PHASEFALE
JouleAlarm

Introduction

Thank you from Phasefale and congratulations of your purchase of Joule Alarm, a lot of research has help us to develop a unique controller that is capable of alarm temperature, pressure and humidity in rooms and in other atmospheres as well as controlling them.. This precision controller has unique communication, logging and other capabilities. The keyboard and browser based access of all controller settings and interactions make Joule Alarm a powerful control yet simple to use and reliable in operation. These characteristics make the Joule Alarm an ergonomic system for monitoring and alarming temperature and other inputs.

Display/Keyboard operation: Summary

Display shows temperature with 0.1°C or 0.1°F decimal precision
Display flashing temperature indicates a current or previous alarm
Large alarm LED flashes on/off during alarm or steady on during alarm acknowledge
Decimal point below small digit flashing indicates a network alarm
Lower right hand decimal point of small digit indicates control output (usually cooling) in ON
Alarm ack: Press > to acknowledge prior alarms and set temp display to steady

Accessing programmable settings: The Joule alarms architecture has 3 levels of programmable settings UL, AA1 and Lod, to unlock AA1 hold M and > keys for 10 seconds, to unlock, to unlock Lod hold M and > keys for 20 seconds.

Programming Joule Alarm

Joule Alarm can be programmed via the red rubber keyboard interface on the joule alarm or via the networked Joule Alarm web browser interface, although only parameters indicated with a bracketed abbreviation (e.g. High Alarm Temp [AH]) on the browser pages are available to be set via the keyboard. All the basic parameters required for regular alarm can be set via the keyboard. Certain parameters (e.g. email address) are only able to be set via the web browser interface.

Controlled outputs

Specialized room temperatures and other atmospheres can be continually monitored and temperature controlled by the joule alarm. The input temperature is measured then processed by the joule alarm which activates the appropriate output. An example is where the room temperature is regulated by controlled outputs such as switching on/off heating and cooling. This is demonstrated by Figure 1 and Figure 2 where the cut in and cut out of the can be reversed for different room scenarios.
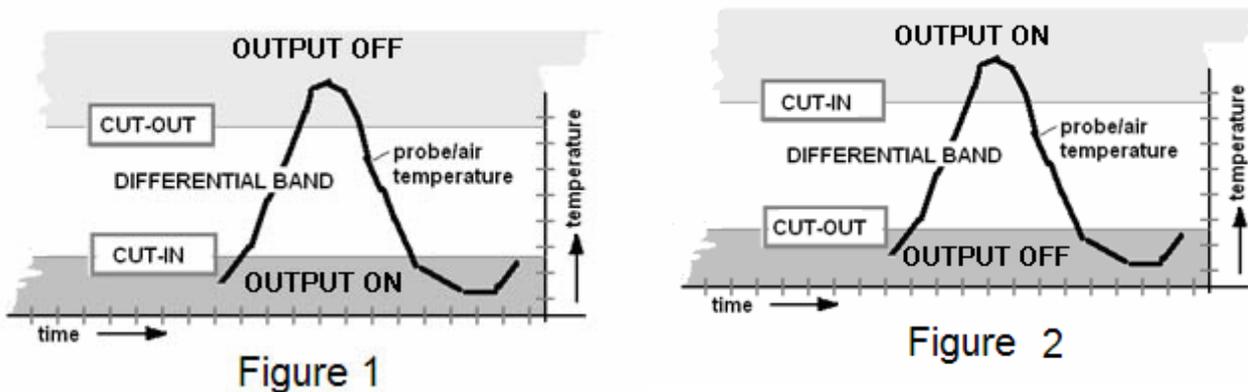

Figure 1

Figure 2

Figure 1 represents the typical set up for heating relay output, as the room heats up the heating the heating output cuts out as the room no longer needs more heating, and as the room cools down the heating cuts in bringing the temperature back up. To provide this kind of control set the CUTIN setpoint BELOW the cutout.

Figure 2 represents the typical set up for a cooling relay output, as the room heats up it the cooling output cuts in and lowers the temperature of the room, as the room cools down the cooling cuts out as it is no longer required anymore. To provide this kind of control set the CUTOUT setpoint BELOW the cutin.

LED Display programmable settings architecture

Abbreviations meanings listed in the tables below
These settings can also be programmed using the browser
Detailed information on the functions and meanings of the keyboard menu items is described in the Joule Alarm Browser Settings section.

Example 1. Programming a room using the keyboard settings

Joule Alarm the basic programming steps are:
a) To unlock the Joule Alarm and alter the settings, press M and ► together for 10 seconds. AA1 will be displayed to indicate that the system is unlocked.
b) After the Joule Alarm is unlocked press M until the setting you wish to alter is displayed.
c) After the setting to be adjusted is displayed, you can increase or decrease the setting by pressing ▲ or ▼ until the numerical value required is displayed.
d) To store the changed value, press the M button. The new value is now stored indefinitely and will remain during power loss.
e) If no button is pressed for 60 seconds the Joule Alarm will once again lock itself and further alterations will be disallowed until unlocked again. This will also occur if the > key is pressed during the programming operation.
Remember to store each altered value using M otherwise the programmed setting will be lost

