Controls Operation and Troubleshooting

CONTENTS

SAFETY CONSIDERATIONS

Installing, starting up, and servicing this equipment can be hazardous due to system pressures, electrical components, and equipment location. Only trained, qualified installers and service mechanics should install, start up, and service this equipment.

When working on this equipment, observe precautions in the literature; on tags, stickers, and labels attached to the equipment, and any other safety precautions that apply. Follow all safety codes. Wear safety glasses and work gloves. Use care in handling, rigging, and setting this equipment, and in handling all electrical components.

⚠ WARNING

Electrical shock can cause personal injury and death. Shut off all power to this equipment during installation and service. There may be more than one disconnect switch. Tag all disconnect locations to alert others not to restore power until work is completed.

⚠ CAUTION

This unit uses a microprocessor-based electronic control system. *Do not* use jumpers or other tools to short out components, or to bypass or otherwise depart from recommended procedures. Any short-to-ground of the control board or accompanying wiring may destroy the electronic modules or electrical components.

GENERAL

This publication contains Start-Up, Controls Operation, and Troubleshooting information for the 50BV,XJ units. These OMNIZONE™ packaged units are self-contained, water-cooled or remote air-cooled indoor units for use in VAV (variable air volume) applications. Units are equipped with Comfort Controller 6400 (CC6400) system controls. Refer to the unit Installation Instructions for unit layout.

MAJOR SYSTEM COMPONENTS

Comfort Controller Processor (PCB1) —

The central processing unit for the OMNIZONE system control is the Comfort Controller 6400. The Comfort Controller provides general purpose HVAC (heating, ventilation and air conditioning) control and monitoring capability in a stand-alone or network environment using closed-loop, direct digital control. The Comfort Controller 6400 has been pre-programmed to work in either stand-alone or CCN (Carrier Comfort Network) system installations.

The CC6400 processor is designed to provide heating and cooling control, loop control, scheduling, and custom programming. The main processor provides 16 field points (8 input and 8 output). Additional points are provided by the I/O modules described on page 2. Table 1 lists the control inputs and outputs for all CC6400 modules.

Specifications for the Comfort Controller 6400 may be found in the Comfort Controller literature.

Comfort Controller I/O Module (PCB2) — This input/output module is factory installed in the 50XJ unit and allows additional field points (8 inputs and 8 outputs): VFD (variable frequency drive) Bypass, VAV Terminals Control, Building Ventilation, and Heating Interlock.

Comfort Controller I/O Module (PCB3) — This accessory control input/output module can be ordered separately and field-installed in the 50XJ unit. This module allows the addition of the following field-installed sensors: Tower Sump Temperature Sensor, Leaving Water Temperature Sensor, Building Pressure Sensor, CO_2 Sensor, Indoor Relative Humidity Sensor, and Outdoor Temperature Sensor.

The accessory I/O module provides the following control outputs (relays): 4-stage heat control, water pump request, tower request, modulating exhaust fan, and external dehumidification.

Local Interface Display — The Local Interface Display (LID) is mounted on the front of the 50BV,XJ units. A number of user-adjustable features are entered/changed using the display keypad. These features described in detail in the Using the Local Interface Display section of this manual.

PCB Addresses — Switch 1 (SW1) is used to set each controller's address. Individual DIP switches on each board are used to set the addresses for individual hardware points. PCB1 switches are factory-set for hardware points 1-15, PCB2 DIP switches are set for points 17-32, and PCB3 for points 33-48. For more information, refer to Table 1 and the Optional and Field-Installed Accessory Sensors/Devices section.

Control Module Communication — When power is applied to the OMNIZONE™ System Control panel, the red LED (light-emitting diode) on the top front of the processor module will flash at a rapid pace (about twice a second) for the first 30 to 60 seconds. See Fig. 1. This rapid flash will then be replaced by a slower paced flash (about once per second).

The green LED below the red LED will start flashing. This LED indicates input/output communications for accessory input output modules and the LID.

The yellow LED (the third LED from the bottom of the controller [PCB1]) will flash when the controller is broadcasting CCN messages to a laptop or other computer.

Table 1 — Control Inputs and Outputs

DESCRIPTION	ABBREV.	TYPE	CONTROLLER I/O NO.		DIP SWITCH SETTINGS					
					Switch No. and Position					
Inputs			Water Econ. Units	Air Econ.Units	SW2		SW3		SW1	
Main Controller (PCB1)									Addr = 1-16	
Supply Air Temperature	SAT	Analog; 10K MCI	1	1	1	Up	1	Down	1	Up
VFD Duct Static Pressure	DSP	4-20mA; Internally Powered	2	2	2	Up	2	Up	2	Down
COL/Safeties — (Comprs.Status; Resister Bd.)	CMP MUX	Analog; 0-10VDC	3	3	3	Up	3	Down	3	Down
Fire Alarm/Shutdown	FSD	Switch closure	4	4	4	Up	4	Down	4	Down
Condenser Waterflow Switch	CDWF	Switch closure	5	5	5	Up	5	Down	5	Down
Remote Occupancy	RMTOCC	Switch closure	6	6	6	Up	6	Down	6	Down
Duct High Static Limit Switch	DHS	Switch closure	7	7	7	Up	7	Down	7	Up
Entering Water Temp. Sensor	EWT	Analog; 5K	8	8	8	Up	8	Down	8	Up
I/O Board (PCB2)									Addr = 17-32	
Mixed/Return Air Sensor	MAT/RAT	Analog; 10K MCI	1	1	1	Up	1	Down	1	Up
Filter Status Switch (Dirty Filter Detect)	FLTS	Switch closure	2	2	2	Up	2	Down	2	Down
Phase Loss Monitor	PHASE	Switch closure	3	3	3	Up	3	Down	3	Down
External reset	RESET	0-10VDC Externally Powered	4	4	4	Up	4	Down	4	Down
Water Econ. FreezeStat	FREEZE	Switch closure	5	—	5	Up	5	Down	5	Up
Differential Enthalpy	ENTH	Switch closure	—	5	5	Up	5	Down	6	Down
Space Zone Sensor(s)	SPT	Analog; 10K MCI	6	6	6	Up	6	Down	7	Up
VFD Bypass Enable	BYPASS	Switch closure	7	7	7	Up	7	Down	8	Up
Refrigerant Pressure (Compr.#1)	PRES	4-20mA; Internally Powered	8	8	8	Up	8	Up	—	—
I/O Board (PCB3)									Addr = 33-48	
Tower Sump Temp.	TWRTEMP	Analog; 10K MCI	1	1	1	Up	1	Up	1	Up
Building Pressure	BSP	4-20mA; Internally Powered	2	2	2	Up	2	Down	2	Down
Leaving Water Temp.	LWT	Analog; 10K MCI	3	3	3	Up	3	Up	3	Down
Indoor Air Quality	IAQ	4-20mA; Internally Powered	—	4	4	Up	4	Down	4	Down
Indoor relative Humidity	IRH	4-20mA; Internally Powered	—	5	5	Up	5	Down	5	Down
Outside Air Temp.	OAT	Analog; 10K MCI	—	6	6	Up	6	Up	6	Up
Unassigned	—	—	—	—	—	—	—	—	7	Up
Unassigned	—	—	—	—	—	—	—	—	8	Up

DESCRIPTION	ABBREV.	TYPE	CONTROLLER I/O NO.		DIP SWITCH SETTINGS					
					Switch No. and Position					
Outputs			Water Econ. Units	Air Econ.Units	SW4		SW5		SW6	
Main Controller (PCB1)										
Compressor #1 Relay	CMP1	24VDC Discrete	1	1	1	Either	1	DO	—	
Compressor #2 Relay	CMP2	24VDC Discrete	2	2	2	Either	2	DO	—	
Compressor #3 Relay	CMP3	24VDC Discrete	3	3	3	Either	3	DO	—	
Compressor #4 Relay	CMP4	24VDC Discrete	4	4	4	Either	4	DO	—	
VFD On/Off	SF	24VDC Discrete	5	5	5	Either	—		1	DO
VFD Speed Control	SPEED	4-20mA modulating	6	6	6	Down	—		2	AO
Alarm Pending	ALARM1	24VDC Discrete	7	7	7	Either	—		3	DO
Service Required	ALARM2	24VDC Discrete	8	8	8	Either	—		4	DO
I/O Board (PCB2)										
Ventilation Output	VENTOUT	24VDC Discrete	1	1	1	Either	1	DO	—	
Terminals Occupied	OCCTRM	24VDC Discrete	2	2	2	Either	2	DO	—	
2-Position\ Reverse Operation Valve	ECONO	4-20mA modulating	3		3	Down	3	AO	—	
Economizer Damper	ECONO	4-20mA modulating	—	3	3	Down	3	AO	—	
Modulating Valve Econ./ Head Pressure Control	MODVLV	4-20mA modulating	4	4	4	Down	4	AO	—	
Hot Water Coil Valve Control	HWV	4-20mA modulating	5	5	5	Down	—		1	AO
Heat Interlock Relay	HIR	24VDC Discrete	6	6	6	Either	—		2	DO
VFD Bypass Start	BPSS	24VDC Discrete	7	7	7	Either	—		3	DO
VAV Terminals Open	DAMPERS	24VDC Discrete	8	8	8	Either	—		4	DO
I/O Board (PCB3)										
Electric Heat Control — Stage #1	HEAT1	24VDC Discrete	1	1	1	Either	1	DO	—	
Electric Heat Control — Stage #2	HEAT2	24VDC Discrete	2	2	2	Either	2	DO	—	
Electric Heat Control — Stage #3	HEAT3	24VDC Discrete	3	3	3	Either	3	DO	—	
Electric Heat Control — Stage #4	HEAT4	24VDC Discrete	4	4	4	Either	4	DO	—	
Water Pump Request	PUMP	24VDC Discrete	5	5	5	Either	—		1	DO
Tower Request	TOWER	24VDC Discrete	6	6	6	Either	—		2	DO
Modulating Exhaust Fan	EXH	4-20mA modulating	7	7	7	Down	—		3	AO
External Dehumidification	DEHUM	24VDC Discrete	8	8	8	Either	—		4	DO

LEGEND

AO — Analog Output
DO — Discreet Output
MCI — Precon Type II Thermistor
VAV — Variable Air Volume
VFD — Variable Frequency Drive

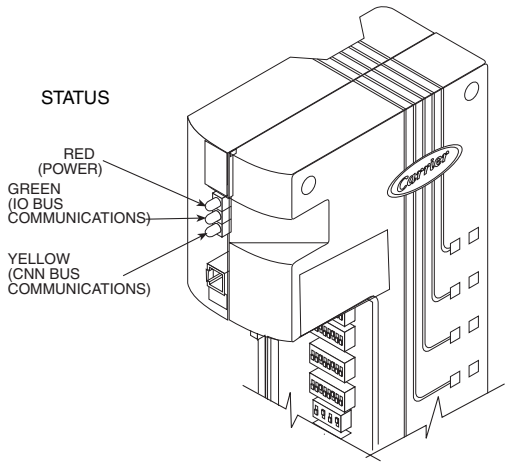


Fig. 1 — CC6400 Control Module LEDs

Carrier Comfort Network Interface — The 50BV,XJ units can be connected to the CCN (Carrier Comfort Network) if desired. System elements are connected to the communication bus in a daisy chain arrangement. The negative pin of each system element's communication connector must be wired to the respective negative pins, and positive pins on each component must be connected to respective positive pins. The controller signal pins must be wired to the signal ground pins. Wiring connections for CCN must be made at the 3-pin plug.

At any baud rate (9600, 19200, 38400 baud), the number of controllers is limited to 239 devices maximum. Bus length may not exceed 4000 ft, with no more than 60 total devices on any 1000-ft section. Optically isolated RS-485 repeaters are required every 1000 ft.

NOTE: Carrier device default is 9600 baud.

The CCN Communication Bus wiring is field-supplied and field-installed. It consists of shielded three-conductor cable with drain (ground) wire. The cable selected must be identical to the CCN Communication Bus wire used for the entire network. See Table 2 for cable recommendations.

NOTE: Conductors and drain wire must be at least 20 AWG (American Wire Gage), stranded, and tinned copper. Individual conductors must be insulated with PVC, PVC/nylon, vinyl, Teflon, or polyethylene. An aluminum/polyester 100% foil shield and an outer jacket of PVC, PVC/nylon, chrome vinyl, or Teflon with a minimum operating temperature range of –20 C to 60 C is required.

The communication bus shields must be tied together at each system element. If the communication bus is entirely within one building, the resulting continuous shield must be connected to ground at only one single point. If the communication bus cable exits from one building and enters another building, the shields must be connected to the grounds at a lightning suppressor in each building (one point only).

Optional and Field-Installed Accessory Sensors/Devices — The 50XJ unit can be ordered with options and accessories that add functionality and control. These options and accessories are controlled by the CC6400 system as described below.

NOTE: The CC6400 Control software includes all PCB1 functions, and most of the sensors/devices associated with those functions are factory installed. However, some PCB1 sensors/devices must be field-connected to the proper terminal. PCB2 devices are field-installed accessories. The CC6400 software includes these functions, but the actual sensor/device must be installed and wired in the field. PCB3 is an accessory control module. All PCB3 sensors/devices and software are field-installed.

Table 2 — Communication Cable Recommendations

MANUFACTURER	PART NUMBER
Alpha	2413 or 5463
American	A22503
Belden	8772
Columbia	02525

REMOTE OCCUPANCY CONTROL (PCB1) — This control is a field located switch, controller or timer input which, when activated, tells system when to switch from Unoccupied to Occupied mode.

When in Occupied mode, the unit turns on the supply fan and controls supply fan speed to maintain a duct static set point measured at the Duct Static Pressure Sensor (DSP). The unit operates to provide conditioning to a set point. When in Unoccupied mode, the unit provides no cooling/heating, or controls to a 'setback' set point.

FIRE ALARM (PCB1) — The fire alarm is a control voltage input to the 50XJ unit, which causes the controller to shut the system down in the event of a fire.

CONDENSER WATER FLOW SWITCH (50XJ PCB1) — This thermal dispersion type flow switch if factory installed, is located in the unit waterline to ensure that there is waterflow before allowing the unit to start the compressor(s). If no flow is detected, then compressor operation and economizer cooling is avoided until waterflow is again detected. An warning light (yellow) is provided during this state.

HEAT INTERLOCK OUTPUT (50XJ PCB2) — This output is activated whenever heating is activated, commanding the VAV dampers to operate in heating control mode.

NOTE: In order to this output to function, the Terminal Occupied output must also be on.

TERMINAL OCCUPIED (50XJ PCB2) — Terminal Occupied is activated to command VAV dampers to control to the cooling set point. Terminal Occupied must be on along with Heat Interlock for heating set point control to function.

EXTERNAL RESET INPUT (50XJ PCB2) — This modulating input (0 to 10 vdc) allows remote adjustment (upward) of the Supply Air Temperature (SAT) sensor set point. The default External Reset Input setting is 55 F. This variable input can raise the set point by up to 20 F for a full-range input signal, or to any point in between.

WATER ECONOMIZER COIL (50XJ PCB2) — This factory-installed option contains a water-to-air coil, two (2) electronic motorized water valves, and related piping. Control of the water economizer also requires a Mixed/Return Air Temperature Sensor, a Condenser Water Inlet Temperature Sensor and an Economizer Freezestat safety switch.

The electronic motorized water valves are each controlled by the unit controller via separate 4 to 20 mA variable signals to define variable valve position.

The Mixed/Return Air Sensor (MA_RA) is an air temperature sensor located in the unit, between economizer coil and evaporator.

The Condenser Water Inlet Temperature Sensor (CWT) is located at the unit water inlet connection. This sensor receives input power from the unit main controller and provides a linear variable 1 to 5 vdc signal back to the controller. The full temperature range is 32 to120 F.

The 50XJ units can be connected to two types of building water systems: variable and fixed or constant flow control. In either case, the economizer water valves are opened whenever there is a call for Cooling and the Inlet Water Temperature is colder than the Econ Start Set Point in the custom configuration.

Dependencies — Water Economizer option is enabled, and Fan is On, and Inlet Water Temperature is below set point; or from "Remote Scheduler," or from "Remote Linkage."

Economizer mode is switched to Off or no start if: there is no condenser waterflow, Fire Input is On, Fan is not On, or Unoccupied mode is On.

Variable Waterflow Systems — Whenever water economizer is off, the economizer flow control valve is fully closed, and the reverse flow valve directly to the condenser is fully open. Upon engagement of the water economizer, the economizer flow control valve shall be controlled to maintain the MA_RA located between the economizer coil and the DX cooling coil, at a temperature near the supply air set point. The the reverse flow valve will be controlled in reverse of the economizer flow control valve's position. The following formula is an example: Reverse/Head Press Ctrl output = 100 – two-position/Econo output.

When the unit is off, both valves are closed.

Constant Waterflow Systems — Control of the economizer flow control valve is same as for variable waterflow systems. Control of the reverse flow control valve position will inversely track the economizer flow control valve, such that the total sum of the two valves open positions always equals 100%. The only difference between the variable waterflow system and the constant waterflow system is that for the constant flow system when the unit is off, the economizer valve will be closed and the reverse flow control valve will be open.

WATER ECONOMIZER COIL (50BV) — For the 50BV unit, this factory-installed option contains a water-to-air coil, a two-position diverting valve, and related piping. The water economizer is controlled by an Aquastat and a return-air thermostat.

HEATING COILS AND VALVE (50XJ PCB2) — Water or steam heating options are factory installed. Each includes a motorized, variable control water or steam flow control valve, which can be factory supplied for field installation outside the unit. Installed in the water or steam inlet pipe, this valve is wired to the unit main controller and operates on a 4 to 20 mA signal. A Heating mode PID control is needed to control the valve position (i.e., coil heating capacity) variably between 10 and 100%. The PID will control a set point to + 1° F; for VAV Units this set point is at the Supply Air Temperature Sensor, or as communicated from a remote thermostat.

HEAD PRESSURE CONTROL (50XJ PCB2) — Head Pressure Control is required for unit installations that will experience entering condenser water temperatures of 55 F or lower.

NOTE: Head Pressure Control is not needed or used in conjunction with a Water Economizer. A refrigerant pressure transducer will monitor head pressure on compressor circuit 1, allowing the unit main controller to regulate water flow rate in the main water line entering the unit; i.e., flow to all condensers. (Water header design to the condensers will be optimized such as to provide relative flow rates to each condenser based on its compressor capacity, enabling successful waterflow control at the main entering pipe.) There are two possible water valving configurations, as outlined below.

Pressure transducer input is factory installed in the discharge line of compressor circuit 1. It is provided 5 vdc by the unit main controller and returns a signal 1 to 5 vdc linearly. The sensor's range is 0 to 550 psig.

Water Valve(s) Control

Variable Building Waterflow Systems — Variable waterflow configurations use only one water valve in the main water supply pipe. The factory installed valve is a normally open motorized variable control type. The valve is controlled by a 4 to 20 mA signal from the main unit controller using the Reverse/Head Press Ctrl output, which modulates to maintain the head pressure set point (Setpoint 04).

Constant Building Waterflow Systems — Constant waterflow configurations use two (2) water valves, only one of which is in the main water supply pipe. The second valve is located in a bypass pipe to the main outlet water pipe branched off of the supply pipe immediately ahead of the first valve. This valve is same type, but normally closed and is controlled in unison with the first valve, but opposite position, such that the total opening of the 2 valves always equals 100%.

VFD BYPASS (50XJ PCB2) — The VFD Bypass option provides backup for the VFD Drive in VAV units. It uses a manually operated rotary switch, which includes a series of high voltage contacts. The bypass is a direct input to the unit controller, and will be activated via a switch on the unit front panel. When manually activated, the rotary switch takes the VFD out of the fan power circuit and provides the 3-phase power directly to the fan motor, running it at constant speed. A low voltage control circuit ensures that the unit controller provides a signal to allow all VAV dampers to open fully before the fan is turned on (at constant/full speed). A blue indicator light located on the front of the unit indicates that the VFD Bypass is active. A High Duct Static Switch (HDS) shuts the fan down if duct static exceeds a maximum setting.

VENTILATION OUTPUT (50XJ PCB2) — The ventilation output is controller output signal (available for field connection) to a field-supplied ventilation damper(s). This signal is activated whenever the unit is in the occupied mode.

SPACE TEMPERATURE SENSOR (50XJ PCB2) — A field-supplied Carrier space temperature sensor is required to maintain space temperature in sensor mode.

SUPPLY AIR RESET (50XJ PCB2) — Supply air temperature set point may be reset using either the SPT or MA_RA.

SUPPLY AIR RESET (50BV) — Reset is provided by a field-installed temperature sensor.

EXHAUST FAN CONTROL OUTPUT (50XJ PCB2) — This output is activated whenever the unit is in the Occupied mode. This is a modulating output that controls based on the Building Pressure Input set point.

CONDENSER WATER PUMP/WATER TOWER (50XJ PCB2) — This output (provided for field connection) is used to control condenser water flow. Either an On/Off signal or a variable output may be required for this feature.

PHASE LOSS/REVERSAL PROTECTION SWITCH (50XJ PCB2) — This switch monitors VFD/Fan Motor supply leads to detect phase loss or reversal. If the switch detects improper phasing, an input is sent to the unit controller, which shuts the unit down. After a time delay, the controller attempts to restart the unit.

A phase loss/reversal switch may be installed in the unit to detect over/under voltage conditions and phase loss or reversal. When the switch opens, the controller outputs are forced to off with Safety forces, the alarm output will close and the red alarm light will be lit. A system alarm will be generated and displayed on the unit keypad. Unit reset is automatic when the voltage and power phases have been restored.

FREEZE THERMOSTAT (FREEZSTAT) (50XJ PCB2) — The Economizer Freezestat, used in conjunction with an optional water economizer coil or heating coil, is a factory installed averaging (capillary tube) air temperature sensor positioned in the unit inlet airstream.

If the freeze protection switch contacts open the ventilation request output will be closed for 15 minutes and the warning light will light. If the freeze protection switch contacts are still open after 15 minutes the supply fan will be stopped, all compressor cooling will stop, the economizer valve will open to 100%, the pump request output will remain on, and the alarm light will light. This will maintain condenser water flow through the coil to prevent freezing the coil while stopping all other operations that could have contributed or will be affected

by the freeze condition. Unit reset is automatic when the contacts on the freeze protection switch close again. The contacts on the freeze protection switch open below 37 F.

TOWER SUMP TEMPERATURE SENSOR (50XJ PCB3) — This sensor is used for monitoring (only) the tower sump temperature.

LEAVING WATER TEMPERATURE SENSOR (50XJ PCB3) — This sensor is used for monitoring (only) the leaving water temperature.

BUILDING STATIC PRESSURE SENSOR (50XJ PCB3) — This sensor is used to control both the speed of the building exhaust fan and the building static pressure.

INDOOR AIR QUALITY (CO_2) SENSOR (50XJ PCB3) — This sensor monitors CO_2 levels.

INDOOR RELATIVE HUMIDITY SENSOR (50XJ PCB3) — This sensor monitors and controls the humidity control relay.

OUTDOOR AIR TEMPERATURE SENSOR (50XJ PCB3) — This sensor is used to monitor outdoor air and broadcast the value over the Carrier Comfort Network (CCN).

STAGE HEAT RELAYS (50XJ PCB3) — These relays control up to four stages of electric heat, or other heating methods.

PUMP REQUEST RELAY (50XJ PCB3) — This relay turns on a tower pump when requested.

TOWER REQUEST/CONTROL RELAY (50XJ PCB3) — This relay is used to activate a tower fan.

BUILDING EXHAUST FAN SPEED CONTROL (50XJ PCB3) — This output controls building exhaust fan speed.

HUMIDITY CONTROL RELAY (50XJ PCB3) — This relay controls a humidifier or dehumidification device.

Wiring Control Devices — Standard controls for the 50XJ require no field-wiring. Standard 50XJ controls include: Supply Air Temperature (SAT), Duct Static Pressure (DSP), Duct High Static Limit Switch (DHS), Filter Status Switch (FLTS), Entering Water Temperature (EWT), Compressor Status (CSMUX), Supply Fan Start/Stop (SF), Supply Fan Speed (SPEED), and Mixed/Air Return/Air sensor (MA_RA).

NOTE: The MA_RA sensor will be located in the return air steam if the unit does not have a water economizer, and in the mixed airstream if the unit is equipped with a water economizer.

For the 50BV unit, standard controls include: Duct Static Pressure (DSP), Duct High Static Limit Switch (DHS), Compressor Status (CSMUX), Supply Fan Start/Stop (SF), and Supply Fan Speed (SPEED).

For the 50XJ unit, optional controls will be wired to the field terminal blocks (TB5 and TB6) provided. Refer to Fig. 2A and the descriptions below.

For the 50BV unit, optional controls are wired to field terminal block TB2 as shown in Fig. 2B.

EXTERNAL 0 TO 10 VOLT DC RESET SIGNAL (RESET) (50XJ PCB2) — This field-supplied 0 to 10 vdc signal is used to reset the 50XJ supply-air temperature. The controller will scale the signal to provide 0 reset at 0 volts and 20 degrees of reset at 10 volts. Wire the positive of the signal to the RESET terminal and the negative to the C or common terminal.

SUPPLY AIR RESET (50BV) — Use a 5k ohm sensor installed at the Entering Water Temperature sensor (EWT) location on PCB1. For space temperature averaging, two 10k ohm Space Temperature Sensors (SPT) can be wired in parallel.

SPACE TEMPERATURE SENSOR (50XJ PCB2) — The space temperature sensor (33ZCT55SPT) is used in the following cases:

- When using the optional water economizer and not using Carrier's ComfortID™ System.

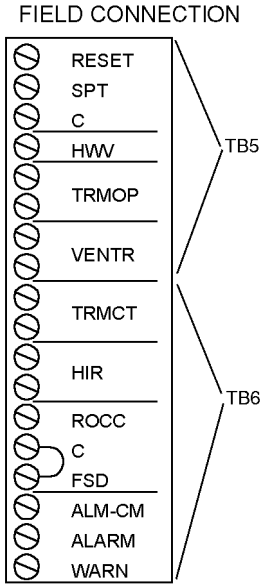


Fig. 2A — Field Terminal Blocks for 50XJ Unit

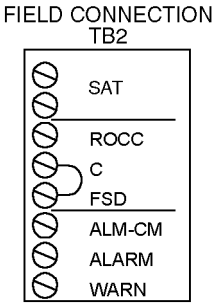


Fig. 2B — Field Terminal Block for 50BV Unit

- To determine the average temperature of the space being served.
- To determine supply-air temperature reset, occupied heating, unoccupied heating and cooling (refer to Sequence of Operation in the Start-Up section.).

To wire the sensor, perform the following (see Fig. 3).

Identify which cable is for the sensor wiring.

1. Strip back the jacket from the cable for at least 3 inches. Strip $^1/_4$-in. of insulation from each conductor. Cut the shield and drain wire from the sensor end of the cable.
2. Wire the sensor to the SPT and C terminals on the field terminal block (TB5). A typical 10K thermistor such as the 33ZCT55SPT sensor may be used. If the SPT sensor is not installed and the MA_RA (mixed air/return air) sensor is configured for return air, the 50XJ unit will use this sensor to control supply air reset, occupied heat, and unoccupied heating and cooling

See Fig. 4 for space temperature sensor averaging.

HOT WATER OR STEAM VALVE (HWV) (50XJ PCB2) — The HWV terminal supplies the positive signal to control a 4 to 20 mA hot water or steam valve for occupied and unoccupied heat. Connect the common side of the valve to the C terminal or an equipment ground.

AIR TERMINALS AND FRESH AIR DAMPER (50XJ PCB2) — The VAV Terminal Open (TRMOP), Ventilation Output (VENTR), VAV Terminals Control (TRMCT), and Heat Interlock Relay (HIR) terminals provide dry contacts to command the VAV terminals open; a ventilation damper open; VAV terminals to control to their cooling set points; and VAV terminals to control to their heat set points, respectively.

REMOTE OCCUPANCY (ROCC) (TB2 50BV, TB6 50XJ) — The 50XJ,BV unit may be commanded by a remote control system or a twist timer to become occupied and run when a set of dry contacts close. In order for this to occur, wire the contacts to ROCC and C.

SMOKE DETECTOR/FIRE ALARM SHUTDOWN (FSD) (TB2 50BV, TB6 50XJ) — To allow a smoke detector to shut the 50XJ,BV unit down, remove the jumper from FSD to C and wire these terminals to a set of normally closed contacts on the smoke detector.

ALARM (ALARM) AND WARNING (WARN) OUTPUTS (TB2 50BV, TB6 50XJ) — Two dry contacts output a discrete signal when the alarm and warning lights on the display are lit. To pick up the alarm output signal, wire between the ALARM and ALM-CM terminals. To pick up the warning output signal, wire between the WARN and ALM-CM terminals.

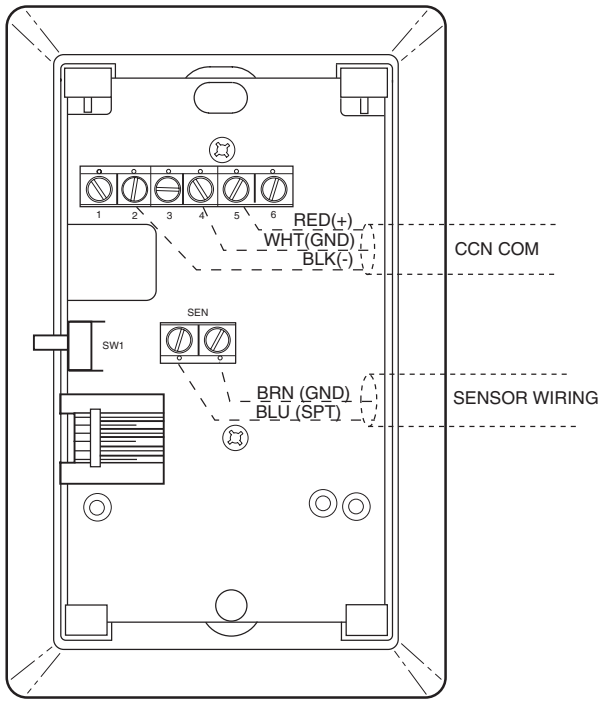
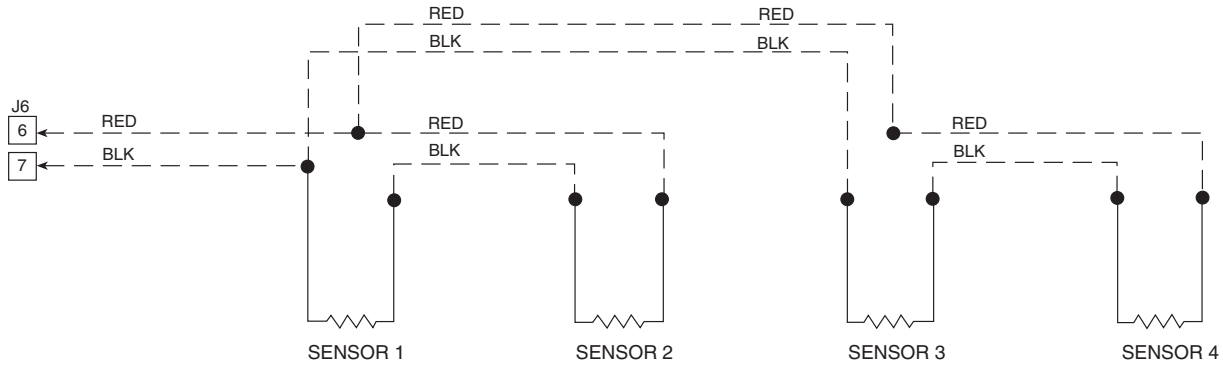
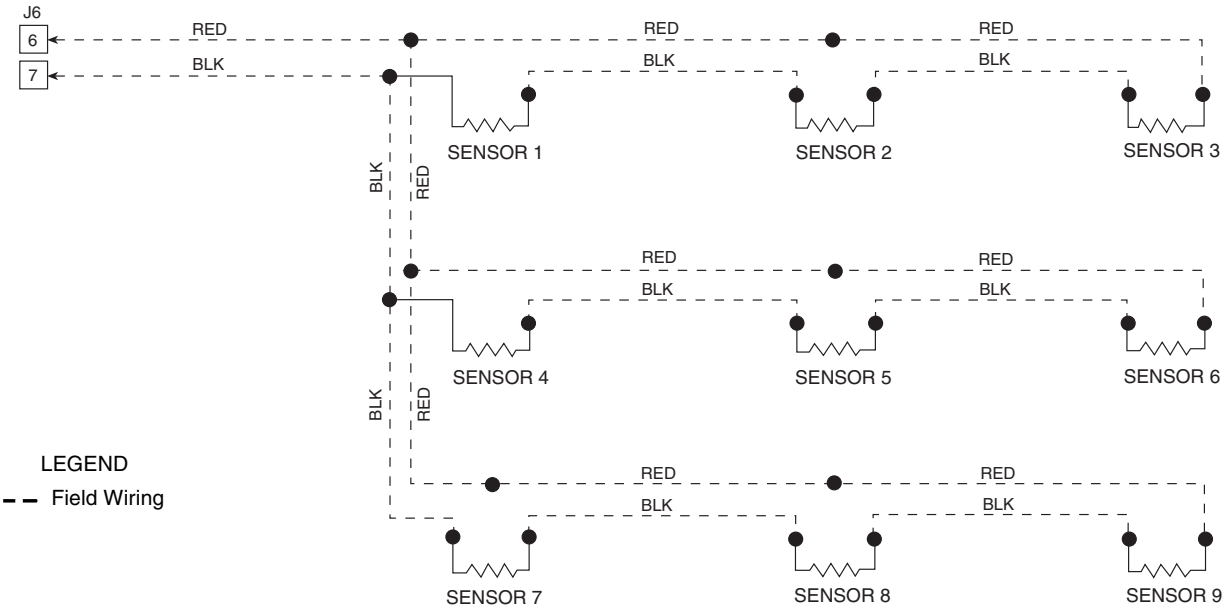


Fig. 3 — Space Temperature Sensor Typical Wiring (33ZCT55SPT)



SPACE TEMPERATURE AVERAGING — 4 SENSOR APPLICATION



SPACE TEMPERATURE AVERAGING — 9 SENSOR APPLICATION

Fig. 4 — Space Temperature Averaging

CONTROLS AND FUNCTIONS

Using the Local Interface Display — The Local Interface Device (LID) is a CCN operator interface that gives the user the capability to view and modify all configuration and service data for the CC6400 control system. The LID also allows the user to override all point display and maintenance data.

