

CXM2 UNIT CONTROLS

APPLICATION, OPERATION & MAINTENANCE MANUAL

Part#: 97B0137N01 | Updated: May 24, 2024

CXM2 Digital Heat Pump Controller

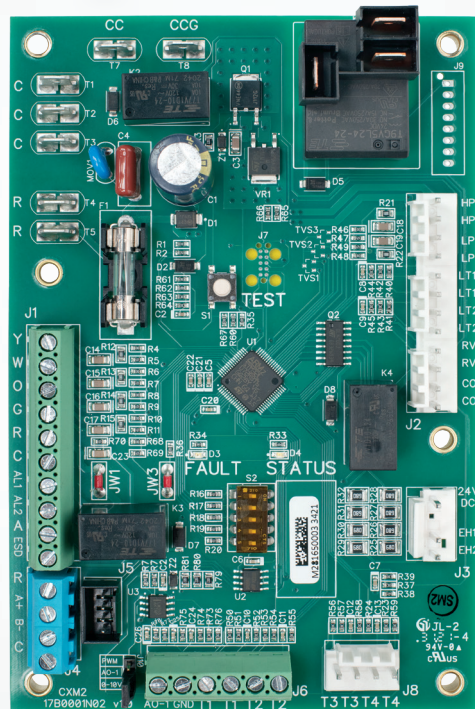


Table of Contents

3	Overview
4	Legend and Glossary of Abbreviations
5	CXM2 Board Identification
6	Physical Dimensions and Layout
7	Field Selectable Inputs and DIP Switches
8	Safety Features
9	Fault Codes
12	Operating Descriptions
13	Special CXM2 Application Note and Other Outputs
15	Nominal Resistance per Temperature
16	Basic Troubleshooting Information and Service and Application Notes
17	Configuration and Advanced Troubleshooting
19	CXM2 Functional Troubleshooting Flow Chart
20	Functional Troubleshooting
23	Performance Troubleshooting
28	Revision History

ClimateMaster works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice and may not be as described herein. Please contact ClimateMaster's Customer Service Department at 1-800-299-9747 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely ClimateMaster's opinion or commendation of its products.

The CXM2 Electronic Control is a robust, microprocessor-based heat-pump controller that is advanced and feature-laden for maximum application flexibility. The CXM2 Control has relay outputs for Compressor, Reversing Valve, Alarm Relay, and a configurable relay for Fan. For on-board diagnostics, there are two LEDs to provide status indication.

There are inputs for safety-pressure switches, low-temperature protection thermistors, condensate-overflow sensor, DIP switch selection inputs, thermostat inputs, pump feedback, and emergency-shutdown input. Additional configurable temperature-sensor inputs are available that may be used for compressor discharge, leaving air, leaving water, and entering-water temperature sensors (except for TRL and water-to-water products, see product line submittals for details).

The CXM2 has an RS-485 communications port to interface with a communicating thermostat or other communicating controls and tools.

GENERAL OPERATING PARAMETERS

The following are general operating parameters for the CXM2 Control:

- Operating Environment: -40°F to 176°F and up to 95% relative humidity, non-condensing
- Storage Environment: -40°F to 185°F and up to 95% relative humidity, non-condensing

POWER REQUIREMENTS

CXM2 only power draw:

- Normally 5VA draw at 24VAC
- Maximum 10VA draw at 24VAC
- A dedicated 24VAC, 50-60Hz, 1Ph, 40VA transformer minimum is required for typical WSHP application

RELAY CONTACT AND CONNECTION RATINGS

The following relays are mounted on the CXM2 Control:

- Compressor Relay: 40VA at 24VAC
- Alarm Relay: 28VA at 24VAC
- Reversing Valve: 28VA at 24VAC
- Fan Enable / Loop-Pump Relay: 1 HP at 240VAC
- A terminal: 20VA at 24VAC

GROUNDING

The control board must be grounded from one of the C terminals.

BASIC CONTROL FEATURES

- Single-compressor control
- Anti-short cycle protection
- High-pressure cutout
- Low-pressure cutout
- Over- and under-voltage cut-outs
- Water coil low temperature cut-out
- Air coil low temperature cut-out
- Random start
- Status LED and Fault LED
- Reset lockout at unit or disconnect
- Condensate-overflow sensor
- Intelligent fault retry
- Test Mode
- Multiple blower configuration options
- Electric heat outputs
- Unit Performance Sentinel
- Accessory water valve connection

ADVANCED CONTROL FEATURES

- Auxiliary shutdown capability
- Accepts conventional heat pump (Y, O) thermostat types
- RS-485 port to interface with a communicating thermostat or other communicating controls and tools
- Configurable inputs and outputs for advanced functions
- Stores operating condition history during last five faults and offers possible reasons for faults
- Master/Slave thermostat control of up to 3 units

Models:
CXM2

Legend and Glossary of Abbreviations

Abbreviations	Descriptions
Btuh	Btu (British Thermal Unit) per hour
CDT	Compressor discharge temperature
CFM	Airflow, cubic feet per minute
COP	Coefficient of performance = Btuh output/Btuh input
CT EC	Electronic commutated constant torque blower motor
CV EC	Electronic commutated constant volume blower motor
DB	Dry bulb temperature, °F
EAT	Entering air temperature
EER	Energy efficient ratio = Btuh output/Watt input
ESP	External static pressure, inches w.g.
EWT	Entering water temperature
FPT	Female pipe thread
GPM	Water flow in U.S., gallons per minute
HC	Air heating capacity, Btuh
HE	Total heat of extraction, Btuh
HR	Total heat of rejection, Btuh
HWC	Hot water generator (desuperheater) capacity, MBtuh
kW	Total power unit input, kilowatts
LAT	Leaving air temperature, °F
LC	Latent cooling capacity, Btuh
LOC	Loss of charge
LWT	Leaving water temperature, °F
MBtuh	1,000 Btu per hour
MPT	Male pipe thread
MWV	Motorized water valve
PSC	Permanent split capacitor
RDS	Refrigerant Detection System
SC	Sensible cooling capacity, Btuh
S/T	Sensible to total cooling ratio
TC	Total cooling capacity, Btuh
TD or delta T	Temperature differential
VFD	Variable frequency drive
WB	Wet bulb temperature, °F
WPD	Waterside pressure drop, psi or feet of head
WSE	Waterside economizer

CXM2 Board Identification

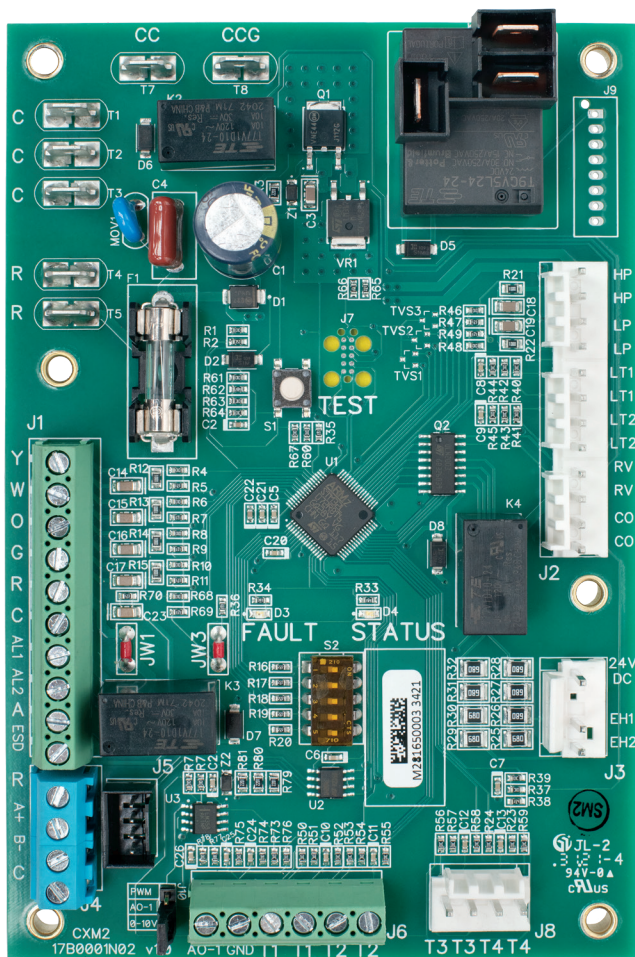
Models:
CXM2

Before beginning a repair, verify your CXM2 Part Number. Reference the images below for differences in Part Numbers 17B0001N02 and 17B0001N05.

