RBU-3

Manual for use and maintenance

RBU-3

Emergency Backup

Ag/MIS/UmGB-2137-09/13 rev 1.0
P/N: 116031

Munters

RBU-3

Manual for use and maintenance

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Product Software: N/A

This manual for use and maintenance is an integral part of the apparatus together with the attached technical documentation.

Munters reserves the right to effect modifications to the apparatus in accordance with technical and legal developments.

Index

1 Introduction

1.1 Disclaimer

Munters reserves the right to make alterations to specifications, quantities, dimensions etc. for production or other reasons, subsequent to publication. The information contained herein has been prepared by qualified experts within Munters. While we believe the information is accurate and complete, we make no warranty or representation for any particular purposes. The information is offered in good faith and with the understanding that any use of the units or accessories in breach of the directions and warnings in this document is at the sole discretion and risk of the user.

1.2 Introduction

Congratulations on your excellent choice of purchasing an RBU-3!

In order to realize the full benefit from this product it is important that it is installed, commissioned and operated correctly. Before installation or using the fan, this manual should be studied carefully. It is also recommended that it is kept safely for future reference. The manual is intended as a reference for installation, commissioning and day-to-day operation of the Munters Controllers.

1.3 Notes

Date of release: July 2010

Munters cannot guarantee to inform users about the changes or to distribute new manuals to them.

2 Operation

The Alarm Backup RBU-3 measures the inside temperature via one or two temperature sensors, and according to user defined parameters.

- **RBU-3A**: High Temperature Alarm, Low Temperature Alarm
- **RBU-3B**: High Temperature Alarm, Low Temperature Alarm, Differential for Heaters and Fan

When required the unit activates the alarm system, fans, or heaters.

NOTE Only the RBU-3B supports heaters and fans.

- Features
- Operation mode
- Hidden parameters
- Setting mode
- Time setting
- Alarm delay

2.1 Features

- One stainless steel, reliable temperature sensor (second temperature sensor optional)
- Three digits on-line temperature display
- Guide light to indicate display status and setting mode
- Temperature display in °F or °C
- User-friendly, one-touch setting
- Real time clock with battery backup
- Water and dust resistant
- Un-erasable memory
- Simple installation and service
- There is a real time clock for automatic reduction of alarm set points for the entire growth period. It also activates the alarm system and fans or heaters, as required.
- The RBU-3 has Phase 1, Phase 2, and Phase 3 inputs.
- The alarm starts functioning if the voltage decreases 20% from normal voltage.
- There are two auxiliary inputs AUX1 and AUX2 for external system alarm outputs (the RBU-3 also functions as an alarm center).
- It is possible to connect a dialer to the RBU-3 and to receive alarm messages at any phone number or beeper.
- You can connect a pressure sensor to measure low static pressure inside the house and activate alarms in case of “Low pressure” or “High Pressure”.

2.2 Operation mode

The RBU-3 is in operation mode when the top guide light is switched on, in the first line (Red) of the menu. The Inside Temperature and the appropriate unit indicator (F° or C°) are displayed.

The OPERATION MODE also displays the following:

- ERROR MESSAGE: A blinking "SF" (Sensor Failure) message is displayed each time that the installed temperature sensors are disconnected or faulty. For more information, see TEMPERATURE SENSORS

2.3 Hidden parameters

RBU-3 has 13 hidden parameters that have a different access format to protect them from being changed accidentally. While these parameters are pre-programmed with default values of a typical system, a check should be performed after installation has been completed.

CAUTION *Make sure that you understand what they mean before doing any changes. If you are uncertain, use the default values given below each parameter.*

To display the Hidden parameters, the controller must be in OPERATION MODE first. When that is done, press the Up and Down arrow keys simultaneously for about two seconds. The first parameter "FC" and its current value (blinking) appear. To display other Hidden Parameters, use the SELECT Key. Each time pressed, it moves to the next parameter. To return to OPERATION MODE, pass, with the SELECT key through all the hidden parameters.

To change the value of a parameter, use the UP and DOWN arrow keys.

- FC - Fahrenheit or celsius
- FH - Fan hysteresis
- HH - Hysteresis for heaters
- P2 - Phase 2 failure detect
- P3 - Phase 3 failure detect
- PrC - Percentage for Phase 1 failure detect
- CUr - Curve enableFr.d - From day
- Fr.H - From high temperature alarm
- Fr.L - From Low temperature alarm
- to.d - To day
- to.H - To high temperature alarm
- to.L - To low temperature alarm

Table 1: Hidden Parameters

Alarm Code	Description
FC	Temperature units of measurement. Select Fahrenheit Or Celsius
FH	(Fan Hysteresis) Hysteresis for fans (F° or C°)
HH	(Heaters Hysteresis) Hysteresis for heaters (F° or C°)
P2	Phase 2 alarm Enable/Disable (1-Enable, 0-Disable)
P3	Phase 3 alarm Enable/Disable (1-Enable, 0-Disable)

Alarm Code	Description
PrC	Percentage of nominal voltage for alarm on phase 1
CUr	Using curves for high and low temperature alarm setting
Fr.d	First day to start the curve
Fr.H	From Day High Temperature Alarm set point
Fr.L	From Day Low Temperature Alarm set point
to.d	Last day of the curve
to.H	Last Day High Temperature Alarm set point
to.L	Last Day Low Temperature Alarm set point

2.3.1 FC - Fahrenheit or celsius

RBU-3 can display temperature in Celsius or Fahrenheit.