MENU STRUCTURE — The LID operates on a hierarchy of four levels (menus).

The top level contains the LID's major functions. Each function has a corresponding key on the LID. For an explanation of each function key, refer to Table 3.

The second level separates the major functions (items) into types with corresponding type numbers that can be used for quick access.

The third level gives the user the capability to access each occurrence of an item. For example, the application may require two DO (Discreet Output) — Analog Comparison algorithms. Thus, the CC6400 Controller would have two occurrences of the DO — Analog Comparison algorithm.

The fourth level gives the user the capability to access maintenance and configuration data associated with the selected occurrence of the item.

DEFAULT SCREEN — Figure 5 shows the LID. The LID's screen provides the user with the 24-character controller name and the controller's current time, date, and alarm status. This screen appears when the LID is powered up and communicating with the controller or there is no keyboard activity for 10 minutes.

KEYPAD AND DISPLAY — The LID consists of a keypad with 8 function keys, 4 operative keys, 12 numeric keys (0 to 9,., and -) and a two-line, alphanumeric liquid crystal display (LCD). Each line on the LCD can display up to 24 characters. See Fig. 5. Table 4 defines the purpose of the LID's operative keys. Table 5 defines the purpose of the LID's numeric keys.

Table 3 — LID Function Keys

OPERATIVE KEYS	USE
STAT	Status — gives access to maintenance values and configuration data for points.
TEST ALRM	Alarm — gives access to maintenance and configuration data for alarms.
HIST	History — gives access to maintenance and configuration data for history system functions.
SRVC	Service — gives access to maintenance and configuration data for service system functions.
SET	Setup — gives access to configuration data for setup system functions.
SCHD	Schedule — gives access to maintenance and configuration data for schedules.
ALGO	Algorithm — gives access to maintenance and configuration data for AO, DO, and global algorithms. It also gives access to BEST ++™ custom programs.
EXPN EDIT	Edit — gives the capability to switch from Status mode to Edit (configuration) mode for the selected item.

LEGEND

AO — Analog Output
DO — Digital/Discreet Output

Table 4 — Operative Keys

OPERATIVE KEYS	USE
CLEAR	Clear — performs three operations: • Cancels a data entry before the user presses Enter, thus leaving the current value unchanged. • Returns a forced point to automatic control. • Redisplays the previous menu level.
ENTER	Enter — performs two operations: • Selects the displayed item, thus displaying either its maintenance or configuration data, depending on whether the user is in the Status mode or the Edit mode. • Accepts the value entered in a configuration decision as new configuration data or as a force.
▼	Down arrow — displays the next configured item or decision. When the last configured item or decision is displayed, the LID re-displays the first configured item or decision. For example, when the user presses the down arrow key while viewing the last configuration decision of an algorithm, the LID re-displays the first configuration decision.
▲	Up arrow — Displays the previous configured item or decision.

Table 5 — Numeric Keys

OPERATIVE KEYS	USE
1 - 9	Numeric keys
.	Performs two operations: • Separates items, such as an algorithm from its occurrence or hours from minutes. • Serves as a decimal point in numeric values.
–	Performs two operations: • Negates the value of numeric keys. • Clears current data entry value any time it is not the first key pressed during the data entry sequence.

VIEWING MODES — The user can view items in either the Status (maintenance) mode or the Edit (configuration) mode.

Status Mode — When the user first powers up the LID, it displays the CC6400 controller items in Status (maintenance) mode. The user may view the current value or status of an item in Status mode without actually logging on to the Controller. Knowing the current values or status of items can be useful when troubleshooting. For example, the user could determine if a point was forced.

NOTE: Not all items have maintenance data. If the item you select does not have maintenance data, the LID will display "No maintenance."

Accessing Items in Status Mode — The user can access maintenance data in Status mode in two ways:

- Pressing the appropriate function key (i.e., ALRM) once to access a category (i.e., alarms) and then continuing to press that key (ALRM) to scroll through all the items in that category (i.e., Limit Alarm, Set point Alarm, Discrete Alarm, First Out Alarm, Runtime Alarm, and Number of Starts Alarm). Press ENTER to display the first maintenance decision.

  NOTE: *Scrolling by repeatedly pressing the function key* displays the name of all the items in that category, whether or not they are actually configured. *Scrolling by pressing the up or down arrow* displays only the configured items within that category.

- Pressing the appropriate LID numeric key (i.e., 2) and the appropriate function key (i.e., ALRM) to directly access an item without having to scroll through all the items in that category. Press ENTER to display the first maintenance decision.

Edit Mode — Because the LID first displays items in Status mode when it is powered up, the user must log on to the connected CC6400 Controller and press the EXPN/EDIT key to switch to Edit mode.

While in Edit mode, the user can change the configuration of items. For example, the user could change the value of an algorithm's configuration decision.

NOTE: Not all items have configuration data. If the item selected does not have configuration data, pressing the EXPN/EDIT key will have no effect. The LID will display "No configuration."

Accessing Items in Edit Mode — The two ways to access items in Edit mode are the same as in Status mode, except for an additional step — pressing the EXPN/EDIT key.

The user can access configuration data in Edit mode in two ways:

- Pressing the appropriate function key (i.e., ALRM) once to access a category (i.e., alarms), pressing EXPN/EDIT and then continuing to press that key (ALRM) to scroll through all the items in that category (i.e., Limit Alarm, Set point Alarm, Discrete Alarm, First Out Alarm, Runtime Alarm, and Number of Starts Alarm).

  NOTE: *Scrolling by repeatedly pressing the function key* displays the name of all the items in that category, whether or not they are actually configured. *Scrolling by pressing the up or down arrow* displays only the configured items within that category.
- Pressing the appropriate LID numeric key (i.e., 2), the appropriate function key (i.e., ALRM), and EXPN/EDIT to directly access an item without having to scroll through all the items in that category.

QUICK ACCESS IN EITHER STATUS OR EDIT MODE — Use Table 6 as a reference to directly access CC6400 Controller items using a LID in either Status or Edit mods. For example, to access maintenance data for the AO — Heating VAV algorithm, press 6, ALGO, and ENTER. To access configuration data for the AO (Analog Output) — Heating VAV algorithm, press 6, ALGO, EXPN/EDIT, and ENTER. If the database consisted of two AO — Heating VAV algorithms, to access the second one, press 6, . *(decimal),* 2, ALGO, EXPN/EDIT, and ENTER.

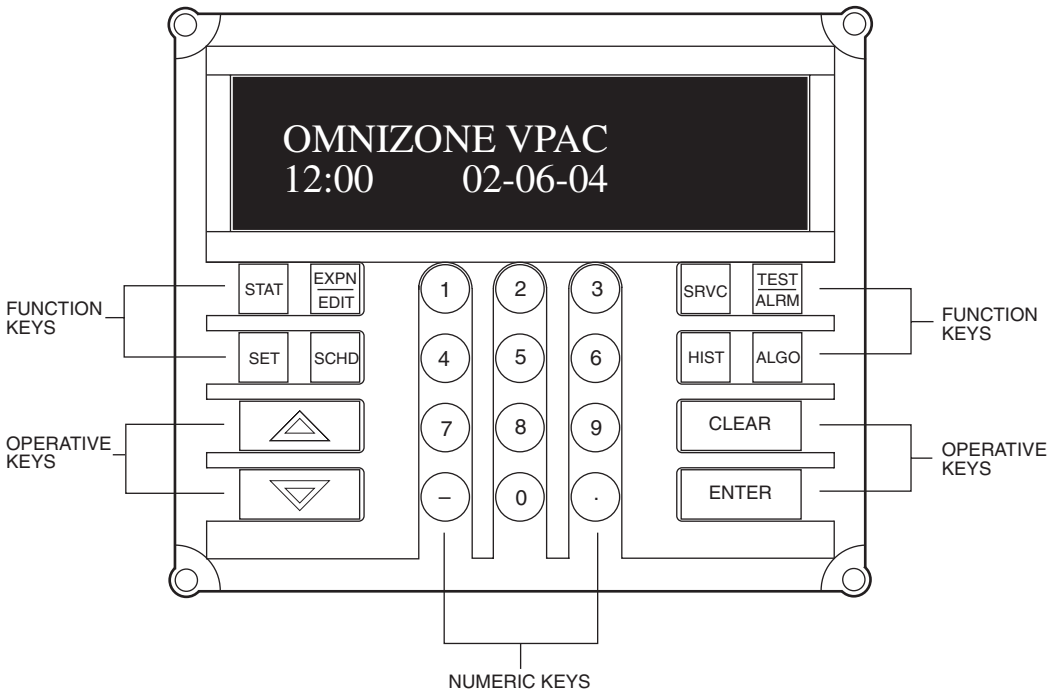


Fig. 5 — Local Interface Display (LID)

Table 6 — Quick Access Chart

LID NUM. KEY	LID FUNCTION KEYS						
	Algorithms (ALGO)	Status (STAT)	History (HIST)	Service (SRVC)	Alarm (ALRM)	Setup (SET)	Schedules (SCHD)
1	AO—Adaptive Control	Hardware Points	Alarm History	Function Definition	Limit	Set Clock	Occupancy
2	AO—Cooling CV	Software Points	Analog Point Trace	Channel Definition	Setpoint	Real Time Clock	Setpoint
3	AO—Cooling VAV	Temperature Input	Discrete Point Trace	System Definition	Discrete	Controller Password	Holiday
4	AO—Fan Tracking	Milliamp Input	Consumable Channel	Setpoint Definition	First out	N/A	S/W Setpoint
5	AO—Heating CV	Custom Milliamp Input	Internal Consumable	Database Control	Runtime	N/A	Network Time
6	AO—Heating VAV	Voltage Input	Runtime Channel	Comfort Controller	# of starts	N/A	N/A
7	AO—Humidity Control	Custom Voltage Input	N/A	CCN Control	N/A	N/A	N/A
8	AO—Mixed Air CV w/IAQ	Sensed Discrete Input	N/A	LID Preferences	N/A	N/A	N/A
9	AO—Mixed Air VAV w/IAQ	Latched Discrete Input	N/A	N/A	N/A	N/A	N/A
10	AO—Permissive Interlock	Pulsed Discrete Input	N/A	N/A	N/A	N/A	N/A
11	AO—Reset	Milliamp Output	N/A	N/A	N/A	N/A	N/A
12	AO—Shared Transducer	Custom Milliamp Output	N/A	N/A	N/A	N/A	N/A
13	AO—Static Pressure	Voltage Output	N/A	N/A	N/A	N/A	N/A
14	DO—Analog	Custom Voltage Output	N/A	N/A	N/A	N/A	N/A
15	DO—DX-Staging VAV	Discrete Output	N/A	N/A	N/A	N/A	N/A
16	DO—Electric Heat CV	Stepper Motor Output	N/A	N/A	N/A	N/A	N/A
17	DO—Electric Heat VAV	Discrete Software Point	N/A	N/A	N/A	N/A	N/A
18	DO—Enthalpy Comparison	Analog Software Point	N/A	N/A	N/A	N/A	N/A
19	DO—Interlock	Network Data Out	N/A	N/A	N/A	N/A	N/A
20	DO—Lighting Control	Network Data In	N/A	N/A	N/A	N/A	N/A
21	DO—Permissive Interlock	N/A	N/A	N/A	N/A	N/A	N/A
22	DO—Pump Control	N/A	N/A	N/A	N/A	N/A	N/A
23	DO—Prop Thermo	N/A	N/A	N/A	N/A	N/A	N/A
24	DO—Prop Thermo 2 Pipe	N/A	N/A	N/A	N/A	N/A	N/A
25	DO—Prop Thermo 4 Pipe	N/A	N/A	N/A	N/A	N/A	N/A
26	DO—Staged Thermostat	N/A	N/A	N/A	N/A	N/A	N/A
27	DO—Staging Control	N/A	N/A	N/A	N/A	N/A	N/A
28	DO—Time Clock	N/A	N/A	N/A	N/A	N/A	N/A
29	DO—Time Clock w/Check	N/A	N/A	N/A	N/A	N/A	N/A
30	AOSS Schedule	N/A	N/A	N/A	N/A	N/A	N/A
31	Network Broadcast	N/A	N/A	N/A	N/A	N/A	N/A
32	Linkage/AOSS Schedule	N/A	N/A	N/A	N/A	N/A	N/A
33	NTFC w/Enthalpy Check	N/A	N/A	N/A	N/A	N/A	N/A
34	Sensor Group	N/A	N/A	N/A	N/A	N/A	N/A
35	WSM Air Source	N/A	N/A	N/A	N/A	N/A	N/A
36	WSM Cool Source	N/A	N/A	N/A	N/A	N/A	N/A
37	Custom Program	N/A	N/A	N/A	N/A	N/A	N/A

LEGEND

AO — Analog Output
AOSS — Adaptive Optimal Start/Stop
CV — Constant Volume
DO — Digital Output
IAQ — Indoor Air Quality
N/A — Not Available
NTFC — Nighttime Free Cooling
VAV — Variable Air Volume
WSM — Water System Manager

NOTES:
1. To change from Edit mode to Status mode, press CLEAR or press EXPN/EDIT again.
2. Not all available selections will have items to select in sublevels.

Automatic Run Test — The 50BV,XJ unit controls are programmed with an automatic run test that checks connection and operation of major components. To perform the run test:

Verify that the control display (LID device/System Monitor) interface cable is connected to internal jack on main controller; that the fire alarm/shutdown switch input (FSD) has a factory jumper or field input; that Bypass (if installed) is set in the DRIVE position; and that the Local/Off/Remote switch is set to the REMOTE position.

NOTE: When the Local/Off/Remote switch is in the REMOTE position, the controller time schedule is pre-set (from the factory) as unoccupied. This means that the unit will not turn on until the run test is enabled. However, if the controller schedule has already been modified in the field, and the current time of day is occupied, then the supply fan will start. The run test will shut the fan down when it begins. The run test will complete and then the supply will automatically restart.

NOTE: If the Local/Off/Remote switch is in the OFF position, it is normal for the red alarm light on the display panel to be lit, indicating that the unit is disabled.

NOTE: If the red light stays on when the switch is moved to REMOTE, or if any other problems occur during the run test, refer to the Troubleshooting section of this manual.

To perform the Run Test:

1. Turn unit power on.

   The LID display will show the controller identification, time and date (Fig. 5):

   OMNIZONE VPAC

   hh:mm mm-dd-yy

2. Press 3 and then SET. The LID display will show:
   Controller Password
3. Press ENTER. The LID display will show:
   Log in to Controller
   Enter Password
   NOTE: The LID display has two modes: Edit mode and Status/Maintenance mode. If the LID display is in Edit mode, then the display will only show the word "password." Press the EXPN/EDIT key to toggle to the Status mode.
   Press the EXPN/EDIT to display:
   Log in to Controller
   Enter Password
4. Key in the password and press ENTER.
   NOTE: The default password is 1111.
5. The LID display will show:
   Log in to Controller
   Logged In
   NOTE: At this point, for the 50BV unit only, the run test will follow these steps:
   a. Press 37 ALGO . The display will show:
      Custom Program
   b. Press ENTER. The display will show:
      2.0 Global Dictionary
      OMNIZONE
   c. Press EXPN/EDIT (NOTE: Display will flash, indicating that the device is now in edit mode.) The display will show:
      2.0 Global Dictionary
      OMNIZONE
   d. Press ENTER. The display will show:
      Compressor Stages
      4.00
      NOTE: A 50BV unit with only 2 compressors will display 2.00. Skip to Step 6.
   e. Input 2.00 and Press ENTER. The display will show:
      Compressor Stages
      2.00
6. Press STAT. The LID display will show:
   Hardware Points
7. Press STAT again. The LID display will show:
   Software Points
8. Press ENTER. The LID display will show:
   Compressor 1 Status
9. Press ▼ 6 times. The LID display will show:
   Factory/Field Test
   Stop
10. Press 1 then ENTER, The LID display will show:
    Factory/Field Test
    Start
    NOTE: At this point, the yellow warning light on the display panel will be lit and will stay on throughout the run test. After each successful step, the red alarm light will blink once.
11. The control module will now check if there is input from BYPAS (50XJ), DHS, FSD, SAT, DSP, and CSMUX.
    If the control does not receive open/open/closed/ in range/in range/in range, the red alarm LED will go on and the test will stop.
    If the inputs are OK, the red alarm LED blinks once and the test continues.
12. Next, the control forces the Supply Fan (SF) and all of the Compressors (COMP) off, and waits 15 seconds.
    For the 50XJ unit, if the REMOTE LED and AUTO LED on the VFD display are on, the red LED blinks once and the test continues.
    NOTE: For the 50XJ unit, if the controller is configured with a water Economizer, the delay is 2 min. and both valves are commanded to 0%. Both water valves will close.
13. The control forces SF on and SPEED to 20 percent and then waits 30 seconds.
    If the VFD display shows "10.6 Hz," the Remote and Auto LEDs blink, and the fan goes on, then the red LED on the control module blinks once and the test continues.
    NOTE: For the 50XJ unit, if the controller is configured with a water Economizer the delay is 2 min. and Econo valve is commanded to 100%. The economizer valve will open and the RVS/HD (reverse/head pressure) valve will remain closed.
14. The control forces SF on and SPEED to 35 percent and then waits 30 seconds.
    If the VFD display shows "20.0 Hz," the Remote and Auto LEDs blink, and the fan goes on, then the red LED on the control module blinks once and the test continues.
    NOTE: For the 50XJ unit, if the controller is configured with a water Economizer the delay is 2 min. and RVS/HD valve is commanded to 100%. The economizer valve is commanded to 0% and the RVS/HD valve will open.
15. The control forces SF off then waits 15 seconds.
    If the VFD display shows "Off," the Remote and Auto LEDs are off, and the fan goes off, then the red LED on the control module blinks once and the test continues.
    NOTE: For the 50XJ unit, if the controller is configured with a water Economizer both valves are commanded to 0%. The economizer valve and RVS/HD will close.
    NOTE: For the 50BV unit, the steps below (16-24) will be completed for the number of compressors configured.
16. The control forces CMP1 (compressor 1) on then waits 5 seconds.
    If CSMUX is not in range the red LED will go on and the test will stop.
    If CSMUX is in range, the red LED blinks once and the test continues.
17. The control forces CMP1 off.
18. The control forces CMP2 (compressor 2) on then waits 5 seconds.
    If CSMUX is not in range the red LED will go on and the test will stop.
    If CSMUX is in range, the red LED blinks once and the test continues.
19. The control forces CMP2 off.
20. The control forces CMP3 (compressor 3) on, if configured, then waits 5 seconds.
    If CSMUX is not in range the red LED will go on and the test will stop.
    If CSMUX is in range, the red LED blinks once and the test continues.
21. The control forces CMP3 off.

22. The control forces CMP4 (compressor 4) on, if configured, then waits 5 seconds.

    The LID display shows:

    Factory/Field Test

    Stop

    The yellow LED will go off, and the red LED will go off.
23. The control forces CMP4 off.
24. The run test is complete.

Power Up the LID Display — After completing the automatic run test, perform the following procedures to change the controller password, set the controller clock, configure schedules, set parameters, view settings, and view alarm history.

1. Set the Remote/Local/Off switch on the front of the unit to the OFF position. This prevents operation of the fan and compressors while still providing power to the unit controls.

   NOTE: When the switch is in the OFF position, the red alarm LED will be lit; this is normal. The bypass point will also indicate OK.
2. If the unit access panel (for power and controls) is still on the unit, remove it in order to view the control modules during start-up.
3. Switch the main unit power disconnect to ON.

When power is applied to the OMNIZONE™ System Control panel, the red LED on the top front of the processor module will flash at a rapid pace (about twice a second) for the first 30 to 60 seconds. This rapid flash will then be replaced by a slower paced flash (about once per second).

The green LED below the red LED will start flashing. This LED indicates input/output communications for accessory input output modules and the LID display.

The yellow LED will flash when the controller is broadcasting CCN messages to a laptop or other computer.

The third LED from the bottom of the controller (PCB1) will light.

The LID display will show the controller identification, time and date as shown below.

OMNIZONE VPAC

hh:mm mm-dd-yy

Log On to the LID Display — To Log On to the LID display, perform the following procedure:

1. Press 3 and then SET. The LID display will show:

   Controller Password
2. Press ENTER. The LID display will show:

   Log in to Controller

   Enter Password

   NOTE: The LID display has two modes: Edit mode and Status/Maintenance mode. Edit mode allows the user to change settings on the configurations screens. Status/ Maintenance mode only allows the user to look at the settings.

   If the LID display is in Edit mode, then the display will only show the word "password." Press the EXPN/EDIT key to toggle to the Status mode. Make sure the LID display shows:

   Log in to Controller

   Enter Password
3. Key in the password and press ENTER.

   NOTE: The default password is 1111.
4. The LID display will show:

   Log in to Controller

   Logged In

   NOTE: The user will be automatically logged off after 15 min. of non-use.

Change the Default Password — To change the default password, perform the following procedure:

NOTE: The password must have already been entered to perform this procedure.

1. Press 3 and then SET. The LID display will show:

   Controller Password
2. Press ENTER . The LID display will show:

   Log in to Controller

   Logged in
3. Press EXPN/EDIT . The LID display will show:

   Password

   1111 (default password, or previous password entered)
4. Enter the new password (up to 6 digits) and press ENTER . The LID display will show:

   Password

   (password just entered)

   NOTE: Remember this password; write it down.
5. Press CLEAR twice to leave the password screen and return to the default display screen.

Set the Clock — The user must be logged in to set the clock. To set the clock, perform the following procedure:

1. Press 1 and then SET . The LID display will show:

   Set Clock
2. Press ENTER . The LID display will show:

   No Maintenance

   NOTE: There is no maintenance information regarding setting the clock.
3. Press EXPN/EDIT . The LID display will show:

   Time

   00:00
4. Enter the time. The time is entered in military time (for example 14.59 for 2.59 pm). Press ENTER then press the ▼ button. The LID display will show:

   Day of Week

   1
5. Enter the day of week. The numbers 1 through 7 correspond to the days of the week (1 = MON, 2 = TUE, 3 = WED, 4 = THUR, 5 = FRI, 6 = SAT, 7 = SUN). Press ENTER then press ▼ . The LID display will show:

   Month

   1
6. Enter the number of the corresponding month (1 through 12). Press ENTER then press ▼ . The LID display will show:

   Day

   1
7. Enter the day of the month. Press ENTER then press ▼ . The LID display will show:

   Year

   95

8. Enter the last two digits of the current year. Press ENTER then press ▼. The LID display will show:
   Update Clock
   No
9. Press 1 and then ENTER to cause the controller to update the clock. The LID display will flash. Press CLEAR twice to view the default display and the clock should update to the input time and date.

Configure Schedules — Schedules are one method of starting and stopping the unit at specified intervals. To configure the schedules, perform the following procedure:

1. Press 1 and then SCHD. The LID display will show:
   Occupancy Algorithm
2. Press ENTER . The LID display will show:
   Time Schedule
   Enter to select
3. Press ENTER . If the LID display shows "MODE 0" then the user is in Maintenance mode and the LID display is showing the maintenance information for the occupancy schedule. Press EXPN/EDIT to enter the configuration mode. The LID display will show:
   Manual Override Hours
   0 hours
   This is the first configuration for each occupancy algorithm and is used to put the schedule in or out of occupancy override for the number of hours entered.
4. Press ▼ . The LID display will show:
   Period 1: Day of week
   00000000
   The eight digits represent if this period should apply to certain days of the week or holidays. The digits represent M, Tu, W, Th, F, Sa, Su, and Hol, respectively. Enter a series of 0s or 1s with a 1 corresponding to the days that this period should apply to and a 0 for the days that this schedule should not apply to. As an example, entering 11111000 would make the schedule apply to days Monday through Friday and not apply to Saturday, Sunday, or Holidays.
5. Press the ▼ button. The LID display will show:
   Period 1 occupied from
   00:00
6. Input the Occupancy Start time for this period.
   NOTE: 12.00 represents 12:00 pm.
7. Press the ▼ to input the Occupied To time for period 1.
8. Input the days and times for periods 2 through 8 as required.
9. Press clear to leave the occupancy programming.

Program Set Points — To program the set points, perform the following procedure:

1. Press 2 and then SCHD . The LID display will show:
   Set point Schedule
2. Press ENTER . The LID display will show:
   Supply Fan Status
   SETPT01
3. Press ENTER .
4. If "No maintenance" is displayed, press EXPN/EDIT to view the set point information. The LID display will show:
   Occupied Lo Set point
   0.30 ″ H2O
   This is the pressure set point below which the fan is considered to be off.
5. Press ▼ . The LID display will show:
   Occupied Hi Set point
   0.40 ″ H2O
   This is the pressure set point above which the fan is considered to be on.
   The down or up arrow will also display the Unoccupied Low and High Temperature set points. These values should be kept the same as the occupied values.
6. Setpoint 02 internally coordinates the supply air set point reset in several of the algorithms and can not be modified.
   Setpoint 03 is used for comparison by the unit to return air, Space temperature or Average space temperature through linkage to determine when to start reset of the supply air when occupied, when to turn on heat and disable cooling when occupied and when to bring the unit on for unoccupied heating or cooling.
   Setpoint 04 is used to set the head pressure set point if the unit is ordered with the head pressure control option. Only the Occupied Low set point may be modified the other values will change to the Occupied low valued shortly after it is modified so that all the values remain the same.
   Setpoint 05 is used to set the supply air static pressure the unit should maintain. Only the Occupied Low set point may be modified the other values will change to the Occupied low value shortly after it is modified so that all the values remain the same. The set point in the static pressure control algorithm will also follow and cannot be modified in the algorithm configuration screens.
   Setpoint 06 is the Supply air temperature set point. Only the Occupied Low set point may be modified the other values will change to the Occupied low value shortly after it is modified so that all the values remain the same. The set point in DX VAV staging and some of the other algorithms will also follow and cannot be modified in the algorithm configuration screens.
   Setpoint 07 is the building pressure set point for the building pressure control of a variable speed exhaust fan from a field-supplied module. Only the Occupied Low set point may be modified the other values will change to the Occupied low value shortly after it is modified so that all the values remain the same.
   Setpoint 08 is the raw milliamp set point for the building pressure control and is tied to Setpoint 07 for the sensor range selected in the custom programming configuration. Several choices of building static pressure sensors may be purchased and supplied for building pressure control.
   Setpoint 09 is used for the humidification/dehumidification output from a field-supplied module. This set point may be modified to enable the Humidity output to either humidify or dehumidify when the indoor relative humidity (IRH) exceeds the set point.
   Table 7 lists the available controller set points and their default values.
7. Pressing the CLEAR button will take the user out of the set point configuration mode.

Table 7 — Controller Set Points

DESCRIPTION DISPLAY SCREENS	VALUE	UNITS	STATUS	FORCE	NAME
OMNIZONE::SETPT01: Supply fan Status					
Occupied Lo Setpoint	0.3	in H2O			OccLow
Occupied Hi Setpoint	0.4	in H2O			OccHgh
Unoccupied Lo Setpoint	0.3	in H2O			UnOccLow
Unoccupied Hi Setpoint	0.4	in H2O			UnOccHgh
OMNIZONE::SETPT02: VAVRESETbaseline					
Occupied Lo Setpoint	0	dF			OccLow
Occupied Hi Setpoint	0	dF			OccHgh
Unoccupied Lo Setpoint	0	dF			UnOccLow
Unoccupied Hi Setpoint	0	dF			UnOccHgh
OMNIZONE::SETPT03: Heat\Cool Mode & Reset					
Occupied Lo Setpoint	70	dF			OccLow
Occupied Hi Setpoint	74	dF			OccHgh
Unoccupied Lo Setpoint	55	dF			UnOccLow
Unoccupied Hi Setpoint	85	dF			UnOccHgh
OMNIZONE::SETPT04: Head Pressure Control					
Occupied Lo Setpoint	225	PSIG			OccLow
Occupied Hi Setpoint	225	PSIG			OccHgh
Unoccupied Lo Setpoint	225	PSIG			UnOccLow
Unoccupied Hi Setpoint	225	PSIG			UnOccHgh
OMNIZONE::SETPT05: Supply Static Pressure					
Occupied Lo Setpoint	1.5	in H2O			OccLow
Occupied Hi Setpoint	1.5	in H2O			OccHgh
Unoccupied Lo Setpoint	1.5	in H2O			UnOccLow
Unoccupied Hi Setpoint	1.5	in H2O			UnOccHgh
OMNIZONE::SETPT06: Supply Air Temperature					
Occupied Lo Setpoint	55	dF			OccLow
Occupied Hi Setpoint	55	dF			OccHgh
Unoccupied Lo Setpoint	55	dF			UnOccLow
Unoccupied Hi Setpoint	55	dF			UnOccHgh
OMNIZONE::SETPT07: Building Static Pressure					
Occupied Lo Setpoint	0.02	in H2O			OccLow
Occupied Hi Setpoint	0.02	in H2O			OccHgh
Unoccupied Lo Setpoint	0.02	in H2O			UnOccLow
Unoccupied Hi Setpoint	0.02	in H2O			UnOccHgh
OMNIZONE::SETPT08: BSP raw control					
Occupied Lo Setpoint	12.32	ma			OccLow
Occupied Hi Setpoint	12.32	ma			OccHgh
Unoccupied Lo Setpoint	12.32	ma			UnOccLow
Unoccupied Hi Setpoint	12.32	ma			UnOccHgh
OMNIZONE::SETPT09: Humidity Control					
Occupied Lo Setpoint	0	%RH			OccLow
Occupied Hi Setpoint	99	%RH			OccHgh
Unoccupied Lo Setpoint	0	%RH			UnOccLow
Unoccupied Hi Setpoint	99	%RH			UnOccHgh

LEGEND

BSP — Building Static Pressure
RH — Relative Humidity

Check System Parameters — To check system parameters, press the STAT button. The LID display will show: "Hardware Points Table 1." Press ENTER to view the hardware points. The user can navigate up and down through the points with the up and down arrows.

