

Supra



***User manual and installation
guide***

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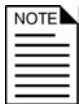
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How to use this manual

This section is a “quick-reference guide” of the manual. You can look at the chart on the next page to help you find what you are looking for. If you are not sure where to find something specific, look in the **Table of contents** at the front of the manual or the **Index** on page 155.

Below are some helpful suggestions.

- ◆ If you have not installed and configured your Supra, read **Chapter 2: Installing your Supra** on page 9 and **Chapter 4: Configuring your Supra** on page 37.
- ◆ If you are ready to install, configure, or program your Supra, use the worksheets starting in **Appendix D** on page 132.
- ◆ If you are not sure how to use the keypad or how to read the display and menus, read **Chapter 3: Understanding your Supra** on page 29
- ◆ If you need to program your Supra or adjust settings (set points, growth curves, fan speeds, etc.), read **Chapter 5: Programming your Supra** on page 63.
- ◆ If you have an alarm condition displayed and are not sure what to do, read **Chapter 6: Monitoring your Supra** on page 99.
- ◆ If you have an alarm condition or warning displayed and are not sure what it means, see **Appendix B: Troubleshooting** on page 125.
- ◆ If you are not sure of the meaning of a term, look it up in the **Glossary** on page 120.



If you have a network of Supras and are monitoring and controlling them using SupraWare, see your **SupraWare user manual** for additional information.

Quick reference chart

Supra overview, features, and accessories Manual overview	Chapter 1 Starting on page 1
Installation instructions Equipment installation (probes, fans, actuators, and so on) Electrical ratings Supra layout (map of the inside and outside of your Supra)	Chapter 2 Starting on page 9
Introduction to the display and menu structure Keypad functions Display characters and text	Chapter 3 Starting on page 29
Configuration instructions Zone, probe, and sensor assignments Variable and relay stage assignments	Chapter 4 Starting on page 37
Programming instructions Group settings (set points and growth curves) Equipment settings (set points, fan speeds, and so on) Alarm settings (bias, duration, silencing, and so on) Security, including users and PINs	Chapter 5 Starting on page 63
Monitoring instructions Input, alarm, and audit logs Status display Responding to alarms	Chapter 6 Starting on page 99
Diagnostic tests Manual override Maintenance	Chapter 7 Starting on page 105
Glossary Troubleshooting information Factory settings Installation worksheets Configuration worksheets Settings worksheets Motor curves	Appendixes Starting on page 119

Limited warranty

This warranty applies only to the Supra. If you need warranty service, return the product and original proof of purchase to your dealer.

Phason Inc. (Phason) warrants the Supra subject to the following terms and conditions.

This warranty is valid only to the original purchaser of the product, for two years from the manufacturing date. The manufacturing date is stated in the first eight digits of the serial number in the form year-month-day.

Phason hereby warrants that should the Supra fail because of improper workmanship, Phason will repair the unit, effecting all necessary parts replacements without charge for either parts or labor.

Conditions

- ◆ Installation must be done according to our enclosed installation instructions.
- ◆ The product must not have been previously altered, modified, or repaired by anyone other than Phason.
- ◆ The product must not have been involved in an accident, misused, abused, or operated or installed contrary to the instructions in our user and/or installation manuals. Phason's opinion about these items is final.
- ◆ The person requesting warranty service must be the original purchaser of the unit, and provide proof of purchase upon request.
- ◆ All transportation charges for products submitted for warranty must be paid by the purchaser.

Except to the extent prohibited by applicable law, no other warranties, whether expressed or implied, including warranties of merchantability and fitness for a particular purpose, shall apply to the Supra. Any implied warranties are excluded.

Phason is not liable for consequential damages caused by the Supra.


Phason does not assume or authorize any representatives, or other people, to assume any obligations or liabilities, other than those specifically stated in this warranty.

Phason reserves the right to improve or alter the Supra without notice.

Service and technical support

Phason will be happy to answer all technical questions that will help you use your Supra. Before contacting Phason, check the following:

- ◆ Read this manual for information about the feature with which you are having trouble.
- ◆ If you see an alarm message and are not sure what it means, look it up in the **Alarm messages** table on page 125 and then follow the instructions for resolving the alarm condition.
- ◆ If you are having a problem using your Supra, see if the problem is described in the **Troubleshooting** table on page 127 and then follow the directions for correcting the problem.
- ◆ If you received a warning during setup or while changing settings, look it up in the **Warnings** table on page 129 and then follow the instructions for correcting the problem.
- ◆ If you still have a problem with your Supra, collect the following information:
 - ◆ The serial number (see page 14)
 - ◆ The firmware version (see page 41)
 - ◆ Any messages displayed by your Supra
 - ◆ A description of the problem
 - ◆ A description of what you were doing before the problem occurred

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	Winnipeg, Manitoba	Fax	204-233-3252
	Canada	E-mail	support@phason.ca
	R2J 4G7	Web site	www.phason.ca

Phason controls are designed and manufactured to provide reliable performance, but they are not guaranteed to be 100 percent free of defects. Even reliable products can experience occasional failures and the user should recognize this possibility.

If Phason products are used in a life-support ventilation system where failure could result in loss or injury, the user should provide adequate back up ventilation, supplementary natural ventilation, or an independent failure-alarm system. The user's lack of such precautions acknowledges their willingness to accept the risk of such loss or injury.

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Chapter 1: Introducing the Supra

This chapter introduces you to your Supra and the layout of this manual. Read this chapter before reading the rest of the manual.

- ◆ Introducing your Supra
- ◆ About this manual

Introducing the Supra

All of us at Phason want to welcome you to the Supra 16-stage environmental control, the most versatile and cost-effective 16-stage control available. The Supra is ideal for poultry, livestock, greenhouse, or light-industrial buildings and is compatible with any ventilation strategy: natural, forced, tunnel, and chimney ventilation.

A powerful four-zone controller

The Supra automatically monitors and controls the temperature in up to four separate zones. The Supra controls the temperature in each zone by operating ventilation equipment such as fans, heaters, inlet actuators, curtain machines, or other equipment according to your programmed settings.

The Supra has two seven-step growth curve programs you can configure for up to 250 days. This powerful feature automatically adjusts the temperature set points over time to control the temperature in a room or zone.

More than just temperature control—monitor water usage and control humidity

Not only can the Supra monitor and control temperatures using ventilation equipment, it can monitor water usage and control humidity.

The Supra's pulse counter allows you to connect a water meter (with pulse output) and monitor water usage. With an optional Relative Humidity Sensor, you can monitor humidity and automatically adjust your ventilation control strategy accordingly.

Security and peace of mind

Your Supra has a five-level PIN (personal identification number) security system. Each level has access to different menus of the Supra. When you enable security, users must enter their PIN before they can access a specific menu or function. This allows you to track who makes changes to your system and its settings.

The Supra is compatible with most alarm sirens and alarm systems. You can connect your Supra to an alarm siren or other external alarm system. The customizable list of alarm settings allows you to choose which alarm conditions you want to be notified about. The Supra automatically logs all alarm conditions.

Easy to use and program

The Supra's four-line, backlit LCD display shows alarm conditions such as high and low temperatures, power failure, and low line voltage. The easy-to-use keypad and menu system make the Supra one of the easiest controls to program. The Supra's advanced and powerful features are never more than a few keystrokes away.

Convenient accessories such as the SupraSaver and Intaglio allow you to store and transfer your Supra settings and configuration and update the firmware version of your Supras.

Standalone control or a network of Supras

You can use your Supra in one of two ways:

- ◆ As a standalone Supra control. Your Supra is a standalone control. All programming is done at the control using the keypad.
- ◆ As one of a network of Supra controls. With the optional SupraWare software, you can connect up to 32 Supras together at distances up to 4000 feet (1220 metres) and monitor and configure them from a personal computer. If you are running SupraWare, you can still make changes at the controls using the keypad.

Features

- ◆ Four variable stages (heat or cool) with overload protection fuses
- ◆ Twelve relay stages (heat, cool, timed event, duty cycle, or actuator control)
- ◆ One alarm relay (for external alarm siren or alarm system)
- ◆ Four-zone temperature monitoring and control
- ◆ Outdoor temperature monitoring
- ◆ Adjustable temperature settings, including two configurable seven-step growth curves
- ◆ Water usage monitoring
- ◆ Humidity monitoring and control
- ◆ Customizable alarm settings
- ◆ Three-second full-power-turn-on for minimizing fan ice-up
- ◆ Data logging of temperatures, alarms, and setting changes
- ◆ Power-failure memory protection, including internal 24-hour clock
- ◆ Five-level PIN security system
- ◆ Four-line, backlit LCD display
- ◆ On-board diagnostics and self tests
- ◆ Thirty-foot temperature probe, extendable to 500 feet (additional probes available)
- ◆ Rugged enclosure (corrosion resistant, water resistant, and fire retardant)
- ◆ CSA approval
- ◆ Two-year limited warranty

Some features require additional sensors or equipment. Water usage requires a water meter with pulse output. Humidity monitoring and control requires a Relative Humidity Sensor. Additional zones or outdoor temperatures require additional temperature probes.

Electrical ratings

Input power	115/230 VAC, 50/60 Hz
Fuse (F5)	1 A, 250 VAC non-time-delay glass
Variable stages (4 - VAR1 to VAR4)	10 FLA at 115/230 VAC ①
Fuses (4 - F1 to F4)	15 A, 250 VAC slow-blow ceramic
Relay stages ② (12 - RLY1 to RLY12)	10 FLA at 115/230/208 VAC, 360 W tungsten at 120 VAC ①
Alarm stage	0.2 A at 230 VAC, 0.4 A at 24 VAC, 2.0 A at 30 VDC
① You can connect more than one piece of equipment to a variable stage or relay as long as they are the same type (for example, two fans), and the total current draw (load) is within the limits.	
② Actuators require two relays: one for opening, one for closing. You can connect a maximum of two actuators.	

Available accessories

Your Supra has several convenient accessories that make it one of the most versatile controls available. For more information about any of these convenient accessories, contact your dealer or visit www.phason.ca.

SupraSaver

Your SupraSaver is an innovative and easy-to-use product that allows you to store your Supra configuration and settings.

Your SupraSaver stores a complete copy of all a Supra's configuration and settings. Your SupraSaver saves time and makes storing or transferring settings and configuration easy. You can even use your SupraSaver to set up new Supras in seconds!



SupraSaver features

- ◆ Quick and easy to use
- ◆ Portable, reliable, and safe storage of settings and configuration
- ◆ Transferable to any Supra (with the same firmware version)
- ◆ Compact design—fits in a pocket
- ◆ 90-day limited warranty

Intaglio

The Intaglio is an innovative and easy-to-use product that allows you to upgrade your Supra's firmware. The Intaglio takes only seconds to use and can upgrade all your Supras at your site.

Phason constantly improves and adds new features to their products. With the Intaglio, you can upgrade the firmware in your Supra as these features become available.

Intaglio features

- ◆ Quick and easy to use
- ◆ Compact design—fits in a pocket
- ◆ 90-day limited warranty

SupraWare

SupraWare allows you to configure and monitor all your Supra controls at your site from a personal computer. You can connect up to 32 Supras together at distances up to 4000 feet (1220 metres).

SupraWare eliminates the need to go to a control to check settings or make changes, you can do it all from one location. SupraWare's easy-to-read displays show you control settings, temperatures, and alarms. The software maintains logs of temperatures, alarms, and system changes and includes four reports and a chart to help you analyze the information.

SupraWare features

- ◆ Convenient, easy-to-use displays
- ◆ Control and status information displays
- ◆ Enhanced data logging
- ◆ Four reports and one chart
- ◆ Backup and restore utility
- ◆ Third-party software compatibility



Temperature probes and extension cable

Temperature probes monitor temperatures ranging from -49 to 122°F (-45 to 50°C). The probes are available in 1, 6, 30, 75, or 150-foot cable lengths and can be extended up to 500 feet using extension cable. Extension cable is available in 500-foot lengths.

Temperature probe features

- ◆ Easy installation
- ◆ Rugged and durable design
- ◆ Weather and UV-resistant cable
- ◆ 90-day limited warranty



Relative Humidity Sensors

The Relative Humidity Sensor comes in two models: the standard version (RHS) and the extended version (RHS-P).

The RHS is designed to monitor relative humidity at the Supra. The RHS comes with the mounting hardware to mount the sensor in the control enclosure.

The RHS-P is designed to monitor relative humidity in remote locations (away from the control). The RHS-P comes with the mounting hardware and cable to mount the sensor up to 100 feet (30.5 m) away from the control.

RHS features

- ◆ Easy installation
- ◆ 100-foot weather and UV-resistant cable (RHS-P only)
- ◆ 90-day limited warranty



About this manual

This manual describes the features of your Supra and how to use them. It does not describe ventilation strategies or equipment (such as fans) you can connect to your Supra.

Styles used in this manual

This manual uses the following styles:

- ◆ All buttons and menu commands are bolded.
For example: Scroll to the next line and then press **ENTER**.
- ◆ All LCD display examples are in a dotted font.
For example: From the Main Menu, select `Settings`.
- ◆ If a menu has a shortcut key, in the instructions, the number for the shortcut will be in brackets after the menu name. For example,
From the Maintenance menu, select `Set Unit Name (#5)`.

Hint/tip



This is a hint or tip. It contains helpful information that might make it easier for you to set up or use your Supra.

Note



This is a note. It contains information that may help you better understand your Supra.

Caution



This is a **caution**. It contains important information that you must follow when installing or servicing your Supra. Failure to follow this information can lead to damaged controls or equipment.

Warning



This is a warning. It contains important safety information that you must follow when installing or servicing your Supra. Failure to follow this information can lead to damaged controls or equipment, electrical shocks, or severe injury.



Chapter 2: Installing your Supra

This chapter explains how to mount and install your Supra and how to connect equipment such as fans, heaters, actuators to your Supra.

- ◆ Before installing your Supra
- ◆ Supra exterior layout
- ◆ Supra interior layout
- ◆ Connecting equipment to your Supra

Before installing your Supra

Before you install your Supra, you need to do some initial preparation:

1. Read **Understanding power surges and surge suppression** below.



If you do not install external surge suppression devices, you risk damage to the electronics inside your Supra, which may cause your Supra to fail.

Because it is not possible to *completely* protect this product internally from the effects of power surges and other transients, Phason *highly recommend* that you install external surge suppression devices. For specific recommendations, see your electrical contractor.

If you do not take these precautions, you acknowledge your willingness to accept the risk of loss or injury.

2. Using the installation worksheets in **Appendix D** (starting on page 132), list all the equipment you want to control using this Supra. Install the equipment and make your electrical connections according to the sheet.
3. Using the configuration worksheets in **Appendix E** (starting on page 134), decide which relays you want to use for each piece of equipment, and how you want the equipment organized by zone in your Supra. You can connect more than one piece of equipment to a single relay *as long as the total amps do not exceed* the relay's limit. For more information about the control ratings, see **Electrical ratings** on page 11.

Understanding power surges and surge suppression

Power surges can be caused by external influences (outside the barn—for example, lightning or utility distribution problems) or they can be caused internally (inside the barn—for example, starting and stopping inductive loads such as motors).

One of the most common causes of power surges is lightning. When lightning strikes the ground, it produces an enormously powerful electromagnetic field. This field affects nearby power lines, which transmit a surge to any device connected to it, such as lights, computers, or environmental controls like your Supra. Lightning does not have to actually strike a power line to transmit a surge.

Surge suppression devices offer some protection from power surges. Because it is not possible to internally protect this product completely from the effects of power surges and other transients, we *highly recommend* that you install external surge suppression devices. For specific recommendations, see your electrical contractor. If you do not take these precautions, you acknowledge your willingness to accept the risk of loss or injury.

Electrical ratings

Input power	115/230 VAC, 50/60 Hz
Fuse (F5)	1 A, 250 VAC non-time-delay glass
Variable stages (4 - VAR1 to VAR4)	10 FLA at 115/230 VAC ①
Fuses (4 - F1 to F4)	15 A, 250 VAC slow-blow ceramic
Relay stages ② (12 - RLY1 to RLY12)	10 FLA at 115/230/208 VAC, 360 W tungsten at 120 VAC ①
Alarm stage	0.2 A at 230 VAC, 0.4 A at 24 VAC, 2.0 A at 30 VDC
① You can connect more than one piece of equipment to a variable stage or relay as long as they are the same type (for example, two fans), and the total current draw (load) is within the limits.	
② Actuators require two relays: one for opening, one for closing. You can connect a maximum of two actuators.	



Make sure the start-up amperes (inrush current) of the connected devices do NOT exceed the relay's current rating. Failure to do this can overload the control and void the warranty.

Precautions, guidelines, and warnings



The Supra must be installed by a qualified electrician.

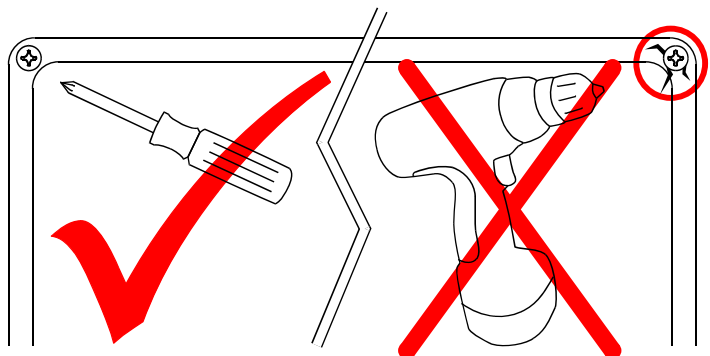
Before installing or servicing the Supra, switch OFF the power at the source.

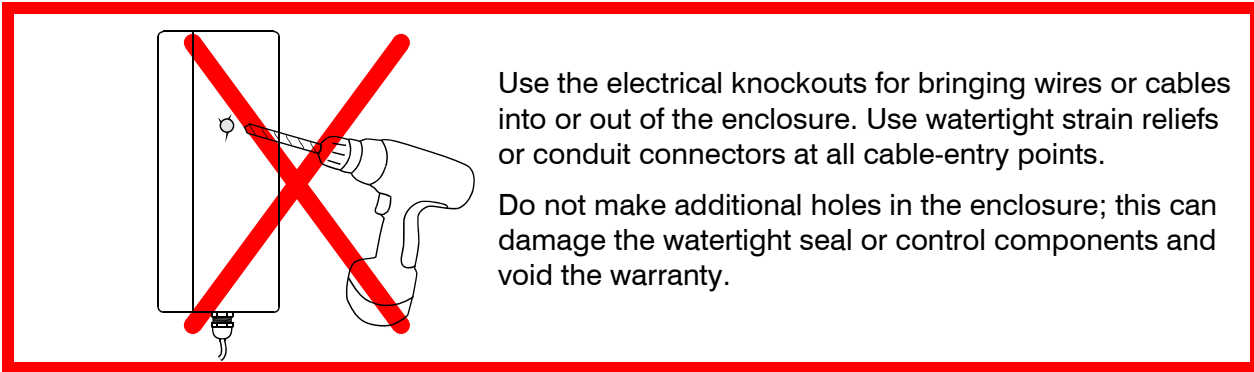
Install the Supra and all equipment connected to it according to local electrical codes.



Mount the control on a sheltered, vertical surface, with the electrical knockouts facing down.

Use a screwdriver to tighten the screws in the enclosure. Do not use a drill or over tighten the screws; this can crack the enclosure and ruin the watertight seal.





Routing data wires

Routing data wires in the same conduit as, or beside AC power cables, can cause electrical interference, erratic readings, and/or improper control. Data wires include **all** of the following:

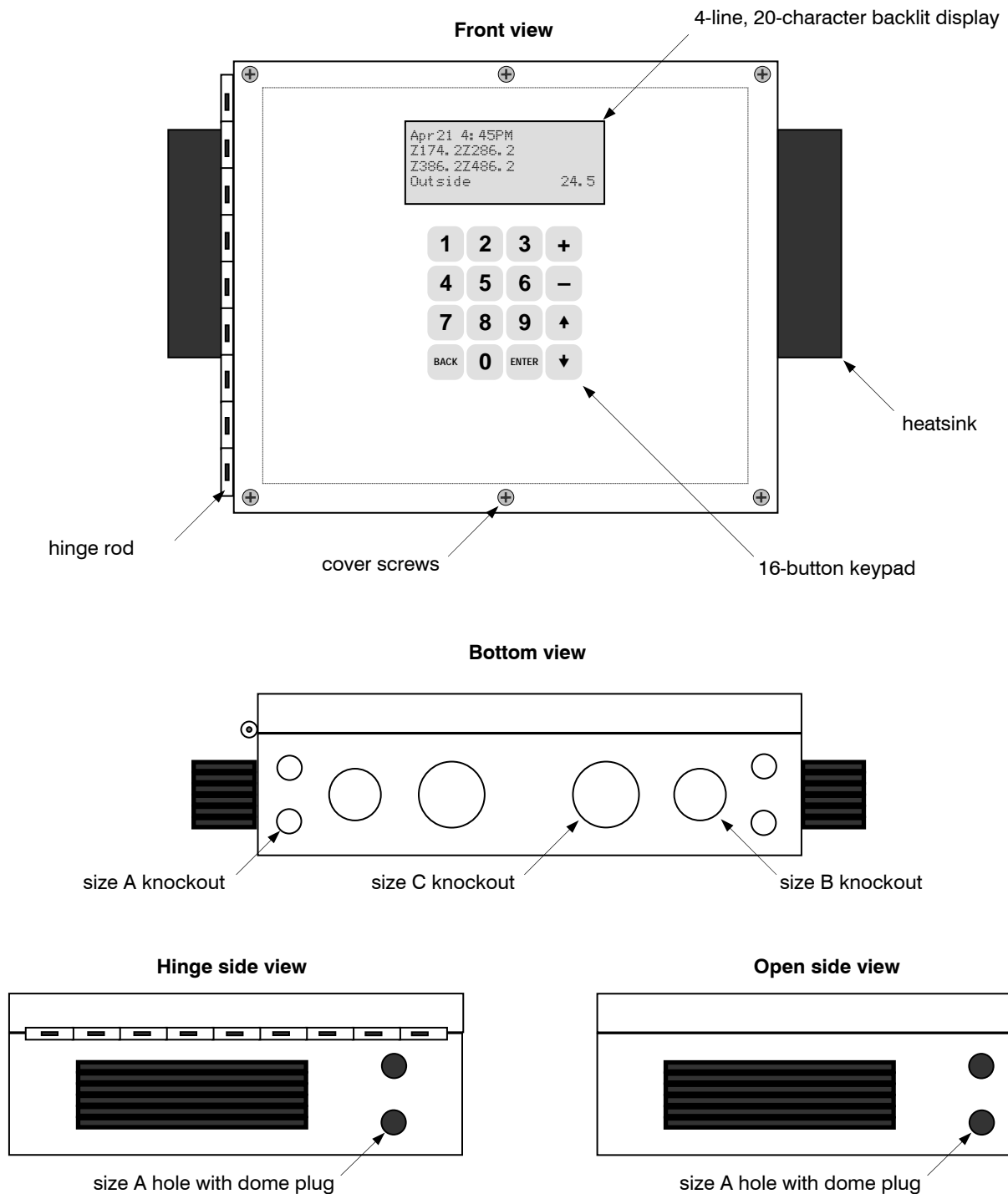
- ◆ Temperature probe and humidity sensor cables
- ◆ Actuator feedback (potentiometer) wires
- ◆ Data communication wires, including RS-232/RS-485
- ◆ Any cable or wire that does not provide AC power

Guidelines for routing data wires

- ◆ Do not run the wires in the same conduit as AC power cables.
- ◆ Do not run the wires beside AC power cables or near electrical equipment.
- ◆ When crossing other cables or power lines, cross them at a 90-degree angle.

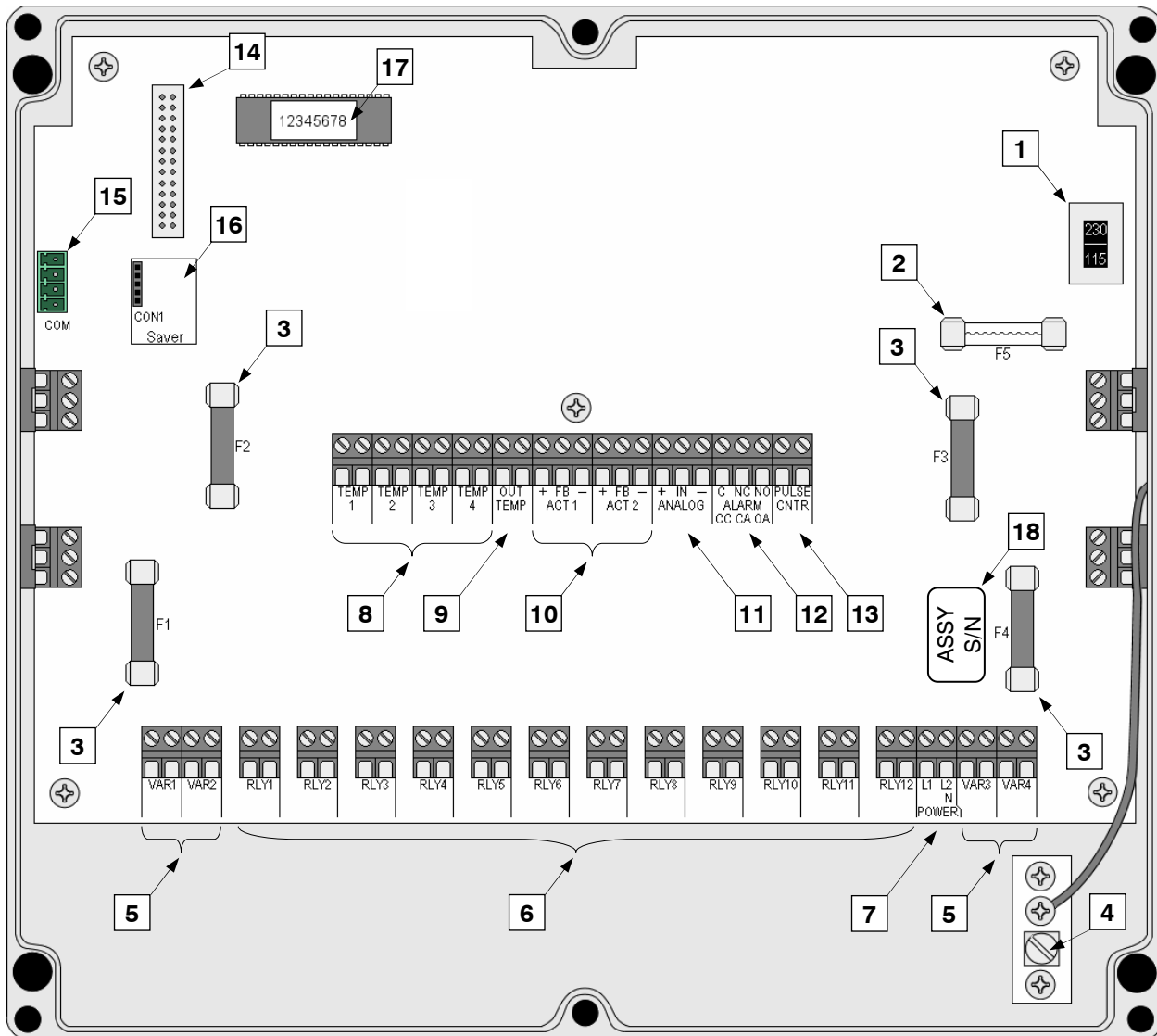
If in doubt, **do not run any wire or cable that is not an AC-power wire** inside the same conduit or beside other AC-power wires.

Supra exterior layout



- ◆ Size A knockout/hole is designed for size PG7 strain relief
- ◆ Size B knockout is designed for 3/4-inch conduit
- ◆ Size C knockout is designed for 1-inch conduit

Supra interior layout



- 1 Voltage selection switch—set this switch to the correct voltage before installing your Supra.
- 2 Incoming power fuse (F5)—1 A, 250 VAC non-time-delay glass fuse.
- 3 Variable stage fuses (F1 to F4)—15 A, 250 VAC fast-acting ceramic. F1 is for variable stage 1, F2 for stage 2, and so on.
- 4 Ground plate screw—connect a ground wire to this screw.
- 5 Variable stage terminals (VAR1 to VAR4)—connect variable heating or cooling equipment such as fans or heat lamps to these terminals.
- 6 General-purpose relay terminals (RLY1 to RLY12)—connect single stage (on or off) equipment to these terminals. You can configure these relays as heat, cool, duty cycle, timed event, curtain control, or inlet control.
- 7 Incoming power terminal—connect the incoming power (115/230 VAC, 50/60 Hz) to this terminal.