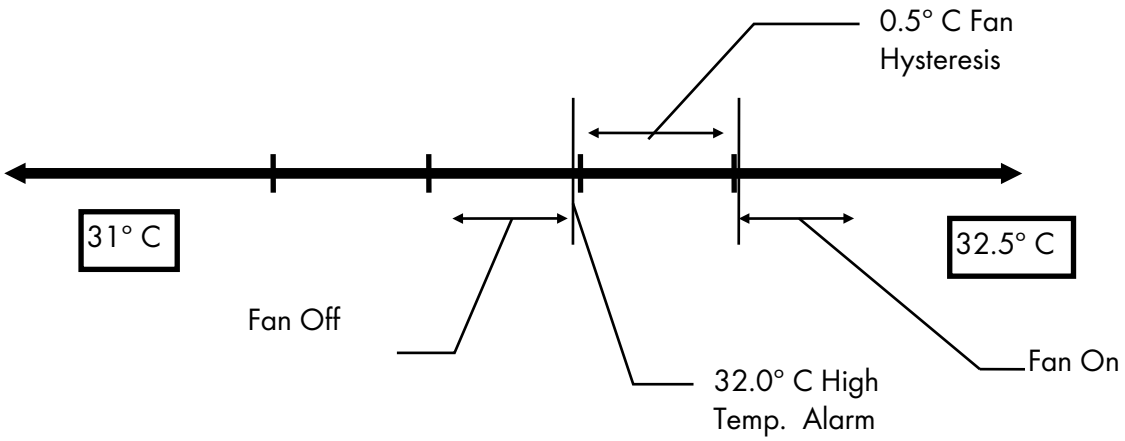
- FC = 1 is for Fahrenheit
- FC = 0 is for Celsius
- Default is FC = 0

2.3.2 FH - Fan hysteresis

This parameter defines a Hysteresis in degrees (F° or C°), near High Temperature Alarm, above which the fans do not function.

NOTE Munsters recommends keeping the default value.

- Default Value: 0.5 C° (1.0 F°)
- Minimum Value: 0.0
- Maximum Value: 9.9



For this example the high temperature alarm is at 32.0°C. The fan is OFF when temperature is under 32.0°C and it is turned ON if the temperature goes above 32.5°C (High Temp + Hysteresis).

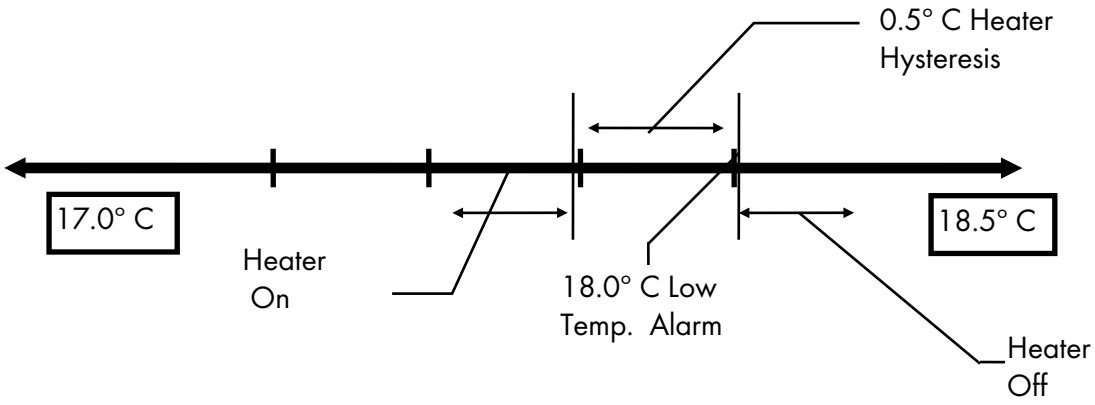
The fan stays ON until the temperature decreases under 32.0°C (High Temp).

2.3.3 HH - Hysteresis for heaters

This parameter defines a hysteresis in degrees (F° or C°), near Low Temperature Alarm, above which the heaters do not function.

NOTE Munsters recommends keeping the default value.

- Default Value 0.5 C° (1.0 F°)
- Minimum Value 0.0
- Maximum Value 9.9



For this example the low temperature alarm is at 18.0°C. The heater is OFF when the temperature is superior to 18.0°C and it is turned ON if the temperature decreases less than 17.5°C (Low Temp - Hysteresis).

The heater stays ON until the temperature goes above 18.5°C.

2.3.4 P2 - Phase 2 failure detect

This parameter enables or disables the Phase 2-failure alarm. If there is no Phase 2, to detect a failure the grower disables Phase 2 failure alarm. This prevents activating the alarm when Phase 2 is not connected to the unit.

