Installation & Operation Manual

ChromaFP Series

Chroma-FP
Freeze protection controller

CHROMALOX
Advanced Thermal Technologies

PK568
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Table of Contents

Safety Precautions

<div style="background:red;color:white">

IMPORTANT SAFEGUARDS

</div>

Safety precautions should always be followed to reduce the risk of fire, electrical shock, injury and even death to persons.

Please read all instructions before operating the Control Panel.

To avoid electrical shock or injury, always remove power before servicing a circuit. Personnel working with or near high voltages should be familiar with modern methods of resuscitation. Contact an area supervisor or safety personnel for more information.

⚠ WARNING

HIGH VOLTAGE is used in the operation of this equipment; DEATH ON CONTACT may result if personnel fail to observe safety precautions.

Learn the areas containing high-voltage connections when installing or operating this equipment.

Be careful not to contact high-voltage connections when installing or operating this equipment.

Before working inside the equipment, turn power off and ground all points of high potential before touching them.

⚠ WARNING

ELECTRIC SHOCK HAZARD. Any installation involving control equipment must be performed by a qualified person and must be effectively grounded in accordance with the National Electrical Code to eliminate shock hazard.

Before Powering Up

Chromalox takes great pride in knowing that we have provided to you a product of premium quality and workman-ship. We have taken every precaution to ensure that your equipment arrives safe and secure.

However, vibration and temperature changes during shipping can cause some components to become loose. Additionally, throughout the life span of this product, other environmental and application conditions may have affected the mechanical and electrical continuity of several internal components. Therefore, for your safety and overall product performance, please take the time to familiarize yourself with the **MAINTENANCE, OPERATION, AND INSTALLATION INSTRUCTIONS** technical manual that was shipped with your panel.

Since it is not uncommon for electrical wiring and mechanical connections to become slightly loosened during shipment, we ask that you pay particular attention to the section titled Wiring and Connections:

WIRING AND CONNECTIONS

Check wiring and connections as follows:

a. Inspect wiring for wear, fraying, chipping, nicks, and evidence of overheating. Repair minor defects with a good grade of electrical tape, or replace if needed.

b. Inspect for loose electrical and mechanical connections. Tighten or replace defective crimp-style lugs. Re-solder loose solder connections. Tighten or replace all loose or missing hardware.

Introduction

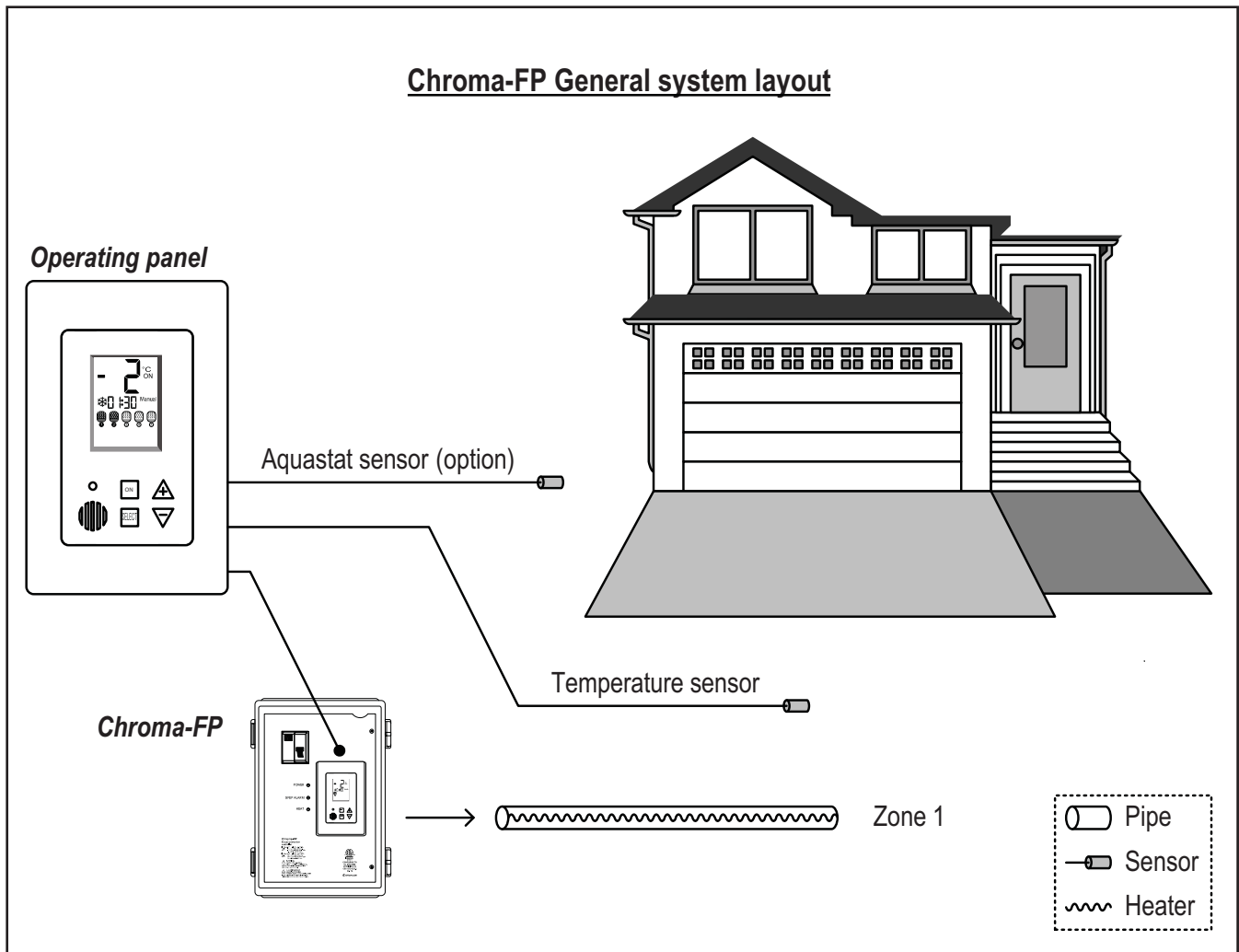The Chroma-FP Series power boxes offer smart and easy control for HEAT TRACING SYSTEMS.