Press 2 and STAT to display the software points. The user can navigate up and down through the points with the up and down arrows.

Refer to Tables 8 and 9 for hardware and software points.

Display Alarm History — If the controller is indicating there are alarms, the user can view the alarm history by pressing the HIST button. The LID display will show "Alarm History." Press ENTER . The LID display will show the date and type of alarm.

As an example, if the LID display shows:

ALARM — 10:55 11-27-02

SFS

That display indicates that on 11/27/02 at 10:55 A.M. the system Supply Fan was either on when it had not been commanded on or was off when it was commanded on.

The user can view other stored alarms by pressing the up and down arrows. The twenty-four most recent alarms are stored.

Configure Custom Programming Selections — To configure the custom programming selections, perform the following procedure:

1. Press 37 ALGO . The LID display will show:
   Custom Program
2. Press ENTER . The LID display will show:
   2.0 Global Dictionary
   OMNIZONE
3. Press ENTER . The display indicates "No Data." Press CLEAR then press EXPN/EDIT . Press ENTER again. The LID display should now show:
   Compressor Stages
   4.00
4. Press 4 and then ENTER to indicate that 4 compressors are installed.
5. Use the down and up arrows to select the other configuration parameters as required. See Table 10 for a list of configuration parameters.
6. A field-supplied 0 to 10 vdc signal to the 50XJ unit may be used to reset the supply-air temperature.
   The reset will be taken off the supply air set point configured in the controller. The reset range can be changed by adjusting the High Conversion Endpoint value of the custom voltage input to a value other than 20. For example for 10 degrees of reset change the Hi input value to 10. This may be found by pressing 7 STAT from the Keypad. RESET will be the second custom voltage input point in the controller. The first will be CSMUX, which is the compressor status multiplexed input. Press ▼ to see the following in the LID display:
   Ext. Supply Air Reset
   RESET
   Press ENTER . If the LID display shows:
   System Value
   Press EXPN/EDIT . The LID display will show:
   Low Input Endpoint
   2.0 Volts

Press ▼ three times to get to the High Conversion Endpoint. The user must be logged in to be able to change this otherwise you can only view it. See the start up section for how to log into the controller.

Configuration parameters are shown in Table 10.

Table 8 — Controller Hardware Points

DESCRIPTION DISPLAY SCREENS	VALUE	UNITS	STATUS	FORCE	NAME
OMNIZONE::HWP01-32:					
Hardware points Table 1					
Supply Air Temperature	67	dF			SAT
Duct Static Pressure	0.2	in H2O			DSP
Comp. Status MUX	1.86	Volts			CSMUX
Fire Alarm/ShutDown	Enable				FSD
Cond. Water Flow Switch	Yes				CDWF
Remote Occupancy	Disable				ROCC
Duct High Press. Switch	Normal				DHS
Entering Water Temp.	69.9	dF			EWT
Compressor 1 Relay	Stop				CMP1
Compressor 2 Relay	Stop				CMP2
Compressor 3 Relay	Stop				CMP3
Compressor 4 Relay	Stop				CMP4
Supply Fan/VFD	Stop				SF
VFD Speed Signal	0	%			SPEED
Non Critical Fault	Off				WARN
Critical Fault	Off				ALARM
Mixed/Return Air Temp	77.2	dF			MA_RA
Dirty Filter Status	Clean				FLTS
Phase Loss Protection	Normal				PHASE
Ext. Supply Air Reset	0	dF			RESET
Water Econ. FreezeStat	Normal				FREEZ
Space_Reset Sensor	79.2	dF			SPT
VFD Bypass Enable	Disable				BYPAS
Head Pressure(Comp1)	118.76	PSIG			PRES
Ventilation Request	Close				VENTR
VAV Terminals Control	No				TRMCT
2-position/Econo Valve	0	%			ECONO
Reverse/Head Press Ctrl	100	%		Control	MVLV
Hot Water Valve	0	%			HWV
Heat Interlock Relay	Off				HIR
Bypass Start_Stop	Stop				BPS_S
VAV Terminals Open MAX	Close				TRMOP
OMNIZONE::HWP33-64:					
Hardware points table 2					
Cooling Tower Sump Temp.	57.5	dF			TWR
Building Static Milliamp	12.51	ma			BSP
Condenser Leaving Water	70.3	dF			LWT
Indoor Air Quality	587.21				IAQ
Indoor Relative Humidity	49.7	%			IRH
Outdoor Air Temp.	76.1	dF			OAT
Heat Stage 1	Off				HEAT1
Heat Stage 2	Off				HEAT2
Heat Stage 3	Off				HEAT3
Heat Stage 4	Off				HEAT4
Pump Request	Off				PUMP
Cooling Tower Request	Off				TOWER
Exhaust Fan	0	%			EXH
Ext. Dehumidification	Stop				DEHUM

Table 9 — Software Points

DESCRIPTION DISPLAY SCREENS	VALUE	UNITS	STATUS	FORCE	NAME
OMNIZONE::SWP65-96:					
Software Points					
Compressor 1 Status	Off				CLO1
Compressor 2 Status	Off				CLO2
Compressor 3 Status	Off				CLO3
Compressor 4 Status	Off				CLO4
Bypass Acc Panel Secure	No				BP_SAFE
DX VAVRESET control	0	dF			VAVRESET
Factory/Field Test	Stop				FLDTST
Building Static Pressure	0.03	in H2O			BSP_IN
Time Clock	Off				TIMCLOCK
Cooling	Disable				COOLOK
Supply Fan Status	Off			Control	SFS
Ok to run Fan	No				OKFAN
OK Fan + Sup. Fan Stat	FALSE				SF_SFS
Fan + Cond. Water Flow	FALSE				FAN_CDWF
Equipment Mode	Cool			Control	MODE
Activate Evacuation Mode	Disable				EVAC
Space Control Point	74	dF			CTRLPT
Mod. Econ Enabled	No			Control	ECON_OK
Head Pressure Control	Disable			Control	HEAD
Economizer Control Temp.	77.22	dF			ECONPT
Compressor Cooling	Disable				COMPRES
Duct Static Failure	Normal				DSP_ALM
Compressor 1 Alarm	Normal				C1_ALM
Compressor 2 Alarm	Normal				C2_ALM
Compressor 3 Alarm	Normal				C3_ALM
Compressor 4 Alarm	Normal				C4_ALM
Cond. Flow Alarm Status	Disable			Control	CDWF_ST

Table 10 — Configuration Parameters

DESCRIPTION	VALUE	UNITS	NAME
Compressor Stages	2.00		NUM_CMP
Reset Ratio	3.00	dF	RSET_RTO
CDWF 0=NO,1=YES	0.00		CDFW_SWT
ECON 0=NO,1=YES	0.00		EWT_SNS
EWT Reset 0=NO,1=YES	1.00		EWT_RST
MOD.VLV 0=NO,1=YES	0.00		MOD_ECON
0=CONST.,1=VARIABLE	0.00		FLOW_TYP
0=RAT,1=MAT 2=NONE	2.00		MARA_SNS
PHASE 0=NO,1=YES	0.00		PHAS_SWT
FREEZ 0=NO,1=YES	0.00		FREZ_SWT
ENABLE ECON.	68.00	dF	ECON_SET
SPT 0=NO,1=YES	0.00		SPT_SNS
PRES 0=NO,1=YES	0.00		PRES_SNS
TWR 0=NO,1=YES	0.00		TWR_SNS
LWT 0=NO,1=YES	0.00		LWT_SNS
IAQ 0=NO,1=YES	0.00		IAQ_SNS
IRH 0=NO,1=YES	0.00		IRH_SNS
BSP 0=NO,1=YES	0.00		BSP_SNS
BSP Range	1.00	in H2O	BSP_RNG
BSP LOW VALUE	–0.50	in H2O	BSP_LOW

LEGEND

BSP — Building Static Pressure
CDWF — Condenser Water Flow
ECON — Economizer
EWT — Entering Water Temperature
IAQ — Indoor Air Quality
IRH — Indoor Relative Humidity
LWT — Leaving Water Temperature
MAT — Mixed Air Temperature
RAT — Return Air Temperature
SPT — Space Temperature

Set Controller Address — To set the address of the OMNIZONE™ System Control panel controller, perform the following procedure:

1. Press 7 and then SRVC. Press ENTER and then EXPN/EDIT .
2. Type in the CCN element number and press ENTER .
3. Press the ▼ button. Type in the CCN bus number and press ENTER .

Log Off from Controller — To log off from the OMNIZONE System controller Press 3 and then SET. The controller password will be displayed.

1. Press ENTER . The display should show:
   Log in to Controller
   Logged in
   If this is not displayed, Press EXPN/EDIT until it is displayed.
2. Press the ▼ button. The LID display will show:
   Log out of Controller
   Press 1. Press ENTER to log off.

OPERATION

Occupancy Determination — The OMNIZONE™ controller can determine occupancy in many ways. Local occupancy is determined by either a local schedule contained in the CC6400 controller, the use of the ROCC discrete input point or by setting the Local/Off/Remote switch to Local. In order for the CC6400 schedule or ROCC point to function the Local/Off/Remote switch must be set to Remote.

When the OMNIZONE unit is connected to a Carrier Comfort Network and the Local/Off/Remote switch is set to Remote, the controller occupancy can be determined by a Network Group schedule, a Network Global schedule, or via Linkage from a linkage device such as a ComfortID™ linkage master.

Fan Control — All Variable Air Volume (VAV) units have a Variable Frequency Drive (VFD) to provide variable fan motor speed and thus variable airflow. Fan control turns the fan on and off based on unit operating mode, and controls fan speed to maintain a particular duct static pressure at a Duct Static Pressure Sensor (DSP). The objective is to maintain a reasonably constant supply-air exit velocity at VAV system outlet grilles, regardless of damper opening positions. The duct static pressure sensor is field-installed about $^2/_3$ of the way toward the "far end" of the ductwork. A High Duct Static Switch (HDS) provides protection by shutting the fan down if the duct static pressure exceeds a maximum setting.

For the 50XJ unit, a VFD interface display is mounted in the front of the unit. A number of user-adjustable features can be entered/changed using the keypad on the display. These features described in detail in the Variable Frequency Drive Control section.

Sequence of Operation — The following control sequence of operation for the 50XJ,BV unit describes the various sequences that occur depending upon the way an operation is triggered and which software control points are involved.

SUPPLY FAN — The Supply fan can be activated in any of the following ways:

- Unoccupied space or return air temperature demand.
- Unoccupied Linkage demand.
- Local Time Schedule (TIMCLOCK software point).
- Remote Occupancy (ROCC software point).
- By placing the remote-off-local switch in the local mode.
- Enabled by Schedule.

Once one of the above conditions exists, either TIMECLOCK or ROCC indicates ON or Enable. The software point OKFAN will turn on followed by the points TRMCT for air terminal control and PUMP and TOWER to request condenser water flow and temperature control. Approximately 20 to 30 seconds later the supply fan (SF) point will turn ON and the VFD output SPEED will increase. The SPEED point will output a signal, determined by a PID calculation, based on the duct static pressure DSP input and the Supply Static Pressure set point in SETPT05.

Once the supply fan is running and the static pressure increases above the Supply fan status set point in SETPT01, the supply fan status point (SFS) will indicate ON and the software point SF_SFS will indicate TRUE.

Enabled By Unoccupied Demand — A software point "Space Control Point" will display the current value of the sensor used to determine unoccupied demand. The EWT sensor provides this function for the 50BV unit. The display is based on the sensors installed and the configuration of these sensors in the custom configuration, or the status of linkage.

If the Return/Mixed air sensor is in the mixed airstream and configured as such and there is no Space temperature sensor installed and no Linkage, the Space Control Point will display a default value of 75 F, which is above the default occupied cooling set point and below the unoccupied cooling set point. If this condition exists, supply air reset from a sensor and unoccupied unit operation will not occur.

If the unit is configured to use a sensor for the Space Control Point or if Linkage is active and the space has unoccupied demand, the software point OKFAN will turn on followed by the points TRMCT for air terminal control and PUMP and TOWER to request condenser water flow and temperature control. Approximately 20 to 30 seconds later the SF point will turn ON and then the VFD output SPEED will increase. If unoccupied demand is the reason the fan is on, a control force will appear next to the OKFAN point. Otherwise there should not be a force on that point.

If the fan is running due to unoccupied heating or cooling demand, either the space temperature (if installed), return air temperature or average linkage temperature must rise or drop to within half way between the occupied and unoccupied set points in order for the fan to turn back off.

Enabled by Switching to Local Mode — When the switch is placed in the local mode the ROCC point will indicate enable. If ROCC is ENABLED a software routine will override the occupancy schedule so that TIMECLOCK will also turn on. When ROCC is turned off the TIMECLOCK point will turn off within 60 seconds.

Supply Fan Shutdown — If the unoccupied demand is satisfied and TIMECLOCK and ROCC are off and disabled, OKFAN will turn off, SF_SFS will turn off, Tower and PUMP will turn off, and then 5 minutes later the SF point will turn off and the VFD speed will go to 0%.

During the 5-minute delay, the cooling and heating routines become disabled. This delay allows a compressor that may have just started to run for its 5-minute minimum on time with the supply fan on. For example, if the staging routine had just started Compressor 3 at the time the OK_FAN point changed to OFF, the cooling routine would become disabled and compressors 1 and 2 would shut off right away. Compressor three would continue to run for its minimum on time of 5 minutes. The fan continues running until all compressors meet the minimum on time and run with a load, preventing them from shutting down due to a safety.

Supply Fan operation with Optional Bypass (50XJ) — If the optional VFD Bypass is installed and the Bypass switch has been turned to Bypass, and the access panel is in place, the software point Bypass access panel secure BB_SAFE has been turned to ON, and the unit operation switch has been placed back in local or remote, then the bypass start stop point BPS_S will follow the SF point when it turns on and off. The terminal open point TRMOP will go on with the TRMCT point before the fan starts.

COMPRESSOR COOLING — If the fan is on and there is no demand for Heat, the equipment mode (MODE) will be COOL, and Cooling (COOLOK) will switch to ENABLE.

If the unit is configured for variable flow the Reverse/Head Pressure CTRL valve will open (otherwise it will already be open), and if there is condenser water flow (CDWF is YES), then the Fan + Condenser water flow point will become TRUE and the Compressor Cooling (COMRES) point will switch to Enable.

COMRES triggers the compressor staging routine that controls the number of compressors energized. Units are equipped with 4 compressors piped in separate refrigerant circuits, and staged On/Off in a fixed sequential manner (compressor no. 1 through compressor no. 4). The compressor control routine uses a PID calculation to determine the percentage of cooling required, from 1 to 100%. Demand for the PID calculation is determined from the supply air temperature and the supply air set point (SETPT06).

Compressor cooling (COMPRES) will be turned off for any of the following reasons:

- There is no condenser water flow (CDWF is Off).
- Economizer Freezestat (FREEZ) has been in alarm for more than 15 minutes.
- MODE changes to heat.
- OK-FAN turns off during normal shut down.
- During normal compressor operation the minimum on time is 5 minutes and the minimum off time is 5 min.

ECONOMIZER COOLING (50XJ) — The unit diverts condenser inlet water flow through an optional economizer coil to precool evaporator entering airflow. This occurs when there is demand for the cooling, and the temperature at an Entering Water Temperature (EWT) thermistor is colder than the economizer start set point. Waterflow is controlled via two electronic water flow valves. This option also incorporates an Economizer Freeze Switch (EFS), located at the inlet of the economizer coil.

Economizer water flow is in series with the condensers allowing compressor operation while the economizer is operating.

If the Fan is on, and there is no demand for heat then the equipment mode (MODE) will be COOL and Cooling (COOLOK) will switch to ENABLE.

If the unit is configured for variable flow the Reverse/Head Pressure CTRL valve will open (otherwise it will already be open), and if there is condenser water flow (CDWF is YES) then the Fan + Condenser water flow point will become TRUE.

If the entering-water temperature is below the Economizer start set point in the configuration parameters table (Table 10), then the Mod. Econ Enabled point (ECONOK) will change to enable and the Economizer valve will modulate open to lower the Economizer control temp to the supply air set point (SETPT06) temperature. The economizer modulation is controlled by a PID loop and the Reverse/Head pressure control valve will modulate in reverse of the Economizer valve using the formula MVLV = 100 – ECONO.

ECONOMIZER COOLING (50BV) — The unit diverts condenser inlet waterflow through an optional economizer coil to precool evaporator entering airflow. If the entering-water temperature is colder than the setting on the Aquastat, and the return-air temperature is warmer than the setting on the return air thermostat, the two-position diverting valve will direct water to the economizer coil.

Economizer water flow is in series with the condensers allowing compressor operation while the economizer is operating.

COOLING RESET (50XJ) — The controller can reset the supply air set point using these three methods:

- An external 0 to 10 volt input RESET
- The value of the space control point
- Linkage

The external 0 to 10 volt input reset is configured to produce a 0 to 20 degree supply air reset over the 2 to 10 volt range. If more than 1.8 volts is sensed on the input, this method of reset takes priority over other methods.

NOTE: The reset from all methods may be limited to 10 F or 15 F by changing the high end point of the custom voltage input from the default (20 F) to 15 F or 10 F.

Either the return air or a space temperature sensor will be used as the space control point. If this variable goes below the Occupied High set point in the HEAT/COOL MODE AND RESET set point (SETPT03), then for each degree that the Space control point is below the set point value the supply air set point will be reset by the value configured in the custom configuration RESET RATIO.

If Linkage is active, for each degree that the average occupied space temperature is below the average occupied cool set point, the supply air set point will be reset by the amount configured in the RESET RATIO. Reset will be limited to the maximum value the custom voltage input RESET can display.

COOLING RESET (50BV) — The 5k ohm temperature sensor will be used as the space control point. If this variable goes below the Occupied High set point in the HEAT/COOL MODE AND RESET set point (SETPT03), then for each degree that the Space control point is below the set point value the supply air set point will be reset by the value configured in the custom configuration RESET RATIO.

HEATING (50XJ) — The controller is configured to control two types of heat:

- A modulating 4 to 20 mA output Hot Water Valve (HWV) in the base unit, wired to the second module.
- Four stages of staged heat wired to a third, accessory module (PCB3).

For either method of heat to function, a space control point must be configured in the custom configuration. This control point comes from a return air sensor or space sensor, or from the average space temperature received through linkage.

Whenever the space control point is below the occupied or unoccupied heat set point the mode will change to heat and if unoccupied the fan will be started. For linkage, this occurs if the average space temperature is below the appropriate average heat set point.

Both heat control routines use a PID to calculate a supply air set point that will satisfy the heat demand in the space. The modulating output and the staged outputs will both operate at the same time to control an attached heat source, such as steam valves or electric heaters, to provide the supply-air temperature required.

The heat mode changes back to cool when the space control point is back above the occupied heat set point. For linkage, the mode changes back to cool when the average space temperature is back above the average occupied heat set point.

When unoccupied heat is enabled the fan will be stopped and the heat turned off when the space control temperature is more than halfway above the difference between the occupied heat set point and the unoccupied heat set point. For example, if the occupied heat set point is 70 and the unoccupied heat set point is 60 the unit will come on for unoccupied heating below 60 F and turn off again above 65 F. The average occupied and unoccupied set points are used when linkage is active.

HEAD PRESSURE CONTROL (HPC) (50XJ) — In installations where entering water temperature can fall below 55 F, where a water economizer (described above) is not installed, the HPC provides 1 or 2 electronic water flow control valves to vary flow to the condensers. Controlling the water flow maintains compressor discharge pressure above a minimum value, ensuring sufficient refrigerant flow out of the condenser and throughout the refrigerant circuit. Refrigerant pressure is measured at compressor circuit no. 1 by a Discharge Pressure Sensor (DPS).

Units not equipped with a water economizer can be ordered with the reverse/head pressure control valve factory installed and a pressure transducer located in the discharge line of compressor no. 1.

When the condenser water temperature gets low enough to cause the head pressure to drop, the valve will be modulated to control the head pressure of all four compressors by varying the water flow through the condensers.

When the unit is operating and the COOLOK software point is enabled and the EWT gets below 60 F, the Head software point will become enabled and the head pressure control valve will modulate to keep the head pressure at the head pressure set point (SETPT04). The default set point is 225 PSI and may be set from 200 to 250 PSI. The minimum output value for the head pressure control algorithm is 40% in order to maintain a minimum flow through the condensers. The valve will modulate between 40 and 100%. Do not set the minimum lower than 40% or the compressors may shut down due to low flow, resulting in the high-pressure switch tripping.

VENTILATION REQUEST (50XJ) — The ventilation request output will close a set of relay contacts to activate a ventilation damper whenever the supply fan and supply fan status are both true and the TIMECLOCK software point is on.

VAV TERMINAL OPERATION OUTPUT (50XJ) — The VAV terminal control output (TRMCT) closes a set of relay contacts to indicate to non-Carrier air terminals that the fan is either forced on or is going to turn on. This signals the terminals to open and start controlling to the desired CFM and Temperature set points.

VAV TERMINAL OPEN OUTPUT (50XJ) — The VAV terminal open output (TRMOP) closes a set of relay contacts to command the air terminals to open to maximum CFM at times when the fan is operating on the VFD Bypass.

PUMP AND TOWER OUTPUTS (50XJ) — The pump and Tower outputs close a set of relay contacts to indicate that the 50XJ unit is in operation and may require condenser water flow through the unit.

BUILDING PRESSURE CONTROL (50XJ) — The building pressure control output provides an analog 4 to 20 mA signal to control return fan or exhaust fan speed. Fan speed is modulated to maintain the building static pressure set point (SETPT07).

The control parameters for the building pressure set point and building pressure are read and controlled in milliamps but are converted to inches of water for ease of setting and display. The range and low start values of the sensor selected should be configured in the custom configurations screen. The raw sensor value in milliamps will be displayed on the hardware point BSP. The converted sensor reading in inches of H_2O will be displayed at the software point BSP_IN. The set point input in SETPT07 in inches of H_2O is converted to a raw milliamp set point in SETPT08. The algorithm controls to the milliamp values since the math required for control using the static pressure in inches generates numbers too small to be used given the range of the controller configuration parameters.

Diagnostic Features — The CC6400 provides a number of features to help protect the unit and allow problem diagnosis.

CRITICAL FAULT — The controller provides an output (for field connection) to signal an external building systems monitor or control that the unit is not operating properly and has shut down. A red light mounted on the front of the unit provides visual indication of this alarm condition.

NOTE: If the Local/Off/Remote switch is in the OFF position, it is normal for the red alarm light on the display panel to be lit, indicating that the unit is disabled.

NON-CRITICAL FAULT — The controller provides an output for a yellow light, mounted on the front of the unit, that indicates the need for minor maintenance or service.

FIRE INPUT (FSD) — This is a normally closed input, which when opened, deenergizes an isolation relay in the unit, opening the input to the controller. When this input turns On, all control outputs are immediately turned Off, including the fan. Unit reset requires manual resetting at the main controller keypad.

DUCT HIGH STATIC INPUT (DHS) — This air switch provides backup protection for the ductwork. It is factory installed in the unit, wired to the unit main controller to receive 5 vdc. It is a normally open discreet switch, with adjustable manual setting at the switch (range is 1 to 5 in. wg). Upon switch closure, the controller immediately turns all outputs Off, including fan, and then indicates an alarm both by turning On its Alarm Output, Red Alarm light and via communications.

DIRTY FILTERS SWITCH (DFLTS) (50XJ) — This switch measures the change (delta) in air pressure across the filters. When the delta increases beyond the preset setting, a yellow warning light will be lit, indicating that the filters need cleaning or replacement.

The switch receives 5 vdc from the unit controller and monitors air pressure delta across the return air filters. Switch is normally open, with manually adjustable setting at the switch between 0.5 and 1.5 in. wg. Upon closure, controller should wait to assure closure for minimum 1 minute, then indicate an alert via its non-critical alert output and via communications. All other unit operation should remain normal.

COMPRESSOR OVERLOAD (COL)/SAFETIES — Each compressor circuit is provided with a temperature overload board (Copeland Protector Bd.), a Current Overload/Sensor Board (COL), High Pressure Switch (HPS), Low Pressure Switch (LPS), and Evaporator Freeze Switch (EFS). These devices are wired in series to the contactor for each compressor. Each such circuit is then wired through a common resistor board; such that any one or more input(s) to the main controller allows it to discern which compressor is not operating when it should be.

The Current Overload Board (COL) is located in the unit control box, wired in the control power line for the compressor pilot relay (which drives the compressor contactor), and incorporates a current loop which monitors one leg of the compressor power leads. This board is powered along with the related compressor contactor.

Whenever the compressor current falls below a threshold level (i.e., compressor not operating), it activates an on-board relay which opens power to the compressor pilot relay (i.e., compressor contactor), and turns On a control power feedback line to the unit controller, via the resistor board (described above). Any one of the safety switches described herein will cause this event. In the event this occurs, the controller shall turn OFF this compressor, and start the next compressor in sequence. After a 5-minute period, the controller shall restart this compressor, and turn the other one off, as cooling demand requires. If the 'problem' compressor then operates for 10 minutes of run time normally, the unit reverts to normal operation and compressor sequencing. If not, and the same error occurs again, this compressor shall be shut down and replaced with the next compressor, as before, and held off for 10 minutes. It shall then be restarted and the other compressor shut down, as before. If it does not run successfully for 10 minutes of normal run time again, it is shut down and replaced a third time. This time it is held off for 15 minutes. If the "problem" compressor does not operate successfully for the 10 minutes of normal run time this third time, this compressor ONLY is shut down and locked out for servicing. Alarm output (Red light) flashes and then remains on.

HIGH-PRESSURE SWITCH (HPS) — This switch is located in the discharge refrigerant line of each compressor, and is set to open at pressures above 360 psig. It is wired in the 115 vac control power line of the compressor contactor (in series with the LPS and EFS), and activates the COL board (above) when it opens.

LOW-PRESSURE SWITCH (LPS) — The Low-Pressure Switch is located in the suction refrigerant line of each compressor, and is set to open at pressures below 27 psig. It is wired in the 115 vac control power line of the compressor contactor (in series with the HPS and EFS), and activates the COL board (above) when it opens.

EVAPORATOR FREEZE SWITCH (EFS) — This is a thermal disk type switch, mounted on a return bend of the evaporator, refrigerant circuit for which corresponds to each respective compressor, and is set to open at temperatures below 28 F. It is wired in the 115 vac control power line of the compressor contactor (in series with the HPS, and activates the COL board (above) when it opens.

COPELAND PROTECTOR BOARD — This board is provided with each compressor, installed in the terminal box, since these compressors do not have internal current protection. This board activates at an overtemperature setting, and locks out operation of the compressor for 30 minutes; there is no method to over-ride or reset this timer. Due to this timing function, please note that the compressor will not attempt to restart until the third attempt described above.

ALARMS — Alarms can be provided via 4 methods; Unit mounted Alarm Light (Red and Yellow), Keypad Display, Network Communications, or a discreet Alarm Output to the Field Low Voltage Terminal Strip. This field output circuit includes an isolation relay and dry contacts. Alarms are covered in detail in the Troubleshooting section.

50XJ Variable Frequency Drive Control — The variable frequency drive is factory wired and programmed for proper operation with the unit controls; no installation or service adjustments are normally required. There is an interface display for the VFD, independent of the main control display, mounted on the front of the 50XJ unit.

The VFD default conditions at unit power up are: "AUTO" run mode, "REMOTE" speed control, and "OFF" in the LED display. When the fan is operating, the LED displays the output frequency in Hz.

OPERATING KEYPAD — The keypad allows users to enable or disable the keypad, input commands from the keypad, and monitor drive operation. Fig. 6 shows the operating panel keypad layout and the locations of the keys and display LEDs.

The 7-character LED displays various values, depending upon what mode is running.

- In Standard Monitor mode: the LED displays the current output frequency.
- In Status Monitor mode: monitors the status conditions and frequency command value setting.
- In Setup mode: displays setup parameter titles and values.
- In Program mode: displays parameter group titles, individual parameter names, and parameter values.
- During a trip: displays the trip title.

The appropriate local/remote LED, which is inset into the speed control key, is lit when the unit is in Local or Remote mode.

The appropriate manual/auto LED, which is inset into the run mode key, is lit when the unit is Manual or Auto mode.

When numeric data is shown on the LED display, the corresponding unit indication LED will be lit. If no unit indication LED is lit, the current data has no unit or the corresponding unit does not exist on the display panel.

KEY FUNCTIONS — Refer to Table 11 for the functions of each key on the keypad.

NON-TRIP MESSAGES — Non-trip messages are those that may be displayed but do not cause a trip and are not recorded in the fault history. Table 12 lists the non-trip messages with their explanations.

TRIP MESSAGES — Trip messages and their causes are shown in Table 13.

CLEARING A TRIP — A trip clear can be performed after the cause of the trip has been removed. To perform a trip clear, either switch off power to the inverter or use the following procedure:

Press Stop/Reset. The display will show: CLr. Press Stop/Reset again. The display will show: 0.0, indicating that the trip is cleared and the display will return to Standard Monitor mode.

If any key other than the STOP/RESET key is pressed at the trip clear command prompt, the trip clear command is aborted and the display returns to Standard Monitor mode (where the trip title will be displayed flashing).The trip clear command does not clear the recorded past faults.

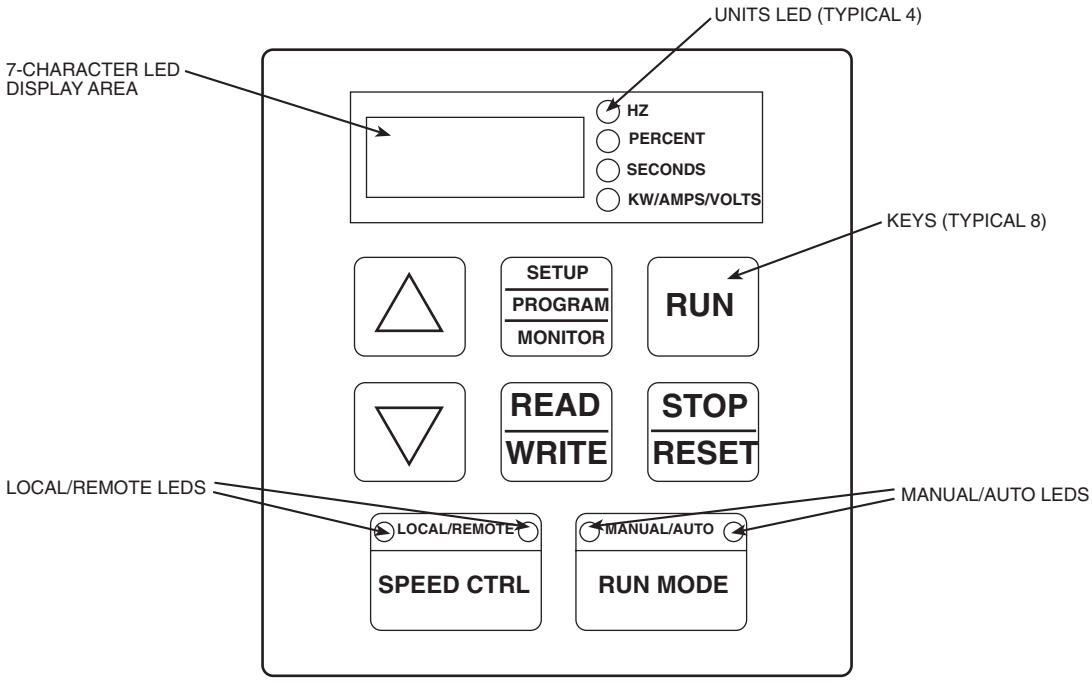


Fig. 6 — 50XJ VFD Display Keypad

STATUS MONITOR MODE — In Status Monitor mode, it is possible to monitor the VFD status (frequency command, output voltage, current, terminal information, etc.). Status monitor mode is entered by pressing the Setup/Program/Monitor key, then selecting MON at the mode selection menu and pressing the Read/Write key. Table 11 details the procedure for entering status monitor mode (from standard monitor mode) and viewing all the monitored status variables. The present output frequency (which, just after power is applied, is 0.0) is displayed. (If the ST-CC terminals are not shorted, OFF will be displayed).

