March 2020 / **Bulletin 100-50-9.1**

SPORLAN

S3C Case Control

Installation and Operation Instructions

S3C CASE CONTROL

VALVE MODULE

DISPLAY MODULE

Parker

ENGINEERING YOUR SUCCESS.

CONTENTS

Bulletin 100-50-9.1, March 2020 supersedes Bulletin 100-50-9.1, June 2018 and all prior publications.
For more information about Parker Sporlan products, visit www.sporlan.com.

1. INTRODUCTION

1.1 HOW TO USE THIS MANUAL

This manual contains information to aid in the installation and operation of the Sporlan S3C Case Control system. To use this manual it is recommended to:

1. Find your application in Section 6; review the set-up, piping and wiring diagrams.
2. Use Section 5 to help with component installation.
3. For any settings that are not covered under initial set-up, refer to Section 11.
4. To access Service features, reference Section 19.

1.2 PRODUCT SUMMARY

The S3C Case Control system provides Control, Monitoring and Service Support for remote and self-contained Refrigerated Display Fixtures. The system supports open protocol communication (BACnet, MODBUS) with other control systems that allows integration into an enterprise wide network of control subsystems. The S3C Case Control system is designed to facilitate both installation and integration by the Refrigerated Fixture OEM as well as retrofit into existing supermarket refrigeration control installations. Controller configuration and network integration are automated where possible and simplified when an automatic solution is not feasible.

The S3C Case Control system is capable of coordinated control of a refrigerated case line-up (remote display fixtures on a parallel compressor refrigeration rack circuit/loop). Coordination of defrost, lighting control, temperature control and controller configuration is made possible via peer to peer communication between S3C Case Controllers. The system supports 1 – 8 display cases per line-up.

The S3C Case Control system can also operate as a stand alone case control subsystem scheduling and performing defrost, temperature control, lighting control, etc. As well as coordinating functionality with a supervisory front end system (Building Automation Systems or BAS) when available and connected. The S3C Case Control always performs local control of all attached control components (valves, fans, etc.) to maintain temperature and superheat control using locally attached sensing devices and internal control algorithms.

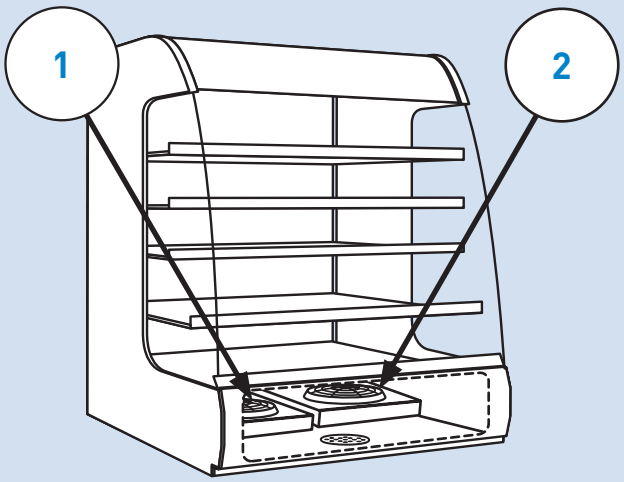
The control system includes a case controller, display and valve module. The system can control display cases with single or multiple evaporators. Evaporator locations are identified left to right, when standing in front of the case. For tub cases, the front is the side opposite the fans. To standardize and provide clarity, the following figure can be referenced for multi coil cases and should be used with this manual.

1.3 TECHNICAL SUPPORT

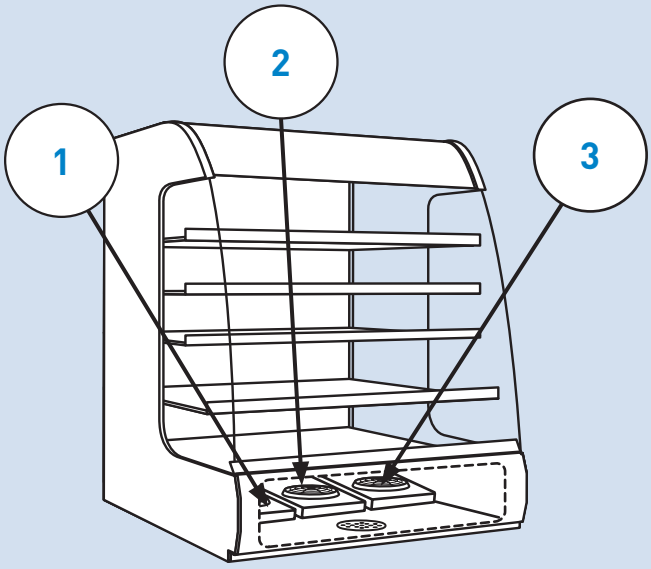
For immediate assistance, Technical Support can be reached at the following:

Toll-Free: 888-920-6284

2 EVAPORATOR CASE



3 EVAPORATOR CASE



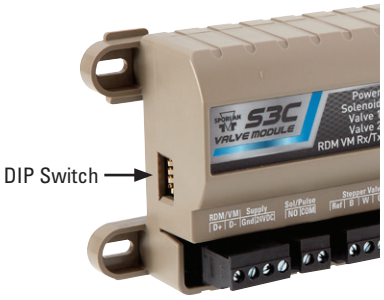
2. SYSTEM COMPONENTS

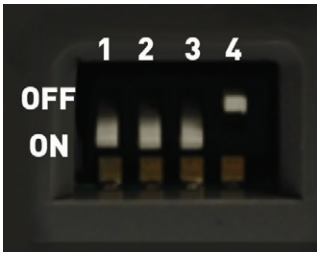
2.1 S3C CASE CONTROL

The S3C Case Control is equipped with the required inputs and outputs for advanced control of medium and low temperature refrigerated display cases in a variety of configurations.

1. One stepper motor driven valve. This can be configured for multiple valve types and control of either an electronic expansion valve (EEV) or electronic evaporator pressure regulating valve (EEPR). Short circuit protection and open circuit detection is incorporated.
2. Two 0 – 10V DC outputs for controlling dimmable LED lighting and variable speed fans.
3. One Solid State Relay output for control of Liquid Line Solenoid or Pulse EEVs.
4. One Form C relay output for evaporator fan control.
5. One Form A relay output for lighting control.
6. One Form C relay output for control of defrost. (Heater Contactor, Drain Heater, Hot Gas Valve, etc.)
7. One 5V logic output for control of an external Solid State relay for switching Anti-Sweat Heaters.
8. Three Digital inputs; One Door Switch, one Service Switch and one User configurable.
9. Five Thermistor Temperature Sensor inputs (2K, 3K,10K selectable) for Coil Outlet, Discharge Air, Return Air, Defrost Termination and One Auxiliary.
10. One Pressure Transducer input with 5V excitation voltage.
11. One Clogged Drain Sensor input.
12. One Occupancy Sensor input.
13. One Ambient Temperature/Humidity sensor input.
14. Two Ethernet RJ-485 Connectors, One RS-485 connection.

2.2 S3C VALVE MODULE





The S3C Valve Module expands the control capabilities of the S3C control system by providing additional inputs and outputs required for more complex applications.

1. Two stepper motor driven valves. These can be configured for multiple valve types and control of either two additional EEVs or one EEV and an EEPR. Short circuit protection and open circuit detection is incorporated.

   For control of an EEPR with the S3C Valve Module set the "DIP Switches" 1 – 3 in the down position. For control of 1 – 2 EEV(s) with the S3C Valve Module set the "DIP Switches" 1 up and 2, 3 in the down position. See System Operation section for more information on configuration and set-up. **Note: DIP switch 4 does not affect valve operation.**
2. One Solid State Relay output for control of Liquid Line Solenoid or Pulse EEVs.
3. Six Thermistor Temperature Sensor inputs (2K, 3K, 10K selectable) for two Coil Outlet, two Discharge Air and two Defrost Termination.
4. One Pressure Transducer input with 5V excitation voltage.

2.3 S3C DISPLAY MODULE (DM)

The S3C Display Module (DM) is the local user interface for the S3C Case Control system. Power and communications comes from the S3C Case Control. Visual indication of control and case status is presented using illuminated icons. Additionally, "Quick View" multi-color LEDs indicate operating status at a glance. Six front panel buttons and a four character LED display provide user interaction with the system. Navigation of a simplified and intuitive series of menus using the buttons provides user control for viewing and setting of system parameters and presentation of current process values. One button password protected access to Service functions and manual Defrost initiation simplify common service and maintenance tasks.

TABLE 1 - DISPLAY MODULE BUTTON DESCRIPTION

Button		Description	Password Protected
	Service	One touch access to SERVICE menu	Yes
	Defrost	One touch Defrost Start/Stop	Yes
ESC	Escape	Navigate one level up within current menu Exit current menu	No
SET	Set	Selects current parameter for editing Commits parameter value to memory Selects menu to enter	No
▲	Up	Navigates to previous Parameter/Process Value Increments parameter value selected for editing	No
▼	Down	Navigates to next Parameter/Process Value Decrements parameter value selected for editing	No

TABLE 2 - DISPLAY MODULE ICON DESCRIPTION

Icon	Description
	When lit indicates that the case is in refrigeration mode and there is refrigerant flow
	When lit indicates the evaporator fans are on
	When lit indicates the case is in active defrost
	When lit indicates one or more alarms are active
°F	When lit indicates displayed temperatures are in degrees Fahrenheit
°C	When lit indicates displayed temperatures are in degrees Celsius
	When lit and solid on the number of cases expected in the lineup does not match the number of cases detected. When lit and flashing there is a device id or IP address conflict on the network.

TABLE 3 - QUICK VIEW COLOR DESIGNATIONS

Color	Description
BLINK	TEV Assist
	Case temperature out of range (alarm threshold)
BLINK	Charge pro active
	Flashes white for 3 seconds after case - case parameter synchronization is complete
	Defrost active
	Medium temperature refrigeration mode, temperature in range
	Low temperature refrigeration mode, temperature in range
	Clean mode active

2.4 S3C DISPLAY NAVIGATION

1. The ▲▼ buttons can be used to scroll up and down through menus.
2. The **SET** button is similar to an "enter" button and can be used to enter a particular submenu or commit a selected parameter when it is changed. **Note: A password is required for changing setpoints.**
3. The **ESC** button can be used to exit a menu or submenu. **Note: A subsequent press of the ESC button will move back to the previous parameter.**
4. The S3C Display Module (DM) will revert to the **default** display after 3 minutes of button inactivity and changes will not be saved.

2.5 S3C DISPLAY MODULE OPERATING DISPLAYS

Normal Cooling (Default Display)

FIGURE 1 - Low Temperature Applications

(Note Blue Quick Views)

FIGURE 2 - Medium Temperature Applications

(Note Green Quick Views)

During the normal refrigeration cycle, the current temperature as measured by the Discharge Air sensor is prominently displayed along with the units of measure. The ❄ and ✣ icons are illuminated indicating refrigeration mode and evaporator fan on status. **Note: ❄ the icon is illuminated when the system is in refrigeration mode and refrigerant is feeding the evaporator coil (i.e. all valves are open allowing flow).** A quick glance at this icon shows that the EEV, EEPR (if used) and liquid line solenoid valve (if used) are either open or closed during refrigeration mode. The Quick View indicators are illuminated **BLUE** for low temperature operation or **GREEN** for medium temperature operation indicating the current temperature is within the user set temperature alarm limits.

Defrost Pumpdown Active

When a defrost cycle is entered, the system will first go into pumpdown mode to remove any refrigerant from the evaporator. During this mode, the temperature display is replaced with dEF and the Quick View indicators will turn off. The fans will continue to run and the ✣ icon will be illuminated until the end of the pumpdown time.

Defrost Active

When a defrost cycle is active, the Quick View indicators change to **PURPLE**. The ❄ icon illuminates when the defrost mechanism is active. The S3C Display Module (DM) will continue to display dEF throughout the entire defrost cycle.

Defrost Terminated/Pulldown Active

During the defrost cycle when the termination temperature is satisfied or the fail-safe time has elapsed, the defrost mechanism will deactivate. After any user set drip cycle time has elapsed, the S3C will resume refrigeration changing the Quick View indicators to **BLUE** or **GREEN** and illuminating the ❄ icon. The ✣ icon remains off until the fans restart in accordance with the fan delay time or temperature setting.

The display will return to the default temperature when the control temperature is within 5°F of setpoint or 30 minutes has elapsed.

Temperature Out of Range

If the measured Discharge Air temperature transgresses the user selected high or low alarm thresholds, the Quick View indicators will change to **ORANGE**.

Temperature Alarm

If the measured Discharge Air temperature transgresses the user selected high or low alarm thresholds for the appropriate alarm delay period the ⚠ icon illuminates.

Service Required Alarm

The ⚠ icon illuminates as an indication that an alarm condition exists not related to case temperature such as a faulty sensor, loss of peer – peer communication, disconnected EEPR or EEV, etc.

3. SYSTEM SPECIFICATIONS

3.1 S3C CASE CONTROL

Electrical

Supply 22 to 26 VDC @ 0.5A minimum

Notes:

1. **External DC Power Supply must be Class 2 and Class II rated.**
2. **Maximum wire length between power supply and Case Control is 400 ft. (22AWG minimum).**

Digital Inputs (4)

Dry contact or Open Collector connection only. Negative reference to be supplied by the Case Control only.

Note: Occupancy Sensor 5V excitation voltage .75mA maximum.

Analog Inputs (7)

Temperature Inputs (5)

2K, 3K, 10K Thermistor (Software selectable)

Note: Auxiliary Temperature input configurable via software as current transformer (CT) input.

CT Output 0 - 5 VDC measuring 0 - 50 Amps AC 50/60 Hz.

Pressure Transducer (1)

.5 – 4.5 VDC Ratiometric output.

Pressure ranges: 150 PSI, 300 PSI, 500 PSI, 652 PSI and Custom

(Absolute or Gauge software selectable)

Digital Sensor Inputs (1)

Proprietary 1-Wire Relative Humidity and Ambient Temperature sensor

Note: Relative Humidity and Ambient Temperature sensor 5V supply voltage 1.5mA maximum.

Relay Outputs (4)

Solenoid/Pulse EEV – 240VAC/1A

Defrost – 240VAC/6A

Fan(s) – 240VAC/6A

Lights – 240VAC/6A

Stepper Motor (1)

Unipolar/Bipolar 13.5VDC @ 400mA/Ø

200 pps/400 pps Software selectable

External Solid State Relay (1)

Anti-sweat Heater Control 5VDC @ 25mA

Analog Output (2)

0 – 10VDC @ 40mA maximum

Data Interface (3)

1. RS-485 MODBUS, BACnet MSTP (Building Automation System)
2. Ethernet MODBUS, BACnet/IP (Case Control to Case Control or Building Automation System)

Notes:

1. **One Ethernet port can be used to connect case controller to case controller and the second port can be connected to the BAS.**
2. **Both Ethernet Ports can be used for case controller to case controller and the RS-485 can be used from the case controller network to the BAS.**

Environmental

Operating

Temperature 0°C (32°F)- +50°C(122°F)

Humidity 10% - 95% RH non condensing

Storage

Temperature -25°C (-13°F)- +70°C(158°F)

Humidity 10% - 90% RH non condensing

Compliance

UL 60730-1 & CAN/CSA-E60730-1:13

UL 60730-2-9 & CAN/CSA-E60730-2-9:15

RoHS, 2011/65/EU

FCC Title 47, Chapter I, Subchapter A, part 15, Class A Digital Device

CAN ICES-3 (A)/NMB-3(A)

3.2 S3C VALVE MODULE

Electrical

Supply 22 - 26 VDC @ 0.75A minimum

Notes:

1. **External DC Power Supply must be Class 2 and Class II rated.**
2. **Maximum wire length between power supply and Valve Module is 400 ft. (22AWG minimum)**

Analog Inputs (7)

Temperature Inputs (6)

10K Thermistor (Software selectable 2K, 3K)

Pressure Transducer (1)

.5 – 4.5 VDC Ratiometric output.

Pressure ranges: 150 PSI, 300 PSI, 500 PSI, 652 PSI and Custom

(Absolute or Gauge software selectable)

Relay Outputs (1)

Solenoid/Pulse EEV – 240VAC/1A

Stepper Motor (2)

Unipolar/Bipolar 13.5VDC @ 400mA/Ø

200 pps/400 pps Software selectable

Data Interface (1)

RS-485 (Not Used)

Environmental

Operating

Temperature 0°(32°F)- +50°C(122°F)

Humidity 10% - 95% RH non condensing

Storage

Temperature -25°C (-13°F)- +70°C(158°F)

Humidity 10% -90% RH non condensing

Compliance

UL 60730-1 & CAN/CSA-E60730-1:13

UL 60730-2-9 & CAN/CSA-E60730-2-9:15

RoHS, 2011/65/EU

FCC Title 47, Chapter I, Subchapter A, part 15, Class A Digital Device

CAN ICES-3 (A)/NMB-3(A)

3.3 S3C DISPLAY MODULE

Electrical

Supply 22 - 26 VDC @ 0.5A minimum

Notes:

1. **External DC Power Supply must be Class 2 and Class II rated.**
2. **Maximum wire length between power supply and Display Module is 400 ft. (22AWG minimum)**

Environmental

Operating

Temperature 0°C - +50°C

Humidity 10% - 95% RH non condensing

Storage

Temperature -25°C - +70°C

Humidity 10% - 90% RH non condensing

4. CONTROL SYSTEM OVERVIEW

4.1 TEMPERATURE CONTROL

The Control Temperature can be user selected as either Discharge Air (DA) or Return Air (RA). Future references in this manual to "Control Temperature" refers to the temperature source selected. Temperature control for the case line-up is based on the average Control Temperature of all cases in the line-up. The S3C Case Control will maintain the control temperature set point by managing the EEV in the case and/or EEPR on the common suction for the case line-up.

Note: Only DA is used as Control Temperature in Dual-Temperature case applications.

4.2 SUPERHEAT CONTROL

The S3C Case Control system will modulate attached EEVs to maintain the superheat set point. Suction pressure and temperature are used for superheat calculation. For multiple evaporator cases, individual coil outlet temperature sensors are required; however, only one suction pressure transducer is required on the common suction leaving all the evaporators. For redundancy, a second transducer may be added as a backup. Both stepper EEV and pulse width EEV designs are supported.

4.3 EEPR CONTROL

When an EEPR is present, the S3C Case Control will modulate the EEPR to maintain temperature or suction pressure based on the type of control selected by the user. The S3C Case Control uses the average of either line-up Discharge Air or Return Air as the temperature control input based on user selection. The inherent redundancy of temperature sensor inputs available in multiple case line-ups allows for the S3C control to continue to control line-up temperature in the event of sensor fault on one or more cases in the line-up. The same is true for pressure control if more than one pressure transducer is present in the line-up. The S3C supports an EEPR per line-up or an EEPR per case.

4.4 DEFROST CONTROL

The S3C Case Control supports multiple defrost schemes and controls attached valves, fans and heaters as dictated by the defrost scheme and user selected defrost parameters. The controller has been designed to pilot many third party contactors to energize electric heaters. Termination can be determined by temperature or time. Temperature termination can be selected to be from a Defrost Termination Sensor or Discharge Air Sensor if Air (Off-Time) defrost is selected. See Operating Mode Section for more details. Sporlan offers an additional defrost CT that allows the S3C to monitor defrost current if electric heaters are used. See Service Section for information on this additional feature.

4.5 LIQUID LINE SOLENOID VALVE CONTROL

The case refrigeration system includes a solenoid valve placed in the liquid refrigerant supply line. A normally closed solenoid is typically used to provide positive closure of the liquid line in the event of power loss. The solenoid may be used on the liquid line for each case or a single solenoid can be used for a line-up of cases; depending on the application. The case controller will open and close the solenoid to maintain control temperature set point. A liquid line solenoid is recommended; however, the S3C does not require one for proper control. If a solenoid valve is used, ensure that LLSP(Liquid Line Solenoid Present) is set to YES.

From the **default** display, press the 🔧 button. The display will show Entr PASS 0.

1. Use the ▲▼ buttons to enter the **Administrator** password and press the **SET** button.
2. The display will show CASE(will skip to Process Values if system is self-contained).
3. Press the **SET** button an d P_u(Process Values) will be displayed.
4. Press the ▼ button until uLuC(Valve Configuration) is showing.
5. Press the **SET** button and scroll to LLSP(Liquid Line Solenoid Present).
6. Press the **SET** button, scroll to YES(if solenoid is used), then press **SET.**
7. Press the **ESC** button two times to exit the menu and return to the **default** display.

4.6 FAN CONTROL

The case controller will operate the evaporator fans in the case based on the operating mode of the system. The case controller supports single speed and variable speed fans. See Service Section for additional fan features.

4.7 LIGHTING CONTROL

The S3C Case Control will control fluorescent and LED lights. Fluorescent lights can be switched ON/OFF based on an internal schedule or by data communication from the BAS. LED lights can be on, off, or dimmed to a lower light level. LED lighting is to be powered by an external LED power supply. The dimming features of the LEDs are determined by the type of power supply used. Power supplies that support 0 – 10V input to control dimming of the attached LED lighting are compatible with the S3C Case Control system. Lights can be controlled in accordance with a lighting schedule and/or input from a Passive Infrared occupancy sensor provided by Sporlan. Occupancy Sensor input state (Occupied/Unoccupied) is user configurable to be shared across a line-up in the event the user desires to have all case lights operated based on input for any sensor on the line-up.

The case controller is capable of operating the lights based on light on/light off commands from the BAS. The case controller additionally supports an internal lighting schedule in the event communication to the BAS is not available. The controller supports a daily simple schedule with one light on time and one light off time that is repeated each day. The

case controller supports a weekly schedule with one light on time and one light off time for each day of the week.

4.8 ANTI-SWEAT HEATER CONTROL

Anti-Sweat Heat control is accomplished via two methods:

1. The heaters are pulsed based on a fixed duty cycle. The duty cycle can be adjusted by the user to suit the needs of the application.

2. The heaters are pulsed on and off based on humidity, ambient air temperature and the surface temperature of the case. The temperature and humidity values are used to calculate the dew point. The heater will be pulsed to maintain case surface temperature sufficiently above the dew point as to avoid the formation of condensation on the case surface. The Sporlan RHT sensor along with a case surface temperature sensor must be installed. The case surface temperature sensor is wired into the "Auxiliary" location on the case controller. See Section 11.17 for configuration.

4.9 LINE-UP CONTROL

A line-up is a group of cases that form a refrigeration circuit and share the same liquid line, suction line, temperature set point and defrost schedule. Cases in the line-up are controlled in a synchronized manner such that they all defrost and refrigerate at the same time. Each S3C Case Control in the line-up will communicate to its peers to maintain efficient control and synchronization. The S3C Case Control with connection to the liquid line solenoid and/or EEPR for the line-up will coordinate the control of the liquid line solenoid and EEPR for the line-up for Defrost, Refrigeration and Service purposes. The controllers within a line-up may share a single pressure transducer on the suction line or each controller can be equipped with its own pressure transducer for EEPR control and/or superheat calculation per case.

The S3C Case Control system additionally uses peer – peer communication to maintain synchronization of operating parameters and user configuration between controllers in a line-up network. If this communication is lost the controller will revert to stand alone operation with the risk that some functions may become unsynchronized.

Note: Line-ups configured for hot gas defrost will not defrost during periods of stand alone operation as this may cause damage to the refrigeration system.

4.10 MODULAR/MULTI COILS

The S3C Case Control system supports control of case designs that incorporate more than one evaporator. For control of additional evaporator coils, an S3C Valve Module expands the S3C Case Controller to add additional hardware support for 1 Pulse valve and 2 stepper valves (2 EEVs or 1 EEV and 1 EEPR), pressure transducer, and six temperature sensors. The temperature sensors measure coil outlet, discharge air, and defrost termination temperatures for up to two additional evaporators. The standard 60W power supply will support one case controller, one Display Module and up to two valve modules.

4.11 MULTIPLE VALVE CONTROL

The S3C Case Controller system is capable of controlling five electronic stepper valves; three EEVs and one EEPR. Solenoid valves are powered externally, and power for stepper valves is generated by the case controller.

4.12 DUAL-TEMPERATURE CASE CONTROL

The S3C Case Control supports control of Dual-Temperature cases using an EEPR for control of selected operational temperature. The controller maintains two sets of alarm threshold values and set points that can be selected by mechanical switch input or via communication from the BAS. If communication is lost to the BAS, the S3C Case Control will continue to operate based on the last temperature set point received.

4.13 SELF-CONTAINED CASES

The S3C Case Control supports control of medium temperature or low temperature self-contained cases that incorporate a compressor and condenser built into the case. The S3C Case Control is capable of controlling the compressor to turn refrigeration on and off. The case will operate with a cut in/cut out temperature control scheme. The control scheme minimizes the amount of time the compressor is on while maintaining Discharge Air or Return Air temperature within set point using user programmable minimum compressor run time selection. The relay output for refrigeration ON/OFF control can pilot the compressor control contactor or alternatively control the liquid line solenoid.

4.14 S3C CASE CONTROL DATA INTERFACE

Data interface to the BAS and other enterprise control subsystems can be achieved using either Ethernet or RS-485 as a hardware interface and the S3C Case Control system supports the following communication protocols:

1. BACnet/IP (Ethernet)

2. BACnet MSTP (RS-485)

3. MODBUS UDP/IP (Ethernet)

4. MODBUS RTU (RS-485)

4.15 LOCAL USER INTERFACE

The S3C Display Module (DM) provides visual indication of alarms, operational status (defrost, refrigeration or system off), fans, lights, network status and process values such as temperature, pressure, superheat, valve position, etc. The Display Module has six buttons to navigate the menus/text on the display and can be used to initiate service functions and configure the control for operation. The S3C Display Module prominently displays system health in the form of a color status indication visible from >100 ft.

4.16 DIAGNOSTICS

The S3C Case Control system employs sensors and diagnostic algorithms to detect and aid in the diagnoses of fault conditions in the case and in some instances the refrigeration system as a whole. The S3C Case Control system monitors, alarms and provides system diagnostics in two areas:

1. Detect and report problems with sensor inputs and stepper motor valves.
2. Detect and report problems with case components such as fans and defrost heaters.

4.17 FAIL-SAFE OPERATION

The S3C Case Control system relies on inputs from several external devices to maintain proper control of the case. The inputs are divided into two types:

1. Hardware inputs
2. Software inputs.

Hardware inputs are physical sensors directly connected to the case controller. These sensors include temperature sensors and pressure transducers. Software inputs are provided via communications link to the BAS or from a peer case controller.

In the event of a sensor fault the controller will notify the BAS of the issue and attempt to control the system when possible. Employing redundant sensors such as pressure transducers on a common suction line, multiple DA/RA sensors in a case or line-up allows the system to adapt and continue to control based on averages of the values reported by the remaining functional sensors.

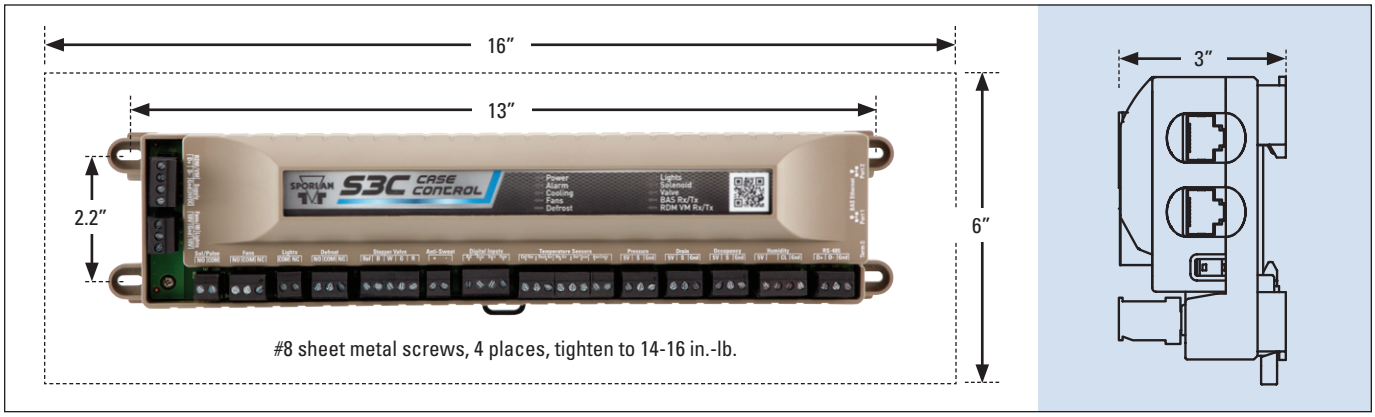
If communication to the BAS system is lost, the case controller will continue to operate as a standalone device performing all required control functions and defrost scheduling in accordance with its configured operating parameters and schedules.

5. COMPONENT MOUNTING AND WIRING

5.1 S3C CASE CONTROL

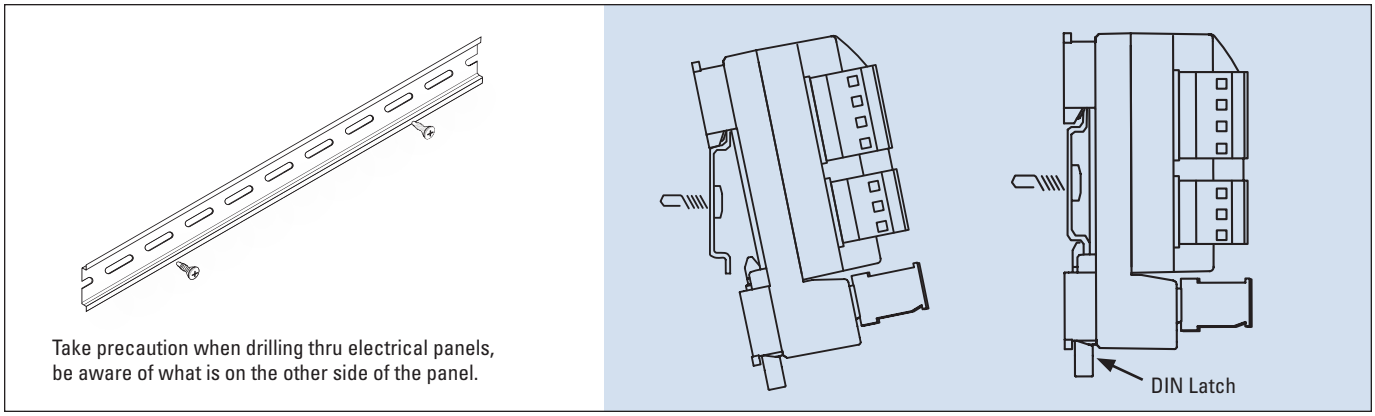
5.1.1 MOUNTING (FLANGE)

Mount the controller in a rain-tight protected location using #8 sheet metal screws; tighten to 14-16 in.-lb. The suggested mounting area is 6 inches high and 16 inches wide, depth is 3 inches.



5.1.2 MOUNTING (DIN RAIL)

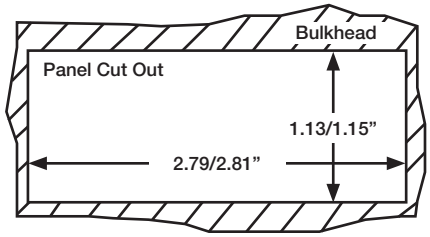
Mount the controller in a rain-tight protected location. Fasten a 14” length of EN 50022 DIN 3 rail (35 mm height X 7.5 mm depth) to the surface where the controller will be mounted. Place the top of the controller down onto the top of the DIN Rail. Lower bottom of controller into place until DIN latch catches.

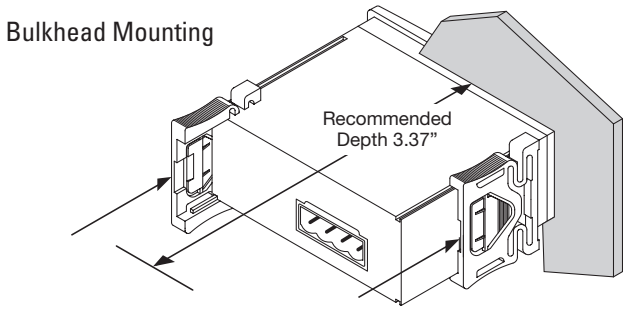


5.2 S3C DISPLAY MODULE

5.2.1 MOUNTING

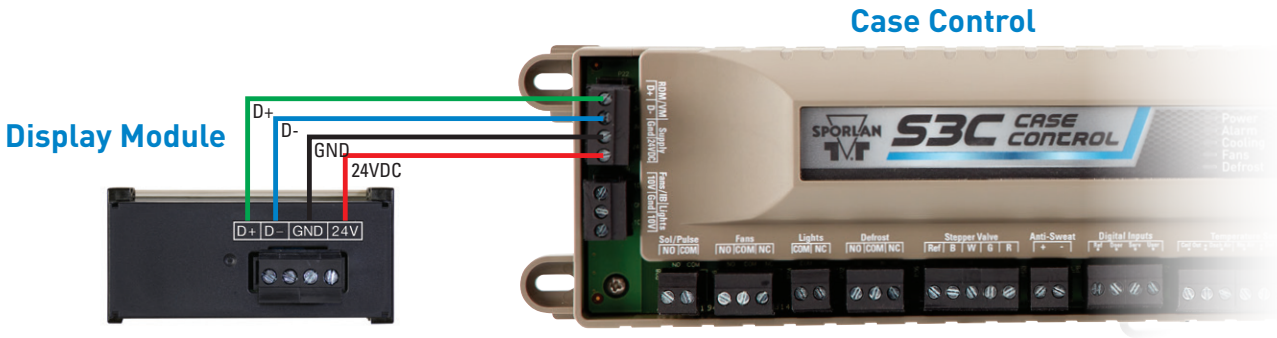
Mount the Display Module in an indoor location on top of or near the refrigerated display case; outside of the conditioned space. After a location is determined, carefully cut out a 2.8" X 1.14" rectangle in the panel/bulkhead. The bulkhead thickness must be less than 0.31". Remove the fastening clips from the Display Module and slide the display into the cut out. Slide on the fastening clips on both sides and push up against the bulkhead. Ratcheting sounds should be heard to ensure rubber knife edge on the Display Module seal tightly against the outside of the bulkhead. Attach power and communication wiring to the back of the Display Module.





5.2.1.1 WIRING

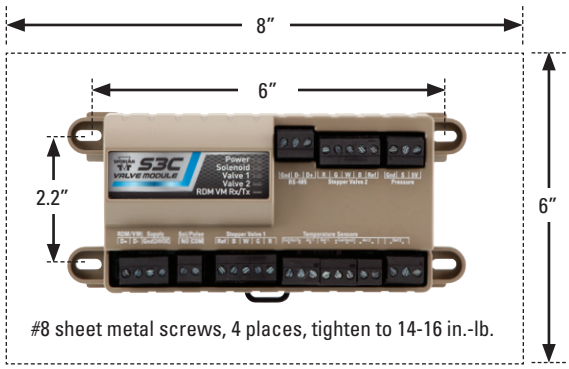
With Case Controller unpowered, carefully route the power and communication wiring from the Display Module to the Case Controller. Use 22/2 shielded twisted pair (Belden 8723 or equivalent). Attach one end of the shield to earth ground. Wire designations are located on the back of the Display Module. Maximum torque on the screw terminals is 3.5 in.-lb. Carefully tug the leads to ensure they are secure. Ensure that all wiring is properly fastened and away from sharp edges or moving objects. Do not route the Display Module wiring in the same conduit as 120VAC or greater. See the following figure.

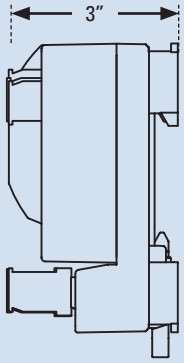


5.3 S3C VALVE MODULE

5.3.1 MOUNTING (FLANGE)

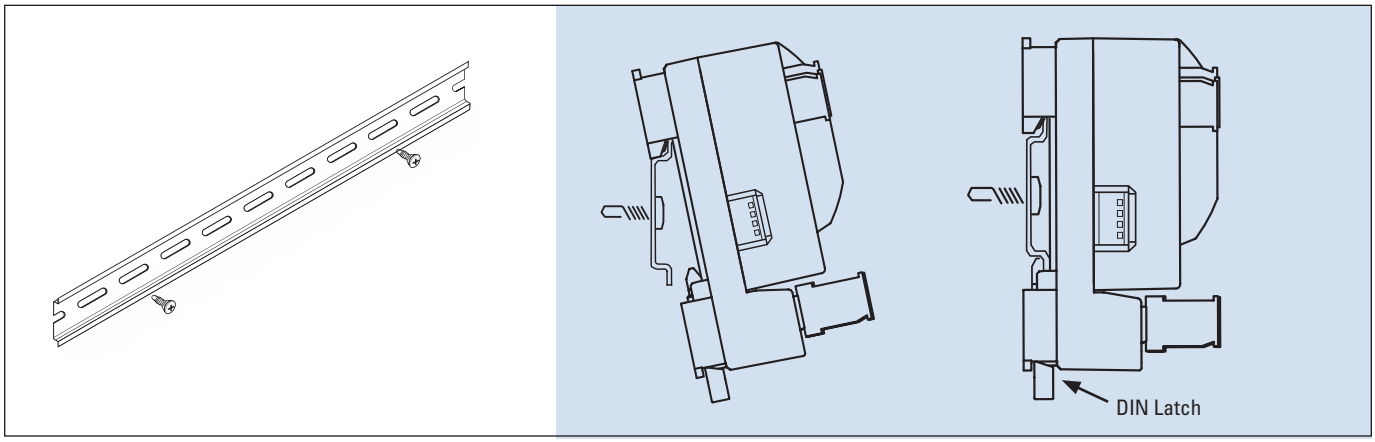
Mount the controller in a rain-tight protected location using #8 sheet metal screws; tighten to 14-16 in.-lb. The suggested mounting area is 6 inches high and 8 inches wide, depth is 3 inches.





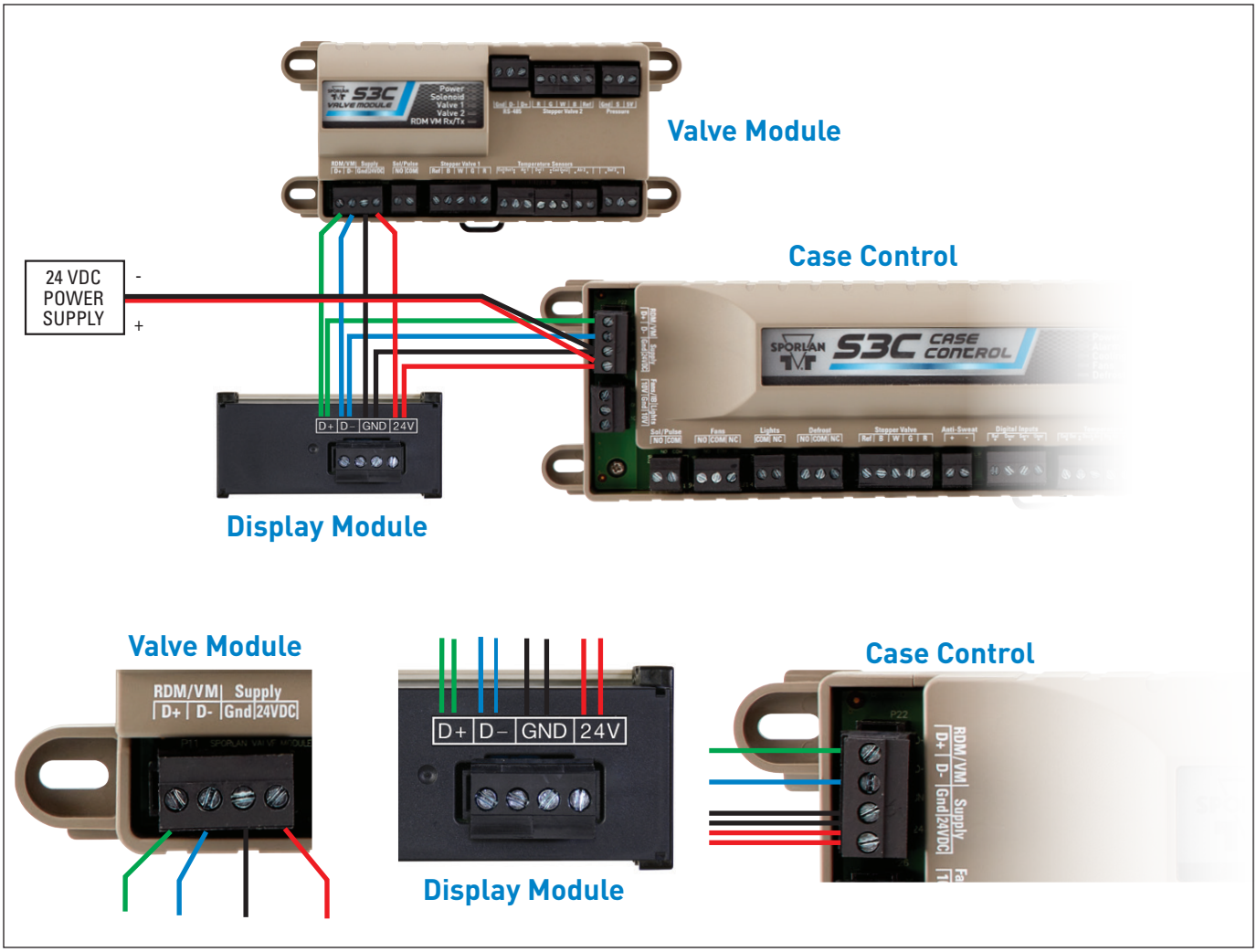
5.3.2 MOUNTING (DIN RAIL)

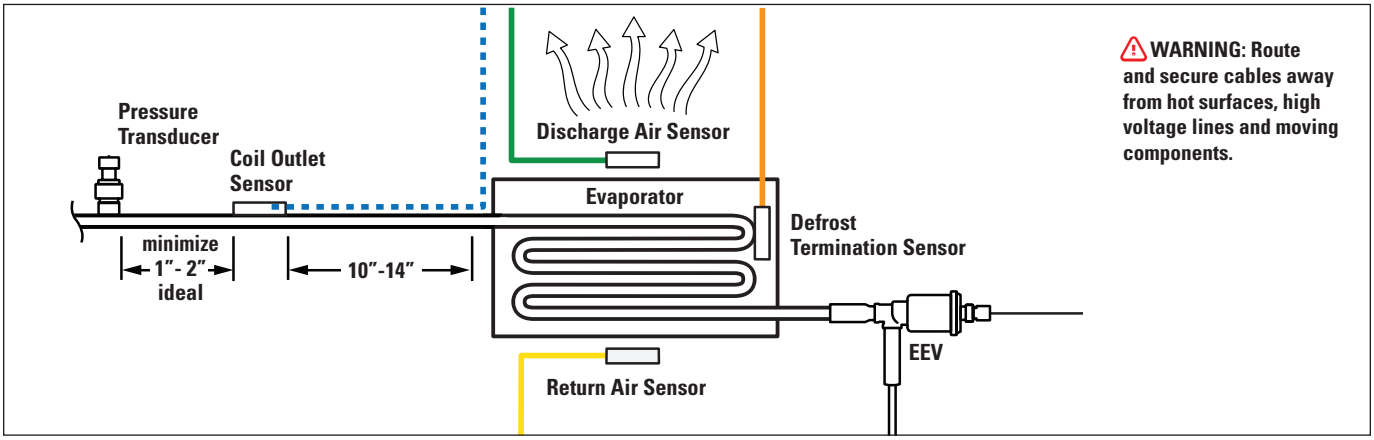
Mount the controller in a rain-tight protected location. Fasten a 7" length of EN 50022 DIN 3 rail (35 mm height X 7.5 mm depth) to the surface where the controller will be mounted. Place the top of the controller down onto the top of the DIN Rail. Lower bottom of controller into place until DIN latch catches.

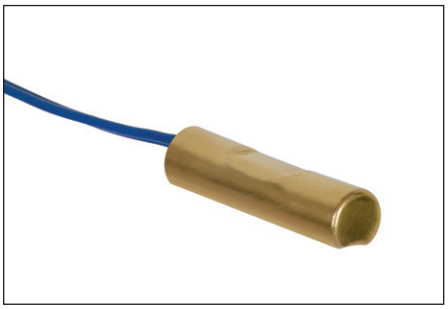


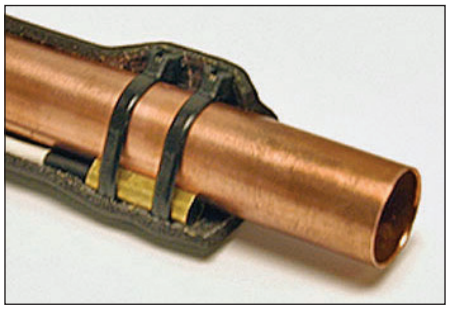
5.3.3 WIRING

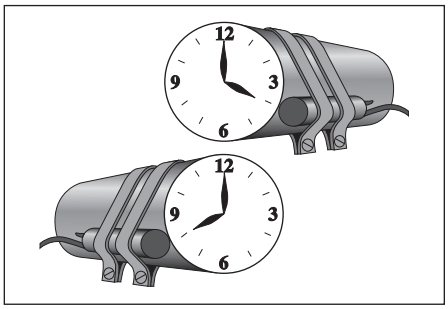
With the Case Controller unpowered, carefully route the power and communication wiring from the Valve Module to the Case Controller. Use 22/2 shielded twisted pair (Belden 8723 or equivalent). Attach one end of the shield to earth ground. Wire designations are located on the top of the Valve Module. Maximum torque on the screw terminals is 3.5 in.-lb. Carefully tug the leads to ensure they are secure. Ensure that all wiring is properly fastened and away from sharp edges or moving objects. Do not route the Valve Module wiring in the same conduit as 120VAC or greater. See the following figures. **Note: The Valve Module and Display Module (DM) will be on the same network back to the Case Controller. It is acceptable to dual stake in the terminals.**











5.4 SENSORS

The S3C control system uses input from several sensors to control case discharge air, superheat and defrost. It is important to follow these instructions to ensure proper location and mounting technique. All sensors should be provided by Sporlan to ensure compatibility and proper operation.

Note: Sensor leads may be extended to 100 ft. (30.5m) with 18 AWG wires and Scotchlok™ UR connectors for long-term integrity. For extending the pressure transducer cable it is recommended to use Belden 9493 or equivalent. For extending temperature sensor cabling it is recommended to use Belden 9409 or equivalent.

5.4.1 COIL OUTLET TEMPERATURE

5.4.1.1 MOUNTING

The coil outlet temperature sensor is required when using an EEV and where superheat calculation is needed. The sensor must be mounted on the suction line after the evaporator as shown in the figure above. The piping must be horizontal and free draining. Position the sensor at the 4 or 8 o'clock position on the suction line. Secure with two heavy duty zip ties, then insulate.

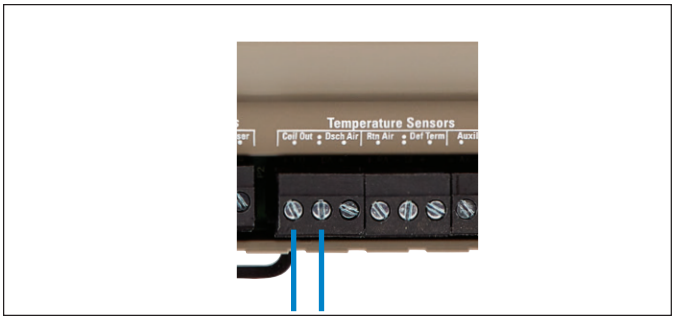
5.4.1.2 WIRING

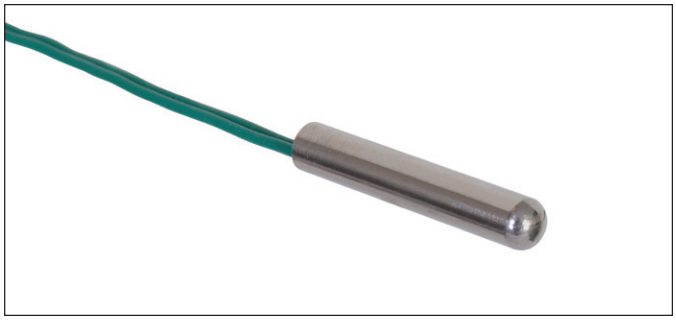
With controller unpowered, carefully route the blue coil outlet sensor leads to the controller. Take caution to route the leads away from sharp edges, fans and defrost heaters. Ensure the terminal screws on the controller are backed all the way out. Insert the leads of the sensor wire into "Coil Out" location on the controller. Tighten the terminal screws to 3-5 in.-lb. Carefully tug the leads to ensure they are secure. See the figure below. **Note: Leads are not polarized and may be installed in either location. One lead of the coil out sensor will share the terminal with the discharge air sensor.**

5.4.2 DISCHARGE AIR TEMPERATURE

5.4.2.1 MOUNTING

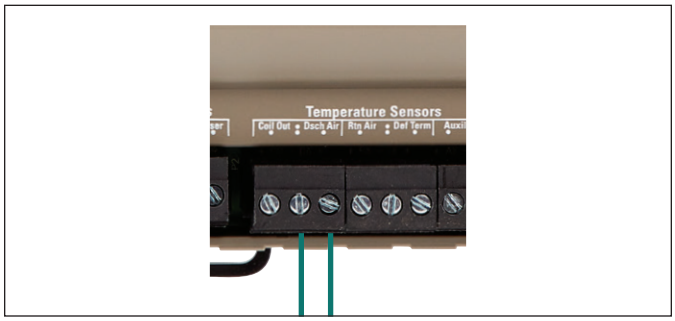
The discharge air temperature sensor is required for case temperature control. The sensor must be mounted inside of the refrigerated display case. Typical location is the middle of the case, inside top. The sensor should be mounted in the discharge air stream, away from large thermal masses such as mounting brackets and or case struts. Secure with two heavy duty zip ties. **Note: The controller may be configured to use the discharge air sensor or return air sensor as the control point.**





5.4.2.1 WIRING

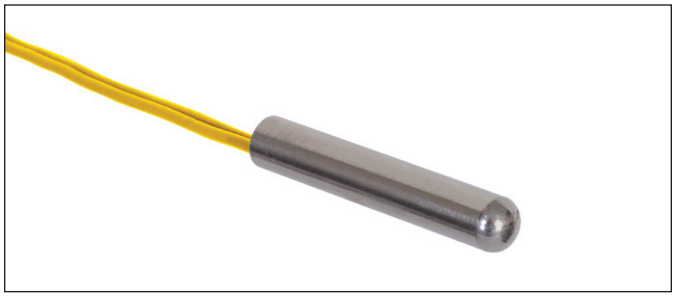
With controller unpowered, carefully route the green Discharge Air sensor leads to the controller. Take caution to route the leads away from sharp edges, fans and defrost heaters. Ensure the terminal screws on the controller are backed all the way out. Insert the leads of the sensor wire into "Dsch Air" location on the controller. Tighten the terminal screws to 3-5 in.-lb. Carefully tug the leads to ensure they are secure. See the following figure. **Note: Leads are not polarized and may be installed in either location. One lead of the Discharge Air sensor will share the terminal with the Coil Out sensor.**



5.4.3 RETURN AIR TEMPERATURE

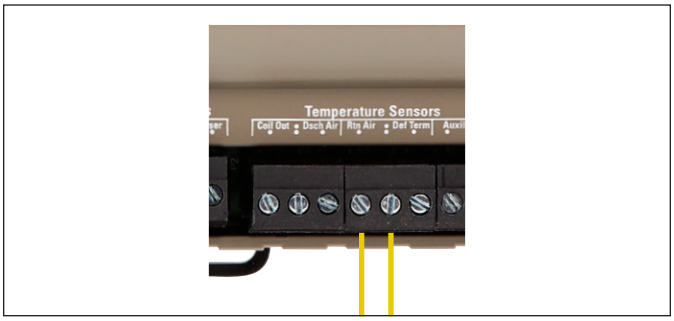
5.4.3.1 MOUNTING

The return air temperature sensor is optional and is not required for case temperature control. The sensor must be mounted inside of the refrigerated display case. Typical location is in the return air grille of the case. Ensure that the sensor is greater than 4 inches away from the evaporator coil surface. Secure with two heavy duty zip ties. **Note: The controller may be configured to use the discharge air sensor or return air sensor as the control point. If return air is the control point, then the return air sensor is required for operation.**



5.4.3.2 WIRING

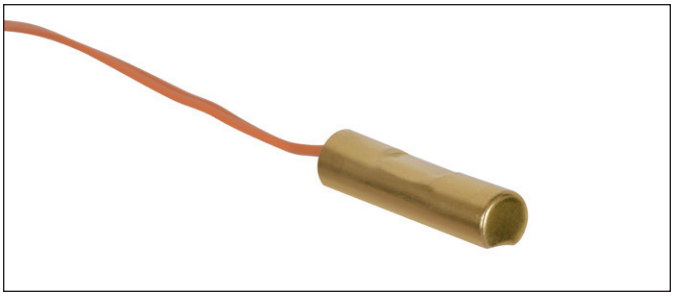
With controller unpowered, carefully route the green Return Air sensor leads to the controller. Take caution to route the leads away from sharp edges, fans and defrost heaters. Ensure the terminal screws on the controller are backed all the way out. Insert the leads of the sensor wire into "Rtn Air" location on the controller. Tighten the terminal screws to 3-5 in.-lb. Carefully tug the leads to ensure they are secure. See the following figure. **Note: Leads are not polarized and may be installed in either location. One lead of the Return Air sensor will share the terminal with the Defrost Termination sensor.**



5.4.4 DEFROST TERMINATION TEMPERATURE

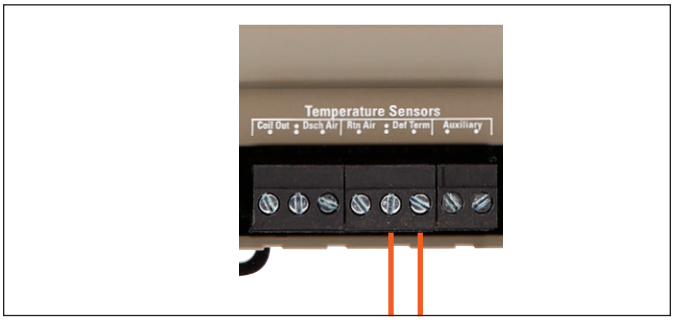
5.4.4.1 MOUNTING

The defrost termination temperature sensor is required for defrost control. The sensor must be mounted to the coldest part of the evaporator coil. Typical location is on the last return bend of the coil circuit, as shown in Section 5.4. **Note: Some coil manufacturers have designs that allow the sensor to be placed inside of the coil; consult the manufacturer for proper location.** Ensure that the sensor is located at least 10 inches away from hot gas lines or heaters. Secure with two heavy duty zip ties. **Note: For medium temperature cases, the controller may be set-up to terminate using the discharge or return air temperature sensor.**



5.4.4.2 WIRING

With controller unpowered, carefully route the orange Defrost Termination sensor leads to the controller. Take caution to route the leads away from sharp edges, fans and defrost heaters. Ensure the terminal screws on the controller are backed all the way out. Insert the leads of the sensor wire into "Def Term" location on the controller. Tighten the terminal screws to 3-5 in.-lb. Carefully tug the leads to ensure they are secure. See the following figure. **Note: Leads are not polarized and may be installed in either location. One lead of the Defrost Termination sensor will share the terminal with the Return Air sensor.**



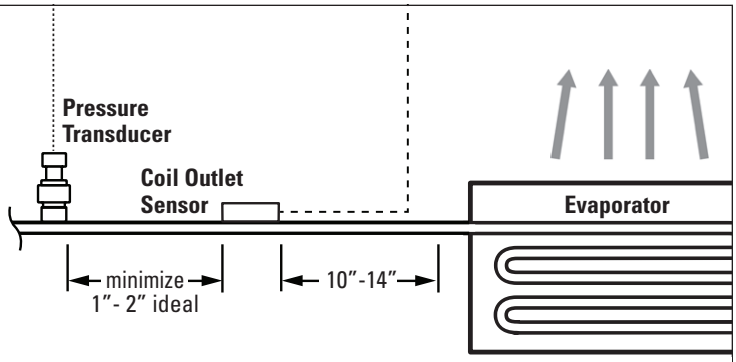
5.4.5 SUCTION PRESSURE TRANSDUCER

5.4.5.1 MOUNTING

The suction transducer is required when using an EEV and where superheat calculation is needed. It is also required when controlling an EEPR off of pressure. The sensor must be mounted on the suction line after the evaporator as shown below. The piping must be horizontal and free draining. Position the sensor at 12 o'clock on the suction line near the coil outlet temperature and tighten to 6-8 ft.-lb. **Note: Copper gasket is not recommended between Schrader valve and transducer. On multi-coil cases, a transducer per evaporator or transducer per case may be used.**

Pressure Range Listed on Label

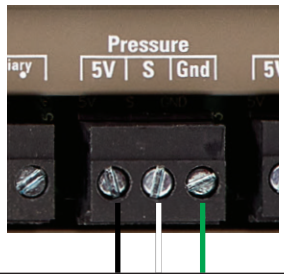
1/4" SAE Flare Installation
Torque: 6-8 ft.-lb.



5.4.5.2 WIRING

With controller unpowered, carefully route the pressure transducer cable to the controller. Take caution to route the cable away from sharp edges, fans and defrost heaters. Ensure the terminal screws on the controller are backed all the way out. Insert the leads of the sensor wire into "Pressure" location on the controller, see chart below for sequence. Tighten the terminal screws to 3-5 in.-lb. Carefully tug the leads to ensure they are secure. See the following figure. **Note: If a Case Controller and Valve Module are used, the pressure transducer may be wired into either controller or two pressure transducers may be used for redundancy.**

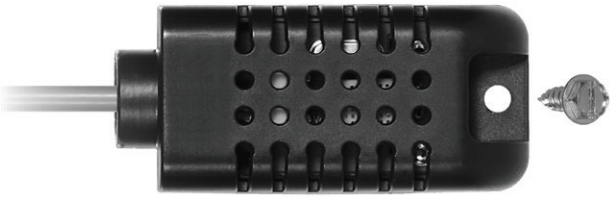
Pressure Transducer Cable	Case Control or Valve Module
Black	5V
White	S
Green	Gnd



5.4.6 RH/AMBIENT TEMPERATURE (RHT) SENSOR

5.4.6.1 MOUNTING

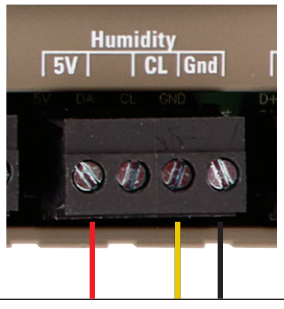
The RHT sensor is required when using pulsed anti-sweat heater control. The sensor must be mounted within 10 ft. of the case. Position the sensor outside of the case and away from periodic air movements such as cooling or heating air vents.



5.4.6.2 WIRING

With controller unpowered, carefully route the RHT cable to the controller. Take caution to route the cable away from sharp edges. Ensure the terminal screws on the controller are backed all the way out. Insert the leads of the sensor wire into "Humidity" location on the controller, see chart below for sequence. Tighten the terminal screws to 3-5 in.-lb. Carefully tug the leads to ensure they are secure. See the following figure.

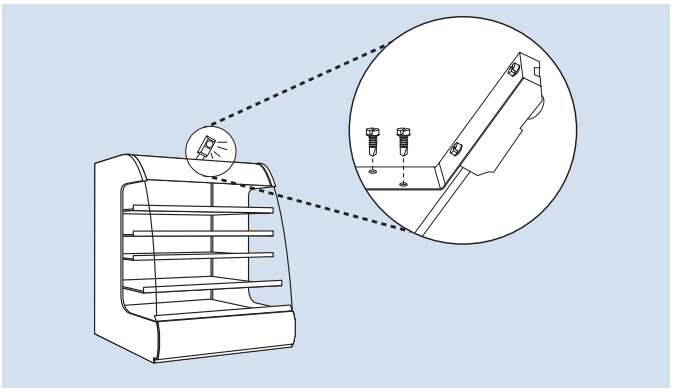
RHT Cable	Case Control
Red	5V
Yellow	CL
Black	Gnd

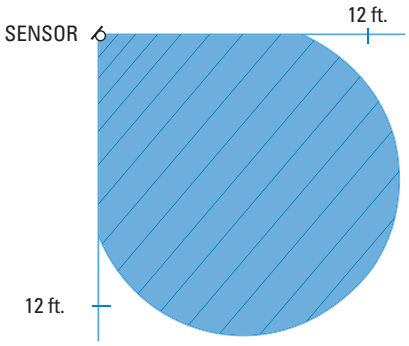


5.4.7 CASE SURFACE TEMPERATURE SENSOR

5.4.7.1 MOUNTING

The case surface temperature sensor is required when using dew point control option for anti-sweat heaters. The sensor must be mounted on the door frame to detect surface temperatures. Follow case OEM instructions for exact mounting location. **Note: Use caution when fastening to the door frame to ensure internal case wiring is not damaged.**





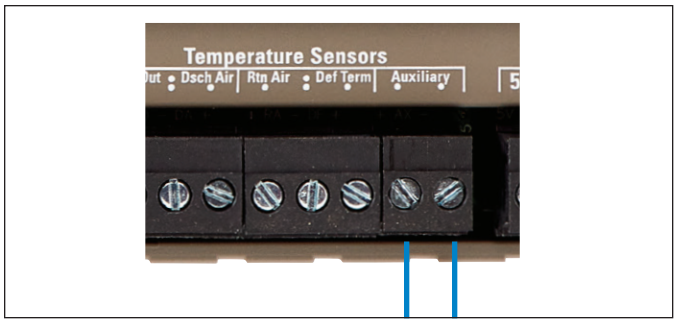
5.4.7.2 WIRING

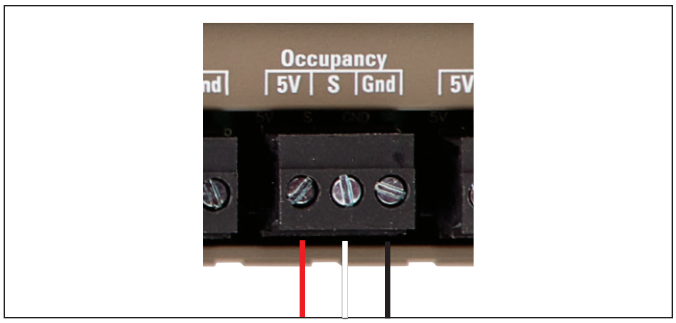
With controller unpowered, carefully route the blue case surface sensor leads to the controller. Take caution to route the leads away from sharp edges and pinch points. Ensure the terminal screws on the controller are backed all the way out. Insert the leads of the sensor wire into "Auxiliary" location on the controller. Tighten the terminal screws to 3-5 in.-lb. Carefully tug the leads to ensure they are secure. See the following figure. **Note: Leads are not polarized and may be installed in either location.** The "Auxiliary" temperature input can also be used for the CT. The controller will need to be configured on which sensor is used. See Section 12.3 for configuration of this input.