It can operate one heating zones.

Typical applications include pipes, valves and gutters.

The backlit LCD screen provides full interface and information to the system status.

The Chroma-FP offers various operating and programming options such as:

- Switchable temperature scales (°F or °C) - Adjustable Lower ambient temperature limit to stop
- Both Automatic and Manual modes heater (lockout)
- Energy saving temperature limit - Commissioning/Test environment
- Adjustable heater hold on off delay

Chroma-FP General system layout

Operating panel

Aquastat sensor (option)

Temperature sensor

Chroma-FP

Zone 1

| Pipe |
| Sensor |
| Heater |

Chroma-FP Series Installation

PLEASE READ THIS MANUAL AND THE SAFETY WARNINGS CAREFULLY BEFORE INSTALLING AND USING THE CONTROLLER AND SAVE IT FOR FUTURE USE.

Installation notes

1. Familiarize yourself with the markings, warnings, components and terminology.

2. The Chroma-FP power boxes and its accessories must be installed by a qualified electrician in accordance with local regulations and the requirements of the NEC (NFPA 72) and the CEC part 1.

⚠WARNING

Ensure the power is disconnect from all circuits before mounting the power box and making any connections. Contact with components carrying hazardous voltage can cause electric shock and may result in severe personal injury or death.

3. **Installer must ensure the installation of approved disconnect means, for all power supply circuits feeding this unit.**

4. The power boxes are suitable for indoor wall mount installation only.

5. Ensure wiring according to the provided schematics using copper conductors only.

6. Make sure the wire gauge (AWG) is suitable for the circuit amperage draw, as specified in the NEC/CEC table 1.

7. Ensure that the main breakers (fuses) are suitable for the heating systems rating (80% load).

8. Grounding means must comply with local regulations and CEC/NEC.

9. Ensure that the heating system/de-icing system connected to this unit complies with the UL 499 or UL 515 & CSA 22.2 # 130.3 standard and is certified / listed by an NRTL.

10. Ensure that all wiring is rated for the application at 60°C (140°F as per UL 515 CSA 22.2 #130 clause 12 table 12.1.

11. Beware that any holes punched for conduit are to compromise the integrity of the enclosure ratings.

Ground Fault Equipment Protector (GFEP)

1. The ground fault interrupter/residual current detector installed in this system is a Non class A GFCI, intended for equipment protection.