If either ▲ or ▼ is pressed continuously, every 0.5 sec the next/previous item will be displayed. As optional points, RUN, STOP, displaying the frequency status, and switching to local/remote and manual/auto modes can be performed.

MANUAL MODE — To override the automatic unit controls and manually operate the fan from the VFD display, press keys for "MANUAL" run mode, "LOCAL" speed control, and press the Up or Down arrow keys to increase or decrease output frequency.

Table 11 — Keys and Functions for 50XJ VFD

KEY	FUNCTION
○ LOCAL/REMOTE ○ SPEED CTRL	Local/Remote Key Switches the source of frequency command information from panel/terminal block. The appropriate LED is lit to indicate local or remote frequency command.
○ MANUAL/AUTO ○ RUN MODE	Manual/Auto Key Switches the source of run/stop command information from panel/terminal block. The appropriate LED is lit to indicate manual or auto run/stop command.
SETUP PROGRAM MONITOR	Setup/Program/Monitor Key Toggles between Setup, Program, Monitor, and Frequency Mode.
READ WRITE	Read/Write Key Mode, group, parameter, data, and frequency selection key. This key is used to select or enter a parameter value, a frequency command, or a group name.
▲	Up Key Scrolls up the setting of the currently displayed parameter. If the key is held down, the scrolling speed gradually increases. Only RAM values are changed. Also toggles to other function group entries. Pushing Read/Write key saves the setting.
▼	Down Key Scrolls down the setting of the currently displayed parameter. If the key is held down, the scrolling speed gradually increases. Only RAM values are changed. Also toggles to other function group entries. Pushing Read/Write key saves the setting.
RUN	Run Key This key is used to start a RUN command (only valid when in manual control mode).
STOP RESET	Stop/Reset Key Functions as the STOP key and emergency stop key during local operation. Functions as the RESET key when an inverter trip occurs. In all other modes, emergency off is engaged when this key is pressed twice.

Table 12 — VFD Non-Trip Messages for 50XJ Unit

LED MESSAGE	EXPLANATION
OFF	Displayed whenever the ST-CC connection is open.
pOFF	Displayed when the VFD control power supply voltage is too low.
nOFF	Displayed when the VFD's main DC bus voltage is low.
rtrY	Auto-restart message: alternately displayed with the output frequency whenever the VFD tries to automatically restart after a non-critical trip.
Err1	Displayed when 2 frequency points (F-P1,F-P2,etc.) are set too close to each other.
CLr	Displayed during a pending clear command (after the STOP/RESET key has been pressed ONCE after a trip).
EOFF	Displayed during a pending emergency off command (after the STOP/RESET key has been pressed ONCE when in terminal control mode).
CtrL	Displayed during a pending coast stop command (after the Local/Remote key has been pressed once when in local control mode while the VFD is running).
HI	This maximum value warning message "HI" will be alternately displayed in the data field of a parameter when an attempt is made to increase the setting value greater than the parameter's maximum value.
LO	This minimum value warning message "LO" will be alternately displayed in the data field of a parameter when an attempt is made to decrease the setting value less than the parameter's minimum value.
PASS	Displayed if the correct password is entered at the password prompt.
Err	Displayed if an incorrect password is entered at the password prompt.
E1	Displayed when the VFD attempts to display a number that exceeds four numerical digits.
db	Displayed when DC injection braking is being executed.
dbon	Displayed when motor shaft stationary control is being executed.
FJOG	Displayed when in forward JOG mode.
rJOG	Displayed when in reverse JOG mode.
L	VFD/motor overload pre-alarm display.
C	Overcurrent pre-alarm display.
P	Overvoltage pre-alarm display.
H	Overheat pre-alarm display.
t	Option board communication alarm display.
Inlt	Displayed when the VFD is initializing values during resetting/power-up.

Table 13 — VFD Trip Messages for 50XJ Unit

LED MESSAGE	EXPLANATION
nErr	Displayed in the trip history in standard monitor mode when no trip has been recorded since the last VFD reset or trip clear.
OC1	Overcurrent during acceleration trip
OC2	Overcurrent during deceleration trip
OC3	Overcurrent during normal (constant speed) run trip
OC1P	Overcurrent in DC section during acceleration trip
OC2P	Overcurrent in DC section during deceleration trip
OC3P	Overcurrent in DC section during normal (constant speed) run trip
OCL	Load end over current trip detected at start-up (output terminals, motor wiring, etc.)
OCA1	U-phase short circuit trip detected at start-up
OCA2	V-phase short circuit trip detected at start-up
OCA3	W-phase short circuit trip detected at start-up
OP1	Overvoltage during acceleration trip
OP2	Overvoltage during deceleration trip
OP3	Overvoltage during normal (constant speed) run trip
OLIn	VFD overloaded trip
OLnt	Motor overloaded trip
OCr	Dynamic braking resistor overcurrent trip
OLr	Dynamic braking resistor overload trip
OH	Inverter overheat trip
E	Emergency off trip message. Displayed after the STOP/RESET key has been pressed once when in Auto Control mode, or press STOP/RESET key twice within one second in Manual control mode.
EEP1	EEPROM failure during write cycle
EEP2	EEPROM abnormality during initial reading
Err2	RAM error
Err3	ROM error
Err4	CPU error
Err5	Communication interruption error
Err6	Gate array error
Err7	Output current detection circuit error
Err8	Option PCB error trip
Err9	Option ROM error
UC	Low operating current trip
UP1	Main circuit undervoltage trip
Ot	Overtorque trip
EF1	Software detected earth fault trip
EF2	Hardware detected earth fault trip
Etn	Auto-tuning error
EtYP	Inverter typeform and EEPROM typeform mismatch error
dANP	Damper trip. When damper function is selected, and damper is closed while the motor is running.
LOSS	IV analog input loss. Valid when LA15 = 3 and frequency command is selected from IV analog input terminal.

LEGEND

CPU — Central Processing Unit
IV — Analog Input Terminal
PCB — Printed Circuit Board
RAM — Random Access Memory
ROM — Read-Only Memory
U-phase — Phase 1 Output (T1)
V-phase — Phase 2 Output (T2)
W-phase — Phase 3 Output (T3)

Table 14 — VFD Mode Summary for 50XJ Unit

KEY OPERATON	LED MESSAGE	EXPLANATION
—	0.0	Standard monitor mode
S/P/M	SEtP	Switch to mode selection menu.
S/P/M	PrG	Program mode.
S/P/M	non	Select Status Monitor mode title with U/D keys.
R/W	Fr-F	Enter Status Monitor mode by pressing R/W. First monitor item (motor run direction) is displayed.
DOWN	60.0	Pressing UP/DOWN views next/previous status variable. Frequency command value displayed (monitor #1)
DOWN	C 0	Load current (%) monitor (monitor #2)
DOWN	Y 228	Input voltage (V) monitor (monitor #3)
DOWN	P 0	Output voltage (V) monitor (monitor #4)
DOWN	A....	Input terminal status monitor
DOWN	b....	Input terminal status monitor
DOWN	O....	Output terminal status monitor
DOWN	t0.00	Total RUN time monitor
DOWN	OC1	Past trip #1 monitor
DOWN	OC2	Past trip #2 monitor
DOWN	OC3	Past trip #3 monitor
DOWN	nErr	Past trip #4 monitor
DOWN	Fr-F	Return to the top menu item

50BV Variable Frequency Drive Control — The variable frequency drive is factory wired and programmed for proper operation with the unit controls; no installation or service adjustments are normally required.

The VFD default conditions at unit power up are: "0.0 Hz" in the LED display. When the fan is operating, the LED displays the output frequency in Hz.

OPERATING KEYPAD — The keypad allows users to enable or disable the keypad, input commands from the keypad, and monitor drive operation. Fig. 7 shows the operating panel keypad layout and the locations of the keys and display LEDs.

The 4-character LED displays various values, depending upon what mode is running.

- In Standard Monitor mode: the LED displays the current output frequency.
- In Status Monitor mode: monitors the status conditions and frequency command value setting.
- In Setup mode: displays setup parameter titles and values.
- During a trip: displays the trip title.

The appropriate local/remote LED, which is inset into the speed control key, is lit when the unit is in local or remote mode.

KEY FUNCTIONS — Refer to Fig. 8 for the functions of each key on the keypad.

NON-TRIP MESSAGES — Non-trip messages are those that may be displayed but do not cause a trip and are not recorded in the fault history. Table 15 lists the non-trip messages with their explanations.

TRIP MESSAGES — Trip messages and their causes are shown in Table 16.

CLEARING A TRIP — A trip clear can be performed after the cause of the trip has been removed. To perform a trip clear, either switch off power to the inverter (keep VFD off until charge LED turns off) or use the following procedure:

Press STOP. The display will show: CLr. Press STOP again. The display will show: 0.0, indicating that the trip is cleared and the display will return to Standard Monitor mode.

If any key other than the STOP key is pressed at the trip clear command prompt, the trip clear command is aborted and the display returns to Standard Monitor mode (where the trip title will be displayed flashing). The trip clear command does not clear the recorded past faults.

STATUS MONITOR MODE — In Status Monitor mode, it is possible to monitor the inverter status (frequency command, output voltage, current, terminal information, etc.). Status monitor mode is entered by pressing the MON key until the monitor LED is lit. The present output frequency (which, just after power is applied, is 0.0) is displayed. (If the ST-CC terminals are not shorted, OFF will be displayed.)

If either ▲ or ▼ is pressed continuously, every 0.5 sec the next/previous item will be displayed. As optional points, RUN, STOP, displaying the frequency status, and switching to local/remote and manual/auto modes can be performed.

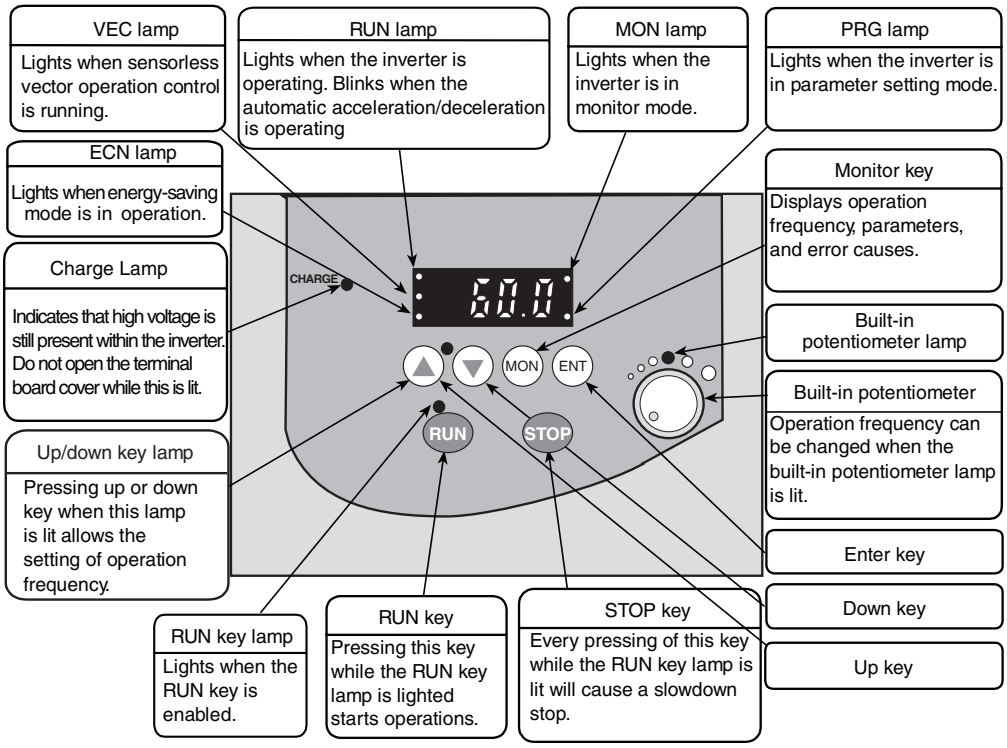


Fig. 7 — 50BV VFD Display

ALL OF THE BASIC PARAMETERS CAN BE SET BY THE SAME STEP PROCEDURES.

[STEPS IN KEY ENTRY FOR BASIC PARAMETERS]

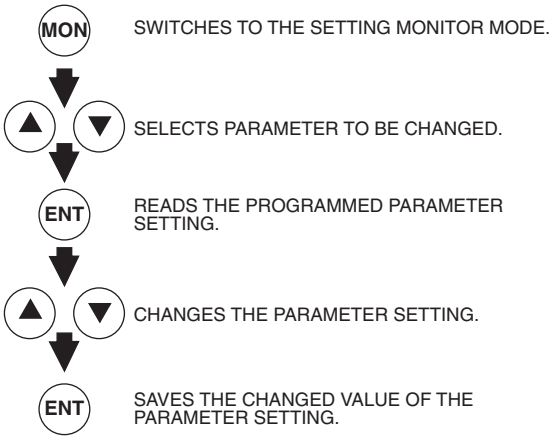


Fig. 8 — 50BV VFD Display Function Keys

Table 15 — Non-Trip Messages for the 50BV VFD

ERROR CODE	PROBLEM	POSSIBLE CAUSES	REMEDIES
OFF (Note 1)	ST terminal OFF	• The ST-CC circuit is opened.	• Close the ST-CC circuit.
NOFF	Undervoltage in main circuit	• The supply voltage between R, S and T is under voltage.	• Measure the main circuit supply voltage. If the voltage is at a normal level, the inverter requires repairing.
rtrY	Retry in process	• The inverter is in the process of retry. • A momentary stop occurred.	• The inverter is normal if it restarts after several tens of seconds. The inverter restarts automatically. Be careful of the machine because it may suddenly restart.
Err1	Frequency point setting error	• The frequency setting signals at points 1 and 2 are set too close to each other.	• Set the frequency setting signals at points 1 and 2 apart from each other.
CLr	Clear command acceptable	• This message is displayed when pressing the STOP key while an error code is displayed.	• Press the STOP key again to clear the trip.
EOFF	Emergency stop command acceptable	• The operation panel is used to stop the operation in automatic control or remote control mode.	• Press the STOP key for an emergency stop. To cancel the emergency stop, press any other key.
HI/LO	Setting error alarm / An error code and data are displayed alternately twice each.	• An error is found in a setting when data is reading or writing.	• Check whether the setting is made correctly.
db	DC braking	• DC braking in process	• Normal if the message disappears after several tens of seconds. (See Note 2.)
In It	Parameters in the process of initialization	• Parameters are being initialized to default values.	• Normal if the message disappears after a while (several seconds to several tens of seconds).
	Setup parameters in the process of being set	• Setup parameters are in the process of being set.	• Normal if the message disappears after a while (several seconds to several tens of seconds).
Atn	Auto-tuning in process	• Auto-tuning is in process.	• Normal if the message disappears after several seconds.

NOTES:
1. ST : Terminal of stand by function.
2. When the ON/OFF function is selected for DC braking (DB), using the input terminal selection parameter, you can judge the inverter to be normal if “db” disappears when opening the circuit between the terminal and CC.

Table 16 — Trip Messages for 50BV VFD

ERROR CODE	COMMUNICATION NO.	PROBLEM	POSSIBLE CAUSES	REMEDIES
OC1	1	Overcurrent during acceleration	• The acceleration time ACC is too short. • The V/F setting is improper. • A restart signal is input to the rotating motor after a momentary stop, etc. • A special motor (e.g. motor with a small impedance) is used.	• Increase the acceleration time ACC. • Check the V/F parameter. • Use F301 (auto-restart) and F302 (ride-through control). • Increase the carrier frequency F300.
OC2	2	Overcurrent during deceleration	• The deceleration time dEC is too short. (During deceleration)	• Increase the deceleration time dEC.
OC3	3	Overcurrent during operation	• The load fluctuates abruptly. • The load is in an abnormal condition.	• Reduce the load fluctuation. • Check the load (operated machine).
OCR	5	Arm overcurrent at start-up	• A main circuit element is defective.	• Make a service call.
OCL	4	Overcurrent (An overcurrent on the load side at start-up)	• The insulation of the output main circuit or motor is defective. • The motor has too small impedance.	• Check the cables and wires for defective insulation.
OP1	A	Overvoltage during acceleration	• The input voltage fluctuates abnormally. (1) The power supply has a capacity of 200kVA or more. (2) A power factor improvement capacitor is opened or closed. (3) A system using a thyristor is connected to the same power distribution line. • A restart signal is input to the rotating motor after a momentary stop, etc.	• Insert a suitable input reactor. • Use F301 (auto-restart) and F302 (ride-through control).
OP2	B	Overvoltage during deceleration	• The deceleration time dEC is too short. (Regenerative energy is too large.) • F304 (dynamic braking resistor activation) is off. • F305 (overvoltage limit operation) is off. (1) The input voltage fluctuates abnormally. The power supply has a capacity of 200kVA or more. (2) A power factor improvement capacitor is opened or closed. (3) A system using a thyristor is connected to the same power distribution line.	• Increase the deceleration time dEC. • Install a suitable dynamic braking resistor. • Enable F304 (dynamic braking selection). • Enable F305 (overvoltage limit operation). • Insert a suitable input reactor.

Table 16 — Trip Messages for 50BV VFD (cont)

ERROR CODE	COMMUNICATION NO.	PROBLEM	POSSIBLE CAUSES	REMEDIES
OP3	C	Overvoltage during constant-speed operation	• The input voltage fluctuates abnormally. (1) The power supply has a capacity of 200kVA or more. (2) A power factor improvement capacitor is opened or closed. (3) A system using a thyristor is connected to the same power distribution line. • The motor is in a regenerative state because the load causes the motor to run at a frequency higher than the inverter output frequency.	• Insert a suitable input reactor. • Install a dynamic braking resistor.
OL1	D	Inverter overload	• The acceleration ACC time is too short. • The DC braking amount is too large. • The V/F setting is improper. • A restart signal is input to the rotating motor after a momentary stop, etc. • The load is too large.	• Increase the acceleration time ACC. • Reduce the DC braking amount F251 and the DC braking time F252. • Check the V/F parameter setting. • Use F301 (auto-restart) and F302 (ride-through control). • Use an inverter with a larger rating.
OL2	E	Motor overload	• The V/F setting is improper. • The motor is locked up. • Low-speed operation is performed continuously. • An excessive load is applied to the motor during operation.	• Check the V/F parameter setting. • Check the load (operated machine). • Adjust OLN to the overload that the motor can withstand during operation in a low speed range.
***EPHO**	9	Output phase failure	• A phase failure occurred in the output line of the main circuit.	• Check the main circuit output line, motor, etc., for phase failure. • Enable F605 (Output phase failure detection).
***EPH1**	8	Input phase failure	• A phase failure occurred in the input line of the main circuit.	• Check the main circuit input line for phase failure. • Enable F608 (input phase failure detection).
OH2	2Eh	External thermal trip	• A thermal trip command is entered from an external input device.	• Check the external input device.
***Ot**	20h	Over-torque trip	• The load torque rises up to the over-torque detection level during operation	• Enable F615 (Over-torque trip selection) • Check whether the system is in a normal condition.
OLr	F	Dynamic braking resistor overload trip	• The deceleration time is too short. • The dynamic braking amount is too large.	• Increase the deceleration time dEC. • Use a dynamic resistor with a larger capacity (W) and adjust F308 (PBR capacity parameter) accordingly.
OH	10h	Overheat	• The cooling fan does not rotate. • The ambient temperature is too high. • The vent is blocked up. • A heat generating device is installed close to the inverter. • The thermistor in the unit is broken.	• Restart the operation by resetting the inverter after it has cooled down enough. • The fan requires replacement if it does not rotate during operation. • Secure sufficient space around the inverter. • Do not place any heat-generating device near the inverter. • Make a service call.
***UP1**	1E	Undervoltage trip (main circuit)	• The input voltage (in the main circuit) is too low.	• Check the input voltage. • Enable F627 (undervoltage trip selection). • To cope with a momentary stop due to undervoltage, enable F302 (ride-through control) and F301 (auto-restart).

Table 16 — Trip Messages for 50BV VFD (cont)

ERROR CODE	COMMUNICATION NO.	PROBLEM	POSSIBLE CAUSES	REMEDIES
***UC**	1D	Small-current operation trip	• The output current falls to the low-current detection level during operation.	• Enable F610 (low-current detection parameter).
				• Check whether the detection level is set properly to the system. (F611 and F612)
				• If no error is found in the setting, make a service call.
EF2	22h	Ground fault trip	• A ground fault occurs in the output cable or the motor.	• Check the cable and the motor for ground faults.
E	11h	Emergency stop	• During automatic operation or remote operation, a stop command is entered from the operation panel or a remote input device.	• Reset the inverter.
Err2	15h	Main unit RAM fault	• The control RAM is defective.	• Make a service call.
Err3	16h	Main unit ROM fault	• The control ROM is defective.	• Make a service call.
Err4	17h	CPU fault trip	• The control CPU is defective.	• Make a service call.
Err5	18h	Remote control error	• An error arises during remote operation.	• Check the remote control device, cables, etc.
EtYP	29h	Inverter type error	• The control circuit board (main circuit board or drive circuit board) is replaced.	• Make a service call.
EEP1	12h	EEPROM fault	• A data writing error occurs.	• Turn off the inverter, then turn it on again. If it does not recover from the error, make a service call.
Etn	28h	Auto-tuning error	• Check the settings of the motor parameters F401to F408 • Check that the motor is not two or more sizes smaller in capacity than the inverter. • Check that the inverter output cable is not too thin. • Check that the motor is not running. • Check that the motor is a three-phase inductive motor.	

*With a parameter, you can choose between trip-on and -off.

NOTES:

1. During operation, the following alarms may be displayed, which have the same meaning as previously defined alarms.
   - C (overcurrent alarm) — same as OC
   - P (overvoltage alarm) — same as OP
   - L (overload alarm) — same as OL1/OL2
   - H (overheat alarm) — same as OH
2. If two or more problems arise simultaneously, one of the following alarms appears and blinks.

   CP, PL, CPL

   The blinking alarms, C, P, L, H are displayed in this order from left to right.

TROUBLESHOOTING

Refer to Tables 17-21 for troubleshooting information.

Run Test Troubleshooting — The automatic run test is a diagnostic tool used during unit start-up. Table 17 describes troubleshooting specifically for the automated run test.

Table 17 — Run Test Troubleshooting

PROBLEM	POSSIBLE CAUSE
Control modules do not have lights when unit power on.	Transformer open. Circuit breaker open. Power wiring open. Module failure.
Control display does not light up when unit power on.	Connection location. Interface cable open. Display failure.
Run test will not start.	Pre-existing ALARM (red)? Not “Logged in” with password. Switch not in Local.
WARN (yel) does not light during run test.	Wiring open. Lamp failure. Control module failure.
ALARM (red) does not light during run test.	Wiring open. Lamp open. Control module failure.
Run test stops, ALARM (red) light is lit after it blinks once.	Bypass switch to LINE. Mode switch to OFF. Duct high pressure switch open. Fire shutdown input or jumper open. Supply air temp out of range. Duct static pressure sensor out of range. Compressor resistor board wiring error or failure.
Fan does not start/ALARM (red) blinks 2 times.	Fan relay failure.
Run test stop, ALARM (red) light is lit after blinking 3 times.	Wiring open. VFD connection error. VFD setup error. Fan relay failure. Current isolator failure. Control module failure.
Run test stop, ALARM (red) is lit after it blinks 4 times. Fan does not increase speed.	VFD connection error. VFD setup error. Current isolator load adjustment too low.
Fan does not stop after ALARM (red) blinks 5 times.	Fan relay failure.
Fan rotation is backwards.	VFD to motor wiring sequence error. VFD setup error.
Run test stop, ALARM (red) is lit after blinking 6 times. Compressor 1 does not start.	Wiring open. Compressor resistor board wiring error or failure. High-pressure switch, low-pressure switch, coil frost switch, or compressor protection module open. Compressor relay failure. Contactor failure. Control module failure. No refrigerant charge.
Run test stop, ALARM (red) is lit after blinking 7 times. Compressor 2 does not start.	Wiring open. Compressor resistor board wiring error or failure. High-pressure switch, low-pressure switch, coil frost switch, or compressor protection module open. Compressor relay failure. Contactor failure. Control module failure. No refrigerant charge.
Run test stop, ALARM (red) is lit after blinking 8 times. Compressor 3 does not start.	Wiring open. Compressor resistor board wiring error or failure. High-pressure switch, low-pressure switch, coil frost switch, or compressor protection module open. Compressor relay failure. Contactor failure. Control module failure. No refrigerant charge.
Run test stop, ALARM (red) is lit after blinking 9 times. Compressor 4 does not start.	Wiring open. Compressor resistor board wiring error or failure. High-pressure switch, low-pressure switch, coil frost switch, or compressor protection module open. Compressor relay failure. Contactor failure. Control module failure. No refrigerant charge.
Compressor rotation is backwards.	Field power wiring sequence error. Compressor power wiring sequence error.
“C” message in I/O status display.	No input signal/communication failure.
“Service” message in I/O status display.	Value is forced from 6400 keypad entry.
“Supervisor” message in I/O status display.	Value is forced from network communication (i.e., PC).
ALARM (red) always on, will not enter run test.	SAT, DSP, CSMUX, DHS, or PHASE input values out of range. Mode switch OFF.

Forcing and Clearing an Input or Output — During unit operation and/or troubleshooting, it may be necessary or desirable to clear an input or output. Tables 18 and 19 describe the procedure for clearing inputs and outputs.

Table 18 — Forcing an Input or Output

STEP # INSTRUCTION/ACTION	RESULT
1. Press 3, SET, ENTER	“Controller Password”
2. Press ENTER	“Log in to Controller” “Enter Password”
3. Press 1111, ENTER	“Log in to Controller” “Logged in”
4. Press STAT	“Hardware Points”
5. Press ENTER	“Supply Air Temperature”
6. Press down arrow to obtain desired item	(NOTE: order is PCB1 I/O, PCB2 I/O, PCB3 I/O)
7. Key in force value (1=on/start, 0 = off/stop), ENTER	force value/status “Service”

Table 19 — Clearing a Forced Input or Output

STEP # INSTRUCTION/ACTION	RESULT
1. Press 3, SET, ENTER	“Controller Password”
2. Press ENTER	“Log in to Controller” “Enter Password”
3. Press 1111, ENTER	“Log in to Controller” “Logged in”
4. Press STAT	“Hardware Points”
5. Press ENTER	“Supply Air Temperature”
6. Press down arrow to obtain desired item	(NOTE: order is PCB1 I/O, PCB2 I/O, PCB3 I/O)
7. Press CLEAR, ENTER	auto value/status (NOTE “Service” must be gone)

Table 20 — Alarms Displayed at Unit LID

FUNCTION	ALARM MESSAGE (Actual Text)	CAUSE	UNIT RESPONSE (See Notes)	RESET
SAT	SAT xx.x dF outside limit of xxx.x dF	SAT reads out of prescribed range for 5 sec. during operation	Unit shuts down and indicates alarm	Automatic
DSP_ALM	Duct Static Sensor Failure	Duct Pressure Sensor reading is out of range (i.e., likely faulty sensor or circuit).	Unit shuts down, indicates alarm	Automatic
FSD	Fire Shutdown	External Fire Alarm input opens for 5 sec.	Unit shuts down, indicates alarm	Automatic
DHS	Duct High Static Pressure	Pressure rises above 3.0 in.H2O during operation. Set point adjustable on the switch. Used for Off position of switch on smaller units with one controller	Unit shuts down, indicates alarm	Automatic
CSMUX	CSMUX x.xx Volts outside limit of x.xx Volts	Compressor safety circuit Resistor Board reads out of prescribed range for 5 sec. during operation	Unit shuts down and indicates alarm	Automatic
CDWF	Check Condenser Water Flow	Waterflow Switch contacts are open at startup, or go open for 5 sec. during operation.	Compressor Cooling shuts down, locks out and indicates warning	Automatic
FLTS	Change Filters	Filter pressure drop exceeds Filter Pressure Switch setting (and contacts open) for 5 sec.	Unit operates normally, but still indicates Warning	Automatic
FREEZ	Economizer Freeze Condition	Economizer Freeze Switch contacts for 5 sec. open during operation.	Warning indicated for 15 minutes turns off ventilation request, then unit shuts down and Econo valve opens, pump request stays on, and Alarm indicated	Automatic
C1_ALM **C2_ALM** **C3_ALM** **C4_ALM**	Compressor 1 Fault Compressor 2 Fault Compressor 3 Fault Compressor 4 Fault	Compressor safety circuit opens for 2 sec.	Unit shuts that compressor down, and indicates Warning, but retries 2 more times before locking it out.	Automatic
SFS	Check Supply Fan	Duct Pressure Sensor reading is below .3 in. H2O at 10 sec. after starting fan, or during operation, or reads above .3″ when fan is supposed to be Off.	If on but indicates off cooling, and heating will be disabled warning light will be on	Automatic
EWT	EWT xx.x dF outside limit of xxx.x dF	EWT reads out of prescribed range for 5 sec. or more	Indicates warning	Automatic
MA_RA	MA_RA xx.x dF outside limit of xxx.x dF	ma_ra reads out of prescribed range for 5 sec. or more	Indicates warning	Automatic
PHASE	Phase Loss	Phase monitor activates (see “Phase Loss/Reversal Protection Switch” on page 5) for 5 sec. during operation.	Unit shuts down, indicates alarm	Automatic
BYPAS		BYPAS switch in Bypass position or Off, local remote in Off position		

NOTES:
1. Unit display will indicate alarm by displaying “There is 1 Alarm” or “There are X alarms”, for the active alarms in the controller.
2. Red light on, indicating alarm.
3. Yellow light is on, indicating a warning.

Standard Diagnostic Features, Alarm and Warning Lights

SUPPLY AIR TEMPERATURE SENSOR FAILURE — If the supply air temperature sensor fails and indicates either 245 F from a short or -40.0 F from and open sensor the controller outputs will be forced to off with safety forces, the alarm output will close and the red Alarm light will be lit. A system alarm will be generated and displayed on the unit keypad. Unit reset is automatic when the supply air sensor has a valid reading again.

DUCT STATIC PRESSURE SENSOR FAILURE — If the duct static pressure sensor fails and indicates either 5.0 inches from a short or 0.0 inches from and open sensor the controller outputs will be forced to off with safety forces, the alarm output will close and the red Alarm light will be lit. A system alarm will be generated and displayed on the unit keypad. Unit reset is automatic when the supply air sensor has a valid reading again.