Joule Alarm Keyboard Roadmap

To unlock UL hold ▶ and Ⓜ for 5s

To unlock AA1 hold ▶ and Ⓜ for 10s

To unlock hold LOD ▶ and Ⓜ for 20s
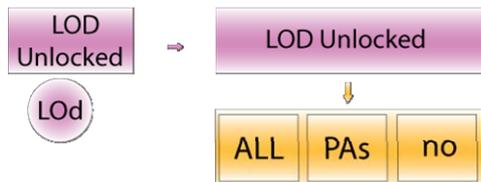
To move across memory settings press Ⓜ

To change settings parameters or mnemonics press ▼ or ▲

Legend

- UL programable settings
- AA1 programable settings
- LOd programable settings
- Numeric Parameters
- Mnemonics

UL Unlocked	→	AF(1-8)	→	AH (1-8)	→	AL(1-8)	→	At(1-9)

UL

nu	nc	no
ta	tn	LPA
LPn	HPA	HPn

AH	AL	At
-99.1 ~ +99.9	-99.0 ~ +99.0	0 ~ 99.9

AA1 Unlocked	→	AA	→	IP1	→	IP2	→	IP3	→	IP4	→	Temperature Units	→	Pressure Units	→	t1n

AA1

AA	IP1	IP2	IP3	IP4	Temperature Units	Pressure Units	t1n
0 to 99.9	0 ~ 255	0 ~ 255	0 ~ 255	0 ~ 255	°C °F	psi Bar	0 to 60 mins

HAh	←	HOP	←	Lop	←	dty	←	dtn	←	dtd	←	t1h

HAh	HOP	Lop	dty	dtn	dtd	t1h
0 ~ 100	AL nu no	0 ~ 99	0 ~ 99	0 ~ 12	0 ~ 31	0 ~ 24 hrs

HAL	→	HAt	→	Buzzer Used / Not Used

HAL	HAt	Buzzer Used / Not Used
0 ~ 100	0 ~ 100	Bnu BuS

LOD Unlocked	→	LOD Unlocked

ALL	PAs	no

Main Settings [UL Keypad menu]

Setting	Display
UL	(Briefly) indicates controller has entered Unlocked or programming mode.
nu	Not Used
no	Normally Open Alarm Switch
nc	Normally Closed Alarm Switch
ta	Temperature alarm
tn	Monitor Temperature
LPA	Low Pressure Alarm (only available for channels 5 – 8)
LPn	Monitor Low Pressure (only available for channels 5 – 8)
HPA	High Pressure Alarm (only available for channels 5 – 8)
HPn	High Pressure Monitor (only available for channels 5 – 8)
AA	Alarm Acknowledge
AF(1-8)	Alarm Function Menu 1 – 8
AH(1-8)	High alarm 1-8
AL(1-8)	Low alarm 1-8
At(1-8)	Alarm time delay

Advanced Settings [AA1 Keypad menu]

Setting	Value Shown
IP1,IP2,IP3,IP4	IP number (IP1 most significant) (Network)
°C /°F	Celsius or Fahrenheit display
Psi / Bar	pound per square inch \ bar
t1n, t1h	Timeclock minutes, Timeclock hours
dtd,dtn,dty	Date days, months, year
Lop	Log period
HOP*	Humidity Function (nu) not used (no) monitor (AL) Alarm
HAh*	Humidity High alarm (0-100) RH%
HAL*	Humidity Low Alarm (0-100) RH%
HAt	Humidity Alarm time delay
Bnu / buS	Buzzer not used=bnu or Buzzer used=bus

Maintenance Settings [LOD Keypad menu]

Setting	Value Shown
ALL	Reset **ALL** user adjustable parameters. [IP to 192.168.160.100]
PAs	Reset admin password for browser programming access
No	Do not load or change memory values

Summary Table Joule Alarm programming items

Item	Menu	Kbd?	Description	Units	Default	Low	High
AH	UL		High Temperature alarm	°C / °F	10.0	-99.0	+99.0
AL	UL		Low Temperature alarm	°C / °F	-20.0	-99.0	+99.0
At	UL		Alarm time delay	Mins.	90.0	0.0	99.0
AA	AA1		Alarm Acknowledge	Mins.	10.0	0.0	99.9
°C / °F	AA1		Celsius or Fahrenheit operation	°C / °F	°C	°C	°F
t1n	AA1		Real time clock RTC minutes	Mins.		0	59
t1h	AA1		RTC clock hours setting	Hours.		0	59
dtd	AA1		RTC clock day setting	Date		1	31
dtn	AA1		RTC month setting	Month		1	12
dty	AA1		RTC year setting	Year		2000	2099
IP1,…4	AA1		Network IP number	192.168.160.100		0	255
Log	AA1		Log Period	Mins.	5	1	60
HAH*	AA1		Humidity High Alarm	%RH	60	0-99%	
HAL*	AA1		Humidity Low Alarm	%RH	40	0-99%	
HAt*	AA1		Humidty Alarm Delay Time	mins	0	0-99 min	
Lod *	LOd		Load memory –no, bus,ALL			no	No/bus/ALL

Description		No	Controller Description	text			35 ch.
Admin pwd		No	Administrator settings password	pass			15 ch.
Email addr.		No	Email events to address				50 ch.
Email type		No	Email events off-0, alarm-1 or all-2	0	0		2
SMTP Srvr		No	Mail server address				30 ch.
Email auth		No	Email acct. require:1 authorization or not:0	0	0		1
Email acct		No	Email account				50 ch.
Email pwd		No	Email account password				15 ch.