The following list details the changes between Part Numbers 17B0001N02 and 17B0001N05:

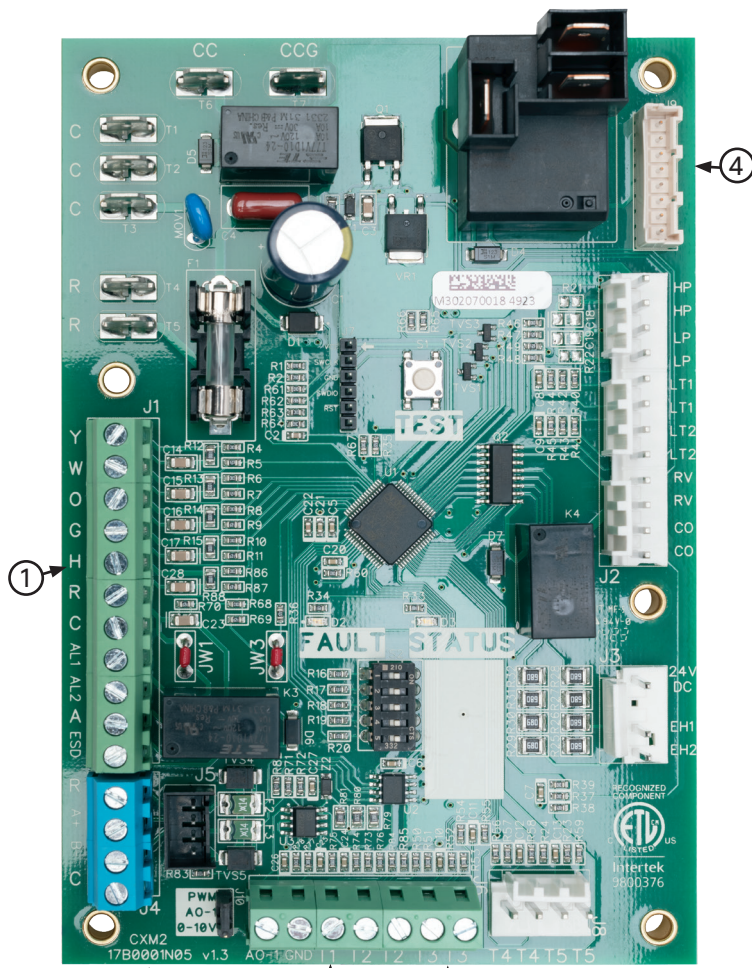
1. The J1 terminal block includes an H terminal on the 17B0001N05 board (the H jumper is for future use)
2. The J6 terminal block includes a T1 input on the 17B0001N05 board
2. Due to the addition of a T1 input on the J6 terminal block, the T3 terminals are now located on the J6 terminal block on the 17B0001N05 board
3. The J9 terminal block is populated on the 17B0001N05 board

CXM2 (17B0001N02)



Part Number

CXM2 (17B0001N05)



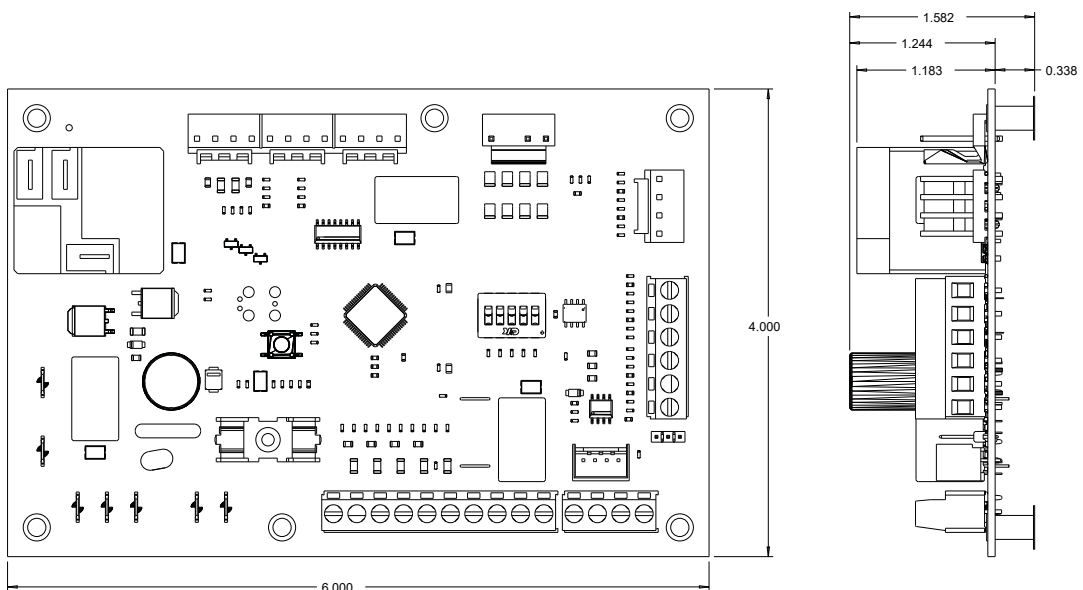
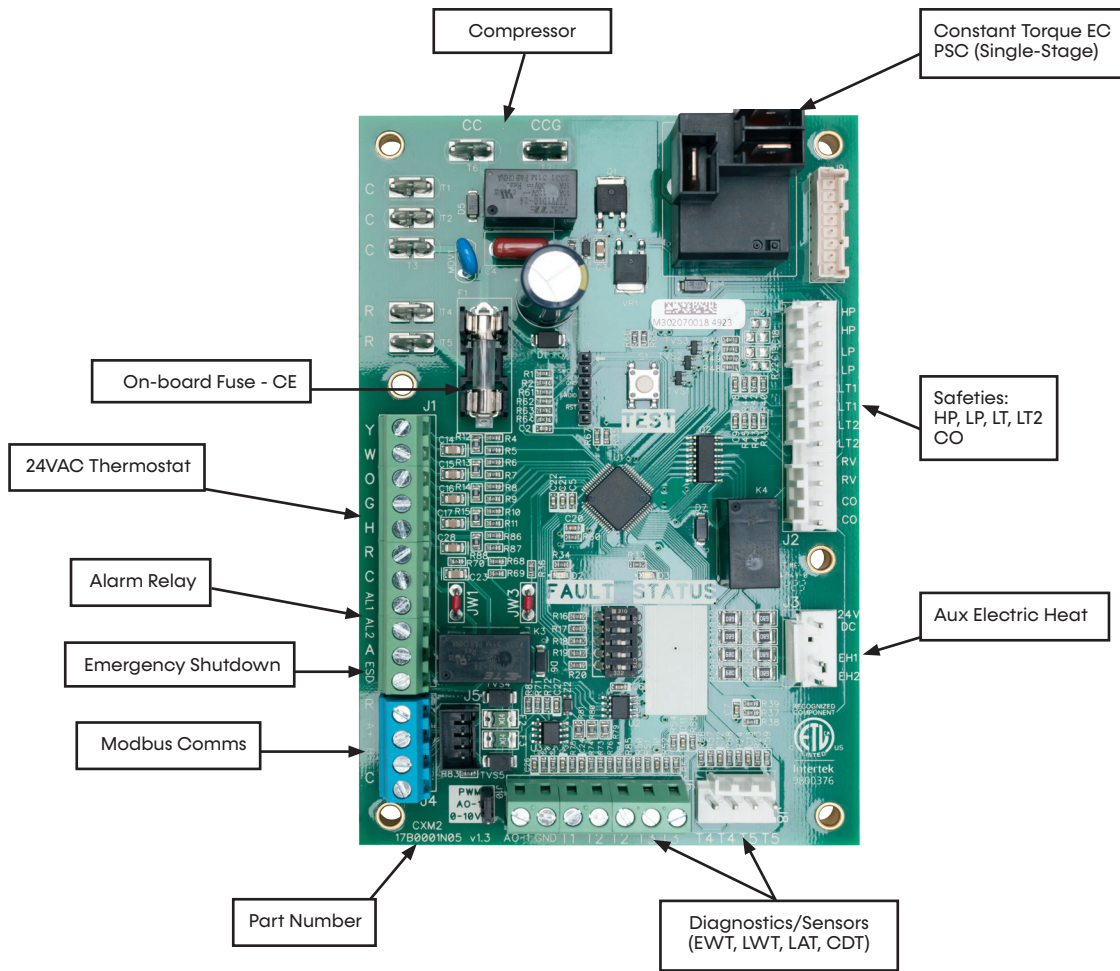
Part Number

②

③

Models:
CXM2

Physical Dimensions and Layout



Field Selectable Inputs and DIP Switches

FIELD-SELECTABLE INPUTS

Test Mode

Test mode allows the service technician to check the operation of the control in a timely manner. By **momentarily** pressing the TEST push button, the CXM2 control enters a 20 minute test-mode period in which all time delays are sped up 15 times. Upon entering Test mode, the Status and Fault LED displays change. The Status LED flashes rapidly to indicate the control is in the Test mode. The Fault LED displays the most recent fault condition in memory.