- | | |
|----|--|
| 8 | Zone temperature probe terminals (TEMP1 to TEMP 4)—connect the temperature probes for monitoring the zones to these terminals. |
| 9 | Outdoor temperature probe terminal (OUT TEMP)—connect the temperature probe for monitoring outdoor temperatures to this terminal. |
| 10 | Actuator feedback terminals (ACT 1 and ACT 2)—connect the feedback from the actuators to these terminals. |
| 11 | Analog terminal—connect a Relative Humidity Sensor here. |
| 12 | Alarm relay terminal—connect an external alarm system or alarm siren to this terminal. |
| 13 | Pulse counter terminal—connect a water meter with pulse output to this terminal. |
| 14 | Display cable socket—make sure the ribbon cable from the display is properly connected to this socket. |
| 15 | Communication socket—if you are using SupraWare to monitor and control a network of Supras, connect the communication wiring to this socket. |
| 16 | Saver socket—if you are using SupraSaver to store/load settings or an Intaglio to update the firmware, you connect it to this socket. |
| 17 | Address label—the address for your Supra. If you are using SupraWare, you will need to know this number. |

Mounting your Supra

1. Select a location for your Supra. Make sure you have enough cable and wire to reach all the equipment (fans, heaters, misters, curtains, etc.) that you want to control.
2. Remove the screws from the front cover and then swing it open.
3. Mount the enclosure to a wall using the four screws provided with the control. Insert the screws into the large holes in each corner of the box and tighten.

Connecting equipment to your Supra

Follow these instructions when installing your Supra and connecting equipment to it.



Use the electrical knockouts for bringing wires or cables into or out of your Supra enclosure. Do not make additional holes in the enclosure; this can damage the watertight seal or control components and void the warranty.



Your Supra's built-in diagnostic tests are useful for testing your equipment after installing and configuring it. For more information, see **Performing diagnostic tests** on page 108.

Connecting actuators

You can connect up to two actuators to a Supra. Actuators are used for control elements that are not OFF or ON. Instead, they vary by a percentage. For example, inlets can be opened various distances from 0 percent to 100 percent.

Typically, linear actuators are connected directly to the inlets, or by cables and pulleys. Inlets are generally located in the ceiling or walls. Inlet systems are usually spring loaded to aid in closing the inlet, or counter weighted to aid in opening the inlets.



Each actuator you connect must have a feedback potentiometer. The feedback potentiometer, which you connect to one of your Supra's two feedback terminals, lets your Supra know how far the actuator's arm is extended.

Most linear actuators are available with potentiometer feedback and internal adjustable limit switches. A 10,000 ohm, 10 turn feedback potentiometer is preferred, but the internal feedback potentiometer can range between 1000 and 20,000 ohms. Potentiometers outside of this range will affect the precision to which your Supra can control the actuator.



If your actuator does not have a feedback potentiometer, Phason offers an Actuator Position Sensor (APS-1). For more information, contact Phason or your distributor.

A system operates more precisely when using the largest amount of stroke that is feasible with the actuator. The stroke is the distance the actuator arm extends or retracts.

Each actuator you connect requires two relays: one for extending the actuator arm (opening the inlet), and one for retracting the arm (closing the inlet). You can connect the actuator to any of the available relays, but side-by-side relays are recommended.



The ratings of the actuator must not exceed the ratings of your Supra's relays.

Supra relay ratings: 10 FLA maximum

To connect actuators

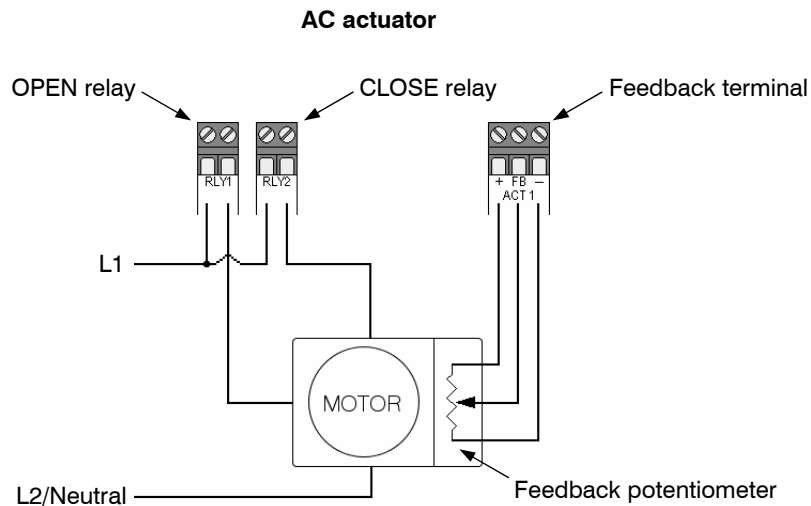
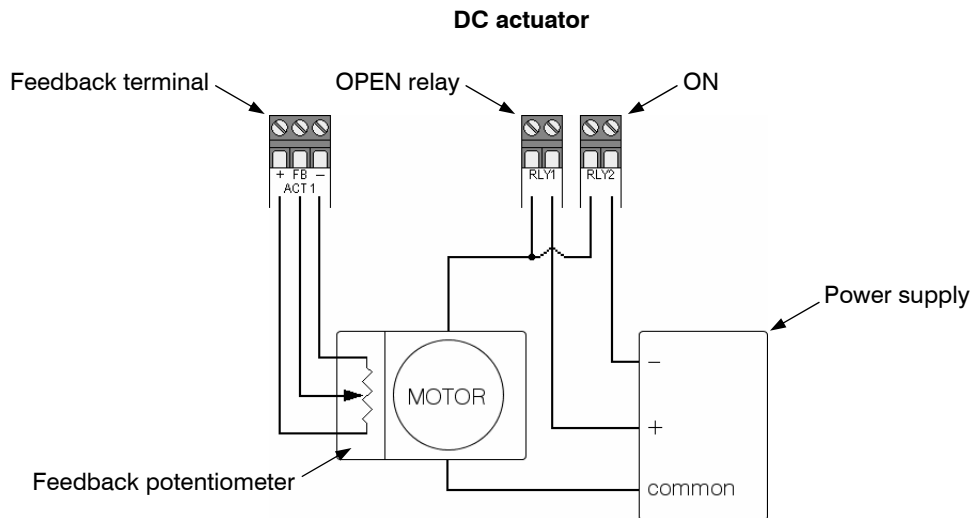
Connect actuators to your Supra as shown below. Refer to your actuator's installation guide for information about its power supply requirements.



Refer to **Appendix D: Installation worksheet** on page 132 and **Appendix E: Configuration worksheets** on page 134 when installing actuators.



When connecting a feedback potentiometer, connect it to ACT1 for actuator 1 and ACT2 for actuator 2.



Connecting single-stage heating or cooling elements

Heating or cooling elements include equipment such as electric heaters, furnaces, single-speed fans, and curtains.



Follow these instructions to connect curtains that are *not* controlled by actuators.



The ratings of the equipment must not exceed the ratings of your Supra's relays.

Supra relay ratings: 10 FLA, 360 watts tungsten

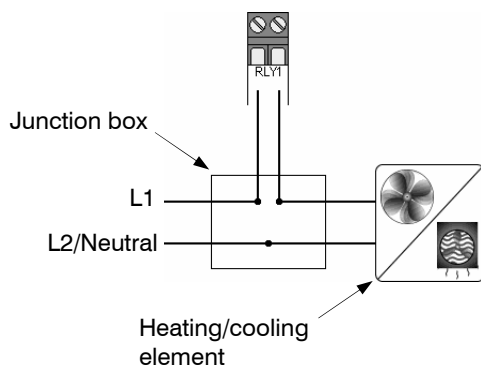
To connect single-stage heating or cooling elements

Connect single-speed heating or cooling elements to your Supra as shown below.

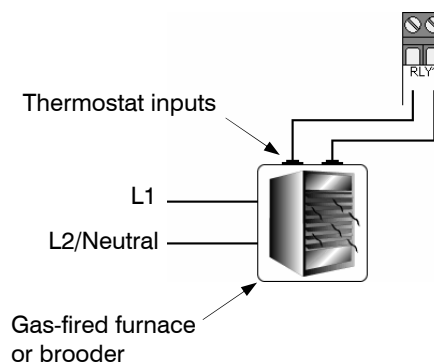


Refer to **Appendix D: Installation worksheet** on page 132 and **Appendix E: Configuration worksheets** on page 134 when installing single-stage heating or cooling elements.

All other single-speed heating or cooling elements



Gas-fired furnace or brooder



Gas furnaces using hot-surface ignition or glow plug can draw more current than indicated on their nameplate and require power contactors. For more information, see your furnace dealer.

Connecting variable-stage heating or cooling elements

Variable heating or cooling elements include equipment such as variable-speed fans or heat mats.



The variable stages are for controlling shaded pole, permanent split capacitor, or universal motors only.

If you are using three-phase power, connect the Supra and the variable heating or cooling equipment to the same phase. For more information, see **Using three-phase power** on page 20.

The ratings of the equipment must not exceed the ratings of your Supra's variable stages.

Supra variable stage ratings: 10 FLA

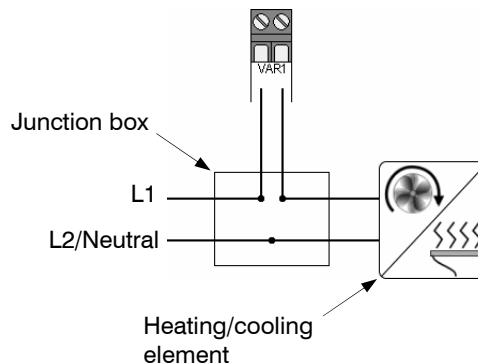
Variable-stage fuses: 15 A, 250 VAC slow-blow ceramic

To connect variable-stage heating or cooling elements

Connect variable heating or cooling elements to your Supra as shown below.



Refer to **Appendix D: Installation worksheet** on page 132 and **Appendix E: Configuration worksheets** on page 134 when installing variable-stage elements.

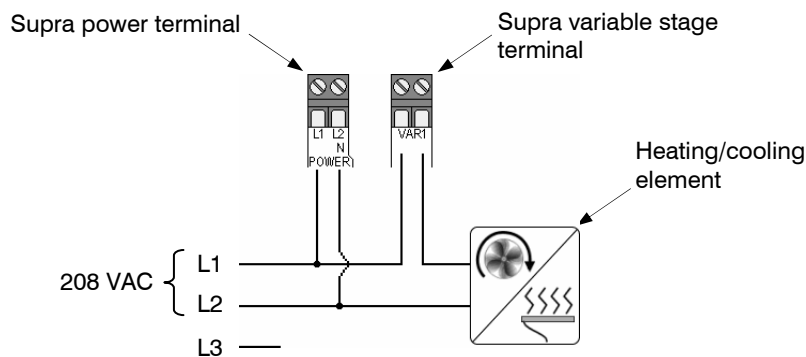


Using three-phase power

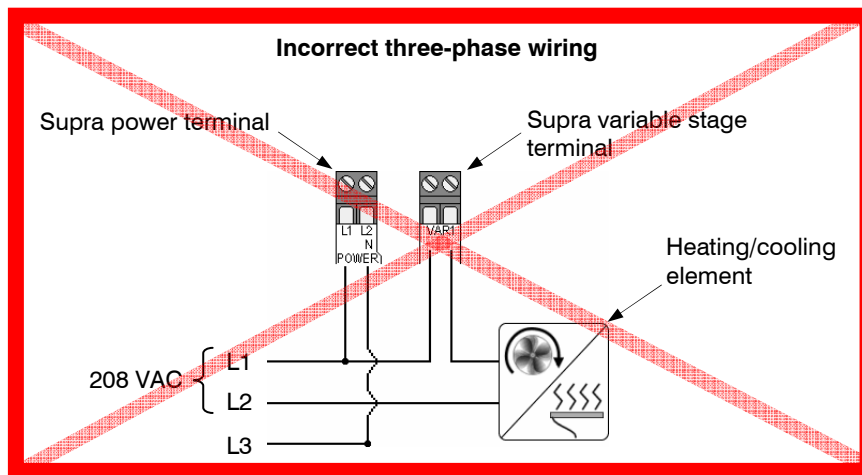
If you are connecting your Supra to a three-phase system, make sure to connect the control power and the variable heating or cooling equipment to the same phase.

Your Supra must be powered from the same phases that supply the equipment. If your Supra power and the variable stages are wired to different phases, the equipment will operate erratically.

Correct three-phase wiring

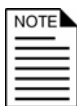


Incorrect three-phase wiring



Connecting an alarm system

You can connect an alarm system to your Supra's alarm terminal. An alarm system can be a siren, an alarm panel, or an auto-dialer.



For the alarm system to sound (or dial out) during an alarm condition, you must enable the alarms for each zone. For more information, see **Programming alarm settings** on page 89.



The ratings of the siren or alarm system must not exceed the ratings of your Supra's alarm relay.

Supra alarm relay ratings: 0.2 A at 230 VAC, 0.4 A at 24 VAC, 2.0 A at 30 VDC

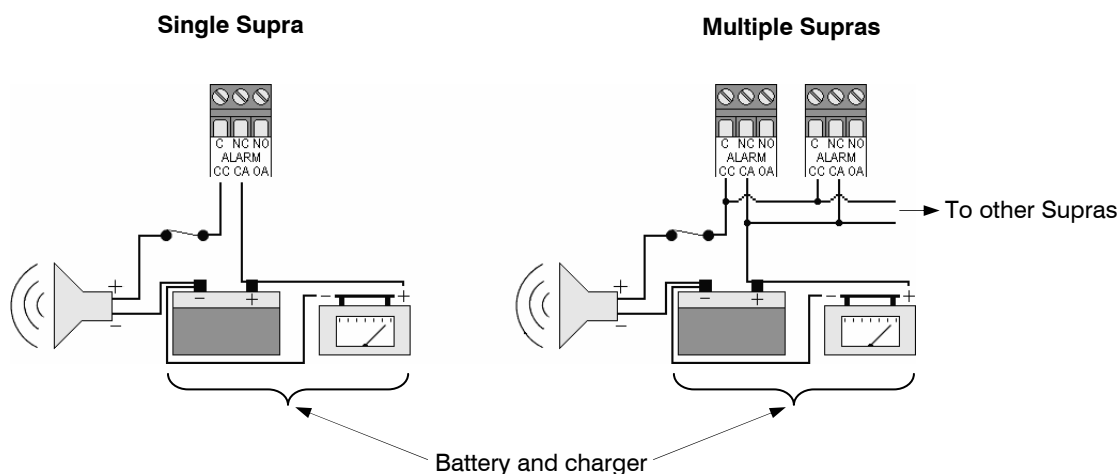
Below are the descriptions for the alarm terminal

- ◆ CC: common connection
- ◆ CA: closed on alarm
- ◆ OA: open on alarm

To connect a battery-powered alarm siren

See your alarm siren's installation guide for installation instructions and information about the type of system, normally open or normally closed.

Connect a battery-powered siren to your Supra as shown below.

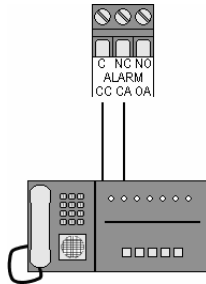


To connect an alarm panel or auto-dialer

See your alarm system's installation guide for installation instructions and information about the type of system, normally open or normally closed.

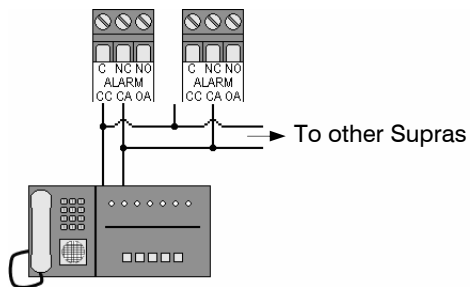
- ◆ If you are connecting the alarm system to a single Supra, connect the system as shown in diagram **A** below.

**A – single Supra
(normally open alarm circuit)**

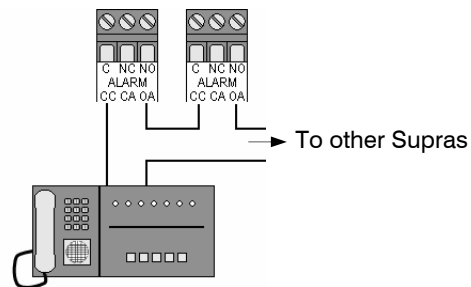


- ◆ If you are connecting the alarm system to a network of Supras and your system uses a normally open connection, connect the system as shown in diagram **B** below. Join all the CC connections together and all the CA connections together. Your Supra alarm relays must be in parallel with each other so any Supra can trigger the alarm system when an alarm condition occurs.
- ◆ If you are connecting the alarm system to a network of Supras and your system uses a normally closed connection, connect the system as shown in diagram **C** below. Join the alarm relays in a continuous loop. Your Supra alarm relays must be in series with each other so any Supra can trigger the alarm system when an alarm condition occurs.

B – multiple Supras, normally open system



C – multiple Supras, normally closed system



Connecting temperature probes

You can connect up to five temperature probes to your Supra: one outdoor probe and up to four indoor (zone) probes. Your Supra automatically detects when a probe is connected to a terminal.

You can connect zone probes to any of the four temperature terminals (**TEMP 1** to **TEMP 4**). If you are monitoring outdoor temperatures, you must connect the outdoor probe to the **OUT TEMP** terminal.

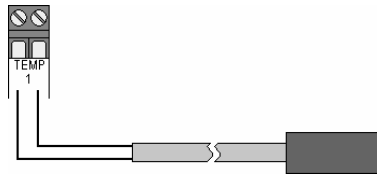


You can extend probe cables up to 500 feet. For more information, see **Extending probe cables** on page 24.

To connect temperature probes

Follow these guidelines and connect the temperature probe as shown below.

- ◆ Do not run the probe cable in the same conduit as AC power cables
- ◆ Do not run the sensor cable beside AC power cables or near electrical equipment.
- ◆ When crossing other cables or power lines, cross them at a 90 degree angle.



Refer to **Appendix D: Installation worksheet** on page 132 and **Appendix E: Configuration worksheets** on page 134 when installing temperature probes.



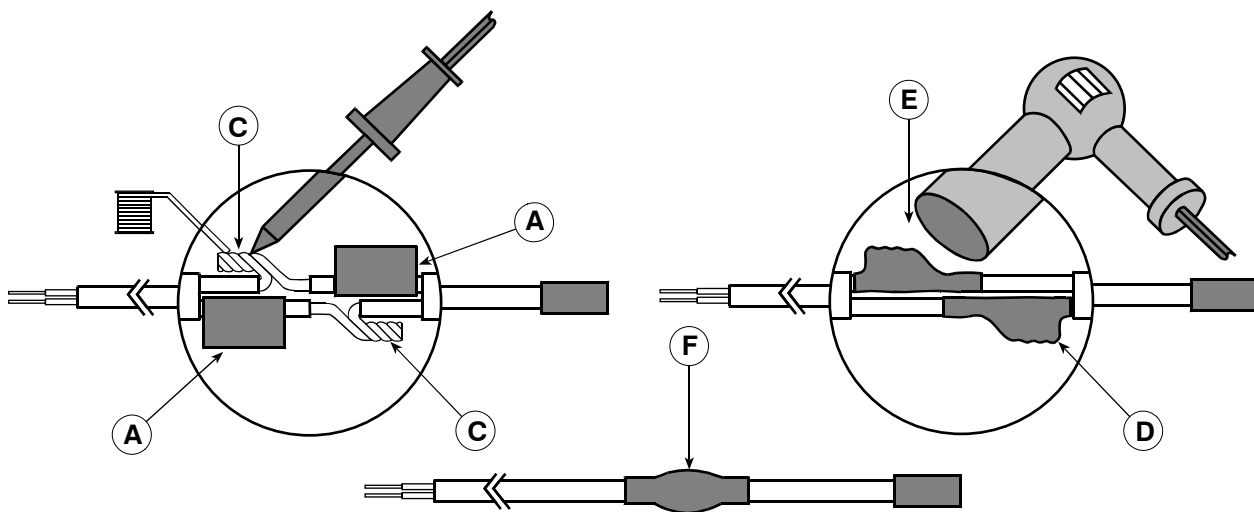
Replace damaged probes as soon as possible. If a probe is damaged, unless you have temperature averaging enabled, your Supra automatically selects the next active temperature probe.

For more information, see **Configuring temperature averaging** on page 56.

Extending probe cables

You can extend temperature probe cables to lengths of up to 500 feet. Follow the guidelines below and on page 23 when extending cables.

- ◆ Use two-wire 18 AWG jacketed cable. Phason recommends Belden # 9408, Alpha # 5052, or an equivalent. Extension cable is also available from Phason. For more information, contact your dealer or Phason.
- ◆ Join the extension cable to the temperature probe cable as shown below.
- ◆ If the unit operates erratically with the extended probe, run the cable along a different path or shorten it.



- A** Slide three pieces of heat shrink tubing over the wires: one for the red wire, one for the black wire, and one for both.
- B** Strip the ends of the wires and then twist them together.
- C** Solder the wires together using rosin-core flux solder—DO NOT use acid core solder.
- D** Slide the heat shrink tubing over the solder joints.
- E** Shrink the tubing using a heat gun.
- F** Your connection should look like this.

Connecting a Relative Humidity Sensor

You can connect a Phason Relative Humidity Sensor (RHS) to the analog terminal. Connecting an RHS allows you to monitor relative humidity in one of your Supra's four zones.



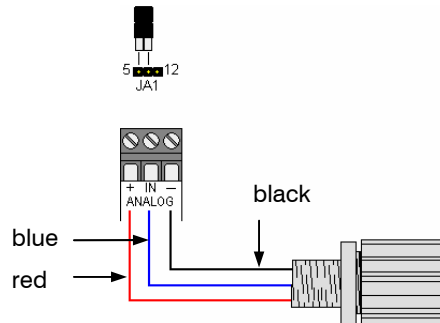
You can monitor relative humidity with the Phason Relative Humidity Sensor (RHS or RHS-P) only. Other humidity sensors will not work properly. For more information about the RHS, see **Relative Humidity Sensors** on page 6.

To connect a Relative Humidity Sensor

1. Make sure jumper JA1 is on the two left pins as shown below.
2. Connect the RHS or RHS-P to the **ANALOG** terminal as shown below.



Refer to **Appendix D: Installation worksheet** on page 132 and **Appendix E: Configuration worksheets** on page 134 when installing a Relative Humidity Sensor.



If your Supra's circuit board does not have the jumper, you cannot use the sensor. Make sure the jumper is on the two left pins before switching on the power to the Supra. If the jumper is not in the correct position when you switch on the power, the sensor will be damaged. This will void the warranty.

Connecting a water meter

You can connect a water meter to the pulse counter (**PULSE CNTR**) terminal. The water meter must have a dry contact pulse output. Connecting a water meter allows you to monitor water usage.

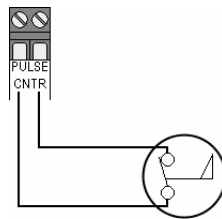


The water meter must measure one unit or greater per pulse. Also, the units per pulse must be a whole number; the Supra does not accept fractions or decimals.

For example, 1 gallon per pulse or 10 gallons per pulse would work; 0.5 gallons per pulse or 1.5 gallons per pulse would not work.

To connect a water meter

Connect a water meter to the **PULSE CNTR** terminal as shown below.



Connecting the power source

You can connect your Supra to 115 or 230 VAC power.



If you are connecting your Supras together in a network and monitoring them using SupraWare, connect your Supras to the computer before connecting the power source. For more information, see your **SupraWare user manual**.



Before connecting the power, set the voltage selection switch to the correct voltage.

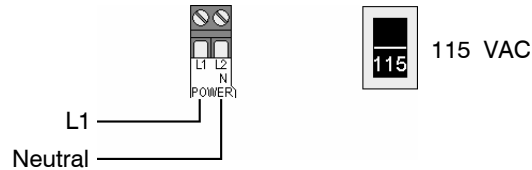


Before connecting the incoming power, switch OFF the power at the source.

Do not switch ON the power until you have finished all wiring and verified all equipment is properly connected and free of obstructions.

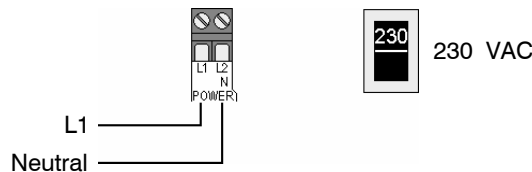
To connect a 115 VAC power source

1. Set the voltage select switch to 115.
2. Connect the incoming power source as shown below.



To connect a 230 VAC power source

1. Set the voltage select switch to 230.
2. Connect the incoming power source as shown below.



If you are using three-phase power, make sure the control power and the variable heating or cooling equipment are connected to the same phase. For more information, see **Using three-phase power** on page 20.

Finishing the installation

After installing and connecting equipment to your Supra, you are ready to finish the installation. Before you start configuring your Supra, you need to verify the connections and close the Supra.

Verifying your connections

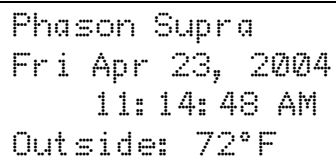
Make sure the configuration worksheets in **Appendix E** correspond to the way the equipment is connected to your Supra.

It is very important that the connections and the worksheet are the same, because the next step after closing the cover is to tell your Supra which equipment is connected to each terminal. It is important so you can be sure you are controlling the equipment you think you are controlling.

Closing the cover

After you have finished connecting all equipment, wiring, and cables to your Supra, it is time to verify the wires are connected properly and then close the cover.

1. Make sure all the wires are properly connected to the correct terminals.
2. Make sure the voltage selection switch is in the correct setting.
3. Make sure the display cable is properly connected to CON3. For more information, see **Supra interior layout** on page 14 (item 14).
4. If you have a network of Supras and are using SupraWare, plug in the AC adapter for the RS-485 Converter. For more information, see your **SupraWare user manual**.
5. Switch on the power to your Supra.
When you switch on the power to your Supra, the display on the front looks like the one below.
If the Supra display does not come on, go back to step 1.



Phason Supra
Fri Apr 23, 2004
11:14:48 AM
Outside: 72°F

6. Close the cover.
7. Insert the four screws into the cover and then tighten them.



Do not over tighten the screws. Avoid using power screwdrivers or drills.



Chapter 3: Understanding your Supra

- ◆ Reading the display
- ◆ Using the keypad

Reading the display

When you switch on the power to your Supra, the display on the front looks like the one below.

```
Phason Supra  
Fri Apr 23, 2004  
11:14:48 AM  
Outside: 72°F
```

The display has 4 lines with 20 character positions on each line. Sometimes there can be several lines of information available. To see the remaining lines of information, you need to “scroll”. To scroll down, press ↓ on the keypad to show a new line. To scroll up, press ↑.

For example, when you go to the Main Menu, you see a display screen like the one below.

```
MAIN MENU  
1 Settings  
2 Maintenance  
3 View Logs
```

Press ↓ three times to get to the View Logs line. Press ↓ once more, the next line displays and the first line scrolls up out of sight.

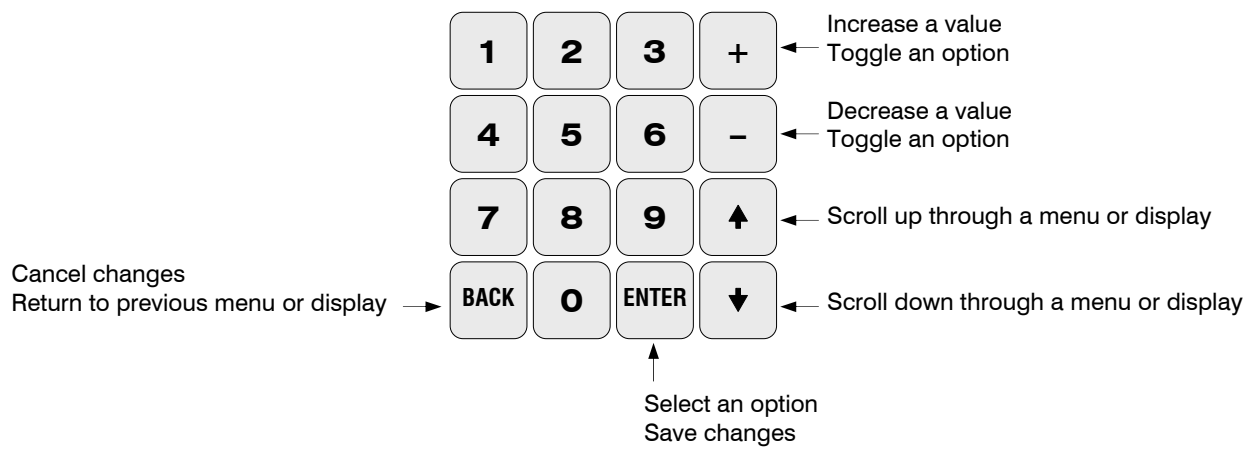
```
1 Settings  
2 Maintenance  
3 View Logs  
4 Security
```

Understanding the menu structure

1. Settings	3. View logs
<ul style="list-style-type: none"> 1. Group Setpoint 2. Heat/Cool Stages 3. Variable Stages 4. Growth Curve 5. Curtains 6. Alarms 7. Actuators 8. Duty Cycle 9. Timed Events 10. Water Meter 11. Humidity Control 	<ul style="list-style-type: none"> 1. Input Log 2. Alarm Log 3. Audit Log 4. Erase All Logs
	4. Security
	<ul style="list-style-type: none"> 1. Security On/Off 2. Change PIN 3. Add User 4. Remove User
2. Maintenance	5. Configuration
<ul style="list-style-type: none"> 1. Manual Override 2. Calibrate Actuator 3. Set Clock 4. Switch F/C 5. Set Unit Name 6. Set Main Display 7. Hysteresis 8. De-Icing 9. Logging Interval 10. Warnings 11. Temperature Probe 12. Motor Curves 13. Averaging On/Off 14. Averaging Setup 15. Humidity Factor 16. Restore Settings 17. Save Settings 	(Relays, VARs, and HUM)
	6. Diagnostics
	<ul style="list-style-type: none"> 1. Display All Inputs 2. Power Supply 3. Communications 4. View relay stages 5. Set relay stages 6. View VAR Stages 7. Set VAR Stages 8. LCD & Keypad check 9. Data Integrity 10. Change Version 11. Force Reset
	7. Factory Settings
	(resets factory settings)

Using the keypad

Your Supra’s 16-button keypad allows you to enter information into the Supra.