Note: If the Defrost CT is used, fixed pulse anti-sweat control must be used instead of dew point control.

Wiring (Sensor): With controller unpowered, carefully route the Occupancy sensor cable to the controller. Take caution to route the cable away from sharp edges. Ensure the terminal screws on the controller are backed all the way out. Insert the leads of the sensor wire into "Occupancy" location on the controller, see chart below for sequence. Tighten the terminal screws to 3-5 in.-lb. Carefully tug the leads to ensure they are secure. See the following figure.

Occupancy Cable	Case Control
Red	5V
White	S
Black	Gnd





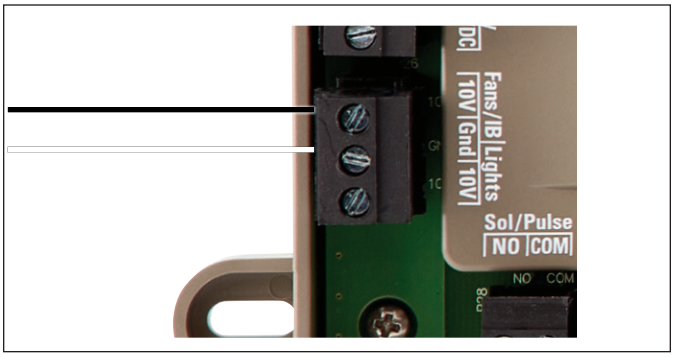
5.4.8 OCCUPANCY SENSOR

5.4.8.1 MOUNTING

The Occupancy sensor is required when a case lighting schedule is not defined in the controller. The sensor must be mounted on the top and centered of the case. The range of the sensor is shown in the figure below. **Note: Use caution when fastening to the top of the case to ensure internal case wiring is not damaged.**

Wiring (LED Driver): The S3C requires an LED driver that supports a 0 to 10VDC signal. The controller will send the LED driver a signal based on the light level configuration of the occupancy sensor. With controller unpowered, carefully route the LED driver cable to the controller. Take caution to route the cable away from sharp edges. Ensure the terminal screws on the controller are backed all the way out. Insert the leads of the sensor wire into "Gnd" and "10V" location

on the controller. See the following figure**. Note: Ensure that the wiring from the LED matches the output on the controller (ground to ground, etc). Tighten the terminal screws to 3-5 in.-lb. Carefully tug the leads to ensure they are secure.**



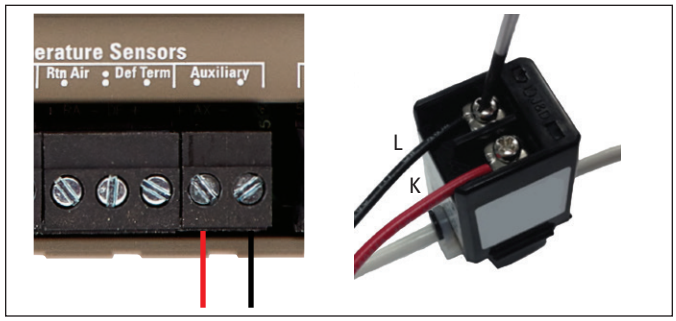
5.4.9 CT SENSOR

5.4.9.1 MOUNTING

The CT sensor is used when defrost current detection is required (electric heaters). The split core design allows the sensor to be installed after final wiring. One leg of the defrost heater circuit must be ran through the CT. Secure the CT to the wire with two zip ties as shown. **Note: In many cases, it is necessary for the S3C to pilot a defrost contactor. It is important to install the CT sensor on the heater circuit, not the pilot circuit.**

5.4.9.2 WIRING

Using 22-24 AWG wire, attach two leads to 'L' and 'K' on the CT as shown in next image. Tighten CT wire screws 10-12 in.-lb. Carefully tug the leads to ensure they are secure. With controller unpowered, carefully route the CT leads to the controller. Take caution to route the cable away from sharp edges. Ensure the terminal screws on the controller are backed all the way out. Insert the 'K' and 'L' leads of the sensor wire into "Auxiliary" location on the controller as shown below. Leads are polarized and require the proper position on the controller. Tighten the terminal screws to 3-5 in.-lb. Carefully tug the leads to ensure they are secure. See the following figure. **Note: The "Auxiliary" temperature input can be used for the CT or another temperature sensor such as case surface temperature. The controller will need to be configured on which sensor is used. See Section Defrost Configuration Section for configuration of this input.**



5.5 DUAL TEMPERATURE SWITCH

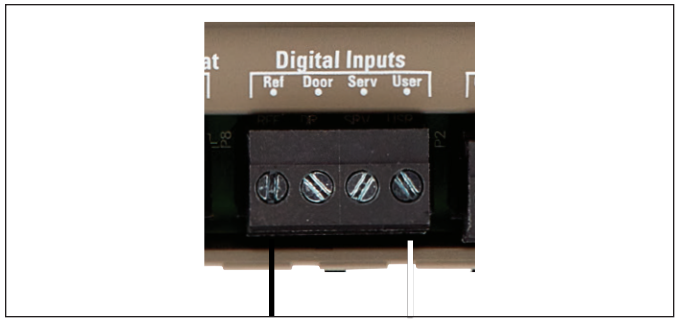
5.5.1 MOUNTING

A dry contact switch may be used to initiate dual temperature mode on a case or line-up. The switch may be located in the mechanical room or on the case. Follow the switch manufacturer's installation instructions.

5.5.2 WIRING

With controller unpowered, carefully route the dual temperature switch cable to the controller. Take caution to route the cable away from sharp edges and hot or moving objects. Ensure the terminal screws on the controller are backed all the way out. Under the "Digital Inputs" section on the controller, insert one lead of the switch into "Ref". Insert the other lead into "User". The leads are not polarized and may be placed in either location. Tighten the terminal screws to 3-5 in.-lb. Carefully tug the leads to ensure they are secure. See the following figure.

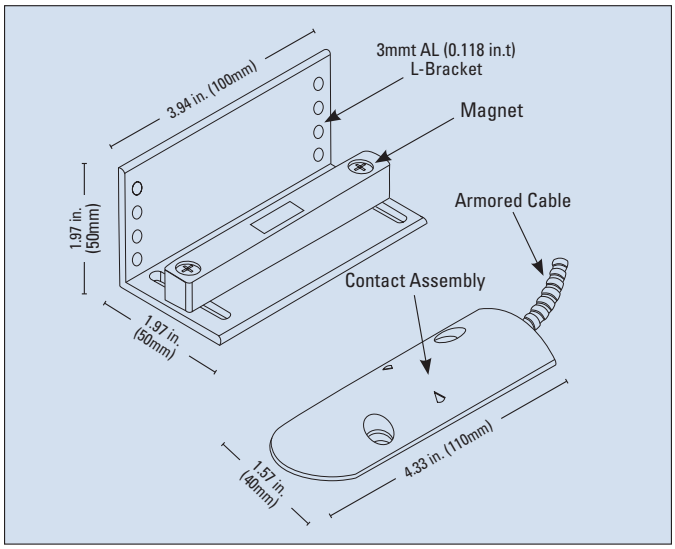
Note: For line-ups, it is only necessary to wire the switch into one of the case controllers. The "User" digital input may also be configured to initiate defrost. See Section 11.7 on configuring this input.



5.6 DOOR SWITCH (WALK IN FREEZER/ COOLER)

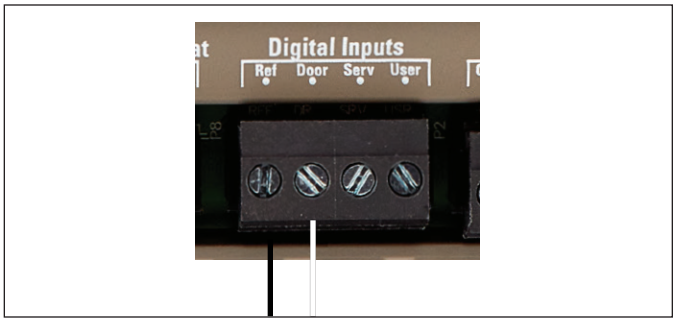
5.6.1 MOUNTING

A door switch may be used on walk in cooler/freezer applications that require the refrigeration to shut off during door openings. The additional switch may also be used to alarm if the door is accidentally left open. The S3C Case Control supports a normally open switch, or "dry contact". For rugged environments, it is recommended to use an Amseco/Potter ODC-59A or equivalent switch; see Figure below (courtesy of Amseco/Potter). Follow the switch manufacturer's recommendation for mounting to the walk in cooler/freezer door and frame. **Note: The "L" bracket attaches to the door.**



5.6.2 WIRING

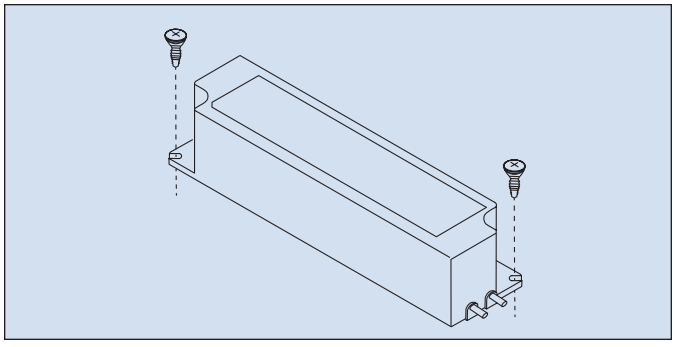
With controller unpowered, carefully route the door switch cable to the controller. Take caution to route the cable away from sharp edges and hot or moving objects. Ensure the terminal screws on the controller are backed all the way out. Under the "Digital Inputs" section on the controller, insert one lead of the switch into "Ref". Insert the other lead into "Door". The leads are not polarized and may be placed in either location. Tighten the terminal screws to 3-5 in.-lb. Carefully tug the leads to ensure they are secure. See the following figure.



5.7 POWER SUPPLY

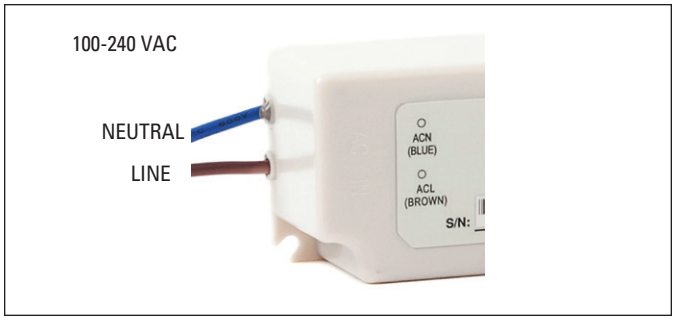
5.7.1 MOUNTING

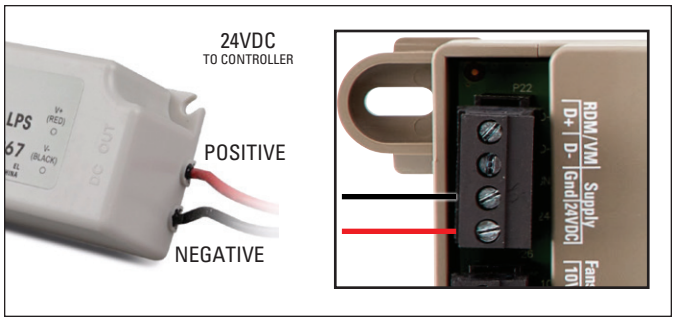
The S3C Case Control has been designed to use 24VDC from an external power supply. The Sporlan external power supply is IP67 for damp locations and uses common supply voltages, such as 120VAC and 240VAC. The supply may be mounted in the same panel as the S3C or remote mounted in the case kick panel or valence. Use two #6 sheet metal screws.



5.7.2 WIRING

Ensure high voltage supply is off. Permanently attach the high voltage wiring to the blue (AC Neutral) and brown (AC Line) leads of the power supply. Carefully route the low voltage red (24VDC +) and black (24VDC -) output wires from the power supply to the controller. Take caution to route the cable away from sharp edges. Ensure the terminal screws on the controller are backed all the way out. Insert the leads of the sensor wire into "Supply" location on the controller, see chart below for sequence. Tighten the terminal screws to 3-5 in.-lb. Carefully tug the leads to ensure they are secure. See the following figure.





5.8 RELAYS

The S3C Case Control has internal relays for the liquid line solenoid valve, evaporator fans, lights and defrost. In many cases, the internal relays will cover the load ratings required of the system so direct wiring is preferred. For higher loads, such as defrost heaters, it is necessary to add an additional relay (or contactor) to switch the load.

5.8.1 DEFROST RELAY

A defrost relay (or contactor) is required on all systems that draw more than 6A for the heater circuit. The S3C will pilot the contactor to regulate the defrost heaters. The contactor may be installed in the same panel as the controller, or remotely located in the case kick panel. Follow industry electrical standards safety when wiring.

5.8.2 FAN RELAY

An evaporator fan relay (or contactor) is required on all systems that draw more than 6A for the fan circuit. The S3C will pilot the contactor to regulate the fans. The contactor may be installed in the same panel as the controller, or remotely located in the case kick panel. Follow industry electrical standards safety when wiring.

5.9 VALVES

5.9.1 ELECTRONIC EXPANSION VALVE (EEV)

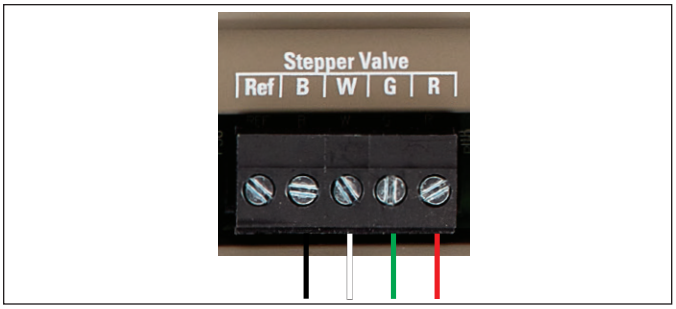
5.9.1.1 MOUNTING

The EEV must be installed at the inlet to the evaporator using standard brazing practices. Refer to Sporlan's valve installation instructions available at www.sporlan.com. For best performance, use only Sporlan EEVs. Bulletin 100-20 may be used for capacity and sizing. EEV location, sizing along with distributor nozzle sizing is important to proper system performance.

5.9.1.2 WIRING

The EEV may be wired to the S3C Case Control or the S3C Valve Module depending on final system configuration. The valve cable color code must match the code written on the controller.

Valve Cable	Case Control or Valve Module
Black	B
White	W
Green	G
Red	R



5.9.2 ELECTRONIC EVAPORATOR PRESSURE REGULATOR

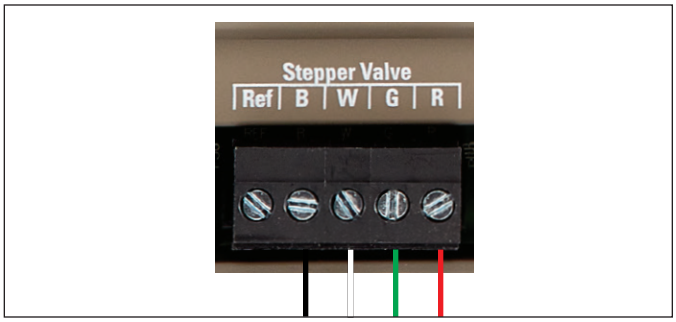
5.9.2.1 MOUNTING

The EEPR may be installed as a circuit control or individual case control. For circuit control, the EEPR must be located in the suction line after the last case on the line-up. The valve may be installed in the conditioned space or outside of the space. If mounted on the outside of the space, it is recommended to insulate the exterior of the valve to eliminate sweating. For individual case control, mount the EEPR in the case after the evaporator. Ensure that the EEPR is positioned after the pressure and temperature sensors used for superheat calculation. In both instances, install the valve using standard brazing practices. Refer to Sporlan's valve installation instructions available at www.sporlan.com. For best performance, use only Sporlan EEPRs. Bulletin 100-40 may be used for capacity and sizing.

5.9.2.2 WIRING

The EEPR may be wired to the S3C Case Control or the S3C Valve Module depending on final system configuration. The valve cable color code must match the code written on the controller.

Valve Cable	Case Control or Valve Module
Black	B
White	W
Green	G
Red	R



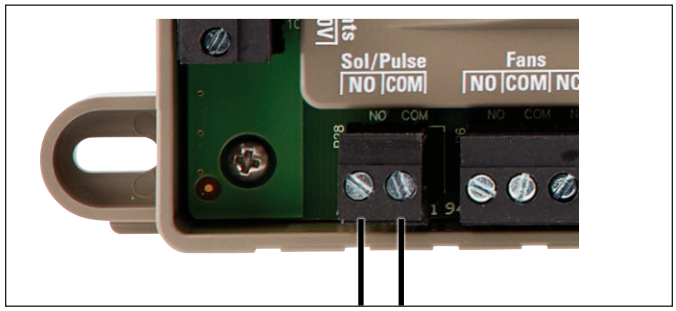
5.9.3 LIQUID LINE SOLENOID VALVE

5.9.3.1 MOUNTING

An optional normally closed AC solenoid valve may be installed in the liquid line feeding each EEV. The liquid line solenoid valve will ensure safe shutoff of refrigeration flow during power loss. Install the valve using standard brazing practices. Refer to Sporlan's valve installation instructions available at www.sporlan.com. Use only Sporlan solenoid valves. Bulletin 30-10 may be used for capacity and sizing. For cut-in/cut-out temperature control, a solenoid valve is required.

5.9.3.2 WIRING

With power off, wire the line leg of the solenoid valve in series with the S3C controller. Ensure the terminal screws on the controller are backed all the way out. Insert the leads of the sensor wire into "Sol/Pulse" location on the controller. Tighten the terminal screws to 3-5 in.-lb. Carefully tug the leads to ensure they are secure. See the following figure. **Note: The solenoid valve must be externally powered.**



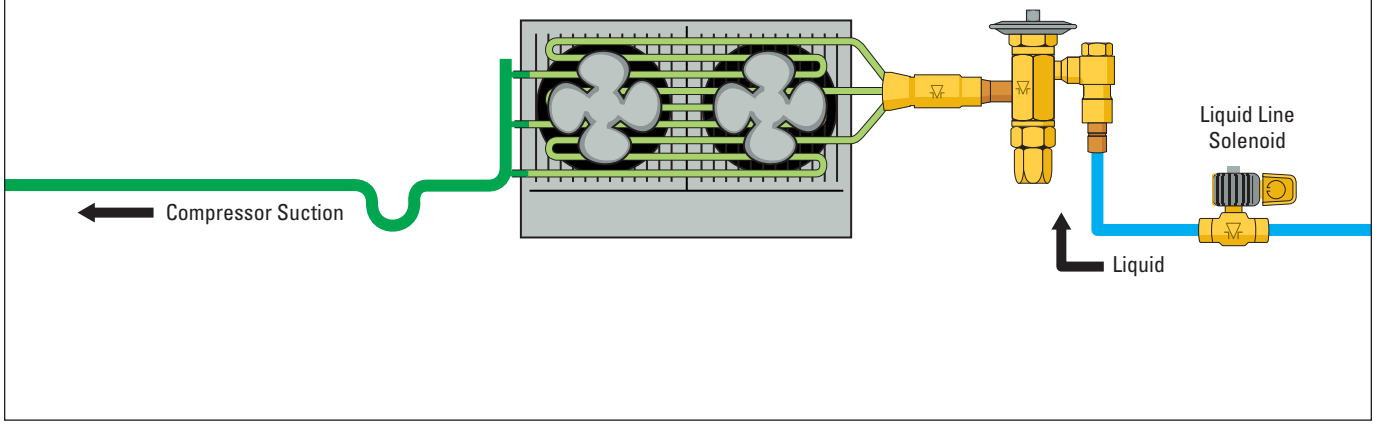
6. APPLICATIONS

The S3C Case Control System offers numerous features to support a wide range of refrigerated display case configurations. This section includes references to piping diagrams, wiring diagrams for each application along with tables that show required controller hardware and proper electronic valve wiring locations on the controllers. The piping diagrams should be used as reference to determine valve and sensor locations. The wiring diagrams should be used as reference to determine controller, valve and sensor requirements along with correct wiring locations on the controller.

6.1 SELF-CONTAINED SINGLE EVAPORATOR – CONFIGURATION A

The S3C case controller is capable of controlling and monitoring single temperature, single evaporator self-contained refrigerated fixtures. In this scenario, one S3C case controller is required. The S3C case controller will control all case functions as well as take all the desired sensor inputs. The typical control method is to allow the TEV to regulate superheat.

SELF-CONTAINED SINGLE EVAPORATOR – CONFIGURATION A



The controller will pulse the required liquid line solenoid to control case temperature using the cut-in/cut-out method.

To configure the S3C control package for configuration A shown above, follow these directions:

If the controller has not been factory set, then upon initial start-up, the controller will be in set-up mode and the screen will display SELF (for self-contained case).

1. Press the **SET** button, then use ▲▼ buttons to scroll to YES; press **SET.** This will configure the controller to support a self-contained case.

2. Press the **SET** button when rc id (Rack Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Rack Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

3. Press the **SET** button when Auto (Auto load configuration through gateway) is displayed, then use ▲▼ buttons to scroll to no and press **SET**.

4. Press the **SET** button when LU id (Line-up Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Line-up Identifier. **Note: Push ▲ button for numeric, ▼ or alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

5. Press the **SET** button when ACd (Case Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Case Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters**. When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

6. Press the **SET** button when APPL (Application Type) is displayed. Use ▲▼ button and scroll to SnGL (Single Temperature Case); press **SET.**

7. Press the **SET** button when StPC (Local Stepper Valve Configuration) is displayed. Use ▼ button to scroll to nonE (None for Thermostatic Expansion Valve); press **SET.**

8. Press the **SET** button when EuLu (Expansion Valve Type) is displayed. Press the **SET** button when display shows tEu.

9. Press the **SET** button when bAS (Building Automation System Expected) is displayed. Use the ▲▼ buttons to choose YES or no; press **SET.**

a. If YES is chosen, the display will show bASP (Building Automation System Protocol). Press the **SET** button then use ▲▼ buttons to choose the B.A.S. Protocol based on the below chart; press **SET.**

Display	Meaning
n485	Modbus Protocol over RS-485
b485	Bacnet Protocol over IP (Ethernet)
bA IP	Bacnet Protocol over IP (Ethernet)
no IP	Modbus Protocol over IP (Ethernet)

10. Press the **SET** button when nonth (Month) is shown. Use the ▲ button to choose the current month; press **SET.**

11. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

12. Press the **SET** button when YEAr (Year) is shown. Use the ▲ button to choose the current year; press **SET.**

13. Press the **SET** button when t nnE (Time) is shown. Use the ▲ button to choose the current time in 24 hour format; press **SET. Note: Holding the ▲ or ▼ down while setting the time will accelerate the scrolling.**

14. Press the **SET** button when rEFt (Refrigerant Type) is shown. Use the ▲▼ buttons to choose the Refrigerant Type; press **SET.** The list of refrigerants can be seen in Table on page 99.

15. Press the **SET** button when dASP (Discharge Air Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

16. Press the **SET** button when dEFt (Defrost Type) is shown. Use the ▲▼ buttons to choose the Defrost Type; press **SET.** Defrost options are:

Display	Meaning
GAS	Hot gas
ELEc	Electric
Air	Air

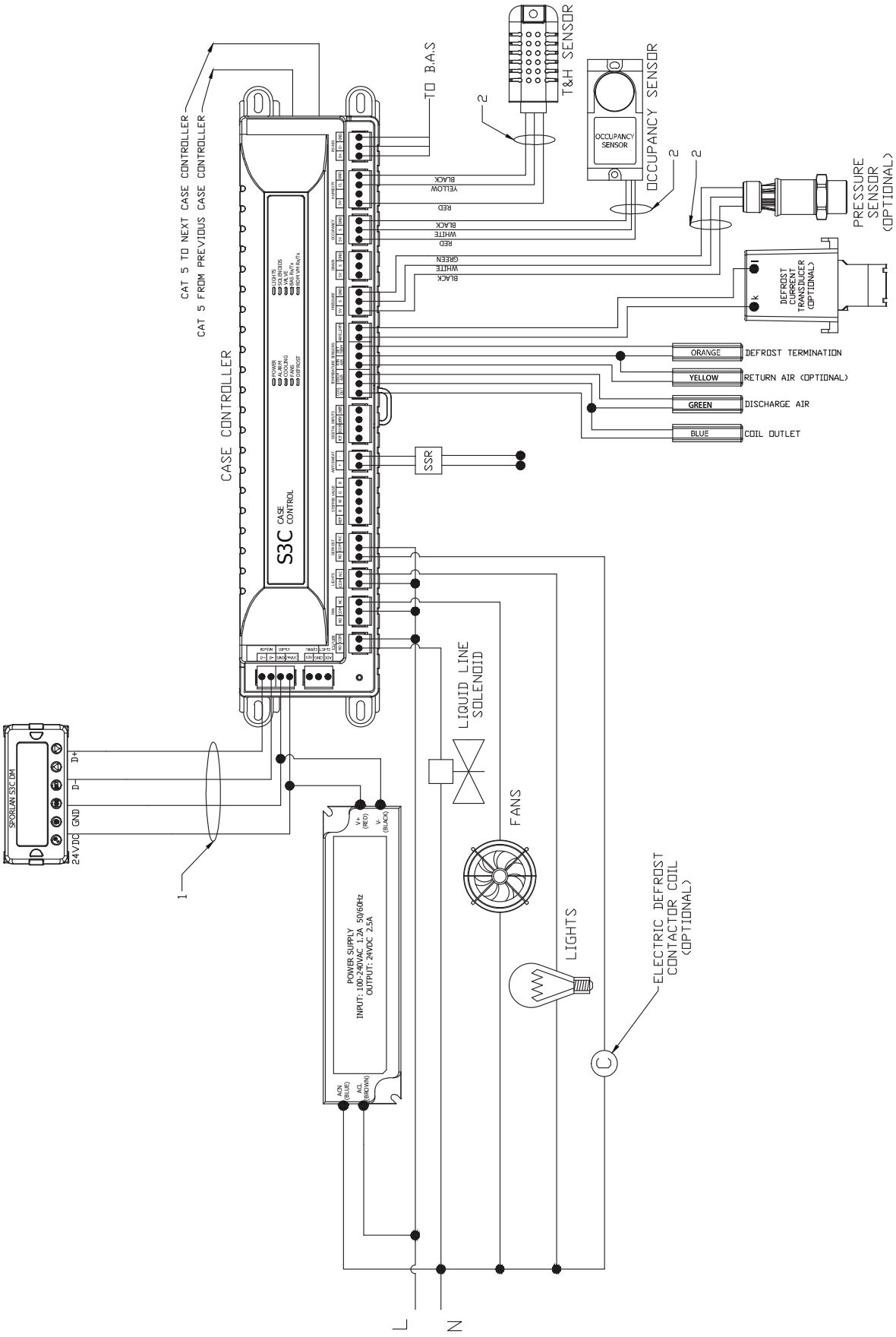
17. Press the **SET** button when dtEP (Defrost Termination Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

18. Press the **SET** button when dttE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**

19. Press the **SET** button when dFPd (Number of Defrosts Per Day) is shown. Use the ▲▼ buttons to choose the defrost per day; press **SET.**

The S3C Case Control system is now set-up and will begin controlling the refrigerated display case.

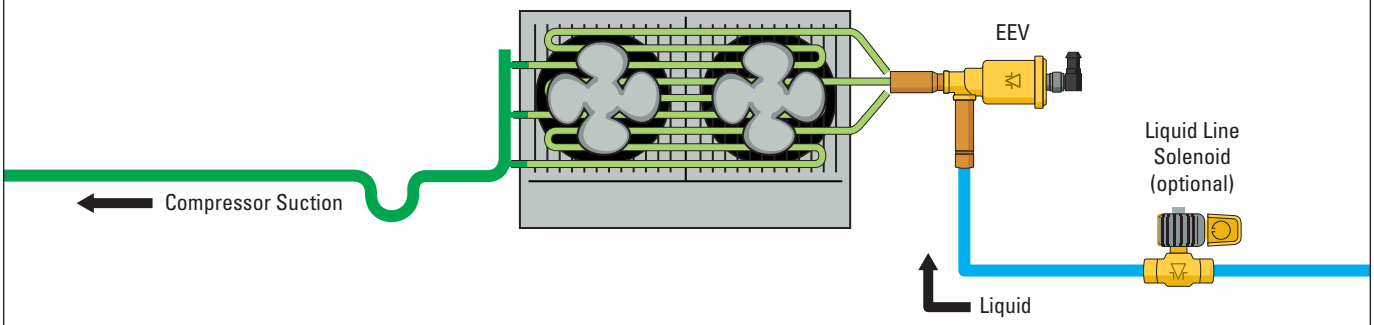
WIRING DIAGRAM – CONFIGURATION A



6.2 SELF-CONTAINED SINGLE EVAPORATOR WITH EEV – CONFIGURATION B

The S3C case controller is capable of controlling and monitoring single temperature, single evaporator self-contained refrigerated fixtures. In this scenario, one S3C case is required. The S3C case controller will control all case functions as well as take all the desired sensor inputs and drive the EEV. The typical control method is to allow the EEV to regulate superheat. The controller will pulse the optional liquid line solenoid and open/close the EEV to control case temperature using the cut-in/cut-out method. The liquid line solenoid (LLS) is optional since flow may be stopped by closing the EEV.

SELF-CONTAINED SINGLE EVAPORATOR WITH EEV – CONFIGURATION B



To configure the S3C control package for configuration B shown above, follow these directions:

If the controller has not been factory set, then upon initial start-up, the controller will be in set-up mode and the screen will display SELF (for self-contained case).

1. Press the **SET** button, then use ▲▼ buttons to scroll to YES; press **SET.** This will configure the controller to support a self-contained case.

2. Press the **SET** button when rc id (Rack Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Rack Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

3. Press the **SET** button when LU id (Line-up Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Line-up Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

4. Press the **SET** button when CA id (Case Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Case Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

5. Press the **SET** button when APPL (Application Type) is displayed. Use ▲ button and scroll to SnGL (Single Temperature Case); press **SET.**

6. Press the **SET** button when StPC (Local Stepper Valve Configuration) is displayed. Use ▲ button to scroll to EEu (Electronic Expansion Valve); press **SET.** This is the valve that is attached to the main S3C Case Controller.

7. Press the **SET** button when EuLu (Expansion Valve Type) is displayed. Use ▲▼ buttons to choose the Expansion Valve Type based on the below chart; press **SET.**

Display	Meaning
PULS	Pulse Width Modulation Valve
500	500 Step Valve
1596	1596 Step Valve
2500	2500 Step Valve
3193	3193 Step Valve
6386	6386 Step Valve
cUSt	Custom Stepper Valve (See Section 11)

8. Press the **SET** button when nEuP (Number of Evaporators) is displayed. Use the ▲ button and scroll to 1 (1 Evaporator); press **SET.**

9. Press the **SET** button when bAS (Building Automation System Expected) is displayed. Use the ▲▼ buttons to choose YES or no; press **SET.**

   a. If YES is chosen, the display will show bASP (Building Automation System Protocol). Press the **SET** button then use ▲▼ buttons to choose the B.A.S. Protocol based on the below chart; press **SET.**

Display	Meaning
rt485	Modbus Protocol over RS-485
b485	Bacnet Protocol over RS-485
bA IP	Bacnet Protocol over IP (Ethernet)
rto IP	Modbus Protocol over IP (Ethernet)

10. Press the **SET** button when rtotH (Month) is shown. Use the ▲ button to choose the current month; press **SET.**

11. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

12. Press the **SET** button when YEAr (Year) is shown. Use the ▲ button to choose the current year; press **SET.**

13. Press the **SET** button when t rtE (Time) is shown. Use the ▲ button to choose the current time in 24 hour format; press **SET. Note: Holding the ▲ or ▼ down while setting the time will accelerate the scrolling.**

14. Press the **SET** button when rEFt (Refrigerant Type) is shown. Use the ▲▼ buttons to choose the Refrigerant Type; press **SET.** The list of refrigerants can be seen in Table on page 99.

15. Press the **SET** button when dASP (Discharge Air Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

16. Press the **SET** button when dEFt (Defrost Type) is shown. Use the ▲▼ buttons to choose the Defrost Type; press **SET.** Defrost options are:

Display	Meaning
GAS	Hot gas
ELEc	Electric
Air	Air

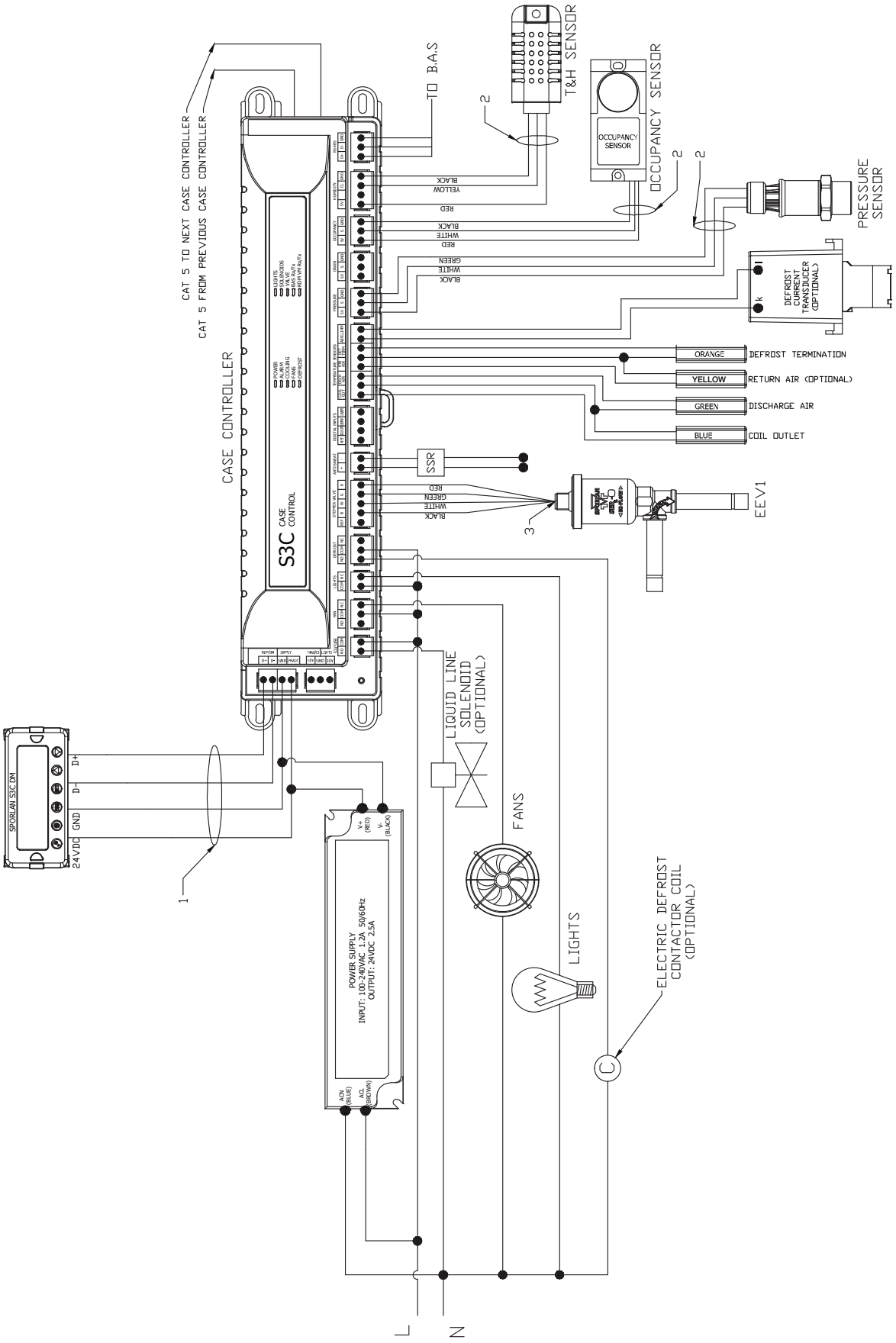
17. Press the **SET** button when dttP (Defrost Termination Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

18. Press the **SET** button when dttE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**

19. Press the **SET** button when dFPd (Number of Defrosts Per Day) is shown. Use the ▲▼ buttons to choose the defrost per day; press **SET.**

The S3C Case Control system is now set-up and will begin controlling the refrigerated display case.

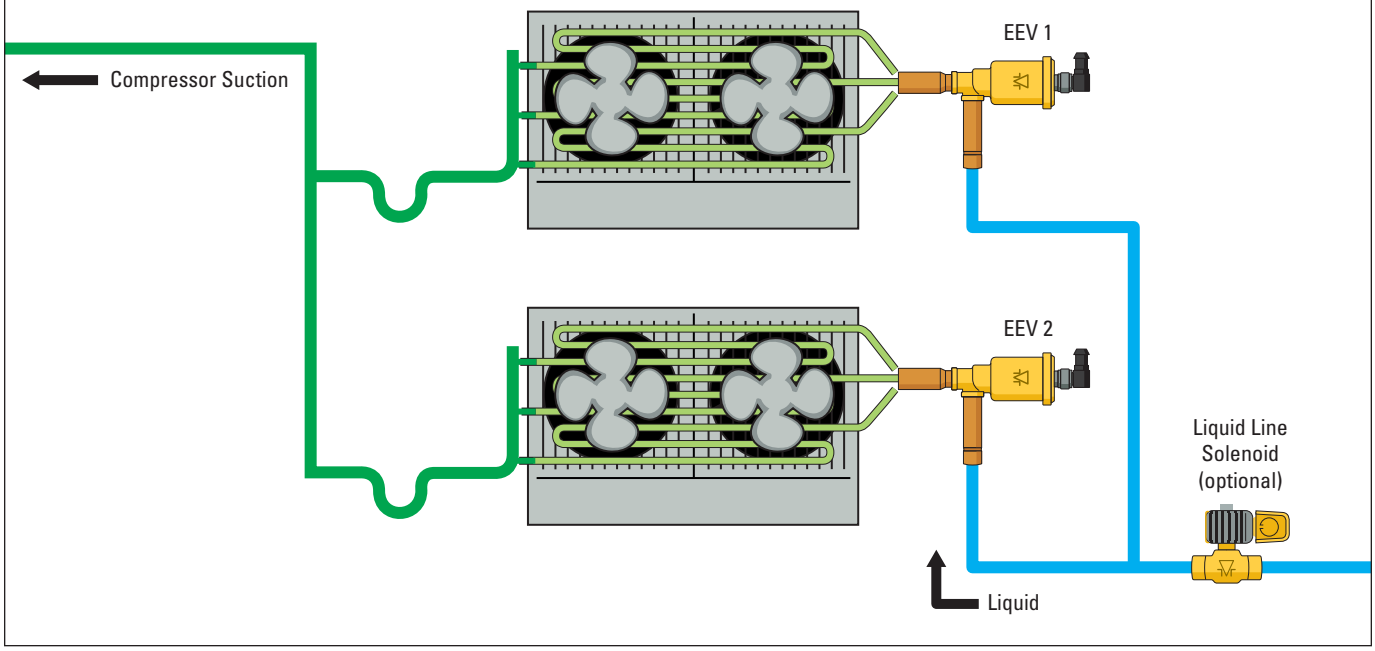
WIRING DIAGRAM – CONFIGURATION B



6.3 SELF-CONTAINED MULTIPLE EVAPORATOR WITH 2 EEVS – CONFIGURATION C

The S3C case controller is capable of controlling and monitoring single temperature, multiple evaporator self-contained refrigerated fixtures. In this scenario, one S3C case controller and one S3C valve module are required. The S3C case controller will control all case functions as well as take all the desired sensor inputs for one evaporator and drive EEV1. The S3C valve module will take all the desired sensor inputs for the second evaporator as well as drive EEV2. The typical control method is to allow the EEV to regulate superheat. The controller will pulse the optional liquid line solenoid and open/close the EEV to control case temperature using the cut-in/cut-out method. The liquid line solenoid (LLS) is optional since flow may be stopped by closing the EEVs.

SELF-CONTAINED MULTIPLE EVAPORATOR WITH 2 EEVS – CONFIGURATION C



To configure the S3C control package for Configuration C shown above, follow these directions:

If the controller has not been factory set, then upon initial start-up, the controller will be in set-up mode and the screen will display SELF (for self-contained case).

1. Press the **SET** button, then use ▲▼ buttons to scroll to YES; press **SET.** This will configure the controller to support a self-contained case.

2. Press the **SET** button when rc id (Rack Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Rack Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

3. Press the **SET** button when LU id (Line-up Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Line-up Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

4. Press the **SET** button when CA id (Case Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Case Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

5. Press the **SET** button when APPL (Application Type) is displayed. Use ▲ button and scroll to SnGL (Single Temperature Case); press **SET.**

6. Press the **SET** button when StPC (Local Stepper Valve Configuration) is displayed. Use ▲ button to scroll to EEv (Electronic Expansion Valve); press **SET.** This is the valve that is attached to the main S3C Case Controller.

7. Press the **SET** button when EvLv (Expansion Valve Type) is displayed. Use ▲▼ buttons to choose the Expansion Valve Type based on the below chart; press **SET.**

Display	Meaning
PULS	Pulse Width Modulation Valve
500	500 Step Valve
1596	1596 Step Valve
2500	2500 Step Valve
3193	3193 Step Valve
6386	6386 Step Valve
cUSt	Custom Stepper Valve (See Section 11)

8. Press the **SET** button when nEuP (Number of Evaporators) is displayed. Use the ▲ button and scroll to 2(2 Evaporators); press **SET.**

9. Press the **SET** button when bAS (Building Automation System Expected) is displayed. Use the ▲▼ buttons to choose YES or no; press **SET.**

   a. If YES is chosen, the display will show bASP (Building Automation System Protocol). Press the **SET** button then use ▲▼ buttons to choose the B.A.S. Protocol based on the below chart; press **SET.**

Display	Meaning
485	Modbus Protocol over RS-485
b485	Bacnet Protocol over RS-485
bA IP	Bacnet Protocol over IP (Ethernet)
Mo IP	Modbus Protocol over IP (Ethernet)

10. Press the **SET** button when MotH (Month) is shown. Use the ▲ button to choose the current month; press **SET.**

11. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

12. Press the **SET** button when YEAr (Year) is shown. Use the ▲ button to choose the current year; press **SET.**

13. Press the **SET** button when t MiE (Time) is shown. Use the ▲ button to choose the current time in 24 hour format; press **SET. Note: Holding the ▲ or ▼ down while setting the time will accelerate the scrolling.**

14. Press the **SET** button when rEFt (Refrigerant Type) is shown. Use the ▲▼ buttons to choose the Refrigerant Type; press **SET.** The list of refrigerants can be seen in Table on page 99.

15. Press the **SET** button when dASP (Discharge Air Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

16. Press the **SET** button when dEFt (Defrost Type) is shown. Use the ▲▼ buttons to choose the Defrost Type; press **SET.** Defrost options are:

Display	Meaning
GAS	Hot gas
Elec	Electric
Air	Air

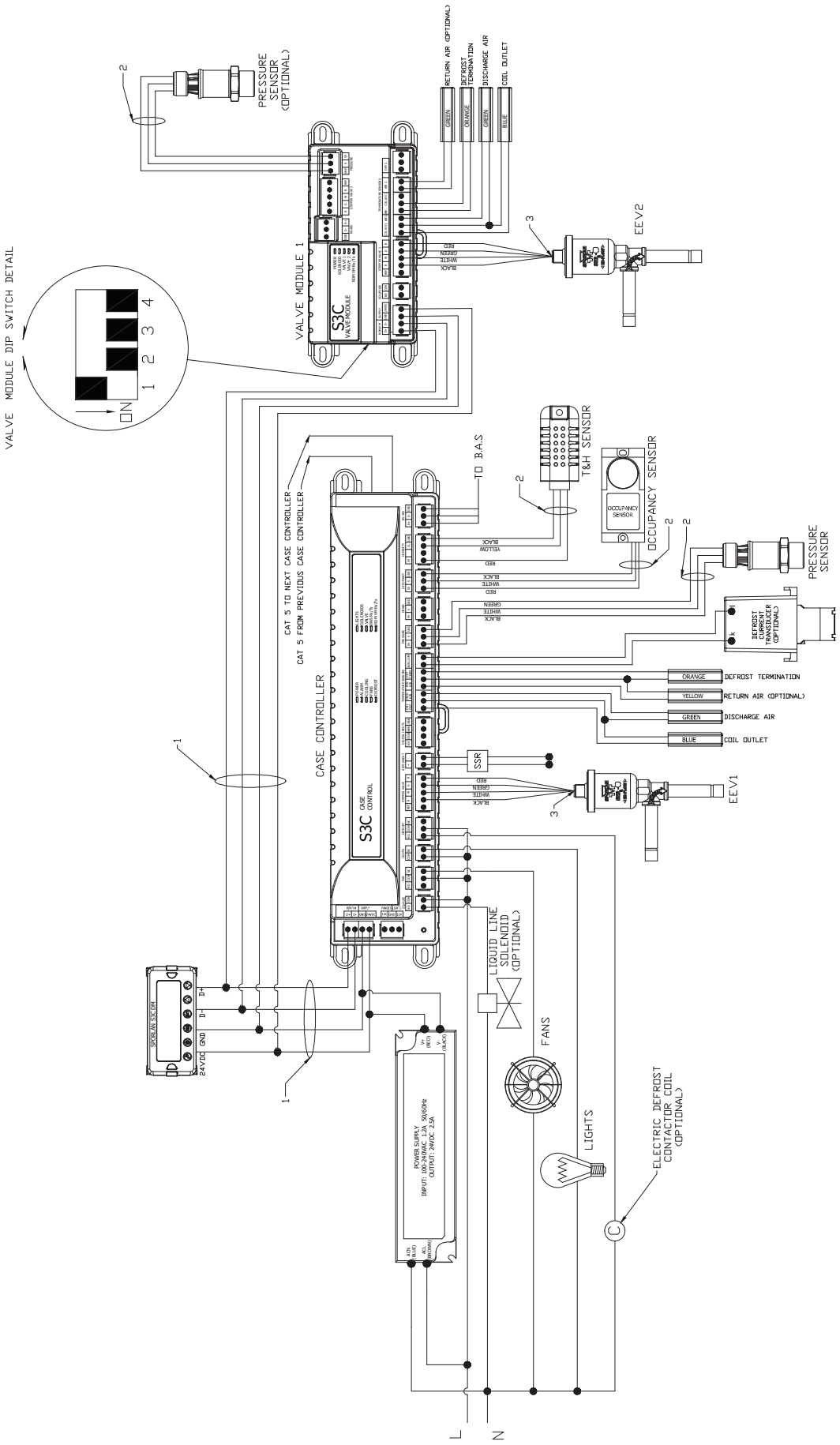
17. Press the **SET** button when dtEP (Defrost Termination Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

18. Press the **SET** button when dttE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**

19. Press the **SET** button when dFPd (Number of Defrosts Per Day) is shown. Use the ▲▼ buttons to choose the defrost per day; press **SET.**

The S3C Case Control system is now set-up and will begin controlling the refrigerated display case.

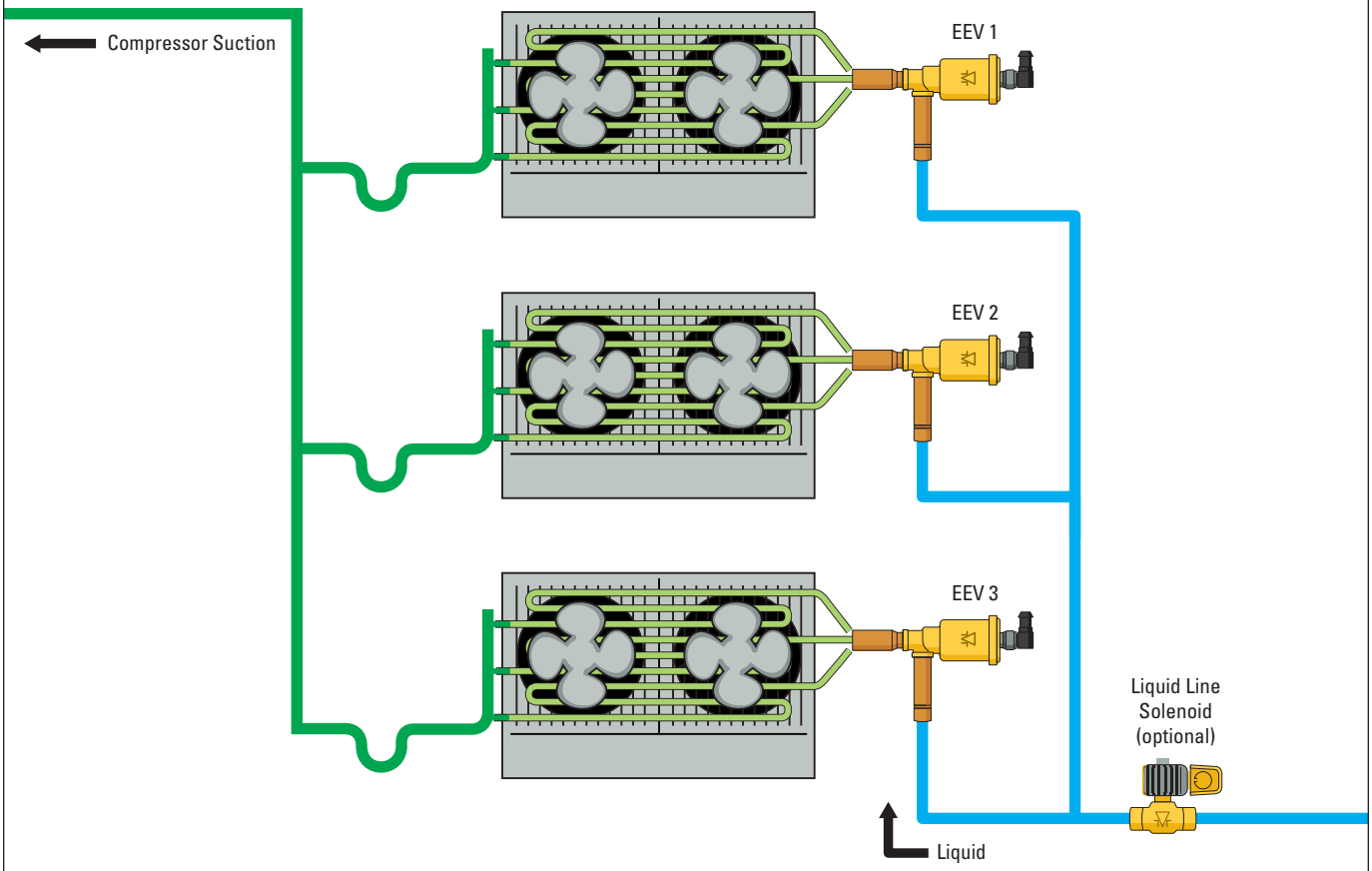
WIRING DIAGRAM – CONFIGURATION C



6.4 SELF-CONTAINED MULTIPLE EVAPORATOR WITH 3 EEVS – CONFIGURATION D

The S3C case controller is capable of controlling and monitoring single temperature, multiple evaporator self-contained refrigerated fixtures. In this scenario, one S3C case controller and one S3C valve module are required. The S3C case controller will control all case functions as well as take all the desired sensor inputs for one evaporator and drive EEV1. The S3C valve module will take all the desired sensor inputs for the second and third evaporators as well as drive both EEV2 and EEV3. The typical control method is to allow the EEVs to regulate superheat. The controller will pulse the optional liquid line solenoid and open/close the EEVs to control case temperature using the cut-in/cut-out method. The liquid line solenoid (LLS) is optional since flow may be stopped by closing the EEVs. If a liquid line solenoid is used, it must be installed on the common liquid line feeding the evaporators and it should be wired into the case controller. This configuration only supports Discharge Air control.

SELF-CONTAINED MULTIPLE EVAPORATOR WITH 3 EEVS – CONFIGURATION D



To configure the S3C control package for configuration D shown above, follow these directions:

If the controller has not been factory set, then upon initial start-up, the controller will be in set-up mode and the screen will display SELF (for self-contained case).

1. Press the **SET** button, then use ▲▼ buttons to scroll to YES; press **SET.** This will configure the controller to support a self-contained case. Press the **SET** button when rc id (Rack Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Rack Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

2. Press the **SET** button when LU id (Line-up Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Line-up Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

3. Press the **SET** button when CA id (Case Identifier) is displayed. Use the▲▼buttons to configure the 4 character Case Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

4. Press the **SET** button when APPL (Application Type) is displayed. Use ▲ button and scroll to SnGL (Single Temperature Case); press **SET.**

5. Press the **SET** button when StPC (Local Stepper Valve

Configuration) is displayed. Use ▲ button to scroll to EEu (Electronic Expansion Valve); press **SET.** This is the valve that is attached to the main S3C Case Controller.

6. Press the **SET** button when EuLu (Expansion Valve Type) is displayed. Use ▲▼ buttons to choose the Expansion Valve Type based on the below chart; press **SET.**

Display	Meaning
PULS	Pulse Width Modulation Valve
500	500 Step Valve
1596	1596 Step Valve
2500	2500 Step Valve
3 193	3193 Step Valve
6386	6386 Step Valve
cUSt	Custom Stepper Valve (See Section 11)

7. Press the **SET** button when nEuP (Number of Evaporators) is displayed. Use the ▲ button and scroll to 3(3 Evaporators); press **SET.**

8. Press the **SET** button when bAS (Building Automation System Expected) is displayed. Use the ▲▼ buttons to choose YES or no; press **SET.**

   a. If YES is chosen, the display will show bASP (Building Automation System Protocol). Press the **SET** button then use ▲▼ buttons to choose the B.A.S. Protocol based on the below chart; press **SET.**

Display	Meaning
7485	Modbus Protocol over RS-485
6485	Bacnet Protocol over RS-485
bA IP	Bacnet Protocol over IP (Ethernet)
7o IP	Modbus Protocol over IP (Ethernet)

9. Press the **SET** button when 7otH (Month) is shown. Use the ▲ button to choose the current month; press **SET.**

10. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

11. Press the **SET** button when YEAr (Year) is shown. Use the ▲ button to choose the current year; press **SET.**

12. Press the **SET** button when t 7iE (Time) is shown. Use the ▲ button to choose the current time in 24 hour format; press **SET. Note: Holding the ▲ or ▼ down while setting the time will accelerate the scrolling.**

13. Press the **SET** button when rEFt (Refrigerant Type) is shown. Use the ▲▼ buttons to choose the Refrigerant Type; press **SET.** The list of refrigerants can be seen in Table 9 on page 99.

14. Press the **SET** button when dASP (Discharge Air Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

15. Press the **SET** button when dEFt (Defrost Type) is shown. Use the ▲▼ buttons to choose the Defrost Type; press **SET.** Defrost options are:

Display	Meaning
hGAS	Hot gas
ELEc	Electric
A ir	Air

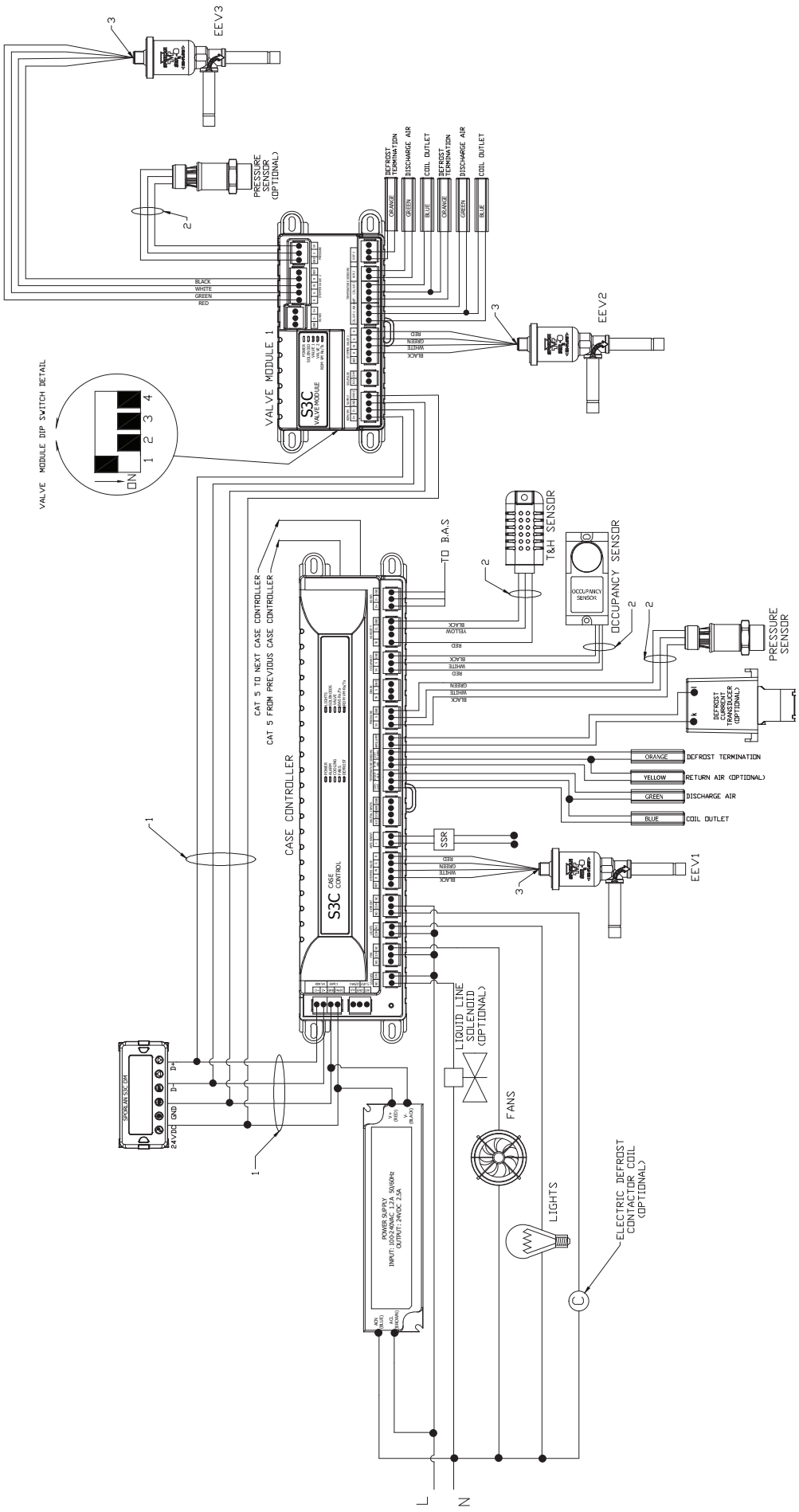
16. Press the **SET** button when dttP (Defrost Termination Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

17. Press the **SET** button when dttE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**

18. Press the **SET** button when dFPd (Number of Defrosts Per Day) is shown. Use the ▲▼ buttons to choose the defrost per day; press **SET.**

The S3C Case Control system is now set-up and will begin controlling the refrigerated display case.

WIRING DIAGRAM – CONFIGURATION D



6.5 REMOTE SINGLE EVAPORATOR – CONFIGURATION E

The S3C case controller is capable of controlling and monitoring single temperature, single evaporator refrigerated fixtures installed as a line-up. The case shown in the diagram below is the lead case of the line-up. In this scenario, one S3C case controller is required. The S3C case controller will control all case functions as well as take all the desired sensor inputs.

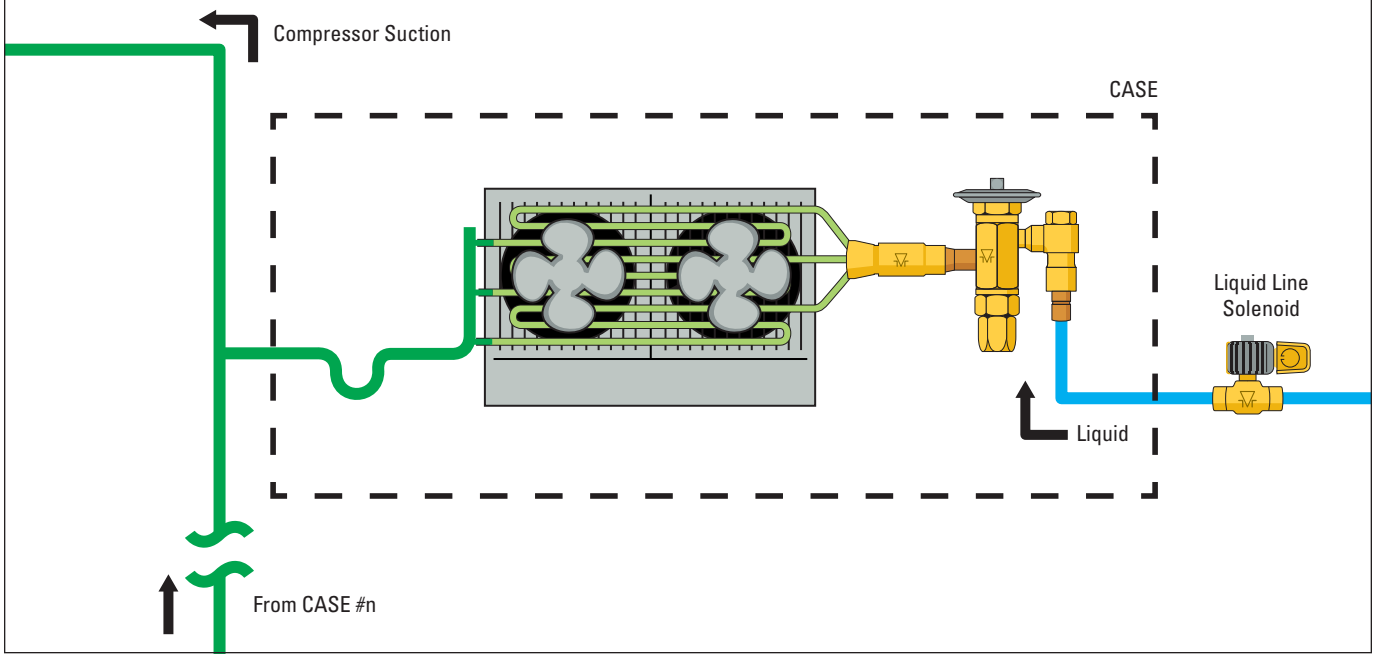
The typical control method:

Without mechanical EPR: TEV will control superheat and liquid line solenoid will control case temperature using cut-in/cut-out method.