- 1 = Phase 2 enabled
- 0 = Phase 2 disabled

2.3.5 P3 - Phase 3 failure detect

This parameter is to enables / disables the Phase 3-failure alarm. If there is no Phase 3, to detect a failure the grower disables Phase 3-failure alarm. This prevents activating the alarm when Phase 3 is not connected to the unit.

- 1 = Phase 3 enabled
- 0 = Phase 3 disabled

2.3.6 PrC - Percentage for Phase 1 failure detect

This parameter sets the percentage of the nominal line voltage, which below this level causes a Phase 1 failure alarm. For example for 220V unit 80% on this parameter generates Phase 1 alarm if the power voltage will decrease below approximately 180V.

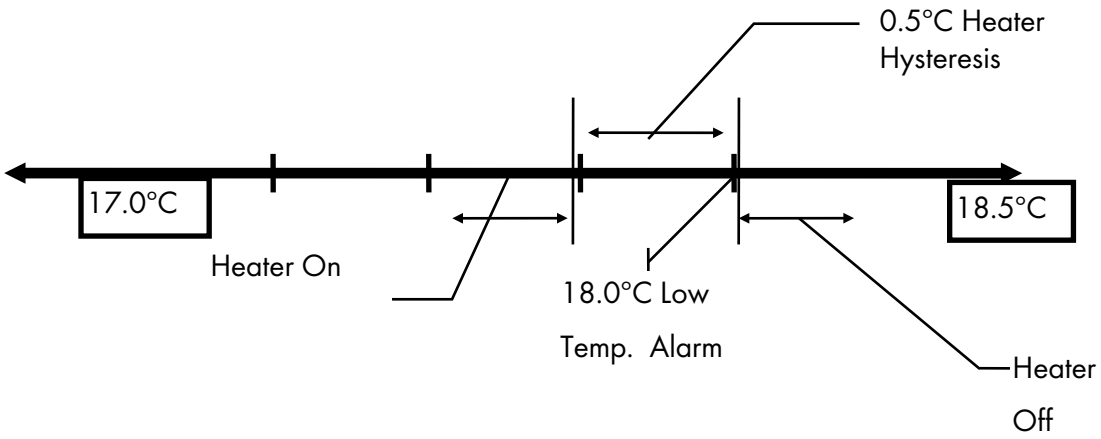
- Default Value 80 (%)
- Minimum Value 0
- Maximum Value 100

2.3.7 CUr - Curve enable

This parameter enables or disable curves for high and low temperature alarms. In case there is no curve needed for the entire of the growth period, the grower can disable the parameter. This gives a constant high and low temperature alarm set point, regardless of the growth day.

- 1 = enabled
- 0 = disabled

If this parameter is set to 1, it is followed by six more variables used to define the curves for High Temperature alarm and Low Temperature alarm according to growth period.



2.3.8 Fr.d - From day

This parameter sets the first day for starting the curves for High/Low Temperature alarm.

- Range: 1 - 999

2.3.9 Fr.H - From high temperature alarm

This parameter sets the High Temperature alarm for the first day. The High Temperature alarm LED blinks while setting this parameter.

- Range: 0° - 50° C / 32° - 132° F

2.3.10 Fr.L - From Low temperature alarm

This parameter set the Low Temperature alarm for the first day. The LED Low Temperature Alarmblinks while setting this parameter.

- Range: 0° - 50° C / 32° - 132° F

2.3.11 to.d - To day

This parameter set the last day for ending the curves for High/Low Temperature alarm.

- Range: 1 - 999

2.3.12 to.H - To high temperature alarm

This parameter set the High Temperature alarm for the last day. The LED High Temperature alarm blinks while setting this parameter.