Usually your Supra will be displaying the status screen, which shows information about the control elements.

```
Phason Supra
Fri Apr 23, 2004
11:14:48 AM
Outside: 72°F
```

Your Supra displays outside temperature only if you have a probe connected to the **OUT TEMP** terminal

To display the Main Menu from the status screen, press **ENTER**.

```
MAIN MENU
1 Settings
2 Maintenance
3 View Logs
```

For an overview of your Supra menu, see **Understanding the menu structure** on page 31.

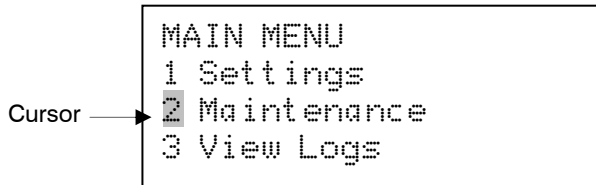
To select an items from the menu

Press the number corresponding to the item.

or

- ◆ Press the \uparrow or \downarrow arrow to move the cursor over the number beside the item you want to select and then press **ENTER**.

For example, to select Maintenance, press **2** or move the cursor over the **2** and then press **ENTER**.



If a menu has a shortcut key, in the instructions, the number for the shortcut will be in brackets after the menu name. For example,

From the Maintenance menu, select Set Unit Name (#5).



If the menu item you want to select has a number higher than 9, you cannot select that item by typing its number. You must move the cursor over the number and then press **ENTER**.

If there is an alarm condition, you will see the alarm screen instead of the status screen. You must acknowledge the alarm before you can proceed. For more information, see **Responding to alarms** on page 101.

To return to a previous menu or screen

To return to a previous menu or screen, press **BACK**.

Entering text in your Supra

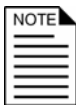
When you are configuring your Supra, you will need to assign descriptions or labels to the elements you are controlling. For example, if you have a fan connected to a variable stage, you might want to assign the label “VS fan 36-inch”.

There are 91 different characters you can enter into your Supra. The table below lists all the characters.

space	0	?	N	!	l
!	1	@	O	^	m
"	2	A	P	`	n
#	3	B	Q	,	o
\$	4	C	R	a	p
%	5	D	S	b	q
&	6	E	T	c	r
'	7	F	U	d	s
(8	G	V	e	t
)	9	H	W	f	u
*	:	I	X	g	v
+	;	J	Y	h	w
,	<	K	Z	i	x
-	=	L	[j	y
.	>	M	¥	k	z
/					

To enter text

- 1. Scroll to the position where you want to enter text and then press **ENTER**.
- 2. Press **+** or **-** until you see the character you want to enter. For example, **T** if you are entering Tom.
- 3. Press **ENTER**.
- 4. Repeat steps 1 to 3 for the each character you want to enter.



If there is already a character under the cursor when you press **+** or **-**, the display starts at that letter and moves up or down.

For example, if the letter “A” is displayed, pressing **+** displays the letter “E”. Pressing **-** displays the character “@”.

When entering text, use the + or – keys to display different characters in order.

+ displays the letters from top to bottom of the following list, – displays the letters from bottom to top.

Because there are so many characters to scroll through, your Supra provides a quick way to “jump” to certain characters. Select the shortcut character closest to the letter you want and then press + or – until you display the character you want.



To display this shortcut letter

Press this key on your Supra keypad

space

0

a

1

e

2

g

3

h

4

i

5

o

6

r

7

u

8

x

9



Chapter 4: Configuring your Supra

This chapter explains how to configure your Supra. Configuring your Supra includes telling it which equipment is connected to each terminal.

- ◆ Before you begin configuring your Supra
- ◆ Configuring your Supra

Before you begin configuring your Supra

Before you begin configuring your Supra, make sure:

- ◆ It has power
- ◆ All equipment has been properly connected to the correct terminals.
- ◆ You know which equipment is connected to which relays and variable stages

Configuring your Supra means telling it what equipment it will be controlling, and to some extent, how it will be controlling that equipment. For example, your Supra has 12 relay stages. You need to tell the stages if they will be controlling curtains, heating or cooling elements, or timed events. In addition, you need to tell the stages in which zone (1, 2, 3, or 4) they will be controlling those elements.



This chapter does not explain set points, idle speeds, or other settings. For information about those settings, See **Chapter 5: Programming your Supra** on page 63.

Because your Supra is a four-zone controller, you can divide your facility into real or imaginary zones—areas that can each be controlled independently of the others. Part of the configuration process is assigning relay stages and variable stages to zones (only one zone per stage).

A zone defines an area set off as distinct from surrounding or adjoining parts. Zones might or might not be separated by walls. For example, a large room could be divided into two zones to provide better control response.

Example 1: two rooms, two zones

You have a large finisher barn that is divided into two rooms. You have a forced-air ventilation system consisting of fans and inlets. You will use one Supra to control both rooms, one zone per room. The configuration could be as follows:

Room	Zone	Ventilation stage	Supra output	Equipment
Room 1	Zone 1	Stage 1	VAR 1	Two 20-inch, variable-speed fans
Room 1	Zone 1	Stage 2	VAR 2	Two 25-inch, variable-speed fans
Room 1	Zone 1	Stage 3	RLY 1	Two 36-inch, single-speed fans
Room 1	Zone 1	Stage 4	RLY 2	One 48-inch, single-speed fan
Room 1	Zone 1	Stage 5	RLY 3	Two 48-inch, single-speed fans
Room 1	Zone 1	—	RLY 4	Gas-fired furnace
Room 1	Zone 1	—	RLY 5	Inlet actuator OPEN
Room 1	Zone 1	—	RLY 6	Inlet actuator CLOSE
Room 2	Zone 2	Stage 1	VAR 3	Two 20-inch, variable-speed fans
Room 2	Zone 2	Stage 2	VAR 4	Two 25-inch, variable-speed fans
Room 2	Zone 2	Stage 3	RLY 7	Two 36-inch, single-speed fans
Room 2	Zone 2	Stage 4	RLY 8	One 48-inch, single-speed fan
Room 2	Zone 2	Stage 5	RLY 9	Two 48-inch, single-speed fans
Room 2	Zone 2	—	RLY 10	Gas-fired furnace
Room 2	Zone 2	—	RLY 11	Inlet actuator OPEN
Room 2	Zone 2	—	RLY 12	Inlet actuator CLOSE

Example 2: one room, two zones

You have a large, single-room finisher barn. You have a forced-air ventilation system consisting of fans and inlets. You will use one Supra to control the barn. Because the room is very large, you will use two zones. The configuration could be as follows:

Zone	Ventilation stage	Supra output	Equipment
Zone 1	Stage 1	VAR 1	Two 20-inch, variable-speed fans
Zone 1	Stage 2	VAR 2	Two 25-inch, variable-speed fans
Zone 1	Stage 3	RLY 1	Two 36-inch, single-speed fans
Zone 1	Stage 4	RLY 2	One 48-inch, single-speed fan
Zone 1	Stage 5	RLY 3	Two 48-inch, single-speed fans
Zone 1	—	RLY 4	Gas-fired furnace
Zone 1	—	RLY 5	Inlet actuator OPEN
Zone 1	—	RLY 6	Inlet actuator CLOSE
Zone 2	Stage 1	VAR 3	Two 20-inch, variable-speed fans
Zone 2	Stage 2	VAR 4	Two 25-inch, variable-speed fans
Zone 2	Stage 3	RLY 7	Two 36-inch, single-speed fans
Zone 2	Stage 4	RLY 8	One 48-inch, single-speed fan
Zone 2	Stage 5	RLY 9	Two 48-inch, single-speed fans
Zone 2	—	RLY 10	Gas-fired furnace
Zone 2	—	RLY 11	Inlet actuator OPEN
Zone 2	—	RLY 12	Inlet actuator CLOSE

Configuring your Supra

Configuring your Supra means telling it what equipment it will be controlling, and to some extent, how it will be controlling that equipment. For example, your Supra has 12 relay stages. You need to tell the stages if they will be controlling curtains, fans, or timed events. In addition, you need to tell the stages in which zone (1, 2, 3, or 4) they will be controlling those elements.

Configuration checklist

Because some items need to be configured before others, we recommend configuring your Supra in following order. If you do not have elements of a particular type, skip that step. For example, if you do not have actuators, skip to the next step.

Pre-configuration

- ☐ Identifying your Supra
- ☐ Setting the date and time
- ☐ Selecting the temperature units
- ☐ Selecting the type of temperature probes

Variable and relay stage configuration

- ☐ Configuring variable stages
- ☐ Configuring relays for actuators
- ☐ Calibrating actuators
- ☐ Configuring relays for single-stage heating and cooling or temperature-based duty cycles
- ☐ Configuring relays for curtains
- ☐ Configuring relays for time-based duty cycles
- ☐ Configuring relays for timed events

System configuration

- ☐ Selecting motor curves
- ☐ Configuring temperature averaging
- ☐ Selecting a humidity zone
- ☐ Configuring the pulse counter
- ☐ Configuring hysteresis
- ☐ Configuring warnings
- ☐ Testing the configuration



We recommend configuring *all* your control elements before programming the settings (temperature set points, idle speeds, and so on). Use the **Appendix E: Configuration worksheets** on page 134 to help you keep track of which equipment is connected to which relays and variable stages.

If you receive a warning during configuration, look it up in the **Warnings** table on page 129 and then follow the instructions for correcting the problem.

Your Supra's built-in diagnostic tests are useful for testing your equipment after installing and configuring it. For more information, see **Performing diagnostic tests** on page 108.



All instructions in the configuration section start from the Main Menu. To display the Main Menu from the status screen, press **ENTER**.

If there is an alarm condition, you will see the alarm screen instead of the status screen. You must acknowledge the alarm before you can proceed. For more information, see **Responding to alarms** on page 101.

If you have a network of Supras and are monitoring and controlling them using SupraWare, DO NOT enter information into your Supras with the keypad and SupraWare at the same time. Choose one method or the other.

Identifying your Supra

To identify a particular Supra, you need to give it a meaningful name, such as “West Barn” or “Finishing Room.” This is even more important when you have several Supras networked together.

If you move your Supra, or change how you use the area controlled by your Supra, you might want to change the name to something more descriptive.

Two additional pieces of information can be found on the Set Unit Name screen.

The version number tells you which version of firmware your Supra has. Phason constantly improves and adds new features to their products. If there are new features available, you can upgrade your Supra using an Intaglio. For more information, see **Intaglio** on page 5.

The address is a unique number generated for your Supra when it was manufactured. If you have a network of Supras and are using SupraWare, you will need to remember this number. For more information, see the SupraWare user manual.

To give your Supra a name

1. From the Main Menu, select **Maintenance** (#2).
2. From the Maintenance menu, select **Set Unit Name** (#5).
The display should look like the one below.

<pre> SET UNIT NAME Name: Phason Supra Version: 1.37 Address: 50B61AC8</pre>	Press \uparrow or \downarrow to scroll through the lines.
---	---

3. Scroll to the second line and then press **ENTER**.
4. Enter the name (maximum 14 characters) for this Supra. For more information, see **Entering text in your Supra** on page 34. To save the name, press **ENTER** until the cursor returns to the beginning of the line. To cancel the change, press **BACK**.
5. Press **BACK** twice to return to the Main Menu.

Selecting the temperature units

Your Supra can display temperatures in either degrees Fahrenheit (°F) or degrees Celsius (°C), but not both at the same time. The factory default is °F.

If you want to change the temperature units, follow the steps below.

To select temperature units

1. From the Main Menu, select **Maintenance**.
2. From the Maintenance menu, select **Switch F/C** (#4).
The display shows which unit of measure your Supra is using.
3. Press \downarrow to move the cursor to the second line and then press **ENTER**.
4. Press **+** or **-** to change the setting to the other unit of measure.
5. To save the setting, press **ENTER**. To cancel the change, press **BACK**.
6. Press **BACK** twice to return to the Main Menu.

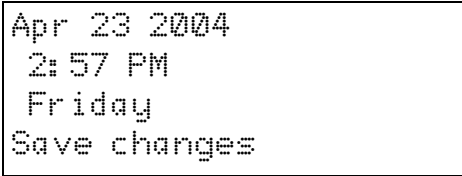
Setting the date and time

Your Supra has a real-time clock that keeps track of the date and time, regardless of power failures. However, your Supra does not automatically adjust for daylight savings time, so you will have to change the clock twice a year: one hour forward in the spring, and one hour back in the fall.

If the date and time shown on your Supra are correct, you do not need to follow these steps. If the date and time are incorrect, follow the steps below to set the time.

To set the date and time

1. From the Main Menu, select **Maintenance** (#2).
2. From the Maintenance menu, select **Set Clock** (#3).
The display should look like the one below.



Apr 23 2004
2:57 PM
Friday
Save changes

Press \uparrow or \downarrow to scroll through the lines.

3. Press **ENTER** to move between the month, day, and year.
4. Press **+** or **-** to change the date. To save the date, press **ENTER** until the cursor returns to the beginning of the line. To cancel the change, press **BACK**.



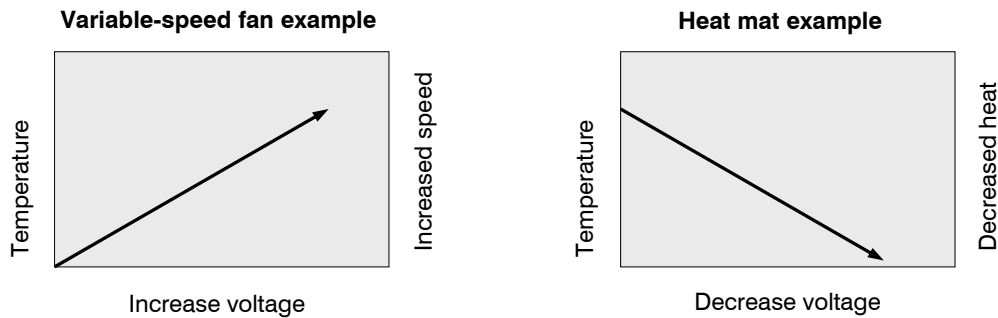
You can press the numbers on the keypad to change the day or the year.

If the day of week is wrong, change the day number of the date; the day of week changes automatically after you save changes.

5. Scroll to the next line and then press **ENTER**.
6. Enter the correct time using the numbers on the keypad. To change from AM to PM, press the **+** or **-** key. To save the time, press **ENTER** until the cursor returns to the beginning of the line. To cancel the change, press **BACK**.
7. Scroll to the last line and then press **ENTER**.
8. Press **BACK** twice to return to the Main Menu.

Configuring variable stages

Your Supra's four variable stages (**VAR1** to **VAR4**) control elements that operate with gradually increasing voltage, such as variable speed fans, or gradually decreasing voltage, such as heat mats.



Configuring the variable stages means selecting the zone (1, 2, 3, or 4) in which the stage will be controlling the equipment, selecting whether it is a heating element (for example, a heat mat) or a cooling element (for example, a fan), and assigning a name to the stage. For more information about how variable stages work, see **Programming variable stages** on page 72.



Use the **Variable stage configuration worksheet** on page 135 when configuring variable stages.

To configure variable stages

1. From the Main Menu, select **Configuration (#5)**.
2. Press \downarrow until the variable stage number you are configuring is displayed.
The display should look like the one below.

```
Var Stage 1 Zone 1
Unassigned
Noname VAR 1
```

Press \uparrow or \downarrow to scroll through the lines.

3. Scroll to the **Zone** line and then press **ENTER**.
4. Press **+** or **-** to select the zone this stage will be controlling and then press **ENTER**.
5. Scroll down to the next line and then press **ENTER**.
6. Press **+** or **-** to select whether the stage is a heating or cooling stage and then press **ENTER**.
7. Scroll down to the last line and then press **ENTER**.

8. Enter the name (maximum 13 characters) for this stage. For more information, see **Entering text in your Supra** on page 34. To save the name, press **ENTER** until the cursor returns to the beginning of the line. To cancel the change, press **BACK**.
9. Repeat steps 2 to 8 for each variable stage you have connected to your Supra.
10. Press **BACK** to return to the Main Menu.

Configuring relays for actuators

You can connect up to two actuators to a Supra. Each actuator you connect requires two relays: one for extending the actuator arm (opening the inlet), and one for retracting the arm (closing the inlet). You can connect actuators to any of the available relays, but side-by-side relays are recommended.

Before configuring the actuator relays, for each actuator, you need to know the following:

- ◆ The open relay number
- ◆ The close relay number
- ◆ The feedback terminal to which the actuator is connected (FB1 for Actuator 1 and FB2 for Actuator 2)
- ◆ The zone where the actuator is located



Use the **Relay configuration worksheet** on page 134 when configuring relays.



DO NOT switch on power to the actuator until you have completed the following steps. Switching on the power to the actuator before completing these steps can damage the actuator or the actuator power supply and will burn out the relays.

To configure relays for actuators



These steps use Actuator 1. If you are configuring a second actuator, follow the same steps, but use Actuator 2 in place of Actuator 1.

1. From the Main Menu, select **Configuration** (#5).
2. Press \downarrow until you see the relay for opening the actuator.
The display should look like the one below.

```
Relay 12      Zone 1
Unassigned
Name: Rly 12
```

Press \uparrow or \downarrow to scroll through the lines.

3. Press **ENTER**.
4. Press **+** or **-** to select the zone this actuator will be controlling and then press **ENTER**.
5. Scroll to the next line and then press **ENTER**.
6. Press **+** or **-** until you see **Actuator 1 Open** (or **Actuator 1 Close** for the closing relay) and then press **ENTER**.
7. Scroll to the last line and then press **ENTER**.
8. Enter the name (maximum 13 characters) for this relay. For more information, see **Entering text in your Supra** on page 34. To save the name, press **ENTER** until the cursor returns to the beginning of the line. To cancel the change, press **BACK**.
9. Repeat steps 2 to 8 using the relay for closing the actuator.
10. Press **BACK** to return to the Main Menu.
11. Go to the section **Calibrating actuators** below.

Calibrating actuators

After configuring the actuator relays, you need to calibrate the actuators. Calibrating the actuator lets your Supra know the position of the actuator when it is fully extended and fully retracted. Your Supra uses the limits to define the range of motion it uses to position the inlets. These limits tell your Supra how much to adjust when you want the actuators, for example, only 25% extended.

There are two stages to calibrating actuators. Stage 1 is testing the open and close functions and setting the limit switches. Testing an actuator really means testing the inlets it is controlling. Stage 2 is calibrating the actuator. In the steps below, we assume the actuator is positioning an inlet.



Because cables can stretch and equipment can come out of alignment (similar to tires on your car), we recommend resetting the limit switches and calibrating your actuators at least once each year.

Stage 1: To set the limit switches

1. From the Main Menu, select **Maintenance (#2)**.
2. From the Maintenance menu, select **Calibrate Actuator (#2)**.
The display should look like the one below.

```
Inlet 1
Never calibrated
Set limit switches
Calibrate now
```

Press **↑** or **↓** to scroll through the lines.

3. Scroll to **Set limit switches** and then press **ENTER**.
The display should look like the one below.

```
Press + to open
Press - to close
Press ENTER to stop
Press Back when done
```

4. Press **+** to extend (open) or **-** to retract (close) the inlets.
5. If the inlets **DO NOT** move in the proper direction, in other words, if they open when you press **-** and close when you press **+**, the wiring for the relays is reversed. Correct the wiring before repeating the test. For more information, see **Connecting actuators** on page 16.
If the inlets move in the proper direction, continue the test.
6. Press **-** and then wait until the inlet reaches its fully closed position. Immediately after it reaches the fully closed position, press **ENTER**.
7. Set the limit switch for the fully closed position.
8. Press **+** and then wait until the inlet reaches its fully open position. Immediately after it reaches the fully open position, press **ENTER**.
9. Set the limit switch for the fully open position.

10. Press **-** and then wait until the inlet stops moving. If it does not stop in the proper position, repeat steps 6 and 7.
11. Press **+** and then wait until the inlet stops moving. If it does not stop in the proper position, repeat steps 8 and 9.
12. After the limit switches are set and the actuator operates properly, go to **Stage 2: To calibrate actuators**.

Stage 2: To calibrate actuators



Calibrating actuators takes several minutes. You can stop the calibration process at any time, but if you do, your Supra will not be able to properly control the inlets.

1. From the Main Menu, select **Maintenance (#2)**.
2. From the Maintenance menu, select **Calibrate Actuator (#2)**.
The display should look like the one below.

```
Inlet 1
UNCALIBRATED

Calibrate now
```

Press **↑** or **↓** to scroll through the lines.

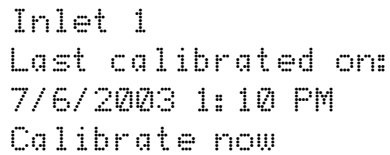
3. Scroll to the last line and then press **ENTER**.
If the actuator is operating properly, the inlet moves to its fully open position (100%), stops, and then moves to its fully closed position (0%).



If the actuator stops after moving in the close direction, or if it fails to position the inlet properly, the Supra is not receiving a proper feedback signal. This can be incorrect wiring or a defective potentiometer. Correct this problem and then restart the calibration at step 1. For more information see, your actuator's installation guide and **Connecting actuators** on page 16.

If the calibration fails (for example, if the actuator jammed), the display shows the reason for the failure. The date and time the actuator was last calibrated does not change. Check the alarm messages and then look up the problem in **Appendix B: Troubleshooting** on page 125. Check the actuator itself. Fix any mechanical or electrical problems.

4. After the actuator has calibrated properly, press **BACK** to return to the list of actuators. The display shows the date and time on which the actuator was calibrated.



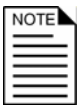
```
Inlet 1
Last calibrated on:
7/6/2003 1:10 PM
Calibrate now
```

5. If you have a second actuator to calibrate, press \downarrow until the second actuator is displayed and then repeat steps 3 and 4.
6. Press **BACK** twice to return to the Main Menu.

Configuring relays for single-stage heating and cooling or temperature-based duty cycles

Relays configured for heating can control equipment such as electric or gas heaters that can be either on or off. The relays switch on when the temperature drops below the set point and off when it rises above.

Relays configured for cooling can control single-speed fans, misters, or other cooling equipment that can be either on or off. The relays switch on when the temperature rises above the set point and off when it drops below.



This section is for ON/OFF relays. For information about variable-powered heating and cooling elements, see **Configuring variable stages** on page 44.



If you need to connect more cooling elements than you have relays, and you are not using all the variable stages, you can use any available variable stages as ON/OFF stages. For more information, see **Programming variable stages** on page 72.

Use the **Relay configuration worksheet** on page 134 when configuring relays.

To configure relays for single-stage heating and cooling or temperature-based duty cycles

1. From the Main Menu, select **Configuration (#5)**.
2. Press \downarrow until you see the relay for the heating element.
The display should look like the one below.

Relay 12	Zone 1
Unassigned	
Name: Rly 12	

Press \uparrow or \downarrow to scroll through the lines.

3. Press **ENTER**.
4. Press **+** or **-** to select the zone this element will be controlling and then press **ENTER**.
5. Scroll to the next line and then press **ENTER**.
6. If you want to configure the relay for controlling a heating element, press **+** or **-** until you see **Heat** and then press **ENTER**. If you want to configure the relay for controlling a cooling element, press **+** or **-** until you see **Cool** and then press **ENTER**.
7. Scroll to the last line and then press **ENTER**.
8. Enter the name (maximum 13 characters) for this relay. For more information, see **Entering text in your Supra** on page 34. To save the name, press **ENTER** until the cursor returns to the beginning of the line. To cancel the change, press **BACK**.
9. Repeat steps 2 to 8 for each heating or cooling element you have connected to your Supra.
10. Press **BACK** to return to the Main Menu.

Configuring relays for curtains

Curtains are usually controlled by equipment called curtain machines (sometimes referred to as winches). Curtains are opened and closed to let in more air or less air, the idea being more air cools the building.

You can connect up to six curtain machines to your Supra. Each curtain machine you connect requires two relays: one for opening the curtain, and one for closing the curtain. You can connect curtain machines to any of the available relays, but side-by-side relays are recommended.



Use the **Relay configuration worksheet** on page 134 when configuring relays.

To configure relays for curtains

1. From the Main Menu, select **Configuration (#5)**.
2. Press \downarrow until you see the relay for the cooling element.
The display should look like the one below.

```

Relay 10      Zone 1
Unassigned

Name: Rly 10
  
```

Press \uparrow or \downarrow to scroll through the lines.

3. Press **ENTER**.
4. Press **+** or **-** to select the zone this element will be controlling and then press **ENTER**.
5. Scroll to the next line and then press **ENTER**.
6. Press **+** or **-** until you see **Curtain 1 Open** (or **Curtain 1 Close** for the closing relay) and then press **ENTER**.
7. Scroll to the last line and then press **ENTER**.
8. Enter the name (maximum 13 characters) for this relay. For more information, see **Entering text in your Supra** on page 34. To save the name, press **ENTER** until the cursor returns to the beginning of the line. To cancel the change, press **BACK**.
9. Repeat steps 2 to 8 for each cooling element you have connected to your Supra.
10. Press **BACK** to return to the Main Menu.

Configuring relays for time-based duty cycles

Time-based duty cycles allow you have equipment operate for specific durations (ON duration and OFF duration) during certain hours of the day. For example, you can have a feed auger run for 15 minute and then stop for 45 minutes between the 6:00 AM and 8:00 PM. In other words, “Between 6:00 AM and 8:00 PM, I want the feed auger ON for 15 minutes, OFF for 45 minutes, ON for 15 minutes...” and so on.

This section explains how to configure time-based duty cycles.



If you want to configure temperature-based duty cycles (duty cycles that operate for specific durations while the temperature is above or below a certain value), see **Configuring relays for single-stage heating and cooling** on page 49.

If you want to configure elements that turn on and off at specific times, see **Configuring relays for timed events** on page 53.



Use the **Relay configuration worksheet** on page 134 when configuring relays.

To configure relays for time-based duty cycles

1. From the Main Menu, select **Configuration (#5)**.
2. Press \downarrow until you see the relay for the duty cycle element.
The display should look like the one below.

```
Relay 9      Zone 1
Unassigned
Name: Rly 9
```

Press \uparrow or \downarrow to scroll through the lines.

3. Press **ENTER**.
4. Press **+** or **-** to select the zone this element will be controlling and then press **ENTER**.
5. Scroll to the next line and then press **ENTER**.
6. Press **+** or **-** until you see **Duty Cycle** and then press **ENTER**.
7. Scroll to the last line and then press **ENTER**.
8. Enter the name (maximum 13 characters) for this relay. For more information, see **Entering text in your Supra** on page 34. To save the name, press **ENTER** until the cursor returns to the beginning of the line. To cancel the change, press **BACK**.
9. Repeat steps 2 to 8 for each duty cycle element you have connected to your Supra.
10. Press **BACK** to return to the Main Menu.

Configuring relays for timed events

Relays configured for timed events can be used to control feed augers, turn lights on and off, or control equipment that must operate at specific times each day, regardless of temperature. An example of a timed event would be switching the yard lights on at 8:00 PM and off at 7:00 AM.



Use the **Relay configuration worksheet** on page 134 when configuring relays.

To configure timed event relays

1. From the Main Menu, select **Configuration (#5)**.
2. Press \downarrow until you see the relay for the timed event element.
The display should look like the one below.

```
Relay 5      Zone 1
Unassigned
Name: Rly 5
```

Press \uparrow or \downarrow to scroll through the lines.