With mechanical EPR: TEV will control superheat and the EPR will control case temperature.

The liquid line solenoid (LLS) may be installed as one-per-case or one-per-line-up if no EPR is used or if an EPR per line-up is used. Case numbers 2, 3, 4,...n will require their own S3C case controller as well.

REMOTE SINGLE EVAPORATOR – CONFIGURATION E



To configure the S3C control package for configuration E shown above, follow these directions:

If the controller has not been factory set, then upon initial start-up, the controller will be in set-up mode and the screen will display SELF (for self-contained case).

1. Press the **SET** button, then use ▲▼ buttons to scroll to no; press **SET.** This will configure the controller to support a remote case.

2. Press the **SET** button when rc id (Rack Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Rack Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

3. Press the **SET** button when LU id (Line-up Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Line-up Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

4. Press the **SET** button when CA id (Case Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Case Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

5. Press the **SET** button when APPL (Application Type) is displayed. Use the ▲ button and scroll to SnGL (Single Temperature Case); press **SET.**

6. Press the **SET** button when StPC (Local Stepper Valve Configuration) is displayed. Use the ▲ button to scroll to nonE (None for Thermostatic Expansion Valve); press **SET.**

7. Press the **SET** button when EuLu (Expansion Valve Type) is displayed. Press the **SET** button when display shows tEu.

8. Press the **SET** button when bAS (Building Automation System Expected) is displayed. Use the ▲▼ buttons to choose YES or no; press **SET.**

   a. If YES is chosen, the display will show bASP (Building Automation System Protocol). Press the **SET** button then use ▲▼ buttons to choose the B.A.S. Protocol based on the below chart; press **SET.**

Display	Meaning
n485	Modbus Protocol over RS-485
b485	Bacnet Protocol over RS-485
bA IP	Bacnet Protocol over IP (Ethernet)
no IP	Modbus Protocol over IP (Ethernet)

9. Press the **SET** button when noth (Month) is shown. Use the ▲ button to choose the current month; press **SET.**

10. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

11. Press the **SET** button when YEAr (Year) is shown. Use the ▲ button to choose the current year; press **SET.**

12. Press the **SET** button when t nIE (Time) is shown. Use the ▲ button to choose the current time in 24 hour format; press **SET. Note: Holding the ▲ or ▼ down while setting the time will accelerate the scrolling.**

13. Press the **SET** button when rEFt (Refrigerant Type) is shown. Use the ▲▼ buttons to choose the Refrigerant Type; press **SET.** The list of refrigerants can be seen in Table 9 on page 99.

14. Press the **SET** button when nL in (Number of Cases Expected in Line-up) is shown. Use the ▲▼ buttons to choose the number of cases expected in the Line-up; press **SET.**

15. Press the **SET** button when EPrt (EPR Type) is shown. Use the ▲ button to choose nonE (for no EPR); press **SET.** This will enable Cut-In/Cut-Out temperature control.

   a. If a mechanical EPR is used, select EPr and this will allow the EPR to control temperature instead of Cut-In/Cut-Out.

16. Press the **SET** button when dASP (Discharge Air Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

17. Press the **SET** button when dEFt (Defrost Type) is shown. Use the ▲▼ buttons to choose the Defrost Type; press **SET.** Defrost options are:

Display	Meaning
hGAS	Hot gas
ELEc	Electric
Air	Air

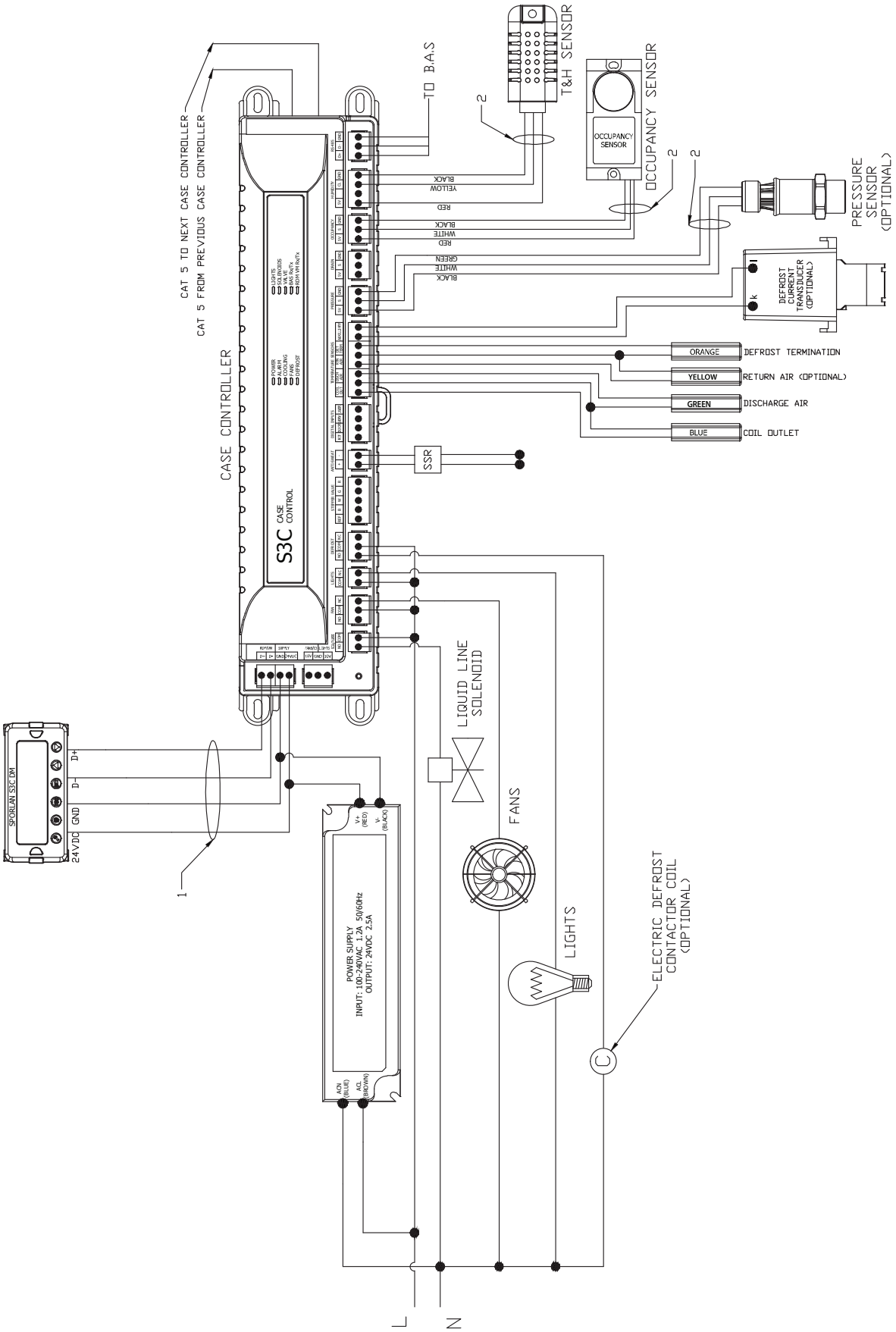
18. Press the **SET** button when dtTP (Defrost Termination Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

19. Press the **SET** button when dtTE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**

20. Press the **SET** button when dFPd (Number of Defrosts Per Day) is shown. Use the ▲▼ buttons to choose the defrost per day; press **SET.**

The S3C Case Control system is now set-up and will begin controlling the refrigerated display case.

WIRING DIAGRAM – CONFIGURATION E



6.6 REMOTE SINGLE EVAPORATOR WITH EEV – CONFIGURATION F

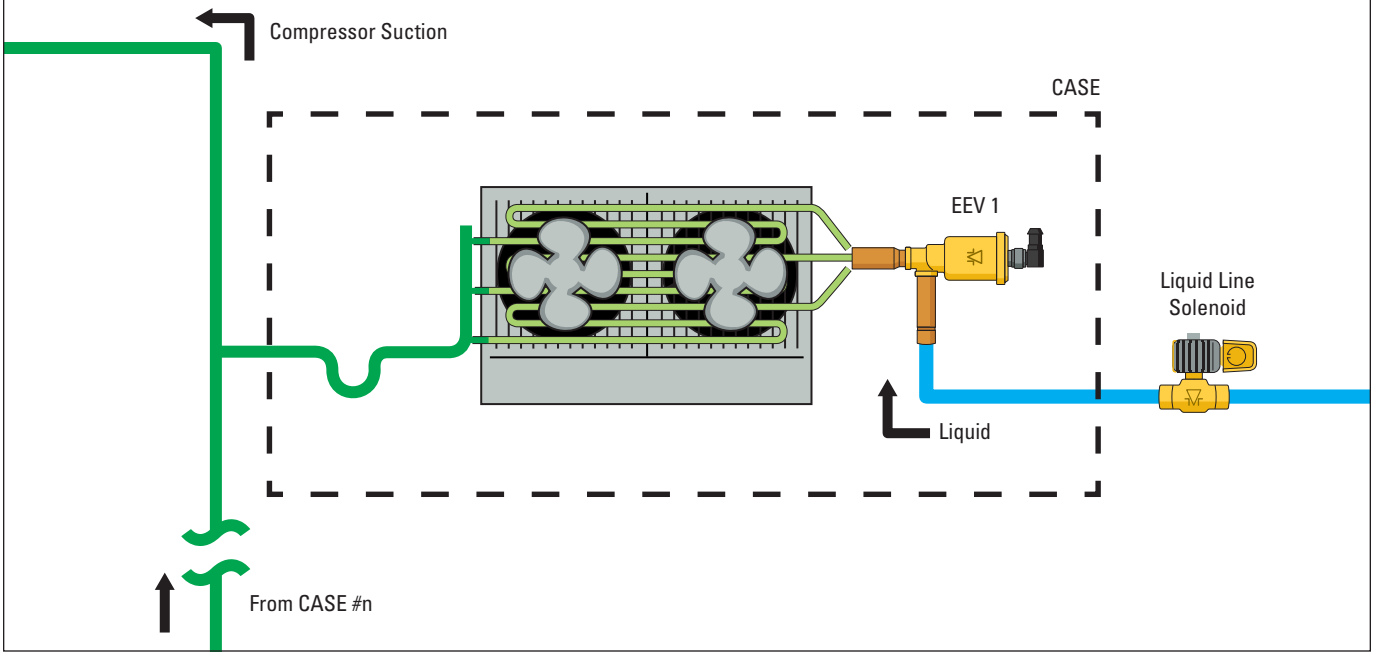
The S3C case controller is capable of controlling and monitoring single temperature, single evaporator refrigerated fixtures installed as a line-up. The case shown in the diagram below is the lead case of the line-up. In this scenario, one S3C case controller is required. The S3C case controller will control all case functions as well as take all the desired sensor inputs and drive the EEV. The typical control method:

Without mechanical EPR: EEV will control case temperature with a minimum superheat setpoint.

With mechanical EPR: EEV will control superheat and the EPR will control case temperature.

The optional liquid line solenoid (LLS) may be installed as one-per-case or one-per-line-up if no EPR is used or if an EPR per line-up is used. Case numbers 2, 3, 4,...n will require their own S3C case controller as well.

FIGURE 3 - REMOTE SINGLE EVAPORATOR WITH EEV – CONFIGURATION F



To configure the S3C control package for configuration F shown above, follow these directions:

If the controller has not been factory set, then upon initial start-up, the controller will be in set-up mode and the screen will display SELF (for self-contained case).

1. Press the **SET** button, then use ▲▼ buttons to scroll to no; press **SET.** This will configure the controller to support a remote case.
2. Press the **SET** button when rc id (Rack Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Rack Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
3. Press the **SET** button when LU id (Line-up Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Line-up Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
4. Press the **SET** button when CA id (Case Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Case Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
5. Press the **SET** button when APPL (Application Type) is displayed. Use the ▲ button and scroll to SnGL (Single Temperature Case); press **SET.**
6. Press the **SET** button when StPC (Local Stepper Valve Configuration) is displayed. Use the ▲ button to scroll to EEu (Electronic Expansion Valve); press **SET.** This is the valve that is attached to the main S3C Case Controller.
7. Press the **SET** button when EuLu (Expansion Valve Type) is displayed. Use ▲▼ buttons to choose the Expansion Valve Type based on the below chart; press **SET.**

Display	Meaning
PuLS	Pulse Width Modulation Valve
500	500 Step Valve
1596	1596 Step Valve
2500	2500 Step Valve
3 193	3193 Step Valve
6386	6386 Step Valve
cUSt	Custom Stepper Valve (See Section 11)

8. Press the **SET** button when nEuP (Number of Evaporators) is displayed. Use the ▲ button and scroll to 1 (1 Evaporator); press **SET.**

9. Press the **SET** button when bAS (Building Automation System Expected) is displayed. Use the ▲▼ buttons to choose YES or no; press **SET.**

   a. If YES is chosen, the display will show bASP (Building Automation System Protocol). Press the **SET** button then use ▲▼ buttons to choose the B.A.S. Protocol based on the below chart; press **SET.**

Display	Meaning
7485	Modbus Protocol over RS-485
6485	Bacnet Protocol over RS-485
bA IP	Bacnet Protocol over IP (Ethernet)
7o IP	Modbus Protocol over IP (Ethernet)

10. Press the **SET** button when 7otH (Month) is shown. Use the ▲ button to choose the current month; press **SET.**

11. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

12. Press the **SET** button when YEAr (Year) is shown. Use the ▲ button to choose the current year; press **SET.**

13. Press the **SET** button when t 7iE (Time) is shown. Use the ▲ button to choose the current time in 24 hour format; press **SET. Note: Holding the ▲ or ▼ down while setting the time will accelerate the scrolling.**

14. Press the **SET** button when rEFt (Refrigerant Type) is shown. Use the ▲▼ buttons to choose the Refrigerant Type; press **SET.** The list of refrigerants can be seen in Table 9 on page 99.

15. Press the **SET** button when nL in (Number of Cases Expected in Line-up) is shown. Use the ▲▼ buttons to choose the number of cases expected in the Line-up; press **SET.**

16. Press the **SET** button when EPrt (Evaporator Pressure Regulating Valve Type) is shown. Use the ▲ button to scroll to nonE (no EEPR); press **SET.**

17. Press the **SET** button when dASP (Discharge Air Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

18. Press the **SET** button when dEFt (Defrost Type) is shown. Use the ▲▼ buttons to choose the Defrost Type; press **SET.** Defrost options are:

Display	Meaning
hGAS	Hot gas
ELEc	Electric
A ir	Air

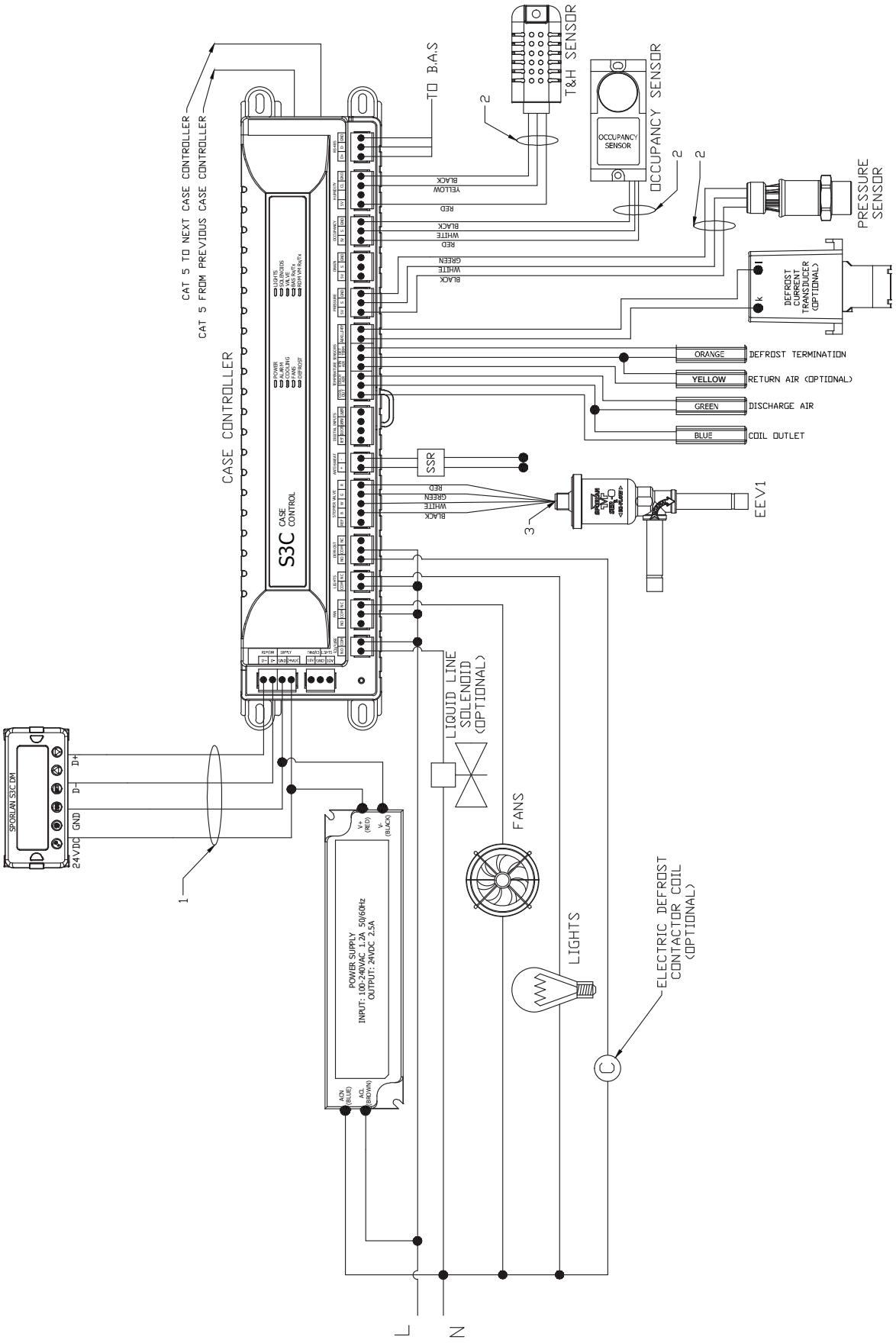
19. Press the **SET** button when dttP (Defrost Termination Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

20. Press the **SET** button when dttE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**

21. Press the **SET** button when dFPd (Number of Defrosts Per Day) is shown. Use the ▲▼ buttons to choose the defrost per day; press **SET.**

The S3C Case Control system is now set-up and will begin controlling the refrigerated display case.

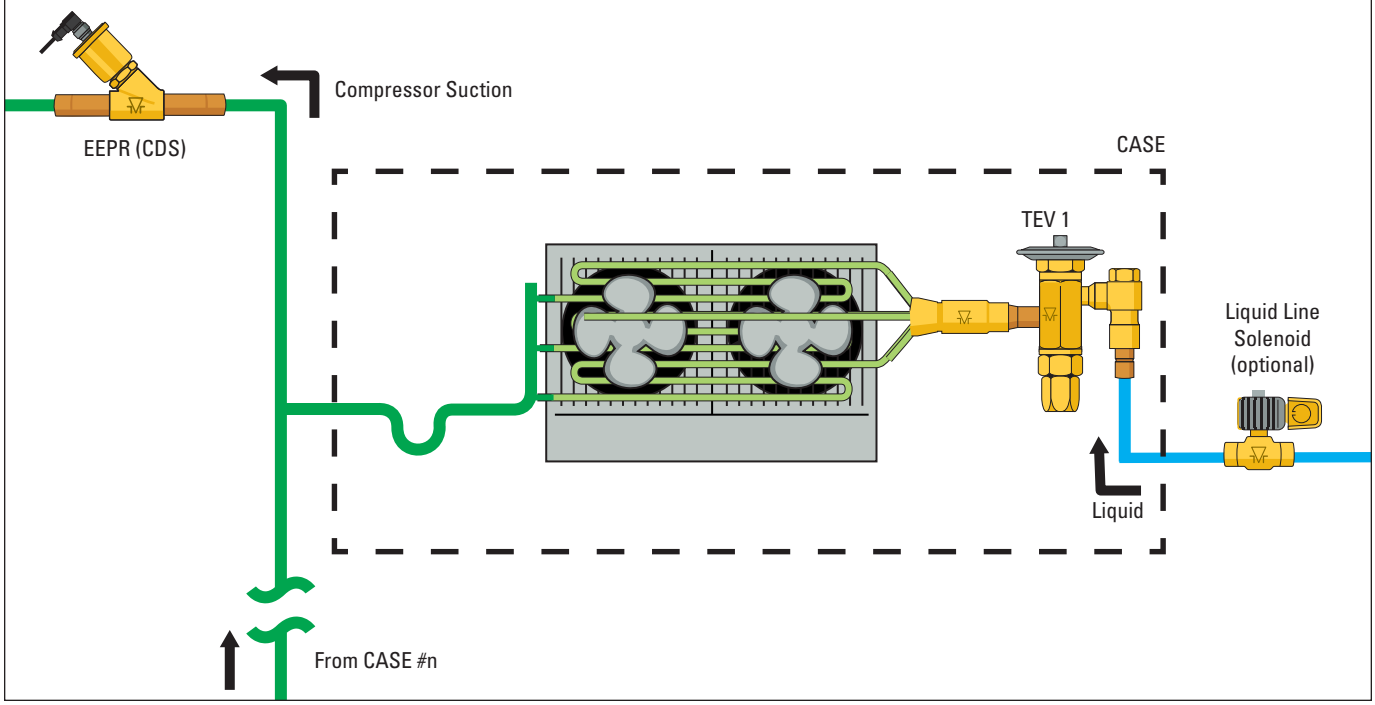
WIRING DIAGRAM – CONFIGURATION F



6.7 REMOTE SINGLE EVAPORATOR WITH CIRCUIT EEPR – CONFIGURATION G

The S3C case controller is capable of controlling and monitoring single temperature, single evaporator refrigerated fixtures installed as a line-up. The case shown in the diagram below is the lead case of the line-up. In this scenario, one S3C case controller is required. The S3C case controller will control all case functions as well as take all the desired sensor inputs and drive the EEPR. The typical control method is to regulate the average discharge air temperature of the evaporators with the EEPR while allowing the TEV to control superheat. Note that the required liquid line solenoid (LLS) may be installed as one-per-case or one-per-line-up. Case numbers 2, 3, 4,...n will require their own S3C case controller as well but will not have an EEPR connected if they share a common suction line with the lead case shown in the diagram below.

FIGURE 4 - REMOTE SINGLE EVAPORATOR WITH CIRCUIT EEPR – CONFIGURATION G



To configure the S3C control package for configuration G shown above, follow these directions:

If the controller has not been factory set, then upon initial start-up, the controller will be in set-up mode and the screen will display SELF (for self-contained case).

1. Press the **SET** button, then use ▲▼ buttons to scroll to no; press **SET.** This will configure the controller to support a remote case.

2. Press the **SET** button when rc id (Rack Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Rack Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

3. Press the **SET** button when LU id (Line-up Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Line-up Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

4. Press the **SET** button when CA id (Case Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Case Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

5. Press the **SET** button when APPL (Application Type) is displayed. Use the ▲ button and scroll to SnGL (Single Temperature Case); press **SET.**

6. Press the **SET** button when StPC (Local Stepper Valve Configuration) is displayed. Use the ▲ button to scroll to EEPr (Electronic Evaporator Pressure Regulator); press **SET.** This is the valve that is attached to the main S3C Case Controller.

7. Press the **SET** button when EuLu (Expansion Valve Type) is displayed. Use the ▲ button to scroll to tEu (Thermostatic Expansion Valve); press **SET.**

8. Press the **SET** button when bAS (Building Automation System Expected) is displayed. Use the ▲▼ buttons to choose YES or no; press **SET.**

a. If YES is chosen, the display will show bASP (Building Automation System Protocol). Press the **SET** button then use ▲▼ buttons to choose the B.A.S. Protocol based on the below chart; press **SET.**

Display	Meaning
rt485	Modbus Protocol over RS-485
b485	Bacnet Protocol over IP (Ethernet)
bA IP	Bacnet Protocol over IP (Ethernet)
rto IP	Modbus Protocol over IP (Ethernet)

9. Press the **SET** button when rntH (Month) is shown. Use the ▲ button to choose the current month; press **SET.**

10. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

11. Press the **SET** button when YEAr (Year) is shown. Use the ▲ button to choose the current year; press **SET.**

12. Press the **SET** button when t rnE (Time) is shown. Use the ▲ button to choose the current time in 24 hour format; press **SET. Note: Holding the ▲ or ▼ down while setting the time will accelerate the scrolling.**

13. Press the **SET** button when rEFt (Refrigerant Type) is shown. Use the ▲▼ buttons to choose the Refrigerant Type; press **SET.** The list of refrigerants can be seen in Table on page 99.

14. Press the **SET** button when nL rn (Number of Cases Expected in Line-up) is shown. Use the ▲▼ buttons to choose the number of cases expected in the Line-up; press **SET.**

15. Press the **SET** button when EPrt (Evaporator Pressure Regulating Valve Type) is shown. Use the ▲▼ buttons to choose from either 2500 or 6386 depending on the valve; press **SET.** Please consult the literature supplied with the valve to determine the correct step count. For custom valve selection, see valve configuration menu in Section 11.

16. Press the **SET** button when EPrL (EPR Location) is shown. Press the ▲ button to scroll to L rnE (EEPR per Line-up); press **SET.**

17. Press the **SET** button when dASP (Discharge Air Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

18. Press the **SET** button when dEFt (Defrost Type) is shown. Use the ▲▼ buttons to choose the Defrost Type; press **SET.** Defrost options are:

Display	Meaning
hGAS	Hot gas
ELEc	Electric
Air	Air

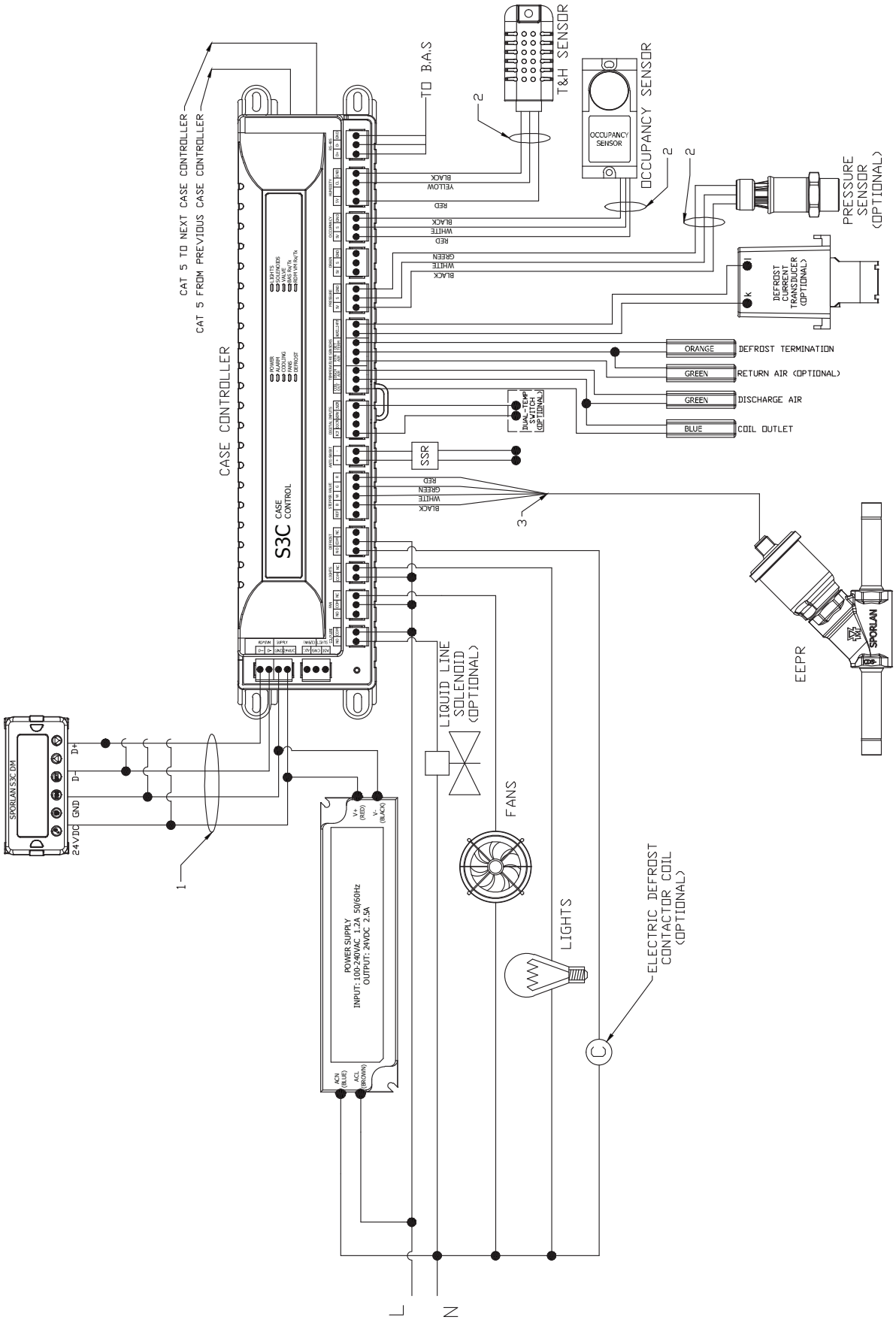
19. Press the **SET** button when dttP (Defrost Termination Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

20. Press the **SET** button when dttE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**

21. Press the **SET** button when dFPd (Number of Defrosts Per Day) is shown. Use the ▲▼ buttons to choose the defrost per day; press **SET.**

The S3C Case Control system is now set-up and will begin controlling the refrigerated display case.

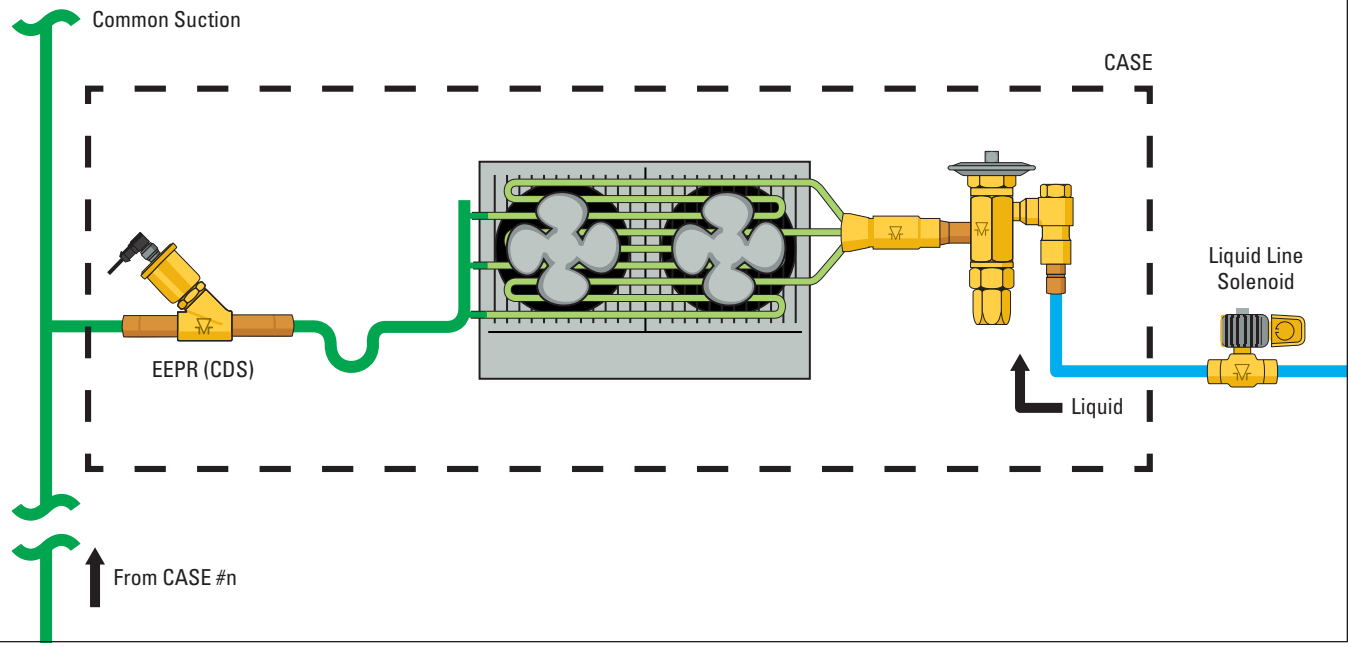
WIRING DIAGRAM – CONFIGURATION G



6.8 REMOTE SINGLE EVAPORATOR WITH CASE EEPR – CONFIGURATION H

The S3C case controller is capable of controlling and monitoring single temperature, single evaporator refrigerated fixtures installed as a line-up. The case shown in the diagram below is the lead case of the line-up. In this scenario, one S3C case controller is required. The S3C case controller will control all case functions as well as take all the desired sensor inputs and drive the EEPR. The typical control method is to regulate the discharge air temperature of the evaporator with the EEPR while allowing the TEV to control superheat. That the required liquid line solenoid (LLS) may be installed as one-per-case or one-per-line-up. Case numbers 2, 3, 4,...n will require their own S3C case controller as well.

REMOTE SINGLE EVAPORATOR WITH CASE EEPR – CONFIGURATION H



To configure the S3C control package for configuration H shown above, follow these directions:

If the controller has not been factory set, then upon initial start-up, the controller will be in set-up mode and the screen will display SELF (for self-contained case).

1. Press the **SET** button, then use ▲▼ buttons to scroll to no; press **SET.** This will configure the controller to support a remote case.
2. Press the **SET** button when rc id (Rack Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Rack Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
3. Press the **SET** button when LU id (Line-up Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Line-up Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
4. Press the **SET** button when CA id (Case Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Case Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
5. Press the **SET** button when APPL (Application Type) is displayed. Use the ▲ button and scroll to SnGL (Single Temperature Case); press **SET.**
6. Press the **SET** button when StPC (Local Stepper Valve Configuration) is displayed. Use the ▲ button to scroll to EEPr (Electronic Evaporator Pressure Regulator); press **SET.** This is the valve that is attached to the main S3C Case Controller.
7. Press the **SET** button when EuLu (Expansion Valve Type) is displayed. Use the ▲ button to scroll to tEu (Thermostatic Expansion Valve); press **SET.**
8. Press the **SET** button when bAS (Building Automation System Expected) is displayed. Use the ▲▼ buttons to choose YES or no; press **SET.**

   a. If YES is chosen, the display will show bASP (Building Automation System Protocol). Press the SET button then use ▲▼ buttons to choose the B.A.S. Protocol based on the below chart; press **SET.**

Display	Meaning
7485	Modbus Protocol over RS-485
6485	Bacnet Protocol over RS-485
bA IP	Bacnet Protocol over IP (Ethernet)
7o IP	Modbus Protocol over IP (Ethernet)

9. Press the **SET** button when MoNtH (Month) is shown. Use the ▲ button to choose the current month; press **SET.**

10. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

11. Press the **SET** button when YEAr (Year) is shown. Use the ▲ button to choose the current year; press **SET.**

12. Press the **SET** button when t tME (Time) is shown. Use the ▲ button to choose the current time in 24 hour format; press **SET. Note: Holding the ▲ or ▼ down while setting the time will accelerate the scrolling.**

13. Press the **SET** button when rEFt (Refrigerant Type) is shown. Use the ▲▼ buttons to choose the Refrigerant Type; press **SET.** The list of refrigerants can be seen in Table 9 on page 99.

14. Press the **SET** button when nL in (Number of Cases Expected in Line-up) is shown. Use the ▲▼ buttons to choose the number of cases expected in the Line-up; press **SET.**

15. Press the **SET** button when EPrt (Evaporator Pressure Regulating Valve Type) is shown. Use the ▲▼ buttons to choose from either 2500 or 6386 depending on the valve; press **SET.** Please consult the literature supplied with the valve to determine the correct step count. For custom valve selection, see valve configuration menu in Section 11.

16. Press the **SET** button when EPrL (EPR Location) is shown. Press the ▲ button to scroll to L inE (EEPR per Line-up); press **SET.**

17. Press the **SET** button when dASP (Discharge Air Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

18. Press the **SET** button when dEFt (Defrost Type) is shown. Use the ▲▼ buttons to choose the Defrost Type; press **SET.** Defrost options are:

Display	Meaning
hGAS	Hot gas
ELEc	Electric
A ir	Air

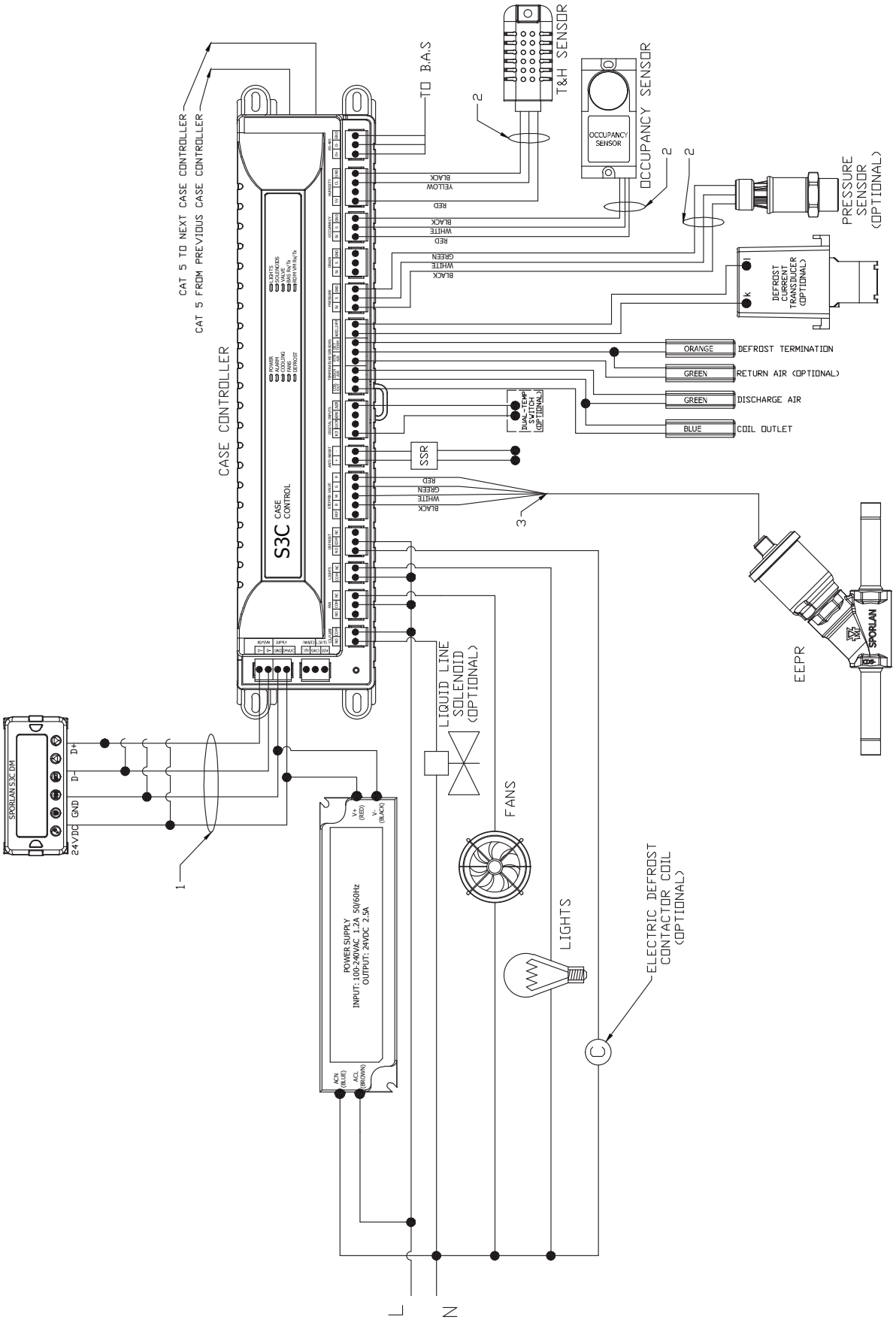
19. Press the **SET** button when dttP (Defrost Termination Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

20. Press the **SET** button when dttE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**

21. Press the **SET** button when dFPd (Number of Defrosts Per Day) is shown. Use the ▲▼ buttons to choose the defrost per day; press **SET.**

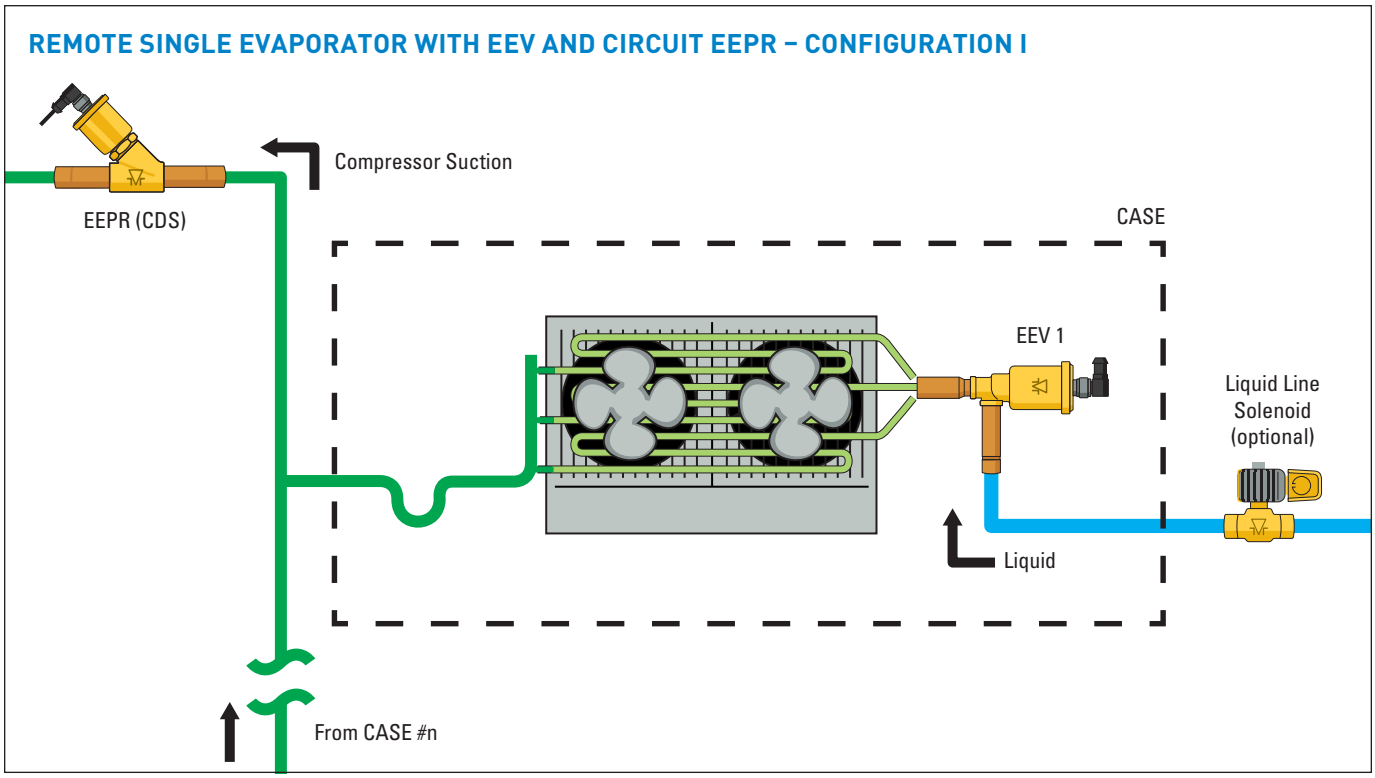
The S3C Case Control system is now set-up and will begin controlling the refrigerated display case.

WIRING DIAGRAM – CONFIGURATION H



6.9 REMOTE SINGLE EVAPORATOR WITH EEV AND CIRCUIT EEPR – CONFIGURATION I

The S3C case controller is capable of controlling and monitoring single temperature, single evaporator refrigerated fixtures installed as a line-up. The case shown in the diagram below is the lead case of the line-up. In this scenario, one S3C case controller and one S3C valve module are required. The S3C case controller will control all case functions as well as take all the desired sensor inputs and drive the EEV. The S3C valve module will drive the EEPR. The typical control method is to regulate the average discharge air temperature of the evaporators on the line-up with the EEPR while allowing the EEV to control superheat. The optional liquid line solenoid (LLS) may be installed as one-per-case or one-per-line-up. In addition, only one case in the line-up (lead case) needs an EEPR connected to a S3C valve module. Case numbers 2, 3, 4,...n will require their own S3C case controller but not a S3C valve module with an EEPR if they share a common suction line with the lead case shown in the diagram below.



To configure the S3C control package for configuration I shown above, follow these directions:

If the controller has not been factory set, then upon initial start-up, the controller will be in set-up mode and the screen will display SELF (for self-contained case).

1. Press the **SET** button, then use ▲▼ buttons to scroll to no; press **SET.** This will configure the controller to support a remote case.

2. Press the **SET** button when rc id (Rack Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Rack Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

3. Press the **SET** button when LU id (Line-up Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Line-up Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

4. Press the **SET** button when CA id (Case Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Case Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

5. Press the **SET** button when APPL (Application Type) is displayed. Use the ▲ button and scroll to Sn9L (Single Temperature Case); press **SET.**

6. Press the **SET** button when StPC (Local Stepper Valve Configuration) is displayed. Use the ▲ button to scroll to EEu (Electronic Expansion Valve); press **SET.** This is the valve that is attached to the main S3C Case Controller.

7. Press the **SET** button when EuLu (Expansion Valve Type) is displayed. Use ▲▼ buttons to choose the Expansion Valve Type based on the below chart; press **SET.**

Display	Meaning
PULS	Pulse Width Modulation Valve
500	500 Step Valve
1596	1596 Step Valve
2500	2500 Step Valve
3 193	3193 Step Valve
6386	6386 Step Valve
cUSt	Custom Stepper Valve (See Section 11)

8. Press the **SET** button when nEuP (Number of Evaporators) is displayed. Use the ▲ button and scroll to 1 (1 Evaporator); press **SET.**

9. Press the **SET** button when bAS (Building Automation System Expected) is displayed. Use the ▲▼ buttons to choose YES or no; press **SET.**

   a. If YES is chosen, the display will show bASP (Building Automation System Protocol). Press the **SET** button then use ▲▼ buttons to choose the B.A.S. Protocol based on the below chart; press **SET.**

Display	Meaning
n485	Modbus Protocol over RS-485
b485	Bacnet Protocol over RS-485
bA IP	Bacnet Protocol over IP (Ethernet)
no IP	Modbus Protocol over IP (Ethernet)

10. Press the **SET** button when nonH (Month) is shown. Use the ▲ button to choose the current month; press **SET.**

11. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

12. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

13. Press the **SET** button when t nnE (Time) is shown. Use the ▲ button to choose the current time in 24 hour format; press **SET. Note: Holding the ▲ or ▼ down while setting the time will accelerate the scrolling.**

14. Press the **SET** button when rEFt (Refrigerant Type) is shown. Use the ▲▼ buttons to choose the Refrigerant Type; press **SET.** The list of refrigerants can be seen in Table on page 99.

15. Press the **SET** button when nL In (Number of Cases Expected in Line-up) is shown. Use the ▲▼ buttons to choose the number of cases expected in the Line-up; press **SET.**

16. Press the **SET** button when EPrt (Evaporator Pressure Regulating Valve Type) is shown. Use the ▲▼ buttons to choose from either 2500 or 6386 depending on the valve; press **SET.** Please consult the literature supplied with the valve to determine the correct step count. For custom valve selection, see valve configuration menu in Section 11.

17. Press the **SET** button when EPrL (EPR Location) is shown. Press the ▲ button to scroll to L InE (EEPR per Line-up); press **SET.**

18. Press the **SET** button when dASP (Discharge Air Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

19. Press the **SET** button when dEFt (Defrost Type) is shown. Use the ▲▼ buttons to choose the Defrost Type; press **SET.** Defrost options are:

Display	Meaning
hGAS	Hot gas
ELEc	Electric
Air	Air

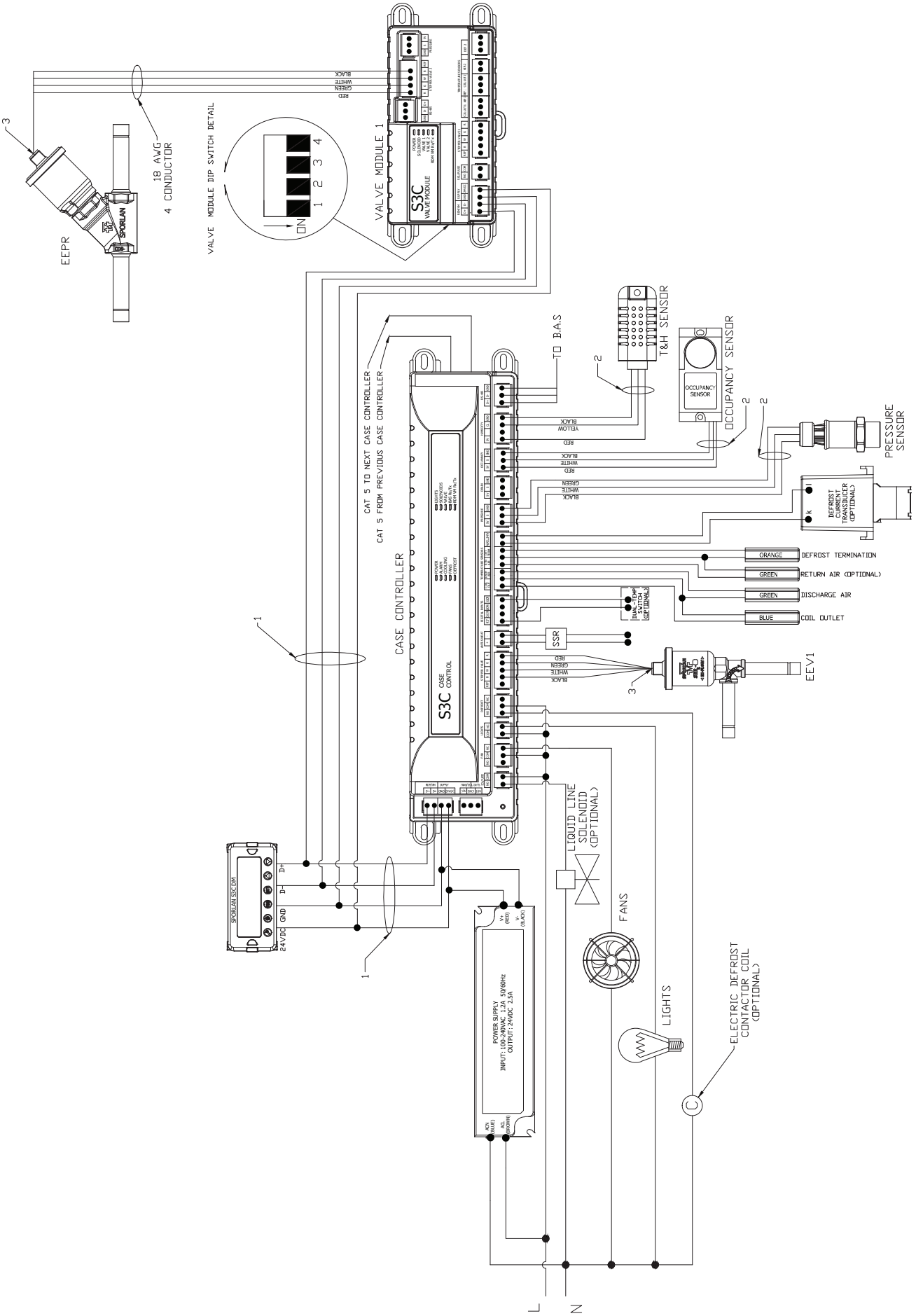
20. Press the **SET** button when dttP (Defrost Termination Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

21. Press the **SET** button when dttE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**

22. Press the **SET** button when dFPd (Number of Defrosts Per Day) is shown. Use the ▲▼ buttons to choose the defrost per day; press **SET.**

The S3C Case Control system is now set-up and will begin controlling the refrigerated display case.

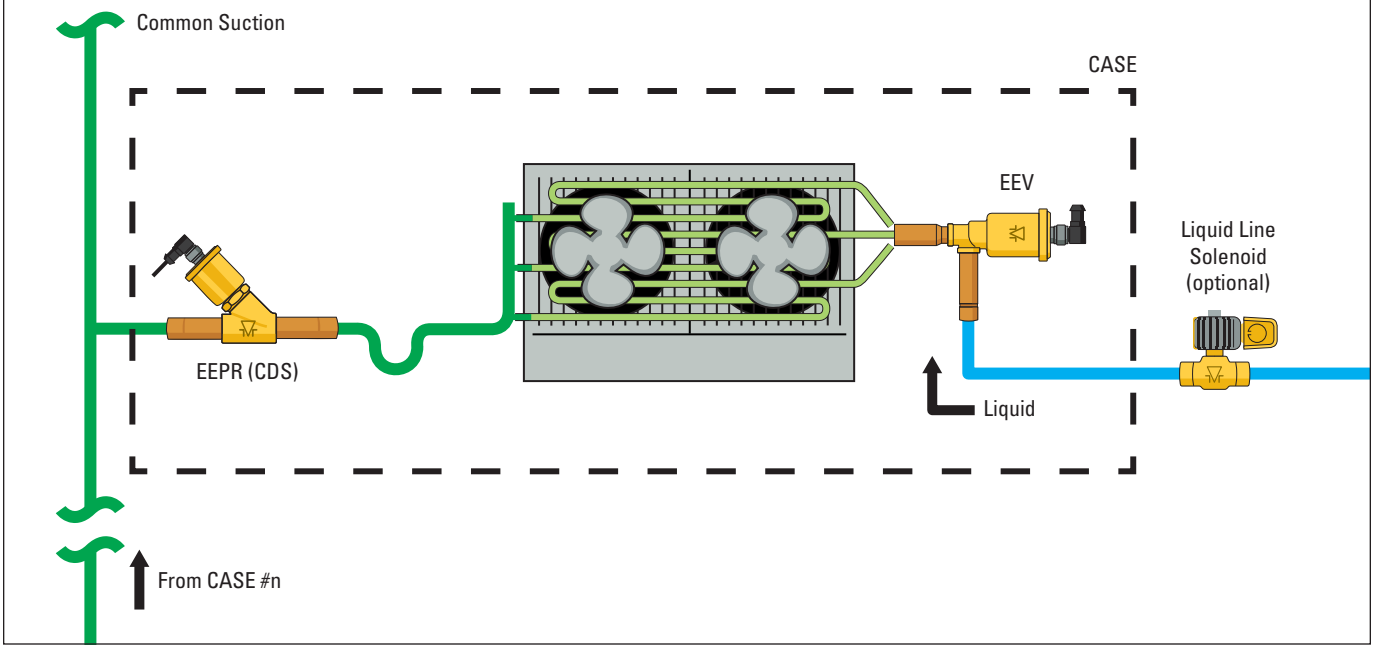
WIRING DIAGRAM – CONFIGURATION I



6.10 REMOTE SINGLE EVAPORATOR WITH EEV AND CASE EEPR – CONFIGURATION J

The S3C case controller is capable of controlling and monitoring single temperature, single evaporator refrigerated fixtures installed as a line-up. The case shown in the diagram below is the lead case of the line-up. In this scenario, one S3C case controller and one S3C valve module are required. The S3C case controller will control all case functions as well as take all the desired sensor inputs and drive the EEV. The S3C valve module will drive the EEPR. The typical control method is to regulate the discharge air temperature of the case evaporator with the EEPR while allowing the EEV to control superheat. The optional liquid line solenoid (LLS) may be installed as one-per-case or one-per-line-up. In this configuration, each case in the line-up has its own EEPR connected to the S3C valve module. Case numbers 2, 3, 4,...n will require their own S3C case controller and valve module as well. All case functions will be synchronized across the line-up in this configuration with the exception of temperature control.

REMOTE SINGLE EVAPORATOR WITH EEV AND CASE EEPR – CONFIGURATION J



To configure the S3C control package for configuration J shown above, follow these directions:

If the controller has not been factory set, then upon initial start-up, the controller will be in set-up mode and the screen will display SELF (for self-contained case).

1. Press the **SET** button, then use ▲▼ buttons to scroll to no; press **SET.** This will configure the controller to support a remote case.
2. Press the **SET** button when rc id (Rack Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Rack Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
3. Press the **SET** button when LU id (Line-up Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Line-up Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
4. Press the **SET** button when CA id (Case Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Case Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
5. Press the **SET** button when APPL (Application Type) is displayed. Use the ▲ button and scroll to SnGL (Single Temperature Case); press **SET.**
6. Press the **SET** button when StPC (Local Stepper Valve Configuration) is displayed. Use the ▲ button to scroll to EEu (Electronic Expansion Valve); press **SET.** This is the valve that is attached to the main S3C Case Controller.
7. Press the **SET** button when EuLu (Expansion Valve Type) is displayed. Use ▲▼ buttons to choose the Expansion Valve Type based on the below chart; press **SET.**

Display	Meaning
PULS	PULSE WIDTH MODULATION VALVE
500	500 STEP VALVE
1596	1596 STEP VALVE
2500	2500 STEP VALVE
3193	3193 STEP VALVE
6386	6386 STEP VALVE
CUSt	CUSTOM STEPPER VALVE (See Section 11)

8. Press the **SET** button when nEuP (Number of Evaporators) is displayed. Use the ▲ button and scroll to 1 (1 Evaporator); press **SET.**

9. Press the **SET** button when bAS (Building Automation System Expected) is displayed. Use the ▲▼ buttons to choose YES or no; press **SET.**

   a. If YES is chosen, the display will show bASP (Building Automation System Protocol). Press the **SET** button then use ▲▼ buttons to choose the B.A.S. Protocol based on the below chart; press **SET.**

Display	Meaning
485	Modbus Protocol over RS-485
6485	Bacnet Protocol over RS-485
bA IP	Bacnet Protocol over IP (Ethernet)
Mo IP	Modbus Protocol over IP (Ethernet)

10. Press the **SET** button when MotH (Month) is shown. Use the ▲ button to choose the current month; press **SET.**

11. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

12. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

13. Press the **SET** button when t MiE (Time) is shown. Use the ▲ button to choose the current time in 24 hour format; press **SET. Note: Holding the ▲ or ▼ down while setting the time will accelerate the scrolling.**

14. Press the **SET** button when rEFt (Refrigerant Type) is shown. Use the ▲▼ buttons to choose the Refrigerant Type; press **SET.** The list of refrigerants can be seen in Table on page 99.

15. Press the **SET** button when nL in (Number of Cases Expected in Line-up) is shown. Use the ▲▼ buttons to choose the number of cases expected in the Line-up; press **SET.**

16. Press the **SET** button when EPrt (Evaporator Pressure Regulating Valve Type) is shown. Use the ▲▼ buttons to choose from either 2500 or 6386 depending on the valve; press **SET.** Please consult the literature supplied with the valve to determine the correct step count. For custom valve selection, see valve configuration menu in Section 11.