- Range: 0° - 50° C / 32° - 132° F

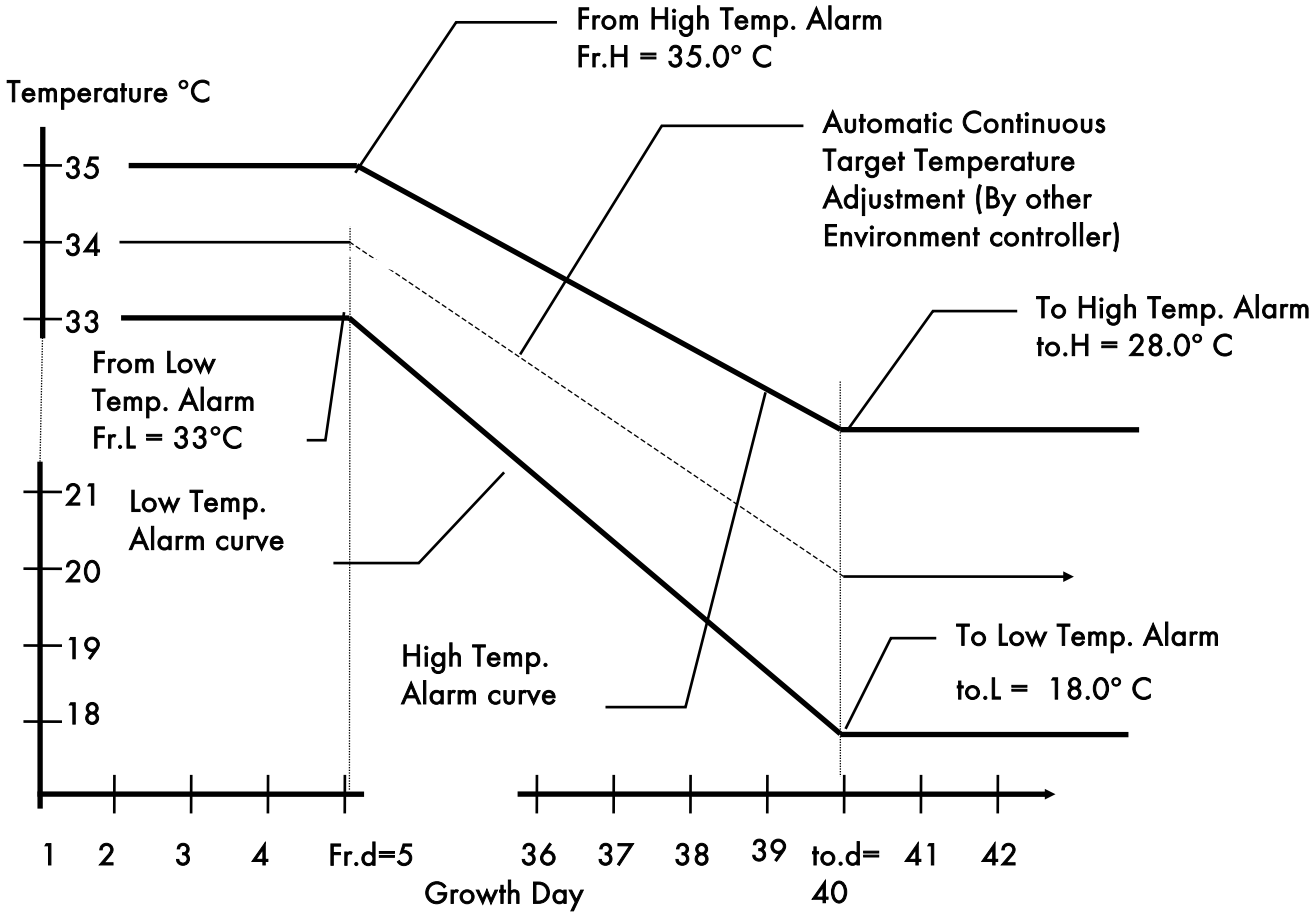
2.3.13 to.L - To low temperature alarm

This parameter set the Low Temperature alarm for the last day. The LED Low Temperature Alarm blinks while setting this parameter.

- Range: 0° - 50° C / 32° - 132° F

The RBU-3 has an automatic temperature adjustment feature. This permits you to set the High/Low temperatures limits for the entire flock growth period, and let the RBU-3 adjust the temperatures for you each day.

Attached is a diagram for the curve definition (6 points):



As shown in the figure above, High/Low Temperature Alarm is constant up to the first day (Fr.d = 5) of automatic temperature adjustment. The RBU-3 then automatically adjusts the alarms high/low temperature set points each day (also during the day) up to the last day of automatic adjustment (to.d = 40). In the figure, the first day is 5 (Fr.d = 5), and High Temperature is 35.0°C. As long as the growth day is less than or equal to five, the RBU-3 keeps a high temperature alarm of 35.0°C. Last day is set to 40 (to.d = 40) with high temperature alarm of 28.0°C. From growth day 40 and on the high temperature alarm will be 28.0°C. (These numbers are an example only; your settings may be different.)

The same with low temperature alarm in this example till day 5 the low temperature alarm is 33°C, between days 5 and 40 there is a linear curve, and after day 40 the low temperature alarm is 18°C.

2.4 Setting mode

The SETTING MODE is used for setting the parameters according to which the user wishes to operate his barn. Press the SELECT key to choose between the setting options (note that the setting options have a yellow background on the panel of the controller). The guide light will blink and indicate the chosen option. To choose another option, press the SELECT key.

After choosing the desired option, use Up & Down arrow keys to adjust the desired parameter.

After adjusting parameters, press **SELECT** repeatedly to return to the OPERATION MODE. If you do not do this, the controller will return to the Operation Mode, automatically, after about two minutes during which it maintains normal operation.

2.4.1 Setting Options

- High Temperature Alarm
- Low Temperature Alarm
- Growth Day Setting

2.4.1.1 High temperature alarm

If the CUR hidden parameter is set to 0, this parameter sets the High Temperature Alarm (the temperature at which the user wants the alarm for high temperature to start functioning). If the inside temperature increases above the set temperature, a blinking message is displayed, and the Controller operates the fans. If after the time delay set by the user, the temperature does not decrease, the alarm system will start operating.

- Default Value: 40.0 C° (104 F°)
- Minimum Value: 0
- Maximum Value: 132

NOTE When setting High Temp. Alarm, the minimum possible value is limited by the low Temperature Alarm setting. This means that the grower cannot set a value for High Temperature Alarm under the value for Low Temperature Alarm. The minimum difference between the two values must be at least 1° C.