3. Press **ENTER**.
4. Press **+** or **-** to select the zone this element will be controlling and then press **ENTER**.
5. Scroll to the next line and then press **ENTER**.
6. Press **+** or **-** until you see **Timed Event** and then press **ENTER**.
7. Scroll to the last line and then press **ENTER**.
8. Enter the name (maximum 13 characters) for this relay. For more information, see **Entering text in your Supra** on page 34. To save the name, press **ENTER** until the cursor returns to the beginning of the line. To cancel the change, press **BACK**.
9. Repeat steps 2 to 8 for each timed event element you have connected to your Supra.
10. Press **BACK** to return to the Main Menu.

Selecting motor curves

The Phason “Optimum” curve should work properly for all fan models. However, if you have one of the fans listed in **Appendix G: Supra motor curves** on page 154, you can select a different motor curve. We recommend using the Phason Optimum curve. Motor curves have no effect on variable *heating* stages.

To change the motor curve

1. From the Main Menu, select **Maintenance (#2)**.
2. From the Maintenance menu, select **Motor Curves**.

The display should look like the one below.

VAR 1	Optimum
VAR 2	Optimum
VAR 3	Optimum
VAR 4	Optimum

Press ↑ or ↓ to scroll through the lines.

3. Scroll to a curve you want changed and then press **ENTER**.
4. Press **+** or **-** to cycle through the list of curves. Select the curve you want and then press **ENTER**.
5. Repeat steps 3 and 4 for each motor curve you want to change.
6. Press **BACK** twice to return to the Main Menu.

Testing the configuration

After configuring all the control elements (variable stages relays, and so on), test your Supra to make sure the configuration is correct. In other words, make sure what you think is connected to a particular relay or stage *is* actually connected to that relay or stage.

You can test the configuration by using the diagnostic feature of your Supra. The diagnostic feature allows you to operate the equipment, regardless of temperature or time. As you operate each piece of equipment, visually check to see if that equipment is doing what you tell it.

For example, when you switch on VAR 1 (variable stage 1) at the Supra, does the fan or heater you think have connected to that stage switch on? When you switch VAR 1 off, does the fan or heater switch off?

For more information about the diagnostic test, see **Chapter 7: Servicing and maintaining your Supra** on page 105.

Selecting the type of temperature probes

Your Supra comes with a Phason 3K temperature probe, the standard for most Phason controls. If you want to connect a 1K probe, you need to tell the Supra that you have connected a different type of probe.

By default, the Supra is set to “normal” for 3K temperature probes. You need to select the type of probe *only if* you are *not* using a standard Phason 3K temperature probe. A 1K probe is typically used in (embedded inside) heat mats. For example, Master Mat.

To select the type of temperature probe

1. From the Main Menu, select Maintenance (#2).
2. From the Maintenance menu, select Temperature Probe.
The display should look like the one below.

Probe 1	Normal
Probe 2	Normal
Probe 3	Normal
Probe 4	Normal

Press ↑ or ↓ to scroll through the lines.

3. If you are using a 1K temperature probe, scroll to the line corresponding to the zone where you installed the probe and then press **ENTER**.
4. Press **+** or **-** to change **Normal** to **Special** and then press **ENTER**.
5. Repeat steps 3 and 4 for each 1K probe you installed.
6. Press **BACK** twice to return to the Main Menu.



Replace damaged probes as soon as possible. If a probe is damaged, unless you have temperature averaging enabled, your Supra automatically selects the next active temperature probe.

For more information, see **Configuring temperature averaging** on page 56.

Configuring temperature averaging

Temperature averaging allows you to take temperature readings from up to four probes and average the values.

How temperature averaging works

Let's say you have a large room controlled as a single zone. Because the room is large, you want to have temperature readings from two different ends of the room.

You enable temperature averaging and then set up zone 1 to average probes 1 and 2. If probe 1 reads 72.0°F and probe 2 reads 74.0°F, your Supra uses the average temperature of 73.0°F as the temperature for the zone.



When averaging is on, if a probe is damaged, the Supra uses the temperature from the remaining averaged probe(s) for the zone.

If all of the averaged probes for a zone are damaged (in other words, there are no probes available), the Supra switches all the heating elements off and switches all the cooling elements on 100% for that zone.

Another advantage of temperature averaging is that it prevents the Supra from using an “undesirable” probe if the one for a zone becomes damaged.

For example, let's say you have four probes connected to your Supra and are using four zones. Temperature averaging is off. If probe 3 gets damaged, the Supra would use the probe for zone 4 to control zone 3. If the probe for zone 4 is a heat mat probe, this can cause the ventilation equipment for that zone to operate undesirably. To prevent this, use averaging to isolate dissimilar zones.

With averaging, you could set up your Supra to average one probe for each zone as follows: zone 1 - probe 1; zone 2 - probe 2; zone 3 - probe 3; zone 4 - probe 4. In this case, if probe 3 gets damaged, the Supra would not default to probe 4; instead, it would switch all the heating elements off and all the cooling elements on 100% for that zone.



Use the **Temperature averaging worksheet** on page 136 when configuring temperature averaging.

To configure temperature averaging

1. From the Main Menu, select **Maintenance (#2)**.
2. From the Maintenance menu, select **Averaging On/Off**.
The display should look like the one below.

```
Averaging is:      Off
```

Press ↑ or ↓ to scroll through the lines.

3. Press **ENTER**.
4. Press **+** or **-** to change the **Off** to **On** and then press **ENTER**.
5. Press **BACK** to return to the Maintenance menu.
6. From the Maintenance menu, select **Averaging Setup**.
The display should look like the one below.

```
Zone 1    Avg 1&2&3&4
Zone 2    Avg 1&2&3&4
Zone 3    Avg 1&2&3&4
Zone 4    Avg 1&2&3&4
```

7. Scroll to a line that needs to be changed and then press **ENTER**.
8. Press **+** or **-** to cycle through the options. Select the option you want and then press **ENTER**.
9. Repeat steps 7 and 8 for each zone.
10. Press **BACK** twice to return to the Main Menu.

Selecting a humidity zone

If you installed a Relative Humidity Sensor, you need to select which zone the sensor will be monitoring. A humidity sensor can monitor only one zone.

For more information, see **Relative Humidity Sensors** on page 6.



Use the **Humidity zone worksheet** on page 136 when configuring humidity.

To select a humidity zone

1. From the Main Menu, select **Configuration (#5)**.
2. Press **↑** until you see **Hum Zone Assignment**.
The display should look like the one below.

```
Hum Zone Assignment
Unassigned
```

Press **↑** or **↓** to scroll through the lines.

3. Scroll to **Unassigned** and then press **ENTER**.
4. Press **+** or **-** to select the zone the sensor will be monitoring and then press **ENTER**.
5. Press **BACK** to return to the Main Menu.

Configuring the pulse counter

If you connected a water meter to your Supra's pulse counter terminal and will be monitoring water usage, you need to tell your Supra how much water (in litres or US gallons) goes through the meter for each pulse the meter puts out. Your Supra uses this information to convert the pulses to water usage values.

For example, let's say your water meter puts out 1 pulse for every 10 gallons of water that goes through it. If your Supra received 125 pulses from the meter during the day, you used 1250 gallons of water.



Use the **Pulse counter worksheet** on page 137 when configuring a pulse counter.

To configure a pulse counter

1. From the Main Menu, select **Settings (#1)**.
2. From the Settings menu, select **Water Meter**.
The display should look like the one below.

```
Water Meter
1 Litre / pulse
Display in Litres
```

Press **↑** or **↓** to scroll through the lines.

3. Scroll to the second line and then press **ENTER**.
4. Enter the number of litres or gallons for each pulse, or press **+** or **-** to adjust the number and then press **ENTER**.
5. Press **+** or **-** to select Litre or Gallon / pulse and then press **ENTER**.
6. Scroll to the third line and then press **ENTER**.
7. Press **+** or **-** to select whether to display water usage in Litres or Gallons and then press **ENTER**.
8. Press **BACK** twice to return to the Main Menu.

Configuring de-icing

Your Supra's de-icing feature helps keep variable-speed fans from icing up if the outdoor temperature is too cold. When de-icing is enabled, variable-speed fans start at full speed before dropping to the idle or normal speed. Configuring de-icing means setting the temperature at which de-icing starts, setting the duration it lasts, and selecting which variable speed fans to de-ice.

For example, if you set the de-icing temperature to 32°F and the duration to 3 seconds, when the fan starts up, it automatically runs at full speed for three seconds before dropping down to its normal speed (whatever the normal speed should be for the current temperature in that zone).



For de-icing to work properly, you must have a temperature probe connected to the **OUT TEMP** terminal. For more information, see **Connecting temperature probes** on page 23.

If de-icing is enabled and there is no outdoor probe (or it is damaged), your Supra operates as if the outdoor temperature is below the de-icing temperature.



Use the **De-icing worksheet** on page 137 when configuring de-icing.

To set the de-icing defaults

1. From the Main Menu, select **Maintenance** (#2).
 2. From the Maintenance menu, select **De-Icing** (#8).
- The display should look like the one below.

```
De-ice VAR fans when
Colder than      33.0°F
For 3 seconds
VS Fan 1                No
```

Press **↑** or **↓** to scroll through the lines.

3. Scroll to the second line and then press **ENTER**.
4. Enter the temperature using the keypad, or press **+** or **-** to adjust the de-icing temperature and then press **ENTER**.



Your Supra interprets the last digit as a decimal. For example, to enter 33.0°F, enter 330.

5. Scroll to the third line and then press **ENTER**.
6. Enter the duration (in seconds) or press **+** or **-** to adjust the de-icing duration and then press **ENTER**.
7. Scroll to the next line.
8. If you want to enable or disable the de-icing for this variable stage, press **ENTER** and then press **+** or **-** to enable or disable the de-icing for this variable stage (Yes is enabled, No is disabled).
9. Press **ENTER**.
10. Repeat steps 7 and 9 for each variable stage.
11. Press **BACK** twice to return to the Main Menu.

Configuring hysteresis

Hysteresis helps prevent damage to the relays, variable stages, and the equipment connected to them by preventing the stages from switching on and off rapidly when the temperature is hovering close to the set point.



Use the **Hysteresis worksheet** on page 138 when configuring hysteresis. The worksheet contains detailed explanations about the settings and the defaults and ranges for each setting.

To set hysteresis values

1. From the Main Menu, select **Maintenance** (#2).
2. From the Maintenance menu, select **Hysteresis** (#7).
The display should look like the one below.

HYSTERESIS	
H/C Stages	0.5°F
VAR Idle Off	0.3°F
Actuator	0.3°F

Press \uparrow or \downarrow to scroll through the lines.

3. Scroll to the second line and then press **ENTER**.
4. Enter the temperature using the keypad, or press **+** or **-** to adjust the hysteresis and then press **ENTER**.



Your Supra interprets the last digit as a decimal. For example, to enter 0.5°F, enter 05.

5. Scroll to the next line.
6. Repeat steps 4 and 5 for each setting.



Actuators have three hysteresis values: one for temperature, one for position, and one for duration. For more information, see the **Hysteresis worksheet** on page 138.

7. Press **BACK** twice to return to the Main Menu.

Configuring warnings

Warnings are one of your Supra's built-in diagnostic tools. They warn you about conflicts or out-of-range conditions as you are programming the control. When your Supra comes from the factory, all warnings are active (set to **Yes**). You can select which warnings you want active and which ones you want inactive.



Use the **Warnings worksheet** on page 139 when configuring warnings. The worksheet has descriptions for each warning.

To configure warnings

1. From the Main Menu, select **Maintenance** (#2).

2. From the Maintenance menu, select **Warnings**.

The display should look like the one below.

H/C Conflict	Yes
Min Ventilation	Yes
Large VAR Range	Yes
Odd Timed Evnts	Yes
Overlap Events	Yes
Edit Aborted	Yes

Press **↑** or **↓** to scroll through the lines.

3. Scroll to the line of a warning you want to change and then press **ENTER**.

4. Press **+** or **-** to activate or deactivate the warning (Yes is active, No is inactive) and then press **ENTER**.

5. Repeat steps 3 and 4 for each warning you want to change.

6. Press **BACK** twice to return to the Main Menu.



Chapter 5: Programming your Supra

This chapter discusses how to program your Supra with the settings it uses to control your equipment.

- ◆ Programming your Supra
- ◆ Programming the zones
- ◆ Programming the stages
- ◆ Programming the alarm and display settings
- ◆ Setting up security and users

Programming your Supra

Programming your Supra basically means telling the equipment what you want it to do and when you want it done. For example, for a single-speed fan set for cooling, you might say: “Switch on when the temperature rises above 80°F.”

Programming checklist

Because some settings must be programmed before others, we recommend programming your Supra in the following order. If you do not have elements of a particular type, skip that step. For example, if you do not have curtains, skip the Programming curtain control relays step.

Programming the zones

- ☐ Setting the group set point
- ☐ Setting up growth curves
- ☐ Programming the humidity compensation

Programming the stages

- ☐ Programming variable stages
- ☐ Programming actuator relays
- ☐ Programming curtain control relays
- ☐ Programming heating and cooling elements and temperature-based duty cycles
- ☐ Programming timed events
- ☐ Setting up time-based duty cycles

Programming the alarm and display settings

- ☐ Programming alarm settings
- ☐ Setting up the status display
- ☐ Setting the logging interval

Setting up security and users

- ☐ Adding and removing users
- ☐ Enabling and disabling security

Before you begin programming your Supra, make sure:

- ◆ It has power
- ◆ All equipment has been properly connected to the correct terminals.
- ◆ You know which equipment is connected to which relays and variable stages
- ◆ All variable and relay stages have been properly configured and tested. For more information, see **Chapter 4: Configuring your Supra** on page 37.

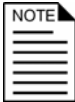


Use the **Settings worksheets** in **Appendix F** on page 140 when programming your Supra.

If you receive a warning during configuration, look it up in the Warnings table on page 129 and then follow the instructions for correcting the problem.

All instructions start from the Main Menu. To display the Main Menu from the status screen, press **ENTER**.

If there is an alarm condition, you will see the alarm screen instead of the status screen. You must acknowledge any alarms before you can proceed. For more information, see **Responding to alarms** on page 101.



If you have a network of Supras and are monitoring and controlling them using SupraWare, **DO NOT** program your Supras with the keypad and SupraWare at the same time. Choose one method or the other.

Your Supra checks settings against a set of factory-defined rules. If any settings might cause a problem, your Supra displays a warning. The warning does not appear again until that setting is accessed. A list of warnings and their meanings is in **Appendix B: Troubleshooting** on page 125 .

Programming the zones

Programming the zones means entering the “target temperatures” for each zone. If you are monitoring humidity, you need to program the humidity control limits.

There are two options for the zone temperatures:

- ◆ Group set points
- ◆ Growth curves

You can set up both group set points and growth curves, but your Supra will use only one or the other. If a growth curve is enabled for a zone, the control uses the growth curve settings. If there is no growth curve for a zone, the control uses the group set points.

Setting the group set point

A group set point is the desired or target temperature for a zone. The individual set points for each variable and relay stage will be adjusted relative to the group set point for that zone. **Make sure you set the group set point before setting the individual set points.**

For example, let's say the group set point for zone 1 is 80°F, a variable-stage fan set point is 5 degrees higher (85°F), and a single-stage heater set point is 7 degrees lower (73°F). If you lower the group set point by 5 degrees to 75°F, the set points for the fan and heater will also be lowered by 5 degrees to 80°F and 68°F respectively.

Once a group set point is set, it remains at that temperature until you change it, or until an enabled growth curve makes an adjustment to it.



Use the **Group set point worksheet** on page 140 when setting up groups set points.

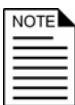
To set a group set point

1. From the Main Menu, select **Settings (#1)**.
2. From the Settings menu, select **Group Setpoint (#1)**.
The display should look like the one below.

Zone 1	85.0°F
Zone 2	85.0°F
Zone 3	85.0°F
Zone 4	85.0°F

Press \uparrow or \downarrow to scroll through the lines.

3. Scroll to a zone you want to change and then press **ENTER**.
4. Enter the temperature using the keypad, or press **+** or **-** to adjust the set point and then press **ENTER**.



Your Supra interprets the last digit as a decimal. For example, to enter 80.5°F, enter 805.

5. Repeat steps 3 and 4 for each zone you want to set up.
6. Press **BACK** twice to return to the Main Menu.

Setting up growth curves

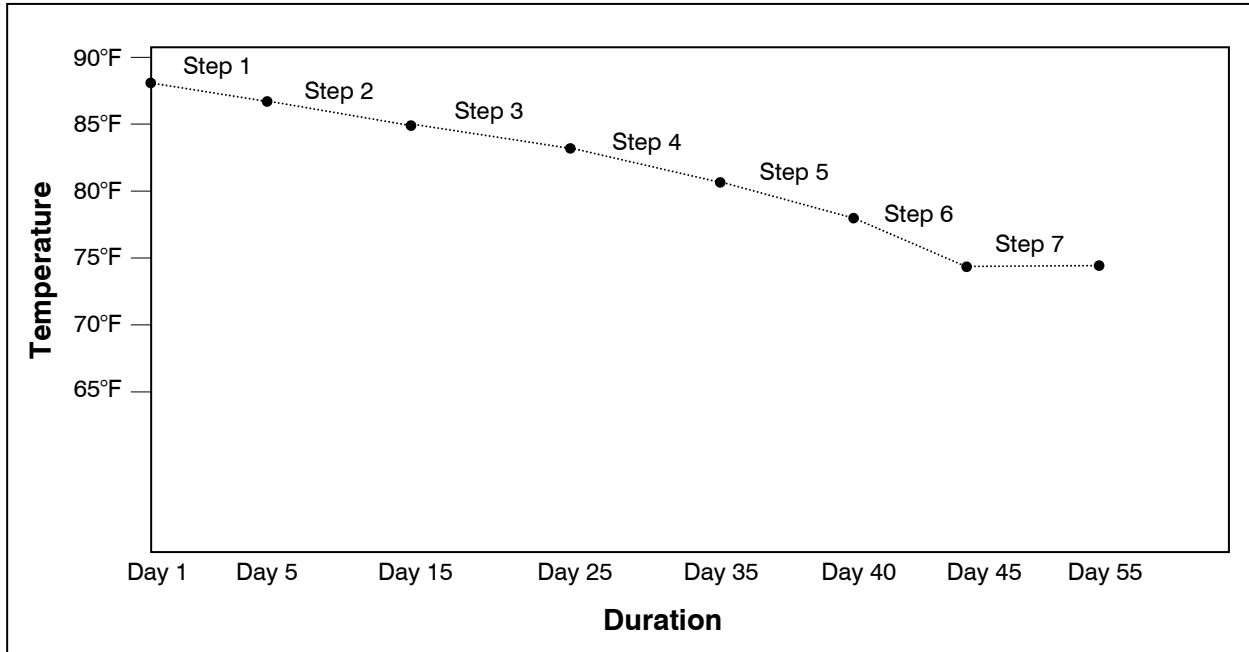
A growth curve is an extension of the group set point concept. The growth curve automatically adjusts the temperature set points over time to control the temperature in a room or zone. It is called a “growth” curve because it adjusts the set-points as the animals “grow”.

For example, in hog production, newborn piglets require a high temperature for comfort and health. As they grow older, they need a steadily lower temperature. Using the growth curve, you can have your Supra automatically adjust the temperatures. For example, start at 76°F for 1 day, drop to 74°F for 1 day, then to 71°F for 21 days, 68°F for 14 days, and so on.

You can have up to seven steps in a growth curve. Each step has a starting temperature set point and a duration. Your Supra automatically calculates the set points for the days between the steps and adjusts the set points at midnight each day. Individual set points for the variable and fixed stages are adjusted relative to the growth curve temperature for that particular day. This is an extremely powerful feature because it lets you put fan and heating strategies in place once, and then adjust them automatically over time.

For example, in the table below, step 2 has a duration of 10 days. The difference between the starting set point (86.5°F) and the starting set point for the next step (85°F) is 1.5°F. The Supra divides the temperature difference by the duration $1.5 \div 10 = 0.15$ and then automatically adjusts the set point by 0.15°F each day for 10 days.

Set point	Temperature (°F)	Duration (days)
1	88.0	5
2	86.5	10
3	85.0	10
4	83.5	10
5	81.0	5
6	78.0	5
7	74.0	10



Your Supra lets you define two growth curves: Growth Curve A and Growth Curve B. This lets you control two different areas of your facility with independent set points.

You cannot define two growth curves for the same zone. If all zones are controlled by a single growth curve, use Growth Curve A.



Use the **Growth curve worksheet** on page 140 when setting up growth curves. The worksheet contains detailed explanations about the settings and the defaults and ranges for each setting.

To define growth curves

1. From the Main Menu, select **Settings** (#1).
2. From the Settings menu, select **Growth Curve** (#4).
The display should look like the one below.

```
GROWTH CURVE A
Zone: None
Status: Disabled
Current day: 1
```

Press \uparrow or \downarrow to scroll through the lines.

3. Scroll to the next line and then press **ENTER**.
4. Press **+** or **-** to select the zone or zones for this growth curve and then press **ENTER**.
5. Scroll to the next line and then press **ENTER**.

6. Press **+** or **-** to select the status for this growth curve and then press **ENTER**. The table below describes each choice.

Setting	Description
Disabled	This growth curve is ignored. When enabled, the growth curve starts at day 1.
Enabled	This growth curve is active for the zones specified.
Suspended	All set points will stay at their current values, and the growth curve will remain on its current day, until it is enabled again. When enabled, it will pick up where it left off.
Override	This growth curve will still advance one day at a time (in other words, the clock still advances), but the control uses the group set point instead of the growth curve. When enabled, the control uses the growth curve set point for that day. This can cause a sudden change in temperature if the group set point is very different from the growth curve set point.



If you are setting up your growth curve a few days before you want it to start, set the status to disabled. On the day you want to start the growth curve, change the status to enabled.

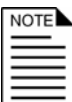
7. Scroll down to **Current day** and then press **ENTER**.
8. Enter 1 as the day and then press **ENTER**.
9. Scroll to the next line and then press **ENTER**.
You start to see the temperature set points for each stage.

Zone:	All
Status:	Disabled
Current day:	1
St1 Day	1 85.0°F
St2 Day	4 80.0°F
St3 Day	14 75.0°F
St4 Day	24 70.0°F
St5 Day	34 65.0°F
St6 Day	44 60.0°F
St7 Day	64 60.0°F

The settings shown are the factory defaults.

Press **↑** or **↓** to scroll through the lines.

10. Scroll to **St 1** and then press **ENTER**.
11. Enter the temperature using the keypad, or press **+** or **-** to adjust the set point and then press **ENTER**.



Your Supra interprets the last digit as a decimal. For example, to enter 80.5°F, enter 805.

12. Scroll to **St 2** and then press **ENTER**.
13. Enter the start day for the growth curve step using the keypad, or press **+** or **-** to adjust the day and then press **ENTER**.
14. Enter the temperature using the keypad, or press **+** or **-** to adjust the set point and then press **ENTER**.
15. Repeat steps 12 to 14 for each growth curve step.
16. If you want to define growth curve B, scroll down until you see **GROWTH CURVE B** on the first line and then repeat steps 3 to 15.
17. Press **BACK** twice to return to the Main Menu.

Programming the humidity compensation

If you have installed and configured a humidity sensor, you need to program the humidity compensation. Programming the humidity compensation means setting the humidity factor and the upper and lower humidity limits. Your Supra uses these settings to compensate for high humidity levels and it adjusts the ventilation accordingly.

The humidity band is the humidity range in which your Supra attempts to compensate for humidity. The band consists of a lower and upper limit.

The humidity factor is a number between 0 and 10 that determines the amount of humidity compensation. A lower value produces a slight ventilation adjustment, while a higher value produces a greater adjustment.

How humidity compensation works

Your Supra uses the humidity band and humidity factor to adjust the ventilation for the zone. At the beginning of the band (the lower limit), very little adjustment is made. As the humidity rises, the adjustment increases. At or above the upper limit of the band, the maximum adjustment is applied.

For example, if the maximum acceptable humidity for your zone is 70%, you would set the lower limit to 70%. The upper limit could be set for 90% (90% is the maximum allowed and 20% is the minimum difference between the lower and upper limits).

When the humidity is below 70%, the ventilation rate is controlled by the zone's normal, programmed settings. As the humidity rises above 70%, humidity compensation starts to take effect and the ventilation rate increases. When the humidity reaches 90%, the humidity compensation reaches its maximum adjusted rate.

If the outside air is cooler than the zone temperature, the ambient temperature in the zone drops due to the increased ventilation. This causes the heaters to switch on, which help to dry the air. It is important to balance this effect with your heating system's ability to maintain the temperature while drying out the room. A lower humidity factor starting at a lower humidity level, and spread over a wider band, is better for lower-capacity heating systems.



Before programming the humidity compensation, you must assign the humidity sensor to a zone. For more information, see **Selecting a humidity zone** on page 57.



Use the **Humidity compensation settings worksheet** on page 142 when programming the humidity compensation. The worksheet includes a table of values to use as a guideline when programming.

To program the humidity compensation

1. From the Main Menu, select **Maintenance (#2)**.
2. From the Maintenance menu, select **Humidity Factor**.
The display should look like the one below.

```
Humidity Factor      3
```

3. Press **ENTER**.
4. Enter the humidity factor using the keypad, or press **+** or **-** to adjust the factor and then press **ENTER**.
5. Press **BACK** twice to return to the Main Menu.
6. From the Main Menu, select **Settings (#1)**.
7. From the Settings menu, select **Humidity Control**.
The display should look like the one below.

```
_Humidity Control
Zone 1
Upper limit      90%
Lower limit      30%
```

Press **↑** or **↓** to scroll through the lines.

8. Scroll to **Upper limit** and then press **ENTER**.
9. Enter the upper limit using the keypad, or press **+** or **-** to adjust the limit and then press **ENTER**.

10. Scroll to **Lower limit** and then press **ENTER**.
11. Enter the lower limit using the keypad, or press **+** or **-** to adjust the limit and then press **ENTER**.
12. Press **BACK** twice to return to the Main Menu.

Programming the stages

Programming the stages means entering the settings such as temperature set points, idle speeds, ON/OFF times and durations, and so on. Programming the stages involves programming the settings for:

- ◆ Variable stages
- ◆ Relay stages
 - ◆ Actuators
 - ◆ Curtains
 - ◆ Heating and cooling stages, including temperature-based duty cycles
 - ◆ Timed events
 - ◆ Time-based duty cycles

Programming variable stages

Before setting up the variable stages, make sure you have properly configured them. For more information, see **Configuring variable stages** on page 44.

Setting up the variable stages means setting the temperature set points and idle speeds. There are four settings for each variable stage.

For a cooling stage:

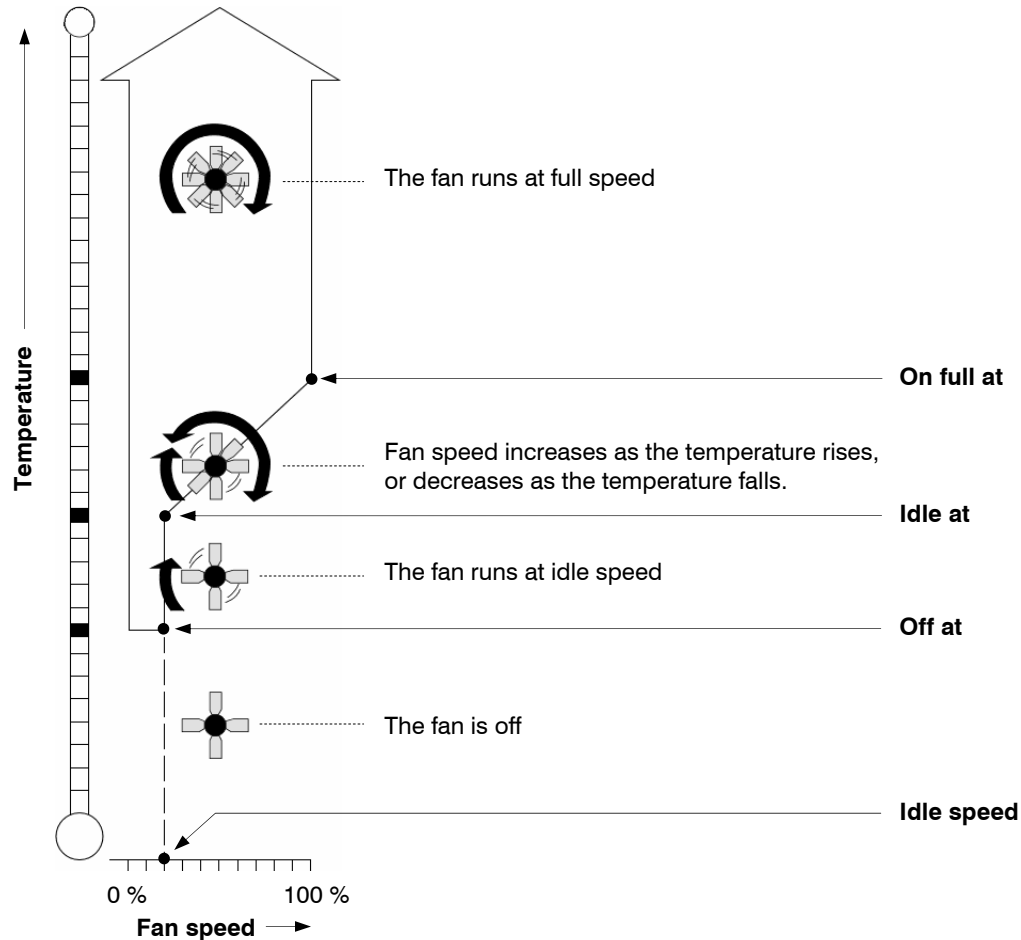
- ◆ On full at
- ◆ Idle at (sometimes called set point)
- ◆ Off at (sometimes called idle range)
- ◆ Idle speed

For a heating stage:

- ◆ Off at
- ◆ Set point
- ◆ On full at
- ◆ Min heat

Cool mode

When the temperature is below the “off at” temperature, the fan is off. When the temperature rises above the idle range, the fan runs at the idle speed. The fan continues to run at the idle speed until the temperature rises to the “idle at” temperature. When the temperature is between the set point and the “on full at” temperature, the fan increases or decreases proportionally with the temperature. When the temperature is above the differential, the fan runs at full speed.