17. Press the **SET** button when EPrL (EPR Location) is shown. Press the ▲ button to scroll to CASE EEPR per Line-up); press **SET.**

18. Press the **SET** button when dASP (Discharge Air Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

19. Press the **SET** button when dEFt (Defrost Type) is shown. Use the ▲▼ buttons to choose the Defrost Type; press **SET.** Defrost options are:

Display	Meaning
hGAS	Hot gas
ELEc	Electric
Air	Air

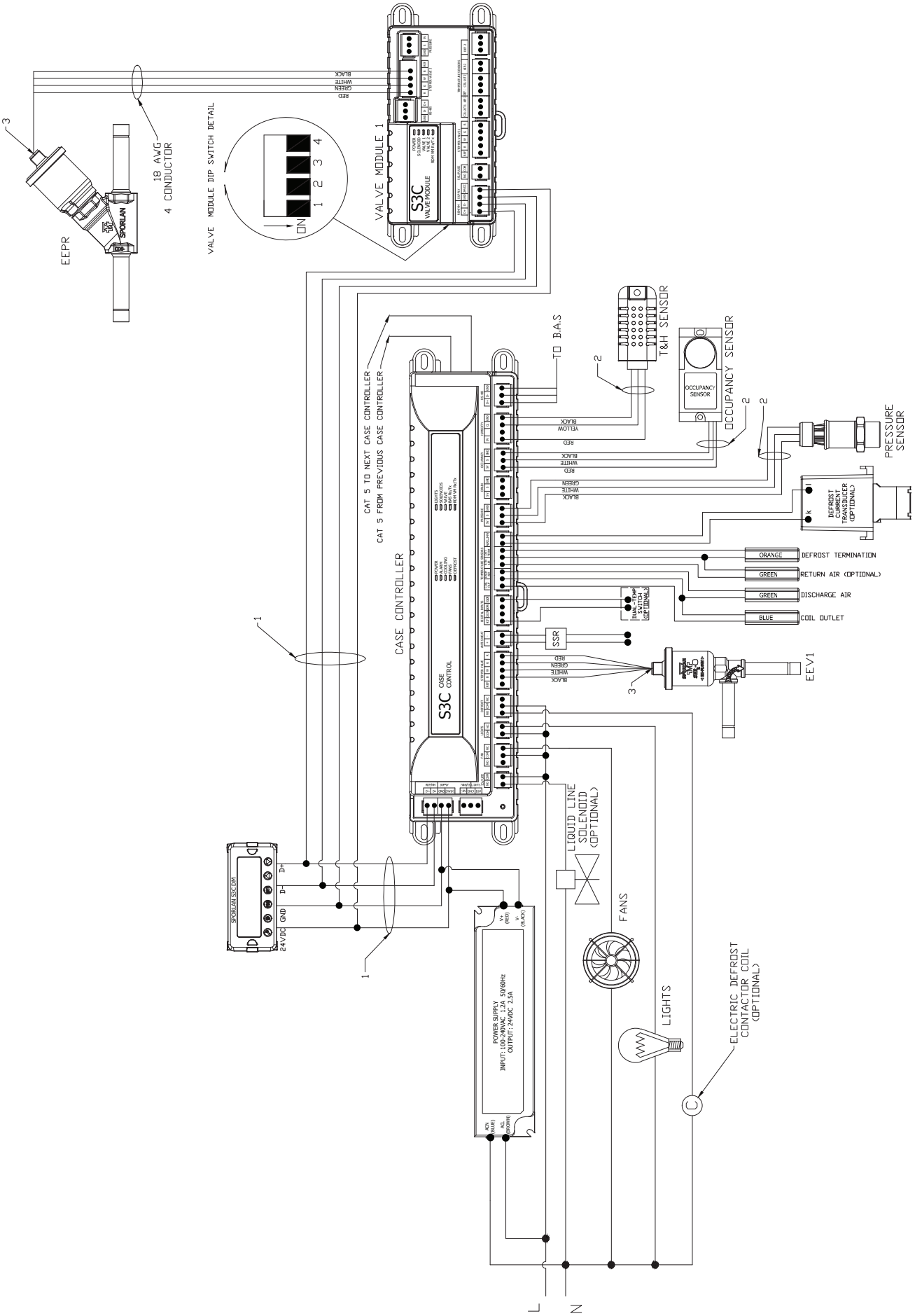
20. Press the **SET** button when dtEP (Defrost Termination Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

21. Press the **SET** button when dtEE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**

22. Press the **SET** button when dFPd (Number of Defrosts Per Day) is shown. Use the ▲▼ buttons to choose the defrost per day; press **SET.**

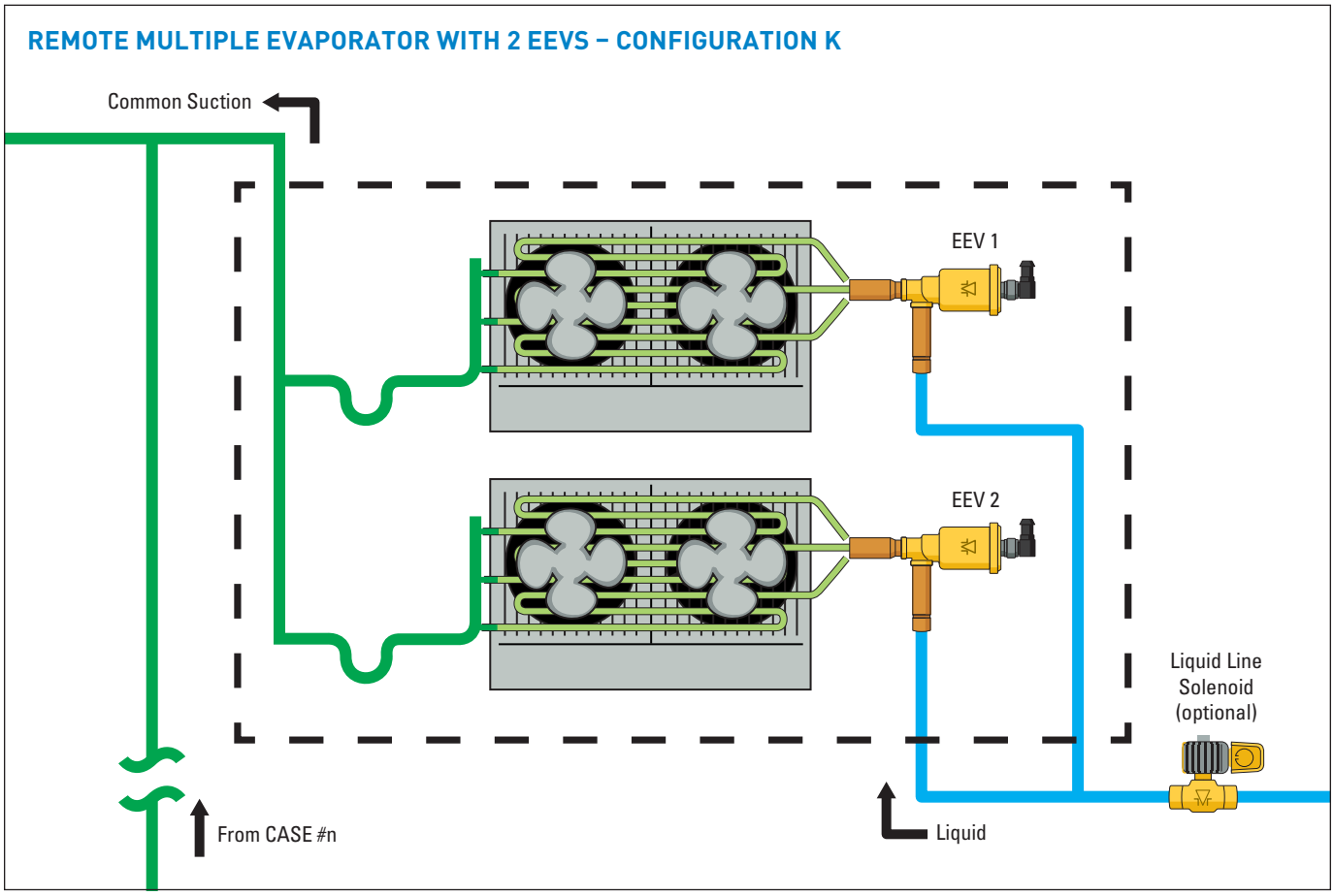
The S3C Case Control system is now set-up and will begin controlling the refrigerated display case.

WIRING DIAGRAM – CONFIGURATION J



6.11 REMOTE MULTIPLE EVAPORATOR WITH 2 EEVS – CONFIGURATION K

The S3C case controller is capable of controlling and monitoring single temperature, multiple evaporator refrigerated fixtures installed as a line-up. The case shown in the diagram below is the lead case of the line-up. In this scenario, one S3C case controller and one S3C valve module are required. The S3C case controller will control all case functions as well as take all the desired sensor inputs for one evaporator and drive EEV1. The S3C valve module will take all the desired sensor inputs for the second evaporator and drive EEV2. The typical control method is to regulate the individual discharge air temperature of each evaporator with the EEVs. The optional liquid line solenoid (LLS) may be installed as one-per-case or one-per-line-up. Case numbers 2, 3, 4,...n that have two evaporators will require their own S3C case controller and S3C valve module as well.



To configure the S3C control package for configuration K shown above, follow these directions:

If the controller has not been factory set, then upon initial start-up, the controller will be in set-up mode and the screen will display SELF (for self-contained case).

1. Press the **SET** button, then use ▲▼ buttons to scroll to no; press **SET.** This will configure the controller to support a remote case.

2. Press the **SET** button when rc id (Rack Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Rack Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

3. Press the **SET** button when LU id (Line-up Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Line-up Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

4. Press the **SET** button when CA id (Case Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Case Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

5. Press the **SET** button when APPL (Application Type) is displayed. Use the ▲ button and scroll to SnGL (Single Temperature Case); press **SET.**

6. Press the **SET** button when StPC (Local Stepper Valve Configuration) is displayed. Use the ▲ button to scroll to EEu (Electronic Expansion Valve); press **SET.** This is the valve that is attached to the main S3C Case Controller.

7. Press the **SET** button when EuLu (Expansion Valve Type) is displayed. Use ▲▼ buttons to choose the Expansion Valve Type based on the below chart; press **SET.**

Display	Meaning
PuLS	Pulse Width Modulation Valve
500	500 Step Valve
1596	1596 Step Valve
2500	2500 Step Valve
3 193	3193 Step Valve
6386	6386 Step Valve
cUSt	Custom Stepper Valve (See Section 11)

8. Press the **SET** button when nEuP (Number of Evaporators) is displayed. Use the ▲ button and scroll to 2(2 Evaporators); press **SET.**

9. Press the **SET** button when bAS (Building Automation System Expected) is displayed. Use the ▲▼ buttons to choose YES or no; press **SET.**

   a. If YES is chosen, the display will show bASP (Building Automation System Protocol). Press the **SET** button then use ▲▼ buttons to choose the B.A.S. Protocol based on the below chart; press **SET.**

Display	Meaning
n485	Modbus Protocol over RS-485
b485	Bacnet Protocol over RS-485
bA IP	Bacnet Protocol over IP (Ethernet)
no IP	Modbus Protocol over IP (Ethernet)

10. Press the **SET** button when nonH (Month) is shown. Use the ▲ button to choose the current month; press **SET.**

11. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

12. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

13. Press the **SET** button when t nnE (Time) is shown. Use the ▲ button to choose the current time in 24 hour format; press **SET. Note: Holding the ▲ or ▼ down while setting the time will accelerate the scrolling.**

14. Press the **SET** button when rEFt (Refrigerant Type) is shown. Use the ▲▼ buttons to choose the Refrigerant Type; press **SET.** The list of refrigerants can be seen in Table on page 99.

15. Press the **SET** button when nL in (Number of Cases Expected in Line-up) is shown. Use the ▲▼ buttons to choose the number of cases expected in the Line-up; press **SET.**

16. Press the **SET** button when EPrt (Evaporator Pressure Regulating Valve Type) is shown. Press the ▼ button to scroll to nonE (No EEPR); press **SET.**

17. Press the **SET** button when dASP (Discharge Air Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

18. Press the **SET** button when dEFt (Defrost Type) is shown. Use the ▲▼ buttons to choose the Defrost Type; press **SET.** Defrost options are:

Display	Meaning
hGAS	Hot gas
ELEc	Electric
Air	Air

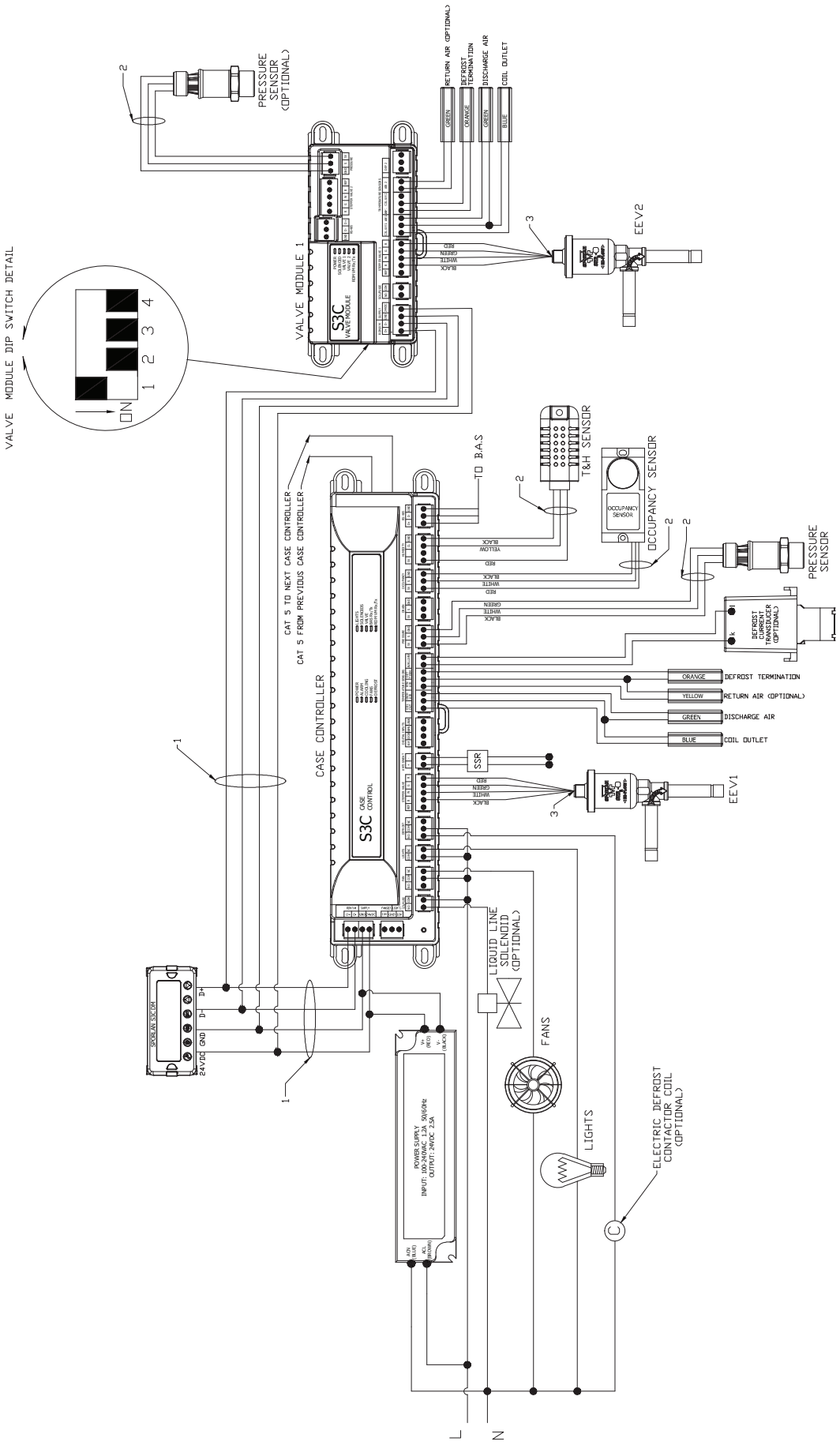
19. Press the **SET** button when dttP (Defrost Termination Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

20. Press the **SET** button when dttE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**

21. Press the **SET** button when dFPd (Number of Defrosts Per Day) is shown. Use the ▲▼ buttons to choose the defrost per day; press **SET.**

The S3C Case Control system is now set-up and will begin controlling the refrigerated display case.

WIRING DIAGRAM – CONFIGURATION K

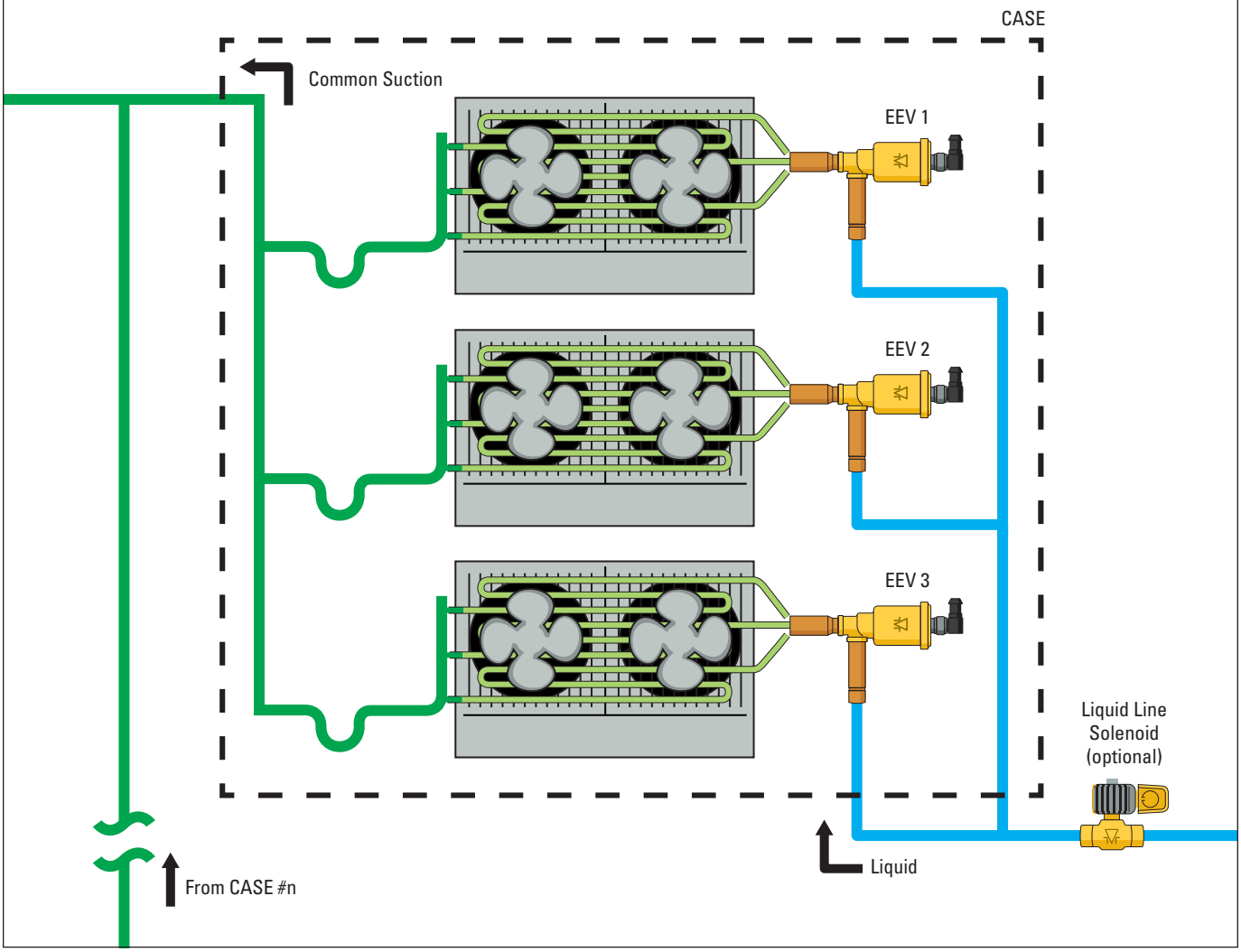


6.12 REMOTE MULTIPLE EVAPORATOR WITH 3 EEV – CONFIGURATION L

The S3C case controller is capable of controlling and monitoring single temperature, multiple evaporator refrigerated fixtures installed as a line-up. The case shown in the diagram below is the lead case of the line-up. In this scenario, one S3C case controller and one S3C valve module are required. The S3C case controller will control all case functions as well as take all the desired sensor inputs for one evaporator and drive EEV1. The S3C valve module will take all the desired sensor inputs for the second and third evaporators as well as drive both EEV2 and EEV3. The typical control method is to regulate the individual discharge air temperature of each evaporator with the EEVs. The optional liquid line solenoid (LLS) may be installed as one-per-case or one-per-line-up. Case numbers 2, 3, 4,…n that have two or three evaporators will require their own S3C case controller and S3C valve module as well.

If a liquid line solenoid is used, it must be installed on the common liquid line feeding the evaporators and it should be wired into the case controller. This configuration only supports Discharge Air control.

REMOTE MULTIPLE EVAPORATOR WITH 3 EEVS – CONFIGURATION L



To configure the S3C control package for configuration L shown above, follow these directions:

If the controller has not been factory set, then upon initial start-up, the controller will be in set-up mode and the screen will display SELF (for self-contained case).

1. Press the **SET** button, then use ▲▼ buttons to scroll to no; press **SET.** This will configure the controller to support a remote case.
2. Press the **SET** button when rc id (Rack Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Rack Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
3. Press the **SET** button when LU id (Line-up Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Line-up Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

4. Press the **SET** button when CA id (Case Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Case Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

5. Press the **SET** button when APPL (Application Type) is displayed. Use the ▲ button and scroll to SnGL (Single Temperature Case); press **SET.**

6. Press the **SET** button when StPC (Local Stepper Valve Configuration) is displayed. Use the ▲ button to scroll to EEu (Electronic Expansion Valve); press **SET.** This is the valve that is attached to the main S3C Case Controller.

7. Press the **SET** button when EuLu (Expansion Valve Type) is displayed. Use ▲▼ buttons to choose the Expansion Valve Type based on the below chart; press **SET.**

Display	Meaning
PULS	Pulse Width Modulation Valve
500	500 Step Valve
1596	1596 Step Valve
2500	2500 Step Valve
3 193	3193 Step Valve
6386	6386 Step Valve
cUSt	Custom Stepper Valve (See Section 11)

8. Press the **SET** button when nEuP (Number of Evaporators) is displayed. Use the ▲ button and scroll to 2(2 Evaporators); press **SET.**

9. Press the **SET** button when bAS (Building Automation System Expected) is displayed. Use the ▲▼ buttons to choose YES or no; press **SET.**

   a. If YES is chosen, the display will show bASP (Building Automation System Protocol). Press the **SET** button then use ▲▼ buttons to choose the B.A.S. Protocol based on the below chart; press **SET.**

Display	Meaning
7485	Modbus Protocol over RS-485
b485	Bacnet Protocol over RS-485
bA IP	Bacnet Protocol over IP (Ethernet)
7o IP	Modbus Protocol over IP (Ethernet)

10. Press the **SET** button when 7otH (Month) is shown. Use the ▲ button to choose the current month; press **SET.**

11. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

12. Press the **SET** button when YEAr (Year) is shown. Use the ▲ button to choose the current day; press **SET.**

13. Press the **SET** button when t 7iE (Time) is shown. Use the ▲ button to choose the current time in 24 hour format; press **SET. Note: Holding the ▲ or ▼ down while setting the time will accelerate the scrolling.**

14. Press the **SET** button when rEFt (Refrigerant Type) is shown. Use the ▲▼ buttons to choose the Refrigerant Type; press **SET.** The list of refrigerants can be seen in Table on page 99.

15. Press the **SET** button when nL in (Number of Cases Expected in Line-up) is shown. Use the ▲▼ buttons to choose the number of cases expected in the Line-up; press **SET.**

16. Press the **SET** button when EPrt (Evaporator Pressure Regulating Valve Type) is shown. Press the ▼ button to scroll to nonE (No EEPR); press **SET.**

17. Press the **SET** button when dASP (Discharge Air Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

18. Press the **SET** button when dEFt (Defrost Type) is shown. Use the ▲▼ buttons to choose the Defrost Type; press **SET.** Defrost options are:

Display	Meaning
hGAS	Hot gas
ELEc	Electric
Air	Air

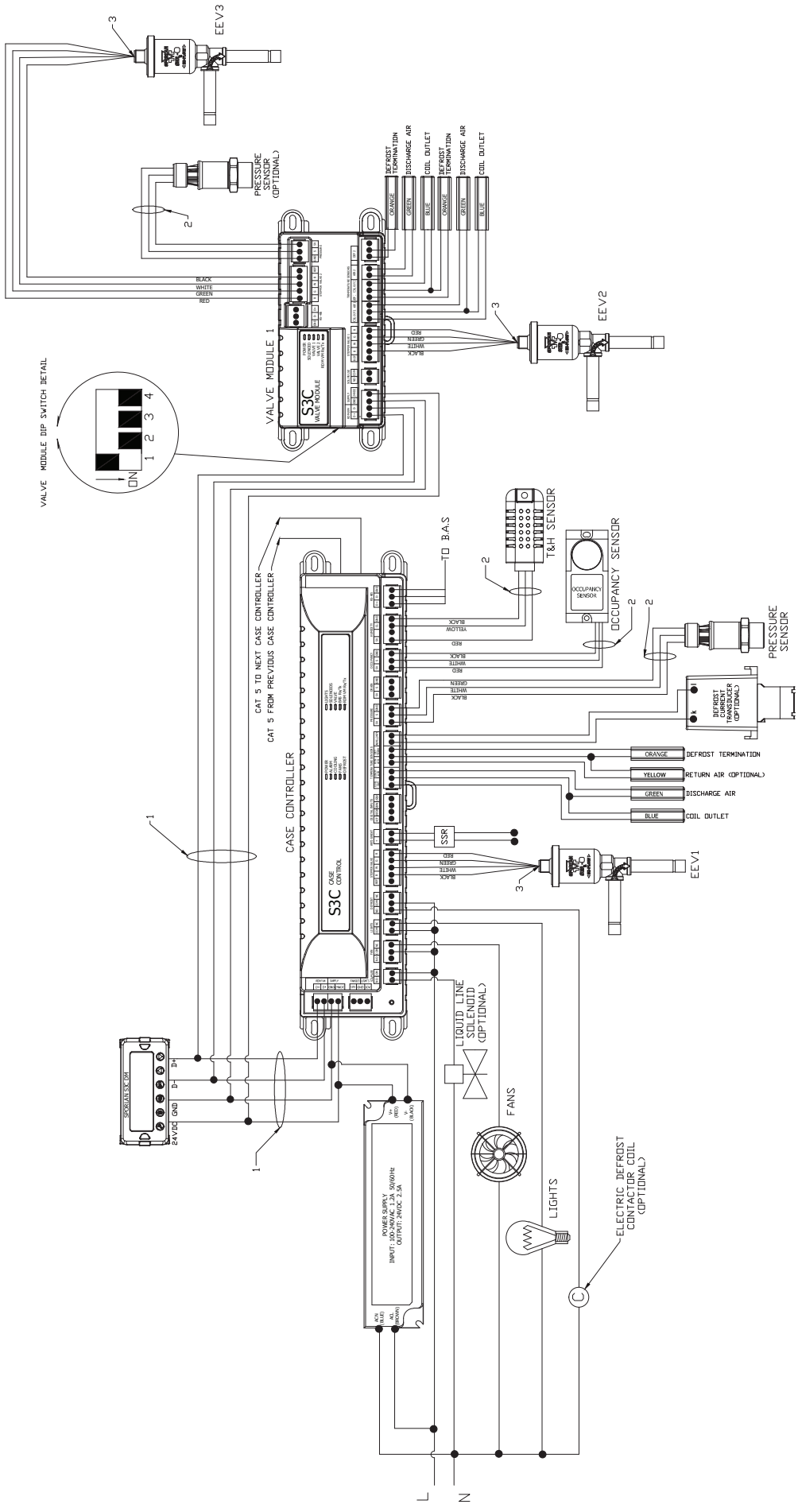
19. Press the **SET** button when dttP (Defrost Termination Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

20. Press the **SET** button when dttE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**

21. Press the **SET** button when dFPd (Number of Defrosts Per Day) is shown. Use the ▲▼ buttons to choose the defrost per day; press **SET.**

The S3C Case Control system is now set-up and will begin controlling the refrigerated display case.

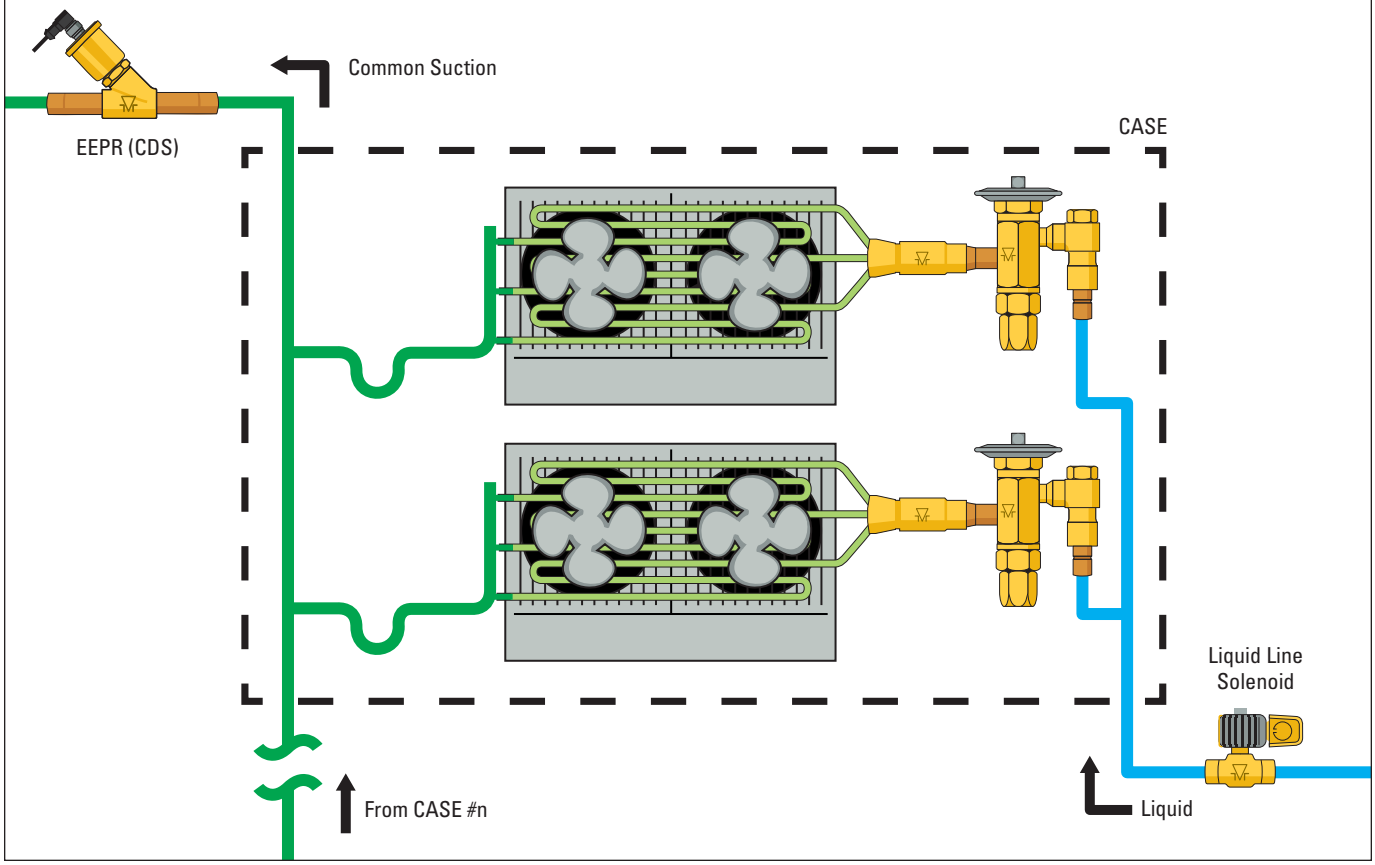
WIRING DIAGRAM – CONFIGURATION L



6.13 REMOTE MULTIPLE EVAPORATOR WITH CIRCUIT EEPR – CONFIGURATION M

The S3C case controller is capable of controlling and monitoring single temperature, multiple evaporator refrigerated fixtures installed as a line-up. The case shown in the diagram below is the lead case of the line-up. In this scenario, one S3C case controller is required. The S3C case controller will control all case functions as well as take all the desired sensor inputs and drive the EEPR. The typical control method is to regulate the average discharge air temperature of all evaporators on the line-up with the EEPR while allowing the TEVs to control superheat. The EEPR is located in the common suction line. The required liquid line solenoid (LLS) may be installed as one-per-case or one-per-line-up. In addition, only one case in the line-up (lead case) needs an EEPR wired to the S3C case controller. Case numbers 2, 3, 4,….n will require their own S3C case controller but will not have an EEPR connected to them if they share a common suction line with the lead case shown in the diagram below.

FIGURE 5 - REMOTE MULTIPLE EVAPORATOR WITH CIRCUIT EEPR – CONFIGURATION M



To configure the S3C control package for configuration M shown above, follow these directions:

If the controller has not been factory set, then upon initial start-up, the controller will be in set-up mode and the screen will display SELF (for self-contained case).

1. Press the **SET** button, then use ▲▼ buttons to scroll to no; press **SET.** This will configure the controller to support a remote case.
2. Press the **SET** button when rc id (Rack Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Rack Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
3. Press the **SET** button when LU id (Line-up Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Line-up Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
4. Press the **SET** button when CA id (Case Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Case Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
5. Press the **SET** button when APPL (Application Type) is displayed. Use the ▲ button and scroll to SnGL (Single Temperature Case); press **SET.**
6. Press the **SET** button when STPC (Local Stepper Valve Configuration) is displayed. Use ▲ button to scroll to EEPr (Electronic Evaporator Pressure Regulator); press **SET.** This is the valve that is attached to the main S3C Case Controller.

7. Press the **SET** button when EuLu (Expansion Valve Type) is displayed. Use ▲ button and scroll to tEu (Thermostatic Expansion Valve); press **SET.**

8. Press the **SET** button when bAS (Building Automation System Expected) is displayed. Use the ▲▼ buttons to choose YES or no; press **SET.**

   a. If YES is chosen, the display will show bASP (Building Automation System Protocol). Press the **SET** button then use ▲▼ buttons to choose the B.A.S. Protocol based on the below chart; press **SET.**

Display	Meaning
'i485	Modbus Protocol over RS-485
b485	Bacnet Protocol over RS-485
bA iP	Bacnet Protocol over IP (Ethernet)
'io iP	Modbus Protocol over IP (Ethernet)

9. Press the **SET** button when 'iotH (Month) is shown. Use the ▲ button to choose the current month; press **SET.**

10. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

11. Press the **SET** button when YEAr (Year) is shown. Use the ▲ button to choose the current day; press **SET.**

12. Press the **SET** button when t 'iE (Time) is shown. Use the ▲ button to choose the current time in 24 hour format; press **SET. Note: Holding the ▲ or ▼ down while setting the time will accelerate the scrolling.**

13. Press the **SET** button when rEFt (Refrigerant Type) is shown. Use the ▲▼ buttons to choose the Refrigerant Type; press **SET.** The list of refrigerants can be seen in Table on page 99.

14. Press the **SET** button when nL in (Number of Cases Expected in Line-up) is shown. Use the ▲▼ buttons to choose the number of cases expected in the Line-up; press **SET.**

15. Press the **SET** button when EPrt (Evaporator Pressure Regulating Valve Type) is shown. Use the ▲▼ buttons to choose from either 2500 or 6386 depending on the valve; press **SET.** Please consult the literature supplied with the valve to determine the correct step count. For custom valve selection, see valve configuration menu in Section 11.

16. Press the **SET** button when EPrL (EPR Location) is shown. Press the ▲ button to scroll to L inE (EEPR per Line-up); press **SET.**

17. Press the **SET** button when dASP (Discharge Air Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

18. Press the **SET** button when dEFt (Defrost Type) is shown. Use the ▲▼ buttons to choose the Defrost Type; press **SET.** Defrost options are:

Display	Meaning
hGAS	Hot gas
ELEc	Electric
Air	Air

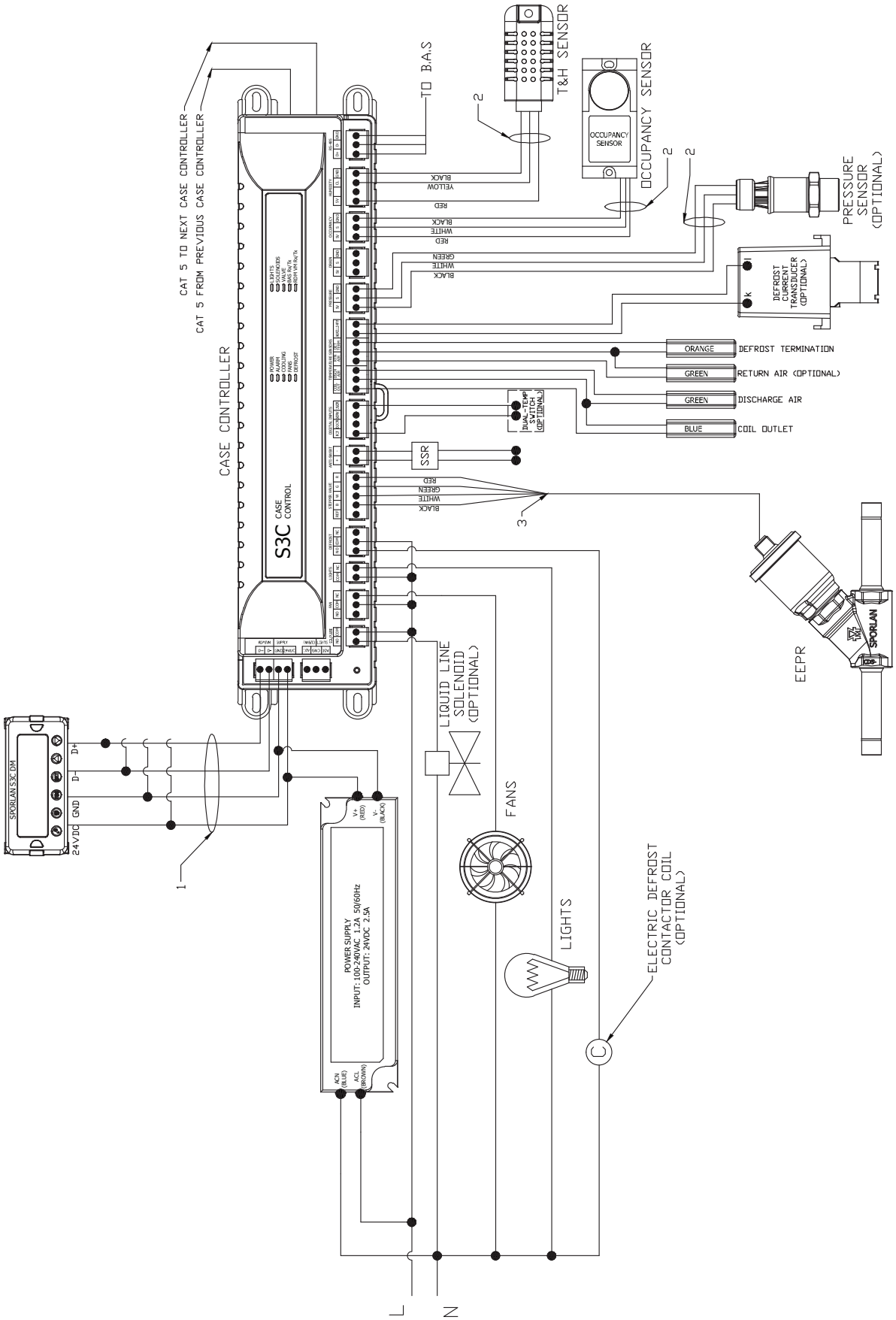
19. Press the **SET** button when dttP (Defrost Termination Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

20. Press the **SET** button when dttE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**

21. Press the **SET** button when dFPd (Number of Defrosts Per Day) is shown. Use the ▲▼ buttons to choose the defrost per day; press **SET.**

The S3C Case Control system is now set-up and will begin controlling the refrigerated display case.

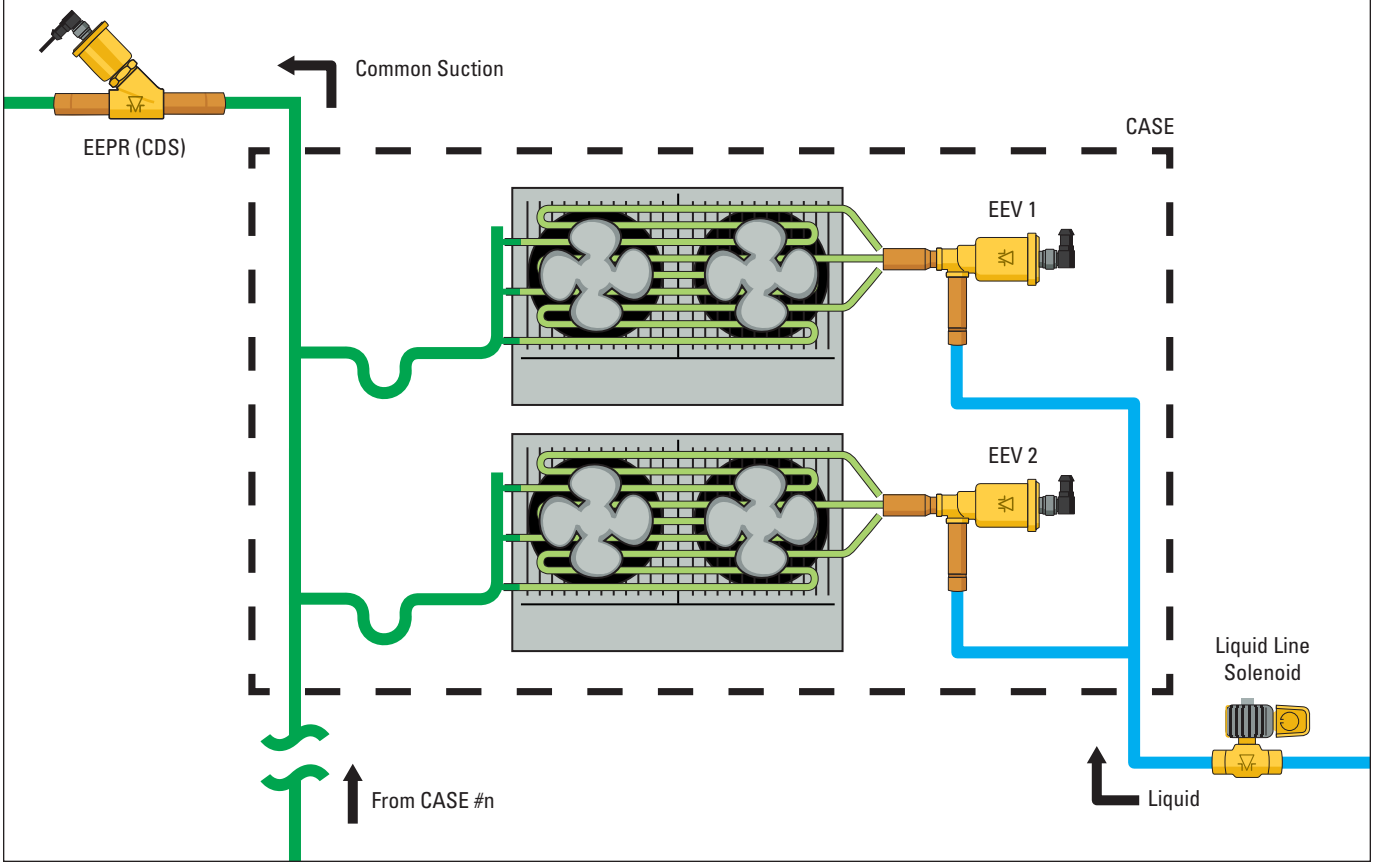
WIRING DIAGRAM – CONFIGURATION M



6.14 REMOTE MULTIPLE EVAPORATOR WITH 2 EEVS AND CIRCUIT EEPR – CONFIGURATION N

The S3C case controller is capable of controlling and monitoring single temperature, multiple evaporator refrigerated fixtures installed as a line-up. The case shown in the diagram below is the lead case of the line-up. In this scenario, one S3C case controller and one S3C valve module are required. The S3C case controller will control all case functions as well as take all the desired sensor inputs for one evaporator and drive EEV1. The S3C valve module will take all the desired sensor inputs for the second evaporator as well as drive both EEV2 and the EEPR. The typical control method is to regulate the average discharge air temperature of all evaporators on the line-up with the EEPR while allowing the EEVs to control superheat. The optional liquid line solenoid (LLS) may be installed as one-per-case or one-per-line-up. In addition, only one case in the line-up (lead case) needs an EEPR connected to the S3C valve module. Case numbers 2, 3, 4,...n that have two evaporators will require their own S3C case controller and valve module but will not have an EEPR connected to them if they share a common suction line with the lead case shown in the diagram below.

FIGURE 6 – REMOTE MULTIPLE EVAPORATOR WITH 2 EEVS AND CIRCUIT EEPR – CONFIGURATION N



To configure the S3C control package for configuration N shown above, follow these directions:

If the controller has not been factory set, then upon initial start-up, the controller will be in set-up mode and the screen will display SELF (for self-contained case).

1. Press the **SET** button, then use ▲▼ buttons to scroll to no; press **SET.** This will configure the controller to support a remote case.

2. Press the **SET** button when rc id (Rack Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Rack Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

3. Press the **SET** button when LU id (Line-up Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Line-up Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

4. Press the **SET** button when CA id (Case Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Case Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

5. Press the **SET** button when APPL (Application Type) is displayed. Use the ▲ button and scroll to SnGL (Single Temperature Case); press **SET.**

6. Press the **SET** button when StPC (Local Stepper Valve Configuration) is displayed. Use the ▲ button to scroll to EEu (Electronic Expansion Valve); press **SET.** This is the valve that is attached to the main S3C Case Controller.

7. Press the **SET** button when EuLu (Expansion Valve Type) is displayed. Use ▲▼ buttons to choose the Expansion Valve Type based on the below chart; press **SET.**

Display	Meaning
PULS	Pulse Width Modulation Valve
500	500 Step Valve
1596	1596 Step Valve
2500	2500 Step Valve
3 193	3193 Step Valve
6386	6386 Step Valve
cUSt	Custom Stepper Valve (See Section 11)

8. Press the **SET** button when nEuP (Number of Evaporators) is displayed. Use the ▲ button and scroll to 2(2 Evaporators); press **SET.**

9. Press the **SET** button when bAS (Building Automation System Expected) is displayed. Use the ▲▼ buttons to choose YES or no; press **SET.**

   a. If YES is chosen, the display will show bASP (Building Automation System Protocol). Press the **SET** button then use ▲▼ buttons to choose the B.A.S. Protocol based on the below chart; press **SET.**

Display	Meaning
n485	Modbus Protocol over RS-485
6485	Bacnet Protocol over IP (Ethernet)
bA nP	Bacnet Protocol over IP (Ethernet)
no nP	Modbus Protocol over IP (Ethernet)

10. Press the **SET** button when noth (Month) is shown. Use the ▲ button to choose the current month; press **SET.**

11. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

12. Press the **SET** button when YEAr (Year) is shown. Use the ▲ button to choose the current day; press **SET.**

13. Press the **SET** button when t nmE (Time) is shown. Use the ▲ button to choose the current time in 24 hour format; press **SET. Note: Holding the ▲ or ▼ down while setting the time will accelerate the scrolling.**

14. Press the **SET** button when rEFt (Refrigerant Type) is shown. Use the ▲▼ buttons to choose the Refrigerant Type; press **SET.** The list of refrigerants can be seen in Table on page 99.

15. Press the **SET** button when nL in (Number of Cases Expected in Line-up) is shown. Use the ▲▼ buttons to choose the number of cases expected in the Line-up; press **SET.**

16. Press the **SET** button when EPrt (Evaporator Pressure Regulating Valve Type) is shown. Use the ▲▼ buttons to choose from either 2500 or 6386 depending on the valve; press **SET.** Please consult the literature supplied with the valve to determine the correct step count. For custom valve selection, see valve configuration menu in Section 11.

17. Press the **SET** button when EPrL (EPR Location) is shown. Press the ▲ button to scroll to L inE (EEPR per Line-up); press **SET.**

18. Press the **SET** button when dASP (Discharge Air Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

19. Press the **SET** button when dEFt (Defrost Type) is shown. Use the ▲▼ buttons to choose the Defrost Type; press **SET.** Defrost options are:

Display	Meaning
hGAS	Hot gas
ELEc	Electric
Air	Air

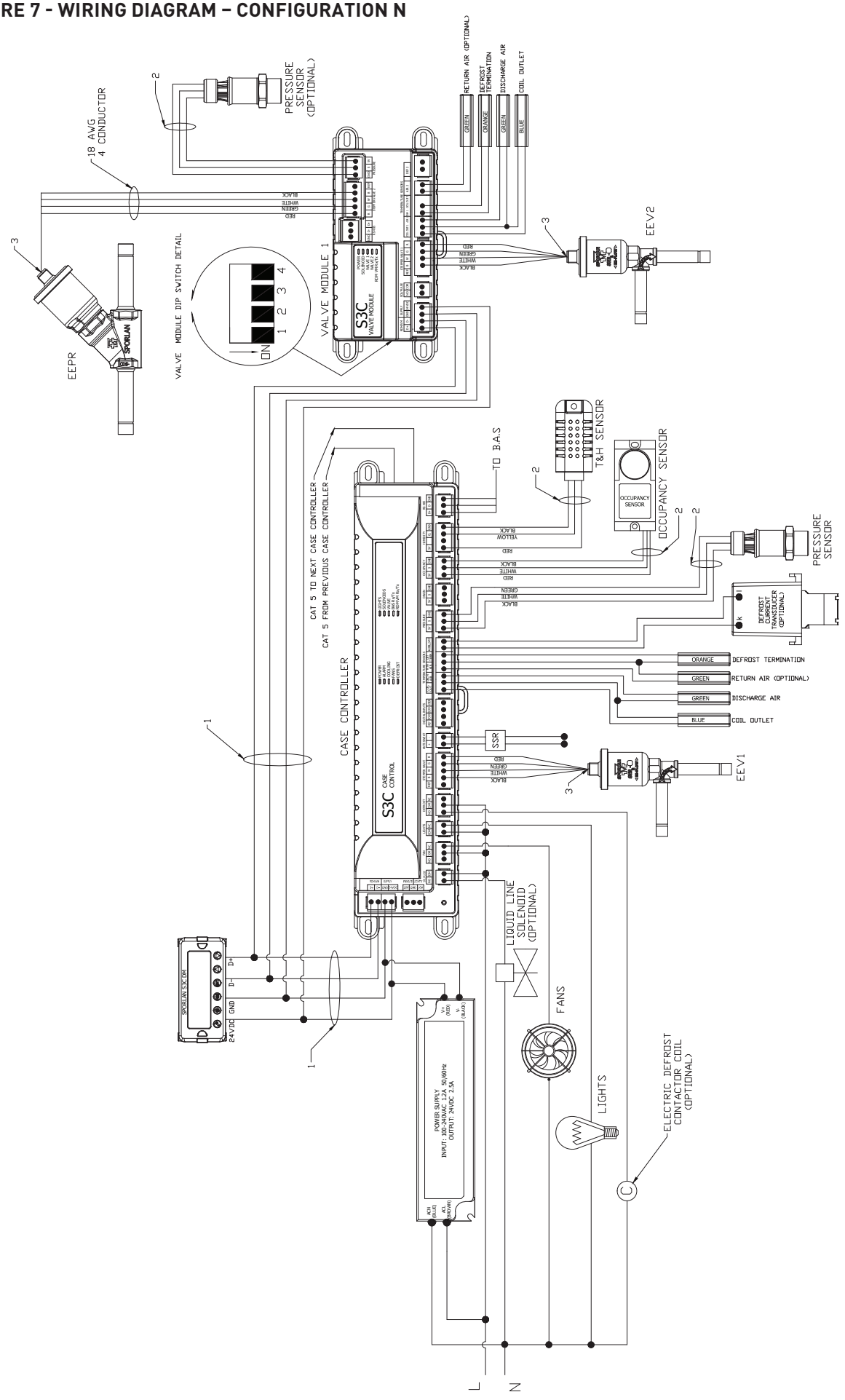
20. Press the **SET** button when dtEP (Defrost Termination Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

21. Press the **SET** button when dttE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**

22. Press the **SET** button when dFPd (Number of Defrosts Per Day) is shown. Use the ▲▼ buttons to choose the defrost per day; press **SET.**

The S3C Case Control system is now set-up and will begin controlling the refrigerated display case.

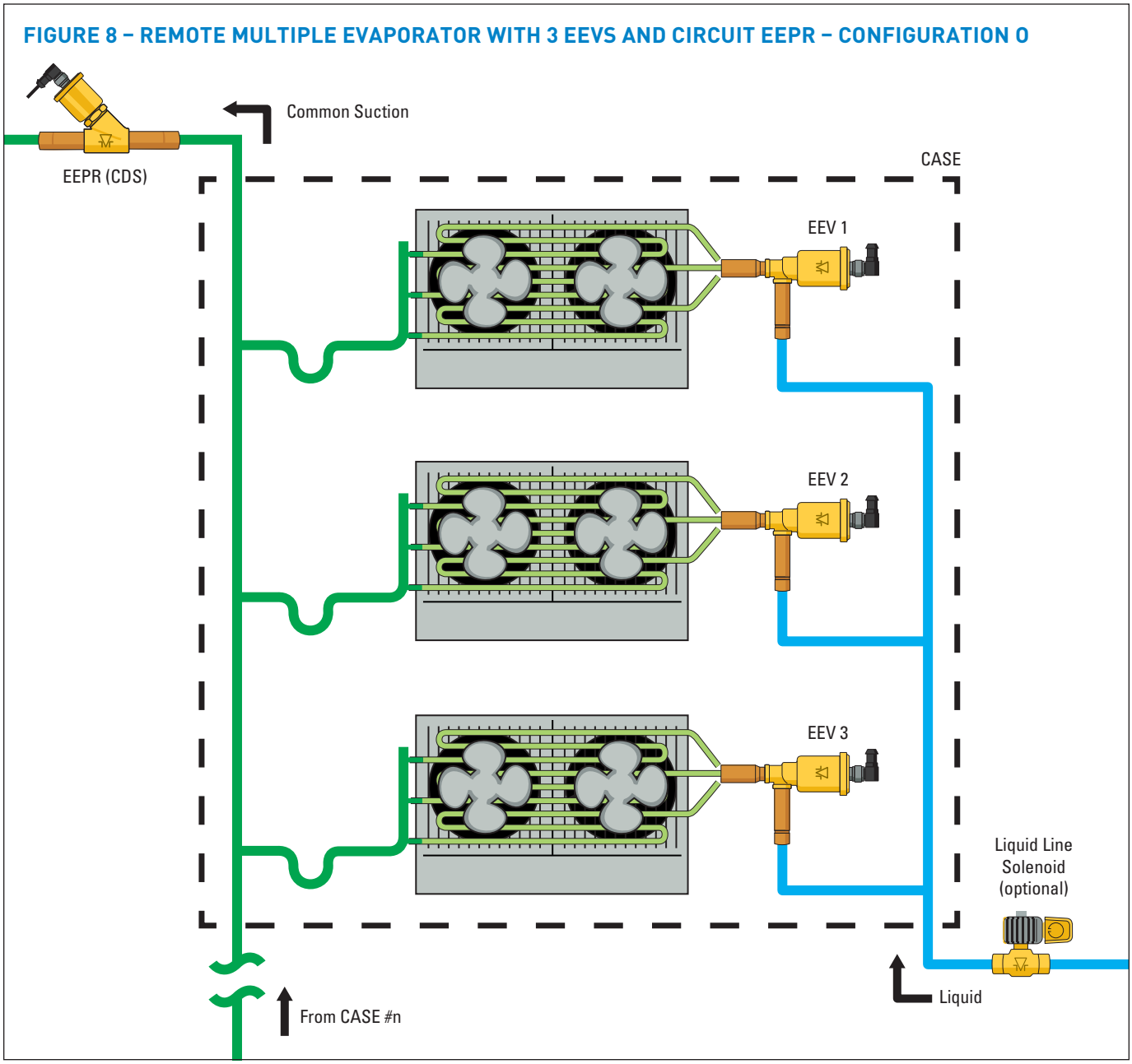
FIGURE 7 - WIRING DIAGRAM – CONFIGURATION N



6.15 REMOTE MULTIPLE EVAPORATOR WITH 3 EEVS AND CIRCUIT EEPR – CONFIGURATION 0

The S3C case controller is capable of controlling and monitoring single temperature, multiple evaporator refrigerated fixtures installed as a line-up. The case shown in the diagram below is the lead case of the line-up. In this scenario, one S3C case controller and two S3C valve modules are required. The S3C case controller will control all case functions as well as take all the desired sensor inputs for one evaporator and drive EEV1. S3C valve module 1 will take all the desired sensor inputs for the second evaporator as well as drive EEV2. Valve module 2 will take all the desired sensor inputs for the third evaporator as well as drive both EEV3 and the EEPR. This configuration only supports Discharge Air control. The typical control method is to regulate the average discharge air temperature of all evaporators on the line-up with a single circuit EEPR while allowing the EEVs to control superheat. The optional liquid line solenoid (LLS) may be installed as one-per-case or one-per-line-up. In addition, only one case in the line-up (lead case) needs an EEPR connected to a S3C valve module. Case numbers 2, 3, 4,...n that have two or three evaporators will require their own S3C case controller and valve modules but will not have an EEPR connected to them if they share a common suction line with the lead case shown in the diagram below.

FIGURE 8 – REMOTE MULTIPLE EVAPORATOR WITH 3 EEVS AND CIRCUIT EEPR – CONFIGURATION 0



To configure the S3C control package for configuration O shown above, follow these directions:

If the controller has not been factory set, then upon initial start-up, the controller will be in set-up mode and the screen will display SELF (for self-contained case).

1. Press the **SET** button, then use ▲▼ buttons to scroll to no; press **SET.** This will configure the controller to support a remote case.
2. Press the **SET** button when rc id (Rack Identifier) is displayed. Use the ▲▼ buttons to configure the 4

character Rack Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

3. Press the **SET** button when LU id (Line-up Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Line-up Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
4. Press the **SET** button when CA id (Case Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Case Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
5. Press the **SET** button when APPL (Application Type) is displayed. Use the ▲ button and scroll to SnGL (Single Temperature Case); press **SET.**
6. Press the **SET** button when StPC (Local Stepper Valve Configuration) is displayed. Use the ▲ button to scroll to EEv (Electronic Expansion Valve); press **SET.** This is the valve that is attached to the main S3C Case Controller.
7. Press the **SET** button when EvLv (Expansion Valve Type) is displayed. Use ▲▼ buttons to choose the Expansion Valve Type based on the below chart; press **SET.**

Display	Meaning
PULS	Pulse Width Modulation Valve
500	500 Step Valve
1596	1596 Step Valve
2500	2500 Step Valve
3 193	3193 Step Valve
6386	6386 Step Valve
cUSt	Custom Stepper Valve (See Section 11)

8. Press the **SET** button when nEvP (Number of Evaporators) is displayed. Use the ▲ button and scroll to 3 (3 Evaporators); press **SET.**
9. Press the **SET** button when bAS (Building Automation System Expected) is displayed. Use the ▲▼ buttons to choose YES or no; press **SET.**

   a. If YES is chosen, the display will show bASP (Building Automation System Protocol). Press the **SET** button then use ▲▼ buttons to choose the B.A.S. Protocol based on the below chart; press **SET.**

Display	Meaning
n485	Modbus Protocol over RS-485
b485	Bacnet Protocol over RS-485
bA IP	Bacnet Protocol over IP (Ethernet)
no IP	Modbus Protocol over IP (Ethernet)

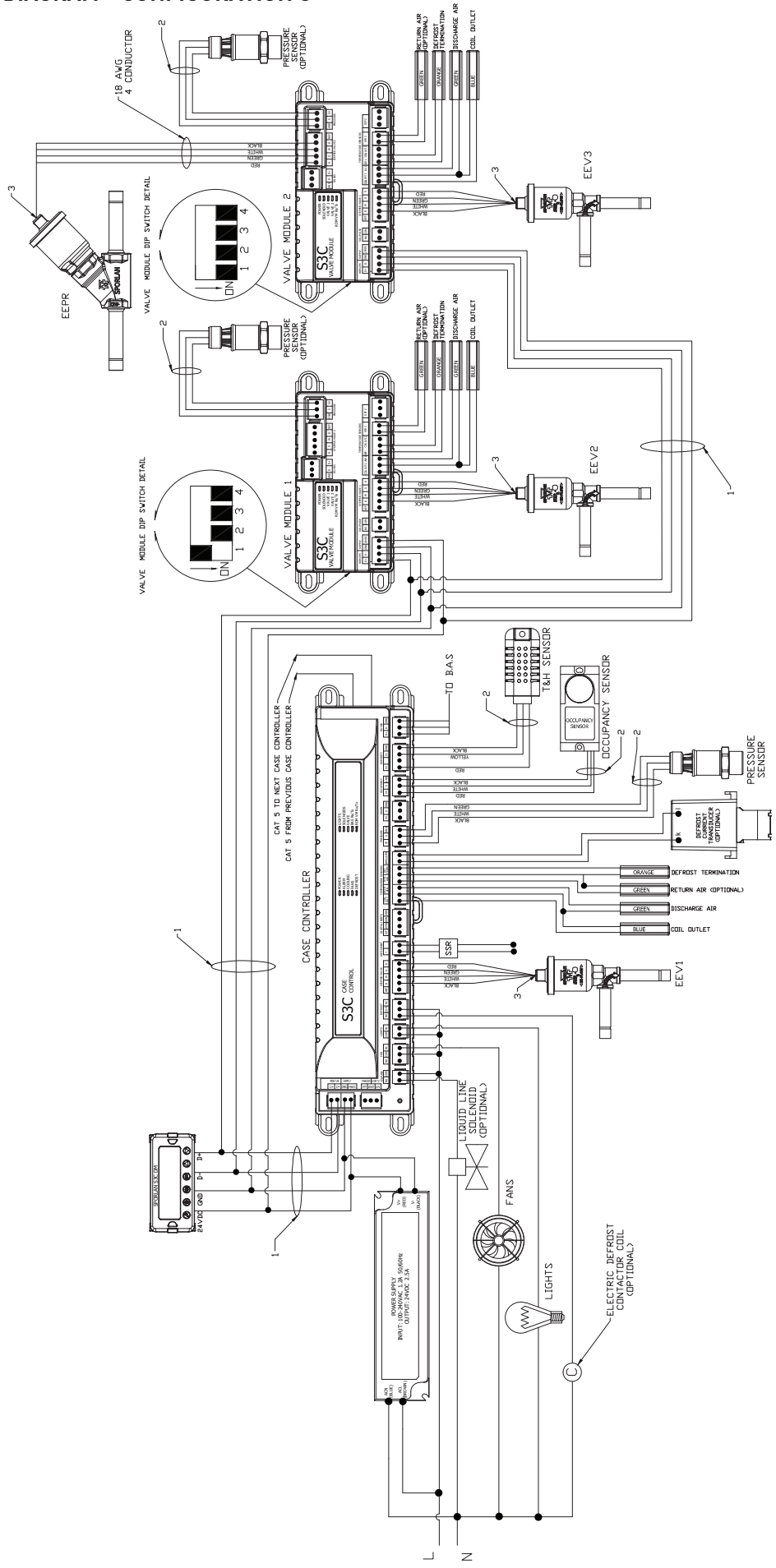
10. Press the **SET** button when noth (Month) is shown. Use the ▲ button to choose the current month; press **SET.**
11. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**
12. Press the **SET** button when YEAr (Year) is shown. Use the ▲ button to choose the current day; press **SET.**
13. Press the **SET** button when t nnE (Time) is shown. Use the ▲ button to choose the current time in 24 hour format; press **SET. Note: Holding the ▲ or ▼ down while setting the time will accelerate the scrolling.**
14. Press the **SET** button when rEFt (Refrigerant Type) is shown. Use the ▲▼ buttons to choose the Refrigerant Type; press **SET.** The list of refrigerants can be seen in Table on page 99.
15. Press the **SET** button when nL in (Number of Cases Expected in Line-up) is shown. Use the ▲▼ buttons to choose the number of cases expected in the Line-up; press **SET.**
16. Press the **SET** button when EPrt (Evaporator Pressure Regulating Valve Type) is shown. Use the ▲▼ buttons to choose from either 2500 or 6386 depending on the valve; press **SET.** Please consult the literature supplied with the valve to determine the correct step count. For custom valve selection, see valve configuration menu in Section 11.
17. Press the **SET** button when EPrL (EPR Location) is shown. Press the ▲ button to scroll to L inE (EEPR per Line-up); press **SET.**
18. Press the **SET** button when dASP (Discharge Air Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**
19. Press the **SET** button when dEFt (Defrost Type) is shown. Use the ▲▼ buttons to choose the Defrost Type; press **SET.** Defrost options are:

Display	Meaning
hGAS	Hot gas
ELEc	Electric
Air	Air

20. Press the **SET** button when dttP (Defrost Termination Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**
21. Press the **SET** button when dttE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**
22. Press the **SET** button when dFPd (Number of Defrosts Per Day) is shown. Use the ▲▼ buttons to choose the defrost per day; press **SET.**

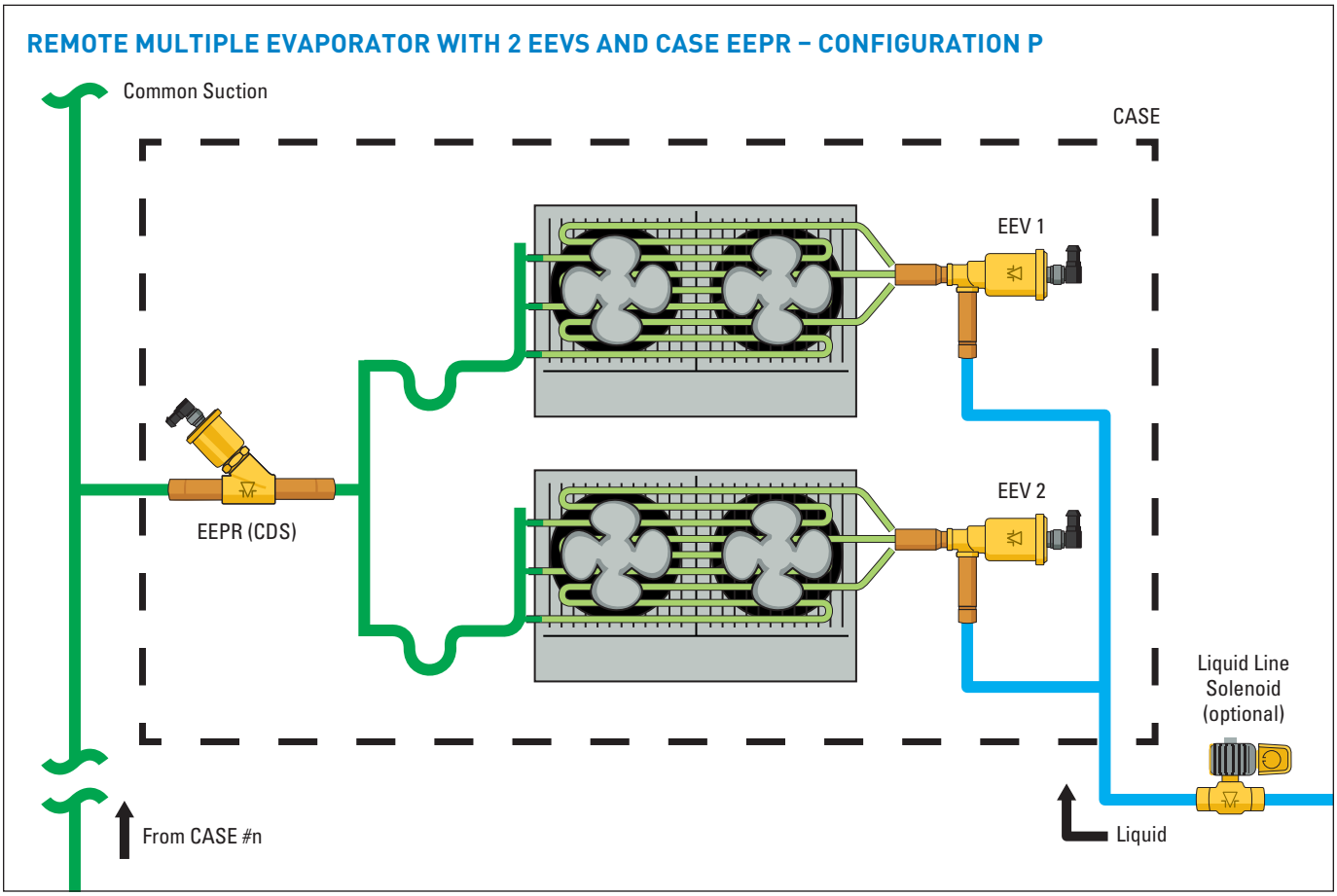
The S3C Case Control system is now set-up and will begin controlling the refrigerated display case.

