

FROSTPROTECTOR +2 ALARM UNIT (FP+2)

1.0 SPECIFICATION

Supply	12VAC (230VAC boxed version)
Battery Volts	9v DC nominal.
Battery type	PP3 rechargeable.
PCB connection	Plugable screw terminals 2.5mm capacity.
Temperature ranges	HT +15°C to -30°C LT 0°C to -30°C Other ranges by special order.
Temp. alarm inhibit timer	1 - 30 mins (1 - 60 to order).
Volt free alarm contact	240v 7A (resistive), 2A (inductive).
Probe type	P.T.C. 1.5m long (compatible with Eliwell type PELE 320)
Fault inputs	Volt free contacts only.
Locked in switch	Latching switch fitted with flashing L.E.D.
Sounder	90 dB. Output at 1 metre, with mute function. Person trapped alarm cannot be muted.
Standard indicators	Power on. Power Fail. Unit fault. Temperature fault. Defrost on. Person trapped.
Optional indicator	Can operate as indicator or indicator with alarm.

2.0 LOCKED-IN SWITCH ASSEMBLY

2.1 The locked in switch supplied with the FP+2 includes a flashing L.E.D. location indicator and should be mounted in an unobstructed position adjacent to opening side of the Coldroom door. When the alarm unit is powered, the indicator will flash continuously. The switch contact is n/c so turning the switch ON to operate the indicator and alarm on the remote panel opens the circuit i.e. 10V at terminal 2 is turned off. The sounder cannot be muted during a locked in alarm. For connection details see diagram 3.10

2.2 If the locked in switch is not fitted, link together terminals 1 and 2 at the P.C.B (or the corresponding panel terminals.)

3.0 INSTALLATION / CONNECTION OF THE FP+2

3.1 Mount the FP+2 in a convenient position where the sounder/indicator will not be obscured and away from unduly hot or wet conditions. Do not locate the unit too high for the mute button to be operated.

3.2 The unit is not sealed against water ingress and should not be used in wash down areas.

3.3 The FP+2 requires a 12VAC supply, nominally 1 amp. Consumption is around 100 mA max.

3.4 Connect the locked in switch as 2.1

3.5 Fit the alarm probe in the Coldroom, in a position away from the coldroom door or draughts from the evaporator fans. Make sure the connections to the probe are made outside the coldroom and that they are sealed to prevent moisture causing malfunction.

3.6 Connect the probe to the alarm unit with either twin or twisted pair cable at least 0.5 mm c.s.a. Locate the cable away from mains cables as much as possible. Do not use spare multicore cables. If the run exceeds 50m, use a larger (1.5mm) or screened cable to connect. The probe is not polarised - can be connected either way.

3.7 Connect any remote siren or BMS cables to volt free terminals 13, 14, 15 as required.

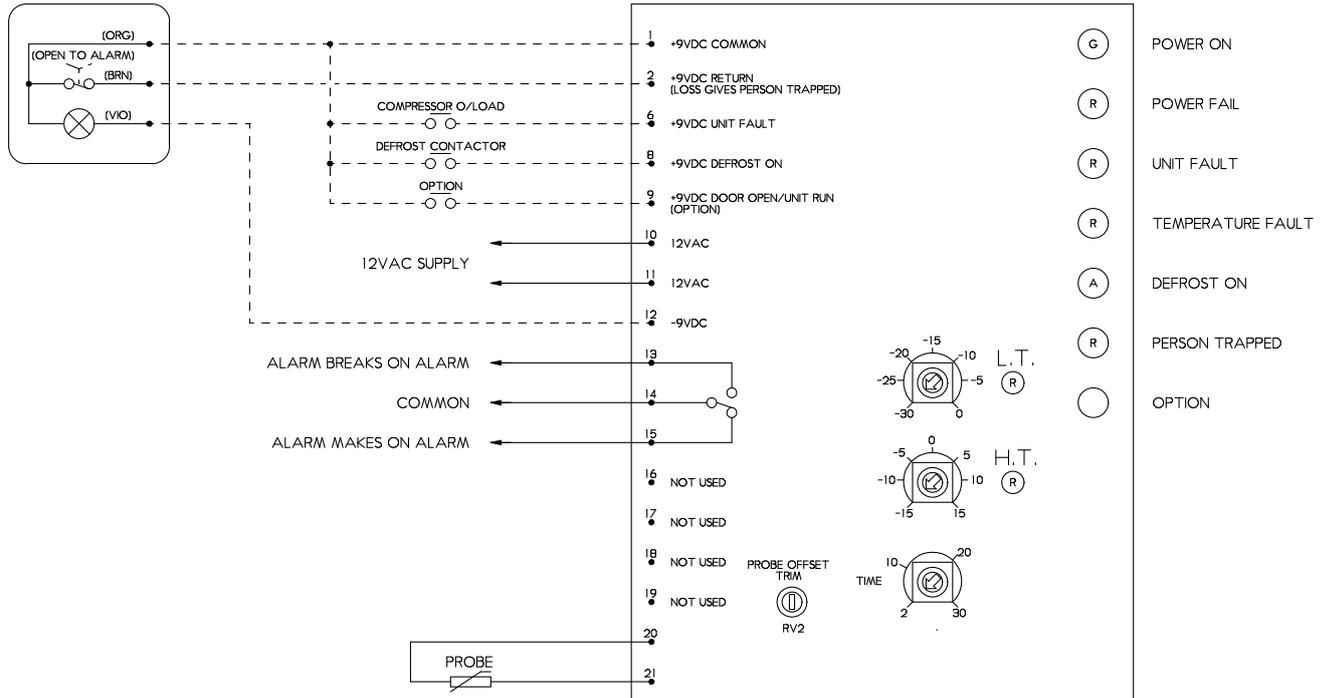
3.8 If the unit is stand alone, connection may also be required for defrost, unit fault, door open or unit run etc. Make these connections from T1 (+10V) to the appropriate inputs via volt free contacts only. IMPORTANT: Mains inputs must not be connected to the unit or permanent damage will result.