## Browser Interface - Joule Alarm Standard Web pages

JouleAlarm has 3 programmable standard pages, each with the following functionality;

Page address	Main Use
/index.html	User access to Joule Alarm, optionally a graph can be displayed on this page. Provides control and alarm
/settings.html (password protected)	Display and setting of primary control, alarm, email
/maintenance.html (password protected)	[only accessed through settings.html page] Import and export of Joule Alarm settings to text file, display and diagnostics of inputs and outputs, Software version display

Example 2. Programming Alarm for multiple points.

A system with multiple points is being setup and we will program using a web browser. From the main page click on programming enter username (admin) and password (pass unless it has been changed) . Give channel 1 the description of Cool Room Temperature and click save settings, then enter the desired high alarm the low alarm and the alarm time delay. Also set the function to Temperature alarm for this point. Click save settings often to ensure you don't lose any changes and complete the channels as required.

Main Page
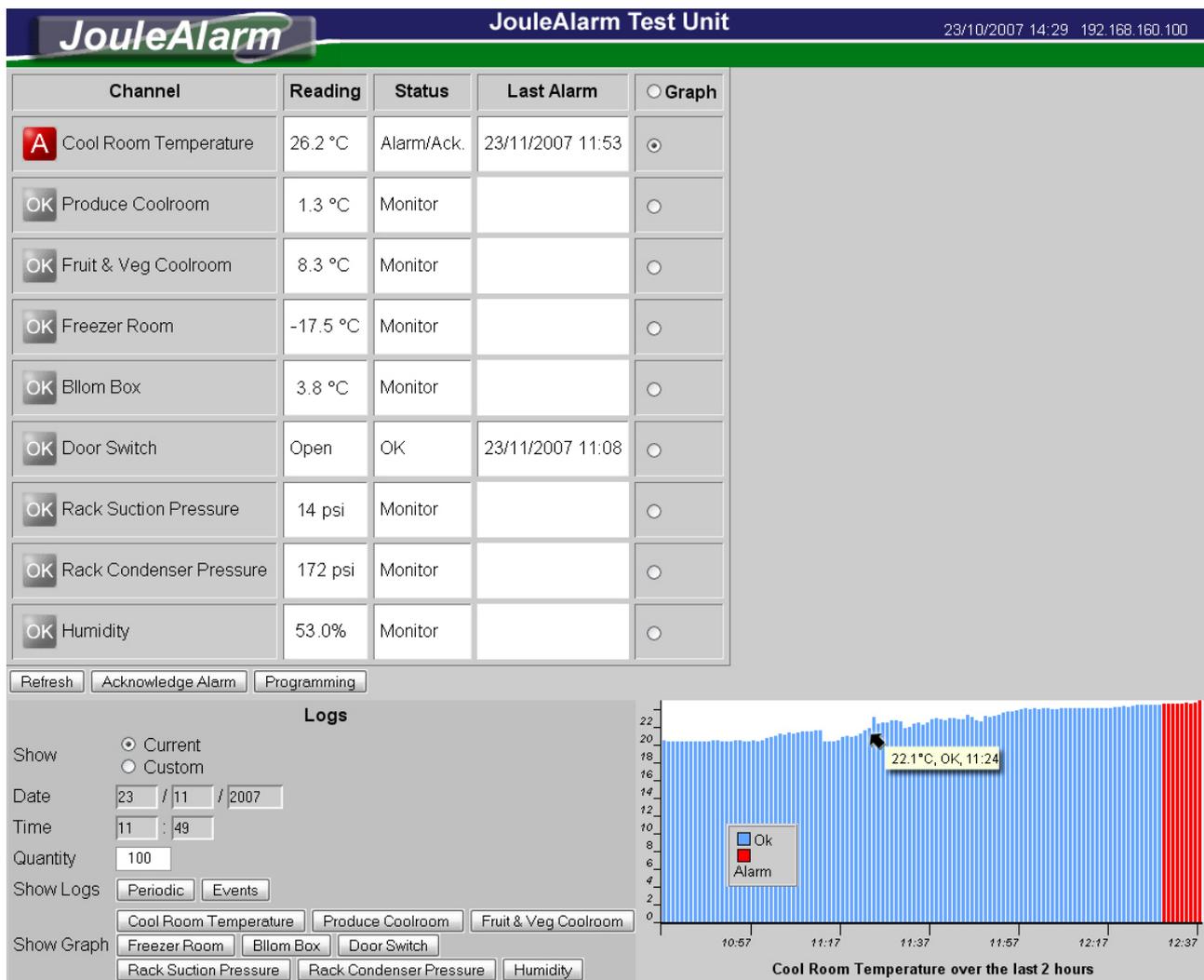
Tips on using the index page:

