -4.0°F (-2.0°C).

Adjusting reduc. Per day ramping for mat 2:

- rotate the Selector dial to position (4),
- rotate the Adjustor dial counterclockwise to increase ramping rate, clockwise to decrease it.

NOTE: When ramping is activated or enabled, the mat temperature can not be adjusted. Ramping automatically turns OFF when the minimum set point temperature limit is reached.

Example: Mat temperature is set to 70°F and the ramping is adjusted to -0.05°F. The following day, the mat set point temperature will drop to 69.95°F followed by 69.90°F on the day after. Although the mat temperature real value decreases, the display will be changed after 10 days. The mat set point temperature will then be 69.5°F.

LO LIMIT RAMPING MAT 2

5

LO
LIMIT

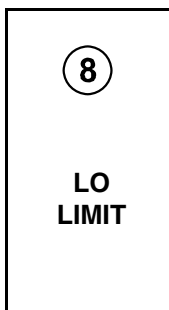
The "Lo Limit" is the lowest mat temperature set point that the ramping function can decrease to. This is a security feature. It is adjusted in 0.5 degree increments from a minimum setting of 13.5°F (-9.5°C) to a maximum setting of 105.0°F (41.0°C).

Adjusting the lo limit ramping setting:

- rotate the Selector dial to position (5),
- rotate the Adjustor dial counterclockwise to decrease it, clockwise to increase it.

Note: When the mat set point temperature reaches the Lo Limit, the ramping setting automatically change to OFF.

LO LIMIT RAMPING MAT 1



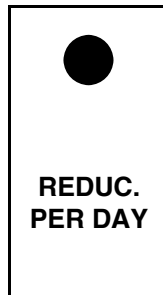
The "Lo Limit" is the lowest mat temperature set point that the ramping function can decrease to. This is a security feature. It is adjusted in 0.5 degree increments from a minimum setting of 13.5°F (-9.5°C) to a maximum setting of 105.0°F (41.0°C).

Adjusting the lo limit ramping setting:

- rotate the Selector dial to position (8),
- rotate the Adjustor dial counterclockwise to decrease it, clockwise to increase it.

Note: When the mat set point temperature reaches the Lo Limit, the ramping setting automatically change to OFF.

REDUC. PER DAY RAMPING MAT 1



The ramping function automatically reduces the mat temperature setting by the set amount every 24 hours. The ramping is adjusted in 0.1 degrees decrements from a minimum setting of OFF -0.1°F (0.1°C) to a maximum setting of -4.0°F (2.0°C).

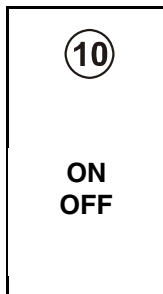
Adjusting reduc. Per day ramping for mat 1:

- rotate the Selector dial to position (9),
- rotate the Adjustor dial counterclockwise to increase ramping rate, clockwise to decrease it.

NOTE: When ramping is activated or enabled, the mat temperature can not be adjusted. Ramping automatically turns OFF when the minimum set point temperature limit is reached.

Example: Mat temperature is set to 70°F and the ramping is adjusted to -0.05°F. The following day, the mat set point temperature will drop to 69.95°F followed by 69.90°F on the day after. Although the mat temperature real value decreases, the display will be changed after 10 days. The mat set point temperature will then be 69.5°F.

SET MAT 1 ON / OFF



This function set each group of Mat, active or non active. When it is active, the mat turns on at the mat set point.

Adjusting Mat 1 On / Off:

- rotate the Selector dial to position (10),
- rotate the adjustment dial counterclockwise to deactivate mat (OFF is displayed),
- rotate clockwise to activate mat (ON is displayed).

SET MAT 1 TEMPERATURE

11

SET MAT
TEMP.

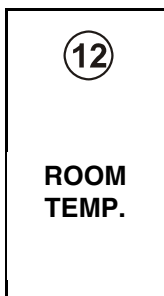
This set point establishes the target temperature for the mat 1. It is adjusted in 0.5 degree increments from a minimum setting of 13.5°F (-9.5°C) to a maximum setting of 105.0°F (41.0°C).