NOTE: A flash code of 1 indicates there are no faults stored in memory.

For diagnostic ease at conventional thermostats, the alarm relay cycles during Test mode. The alarm relay cycles on and off in sync with Fault LED to indicate a code representing the last fault at the thermostat.

To exit Test mode, press the TEST button for 3 seconds. Alternatively, exit Test mode by cycling the G input three times within 60 seconds.

In Test mode, the control monitors to see if the LT1 and LT2 thermistors are connected and operating properly. If the control is in Test mode, the control will lockout with Code 9 after 60 seconds if:

- The compressor is On in Cooling Mode and the LT1 sensor is colder than the LT2 sensor. Or,
- The compressor is On in Heating Mode and the LT2 sensor is colder than the LT1 sensor.

Retry Mode

If the control is attempting a retry of a fault, the Fault LED slow flashes to indicate the control is in the process of retrying (slow flash = one flash every 2 seconds).

FIELD-CONFIGURATION OPTIONS

NOTE: In the following field configuration options, jumper wires should be clipped ONLY when power is removed from the CXM2 control.

NOTE: Jumper 3 must not be clipped prior to adding antifreeze to the water loop. Antifreeze protection to 10°F required. Clipping JW3 without antifreeze may result in freeze damage and will void the unit warranty.

Water Coil Low Temperature Limit Setting

Jumper 3 (JW3-LT1 Low Temp) provides field selection of temperature limit setting for LT1 of 30°F or 10°F (-1°F or -12°C) (refrigerant temperature).

- Not Clipped = 30°F, Clipped = 10°F

Alarm Relay Setting

Jumper 1 (JW1-AL2 Dry) provides field selection of alarm function when Alarm Relay is energized.

- Not Clipped = AL1 connected to R (24VAC) with Alarm Relay active
- Clipped = Dry contact connection between AL1 and AL2 with Alarm Relay active

DIP SWITCHES

NOTE: In the following field configuration options, DIP switches should only be moved when power is removed from the CXM2 control to ensure proper operation.

DIP Package S2

DIP Package #2 is five position and provides the following setup selections.

- **DIP 2.1 – Unit Performance Sentinel Disable:**
Provides field selection to disable the UPS feature
 - On = Enabled, Off = Disabled
- **DIP 2.2 – Compressor Relay Staging Operation:**
Provides selection of Compressor Relay staging operation. The Compressor Relay can be selected to turn on with Stage 1 or Stage 2 call from the thermostat. This is used with Dual Stage units (two compressors where two CXM2 Controls are being used) or with master/slave applications. In master/slave applications, each compressor and fan will stage according to its appropriate DIP 2.2. If set to Stage 2, the compressor will have a 3-second on-delay before energizing during a Stage 2 demand. Also, if set for Stage 2, the Alarm Relay will NOT cycle during Test mode.
 - On = Stage 1. Off = Stage 2.

NOTE: For two-compressor or master/slave operation, Y1 from thermostat is wired to the stage 1 CXM2 control and Y2 is wired to the stage 2 CXM2 control.

Safety Features

Table 1: DIP Switch Settings

DIP Switch	Description	Options	Default
DIP 2.1	Unit Performance Sentinel	Enable, Disable	Enable
DIP 2.2	Compressor Staging	Stage 1, Stage 2	--
DIP 2.3	Modbus Communications	Modbus Master, Modbus Slave	Modbus Master
DIP 2.4	EH2/DDC Operation	EH2 Normal, DDC Output at EH2	--
DIP 2.5	Factory Setting	--	ON

- DIP 2.3 – Communications Configuration:** Provides selection of the CXM2 operation in a communicating system. The CXM2 may operate as a communicating master or slave device depending on the network configuration. In most configurations, the CXM2 will operate as a leader device.
 - On = Communicating Master device (default)
 - Off = Communicating Slave device
- DIP 2.4 – DDC Output at EH2:** Provides selection for DDC operation. If set to DDC Output at EH2, the EH2 terminal will continuously output the last fault code of the controller. If set to EH2 normal, then the EH2 will operate as standard electric heat output.
 - On = EH2 Normal, Off = DDC Output at EH2
- DIP 2.5 – Factory Setting:** Normal position is On. Do not change selection unless instructed to do so by the Factory.

SAFETY FEATURES

The following safety features are provided to protect the compressor, heat exchangers, wiring, and other components from damage caused by operation outside of design conditions.

Anti-Short Cycle Protection: The control features a 5 minute anti-short cycle protection for the compressor. The anti-short cycle time begins when a call for the compressor ends.

NOTE: The 5-minute anti-short cycle also occurs at power up.

Random Start: The control features a 5-80 second random start upon power up. The random start delay is present after a control power up and after returning from Emergency Shutdown mode.

Extended Compressor Operation Monitoring: If the compressor relay is on for four continuous hours, the control automatically turns off the compressor relay and waits the anti-short cycle protection time. All appropriate safeties are monitored during the off time. If all operation is normal, and if the compressor demand is still present, the control turns the compressor back on.

Fault Retry: In Fault Retry mode, the Fault LED begins slow flashing to signal that the control is trying to recover from a fault input. The CXM2 Control stages off the outputs and then attempts to satisfy the thermostat call for compressor. Once the thermostat input calls are satisfied, the control continues as if no fault occurred. If three consecutive faults occur without satisfying the thermostat call for compressor, then the control enters Lockout mode. The last fault causing the lockout is stored in memory and is displayed at the Fault LED by entering the Test mode.

NOTE: LT1 and LT2 faults are factory set for one try, so there will be no retries for LT1 and LT2 faults. The control is factory configured to enter lockout mode after first LT1 or LT2 fault.

Refrigerant Leak Detection: If a refrigerant leak above the maximum threshold is detected or the control registers a fault with the refrigeration detection system, all outputs turn off and the fan turns on.

FAULT CODES

Lockout: In Lockout mode, the Fault LED begins flashing fast. The compressor relay is turned off immediately. The fan output is turned off after the current blower-off delay unless auxiliary heat is active. The Lockout mode can be soft reset via the thermostat by removing the call for compressor, or by a hard reset (disconnecting power to the control). The fault code is stored in non-volatile memory that can be displayed by the Fault LED by entering the Test mode even if power was removed from the control.

Fault Code 2 – High-Pressure Switch: When the High-Pressure switch (HP) opens due to high refrigerant pressures, the compressor relay is de-energized immediately. The high-pressure fault recognition is immediate (does not delay for 30 continuous seconds before de-energizing the compressor). When Test mode is activated, the Fault LED displays a fault code of 2 for a high-pressure fault.

Fault Code 3 – Low-Pressure Switch: The Low-Pressure Switch (LP) must be open and remain open for 30 continuous seconds during a compressor on cycle to be recognized as a low-pressure fault. If the Low-Pressure switch is open for 30 seconds prior to compressor power up, it is considered a low-pressure fault. The Low-Pressure switch input is bypassed for the initial 120 seconds of a compressor run cycle. When the test mode is active, the Fault LED displays a fault code of 3 for a low-pressure fault.

Fault Code 4 – Water Coil Low Temperature Cut-Out Limit (LT1): The control recognizes an LT1 fault during a compressor run cycle if:

- a. The LT1 thermistor temperature is below the selected low temperature protection limit setting for at least 50 seconds, AND
- b. The LT1 thermistor temperature is rising (getting warmer) at a rate LESS than 2°F every 30 seconds

The LT1 input is bypassed for the initial 120 seconds of a compressor run cycle. When the test mode is active, the Fault LED displays a fault code of 4 for a LT1 fault.

CAUTION

Do not restart units without inspection and remedy of faulting condition. Equipment damage may occur.