FIGURE 9 - WIRING DIAGRAM – CONFIGURATION 0



6.16 REMOTE MULTIPLE EVAPORATOR WITH 2 EEVS AND CASE EEPR – CONFIGURATION P

The S3C case controller is capable of controlling and monitoring single temperature, multiple evaporator refrigerated fixtures installed as a line-up. The case shown in the diagram below is the lead case of the line-up. In this scenario, one S3C case controller and one S3C valve module are required. The S3C case controller will control all case functions as well as take all the desired sensor inputs for one evaporator and drive EEV1. The S3C valve module will take all the desired sensor inputs for the second evaporator as well as drive both EEV2 and the EEPR. The typical control method is to regulate the average discharge air temperature of all case evaporators with the EEPR while allowing the EEVs to control superheat. The optional liquid line solenoid (LLS) may be installed as one-per-case or one-per-line-up. In this configuration, each case in the line-up has its own EEPR connected to the S3C valve module. Case numbers 2, 3, 4,...n that have two evaporators will require their own S3C case controller and valve module as well. All case functions will be synchronized across the line-up in this configuration with the exception of temperature control.



To configure the S3C control package for configuration P shown above, follow these directions:

If the controller has not been factory set, then upon initial start-up, the controller will be in set-up mode and the screen will display SELF (for self-contained case).

1. Press the **SET** button, then use ▲▼ buttons to scroll to no; press **SET.** This will configure the controller to support a remote case.
2. Press the **SET** button when rc id (Rack Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Rack Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
3. Press the **SET** button when LU id (Line-up Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Line-up Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
4. Press the **SET** button when CA id (Case Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Case Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
5. Press the **SET** button when APPL (Application Type) is displayed. Use the ▲ button and scroll to SnGL (Single Temperature Case); press **SET.**
6. Press the **SET** button when STPC (Local Stepper Valve Configuration) is displayed. Use the ▲ button to scroll to EEu (Electronic Expansion Valve); press **SET.** This is the valve that is attached to the main S3C Case Controller.

7. Press the **SET** button when EuLu (Expansion Valve Type) is displayed. Use ▲▼ buttons to choose the Expansion Valve Type based on the below chart; press **SET.**

Display	Meaning
PULS	Pulse Width Modulation Valve
500	500 Step Valve
1596	1596 Step Valve
2500	2500 Step Valve
3 193	3193 Step Valve
6386	6386 Step Valve
cUSt	Custom Stepper Valve (See Section 11)

8. Press the **SET** button when nEuP (Number of Evaporators) is displayed. Use the ▲ button and scroll to 2(2 Evaporators); press **SET.**

9. Press the **SET** button when bAS (Building Automation System Expected) is displayed. Use the ▲▼ buttons to choose YES or no; press **SET.**

   a. If YES is chosen, the display will show bASP (Building Automation System Protocol). Press the **SET** button then use ▲▼ buttons to choose the B.A.S. Protocol based on the below chart; press **SET.**

Display	Meaning
n485	Modbus Protocol over RS-485
b485	Bacnet Protocol over RS-485
bA IP	Bacnet Protocol over IP (Ethernet)
no IP	Modbus Protocol over IP (Ethernet)

10. Press the **SET** button when noth (Month) is shown. Use the ▲ button to choose the current month; press **SET.**

11. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

12. Press the **SET** button when YEAr (Year) is shown. Use the ▲ button to choose the current day; press **SET.**

13. Press the **SET** button when t nIE (Time) is shown. Use the ▲ button to choose the current time in 24 hour format; press **SET. Note: Holding the ▲ or ▼ down while setting the time will accelerate the scrolling.**

14. Press the **SET** button when rEFt (Refrigerant Type) is shown. Use the ▲▼ buttons to choose the Refrigerant Type; press **SET.** The list of refrigerants can be seen in Table on page 99.

15. Press the **SET** button when nL in (Number of Cases Expected in Line-up) is shown. Use the ▲▼ buttons to choose the number of cases expected in the Line-up; press **SET.**

16. Press the **SET** button when EPrt (Evaporator Pressure Regulating Valve Type) is shown. Use the ▲▼ buttons to choose from either 2500 or 6386 depending on the valve; press **SET.** Please consult the literature supplied with the valve to determine the correct step count. For custom valve selection, see valve configuration menu in Section 11.

17. Press the **SET** button when EPrL (EPR Location) is shown. Press the ▲ button to scroll to L inE (EEPR per Line-up); press **SET.**

18. Press the **SET** button when dASP (Discharge Air Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

19. Press the **SET** button when dEFt (Defrost Type) is shown. Use the ▲▼ buttons to choose the Defrost Type; press **SET.** Defrost options are:

Display	Meaning
hGAS	Hot gas
ELEc	Electric
Air	Air

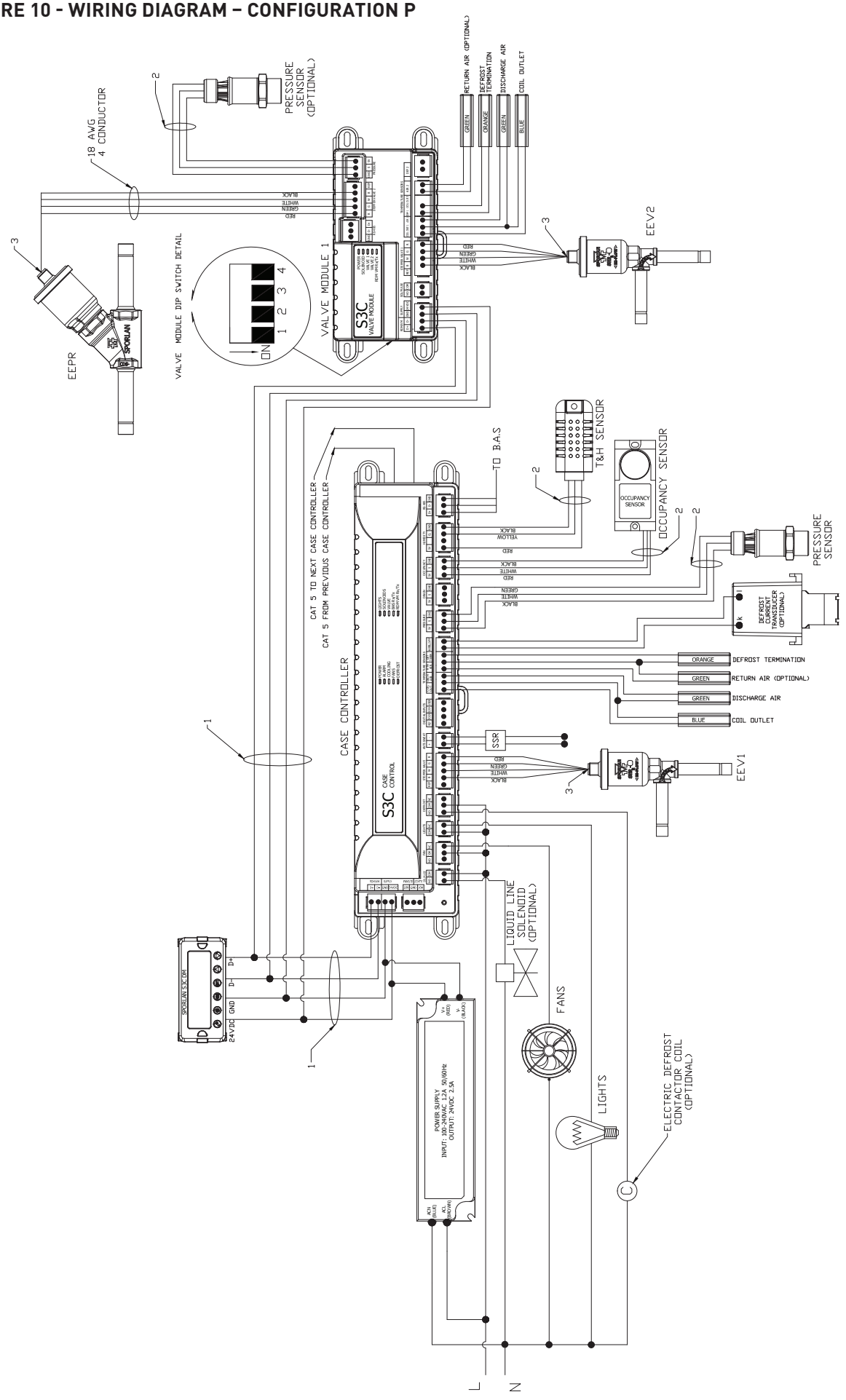
20. Press the **SET** button when dttP (Defrost Termination Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

21. Press the **SET** button when dttE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**

22. Press the **SET** button when dFPd (Number of Defrosts Per Day) is shown. Use the ▲▼ buttons to choose the defrost per day; press **SET.**

The S3C Case Control system is now set-up and will begin controlling the refrigerated display case.

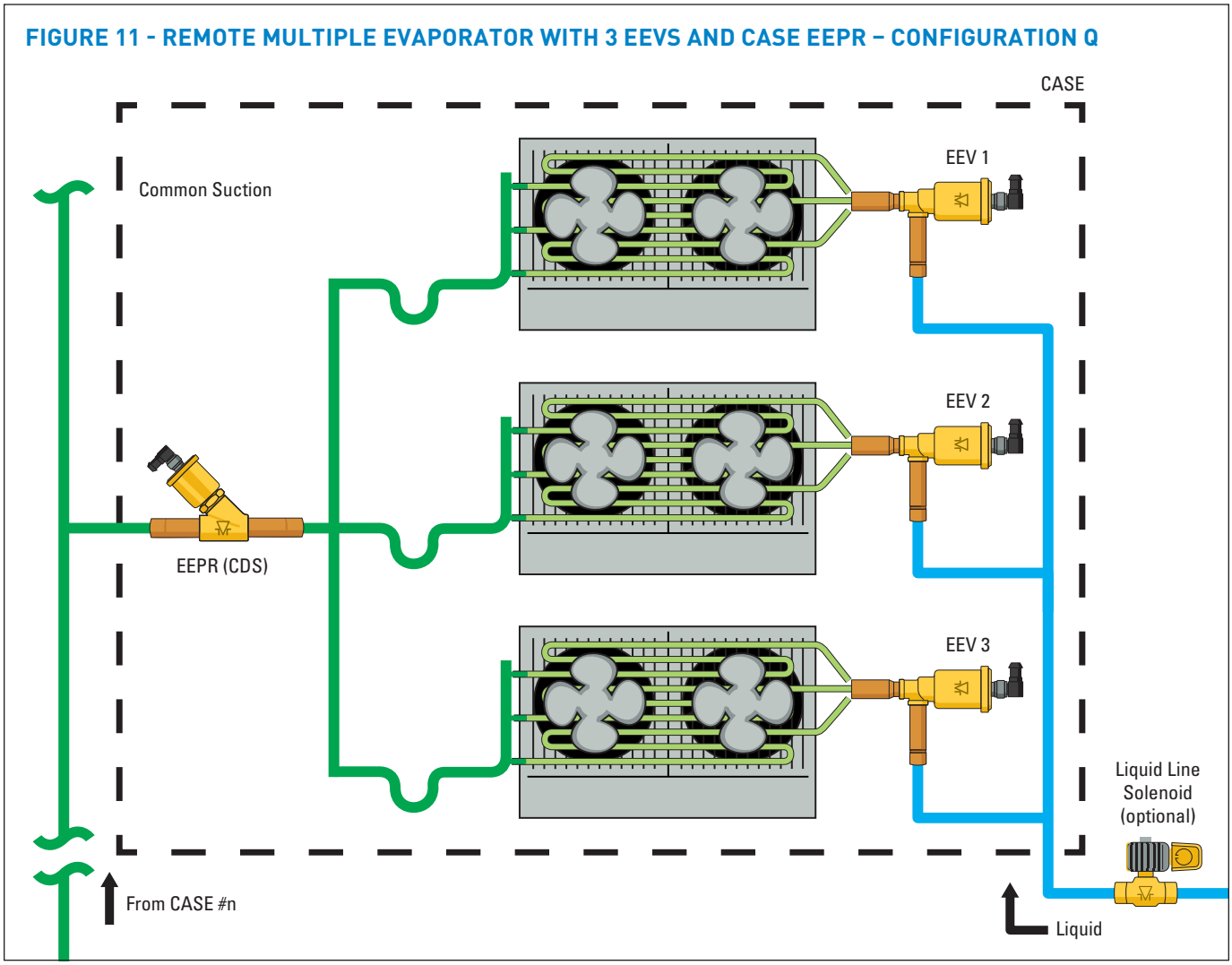
FIGURE 10 - WIRING DIAGRAM – CONFIGURATION P



6.17 REMOTE MULTIPLE EVAPORATOR WITH 3 EEVS AND CASE EEPR – CONFIGURATION Q

The S3C case controller is capable of controlling and monitoring single temperature, multiple evaporator refrigerated fixtures installed as a line-up. The case shown in the diagram below is the lead case of the line-up. In this scenario, one S3C case controller and two S3C valve modules are required. The S3C case controller will control all case functions as well as take all the desired sensor inputs for one evaporator and drive EEV1. S3C valve module 1 will take all the desired sensor inputs for the second evaporator as well as drive EEV2. Valve module 2 will take all the desired sensor inputs for the third evaporator as well as drive both EEV3 and the EEPR. The typical control method is to regulate the average discharge air temperature of all case evaporators with the individual case EEPRs while allowing the EEVs to control superheat. This configuration only supports Discharge Air control. The optional liquid line solenoid (LLS) may be installed as one-per-case or one-per-line-up. In this configuration, each case in the line-up has its own EEPR connected to the S3C valve module. Case numbers 2, 3, 4,...n that have two or three evaporators will require their own S3C case controller and valve module as well. All case functions will be synchronized across the line-up in this configuration with the exception of temperature control.

FIGURE 11 - REMOTE MULTIPLE EVAPORATOR WITH 3 EEVS AND CASE EEPR – CONFIGURATION Q



To configure the S3C control package for configuration Q shown above, follow these directions:

If the controller has not been factory set, then upon initial start-up, the controller will be in set-up mode and the screen will display SELF (for self-contained case).

1. Press the **SET** button, then use ▲▼ buttons to scroll to no; press **SET.** This will configure the controller to support a remote case.

2. Press the **SET** button when rc id (Rack Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Rack Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit Pressing **SET** multiple times will move to the next parameter.

3. Press the **SET** button when LU id (Line-up Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Line-up Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

4. Press the **SET** button when CA id (Case Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Case Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

5. Press the **SET** button when APPL (Application Type) is displayed. Use the ▲ button and scroll to SnGL (Single Temperature Case); press **SET.**

6. Press the **SET** button when StPC (Local Stepper Valve Configuration) is displayed. Use the ▲ button to scroll to EEu (Electronic Expansion Valve); press **SET.** This is the valve that is attached to the main S3C Case Controller.

7. Press the **SET** button when EuLu (Expansion Valve Type) is displayed. Use ▲▼ buttons to choose the Expansion Valve Type based on the below chart; press **SET.**

Display	Meaning
PULS	Pulse Width Modulation Valve
500	500 Step Valve
1596	1596 Step Valve
2500	2500 Step Valve
3 193	3193 Step Valve
6386	6386 Step Valve
cUSt	Custom Stepper Valve (See Section 11)

8. Press the **SET** button when nEuP (Number of Evaporators) is displayed. Use the ▲ button and scroll to 3(3 Evaporators); press **SET.**

9. Press the **SET** button when bAS (Building Automation System Expected) is displayed. Use the ▲▼ buttons to choose YES or no; press **SET.**

   a. If YES is chosen, the display will show bASP (Building Automation System Protocol). Press the **SET** button then use ▲▼ buttons to choose the B.A.S. Protocol based on the below chart; press **SET.**

Display	Meaning
7485	Modbus Protocol over RS-485
6485	Bacnet Protocol over RS-485
bA IP	Bacnet Protocol over IP (Ethernet)
7o IP	Modbus Protocol over IP (Ethernet)

10. Press the **SET** button when 7otH (Month) is shown. Use the ▲ button to choose the current month; press **SET.**

11. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

12. Press the **SET** button when YEAr (Year) is shown. Use the ▲ button to choose the current day; press **SET.**

13. Press the **SET** button when t 7iE (Time) is shown. Use the ▲ button to choose the current time in 24 hour format; press **SET. Note: Holding the ▲ or ▼ down while setting the time will accelerate the scrolling.**

14. Press the **SET** button when rEFt (Refrigerant Type) is shown. Use the ▲▼ buttons to choose the Refrigerant Type; press **SET.** The list of refrigerants can be seen in Table on page 99.

15. Press the **SET** button when nL in (Number of Cases Expected in Line-up) is shown. Use the ▲▼ buttons to choose the number of cases expected in the Line-up; press **SET.**

16. Press the **SET** button when EPrt (Evaporator Pressure Regulating Valve Type) is shown. Use the ▲▼ buttons to choose from either 2500 or 6386 depending on the valve; press **SET.** Please consult the literature supplied with the valve to determine the correct step count. For custom valve selection, see valve configuration menu in Section 11.

17. Press the **SET** button when EPrL (EPR Location) is shown. Press the ▲ button to scroll to L inE (EEPR per Line-up); press **SET.**

18. Press the **SET** button when dASP (Discharge Air Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

19. Press the **SET** button when dEFt (Defrost Type) is shown. Use the ▲▼ buttons to choose the Defrost Type; press **SET.** Defrost options are:

Display	Meaning
hGAS	Hot gas
ELEc	Electric
Air	Air

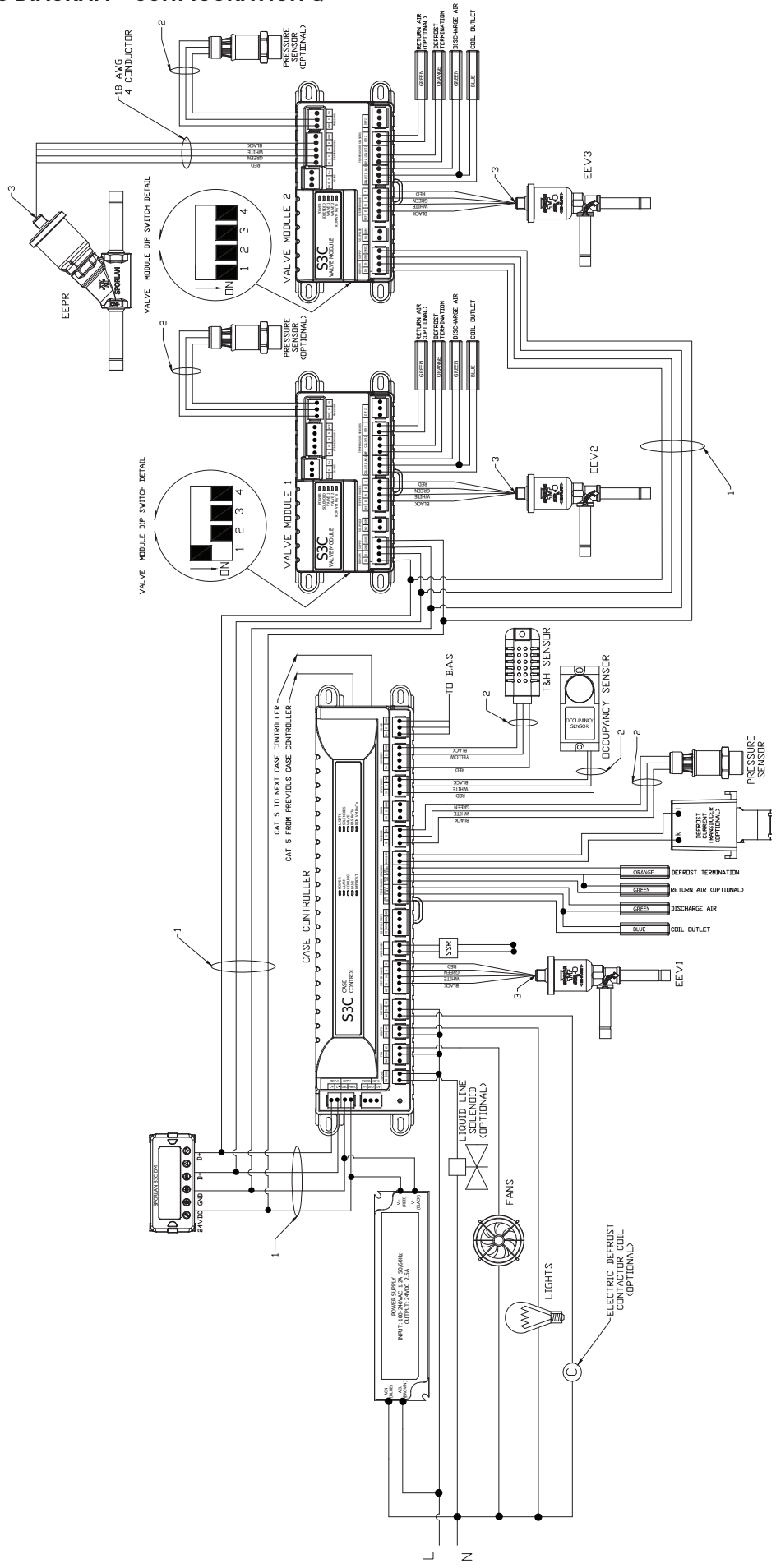
20. Press the **SET** button when dttP (Defrost Termination Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

21. Press the **SET** button when dttE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**

22. Press the **SET** button when dFPd (Number of Defrosts Per Day) is shown. Use the ▲▼ buttons to choose the defrost per day; press **SET.**

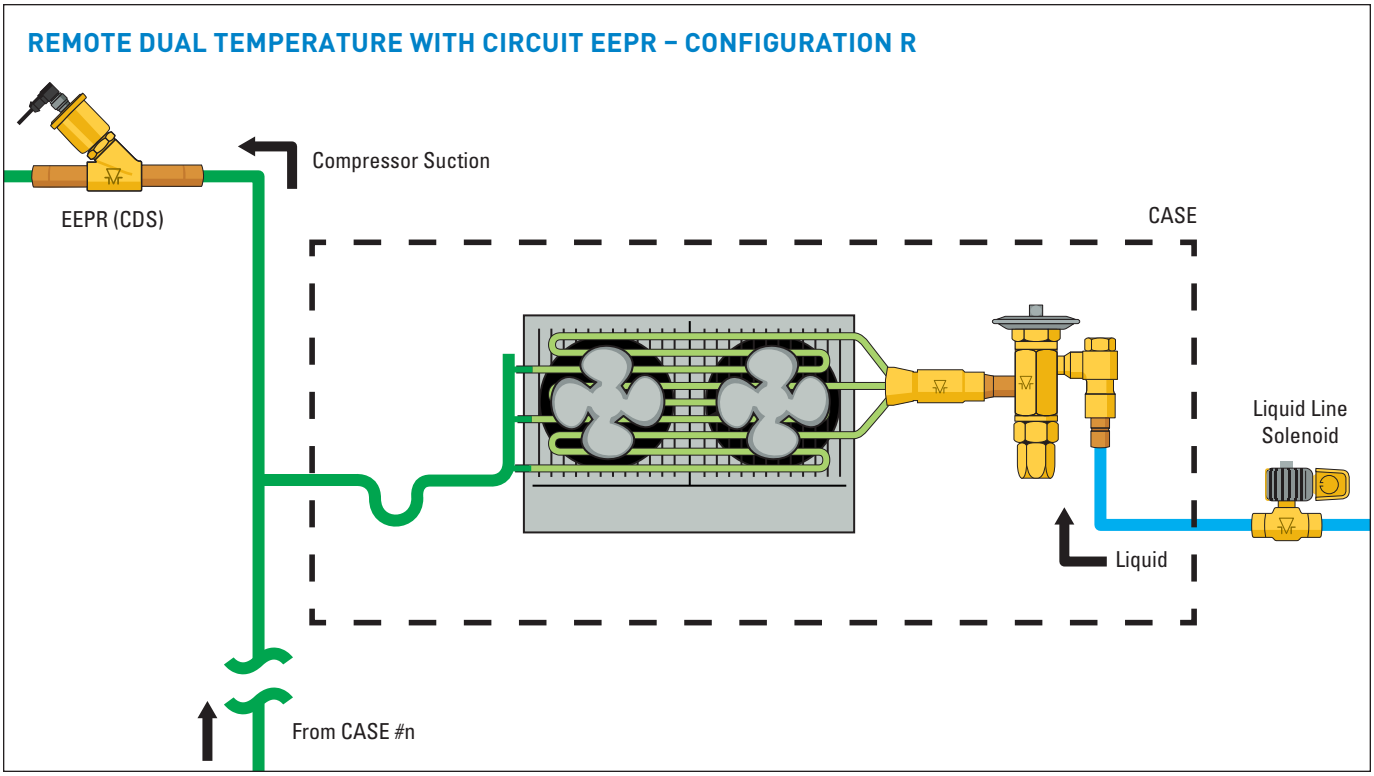
The S3C Case Control system is now set-up and will begin controlling the refrigerated display case.

FIGURE 12 - WIRING DIAGRAM – CONFIGURATION Q



6.18 REMOTE DUAL TEMPERATURE WITH CIRCUIT EEPR – CONFIGURATION R

The S3C case controller is capable of controlling and monitoring dual temperature, single evaporator refrigerated fixtures installed as a line-up. The case shown in the diagram below is the lead case of the line-up. In this scenario, one S3C case controller is required. The S3C case controller will control all case functions as well as take all the desired sensor inputs for one evaporator and drive the EEPR. The typical control method is to regulate the average discharge air temperature with the EEPR while allowing the TEV to control superheat. Note that the required liquid line solenoid (LLS) may be installed as one-per-case or one-per-line-up. In addition, only one case in the line-up (lead case) needs an EEPR connected to the S3C case controller. Case numbers 2, 3, 4,...n will require their own S3C case controller but will not have an EEPR connected to them if they share a common suction line with the lead case shown in the diagram below. The case is toggled between its two operating temperatures either via the building automation system (BAS) or with a locally installed physical switch. When the case controller receives a command to change temperature, the EEPR will either open or close to lower or raise the case temperature, respectively.



To configure the S3C control package for configuration R shown above, follow these directions:

If the controller has not been factory set, then upon initial start-up, the controller will be in set-up mode and the screen will display SELF (for self-contained case).

1. Press the **SET** button, then use ▲▼ buttons to scroll to no; press **SET.** This will configure the controller to support a remote case.
2. Press the **SET** button when rc id (Rack Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Rack Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
3. Press the **SET** button when LU id (Line-up Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Line-up Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
4. Press the **SET** button when CA id (Case Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Case Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
5. Press the **SET** button when APPL (Application Type) is displayed. Use the ▲ button and scroll to dUAL (Dual Temperature Case); press **SET.**
6. Press the **SET** button when StPC (Local Stepper Valve Configuration) is displayed. Use the ▲ button to scroll to EEPr (Electronic Evaporator Pressure Regulator); press **SET.** This is the valve that is attached to the main S3C Case Controller.
7. Press the **SET** button when EuLu (Expansion Valve Type) is displayed. Use ▲▼ buttons to choose the Expansion Valve Type based on the below chart; press **SET.**
8. Press the **SET** button when bAS (Building Automation System Expected) is displayed. Use the ▲▼ buttons to choose YES or no; press **SET.**

a. If YES is chosen, the display will show bASP (Building Automation System Protocol). Press the **SET** button then use ▲▼ buttons to choose the B.A.S. Protocol based on the below chart; press **SET.**

Display	Meaning
M485	Modbus Protocol over RS-485
B485	Bacnet Protocol over RS-485
bA IP	Bacnet Protocol over IP (Ethernet)
Mo IP	Modbus Protocol over IP (Ethernet)

9. Press the **SET** button when MotH (Month) is shown. Use the ▲ button to choose the current month; press **SET.**

10. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

11. Press the **SET** button when YEAr (Year) is shown. Use the ▲ button to choose the current day; press **SET.**

12. Press the **SET** button when t MiE (Time) is shown. Use the ▲ button to choose the current time in 24 hour format; press **SET. Note: Holding the ▲ or ▼ down while setting the time will accelerate the scrolling.**

13. Press the **SET** button when rEFt (Refrigerant Type) is shown. Use the ▲▼ buttons to choose the Refrigerant Type; press **SET.** The list of refrigerants can be seen in Table on page 99.

14. Press the **SET** button when nL in (Number of Cases Expected in Line-up) is shown. Use the ▲▼ buttons to choose the number of cases expected in the Line-up; press **SET.**

15. Press the **SET** button when EPrt (Evaporator Pressure Regulating Valve Type) is shown. Use the ▲▼ buttons to choose from either 2500 or 6386 depending on the valve; press **SET.** Please consult the literature supplied with the valve to determine the correct step count. For custom valve selection, see valve configuration menu in Section 11.

16. Press the **SET** button when EPrL (EPR Location) is shown. Press the ▲ button to scroll to L inE (EEPR per Line-up); press **SET.**

17. Press the **SET** button when dALt (Discharge Air Low Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

18. Press the **SET** button when dAMt (Discharge Air Medium Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

19. Press the **SET** button when dEFt (Defrost Type) is shown. Use the ▲▼ buttons to choose the Defrost Type; press **SET.** Defrost options are:

Display	Meaning
hGAS	Hot gas
ELEc	Electric
Air	Air

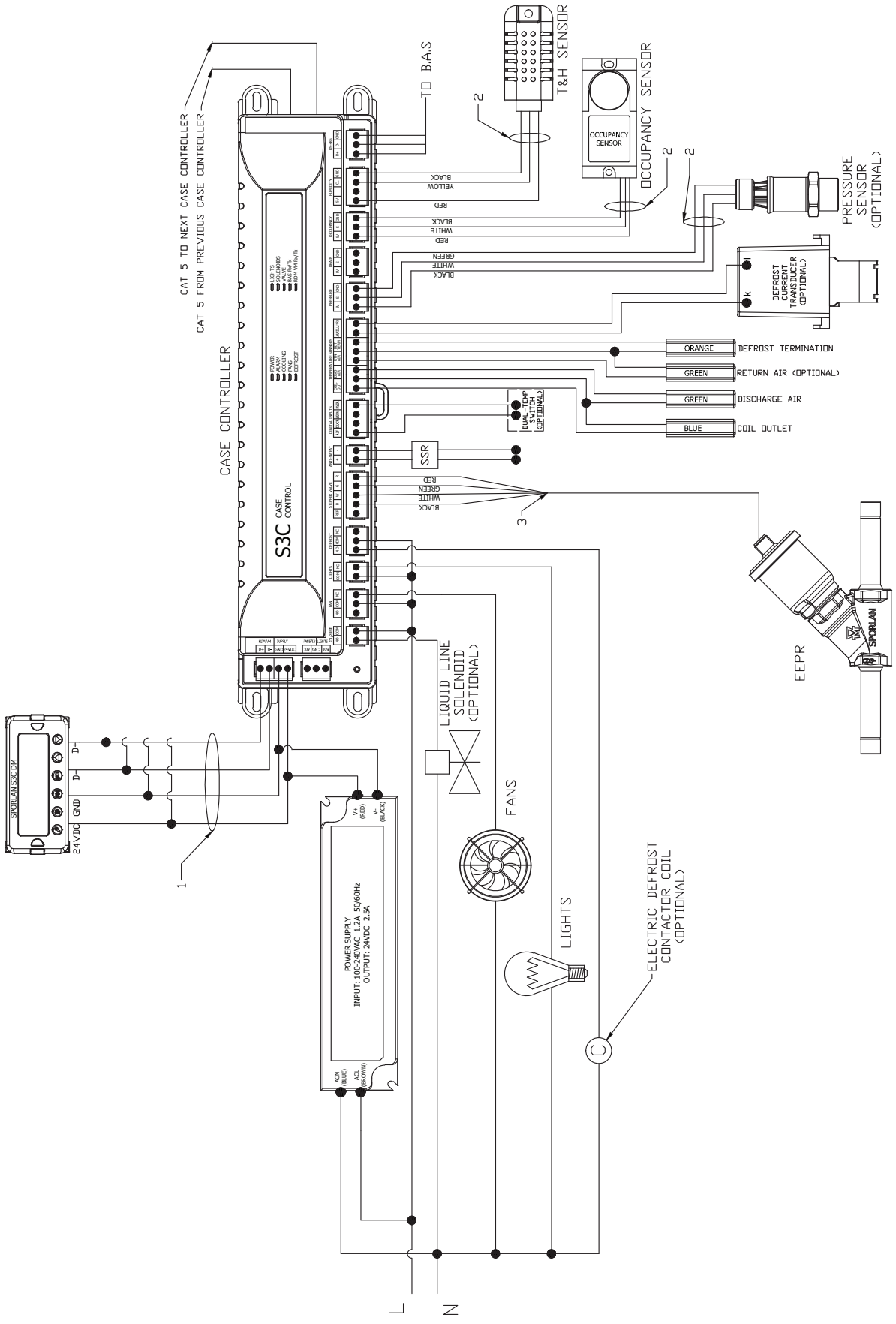
20. Press the **SET** button when dttP (Defrost Termination Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

21. Press the **SET** button when dttE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**

22. Press the **SET** button when dFPd (Number of Defrosts Per Day) is shown. Use the ▲▼ buttons to choose the defrost per day; press **SET.**

The S3C Case Control system is now set-up and will begin controlling the refrigerated display case.

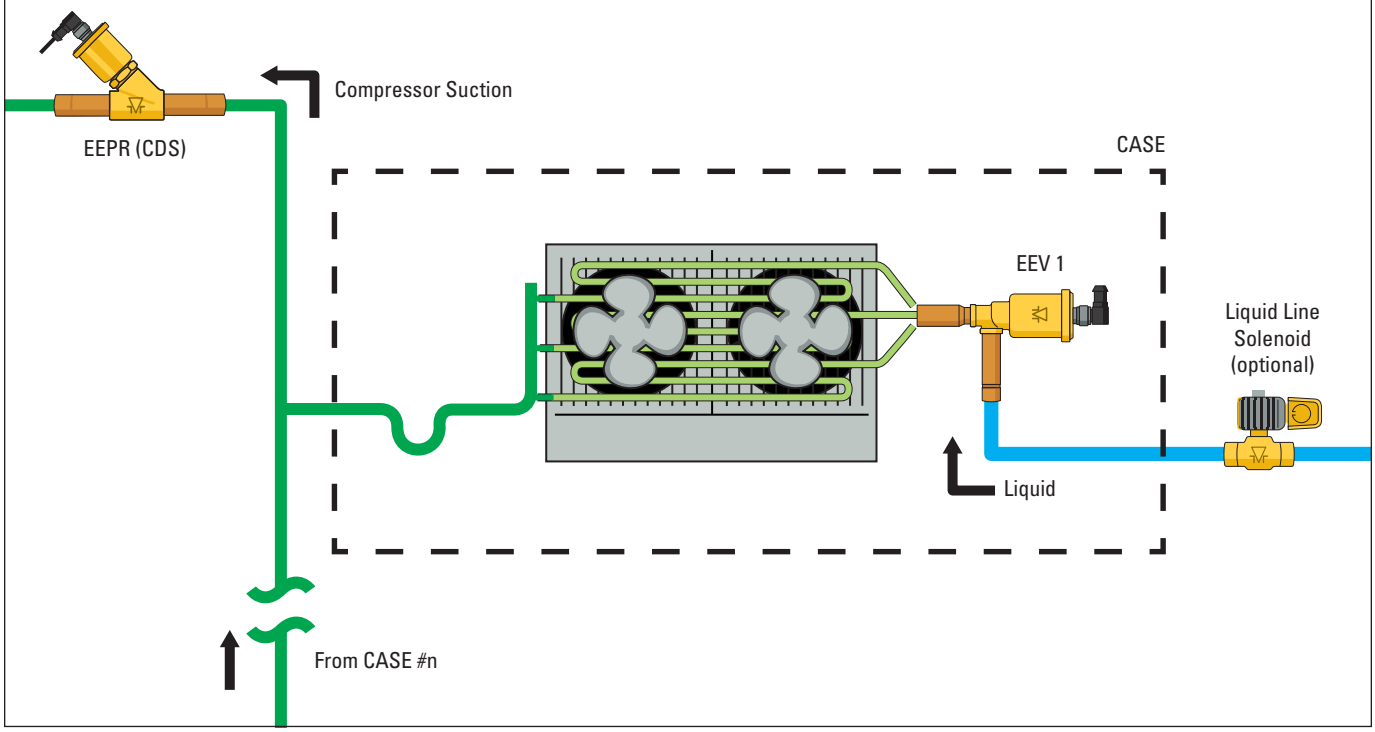
FIGURE 13 - WIRING DIAGRAM – CONFIGURATION R



6.19 REMOTE DUAL TEMPERATURE WITH EEV AND CIRCUIT EEPR – CONFIGURATION S

The S3C case controller is capable of controlling and monitoring dual temperature, single evaporator refrigerated fixtures installed as a line-up. The case shown in the diagram below is the lead case of the line-up. In this scenario, one S3C case controller and one S3C valve module are required. The S3C case controller will control all case functions as well as take all the desired sensor inputs for one evaporator and drive the EEV. The S3C valve module will drive the EEPR. The typical control method is to regulate the average line-up discharge air temperature with the EEPR while allowing the EEV to control superheat. The optional liquid line solenoid (LLS) may be installed as one-per-case or one-per-line-up. In addition, only one case in the line-up (lead case) needs an EEPR connected to the S3C valve module. Case numbers 2, 3, 4,…n will require their own S3C case controller but will not have an EEPR connected to them if they share a common suction line with the lead case shown in the diagram below. Therefore, other cases in the line-up only require the S3C case controller without a S3C valve module. The case is toggled between its two operating temperatures either via the building automation system (BAS) or with a locally installed physical switch. When the case controller receives a command to change temperature, the EEPR will either open or close to lower or raise the case temperature, respectively.

FIGURE 14 - REMOTE DUAL TEMPERATURE WITH EEV AND CIRCUIT EEPR – CONFIGURATION S



To configure the S3C control package for configuration S shown above, follow these directions:

If the controller has not been factory set, then upon initial start-up, the controller will be in set-up mode and the screen will display SELF (for self-contained case).

1. Press the **SET** button, then use ▲▼ buttons to scroll to no; press **SET.** This will configure the controller to support a remote case.
2. Press the **SET** button when rc id (Rack Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Rack Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
3. Press the **SET** button when LU id (Line-up Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Line-up Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
4. Press the **SET** button when CA id (Case Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Case Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
5. Press the **SET** button when APPL (Application Type) is displayed. Use the ▲ button and scroll to dUAL (Dual Temperature Case); press **SET.**
6. Press the **SET** button when StPC (Local Stepper Valve Configuration) is displayed. Use the ▲ button to scroll to EEu (Electronic Expansion Valve); press **SET.** This is the valve that is attached to the main S3C Case Controller.

7. Press the **SET** button when EuLu (Expansion Valve Type) is displayed. Use ▲▼ buttons to choose the Expansion Valve Type based on the below chart; press **SET.**

Display	Meaning
PULS	Pulse Width Modulation Valve
500	500 Step Valve
1596	1596 Step Valve
2500	2500 Step Valve
3 193	3193 Step Valve
6386	6386 Step Valve
cUSt	Custom Stepper Valve (See Section 11)

8. Press the **SET** button when nEuP (Number of Evaporators) is displayed. Use the ▲ button and scroll to 1(1 Evaporator); press **SET.**

9. Press the **SET** button when bAS (Building Automation System Expected) is displayed. Use the ▲▼ buttons to choose YES or no; press **SET.**

   a. If YES is chosen, the display will show bASP (Building Automation System Protocol). Press the **SET** button then use ▲▼ buttons to choose the B.A.S. Protocol based on the below chart; press **SET.**

Display	Meaning
n485	Modbus Protocol over RS-485
b485	Bacnet Protocol over RS-485
bA IP	Bacnet Protocol over IP (Ethernet)
no IP	Modbus Protocol over IP (Ethernet)

10. Press the **SET** button when noth (Month) is shown. Use the ▲ button to choose the current month; press **SET.**

11. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

12. Press the **SET** button when YEAr (Year) is shown. Use the ▲ button to choose the current day; press **SET.**

13. Press the **SET** button when t nIE (Time) is shown. Use the ▲ button to choose the current time in 24 hour format; press **SET. Note: Holding the ▲ or ▼ down while setting the time will accelerate the scrolling.**

14. Press the **SET** button when rEFt (Refrigerant Type) is shown. Use the ▲▼ buttons to choose the Refrigerant Type; press **SET.** The list of refrigerants can be seen in Table on page 99.

15. Press the **SET** button when nL in (Number of Cases Expected in Line-up) is shown. Use the ▲▼ buttons to choose the number of cases expected in the Line-up; press **SET.**

16. Press the **SET** button when EPrt (Evaporator Pressure Regulating Valve Type) is shown. Use the ▲▼ buttons to choose from either 2500 or 6386 depending on the valve; press **SET.** Please consult the literature supplied with the valve to determine the correct step count. For custom valve selection, see valve configuration menu in Section 11.13.

17. Press the **SET** button when EPrL (EPR Location) is shown. Press the ▲ button to scroll to L inE (EEPR per Line-up); press **SET.**

18. Press the **SET** button when dALt (Discharge Air Low Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

19. Press the **SET** button when dAit (Discharge Air Medium Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

20. Press the **SET** button when dEFt (Defrost Type) is shown. Use the ▲▼ buttons to choose the Defrost Type; press **SET.** Defrost options are:

Display	Meaning
hGAS	Hot gas
ELEc	Electric
Air	Air

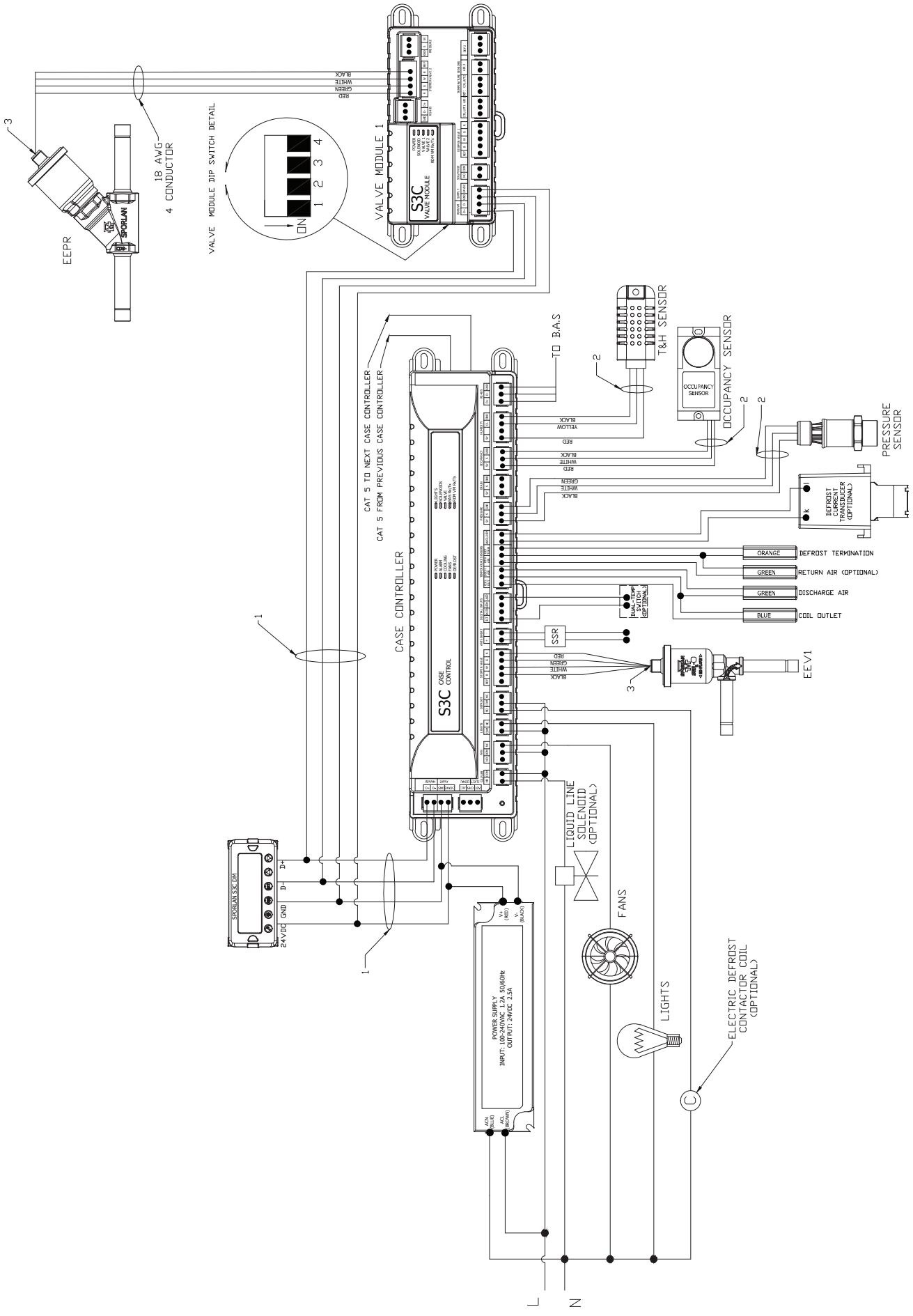
21. Press the **SET** button when dttE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**

22. Press the **SET** button when dttE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**

23. Press the **SET** button when dFPd (Number of Defrosts Per Day) is shown. Use the ▲▼ buttons to choose the defrost per day; press **SET.**

The S3C Case Control system is now set-up and will begin controlling the refrigerated display case.

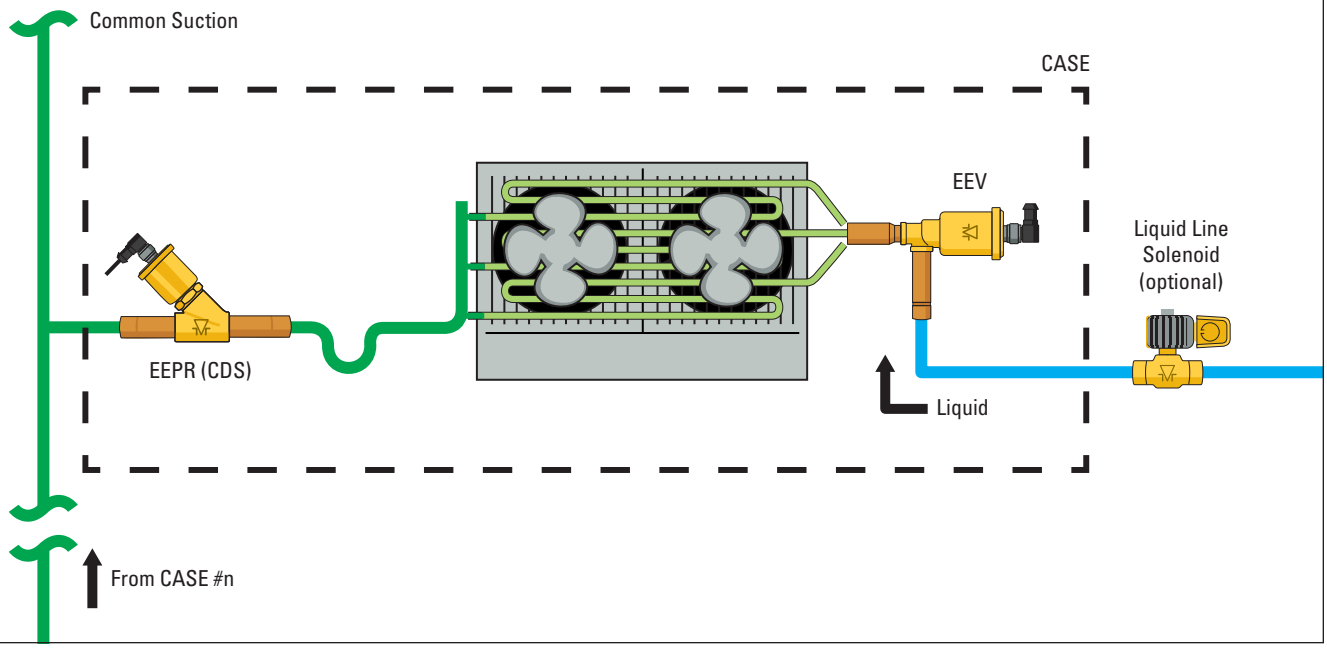
FIGURE 12 - WIRING DIAGRAM – CONFIGURATION S



6.20 REMOTE DUAL TEMPERATURE WITH EEV AND CASE EEPR – CONFIGURATION T

The S3C case controller is capable of controlling and monitoring dual temperature, single evaporator refrigerated fixtures installed as a line-up. The case shown in the diagram below is the lead case of the line-up. In this scenario, one S3C case controller and one S3C valve module per case are required. The S3C case controller will control all case functions as well as take all the desired sensor inputs for one evaporator and drive the EEV. The S3C valve module will drive the EEPR. The typical control method is to regulate the average case discharge air temperature with the EEPR while allowing the EEV to control superheat. Note that the optional liquid line solenoid (LLS) may be installed as one-per-case or one-per-line-up. Case numbers 2, 3, 4,...n will require their own S3C case controller and S3C valve module. The case is toggled between its two operating temperatures either via the building automation system (BAS) or with a locally installed physical switch. When the case controller receives a command to change temperature, the EEPR will either open or close to lower or raise the case temperature, respectively.

REMOTE DUAL TEMPERATURE WITH EEV AND CASE EEPR – CONFIGURATION T



To configure the S3C control package for configuration T shown above, follow these directions:

If the controller has not been factory set, then upon initial start-up, the controller will be in set-up mode and the screen will display SELF (for self-contained case).

1. Press the **SET** button, then use ▲▼ buttons to scroll to no; press **SET.** This will configure the controller to support a remote case.
2. Press the **SET** button when rc id (Rack Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Rack Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
3. Press the **SET** button when LU id (Line-up Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Line-up Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
4. Press the **SET** button when CA id (Case Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Case Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
5. Press the **SET** button when APPL (Application Type) is displayed. Use the ▲ button and scroll to dUAL (Dual Temperature Case); press **SET.**
6. Press the **SET** button when StPC (Local Stepper Valve Configuration) is displayed. Use the ▲ button to scroll to EEu (Electronic Expansion Valve); press **SET.** This is the valve that is attached to the main S3C Case Controller.
7. Press the SET button when EuLu (Expansion Valve Type) is displayed. Use ▲▼ buttons to choose the Expansion Valve Type based on the below chart; press **SET.**

Display	Meaning
PuLS	Pulse Width Modulation Valve
500	500 Step Valve
1596	1596 Step Valve
2500	2500 Step Valve
3193	3193 Step Valve
6386	6386 Step Valve
cUSt	Custom Stepper Valve (See Section 11)

8. Press the **SET** button when nEvP (Number of Evaporators) is displayed. Use the ▲ button and scroll to 1 (1 Evaporator); press **SET.**

9. Press the **SET** button when bAS (Building Automation System Expected) is displayed. Use the ▲▼ buttons to choose YES or no; press **SET.**

   a. If YES is chosen, the display will show bASP (Building Automation System Protocol). Press the **SET** button then use ▲▼ buttons to choose the B.A.S. Protocol based on the below chart; press **SET.**

Display	Meaning
1485	Modbus Protocol over RS-485
6485	Bacnet Protocol over RS-485
bA IP	Bacnet Protocol over IP (Ethernet)
1o IP	Modbus Protocol over IP (Ethernet)

10. Press the **SET** button when 1otH (Month) is shown. Use the ▲ button to choose the current month; press **SET.**

11. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

12. Press the **SET** button when YEAr (Year) is shown. Use the ▲ button to choose the current day; press **SET.**

13. Press the **SET** button when t 1nE (Time) is shown. Use the ▲ button to choose the current time in 24 hour format; press **SET. Note: Holding the ▲ or ▼ down while setting the time will accelerate the scrolling.**

14. Press the **SET** button when rEFt (Refrigerant Type) is shown. Use the ▲▼ buttons to choose the Refrigerant Type; press **SET.** The list of refrigerants can be seen in Table on page 99.

15. Press the **SET** button when nL 1n (Number of Cases Expected in Line-up) is shown. Use the ▲▼ buttons to choose the number of cases expected in the Line-up; press **SET.**

16. Press the **SET** button when EPrt (Evaporator Pressure Regulating Valve Type) is shown. Use the ▲▼ buttons to choose from either 2500 or 6386 depending on the valve; press **SET.** Please consult the literature supplied with the valve to determine the correct step count. For custom valve selection, see valve configuration menu in Section 11.

17. Press the **SET** button when EPrL (EPR Location) is shown. Press the ▲ button to scroll to L 1nE (EEPR per Line-up); press **SET.**

18. Press the **SET** button when dALt (Discharge Air Low Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

19. Press the **SET** button when dA1t (Discharge Air Medium Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

20. Press the **SET** button when dEFt (Defrost Type) is shown. Use the ▲▼ buttons to choose the Defrost Type; press **SET.** Defrost options are:

Display	Meaning
hGAS	Hot gas
ELEc	Electric
Air	Air

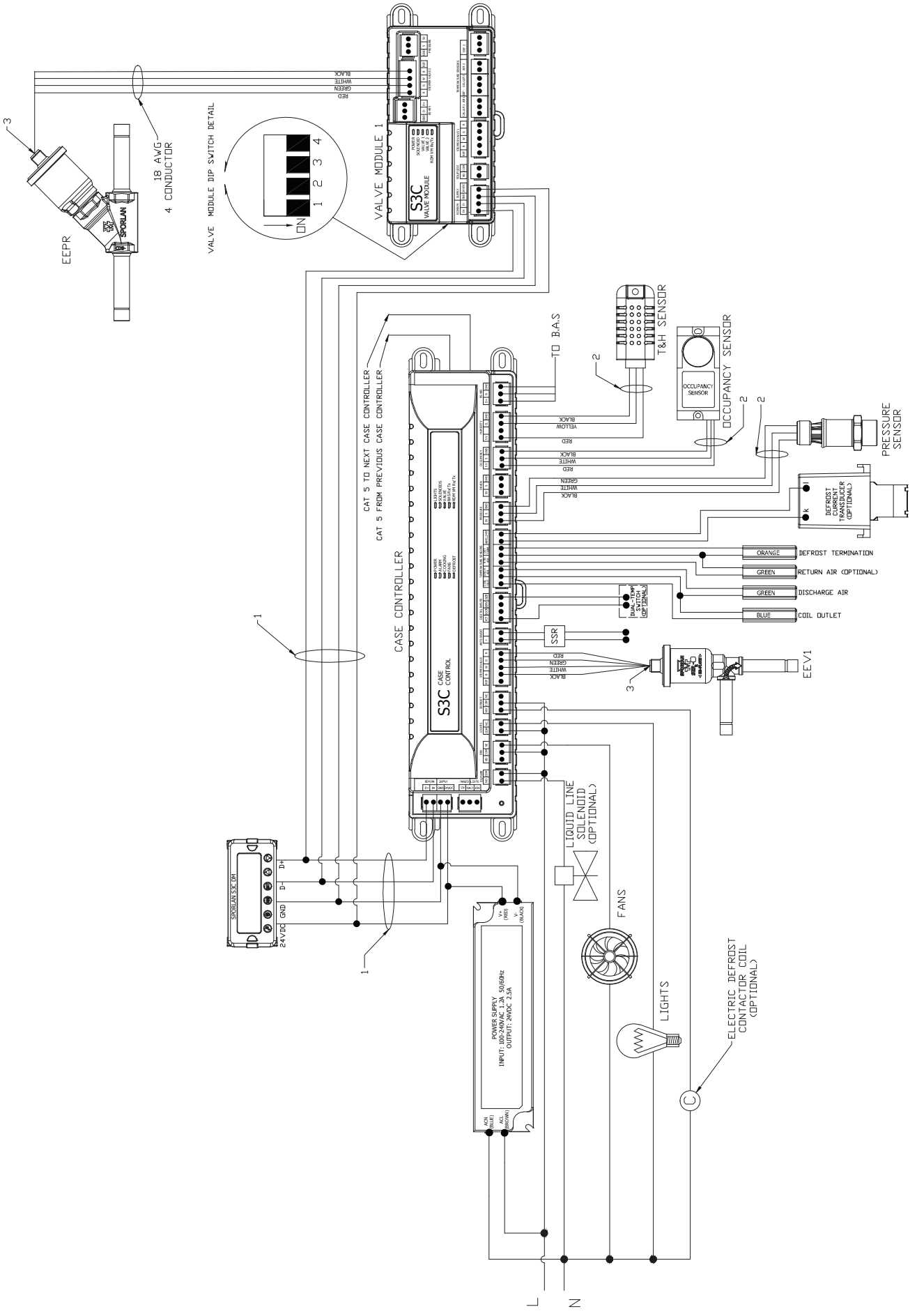
21. Press the **SET** button when dtEP (Defrost Termination Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

22. Press the **SET** button when dttE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**

23. Press the **SET** button when dFPd (Number of Defrosts Per Day) is shown. Use the ▲▼ buttons to choose the defrost per day; press **SET.**

The S3C Case Control system is now set-up and will begin controlling the refrigerated display case.

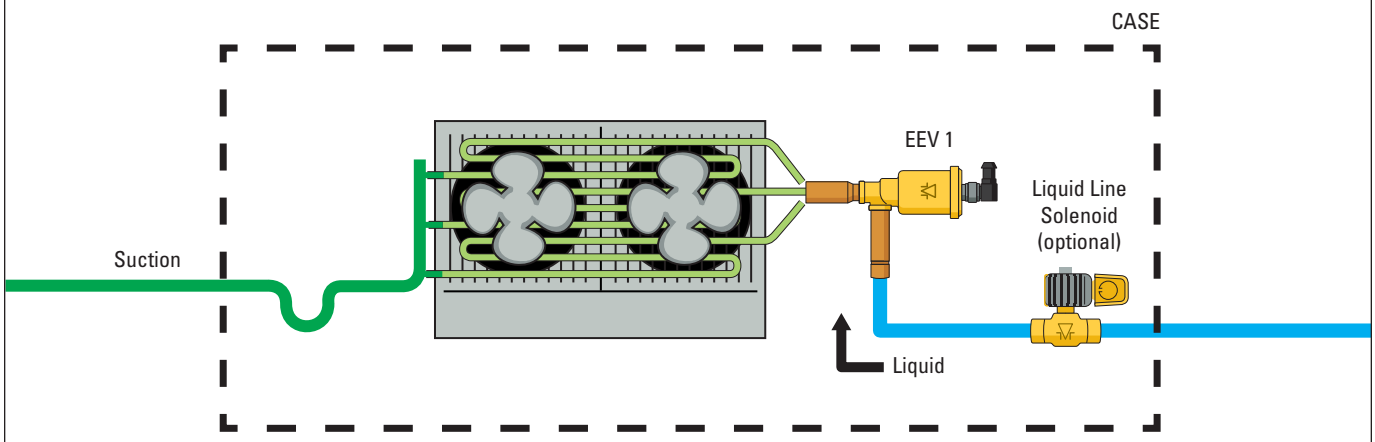
WIRING DIAGRAM – CONFIGURATION T



6.21 WALK-IN SINGLE EVAPORATOR WITH EEV – CONFIGURATION U

The S3C case controller is capable of controlling and monitoring walk-in coolers and freezers equipped with electric defrost. For a single coil walk-in with an EEV, one S3C case controller is required. In the scenario detailed above, the user has two choices of control method. Method one involves return air temperature (box temperature) control using the EEV. Method two involves superheat control with the EEV and cut-in/cut-out temperature control by pulsing the optional liquid line solenoid valve and opening/closing the EEV.