If Hidden parameter CUR = 1 than the line High Temperature Alarmwill only display what is the current High Temperature Alarm according to the curve defined by the hidden parameters and there is not possible to set it.

2.4.1.2 Low temperature alarm

If the CUR hidden parameter is set to 0, this parameter sets the Low Temperature Alarm (the temperature at which the user wants the alarm for Low temperature to starts functioning). If the inside temperature decreases under the set temperature, a message will be displayed and the Controller will operate heaters. If after the delay time set by the user the temperature does not increase, the alarm system will start functioning.

- Default Value: 10.0° C (50° F°)
- Minimum Value: 0
- Maximum Value: 132

NOTE When setting Low Temperature Alarm the maximum value is limited also by High Temperature Alarm setting. That means that the grower cannot set a value for Low Temperature Alarm above the value for High Temperature Alarm. The minimum difference between the two values must be at least 1°.
If Hidden parameter CUR = 1 than the line Low Temperature Alarmwill only display what is the current Low Temperature Alarm according to the curve defined by the hidden parameters and there is not possible to set it .

2.4.1.3 Growth day setting

Press Select and go down to Growth Day line and Use UP and DOWN arrow keys to change the growth day. Press Select to return to OPERATION MODE.

2.5 Time setting

To display the time, the controller must be in OPERATION MODE first. When that is done, press the Down and Select arrow keys simultaneously for about 2 seconds. The display will show hh:mx (for example 15:3x is hour 15 and 3x minutes while x is not shown because there is only 3 digits display). Press Select again and the hour digits (hh) will blink, Use UP and DOWN arrow keys to change hours. Press Select, then UP and DOWN arrow keys to change minutes (The display will change to xh.mm for the example if the hour was 15:34 than the display will be 5.34 and the 34 will blink for minute setting)

2.6 Alarm delay

Set the delay period between the moment of an alarm cause and the moment when the alarm relay should operate the alarm system.

This delay period enables to stabilize the unit, to eliminate false alarms and in case of High/Low Temperature alarm, to enable the fans/heaters to control the temperature before activating the alarm system.

Alarm Delay Adjustment Procedure

1. To adjust the Alarm delay parameters, the controller must be in OPERATION MODE first.
2. Press and hold **Select** until the alarm led indicator blinks.
3. An AL.d (For Alarm Delay) message will blink alternating with the current set value per minute.
4. Use the Up Arrow and Down Arrow keys to edit the value.
5. Press **Select** to return to OPERATION MODE.
6. If you forget to finish editing with the Select key, the RBU-3 automatically returns to the standard display after a short delay.

- Default Value: 0.5 Minute (30 seconds)
- Minimum Value: 0
- Maximum Value: 9.9

3 Alarms operation

Munters' RBU-3 can provide an alarm for six different alarm sources (sensor failure, "SF" not included). The message that indicates the alarm source will be displayed, alternating with INSIDE TEMPERATURE as soon as there is an alarm. Yet, the alarm relay (and led) will not operate until the set alarm delay is not over. The alarm messages (listed also on the front panel) are as follows:

- P1, P2, P3: Phase 1, Phase 2 or Phase 3 failure, respectively.
- L0: Low temperature alarm
- HI: High temperature alarm
- A1, A2: Auxiliary 1 or Auxiliary 2 alarm

NOTE In situations where there are multiple alarm sources, the complete list of alarm sources appear blinking, alternating with the current inside temperature.

3.1 P1, P2, P3

When the voltage on phase 1, phase 2 or phase 3 goes below 180V (for 230V unit), the message P1, P2 or P3 or both (it depends what phase voltage failed) are blinking. Once the alarm delay is over, if the phase does not return to normal operation, the alarm relay operates the alarm system.

NOTE The voltage for P2, P3 alarm is setting by hardware (2 trimmers on the power board), and for P1 is setting by hidden parameter PrC. See Table 1 for more information.

3.2 LO

When the inside temperature decreases below the Low Temperature alarm setting minus heater hysteresis, the alarm message "LO" starts blinking alternating with inside temperature. Once the alarm delay is over, if the inside temperature does not raise above Low Temperature alarm setting, then the alarm relay operates the alarm system.

3.3 HI

When the inside temperature increases above the High Temperature alarm setting plus fan hysteresis then the alarm message "HI" start blinking alternating with inside temperature. Once the alarm delay is over, if the inside temperature does not decrease under High Temperature alarm setting, then the alarm relay operates the alarm system.

3.4 A1, A2

The RBU-3 has two Aux inputs to connect external systems alarm. Connect the dry contact output of the external system to COM and to one of the auxiliary inputs (AUX 1 for example). If the external system does operate the alarm (contact close) then the message "A1" starts blinking alternating with inside temperature. Once the alarm delay is over, if the external system alarm still works, the alarm relay will operate the alarm system.

3.5 Alarm Reset

When the alarm relay is operating it is possible to reset the alarm by pressing any key. Doing this the alarm relay will stop operating the alarm system. Still the alarm led indicator remains lit and the alarm message remains flashing until the source of alarm is removed.