Fault Code 5 – Air Coil Low-Temperature Cutout (LT2):

The control recognizes an LT2 fault during a compressor run cycle if:

- a. The LT2 thermistor temperature is below the low-temperature protection limit setting for at least 50 seconds, AND
- b. The LT2 thermistor temperature is rising (getting warmer) at a rate LESS than 2°F every 30 seconds

The LT2 input is bypassed for the initial 120 seconds of a compressor run cycle. When the test mode is active, the Fault LED displays a fault code of 5 for a LT2 fault.

Fault Code 6 – Condensate Overflow:

The Condensate-Overflow sensor must sense overflow levels for 30 continuous seconds to be recognized as a CO fault. Condensate overflow is monitored continuously during the compressor run cycle. When the Test mode is active, the Fault LED displays a fault code of 6 for a condensate-overflow fault.

Fault Code 7 – Over-/Under-Voltage Shutdown:

An Over-/Under-Voltage condition exists when the control voltage is outside the range of 18VAC to 31.5VAC. Over-/Under-Voltage Shutdown is self-resetting in that if the voltage comes back within range of 18.5VAC to 31VAC for at least 0.5 seconds, then normal operation is restored. This is not considered a fault or lockout. If the CXM2 is in Over-/Under-Voltage Shutdown for 15 minutes, the Alarm Relay closes. When the Test mode is active, the Fault LED displays a fault code of 7 for an Over-/Under-Voltage Shutdown.

Fault Code 8 – Unit Performance Sentinel - UPS:

The UPS feature warns when the heat pump is operating inefficiently. A UPS condition exists when:

- a. In Heating Mode with compressor energized, if LT2 is greater than 125°F for 30 continuous seconds, Or
- b. In Cooling Mode with compressor energized, if LT1 is greater than 125°F for 30 continuous seconds, OR LT2 is less than 40°F for 30 continuous seconds.

Models:
CXM2

Fault Codes

If a UPS condition occurs, the control immediately enters UPS warning. The status LED remains lit as if the control is in Normal mode (See Table 2). Outputs of the control, excluding Fault LED and Alarm Relay, are NOT affected by UPS. The UPS condition cannot occur during a compressor off cycle. During UPS warning, the Alarm Relay cycles on and off. The cycle rate is On for 5 seconds, Off for 25 seconds, On for 5 seconds, Off for 25 seconds, etc. When Test mode is active, the Fault LED displays a fault code of 8 for a UPS condition.

Fault Code 9 – Unit Performance Test-UPT/Swapped LT1 and LT2 Thermistors: During Test mode, the control

monitors to see if the LT1 and LT2 thermistors are connected and operating properly. If the control is in Test mode, the control locks out with Code 9 after 60 seconds if:

- a. The compressor is On in Cooling Mode and the LT1 sensor is colder than the LT2 sensor. Or,
- b. The compressor is On in Heating Mode and the LT2 sensor is colder than the LT1 sensor.

When Test mode is active, the Fault LED displays a fault code of 9 for a Swapped-Thermistor fault.

Table 2: LED and Alarm-Relay Output

CXM2 CONTROLLER FAULT CODES			
CXM2 Fault and Status LED Operation with Test Mode Not Active	Fault LED (Red)	Status LED (Green)	Alarm Relay
CXM2 is non-functional	Off	Off	Open
Normal operation - No active communication	On	On	Open
Normal operation - With active communication	Very Slow Flash	On	Open
Control is in anti-short cycle delay - With active communication	Very Slow Flash	On	Open
Control is currently in Fault-Retry mode or in anti-short cycle delay	Slow Flash	–	Open
Control is currently locked out	Fast Flash	–	Closed
(ESD) Emergency shutdown condition recognized	–	Flashing Code 3	–
Invalid thermostat input combination	–	Flashing Code 4	–
CXM2 Fault LED and Status Operation with Test Mode Active	Fault LED (Red)	Status LED (Green)	Alarm Relay
No fault since power up in memory	Flashing Code 1	–	Cycling Code 1
High-pressure fault in memory	Flashing Code 2	–	Cycling Code 2
Low-pressure fault in memory	Flashing Code 3	–	Cycling Code 3
Low-temperature protection 1 fault in memory	Flashing Code 4	–	Cycling Code 4
Low-temperature protection 2 fault in memory	Flashing Code 5	–	Cycling Code 5
Condensate-overflow fault in memory	Flashing Code 6	–	Cycling Code 6
Over-/Under-voltage shutdown in memory	Flashing Code 7	–	Cycling Code 7
UPS warning in memory	Flashing Code 8	–	Cycling Code 8
UPT fault in memory / swapped LT1 and LT2 thermistors	Flashing Code 9	–	Cycling Code 9
Low water flow/flow controller fault	Flashing Code 13	–	Cycling Code 13
Leaving water temperature low	Flashing Code 14	–	Cycling Code 14
RDS fault in memory	Flashing Code 15	–	Cycling Code 15

- Fast Flash = 2 flashes every 1 second
- Slow Flash = 1 flash every 2 seconds
- Very Slow Flash = 1 flash every 5 seconds
- Numeric Codes = On pulse 1/3 second; Off pulse 1/3 second followed by a 10 second delay
- Alarm Relay Open = alarm signal off; Alarm Relay Closed = alarm signal on

Fault Codes

Models:
CXM2

Fault Code 13 – Low Water flow: The control recognizes a low water flow fault if:

In applications with vFlow®

- When operating an internal flow center, the CXM2 monitors the pump feedback signal and may detect one of several pump faults. The control may detect locked rotor, low voltage, no flow, or bad pump sensor conditions that will result in an internal flow center fault. When the test mode is active, the Fault LED will display a fault code of 13 for any of these flow center faults.

TRL only

The flow switch indicates there is no water flow. This triggers a lockout condition.

Fault Code 14 – Low Leaving Water Temperature (TRL only): The control recognizes a low leaving water temperature fault if the leaving water temperature is out of range.

Fault Code 15 – RDS Sensor Fault: A Refrigerant Detection System (RDS) sensor fault exists if the CXM2 loses communication with a refrigeration-detection sensor, or a refrigeration-detection sensor detects a refrigeration leak. In Refrigerant-Leak-Detection Mitigation mode, the Fault LED begins fast flashing. All outputs are turned off immediately and the fan output is turned on for a minimum of 5 minutes.

If communication with the sensor is re-established or the RDS stops sensing a refrigerant leak, the unit resumes normal operation 5 minutes after the RDS stops sensing a refrigeration leak. The fault code is stored in nonvolatile memory that is displayed by the Fault LED. When Test mode is active, the Fault LED displays a fault code of 15 for a RDS sensor fault.

Emergency Shutdown – ESD: You can enable ESD mode from an external common signal to terminal ESD. For WSHP rooftop products, ESD Mode is utilized when the ERV (Energy Recovery Ventilator) option is applied to a ST series rooftop unit to indicate an ERV fault. A contact closure at the ERV unit connects common to the ESD terminal, which shuts down the rooftop/ERV units. The green Status LED flashes code 3 when the unit is in ESD Mode. (See Thermostat Inputs section for details.)

Diagnostic Features: The green Status LED and red Fault LED on the CXM2 Control advise service personnel of the current status of the CXM2 Control. The LEDs indicate the current operating status of the CXM2, as well as the LAST fault in memory. If there is no fault in memory and the fault display is selected, the Fault LED flashes Code 1. See Table 2 for a complete listing of codes.

Power Up: The unit will not operate until all the inputs and safety controls are checked for normal conditions.

NOTE: The compressor has a 5-minute anti-short cycle delay at power-up.

Standby/Fan Only: In Standby mode, the compressor is off. The fan output and RV relay may be on if appropriate inputs are present. If there is demand for constant fan, the fan output is activated for constant fan airflow.

The RV relay does not directly track the input demands for RV, the CXM2 Control employs smart RV control. This ensures that the RV only switches positions if the thermostat has called for a Heating/Cooling Mode change.

Compressor Heating: In Compressor Heating mode, the selected Fan output and the compressor relay are turned on immediately. If configured as Stage 2 (DIP 2.2 = off), then the compressor and fan do not turn on until there is Stage 2 demand. The compressor relay is turned off immediately when the compressor-heating demand is removed. The selected Fan output turns off after the selected heating blower-off delay, and the control then reverts to Standby mode. If there is a Master/Slave configuration or a dual-compressor configuration, all compressor relays and related functions track with their associated DIP 2.2.