WALK-IN SINGLE EVAPORATOR WITH EEV – CONFIGURATION U



To configure the S3C control package for configuration U shown above, follow these directions:

If the controller has not been factory set, then upon initial start-up, the controller will be in set-up mode and the screen will display SELF (for self-contained case).

1. Press the **SET** button, then use ▲▼ buttons to scroll to no; press **SET.** This will configure the controller to support a remote case.

2. Press the **SET** button when rc id (Rack Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Rack Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

3. Press the **SET** button when LU id (Line-up Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Line-up Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

4. Press the **SET** button when CA id (Case Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Case Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.

5. Press the **SET** button when APPL (Application Type) is displayed. Use the ▲ button and scroll to WALK (Walk-In); press **SET.**

6. Press the **SET** button when StPC (Local Stepper Valve Configuration) is displayed. Use the ▲ button to scroll to EEu (Electronic Expansion Valve); press **SET.** This is the valve that is attached to the main S3C Case Controller.

7. Press the **SET** button when EuLu (Expansion Valve Type) is displayed. Use ▲▼ buttons to choose the Expansion Valve Type based on the below chart; press **SET.**

Display	Meaning
PULS	Pulse Width Modulation Valve
500	500 Step Valve
1596	1596 Step Valve
2500	2500 Step Valve
3193	3193 Step Valve
6386	6386 Step Valve
cUSt	Custom Stepper Valve (See Section 11)

8. Press the **SET** button when nEuP (Number of Evaporators) is displayed. Use the ▲ button and scroll to 1 (1 Evaporator); press **SET.**
9. Press the **SET** button when bAS (Building Automation System Expected) is displayed. Use the ▲▼ buttons to choose YES or no; press **SET.**

    a. If YES is chosen, the display will show bASP (Building Automation System Protocol). Press the **SET** button then use ▲▼ buttons to choose the B.A.S. Protocol based on the below chart; press **SET.**

Display	Meaning
n485	Modbus Protocol over RS-485
b485	Bacnet Protocol over IP (Ethernet)
bA nP	Bacnet Protocol over IP (Ethernet)
no nP	Modbus Protocol over IP (Ethernet)

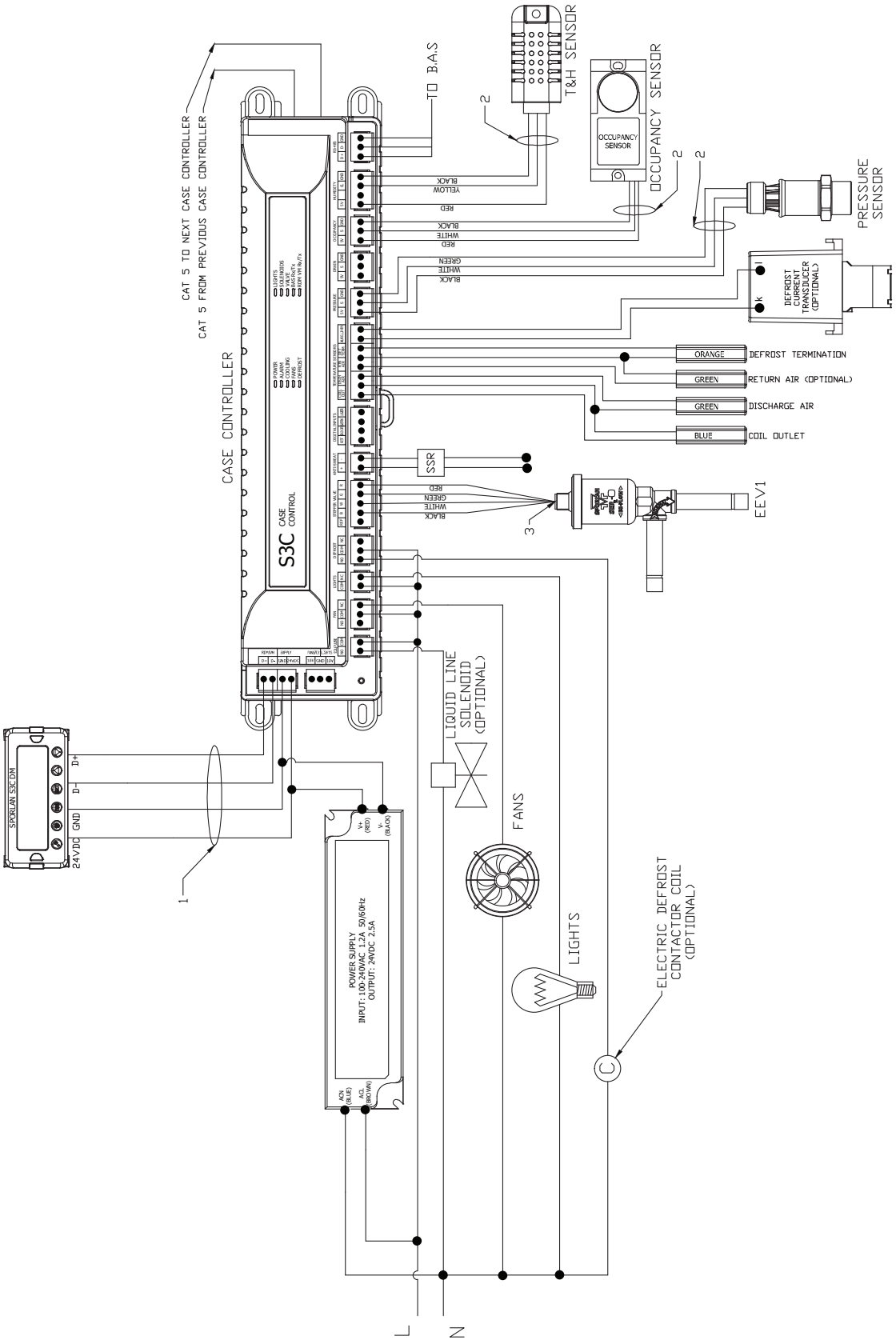
10. Press the **SET** button when nonH (Month) is shown. Use the ▲ button to choose the current month; press **SET.**
11. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**
12. Press the **SET** button when YEAr (Year) is shown. Use the ▲ button to choose the current day; press **SET.**
13. Press the **SET** button when t nnE (Time) is shown. Use the ▲ button to choose the current time in 24 hour format; press **SET. Note: Holding the ▲ or ▼ down while setting the time will accelerate the scrolling.**
14. Press the **SET** button when rEFt (Refrigerant Type) is shown. Use the ▲▼ buttons to choose the Refrigerant Type; press **SET.** The list of refrigerants can be seen in Table on page 99.
15. Press the **SET** button when nL nn (Number of Cases Expected in Line-up) is shown. Use the ▲▼ buttons to choose the number of cases expected in the Line-up; press **SET.**
16. Press the **SET** button when EPrt (Evaporator Pressure Regulating Valve Type) is shown. Use the ▼ button to scroll to nonE (no EEPR); press **SET.**
17. Press the **SET** button when rASP (Return Air Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**
18. Press the **SET** button when dEFt (Defrost Type) is shown. Use the ▲▼ buttons to choose the Defrost Type; press **SET.** Defrost options are:

Display	Meaning
hGAS	Hot gas
ELEc	Electric
Air	Air

19. Press the **SET** button when dttP (Defrost Termination Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**
20. Press the **SET** button when dttE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**
21. Press the **SET** button when dFPd (Number of Defrosts Per Day) is shown. Use the ▲▼ buttons to choose the defrost per day; press **SET.**

The S3C Case Control system is now set-up and will begin controlling the walk-in cooler/freezer.

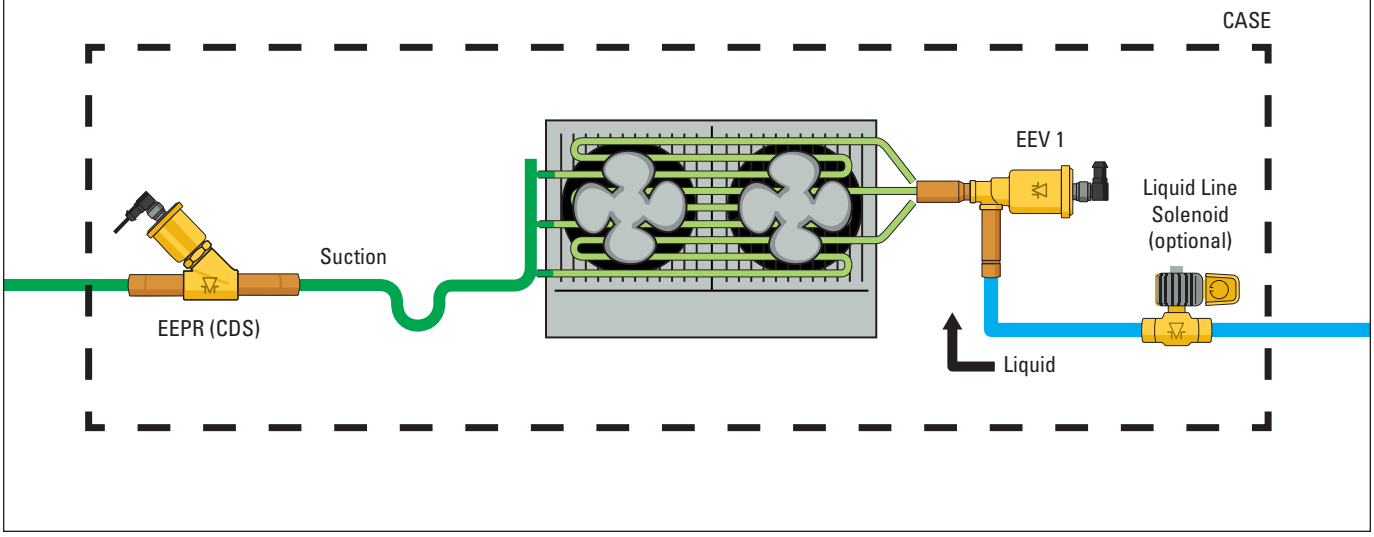
WIRING DIAGRAM – CONFIGURATION U



6.22 WALK-IN SINGLE EVAPORATOR WITH EEV AND EEPR – CONFIGURATION V

The S3C case controller is capable of controlling and monitoring walk-in coolers and freezers equipped with electric defrost. For a single coil walk-in with an EEV and EEPR, one S3C case controller and one S3C valve module are required. In the scenario detailed above, the typical control method involves controlling return air temperature (box temp) with the EEPR and controlling superheat with the EEV. As with all evaporators equipped with an EEV, a liquid line solenoid (LLS) or suction stop solenoid is optional as flow through the evaporator can be stopped by closing the EEV.

WALK-IN SINGLE EVAPORATOR WITH EEV AND EEPR – CONFIGURATION V



To configure the S3C control package for Configuration V shown above, follow these directions:

If the controller has not been factory set, then upon initial start-up, the controller will be in set-up mode and the screen will display SELF (for self-contained case).

1. Press the **SET** button, then use ▲▼ buttons to scroll to no; press **SET.** This will configure the controller to support a remote case.
2. Press the **SET** button when rc id (Rack Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Rack Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
3. Press the **SET** button when LU id (Line-up Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Line-up Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
4. Press the **SET** button when CA id (Case Identifier) is displayed. Use the ▲▼ buttons to configure the 4 character Case Identifier. **Note: Push ▲ button for numeric, ▼ for alpha characters.** When satisfied with each digit, press the **SET** button to go to the next digit. Pressing **SET** multiple times will move to the next parameter.
5. Press the **SET** button when APPL (Application Type) is displayed. Use the ▲ button and scroll to WALK(Walk-In); press **SET.**
6. Press the **SET** button when StPC (Local Stepper Valve Configuration) is displayed. Use the ▲ button to scroll to EEv(Electronic Expansion Valve); press **SET.** This is the valve that is attached to the main S3C Case Controller.
7. Press the **SET** button when EvLv (Expansion Valve Type) is displayed. Use ▲▼ buttons to choose the Expansion Valve Type based on the below chart; press **SET.**

Display	Meaning
PULS	Pulse Width Modulation Valve
500	500 Step Valve
1596	1596 Step Valve
2500	2500 Step Valve
3 193	3193 Step Valve
6386	6386 Step Valve
cUSt	Custom Stepper Valve (See Section 11)

8. Press the **SET** button when nEvP (Number of Evaporators) is displayed. Use the ▲ button and scroll to 1(1 Evaporator); press **SET.**
9. Press the SET button when bAS (Building Automation System Expected) is displayed. Use the ▲▼ buttons to choose YES or no; press **SET.**

a. If YES is chosen, the display will show bASP (Building Automation System Protocol). Press the **SET** button then use ▲▼ buttons to choose the B.A.S. Protocol based on the below chart; press **SET.**

Display	Meaning
n485	Modbus Protocol over RS-485
6485	Bacnet Protocol over RS-485
bA IP	Bacnet Protocol over IP (Ethernet)
no IP	Modbus Protocol over IP (Ethernet)

10. Press the **SET** button when nonH (Month) is shown. Use the ▲ button to choose the current month; press **SET.**

11. Press the **SET** button when dAY (Day) is shown. Use the ▲ button to choose the current day; press **SET.**

12. Press the **SET** button when YEAr (Year) is shown. Use the ▲ button to choose the current day; press **SET.**

13. Press the **SET** button when t nnE (Time) is shown. Use the ▲ button to choose the current time in 24 hour format; press **SET. Note: Holding the ▲ or ▼ down while setting the time will accelerate the scrolling.**

14. Press the **SET** button when rEFt (Refrigerant Type) is shown. Use the ▲▼ buttons to choose the Refrigerant Type; press **SET.** The list of refrigerants can be seen in Table on page 99.

15. Press the **SET** button when nL in (Number of Cases Expected in Line-up) is shown. Use the ▲▼ buttons to choose the number of cases expected in the Line-up; press **SET.**

16. Press the **SET** button when EPrt (Evaporator Pressure Regulating Valve Type) is shown. Use the▲▼ buttons to choose from either 2500 or 6386 depending on the valve; press **SET.** Please consult the literature supplied with the valve to determine the correct step count. For custom valve selection, see valve configuration menu in Section 11.

17. Press the **SET** button when EPrL (EPR Location) is shown. Press the ▲ button to scroll to L inE (EEPR per Line-Up); press **SET.**

18. Press the **SET** button when rASP (Return Air Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

19. Press the **SET** button when dEFt (Defrost Type) is shown. Use the ▲▼ buttons to choose the Defrost Type; press **SET.** Defrost options are:

Display	Meaning
hGAS	Hot gas
ELEc	Electric
Air	Air

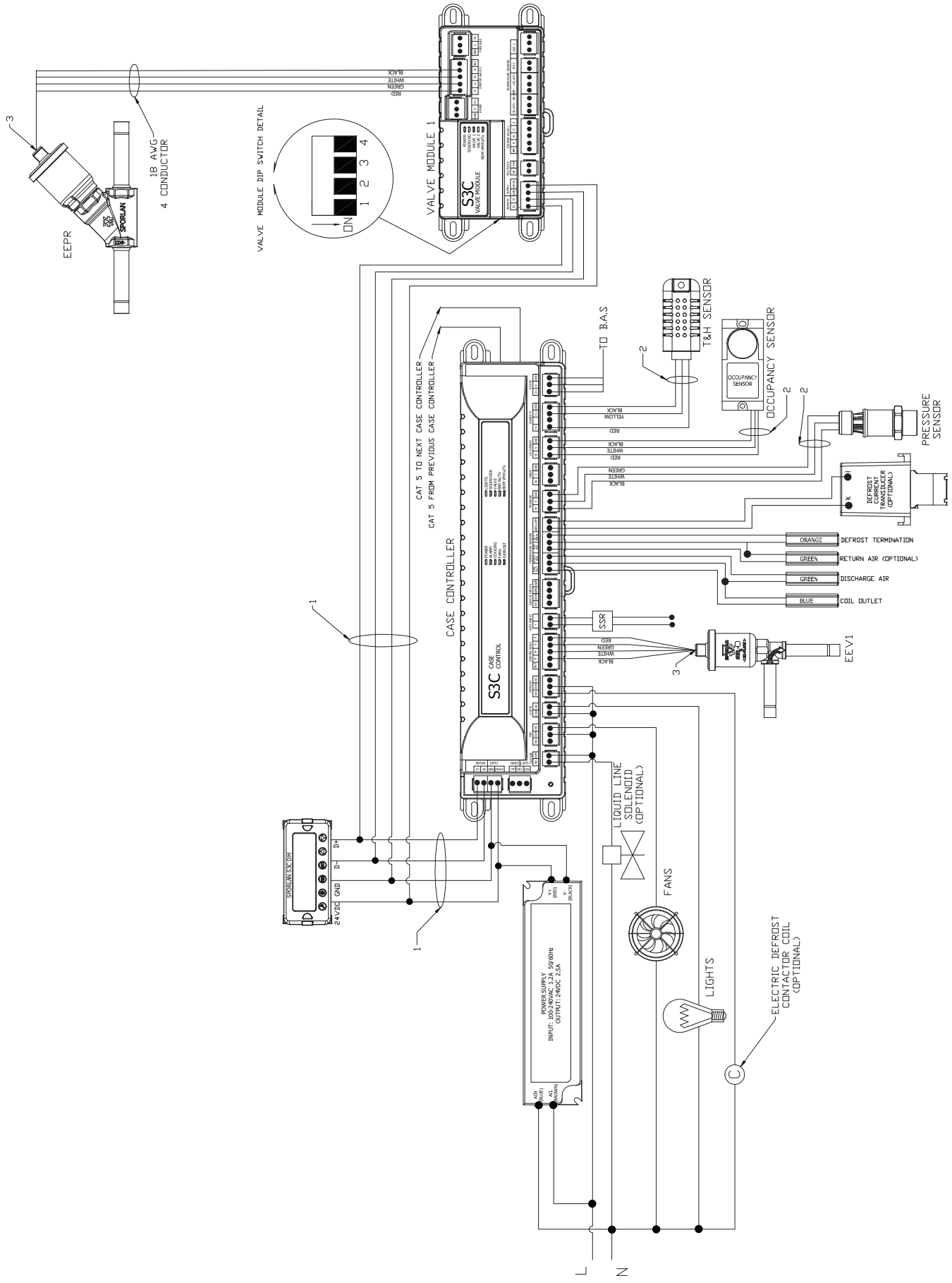
20. Press the **SET** button when dttP (Defrost Termination Temperature Setpoint) is shown. Use the ▲▼ buttons to choose the setpoint in °F; press **SET.**

21. Press the **SET** button when dttE (Defrost Termination Fail-safe Time) is shown. Use the ▲▼ buttons to choose the fail-safe time in minutes; press **SET.**

22. Press the **SET** button when dFPd (Number of Defrosts Per Day) is shown. Use the ▲▼ buttons to choose the defrost per day; press **SET.**

The S3C Case Control system is now set-up and will begin controlling the walk-in cooler/freezer.

WIRING DIAGRAM – CONFIGURATION V



6.22.1 DOOR SWITCH OPERATION

A door switch may be used on low temperature walk-in freezer applications. When the door switch is active, the S3C case controller will shut off evaporator fans and will turn off refrigeration by closing the liquid line solenoid valve and EEV. Once activated, the system will remain off for 15 minutes. The door switch polarity may be set through communications.

6.23 CONTROLLER REQUIREMENTS CHART

The following chart shows the required hardware per configuration. Quantities are per case unless otherwise noted.

Configuration	Case Controller	Display Module	Valve Module
A	1	1	
B	1	1	
C	1	1	1
D	1	1	1
E	1	1	
F	1	1	
G	1	1	
H	1	1	
I	1	1	1 (per line-up)
J	1	1	1
K	1	1	1
L	1	1	1
M	1	1	
N	1	1	1
O	1	1	2 (1 per case, 1 per line-up)
P	1	1	1
Q	1	1	2
R	1	1	
S	1	1	1 (per line-up)
T	1	1	1
U	1	1	
V	1	1	1

6.24 VALVE WIRING LOCATION CHART

The below chart shows valve wiring location based on the controller input. For example: Valve Module 2, “Stepper Valve 2” indicates that the valve is located on a second Valve Module and wired into the “Stepper Valve 2” location on that controller. See following figure for wiring location.

S3C CASE CONTROLLER

Stepper Valve

Ref	B	W	G	R

S3C VALVE MODULE

Stepper Valve 1

Ref	B	W	G	R

R	G	W	B	Ref

Stepper Valve 2

Configuration	EEV	EEV2	EEV3	EEPR
A	Not Used	Not Used	Not Used	Not Used
B	Case Controller "Stepper Valve"	Not Used	Not Used	Not Used
C	Case Controller "Stepper Valve"	Valve Module "Stepper Valve 1"	Not Used	Not Used
D	Case Controller "Stepper Valve"	Valve Module "Stepper Valve 1"	Valve Module "Stepper Valve 2"	Not Used
E	Not Used	Not Used	Not Used	Not Used
F	Case Controller "Stepper Valve"	Not Used	Not Used	Not Used
G	Not Used	Not Used	Not Used	Case Controller "Stepper Valve"
H	Not Used	Not Used	Not Used	Case Controller "Stepper Valve"
I	Case Controller "Stepper Valve"	Not Used	Not Used	Valve Module "Stepper Valve 2"
J	Case Controller "Stepper Valve"	Not Used	Not Used	Valve Module "Stepper Valve 2"
K	Case Controller "Stepper Valve"	Valve Module "Stepper Valve 1"	Not Used	Not Used
L	Case Controller "Stepper Valve"	Valve Module "Stepper Valve 1"	Valve Module "Stepper Valve 2"	Not Used
M	Not Used	Not Used	Not Used	Case Controller "Stepper Valve"
N	Case Controller "Stepper Valve"	Valve Module "Stepper Valve 1"	Not Used	Valve Module "Stepper Valve 2"
O	Case Controller "Stepper Valve"	Valve Module 1 "Stepper Valve 1"	Valve Module 2 "Stepper Valve 1"	Valve Module 2 "Stepper Valve 2"
P	Case Controller "Stepper Valve"	Valve Module "Stepper Valve 1"	Not Used	Valve Module "Stepper Valve 2"
Q	Case Controller "Stepper Valve"	Valve Module 1 "Stepper Valve 1"	Valve Module 2 "Stepper Valve 1"	Valve Module2 "Stepper Valve 2"
R	Not Used	Not Used	Not Used	Case Controller "Stepper Valve"
S	Case Controller "Stepper Valve"	Not Used	Not Used	Valve Module "Stepper Valve 2"
T	Case Controller "Stepper Valve"	Not Used	Not Used	Valve Module "Stepper Valve 2"
U	Case Controller "Stepper Valve"	Not Used	Not Used	Not Used
V	Case Controller "Stepper Valve"	Not Used	Not Used	Valve Module "Stepper Valve 2"

7. PASSWORDS

7.1 S3C PASSWORDS

Access to the S3C Case Control system configuration parameters and service functions are password protected. There are two levels of password protection; Administrator and Technician. The Administrator password allows access to all system control and configuration parameters for purposes of setting up the S3C control system for an intended application. The Technician password allows access to the Service Menu where a service technician can access service functions such as forcing a valve position or changing operating modes (See Service Section). Parameter changes made with the Administrator level are permanent whereas Technician level changes are temporary and revert to their original values when exiting the Service Menu. Passwords are numeric and can range from 0 – 4999. **Note: The default Administrator password is 19 and the default Technician password is 81.**

7.1.1 SETTING PASSWORDS

To set the two levels of passwords:

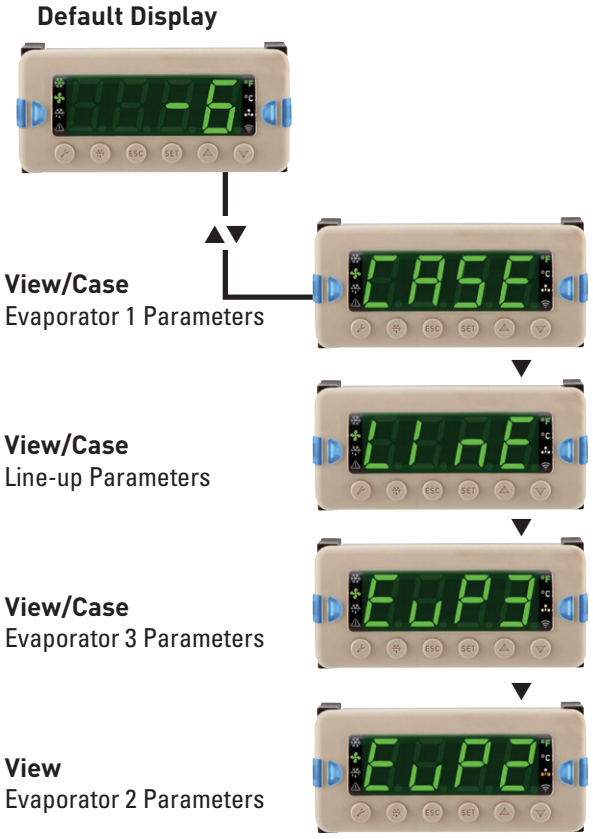
1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE (will skip to Process Values if system is self-contained).
4. Press the **SET** button and P_u (Process Values) will be displayed.
5. Press the ▼ button until d iSP (Display) is showing.
6. Press the **SET** button and AP'_d (Administrator Password) will be displayed.
7. Press the **SET** button and use the ▲▼ buttons to adjust the password value.
8. Press the **SET** button to enter the new value. The display will revert to AP'_d.
9. Press the **ESC** button 3 times to revert to the **default** display.

To set the Technician password:

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE (will skip to Process Values if system is self-contained).
4. Press the **SET** button and P_u will be displayed.
5. Press the ▼ button until d iSP is showing.
6. Press the **SET** button and AP'_d (Administrator Password) will be displayed.
7. Press the ▼ button until tP'_d (Technician Password) will be displayed.
8. Press the **SET** button and use the ▲▼ buttons to adjust the password value.
9. Press the **SET** button to enter the new value. The display will revert to tP'_d.
10. Press the **ESC** button 3 times to revert to the **default** display.

8. MENU STRUCTURE

The S3C Case Control system has a structured menu design that allows Administrators and Service Technicians to access key parameters independently. The structure includes menus for the Case, Line-Up and Evaporator. Each menu has viewable parameters related to that subsystem. See following figure. Subsequent sections will define each menu in more detail.



A new controller starts with the Set-Up menu. This enables the product to be set-up through the display. The controller may also go into the Set-Up menu after a factory reset. See Service Section for more information on factory reset option. After the control system has been set-up, it will enter the "default display" which shows the case temperature or mode of operation such as defrost. The default display menu is read only and does not require a password. This top level view may be used for a quick check on system variables, such as case superheat or EEPR position. For example, to view Case superheat:

From the **default** display, press the ▲ button to CASE then press **SET.**

1. Press the ▲ button and scroll to SH.
2. Press **SET** button to show current superheat value.
3. Press **ESC** button three times to return to dEFAULt display (discharge air).

9. SET-UP MENU

Upon first power up of the S3C Case Control system the user is presented with a Start Up menu through the Display Module where critical parameters are set to allow the system to operate in a safe default operating mode. This eliminates the possibility of case or refrigeration system damage. Additionally, critical communication and refrigeration system parameters are set to assist in simplifying detailed set-up by enabling automatic synchronization of case evaporator and line-up level settings. For circuit line-up control, common settings such as control temperature set point, defrost type and schedule, etc. need only be set at one S3C Case Control and the user entered settings are synchronized among all connected controllers in the line-up. The S3C Control System can be configured via communications or by use of the local S3C Display Module (DM).

Note:

1. **This manual describes configuration using the DM only. Refer to communication documentation for configuration via BACnet or MODBUS.**
2. **Before beginning set-up of the S3C Control System ensure all wiring is completed in accordance with the appropriate wiring diagrams contained in this manual.**
3. **All S3C Case Control configuration parameters are available for modification. Values entered during Start up can be changed subsequent to completing the following procedure.**

9.1 NAVIGATING THE SET-UP MENU

- After the current parameter has been set, the display advances to the next parameter.
- When a parameter is displayed, press the **SET** or ▲▼ buttons on the DM to present the options/value for that parameter.
- Use the ▲▼ buttons to navigate through the options or increment/decrement the parameter value.

TABLE 4 - SET-UP MENU PARAMETERS

Display	Description	Factory Default	Hide Condition
SELF	Case Type - Self-contained or remote	No (for remote)	
rc id	Rack ID - Unique alpha numeric ID of refrigeration rack that supports the case	A	
LU id	Line-up ID - Unique alpha numeric ID of the case line-up the control operates in	0	
CA id	Case ID - Alpha numeric ID of the case the control is operating	0	
AUto	Automatically configured through the gateway		
APPL	Application - Single or dual temperature operation	Single temp	
StPC	Stepper valve configuration - type of valve attached to the S3C Case Control	EEV	
EuLu	Expansion valve type attached to evaporators in case (TEV, pulse or numbers of steps, custom valve type)	2500 step	(2)
EEuU	Custom valve type unipolar or bipolar	Bipolar	(3)
EEuS	Number of steps for custom valve		(3)
EEur	Custom valve step rate	200	(3)
nEuP	Number of evaporators in case	1	(4)
bAS	*Building automation system (BAS) connected to control	Yes	
bASP	*Building automation system protocol	BACnet/IP	(5)
Addr	*RS-485 address	1	(6)
Moth	*Month	January	
dAY	*Day of the month	1	
YEAr	*Year		
t miE	*Time (24 hour clock displayed in hours and minutes)		
rEFt	*Refrigerant type	404A	(7)
nL in	*Number of cases in the line-up	1	(1)
EPrt	*EPR type	2500 step	(8)
EPrL	*EPR location - at the case or line-up (circuit)	Case	
dASP	*Discharge air set point	-5	(9)
rASP	*Return air set point	-5	(10)
dALt	*Discharge air low temperature set point (dual temp)	-5	(11)
dAMt	*Discharge air medium temperature set point (dual temp)	36	(11)
dEFt	*Defrost type	Electric	
dttP	*Defrost termination temperature	55° Elect/Hot Gas 47° Air	
dttE	*Defrost duration fail-safe time	60 min. Elect/Hot Gas 28 min. air	
dFPd	*Number of defrosts per day	4	

- Press the **SET** button to commit the selected parameter value to memory
- The **ESC** button can be used to exit the value selection for the current parameter. A subsequent press of the **ESC** button will move to the previous parameter.

The set-up is simplified by presenting the user with only the parameter selections required based on previous parameter value selections. Parameters that can be hidden in the table above are shaded and assigned a number in parenthesis. The explanations below correspond to those numbers.

TABLE 5 - HIDE CONDITIONS FOR SET-UP MENU ITEMS

Number	Hide Condition
1	Case type is self-contained
2	Stepper valve type is secondary fluid valve (SFV)
3	Stepper valve type is not custom
4	Expansion Valve is TEV and local stepper valve is not used or controlling an EEPR or SFV
5	BAS is set to NO
6	BAS is set to YES and BAS protocol is set to BACnet/IP or MODBUS/IP
7	Stepper valve type is secondary fluid valve (SFV)
8	Stepper valve type is secondary fluid valve (SFV)
9	Application is dual temperature case
10	Application is single or dual temperature case
11	Application is single temperature case

Synchronization of certain S3C Case Control system settings between controls in a line-up is set to 'on' by default. The parameters in Table 4 above marked with an * are duplicated in all networked controls with the same Rack ID - rcld and Line-up ID - LUid.

After the first control in the line-up is configured via the Start Up menu through the Display Module, all subsequent controls on the line-up will synchronize available settings to simplify set-up. Each time a parameter is synchronized, the Display Module will momentarily show 'SYNC' as shown below. Once the controller has been set-up, the display will show the default discharge air temperature.

Note: In able for this feature to function, prior to setting all control parameters:

1. Each S3C Case Control must contain a unique IP address. Each control is supplied from Sporlan with a unique IP address by default. If your installation utilizes an addressing scheme that necessitates changing this address it must NOT be done prior to setting up the controls (See Configuring IP Address).
2. S3C Case Controls in the line-up must be connected to each other using CAT-5 cabling with RJ-45 plugs wired as either straight through or crossover Ethernet cables.
3. The Rack ID and Line-up ID must be the same in all controls in the line-up.

This mechanism operates continuously during operation to ensure pertinent operating parameters are synchronized among S3C Case Controls in the line-up. In addition to these parameters, the Real Time Clocks are synchronized periodically and coordinated functions such as defrost termination and lighting control are controlled.

In the event a control in the line-up is replaced or a new one added, it will receive its line-up level operating parameters from its peer controllers as soon as it is recognized on the case – case network by matching its Rack and Line-up ID.

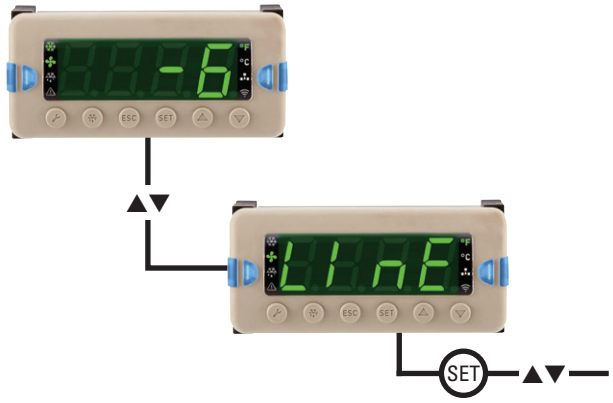
Parameters that are synchronized across the line-up are located in Section 21.

10. VIEW ONLY MENUS

The view only menus are available by pressing the ▲▼ buttons from the default display after the system has been set-up. These menus are used as a quick check on system parameters such as superheat or suction pressures. The menu will time out after 3 minutes and will return to the default display.

10.1 LINE-UP MENU

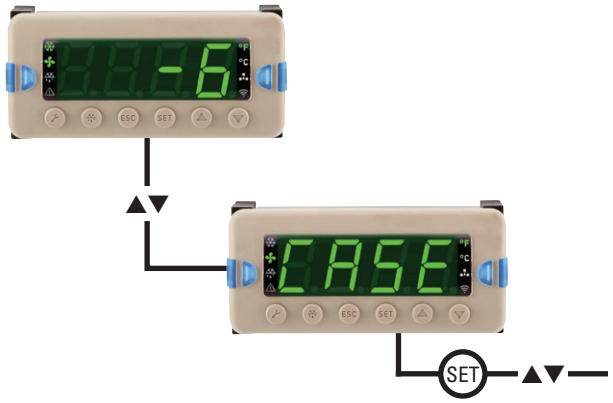
DEFAULT DISPLAY



Display	Meaning
dA	Aggregated Discharge Air Temperature across Line-up
rA	Aggregated Return Air Temperature across Line-up
SUcP	Suction Pressure (Aggregated suction pressure on Line-up)
EEPr	EEPR Valve Position

10.2 CASE MENU

DEFAULT DISPLAY



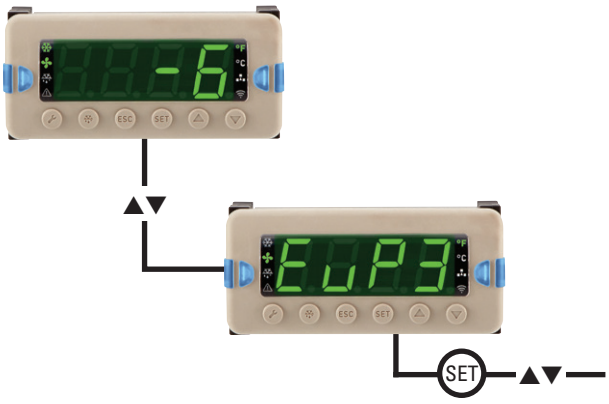
Display	Meaning
CALS	Case control alarms
SALS	Sensor Alarms
uErS	Firmware Revision
t mE	24 Hour Time
d'EE	Day of the Week
nUPd	Number of controller firmware updates still in process on the COM loop
CA id	Case position of the Case ID
LU id	Line up or Circuit number of the Case ID
rc id	Rack ID of the Case ID
iP4	Current Ethernet IP Address Octet 4
iP3	Current Ethernet IP Address Octet 3
iP2	Current Ethernet IP Address Octet 2
iP 1	Current Ethernet IP Address Octet 1
nCAS	Number of controllers detected in the COM loop
nrAC	Number of controllers detected on the rack
nL in	Number of controllers detected in the line-up
EPrc	EEPR Controller Detected
EuPd	Number of Evaporators Detected
USrS	User Configured Switch State
occS	Occupancy Switch State
SErS	Service Switch State
door	Door Switch State
AS	Anti-Sweat Heater State
dEF	Defroster State
FAnS	Evaporator Fans State
SoL	Liquid Line/Suction Stop Solenoid State
L itE	Light State
FAnC	Evaporator Fans Current
CLoG	Clogged Drain Sensor Level
ASdc	Anti-Sweat Heater Duty Cycle
dPt	Air Dew Point Temperature
dbOU	Dry Bulb Temperature Out of Service
dbt	Ambient Air Dry Bulb Temperature
rHOu	Relative Humidity Out of Service
rH	Ambient Air Relative Humidity
CSOu	Case Surface Temperature Out of Service
CStP	Case Surface Temperature
rAOu	Return Air Temperature Out of Service
rA_ 1	
rA	Return Air Temperature
dtOu	Defrost Termination Temperature Out of Service

Display	Meaning
dt_1	
dEFt	Defrost Temperature
COOu	Coil Outlet Temperature Out of Service
Co_1	
COUt	Evaporator Coil Outlet Temperature
tSAt	Refrigerant Dew Point Saturation Temperature (Based on aggregated suction pressure)
EEud	EEV/SFV Duty Cycle
EEu1	EEV Left Valve Position
EEu	EEV Position
SFud	SFV Duty Cycle
SFu	SFV Position
EPrd	EEPR Duty Cycle
EEPr	EEPR Position
SPOu	Suction Pressure (Local suction pressure on case) Out of Service
SUcP	Suction Pressure (Local suction pressure OR aggregated suction pressure on case)
SH_1	
SH	Superheat
dAOu	Discharge Air Temperature Out of Service
dA_1	
dA	Discharge Air Temperature
dLtr	Dual Temperature Selection
UALS	User Configured Alarms

10.3 EVAPORATOR MENU

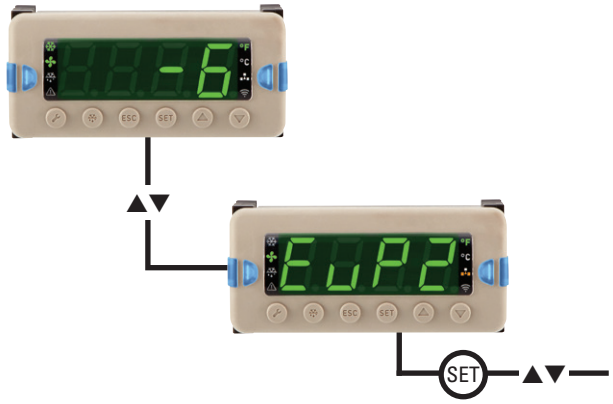
The EuP, or Evaporator view, shows process values for valves and sensors connected to a particular evaporator. These views are available on multi-coil cases. For single coil cases, the evaporator parameters may be viewed thru the CASE menu. The following views are shown for the second and third evaporator.

DEFAULT DISPLAY



Display	Meaning
dA	Discharge Air Temperature
dAOu	Discharge Air Temperature Out of Service
SH	Superheat
SUcP	Suction Pressure (Local suction pressure OR aggregated suction pressure on case)
SPOu	Suction Pressure Out of Service
EEu	Valve Position
tSAt	Refrigerated Dew Point Saturation Temperature
COUt	Evaporator Coil Outlet Temperature
COOu	Coil Outlet Temperature Out of Service
dEFt	Defrost Termination Temperature
dtOu	Defrost Termination Temperature Out of Service
rA	Return Air Temperature
rAOu	Return Air Temperature Out of Service
SoL	Solenoid/Pulse State
uErS	Firmware Revision

DEFAULT DISPLAY



Display	Meaning
dA	Discharge Air Temperature
dAOu	Discharge Air Temperature Out of Service
SH	Superheat
SUcP	Suction Pressure (Local suction pressure OR aggregated suction pressure on case)
SPOu	Suction Pressure Out of Service
EEu	Valve Position
tSAt	Refrigerated Dew Point Saturation Temperature
COUt	Evaporator Coil Outlet Temperature
COOu	Coil Outlet Temperature Out of Service
dEFt	Defrost Termination Temperature
dtOu	Defrost Termination Temperature Out of Service
rA	Return Air Temperature
rAOu	Return Air Temperature Out of Service
SoL	Solenoid/Pulse State
uErS	Firmware Revision

11. CONFIGURABLE MENUS

11.1 ADMINISTRATOR AND TECHNICIAN LEVEL ACCESS

Once the S3C system has been set-up, it will go into the default display and the case will begin to operate. As noted above, the default display and view only menus can be accessed without a password.

If it is necessary to reconfigure and adjust parameters or access the case for service then a password is required. The S3C offers two levels of access: Administrator and Technician.

Administrator Access (Default Password = 19): Full level access. Any changes will be permanent and will take effect once the menu is exited. It is used to:

- View and configure all parameters
- Lock out set-points defined by installer or store owner

Technician Access (Default Password = 81): Service level access. Any changes will be temporary. All settings will resort back to previous setting after exiting this level. It is used to:

- View all service parameters
- Change service parameters to help diagnose system

11.2 CONFIGURING THE S3C CASE CONTROL SYSTEM (ADMINISTRATOR LEVEL)

Detailed configuration of all operating parameters contained in the S3C Case Control system is possible using the S3C DM when the system is accessed using the Administrator password. A series of menus are presented to the user in accordance with the Display Module (DM) navigation mechanisms (See DM Navigation).

Configuration of the S3C Case Control system, like the default display "view mode", is divided into three top level menus:

- Case
- Line-up
- Evaporator (Available on Multi-Coil Systems)

Sub-Menus and parameters are grouped according to these categories in order to simplify and speed the configuration process and are password protected.

Note: Set-up is simplified by presenting the user with only the parameter selections required based on previous parameter value selections. Parameters that can be hidden in the tables below are shaded and assigned a number in parenthesis. The explanations below the table correspond to the numbers in parenthesis.

To access the Top Level Menus:

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE.
4. Use the ▲▼ buttons to select the desired top level menu.
5. Press the **SET** button to enter the desired configuration menu.

TABLE 6 - TOP LEVEL MENUS

Display	Meaning	Description	Hide Condition
CASE	Case Configuration	Allows configuration of case level parameters	
L inE	Line-up Configuration	Allows viewing of line-up level process values	(1)
EuP3	Evaporator 3 Configuration	Allows configuration of evaporator level sensors offsets for evaporator 3	(2)
EuP2	Evaporator 2 Configuration	Allows configuration of evaporator level sensors offsets for evaporator 2	(3)

TABLE 7 - HIDE CONDITIONS FOR TOP LEVEL MENU ITEMS

Number	Hide Condition
1	Case type is self-contained
2	nEuP Number of evaporators is configured to < 3
3	nEuP Number of evaporators is configured to 1

11.3 CASE LEVEL CONFIGURATION

The case level menu can be used to view and change case parameters. It may be used for troubleshooting or updating parameters.

To access Case Level Menus:

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE; press **SET.**
4. Use the ▲▼ buttons to select the desired parameter, see Table 8 below.
5. Press the **SET** button to enter and change the parameter.
6. After adjusting the parameter, press the **SET** button to commit the change.

11.4 BASIC OPERATIONAL CONFIGURATION

The basic menu presents key case parameters that may be changed. If entering this menu thru the Administration level password, changes will be permanent. Use caution when changing parameters from the original OEM settings.

To access Basic Parameter Menu:

7. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
8. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
9. The display will show CASE; press **SET.**
10. Press the ▲ button to scroll to the basic menu bSc; press **SET.**
11. Use the ▲▼ buttons to select the desired parameter.
12. Press the **SET** button to enter and change the parameter.

TABLE 8 - CASE CONFIGURATION MENUS

Display	Meaning	Description
P_u	Process values	Allows viewing of operational and sensed values
bSc	Basic operational configuration	Configuration of basic operational settings
uLuC	Valve configuration	Configuration of attached valves
SEnS	Sensor configuration	Configures type, range, offset and use of sensors
ALrC	User alarm configuration	Configures user alarm thresholds and delays
d iSP	Display (DM) configuration	Configures passwords, display actions and units
L itC	Lighting control configuration	Configures lighting schedule and occupancy sensor action
dEFC	Defrost configuration	Configures defrost type and settings
FAnC	Evaporator fan control configuration	Configures evaporator fan settings and alarms
AS_C	Anti-sweat heater control configuration	Configures anti-sweat heater control
cA id	Case controller indentifier configuration	Indentifies case location based on rack and line-up ID
nEtC	Network configuration	Configures network for BAS and peer - peer
dAtE	Set time and date	Used for setting internal real time clock (RTC)

TABLE 9 - BASIC CONFIGURATION MENU

Display	Meaning	Range	Selection	Hide Condition
APPL	Application Type	Walk-in Single Temperature Case Dual Temperature Case (s)	WALK Sn9L dUAL	
SELF	Case Type: Remote or Self Contained	Yes No	YES no	
tPCS	Temperature Control Scheme	Cut-in/Cut-out Constant On	CUt ConS	
tPC1	Control Temperature Input Selection	Controlling Return Air Controlling Discharge Air	rAtP dAtP	
dASP	Discharge Air Temperature Set Point	-30 to 40°F	-30 - 40	(1), (2)
dALt	Discharge Air Low Temperature Set Point	-30 to 19°F	-30 - 19	(2), (3)
dAMt	Discharge Air Medium Temperature Set Point	20 to 50°F	20 - 50	(2), (3)
dAtd	Discharge Air Temperature Differential	1 to 10°F	1 - 10	(2), (4)
rASP	Return Air Temperature Set Point	-30 to 50°F	-30 - 50	(1), (5)
rALt	Return Air Low Temperature Set Point	-30 to 19°F	-30 - 19	(5), (6)
rAMt	Return Air Medium Temperature Set Point	20 to 50°F	20 - 50	(5), (6)
rAtd	Return Air Temperature Differential	1 to 10°F	1 - 10	(4), (5)
SHSP	Superheat Set Point	5 to 45°F	5 -45	(7)
EPrC	EEPR Control Type	Controlling Pressure Controlling Temperature Forced Open	CtLP CtLt OPEn	(7), (8)
SPSP	Suction Pressure Set Point	0 to 652 PSIG	0 - 652	(1), (7), (8), (9)
LtPr	Low Temperature Suction Pressure Set Point	0 to 652 PSIG	0 - 652	(3), (7), (8), (9)
MtPr	Medium Temperature Suction Pressure Set Point	0 to 652 PSIG	0 - 652	(3), (7), (8), (9)
ont	Minimum On Time	0 to 60 minutes	0 - 60	(4)
oFFt	Minimum Off Time	0 to 60 minutes	0 - 60	(4)
nEvP	Number of Evaporators	1 to 3	1 - 3	(7), (9) (10), (11)
nL in	Number of Cases on Line-up	1 to 8	1 - 8	(12)
nrAC	Number of Cases on Rack	1 to 32	1 - 32	(12)
nCAS	Number of Cases in Store	1 to 200	1 - 200	(12)
SPAM	Suction Pressure Aggregation Mode	Median Average Smallest Largest	MEdn AUr9 SMLL LAr9	(7), (8) (12), (13)
CtAM	Control Temperature Aggregation Mode	Median Average Coldest Warmest	MEdn AUr9 CoLd WArM	(12), (13)

TABLE 9 - BASIC CONFIGURATION MENU

Display	Meaning	Range	Selection	Hide Condition
rEFt	Refrigerant Type	R-1366MZZ	dr2	(7)
		R-513A	5 13A	
		R-452A	452A	
		R-449A	449A	
		R-450A	450A	
		R-448A	448A	
		R-444B	444b	
		R-434A	434A	
		R-407F	407F	
		R-508B	508b	
		R-508A	508A	
		R-408A	408A	
		R-401B	40 1b	
		R-438A	438A	
		R-E5	rE45	
		R-245FA	245F	
		R-744	r744	
		R-507A	507A	
		R-422d	422d	
		R-422A	422A	
		R-417A	4 17A	
		R-410A	4 10A	
		R-407C	407C	
		R-407A	407A	
		R-404A	404A	
		R-402A	402A	
		R-134A	134A	
		R-22	r22	
LSAt	Low Operating Saturation Temperature	-60 to 32°F	-60 - 32	
dLtr	Dual Temperature Selection	L tmp M tmp	LtmP MtmP	(1)
uLoc	Fireware Version Lock	Yes NO	YES no	

TABLE 10 - HIDE CONDITIONS FOR BASIC CONFIGURATION MENU ITEMS

Number	Hide Condition
1	Application type is dual temperature
2	Control temperature input selection is return air temperature
3	Application type is single temperature or walk-in
4	Control scheme is constant on
5	Control temperature input selection is discharge air temperature
6	Application type is single temperature
7	Local stepper valve type configured as SFV
8	EPR type is configured as non or mechanical
9	EEPR control type configured as temperature or forced open
10	Local stepper valve type configured as none
11	Expansion valve type configured as mechanical and local stepper valve type is EEPR
12	Case type configured as self-contained
13	Number of evaporators configured as 1

11.5 SENSOR CONFIGURATION

The S3C supports Sporlan 10K thermistors and 0.5 to 4.5V ratiometric pressure transducers by default. There are several additional options that are available in the controller. The following steps can be followed to change the defaults.

11.5.1 TEMPERATURE SENSORS

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE; press **SET.**
4. Press the ▲ button to scroll to the SEnS (sensor configuration menu); press **SET.**
5. Press the ▲ button to scroll to ttYP (thermistor type); press **SET.**
6. Press the ▼ button to scroll thru the options 10 (10k), 3 (3k), 2 (2k); press **SET.**
7. Press **ESC** button three times to return to **default** display.

11.5.2 PRESSURE TRANSDUCERS

11.5.2.1 PRESSURE TRANSDUCER TYPE

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE; press **SET.**
4. Press the ▲ button to scroll to the SEnS (sensor configuration menu); press **SET.**
5. Press the ▲ button to scroll to PtYP (pressure transducer type); press **SET.**
6. Press the ▼ button to scroll thru the options GAUG (gauge) or AbSL (absolute); press **SET.**
7. Press **ESC** button three times to return to **default** display.

11.5.2.2 PRESSURE TRANSDUCER RANGE

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE; press **SET.**
4. Press the ▲ button to scroll to the SEnS (sensor configuration menu); press **SET.**
5. Press the ▲ button to scroll to Prng (pressure transducer range); press **SET.**
6. Press the ▲▼ button to scroll thru the options; then press **SET.**

Display	Description
CUSt	Custom Transducer (see below for configuration)
652	652 psi
500	500 psi
300	300 psi
150	150 psi

7. Press the **ESC** button three times to return to **default** display.

11.5.2.3 CUSTOM PRESSURE TRANSDUCER

A custom transducer range may be configured in the S3C. The transducer must be a 0.5 to 4.5V ratiometric with 5V supply. The custom configuration has a range of 50 to 2000psi.

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE; press **SET.**
4. Press the ▲ button to scroll to the SEnS (sensor configuration menu); press **SET.**
5. Press the ▲ button to scroll to Prng; press **SET.**
6. Press the ▲ button to scroll to CUSt (custom); press **SET.** This will enable the custom parameters.
7. With the display at Prng, press the ▲ button to scroll to CPrr (custom pressure transducer range); press **SET.**
8. Use the ▲▼ buttons to scroll to the desired pressure range; press **SET.** For example; to support a 200psi transducer, set CPrr to 200.
9. Press the **ESC** button three times to return to **default** display.

11.5.2.4 MULTIPLE PRESSURE TRANSDUCERS FOR MULTI-COIL CASES

For multi-coil cases, one pressure transducer may be used per case or per evaporator. For a single transducer design, the S3C will use the common suction pressure across all evaporators to control superheat. If a pressure transducer is used per evaporator, then the S3C will control superheat based on the pressure of each evaporator. See Section 6 for recommended wiring and piping diagrams per application.

11.6 SENSOR CALIBRATION OFFSET

The temperature, pressure and relative humidity sensors may be calibrated with an offset that is configurable in the S3C.

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE; press **SET.**

Display	Description	Range
dbco	Dry bulb temperature calibration offset	-10°F to 10°F
rHco	Relative humidity calibration offset	-10°F to 10%
dAco	Discharge air temperature calibration offset	-10°F to 10°F
rAco	Return air temperature calibration offset	-10°F to 10°F
dtco	Defrost termination temperature calibration offset	-10°F to 10°F
Coco	Coil outlet temperature calibration offset	-10°F to 10°F
SPco	Suction pressure calibration offset	-10°F to 10PSIG
Atco	Auxiliary temperature calibration offset	-10°F to 10°F

4. Press the ▲ button to scroll to the SEnS (sensor configuration menu); press **SET.**
5. Press the ▼ button to scroll thru the options; press **SET** to enter parameter, change as needed; then press **SET.**
6. Press **ESC** button three times to return to **default** display.

11.7 DIGITAL INPUT CONFIGURATION

The S3C Case Control supports separate digital inputs for the following:

- Doors (used when optional door switch is available for walk in coolers)
- Service (used when controller needs to be put in service mode to shut down refrigeration, fans and defrost)
- User (this input can be configured to switch controller into dual temperature mode or defrost initiation)

To configure the User input:

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE; press **SET.**
4. Press the ▲ button to scroll to the SEnS (sensor configuration menu); press **SET.**
5. Press the ▲ button to scroll to d inP (digital input); press **SET.**
6. Scroll to the preferred configuration based on the following chart; press **SET.**

Display	Description
dEF	Defrost initiation
dUAL	Dual temperature profile selection
nonE	Not used

7. Press **ESC** button three times to return to **default** display.

11.8 DISPLAY CONFIGURATION

The brightness of the side "Quick View" indicators on the Display Module (DM) may be adjusted to suit individual requirements. The indicators may also be turned off.

11.8.1 ADJUSTING QUICK VIEW INDICATOR INTENSITY

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE.
4. Press the **SET** button and P_u will be displayed.
5. Press the ▲ button until dI SP is displayed.
6. Press the **SET** button and tP'Id will be displayed.
7. Press the ▼ button until A int (alarm intensity) is displayed. This is the intensity of the Quick View indicators during a temperature alarm condition.
8. Press the **SET** button and the current intensity value will be displayed.
9. Use the ▲▼ buttons to adjust the intensity value up or down (0 – 100%). To turn off quick view indicators for alarms; set to 0%.
10. Press the **SET** button to enter the new value. The display will revert to A int.
11. Press the ▼ button once and n int (normal intensity) is displayed. This is intensity of the Quick View indicators during normal operation (no alarm).
12. Press the **SET** button and the current intensity value will be displayed.
13. Use the ▲▼ buttons to adjust the intensity value up or down (0 – 100%). To turn off quick view indicators for normal operation, set to 0%.
14. Press the **SET** button to enter the new value. The display will revert to n int.
15. Press the **ESC** button three times to exit the menu and return to the **default** display.

11.9 FAN CONFIGURATION

The S3C offers multiple evaporator fan control options along with an integrated fan fault alarming feature. The controller is configured, by default, to fixed speed. If variable fans or fixed two speed fans are required, consult Sporlan to discuss the application.

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE.
4. Press the **SET** button and P_u will be displayed.

Display	Description	Range
FCty	Fan control type	Variable speed ( ) Dual speed ( ) Single speed ( )
FCUr	Fan fault current baseline	.12 to 6A
FFEn	Fan fault detection enabled	No or yes
FFSE	Fan fault sensitivity	120 to 500mA
FFdt	Fan fault delay time	0 to 100 minutes
SPdL	Fan speed low setpoint	0 to 99%
SPdH	Fan speed high setpoint	1 to 100%

5. Press the ▼ button until FAnC, (fan configuration) is displayed, press **SET.**

6. The display will show FCty(fan control type); press **SET.**

7. Press the ▼ button to scroll to 1SPd(one speed); press **SET.** This will set the system to single speed fans.

8. The display will show FCty, press the ▼ button, scroll to FCUr (fan current baseline); press **SET.**

9. Use the ▲▼ buttons to enter the case fan current, in Amps, then press **SET.** This should be the design fan current (include all fans in the case). For example: if one case has four fans and each fan operates at 800mA, then FCUr should be set at 3.2A (800mA X 4). **Note: If this setting is not entered, the S3C will automatically calculate this value based on actual run time data.**

10. The display will show FCUr, press the ▼ button, scroll to FFEn (fan fault enabled); press **SET.**

11. Scroll to no to turn off the fault feature, scroll to YES to keep it active; press **SET.**

12. The display will show FFEn, press the ▼ button, scroll to FFSE (fan fault sensitivity); press **SET.**

13. Use the ▲▼ buttons to enter fault sensitivity, in mA, then press **SET.** The sensitivity is the amount of current the bank of fans can drop before a fault is presented. For example: If FCUr is set to 3.2A and FFSE is set to 120mA, then a fault condition will occur when the current drops to 3.08A (3.2A – 0.120A).

14. The display will show FFSE, press the ▼ button, scroll to FFdt (fan fault delay time); press **SET.**

15. Use the ▲▼ buttons to enter fault delay time, in minutes, then press **SET.** The fault delay time is the amount of time the controller waits before sending out a fault alert.

16. Press the **ESC** button three times to exit the menu and return to the **default** display.

11.9.1 EVAPORATOR FAN CURRENT SENSING

The S3C Case Control offers evaporator fan fault detection to aid in troubleshooting for cases that use ECM and shaded poll motors. The fan current baseline may be manually entered by setting the parameter FCUr (Fan Fault Current Baseline). If this parameter is not set, the controller will automatically establish a baseline current using system run time information within the first 24 hours of operation. An alarm will be generated when the fan current drops below the baseline. This feature may be disabled by setting FFEn (Fan Fault Detection Enabled) to no.

It is important to ensure all fan circuitry is wired correctly and fan loads are within expectations of the case prior to start up.

Note: If the fans are replaced after operation, it is necessary to reset the baseline. See Service section for more details. The Service section will also provide details on how to manually initiate fan operation and check for proper operation.

11.10 NETWORK CONFIGURATION

The S3C Case Control system must be configured to properly communicate to the BAS. The controller offers the following communication options:

1. BACnet/IP (Ethernet)
2. BACnet MSTP (RS-485)
3. MODBUS UDP/IP (Ethernet)
4. MODBUS RTU (RS-485)

Follow the procedure below to set-up and configure the case controller network settings. For more information, see Network and Communication Section 21.

Note: Ensure that the S3C control is configured to match the requirements of the BAS and network design.

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.

2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**

3. The display will show CASE (will skip to Process Values if system is self-contained).

4. Press the **SET** button and P_u (Process Values) will be displayed.

5. Press the ▼ button until nEtC (Network Configuration) is showing, then press **SET.**

6. Using the chart below, scroll thru and configure the controller to match the BAS and network requirements.

Display	Description	Range	Selections
CSyn	Case Settings Synchronization	No Yes	no YES
bAS	BAS Expected	No Yes	no YES
bASP	BAS Communications Protocol	MODBUS over IP BACnet over IP BACnet over RS-485 MODBUS over RS-485	MoIP bAIP b485 M485
bASt	BAS Communications Time-out	1 to 100 minutes	
IPAS	IP Address Selection	DHCP with AutoIP DHCP with static Address Static IP Address	dHcP dHSt StAt
IP 1	IP Address Octet 1	0 to 254	
IP2	IP Address Octet 2	0 to 254	
IP3	IP Address Octet 3	0 to 254	
IP4	IP Address Octet 4	0 to 254	
IPS 1	IP Subnet Mask Octet 1	0 to 254	
IPS2	IP Subnet Mask Octet 2	0 to 254	
IPS3	IP Subnet Mask Octet 3	0 to 254	
IPS4	IP Subnet Mask Octet 4	0 to 254	
IPG 1	IP Gateway Address Octet 1	0 to 254	
IPG2	IP Gateway Address Octet 2	0 to 254	
IPG3	IP Gateway Address Octet 3	0 to 254	
IPG4	IP Gateway Address Octet 4	0 to 254	
IPd 1	IP DNS Address Octet 1	0 to 254	
IPd2	IP DNS Address Octet 2	0 to 254	
IPd3	IP DNS Address Octet 3	0 to 254	
IPd4	IP DNS Address Octet 4	0 to 254	
b IPn	BACnet IP Network Number	0 to 9999	
Addr	RS-485 Address	0 to 254	
MMAS	Maximum Master	0 to 254	
485n	BACnet RS-485 Subnet Number	0 to 9999	
bAUd	RS-485 Baud Rate	9,600bps 19,200bps 38,400bps 57,600bps 76,800bps 115,000bps	9_6 9_2 38_4 57_6 76_8 115_0
nPAr	RS-485 Network Parity	No Parity Even Parity Odd Parity	nonE EvEn odd
bLUE	Bluetooth Enabled	Off On	oFF on

11.11 SETTING TIME AND DATE

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE; press **SET.**
4. Press the ▼ button to scroll to dAtE; press **SET.**
5. The display will show MotH(month); press **SET.**
6. Use the ▲▼ buttons and scroll to the correct month; press **SET.**
7. Press the ▼ button to scroll to t mE; press **SET.**
8. Use the ▲▼ buttons and scroll to the correct time (24 hour format); press **SET.**
9. Press the ▼ button to scroll to YEAr; press **SET.**
10. Use the ▲▼ buttons and scroll to the correct year; press **SET.**
11. Press the **ESC** button three times to exit the menu and return to the **default** display.

11.13 VALVE CONFIGURATION

This menu configures valve types attached to the S3C Case Control system. **The Local Stepper Valve Type** selection configures the functionality of the stepper valve connection on the S3C Case Control and optionally the stepper valve connections on the S3C Valve Module if more than one stepper valve is used.