4 Temperature Sensors

Munters' RBU-3 can work with one or two temperature sensors. Proper sensor deployment should be inside the coop. If one sensor is used, RBU-3 works according to its temperature reading. If two sensors are used, RBU-3 works according to the average of the two. If two are installed and one is faulty, RBU-3 works safely according to the working sensor.

4.1 Faulty sensors

- If all the temperature sensors that were installed (one or two) are faulty, a blinking ERROR message ("SF") apprears. This message ceases after installing at least one good sensor.
- If two sensors were installed and only one is faulty, a blinking ERROR message will be ("SF") appears, alternating with the INSIDE TEMPERATURE read by the working sensor.

To identify the faulty sensor and to remove the blinking message:

1. In OPERATION MODE, press the **UP** key and then press **SELECT** and keep them pressed simultaneously for about two seconds. The display alternates between the current inside temperature and the sensor number.
2. Press **SELECT** to display the second sensor.
3. Return to OPERATION MODE by pressing **SELECT** once more.

A faulty sensor will read 32 F° (or 0 C°). If any of the two sensors shows this value, it means that it is defective and should be replaced (if required) (the user can keep the controller running safely with one sensor). At the end of this procedure, the ERROR ("SF") message stops blinking.

4.2 Temperature sensors calibration

When installing or replacing a RBU-3, calibrate the temperature sensors. To do this:

- Use an accurate thermometer.
- Place it near the temperature sensor.
- Make sure that the inside temperature is stable. (No heater, etc.)
- Calibrate the temperature sensor immediately.

4.3 Calibration procedure

1. Press the UP Key and then press SELECT and keep them pressed simultaneously for about two seconds. The display will alternate between the current inside temperature and the sensor number.
2. Use the UP or DOWN Keys to calibrate the sensor according to the thermometer reading.
3. Press **SELECT** to display the second sensor, use the UP or DOWN Keys to calibrate.
4. Press **SELECT** to return to Operation Mode.

NOTE A disconnected sensor will display 32 F° or 0 C°. In this case, do not attempt to calibrate this sensor.

5 Technical Specifications

Input Power Voltage	One Phase
	• 110 VAC (USA and Canada)
	• 240 VAC (ROW)
	0.2 Amp, 50-60 Hz
Heater Output	5 AMP; Normally open relay
Fan output	5 AM; Normally open relay
Alarm Output	3 AMP; Normally close relay
Operating Temperature Range	0÷C to 50÷C (32÷F to 132÷F)
Enclosure	Water and dust tight, IP-55
Fuses	Main fuse: 0.315 Amps T
	Others: 5 Amp T

Environmental Protection

Recycle raw materials instead of disposing as waste. The controller, accessories and packaging should be sorted for environmental-friendly recycling. The plastic components are labeled for categorized recycling.

6 Installation

WARNING! Only an authorized electrician should install the RBU-3. Power must be disconnected to avoid electrical shock and damage.

CAUTION To avoid exposing the RBU-3 to harmful gases or high humidity, it is recommended to install it in the service room.