Supplemental Heating: In Supplemental Heating mode, the selected Fan output and Compressor relays remain on. The EH1 output turns on immediately. With continuing supplemental-heating demand, EH2 turns on after 10 minutes. EH1 and EH2 are turned off immediately when the supplemental-heating demand is removed, and the control reverts to Compressor Heating mode. During Supplemental Heating mode, EH2 is off (or turns off if already on) if:

- a. LT1 is greater than 45°F AND
- b. LT2 is greater than 110°F (LT2 greater than 110°F includes the condition that LT2 is shorted). This condition has a 30-second recognition time.

Emergency Heat: In Emergency Heat mode, the selected fan output is activated and EH1 is turned on immediately. With continuing Emergency Heat demand, EH2 turns on after 5 minutes. EH1 and EH2 are turned off immediately when the Emergency Heat demand is removed. The selected fan output turns off after the selected heating blower off delay and the control reverts to Standby mode.

Cooling: In Cooling mode, the selected fan output, compressor, and RV relays are turned on immediately. If configured as Stage 2 (DIP 2.2 = off), then the compressor and fan does not turn on until there is Stage-2 demand. The Compressor relay is turned off immediately when the cooling demand is removed. The selected Fan output turns off after the selected cooling blower off delay, and the control then reverts to Standby mode. The RV relay remains on until there is a Heating demand. If there is a Master/Slave configuration or a dual-compressor configuration, all compressor relays and related functions track with their associated DIP 2.2.

Blower Configurations: The CXM2 may be configured to operate several different blowers and blower configurations. The configurations include:

- a. **Single-Speed Blower:** If the CXM2 is configured for a single-speed PSC blower, the K1 relay operates as the blower relay.
- b. **No Blower:** If the CXM2 is configured for no blower (split-system compressor sections), the K1 relay operates as a loop-pump relay.
- c. **VFD Blower or Plug EC fan:** If the CXM2 control is configured for a VFD blower or Plug EC, the CXM2 directly controls a VFD or Plug EC to achieve a target Leaving Air Temperature (LAT) or at discrete speeds depending on the selected blower control mode. When operating a VFD or Plug EC, the K1 relay becomes the VFD or Plug EC enable relay. When the VFD or Plug EC is off, the output is set to 0VDC. If configured for fixed-speed blower control, there are maximum and minimum operating speeds for each operating mode unique to each unit size.

Special CXM2 Application Note and Other Outputs

SPECIAL CXM2 APPLICATION NOTES

ESD: ESD is the input for Emergency-Shutdown mode. When the ESD input is connected to Ground C, all inputs are ignored and all outputs are turned off. There is a random-start timer when coming back from ESD.

NOTE: For 3-phase applications, the power input for all controls with daisy-chained ESD input signals must be in-phase (i.e. control transformers across L1 and L2 with same polarity) for each control to correctly recognize the state of the ESD signal. If the power phasing cannot be matched between units sharing the external signal, use a shared external signal to control an added relay that connects the ESD and C terminals on each control.

OTHER OUTPUTS

Electric Heat: Outputs EH1 and EH2 turn on whenever the CXM2 Control is in the following modes: Heating Stage 2 and Emergency Heat.

Status LED: The Status LED is green. The Status LED indicates the operating status of the CXM2 Control. See Table 2.

Fault LED: The Fault LED is red. The Fault LED displays the current operating status of the control, or flashes the corresponding code for the last fault that occurred if the test mode is active. If there is no fault in memory, then the Fault LED flashes Code 1. If the Fault type is Primary (HP, LP, LT1, LT2, or CO) then the Fault type is always retained in memory (Primary faults will overwrite Secondary faults). If the Fault type is Secondary (Over/Under Voltage, UPS or Swapped LT1/LT2), then the Fault type is only retained if there are no Primary faults in memory. The Secondary Fault types do not overwrite the Primary fault memory. See Table 2.

Communications: The CXM2 has a single RS-485 communications port that provides communication capabilities for communicating thermostats or connecting with other communicating controls.

Pressure Switches: All pressure switches are designed to be normally closed during normal-operating conditions, and to open upon fault.

Condensate Sensor: The Condensate Sensor input faults upon sensing impedance less than 100,000 Ohms for 30 continuous seconds. The recommended design uses a single wire terminated with a male ¼-inch quick connect located in the drain pan at desired trip level. Upon a high-condensate level, the water shorts between the air coil and the quick connect producing a resistance less than 100,000 Ohms. Since condensate is free of impurities, it has no conductivity. Only the impurities from the drain pan and coil dust or dirt create the conductance. To replace the air coil ground path, use a second ground wire with the appropriate terminal to the drain pan with the control. The Condensate Sensor can also essentially be any open contact that closes upon a fault condition.

Thermistor-Temperature Sensors: The thermistors used with the CXM2 are NTC (negative temperature coefficient) type. The sensors have a 1% tolerance and follow the characteristics shown in Table 4. Use Table 5 to find the nominal resistance at any given temperature and for field-service reference. The sensor uses a minimum of 24 AWG wire.

Models:
CXM2

Thermostat Inputs with Resulting Demands and Sensor Calibration

Table 3: Thermostat Inputs with Resulting Demands

Mode	Thermostat Operating Modes							
	Input				Output			
	O	G	Y	W	RV	Fan	H/C	AUX
No Demand	ON/OFF	OFF	OFF	OFF	ON/OFF	OFF	OFF	OFF
Fan Only	ON/OFF	ON	OFF	OFF	ON/OFF	ON	OFF	OFF
Cooling	ON	ON	ON	OFF	ON	ON	ON	OFF
Heating	OFF	ON	ON	OFF	OFF	ON	ON	OFF
Heating 2 nd Stage	OFF	ON	ON	ON	OFF	ON	ON	ON
Emergency Heat	OFF	ON	OFF	ON	OFF	ON	OFF	ON

1 ON/OFF = Either ON or OFF; H/C = Either Heating or Cooling.

Table 4: 1% Sensor Calibration Points

Temp (°F)	Minimum Resistance (Ohm)	Maximum Resistance (Ohm)	Nominal Resistance (Ohm)
78.5	9523	9715	9619
77.5	9650	9843	9746
76.5	10035	10236	10135
75.5	10282	10489	10385
33.5	30975	31598	31285
32.5	31871	32512	32190
31.5	32653	33310	32980
30.5	33728	34406	34065
1.5	80624	82244	81430
0.5	83327	85002	84160
0.0	84564	86264	85410