- *A channels data graph can be turned on and off (speeds refresh time) by clicking on the graph button for the particular channel*
- *Hover mouse over graph to get a time and status pop up information box*
- *Refresh button updates screen with latest information*
- *Acknowledge alarm will suppress alarm output for the programmed AA time (see settings)*
- *Programming links to settings page (username [admin] and password [pass] are required.)*
- *Top bar indicates controller name, its current time and date plus IP settings*
- *Logs can be from present back for a quantity of logs (set by LP logging period)*
- *To log from a specific date and time, click Show custom and enter date and time*
- *Periodic logs generate a table which can be saved and used as import to Excel spreadsheet*
- *Events logs are a chronological record of all Joule Alarm events as they occur.*
- *Alarm status icon changes from Monitor(ok), no alarm, alarm, alarm acknowledge*

Channel Options

Channel: displays the description programmed into the Joule Alarm (up to 32 characters)
Date/Time: displays the date and time as stored in Joule Alarm real time clock (this may be different from your PC's time)
192.168.160.91: displays the IP of the Joule Alarm.
Temperature can be programmed to be shown in Celsius or Fahrenheit.
Current Temperature: main temperature sensor reading. updated every 60 seconds or whenever you press refresh
Alarm status: displays current alarm status: not used (i.e. no alarm function is set), memory (an alarm has occurred and has not been acknowledged), Alarm (temp has been outside the alarm limits for the delay time) or Acknowledged (an alarm is active but has been acknowledged. the alarm will re-initiate after the alarm acknowledge time elapses if it remains outside the limits)
Last Alarm: date and time of last registered alarm on control
Graph: click button to graph function
Channels 1-4 can graph data to browser of n/o switch or n/c switch or temperature
Channels 5-8 can graph data to browser of n/o switch or n/c switch or temperature, Low Pressure or High Pressure

Control Buttons

Refresh: click this button to update the page including all readings and graph.
Acknowledge alarm: click to acknowledge an active alarm (this will put alarm light to steady ON, and security relay to normal. If alarm conditions persist, the alarm will re-activate after the alarm acknowledge period. If an alarm Memory condition is active, clicking Alarm acknowledge will clear the memory condition and alarm will be off.
Programming: access the controller settings. This option requires a username admin & password (default pass)

Logs

Show from current date/time: when checked the graph, Termination sensor, periodic and Events buttons operate from the current time of the Joule Alarm back in time for the quantity of logs set. When unchecked, Joule Alarm uses the date and time as set.
Quantity: sets the number of logs to be displayed separated by the log period (set from 1 to 900 max)

Log Control Buttons

Important! If **log Options** are changed the memory is automatically **cleared** – same function as in the Maintenance Page "Clear All Logs" Button. **Log Period (Lop)** (1-60 Mins.) Change this parameter to set the logging period. Note: changing Lop does NOT clear all logs.
Graph: opens a graph of the main sensor temperature in a separate window. The number of points displayed is set by the quantity option (max=600 depending on browser). Hover over various points to get a pop up reading of the point including temp, control, alarm, defrost and door status. The graph page includes a close button to close the page and return to the main page. Also measures pressure.
Periodic: a table of data including date, time, temp, alarm status for each channel. This data can be saved as a text file and imported into Excel to manipulate the data as required. The periodic data includes a fixed time period (as set by the logging period) for the number of points set in quantity.
Events: a table of event based items with date, time, event, temps status. Events include abnormal or exception events such as alarm, alarm restoral, programming changes, and are stored as they occur.

Graph

The main page automatically displays a graph with the last 120 points (2 hours when logging period is set to 1 minute). A legend is included which details the various status conditions at the time of the log with alarm , displayed by a color code. By hovering over the band, a pop up message displays detailed information including temp, alarm and time.

Graph Legend

Alarm - red: the control is in alarm (highest priority)
OK – blue: no alarm

Settings Page

The majority of Joule Alarm programming items (normal settings, AA settings, general settings are accessed and changed on this page.   To change a setting, enter the desired value in the entry box and click on the save settings button (one at top and at bottom of page). Note: after clicking, WAIT until hourglass has stopped before clicking other buttons (such as main page) as settings re not updated until hourglass stops.

Main Page | Save Settings

Normal Settings

Channel	Description	Function	Alarm High	Alarm Low	Alarm Delay
Channel 1	Cool Room Temperature	Temperature Alarm	24.5 °C	-5.0 °C	0.2 min.
Channel 2	Produce Coolroom	Temperature Monitor			
Channel 3	Fruit & Veg Coolroom	Temperature Monitor			
Channel 4	Freezer Room	Temperature Monitor			
Channel 5	Bllom Box	Temperature Monitor			
Channel 6	Door Switch	Normally Open			0.1 min.
Channel 7	Rack Suction Pressure	LP Monitor			
Channel 8	Rack Condenser Pressure	HP Monitor			

General Settings

Main Description	Joule Alarm Test Unit
Admin Password	pass
Events to Email	All
Send to Email Address	ben.reaby@gmail.com
SMTP Server	192.168.160.2
Server Requires Authentication	☐
Account	sales@phasefale.com.au
Password	sales