Note:

1. **Local Stepper Valve Type configured as None forces Expansion Valve Type to TEV.**
2. **Local Stepper Valve Type configured as None forces the EEPR to operate on an attached S3C Valve Module. The stepper valve input on the S3C Case Controller is then disabled.**

To access Valve Configuration Menu:

12. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
13. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
14. The display will show CASE; press **SET.**
15. Press the ▲ button to scroll to the basic menu uLuC (valve configuration); press **SET.**

TABLE 11 - VALVE CONFIGURATION MENU ITEMS

Display	Description	Range	Selection	Hide Condition
StPC	Local stepper valve type	EEV None SFV EEPR	EEU nonE SFU EEPr	
EuLu	Expansion valve type	Custom valve 6386 step bipolar valve 3193 step bipolar valve 2500 step bipolar valve 1596 step bipolar valve Pulse valve 500 step unipolar valve Mechanical TEV	CUSt 6386 3 193 2500 1596 500 PULS tEu	(1), (2)
EEuU	Custom expansion valve type	Unipolar valve Bipolar valve	Un ı b ı	(3)
EEuS	Custom expansion valve number of steps	400 - 6400	400 - 6400	(3)
EEur	Custom expansion valve step rate	30 - 800	30 - 800	(3)
PLSP	Pulse valve PWM period	0 -10 seconds	0 - 10	(4)
EPrt	EPR type	Custom valve 6386 step bipolar valve 2500 steps bipolar valve Mechanical EPR None	CUSt 6386 2500 EPr nonE	(2)
EPrU	Custom EEPR type	Unipolar valve Bipolar valve	Un ı b ı	(5)
EPrS	Custom EEPR number of steps	400 - 6386	400 - 6386	(5)
EPrr	Custom EEPR step rate	30 - 800	30 -800	(5)
EPrL	EPR location	Case or line-up	L inE CASE	(5)
FSoc	Variable fan speed output selection	Control either EEPR using interface board or fan speed from 0-10V output	EEPr FAnS	(5)
LLSP	Liquid line solenoid present	Yes or no	YES or no	

TABLE 12 - HIDE CONDITIONS FOR VALVE CONFIGURATION MENU ITEMS

Number	Hide Condition
1	If local stepper valve type is configured as none, expansion valve type is forced to TEV
2	Local stepper valve type is configured as SFV
3	Expansion valve type not configured as custom
4	Expansion valve type not configured as pulse valve
5	EPR type NOT configured as custom

11.14 CUSTOM VALVE CONFIGURATION

The S3C offers a custom valve selection for the electronic expansion valve and electronic evaporator pressure regulator. This feature is available for stepper motor valves. Once the Expansion Valve Type (EuLu) or Evaporator Pressure Regulator Type (EPrt) is set to Custom (CUSt), the following selections are made available: Valve Type, Step Rate and Max stroke. **Note: Contact the valve manufacturer for proper specifications.**

Warning: An improperly configured EEV or EEPR may result in poor performance or system damage.

To set-up a Custom EEV:

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE; press **SET.**
4. Press the ▲ button to scroll to the uLuC (valve configuration menu); press **SET.**
5. Press the ▲ button to scroll to EuLu (expansion valve type); press **SET.**
6. Press the ▲ button to scroll to CUSt (custom valve); press **SET.**
7. Display will show EuLu; press the ▲ button to scroll to EEuU (unipolar or bipolar valve); press **SET** to change to either b ı (bipolar) or Un ı (unipolar); press **SET.**
8. Display will show EEuU; press the ▲ button to scroll to EEu5 (number of steps); press **SET** to change the max stroke in steps; press **SET.**
9. Display will show EEu5; press the ▲ button to scroll to EEur (step rate); press **SET** to change the step motor speed in steps/second; press **SET.**
10. Press the **ESC** button 3 times to revert to the **default** display.

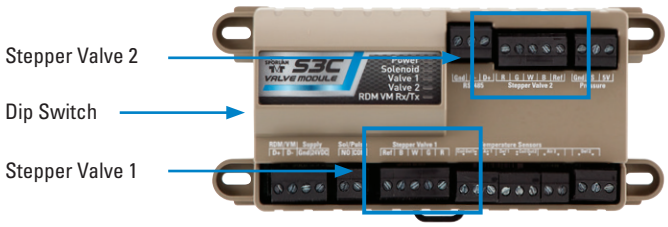
To set-up a Custom EEPR:

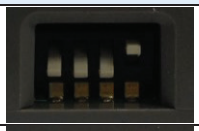
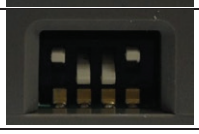
1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE; press **SET.**
4. Press the ▲ button to scroll to the uLuC (valve configuration menu); press **SET.**
5. Press the ▲ button to scroll to EPrt (evaporator pressure regulator type); press **SET.**
6. Press the ▲ button to scroll to CUSt (custom valve); press **SET.**
7. Display will show EPrt; press the ▲ button to scroll to EPrU (uni-polar or bi-polar valve); press **SET** to change to either b ı (bi-polar) or Un ı (uni-polar); press **SET.**
8. Display will show EPrU; press the ▲ button to scroll to EPr5 (number of steps); press **SET** to change the max stroke in steps; press **SET.**
9. Display will show EPr5; press the ▲ button to scroll to EPrr (step rate); press **SET** to change the step motor speed in steps/second; press **SET.**
10. Press the **ESC** button 3 times to revert to the **default** display.

11.15 VALVE MODULE CONFIGURATION (FOR EEV AND EEPR)

The S3C Valve Module may be configured to support two EEVs or one EEV and one EEPR. Additional Valve Modules may be added to support multiple coil cases. The DIP switch located on the side of the Valve Module must be configured based on the required valve support. The stepper valve and DIP switch locations can be seen in the following charts.

S3C VALVE MODULE



Location on Valve Module		DIP Position
Stepper Valve 1: Ref | B | W | G | R	R | G | W | B | Ref: Stepper Valve 2	
EEV	EEPR	
EEV	EEV	

NOTES:

DIP switch 4 is a termination resistor for the DM/VM network and does not affect valve operation.

Two Valve Modules are needed when discharge air and return air sensors are required for three coil cases.

11.16 MINIMUM SATURATION TEMPERATURE

The S3C includes a minimum saturation temperature setpoint, that can be used to limit the temperature in the evaporator coil during operation. This is typically used on high efficiency coils to minimize formation of frost on the coil. In normal operation the EEPR will modulate to maintain the control temperature or pressure based on user defined settings. Once the temperature reaches the setpoint, the EEPR will modulate to maintain the temperature at or above the setpoint.

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE; press **SET.**
4. Press the ▲ button to scroll to the bSc; press **SET.**
5. Press the ▼ button to scroll to the LoPr; press **SET.**
6. Press ▲▼ buttons to change the low pressure setpoint; press **SET** to commit the change.
7. Press the **ESC** button 3 times to revert to the **default** display.

11.17 ANTI-SWEAT CONFIGURATION

The S3C Case Control offers two methods of anti-sweat heater control; Fixed Duty Cycle and Dew Point Control. The fixed duty cycle selection offers simple pulsed heat based on a user selectable duty cycle and pulse period. The duty cycle is the amount of time the heaters stay on over the period. The pulse period establishes the total time for the on/off cycle.

The dew point control pulses the heaters to maintain case surface temperatures above the local dewpoint around the case. Additional case surface temperature sensor and Sporlan RHT sensor must be used. A user defined temperature offset is entered to maintain the heater temperature above dewpoint.

11.17.1 FIXED DUTY CYCLE CONTROL

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE; press **SET.**
4. Press the ▼ button repeatedly until AS_C is displayed; press **SET.**
5. When display shows ASCt (Anti-Sweat Control Type); press **SET.**
6. Use the ▲▼ buttons, scroll to FdtY (Fixed Duty Cycle); press **SET.**
7. Scroll to ASFd (Anti-Sweat Fixed Duty Cycle); press **SET.**
8. Use the ▲▼ buttons to adjust duty cycle in %; press **SET.** For example, 100 means constant on, 80 means that the heaters will be on for 80% of the period and off the other 20%.
9. Scroll to ASPP (Anti-Sweat Pulse Period); press **SET.**
10. Use the ▲▼ buttons to adjust pulse period, in seconds; press **SET.**
11. Press the **ESC** button 3 times to revert to the **default** display.

Example: Setting Duty cycle, ASFd to 60 % and Period, ASPP, to 20 seconds will provide a control scheme with heaters on for 12 seconds (60% X 20 seconds) and heaters off for 8 seconds.

11.17.2 DEW POINT CONTROL

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE; press **SET.**
4. Press the ▼ button repeatedly until AS_C is displayed; press **SET.**
5. When display shows ASCt (Anti-Sweat Control Type); press **SET.**
6. Use the ▲▼ buttons, scroll to dPtC (Dew Point Control); press **SET.**
7. Scroll to ASFd (Anti-Sweat Fixed Duty Cycle); press **SET.**
8. Use the ▲▼ buttons to adjust control offset temperature, in degrees; press **SET.** The offset temperature is the maximum temperature above dewpoint that the heaters will operate to.

   Example: If anti-sweat control offset, ASCo, is set to 8 degrees and the dewpoint is 60 degrees then the heaters will start to pulse when the case surface temperature drops to 60 degrees. Heaters will then stop pulsing when the case surface temperature reaches 68 degrees.
9. Press the **ESC** button 3 times to revert to the **default** display.

TABLE 13 - ANTI-SWEAT CONFIGURATION MENU ITEMS

Display	Meaning	Range	Selection	Hide Condition
ASCt	Anti-sweat control type	Set the type of control used for anti-sweat control	FdtY = fixed duty cycle control dPtC = dew point control	
ASPP	Anti-sweat pulse period	Sets the pulse period (total time of pulse cycle, includes on/off)	1 to 120 seconds	(1)
ASFd	Anti-sweat fixed duty cycle	Sets the amount of time the heaters are on for the period	0 to 100%	(1)
ASCo	Anti-sweat control offset	Sets when the heaters turn off (degrees above dew point)	0 to 100°F	(2)

The set-up is simplified by presenting the user with only the parameter selections required based on previous parameter value selections. Parameters that can be hidden in the table above are shaded and assigned a number in parenthesis. The explanations below correspond to those numbers.

TABLE 14 - HIDE CONDITIONS FOR ANTI-SWEAT CONFIGURATION MENU ITEMS

Number	Hide Condition
1	Skipped if anti-sweat control type is dew point control
2	Skipped if anti-sweat control type is fixed duty cycle

12. DEFROST CONFIGURATION

The Set-up menu ensures that the minimum required for safe and effective execution of case defrost is entered. Additional features and modification of the Defrost Cycle (See Defrost) is performed using the Defrost Menu. There are two sections for configuring defrost: Operation and Schedule. The Operation section is used to adjust key parameters that affect functionality such as type of defrost, defrost grouping and valve positions during defrost. The Schedule section simply defines when defrost occurs.

12.1 DEFROST OPERATION

1. From the **default** display, press the 🔧 button. The display will show `Entr PASS 0`.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show `CASE`; press **SET.**
4. Press the ▲ button to scroll to the `dEFC` (defrost configuration menu); press **SET.**
5. Using the table below, scroll to the required parameter, then press **SET** to change.

TABLE 15 - DEFROST CONFIGURATION MENU ITEMS

Display	Meaning	Description	Selections	Hide Condition
`dEFt`	Defrost type	Type of defrost for case/line-up	Electric `ELEc` Hot gas `HGAS` Off time `Air`	
`dttP`	Defrost termination temperature set point	Temperature at which active defrost mechanism (heater, hot gas) deactivates	`40 - 75` °F	
`dttE`	Defrost termination fail-safe time	Maximum elapsed time before active defrost mechanism deactivates	`10-20` minutes	
`dcdt`	Defrost coil drain time	Time period between deactivation of defrost mechanism and re-initiating refrigeration	`0 -60` minutes	(2)
`dLtE`	Min defrost time	Minimum time for a defrost	`1-20` minutes	
`FdtP`	Fan delay temperature	Temperature at which evaporator fans energize after defrost	`-32 -32`	(2)
`FdtE`	Fan delay time	Maximum elapsed time before fans resume operation	`0 -60` minutes	(2)
`LLSd`	Liquid line solenoid defrost operation	Liquid line solenoid energized/de-energized during defrost	`CLoS` `OPEn`	(3)
`Pdn`	Defrost pump down time	Time period after refrigerant flow has ceased prior to activating the defrost mechanism	`0 -300` seconds	
`dSYn`	Defrost synchronization group	Selects defrost group within line-up this case is a member of	`1 -8`	(4)
`iSch`	Use internal defrost schedule	Selects internal defrost schedule to used when no BAS detected on network	`no` `YES`	
`dFPd`	Defrosts per day	Number of defrosts per day	`0 - 12`	
`dFSt`	Daily start time	Starts time of first defrost	`0 - 2359`	
`FAnS`	Fans on during defrost	Selects evaporator fan action during defrost	`On` `OFF`	(2)
`dtS`	Defrost termination sensor	Selects defrost termination temperature sensor	Defrost termination `dEFt` Discharge air `dAir` Time terminated `tiME`	(5)
`dEFP`	Defrost active relay contract	Defrost relay energized/de-energized during active defrost. See active defrost.	Normally open `norO` Normally closed `norC`	(2)
`EPrd`	EEPR percent open during hot gas drain	% EEPR is open during drain time to allow for equalization of evaporator pressure to suction	`0 - 100`%	(1)
`dCUr`	Defrost current	Expected defrost current	1.5 to 50 Amps	

The set-up is simplified by presenting the user with only the parameter selections required based on previous parameter value selections. Parameters that can be hidden in the table above are shaded and assigned a number in parenthesis. The explanations ➔ correspond to those numbers.

TABLE 16 - HIDE CONDITIONS FOR DEFROST CONFIGURATION MENU ITEMS

Number	Hide Condition
1	Defrost type is air or electric
2	Defrost type is air
3	Defrost type is hot gas
4	Case type is self-contained

6. Once the parameter is changed, press **SET** to commit the change.
7. Press the **ESC** button 3 times to revert to the **default** display.

Defrost Notes:

1. **If evaporator fans are programmed to be off during defrost, it is desirable to delay resumption of operation until the evaporator temperature is sufficient to re-freeze any remaining defrost water. Coil Outlet Temperature reading is used for this function.**
2. **If the Fan Delay Temperature is not met within the Fan Delay Time, fan operation will resume when this time has elapsed.**
3. **There can be up to 8 defrost groups within a line-up. This allows individual portions of a case line-up to share a common defrost schedule while the entire line-up shares a common EEPR, DA set point, suction pressure set point, etc.**
4. **Coil drain allows for elimination of defrost water prior to resumption of refrigeration.**
5. **Maximum elapsed time at which active defrost mechanism (Heater, Hot Gas) deactivates if Termination Temperature not reached.**

12.2 DEFROST SCHEDULE

The S3C offers a simple schedule and a custom schedule. The simple schedule only includes start time and number of defrosts per day. The custom schedule can be configured for each individual day or weekly defrost times.

12.2.1 SIMPLE DEFROST SCHEDULE

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE; press **SET.**
4. Press the ▲ button to scroll to the dEFC (defrost configuration menu); press **SET.**
5. Press the ▼ button to scroll to the dFSt (defrost start time); press **SET.**
6. Use the ▲▼ buttons to scroll to start time (in 24 hour time); press **SET.**
7. Press the ▼ button to scroll to the dFPd (defrost per day); press **SET.**
8. Use the ▲▼ buttons to scroll to the amount of defrosts per day; press **SET.**
9. Press the **ESC** button 3 times to revert to the **default** display.

12.2.2 CUSTOM DEFROST SCHEDULE

A custom schedule can only be configured through BAS communications.

12.3 DEFROST CT SENSOR

The S3C Case Control system supports an external current transformer (CT) to monitor defrost heater current. The current is used internally to the controller for diagnostic purposes to ensure proper defrost function. The defrost heater current can also be displayed through the Display Module (DM) for troubleshooting purposes. The controller comes default with the auxiliary temperature sensor input set to tEMP to measure temperature. To use the CT, the auxiliary input must be configured to dEFC.

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE; press **SET.**
4. Press the ▲ button to scroll to the SEnS (sensor configuration menu); press **SET.**
5. Press the ▲ button to scroll to AUSC (auxiliary sensor configuration); press **SET.**
6. Press the ▲ button to scroll to dEFC (defrost current sensor); press **SET.**
7. Press the ▲ button to scroll to dcSt (defrost current sensor type); press **SET.**
8. Scroll to sensor type, based on the following chart; press **SET.**

Display	Description
0_5	0 to 5V output (Use for Sporlan CT item 953507)
0_10	0 to 10V output

9. Press the ▲ button to scroll to dcSr (defrost current sensor range); press **SET.**
10. Use the ▲▼ buttons to enter the sensor range (5 to 50A); press **SET.** Use 25 for Sporlan CT Item 953507.
11. Press **ESC** button three times to return to **default** display.

Note: The Auxiliary Temperature input on the S3C Case Control can be used as an additional temperature or support for the Defrost CT.

13. LIGHTING CONFIGURATION

The S3C offers three case lighting options; Constant On, Simple One Day Schedule and a Full Custom 7 Day Schedule. In addition to the schedules, an optional occupancy sensor is available that will dim lighting when motion is not detected near the refrigerated display case. The dimming feature is only active during scheduled "on times". An external LED driver that supports 0 to 10VDC signal is required when the dimming feature is used. See below for configuration.

13.1 LIGHTS CONSTANT ON

1. From the **default** display, press the 🔧 button. The display will show EntrPASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE; press **SET.**
4. Press the ▲ button to scroll to the L itC (light configuration menu); press **SET.**
5. Scroll to SchE (schedule type); press **SET.**
6. Scroll to on; press **SET.**
7. Press the **ESC** button 3 times to revert to the **default** display.

13.2 ONE DAY LIGHTING SCHEDULE

1. From the **default** display, press the 🔧 button. The display will show EntrPASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE; press **SET.**
4. Press the ▲ button to scroll to the L itC (light configuration menu); press **SET.**
5. Scroll to SchE (schedule type); press **SET.**
6. Scroll to 1dAY; press **SET.**
7. Press the ▲ button to scroll to the onTE (on time); press **SET.**
8. Use the ▲▼ buttons to scroll to the time the lights turn on (in 24 hour time); press **SET.**
9. Press the ▲ button to scroll to the oFtE (off time); press **SET.**
10. Use the ▲▼ buttons to scroll to the time the lights turn off (in 24 hour time); press **SET.**
11. Press the **ESC** button 3 times to revert to the **default** display.

13.3 SEVEN DAY LIGHTING SCHEDULE

1. From the **default** display, press the 🔧 button. The display will show EntrPASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE; press **SET.**
4. Press the ▲ button to scroll to the L itC (light configuration menu); press **SET.**
5. Scroll to SchE (schedule type); press **SET.**
6. Scroll to 7dAY; press **SET.**
7. Press the ▲ button to scroll to each day and set on time and off time (in 24 hour time); press **SET.** Use the following chart to configure the custom 7 day schedule:
8. Press the **ESC** button 3 times to revert to the **default** display.

Display	Meaning	Description
MoOn	Monday on time	Lights will come on at this time on Monday
MoOF	Monday off time	Lights will turn off at this time on Monday
tUOn	Tuesday on time	Lights will come on at this time on Tuesday
tUOF	Tuesday off time	Lights will turn off at this time on Tuesday
WEOn	Wednesday on time	Lights will come on at this time on Wednesday
WEOF	Wednesday off time	Lights will turn off at this time on Wednesday
thOn	Thursday on time	Lights will come on at this time on Thursday
thOF	Thursday off time	Lights will turn off at this time on Thursday
FrOn	Friday on time	Lights will come on at this time on Friday
FrOF	Friday off time	Lights will turn off at this time on Friday
SAOn	Saturday on time	Lights will come on at this time on Saturday
SAOF	Saturday off time	Lights will turn off at this time on Saturday
SUOn	Sunday on time	Lights will come on at this time on Sunday
SUOF	Sunday off time	Lights will turn off at this time on Sunday

13.4 OCCUPANCY SENSOR

The S3C supports the Sporlan OCC occupancy sensor. This sensor is mounted on the top of the case and senses when there is movement near the front of the case. This sensor is used in conjunction with an LED driver to dim or turn off the lights when there is no movement near the case. To configure the sensor, there are three parameters; Occupied Light Intensity, Unoccupied Light Intensity and the Unoccupied Time Limit. If the cases are in a line-up, an additional parameter oShr (occupancy sensor sharing) may be set to share the sensor information across the line-up.

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE; press **SET.**
4. Press the ▲ button to scroll to the L it (light configuration menu); press **SET.**
5. Press the▼ button to scroll to the UocL (unoccupied light level); press **SET.**
6. Use the ▲▼ buttons to adjust % Intensity (0% = Off, 100% = On); press **SET.**

   This is the light level when the area around the case is unoccupied.
7. Press the ▼ button to scroll to the t miU(Unoccupied time limit); press **SET.**
8. Use the ▲▼ buttons to adjust the amount of time the lights turn off after no motion is detected (in minutes); press **SET.**
9. Press the ▼ button to scroll to the occL (occupied light level); press **SET.**
10. Use the ▲▼ buttons to adjust % Intensity (0% = Off, 100% = On); press **SET.**

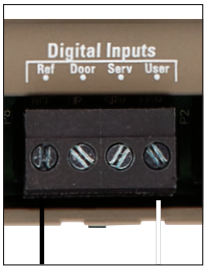
    This is the light level when the area around the case is occupied.
11. If sensor sharing across a line-up is required; press the ▲ button to scroll to the oSHr (occupancy sensor sharing); press **SET.**
12. Scroll to on; press **SET.**

    This will allow all case lighting to turn on and off together based on a signal from any occupancy sensor in the line-up.
13. Press the **ESC** button 3 times to revert to the **default** display.

14. DUAL TEMPERATURE CONFIGURATION

14.1 CHANGING TEMPERATURE MODE VIA THE DISPLAY

The S3C Case Control supports dual temperature cases that utilize an EEPR. Dual temperature mode may be activated by a manual switch, through the Display Module, or by communication from the BAS. If an external switch is used then the digital input on the controller must be configured along with wiring the switch into the controller as shown below. The final step is to set-up the medium temperature and low temperature alarm thresholds.



The dual temperature switch is wired into the 'Ref' and 'User' input on the S3C Case Control. See Section 5.

14.2 CONFIGURE THE USER INPUT

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE; press **SET.**
4. Press the ▲ button to scroll to the SEnS(sensor configuration menu); press **SET.**
5. Press the ▲ button to scroll to d inP (digital input); press **SET.**
6. Scroll to dUAL; press **SET.**
7. Press **ESC** button three times to return to **default** display.

14.3 CONFIGURE THE ALARM THRESHOLDS

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE; press **SET.**
4. Press the ▲ button to scroll to the ALrC(alarm configuration menu); press **SET.**
5. Press the ▲ button to scroll to the desired parameter as shown in the below chart, change as needed; press **SET.**
6. Press **ESC** button three times to return to **default** display.

Display	Meaning	Description	Selection	Hide Condition
LtH	Low temperature high alarm threshold	Sets the high temperature alarm when operating in low temperature mode	-60 to 100 °F	
LtL	Low temperature low alarm threshold	Sets the low temperature alarm when operating in low temperature mode	-60 to 100 °F	
LthD	Low temperature high alarm delay	Sets the time delay for high temperature alarm when operating in low temperature mode	0 to 100 minutes	
LtLd	Low temperature low alarm delay	Sets the time delay for low temperature alarm when operating in low temperature mode	0 to 100 minutes	
mtH	Medium temperature high alarm threshold	Sets the high temperature alarm when operating in medium temperature mode	-60 to 100 °F	
mtL	Medium temperature low alarm threshold	Sets the low temperature alarm when operating in medium temperature mode	-60 to 100 °F	
mthD	Medium temperature high alarm delay	Sets the time delay for high temperature alarm when operating in medium temperature mode	0 to 100 minutes	
mtLd	Medium temperature low alarm delay	Sets the time delay for low temperature alarm when operating in medium temperature mode	0 to 100 minutes	

15. SYSTEM START UP

15.1 CHARGE PRO

The S3C control system includes "Charge Pro" feature. It may be used in preparation of a new start up. When selected, this mode opens all refrigerated display case valves to allow evacuation and refrigerant charging. This feature is manually initiated through the display and automatically resumes control once refrigerant starts feeding the evaporator and proper system conditions are met. While in this mode, the Quick View indicators will blink orange and the display will show ChrG.

Note: Charge Pro mode will not initiate if the refrigerated display case:

- Uses an EEV and the S3C is missing the Coil Out sensor.
- Uses a TEV and the S3C is missing the control temperature sensor (Discharge or Return Air).

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the Service password and press **SET.**
3. Press the ▼ button to scroll to ChrG (Charge mode); press **SET.**
4. Press the ▲ button to scroll to on; press **SET.** This will turn on Charge Pro.

Charge Pro will exit automatically and will resume control once enough refrigerant has been added to the rack.

To Exit thru the Display:

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the Service password and press **SET.**
3. Press the ▼ button to scroll to ChrG (Charge mode); press **SET.**
4. Press the ▲ button to scroll to oFF; press **SET.** This will turn Charge Pro off for that case and all the other cases in its assigned line-up.

15.2 VALVE INITIALIZATION

All stepper valves are initialized on power up to establish the 0% open or "home" position. The initialization routine is common when using open loop control systems to ensure that the valve position is synchronized with the control output. During normal operation, the stepper valves will be initialized if:

- Valve is at 0% and it has been 24 hours.
- The S3C Case Control or Valve Module has been power cycled.
- Valve configurations are changed thru the uLuC menu.
- During start up, the S3C Case Control scans all sensor inputs both local and those present on any attached S3C Valve Modules in order to detect available sensors for control and monitoring. If a sensor required for any configured control operation is not detected, an alarm is generated. If a new sensor is added then a sensor scan must be initiated using the Display Module (DM) to add the new sensor to the detected sensor list in the control. (See Service Menu to reset)

The S3C features Evaporator Fan Fault detection. During start up a baseline fan current is determined. If a fan is changed or replaced, this baseline must be recalculated. This is initiated by user input using the Display Module. (See Service Menu to reset.)

16. SYSTEM OPERATION

16.1 EEV

EEVs Maintain Control Temperature or Superheat dependent upon set points and refrigeration system conditions. In order for the EEV to switch from controlling superheat to control temperature, the superheat must be above the superheat set point and the calculated required saturated suction temperature at the evaporator must be satisfied. The S3C Case Control reverts to superheat control when:

1. The above conditions are not met.
2. During pull down after defrost.
3. Superheat falls below the set point (for flood back prevention).

16.2 TEV WITH EEPR

EEPRs can be controlled to maintain case air temperature or suction pressure as according to user selected control parameter values. The EEPR will close during defrost and return to controlling the selected parameter when defrost terminates.

16.3 EEV WITH EEPR

The S3C Case Control operates attached EEVs and the EEPR according to user selected control parameter values and the valve arrangement. The EEV controls superheat only to a superheat set point. The EEPR can be controlled to maintain case air temperature or suction pressure in accordance with user selected control parameter values. The EEV closes during defrost for electric defrost systems and open to 100% when hot gas is used. The EEPR will close during defrost and return to controlling the selected parameter when defrost terminates.

16.4 EEV WITH EPR

If an EPR is detected on the line-up (by menu configuration or valve module DIP switch position) the EEV defaults to superheat control only. The EEV closes during defrost for electric defrost systems and opens to 100% when hot gas is used.

16.5 MULTIPLE EEVS WITH EEPR

The S3C Case Control operates attached EEVs and the EEPR according to user selected control parameter values and the valve arrangement. EEVs control superheat only to a superheat set point. The EEPR can be controlled to maintain case air temperature or evaporator pressure in accordance with user selected control parameter values. The EEV closes during defrost for electric defrost systems and open to 100% when hot gas is used. The EEVs resume controlling superheat during pulldown. The EEPR will close during defrost and return to controlling the selected parameter when defrost terminates.

16.6 MULTIPLE EEV WITH EPR

If an EPR is detected on the line-up (by menu configuration or valve module DIP switch position) the EEVs default to superheat control only. The EEVs close during defrost for electric defrost systems and open to 100% when hot gas is used and will resume controlling superheat when all evaporators in the case have reached termination temperature or the defrost fail-safe time has elapsed.

17. OPERATING MODES

17.1 REFRIGERATION

17.1.1 DELAY ON START UP

For systems that use cut-in/cut-out case temperature control, there will be a delay on start up prior to opening the liquid line solenoid valve or powering the compressor contactor. This delay is set by the minimum off time, oFFt.

17.2 DEFROST

The S3C Case Control supports multiple defrost schemes and controls attached valves, fans and heaters as dictated by the defrost scheme and user selected defrost parameters.

Termination can be determined by temperature or time. Temperature termination can be selected to be from a Defrost Termination Sensor or Discharge Air Sensor if Air (Off-Time) defrost is selected. For line-up control, all cases will enter defrost together. Each case on the line-up will terminate separately and will resume refrigeration once all the cases have terminated defrost.

If a case is in defrost during power loss, it will resume defrost once power is restored only if it has been less than one hour before the start of defrost.

The following chart shows what each electronic valve will do during the specified defrost type:

	Electric Defrost	Hot Gas Defrost
EEV (Stepper or Pulse)	Close	Open
EEPR	Close	Close
Liquid Line Solenoid Valve	Close	Open

17.2.1 PUMP DOWN

When defrost is initiated, the system will first go into pumpdown mode to remove any refrigerant from the evaporator. **If a liquid line solenoid valve is present** (LLSP set to YES under Valve Configuration), the S3C will first close the liquid line solenoid valve and then wait until the pumpdown delay time, Pdn, has elapsed. Once it has elapsed, the EEV and EEPR (if used) will close to 0%. **If a liquid line solenoid valve is not present**, the EEV will close to 0% then wait until the pumpdown delay time has elapsed before closing the EEPR (if used) and going into active defrost.

By setting pumpdown delay time, Pdn, to 0 seconds, the system will skip pumpdown mode and go immediately into active defrost upon defrost initiation.

17.2.2 ACTIVE DEFROST

After pumpdown mode, the S3C will go into active defrost mode and will operate the defrost mechanism such as heaters or hot gas solenoid valve. For applications that use off time defrost, the refrigeration will turn off and the fans will remain on. Active defrost mode is terminated when the defrost termination sensor has reached its temperature setpoint defined by dtEP or the termination time, set by dttE, has been met.

17.2.3 DRIP CYCLE

Upon defrost termination, the S3C will go into a drip cycle mode for applications that require the fans to be off during defrost. Refrigeration, fans and defrost mechanism will remain off until Defrost Coil Drain Time, dcdt, is met. A drip cycle allows the moisture to naturally drip off of the evaporator and into the case tub.

By setting Defrost Coil Drain Time, dcdt, to 0 minutes, the system will skip drip cycle mode and go immediately into Fan Delay mode.

17.2.4 FAN OPERATION/DELAY

If evaporator fans are configured to be off during defrost, operation will resume when either the Fan Delay Temperature, FdtP, is reached or when the Fan Delay Time, FdtE, has elapsed. Fan delay temperature is read from the Coil Outlet sensor. If no Coil Outlet sensor is present, then the Fan Delay Time will be the sole source for determining when the evaporator fans will resume operation. The fan delay allows any residual moisture droplets to freeze before the evaporator fans are turned on. This minimizes water droplets being blown into the air stream and may reduce excess humidity in the case.

By setting Fan Delay Time, FdtE, to 0 minutes, the system will skip fan delay mode and go immediately back into refrigeration upon defrost termination.

17.2.5 TERMINATION SYNCHRONIZATION

The S3C Case Control case – case network allows for the synchronization of termination of the defrost cycle and the resumption of cooling mode. Line-up (Defrost Group) refrigeration will not be initiated until all controllers in the line-up (Defrost Group) have terminated their defrost cycle. For cases with multiple evaporators, each evaporator must reach termination temperature or the fail-safe time has elapsed before the case is considered defrosted. Controllers with the same dSyn setting are part of the same Defrost Group.

17.2.6 SCHEDULE

The defrost schedule for each case or group of cases in the supermarket will be typically coordinated by the Building Automation System. The defrost schedule determines the time each defrost will be initiated. Additionally, a defrost cycle can be initiated on an ad hoc basis by the BAS via communication or activation of a digital input. The case controller will respond to each request to enter defrost and will manage the defrost mechanism and defrost termination. Termination of defrost is based on the requirements of an individual evaporator. Resumption of refrigeration is coordinated on a line-up level and occurs only when defrost has terminated on all evaporators within the line-up.

The S3C Case Control system has a real time clock (RTC) that allows for supporting an internal defrost schedule that can be used when defrost coordination by a BAS is not available. The internal defrost schedule serves as a backup in the event communication with the BAS is lost or as the primary defrost initiation mechanism in the absence of a BAS. The internal defrost schedule will take the form of a daily simple schedule, a daily custom schedule, or a weekly custom schedule.

17.2.7 AIR DEFROST

Air defrost is accomplished by stopping the flow of refrigerant to the evaporator while leaving the evaporator fans on. The S3C Case Controller will stop the flow of refrigerant via a connected liquid line or suction stop solenoid, closing of an attached Electronic Expansion Valve (EEV), closing of an attached Electronic Evaporator Pressure Regulator (EEPR) or any combination thereof. Refrigeration will remain off until the selected temperature input (Discharge Air, Defrost Termination) sensor reaches the defrost termination temperature set point or the defrost duration limit is reached. When resuming refrigeration, the Solenoid and EEV open while leaving the fans off. The fans are turned on when the coil temperature reaches the fan delay temperature or the maximum fan delay time is reached. The fan delay allows any remaining liquid to re-freeze prior to turning on the evaporator fans.

17.2.8 ELECTRIC DEFROST

Electric Defrost uses an electric heater to defrost the evaporator. The S3C Case Controller will stop the flow of refrigerant via a connected liquid line or suction stop solenoid, closing of an attached Electronic Expansion Valve (EEV), closing of an attached Electronic Evaporator Pressure Regulator (EEPR) or any combination thereof. It controls evaporator fans in accordance with configuration of the Fans On During Defrost parameter, and energizes the electric heaters. The heaters will remain on until the defrost termination temperature is reached or the maximum defrost time limit is reached. A user programmed drain time delay after de-energizing the heaters allows water to drip off the coil and exit the case via the drain before resuming refrigeration. When resuming refrigeration, the Solenoid and EEV open while leaving the fans off. The fans are turned on when the coil temperature reaches the fan delay temperature or the maximum fan delay time is reached. The fan delay allows any remaining liquid to re-freeze prior to turning on the evaporator fans.

17.2.9 HOT GAS DEFROST

To control hot gas defrost, the controller will close the suction line (CDS or solenoid) after closing the liquid line (solenoid and/or EEV) to stop the flow of refrigerant. A programmable delay time between stopping refrigerant flow and closing of the EEPR allows for pumping refrigerant out of the refrigeration circuit (case line-up) to be defrosted. If a suction solenoid is used it will be connected to the defrost relay on the opposite contact from the hot gas bypass valve. With both connected to the same SPDT relay one will always be energized while the other is de-energized and they will switch at the same time. With the EEV and liquid line solenoid closed the system employs a check valve to allow the hot gas to enter the Liquid Header. The controller will open the defrost solenoid and the hot gas will flow from the coil outlet to the coil inlet (reverse normal direction of refrigerant) and the hot gas will enter the liquid header. If a liquid line solenoid with internal check is used the solenoid must remain open for hot gas to flow through the coil.

The case will remain in defrost until the defrost termination temperature is reached or the maximum defrost time limit

is reached. The drain time delay allows water to drip off the coil and exit the case via the drain before resuming refrigeration. During this period, the EEV remains closed and the EEPR opens to the user selected EEPR Percent Open during drain parameter to bleed excess pressure to the suction header. In accordance with its configuration, when resuming refrigeration, the Solenoid and EEV opens while leaving the fans ON/OFF. If the fans are programmed to be off during defrost, they are turned on when the coil temperature reaches the fan delay temperature or the maximum fan delay time is reached. The fan delay allows any remaining liquid to re-freeze prior to turning on fans.

18. ALARMS

The S3C Case Control monitors control components and system conditions and performance and detects conditions that result in alarm notification to the user and appropriate risk mitigating controller reaction. Alarm notification appears locally on the Display Module (DM) display and is published via communication both via MODBUS and BACnet. Any one or all of these media may be used as a means of notification as well as real-time viewing of active alarm conditions.

Multiple alarm conditions can exist simultaneously and may share a common root cause such as component fault or transgression of a user programmed alarm threshold. Some alarm conditions are self-clearing while others are persistent and require user intervention to clear the alarm condition and the subsequent notification. All alarm events are retained in an alarm history to aid in troubleshooting the system and occurrence of self-clearing alarms that are no longer active.

18.1 ALARM CONFIGURATION

1. From the default display, press the 🔧 button. The display will show `Entr PASS 0`.
2. Use the ▲▼ buttons to enter the Administrator password and press **SET.**
3. The display will show `CASE`
4. Press SET to enter the `CASE` sub-menu. The display will show `P_u` (Process Values).
5. Press the ▼ button repeatedly until `ALrC` is displayed.
6. Press **SET** to enter the Alarm Configuration sub-menu.

TABLE 17 - ALARM CONFIGURATION MENU ITEMS

Display	Meaning	Hide Condition
door	Door Alarm Delay	1
SrvS	Service Alarm Delay	2
dAh	Discharge Air Temperature High Alarm Threshold	2
dAL	Discharge Air Temperature Low Alarm Threshold	2
dAhd	Discharge Air Temperature High Alarm Delay	2
dALd	Discharge Air Temperature Low Alarm Delay	2
rAh	Return Air Temperature High Alarm Threshold	3
rAL	Return Air Temperature Low Alarm Threshold	3
rAhd	Return Air Temperature High Alarm Delay	3
rALd	Return Air Temperature Low Alarm Delay	3
LEh	Low Temperature High Alarm Threshold	4
LEL	Low Temperature Low Alarm Threshold	4
LEhd	Low Temperature High Alarm Delay	4
LELd	Low Temperature Low Alarm Delay	4
mEh	Medium Temperature High Alarm Threshold	4
mEL	Medium Temperature Low Alarm Threshold	4
mEhd	Medium Temperature High Alarm Delay	4
mELd	Medium Temperature Low Alarm Delay	4
SPh	Suction Pressure High Alarm Threshold	5
SPL	Suction Pressure Low Alarm Threshold	5
LEPh	Low Temperature Suction Pressure High Alarm Threshold	6
LEPL	Low Temperature Suction Pressure Low Alarm Threshold	6
mEPh	Medium Temperature Suction Pressure High Alarm Threshold	6
mEPL	Medium Temperature Suction Pressure Low Alarm Threshold	6
SPAd	Suction Pressure Alarm Delay	7
Shh	Superheat High Alarm Threshold	8
ShL	Superheat Low Alarm Threshold	8
Shhd	Superheat High Alarm Delay	8
ShLd	Superheat Low Alarm Delay	8
Cd_h	Clogged Drain Level High Alarm Threshold	9
Cd_d	Clogged Drain Level Alarm Delay	9

The set-up is simplified by presenting the user with only the parameter selections required based on previous parameter value selections. Parameters that can be hidden can be seen in the table below.

TABLE 18 - HIDE CONDITIONS FOR ALARM CONFIGURATION MENU ITEMS

Number	Hide Condition
1	Skipped if application type is not walk-in
2	Skipped if application type is dual temperature case or control temperature input selection is not discharge air temperature
3	Skipped if application type is dual temperature case or control temperature input selection is not return air temperature
4	Skipped if application type is not dual temperature case
5	Skipped if application type is dual temperature case or there has never been a valid pressure reading at the case level which includes all the evaporators and local EEPR
6	Skipped if application type is not a dual temperature case or there has never been a valid pressure reading at the case level which includes all the evaporators and local EEPR
7	Skipped if there has never been a valid pressure reading at the case level which includes all the evaporators and local EEPR
8	Skipped if there has never been a valid pressure reading or coil outlet temperature reading at the case level which includes all the evaporators
9	Skipped if valid Clogged Drain Level reading has never been detected

Alarms are categorized as one of three types; Control Alarms (CAL5), User Alarms (UAL5) or Sensor Alarms (SAL5). Control Alarms are those that are generated according to an internal or control system fault. They involve no user settable parameters or delays and are generally related to S3C Control System application and/or configuration. User Alarms are generated in accordance with user definable alarm limits and associated alarm delay periods. Sensor Alarms are specific to attached sensor malfunction and are not related to a sensed value but rather functionality of the sensor itself.

Note: If there are no active alarms in an alarm category (Control Alarms, User Alarms or Sensor Alarms) then the associated sub-menu selection will not be visible.

Viewing alarms using the Display Module (DM):

1. From the **default** display press the ▼ button.
2. The display will show CASE
3. Press **SET** to enter the CASE sub-menu.
4. CAL5 (Control Alarms) or SAL5 (Sensor Alarms) or UAL5 (User Alarms) is displayed if any alarms of the associated type exist.

18.2 CONTROL ALARMS

RED denotes required control configuration to enable alarm and/or control response.

Alarm	Description	Cause	Control Response	Self Clearing
dEF1	Incomplete defrost alarm	Signals that defrost has ended on time for consecutive defrost cycles and that the defrost could be incomplete		
rESt	Hard Reset Required alarm	Indicates an internal controller hardware failure has occurred that will require power to be removed and re-applied to address the issue		
bnid	BACnet Device Identifier Conflict / Configuration Error alarm	There are two or more controllers on the network that have the same BACnet and/or Case ID		
IPAc	IP Address Conflict alarm	There are two or more controllers on the network with the same IP address.		
CLOC	Real-time clock reset alarm	Power loss for more than 3 days		No

RED denotes required control configuration to enable alarm and/or control response.

Alarm	Description	Cause	Control Response	Self Clearing
SUcP	No Suction Pressure Transducer detected Single Evaporator	Superheat or Pressure Control selected. Pressure Transducer(s) not connected, miswired or faulty.	Superheat Control selected. EEV closes to prevent possible flood back. EEPR Pressure control selected. 1. Single case in line-up: EEPR moves to calculated "fault" position. 2. Multiple cases with pressure transducers in line-up. Pressure Sharing Enabled: Average pressure value from remaining available pressure transducers is used for control.	Yes
dA_S rA_S	No Control Temperature sensor detected (Discharge or Return Air)	S3C Case Control must have at least one control temperature input. Sensor not connected, miswired or shorted.	EEPR Temperature control selected. 1. Single case in line-up: EEPR moves to calculated "fault" position. 2. Multiple cases or evaporators with Discharge Air sensors available in line-up: Average temperature value from remaining available sensors is used for control.	Yes
rH	No Dew Point sensor detected	Anti-sweat control using dew point enabled. Sensor not connected, miswired or shorted.	Anti-sweat output reverts to 100% on	Yes
CSFc	No Case Surface Temperature sensor detected	Anti-sweat control using dew point enabled. Sensor not connected, miswired or shorted.	Anti-sweat output reverts to 100% on	Yes
EoUt	No Coil Outlet Temperature sensor detected **Note:** **Can be Coil Outlet sensor on Valve Module in multiple evaporator applications.**	EEV (superheat control) selected. Sensor not connected, miswired or shorted.	EEV (superheat control) selected. EEV closes to prevent possible flood back to compressor(s)	Yes
dEFt	No Defrost Termination Temperature sensor detected **Note:** **Can be Defrost Termination sensor on Valve Module in multiple evaporator applications.**	Not configured for defrost termination using Discharge Air Temperature. Sensor not connected, miswired or shorted.	Defrost cycle terminates on fail-safe time.	Yes
dAtd	No Discharge Air sensor detected for defrost termination. **Note:** **Can be Discharge Air sensor on Valve Module in multiple evaporator applications.**	Air Defrost and Discharge Air selected for defrost termination temperature. Sensor not connected, miswired or shorted.	Defrost cycle terminates on fail-safe time.	Yes
CLo9	Clogged Drain	Condensate level in case exceeds selected threshold for period exceeding selected Clogged Drain alarm delay.		Yes
FAnF	Fan Fault	Fan(s) failed to start or stopped or stalled (ECM) during operation		No
dEFH	Defrost Heater Fault	Electric Defrost selected and Defrost Heater CT installed. Defrost Heater failed to energize during defrost		Yes
dEFS	Defrost Heater energized during cooling	Electric Defrost selected and Defrost Heater CT installed. Defrost Heater contactor failed ON		Yes
SErv	Service Mode alarm	Time control is in Service Mode exceeds selected Service Alarm Delay Time		No
EEPr	EEPR Open Load	EEPR configured. EEPR not connected, miswired or open winding/connection.		Yes

RED denotes required control configuration to enable alarm and/or control response.

Alarm	Description	Cause	Control Response	Self Clearing
SFu EEu	EEV Open Load/SFV Open Load	EEV/SFV configured for 1 evaporator. EEV not connected, miswired or open winding/connection.		Yes
EEu1	Left coil EEV Open Load	EEV Configured for 2 or more evaporators. Left evaporator EEV assigned to S3C Case Control not connected, miswired or open winding/connection.		Yes
EEu2	Center coil EEV Open Load	EEV Configured for 3 evaporators. Center evaporator EEV assigned to S3C Valve Module not connected, miswired or open winding/connection.		Yes
EEu3	Right coil EEV Open Load	EEV Configured for 2 or 3 evaporators. Right evaporator EEV assigned to S3C Valve Module not connected, miswired or open winding/connection.		Yes
mEPr	Multiple EEPRs configured for line-up	EEPR assigned to more than 1 control in line-up		Yes
door	Door Open	Door opening detection input to control configured (Walk-In only). Door Open time exceeds user selected Door Open alarm delay time.		Yes
bASc	Building Automation System communication fault	S3C Case Control configured for BAS present. BAS Network settings incorrect, Communication wiring incorrect.		Yes
uLvM	Valve Module (VM) communication fault (Device Expansion Network (DEN))	S3C Case Control configured for presence of 1 or more Valve Modules. DEN wiring incorrect. Failed VM. VM dip switches configured for EEV when EEPR selected or when 2 evaporators selected.		Yes
CASc	Case Network communication fault.	S3C Case Control configured for presence of 2 or more controls in line-up. Case Network settings incorrect, Communication wiring incorrect. Failed S3C Control in line-up.		Yes

18.3 SENSOR ALARMS

RED denotes required control configuration to enable alarm and/or control response.

Alarm	Description	Cause	Control Response	Self Clearing
no → SEnS	Alternating no → SEnS at default screen when no Discharge Air (DA) sensor(s) detected	Discharge Air sensor(s) not connected, miswired or shorted.	EEPR Temperature control selected. 1. Single case in line-up with single evaporator. One DA sensor connected to S3C Case Controller: EEPR moves to calculated "fault" position. 2. Multiple cases in line-up and / or multiple evaporators with DA sensors: Average temperature value from remaining available sensors is used for control.	Yes
CO_L	Circuit Coil Outlet temperature sensor fault	The coil outlet temperature sensor for the circuit is not connected, miswired, or shorted.		
SP_1	No Suction Pressure Transducer detected on Left Evaporator (S3C Case Control pressure input). 2 or 3 Evaporators with multiple suction pressure transducers installed in case.	Superheat Control using EEV selected. Number of evaporators in case greater than 1. Sensor must be detected on initial power up to enable alarm. Pressure Transducer(s) not connected, miswired or faulty.	Superheat Control selected. 1. EEV closes to prevent possible flood back. 2. Pressure Sharing Enabled: Average pressure value from remaining available pressure transducers is used for superheat calculation.	Yes

RED denotes required control configuration to enable alarm and/or control response.

Alarm	Description	Cause	Control Response	Self Clearing
SP_2	No Suction Pressure Transducer detected on Center Evaporator (S3C Valve Module pressure input). 2 or 3 Evaporators with multiple suction pressure transducers installed in case.	Superheat Control using EEV selected. Number of evaporators in case greater than 1. Sensor must be detected on initial power up to enable alarm. Pressure Transducer(s) not connected, miswired or faulty.	Superheat Control selected. 1. EEV closes to prevent possible flood back. 2. Pressure Sharing Enabled: Average pressure value from remaining available pressure transducers is used for superheat calculation.	Yes
SP_3	No Suction Pressure Transducer detected on Right Evaporator (S3C Valve Module pressure input). 2 or 3 Evaporators with multiple suction pressure transducers installed in case.	Superheat Control using EEV selected. Number of evaporators in case greater than 1. Sensor must be detected on initial power up to enable alarm. Pressure Transducer(s) not connected, miswired or faulty.	Superheat Control selected. 1. EEV closes to prevent possible flood back. 2. Pressure Sharing Enabled: Average pressure value from remaining available pressure transducers is used for superheat calculation.	Yes
CO_1	No Coil Outlet Temperature sensor detected on Left Evaporator (S3C Case Control CO input). 2 or 3 Evaporators installed in case.	Superheat Control using EEV selected. Number of evaporators in case greater than 1. Coil Outlet Temperature sensor not connected, miswired or faulty.	Superheat Control selected. 1. EEV closes to prevent possible flood back.	Yes
CO_2	No Coil Outlet Temperature sensor detected on Center Evaporator (S3C Valve Module CO2 input). 3 Evaporators installed in case.	Superheat Control using EEV selected. Three evaporators in case. Coil Outlet Temperature sensor not connected, miswired or faulty.	Superheat Control selected. 1. EEV closes to prevent possible flood back.	Yes
CO_3	No Coil Outlet Temperature sensor detected on Right Evaporator (S3C Valve Module CO1 input). 2 or 3 Evaporators installed in case.	Superheat Control using EEV selected. Two or Three evaporators in case. Coil Outlet Temperature sensor not connected, miswired or faulty.	Superheat Control selected. 1. EEV closes to prevent possible flood back.	Yes
dt_1	No Defrost Termination Temperature sensor detected on Left Evaporator (S3C Case Control DF input). 2 or 3 Evaporators installed in case.	Discharge Air Temperature not selected for Air Defrost termination. Defrost Termination Temperature sensor not connected, miswired or faulty.	Defrost terminates on selected time.	Yes
dt_2	No Defrost Termination Temperature sensor detected on Center Evaporator (S3C Valve Module DF2 input). 2 or 3 Evaporators installed in case.	Discharge Air Temperature not selected for Air Defrost termination. Defrost Termination Temperature sensor not connected, miswired or faulty.	Defrost terminates on selected time.	Yes
dt_3	No Defrost Termination Temperature sensor detected on Right Evaporator (S3C Valve Module DF1 input). 2 or 3 Evaporators installed in case.	Discharge Air Temperature not selected for Air Defrost termination. Defrost Termination Temperature sensor not connected, miswired or faulty.	Defrost terminates on selected time.	Yes
rA	No Return Air Temperature sensor detected on S3C Case Control RA input.	Sensor must be detected on initial power up to enable alarm. Return Air Temperature sensor not connected, miswired or faulty.		Yes
dA_1	No Discharge Air (DA) Temperature sensor detected on Left Evaporator (S3C Case Control DA input). 2 or 3 Evaporators installed in case.	Sensor must be detected on initial power up to enable alarm. Discharge Air Temperature sensor not connected, miswired or faulty.	EEPR Temperature control selected. 1. Single case in line-up. One DA sensor connected to S3C Case Controller: EEPR moves to calculated "fault" position. 2. Multiple cases in line-up or evaporators with Discharge Air sensors available: Average temperature value from remaining available sensors is used for control.	Yes

RED denotes required control configuration to enable alarm and/or control response.

Alarm	Description	Cause	Control Response	Self Clearing
dA_2	No Discharge Air Temperature sensor detected on Center Evaporator (S3C Valve Module DA2 input). 3 Evaporators installed in case.	Sensor must be detected on initial power up to enable alarm. Discharge Air Temperature sensor not connected, miswired or faulty.	EEPR Temperature control selected. 1. Single case in line-up. One DA sensor connected to S3C Valve Module: EEPR moves to calculated "fault" position. 2. Multiple cases or evaporators in line-up with Discharge Air sensors available: Average temperature value from remaining available sensors is used for control.	Yes
dA_3	No Discharge Air (DA) Temperature sensor detected on Right Evaporator (S3C Valve Module DA1 input). 2 or 3 Evaporators installed in case.	Sensor must be detected on initial power up to enable alarm. Discharge Air Temperature sensor not connected, miswired or faulty.	EEPR Temperature control selected. 1. Single case in line-up. One DA sensor connected to S3C Valve Expansion Module: EEPR moves to calculated "fault" position. 2. Multiple cases or evaporators in line-up with Discharge Air sensors available: Average temperature value from remaining available sensors is used for control.	Yes
CSEP	No Case Surface Temperature sensor detected (S3C Case Control AX input).	Sensor must be detected on initial power up to enable alarm. Discharge Air Temperature sensor not connected, miswired or faulty.	Antisweat Dew Point control selected: Antisweat heaters run at 100% on.	Yes
rH	No Air Temperature/ Humidity sensor detected.	Sensor must be detected on initial power up to enable alarm. Air Temperature/Humidity sensor not connected, miswired or faulty.	Antisweat Dew Point control selected: Antisweat heaters run at 100% on.	Yes
CLoG	No Clogged Drain sensor detected	Sensor must be detected on initial power up to enable alarm. Clogged Drain sensor not connected, miswired or faulty.		Yes

18.4 USER ALARMS

RED denotes required control configuration to enable alarm and/or control response.

Alarm	Description	Cause	Control Response	Self Clearing
SPL	Suction pressure low	Measured suction pressure is below user selected low limit for a period greater than selected low alarm time delay.		Yes
SPH	Suction pressure high	Measured suction pressure is above user selected high limit for a period greater than selected high alarm time delay.		Yes
dA_L rA_L	Discharge Air Temperature Low Return Air Temperature Low (Alarms on selected control temperature sensor)	Measured Discharge Air or Return Air Temperature is below user selected low Control Temperature limit for a period greater than selected Control Temperature low alarm time delay.		Yes
dA_H rA_H	Discharge Air Temperature High Return Air Temperature High (Alarms on selected control temperature sensor)	Measured Discharge Air or Return Air Temperature is above user selected high Control Temperature limit for a period greater than selected Control Temperature high alarm time delay.		Yes
SHL	Superheat low	Superheat is below user selected low superheat limit for a period greater than selected superheat low alarm time delay.	Disabled if Coil Outlet Temperature sensor missing or faulty.	Yes
SHH	Superheat high	Superheat is above user selected high superheat limit for a period greater than selected superheat high alarm time delay.	Disabled if Coil Outlet Temperature sensor missing or faulty.	Yes

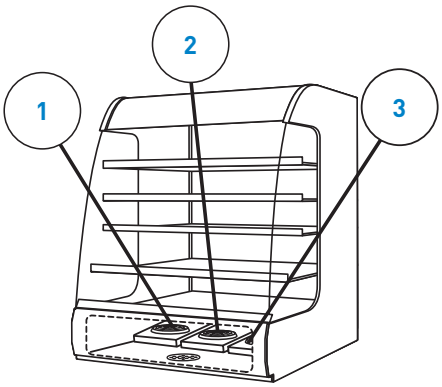
19. SERVICE

Display	Meaning
CLEn	Enable/Disable Clean Mode
dHtr	Defrost Heater Detection Reset
FFdr	Fan Failure Detection Reset
SCAn	Sensor Scan
CrSt	Controller Reset
CLrA	Clears and resets all alarms
CHrG	Enable/Disable Charge Pro
tESt	REnter Test Mode (Enable required)
SYSP	View Process Values and Modify Parameters Temporarily
dEF	Manual defrost
tEuS	TEV Assist for setting Superheat (holds pressure for TEV setup. Blinks white)

19.1 INITIATE DEFROST

It may be necessary to manually force a defrost to clear an evaporator coil of frost or ensure proper function of the defrost cycle.

1. From the **default** display, press the ❄ button. The display will show Entr PASS 0.
2. Use the ▲ button to enter the Technician password (default is 81) and press **SET.**
3. Use the ▲ button and scroll to on, then press **SET.** This will initiate defrost. **Note: If line-up synchronization is enabled, all the cases in the line-up will go into defrost.**



19.2 TERMINATE DEFROST

1. From the **default** display, press the ▲ button. The display will show Entr PASS 0.
2. Use the ▲ button to enter the Technician password (default is 81) and press **SET.**
3. Use the ▼ button and scroll to oFF, then press **SET.** This will terminate defrost. **Note: If line-up synchronization is enabled, all the cases in the line-up will come out of defrost.**

Note: Initiating a defrost on a case that is part of a refrigeration line-up will force all the cases in the line-up into defrost.

19.3 VIEW DISCHARGE AIR TEMPERATURE

The default display shows discharge air temperature of the case, however, it may be necessary to view individual temperatures for each evaporator on multi-coil cases.

For Coil 1:
1. From the default display, press the ▲ button to CASE then press **SET.**
2. Press the ▲ button and scroll to dA_1.
3. Press **SET** button to show current discharge air value.
4. Press **ESC** button three times to return to **default** display.

For Coil 2:
1. From the default display, press the ▲ button to EuP2 then press **SET.**
2. Press the ▲ button and scroll to dA.
3. Press **SET** button to show current discharge air value.
4. Press **ESC** button three times to return to **default** display.

For Coil 3:
1. From the **default** display, press the ▲ button to EuP3 then press **SET.**
2. Press the ▲ button and scroll to dA.
3. Press the **SET** button to show current superheat value.
4. Press the **ESC** button three times to return to **default** display.

19.4 VIEW SUPERHEAT

19.4.1 SINGLE COIL CASE

1. From the **default** display, press the ▲ button to CASE then press **SET.**
2. Press the ▲ button and scroll to Sh.
3. Press **SET** button to show current superheat value.
4. Press **ESC** button three times to return to **default** display (discharge air).

19.4.2 MULTI-COIL CASE

For Coil 1:
1. From the **default** display, press the ▲ button to CASE then press **SET.**
2. Press the ▲ button and scroll to Sh_1.
3. Press **SET** button to show current superheat value.
4. Press **ESC** button three times to return to **default** display (discharge air).

For Coil 2:
1. From the **default** display, press the ▲ button to EuP2 then press **SET.**
2. Press the ▲ button and scroll to Sh.
3. Press **SET** button to show current superheat value.
4. Press **ESC** button three times to return to **default** display (discharge air).

For Coil 3:
1. From the **default** display, press the ▲ button to EuP3 then press **SET.**
2. Press the ▲ button and scroll to Sh.
3. Press **SET** button to show current superheat value.
4. Press **ESC** button three times to return to **default** display (discharge air).

19.5 VIEW SUCTION PRESSURE

1. From the **default** display, press the ▲ button to CASE then press **SET.**
2. Press the ▲ button and scroll to SUcP.
3. Press **SET** button to show suction pressure value.
4. Press **ESC** button three times to return to **default** display (discharge air).

19.6 VIEW COIL OUTLET TEMPERATURE

19.6.1 SINGLE COIL CASE

1. From the **default** display, press the ▲ button to CASE then press **SET.**
2. Press the ▲ button and scroll to CoUt.
3. Press **SET** button to show evaporator coil outlet temperature.
4. Press **ESC** button three times to return to **default** display.

19.6.2 MULTI-COIL CASE

For Coil 1:
1. From the **default** display, press the ▲ button to CASE then press **SET.**
2. Press the ▲ button and scroll to Co_1.
3. Press **SET** button to show evaporator coil outlet temperature.
4. Press **ESC** button three times to return to **default** display.

For Coil 2:
1. From the **default** display, press the ▲ button to EuP2 then press **SET.**
2. Press the ▲ button and scroll to CoUt.
3. Press **SET** button to show evaporator coil outlet temperature.
4. Press **ESC** button three times to return to **default** display.

For Coil 3:
1. From the **default** display, press the ▲ button to EuP3 then press **SET.**
2. Press the ▲ button and scroll to CoUt.
3. Press **SET** button to show evaporator coil outlet temperature.
4. Press **ESC** button three times to return to **default** display.

19.7 VIEW EEV POSITION

19.7.1 SINGLE COIL CASE

1. From the **default** display, press the ▲ button to CASE then press **SET.**
2. Press the ▲ button and scroll to EEu.

3. Press **SET** button to show EEV position.
4. Press **ESC** button three times to return to **default** display.

19.7.2 MULTI-COIL CASE

For Coil 1:

1. From the **default** display, press the ▲ button to CASE then press **SET.**
2. Press the ▲ button and scroll to EEu 1.
3. Press **SET** button to show EEV position.
4. Press **ESC** button three times to return to **default** display.

For Coil 2:

1. From the **default** display, press the ▲ button to EuP2 then press **SET.**
2. Press the ▲ button and scroll to EEu.
3. Press **SET** button to show EEV position.
4. Press **ESC** button three times to return to **default** display.

For Coil 3:

1. From the **default** display, press the ▲ button to EuP3 then press **SET.**
2. Press the ▲ button and scroll to EEu.
3. Press **SET** button to show EEV position.
4. Press **ESC** button three times to return to **default** display.

19.8 VIEW EEPR POSITION

19.8.1 LINE-UP EEPR

The EEPR position may be viewed from any Display Module (DM) on the line-up.

1. From the **default** display, press the ▼ button to show LinE then press **SET.**
2. Press the ▲ button and scroll to EEPr.
3. Press **SET** button to show EEPR position.
4. Press **ESC** button three times to return to **default** display (discharge air).

19.8.2 CASE EEPR

Each case EEPR position can only be viewed thru the corresponding case Display Module (DM).

1. From the **default** display, press the ▼ button to show CASE then press **SET.**
2. Press the ▲ button and scroll to EEPr.

19.9 ADJUST SUPERHEAT SETPOINT

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the Technician password and press **SET.**
3. The display will show CLEn.
4. Press the ▼ button until SYSP is displayed; press **SET.**
5. Use the ▲▼ buttons and scroll to CASE; press **SET.**
6. Press the ▲ button to scroll to bSc (basic menu); press **SET.**
7. Press the ▲ button to scroll to ShSP (superheat setpoint); press **SET.**
8. Use the ▲▼ buttons to increase or decrease setpoint; press **SET** to make the change.
9. To exit and discard changes, press **ESC** button four times to return to **default** display.

Note: Settings that are changed under the Service access will be discarded once exiting to the default display. For permanent changes, enter the menu using Administrator password.

19.10 ADJUST DISCHARGE AIR SETPOINT

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the Technician password and press **SET.**
3. The display will show CLEn.
4. Press the ▼ button until SYSP is displayed; press **SET.**
5. Use the ▲▼ buttons and scroll to CASE; press **SET.**
6. Press the ▲ button to scroll to bSc (basic menu); press **SET.**
7. Press the ▲ button to scroll to dASP (discharge air setpoint); press **SET.**
8. Use the ▲▼ buttons to increase or decrease setpoint; press **SET** to make the change.
9. To exit and discard changes, press **ESC** button four times to return to **default** display.