FIRE/SHUTDOWN INPUT (FSD) — This is a normally closed input, which when opened, deenergizes an isolation relay in the unit, opening the input to the controller. When this input turns opens, all control outputs are immediately turned off, including the fan. Fire forces will be displayed on the outputs. Unit reset is automatic when the FSD input is closed again. A system alarm will be generated and displayed at the keypad.

DUCT HIGH STATIC INPUT (DHS) — This air switch provides over pressurization protection for the ductwork. It is factory installed in the unit. The switch is a normally open switch, with adjustable manual setting (range is 1 to 5 in. wg default setting is 3.0 in. wg). Upon switch closure, the controller outputs will be forced to off with safety forces, the alarm output will close and the red Alarm light will be lit. A system alarm will be generated and displayed on the unit keypad. Unit reset is automatic when the duct pressure is again below the switch setting minus the device hysteresis.

COMPRESSOR MULTIPLEX (MUX) BOARD — A resistance board is used to generate a variable voltage input to the controller to determine compressor status. If the voltage output from this board gets out of the acceptable range the controller outputs will be forced to off with safety forces, the alarm output will close and the red Alarm light will be lit. A system alarm will be generated and displayed on the unit keypad. Unit reset is automatic when the Mux board has a valid reading again. The valid range is between 1.5 and 10 vdc. The table below indicates what voltages correspond to the compressor status indicated in the controller.

Table 21 — Compressor MUX Board Voltages

COMP	VOLTS	RANGE
None	1.86	1.50 < V < .95
1	2.88	last val < = V < 2.95
2	3.59	last val < = V < 3.68
1,2	4.44	last val < = V < 4.55
3	5.13	last val < = V < 5.25
4	5.71	last val < = V < 5.85 and CMP4 is on
1,3	5.85	last val < = V < 5.99
1,4	6.39	last val < = V < 6.51 and CMP4 is on
2,3	6.36	last val < = V < 6.54
2,4	6.87	last val < = V < 7.03 and CMP4 is on
1,2,3	6.99	last val < = V < 7.15
1,2,4	7.46	last val < = V < 7.63
3,4	7.94	last val < = V < 8.11
1,3,4	8.45	last val < = V < 8.58
2,3,4	8.81	last val < = V < 8.99
1,2,3,4	9.26	V > 8.99

CONDENSER WATER FLOW — This is an optional switch that can be used with the OMNIZONE™ controller. A thermal dispersion flow switch detects water flowing past the sensor element and closes normally open contacts that energize a relay with normally open contacts to the unit controller. If no flow switch is installed, a jumper must be in place to indicate that there is water flow all the time in order for the economizer and compressors to operate. A configuration decision is used to indicate if a flow switch is installed and disable alarms from the flow switch. When the flow switch is installed, the controller will check for water flow when flow is requested for unit operation. The controller will also test or to see if there is water flow when the unit is not operating. If there is no flow when the unit is operating or if there is flow when the unit is not operating, the warning relay will energize and the yellow light will be lit. If only loss of flow indication is desired, the configuration for the flow switch may be set to no and the controller will only energize the warning relay and turn on the yellow light if there is a loss of flow while the unit is in operation.

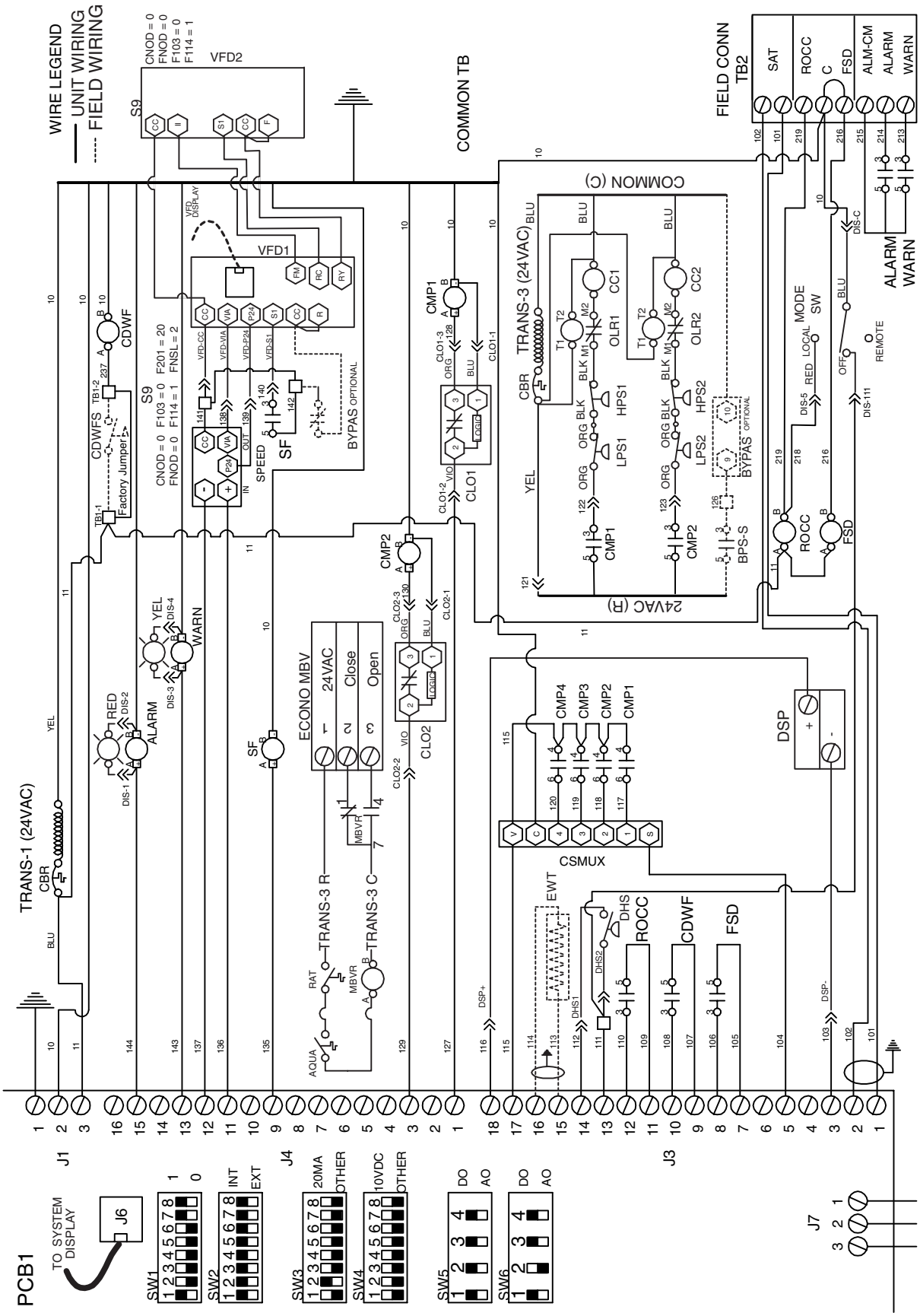
DIRTY FILTERS INPUT — This air pressure delta switch is factory installed in the 50XJ unit. It receives 5 vdc from the unit controller and monitors air pressure delta across the return air filters. Switch is normally open, with manually adjustable setting at the switch between 0.5 to 1.5 in. wg. Upon closure, controller should wait to assure closure for minimum 1 minute, and then indicate an alarm both via its Alarm Output and via communications. However, all other unit operation should remain normal.

A phase loss reversal switch may be installed in the unit to detect over, under voltage conditions and phase loss or reversal. Upon switch opening, the controller outputs will be forced to off with safety forces, the alarm output will close and the red Alarm light will be lit. A system alarm will be generated and displayed on the unit keypad. Unit reset is automatic when the voltage and power phases have been restored.

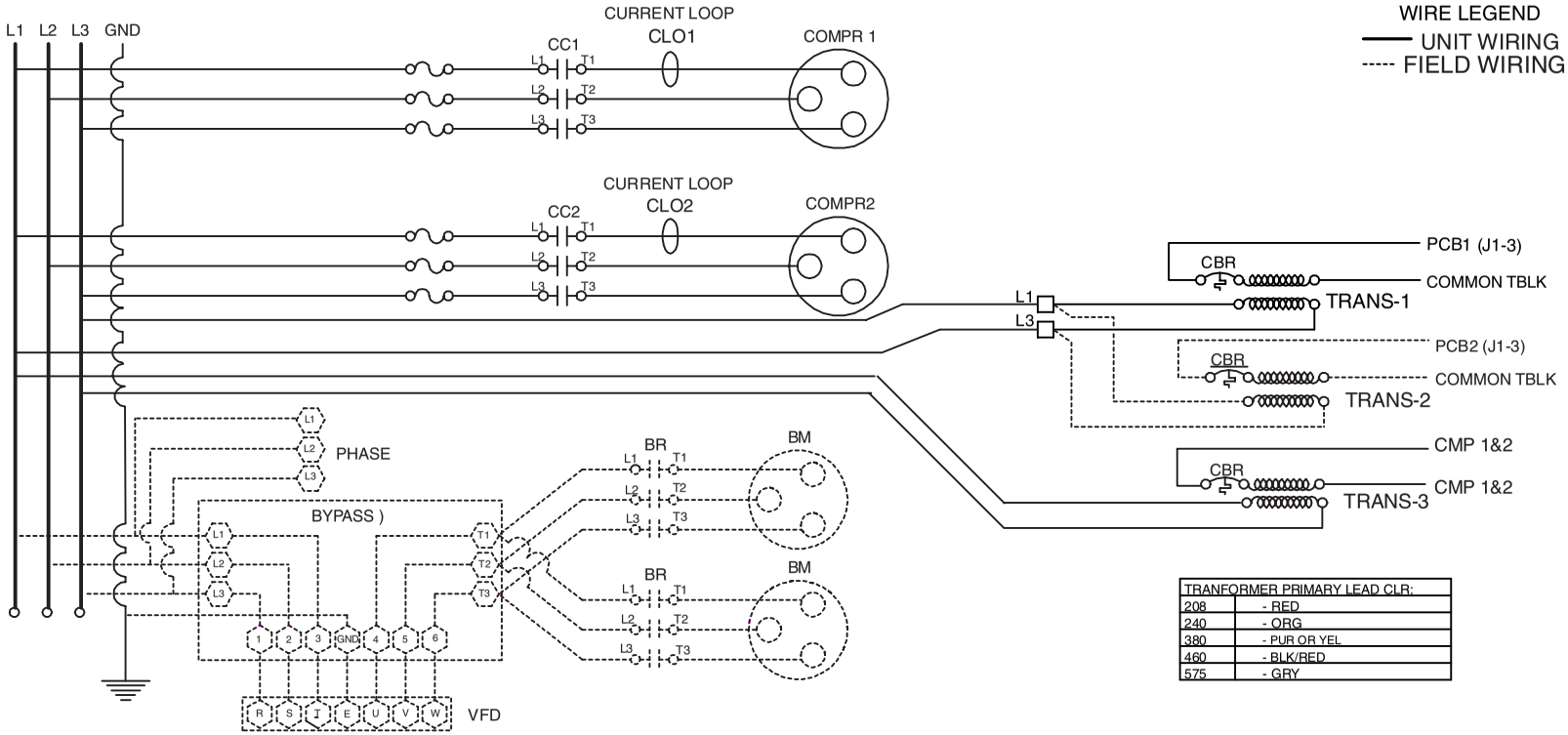
ECONOMIZER COIL FREEZE PROTECTION SWITCH — This switch is installed in the 50XJ unit when the economizer coil is provided. In the event the freeze protection switch contacts open, the ventilation request output will be closed for 15 minutes and the Warning light will light. If the freeze protection switch contacts are still open after 15 minutes, the supply fan will be stopped, all compressor cooling will stop, the economizer valve will open to 100%, the pump request output will remain on, and the Alarm light will light. This will maintain condenser water flow through the coil to prevent freezing the coil while stopping all other operations that could have contributed or will be affected by the freeze condition. Unit reset is automatic when the contacts on the freeze protection switch close again. The contacts on the freeze protection switch open below 37 F.

SUPPLY FAN STATUS — Supply fan status is determined by the duct static pressure sensor. If the fan is operating and a fan speed signal is sent to the variable frequency drive, the duct static pressure must become greater than the supply fan status high set point (SETPT01) for the supply fan status software point to turn on. When the duct static pressure becomes lower than the supply fan status low set point, the supply fan status will indicate OFF. If at any time the commanded state of the supply fan does not agree with the supply fan status for more than a minute, a supply fan status warning will be issued and the warning light will be lit.

COMPRESSOR STATUS — Compressor status is determined from the compressor MUX voltage input to the OMNIZONE controller. If at any time the compressor status indicates off for more than 30 seconds when the compressor commanded state is on, the compressor will be turned off with a safety force and the controller will try to start the compressor after five minutes. If the compressor status does not indicate on for more than 30 seconds then the compressor will be turned off again with a safety force for ten minutes. The controller will then try to restart the compressor a second time. If the compressor status does not come on within 30 seconds the compressor will be turned off for 15-minutes this time. After the 15-minute delay the controller will try to restart the compressor for a third time. If the compressor does not start it will be locked out for this operating cycle and will not be restarted until the OMNIZONE controller goes through an off cycle where the cooling and supply fan are shut down. When the compressor is going through the three restarts or when it is locked out the Warning light will be lit and the specific compressor alarm will be indicated on the display and via communications. The three strikes compressor test is reset automatically if the compressor status comes on while the compressor is on.

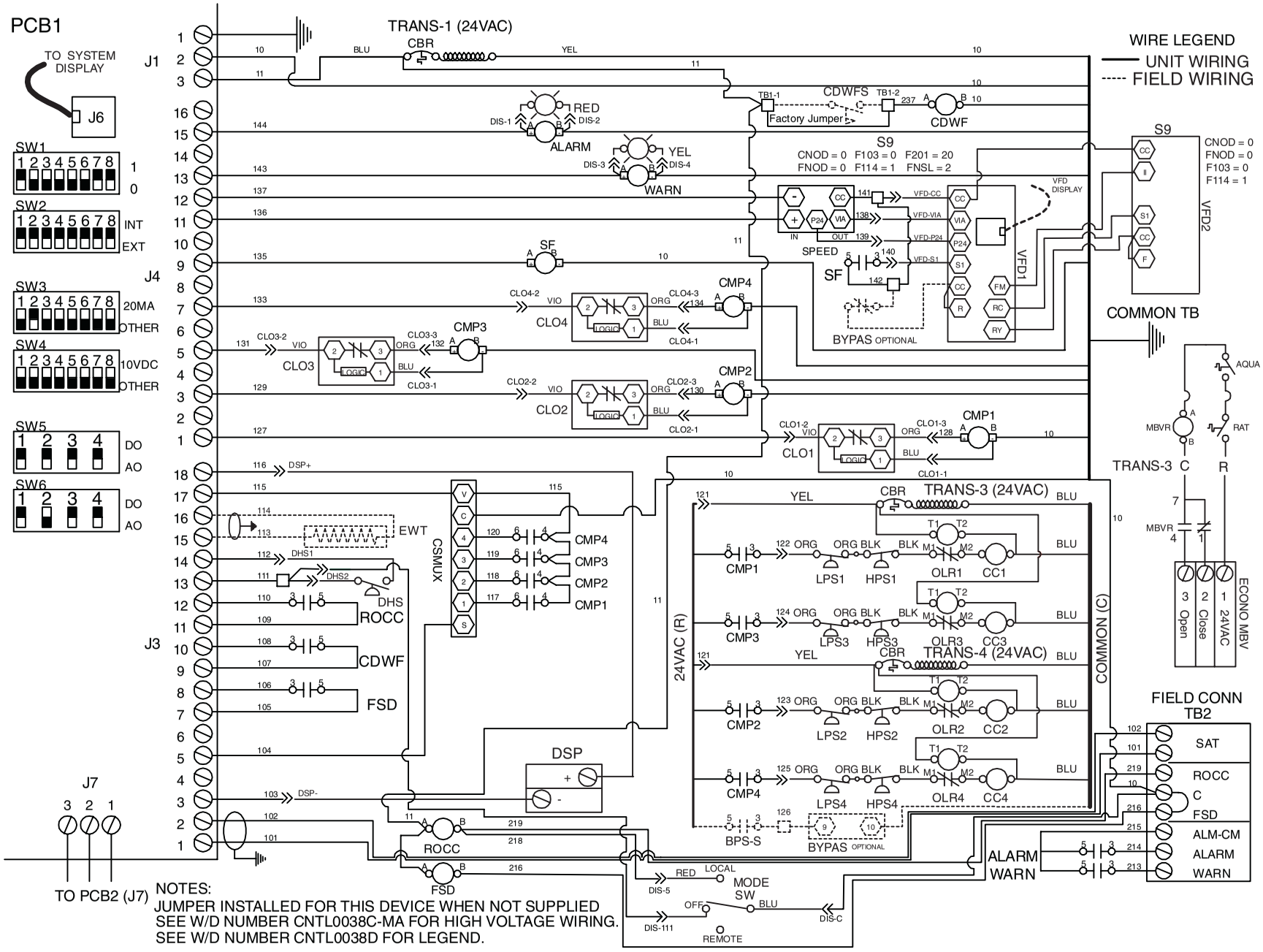


50BVJ,K Low Voltage Schematic

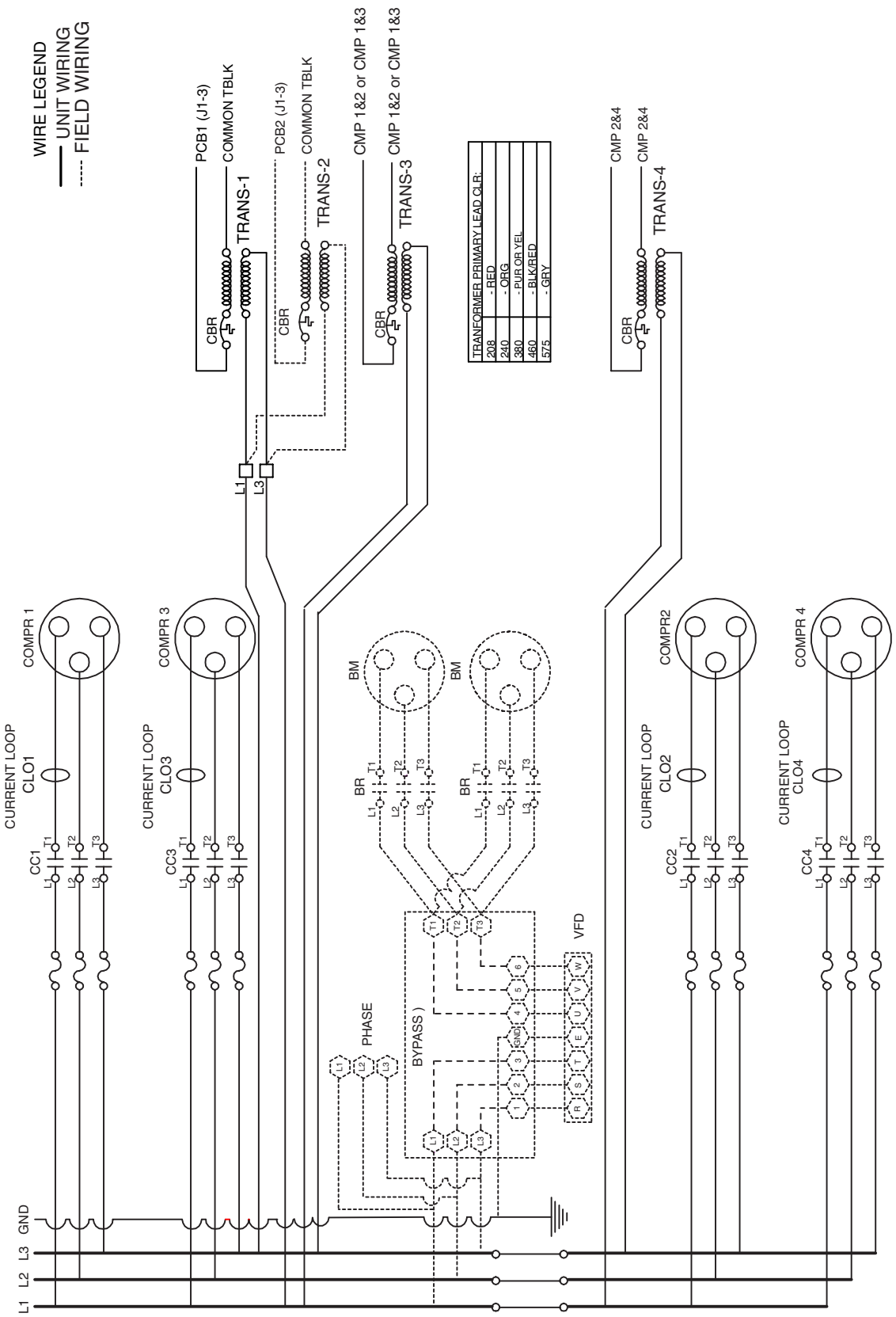


NOTES:
SEE W/D NUMBER CNTL0038A-EM FOR PCB1 LOW VOLTAGE WIRING.
SEE W/D NUMBER CNTL0038B FOR PCB2 LOW VOLTAGE WIRING.
SEE W/D NUMBER CNTL0038D FOR LEGEND.

50BVJ,K High Voltage Schematic

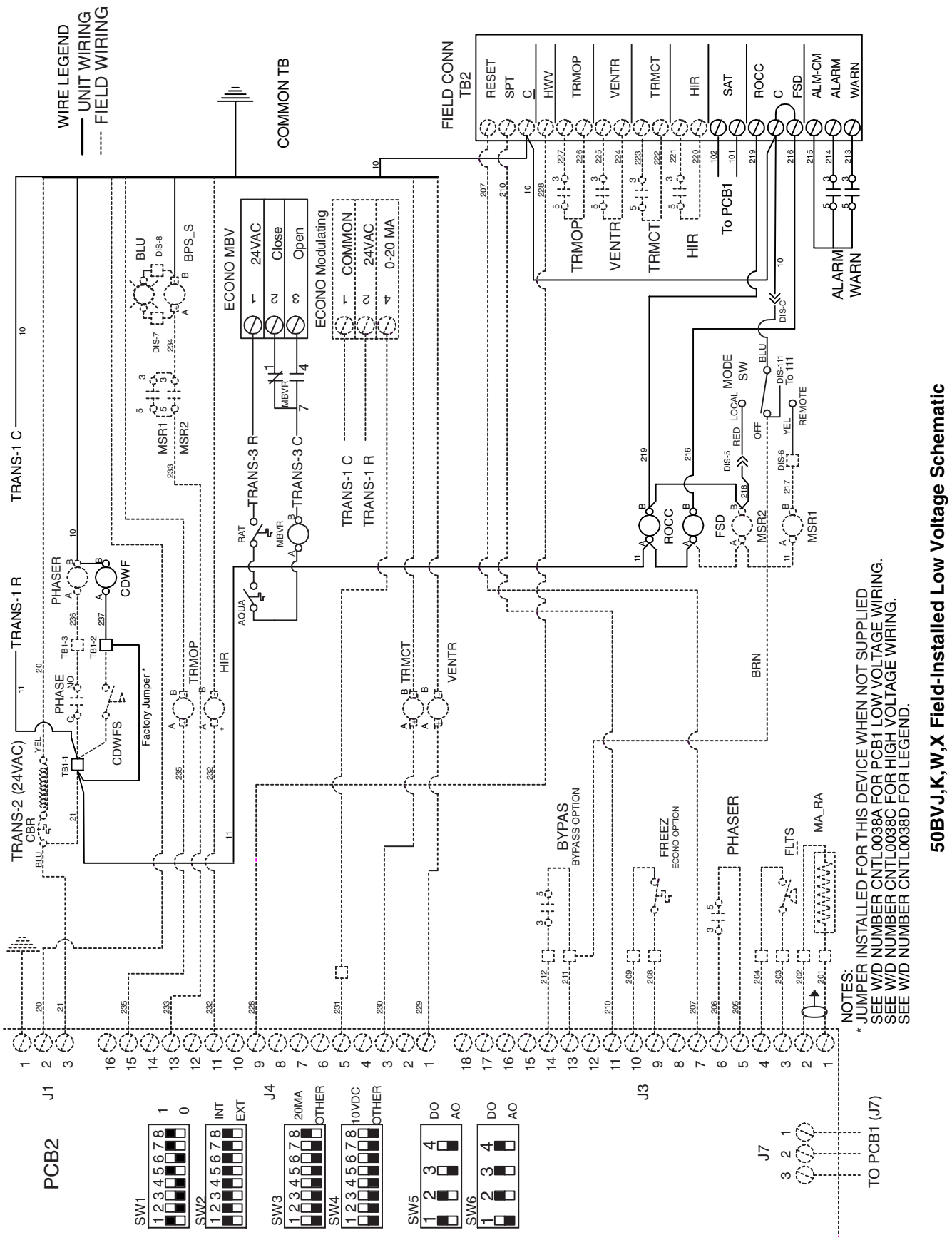


50BVW,X Low Voltage Schematic



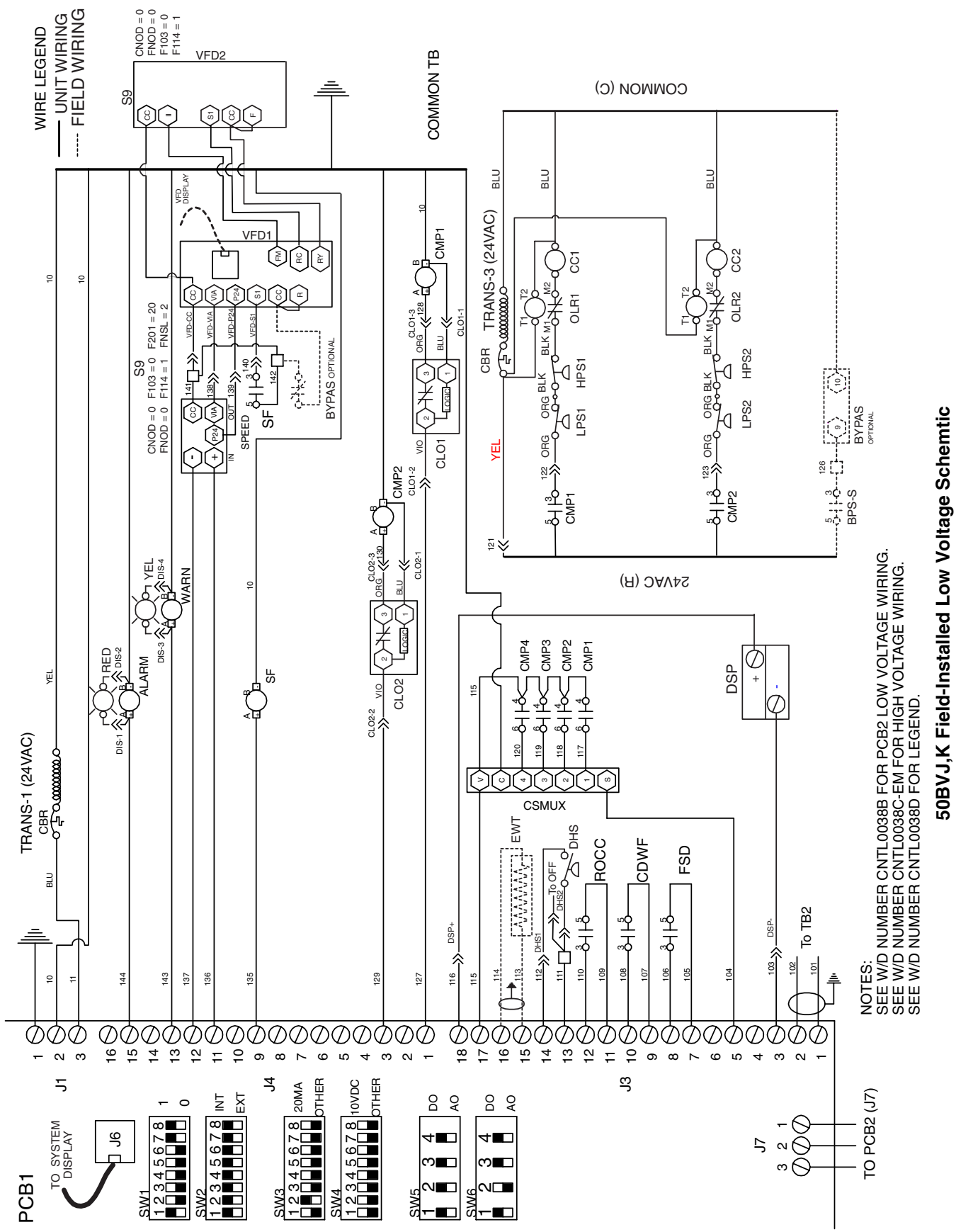
NOTES:
SEE W/D NUMBER CNTL0038A-MA FOR PCB1 LOW VOLTAGE WIRING.
SEE W/D NUMBER CNTL0038B FOR PCB2 LOW VOLTAGE WIRING.
SEE W/D NUMBER CNTL0038D FOR LEGEND.

50BVW,X High Voltage Schematic



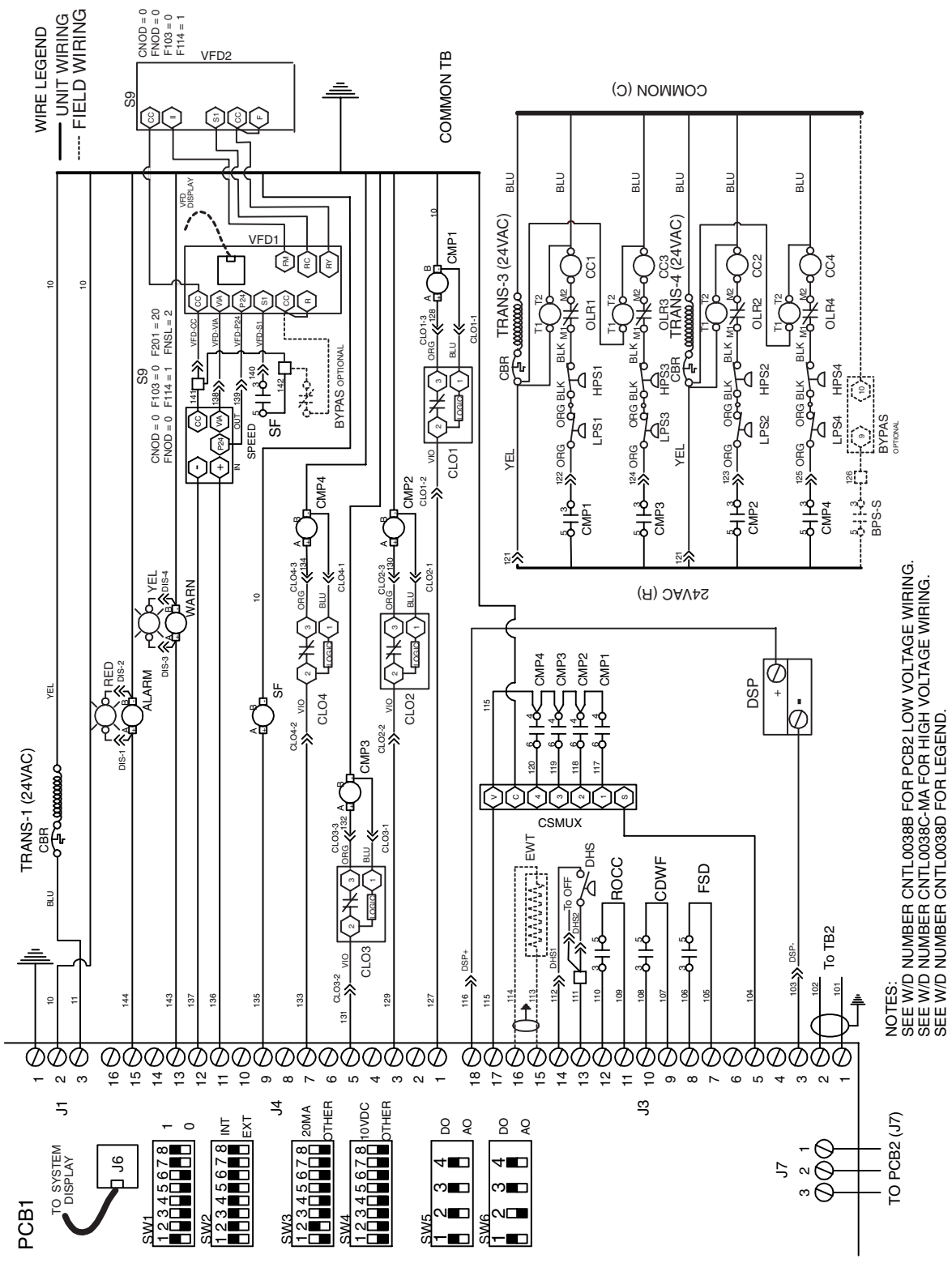
NOTES:
* JUMPER INSTALLED FOR THIS DEVICE WHEN NOT SUPPLIED
SEE W/D NUMBER CNTL0038A FOR PCB1 LOW VOLTAGE WIRING.
SEE W/D NUMBER CNTL0038C FOR HIGH VOLTAGE WIRING.
SEE W/D NUMBER CNTL0038D FOR LEGEND.