3.9 See connection diagram 3.10 for relevant detail.

3.10

PERSON TRAPPED SWITCH

FROSTPROTECTOR +2



4.0 SWITCHING ON

4.1 Set the H.T. control above the anticipated temperature and the L.T. control below the same point.

4.2 Set the time delay control to minimum (Approx. 1 minute).

4.3 Connect the battery clip to the PP3, the Power Failed indicator flashes and the alarm sounds. Press Mute to silence. If the Locked In indicator also operates, either turn off the Locked In switch in the coldroom or link together terminals 1 and 2.

4.4 Turn on the mains supply, Power Failed goes out Power On lights.

4.5 If the coldroom is above the temperature set on the H.T. scale, the small indicator on the P.C.B. will light and after the set delay period the alarm sounds and the Temperature Fault indicator flashes. Either wait until the temperature drops or increase the H.T. setting to stop the alarm.

4.6 Other indicators may light depending on the inputs applied.

5.0 SET PROCEDURE

5.1 The controls for H.T./ L.T. and delay time need to be set correctly during commissioning.

5.2 The timer starts when a temperature fault occurs and prevents the alarm operating for the period set. After commissioning, make sure the timer is set to some reasonable value, say 10 minutes, to prevent nuisance calls.

5.3 When the coldroom temperature drops to the control point, turn the H.T. control anticlockwise until the small H.T. indicator adjacent lights. This point on the temperature scale should approximately coincide with temperature of the room. It is usual to set the alarm temperature 5 - 10°C above the control temperature. The L.T. control is similarly set 5 - 10°C below the control temperature.

5.4 If the small set LED's operate at a significantly different temperature to the room temperature, this may be due to length of connecting cables, etc. and in this case the control should be set at the point on the scale where it is required operate, and the small control marked Trim should be moved until the set L.E.D. just operates

5.5 The temperature scale is now the same as the coldroom temperature, for both L.T. and H.T. scales. Set the alarm temperatures above and below the setpoint temperature as 5.3. above.

5.6 The locked in switch operates the alarm directly, there is no delay nor any mute facility. The switch opens to alarm so a broken wire or faulty connection will operate the alarm. If the switch is not required, link terminal 1 and 2 to prevent the alarm operating.

6.0 TROUBLE SHOOTING

IMPORTANT - Do NOT use a Megger or other voltage source to check the probe or cables with the FP+2 connected or permanent damage will occur. It is easy to disconnect the FP+2 by pulling out the plug-in type terminals.

6.1 Check the battery occasionally by turning off the mains to the P.C.B. The Supply Failed indicator should light and the siren sound. If not the battery may need replacing. Use only rechargeable NiCad PP3 type, do not fit a dry battery. With the mains on the voltage at the battery terminals should be 10.1V.

6.2 IF THE H.T. ALARM IS PERMANENTLY ON

First check the temperature in the room. If it is correct check the alarm setting temperature is 5 - 10°C higher than the room temperature. If this is also correct, note the set temperature then turn the control clockwise to check whether the alarm turns off. If it does, check the alarm setting point as 5.3, 5.4 above. Check the L.T. control operates at approximately the same temperature as the H.T.

6.3 If the alarm will not turn off during the above procedure, check the P.C.B operation follows. Short together terminal 20, 21. If the P.C.B is working and H.T. indicator should go off and the L.T. should turn on instead. If this occurs it means the P.C.B. is working correctly and the fault is therefore in take probe or connecting leads.

6.4 With the probe disconnected (unplugged) from the P.C.B use a multimeter to check the resistance of the probe, which should be in the range below according to the room temperature:

+5°C	842R
0°C	807R
-5°C	773R
-10°C	740R
-15°C	708R
-20°C	677R

6.5 If a corresponding value is not seen, the probe itself should be checked after disconnecting. If need be connect the probe directly to terminals 20, 21 of the P.C.B and recheck. If the probe is satisfactory, the fault lies in the connecting cables or terminals.