Adjusting the Mat 1 temperature:

- rotate the Selector dial to position (11),
- rotate the Adjustor dial counterclockwise to decrease the temperature setting, clockwise to increase it.

Note: The ramping feature for mat 1 (function 9) must be (OFF) to adjust the mat 1 temperature set point.

ROOM TEMPERATURE



This function displays the ambient room temperature. The selector should be left in this position. The ambient temperature is displayed to the nearest 0.5 degree from a minimum display of 13.5°F (-9.9°C) to a maximum display of 105.0°F (40.9°C). If the temperature is lower than 13.5°F (-9.9°C), **LO** is displayed. If the temperature is higher than 105°F (40.9°C), **HI** is displayed.

Viewing the ambient temperature:

- rotate the Selector dial to position (12),
- the temperature is displayed on the front panel.

APPENDIX

TROUBLESHOOTING

SYMPTOM	CAUSE and REMEDY
Lo is continually displayed	<ul style="list-style-type: none">– Temperature is below minimum (13.5°F or -9.9°C).– Probe is disconnected or defective.
Hi is continually displayed	<ul style="list-style-type: none">– Temperature is above maximum (105.5°F or 40.9°C).– Probe is short circuited.
Heat mat not operating	<ul style="list-style-type: none">– Verify whether the mat LED is on. If LED is OFF, change set point above the room temperature until the LED turns ON. If LED is on, verify wiring, mat and fuse. Refer Figure 1 for fuse location. If fuse is blown, replace with fuse of same type.– Verify if pos. (3) & (10) on the EMC-2 are not at the OFF position
Display is blank	<ul style="list-style-type: none">– Verify that the line voltage selector switch is properly set.– Verify that the 10 pin flat cable between the main board and the faceplate board is properly connected.

SPECIFICATIONS

DESCRIPTION	VALUE
INPUT POWER	- 115/230 -20%, +10% VAC - 50 / 60 Hz - 20Amp resistive
MAXIMUM RATING for each group	- 1000W @ 115V - 2000W @ 230V

Storage
Temperature: -4 to 130°F (-20 to 55°C)

operation
temperature: 32 to 122°F (0 to 50°C)

Weight: 5 pounds (2.25Kg)

Dimension: 8.35"x4.60"x7.87" (212x117x200mm)

RECORD FORM

Dial	Option	Default setting		User setting
1	Mat 1 & 2 Differential	18°C	32.5°F	
2	Set Mat 2 Temperature	16.0°C	59.5°F	
3	Mat 2 On / Off	ON	ON	
4	Reduc. Per Day Mat 2 Ramping	OFF	OFF	
5	Lo Limit Mat 2 Ramping	16.0°C	59.5°F	
8	Lo Limit Mat 1 Ramping	16.0°C	59.5°F	
9	Reduc. Per Day Mat 1 Ramping	OFF	OFF	
10	Mat 1 On / Off	ON	ON	
11	Set Mat 1 Temperature	16.0°C	59.5°F	

Limited Warranty

The manufactured equipment and supplied components have gone through rigorous inspection to assure optimal quality of product and reliability. Individual controls are factory tested under load, however the possibility of equipment failure and/or malfunction may still exist.

For service, contact your local retailer or supplier. The warranty period shall be for two years from manufacturing date. Proof of purchase is required for warranty validation.

In all cases, the warranty shall apply only to defects in workmanship and specifically exclude any damage caused by over-voltage, short circuit, misuse, acts of vandalism, fortuitous events, acts of God, flood, fire, hail, lightning, or any other natural disaster. Any unauthorized work, modification or repair on this product automatically voids the warranty and disclaims the manufacturer from all responsibility.

The manufacturer assumes only those obligations set forth herein, excluding all other warranties or obligations. This warranty stipulates that in all cases the manufacturer shall be liable only for the supply of replacement parts or goods and shall not be liable for any personal injury, damages, loss of profits, interrupted operations, fine contravention of the law or damages to the production of the PURCHASER and the PURCHASER shall take up the defense and hold the manufacturer faultless regarding any legal or extra legal proceedings, notice, or claim by the customer or by a third party, and regarding any legal and extra legal expenses and fees brought forward on by such damages.

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march 5, 2008