Installation Category (Overvoltage Category) III

6.1 Mounting

The power supply to the controller should be protected by 5 Amps circuit breaker

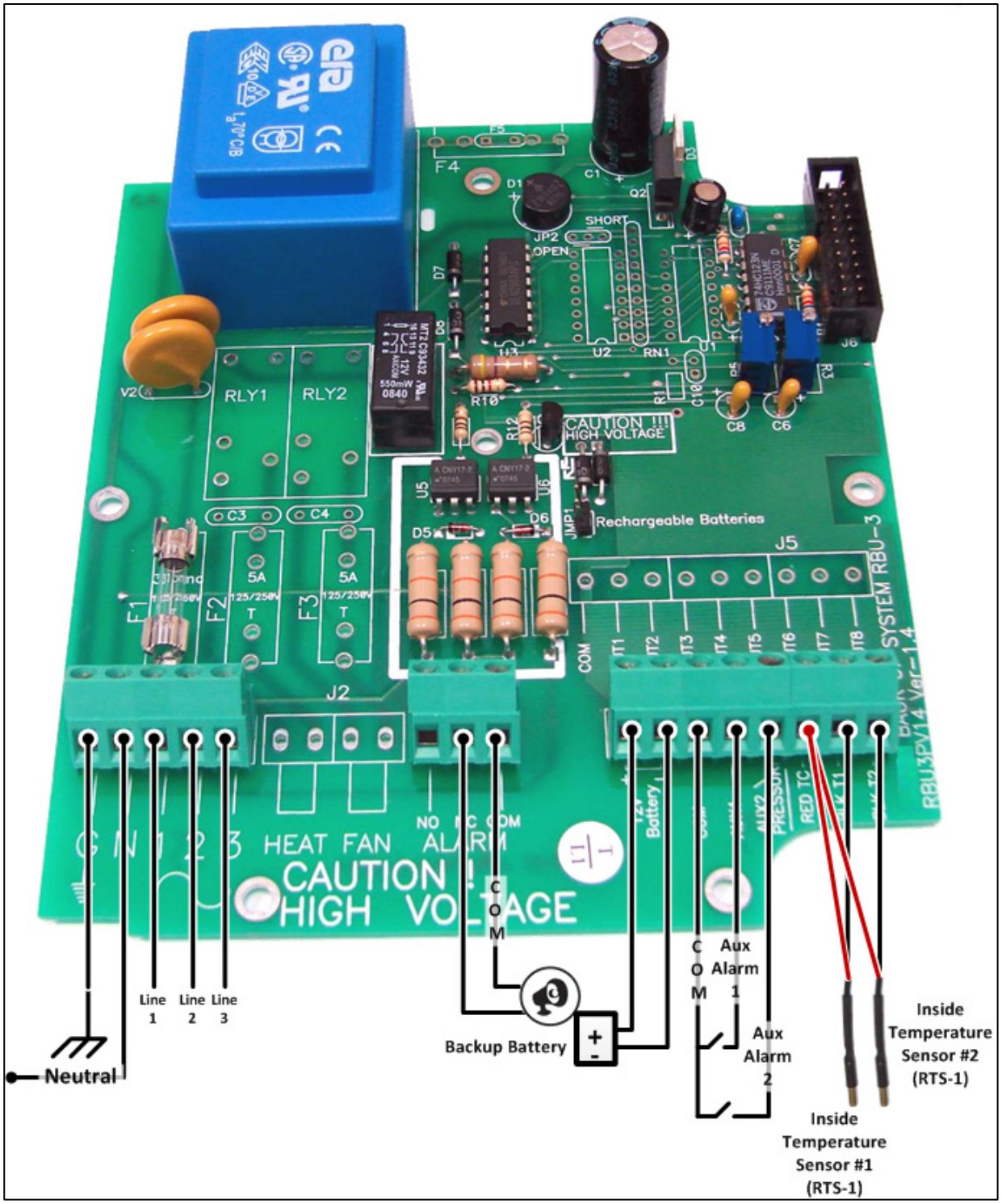
1. Open the enclosure lid by removing the two left-hand side screws in the front.
2. Mount RBU-3 to the wall, using the three supplied screws through the mounting holes (Figure 2).
3. Place the required cables through the cable holders at the bottom of the unit. Connect the wires according to the wiring diagram.
4. To connect the temperature sensors, use the two shielded conductors #18-#24 gauge cable.
5. Close the lid carefully and tightly. Use RTV silicon or equivalent sealant to seal the cable holders.
6. After installation is completed, operate RBU-3 for a few hours and check the operation.