6.6 L.T. SET-UP INDICATOR AND TEMPERATURE ALARM PERMANENTLY ON

Carry out a similar procedure to 6.2 above, but move the L.T. adjuster anti-clockwise to see if the L.E.D. will turn off.

6.7 If the H.T. indicator remains on it is likely that the fault is open circuit or high resistance where as on L.T. fault would indicate a short circuit or low resistance. Moisture on the connecting terminals is liable to cause a L.T. fault.

6.8 LOCKED IN ALARM PERMANENTLY ON

- Check that the locked in switch is not turned on and there is no one trapped in the room !!
- Short together terminal 1 and 2 at the P.C.B the alarm should turn off. If not the fault is on the P.C.B. which should be replaced (See end of section).
- If the alarm DOES turn off with the terminals connected together, this indicates an OPEN CIRCUIT fault in the switch or the connection to it.
- Check whether the L.E.D. in the locked in switch itself is flashing, if not the cable or the connection may be checked at any point by shorting the 10v wires together to see if the alarm stops.

6.9 LOCKED IN ALARM FAILS TO OPERATE

- Check that at least 8v DC is present between terminal 1 and 17 on the P.C.B. (If not see 6.11)
- Disconnect the wire from terminal 1, the alarm should operate. If not the P.C.B. is faulty and should be replaced (see end of section.) If the alarm does operate, the fault is in the connections to the switch, where there is probably a SHORT CIRCUIT or faulty switch. Check by disconnecting the wires from the switch and testing separately.

6.10 POWER FAILED INDICATION DOES NOT LIGHT WHEN MAINS SUPPLY IS REMOVED

6.11 Remove the battery clip and with the mains supply on check the voltage on the clip itself which should be 10.1v DC. With the clip removed, check also the battery volts, should be between 8 and 9 volts, if it has dropped below 8v the battery should be replaced (see end of section). If the voltage at the clip is not approximately 10.1v DC check that the mains is available, and that the AC input to terminals 10, 11 is 12v AC approximately NOTE. Discharged battery will take about 18 hours to be fully recharged, although the terminal voltage of a serviceable battery would return above 8.5v after approx one hour charge.

6.12 Other inputs to the P.C.B may be checked by operating the appropriate contact manually or by linking the relevant to +v at P.C.B terminal 1.

6.13 MUTE DOES NOT OPERATE

Make sure the Person Trapped is not on at the same time as other fault indication, if it is on, it will prevent the mute operating. Other than this, the P.C.B will need to be replaced.

6.14 CHECKING THE TIMER

- a) The delay timer only operates with a high or low temperature fault.
- b) First note the set point of the timer and the H.T. controls. Move the timer control to minimum then move the H.T. control anticlockwise until the red set light comes on. After a delay of 1 to 2 minutes the alarm should operate. Return both the controls to their original settings.
- c) NOTE - A Defrost On signal always inhibits the temperature alarms. When the defrost input goes off and a temperature fault is still present, the timer will start and the alarm will operate after the set delay. In other words a temperature fault will not operate during a defrost period, nor for the set delay after a defrost.

6.15 H.T. ALARM SOUNDS FOLLOWING A DEFROST.

This will be due to the delay timer interval not set long enough to allow the coil to re-cool following a defrost. Increase the time period; usually 10 minutes is sufficient.

6.16 VOLT FREE CONTACTS.

These operate when any alarm condition is present. The changeover contact is rated at 7A 240V and can be used to switch a remote siren or beacon, a B.M.S system or an auto-dial-out unit, any of which can be supplied as extras, pre-checked for correct operation, by Frostechnic. A range of extension repeater equipment is available on request.

6.17 REPLACEMENT P.C.B.

- 1) Unplug the battery clip.
- 2) Remove the mains supply.
- 3) Unplug all terminal strips at the left hand side of the P.C.B. by pulling carefully to the left.
- 4) Make a note of the temperature and timer settings.
- 5) Pull off the black cap on the mute switch and undo the front retaining nut.
- 6) Pinch together the P.C.B. retaining clip tags above and below the terminal strips, and while they are depressed, pull the P.C.B. clear of the clips.
- 7) The L.E.D. indicators are clipped into the black bezels. Pull the P.C.B. carefully but firmly backwards to withdraw the indicators and free the board from the front plate.
- 8) Remove the mute switch cap and one nut from the replacement board.
- 9) Insert the LED's into the bezels, making sure the indicators and the switch line up correctly and click the LED's into the bezels. Line up the retainers on the L.H.S. and push the board onto them. Replace the front nut and cap on the mute switch replace the terminal connectors. Reset the controls to their original settings, turn the mains back on and replace the battery clip.
- 10) Return the faulty P.C.B. with a note of the fault to Frostechnic. (see section 1.1.)

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