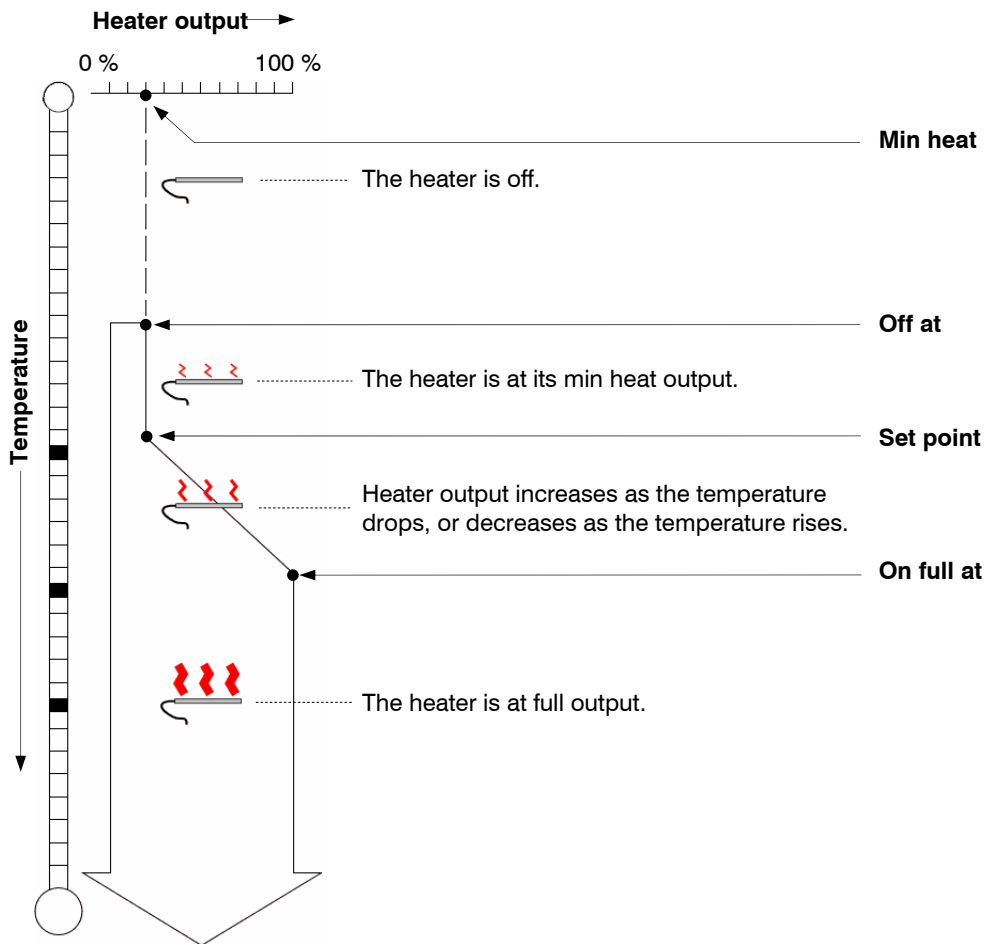
If you need to connect more cooling elements than you have relays, and you are not using all the variable stages, you can use any available variable stage as an ON/OFF stage.

Set the idle speed to 100% and “off at” to the temperature at which you want the stage to switch on/off.

You no longer have “variable” speed or power; instead you have either full on or full off, the same as a regular cooling element. The “idle at” and “on full at” settings have no effect when you use a variable stage this way.

Heat mode

Heat mode works the same as cooling mode, except in reverse. When the temperature is above the off at temperature, the heater is off. When the temperature drops below the off at temperature, the heater is at the min output. The heater continues to operate at the min output until the temperature drops to the set point. When the temperature is between the set point and the differential (“on full at” temperature), the heater output increases or decreases proportionally with the temperature. When the temperature is below the differential, the heater is at full output.



If you need to connect more heating elements than you have relays, and you are not using all the variable stages, you can use any available variable stage as an ON/OFF stage.



Set “min heat” to 100% and “off at” to the temperature at which you want the stage to switch on/off.

You no longer have “variable” speed or power; instead you have either full on or full off, the same as a regular heating element. The “setpoint” and “on full at” settings have no effect when you use a variable stage this way.



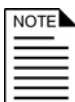
Use the **Variable stage settings worksheet** on page 141 when setting up variable stages.

To set up variable stages

- From the Main Menu, select **Settings** (#1).
- From the Settings menu, select **Variable Stages** (#3).
The display should look like the one below, depending on the stage it is set up for cool mode or heat mode. The first line is the name you gave the variable stage when you configured it.

Cool mode		Press ↑ or ↓ to scroll through the lines.	Heat mode	
VS Fan 1	Zone 2		Heat Mat 4	Zone 2
On Full at	85.0°F		Off at	86.5°F
Idle at	80.0°F		Setpoint	85.0°F
Off at	40.0°F		On full at	80.0°F
Idle Speed	20%		Min Heat	20%

- Scroll to **Idle Speed** (**Min Heat** for a heating stage) and then press **ENTER**.
- Enter the speed (output for a heating stage) using the keypad, or press **+** or **-** to adjust the percentage and then press **ENTER**.
- Scroll to **Off at** (**On Full at** for a heating stage) and then press **ENTER**.
- Enter the temperature using the keypad, or press **+** or **-** to adjust the temperature and then press **ENTER**.



Your Supra interprets the last digit as a decimal. For example, to enter 80.5°F, enter 805.

- Repeat steps 5 and 6 for **Idle at** and **On Full at** (**Setpoint** and **Off at** for a heating stage).
- Scroll down to **Idle Speed** (**Min Heat** for a heating stage) and then press **ENTER**.
- Enter the speed (output for a heating stage) using the keypad, or press **+** or **-** to adjust the percentage and then press **ENTER**.
- Scroll down to the next variable stage and then repeat steps 3 to 9.
- Press **BACK** twice to return to the Main Menu.

Programming actuator relays

Before programming the actuator relays, make sure you have properly configured the relays and calibrated the actuators. For more information, see **Configuring relays for actuators** on page 45 and **Calibrating actuators** on page 46.



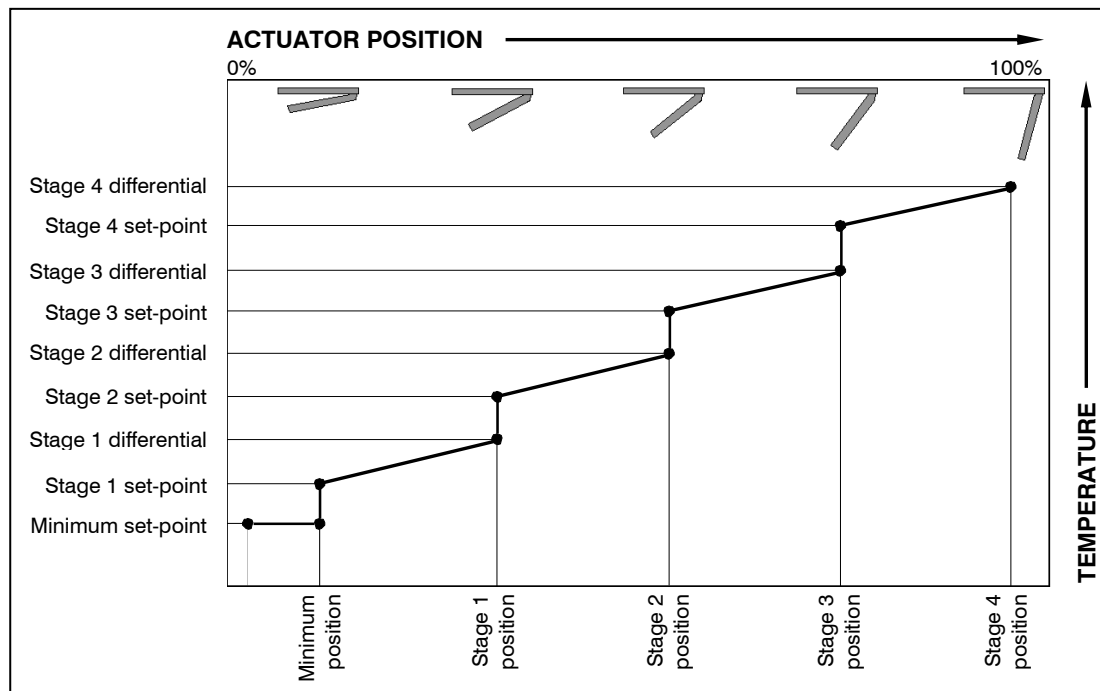
Do not use the Supra's actuator control function to control curtains. This can burn out the curtain machines. Set up curtains using relays and timers. For more information, see **Programming curtain control** relays on page 78.

Setting up the actuators means setting the temperature set points, differential, and position for each stage of the actuator. Each actuator has four stages. For each actuator you are setting up you need to program the:

- ◆ Minimum set point temperature
- ◆ Minimum position
- ◆ Set point temperature, differential temperature, and position for stages 1 to 4

How actuators work

Below is an explanation of the settings and how actuators function.



- ◆ While the temperature is below the minimum set point, the actuator is closed.
- ◆ When the temperature rises to the minimum set point, the actuator moves to the minimum position.
- ◆ As the temperature rises, the actuator has four stages it moves through until it reaches its maximum open position. This method lets you gradually open inlets instead of fully opening them when the temperature rises above a single set point.

For example, you might decide to have the actuator open to 40 percent at stage 1, 60 percent at stage 2, 80 percent at stage 3, and 100 percent at stage 4.

However, you do not want the actuator to open directly to 40 percent. That is why there are two temperature settings for each stage. The first setting is the stage set point. This is where the actuator starts opening. The second setting is the differential. This is where the actuator reaches the stage position.

In other words, “when the temperature is here (stage set point), I want the actuator to start opening. When the temperature reaches here (stage differential), I want the actuator to be at this position (stage position) percent.”



Use the **Actuator settings worksheet** on page 143 when setting up actuators.

To set up actuators

1. From the Main Menu, select **Settings** (#1).
2. From the Settings menu, select **Actuators** (#7).
The display should look like the one below. The first line is the name you gave the actuator when you configured it.

Inlet 1	Zone 2
Closes at	40.0°F
Minimum Pos	20%

Press \uparrow or \downarrow to scroll through the lines.

3. Scroll to **Closes at** and then press **ENTER**.
4. Enter the temperature using the keypad, or press **+** or **–** to adjust the temperature and then press **ENTER**.



Your Supra interprets the last digit as a decimal. For example, to enter 40.0°F, enter 400.

5. Scroll to the next line and then press **ENTER**.
6. Enter the position the actuator will be at when the temperature reaches the minimum set point, or press **+** or **-** to adjust the percentage and then press **ENTER**.
7. Scroll down to the settings for the first stage and then press **ENTER**.
The display should look like the one below.

Closes at	40.0°F
Minimum Pos	20%
1 83.4 – 84.9°F	40%

Press **↑** or **↓** to scroll through the lines.

8. Enter the stage's set point, differential, and position. Press **ENTER** after each setting.
9. Scroll to the next stage and then press **ENTER**.
10. Repeat steps 8 and 9 for each actuator stage.
11. If you have a second actuator configured, scroll down until you see the settings for that actuator and then repeat steps 3 to 10.
12. Press **BACK** twice to return to the Main Menu.

Programming curtain control relays

Curtains control the temperature by adjusting the air flow into the facility. Before setting up the curtains, make sure you have properly configured the relays. For more information, see **Configuring relays for curtains** on page 50.

Setting up the curtains means setting the temperature set point, idle band, and idle and run times. Each curtain has six settings:

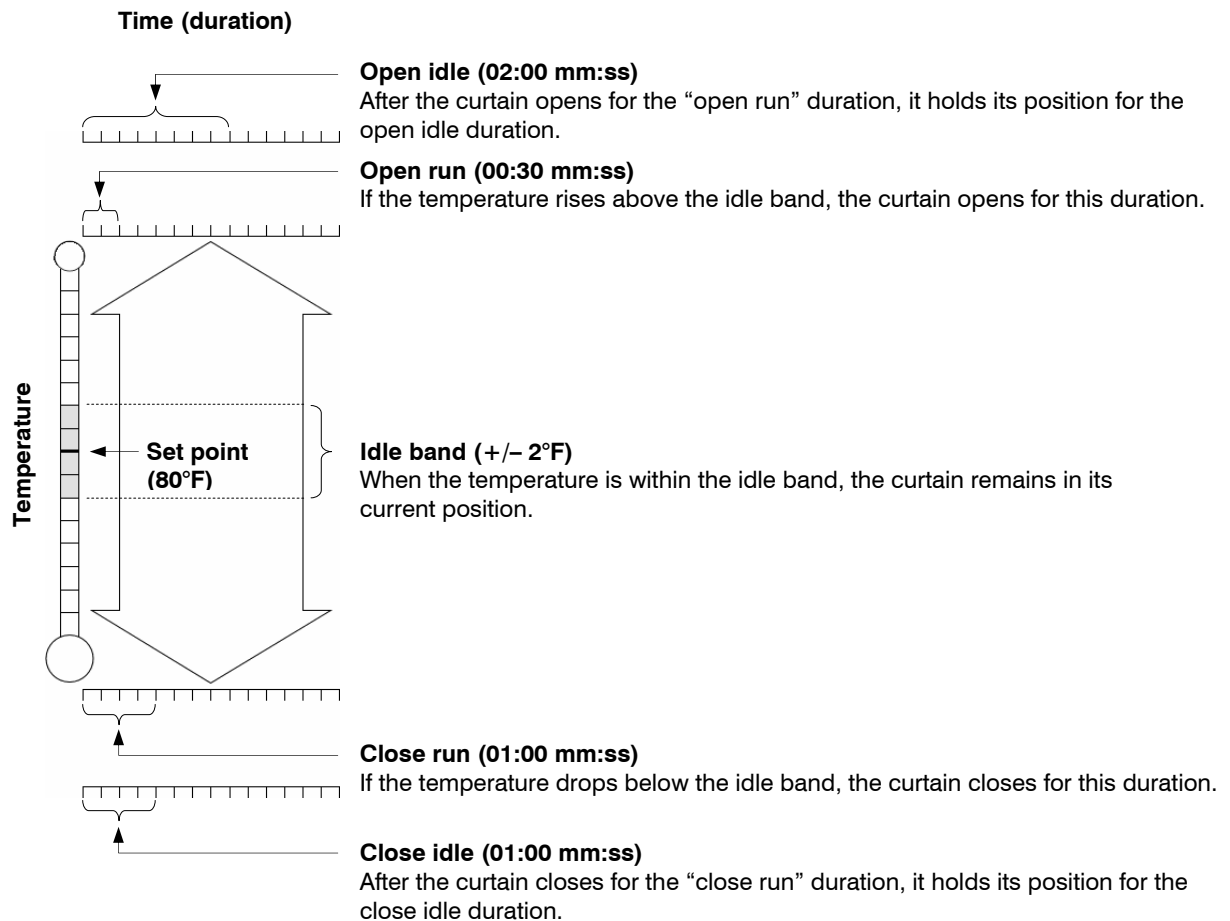
- ◆ Set point—the temperature at which the curtain holds its position.
- ◆ Idle band—the buffer around the set point within which the curtains hold their position.
- ◆ Open run time—the duration the curtains open during the OPEN cycle
- ◆ Open idle time—the duration the curtains hold their position during the OPEN cycle
- ◆ Close run time—the duration the curtains open during the CLOSE cycle
- ◆ Close idle time—the duration the curtains hold their position during the CLOSE cycle

How curtains work

Curtains hold their position while the temperature is within the idle band of the set point. For example, if the set point is 80°F and the idle band is 2°F, the curtain holds its position when the temperature is between 79°F and 81°F.

If the temperature rises above the idle band (above 81°F in our example), the curtain opens for the open run duration. After opening, it holds its position for the open idle duration. If the temperature is still above the idle band, the curtain again opens for the open run duration and the process repeats.

If the temperature drops below the idle band (below 79°F in our example), the curtain closes for the close run duration. After closing, it holds its position for the close idle time. If the temperature is still below the idle band, the curtain again closes for the close run duration and the process repeats.



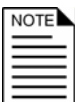
Use the **Curtain worksheet** on page 145 when setting up curtains.

To set up curtains

1. From the Main Menu, select **Settings** (#1).
2. From the Settings menu, select **Curtains** (#5).
The display should look like the one below. The first line is the name you gave the open relay for the curtain when you configured it. Only curtains that have been configured appear in the display.

Curtain 1	Zone 2	Press ↑ or ↓ to scroll through the lines.
Setpoint	80.0°F	
Idle Band	2.0°F	
Open Run	00:30	
Open Idle	02:00	
Close Run	01:00	
Close Idle	01:00	

3. Scroll to **Setpoint** and then press **ENTER**.
4. Enter the temperature using the keypad, or press **+** or **-** to adjust the temperature and then press **ENTER**.



Your Supra interprets the last digit as a decimal. For example, to enter 80.0°F, enter 800.

5. Scroll to **Idle Band** and then repeat step 4.
6. Scroll to the next line and then press **ENTER**.
7. Enter the duration using the keypad, or press **+** or **-** to adjust the duration and then press **ENTER**.
8. Repeat steps 6 and 7 for open idle, close run, and close idle.
9. If you have other curtain relays configured, scroll down to those curtains and then repeat steps 3 to 8.
10. Press **BACK** twice to return to the Main Menu.

Programming heating and cooling elements and temperature-based duty cycles

Heating and cooling elements control the temperature by switching single-stage heating equipment such as electric heaters, or cooling equipment such as misters ON or OFF. Before setting up the elements, make sure you have properly configured the relays. For more information, see **Configuring relays for single-stage heating and cooling** on page 49.

There are two types of heating and cooling element setups: “standard” and “temperature-based duty cycle”. Programming a standard element means setting the temperature set point and selecting “Off” for the duty cycle.

Programming a temperature-based duty cycles means setting the temperature set point, selecting “On” for the duty cycle, and setting the ON and OFF durations.

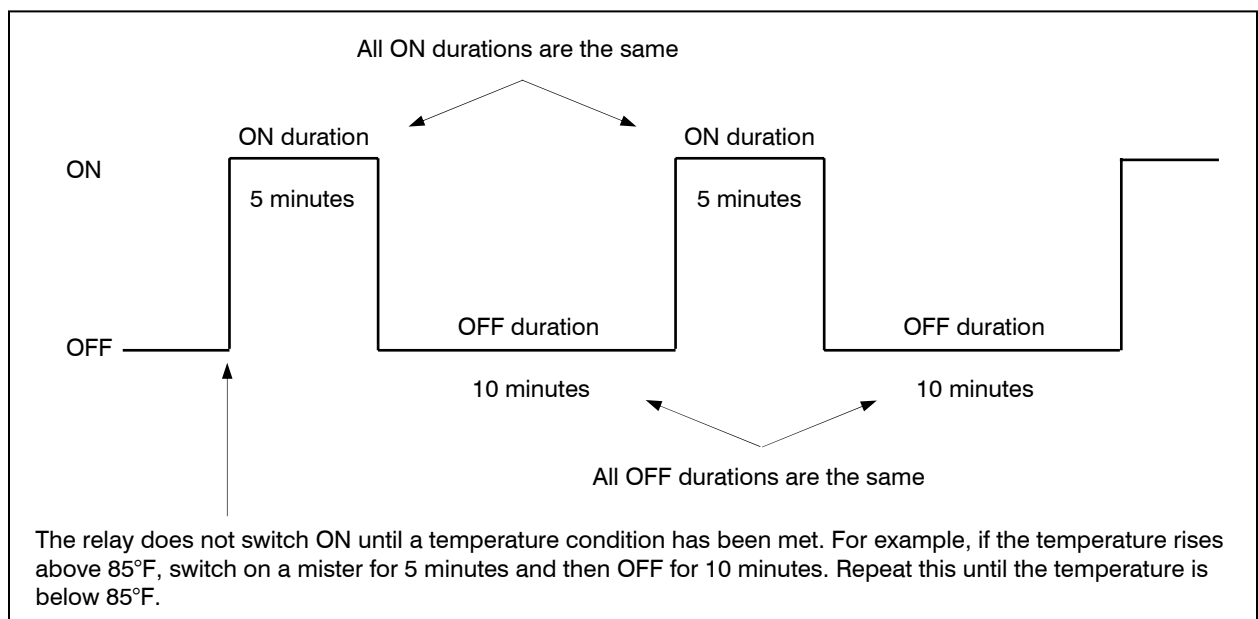
How temperature-based duty cycles work

For heating elements

When the temperature is above the set point, the heating element is off. When the temperature drops below the set point, the element switches on for the on duration and then off for the off duration. If at any time the temperature rises above the set point, the duty cycle switches off and will not switch on again until the temperature drops below the set point.

For cooling elements

When the temperature is below the set point, the cooling element is off. When the temperature rises above the set point, the element switches on for the on duration and then off for the off duration. If at any time the temperature drops below the set point, the duty cycle switches off and will not switch on again until the temperature rises above the set point.





If you need to connect more heating or cooling elements than you have relays, and you are not using all the variable stages, you can use any available variable stages as ON/OFF stages. For more information, see **Programming variable stages** on page 72.

Use the **Heating and cooling elements worksheet** on page 146 when setting up heating and cooling elements or temperature-based duty cycles.

To program heating or cooling elements (without a duty cycle)

1. From the Main Menu, select **Settings** (#1).
2. From the Settings menu, select **Heat/Cool Stages** (#2).
The display should look like the one below. The first line is the name you gave the element when you configured it. Only heating or cooling elements that have been configured appear in the display.

Duty cycle off		Duty cycle on	
Elec. Heat Zone 2		Misters Zone 2	
Setpoint 65.0°F		Set 80.0°F Duty: On	
Duty cycle: Off		On time 05:00	
		Off time 10:00	

Press ↑ or ↓ to
scroll through
the lines.

3. Scroll to the first element you want to set up.
4. Scroll to **Setpoint** (or **Set**) and then press **ENTER**.
5. Enter the temperature using the keypad, or press **+** or **-** to adjust the temperature and then press **ENTER**.



Your Supra interprets the last digit as a decimal. For example, to enter 65.0°F, enter 650.

6. If duty cycle is on, press **+** or **-** to select **Off** and then press **ENTER**.
7. If you have other heating or cooling relays configured, scroll down to the next relay and repeat steps 4 to 6.
8. Press **BACK** twice to return to the Main Menu.

To program temperature-based duty cycles

1. From the Main Menu, select **Settings** (#1).
2. From the Settings menu, select **Heat/Cool Stages** (#2).
The display should look like the one below. The first line is the name you gave the element when you configured it. Only heating or cooling elements that have been configured appear in the display.

Duty cycle off		Duty cycle on	
Elec. Heat	Zone 2	Misters	Zone 2
Setpoint	65.0°F	Set	80.0°F
Duty cycle:	Off	Duty:	On
		On time	05:00
		Off time	10:00

Press ↑ or ↓ to scroll through the lines.

3. Scroll to the first element you want to set up.
4. Scroll to **Setpoint** (or **Set**) and then press **ENTER**.
5. Enter the temperature using the keypad, or press **+** or **-** to adjust the temperature and then press **ENTER**.



Your Supra interprets the last digit as a decimal. For example, to enter 65.0°F, enter 650.

6. If duty cycle is off, scroll down and then press **ENTER**. Press **+** or **-** to select **On** and then press **ENTER**.
7. Scroll to **On time** and then press **ENTER**.
8. Enter the duration using the keypad, or press **+** or **-** to adjust the duration and then press **ENTER**.
9. Scroll to **Off time** and then press **ENTER**.
10. Enter the duration using the keypad, or press **+** or **-** to adjust the duration and then press **ENTER**.
11. If you have other heating or cooling relays configured, scroll down to the next relay and then repeat steps 4 to 10.
12. Press **BACK** twice to return to the Main Menu.

Programming timed events

Timed event relays control equipment such as lights that need to be switched ON or OFF during certain times of the day. Before setting up the timed events, make sure you have properly configured the relays. For more information, see **Configuring relays for timed events** on page 53.

Programming timed events means setting the “on” and “off” times. Timed events must occur in pairs. This means that every time you set a relay to switch on (an on time), you must set a time for it to switch off (off time).



Use the **Timed events worksheet** on page 147 when setting up timed events.

To program timed events

1. From the Main Menu, select **Settings**. (#1).
2. From the Settings menu, select **Timed Events** (#9).
If you have not set up any timed events, the display should look like the one below. The first line is the name you gave the relay when you configured it. Only timed events that have been configured appear in the display.

```
Yard Lights  
Add New Event
```

Press \uparrow or \downarrow to scroll through the lines.

3. Scroll to **Add New Event** and then press **ENTER**.
The display should look like the one below.

```
12:00 AM Off  
Add Timed Event For  
Yard Lights
```

Press \uparrow or \downarrow to scroll through the lines.

4. With the cursor on the first line, press **ENTER**.
5. Enter the ON time for the first event, press **+** or **-** to select **AM** or **PM**, and then press **ENTER**.



When you enter the time, enter it in 12-hour format. For example, if you want 3:00 PM, enter 0300 and then press **+** or **-** to change the AM to PM.

6. Press **+** or **-** to select **On** and then press **ENTER**.
The event appears on the bottom line of the display.

```

  7:00 PM On
Add Timed Event For
Yard Lights
Added 7:00 PM On
  
```

Press **↑** or **↓** to scroll through the lines.

7. Repeat steps 4 to 6 for the matching OFF time.
8. Repeat steps 4 to 7 for each pair of events you want to set up for this relay.
9. If you have other timed event relays configured, scroll down to the next relay and the repeat steps 3 to 8.
10. Press **BACK** twice to return to the Main Menu.



Retroactive events start when you exit the menu. For example, if you set an event to switch ON at 9:00 AM and OFF at 6:00 PM and the event was added to the control at 10:00 AM, the relay switches ON when you exit the Timed Event menu.

To edit timed events

1. From the Main Menu, select **Settings**. (#1).
2. From the Settings menu, select **Timed Events** (#9).
The display should look like the one below. The first line is the name you gave the relay when you configured it. All your timed events for the selected relay are listed.

```

Yard Lights
 1  8:00 PM  ON
 2  6:00 AM  OFF
Add New Event
  
```

Press **↑** or **↓** to scroll through the lines.

3. Press **↑** or **↓** until you see the timed events for the relay you want to edit.
4. Scroll to the timed event you want to edit and then press **ENTER**.
5. To edit the time, enter a new time, press **+** or **-** to select **AM** or **PM**, and then press **ENTER**.



When you enter the time, enter it in 12-hour format. For example, if you want 3:00 PM, enter 0300 and then press **+** or **-** to change the AM to PM.

6. Press **+** or **-** to select ON, OFF, or NONE and then press **ENTER**.



Selecting **NONE** removes the timed event.