Nominal Resistance per Temperature

Table 5: Nominal Resistance per Temperature

Temp (°C)	Temp (°F)	Resistance (kOhm)	Temp (°C)	Temp (°F)	Resistance (kOhm)	Temp (°C)	Temp (°F)	Resistance (kOhm)	Temp (°C)	Temp (°F)	Resistance (kOhm)
-17.8	0.0	85.34	20	68.0	12.49	55	131.0	2.99	90	194.0	0.92
-17.5	0.5	84.00	21	69.8	11.94	56	132.8	2.88	91	195.8	0.89
-16.9	1.5	81.38	22	71.6	11.42	57	134.6	2.77	92	197.6	0.86
-12	10.4	61.70	23	73.4	10.92	58	136.4	2.67	93	199.4	0.84
-11	12.2	58.40	24	75.2	10.45	59	138.2	2.58	94	201.2	0.81
-10	14.0	55.30	25	77.0	10.00	60	140.0	2.49	95	203.0	0.79
-9	15.8	52.38	26	78.8	9.57	61	141.8	2.40	96	204.8	0.76
-8	17.6	49.64	27	80.6	9.16	62	143.6	2.32	97	206.6	0.74
-7	19.4	47.05	28	82.4	8.78	63	145.4	2.23	98	208.4	0.72
-6	21.2	44.61	29	84.2	8.41	64	147.2	2.16	99	210.2	0.70
-5	23.0	42.32	30	86.0	8.06	65	149.0	2.08	100	212.0	0.68
-4	24.8	40.15	31	87.8	7.72	66	150.8	2.01	101	213.8	0.66
-3	26.6	38.11	32	89.6	7.40	67	152.6	1.94	102	215.6	0.64
-2	28.4	36.18	33	91.4	7.10	68	154.4	1.88	103	217.4	0.62
-1	30.2	34.37	34	93.2	6.81	69	156.2	1.81	104	219.2	0.60
0	32.0	32.65	35	95.0	6.53	70	158.0	1.75	105	221.0	0.59
1	33.8	31.03	36	96.8	6.27	71	159.8	1.69	106	222.8	0.57
2	35.6	29.50	37	98.6	6.01	72	161.6	1.64	107	224.6	0.55
3	37.4	28.05	38	100.4	5.77	73	163.4	1.58	108	226.4	0.54
4	39.2	26.69	39	102.2	5.54	74	165.2	1.53	109	228.2	0.52
5	41.0	25.39	40	104.0	5.33	75	167.0	1.48	110	230.0	0.51
6	42.8	24.17	41	105.8	5.12	76	168.8	1.43	111	231.8	0.50
7	44.6	23.02	42	107.6	4.92	77	170.6	1.39	112	233.6	0.48
8	46.4	21.92	43	109.4	4.72	78	172.4	1.34	113	235.4	0.47
9	48.2	20.88	44	111.2	4.54	79	174.2	1.30	114	237.2	0.46
10	50.0	19.90	45	113.0	4.37	80	176.0	1.26	115	239.0	0.44
11	51.8	18.97	46	114.8	4.20	81	177.8	1.22	116	240.8	0.43
12	53.6	18.09	47	116.6	4.04	82	179.6	1.18	117	242.6	0.42
13	55.4	17.26	48	118.4	3.89	83	181.4	1.14	118	244.4	0.41
14	57.2	16.46	49	120.2	3.74	84	183.2	1.10	119	246.2	0.40
15	59.0	15.71	50	122.0	3.60	85	185.0	1.07	120	248.0	0.39
16	60.8	15.00	51	123.8	3.47	86	186.8	1.04	121	249.8	0.38
17	62.6	14.32	52	125.6	3.34	87	188.6	1.01	122	251.6	0.37
18	64.4	13.68	53	127.4	3.22	88	190.4	0.97	123	253.4	0.36
19	66.2	13.07	54	129.2	3.10	89	192.2	0.94			

Basic Troubleshooting Information and Service and Application Notes

GENERAL TROUBLESHOOTING

Basic CXM2 Control troubleshooting in general is best summarized as simply verifying inputs and outputs. After this process is verified, confidence in board operation is confirmed, and the trouble must be elsewhere. Below are some general guidelines required for developing training materials and procedures when applying the CXM2 Control.

CXM2 Field Inputs:

All conventional inputs are 24VAC from the thermostat and can be verified using a voltmeter between C and Y, W, O, and G.

Sensor Inputs:

All sensor inputs are paired wires connecting each component with the board; therefore, continuity on pressure switches can be checked at the board connector.

Measure thermistor resistance with the connector removed so that only the impedance of the thermistor is measured. If desired, compare this reading to the chart shown in the thermistor section of this manual based upon the actual temperature of the thermistor clip (See Table 4 and Table 5 for thermistor-temperature and resistance values). Use an ice bath to check calibration of a thermistor if needed.

CXM2 Outputs:

To verify the 24VAC compressor relay, use a voltmeter. The Alarm Relay can either be 24VAC as shipped or dry contacts (measure continuity during fault) for use with DDC by clipping the JW1 jumper. Electric heat outputs are 24VDC and require a voltmeter set for VDC to verify operation. When troubleshooting, measure from 24VDC terminal to EH1 or EH2 terminals.

Test Mode:

To enter Test mode for 20 minutes, press the Test button. For diagnostic ease at a conventional thermostat, the Alarm Relay cycles during Test mode. The Alarm Relay cycles on and off in sync with the Fault LED to indicate a code representing the last fault at the thermostat. Alternatively, enter and exit Test mode by cycling the G input three times within 60 seconds.

CXM2 THERMOSTAT DETAILS

Anticipation Leakage Current:

Maximum leakage current for Y is 50mA and for W is 20mA. You can use triacs if leakage current is less than above. Thermostats with anticipators can be used if anticipation current is less than that specified above.

Thermostat Signals:

- Y, W, O, and G have a 1-second recognition time when being activated or removed.
- H is for future use
- R and C are from the transformer.
- AL1 and AL2 originate from the Alarm Relay.
- A is paralleled with the compressor output for use with motorized-water valves.

Safety Listing:

The CXM2 Control is listed under UL 60730, and is CE listed under IEC 60730.

Configuration and Advanced Troubleshooting

GENERAL

To properly configure and troubleshoot advanced control features, and to aid in troubleshooting basic control features, a communicating thermostat or diagnostic tool with similar capabilities should be used.

SYSTEM CONFIGURATION

All factory installed CXM2 controls have their basic configuration parameters set as part of the factory-manufacturing and test process. The System Configuration option provides the installer with the ability to set control options, setup the loop configuration, parameters, and configure field replacement controls.

NOTE: A communicating thermostat or a configuration/diagnostic tool is required to configure systems. For CXM2 applications and CXM replacements, configuring the product series, size, and options is not required for functionality. The system will function without being configured from a communicating device.

Heating/Cooling Off Delays: The heating- and cooling-mode blower-off delay times may be independently adjusted by the user. Each delay time may be set between 0 and 255 seconds.

Option Selection: The Option Selection menu allows the installer to set selected control options.

LT2 Setpoint: The LT2 setpoint should be set to ANTI-FREEZE ONLY when the unit is configured as a water-to-water unit with antifreeze in the load-side loop. For ALL other unit configurations, the LT2 setpoint should be set to WATER.

Motorized Valve: The Motorized Valve option should be set to ON when a motorized-water valve with end switch wired to the CXM2 Y is used with a communicating thermostat. For all other system configurations, the Motorized Valve option should be set to OFF.

Unit Configuration: Selections under the Unit Configuration menu are set at the factory as a normal part of the manufacturing and test process. This menu allows the configuration to be modified for special applications, or to configure field-replacement controls. The Unit Configuration menu

provides the ability to select the Heat Pump Family, Unit Size, Blower Type, and Loop Type. Making these selection configurations is not required. This is an optional step only.

Heat Pump Family: When replacing a control in the field, you can select the Heat Pump Family. The valid unit family values are available for the user to scroll through to select the proper value. This step is not required.

Heat Pump Size: When replacing a control in the field, you can select the Heat Pump Size. The valid Heat Pump Size values are available for the user to scroll through to select the proper value. This step is not required.

Blower Type: When replacing a control in the field, you can select the Blower Type. The valid Blower Type values are available for the user to scroll through to select the appropriate value for No Blower or Single-Speed configurations. This step is not required.

SERVICE MODE

Service Mode provides the installer with several functions for troubleshooting, including Manual Operation, Control Diagnostics, Control Configuration, and Fault History.

Manual Operation: Manual Operation mode allows the installer to bypass normal thermostat timings and operating modes, to directly activate the thermostat inputs to the CXM2, activate the CXM2 Test mode, and directly control the internal-flow center and proportional valve.

Control Diagnostics: The Control Diagnostics menus allow the installer to see the current status of all CXM2 control switch inputs, values of all temperature sensor inputs, control voltage, internal-flow center, and proportional valve-operating status or parameters.

DIP Switch Configuration: The DIP Switch Configuration menu allows the installer to easily see the current CXM2 control configuration.

Fault History: In addition to the fault code, the CXM2 stores the status of all control inputs and outputs when a fault condition is detected. The fault history covering the last five lockout conditions is stored and may be retrieved from the CXM2. After a specific fault in the fault history is selected, the operating mode and time when the fault occurred are displayed with options to select specific control status values when the lockout occurred.

Fault Temp Conditions: This option displays the CXM2 temperature and voltage values when the lockout occurred.

Fault I/O Conditions: This option displays the status of the CXM2 physical and communicated inputs and the relay outputs when the lockout occurred.

Fault Configuration Conditions: This option displays the status of the CXM2 option selections when the lockout occurred.

Fault Possible Causes: This option displays a list of potential causes of the stored fault.

Clear Fault History: This option allows you to clear the fault history stored in the non-volatile memory of the CXM2.

CXM2 MASTER/SLAVE ADDRESSING

Multiple CXM2 controls may be controlled from a single communicating thermostat; up to three controls may be controlled from the same communicating thermostat.