50BVJ,K,W,X Field-Installed Low Voltage Schematic



NOTES:
SEE W/D NUMBER CNTL0038B FOR PCB2 LOW VOLTAGE WIRING.
SEE W/D NUMBER CNTL0038C-EM FOR HIGH VOLTAGE WIRING.
SEE W/D NUMBER CNTL0038D FOR LEGEND.

50BVJ,K Field-Installed Low Voltage Schemtic



50BVW,X Field-installed Low Voltage Schematic

LEGEND AND NOTES FOR ALL 50BV WIRING DIAGRAMS

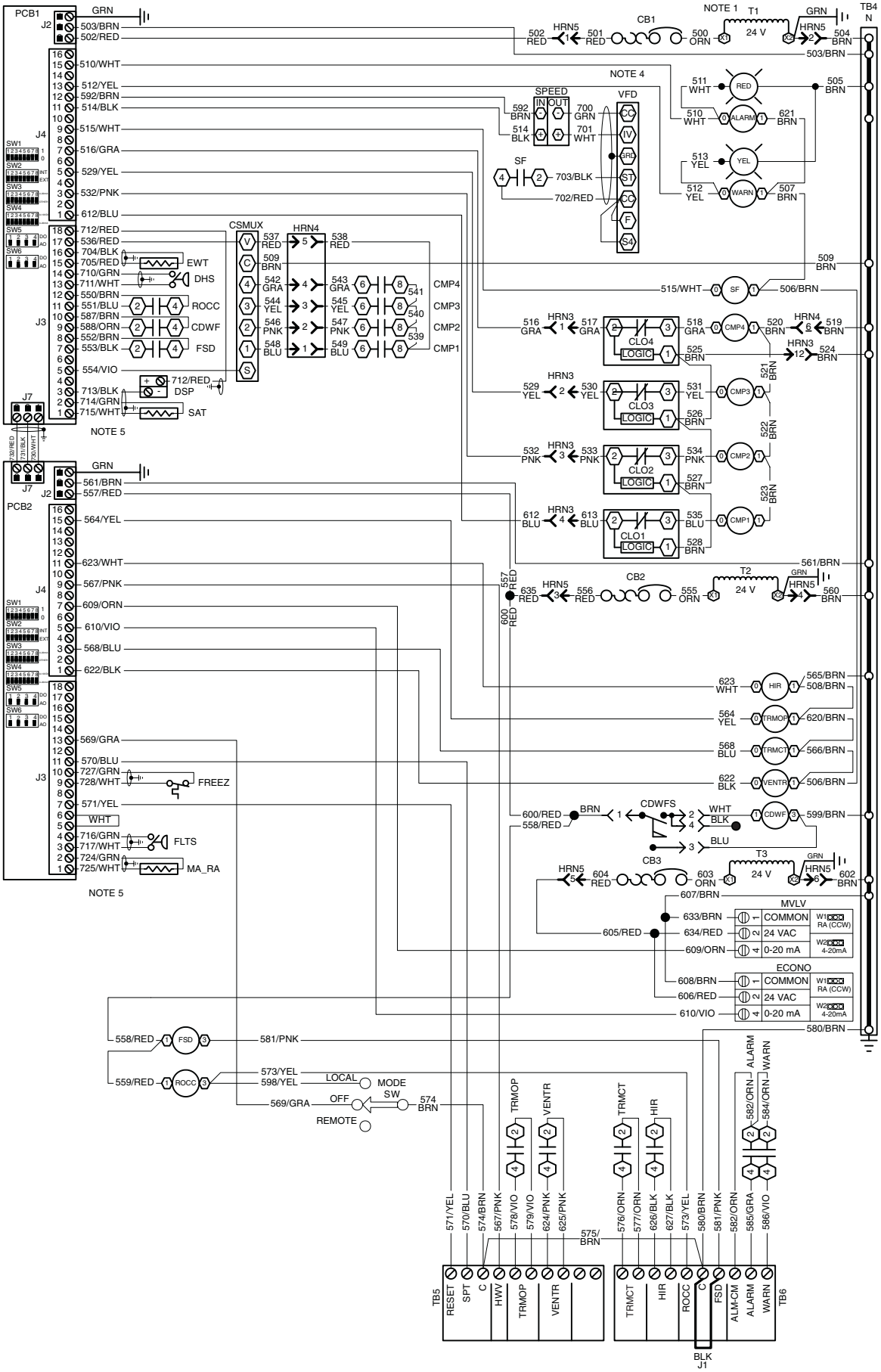
LEGEND

ALARM — Unit Alarm Relay (Critical Fault)
ALM-CM — Alarm/Warning Relay Common
AO — Analog Output
AQUA — Aquastat
BM — Blower Motor
BPS_S — Fan Start/Stop Relay (VFD Bypass Mode)
BR — Blower Relay
BYPAS — VFD Bypass Control
CBR — Circuit Breaker
CC — Compressor Contactor
CDWF — Condenser Waterflow Relay
CDWFS — Condenser Waterflow Switch
CLO — Compressor Lockout Control
CMP — Compressor Control Relay
COMPR — Compressor
CSMUX — Signal Multiplexer-Comp Status
DEHUM — External Dehumidification
DHS — Duct High Static Limit Switch
DO — Digital Output
DSP — Duct Static Pressure Transducer
ECONO — Economizer Valve/Damper Control
EWT — Entering Water Temp. Sensor
FLTS — Filter Status Switch
FREEZ — Freeze Thermostat (Water Economizer)
FRZ — Freeze Thermostat (DX Circuit)
FSD — Fire Alarm/Shutdown
GND — Ground
HIR — Heat Interlock Relay
HPS — High Refrigerant Pressure Switch
HWV — Hot Water Valve
LPS — Low Refrigerant Pressure Switch
MA_RA — Mixed/Return Air Temp. Sensor
MBVR — Motorized Ball Valve Relay
MSR — Local/Remote Control Relays
OLR — Compressor Motor Protector
PCB1 — Unit Control Board
PCB2,3 — I/O Expansion Board
PHASE — Phase/Rotation Monitor
PHASER — Phase Monitor Relay
RAT — Return Air Thermostat
RESET — External Reset
ROCC — Remote Occupancy
SAT — Supply Air Temp. Sensor
SPT — Space/Zone Temperature Sensor
SF — Supply Fan Start/Stop Relay
SPEED — 0-10 VDC Signal Isolator for VFD
SW — Switch
T — Transformer
TB2 — Terminal Block for Field Connections
TRANS — Transformer
TRMCT — VAV Terminals Control
TRMOP — VAV Terminals Open
VENTR — Ventilation Output
VFD — Variable Frequency Drive
WARN — Unit Warning Relay (Non-Critical Fault)

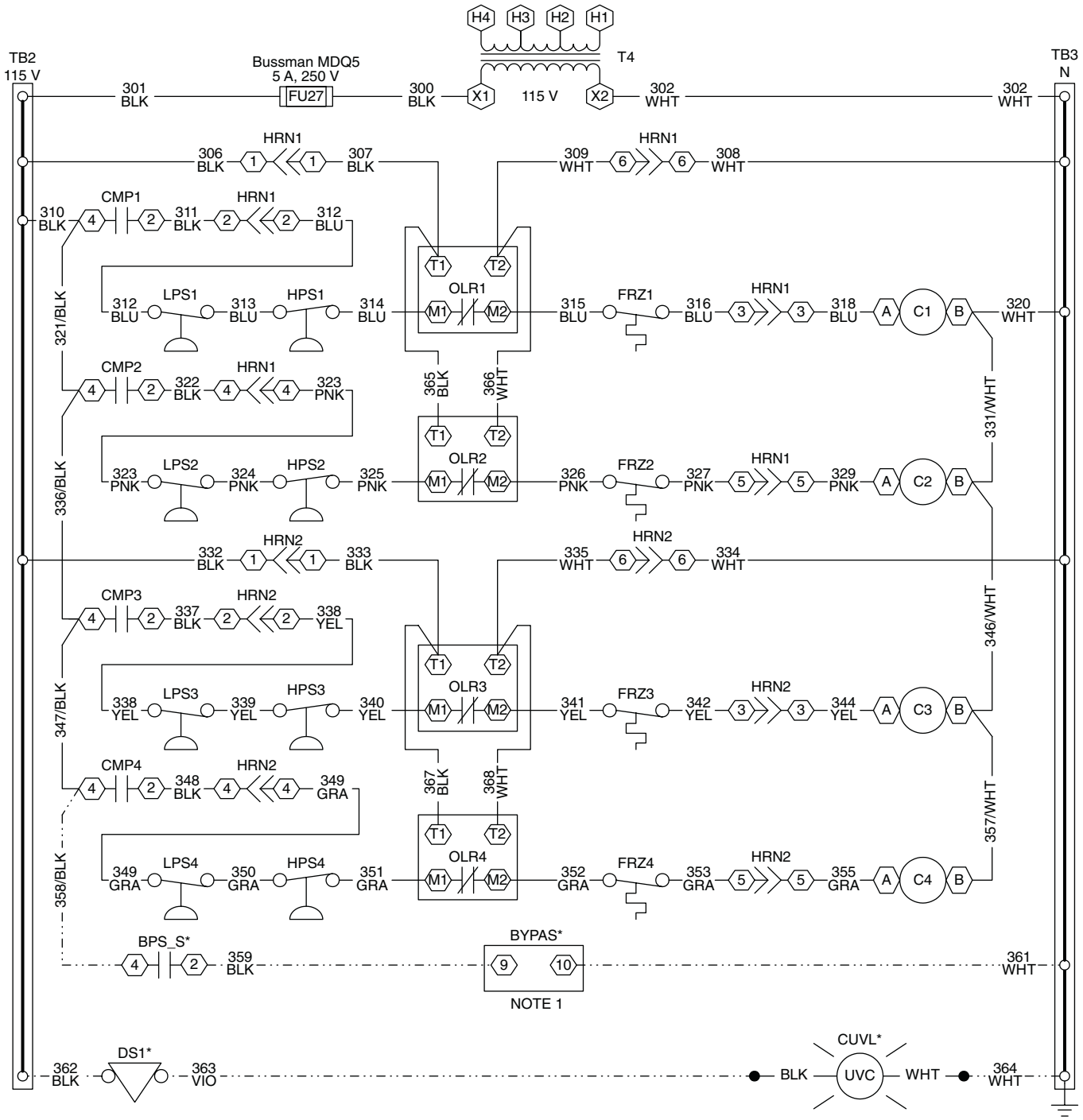
Unit Wire

Field Wiring

NOTES:
1. Partial wiring shown on both power and control diagrams.
2. Class 2 transformer TRANS-1 is wired into separate circuit. Do not interconnect other transformers or circuits; circuit separation or compressor transformers from low voltage control panel transformers shall be maintained.
3. Shielded wire shall have drain wire connected to VFD ground screw. The floating end of the drain wire shall be insulated.
4. Shielded wire shall have drain wire connected to the control panel, adjacent to the PCB. The floating end of the drain wire shall be insulated.



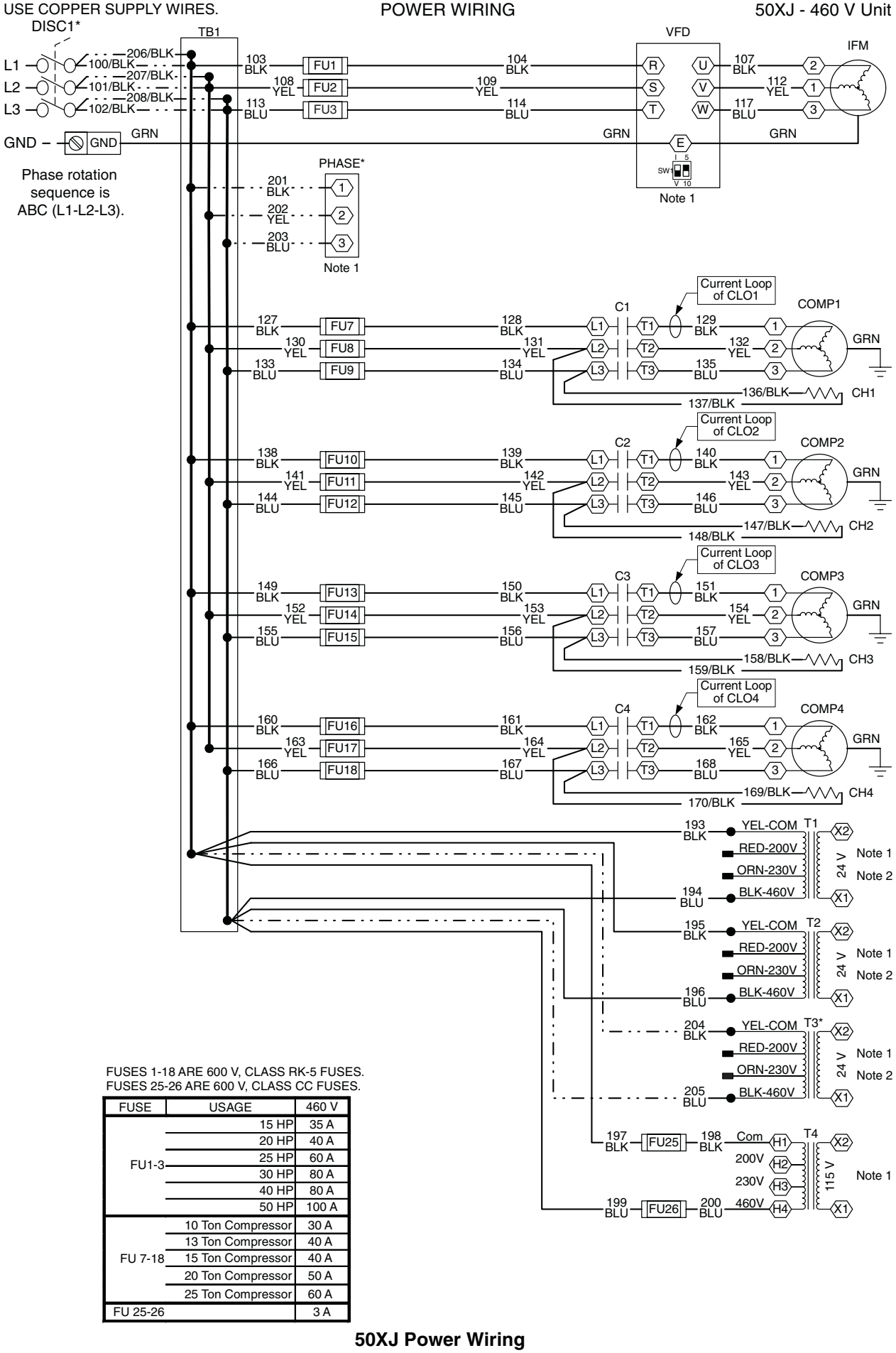
50XJ Low Voltage Control Wiring



SWITCH SETTINGS

ID	Open	Close
FRZ1-4	30 +/- 5 °F	45 +/- 6 °F
HPS1-4	360 +/- 10 PSIG	264 +/- 15 PSIG
LPS1-4	27 +/- 4 PSIG	67 +/- 7 PSIG

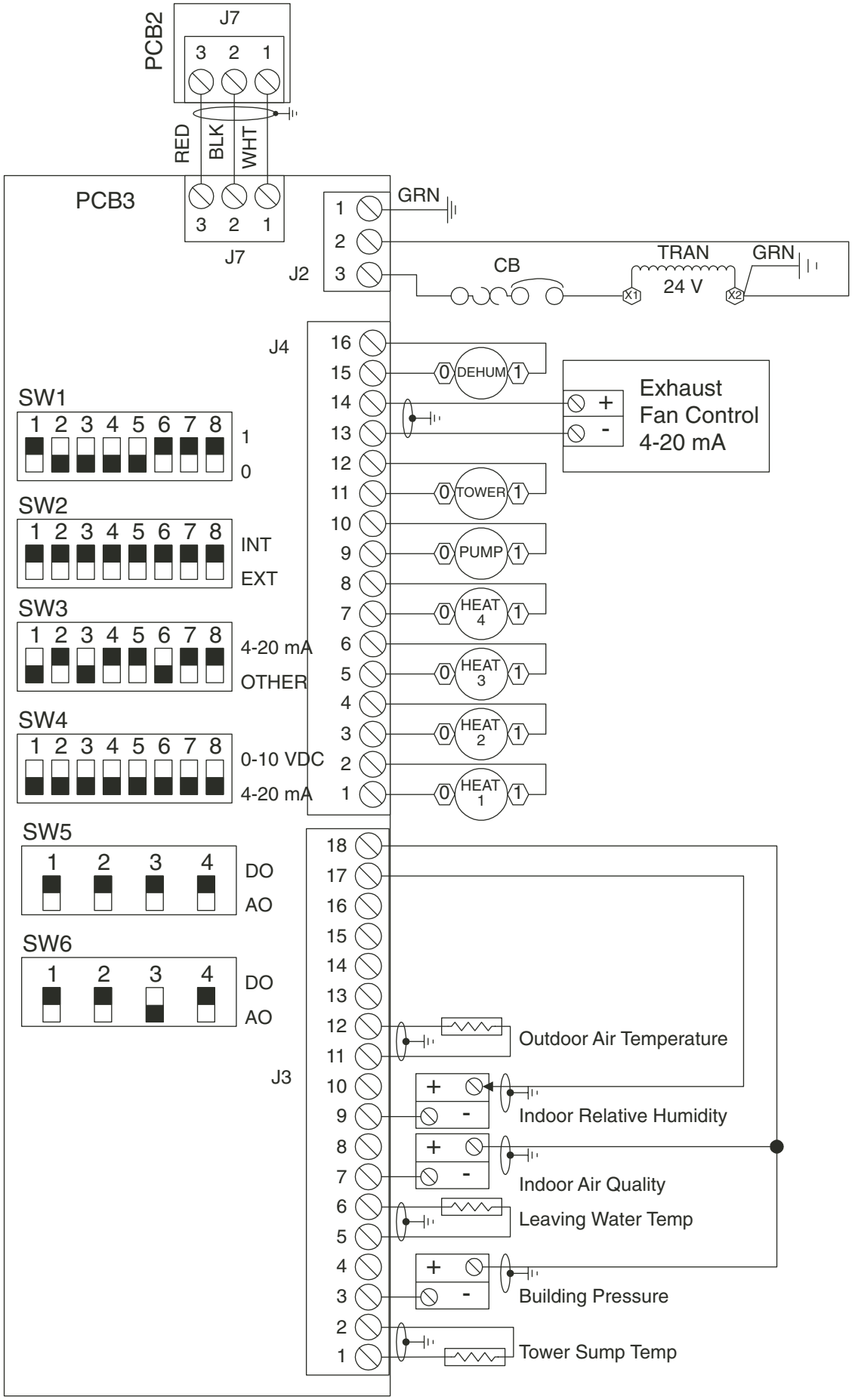
50XJ 115V Control Wiring



FUSES 1-18 ARE 600 V, CLASS RK-5 FUSES.
FUSES 25-26 ARE 600 V, CLASS CC FUSES.

FUSE	USAGE	460 V
FU1-3	15 HP	35 A
	20 HP	40 A
	25 HP	60 A
	30 HP	80 A
	40 HP	80 A
	50 HP	100 A
FU 7-18	10 Ton Compressor	30 A
	13 Ton Compressor	40 A
	15 Ton Compressor	40 A
	20 Ton Compressor	50 A
	25 Ton Compressor	60 A
FU 25-26		3 A

50XJ Power Wiring



50BV,XJ Accessory Control Module (PCB3) Schematic

LEGEND AND NOTES FOR ALL 50XJ WIRING DIAGRAMS

LEGEND

ALARM — Unit Alarm Relay (Critical Fault)
ALM-CM — Alarm/Warning Relay Common
BPS_S — Fan Start/Stop Relay (VFD Bypass Mode)
BYPAS — VFD Bypass Control
C — Compressor Contactor
CB — Circuit Breaker
CDWF — Condenser Waterflow Relay
CDWFS — Condenser Waterflow Switch
CH — Crankcase Heater
CLO — Compressor Lockout Control
CMP — Compressor Control Relay
COMP — Compressor
CSMUX — Signal Multiplexer-Comp Status
CUVL — UVC Light For Indoor Coil Area
DEHUM — External Dehumidification
DHS — Duct High Static Limit Switch
DISC1 — Disconnect Switch
DS — Door Switch
DSP — Duct Static Pressure Transducer
ECONO — Economizer Valve/Damper Control
EWT — Entering Water Temp. Sensor
FLTS — Filter Status Switch
FREEZ — Freeze Thermostat (Water Economizer)
FRZ — Freeze Thermostat (DX Circuit)
FSD — Fire Alarm/Shutdown
FU — Fuse
GND — Ground
HEAT — Electric Heat Stage Control
HIR — Heat Interlock Relay
HPS — High Refrigerant Pressure Switch
HRN — Harness
HWV — Hot Water Valve
IFM — Indoor Fan Motor
J — Jumper Wire
LPS — Low Refrigerant Pressure Switch
MA_RA — Mixed/Return Air Temp. Sensor
MVLV — Modulating Valve (Econ)/ Heat Pres. Ctl.
OLR — Compressor Motor Protector
PCB1 — Unit Control Board
PCB2,3 — I/O Expansion Board
PHASE — Phase/Rotation Monitor
PUMP — Water Pump Request
RESET — External Reset
ROCC — Remote Occupancy
SAT — Supply Air Temp. Sensor
SPT — Space/Zone Temperature Sensor
SF — Supply Fan Start/Stop Relay
SPEED — 0-10 VDC Signal Isolator for VFD
SW — Switch
T — Transformer
TB1 — Power Distribution Terminal Block
TB2 — 120 V-Hot Terminal Block
TB3 — 120 V-Neutral Terminal Block
TB5-7 — Terminal Blocks for Field Connections
TOWER — Tower Request
TRMCT — VAV Terminals Control
TRMOP — VAV Terminals Open
VENTR — Ventilation Output
VFD — Variable Frequency Drive
WARN — Unit Warning Relay (Non-Critical Fault)
— · · — Optional Wiring (Optional Items Noted With "*")
— — Field Wiring

NOTES:
1. Partial wiring shown on both power and control diagrams.
2. All class 2 transformers are wired into separate circuits. Do not interconnect these transformers or circuits; circuit separation shall be maintained.
3. On 200/240 v units, the transformers are factory wired for 240 v. For 200 v applications, move the blue wire to the 200 v tap of each transformer.
4. Shielded wire shall have drain wire connected to VFD ground screw. The floating end of the drain wire shall be insulated.
5. Shielded wire shall have drain wire connected to the control panel, adjacent to the PCB. The floating end of the drain wire shall be insulated.

APPENDIX B — CONTROL SCREENS

Display Screens

DESCRIPTION	VALUE	UNITS	STATUS	FORCE	NAME
OMNIZONE::HWP01-32:Hardware points Table 1					
Supply Air Temperature	67	dF			SAT
Duct Static Pressure	0.2	in H2O			DSP
Comp. Status MUX	1.86	Volts			CSMUX
Fire Alarm/Shut Down	Enable				FSD
Cond. Water Flow Switch	Yes				CDWF
Remote Occupancy	Disable				ROCC
Duct High Press. Switch	Normal				DHS
Entering Water Temp.	69.9	dF			EWT
Compressor 1 Relay	Stop				CMP1
Compressor 2 Relay	Stop				CMP2
Compressor 3 Relay	Stop				CMP3
Compressor 4 Relay	Stop				CMP4
Supply Fan/VFD	Stop				SF
VFD Speed Signal	0	%			SPEED
Non Critical Fault	Off				WARN
Critical Fault	Off				ALARM
Mixed/Return Air Temp	77.2	dF			MA_RA
Dirty Filter Status	Clean				FLTS
Phase Loss Protection	Normal				PHASE
Ext. Supply Air Reset	0	dF			RESET
Water Econ. FreezeStat	Normal				FREEZ
Space_Reset Sensor	79.2	dF			SPT
VFD Bypass Enable	Disable				BYPAS
Head Pressure(Comp1)	118.76	PSIG			PRES
Ventilation Request	Close				VENTR
VAV Terminals Control	No				TRMCT
2-position/Econo Valve	0	%			ECONO
Reverse/Head Press Ctrl	100	%		Control	MVLV
Hot Water Valve	0	%			HWV
Heat Interlock Relay	Off				HIR
Bypass Start_Stop	Stop				BPS_S
VAV Terminals Open MAX	Close				TRMOP
OMNIZONE::HWP33-64: Hardware points table 2					
Cooling Tower Sump Temp.	57.5	dF			TWR
Building Static Milliamp	12.51	ma			BSP
Condenser Leaving Water	70.3	dF			LWT
Indoor Air Quality	587.21				IAQ
Indoor Relative Humidity	49.7	%			IRH
Outdoor Air Temp.	76.1	dF			OAT
Heat Stage 1	Off				HEAT1
Heat Stage 2	Off				HEAT2
Heat Stage 3	Off				HEAT3
Heat Stage 4	Off				HEAT4
Pump Request	Off				PUMP
Cooling Tower Request	Off				TOWER
Exhaust Fan	0	%			EXH
Ext. Dehumidification	Stop				DEHUM
OMNIZONE::SWP65-96:Software Points					
Compressor 1 Status	Off				CLO1
Compressor 2 Status	Off				CLO2
Compressor 3 Status	Off				CLO3
Compressor 4 Status	Off				CLO4
Bypass Acc Panel Secure	No				BP_SAFE
DX VAV RESET Control	0	dF			VAVRESET
Factory/Field Test	Stop				FLDTST
Building Static Pressure	0.03	in H2O			BSP_IN
Time Clock	Off				TIMCLOCK
Cooling	Disable				COOLOK
Supply Fan Status	Off			Control	SFS
Ok to run Fan	No				OKFAN
OK Fan + Sup. Fan Stat	FALSE				SF_SFS
Fan + Cond. Water Flow	FALSE				FAN_CDWF
Equipment Mode	Cool			Control	MODE
Activate Evacuation Mode	Disable				EVAC
Space Control Point	74	dF			CTRLPT
Mod. Econ Enabled	No			Control	ECON_OK
Head Pressure Control	Disable			Control	HEAD
Economizer Control Temp.	77.22	dF			ECONPT
Compressor Cooling	Disable				COMPRES
Duct Static Failure	Normal				DSP_ALM
Compressor 1 Alarm	Normal				C1_ALM
Compressor 2 Alarm	Normal				C2_ALM
Compressor 3 Alarm	Normal				C3_ALM
Compressor 4 Alarm	Normal				C4_ALM
Cond. Flow Alarm Status	Disable			Control	CDWF_ST

Display Screens (cont)

DESCRIPTION	VALUE	UNITS	STATUS	FORCE	NAME
OMNIZONE:Custom Configuration					
Compressor Stages	2				NUM_CMP
Reset Ratio	3	dF			RSET_RTO
CDWF 0=NO,1=YES	0				CDFW_SWT
ECON 0=NO,1=YES	0				EWT_SNS
EWT Reset 0=NO,1=YES	1				EWT_RST
MOD.VLV 0=NO,1=YES	0				MOD_ECON
0=CONST.,1=VARIABLE	0				FLOW_TYP
0=RAT,1=MAT,2=NONE	2				MARA_SNS
PHASE 0=NO,1=YES	0				PHAS_SWT
FREEZ 0=NO,1=YES	0				FREZ_SWT
ENABLE ECON.	68	dF			ECON_SET
SPT 0=NO,1=YES	0				SPT_SNS
PRES 0=NO,1=YES	0				SPT_SNS
TWR 0=NO,1=YES	0				TWR_SNS
LWT 0=NO,1=YES	0				LWT_SNS
IAQ 0=NO,1=YES	0				IAQ_SNS
IRH 0=NO,1=YES	0				IRH_SNS
BSP 0=NO,1=YES	0				BSP_SNS
BSP Range	1.00	in H2O			BSP_RNG
BSP LOW VALUE	-0.5	in H2O			BSP_LOW
Setpoints					
OMNIZONE::SETPT01: Supply fan Status					
Occupied Lo Setpoint	0.3	in H2O			OccLow
Occupied Hi Setpoint	0.4	in H2O			OccHgh
Unoccupied Lo Setpoint	0.3	in H2O			UnOccLow
Unoccupied Hi Setpoint	0.4	in H2O			UnOccHgh
OMNIZONE::SETPT02: VAVRESETbaseline					
Occupied Lo Setpoint	0	dF			OccLow
Occupied Hi Setpoint	0	dF			OccHgh
Unoccupied Lo Setpoint	0	dF			UnOccLow
Unoccupied Hi Setpoint	0	dF			UnOccHgh
OMNIZONE::SETPT03: Heat\Cool Mode & Reset					
Occupied Lo Setpoint	70	dF			OccLow
Occupied Hi Setpoint	74	dF			OccHgh
Unoccupied Lo Setpoint	55	dF			UnOccLow
Unoccupied Hi Setpoint	85	dF			UnOccHgh
OMNIZONE::SETPT04: Head Pressure Control					
Occupied Lo Setpoint	225	PSIG			OccLow
Occupied Hi Setpoint	225	PSIG			OccHgh
Unoccupied Lo Setpoint	225	PSIG			UnOccLow
Unoccupied Hi Setpoint	225	PSIG			UnOccHgh
OMNIZONE::SETPT05: Supply Static Pressure					
Occupied Lo Setpoint	1.5	in H2O			OccLow
Occupied Hi Setpoint	1.5	in H2O			OccHgh
Unoccupied Lo Setpoint	1.5	in H2O			UnOccLow
Unoccupied Hi Setpoint	1.5	in H2O			UnOccHgh
OMNIZONE::SETPT06: Supply Air Temperature					
Occupied Lo Setpoint	55	dF			OccLow
Occupied Hi Setpoint	55	dF			OccHgh
Unoccupied Lo Setpoint	55	dF			UnOccLow
Unoccupied Hi Setpoint	55	dF			UnOccHgh
OMNIZONE::SETPT07: Building Static Pressure					
Occupied Lo Setpoint	0.02	in H2O			OccLow
Occupied Hi Setpoint	0.02	in H2O			OccHgh
Unoccupied Lo Setpoint	0.02	in H2O			UnOccLow
Unoccupied Hi Setpoint	0.02	in H2O			UnOccHgh
OMNIZONE::SETPT08: BSP raw control					
Occupied Lo Setpoint	12.32	ma			OccLow
Occupied Hi Setpoint	12.32	ma			OccHgh
Unoccupied Lo Setpoint	12.32	ma			UnOccLow
Unoccupied Hi Setpoint	12.32	ma			UnOccHgh
OMNIZONE::SETPT09: Humidity Control					
Occupied Lo Setpoint	0	%RH			OccLow
Occupied Hi Setpoint	99	%RH			OccHgh
Unoccupied Lo Setpoint	0	%RH			UnOccLow
Unoccupied Hi Setpoint	99	%RH			UnOccHgh

Configuration Screens

DESCRIPTION	VALUE*	UNITS	NAME
OMNIZONE::CC6400:Controller Identification			
Description:	OMNIZONE VPAC		DevDesc
Location:	Test Version 0.009		Location
Software Part Number:	CEPP-130124-07		PartNum
Model Number:	6400		ModelNum
Serial Number:			SerialNo
Reference Number:	Version 1.6		RefNum
OMNIZONE::ADAPT01: VAVRESET Software point control			
Analog Output Point	VAVRESET		Name
Status Point	COOLOK		Name
Time Schedule	LINK_01		Name
Setpoint Schedule	SETPT02		Name
Reset Point	TEMP_I00		Name
Reset			
Start Reset Value	-40	dF	StrtRst
Stop Reset Value	245	dF	StopRst
Control Point	RESET		Name
PID_Master_Loop			
Proportional Gain	1		KP
Integral Gain	0		KI
Derivative Gain	0		KD
Disabled Output Value	0	%	DsblOut
Minimum Output Value	0	%	MinOut
Maximum Output Value	20	%	MaxOut
Starting Value	20	%	StartVal
Block Iteration Rate	10	sec	BlkRate
Power on Delay	0	sec	PowerUp
OMNIZONE::ADAPT02: Head Pressure control			
Analog Output Point	MVLV		Name
Status Point	HEAD		Name
Time Schedule	LINK_01		Name
Setpoint Schedule	SETPT04		Name
Reset Point	TEMP_I00		Name
Reset			
Start Reset Value	-40	PSIG	StrtRst
Stop Reset Value	245	PSIG	StopRst
Control Point	PRES		Name
PID_Master_Loop			
Proportional Gain	-0.2		KP
Integral Gain	-0.1		KI
Derivative Gain	-0.1		KD
Disabled Output Value	0	%	DsblOut
Minimum Output Value	40	%	MinOut
Maximum Output Value	100	%	MaxOut
Starting Value	100	%	StartVal
Block Iteration Rate	10	sec	BlkRate
Power on Delay	0	sec	PowerUp
OMNIZONE::ADAPT03: Building Pressure Ctrl.			
Analog Output Point	EXH		Name
Status Point	OKFAN		Name
Time Schedule	LINK_01		Name
Setpoint Schedule	SETPT08		Name
Reset Point	TEMP_I00		Name
Reset			
Start Reset Value	-40	ma	StrtRst
Stop Reset Value	245	ma	StopRst
Control Point	BSP		Name
PID_Master_Loop			
Proportional Gain	-20		KP
Integral Gain	-10		KI
Derivative Gain	0		KD
Disabled Output Value	0	%	DsblOut
Minimum Output Value	0	%	MinOut
Maximum Output Value	100	%	MaxOut
Starting Value	40	%	StartVal
Block Iteration Rate	10	sec	BlkRate
Power on Delay	0	sec	PowerUp
OMNIZONE::ANCTL01: Supply Fan Status			
Discrete Output Point	SFS		Name
Sensor Group/SPT Sensor	DSP		Name
Time Schedule	OCCPC01		Name
Setpoint Schedule	SETPT01		Name
Analog			
Hysteresis	0	in H2O	Hyst
Block Iteration Rate	30	sec	BlkRate
Power on Delay	0	sec	PowerUp

*Default values from factory.