7. Repeat steps 4 to 6 for each timed event you want to edit.
8. Press **BACK** twice to return to the Main Menu.

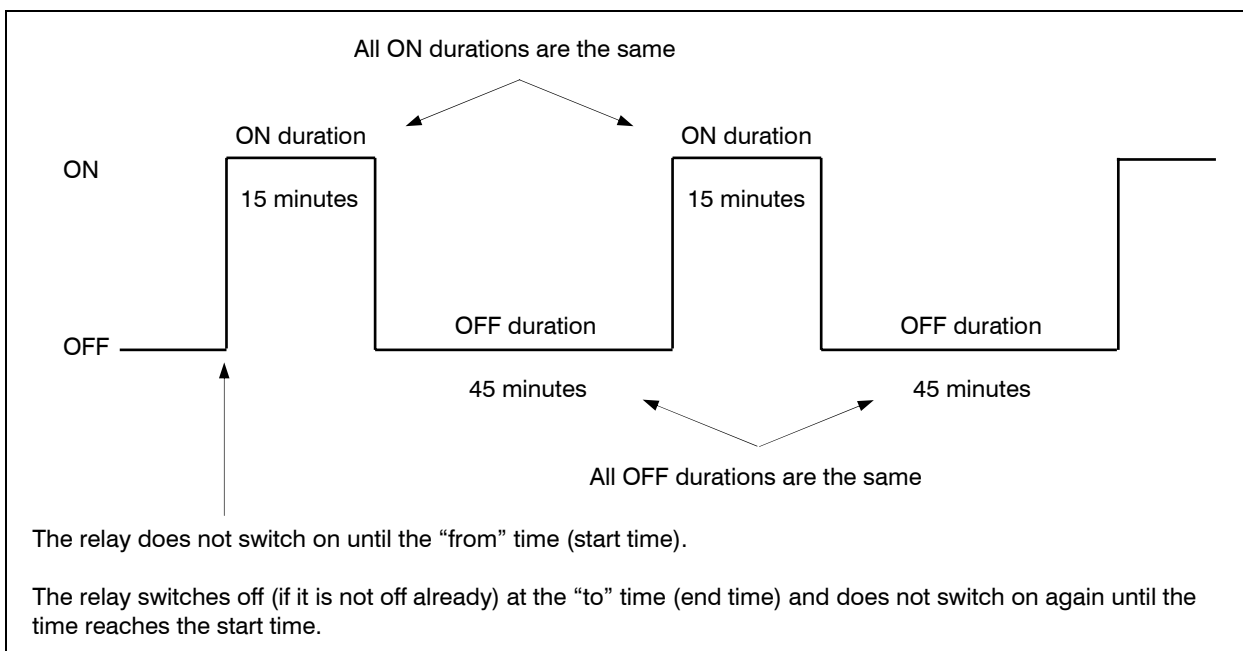
Setting up time-based duty cycles

Time-based duty cycles are a cross between temperature-based duty cycles and timed events. Unlike temperature-based duty cycles, time-based duty cycles occur between certain hours of the day, regardless of temperatures.

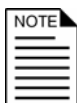
Setting up a time-based duty cycles means setting the ON and OFF durations and the “from” time (start time) and the “to” time (end time). Before setting up the time-based duty cycles, make sure you have properly configured the relays. For more information, see **Configuring relays for time-based duty cycles** on page 51.

How time-based duty cycles work

The relay does not switch on until the “From” time (start time). Between the start time and the “To” time (end time), the relay switches on for the ON duration and then OFF for the off duration. When the time reaches the end time, the relay switches off (if it is not off already) and does not switch on again until the time reaches the start time.



For example, you can have a feed auger run for 15 minute and then stop for 45 minutes between the 6:00 AM and 8:00 PM. In other words, “Between 6:00 AM and 8:00 PM, I want the feed auger ON for 15 minutes, OFF for 45 minutes, ON for 15 minutes... and so on.”



This section explains how to set up time-based duty cycles. If you want to set up temperature-based duty cycles (duty cycles that operate for specific durations while the temperature is above or below a certain value), see **Programming heating and cooling elements** on page 81.

If you want to set up elements that turn on and off at specific times, see **Programming timed events** on page 84.



Use the **Time-based duty cycle worksheet** on page 149 when setting up time-based duty cycles.

To set up time-based duty cycles

1. From the Main Menu, select **Settings** (#1)
2. From the Settings menu, select **Duty Cycle** (#8).
The display should look like the one below. The first line is the name you gave the relay when you configured it. Only duty cycles that have been configured appear in the display.

```
Feeder 1
On 15:00   Off 45:00
From  6:00 AM
To    8:00 PM
```

This part is the duty cycle

This part is the time condition

Press \uparrow or \downarrow to scroll
through the lines.

3. Scroll to the second line, and press **ENTER**.
4. Enter the ON duration using the keypad, or press **+** or **-** to adjust the duration and then press **ENTER**.



Your Supra interprets the last two digits as the number of seconds. For example, if you want the relay on for 15 minutes, enter 1500.

5. Enter the OFF duration using the keypad, or press **+** or **-** to adjust the duration and then press **ENTER**.
6. Scroll to the next line and press **ENTER**.
7. Enter the start time for the cycle, press **+** or **-** to select **AM** or **PM**, and then press **ENTER**.



When you enter the time, enter it in 12-hour format. For example, if you want 3:00 PM, enter 0300 and then press **+** or **-** to change the AM to PM.

8. Scroll to the next line and then press **ENTER**.
9. Enter the end time for the cycle, press **+** or **-** to select **AM** or **PM**, and then press **ENTER**.
10. If you have other duty cycle relays configured, scroll down to the next relay and the repeat steps 3 to 9.
11. Press **BACK** twice to return to the Main Menu.

Programming the alarm and display settings

After programming the variable and relay stages, you can move on to the alarm and display settings. There are three alarm and display settings:

- ◆ Alarms
- ◆ Status screen display
- ◆ Logging interval

Programming alarm settings

The alarm settings for your Supra determine which alarm conditions are enabled, which are disabled, and their settings. All these work together to determine how and when the alarm relay activates (in other words, signals an alarm condition).

The alarm relay activates if an alarm condition (one that is enabled) is present for longer than the minimum duration. Minimum duration prevents alarms from activating when the temperature rises or drops for just a few seconds. Minimum duration can be between 0 and 10 minutes. Setting it to 0 activates the alarm relay immediately after an alarm is detected.

Another important setting is alarm silencing. Silencing temporarily disables an alarm setting after an alarm has been acknowledged. This prevents the alarm relay from activating immediately after acknowledging the alarm. If the alarm condition is still present after the silencing period, the alarm relay activates again.

You can set the silencing duration to be from 0 seconds to 30 minutes. If you set it to 0 seconds, acknowledging the alarm will not deactivate the relay; the alarm relay remains active until the alarm condition goes away.

Besides the standard high and low temperature alarms, the Supra has many other alarm conditions. For a complete list and descriptions, see the **Alarm settings worksheet** on page 150.

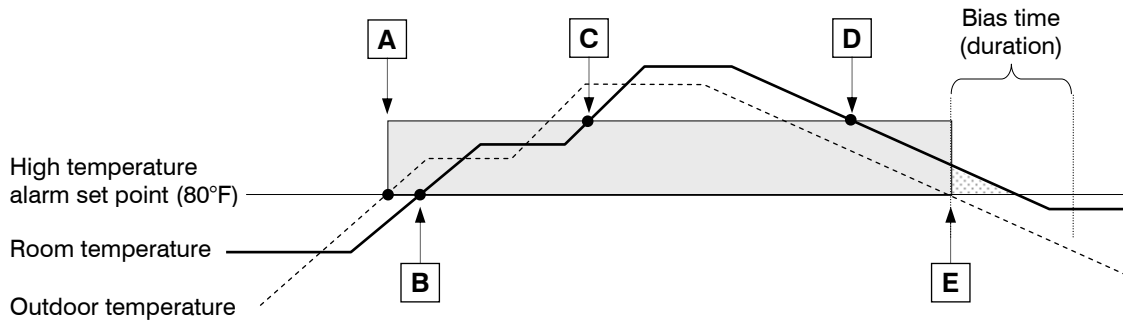
How alarm settings work

Let's say the High Temp alarm setting is 85.0°F, the minimum duration is 5 minutes, and the silencing duration is 15 minutes. If the temperature rises to 86 degrees, but drops below 85 degrees 2 minutes later (before the minimum duration of 5 minutes), the alarm relay does not activate.

If the temperature rises to 86 degrees and stays there for 5 minutes, the alarm relay activates. The alarm relay remains active until a user acknowledges the alarm or the temperature drops below the High Temp setting. After the alarm has been acknowledged, if the temperature remains above the High Temp setting, the relay activates again in 15 minutes (after the silencing duration).

How alarm biasing works

The purpose of alarm biasing is to prevent the alarm from sounding on very hot days when the temperature set point cannot be maintained. The bias temperature is added to the high temperature alarm setting if the outdoor temperature is higher than the high temperature alarm setting.



- A** A bias temperature of 5°F allowed so that the room temperature can rise to 85°F before an alarm occurs.
- B** The room temperature exceeds the normal alarm temperature. No alarm occurs because the room temperature is lower than the high temperature alarm plus the alarm bias.
- C** A high temperature alarm occurs because the room temperature exceeds the high temperature alarm plus the alarm bias.
- D** The alarm condition ends when the room temperature drops below the alarm bias.
- E** After the outdoor temperature drops below the high temperature set point, the bias remains for the duration of the bias time. This gives the room a chance to cool off before removing the bias.



Use the **Alarm settings worksheet** on page 150 when setting up alarms. The worksheet contains descriptions of each setting.

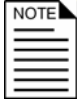
To program alarm settings

- From the Main Menu, select **Settings** (#1).
- From the Settings menu, select **Alarms** (#6).
The display should look like the one below.

ALARMS	
Probe 1	Disabled
Probe 2	Disabled
Probe 3	Disabled

Press \uparrow or \downarrow to scroll through the lines.

3. Refer to the **Alarm settings worksheet** on page 150. Scroll to a line that needs to be changed and then press **ENTER**.
 - To toggle between **Disabled** and **Enabled** or between **No** and **Yes**, press **+** or **-** and then press **ENTER**.
 - To enter a number for temperature or duration use the keypad, or press **+** or **-** to adjust the number and then press **ENTER**.



When entering durations in mm:ss (minutes:seconds), your Supra interprets the last two digits as seconds. For example, if you want 15:00, enter 1500 and then press **ENTER**.

When entering temperatures, your Supra interprets the last digit as a decimal. For example, to enter 40.0°F, enter 400.

4. Repeat step 3 for each alarm setting you want to change.
5. Press **BACK** twice to return to the Main Menu.

Setting up the status display

When you are looking at your Supra while it is operating normally, you want to be able to quickly see what is happening. Alarm displays indicate if there is a problem, but there is other valuable information you might want to know.

Your Supra lets you display different types of information on the display. If this information uses more than four lines, the information cycles through groups of four lines so you can watch the display for a few seconds to get all the information you need.

You can display the status of any device connected to the unit, as well as the following:

- ◆ Name of the unit
- ◆ Current date and time
- ◆ Current outdoor temperature (if an outdoor probe is connected)
- ◆ Current temperature of each zone
- ◆ Current day's high and low temperatures
- ◆ Current humidity (if a Relative Humidity Sensor is connected)
- ◆ Current day's water usage (if a water meter is connected)

Setting up the status display means selecting which information you want the status display to show and for how long.



If there are one or more alarm conditions, your Supra will display them instead of scrolling through the status display. For a list of alarm and error messages, see **Appendix B: Troubleshooting** on page 125.



Use the **Status screen display worksheet** on page 152 when setting up the status display.

To set up the status display

1. From the Main Menu, select **Maintenance** (#2).
2. From the Maintenance menu, select **Set Main Display** (#6).
The display should look like the one below.

```
SET DISPLAY ITEMS
Zone Temps:      All
Temp Extremes    No
Rly 1            No
```

Press \uparrow or \downarrow to scroll through the lines.

3. Refer to the **Status screen display worksheet** on page 152. Scroll to a line that needs to be changed and then press **ENTER**.
4. Press **+** or **-** to change the setting and then press **ENTER**.
5. Repeat steps 3 and 4 for each item you want to change.
6. Press **BACK** twice to return to the Main Menu.

Setting the logging interval

Your Supra stores outdoor and zone temperatures in a log file, which you can view anytime. Setting the log interval means selecting how often you want to store new information in the Input log. You can set the log interval to 1, 8, 16, or 24 hours. For information about viewing the log, see **Reading the input log** on page 102.



Changing the logging interval affects how often the Supra logs data. If you are using SupraWare, changing the logging interval does not affect the logging of temperature data in the SupraWare software. SupraWare collects temperature data every ten minutes.

To set the logging interval

1. From the Main Menu, select **Maintenance** (#2).
2. From the Maintenance menu, select **Logging Interval** (#9).
The display should look like the one below.

```

LOGGING INTERVAL
Log outdoor and
zone temperatures
every 24 hours
  
```

Press **↑** or **↓** to scroll through the lines.

3. Scroll to the last line and then press **ENTER**.
4. Press **+** or **-** to select how often you want the outdoor and zone temperatures logged and then press **ENTER**.



Your Supra has a limited amount of log storage space. As new information is added, old information is removed. Longer intervals allow you to see how your system is operating over longer durations.

5. Press **BACK** twice to return to the Main Menu.

Setting up security and users

Your Supra has a five-level PIN security system. Each level has access to different areas of the Supra.

When you first receive your Supra, security is not enabled. This means anyone can do anything with your Supra. When you enable security, users must enter their PIN (personal identification number) before they can access a specific menu or function.

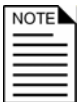


Use the **Security levels worksheet** on page 153 when setting up security and users.

Setting up and enabling security allows your Supra to log who acknowledges alarms and makes changes to settings. It tracks this information using the PIN each user enters when they access the control. For more information about logging, see **Reading the audit log** on page 103.

The table below lists the access allowed for each security level.

Allowed to...	Security level				
	Admin	Manager	Personnel	Technician	View only
Change settings	✓	✓	✓		
Acknowledge alarms	✓	✓	✓	✓	
Maintenance functions	✓	✓			
Calibrate actuators	✓	✓		✓	
View logs	✓	✓	✓	✓	
Add and remove users	✓				
Configuration	✓	✓			
Diagnostics	✓	✓		✓	
View only (no security required)					✓



If all security PINs have been forgotten and nobody can access the control, pressing \uparrow , +, \downarrow , and – as a PIN number and then answering Yes on the next screen will turn off security and restore the factory settings.

Use this step only as a last resort. It erases ALL your configuration and settings. You will have to reconfigure and reprogram your Supra.

Adding and removing users

When you initially set up your Supra, if you will be using security, you need to add users to your system. When security is enabled, each user must enter their PIN before changing any settings or acknowledging alarms. This allows the Supra to track who has performed each change and prevents unauthorized access to the control.

If you hire a new employee (user), and you are using security to control access to your Supra, you will need to add the employee to the security list. If an employee leaves your operation, you should remove the user from the Supra.



Use the **Security levels worksheet** on page 153 when setting up security and users.

If you want to change the security level for a user, remove that user and then add the user with the new security level.

To view all the users set up in the security system, in the Security menu, select **Erase User** and then scroll through the list of users.

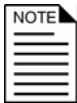
To add users

1. From the Main Menu, select **Security** (#4).
2. From the Security menu, select **Add User** (#3).
The display should look like the one below.

```
Name: User          1
Access Code:       1234
Level: Admin
Add this user
```

Press **↑** or **↓** to scroll through the lines.

3. Press **ENTER**.
4. Enter the name (maximum 14 characters) for this user. For more information, see **Entering text in your Supra** on page 34. To save the name, press **ENTER** until the cursor returns to the beginning of the line. To cancel the change, press **BACK**.
5. Scroll to the next line and then press **ENTER**.
6. Enter a *unique* four-digit number that will be used by that person as the PIN and then press **ENTER**.



If you do not enter four numbers, your Supra will fill the remaining digits with zeros. For example, if you enter 26, your Supra changes this to 0026. The user must enter all four digits (0026) when prompted for the PIN.

7. Scroll to the third line and then press **ENTER**.
8. Press **+** or **-** to select the security level for this user and then press **ENTER**. For more information about security levels, see the table on page 91.
9. Scroll to the last line and then press **ENTER**.
Your Supra saves the user and displays a screen like the one below.

```
One new user added
Position 0
Log ID 2
Press the BACK key.
```

10. Press **BACK** to return to the Security menu.
11. Repeat steps 2 to 10 for each user you want to add.
12. Press **BACK** to return to the Main Menu.

To remove users

1. From the Main Menu, select **Security** (#4).
2. From the Security menu, select **Remove User** (#4).
The first user is displayed, like the one below.

```
Name: User          1
Access Code:       1234
Level: Admin
Erase this user
```

Press ↑ or ↓ to scroll through the lines.

3. Scroll down until you see the name of the user you want to remove.



Make sure you really want to remove this user. You will not be asked to confirm the removal. If you remove a user by mistake, you will have to add the user again.

4. Scroll down to **Erase this user** and then press **ENTER**.
The display confirms that the user has been removed.
5. Press **BACK**.
6. Repeat steps 3 to 5 for each user you want to remove.
7. Press **BACK** twice to return to the Main Menu.

Changing PINs

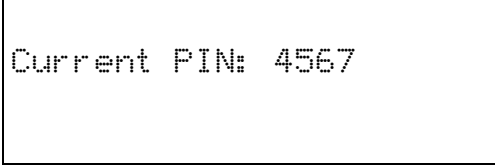
Occasionally, a PIN might need to be changed. For example, when you first set up a user, you might provide a temporary PIN, and then have that user change the PIN the first time they log in to the Supra.



Only the “owner” of a PIN can change that PIN.

To change PINs

1. From the Main Menu, select `Security` (#4).
2. From the Security menu, select `Change PIN` (#2).
The display should look like the one below.



```
Current PIN: 4567
```

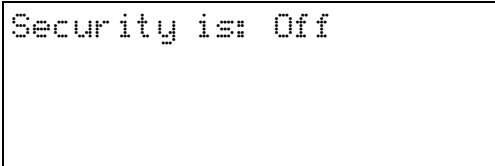
3. Scroll to `Current PIN` and then press **ENTER**.
4. Enter a new four-digit PIN and then press **ENTER**.
5. Press **BACK** twice to return to the Main Menu.

Enabling and disabling security

If security is enabled, only users with Admin access can disable it. If security is off, anyone can enable it.

To enable security

1. From the Main Menu, select `Security` (#4).
2. From the Security menu, select `Security On/Off` (#1).
The display should look like the one below.

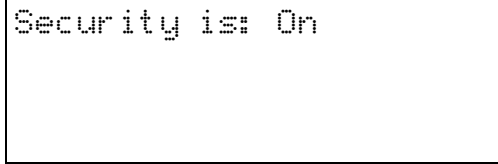


```
Security is: Off
```

3. Press **ENTER**.
4. Press **+** or **-** to change `Off` to `On` and then press **ENTER**.
5. Press **BACK** twice to return to the Main Menu.

To disable security

1. From the Main Menu, select `Security` (#4).
2. From the Security menu, select `Security On/Off` (#1).
The display should look like the one below.



```
Security is: On
```

3. Press **ENTER**.
4. Press **+** or **-** to change `On` to `Off` and then press **ENTER**.
5. Press **BACK** twice to return to the Main Menu.



Chapter 6: Monitoring your Supra

This chapter explains how to monitor your Supra after you have installed, configured, and programmed it.

- ◆ Monitoring the status display
- ◆ Responding to alarms
- ◆ Reading the input log
- ◆ Reading the alarm log
- ◆ Reading the audit log
- ◆ Erasing the logs

Monitoring your Supra

This chapter explains how to monitor your Supra after you have installed, configured, and programmed the control. Monitoring your Supra includes:

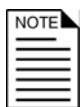
- ◆ Monitoring the status screen (below)
- ◆ Responding to Alarms (on page 101)
- ◆ Reading the input log (on page 102)
- ◆ Reading the alarm log (on page 103)
- ◆ Reading the audit log (on page 103)
- ◆ Erasing the logs (on page 104)

Monitoring the status display

Your Supra status screen can display important information about what is happening with your Supra, the equipment connected to it, and the environmental conditions in your building.

Check your Supra status display regularly. Some things to look for include:

- ◆ Are any temperatures approaching high or low limits that would set off an alarm if left unchecked?
- ◆ Are there large swings in the temperatures recorded by your Supra? You might need to check the settings.
- ◆ Is all equipment working as intended or as you expected?
- ◆ Has your Supra logged an unusual number of alarms? To find out, check the temperature, audit, and alarm logs (see the appropriate sections in this chapter).
- ◆ If connected to a computer, are your Supra and computer communicating correctly and consistently?



If there is a probe missing and averaging is OFF, the Supra uses and displays the temperature for the next zone. For example, if there is no probe for zones 2 and 3, the Supra uses and displays the temperature for zone 4.

If there is a missing outdoor probe, the Supra displays°F (or °C).

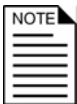


You should set up a regular maintenance schedule to check different mechanical and electronic connections. Check the status display of your Supra regularly.

Responding to alarms

If there are one or more alarms, your Supra activates the alarm relay and displays messages. To deactivate the relay, and before you can do anything else with your Supra, you must acknowledge the alarms.

If you see an alarm message and are not sure what it means, look it up in the **Alarm messages** table on page 125 and then follow the instructions for resolving the alarm condition.



If security is enabled, only users who have access to acknowledge alarms can do so. For more information about security levels, see **Setting up security and users** on page 93.

```
High Temp Probe 1
Actuator 2 Jam
```

If there are alarms, the display looks like this, with your current alarms displayed.

To respond to alarms

1. Press **ENTER**.

The display should look like the one below.

```
CURRENT ALARMS 1
High Temp Probe 1
Actuator 2 Jam

Acknowledge now
```

Press \uparrow or \downarrow to scroll through the lines.

2. Press **ENTER**.

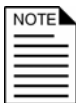
If security *is not* enabled, the alarms are acknowledged and the Main Menu appears. Go to step 5.

If security is enabled, the display should look like the one below.

```
Alarms must be
acknowledged!
Enter PIN:
```

3. If security is enabled, enter your security PIN and then press **ENTER**.
Your Supra logs who acknowledges the alarm.
4. Press **ENTER** to go to the Main Menu.

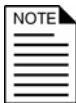
5. Look up the meaning of the alarm(s) in the table on page 125 and then follow the instructions in the table.



When troubleshooting temperature probe problems, make sure you are troubleshooting the correct probe. Probe 1 does not necessarily mean Zone 1. Refer to your configuration and installation worksheets.

Reading the input log

Your Supra stores information about environmental conditions periodically in a log file called the input log. Your Supra stores outside temperatures, zone temperatures, humidity, and water usage. For more information about the logs and setting up the logging interval, see **Setting the logging interval** on page 92.



To record and display outside temperatures, you must have a temperature probe connected to the **OUT TEMP** terminal. For more information, see **Connecting temperature probes** on page 23.

To record and display water usage, you must have a water meter connected to your Supra. For more information, see **Connecting a water meter** on page 26.

To record and display humidity, you must have a humidity sensor connected to your Supra. For more information, see **Connecting a Relative Humidity Sensor** on page 25.

To view the input log

1. From the Main Menu, select **View Logs (#3)**.
2. From the View Logs menu, select **Input Log (#1)**.
The display should look like the one below.

Apr 21 4:45 PM	
Z1 74.2	Z2 86.2
Z3 86.2	Z4 86.2
Outside	24.5
Humidity	83.6%
Water	2000Ltr

Date
Zone temperatures
Outside temperature
Humidity
Water usage

Press ↑ or ↓ to scroll through the lines.

3. Scroll down to view all the information that was logged.
4. Press **BACK** twice to return to the Main Menu.

Reading the alarm log

For each alarm that occurs, your Supra stores information in its alarm log.

To view the alarm log

1. From the Main Menu, select **View Logs (#3)**.
2. From the View Logs menu, select **Alarm Log (#2)**.
For each alarm, your Supra displays four lines of information like shown below.

04/21/2004 04:12 PM	The date and time the alarm occurred
High Temp Probe 1	The type of alarm
Ack: George	The name of the person who acknowledged the alarm
04/21/2004 04:32 PM	The date and time the alarm was acknowledged

3. Scroll down to view all the information that was logged.
4. Press **BACK** twice to return to the Main Menu.

Reading the audit log

Each time someone adjusts a setting, your Supra stores information in its audit log.

To view the audit log

1. From the Main Menu, select **View Logs (#2)**.
2. From the View Logs menu, select **Audit Log (#3)**.
For each adjustment, your Supra displays six lines of information like shown below.

04/22/2004 02:59 PM	The date and time the change was made
West pit fan	The description of the element affected
On Full Point	The setting that was changed
From: 81.0	The previous setting
To: 80.0	The new setting
By John	Who changed it

3. Scroll down to view all the information that was logged.
4. Press **BACK** twice to return to the Main Menu.

Erasing the logs

Use this option to erase every record in all three of the logs: Audit Log, Alarm Log, and Temperature Log.

1. From the Main Menu, select **View Logs (#3)**.
2. From the View Logs menu, select **Erase All Logs**.
A confirmation screen like the one below displays.

```
WARNING! This will  
Erase every record  
In all three logs!  
Are you sure? No
```

Press **↑** or **↓** to scroll through the lines.

3. If you do not want to erase all the logs, press **BACK**.
4. If you want to erase all the logs, scroll to the last line and press **ENTER**.
5. Press **+** or **-** to change **No** to **Yes** and then press **ENTER**.
6. Press **BACK** to return to the Main Menu.



Chapter 7: Servicing and maintaining your Supra

This chapter explains how to test, service, and maintain your Supra and its equipment.

- ◆ Using manual override
- ◆ Performing diagnostic tests
- ◆ Servicing and maintaining your Supra

Using manual override

Manual override allows you to temporarily override settings for a stage. This is useful for testing equipment and ventilation strategies or diagnosing problems.



When you are finished testing the stages, set *each* stage back to “Auto” to return them to normal, programmed settings.

Any stages you do not change back to Auto will not function according to their normal programmed settings, but will instead remain in manual override.

To enter manual override

1. From the Main Menu, select **Maintenance** (#2).
2. From the Maintenance menu, select **Manual Override** (#1).
The display should look like the one below.

```
MANUAL OVERRIDE
1 Variable Speed
2 Relays
3 Curtains
4 Actuators
```

Press ↑ or ↓ to scroll through the lines.

3. Scroll to the type of element you want to override and then press **ENTER**.
The display should look like one of the examples below.

Variable stages

```
St1 36" Fan      Auto
St2 24" Fan      Auto
N Heat mats      Auto
W Heat mats      Auto
```

Curtains

```
CURTAIN OVERRIDE
West curtains    Auto
Open relay       5
Close relay      6
```

Relay stages

```
RELAY OVERRIDE
Relay 1
West heat      Auto
```

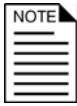
Actuators

```
ACTUATOR OVERRIDE
Roof inlets      Auto
Open relay       3
Close relay      4
```

Press ↑ or ↓ to
scroll through the
lines.

4. Scroll to the **Auto** line for the element to you want to override and then press **ENTER**.

5. Press **+** or **-** to adjust the setting of the stage. If you need to check equipment, go to the equipment connected to the stage and check if it does what you expect (turns on or off, opens or closes, extends or retracts, and so on).



If you press **ENTER** after adjusting the setting of the stage and then exit the menu (by pressing **BACK**), the element stays at that setting until you return to the menu and change it.

If you do not press **ENTER** after adjusting the setting, when you press **BACK**, the setting returns to what it was before you changed it.

6. Press **BACK** three times to return to the Main Menu.

To exit manual override

Exiting manual override means restoring the stage to “Auto”. When you restore a stage to auto, the stage returns to its normal, programmed settings.

1. From the Main Menu, select **Maintenance (#2)**.
2. From the Maintenance menu, select **Manual Override (#1)**.
The display should look like the one below.

```

MANUAL OVERRIDE
1 Variable Speed
2 Relays
3 Curtains
4 Actuators

```

Press **↑** or **↓** to scroll through the lines.

3. Scroll to the type of element you want to return to its normal settings and then press **ENTER**.
4. Scroll to the setting line (the one that has **On**, **Off**, or a percentage) for the element to you want and then press **ENTER**.
5. Press **+** or **-** to return the setting to **Auto** and then press **ENTER**.
6. Press **BACK** three times to return to the Main Menu.

Performing diagnostic tests

Your Supra has several built-in diagnostic tests. If you suspect the control is not responding as it should, perform these diagnostic tests.

If you contact Phason Customer Support (see the contact information on page iv), they might ask for some information displayed by the diagnostic tests.

Displaying information about each input

Your Supra allows you to display current information for each zone and input (temperature, feedback, water, and humidity). This is called the input test. There are four information display screens.

To display information about each zone

1. From the Main Menu, select **Diagnostics** (#6).
2. From the Diagnostics menu, select **Display All Inputs** (#1).
The display should look like the one below.

Zone 1	68.6°F	No probe for zones 3 and 4, uses next available zone temperature
Zone 2	86.2°F	
Zone 3	68.6°F	
Zone 4	68.6°F	

If there is a probe missing and averaging is OFF, the Supra displays the temperature for the next zone. In this example, there is no probe connected to 3 and 4 so the Supra uses the temperature for zone 1.

3. To display the second screen, press **ENTER**.
The second display should look like the one below.

Probe 1	564	68.6°F
Probe 2	455	86.2°F
Probe 3	1023	----°F
Probe 4	1023	----°F

If there is no probe for a zone, your Supra displays 1023 ----°F (or °C) for that zone.