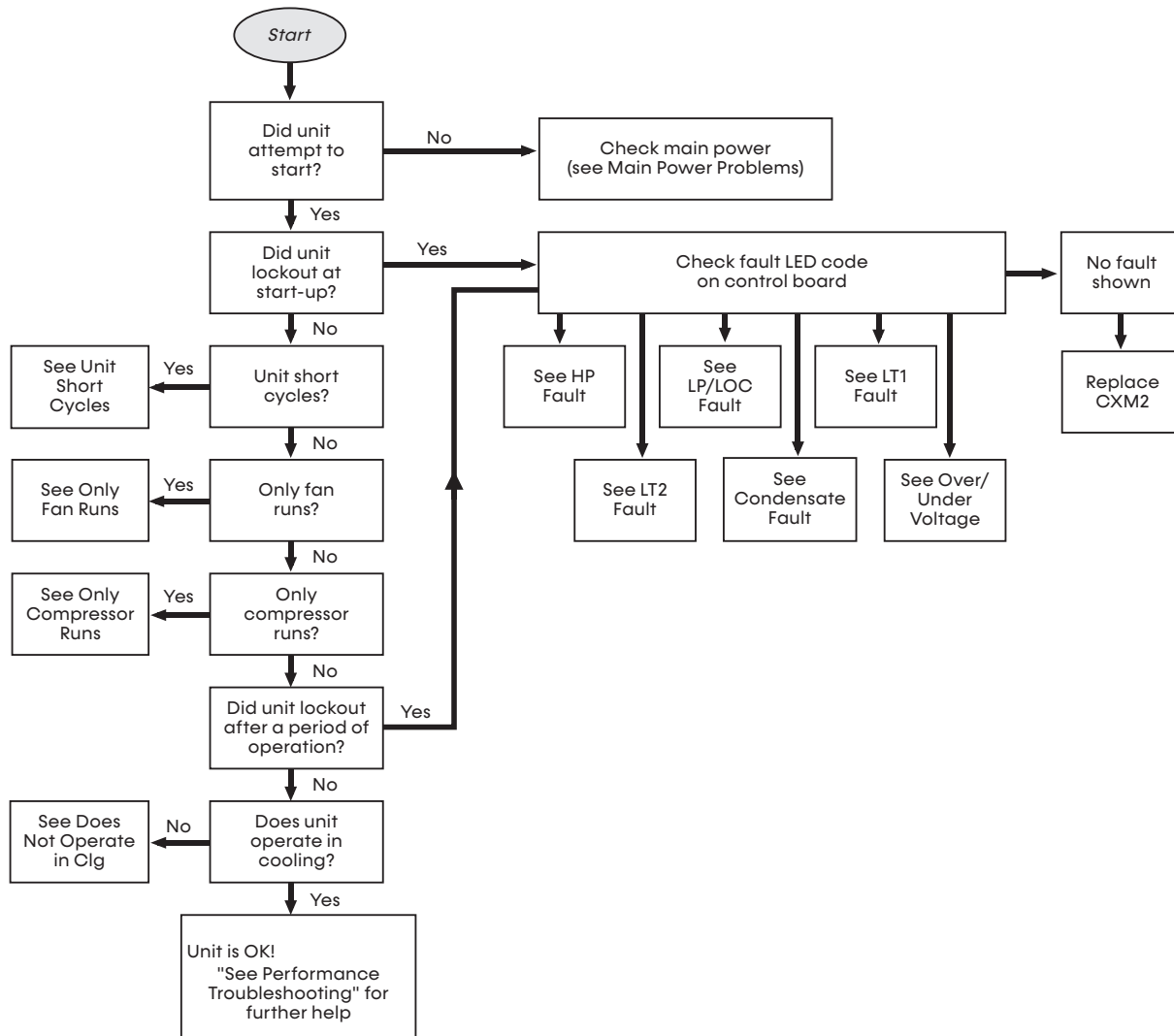
When configuring multiple units for control by the same thermostat, before applying power:

1. Connect the thermostat to each CXM2 control normally, using the A+ & B- connections (daisy-chain wiring so all CXM2 controls share the communication port).
2. Next, confirm that the DIP switch S2-3 is in the ON position for only the master CXM2, and S2-3 is in the OFF position for all slave CXM2 controls.
3. Apply power to the master unit and one of the unaddressed slave units that is to be controlled by the same thermostat.
4. After applying unit power, press and hold the TEST button on the CXM2 control of the slave unit. After several seconds, the Fault and Status LEDs flash. Release the TEST button. When both LEDs are flashing rapidly, the slave is assigned an address and is controlled by the same thermostat-demand messages as the master CXM2 control.
5. Repeat steps 3 and 4 for each additional unit to be added to the system (the master CXM2 unit and addressed slaves should remain powered).

CXM2 Functional Troubleshooting Flow Chart

Models:
CXM2

Use the following troubleshooting flow chart and tables on the following pages to find the appropriate troubleshooting strategies for the CXM2 control and most water source heat pump applications.



Models:
CXM2

Functional Troubleshooting

⚠ CAUTION

Do not restart units without inspection and remedy of faulting condition. Equipment damage may occur.

Fault	Htg	Clg	Possible Cause	Solution
Main power problems	X	X	Green Status LED Off	Check line voltage circuit breaker and disconnect.
				Check for line voltage between L1 and L2 on the contactor.
				Check for 24VAC between R and C on CXM2/DXM2.5.
				Check primary/secondary voltage on transformer.
HP Fault Code 2 High Pressure		X	Reduced or no water flow in cooling	Check pump operation or valve operation/setting. Check water flow adjust to proper flow rate.
		X	Water Temperature out of range in cooling	Bring water temp within design parameters.
	X		Reduced or no airflow in heating	Check for dirty air filter and clean or replace.
				Check fan motor operation and airflow restrictions.
				Dirty Air Coil - construction dust etc.
				Too high of external static? Check static vs blower table.
	X		Air temperature out of range in heating	Bring return air temp within design parameters.
X	X	Overcharged with refrigerant	Check superheat/subcooling vs typical operating condition table.	
X	X	Bad HP Switch	Check switch continuity and operation. Replace.	
LP/LOC Fault Code 3 Low Pressure / Loss of Charge	X	X	Insufficient charge	Check for refrigerant leaks.
				Compressor pump down at startup
LT1 Fault Code 4 Water coil low-temperature limit	X		Reduced or no water flow in heating	Check pump operation or water valve operation/setting.
				Plugged strainer or filter? Clean or replace.
				Check water flow. Adjust to proper flow rate.
	X		Inadequate antifreeze level	Check antifreeze density with hydrometer.
	X		Improper temperature limit setting (30°F vs 10°F [-1°C vs -2°C])	Clip JW3 jumper for antifreeze (10°F [-12°C]) use.
	X	X	Bad thermistor	Check temp and impedance correlation per chart.
LT2 Fault Code 5 Air coil low-temperature limit		X	Reduced or no airflow in cooling	Check for dirty air filter and clean or replace.
				Check fan motor operation and airflow restrictions.
				Too high of external static? Check static vs blower table.
		X	Air Temperature out of range	Too much cold vent air? Bring entering air temp within design parameters.
	X		Improper temperature limit setting (30°F vs 10°F [-1°C vs -12°C])	Normal airside applications will require 30°F [-1°C] only.
X	X	Bad thermistor	Check temp and impedance correlation per chart.	
Condensate Fault Code 6	X	X	Blocked drain	Check for blockage and clean drain.
	X	X	Improper trap	Check trap dimensions and location ahead of vent.
		X	Poor drainage	Check for piping slope away from unit.
				Check slope of unit toward outlet.
				Poor venting? Check vent location.
		X	Moisture on sensor	Check for moisture shorting to air coil.
	X	X	Plugged air filter	Replace air filter.
X	X	Restricted Return Airflow	Find and eliminate restriction. Increase return duct and/or grille size.	

Table continued on next page.

Functional Troubleshooting

Models:
CXM2

Table continued from previous page.