Control Output	Sensor	Cutin	Cutout
C Relay	Not Used		
H Relay	Not Used		
F Relay	Not Used		

AA Settings

Alarm Ack. (AA)	99.0	min.
Temperature Units	Celcius	
Pressure Units	psi	
Date Display	dd / mm / yyyy	
Log Period (LOP)	1	min.
Enable Time and Date Change	☐	
Time (24Hr:min)	13 : 15	
Date (dd / mm / yyyy)	23 / 11 / 2007	
Network IP	192 168 160 100	
Gateway IP	192 168 160 001	
Humidity Function	Monitor	
Humidity Alarm High (HAH)	81	%rH
Humidity Alarm Low (HAL)	20	%rH
Humidity Alarm Delay (HAt)	0.2	min.
Buzzer Function	Not Used	

Save Settings | Main Page | Network | Maintenance

Tips on using the setting page:

- *Hover over settings drop boxes to get a pop up information box on the setting*
- *After changing a setting wait until hourglass stops to ensure setting has been updated*
- *The Maintenance pages can only be accessed from the links on this settings page*

Normal Settings

Description: enter a 32 character description of the channel
Function: Choose the type of alarm function channels 1-4 (Not Used, Normally Open, Normally Closed, Temperature Monitor, Temperature Alarm)
Channels 5-8 (Not Used, Normally Open, Normally Closed, Temperature Monitor, Temperature Alarm, Low Pressure, High Pressure, Low Pressure Monitor, High Pressure Monitor)

Alarm High [Ah]: upper limit of normal temperature range

Alarm low [AL]: lower limit of temperature range

Alarm Delay [Ad]: delay time before a temperature alarm occurs (prevents false alarms due to door openings, defrosts etc}

General Settings [no keypad menus for these parameters]

These settings not available via the Joule Alarm keyboard and must be made via the browser interface

Main Description: the name which appears at the top of the page and also in emails sent by Joule Alarm
Sensor S2 Description: a 32 character description (default is Defrost Termination)
Admin Password: 32 character password for setting page access (default is pass). Important Note if this password is lost, it can be reset to "pass" bwith the keyboard LOd menu and selecting the Pas option.
Events to Email: none (do not send emails), All (includes all exception events -e.g. setting change, manual defrost initiate, etc), Alarm (only alarm events)
Send to email address: user account email address e.g. bob@hotmail.com
SMTP Server: server IP address. This address must be on the same subnet range as the Joule Alarm or DHCP and be a fixed IP 192.168.156.21 (Note: as Joule Alarm does not support fully qualified domain names it must be a fixed IP server address)
Server requires authentication: Yes or No
Account: server account (usually same as send to account)
Password: email account password.
Output Control
Sensor: Select the corresponding sensor to the alarm channel
Cut in: Set the temperature that the output switches on
Cut out: Set the temperature that the output switches off

AA Settings

Alarm Acknowledge [AA]: time min minutes that and alarm is suppressed before re-initiating
Temperature units can be either Celsius or Fahrenheit
Pressure units can be either psi or Bar
Date can be displayed two ways
Changing time and date: enter in the new time and new date then click the button enable time and date change
Network IP connect to the computer network
Gateway IP setting is required for external email server addresses.
Humidity Function: choose from monitor, alarm or not used
Humidity High alarm: set the maximum humidity level before an alarm
Humidity Low alarm: set the lowest humidity before an alarm
Humidity Alarm Delay: set the alarm delay
Buzzer can be disabled

Maintenance Page

Tips on using the maintenance page:

- *Software version is displayed top left*
- *Input voltages are displayed which can be checked and compared using a multimeter*
- *Time and date can be set from here directly*
- *Clear all logs clears time and date stamped logs in memory*
- *Load defaults loads defaults into controller as per settings reference table*
- *Export settings generates a separate page with a text based list of all Joule Alarm settings*
- *Import settings updates controller to a settings file: when completed Joule Alarm jumps to the settings page to indicate a successful load.*
- *Output over-rides are for 1 minute only after which Joule Alarm resumes normal operation*

Setting File

Joule Alarm can export and import a text based settings file which can be edited. A partial text file can be imported to change only the parameters required, as an example the following file would only change the 4 listed parameters;

```
Humidity Function: 0
Humidity Alarm High: 81
Humidity Alarm Low: 20
Humidity Alarm Delay:  0.2
```

Outputs

This menu gives options to either manually or automatically control of all the system outputs. Eg. If you found that the buzzer was no longer needed you could switch the function off.

Installation

Pressure Transducer Installation

A pressure sensor converts pressure measurements into analog electrical signals.

Working range	1- 6 V
Low Pressure Range	0 – 100 psi
High Pressure	0 - 500 psi

Accuracy	1%
Shielding	Shielding is required for cables more than 10 m
Rated Supply Current / Supply	4mA, 12VDC supply

If the sensor cable is open [Ero] or short [Erc] circuit, the display will indicate the fault.
Dirt or moisture at the join will reduce the resistance of the probe and result in a higher temperature reading than normal.