4. To display the third screen, press **ENTER**.
The third display should look like the one below.

Outside	456	86.0°F	
Fdbk 1	559	Uncald	Actuator 1 feedback
Fdbk 1	559	Uncald	Actuator 2 feedback
Hum	598	68%	

5. To display the fourth screen, press **ENTER**.
The fourth display should look like the one below.

Water	400 Gal	This is the total water usage for the current day (12:00 AM until current time)
Pulses	40	

6. Press **BACK** twice to return to the Main Menu.

Monitoring power conditions

If you get several low or high power alarms, you should look at the incoming power supply. The information in the power tests can help you determine if you have power supply problems.

To monitor power conditions

1. From the Main Menu, select **Diagnostics (#6)**.
2. From the Diagnostics menu, select **Power Supply (#2)**.
The display should look like the one below.

POWER SUPPLY	
Min	14.4 VDC 59.5 Hz
Now	15.4 VDC 60.0 Hz
Max	16.1 VDC 60.4 Hz

3. Check the value next to **Now**; it indicates the condition of the power your Supra is receiving. If the value is not within approximately ± 3 Hz of your power frequency, or the voltage outside of the 10 to 18 VDC range, an alarm will sound.

The Min and Max values indicate the lowest and highest values your Supra received since your Supra was powered up or since you cleared the values.

4. Press **BACK**.

The display should look like the one below.

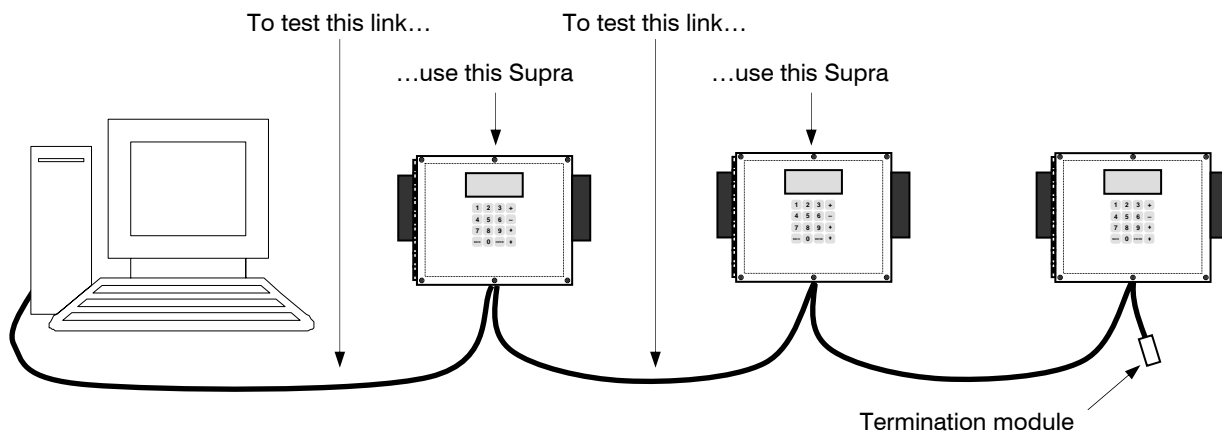
```
Press ENTER to clear
values or press BACK
to keep old values
```

5. If you want to clear the values, press **ENTER**.
6. Press **BACK** twice to return to the Main Menu.

Testing communication between Supras

If you have a network of Supras and are monitoring and controlling them using SupraWare, you can test the communication between the computer and a Supra, or between Supras.

The communication test allows you to test the communication between one device (Supra or computer) and the next.



When testing communication, test the Supra closest to the computer, and then work outward.

To test communication

1. Go to the Supra you want to test.
2. From the Main Menu, select **Diagnostics** (#6).
3. From the Diagnostics menu, select **Communications** (#3).
The display should look like the one below. Both numbers should be changing if SupraWare is running on the computer.

Proper communication

Communication Status	
Receive	51
Transmit	11

No communication

Communication Status	
Receive	0
Transmit	0

4. If SupraWare is running but the numbers are not changing, the problem is likely the communication cable between the computer and your Supra. Check the cable and connections. For more information, see your **SupraWare user manual**.
5. Press **BACK** twice to return to the Main Menu.

Testing equipment connected to relays

Your Supra has two displays for testing equipment connected to relays: one for viewing the states (ON or OFF) and one for manually testing the equipment connected to each relay. The relay tests are useful for detecting faulty connections or configuration errors.



Before testing equipment connected to relays, make sure you know what is connected to each relay. Testing relays without knowing which equipment is connected to them can damage your equipment.

For example, switching on an actuator's open and close relays at the same time can damage the actuator power supply and the Supra's relays.

For more information about what is connected to your Supra, see your installation worksheets.

To test equipment connected to relays

1. From the Main Menu, select **Diagnostics** (#6).
2. From the Diagnostics menu, select **View relay Stages** (#4).
The display shows the current state of each relay. The display should look like the one below.

1 On	5 On	9 Off
2 On	6 Off	10 Off
3 Off	7 On	11 Off
4 Off	8 Off	12 Off

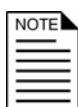
If a relay is closed, the display shows **On** next to the relay.
If a relay is open, the display shows **Off** next to the relay.

3. Confirm the equipment is producing the proper output for the current relay state by going to the equipment connected to each stage and checking that it is on if the state displays **On**, or off if the state displays **Off**.
4. If the displayed states are correct, go to step 10. If any are incorrect, go to the next step.
5. Press **BACK** to return to the Diagnostics menu and then select **Set relay Stages** (#5).
When you enter the display, all relay stages switch off. The display should look like the one below.

1 Off	5 Off	9 Off
2 Off	6 Off	10 Off
3 Off	7 Off	11 Off
4 Off	8 Off	12 Off

Press **↑** or **↓** to scroll through the lines.
Press **ENTER** to scroll left to right on a line.

6. Scroll to the line containing the relay for which you want to change the state (ON to OFF or OFF to ON).
7. Press **ENTER** to move left to right on a line until the relay you want to change is selected.
8. Press **+** or **-** to change the relay state and then press **ENTER**.
The relay state changes.
9. Repeat steps 6 to 8 for each relay you want to change.
10. Press **BACK** three times to return to the Main Menu.
The relays return to their normal, programmed settings.



While the Supra is in the Set relay stages display, the control will not operate the equipment connected to the relays according to the programmed settings. When you are finished testing, press **BACK** to return to the Diagnostics menu and return the relays to normal operation.

Testing equipment connected to variable stages

Your Supra has two displays for testing variable stages: one for viewing the current states (0 to 100%) and one for manually testing each stage. The variable stage tests are useful for detecting faulty connections or configuration errors.

To view and test variable stages

1. From the Main Menu, select **Diagnostics** (#6).
2. From the Diagnostics menu, select **View VAR stages** (#6).
The display shows the current state of each variable stage. The display should look like the one below.

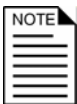
1 St1 36" Fan	80%
2 St2 24" Fan	30%
3 N Heat mats	0%
4 W Heat mats	0%

3. Confirm the equipment is producing the proper output for the current output by going to the equipment and checking that the speed (or heat output) is correct.
4. If the displayed states are correct, go to step 10. If any are incorrect, go to the next step.
5. Press **BACK** to return to the Diagnostics menu and then select **Set VAR stages** (#7).
When you enter the display, all stages switch off. The display should look like the one below.

1 St1 36" Fan	80%
2 St2 24" Fan	30%
3 N Heat mats	0%
4 W Heat mats	0%

Press \uparrow or \downarrow to scroll through the lines.

6. Scroll to the stage you want to test and then press **ENTER**.
7. Press **+** or **-** to adjust the output and then press **ENTER**.
8. Repeat steps 6 and 7 for each stage you want to change.
9. Press **BACK** twice to return to the Main Menu.
The relays return to their normal, programmed settings.



While the Supra is in the Set VAR stages display, the control will not operate the equipment connected to the stages according to the normal, programmed settings. When you are finished testing, press **BACK** to return to the Diagnostics menu and return the stages to normal operation.

Testing your Supra keypad and display

The keypad and display test can help you determine if you have problems with your keypad or display.

To test the keypad and display

1. From the Main Menu, select **Diagnostics** (#6).
2. From the Diagnostics menu, select **LCD & Keypad check** (#8).
3. Press each key on the keypad, *except* **BACK**.
As you press a key, the corresponding symbol should appear on the display. For example, press 1 and the screen displays 1; press ENTER and the screen displays E).
4. If any of the keys do not work, or the display does not show the correct characters, call your dealer or Phason Customer Support.
5. Press **BACK** twice to return to the Main Menu.

Testing the data integrity

The data integrity test lets you know if there is a problem with your Supra’s internal memory. If you suspect there might be a problem, for example, if settings are lost, then run this test.

To test data integrity

1. From the Main Menu, select **Diagnostics** (#6).
2. From the Diagnostics menu, select **Data Integrity** (#9).
Your Supra test its memory and displays the results. The display should look like the one below.

Normal			Problem		
Bank	1	PASS (B)	Bank	1	FAIL
Bank	2	PASS (A)	Bank	2	PASS (A)
Bank	3	PASS (B)	Bank	3	PASS (B)
Bank	4	PASS (B)	Bank	4	PASS (B)

3. If any of the memory banks fail, call your dealer or Phason Customer Support.
4. Press **BACK** twice to return to the Main Menu.

Resetting your Supra to its factory settings

When your Supra leaves the factory, it comes with default settings and configuration. When you configure and set up your Supra, you change its settings. Resetting your Supra erases all the configuration and settings you programmed and then restores the settings to what they were when the control left the factory.

For information about your Supra's factory settings, see **Appendix C: Factory settings** on page 130.



This function is very powerful; use caution when using it.

If you reset your Supra to its factory defaults, disconnect the power to all loads and then reconfigure the control before restoring power to the loads.

To restore the factory default settings

1. From the Main Menu, select **Factory Settings (#7)**.

The display should look like the one below.

```
Restore factory
settings. Press
ENTER to proceed
or BACK to abort.
```

2. Press **ENTER**.
You are asked to confirm that you want to erase all your configuration settings.
3. Scroll to the last line and then press **ENTER**.
4. Press **+** or **-** to change the **No** to **Yes** and then press **ENTER**.
Your Supra erases all your configuration and settings and then returns to the Main Menu.

Servicing and maintaining your Supra

Servicing and maintaining your Supra will extend the life of the control and your equipment.



Before installing or servicing your Supra, switch OFF the power at the source.

Moisture

Moisture will not cause a problem with the control if you take proper care during installation. The control's enclosure is made of fire retardant plastic and sealed with a rubber gasket. The sensor entry is sealed with a liquid-tight cable connector.

After the first two weeks of operation, remove the cover from the unit and check inside for moisture. Be sure to turn off the power to the control before opening the cover.

If there is moisture present, wipe it out with a dry cloth and check the cable entry points and rubber gasket for proper sealing.

If the cable connectors are not sealing, apply RTV or Silicon II sealant around the cable.



Some silicone sealants release acetic acid while curing. This can cause corrosion and damage the control. Let the silicone cure completely (one to three days) with the cover open and ensure no moisture enters the control. Failure to do this may damage the control and void the warranty.

An alternative is to use a non-acetic acid silicone sealant.

Check the control again after two weeks to verify it is sealing properly.

Open and inspect the control for moisture once a year. Proper care and maintenance will extend the life of the control.

Cleaning

Use caution when washing the room with a high-pressure washer. DO NOT direct a high-pressure washer at the control. To clean the surface of the control, wipe it with a damp cloth. Do not use harsh or abrasive cleaners or rub it with your bare hands.

Actuator maintenance

Because cables can stretch and equipment can come out of alignment (similar to tires on your car), we recommend resetting the limit switches and calibrating your actuators at least once each year. For more information, see **Calibrating actuators** on page 46.



Appendixes

This section contains reference information that is useful when installing, configuring, setting up, or troubleshooting your Supra.

- ◆ Appendix A: Glossary
- ◆ Appendix B: Troubleshooting
- ◆ Appendix C: Factory settings
- ◆ Appendix D: Installation worksheet
- ◆ Appendix E: Configuration worksheets
- ◆ Appendix F: Settings worksheets
- ◆ Appendix G: Supra motor curves

Appendix A: Glossary

AC power	Utility companies supply electrical power as alternating current, which is usually referred to as AC power.
actuator	<p>A device that has a mechanical arm that extends and retracts. Actuators are used for control elements that are not OFF or ON. Instead, they vary by a percentage. For example, inlets can be opened various distances from 0 percent to 100 percent.</p> <p>Typically, linear actuators are connected directly to the inlets, or by cables and pulleys. Inlets are generally located in the ceiling or walls. Inlet systems are usually spring loaded to aid in closing the inlet, or counter weighted to aid in opening the inlets.</p> <p>For more information, see Connecting actuators on page 16.</p>
actuator-stage set point	<p>While the temperature is below the minimum set point, the actuator is closed. When the temperature rises to the minimum set point, the actuator moves to the minimum position.</p> <p>As the temperature rises, the actuator has four stages it moves through until it reaches its maximum open position. This method lets you gradually open inlets instead of fully opening them when the temperature rises above a single set point.</p> <p>In other words, “when the temperature is here (stage set point), I want the actuator to start opening. When the temperature reaches here (stage differential), I want the actuator to be at this position (stage position) percent.”</p> <p>For more information, see Programming actuator on page 76.</p>
alarm bias	<p>The purpose of alarm biasing is to prevent the alarm from sounding on very hot days when the temperature set point cannot be maintained. Bias temperature is added to the high temperature alarm setting if the outdoor temperature is higher than the High Temp alarm setting.</p> <p>For more information, see Programming alarm settings on page 89.</p>
alarm silencing	<p>Alarm silencing temporarily disables an alarm setting after an alarm has been acknowledged. This prevents the alarm relay from activating immediately after acknowledging the alarm if the condition is still present.</p> <p>For more information, see Programming alarm settings on page 89.</p>
control elements	Control elements are devices connected to your Supra, such as fans, heaters, actuators, and so on.

curtain idle band	<p>Curtain idle band is the buffer (in °F or °C) around the set point within which the curtains hold their position. When the temperature is outside of the band, the curtain starts cycling open or closed. Idle band is one of six curtain settings.</p> <p>For more information, see Programming curtain control relays on page 78.</p>
curtain set point	<p>Curtain set point is the temperature at which the curtain holds its position. When the temperature is between the set point and the idle band limits, the curtain holds its position. Set point is one of six curtain settings.</p> <p>For more information, see Programming curtain control relays on page 78.</p>
differential	<p>For variable stages, differential is the difference (in degrees) between the “idle at” (or set point) temperature and the “on full at” temperature.</p> <p>For more information, see Programming variable stages on page 72.</p>
duty cycle	<p>See <i>time-based duty cycle</i> or <i>temperature-based duty cycle</i>.</p>
firmware	<p>The internal program instructions of your Supra. It comprises all the menus, displays, and more.</p> <p>You can update the firmware version of your Supra to the latest version using an Intaglio. For more information, see Available accessories on page 4.</p>
group set point	<p>A group set point is the desired or target temperature for a zone. The individual set points for each variable and relay stage will be adjusted relative to the group set point for that zone.</p> <p>For more information, see Setting the group set point on page 66.</p>
growth curve	<p>A growth curve is an extension of the group set point concept. The growth curve automatically adjusts the temperature set points over time to control the temperature in a room or zone. It is called a “growth” curve because it adjusts the set-points as the animals “grow”.</p> <p>For more information, see Setting up growth curves on page 67.</p>
humidity band	<p>The humidity range in which your Supra attempts to compensate for humidity. The band consists of a lower and upper limit.</p> <p>For more information, see Programming the humidity on page 70.</p>
humidity compensation	<p>The adjustment your Supra makes to compensate for high humidity levels.</p> <p>For more information, see Programming the humidity on page 70.</p>
humidity factor	<p>The amount of effect on the ventilation rate at high humidity levels; 0 is little effect, while 10 is full effect.</p> <p>For more information, see Programming the humidity on page 70.</p>

humidity zone	<p>The zone the humidity sensor (if connected) is assigned to. A humidity sensor can be assigned to only one zone.</p> <p>For more information, see Selecting a humidity zone on page 57.</p>
hysteresis	<p>Hysteresis helps prevent damage to the relays, variable stages, and the equipment connected to them by preventing the stages from switching on and off rapidly when the temperature is hovering close to the set point. For example, a household thermostat might turn on a furnace at 68 °F when the house is cooling down, but turn it off at 72 °F when the house is warming up. The difference between these two values is the hysteresis.</p> <p>For more information, see Configuring hysteresis on page 60.</p>
idle at	<p>The temperature at which a variable cooling stage is at its minimum speed.</p> <p>For more information, see Programming variable stages on page 72.</p>
idle speed	<p>The speed, in percentage of full speed, a variable stage fan is at when the temperature in the zone is between the “off at” and “idle at” temperatures.</p> <p>For more information, see Programming variable stages on page 72.</p>
inlet actuator	<p>See <i>actuator</i>.</p>
inlets	<p>Inlets are shutter-like devices mounted on a wall or ceiling that are used to control air flow in a building.</p>
minimum duration	<p>Minimum duration is the minimum amount of time and alarm condition must be present before the Supra signals an alarm. Minimum duration prevents alarms from activating when the temperature rises or drops for just a few seconds.</p> <p>For more information, see Programming alarm settings on page 89.</p>
minimum idle	<p>The slowest speed at which a variable speed fan can safely idle. It is used to establish minimum air movement (sometimes called minimum ventilation).</p>
minimum position	<p>The percentage an actuator will be open when the temperature is at the minimum set point.</p> <p>For more information, see Programming actuator on page 76.</p>
minimum set point	<p>The temperature at which an actuator is at its minimum position, and below which an actuator closes completely.</p> <p>For more information, see Programming actuator on page 76.</p>
off at	<p>For variable cooling stages, the fan is off at and below this temperature. For variable heating stages, the heat mat is off at and above this temperature.</p> <p>For more information, see Programming variable stages on page 72.</p>

on full at	<p>For variable cooling stages, the fan is on full (100% speed) at and above this temperature. For variable heating stages, the heat mat is on full at and below this temperature.</p> <p>For more information, see Programming variable stages on page 72.</p>
PIN	<p>Personal identification number. A PIN is a unique four-digit number similar to a password.</p> <p>When security is enabled, each user must enter their PIN before changing any settings or acknowledging alarms. This allows the Supra to track who has performed each change and prevents unauthorized access to the control.</p> <p>For more information, see Programming alarm settings on page 89.</p>
pulse counter	<p>An electronic counter that counts the number of electric pulses (switch closures). The Supra's pulse counter can count the electronic pulses emitted by a water meter with pulse output.</p>
relative humidity	<p>Relative humidity is the quantity of water vapor the air contains compared to the maximum amount it can hold at that particular temperature.</p> <p>For example, a relative humidity of 60% means the air contains 60% of the maximum moisture it can contain at the present temperature. The warmer the air, the more moisture the air can hold.</p>
relay	<p>An electromagnetic switch that is either on (closed) or off (open).</p>
set point, temperature	<p>The temperature at which a stage switches on or off. A cooling stage switches on when the temperature rises above the set point. A heating stage switches on when the temperature drops below the set point.</p> <p>For more information, see Programming heating and cooling elements on page 81.</p> <p>See also <i>actuator-stage set point</i>, <i>curtain set point</i>, and <i>variable-stage set point</i>.</p>
silencing	<p>See <i>alarm silencing</i>.</p>
spikes	<p>Short-term deviations or changes from a desired voltage level or signal. These deviations can cause damage to electronic devices, or cause them to malfunction. Spikes are often caused by sudden excess power, also known as “power surges”, or by drops in power, known as “brown outs”.</p> <p>For more information, see Understanding power surges and surge suppression on page 10.</p>

temperature-based duty cycle	<p>A temperature-based style of controlling heating or cooling elements using “on durations” and “off durations”. Temperature-based duty cycles are often used to control misters.</p> <p>For cooling elements, when the temperature is below the set point, the cooling element is off. When the temperature rises above the set point, the element switches on for the “on duration” and then off for the “off duration”. If at any time the temperature drops below the set point, the duty cycle relay switches off and will not switch on again until the temperature rises above the set point.</p> <p>For heating elements, when the temperature is above the set point, the heating element is off. When the temperature drops below the set point, the element switches on for the “on duration” and then off for the “off duration”. If at any time the temperature rises above the set point, the duty cycle relay switches off and will not switch on again until the temperature drops below the set point.</p> <p>For more information, see Programming heating and cooling elements on page 81.</p>
terminal block	<p>The part of your Supra where you connect the wires for incoming power, control elements, and so on.</p> <p>For more information, see Supra interior layout on page 14.</p>
time-based duty cycle	<p>A time-based style of controlling elements using “on durations” and “off durations” between certain hours of the day. Time-based duty cycles are often used to control feed augers.</p> <p>For more information, see Setting up time-based duty cycles on page 86.</p>
timed event	<p>A time-based style of controlling elements using “on times” and “off times”. Timed events are often used to control equipment such as lights that need to be switched on or off during certain times of the day.</p> <p>For more information, see Programming timed events on page 84.</p>
variable stage set point	<p>The temperature at which a variable heating stage is at its minimum output.</p> <p>For more information, see Programming variable stages on page 72.</p> <p>See also <i>idle at</i>.</p>
voltage	<p>Electromotive force or potential difference, usually expressed in volts.</p>
zone	<p>A zone defines an area set off as distinct from surrounding or adjoining parts. Zones might or might not be separated by walls. For example, a large room could be divided into two zones to provide better control response.</p> <p>For more information, see Before you begin configuring your Supra on page 38.</p>

Appendix B: Troubleshooting

- ◆ If you see an alarm message and are not sure what it means, look it up in the **Alarm messages** table below and then follow the instructions for resolving the alarm condition.
- ◆ If you are having a problem using your Supra, see if the problem is described in the **Troubleshooting** table on page 127 and then follow the directions for correcting the problem.
- ◆ If you received a warning during setup or while changing settings, look it up in the **Warnings** table on page 129 and then follow the instructions for correcting the problem.

Alarm messages

The following table lists the alarm messages, the possible causes, and their possible solutions. If you see an alarm message and are not sure what it means, look it up in the Alarm messages table and then follow the instructions for resolving the alarm condition.

Alarm message	Possible cause	Possible solution
High Temp Probe 1 High Temp Probe 2 High Temp Probe 3 High Temp Probe 4	The temperature associated with a probe has gone above the high temperature alarm point and past any alarm biasing.	Try to lower the temperature by turning heaters down or off, or by increasing or turning on cooling elements (such as fans or misters), or by a combination of both. Check the temperature probes. Check to see if a fan has failed. Check settings. Check if probe averaging is enabled and configured correctly.

Alarm message	Possible cause	Possible solution
Low Temp Probe 1 Low Temp Probe 2 Low Temp Probe 3 Low Temp Probe 4	The temperature associated with a probe has gone below the low temperature alarm point.	Try to raise the temperature by turning heaters up or on, or by decreasing or turning off cooling elements (such as fans or misters), or by a combination of both. Check the temperature probes. Check to see if a heater has failed. Check settings. Check if probe averaging is enabled and configured correctly.
Probe 1 Shorted Probe 2 Shorted Probe 3 Shorted Probe 4 Shorted	An active temperature probe has shorted.	The next active Probe will be used. If Averaging is ON, the defective probe will be excluded from the average. Replace the temperature probe. The control should recover automatically.
Probe 1 Absent Probe 2 Absent Probe 3 Absent Probe 4 Absent	An active temperature probe has disconnected.	The next active Probe will be used. If Averaging is ON, the defective probe will be excluded from the average. Reconnect the temperature probe. The control should recover automatically.
Actuator 1 Jam Actuator 2 Jam	Your Supra is attempting to open or close an inlet or other element operated by an actuator, and has not received the correct response from the positioning motor.	Check the element controlled by the actuator to see if it is mechanically stuck. Check feedback wires for damage.
Error for a relay during the status display	You have configured an “open relay” for an actuator or curtain, but not a “close relay”.	Check the relay configuration and configure the close relay.
Low AC Line Frequency High AC Line Frequency	The AC line frequency is outside acceptable limits (± 3 Hz at rated line frequency). There is a danger of damaging the control if this condition persists.	Consult your local power company. If using generator power, adjust the generator frequency to 60Hz(or 50Hz).
Low Power Volt. High Power Volt.	AC power supply is outside acceptable limits (+10%/-20% at rated line voltage).	Consult an electrician or your local power company.
PC Comm. Alarm	The communication cable between your Supra and the computer is damaged or disconnected.	Check the cable. Verify that cable leads are properly seated in terminal block.

Troubleshooting

The following table lists some problems, possible causes, and possible solutions. If you are having a problem using your Supra, see if the problem is described in the Troubleshooting table and then follow the directions for correcting the problem.

Problem	Possible cause	Possible solution
Power supply components blown out	Power surge, brownout, or power outage	Cannot do anything when it happens, but could avoid problem in future by providing proper voltage to unit or by providing proper protection to the unit.
Burn marks on boards and components		
Motors and fans slow down or stop		
No power and/or display	A circuit breaker at service panel is off or tripped. Incorrect wiring Display board inter-connect cable is not plugged into the power supply board properly. 115/230 VAC switch in the wrong position	Reset the circuit breaker. Correct the wiring. Plug in the display board cable. Switch off the power, set switch to the correct setting, and then switch on the power.
Variable fan or variable heat element runs at maximum.	Incorrect wiring Minimum idle speed too high Variable speed range matches temperature set point	Correct the wiring. Decrease the minimum idle speed setting. Adjust the temperature set point to the desired temperature.
Variable fan or variable heat element not running	Incorrect wiring Fuse open or blown Minimum Idle setting too low Idle off setting too high Temperature set point is above room temperature. No power to fan/heater. Faulty fan/heater Circuit breaker open	Correct the wiring. Check why the fuse was blown and repair any problems. Replace the fuse. Increase the minimum Idle speed setting. Decrease the idle off setting. Adjust the temperature set point to the desired temperature. Switch on the power. Replace the equipment. Reset the breaker.

Problem	Possible cause	Possible solution
Relay not operating load	<p>Incorrect wiring</p> <p>Switch-on setting for stage incorrect</p> <p>Relay set to cool for a heater</p> <p>Relay set to heat for a fan</p> <p>No power to load</p> <p>Faulty equipment</p> <p>Circuit breaker open</p> <p>Blown relay</p>	<p>Correct the wiring.</p> <p>Adjust the setting.</p> <p>Change the configuration for the relay to heat.</p> <p>Change the configuration for the relay to cool.</p> <p>Switch on the power.</p> <p>Replace the equipment.</p> <p>Reset the breaker.</p> <p>Solve the problem that caused the relay to blow and then replace the circuit board or use a different relay.</p>
Alarm relay not operating alarm system	Incorrect wiring	Correct the wiring.
Display showing unusually high temperature	<p>Incorrect wiring</p> <p>Extension cable connected to temperature probe is providing a poor connection</p> <p>Damaged probe</p>	<p>Correct the wiring.</p> <p>Check the extension cable connection. Resolder it if necessary.</p> <p>Replace the temperature probe.</p>
Variable speed 1 or variable speed 2 fan switches on, runs at full speed, and then turns off. Keeps cycling.	Hysteresis not high enough. Outside temperature rising and falling quickly. Happens most often in the spring and fall.	Adjust the hysteresis setting or overlap the Variable speed 1 or variable speed 2 fan settings.
Staged heater cycles on and off	<p>Heater set points are too close together with variable speed fans.</p> <p>Heater too large for room</p> <p>Stage is set up as a temperature-based duty cycle</p>	<p>Adjust the hysteresis setting.</p> <p>Move the temperature probe closer to the heater.</p> <p>Widen the set points.</p> <p>Replace the heater with a smaller output unit.</p> <p>Remove the duty cycle from the stage's settings</p>
Date/time not correct	Daylight savings	Adjust the date/time.
Forgotten PIN	Memory lapse. It happens... Now where was I?	<p>Have a user with "Admin" access assign a new password.</p> <p>As a last resort, reset the factory defaults.</p>

Warnings

Certain conditions, if detected when making settings, generate a warning. You will still be able to make the changes, but the warning will be written to the audit log. The table below describes the warnings and their descriptions.

Warning	Type of element being set up	Description
H/C Conflict	Single or variable-stage element	There is a heat/cool set point conflict. The heating set point is set above the cooling set point.
Min Ventilation	Variable-stage cooling element	The idle band is too small. The minimum idle rate on a variable stage is between 0% and 10%.
Large VAR Range	Variable stage element	The differential on a variable stage is more than 5°.
Odd Timed Events	Timed events	There is an odd number of timed events.
Overlap Events	Timed events	One or more timed events are overlapping.
Edit Aborted	All	You did not press ENTER after changing the settings.

Appendix C: Factory settings

When your Supra leaves the factory, it comes with default settings and configuration. When you configure and set up your Supra, you change its settings. Resetting your Supra erases *all the configuration and settings you programmed* and then restores the settings to what they were when the control left the factory. For more information, see **Resetting your Supra to its factory settings** on page 115.

The table below lists the factory defaults.