NOTE: See CC6400 Comfort Controller Overview and Configuration Manual for configuation information.

Configuration Screens (cont)

DESCRIPTION	VALUE*	UNITS	NAME
OMNIZONE::DOPI_01: Supply Fan Status			
Discrete Output Point	SFS		Name
Time Schedule	OCCPC01		Name
Setpoint Schedule	SETPT01		Name
Permissive Interlock			
Control Point Type	Analog		Type
Occ Discrete State	On		OccSt
Unocc Discrete State	On		UnoccSt
Occ Analog Test	Low		OAnlgTst
Unocc Analog Test	Low		UAnlgTst
Override Value	0		Ovrd
Hysteresis	0.2	in H2O	Hyst
Persistence Time	0	sec	Persist
Analog Control Point	DSP		Name
Discrete Control Point	PNT_NAME		Name
Power on Delay	0	sec	PowerUp
OMNIZONE::ANCTL02: Humidity Control			
Discrete Output Point	DEHUM		Name
Sensor Group/SPT Sensor	IRH		Name
Time Schedule	LINK_01		Name
Setpoint Schedule	SETPT09		Name
Analog			
Hysteresis	10	%RH	Hyst
Block Iteration Rate	60	sec	BlkRate
Power on Delay	0	sec	PowerUp
OMNIZONE::CCVAV01: Modulating Economizer Control			
Cooling Coil Valve	ECONO		Name
Fan Status Point	ECON_OK		Name
Sensor Group/SPT Sensor	VAVRESET		Name
Time Schedule	LINK_01		Name
Setpoint Schedule	SETPT02		Name
High Humidity Switch	SENSDI00		Name
Humidity Setpoint	SETPT00		Name
High Humidity Sensor	MAMP_I00		Name
VAV Setpoint Reset			
Supply Air Setpoint	53	dF	Setpt
Reset Ratio	1	^F	RstRat
Start Reset	20	dF	StrtRst
Maximum Reset	20	^F	MaxReset
Supply Air Temperature	ECONPT		Name
PID_Master_Loop			
Proportional Gain	-4		KP
Integral Gain	-2		KI
Derivative Gain	0		KD
Disabled Output Value	0	%	DsblOut
Minimum Output Value	0	%	MinOut
Maximum Output Value	100	%	MaxOut
Starting Value	30	%	StartVal
Block Iteration Rate	30	sec	BlkRate
Power on Delay	0	sec	PowerUp
OMNIZONE::BSP: Building Static Milliamp			
Low Input Endpoint	4	ma	LowRange
High Input Endpoint	20	ma	HighRng
Low Conversion Endpoint	4	ma	LowConv
High Conversion Endpoint	20	ma	HighConv
Low Input Fault	4	ma	LowFlt
High Input Fault	20	ma	HighFlt
Externally Powered	No		ExtPower
OMNIZONE::IAQ: Indoor Air Quality			
Low Input Endpoint	4	ma	LowRange
High Input Endpoint	20	ma	HighRng
Low Conversion Endpoint	0		LowConv
High Conversion Endpoint	2000		HighConv
Low Input Fault	4	ma	LowFlt
High Input Fault	20	ma	HighFlt
Externally Powered	Yes		ExtPower
OMNIZONE::CSMUX: Comp. Status MUX			
Low Input Endpoint	0	Volts	LowRange
High Input Endpoint	11	Volts	HighRng
Low Conversion Endpoint	0	Volts	LowConv
High Conversion Endpoint	11	Volts	HighConv
Low Input Fault	1	Volts	LowFlt
High Input Fault	10.5	Volts	HighFlt

*Default values from factory.

NOTE: See CC6400 Comfort Controller Overview and Configuration Manual for configuration information.

Configuration Screens (cont)

DESCRIPTION	VALUE*	UNITS	NAME
OMNIZONE::PRES: Head Pressure(Comp1)			
Low Input Endpoint	0.6	Volts	LowRange
High Input Endpoint	4	Volts	HighRng
Low Conversion Endpoint	6.23	PSIG	LowConv
High Conversion Endpoint	309.77	PSIG	HighConv
Low Input Fault	0.3	Volts	LowFlt
High Input Fault	5	Volts	HighFlt
OMNIZONE::RESET: Ext. Supply Air Reset			
Low Input Endpoint	2	Volts	LowRange
High Input Endpoint	10	Volts	HighRng
Low Conversion Endpoint	0	dF	LowConv
High Conversion Endpoint	20	dF	HighConv
Low Input Fault	0	Volts	LowFlt
High Input Fault	10	Volts	HighFlt
OMNIZONE::ALARM: Critical Fault			
Output Logic Type	Normal		LogType
Minimum Off Time	4	sec	MinOff
Minimum On Time	4	sec	MinOn
Delay Time	10	sec	DlyTim
OMNIZONE::BPS_S: Bypass Start_Stop			
Output Logic Type	Normal		LogType
Minimum Off Time	60	sec	MinOff
Minimum On Time	60	sec	MinOn
Delay Time	5	sec	DlyTim
OMNIZONE::CMP1: Compressor 1 Relay			
Output Logic Type	Normal		LogType
Minimum Off Time	300	sec	MinOff
Minimum On Time	300	sec	MinOn
Delay Time	30	sec	DlyTim
OMNIZONE::CMP2: Compressor 2 Relay			
Output Logic Type	Normal		LogType
Minimum Off Time	300	sec	MinOff
Minimum On Time	300	sec	MinOn
Delay Time	30	sec	DlyTim
OMNIZONE::CMP3: Compressor 3 Relay			
Output Logic Type	Normal		LogType
Minimum Off Time	300	sec	MinOff
Minimum On Time	300	sec	MinOn
Delay Time	30	sec	DlyTim
OMNIZONE::CMP4: Compressor 4 Relay			
Output Logic Type	Normal		LogType
Minimum Off Time	300	sec	MinOff
Minimum On Time	300	sec	MinOn
Delay Time	30	sec	DlyTim
OMNIZONE::DEHUM: Ext. Dehumidification			
Output Logic Type	Normal		LogType
Minimum Off Time	60	sec	MinOff
Minimum On Time	60	sec	MinOn
Delay Time	10	sec	DlyTim
OMNIZONE::HEAT1: Heat Stage 1			
Output Logic Type	Normal		LogType
Minimum Off Time	60	sec	MinOff
Minimum On Time	60	sec	MinOn
Delay Time	10	sec	DlyTim
OMNIZONE::HEAT2: Heat Stage 2			
Output Logic Type	Normal		LogType
Minimum Off Time	60	sec	MinOff
Minimum On Time	60	sec	MinOn
Delay Time	10	sec	DlyTim
OMNIZONE::HEAT3: Heat Stage 3			
Output Logic Type	Normal		LogType
Minimum Off Time	60	sec	MinOff
Minimum On Time	60	sec	MinOn
Delay Time	10	sec	DlyTim
OMNIZONE::HEAT4: Heat Stage 4			
Output Logic Type	Normal		LogType
Minimum Off Time	60	sec	MinOff
Minimum On Time	60	sec	MinOn
Delay Time	10	sec	DlyTim

*Default values from factory.

NOTE: See CC6400 Comfort Controller Overview and Configuration Manual for configuration information.

Configuration Screens (cont)

DESCRIPTION	VALUE*	UNITS	NAME
OMNIZONE::HIR: Heat Interlock Relay			
Output Logic Type	Normal		LogType
Minimum Off Time	60	sec	MinOff
Minimum On Time	60	sec	MinOn
Delay Time	5	sec	DlyTim
OMNIZONE::PUMP: Pump Request			
Output Logic Type	Normal		LogType
Minimum Off Time	5	sec	MinOff
Minimum On Time	5	sec	MinOn
Delay Time	5	sec	DlyTim
OMNIZONE::SF: Supply Fan/VFD			
Output Logic Type	Normal		LogType
Minimum Off Time	30	sec	MinOff
Minimum On Time	60	sec	MinOn
Delay Time	10	sec	DlyTim
OMNIZONE::TOWER: Cooling Tower Request			
Output Logic Type	Normal		LogType
Minimum Off Time	5	sec	MinOff
Minimum On Time	5	sec	MinOn
Delay Time	5	sec	DlyTim
OMNIZONE::TRMCT: VAV Terminals Control			
Output Logic Type	Normal		LogType
Minimum Off Time	60	sec	MinOff
Minimum On Time	60	sec	MinOn
Delay Time	5	sec	DlyTim
OMNIZONE::TRMOP: VAV Terminals Open MAX			
Output Logic Type	Normal		LogType
Minimum Off Time	5	sec	MinOff
Minimum On Time	5	sec	MinOn
Delay Time	5	sec	DlyTim
OMNIZONE::VENTR: Ventilation Request			
Output Logic Type	Normal		LogType
Minimum Off Time	3	sec	MinOff
Minimum On Time	3	sec	MinOn
Delay Time	5	sec	DlyTim
OMNIZONE::WARN: Non Critical Fault			
Output Logic Type	Normal		LogType
Minimum Off Time	4	sec	MinOff
Minimum On Time	4	sec	MinOn
Delay Time	10	sec	DlyTim
OMNIZONE::DSALM01: Duct High Pressure			
Monitored Input Point	DHS		Name
Comparison Point	SENSDI00		Name
Alarm Inhibit Point	SENSDI00		Name
Discrete Check			
Alarm Logic	Normal		AlmLogic
Enable Delay Time	15	sec	DlyTim
Persistence Time	10	sec	Persist
Alarm Processor			
Alarm Processing	Enable		AlmProc
Re-Alarm Interval	0	min	ReAlmTim
Alarm=1 or Alert=0	1		Type
Alarm Level	1		AlmLevel
Alarm Source	5		AlmSrc
Alarm Routing	11010000		AlmRtg
Alarm Description Index	0		AlmDesc
Alarm Message - Part 1	Duct High Static		Message
Alarm Message - Part 2	Pressure		Message
Alarm Message - Part 3			Message
Alarm Message - Part 4			Message
Power on Delay	0	sec	PowerUp

*Default values from factory.

NOTE: See CC6400 Comfort Controller Overview and Configuration Manual for configuration information.

Configuration Screens (cont)

DESCRIPTION	VALUE*	UNITS	NAME
OMNIZONE::DSALM02: Phase Protection			
Monitored Input Point	PHASE		Name
Comparison Point	SENSDI00		Name
Alarm Inhibit Point	SENSDI00		Name
Discrete Check			
Alarm Logic	Normal		AlmLogic
Enable Delay Time	15	sec	DlyTim
Persistence Time	10	sec	Persist
Alarm Processor			
Alarm Processing	Enable		AlmProc
Re-Alarm Interval	0	min	ReAlmTim
Alarm=1 or Alert=0	1		Type
Alarm Level	1		AlmLevel
Alarm Source	5		AlmSrc
Alarm Routing	11010000		AlmRtg
Alarm Description Index	0		AlmDesc
Alarm Message - Part 1	Phase Loss		Message
Alarm Message - Part 2			Message
Alarm Message - Part 3			Message
Alarm Message - Part 4			Message
Power on Delay	0	sec	PowerUp
OMNIZONE::DSALM03: Freeze Protection			
Monitored Input Point	FREEZ		Name
Comparison Point	SENSDI00		Name
Alarm Inhibit Point	SENSDI00		Name
Discrete Check			
Alarm Logic	Normal		AlmLogic
Enable Delay Time	15	sec	DlyTim
Persistence Time	900	sec	Persist
Alarm Processor			
Alarm Processing	Enable		AlmProc
Re-Alarm Interval	0	min	ReAlmTim
Alarm=1 or Alert=0	1		Type
Alarm Level	1		AlmLevel
Alarm Source	5		AlmSrc
Alarm Routing	11010000		AlmRtg
Alarm Description Index	0		AlmDesc
Alarm Message - Part 1	Economizer Freez		Message
Alarm Message - Part 2	e Condition		Message
Alarm Message - Part 3			Message
Alarm Message - Part 4			Message
Power on Delay	0	sec	PowerUp
OMNIZONE::DSALM04: Duct Static Failure			
Monitored Input Point	DSP_ALM		Name
Comparison Point	SENSDI00		Name
Alarm Inhibit Point	SENSDI00		Name
Discrete Check			
Alarm Logic	Normal		AlmLogic
Enable Delay Time	10	sec	DlyTim
Persistence Time	10	sec	Persist
Alarm Processor			
Alarm Processing	Enable		AlmProc
Re-Alarm Interval	0	min	ReAlmTim
Alarm=1 or Alert=0	1		Type
Alarm Level	1		AlmLevel
Alarm Source	5		AlmSrc
Alarm Routing	11010000		AlmRtg
Alarm Description Index	0		AlmDesc
Alarm Message - Part 1	Duct Static Sens		Message
Alarm Message - Part 2	or Failure		Message
Alarm Message - Part 3			Message
Alarm Message - Part 4			Message
Power on Delay	0	sec	PowerUp

*Default values from factory.

NOTE: See CC6400 Comfort Controller Overview and Configuration Manual for configuration information.

Configuration Screens (cont)

DESCRIPTION	VALUE*	UNITS	NAME
OMNIZONE::DSALM05: Fire alarm			
Monitored Input Point	FSD		Name
Comparison Point	SENSDI00		Name
Alarm Inhibit Point	SENSDI00		Name
Discrete Check			
Alarm Logic	Invert		AlmLogic
Enable Delay Time	10	sec	DlyTim
Persistence Time	10	sec	Persist
Alarm Processor			
Alarm Processing	Enable		AlmProc
Re-Alarm Interval	0	min	ReAlmTim
Alarm=1 or Alert=0	1		Type
Alarm Level	0		AlmLevel
Alarm Source	5		AlmSrc
Alarm Routing	11010000		AlmRtg
Alarm Description Index	0		AlmDesc
Alarm Message - Part 1	Fire Shutdown		Message
Alarm Message - Part 2			Message
Alarm Message - Part 3			Message
Alarm Message - Part 4			Message
Power on Delay	0	sec	PowerUp
OMNIZONE::DSALM06: Condenser Water Flow			
Monitored Input Point	CDWF		Name
Comparison Point	COOLOK		Name
Alarm Inhibit Point	CDWF_ST		Name
Discrete Check			
Alarm Logic	Normal		AlmLogic
Enable Delay Time	120	sec	DlyTim
Persistence Time	120	sec	Persist
Alarm Processor			
Alarm Processing	Enable		AlmProc
Re-Alarm Interval	0	min	ReAlmTim
Alarm=1 or Alert=0	1		Type
Alarm Level	2		AlmLevel
Alarm Source	5		AlmSrc
Alarm Routing	11010000		AlmRtg
Alarm Description Index	0		AlmDesc
Alarm Message - Part 1	Check Condenser		Message
Alarm Message - Part 2	Water Flow		Message
Alarm Message - Part 3			Message
Alarm Message - Part 4			Message
Power on Delay	0	sec	PowerUp
OMNIZONE::DSALM07: Filter Alarm			
Monitored Input Point	FLTS		Name
Comparison Point	SENSDI00		Name
Alarm Inhibit Point	SENSDI00		Name
Discrete Check			
Alarm Logic	Normal		AlmLogic
Enable Delay Time	10	sec	DlyTim
Persistence Time	20	sec	Persist
Alarm Processor			
Alarm Processing	Enable		AlmProc
Re-Alarm Interval	0	min	ReAlmTim
Alarm=1 or Alert=0	1		Type
Alarm Level	2		AlmLevel
Alarm Source	5		AlmSrc
Alarm Routing	11010000		AlmRtg
Alarm Description Index	0		AlmDesc
Alarm Message - Part 1	Change Filters		Message
Alarm Message - Part 2			Message
Alarm Message - Part 3			Message
Alarm Message - Part 4			Message
Power on Delay	0	sec	PowerUp

*Default values from factory.

NOTE: See CC6400 Comfort Controller Overview and Configuration Manual for configuration information.

Configuration Screens (cont)

DESCRIPTION	VALUE*	UNITS	NAME
OMNIZONE::DSALM08: Compressor 1 Alarm			
Monitored Input Point	C1_ALM		Name
Comparison Point	SENSDI00		Name
Alarm Inhibit Point	SENSDI00		Name
Discrete Check			
Alarm Logic	Normal		AlmLogic
Enable Delay Time	10	sec	DlyTim
Persistence Time	10	sec	Persist
Alarm Processor			
Alarm Processing	Enable		AlmProc
Re-Alarm Interval	0	min	ReAlmTim
Alarm=1 or Alert=0	1		Type
Alarm Level	2		AlmLevel
Alarm Source	5		AlmSrc
Alarm Routing	11010000		AlmRtg
Alarm Description Index	0		AlmDesc
Alarm Message - Part 1	Compressor 1 fau		Message
Alarm Message - Part 2	lt		Message
Alarm Message - Part 3			Message
Alarm Message - Part 4			Message
Power on Delay	0	sec	PowerUp
OMNIZONE::DSALM09: Compressor 2 Alarm			
Monitored Input Point	C2_ALM		Name
Comparison Point	SENSDI00		Name
Alarm Inhibit Point	SENSDI00		Name
Discrete Check			
Alarm Logic	Normal		AlmLogic
Enable Delay Time	10	sec	DlyTim
Persistence Time	10	sec	Persist
Alarm Processor			
Alarm Processing	Enable		AlmProc
Re-Alarm Interval	0	min	ReAlmTim
Alarm=1 or Alert=0	1		Type
Alarm Level	2		AlmLevel
Alarm Source	5		AlmSrc
Alarm Routing	11010000		AlmRtg
Alarm Description Index	0		AlmDesc
Alarm Message - Part 1	Compressor 2 Fau		Message
Alarm Message - Part 2	lt		Message
Alarm Message - Part 3			Message
Alarm Message - Part 4			Message
Power on Delay	0	sec	PowerUp
OMNIZONE::DSALM10: Compressor 3 Alarm			
Monitored Input Point	C3_ALM		Name
Comparison Point	SENSDI00		Name
Alarm Inhibit Point	SENSDI00		Name
Discrete Check			
Alarm Logic	Normal		AlmLogic
Enable Delay Time	10	sec	DlyTim
Persistence Time	10	sec	Persist
Alarm Processor			
Alarm Processing	Enable		AlmProc
Re-Alarm Interval	0	min	ReAlmTim
Alarm=1 or Alert=0	1		Type
Alarm Level	2		AlmLevel
Alarm Source	5		AlmSrc
Alarm Routing	11010000		AlmRtg
Alarm Description Index	0		AlmDesc
Alarm Message - Part 1	Compressor 3 Fau		Message
Alarm Message - Part 2	lt		Message
Alarm Message - Part 3			Message
Alarm Message - Part 4			Message
Power on Delay	0	sec	PowerUp

*Default values from factory.

NOTE: See CC6400 Comfort Controller Overview and Configuration Manual for configuration information.

Configuration Screens (cont)

DESCRIPTION	VALUE*	UNITS	NAME
OMNIZONE::DSALM11: Compressor 4 Alarm			
Monitored Input Point	C4_ALM		Name
Comparison Point	SENSDI00		Name
Alarm Inhibit Point	SENSDI00		Name
Discrete Check			
Alarm Logic	Normal		AlmLogic
Enable Delay Time	10	sec	DlyTim
Persistence Time	10	sec	Persist
Alarm Processor			
Alarm Processing	Enable		AlmProc
Re-Alarm Interval	0	min	ReAlmTim
Alarm=1 or Alert=0	1		Type
Alarm Level	2		AlmLevel
Alarm Source	5		AlmSrc
Alarm Routing	11010000		AlmRtg
Alarm Description Index	0		AlmDesc
Alarm Message - Part 1	Compressor 4 Fau		Message
Alarm Message - Part 2	lt		Message
Alarm Message - Part 3			Message
Alarm Message - Part 4			Message
Power on Delay	0	sec	PowerUp
OMNIZONE::DSALM12: Supply Fan Alarm			
Monitored Input Point	SFS		Name
Comparison Point	SF		Name
Alarm Inhibit Point	SENSDI00		Name
Discrete Check			
Alarm Logic	Normal		AlmLogic
Enable Delay Time	120	sec	DlyTim
Persistence Time	120	sec	Persist
Alarm Processor			
Alarm Processing	Enable		AlmProc
Re-Alarm Interval	0	min	ReAlmTim
Alarm=1 or Alert=0	1		Type
Alarm Level	2		AlmLevel
Alarm Source	5		AlmSrc
Alarm Routing	11010000		AlmRtg
Alarm Description Index	0		AlmDesc
Alarm Message - Part 1	Check Supply Fan		Message
Alarm Message - Part 2			Message
Alarm Message - Part 3			Message
Alarm Message - Part 4			Message
Power on Delay	0	sec	PowerUp
OMNIZONE::DXVAV01: Compressor Staging			
Discrete Output Point 1	CMP1		Name
Discrete Output Point 2	CMP2		Name
Discrete Output Point 3	CMP3		Name
Discrete Output Point 4	CMP4		Name
Discrete Output Point 5	DISCRO00		Name
Discrete Output Point 6	DISCRO00		Name
Fan Status Point	COMPRES		Name
Sensor Group/SPT Sensor	VAVRESET		Name
Time Schedule	LINK_01		Name
Setpoint Schedule	SETPT02		Name
High Humidity Switch	SENSDI00		Name
Humidity Setpoint	SETPT00		Name
High Humidity Sensor	IRH		Name
VAV Setpoint Reset			
Supply Air Setpoint	57	dF	SetPT
Reset Ratio	1	^F	RstRat
Start Reset	20	dF	StrtRst
Maximum Reset	20	^F	MaxReset
Supply Air Temperature	SAT		Name
PID_Master_Loop			
Proportional Gain	-1		KP
Integral Gain	-0.4		KI
Derivative Gain	-0.7		KD
Disabled Output Value	0	%	DsblOut
Minimum Output Value	0	%	MinOut
Maximum Output Value	100	%	MaxOut
Starting Value	0	%	StartVal
Block Iteration Rate	30	sec	BlkRate
Staging Control			
Total Number of Stages	4		TotalStg
On Time Delay	2	min	OnDelay
Off Time Delay	1	min	OffDelay
Power on Delay	0	sec	PowerUp

*Default values from factory.

NOTE: See CC6400 Comfort Controller Overview and Configuration Manual for configuration information.

Configuration Screens (cont)

DESCRIPTION	VALUE*	UNITS	NAME
OMNIZONE::EHVAV01: DO - Elec Heat VAV 01			
Discrete Output Point 1	HEAT1		Name
Discrete Output Point 2	HEAT2		Name
Discrete Output Point 3	HEAT3		Name
Discrete Output Point 4	HEAT4		Name
Discrete Output Point 5	DISCRO00		Name
Discrete Output Point 6	DISCRO00		Name
Fan Status Point	MODE		Name
Sensor Group/SPT Sensor	LINK_09		Name
Time Schedule	LINK_01		Name
Setpoint Schedule	LINK_01		Name
High Humidity Switch	SENSDI00		Name
Humidity Setpoint	SETPT00		Name
High Humidity Sensor	IRH		Name
Duct Temperature	SAT		Name
Duct High Limit	150	dF	Value
Occupied Heating	Yes		OccHeat
PID_Master_Loop			
Proportional Gain	5		KP
Integral Gain	2.5		KI
Derivative Gain	0		KD
Disabled Output Value	0	%	DdblOut
Minimum Output Value	0	%	MinOut
Maximum Output Value	100	%	MaxOut
Starting Value	0	%	StartVAl
Block Iteration Rate	15	sec	BlkRate
Heating Setpoint Offset	3	^F	Value
Staging Control			
Total Number of Stages	4		TotalStg
On Time Delay	3	min	OnDelay
Off Time Delay	1	min	OffDelay
Power on Delay	0	sec	PowerUp
OMNIZONE::HCVAV01: AO - Heating VAV 01			
Heating Coil Valve	HWV		Name
Fan Status Point	MODE		Name
Sensor Group/SPT Sensor	LINK_09		Name
Time Schedule	LINK_01		Name
Setpoint Schedule	LINK_01		Name
Heating Setpoint Offset	3	^F	Value
High Humidity Switch	SENSDI00		Name
Humidity Setpoint	SETPT00		Name
High Humidity Sensor	IRH		Name
Occupied Heating	Yes		OccHeat
PID_Master_Loop			
Proportional Gain	3		KP
Integral Gain	1.5		KI
Derivative Gain	0		KD
Disabled Output Value	35	dF	DsblOut
Minimum Output Value	40	dF	MinOut
Maximum Output Value	140	dF	MaxOut
Starting Value	80	dF	StartVal
Block Iteration Rate	15	sec	BlkRate
Supply Air Temperature	SAT		Name
P_Submaster_Loop			
Proportional Gain	3		KP
Disabled Output Value	0	%	FanOff
Minimum Output Value	0	%	MinOut
Maximum Output Value	100	%	MaxOut
Center Value	30	%	Center
Block Iteration Rate	2	sec	BlkRate
Power on Delay	0	sec	PowerUp
OMNIZONE::INTLK01: OK to run Fan			
Discrete Output Point	OKFAN		Name
Discrete Input Point 1	TIMCLOCK		Name
Discrete Input Point 2	ROCC		Name
Discrete Interlock			
Input 1 Comparison	Off		Sns1Sta
Input 2 Comparison	Off		Sns2Sta
Off Persistence Time	5	sec	OffPrst
On Persistence Time	5	sec	OnPrst
Output Logic Type	Invert		LogType
Power on Delay	5	sec	PowerUp

*Default values from factory.

NOTE: See CC6400 Comfort Controller Overview and Configuration Manual for configuration information.

Configuration Screens (cont)

DESCRIPTION	VALUE*	UNITS	NAME
OMNIZONE::INTLK02: Ok to Cool			
Discrete Output Point	COOLOK		Name
Discrete Input Point 1	MODE		Name
Discrete Input Point 2	SF_SFS		Name
Discrete Interlock			
Input 1 Comparison	Off		Sns1Sta
Input 2 Comparison	On		Sns2Sta
Off Persistence Time	3	sec	OffPrst
On Persistence Time	10	sec	OnPrst
Output Logic Type	Normal		LogType
Power on Delay	0	sec	PowerUp
OMNIZONE::INTLK03: OK Fan + Sup. Fan Stat			
Discrete Output Point	SF_SFS		Name
Discrete Input Point 1	OKFAN		Name
Discrete Input Point 2	SFS		Name
Discrete Interlock			
Input 1 Comparison	On		Sns1Sta
Input 2 Comparison	On		Sns2Sta
Off Persistence Time	2	sec	OffPrst
On Persistence Time	2	sec	OnPrst
Output Logic Type	Normal		LogType
Power on Delay	0	sec	PowerUp
OMNIZONE::INTLK04: Supply Fan Delays			
Discrete Output Point	SF		Name
Discrete Input Point 1	OKFAN		Name
Discrete Input Point 2	SENSDI00		Name
Discrete Interlock			
Input 1 Comparison	On		Sns1Sta
Input 2 Comparison	Off		Sns2Sta
Off Persistence Time	300	sec	OffPrst
On Persistence Time	20	sec	OnPrst
Output Logic Type	Normal		LogType
Power on Delay	0	sec	PowerUp
OMNIZONE::INTLK05: Dis. Cool befor SF delay			
Discrete Output Point	FAN_CDWF		Name
Discrete Input Point 1	CDWF		Name
Discrete Input Point 2	OKFAN		Name
Discrete Interlock			
Input 1 Comparison	On		Sns1Sta
Input 2 Comparison	On		Sns2Sta
Off Persistence Time	3	sec	OffPrst
On Persistence Time	3	sec	OnPrst
Output Logic Type	Normal		LogType
Power on Delay	0	sec	PowerUp
OMNIZONE::INTLK06: Activate VAV Terminals			
Discrete Output Point	TRMCT		Name
Discrete Input Point 1	OKFAN		Name
Discrete Input Point 2	SF		Name
Discrete Interlock			
Input 1 Comparison	Off		Sns1Sta
Input 2 Comparison	Off		Sns2Sta
Off Persistence Time	1	sec	OffPrst
On Persistence Time	1	sec	OnPrst
Output Logic Type	Invert		LogType
Power on Delay	1	sec	PowerUp
OMNIZONE::INTLK07: Ventilation Request			
Discrete Output Point	VENTR		Name
Discrete Input Point 1	TIMCLOCK		Name
Discrete Input Point 2	SF_SFS		Name
Discrete Interlock			
Input 1 Comparison	On		Sns1Sta
Input 2 Comparison	On		Sns2Sta
Off Persistence Time	1	sec	OffPrst
On Persistence Time	1	sec	OnPrst
Output Logic Type	Normal		LogType
Power on Delay	1	sec	PowerUp
OMNIZONE::INTLK08: Heat Interlock Relay			
Discrete Output Point	HIR		Name
Discrete Input Point 1	MODE		Name
Discrete Input Point 2	SF_SFS		Name
Discrete Interlock			
Input 1 Comparison	On		Sns1Sta
Input 2 Comparison	On		Sns2Sta
Off Persistence Time	30	sec	OffPrst
On Persistence Time	30	sec	OnPrst
Output Logic Type	Normal		LogType
Power on Delay	5	sec	PowerUp

*Default values from factory.