Humidity Sensor Installation

Working range	0-99% RH
Temp range	-10 to +70 °C
Accuracy	1%
Rated Current	20 mA
Placement	Wall Mounted
Shielding	No shielding required for cables any length
Supply	Min 12VDC supply

If the sensor cable is open [Ero] or short [Erc] circuit, the display will indicate the fault.
Dirt or moisture at the join will reduce the resistance of the probe and result in a higher temperature reading than normal.

Temperature Sensor (M Probe) Installation

Working range	0-99% RH
Temp range	-10 to +70 °C
Accuracy	1%
Rated Current	20 mA
Placement	Refrigerated air is circulating
Shielding	Cables in excess of 50 m need shielding

M Probe- Resistance vs Temp. (Celsius)

Extend M Probe to 100m. using Heatshrink on joins
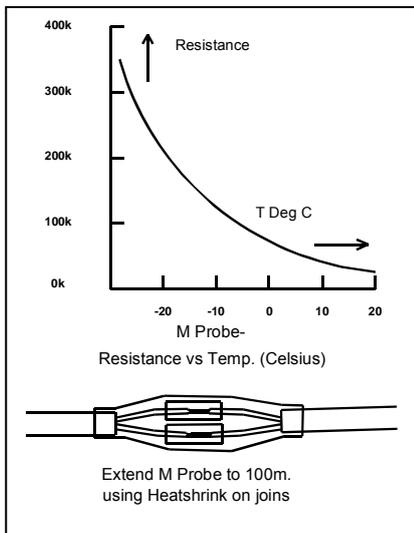
The temperature sensor is an NTC thermistor of extreme accuracy (0.2°C), and it has a non-linear resistance-temperature characteristic (see chart at right). [This is the standard Phasefale Mprobe as used in TACm, Pressnet, TA1, etc]. It is ideally mounted in a position where air is circulating for friges. It can be situated in the air off the evaporator coil (coldest) or return air (warmest) position as preferred.
At least 150mm of the sensor cable needs to be in the refrigerated space to ensure accurate temperature sensing.
If the sensor cable is open [Ero] or short [Erc] circuit, the display will indicate the fault. If a defrost terminate probe is used it should be mounted centrally in the evaporator coil.
The sensor cable is double insulated and therefore does not need to be enclosed in a conduit. There is no polarity to the sensor connection and it may be extended up to 100 meters by joining an extra cable (use double insulated cable) but the join must be well insulated and away from any dirt or moisture.
For cable runs in excess of 30 meters a shielded cable is required.
Dirt or moisture at the join will reduce the resistance of the probe and result in a higher temperature reading than normal. (Note -80°C Type Sensors are not supported in JouleAlarm). Cables in excess of 50 m need shielding.

Electrical Installation

A solid ground connection is required for JouleAlarm Refer also to the electrical wiring diagram for connection details. The Active supply to the unit should be fused with a maximum rating to suit total load. The control and light outputs are rated at 10A resistive.
Motors larger than 1 HP MUST be switched via a relay or contactor
The dialler output provides alarm contacts that open on alarm or power loss. The contacts can be connected to Phasefale's AD2 telephone dialler to provide a remote alarm using existing phone lines.
If an AD2 is connected, the +12 and GND terminals can be used to supply 12V DC to the dialler. The correct polarity is indicated on the wiring diagram. If a battery is fitted, connect the AD2 to the battery.
If a battery back-up (PSB30) unit is to be used to supply 12V DC to the AD2, it may also be used to supply back-up power to the Joule Alarm by connecting L and G from the PSB30 to +12 and GND on the Joule Alarm.
The PSB30 is supplied with the battery + lead disconnected. Reconnect once mains power is connected.

If the PCB option board for heater and fan outputs is to be fitted, follow the instructions supplied with it.

JouleAlarm Ethernet connection options

To extract the full potential of Joule Alarm an Ethernet connection is required which is available in a few ways. The following methods are available, a computer administrator is required to establish connection as this is beyond the scope of technical support provided by Phasefale. Joule Alarm supports 10 Base Ethernet with a fixed IP. **Important: DHCP & Fully qualified domain name servers are not supported**. Refer connection diagram page 14.

To connect directly to Joule Alarm with your notebook

Consult your computer administrator as this is beyond the scope of the tech support provided by Phasefale. Note Joule Alarm does not support DHCP and a fixed IP is required to be programmed into the control. Adjust the PC's TCP/IP to a fixed address with the same range programmed into the Joule Alarm. Use a crossover cable (special version of a RJ45 Patch lead obtainable from computer shops) and plug directly into the Joule Alarm. Use your browser to type the IP directly: e.g. 192.168.1.98. Alternatively, using regular patch leads and a computer HUB, SWITCH or ROUTER make connections from Joule Alarm to the hub, and your laptop to the hub. Refer schematic connection diagram page 14.

To access your Joule Alarm on a LAN

Consult your computer administrator as this is beyond the scope of the tech support provided by Phasefale. Note Joule Alarm does not support DHCP and a fixed IP is required to be programmed into the control. Ensure the programmed IP is different for each Joule Alarm and if they're on the same LAN IP1, IP2, IP3 will be the same, which will also coincide with the PC you use to access the Joule Alarm. Refer diagram page 14.