19.11 MANUALLY POSITION EEV

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the Technician password and press **SET.**
3. The display will show CLEn.
4. Press the ▼ button until tESt is displayed.
5. Press **SET** to enter the Test sub-menu. The display will show tEnA (Test Enable).
6. Press **SET** to enter ON/OFF sub-menu. The display will show oFF (Or current state of **Test Enable**).
7. Press the ▲ button to on.
8. Press **SET** to activate **Test Mode**. The display will revert to tEnA.
9. Press the ▲ button until EEu is displayed. **Note: for multiple coil cases EEu 1, EEu2, EEu3 may be shown.**
10. Press the **SET** button. The current EEV % open value will be displayed.
11. Use the ▲▼ buttons to adjust the desired valve position.

12. Press the **SET** button to move the valve to the desired position. The display will revert to EEu.
13. Repeat steps 9 – 12 to move the valve to any desired position.
14. When finished, press the **ESC** button twice to return to the **default** display and exit **Test Mode**.

19.12 MANUALLY POSITION EEPR

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the Technician password and press **SET.**
3. The display will show CLEn.
4. Press the ▼ button until tEST is displayed.
5. Press **SET** to enter the Test sub-menu. The display will show tEnA(Test Enable).
6. Press **SET** to enter ON/OFF sub-menu. The display will show oFF(Or current state of **Test Enable**).
7. Press the ▲ button to on.
8. Press **SET** to activate **Test Mode.** The display will revert to tEnA.
9. Press the ▲ button until EEPr is displayed.
10. Press the **SET** button. The current EEPR % open value will be displayed.
11. Use the ▲▼ buttons to adjust the desired valve position.
12. Press the **SET** button to move the valve to the desired position. The display will revert to EEPr.
13. Repeat steps 9 – 12 to move the valve to any desired position.
14. When finished, press the **ESC** button twice to return to the **default** display and exit **Test Mode.**

19.13 CLEAN MODE

The S3C Case Control supports a Clean Mode. Putting the control in this state shuts off refrigeration and evaporator fans, suspends defrost requests and disables all alarms. They will remain off until the user terminates the Clean Mode. This allows for either cleaning of the case or performing service functions that require the case to be in an "OFF" state. Clean Mode can be initiated or terminated using any S3C Display Module (DM) in the case line-up.

⚠ **Warning:** The Clean Mode feature is not to be used for safety critical servicing. Use proper lockout tag out producers, as defined by local requirements and codes, on the case if electrical repair or other safety critical servicing is required.

19.13.1 SINGLE KEY PRESS CLEAN MODE ENTRY

⚠ **Warning:** It is imperative that Clean Mode be manually terminated in a timely fashion to prevent product loss or possible equipment malfunction. Single key press Clean Mode entry:

1. From the **default** display, press and hold the 🔧 and ▼ buttons for 3 seconds. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the Technician password and press **SET.**
3. The display will show CLEn.
4. Press **SET** to enter ON/OFF sub-menu. The display will show oFF (Or current state of Clean Mode).

5. Press the ▲ button to on.
6. Press **SET** to activate **Clean Mode.**

19.13.2 STANDARD MENU ENTRY FOR CLEAN MODE

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **service** password and press **SET.**
3. The display will show CLEn.
4. Press **SET** to enter ON/OFF sub-menu. The display will show oFF (Or current state of Clean Mode).
5. Press the ▲ button to on.
6. Press **SET** to activate **Clean Mode.**

19.13.3 TO EXIT CLEAN MODE AND RESUME NORMAL OPERATION

1. From the **default** or CLEn display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **Technician** password and press **SET.**
3. The display will show CLEn.
4. Press **SET** to enter ON/OFF sub-menu. The display will show on (Or current state of Clean Mode).
5. Press the ▲ button to oFF.
6. Press **SET** to deactivate **Clean Mode.**

19.14 TEST MODE

The controller may be placed in test mode to manually toggle the internal relays or operate the step motor valves. This mode can help verify correct operation of the components and may aid in troubleshooting. **Note: Once the controller is placed in test mode (tEnA set to on), the controller will remain in test mode until tEnA is set to oFF or by pressing the ESC button until the default display (case temperature) is shown.**

⚠ **WARNING:** Controller functionality will halt while in test mode. All components, such as valves, fans and lights, will remain in the last position/state when test mode was entered. Do not leave the case unattended while in test mode; there is no time-out. Take caution to ensure superheat does not become too low or case temperature does not become too high while operating in test mode. If this occurs, simply exit out of test mode and normal control will resume.

1. From the default display, press the 🔧 button. The display will show `Entr PASS 0`.
2. Use the ▲ button to enter the technician password and press **SET** (default is 81).
3. Press **SET** to enter the Service sub-menu. The display will show `CLEn` (Clean Mode).
4. Use the ▼ button and scroll to `tESt` (Test Mode); press **SET.**
5. When display shows `tEnA` (Test Mode Enabled); press **SET.**
6. Using ▲ button, scroll to `on`; press **SET.** This will enable test mode.
7. When display shows `tEnA`; press ▼ button to scroll thru the components to test.
8. Scroll to the component, then press **SET** to toggle the relay or drive the valve.

The following chart shows available components to test.

Display	Component	Application Configuration (see section 6)	Action
`LEd`	LED Driver (lighting)	ALL	Press ▲▼, then **SET** to dim (0-100% of 10V)
`FSo`	Fan Speed Output	ALL	Press ▲▼, then **SET** to change speed (0-100% of 10V)
`AS`	Anti-Sweat Duty Cycle	ALL	Press ▲▼, then **SET** to change duty cycle (0-100% of "time on")
`dEF`	Defrost	ALL	Press ▲▼, then **SET** to manipulate the defrost mechanism such as heaters
`L itE`	Lights	ALL	Press ▲▼, then **SET** to turn fans on/off
`FAn`	Evaporator Fans	ALL	Press ▲▼, then **SET** to turn fans on/off
`EEu`	Electronic Expansion Valve Device: Case Controller Location (on hdw): Stepper Valve	B, J, M, N W, X, Y, Z	Press ▲▼, then **SET** to change position (0-100% open)
`EEu2`	Electronic Expansion Valve Device: Valve Module 1 Location (on hdw): Stepper Valve 1	C, O, R, T	Press ▲▼, then **SET** to change position (0-100% open)
`EEu3`	Electronic Expansion Valve Device: Valve Module 1 Location (on hdw): Stepper Valve 2	D, P	Press ▲▼, then **SET** to change position (0-100% open)
	Electronic Expansion Valve Device: Electronic Expansion Valve Device: Valve Module 2 Location: Stepper Valve 1	S, U	
`EEPr`	Electronic Evaporator Pressure Regulator Device: Case Controller Location (on hdw): Stepper Valve	K, L, Q, V	Press ▲▼, then **SET** to change position (0-100% open)
	Electronic Evaporator Pressure Regulator Device: Valve Module 1 Location: Stepper Valve 2	R, T	
	Electronic Evaporator Pressure Regulator Device: Valve Module 2 Location: Stepper Valve 2	S, U	
`SrEL`	Solid State Relay (Solenoid Valve or Pulse EEV)	ALL	Press ▲▼ to open/close valve, then **SET**

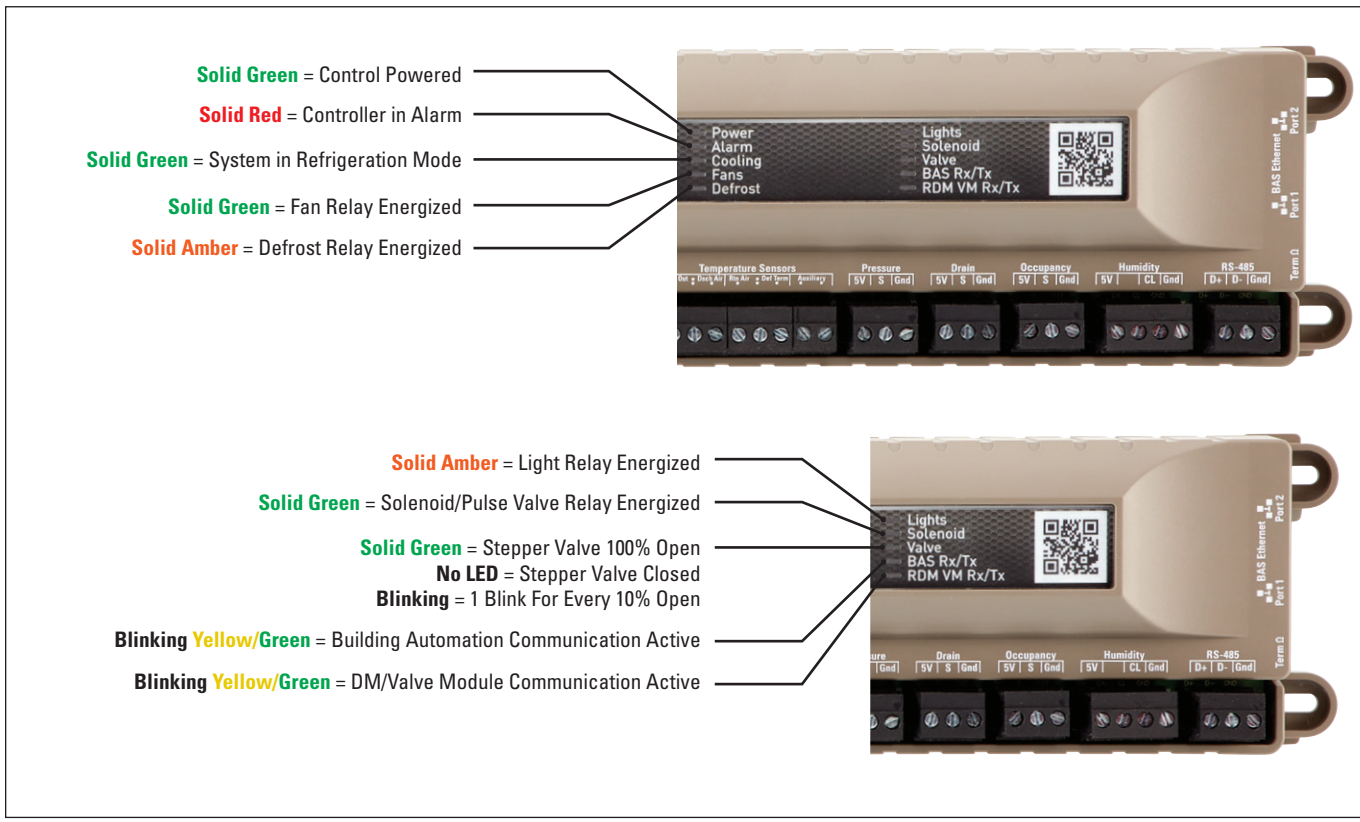
To Exit Test Mode:

1. Use the ▼ button and scroll to tEnA; press **SET.**
2. Use the ▼ button and scroll to oFF; press **SET.**
   The system will resume operation.
3. Press the **ESC** button 2 times to revert to the **default** display.

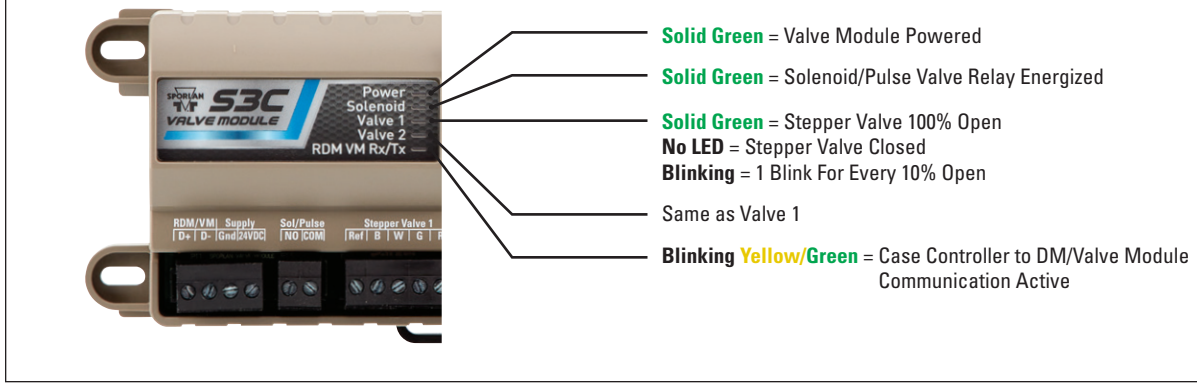
19.15 LED SERVICE INDICATORS

The S3C case control and Valve Module have integrated visible LED indicators on the top surface of the enclosures. The indicators are used to show condition of critical components, such as valves and fans. The following charts show the location and function of each LED.

19.15.1 LED CASE CONTROL



19.15.2 LED VALVE MODULE



19.16 SENSOR SCAN

The S3C Case Control system uses multiple sensors for monitoring and control. Upon new start up, the controller will scan and find all the sensors that are currently attached; both on the Case Control and the Valve Module(s). The controller will locate these sensors in memory to aid in troubleshooting. If a sensor is removed and not replaced, an alarm will be generated. If extra temperature sensors for monitoring are installed at initial set-up then later removed, then the controller should have a sensor scan performed. This scan allows the controller to determine the proper sensors required by the application.

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲ button to enter the **technician** password and press **SET** (default is 81).
3. Press **SET** to enter the Service sub-menu. The display will show CLEn (Clean Mode).
4. Use the ▲ button and scroll to ScAn; press **SET.**
5. Use the ▲ buttons and scroll to YES; press **SET.**

19.17 DEFROST CURRENT BASELINE RESET

The S3C Case Control supports an external current transformer (CT) that may be applied across the defrost heater circuit to monitor and measure current. The Sporlan provided CT is a two wire design and is wired into the "Auxillliary" Temperature Sensor input. See Accessories Section for part number. At some point, it may be necessary to reset the baseline defrost current that the controller has stored in memory. This is required after defrost heater or evaporator coil replacement.

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲ button to enter the **technician** password and press **SET** (default is 81).
3. Press **SET** to enter the Service sub-menu. The display will show CLEn (Clean Mode).
4. Use the ▲ button and scroll to dHtr (Defrost Heater Reset); press **SET.**
5. Use the ▲ buttons and scroll to YES; press **SET.**

19.18 FAN CURRENT BASE LINE RESET

The S3C Case Control has an integrated detection circuit for fan current. This feature allows current monitoring of the bank of fans for each case. At some point, it may be necessary to reset the baseline fan current that the controller has stored in memory. This is required after a fan replacement. **Note: Before resetting the baseline current ensure that the evaporator is clear for proper air flow and that all the fans are operating correctly in the case.**

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲ button to enter the t**echnician** password and press **SET** (default is 81).
3. Press **SET** to enter the Service sub-menu. The display will show CLEn (Clean Mode).
4. Use the ▲ button and scroll to FFdr (Fan Fault Detection Reset); press **SET.**
5. Use the ▲ buttons and scroll to YES; press **SET.**

19.19 FUSE REPLACEMENT

The S3C Case Control has replacement cartridge fuses on the liquid line solenoid/pulse valve, fans, lights and defrost circuits. The S3C Valve Module has a fuse on the liquid line solenoid/pulse valve circuit. The Display Module (DM) does not have any serviceable components.

⚠ **Warning:** Use caution when working around high voltage components. Ensure power is removed from all inputs prior to handling the controller.

19.19.1 CHANGING A FUSE ON THE CASE CONTROLLER

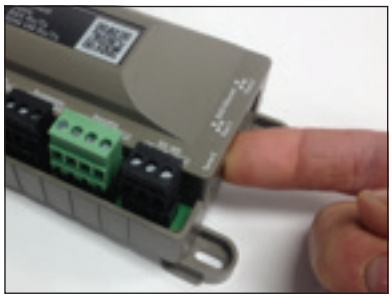
For replacement use the following fuse specification or equivalent:

Liquid Line Solenoid/Pulse Valve – 1A 250VAC 2AG Littelfuse Part Number 0225001.MXP

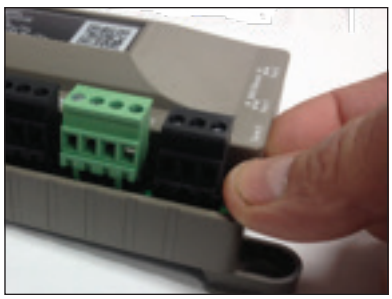
Fans, Lights and Defrost – 6.3A 250VAC 5X20MM Littelfuse Part Number 021806.3HXP

1. Remove power from controller.
2. Remove upper housing.

   a. Remove Ethernet from port 1 (if used) and place index finger on upper housing as shown.

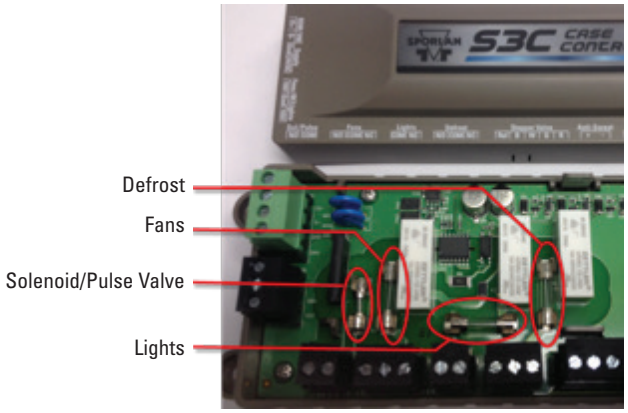


   b. Place thumb on front edge of lower housing as shown.



   c. Using a pinching motion (push down with thumb and up with index finger), pop off upper housing. **Note: Use caution not to impact circuit board.**

3. Locate fuses as shown below. Replace as necessary.



4. Install upper housing.

   a. Place the back of the upper housing onto the back of the lower housing as shown.

   b. Rotate upper housing down toward the front until it contacts the lower housing; press down until a snap is heard.

19.19.2 CHANGING A FUSE ON THE VALVE MODULE

⚠ **WARNING:** Use caution when working around high voltage components. Ensure power is removed from all inputs prior to handling the controller.

For replacement use the following fuse specification or equivalent:

Liquid Line Solenoid/Pulse Valve – 1A 250VAC 2AG Littelfuse Part Number 0225001.MXP

1. Remove power from valve module.
2. Remove upper housing.

   a. Make note of the switch locations on the side of the valve module.

   b. Place index finger on upper housing (inside of switch recess) as shown. **Note: take caution not to move the switches.**

   c. Place thumb on front edge of lower housing as shown.

   d. Using a pinching motion (push down with thumb and up with index finger), pop off upper housing. **Note: Use caution not to impact circuit board.**

3. Locate fuse as shown below. Replace as necessary.

4. Install upper housing (Valve Module).

   a. Place upper housing on lower housing.

   b. Press down as shown on top of upper housing until a snap is heard.

19.20 CONTROLLER REPLACEMENT

⚠ **WARNING:** Use caution when working around high voltage components. Ensure power is removed from all inputs prior to handling controller.

19.20.1 CASE CONTROLLER

1. Remove power from the S3C Case Control.
2. Remove terminal plugs (keeping wires attached); mark as needed.
3. Note and record position of termination resistor switch on the side of the controller. See following figure.

4. Remove controller either by pressing down and releasing the DIN rail latch or removing the four mounting screws.
5. Install new controller by snapping on to DIN rail or using mounting screws.
6. Install terminal plugs (with wires).
7. Ensure the position of the termination resistor switch is the same as the old controller.
8. Retighten all wiring on the terminal plugs.
9. Apply power to the S3C Case Control. **Note: If replacing with a newer date code, then the new controller will auto configure to the previous parameters of the old controller and run updates.** UPdt followed by dashes may appear on the display while the controller is making updates. See below figure. If replacing both the case controller and Display Module (DM) at the same time, or replacing a controller with an older controller, then standard set-up thru the Display Module (DM) will be required.

19.20.2 VALVE MODULE

1. Remove power from the S3C Valve Module.
2. Remove terminal plugs (keeping wires attached); mark as needed.
3. Note and record positions of the four switches on the side of the module. See following figure.

4. Remove valve module either by pressing down and releasing the DIN rail latch or removing the four mounting screws.
5. Install new module by snapping on to DIN rail or using mounting screws.
6. Install terminal plugs (with wires).
7. Ensure the position of the four switches are the same as the old module.
8. Retighten all wiring on the terminal plugs.
9. Apply power to the S3C Valve Module. **Note: UPdt followed by dashes may appear on the display while the module is updating.**

19.20.3 DISPLAY MODULE

1. Remove the power and communications terminal plug from the back of the display.
2. Press the slide locks and remove from the sides of the display.
3. Slip out display from the panel/bulkhead.
4. Slide new display into bulkhead.
5. Install slide locks onto the display and compress against bulkhead to ensure proper sealing.
6. Connect power and communications terminal plug. **Note: UPdt followed by dashes may appear on the display while the Display Module (DM) is updating.**

19.21 VIEWING CASE CONTROL FIRMWARE REVISION

To view the controller firmware revision:

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE (will skip to Process Values if system is self-contained).
4. Press the **SET** button and P_u (Process Values) will be displayed.
5. Press the **SET** button and CALS will be displayed.
6. Press the ▼ button until uErS (Version) is showing.
7. Press the **SET** button to display the Case Control firmware revision.
8. Press the **ESC** button four times to exit the menu and return to the **default** display.

19.22 FIRMWARE UPDATES

To update firmware, contact Sporlan Technical Support.
E-mail: svdtechsupport@parker.com
Phone: 636-392-3906

20. TROUBLESHOOTING

As with any refrigeration component troubleshooting, actual system conditions should be verified with a gauge set and calibrated temperature sensor (i.e. verify actual superheat, sub-cooling and refrigerant condition). This system information is valuable in determining whether it is component related or system related.

Typically a refrigerated case should be supplied with at least 5˚F sub-cooling to the expansion device and should have at least 5˚F superheat leaving the evaporator. The case must also have the appropriate saturated suction temperature to meet the specified case temperature. Typically the saturated suction temperature (as defined by the suction pressure) should be maintained at 10˚F below the specified case temperature. In all instances, consult the refrigerated display case OEM specification sheet for sub-cooling, superheat and suction pressure requirements.

For systems or applications that experience light loads, it is important that the evaporator and refrigerant lines are sized correctly. This will ensure proper oil return and will minimize the effects of oil logging in the evaporator. Refer to the evaporator manufacturer's installation instructions.

The following chart can be used as a guide for troubleshooting:

Problem	Check	Solution
Display not powering up	Voltage at Display Module (Gnd and 24VDC)	Ensure wiring is correct and retighten
Display showing dashes	Communications from the Case Controller (D+ and D-)	Ensure wiring is correct and retighten
Display intermittent	Wiring between Case Controller and Display	Ensure wiring is correct and retighten
Case Controller not powering up (power LED indicator not lit)	Voltage at Case Controller (Gnd and 24VDC)	Replace power supply if not 24VDC
	Wiring between power supply and Case Controller	Ensure wiring is correct and retighten
Valve Module not powering up	Voltage at Display Module (Gnd and 24VDC)	
EEPR locked at 100%	Rack suction pressure	
EEPR locked at 0%	For controller alarms	
EEV locked at 100%	Liquid condition feeding the EEV	
EEV locked at 0%	For controller alarms	
Liquid line solenoid not opening	Wiring from controller to valve	Ensure wiring is correct and that the proper voltage is feeding the valve
	Fuse inside of controller	Ensure fuse is not blown; see Service section for replacement procedure
Evaporator fans not working	Wiring from controller to valve	Ensure wiring is correct and that the proper voltage is feeding the fans
	Fuse inside of controller	Ensure fuse is not blown; see Service section for replacement procedure
Case lights not working	Wiring from controller to valve	Ensure wiring is correct and that the proper voltage is feeding the lighting power supply/driver
	Fuse inside of controller	Ensure fuse is not blown; see Service section for replacement procedure
Defrost heaters not working	Wiring from controller to valve	Ensure wiring is correct and that the proper voltage is feeding the heaters or hot gas solenoid
	Fuse inside of controller	Ensure fuse is not blown; see Service section for replacement procedure

21. NETWORK AND COMMUNICATIONS

21.1 CONNECTIONS AND WIRING

21.1.1 CASE CONTROL TO DISPLAY MODULE AND VALVE MODULE

Cable type: 2/22AWG twisted pair (shielded Belden 8723 or equivalent)

Max Cable length: Up to 20 ft.

Communication: RS-485

21.1.2 CASE CONTROL TO CASE CONTROL

Cable Type: CAT5/CAT5E

Max Cable length: Up to 100 m (328 ft.)

Communication: Ethernet

21.1.3 CASE CONTROL TO BAS

Cable Type: 22AWG twisted pair (shielded Belden 8761 or equivalent)

Max Cable length: Up to 100 ft.

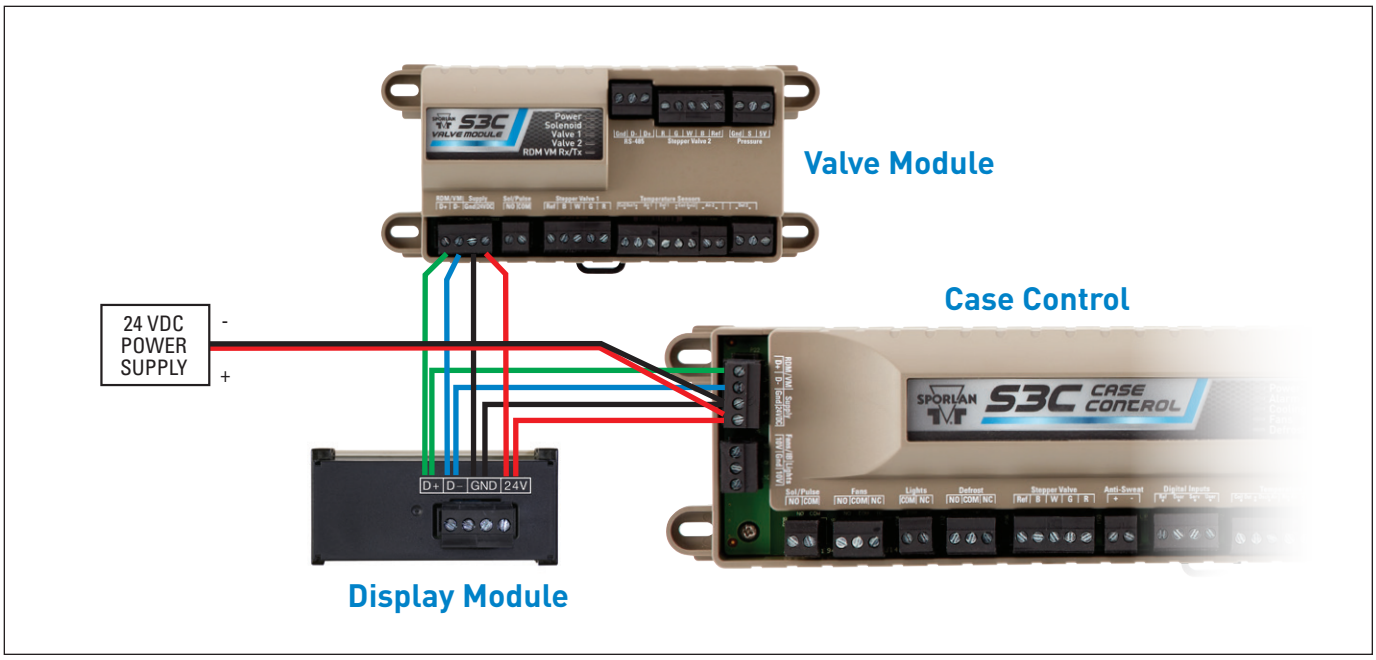
Communication: RS-485

21.2 CASE CONTROLLER

The Case Controller communicates to the DM and Valve Module via a dedicated private network. This network is not configurable through software and is not available for third party components. This network can support one Case Controller, One Display and up to two valve modules for multi-coil cases. 2/22AWG twisted pair is recommended for use between the modules. The following must be attached across all modules: D- (for communication), D+ (for communication), 24VDC (Positive side of supply voltage) and "Gnd" (Negative side of 24VDC).

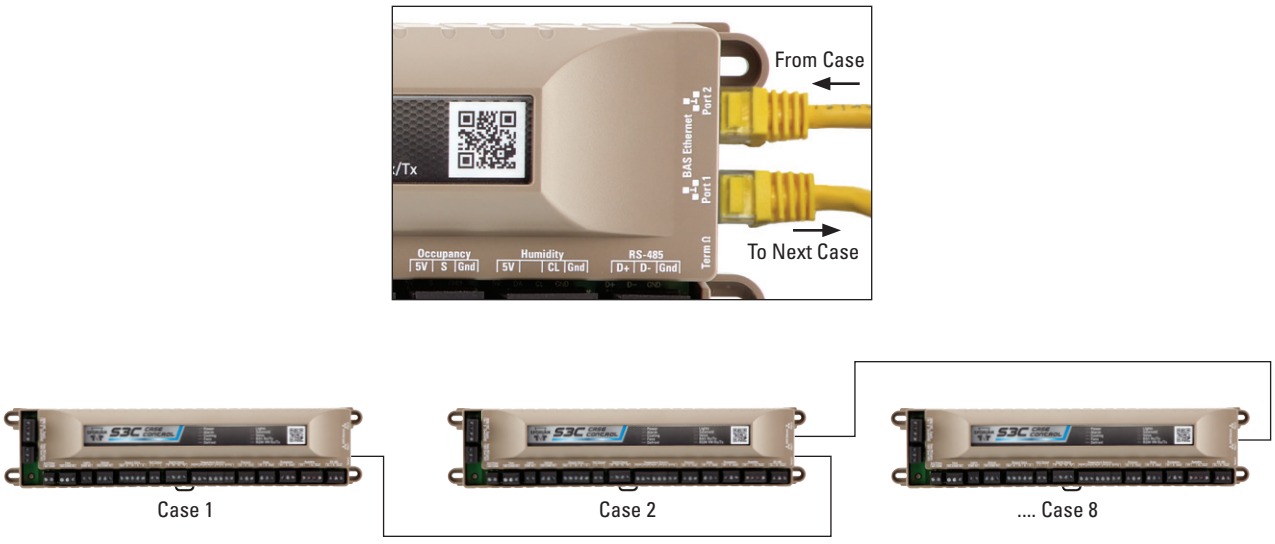
Note: This is only for the dedicated private network between modules, not refrigerated case to refrigerated case.

21.3 LINE-UP



Each case on a line-up should be connected via a CAT5 Ethernet cable to ensure proper synchronization of key system functions, such as defrost. The cable must be installed in either Port 1 or Port 2 on the controller; see the following Figures. Dual Ethernet ports allow simple daisy chain networking of the cases.

21.3.1 LINE-UP SYNCHRONIZATION



Line-up synchronization allows cases within a line-up to share key parameters. In many instances, this simplifies set-up and allows for sensor redundancy to maximize case up time if a sensor failure should occur. This feature is enabled by default and may be changed using the following steps.

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE (will skip to Process Values if system is self-contained).
4. Press the **SET** button and P_u (Process Values) will be displayed.
5. Press the ▼ button until nEtC (Network Configuration) is showing, then press **SET.**
6. Scroll to CSYn (Case Sync); then press **SET.**
7. Use the ▲▼ buttons to scroll to On or OFF; then press **SET. Note: setting this to OFF will disable this feature.**
8. Press the **ESC** button three times to exit the menu and return to the **default** display.

The following chart shows what parameters are synchronized between cases.

Parameter	Description	Use	Display
Month	Current Month	Time and Date stamping of alarms and data logs	moth
Day	Day Of Month	Time and Date stamping of alarms and data logs	dAY
Year	Current Year	Time and Date stamping of alarms and data logs	YEAr
Time	Time of Day (24 hour)	Time and Date stamping of alarms and data logs Defrost and Lighting Schedule control	t mE
Superheat Target	Evaporator superheat set point	Control set point for EEV (Pulse or Stepper)	SHSP
EPR Type	Type of EPR on line-up	Determines temperature control scheme Steps number of steps for EEPR	EPrt
EEPR Custom Valve Type	Custom EEPR type Unipolar or Bipolar	For implementation of non Sporlan EEPR valves.	EEuU
EEPR Custom Number of Steps	Custom EEPR valve number of steps	For implementation of non Sporlan EEPR valves.	EEuS
EEPR Custom Step Rate	Custom EEPR valve step rate PPS	For implementation of non Sporlan EEPR valves.	EEur
EEPR Control Mode	EEPR controlling temperature, pressure or forced open		EPrC
Refrigerant Type	Refrigerant used in system	Used in computing superheat, saturated suction temperature, evaporator TD	rEFt
Low Temperature Control Temperature Set Point	Set Point for Low Temperature Control	In Single Temperature case applications this is the Control Temperature set point. In Dual Temperature case applications, this is the Control Temperature set point when operating in Low Temperature mode	dASP dALt rASP
Medium Temperature Control Temperature Set Point	Set Point for Medium Temperature Control	In Single Temperature case applications this is the Control Temperature set point. In Dual Temperature case applications, this is the Control Temperature set point when operating in Medium Temperature mode	dASP dAmt rASP

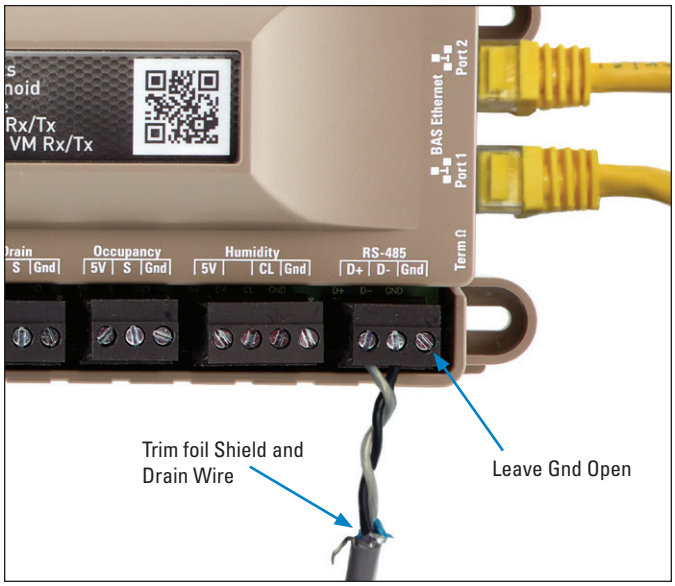
Parameter	Description	Use	Display
Control Temperature Differential	Allowed distance from set point	Used to determine cut-in/ cut-out temperatures for ON/OFF control. (Self-Contained and Walk-In only)	rAtd dAtd
Control Temperature Input Selection	Selects input for temperature control	Determines temperature input used for control and alarms. Discharge Air or Return Air.	tPc ı
Low Temperature Suction Pressure Set Point	Pressure Set Point for Low Temperature Control	In Single Temperature case applications this is the Pressure set point. In Dual Temperature case applications, this is the Pressure set point when operating in Low Temperature mode	LtPr
Medium Temperature Suction Pressure Set Point	Pressure Set Point for Medium Temperature Control	In Single Temperature case applications this is the Pressure set point. In Dual Temperature case applications, this is the Pressure set point when operating in Medium Temperature mode	ıtPr
Line-up Pressure Sharing	Enable/Disable sharing of sensed pressure value with peer controllers	Shares pressure reading between controllers in a line-up. 1. Required if each controller not equipped with a local pressure transducer. 2. Allows for continued superheat control from a common suction pressure if one or more pressure transducer faults occur within a line-up.	PShr
Minimum Cooling Time	Minimum compressor runtime/refrigerant flow time	Used when On/Off temperature control is selected (e.g. Walk-in with condensing unit or Self-contained merchandiser.	ont
Minimum off time	Minimum compressor off time/refrigerant no flow time	Used when On/Off temperature control is selected (e.g. Walk-in with condensing unit or Self-contained merchandiser.	oFFt
Number of Cases in Line-up	Number of peer cases (controllers) in line-up	Determines number of peer controllers expected within line-up for control and alarming purposes.	nCAS
Synchronize Evaporator Settings	Enable/Disable synchronization of evaporator control parameters in multi-evaporator display cases.	Synchronizes settings for multiple evaporators in a display case. 1. Valve type 2. Defrost Termination temperature 3. Control Temperature Set Point 4. Superheat Set Point	ESyn
Temperature Units	Temperature display units display for DM °C/°F		Un_t
Pressure Units	Pressure display units for DM PSIG/BAR		Un_P
Parameters modifiable from DM	Operating parameters can be modified via DM		dSEt
LT Control Temperature High Alarm Threshold	High alarm threshold for Low Temperature operation (Dual Temp)		LtH

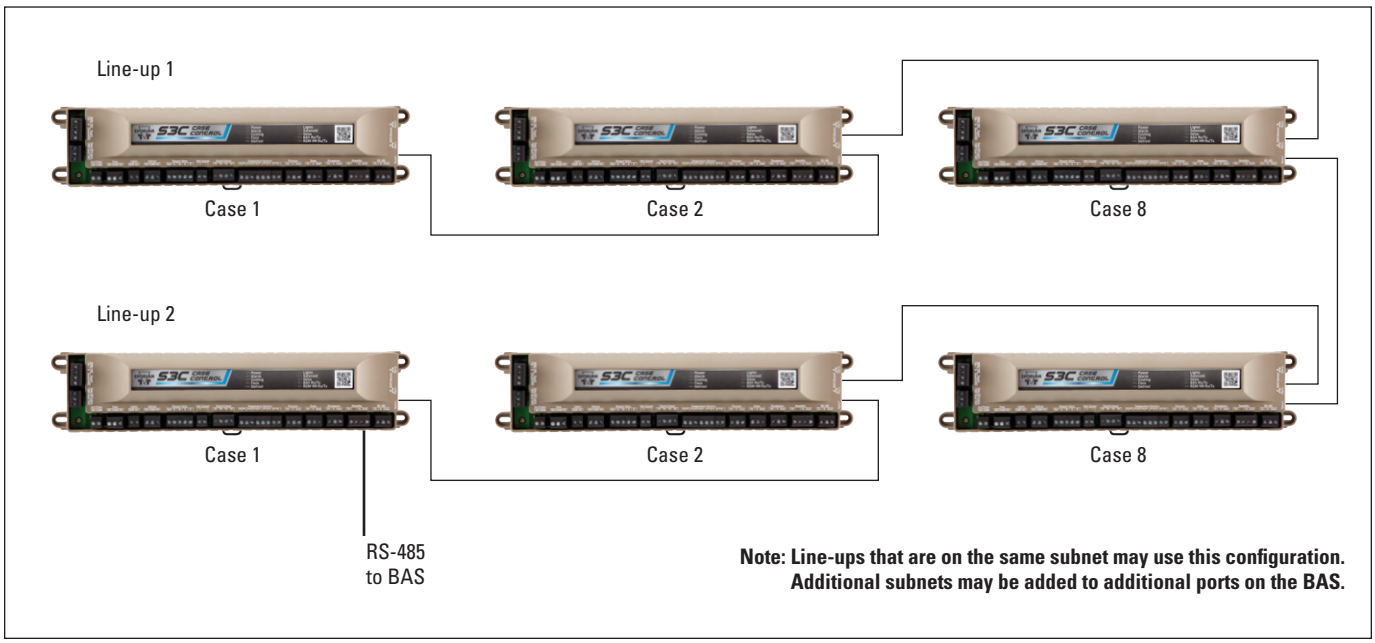
Parameter	Description	Use	Display
LT Control Temperature Low Alarm Threshold	Low alarm threshold for Low Temperature operation (Dual Temp)		LtL
LT Control Temperature High Alarm Delay	High alarm delay time for Low Temperature operation (Dual Temp)		LtHd
LT Control Temperature Low Alarm Delay	Low alarm delay time for Low Temperature operation (Dual Temp)		LtLd
MT Control Temperature High Alarm Threshold	High alarm threshold for Medium Temperature operation (Dual Temp)		mtH
MT Control Temperature Low Alarm Threshold	Low alarm threshold for Medium Temperature operation (Dual Temp)		mtL
MT Control Temperature High Alarm Delay	High alarm delay time for Medium Temperature operation (Dual Temp)		mtHd
MT Control Temperature Low Alarm Delay	Low alarm delay time for Medium Temperature operation (Dual Temp)		mtLd
Superheat High Alarm Threshold	High superheat alarm threshold		SHH
Superheat Low Alarm Threshold	Low superheat alarm threshold		SHL
Superheat High Alarm Delay	High superheat alarm delay time		SHHd
Superheat Low Alarm Delay	Low superheat alarm delay time		SHLd
Low Temperature Suction Pressure High Alarm Threshold	High Pressure alarm threshold for Low Temperature operation (Dual Temp)		LtPH
Low Temperature Suction Pressure Low Alarm Threshold	Low Pressure alarm threshold for Low Temperature operation (Dual Temp)		LtPL
Medium Temperature Suction Pressure High Alarm Threshold	High Pressure alarm threshold for Medium Temperature operation (Dual Temp)		mtPH
Medium Temperature Suction Pressure Low Alarm Threshold	Low Pressure alarm threshold for Medium Temperature operation (Dual Temp)		mtPL
Suction Pressure Alarm Delay	Pressure alarm time delay	Time which pressure must transgress any pressure alarm threshold before triggering a pressure alarm	SPAd
Lighting Schedule Type	Schedule type	Simple daily schedule (same On/Off time each day) or programmable On/ Off time per day	Scht
Lighting Off Schedule 1 – 7	Lighting OFF Time/Day	Not available using DM	
Lighting On Schedule 1 – 7	Lighting ON Time/Day	Not available using DM	
Lighting Simple Daily On Time	Lighting ON Time		OntE
Lighting Simple Daily Off Time	Lighting OFF Time		OFtE
Occupied Light Level	LED Lighting level when shopper presence detected.	Determines 0 – 10V output to dimmable LED power supply expressed as a percentage 0 – 100%	OccL
Time Unoccupied	Time before lighting returns to unoccupied level when no shopper present.	Determines timing between changes from occupied to unoccupied light level.	t mU
Unoccupied Light Level	LED Lighting level when no shopper presence detected.	Determines 0 – 10V output to dimmable LED power supply expressed as a percentage 0 – 100%	UocL

Parameter	Description	Use	Display
Line-up Occupancy Sensor Sharing	Enable/Disable sharing of Occupancy Detector input state with peer controllers.	Shares Occupancy Sensor input state between controllers in a line-up. 1. Required if each controller not equipped with a local Occupancy Sensor. 2. Allows for lighting control of all cases in a line-up from a single Occupancy Sensor or occupancy sensing from a single control.	OShr
BAS Expected	S3C Case Control should expect data connection to Building Automation System	Enables BAS Communication Alarms and BAS initiated functions.	bAS
BAS Communications Protocol	Communication Protocol for Building Automation System	MODBUS over IP MODBUS over RS-485 BACnet/IP BACnet/MSTP	Mo iP M485 bA iP b485
Defrost Type	Type of Defrost for line-up	Electric, Gas, Off Time	dEFt
Defrost Termination Temperature	Temperature at which active defrost mechanism (Heater, Hot Gas) deactivates.		dttP
Defrost Termination Fail-safe Time	Maximum elapsed time at which active defrost mechanism (Heater, Hot Gas) deactivates if Termination Temperature not reached.		dttE
Defrost Coil Drain Time	Time period between deactivation of defrost mechanism an re-initiating refrigeration	Allows for elimination of defrost water.	dcdt
Fan Delay Temperature	Temperature at which evaporator fans energize after defrost.	If evaporator fans are programmed to be off during defrost, it is desirable to delay resumption of operation until the evaporator temperature is sufficient to re-freeze any remaining defrost water.	FdtP
Liquid Line Solenoid Defrost Operation	Liquid Line Solenoid energized/de-energized during defrost.		LLSd
Defrost Pump down Time	Time period after refrigerant flow has ceased prior to activating the defrost mechanism.		Pdn
Use Internal Schedule For Defrost	Internal defrost schedule to be used if no BAS detected.		iSch
Fans On During Defrost	Leave evaporator fans on during defrost		FAnS
Defrosts per Day	Number of defrosts per day	If simple daily schedule is selected	dFPd
Daily Start Time	Start time of 1st Defrost		dFSt
Defrost Schedule 1 - 7	7 Day custom schedule	Not available using DM	
Air Defrost Termination Sensor	Temperature Sensor reading used for defrost termination	Only available when Air Defrost is selected as Defrost Type	AdtS
EEPR Percent Open During Hot Gas Drain	% EEPR open during drain to equalize evaporator pressure to suction	Only available when Hot Gas is selected as Defrost Type	EPrd

21.4 BUILDING AUTOMATION SYSTEM

The S3C Case controller can be integrated into the BAS network using CAT5 Ethernet or RS-485 Serial line. If CAT5 is used, the cable must be connected to either port 1 or port 2 on the case controller; whichever is open. If RS-485 is used, the twisted pair cable must be connected to the RS-485 input on the case controller. In both instances, the controller must be configured thru software to support the correct networking option. This is described below.





Note: Line-ups that are on the same subnet may use this configuration. Additional subnets may be added to additional ports on the BAS.

21.4.1 BAS USING RS-485 SERIAL INTERFACE

In this configuration, the cases must be connected using CAT5. Each line-up on the subnet should also be connected using a CAT 5 cable. A single twisted pair cable must be used between ONE case controller (per subnet) and the BAS. 'Gnd" on the controller must remain open. Take note to trim excess drain wire and foil shield from the cable at the S3C controller side. The shield must be tied to earth ground on the BAS side. A subnet is a set of cases that are networked together that connect thru a single port on the BAS unit.

21.4.2 CONFIGURE THE SOFTWARE TO SUPPORT MODBUS OVER RS-485 TO THE BAS

1. From the **default** display, press the 🔧 button. The display will show `Entr PASS 0`.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show `CASE` (will skip to Process Values if system is self-contained).
4. Press the **SET** button and `P_u` (Process Values) will be displayed.
5. Use the ▼ button and scroll to `nEtC` (network configuration); press **SET.**
6. Use the ▲ button and scroll to `bAS` (building automation); press **SET.**
7. Scroll to `YES`; press **SET.**
8. Use the ▲ button and scroll to `bASP` (building automation protocol); press **SET.**

9. Scroll and select m485 (Modbus over RS-485); press **SET.**
10. Use the ▲ button and scroll to bASt (building automation time-out); press **SET.**
11. Use the ▲▼ buttons to scroll to the desired time-out (in minutes); press **SET. Note: this is the amount of time the S3C Control waits before a communication alarm is generated after loss of communication.**
12. Use the ▼ button and scroll to nPAr (network parity); press **SET.**
13. Use the ▲▼ buttons to scroll to the desired parity setting (nonE, EuEn or Odd); press **SET. Note: The parity selection must match the BAS controller.**
14. Use the ▼ button and scroll to bAUd (baud rate); press **SET.**
15. Use the ▲▼ buttons to scroll to the desired baud rate (115_0 = 115000, 76_8 = 76800, 57_6 = 57600, 38_4 = 38400, 19_2 = 19200, 9_6 = 9600); press **SET. Note: The baud rate selection must match the BAS controller.**
16. Use the ▼ button and scroll to Addr (address); press **SET.**
17. Use the ▲▼ buttons to scroll to the desired address setting; press **SET. Note: Each S3C Case Control on the network must have its own unique address.**
18. Press the **ESC** button three times to exit the menu and return to the **default** display.

21.4.3 CONFIGURE THE SOFTWARE TO SUPPORT BACNET OVER RS-485 TO THE BAS

1. From the **default** display, press the 🔧 button. The display will show Entr PASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE (will skip to Process Values if system is self-contained).
4. Press the **SET** button and P_u (Process Values) will be displayed.
5. Use the ▼ button and scroll to nEtC (network configuration); press **SET.**
6. Use the ▲ button and scroll to bAS (building automation); press **SET.**
7. Scroll to YES; press **SET.**
8. Use the ▲ button and scroll to bASP (building automation protocol); press **SET.**
9. Scroll and select b485 (BACnet over RS-485); press **SET.**
10. Use the ▲ button and scroll to bASt (building automation time-out); press **SET.**
11. Use the ▲▼ buttons to scroll to the desired time-out (in minutes); press **SET. Note: This is the amount of time the S3C Control waits before a communication alarm is generated after loss of communication.**
12. Use the ▼ button and scroll to nPAr (network parity); press **SET.**
13. Use the ▲▼ buttons to scroll to the desired parity setting (nonE, EuEn or Odd); press **SET. Note: BACnet standard specifies that the parity be set to** nonE.
14. Use the ▼ button and scroll to bAUd (baud rate); press **SET.**
15. Use the ▲▼ buttons to scroll to the desired baud rate (115_0 = 115000, 76_8 = 76800, 57_6 = 57600, 38_4 = 38400, 19_2 = 19200, 9_6 = 9600); press **SET.**
16. Use the ▼ button and scroll to 485n (BACnet subnet number); press **SET. Note: The subnet number is important when the S3C Control is used as a router or the subnets are connected together.** If all system components on the networks have unique addresses, then the BACnet subnet number is not required.
17. Use the ▼ button and scroll to mmAS (maximum master); press **SET.**
18. Use the ▲▼ buttons to scroll to the desired maximum master); press **SET. Note: The maximum master should be set to the maximum address of any controller attached to the BAS controller via RS-485 (per BAS communication port).** This will reduce communication loading on the network. For example, if there are two case controllers with addresses 0 and 1 and two rack controllers with addresses 4 and 5 connected to the BAS controller with address 3 via RS-485 on the same BAS communication port, then the maximum master should be set to 5 (maximum of all addresses).
19. Use the ▼ button and scroll to Addr (address); press **SET.**
20. Use the ▲▼ buttons to scroll to the desired address setting; press **SET. Note: Each S3C Case Control on the network must have its own unique address.**
21. Press the **ESC** button three times to exit the menu and return to the **default** display.

See the following figure for example BACnet network configuration using RS-485 to the BAS.

BACNET NETWORK CONFIGURATION USING RS-485 TO BAS

Address =	0
Maximum Master =	2
Baud Rate =	9600
Network Parity =	None
Subnet Number =	1

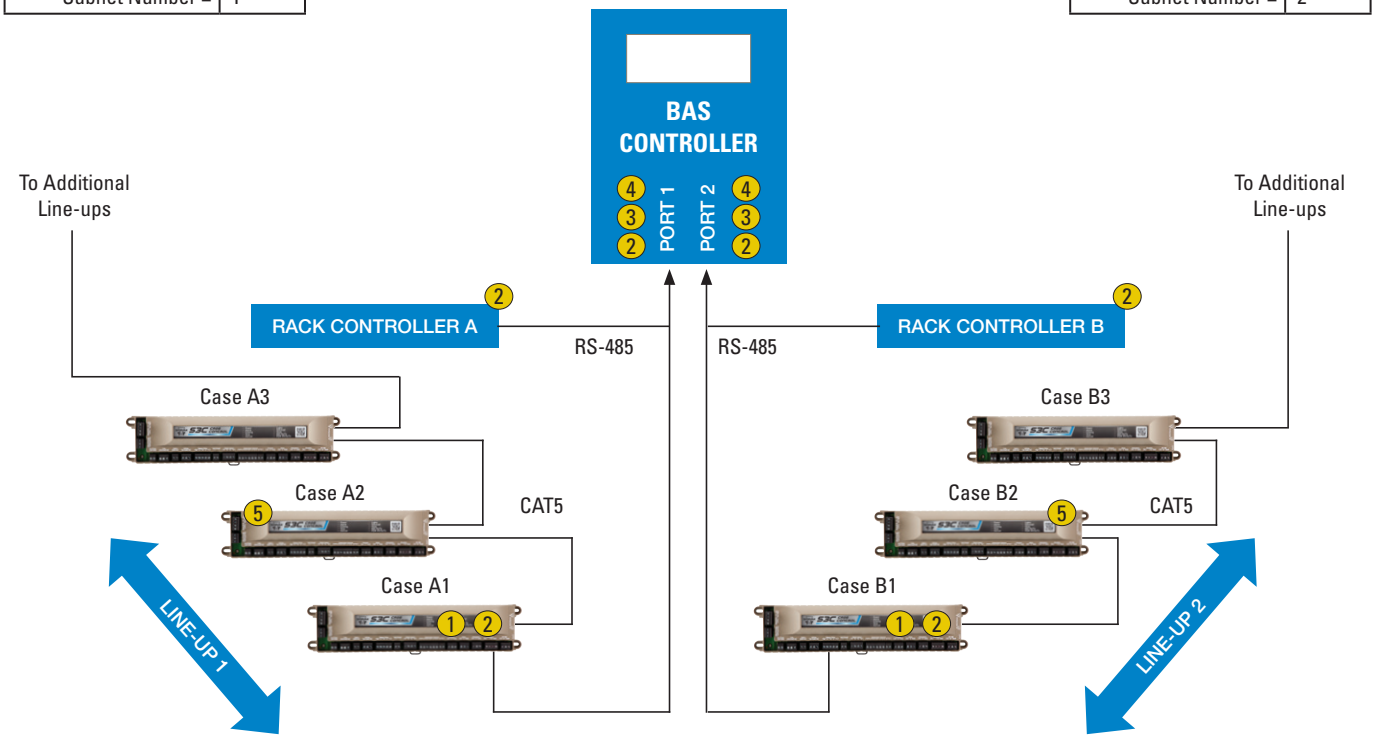
Address =	2
Maximum Master =	2
Baud Rate =	9600
Network Parity =	None
Subnet Number =	1

Address =	0
Maximum Master =	2
Baud Rate =	9600
Network Parity =	None
Subnet Number =	2

Address =	2
Maximum Master =	2
Baud Rate =	9600
Network Parity =	None
Subnet Number =	2

Address =	1
Maximum Master =	2
Baud Rate =	9600
Network Parity =	None
Subnet Number =	1

Address =	1
Maximum Master =	2
Baud Rate =	9600
Network Parity =	None
Subnet Number =	2



1. Cases A1 and B1 are the “routers” that route data from the line-up via ethernet to the BAS via RS-485. These are the cases that communicate into the BAS. All other cases communicate via ethernet.

2. Unique addresses for these components must be configured since they are part of the RS-485 network. These components establish the Maximum Master. The Maximum Master is based on the largest address of these components. Keep the address number low to reduce network loading. Maximum Master is ‘2’ in the above illustration since the largest address is found on the BAS controller and it is address 2.

3. BAS Port 1 is a subnet and BAS Port 2 is another subnet. Both use RS-485. The S3C is able to distinguish between subnets by assigning the BACnet Subnet number, 485n.

4. If the subnets are connected via Ethernet, then it is critical that the 485n parameter is assigned. In some cases a gateway may be used that connects the subnets.

5. RS-485 configuration is not required on cases A2, A3, B2 and B3 since they utilize Ethernet.

21.4.4 CONFIGURING THE SOFTWARE TO SUPPORT BACNET OVER ETHERNET TO THE BAS

1. From the **default** display, press the 🔧 button. The display will show EntrPASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE(will skip to Process Values if system is self-contained).
4. Press the **SET** button and P_u (Process Values) will be displayed.
5. Use the ▼ button and scroll to nEtC(network configuration); press **SET.**
6. Use the ▲ button and scroll to bAS(building automation); press **SET.**
7. Scroll to YES; press **SET.**
8. Use the ▲ button and scroll to bASP(building automation protocol); press **SET.**
9. Scroll and select bAI P(BACnet over IP); press **SET.**
10. Use the ▲ button and scroll to bASt(building automation time-out); press **SET.**
11. Use the ▲▼ buttons to scroll to the desired time-out (in minutes); press **SET. Note: This is the amount of time the S3C Control waits before a communication alarm is generated after loss of communication.**
12. Use the ▲ button and scroll to iPAS(IP address selection); press **SET.**

    Use the ▲▼ buttons to scroll to the desired IP address selection; press **SET.** The options are:

    StAt(Static IP Address) – This is default and is the recommended setting (when DHCP server is not used).

    dHSt (DHCP with Static Address) – Use when there is a router and DHCP server on the network. If the controllers find a DHCP server on the network then the DHCP server will assign the controllers their IP addresses. If the controllers do not find a DHCP server on the network, then the controller IP addresses will remain set by the parameters iP1 thru iP4 internal to the controller. See below in the section on how to view the controller IP address. The DHCP server should also assign the Subnet Mask to the controllers (iPS1 thru iPS4).

    dHcP(DHCP with AutoIP) – Use when there is a router and DHCP server on the network. If the controllers find a DHCP server on the network then the DHCP server will assign the controllers their IP addresses. If the controllers do not find a DHCP server on the network, then the AutoIP protocol will assign unique IP addresses to the controllers. The AutoIP protocol IP range is 169.254.0.1 thru 169.254.255.254. The DHCP server should also assign the Subnet Mask to the controllers (iPS1 thru iPS4).

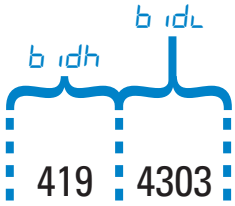
    Note: The IP address of each S3C Control is factory set and unique to each controller. It is recommended to leave the IP addresses at the factory setting. If the address needs to be changed, see below for specific procedure.

    Note: The BAS controller must not have the same IP address as any of the S3C Controls.
13. Press the **ESC** button 3 times to revert to the **default** display.

21.4.4.1 CONFIGURE THE BACNET DEVICE INSTANCE ID

The S3C Control comes default with a unique device instance ID. It is recommended to leave the default number unless the controller needs to meet a specific customer requirement. For configuration through the display, the device instance ID is broken up into two sections; Low (b idL) and High (b idh). The device instance ID cannot exceed 4194303. Reference the following figure for more details.

1. From the **default** display, press the button. The display will show EntrPASS 0.
2. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
3. The display will show CASE (will skip to Process Values if system is self-contained).



BACNET DEVICE INSTANCE NUMBER (LOW AND HIGH)

4. Press the **SET** button and P_u (Process Values) will be displayed.
5. Use the ▼ button and scroll to nEtC (network configuration); press **SET.**
6. Use the ▼ button and scroll to b idL (BACnet Device Instance ID-Low); press **SET.**
7. Use the ▲▼ buttons to scroll and change the last 4 digits of the device instance ID; press **SET.** The device instance ID-Low has a minimum value of 0 and a maximum of 9999.
8. Use the ▼ button and scroll to b idh(BACnet Device Instance ID-High); press **SET.**
9. Use the ▲▼ buttons to scroll and change the first 3 digits of the device instance ID; press **SET.** The device instance ID-High has a minimum value of 0 and a maximum of 419.
10. Press the **ESC** button 3 times to revert to the **default** display.

21.4.5 CONFIGURE THE SOFTWARE TO SUPPORT MODBUS OVER ETHERNET TO THE BAS

Contact Sporlan.

21.5 VIEWING CONTROLLER IP ADDRESS

Viewing of the S3C Case Controller's current IP address and IP Subnet Mask is navigated in a similar manner as setting the IP parameters.

1. From the **Default** display, press the 🔧 button. The display will show `Entr PASS 0`.
2. Use the ▲▼ buttons to enter the **technician** password and press **SET.**
3. The display will show `CASE`.
4. Press **SET** to enter the `CASE` sub-menu. The display will show `P_u` (Process Values).
5. Press the ▼ button repeatedly until `nEtC` is displayed.
6. Press **SET** to enter the Network Configuration sub-menu.
7. Press the ▲ button repeatedly until `iP 1` is displayed.
8. Use the ▲ button and the **SET** button to navigate through `iP 1 - iP4` and Subnet Mask `iPS 1 - iPS4`.

Display	Meaning	Description	Selections
iP 1	IP Address Octet 1	NNN.XXX.XXX.XXX	0 - 254
iP2	IP Address Octet 2	XXX.NNN.XXX.XXX	0 - 254
iP3	IP Address Octet 3	XXX.XXX.NNN.XXX	0 - 254
iP4	IP Address Octet 4	XXX.XXX.XXX.NNN	0 - 254
iPS 1	Subnet Mask Octet 1	NNN.XXX.XXX.XXX	0 - 255
iPS2	Subnet Mask Octet 2	XXX.NNN.XXX.XXX	0 - 255
iPS3	Subnet Mask Octet 3	XXX.XXX.NNN.XXX	0 - 255
iPS4	Subnet Mask Octet 4	XXX.XXX.XXX.NNN	0 - 255

21.6 CONFIGURING CONTROLLER IP ADDRESS AND SUBNET MASK

Each S3C Case Control is supplied from Sporlan with a unique IP address by default. If your installation utilizes an addressing scheme that necessitates changing this address, perform the following procedure. Take care to note the configured custom IP address in order to ensure the ability to communicate with the controller via the Ethernet port subsequent to the change. To avoid the possibility of IP address conflicts, any third part controllers on the network can use the address ranges 10.64.x.x. The factory IP range of the Sporlan S3C Case Control is 10.0.0.1 thru 10.63.255.255

Note: The default address noted on the unit label can be reloaded by performing a Factory Reset.

For immediate assistance, Technical Support can be reached at the following: Toll-Free: 888-920-6284

From the **default** display, press the 🔧 button. The display will show `Entr PASS 0`.

9. Use the ▲▼ buttons to enter the **administrator** password and press **SET.**
10. The display will show `CASE`.
11. Press **SET** to enter the `CASE` sub-menu. The display will show `P_u` (Process Values).
12. Press the ▼ button repeatedly until `nEtC` is displayed.
13. Press **SET** to enter the Network Configuration sub-menu.
14. Press the ▲ button repeatedly until `iP 1` is displayed.
15. Press SET button and then ▲▼ buttons to change IP Address Octet 1.
16. Use the ▲ button and the SET button to navigate through `iP 1 - iP4` and Subnet Mask `iPS 1 - iPS4`.
17. Press the **ESC** button 3 times to revert to the **default** display.

TABLE 19 – IP ADDRESS PARAMETERS

Display	Meaning	Description	Selections
iP 1	IP Address Octet 1	NNN.XXX.XXX.XXX	0 - 254
iP2	IP Address Octet 2	XXX.NNN.XXX.XXX	0 - 254
iP3	IP Address Octet 3	XXX.XXX.NNN.XXX	0 - 254
iP4	IP Address Octet 4	XXX.XXX.XXX.NNN	0 - 254
iPS 1	Subnet Mask Octet 1	NNN.XXX.XXX.XXX	0 - 255
iPS2	Subnet Mask Octet 2	XXX.NNN.XXX.XXX	0 - 255
iPS3	Subnet Mask Octet 3	XXX.XXX.NNN.XXX	0 - 255
iPS4	Subnet Mask Octet 4	XXX.XXX.XXX.NNN	0 - 255

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Parker Hannifin Corporation
Sporlan Division
206 Lange Drive • Washington, MO 63090 USA
phone 636 239 1111
fax 636 239 9130
www.sporlan.com