NOTE: See CC6400 Comfort Controller Overview and Configuration Manual for configuration information.

Configuration Screens (cont)

DESCRIPTION	VALUE*	UNITS	NAME
OMNIZONE::INTLK09: Condenser Pump			
Discrete Output Point	PUMP		Name
Discrete Input Point 1	COOLOK		Name
Discrete Input Point 2	SENSDI00		Name
Discrete Interlock			
Input 1 Comparison	On		Sns1Sta
Input 2 Comparison	Off		Sns2Sta
Off Persistence Time	30	sec	OffPrst
On Persistence Time	2	sec	OnPrst
Output Logic Type	Normal		LogType
Power on Delay	0	sec	PowerUp
OMNIZONE::INTLK10: Tower Request			
Discrete Output Point	TOWER		Name
Discrete Input Point 1	COOLOK		Name
Discrete Input Point 2	SENSDI00		Name
Discrete Interlock			
Input 1 Comparison	On		Sns1Sta
Input 2 Comparison	Off		Sns2Sta
Off Persistence Time	30	sec	OffPrst
On Persistence Time	2	sec	OnPrst
Output Logic Type	Normal		LogType
Power on Delay	0	sec	PowerUp
OMNIZONE::INTLK11: Compressor Cooling			
Discrete Output Point	COMPRES		Name
Discrete Input Point 1	COOLOK		Name
Discrete Input Point 2	FAN_CDWF		Name
Discrete Interlock			
Input 1 Comparison	On		Sns1Sta
Input 2 Comparison	On		Sns2Sta
Off Persistence Time	2	sec	OffPrst
On Persistence Time	30	sec	OnPrst
Output Logic Type	Normal		LogType
Power on Delay	0	sec	PowerUp
OMNIZONE::LINK_01: Linkage/AOSS Schedule 01			
Setpoint Bias	VOLT_I00		Name
Setpoint Schedule	SETPT03		Name
Adaptive Optimal Start			
AO Start Enable	Disable		Enable
Building Insulation	30		BldInsul
Unoccupied 24hr Factor	15		UnOccFct
Offset Low Value	0	^F	Value
Offset High Value	0	^F	Value
Sensor Group/SPT Sensor	CTRLPT		Name
Time Schedule	OCCPC01		Name
Outside Air Temp	OAT		Name
NTFC Algorithm	NTFC_00		Name
Heating Algorithm	HCVAV01		Name
Supply Air Temp	SAT		Name
Fan Status	SF_SFS		Name
Adaptive Optimal Stop			
AO Stop Enable	Disable		Enable
Maximum Stop Time	60	min	MaxStop
Setpoint Bias	2	^F	SPBias
Power on Delay	0	sec	PowerUp
Evacuation	EVAC		Evacuate
Pressurization	TRMOP		Pressure
OMNIZONE::LMALM01: Supply air Sensor			
Monitored Input Point	SAT		Name
Alarm Inhibit Point	SENSDI00		Name
Limit Check			
Low Limit	25	dF	LowLim
High Limit	150	dF	HighLim
Enable Delay Time	15	sec	DlyTim
Persistence Time	10	sec	Persist
Hysteresis	5	^F	Hyst
Alarm Processor			
Alarm Processing	Enable		AlmProc
Re-Alarm Interval	0	min	ReAlmTim
Alarm=1 or Alert=0	1		Type
Alarm Level	1		AlmLevel
Alarm Source	5		AlmSrc
Alarm Routing	11010000		AlmRtg
Alarm Description Index	7		AlmDesc
Alarm Message - Part 1			Message
Alarm Message - Part 2			Message
Alarm Message - Part 3			Message
Alarm Message - Part 4			Message
Power on Delay	0	sec	PowerUp

*Default values from factory.

NOTE: See CC6400 Comfort Controller Overview and Configuration Manual for configuration information.

Configuration Screens (cont)

DESCRIPTION	VALUE*	UNITS	NAME
OMNIZONE::LMALM02: Entering WaterTemp.			
Monitored Input Point	EWT		Name
Alarm Inhibit Point	SENSDI00		Name
Limit Check			
Low Limit	35	dF	LowLim
High Limit	95	dF	HighLim
Enable Delay Time	15	sec	DlyTim
Persistence Time	10	sec	Persist
Hysteresis	5	^F	Hyst
Alarm Processor			
Alarm Processing	Enable		AlmProc
Re-Alarm Interval	0	min	ReAlmTim
Alarm=1 or Alert=0	1		Type
Alarm Level	1		AlmLevel
Alarm Source	5		AlmSrc
Alarm Routing	11010000		AlmRtg
Alarm Description Index	7		AlmDesc
Alarm Message - Part 1			Message
Alarm Message - Part 2			Message
Alarm Message - Part 3			Message
Alarm Message - Part 4			Message
Power on Delay	0	sec	PowerUp
OMNIZONE::LMALM03: Compressor Mux			
Monitored Input Point	CSMUX		Name
Alarm Inhibit Point	SENSDI00		Name
Limit Check			
Low Limit	1.5	Volts	LowLim
High Limit	9.9	Volts	HighLim
Enable Delay Time	15	sec	DlyTim
Persistence Time	10	sec	Persist
Hysteresis	0.2	Volts	Hyst
Alarm Processor			
Alarm Processing	Enable		AlmProc
Re-Alarm Interval	0	min	ReAlmTim
Alarm=1 or Alert=0	1		Type
Alarm Level	1		AlmLevel
Alarm Source	5		AlmSrc
Alarm Routing	11010000		AlmRtg
Alarm Description Index	7		AlmDesc
Alarm Message - Part 1			Message
Alarm Message - Part 2			Message
Alarm Message - Part 3			Message
Alarm Message - Part 4			Message
Power on Delay	0	sec	PowerUp
OMNIZONE::LMALM04: Mixed/Return Air			
Monitored Input Point	MA_RA		Name
Alarm Inhibit Point	SENSDI00		Name
Limit Check			
Low Limit	35	dF	LowLim
High Limit	120	dF	HighLim
Enable Delay Time	10	sec	DlyTim
Persistence Time	10	sec	Persist
Hysteresis	5	^F	Hyst
Alarm Processor			
Alarm Processing	Enable		AlmProc
Re-Alarm Interval	0	min	ReAlmTim
Alarm=1 or Alert=0	1		Type
Alarm Level	2		AlmLevel
Alarm Source	5		AlmSrc
Alarm Routing	11010000		AlmRtg
Alarm Description Index	7		AlmDesc
Alarm Message - Part 1			Message
Alarm Message - Part 2			Message
Alarm Message - Part 3			Message
Alarm Message - Part 4			Message
Power on Delay	0	sec	PowerUp

*Default values from factory.

NOTE: See CC6400 Comfort Controller Overview and Configuration Manual for configuration information.

Configuration Screens (cont)

DESCRIPTION	VALUE*	UNITS	NAME
OMNIZONE::OCCPC01: Occupancy 01			
Time Schedule			
Manual Override Hours	0	hours	Ovrd
Period 1: Day of Week	0		DOW1
Period 1: Occupied from	0:00		Occ1
Period 1: Occupied to	24:00:00		UnOcc1
Period 2: Day of Week	0		DOW2
Period 2: Occupied from	0:00		Occ2
Period 2: Occupied to	24:00:00		UnOcc2
Period 3: Day of Week	0		DOW3
Period 3: Occupied from	0:00		Occ3
Period 3: Occupied to	24:00:00		UnOcc3
Period 4: Day of Week	0		DOW4
Period 4: Occupied from	0:00		Occ4
Period 4: Occupied to	24:00:00		UnOcc4
Period 5: Day of Week	0		DOW5
Period 5: Occupied from	0:00		Occ5
Period 5: Occupied to	24:00:00		UnOcc5
Period 6: Day of Week	0		DOW6
Period 6: Occupied from	0:00		Occ6
Period 6: Occupied to	24:00:00		UnOcc6
Period 7: Day of Week	0		DOW7
Period 7: Occupied from	0:00		Occ7
Period 7: Occupied to	24:00:00		UnOcc7
Period 8: Day of Week	0		DOW8
Period 8: Occupied from	0:00		Occ8
Period 8: Occupied to	24:00:00		UnOcc8
Push Button Override	LATCHI00		Name
Thermostat Override	TEMP_I00		Name
Time Delay	5	min	Value
Timed Override Duration	5	min	Value
Power on Delay	0	sec	PowerUp
OMNIZONE::STPR_01: Supply Fan Speed			
Analog Output Point	SPEED		
Fan Status Point	SF		
Duct Static Pressure	DSP		
Static Pressure Setpoint	1.5	in H2O	
PID_Master_Loop			
Proportional Gain	8		
Integral Gain	4		
Derivative Gain	0		
Disabled Output Value	0	%	
Minimum Output Value	10	%	
Maximum Output Value	100	%	
Starting Value	0	%	
Block Iteration Rate	10	sec	
Power on Delay	0	sec	
OMNIZONE::TC01: DO - Time Clock 01			
Discrete Output Point	TIMCLOCK		Name
Time Schedule	LINK_01		Name
Loadshed	LDSHD00		Name
Duty Cycle			
Duty Cycle Enable	Disable		Enable
First Minute of Hour	0		FirstOff
Second Minute of Hour	0		SecndOff
Occupied Off Duration	0	min	OccOff
Unoccupied Off Duration	60	min	UnOccOff
Minimum Off Time	3	min	MinOff
Redline Bias Time	0	min	BiasTime
Power on Delay	0	sec	PowerUp
OMNIZONE::VPIOC: I/O & Faults			
Compressor Status			
Reschedule Rate	1	sec	RESCHRAT
Power on Delay	10	sec	RESCHPOR
Critical Fault			
Reschedule Rate	2	sec	RESCHRAT
Power on Delay	10	sec	RESCHPOR
Fire Shutdown			
Reschedule Rate	2	sec	RESCHRAT
Power on Delay	10	sec	RESCHPOR
Non Critical Fault			
Reschedule Rate	2	sec	RESCHRAT
Power on Delay	10	sec	RESCHPOR
Compressor Fault/Test			
Reschedule Rate	10	sec	RESCHRAT
Power on Delay	30	sec	RESCHPOR

*Default values from factory.

NOTE: See CC6400 Comfort Controller Overview and Configuration Manual for configuration information.

Configuration Screens (cont)

DESCRIPTION	VALUE*	UNITS	NAME
OMNIZONE::VPTESTC: Field Test			
Field Test			
Reschedule Rate	5	sec	RESCHRAT
Power on Delay	40	sec	RESCHPOR
OMNIZONE::MODECTRC: Mode Control			
Determines Heat			
Reschedule Rate	10	sec	RESCHRAT
Power on Delay	30	sec	RESCHPOR
Run Fan in Bypass			
Reschedule Rate	10	sec	RESCHRAT
Power on Delay	30	sec	RESCHPOR
Water Economizer Control			
Reschedule Rate	10	sec	RESCHRAT
Power on Delay	30	sec	RESCHPOR
Mod Valve & Econo			
Reschedule Rate	2	sec	RESCHRAT
Power on Delay	10	sec	RESCHPOR
OMNIZONE::SETSYNCC: Setpoint Synchronization			
Setpoint Synch			
Reschedule Rate	3	sec	RESCHRAT
Power on Delay	10	sec	RESCHPOR

*Default values from factory.

NOTE: See CC6400 Comfort Controller Overview and Configuration Manual for configuration information.

Maintenance Screens

DESCRIPTION	VALUE	UNITS	STATUS	FORCE	NAME
OMNIZONE::ADAPT01: VAVRESET Software point control					
Analog Output Point	0	%			Value
Status Point	Off				Value
Occupied ?	No				Status
Reset Point	0	dF			Value
Controlling Setpoint	0	dF			RefOut
Control Point	0	dF			Value
PID_Master_Loop					
Reference Output	0	%			RefOut
Proportional Term	0	%			PTerm
Integral Term	0	%			ITerm
Derivative Term	0	%			DTerm
Integrator Flags	100				Flags
Task Timer	6	sec			TaskTimr
OMNIZONE::ADAPT02: Head Pressure control					
Analog Output Point	100	%		Control	Value
Status Point	Off			Control	Value
Occupied ?	No				Status
Reset Point	0	PSIG			Value
Controlling Setpoint	0	PSIG			RefOut
Control Point	117.72	PSIG			Value
PID_Master_Loop					
Reference Output	0	%			RefOut
Proportional Term	0	%			PTerm
Integral Term	0	%			ITerm
Derivative Term	0	%			DTerm
Integrator Flags	100				Flags
Task Timer	2	sec			TaskTimr
OMNIZONE::ADAPT03: Building Pressure Ctrl.					
Analog Output Point	0	%			Value
Status Point	Off				Value
Occupied ?	No				Status
Reset Point	0	ma			Value
Controlling Setpoint	12.32	ma			RefOut
Control Point	12.44	ma			Value
PID_Master_Loop					
Reference Output	0	%			RefOut
Proportional Term	2	%			PTerm
Integral Term	0	%			ITerm
Derivative Term	0	%			DTerm
Integrator Flags	100				Flags
Task Timer	3	sec			TaskTimr

Maintenance Screens (cont)

DESCRIPTION	VALUE	UNITS	STATUS	FORCE	NAME
OMNIZONE::ANCTL01: Supply Fan Status					
Discrete Output Point	Off			Control	Value
Sensor Group/SPT Sensor	0.17	in H2O			Value
Occupied ?	No				Status
Analog					
Low Setpoint	0.3	in H2O			LowSP
Lo Setpoint + Hyst	0	in H2O			ModLowSP
Hi Setpoint - Hyst	0	in H2O			ModHghSP
High Setpoint	0.4	in H2O			HghSP
Reference Output	FALSE				RefOut
Task Timer	47	sec			TaskTimr
OMNIZONE::ANCTL02: Humidity Control					
Discrete Output Point	Off				Value
Sensor Group/SPT Sensor	49.56	%RH			Value
Occupied ?	No				Status
Analog					
Low Setpoint	0	%RH			LowSP
Lo Setpoint + Hyst	10	%RH			ModLowSP
Hi Setpoint - Hyst	89	%RH			ModHghSP
High Setpoint	99	%RH			HghSP
Reference Output	FALSE				RefOut
Task Timer	25	sec			TaskTimr
OMNIZONE::BSP_IN: Building Static Pressure (Typical Analog Software point)					
System Value	0.03	in H2O			Sysvalue
Force	0				Force
Status	0				Status
Alarm Status	Normal				AlmStat
OMNIZONE::CCVAV01: Modulating Economizer Control					
Cooling Coil Valve	0	%			Value
Fan Status Point	Off			Control	Value
Sensor Group/SPT Sensor	0	dF			Value
Occupied ?	No				Status
High Humidity Switch	Off				Value
High Humidity Setpoint	99	%RH			Value
High Humidity Sensor	0	%RH			Value
VAV Setpoint Reset					
Setpoint	73	dF			Setpoint
Setpoint Offset	20	^F			Offset
CCV Supply Air Setpoint	73	dF			CCVVRF
Supply Air Temperature	77.19	dF			Value
PID_Master_Loop					
Reference Output	0	%			RefOut
Proportional Term	0	%			PTerm
Integral Term	0	%			ITerm
Derivative Term	0	%			DTerm
Integrator Flags	100				Flags
Task Timer	4	sec			TaskTimr
OMNIZONE::BSP: Building Static Milliamp					
System Value	12.4	ma			Sysvalue
Force	0				Force
Status	0				HwStat
Alarm Status	Normal				AlmStat
Sensor Value	12.4	ma			SenValue
Hardware Value	12.4	ma			HwValue
Channel Number	34				ChanNum
Control Algorithm Name	ADAPT03				AlgoName
Alarm Algorithm Name					AlmName
OMNIZONE::IAQ: Indoor Air Quality					
System Value	584.3				Sysvalue
Force	0				Force
Status	0				HwStat
Alarm Status	Normal				AlmStat
Sensor Value	584.3				SenValue
Hardware Value	8.7	ma			HwValue
Channel Number	36				ChanNum
Control Algorithm Name					AlgoName
Alarm Algorithm Name					AlmName
OMNIZONE::CSMUX: Comp. Status MUX					
System Value	1.83	Volts			Sysvalue
Force	0				Force
Status	0				HwStat
Alarm Status	Normal				AlmStat
Sensor Value	1.83	Volts			SenValue
Hardware Value	1.8	Volts			HwValue
Channel Number	3				ChanNum
Control Algorithm Name					AlgoName
Alarm Algorithm Name	LMALM03				AlmName

Maintenance Screens (cont)

DESCRIPTION	VALUE	UNITS	STATUS	FORCE	NAME
OMNIZONE::PRES: Head Pressure(Comp1)					
System Value	118.76	PSIG			Sysvalue
Force	0				Force
Status	0				HwStat
Alarm Status	Normal				AlmStat
Sensor Value	118.76	PSIG			SenValue
Hardware Value	1.9	Volts			HwValue
Channel Number	24				ChanNum
Control Algorithm Name	ADAPT02				AlgoName
Alarm Algorithm Name					AlmName
OMNIZONE::RESET: Ext. Supply Air Reset					
System Value	0	dF			Sysvalue
Force	0				Force
Status	0				HwStat
Alarm Status	Normal				AlmStat
Sensor Value	0	dF			SenValue
Hardware Value	1.1	Volts			HwValue
Channel Number	20				ChanNum
Control Algorithm Name	ADAPT01				AlgoName
Alarm Algorithm Name					AlmName
OMNIZONE::UPDATEDB: Database Control					
Database Error	No				DBError
EEPROM Error	No				EEError
RAM Error	No				RAMError
Available Program Bytes	11130				EEPROM
Available Data Bytes	14742				RAM
OMNIZONE::ALARM: Critical Fault (Typical Discrete Out)					
System Value	Off				SysVal
Force	0				Force
Status	0				HwStat
Alarm Status	Normal				AlmStat
Control Value	Off				CtrValue
Hardware Value	Open				HdwValue
Channel Number	16				ChanNum
Control Algorithm Name					AlgoName
Alarm Algorithm Name					AlmName
OMNIZONE::BP_SAFE: Bypass Acc Panel Secure (Typical Discrete Software)					
System Value	No				Sysvalue
Force	0				Force
Status	0				Status
Alarm Status	Normal				AlmStat
OMNIZONE::DOPI_01: Supply Fan Status					
Discrete Output Point	Off			Control	Value
Occupied ?	No				Status
Permissive Interlock					
Reference Output	0				RefOut
Perm Interlock Flag	TRUE				PIFlag
Conditional	Low				Condtion
Modified Setpoint	0.5	in H2O			ModStpt
Persistence Timer	0	sec			PersTime
Setpoint Limit	0.3	in H2O			Value
Analog Control Point	0.17	in H2O			Value
Discrete Control Point	Off				Value
Task Timer	1	sec			TaskTimr
OMNIZONE::DSALM01: Duct High Pressure (Typical Discrete Alarm)					
Monitored Input Point	Off				Value
Comparison Point	Off				Value
Alarm Inhibit Point	Off				Value
Alarm Status	Normal				Status
Alarm Processor					
Alarm Type	0				AlmType
Time of Last Message	0:00				LastTime
Month of Last Message	0				LastDate
Day of Last Message	0				LastDate
Year of Last Message	0				LastDate
Task Timer	2	sec			TaskTimr

Maintenance Screens (cont)

DESCRIPTION	VALUE	UNITS	STATUS	FORCE	NAME
OMNIZONE::DXVAV01: Compressor Staging					
Discrete Output Point 1	Off				Value
Discrete Output Point 2	Off				Value
Discrete Output Point 3	Off				Value
Discrete Output Point 4	Off				Value
Discrete Output Point 5	Off				Value
Discrete Output Point 6	Off				Value
Fan Status Point	Off				Value
Sensor Group/SPT Sensor	0	dF			Value
Occupied ?	No				Status
High Humidity Switch	Off				Value
High Humidity Setpoint	99	%RH			Value
High Humidity Sensor	49.56	%RH			Value
VAV Setpoint Reset					
Setpoint	75	dF			Setpoint
Setpoint Offset	20	^F			Offset
DX Supply Air Setpoint	75	dF			DODXRF
Supply Air Temperature	66.97	dF			Value
PID_Master_Loop					
Reference Output	0	%			RefOut
Proportional Term	11.9	%			PTerm
Integral Term	0	%			ITerm
Derivative Term	0	%			DTerm
Integrator Flags	100				Flags
Staging Control					
Number of Stages	0				NumStgs
Requested Stages	0				ReqStgs
Delta Stages	0				DltaStgs
Delay Timer	0	min			DlyTimer
PID Integrator Clamp	Off				PIDClamp
Task Timer	4	sec			TaskTimr
OMNIZONE::EHVAV01: DO - Elec Heat VAV 01					
Discrete Output Point 1	Off				Value
Discrete Output Point 2	Off				Value
Discrete Output Point 3	Off				Value
Discrete Output Point 4	Off				Value
Discrete Output Point 5	Off				Value
Discrete Output Point 6	Off				Value
Fan Status Point	Off			Control	Value
Sensor Group/SPT Sensor	74	dF			Value
Occupied ?	No				Status
High Humidity Switch	Off				Value
High Humidity Setpoint	99	%RH			Value
High Humidity Sensor	49.71	%RH			Value
Duct Temperature	66.97	dF			Value
Duct High Limit	150	dF			Value
Morning Warm Up					
Reference Output	Off				RefOut
Morning Warmup ?	FALSE				HeatFlg
PID_Master_Loop					
Reference Output	0	%			RefOut
Proportional Term	84.9	%			PTerm
Integral Term	0	%			ITerm
Derivative Term	0	%			DTerm
Integrator Flags	100				Flags
Space Setpoint	55	dF			Value
Staging Control					
Number of Stages	0				NumStgs
Requested Stages	0				ReqStgs
Delta Stages	0				DltaStgs
Delay Timer	0	min			DlyTimer
PID Integrator Clamp	Off				PIDClamp
Task Timer	7	sec			TaskTimr

Maintenance Screens (cont)

DESCRIPTION	VALUE	UNITS	STATUS	FORCE	NAME
OMNIZONE::HCVAV01: AO - Heating VAV 01					
Heating Coil Valve	0	%			Value
Fan Status Point	Off			Control	Value
Sensor Group/SPT Sensor	74	dF			Value
Occupied ?	No				Status
Space Setpoint	55	dF			Value
High Humidity Switch	Off				Value
High Humidity Setpoint	99	%RH			Value
High Humidity Sensor	49.56	%RH			Value
Morning Warm Up					
Reference Output	Off				RefOut
Morning Warmup ?	FALSE				HeatFlg
PID_Master_Loop					
Reference Output	35	dF			RefOut
Proportional Term	50.9	^F			PTerm
Integral Term	0	^F			ITerm
Derivative Term	0	^F			DTerm
Integrator Flags	100				FLAGS
HCV Supply Air Setpoint	35	dF			HCVVRF
Supply Air Temperature	66.99	dF			Value
P_Submaster_Loop					
Reference Output	0	%			RefOut
Proportional Term	-96	%			PropTerm
Submaster Flags	1				SubmFlag
Task Timer	1	sec			TaskTimr
OMNIZONE::INTLK01: OK to run Fan (Typical Interlock)					
Discrete Output Point	Off				Value
Discrete Input Point 1	Off				Value
Discrete Input Point 2	Off				Value
Reference Output	On				RefOut
Task Timer	1	sec			TaskTimr
OMNIZONE::LINK_01: Linkage/AOSS Schedule 01					
Setpoint Bias	0	%			Value
Adaptive Optimal Start					
Start Bias	0	min			StrtBias
Start Cool K Factor	10				CoolKFct
Start Heat K Factor	5				HeatKFct
Biased Start Day					StartDay
Biased Start Time	0:00				BiasTim
Biased Occupied	No				BiasOcc
Cool Flag	FALSE				CoolFlg
Sensor Group/SPT Sensor	74	dF			Value
Occupied ?	No				Status
Outside Air Temp	76.1	dF			Value
Linkage Time Schedule					
Mode	0				Mode
Biased Occupied	0				BiasFlag
Next Occupied Day					NxtOcDay
Next Occupied Time	0:00				NxtOccT
Next Unoccupied Day					NxtUnDay
Next Unoccupied Time	0:00				NxtUnoT
Last Unoccupied Day	Thu				PrvUnDay
Last Unoccupied Time	15:04				PrvUnoT
Status	0				Status
Override is set	0				Override
Linkage Setpt Schedule					
Occupied Lo Setpoint	70	dF			OccLow
Occupied Hi Setpoint	74	dF			OccHgh
Unoccupied Lo Setpoint	55	dF			UnoccLow
Unoccupied Hi Setpoint	85	dF			UnoccHgh
Linkage Space Temp	74	dF			Link
Supply Air Temp	66.97	dF			Value
Fan Status	Off				Value
Air Side Linkage					
Linkage Status	1				LinkStat
Supervisory Element	140				Supe-Adr
Supervisory Bus	0				Supe-Bus
Supervisory Block No.	3				BlockNum
Avg Occ Heat Setpoint	0	dF			OcLoStpt
Avg Occ Cool Setpoint	0	dF			OcHiStpt
Avg Unocc Heat Setpoint	0	dF			UnLoStpt
Avg Unocc Cool Setpoint	0	dF			UnHiStpt
Avg Zone Temperature	0	dF			AZT
Avg Occ Zone Temp	0	dF			AOZT
Adaptive Optimal Stop					
Stop Bias	0	min			StopBias
Stop Cool K Factor	10				CoolKFct
Stop Heat K Factor	15				HeatKFct
Biased Low Setpoint	70	dF			BiasLow
Biased High Setpoint	74	dF			BiasHigh
Biased Stop	No				AOStop
Cool Flag	FALSE				CoolFlg
Biased Stop Day					BiasDay
Biased Stop Time	0:00				BiasTim
Task Timer	9	sec			TaskTimr
Evacuation	Off				Evacuate
Pressurization	Off				Pressure

Maintenance Screens (cont)

DESCRIPTION	VALUE	UNITS	STATUS	FORCE	NAME
OMNIZONE::LMALM01: Supply air Sensor (Typical Limit Alarm)					
Monitored Input Point	66.97	dF			Value
Alarm Inhibit Point	Off				Value
Limit Check					
Alarm Status	Normal				Status
Alarm Value	0	dF			AlmValue
Exceeded Limit	0	dF			ExcdLim
Alarm Processor					
Alarm Type	2				AlmType
Time of Last Message	15:08				LastTime
Month of Last Message	10				LastDate
Day of Last Message	26				LastDate
Year of Last Message	1				LastDate
Task Timer	4	sec			TaskTimr
OMNIZONE::DSP: Duct Static Pressure (Typical Milliamp Input)					
System Value	0.2	in H2O			Sysvalue
Force	0				Force
Status	0				HwStat
Alarm Status	Normal				AlmStat
Sensor Value	0.2	in H2O			SenValue
Hardware Value	4.5	ma			HdwValue
Channel Number	2				ChanNum
Control Algorithm Name	ANCTL01				AlgoName
Alarm Algorithm Name					AlmName
OMNIZONE::ECONO: 2-position/Econo Valve (Typical Milliamp Output)					
System Value	0	%			Sysvalue
Force	0				Force
Status	0				HwStat
Alarm Status	Normal				AlmStat
Control Value	0	%			CtrValue
Hardware Value	4	ma			HdwValue
Channel Number	27				ChanNum
Control Algorithm Name	CCVAV01				AlgoName
Alarm Algorithm Name					AlmName
OMNIZONE::OCCPC01: Occupancy 01					
Time Schedule					
Mode	0				Mode
Current Occupied Period	0				Period
Override in Progress	No				OverLast
Override Duration	0	min			OverDura
Occupied Start Time	0:00				OccStart
Unoccupied Start Time	0:00				UnStart
Next Occupied Day					NxtOccD
Next Occupied Time	0:00				NxtOccT
Next Unoccupied Day					NxtUnOD
Next Unoccupied Time	0:00				NxtUnOT
Last Unoccupied Day	Thu				PrvUnOD
Last Unoccupied Time	15:04				PrvUnOT
Push Button Override	Off				Value
Thermostat Override	0	dF			Value
Task Timer	1	sec			TaskTimr
OMNIZONE::BYPAS: VFD Bypass Enable (Typical)					
System Value	Disable				Sysvalue
Force	0				Force
Status	0				HwStat
Alarm Status	Normal				AlmStat
Sensor Value	Disable				SenValue
Hardware Value	Open				HdwValue
Channel Number	23				ChanNum
Control Algorithm Name					AlgoName
Alarm Algorithm Name					AlmName
OMNIZONE::STPR_01: Supply Fan Speed					
Analog Output Point	0	%			Value
Fan Status Point	Off				Value
Duct Static Pressure	0	in H2O			Value
Static Pressure Setpoint	0	in H2O			Value
PID_Master_Loop					
Reference Output	0	%			RefOut
Proportional Term	0	%			PTerm
Integral Term	0	%			ITerm
Derivative Term	0	%			DTerm
Integrator Flags	0				Flags
Task Timer	0	sec			TaskTimr

DESCRIPTION	VALUE	UNITS	STATUS	FORCE	NAME
OMNIZONE::TC01: DO - Time Clock 01					
Discrete Output Point	Off				Value
Occupied ?	No				Status
Redline ?	No				Status
Duty Cycle					
Reference Output	Off				RefOut
Off Time Duration	0	min			OffTime
Region of Hour	0				Region
Task Timer	22	sec			TaskTimr
OMNIZONE::EWT: Entering Water Temp.					
System Value	69.9	dF			Sysvalue
Force	0				Force
Status	0				HwStat
Alarm Status	Normal				AlmStat
Sensor Value	69.9	dF			SenValue
Channel Number	8				Varnum
Control Algorithm Name					AlgoName
Alarm Algorithm Name	LMALM02				AlmName
OMNIZONE::VPIOM: I/O & Faults (Typical BEST++ maintenance)					
Compressor Status					
Task State	RESCHED				TASKSTAT
Task Timer	1	sec			TASKTIMR
Execution Time	0.183	sec			EXETIME
Critical Fault					
Task State	RESCHED				TASKSTAT
Task Timer	1	sec			TASKTIMR
Execution Time	0.111	sec			EXETIME
Fire Shutdown					
Task State	RESCHED				TASKSTAT
Task Timer	1	sec			TASKTIMR
Execution Time	0.049	sec			EXETIME
Non Critical Fault					
Task State	RESCHED				TASKSTAT
Task Timer	1	sec			TASKTIMR
Execution Time	0.113	sec			EXETIME
Compressor Fault/Test					
Task State	RESCHED				TASKSTAT
Task Timer	1	sec			TASKTIMR
Execution Time	0.046	sec			EXETIME