Access to your Joule Alarm on the Internet

It is possible to display your Joule Alarm on the internet: consult your computer administrator as this is beyond the scope of the tech support provided by Phasefale. One method is as follows: if you have a fixed IP address at your premises (e.g. a mail server on your local LAN such as mail.company.com.au and a router with ports forwarding capability, you can assign local IP numbers to a port address, e.g. 80. The internet address for a control would then be http://mail.company.com.au:80. As an example, your Local IP range is 192.168.10.??? and you setup 4 Joule Alarm as follows;
Joule Alarm 1 Cool Room   192.168.10.124   set port forward to 80 Internet address: http://mail.company.com.au:80
Joule Alarm 2 Produce Room   192.168.10.125   set port forward to 81 Internet address: http://mail.company.com.au:81
Joule Alarm 3 Freezer   192.168.10.126   set port forward to 82 Internet address: http://mail.company.com.au:82
Joule Alarm 4 Fruit and Veg Room   192.168.10.127   set port forward to 83 Internet address: http://mail.company.com.au:83

Note that port 80 is a standard port forward for web pages, other ports may be blocked by certain firewalls and security measures taken by ISP's and phones. Consult your Computer administrator for more details.

C-Tick Compliance

Joule Alarm is Tested to AS/NZS CISPR 22:2004 "Information technology equipment -Radio discturbance characteristics - Limits and method of measurement". PASS Class A Industrial. Warning. This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

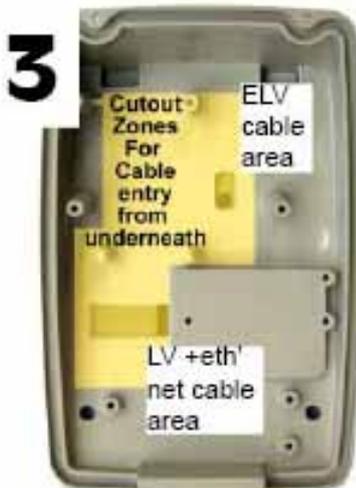# Enclosure Installation /Cabling Routing

1 Decide if you want straight (left picture) or tilt mounting. The wall mount conduit entry points are at the bottom for straight mount and at the top for tilt (approx 15 degrees) mounting.

2 Mount the wall mount base using the 4 off 6mm mounting holes, centers are 90mm high x 72mm wide. (Fixings not included). For conduit entry, the cables for the JouleTemp can enter through the 2 x 19mm conduit entry points placed 30mm apart. Use a knife as shown to open out the holes. Alternatively, the cables can come through the rear of the mounting surface, simply drill a hole in the wall mount base.

For maximum safety, bring LV mains cables (e.g. 240 V AC supply, compressor/evaporator control, fan, heater and alarm light) in through a different conduit than the Extra Low voltage cables (e.g. Sensor cable, alarm isolate, defrost terminate, alarm buzzer and security etc.)

3 Before fitting the enclosure base over the wall mount base, areas for entry can be enlarged as required with a sharp knife or drill. Feed the ELV cabling through the opening under the circuit board and up to the top of the board. For maximum environmental protection, keep the hole as small as possible and later it can be silicone sealed. For maximum safety, ensure LV and ELV cables are segregated.

Locate the enclosure base over the wall mount base with the top 2 lugs and bottom screws provided

4 For an electric defrost system, the optional board is fitted at the bottom of the enclosure base using the 3 screws supplied. When fitting the Quick connect cable connectors, ensure they face upwards and are fully seated to prevent fouling the enclosure when it is fitted later

5 Feed ELV cabling over top edge of board into push fit connectors. Maximum cable size is 0.5mm2 and strip 6mm bare cable. After fitment, gently tension cable and it is then secure. Route LV cables under bottom left edge and into screw terminals there.