Fault	Htg	Clg	Possible Cause	Solution
Over/Under Voltage Code 7 (Auto resetting)	X	X	Under Voltage	Check power supply and 24VAC voltage before and during operation.
				Check power supply wire size.
	X	X	Over Voltage	Check compressor starting. Need hard start kit?
				Check 24VAC and unit transformer. Tap for correct power supply voltage.
Unit Performance Sentinel Code 8	X		Heating mode LT2>125°F [52°C]	Check for poor airflow or overcharged unit.
		X	Cooling Mode LT1>125°F [52°C] OR LT2< 40°F [4°C]	Check for poor water flow or airflow.
Swapped Thermistor Code 9	X	X	LT1 and LT2 swapped	Reverse position of thermistors
Low Water Flow Code 13	X	X	Reduced or no water flow	Check pump or valve operation setting.
				Check water flow and adjust to proper flow rate.
			Inadequate antifreeze level	Check antifreeze density with hydrometer.
	X		Bad flow switch	Confirm applied flow to looks vs minimum flow switch setpoint on label.
Leaving Water Temperature Low Code 14	X		Reduced or no water flow in heating	Check pump or valve operation setting.
				Check water flow and adjust to proper flow rate.
			Inadequate antifreeze level	Check antifreeze density with hydrometer.
	X		Improper temperature limit setting (30°F vs 15°F [-1°C vs -9°C])	Clip JW3 jumper for antifreeze (15°F [-9°C]) use.
	X		Water temperature out of range	Bring water temperature within design parameters.
	X		Bad thermistor	Check temperature impedance correlation per chart.
Refrigerant and RDS Code 15	X	X	Refrigerant Leak	Check refrigerant charge. If the charge is low, identify and repair the leak.
			Faulty RDS sensor	Check refrigerant charge. If the charge is not low, replace the RDS sensor.
No Fault Code Shown	X	X	No compressor operation	See "Only Fan Operates".
	X	X	Compressor overload	Check and replace, if necessary.
	X	X	Control board	Reset power and check operation.
Unit Short Cycles	X	X	Dirty air filter	Check and clean air filter.
	X	X	Unit in "test mode"	Reset power or wait 20 minutes for auto exit.
	X	X	Unit selection	Unit may be oversized for space. Check sizing for actual load of space.
	X	X	Compressor overload	Check and replace, if necessary.
Only Fan Runs	X	X	Thermostat position	Ensure thermostat set for heating or cooling operation.
	X	X	Unit locked out	Check for lockout codes. Reset power.
	X	X	Compressor Overload	Check compressor overload. Replace if necessary.
	X	X	Thermostat wiring	Check thermostat wiring at heat pump. Jumper Y and R for compressor operation in test mode.
Only Compressor Runs	X	X	Thermostat wiring	Check G wiring at heat pump. Jumper G and R for fan operation.
	X	X		Check thermostat wiring at heat pump. Jumper Y and R for compressor operation in test mode.
	X	X	Fan motor relay	Jumper G and R for fan operation. Check for line voltage across BR contacts.
	X	X		Check fan power enable relay operation (if present).
	X	X		Fan motor

Models:
CXM2

Functional Troubleshooting

Table continued from previous page.

Fault	Htg	Clg	Possible Cause	Solution
Unit Doesn't Operate in Cooling		X	Reversing valve	Set for cooling demand and check 24VAC on RV coil and at CXM2/DXM2.5 board.
		X		If RV is stuck, run high pressure up by reducing water flow and while operating engage and disengage RV coil voltage to push valve.
		X	Thermostat setup	Check for 'O' RV setup not 'B'.
		X	Thermostat wiring	Check O wiring at heat pump. Jumper O and R for RV coil 'click'.
		X		Put thermostat in cooling mode. Check 24VAC on O (check between C and O); check for 24VAC on W (check between W and C). There should be voltage on O, but not on W. If voltage is present on W, thermostat may be bad or wired incorrectly.

Performance Troubleshooting

Models:
CXM2

Symptom	Htg	Clg	Possible Cause	Solution
Insufficient capacity/ Not cooling or heating	X	X	Dirty filter	Replace or clean.
	X		Reduced or no airflow in heating	Check for dirty air filter and clean or replace.
				Check fan motor operation and airflow restrictions.
				Too high of external static? Check static vs. blower table.
		X	Reduced or no airflow in cooling	Check for dirty air filter and clean or replace.
				Check fan motor operation and airflow restrictions.
				Too high of external static? Check static vs. blower table.
	X	X	Leaky duct work	Check supply and return air temperatures at the unit and at distant duct registers. If significantly different, duct leaks are present.
	X	X	Low refrigerant charge	Check superheat and subcooling per chart.
	X	X	Restricted metering device	Check superheat and subcooling per chart. Replace.
		X	Defective reversing valve	Perform RV touch test.
X	X	Thermostat improperly located	Check location and for air drafts behind stat.	
X	X	Unit undersized	Recheck loads & sizing. Check sensible cooling load and heat pump capacity.	
X	X	Scaling in water heat exchanger	Perform scaling check and clean if necessary.	
X	X	Inlet water too hot or cold	Check load, loop sizing, loop backfill, ground moisture.	
High Head Pressure	X		Reduced or no airflow in heating	Check for dirty air filter and clean or replace.
				Check fan motor operation and airflow restrictions.
				Too high of external static? Check static vs. blower table.
		X	Reduced or no water flow in cooling	Check pump operation or valve operation/setting. Check water flow. Adjust to proper flow rate.
		X	Inlet water too hot	Check load, loop sizing, loop backfill, ground moisture.
	X		Air temperature out of range in heating	Bring return air temperature within design parameters.
		X	Scaling in water heat exchanger	Perform scaling check and clean if necessary.
	X	X	Unit overcharged	Check superheat and subcooling. Re-weigh in charge.
X	X	Non-condensables in system	Vacuum system and re-weigh in charge.	
X	X	Restricted metering device	Check superheat and subcooling per chart. Replace.	
Low Suction Pressure	X		Reduced water flow in heating	Check pump operation or water valve operation/setting.
				Plugged strainer or filter? Clean or replace.
				Check water flow. Adjust to proper flow rate.
	X		Water temperature out of range	Bring water temperature within design parameters.
		X	Reduced airflow in cooling	Check for dirty air filter and clean or replace. Check fan motor operation and airflow restrictions. Too high of external static? Check static vs. blower table.
		X	Air temperature out of range	Too much cold vent air? Bring entering air temperature within design parameters.
X	X	Insufficient charge	Check for refrigerant leaks.	
Low Discharge Air Temperature in Heating	X		Too high of airflow	Check fan motor speed selection and airflow chart.
	X		Poor performance	See 'Insufficient Capacity'
High humidity		X	Too high of airflow	Check fan motor speed selection and airflow chart.
		X	Unit oversized	Recheck loads & sizing. Check sensible cooling load and heat pump capacity.

Table continued on next page.

Models:
CXM2

Performance Troubleshooting

Table continued from previous page.

Symptom	Htg	Clg	Possible Cause	Solution
Only Compressor Runs	X	X	Thermostat wiring	Check G wiring at heat pump. Jumper G and R for fan operation.
	X	X	Fan motor relay	Jumper G and R for fan operation. Check for line voltage across blower relay contacts. Check fan power. Enable relay operation (if present).
	X	X	Fan motor	Check for line voltage at motor. Check capacitor.
	X	X	Thermostat wiring	Check thermostat wiring at CXM2. Put in Test Mode and then jumper Y1 and W1 to R to give call for fan, compressor and electric heat.
Unit Doesn't Operate in Cooling		X	Reversing valve	Set for cooling demand and check 24VAC on RV coil. If RV is stuck, run high pressure up by reducing water flow and, while operating, engage and disengage RV coil voltage to push valve.
		X	Thermostat setup	For DXM2.5, check for "O" RV setup, not "B".
		X	Thermostat wiring	Check O wiring at heat pump. CXM2 requires call for compressor. To get RV coil, "Click".
Modulating Valve Troubleshooting	X	X	Improper output setting	Verify the AO-2 jumper is in the 0-10V position.
	X	X	No valve output signal	Check DC voltage between AO2 and GND. Should be 0 when valve is off and between 3.3V and 10V when valve is on.
	X	X	No valve operation	Check voltage to the valve. Replace valve if voltage and control signals are present at the valve and it does not operate.

Notes

Models:
CXM2

Models:
CXM2

Notes

Notes

Models:
CXM2

Models:
CXM2

Revision History

Date	Section	Description
05/24/24	All	Updated document design and added CXM2 Board Identification section



A NIBE GROUP MEMBER

7300 SW 44th St. | Oklahoma City, OK 73179
Phone: 1-800-299-9747
www.climatemaster.com



ClimateMaster works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice and may not be as described herein. Please contact ClimateMaster's Customer Service Department at 1-800-299-9747 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely ClimateMaster's opinion or commendation of its products. The latest version of this document is available at www.climatemaster.com.

Engineered and assembled in the USA.

© ClimateMaster, Inc. All Rights Reserved 2024