Configuration defaults		De-icing defaults	
Relays 1 to 12	Zone 1 – unassigned	Colder than	33.0°F
Variable stages 1 to 4	Zone 1 – cool	Duration	3 seconds
Hum zone	Unassigned	VS 1 to 4	No
Variable stage setting defaults (VS 1 to 4)		Water meter setting defaults	
On full at	86.5°F	Display in	Litres
Idle at	85.0°F		1 Litre/pulse
Off at	80.0°F	Logs defaults	
Idle speed	20%	Logging interval	24 hours
			Logs are empty
Humidity setting defaults		Other setting defaults	
Upper limit	90%	Temperature units	°F
Lower limit	30%	Unit name	Phason Supra
Display item defaults		Probe type (all)	Normal
Zone temps	1	Motor curve (all)	Optimum
Temp extremes	No	Actuator settings	None assigned
Rly 1 to 12	No	Curtain settings	None assigned
VS 1 to 4	Yes	Duty cycle settings	None assigned
Water meter	No	Heat/cool settings	None assigned
Humidity	No	Timed event settings	None assigned
Scroll time	4 seconds	Averaging	Off
		Humidity factor	5
		Security	Off
Warnings		Hysteresis defaults	
H/C conflict	Yes	H/C stages	0.5°F
Min Ventilation	Yes	Var idle off	0.3°F
Large VAR Range	Yes	Actuator	0.3°F
Odd Timed Events	Yes	Position	3%
Overlap Events	Yes	Timeout	00:10
Edit Aborted	Yes		

Growth curve defaults		Alarm defaults	
Zone	none	Probe 1	Enabled
Status	disabled	Probe 2-4	Disabled
Current day	1	High temp	99.0°F
Step 1, day 1	85.0°F	Low temp	50.0°F
Step 2, day 4	80.0°F	Biasing enabled	No
Step 3, day 14	75.0°F	High temp bias	10.0°F
Step 4, day 24	70.0°F	Bias time	1 hour
Step 5, day 34	65.0°F	Probe damage	Yes
Step 6, day 44	60.0°F	AC low power	Yes
Step 7, day 64	60.0°F	AC frequency	Yes
Group setpoint defaults		Actuator jam	Yes
Zone 1	85.0°F	PC communications	No
Zone 2	85.0°F	Water overflow	No
Zone 3	85.0°F	Max flow	1
Zone 4	85.0°F	Sensor damage	No
		Silencing	30 minutes
		Minimum duration	1 minute

Appendix D: Installation worksheet

Use the worksheet on the next page to list all the equipment (fans, heaters, curtains, and so on that you want your Supra to control. We recommend you make a copy of the worksheet before filling it in incase you need more than one sheet or you make a mistake.



Use the **Installation worksheet** when you fill in the **Configuration worksheets** (starting on page 134).

Input power	115/230 VAC, 50/60 Hz
Fuse (F5)	1 A, 250 VAC non-time-delay glass
Variable stages (4 - VAR1 to VAR4)	10 FLA at 115/230 VAC ①
Fuses (4 - F1 to F4)	15 A, 250 VAC fast-acting ceramic
Relay stages ② (12 - RLY1 to RLY12)	10 FLA at 115/230/208 VAC, 360 W tungsten at 120 VAC ①
Alarm stage	0.2 A at 230 VAC, 0.4 A at 24 VAC, 2.0 A at 30 VDC
Temperature inputs (5 – TEMP 1 to TEMP 4, OUT TEMP)	Four zone probes (one for each zone) should read from -10°C to 45°C (4°F to 110°F). One outdoor probe should read from -45°C to 75°C (-49°F to 167°F)..
① You can connect more than one piece of equipment to a variable stage or relay as long as they are the same type (for example, two fans), and the total current draw (load) is within the limits.	
② Actuators require two relays: one for opening, one for closing. You can connect a maximum of two actuators.	

For more information, see **Supra interior layout** on page 14.

Equipment to install	Where to connect the equipment on your Supra (relay number, VAR number, etc)
<i>Example: 24-inch single –speed pit fan</i>	<i>RLY1</i>
<i>Example: Actuator 1 – North room</i>	<i>Open relay: RLY11 Close relay: RLY12 Feedback: ACT 1 FB</i>

Equipment to install	Where to connect the equipment on your Supra (relay number, VAR number, etc)

Appendix E: Configuration worksheets



Use the **Installation Worksheet** on page 132 when completing the configuration worksheets.

For Actuator 1, use the feedback terminal ACT 1 FB; for Actuator 2, use ACT 2 FB.

Relay configuration worksheet

For each of the relays in your Supra:

- ◆ Enter the zone number (1, 2, 3, or 4)
- ◆ Enter a description (20 characters maximum)
- ◆ Put a check mark in the appropriate column for how to configure the relay.
- ◆ If the relay uses one of the 6 curtains, enter the curtain number in that column (remember that you need 2 relays for each curtain you use: one for open and one for close)

Relay configuration example

Relay	Zone	Description	Timed event	Duty cycle	Heat	Cool	Actuator 1 open	Actuator 1 close	Actuator 2 open	Actuator 2 close	Curtain open	Curtain close
1	2	Inlet 1					✓					
2	2	Inlet 1 cls						✓				
3	2	Inlet 2							✓			
4	2	Inlet 2 cls								✓		
5	2	Curtain 1									1	
6	2	Curt 1 cls										1
7	2	Curtain 2									2	
8	2	Curt 2 cls										2
9	2	Large Fan				✓						
10	2	Gas Heater			✓							
11	2	Electric Heat			✓							
12	2	Heat Lamps			✓							

Relay	Zone	Description	Timed event	Duty cycle	Heat	Cool	Actuator 1 open	Actuator 1 close	Actuator 2 open	Actuator 2 close	Curtain open	Curtain close
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												

Variable stage configuration worksheet

For each variable stage:

- ◆ Enter the zone number (1, 2, 3, or 4)
- ◆ Circle the type of equipment. For example, “cool” for a cooling fan, or “heat” for a heat mat.
- ◆ Enter a description (20 characters maximum)

Example

Stage	Zone	Type	Description
1	1	Heat <u>Cool</u>	VS fan 1
2	1	Heat <u>Cool</u>	VS fan 2
3	2	Heat <u>Cool</u>	VS fan 3
4	2	<u>Heat</u> Cool	Heat mat

Stage	Zone	Type	Description
1		Heat Cool	
2		Heat Cool	
3		Heat Cool	
4		Heat Cool	

Temperature averaging worksheet

Temperature averaging allows you to take temperature readings from two or more probes and average the values. When averaging is off, a temperature probe can be assigned to only one zone. When averaging is on, a probe can be one of several probes assigned to a zone.

For more information, see **Configuring temperature averaging** on page 56.

Zone	Average these probes			
1	1	2	3	4
2	1	2	3	4
3	1	2	3	4
4	1	2	3	4

Humidity zone worksheet

If you installed a Relative Humidity Sensor, you need to select which zone the sensor will be monitoring. A humidity sensor can monitor only one zone.

For more information, see **Selecting a humidity zone** on page 57.

Humidity sensor is installed in zone: 1 2 3 4

Pulse counter worksheet

If you connected a water meter to your Supra's pulse counter terminal and will be monitoring water usage, you need to tell your Supra how much water (in litres or US gallons) goes through the meter for each pulse the meter puts out.

For more information, see **Configuring the pulse counter** on page 58.

	Setting	Description
Pulse output		Number of units per pulse. For example, 10 gallons per pulse.
Pulse output units	Litres US gallons	The unit of measure for the pulse output. For example, 10 <i>gallons</i> per pulse.
Display units	Litres US gallons	Display water usage in this unit of measure.

De-icing worksheet

Your Supra's de-icing feature helps keep variable-speed fans from icing up if the outdoor temperature is too cold. When de-icing is enabled, variable-speed fans start at full speed before dropping to the idle or normal speed.

For more information, see **Configuring de-icing** on page 59.

	VSP 1	VSP 2	VSP 3	VSP 4
De-icing temperature (-40.0 to 50.0°C, 10.0 to 120.0°F)				
Duration to de-ice (1 to 9 seconds)				

Hysteresis worksheet

Hysteresis helps prevent damage to the relays, variable stages, and the equipment connected to them by preventing the stages from switching on and off rapidly when the temperature is hovering close to the set point.

For more information, see **Configuring hysteresis** on page 60.

Heat/cool stages	_____ °C / °F
The number of degrees above the turn-on point when a heating relay will turn off, and the number of degrees below the turn-on point that a cooling relay will turn off	Range: 0.2 to 2.8°C, 0.3 to 5.0°F Default: 0.3°C , 0.5°F
Variable speed idle off	_____ °C / °F
	Range: 0.2 to 2.8°C, 0.3 to 5.0°F
Actuator/Actuator position	_____ °C / °F
This adjusts the accuracy of the actuator—the tolerance in percent that the actuator can be resting away from the desired position or the number of degrees the actuators will stay at rest between the open and close points.	Range: 0.2 to 2.8°C, 0.3 to 5.0°F Default: 0.3°C, 0.3°F _____ % Range: 1 to 10% Default: 3%
Timeout	_____ mm:ss mm= number of minutes ss= number of seconds Range: 00:02 to 00:10 seconds Default: 00:10
Amount of time your Supra will wait to see if the actuator has moved before actuator jam alarm.	

Warnings worksheet

Warnings are one of your Supra's built-in diagnostic tools. They warn you about conflicts or out-of-range conditions as you are programming the control. When your Supra comes from the factory, all warnings are set to "Yes".

For more information, see **Configuring warnings** on page 61.

Warning	Enable?		Description
H/C conflict	Yes	No	There is a heat/cool set point conflict—The set point for any fixed or variable heater stage is above the set point for any fixed or variable cool stage.
Min Ventilation	Yes	No	The idle band too small—The idle temperature band for any variable cool stage is less than 10°F.
Large VAR Range	Yes	No	The differential for a variable stage is more than 5°.
Odd Timed Events	Yes	No	There is an odd number of timed events—The number of timed events for any relay stage is not a multiple of two. Timed events must have an ON event for every OFF event.
Overlap Events	Yes	No	There are overlapping timed events—A device has two or more consecutive ON events, or consecutive OFF events.
Edit Aborted	Yes	No	You did not press ENTER after changing the settings.

Appendix F: Settings worksheets

This appendix contains worksheets for you to use when programming your Supra settings. Each worksheet contains a brief explanation of the information required. For more information about programming your Supra, see **Chapter 5: Programming your Supra** on page 63.

Group set point worksheet

A group set point is the desired or target temperature for a zone. The individual set points for each variable and relay stage will be adjusted relative to the group set point for that zone. Make sure you set the group set point *before* setting the individual set points.

A group set point is the desired or target temperature for a zone. The individual set points for each variable and relay stage will be adjusted relative to the group set point for that zone. Make sure you set the group set point *before* setting the individual set points.

For example, let's say the group set point for zone 1 is 80°F, a variable-stage fan set point is 5 degrees higher (85°F), and a single-stage heater set point is 7 degrees lower (73°F). If you lower the group set point to by 5 degrees to 75°F, the set points for the fan and heater will also be lowered by 5 degrees to 80°F and 68°F respectively.

For more information, see **Setting the group set point** on page 66.

Zone	Temperature
1	(°C / °F)
2	(°C / °F)
3	(°C / °F)
4	(°C / °F)

Growth curve worksheet

A growth curve is an extension of the group set point concept. The growth curve automatically adjusts the temperature set points over time to control the temperature in a room or zone. It is called a “growth” curve because it adjusts the set-points as the animals “grow”.

You can have up to seven steps in a growth curve. Each step has a starting temperature set point and a duration. Your Supra automatically calculates the set points for the days between the steps and adjusts the set points at midnight each day. Individual set points for the variable and fixed stages are adjusted relative to the growth curve temperature for that particular day.

You can set up two growth curves: growth curve A and growth curve B. This lets you control two different areas of your facility using independent set points.

For more information, see **Setting up growth curves** on page 67.

Growth curve A					Growth curve B						
Zone(s)	All	1	2	3	4	Zone(s)	All	1	2	3	4
Step	Temperature①		Start day			Step	Temperature①		Start day		
St1						St1					
St2						St2					
St3						St3					
St4						St4					
St5						St5					
St6						St6					
St7						St7					
① Temperature in °F/°C, range: –10.0 to 45.0°C, 4.0 to 110.0°F											
② Duration in days, range: 1 to 250 days											

Variable stage settings worksheet

Setting	Variable 1		Variable 2		Variable 3		Variable 4	
Type of element	Heat	Cool	Heat	Cool	Heat	Cool	Heat	Cool
On full at①								
Idle at/Setpoint①								
Off at①								
Idle speed/Min heat②								
① Temperature in °F/°C, range: –10.0 to 45.0°C, 4.0 to 110.0°F								
② Idle speed or Min heat in %, range: 0 to 100 %								



If you need to connect more heating or cooling elements than you have relays, and you are not using all the variable stages, you can use any available variable stage as an ON/OFF stage.

Set the idle speed (min heat for a heating stage) to 100% and “off at” to the temperature at which you want the stage to switch on/off.

You no longer have “variable” speed or power; instead you have either full on or full off, the same as a regular heating or cooling element. The other settings have no effect when you use a variable stage this way.

Humidity compensation settings worksheet

If you have installed and configured a humidity sensor, you need to program the humidity compensation. Programming the humidity compensation means setting the humidity factor and the upper and lower humidity limits. For more information, see **Programming the humidity** on page 70.



If you are using Fahrenheit, a good guideline is to set the humidity factor equal to half the cooling band. If you are using Celsius, use a value equal to the cooling band.

For example, if the temperature set point for the first stage is 70°F and the last stage switches on at 78°F, the cooling band would be 8°F. You would set the humidity factor to 4. For more information, see the table below.

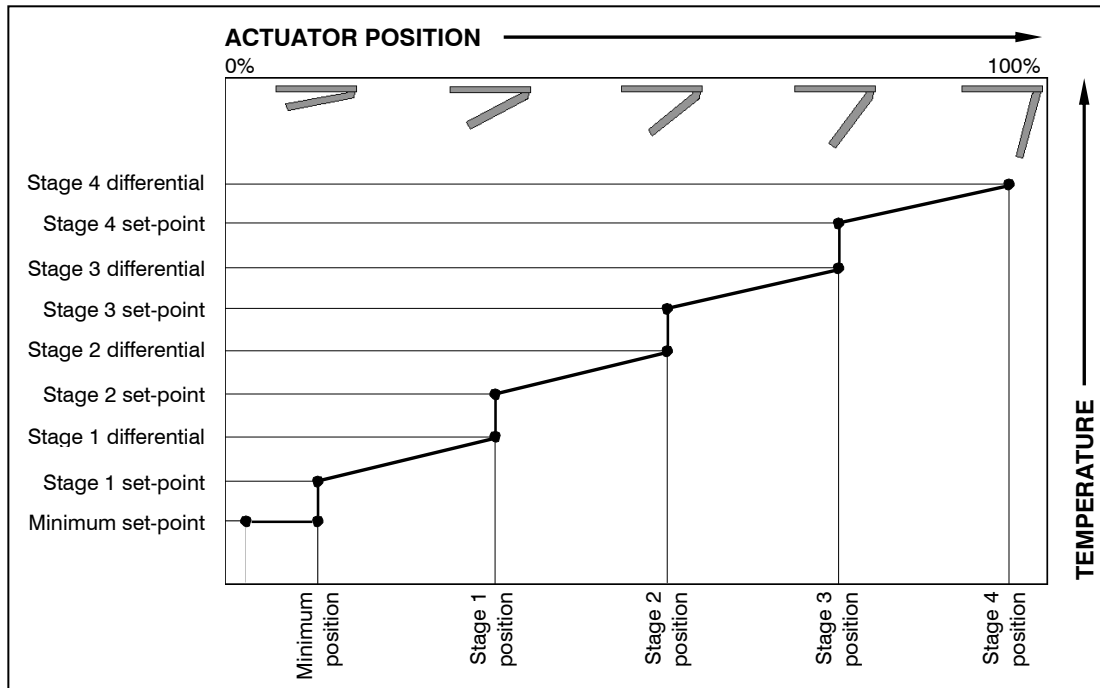
Cooling band (°C)	Cooling band (°F)	Humidity factor
1.0	2.0	1
2.0	4.0	2
3.0	6.0	3
4.0	8.0	4
5.0	10.0	5
6.0	12.0	6
7.0	14.0	7
8.0	16.0	8
9.0	18.0	9
10.0	20.0	10

	Setting	Description
Humidity factor		A number from 0 to 10 used to calculate humidity compensation.
Upper limit	%	90% maximum, must be at least 20% higher than the lower limit.
Lower limit	%	30% minimum, must be at least 20% lower than the upper limit.

Actuator settings worksheet

Each actuator has four stages. For each actuator you are setting up you need to program the:

- ◆ Minimum set point
- ◆ Minimum position
- ◆ Set point, differential, and position for stages 1 to 4



While the temperature is below the minimum set point, the actuator is closed. When the temperature rises to the minimum set point; the actuator moves to the minimum position.

As the temperature rises, the actuator has four stages it moves through until it reaches its maximum open position. This method lets you gradually open inlets instead of fully opening them when the temperature rises above a single set point.

In other words, “when the temperature is here (stage set point), I want the actuator to start opening. When the temperature reaches here (stage differential), I want the actuator to be at this position (stage position) percent.”

For more information, see **Programming actuator** on page 76.

Setting	ACT-1	ACT-2	Description
Minimum set point①			Actuator will close completely when ambient temperature is below this
Position②			After temperature drops and begins to rise again, actuator will open to this position when ambient temperature reaches Minimum Set Pt again
Stage 1 set point①			Temperature at which actuator starts opening for Stage 1
Differential①			Temperature at which actuator is open to Stage 1 Position
Position②			Percentage actuator is open
Stage 2 set point①			Temperature at which actuator starts opening for Stage 2
Differential①			Temperature at which actuator is open to Stage 2 Position
Position②			Percentage actuator is open
Stage 3 set point①			Temperature at which actuator starts opening for Stage 3
Differential①			Temperature at which actuator is open to Stage 3 Position
Position②			Percentage actuator is open
Stage 4 set point①			Temperature at which actuator starts opening for Stage 2
Differential①			Temperature at which actuator is open to Stage 2 Position
Position②			Percentage actuator is open
① Temperature in °F/°C, range: –10.0 to 45.0°C, 4.0 to 110.0°F			
② Position in %, range: 0 to 100 %			

Curtain worksheet

Curtains control the temperature by adjusting the air flow into the facility. Each curtain has six settings:

- ◆ Set point—the temperature at which the curtain holds its position.
- ◆ Idle band—the buffer around the set point within which the curtains hold their position.
- ◆ Open run time—the duration the curtains open during the ON cycle
- ◆ Open idle time—the duration the curtains hold their position during the ON cycle
- ◆ Close run time—the duration the curtains open during the OFF cycle
- ◆ Close idle time—the duration the curtains hold their position during the OFF cycle

For more information, see **Programming curtain control** relays on page 78.

Curtain	Zone	Set point①	Idle band①	Open run②	Open idle②	Close run②	Close idle②
				:	:	:	:
				:	:	:	:
				:	:	:	:
				:	:	:	:
				:	:	:	:
				:	:	:	:
① Temperature in °F/°C, range: –9.9 to 43.3°C (14.0 to 110.0°F)							
② Duration in mm:ss, range: 0 to 10 minutes in 1 second increments							

Heating and cooling elements worksheet

Heating and cooling elements control the temperature by switching single-stage heating equipment such as electric heaters, or cooling equipment such as misters ON or OFF.

There are two types of heating and cooling element setups: “standard” and “temperature-based duty cycle”. Setting up a standard element means setting the temperature set point and selecting “Off” for the duty cycle. Setting up a temperature-based duty cycles means setting the temperature set point, selecting “On” for the duty cycle, and setting the ON and OFF durations.

For more information, **Programming heating and cooling elements and temperature-based duty cycles** on page 81

Relay	Type	Set point ^①	Duty cycle	On duration ^②	Off duration ^②
	Heat Cool		On Off	: :	: :
	Heat Cool		On Off	: :	: :
	Heat Cool		On Off	: :	: :
	Heat Cool		On Off	: :	: :
	Heat Cool		On Off	: :	: :
	Heat Cool		On Off	: :	: :
	Heat Cool		On Off	: :	: :
	Heat Cool		On Off	: :	: :
	Heat Cool		On Off	: :	: :
	Heat Cool		On Off	: :	: :
	Heat Cool		On Off	: :	: :
	Heat Cool		On Off	: :	: :
	Heat Cool		On Off	: :	: :
① Temperature in °F/°C, range: –10.0 to 45.0°C, 10.0 to 120.0°F					
② Duration in hh:mm:ss					

Timed events worksheet

Timed event relays control equipment such as lights that need to be switched on or off during certain times of the day. Setting up timed events means setting the “on” and “off” times. For every on time, you must set an off time.

For more information, see **Programming timed events** on page 84.

Relay		Zone		Relay		Zone		Relay		Zone	
On time		OFF time		ON time		OFF time		ON time		OFF time	
:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:
ON/OFF time in 12-hour format (AM/PM)											

Relay		Zone		Relay		Zone		Relay		Zone	
ON time		OFF time		ON time		OFF time		ON time		OFF time	
:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:
ON/OFF time in 12-hour format (AM/PM)											

Relay		Zone		Relay		Zone		Relay		Zone	
ON time		OFF time		ON time		OFF time		ON time		OFF time	
:		:		:		:		:		:	
:		:		:		:		:		:	
:		:		:		:		:		:	
:		:		:		:		:		:	
:		:		:		:		:		:	
:		:		:		:		:		:	
:		:		:		:		:		:	
:		:		:		:		:		:	
:		:		:		:		:		:	
:		:		:		:		:		:	

ON/OFF time in 12-hour format (AM/PM)

Relay		Zone		Relay		Zone		Relay		Zone	
ON time		OFF time		ON time		OFF time		ON time		OFF time	
:		:		:		:		:		:	
:		:		:		:		:		:	
:		:		:		:		:		:	
:		:		:		:		:		:	
:		:		:		:		:		:	
:		:		:		:		:		:	
:		:		:		:		:		:	
:		:		:		:		:		:	
:		:		:		:		:		:	
:		:		:		:		:		:	
ON/OFF time in 12-hour format (AM/PM)											

Alarm settings worksheet

The alarm settings for your Supra determine which alarm conditions are enabled, which are disabled, and their settings. All these work together to determine how and when the alarm relay activates (in other words, signals an alarm condition).

Minimum duration prevents alarms from activating when the temperature rises or drops for just a few seconds.

Silencing temporarily disables an alarm setting after an alarm has been acknowledged. This prevents the alarm relay from activating immediately after acknowledging the alarm.

Alarm biasing prevents the alarm from sounding on very hot days when the temperature set point cannot be maintained. The bias temperature is added to the high temperature alarm setting if the outdoor temperature is higher than the alarm setting.

For more information, see **Programming alarm settings** on page 89.

Zone	Status		Description
Probe 1	Enabled	Disabled	Enables the temperature alarms for the probe.
Probe 2	Enabled	Disabled	
Probe 3	Enabled	Disabled	
Probe 4	Enabled	Disabled	
High temperature①			The highest temperature to which you can safely allow your facility to rise—identified by probe. This cannot be lower than low temperature alarm.
Low temperature①			The lowest temperature to which you can safely allow your facility to fall—identified by probe. This cannot be higher than high temperature alarm.
① Temperature in °F/°C, range: 10.0 to 120.0°F, –10.0 to 45.0°C			
Biasing enabled	Yes	No	To enable alarm biasing, set this parameter to “Yes”.
High temperature bias②			The maximum difference that is allowed between the zone temperature and the high temperature alarm.
Bias time③			If the outdoor temperature drops but the room has not yet cooled down, the alarm biasing will still be in effect for the length of time specified in this parameter.
② Temperature in °F/°C			
③ Duration in hours, range: 0 to 5 hours			

Zone	Status		Description
Probe damage	Yes	No	Occurs if any existing temperature probe is disconnected or shorted
AC power	Yes	No	Occurs if AC power supply drops below an acceptable level
AC frequency	Yes	No	Occurs if the AC line frequency is outside acceptable limits (± 3 Hz of frequency) Note: frequency in North America is 60 Hz, and in Europe is 50 Hz
Actuator jam	Yes	No	Occurs if the unit is attempting to open or close an inlet and does not receive the correct response from the positioning motor
PC communications	Yes	No	Occurs if there is a communications failure between the unit and the PC or another unit
Water overflow	Yes	No	Occurs if the water flow is above the max flow setting.
Max flow ^④			The maximum daily water flow (usage). If the usage goes above this value, there is an alarm condition
Sensor damage	Yes	No	Occurs if an existing humidity sensor is disconnected or shorted
Silencing ^⑤		:	The length of time an alarm is deactivated after being acknowledged.
Minimum duration ^⑤		:	The time between when an alarm condition is detected and the alarm is activated.
^④ Flow (water usage) in litres or US gallons			
^⑤ Duration in mm:ss, range: 00:00 to 10:00 for silencing and 00:00 to 30:00 for minimum duration			

Status screen display worksheet

When you are looking at your Supra while it is operating normally, you want to be able to quickly see what is happening. Your Supra lets you display different types of information on the display. If this information uses more than four lines, the information cycles through groups of four lines so you can watch the display for a few seconds to get all the information you need.

For more information, see **Setting up the status display** on page 91.

Item	Display?					Notes
Current zone temperatures	1	2	3	4	All	Which zone(s) to display
Temp extremes	Yes		No			Displays the current day's high and low temperatures for each zone selected above
Relay 1	Yes		No			Displays whether the relay is ON or OFF.
Relay 2	Yes		No			
Relay 3	Yes		No			
Relay 4	Yes		No			
Relay 5	Yes		No			If an inlet, displays the percentage of the current stage.
Relay 6	Yes		No			
Relay 7	Yes		No			If a curtain, displays the statistics for that curtain.
Relay 8	Yes		No			
Relay 9	Yes		No			
Relay 10	Yes		No			
Relay 11	Yes		No			
Relay 12	Yes		No			
Variable stage 1	Yes		No			Displays the percentage (speed or voltage) of the stage.
Variable stage 2	Yes		No			
Variable stage 3	Yes		No			
Variable stage 4	Yes		No			
Water meter	Yes		No			Displays the water usage for the current day.
Humidity	Yes		No			Displays the current humidity
Scroll duration	seconds					How often the display changes. Range: 1 to 6

Security levels worksheet

Your Supra has a five-level PIN security system. Each level has access to different areas of the Supra. When you initially set up your Supra, if you will be using security, you need to add users to your system.

When security is enabled, each user must enter their PIN before changing any settings or acknowledging alarms. This allows the Supra to track who has performed each change and prevents unauthorized access to the control.

For more information, see **Setting up security and users** on page 93.

The table below lists the access allowed for each security level.

Allowed to...	Security level				
	Admin	Manager	Personnel	Technician	View only
Change settings	✓	✓	✓		
Acknowledge alarms	✓	✓	✓	✓	
Maintenance functions	✓	✓			
Calibrate actuators	✓	✓		✓	
View logs	✓	✓	✓	✓	
Add and remove users	✓				
Configuration	✓	✓			
Diagnostics	✓	✓		✓	
View only (no security is required)					✓

Name	Security level				
	Admin	Manager	Personnel	Technician	View Only
Example: <i>Resta Shuréd</i>	✓				

Appendix G: Supra motor curves

The table below lists your Supra's available motor curves. For more information about motor curves, see **Selecting motor curves** on page 54.

Optimum	V1	V2	V3	V4	V5
Phason curve	Franklin $\frac{1}{6}$ hp 3450 rpm	Canarm 18"	Marathon $\frac{1}{3}$ hp 1625 rpm	Multifan 4E35	Multifan 4E50
	Leeson $\frac{1}{3}$ hp 1625 rpm	Marathon $\frac{1}{2}$ hp 1625 rpm	Canarm 24 inch	Canarm 20 inch	Multifan 4E45
	Leeson $\frac{1}{4}$ hp 1625 rpm	Magnatek $\frac{1}{6}$ hp 3300 rpm	Magnatek $\frac{1}{3}$ hp 1725 rpm	Magnatek $\frac{1}{3}$ hp 1040 rpm	Multifan 4E40
	AT09Z2 3350 rpm	Magnatek $\frac{1}{6}$ hp 1725 rpm	AT16Z 1625 rpm	Marathon $\frac{3}{4}$ hp 1040 rpm	Magnatek $\frac{1}{2}$ hp 840 rpm
		Leeson $\frac{1}{2}$ hp 1625 rpm		AT24Z 1075 rpm	Baldor $\frac{1}{3}$ hp 840 rpm
		Leeson $\frac{3}{4}$ hp 1625 rpm		Zielhl-Abegg 18 inch	Baldor $\frac{1}{3}$ hp 1700 rpm
		Emerson $\frac{1}{6}$ hp 3400 rpm		Zielhl-Abegg 20 inch	Baldor $\frac{1}{4}$ hp 1700 rpm
					AT36Z1 850 rpm
					Zielhl-Abegg 12 inch

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