6 After all electrical connections have been made, with the ELV cables along the top of the main PCB and LV connections across the bottom, the enclosure cover can be fitted in the following sequence:
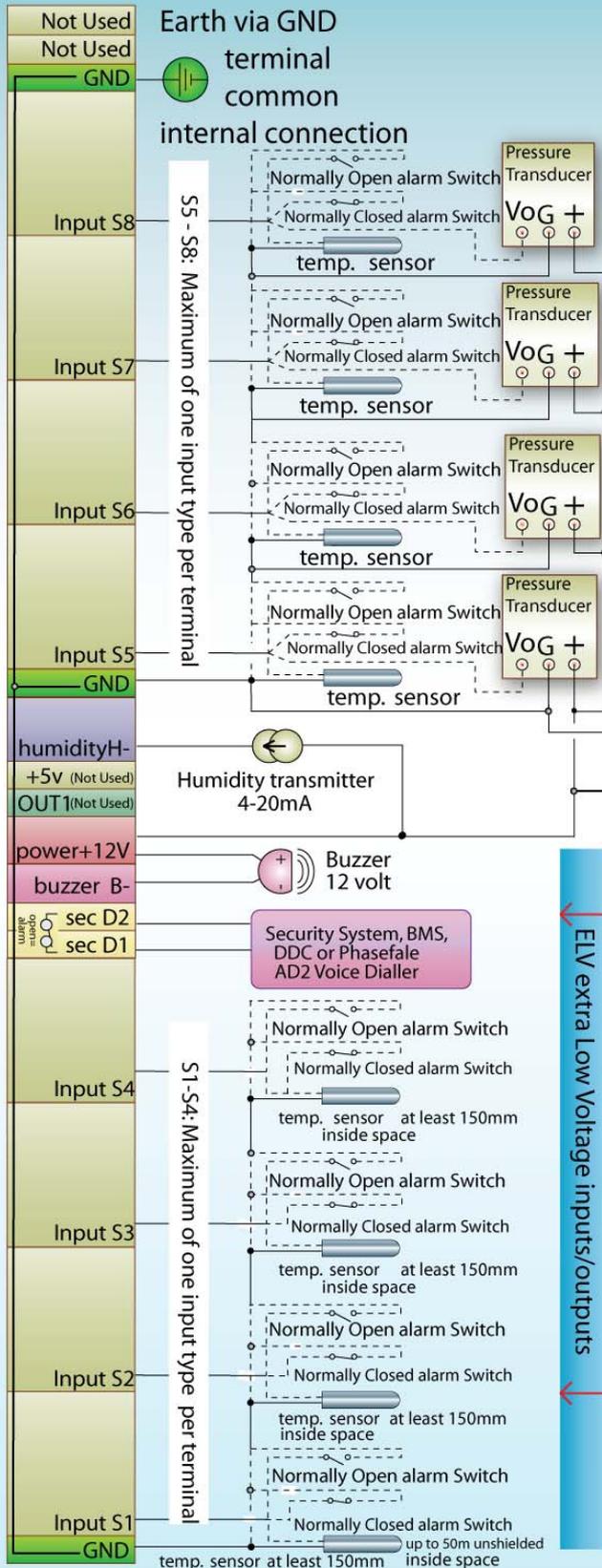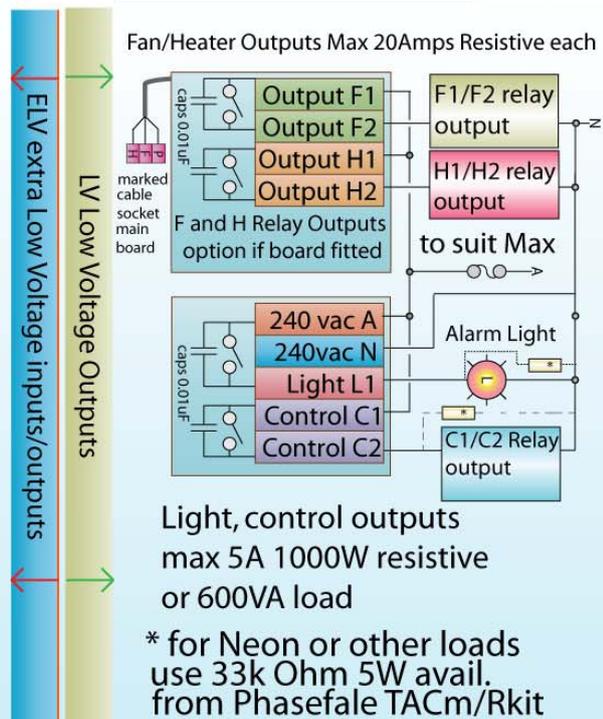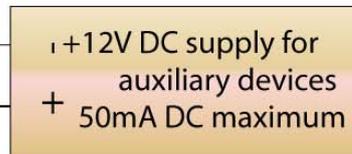- ensure the circular rubber gasket is snug in the channel around the base.
- tilt the cover and locate it under the lug across the bottom of the enclosure base.
- swing the cover against the base and secure with the 2 supplied screws, for a complete seal tightening them so the gap between the base and cover is even around the whole perimeter.

Wiring Schematic

Connector Positions and Ethernet Cabling
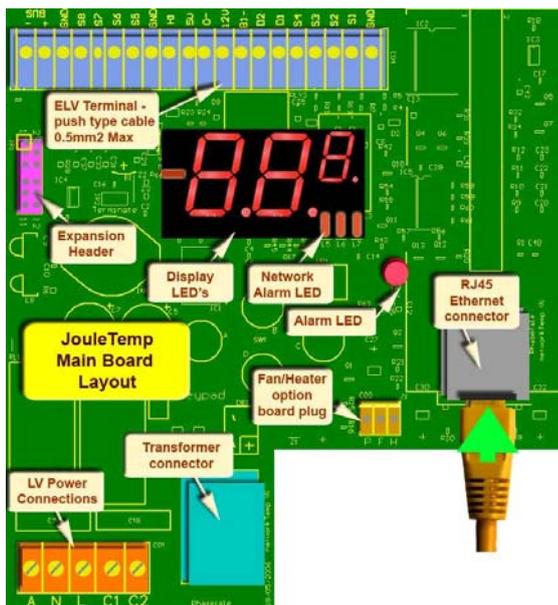
Above: connecting your JouleAlarm to a laptop or PC via direct connection or via a switch/hub/router

Left: Main board connector positions

This document is available online at
http://www.phasefale.com.au/TechSupport.htm go to document directory and select JouleAlarm directory.