6.2 Wiring diagram

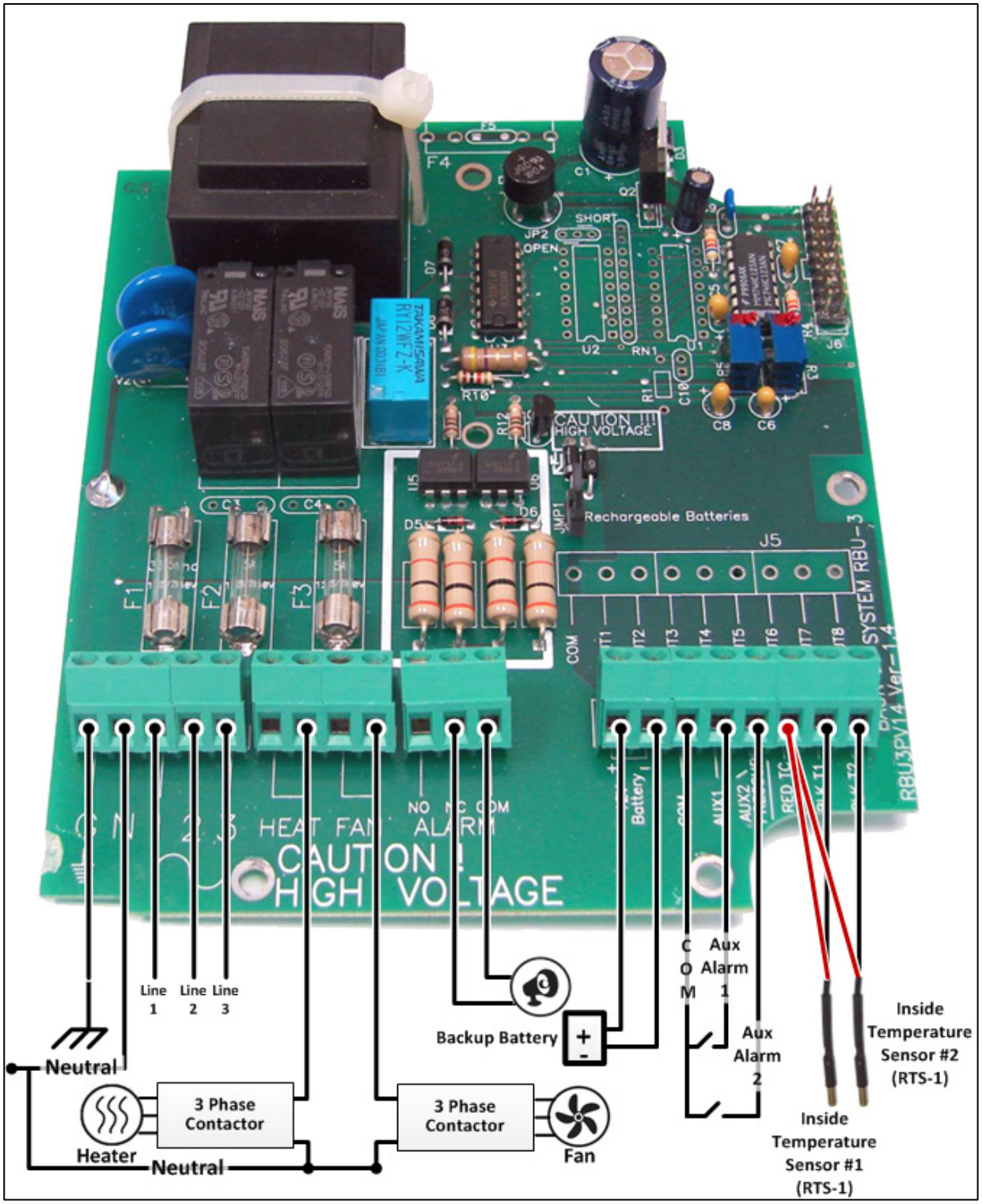
- RBU-3A wiring
- RBU-3B wiring

WARNING! Munters products are designed and manufactured to provide a reliable operation. Strict tests and quality control procedures are applied to every product. Yet, a failure might occur, beyond our control. The user should take this into account. As these products are designed to operate climate control systems in livestock confined environments -where a failure may cause a severe damage - the user should provide adequate back-up and alarm systems to operate vital climate control systems and to support livestock even in case of a Munters system failure. Neglecting to provide such back-up systems will be considered as the user's responsibility to accept the risk of loss, injury and financial damage!

6.2.1 RBU-3A wiring



6.2.2 RBU-3B wiring



7 Warranty

Warranty and technical assistance

Munters products are designed and built to provide reliable and satisfactory performance but cannot be guaranteed free of faults; although they are reliable products they can develop unforeseeable defects and the user must take this into account and arrange adequate emergency or alarm systems if failure to operate could cause damage to the articles for which the Munters plant was required: if this is not done, the user is fully responsible for the damage which they could suffer.

Munters extends this limited warranty to the first purchaser and guarantees its products to be free from defects originating in manufacture or materials for one year from the date of delivery, provided that suitable transport, storage, installation and maintenance terms are complied with. The warranty does not apply if the products have been repaired without express authorisation from Munters, or repaired in such a way that, in Munters' judgement, their performance and reliability have been impaired, or incorrectly installed, or subjected to improper use. The user accepts total responsibility for incorrect use of the products.

The warranty on products from outside suppliers fitted to **RBU-3**, (for example sensors, cables, thermostats, etc.) is limited to the conditions stated by the supplier: all claims must be made in writing within eight days of the discovery of the defect and within 12 months of the delivery of the defective product. Munters has thirty days from the date of receipt in which to take action, and has the right to examine the product at the customer's premises or at its own plant (carriage cost to be borne by the customer).

Munters at its sole discretion has the option of replacing or repairing, free of charge, products which it considers defective, and will arrange for their despatch back to the customer carriage paid. In the case of faulty parts of small commercial value which are widely available (such as bolts, etc.) for urgent despatch, where the cost of carriage would exceed the value of the parts, Munters may authorise the customer exclusively to purchase the replacement parts locally; Munters will reimburse the value of the product at its cost price.

Munters will not be liable for costs incurred in demounting the defective part, or the time required to travel to site and the associated travel costs. No agent, employee or dealer is authorised to give any further guarantees or to accept any other liability on Munters' behalf in connection with other Munters products, except in writing with the signature of one of the Company's Managers.

WARNING: In the interests of improving the quality of its products and services, Munters reserves the right at any time and without prior notice to alter the specifications in this manual.

The liability of the manufacturer Munters ceases in the event of:

- dismantling the safety devices;
- use of unauthorised materials;

- inadequate maintenance;
- use of non-original spare parts and accessories.

Barring specific contractual terms, the following are directly at the user's expense:

- preparing installation sites;
- providing an electricity supply (including the protective equipotential bonding (PE) conductor, in accordance with CEI EN 60204-1, paragraph 8.2), for correctly connecting the equipment to the mains electricity supply;
- providing ancillary services appropriate to the requirements of the plant on the basis of the information supplied with regard to installation;
- tools and consumables required for fitting and installation;
- lubricants necessary for commissioning and maintenance.

It is mandatory to purchase and use only original spare parts or those recommended by the manufacturer.
Dismantling and assembly must be performed by qualified technicians and according to the manufacturer's instructions.

The use of non-original spare parts or incorrect assembly exonerates the manufacturer from all liability.

Requests for technical assistance and spare parts can be made directly to the nearest Munters office. A full list of contact details can be found on the back page of this manual.

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