2. Familiar yourself with its operation and required setting.

3. The GFEP should be tested monthly. Please refer to the GFEP testing instructions.
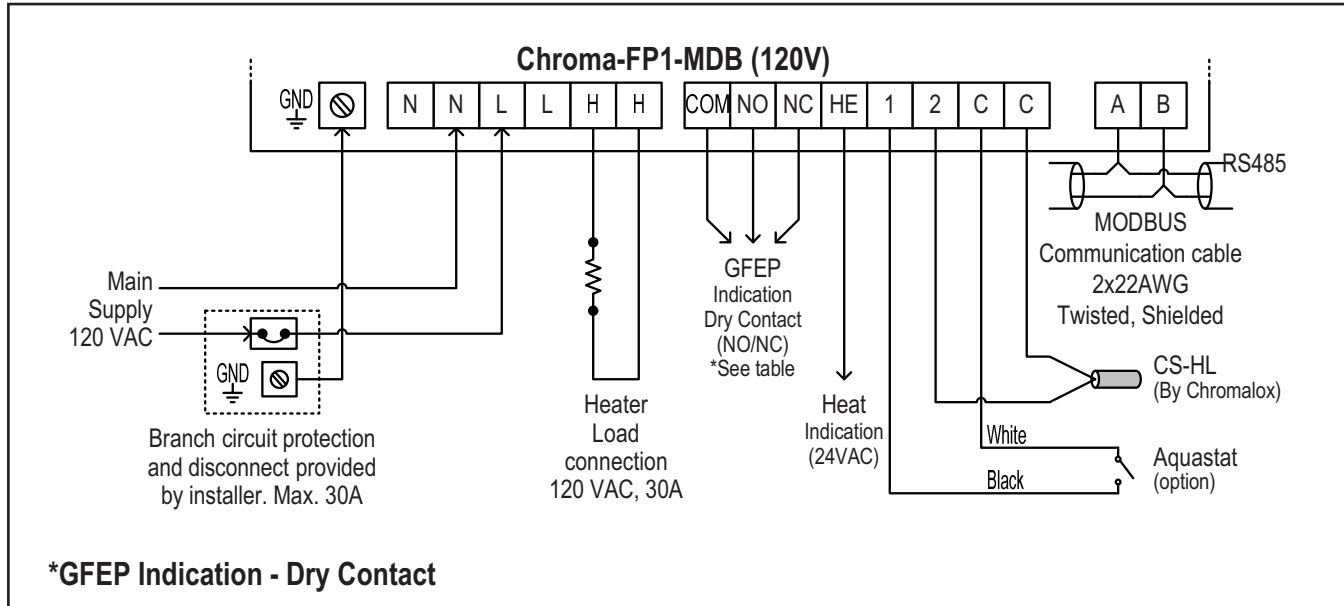
Wiring the Chroma-RG

Heater Load Connection

Provide terminals L, N with up to 120 VAC, 30 AMP.

Make sure the wire Gauge (AWG) is suitable for the circuit Amperage draw, as specified in the NEC/ CEC table 1.

⚠CAUTION

Incorrect voltage may cause fire or seriously damage the unit.

Chroma-FP1 (120V)

*GFEP Indication - Dry Contact

Chroma-FP1-MDB (120V)

*GFEP Indication - Dry Contact

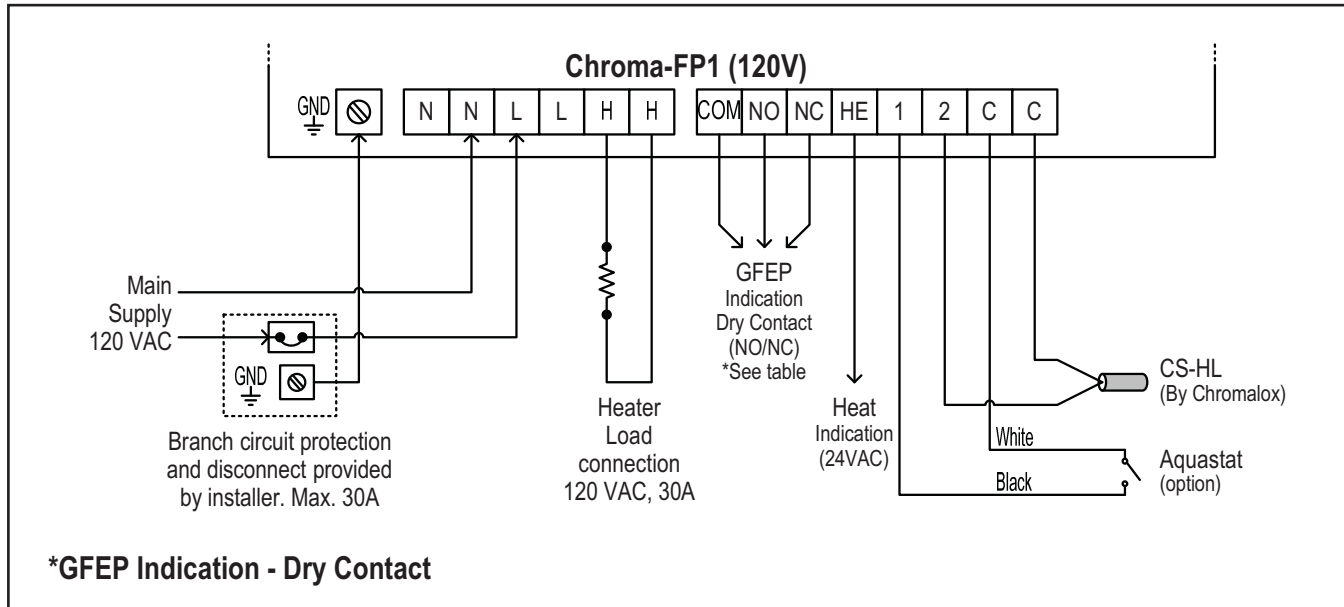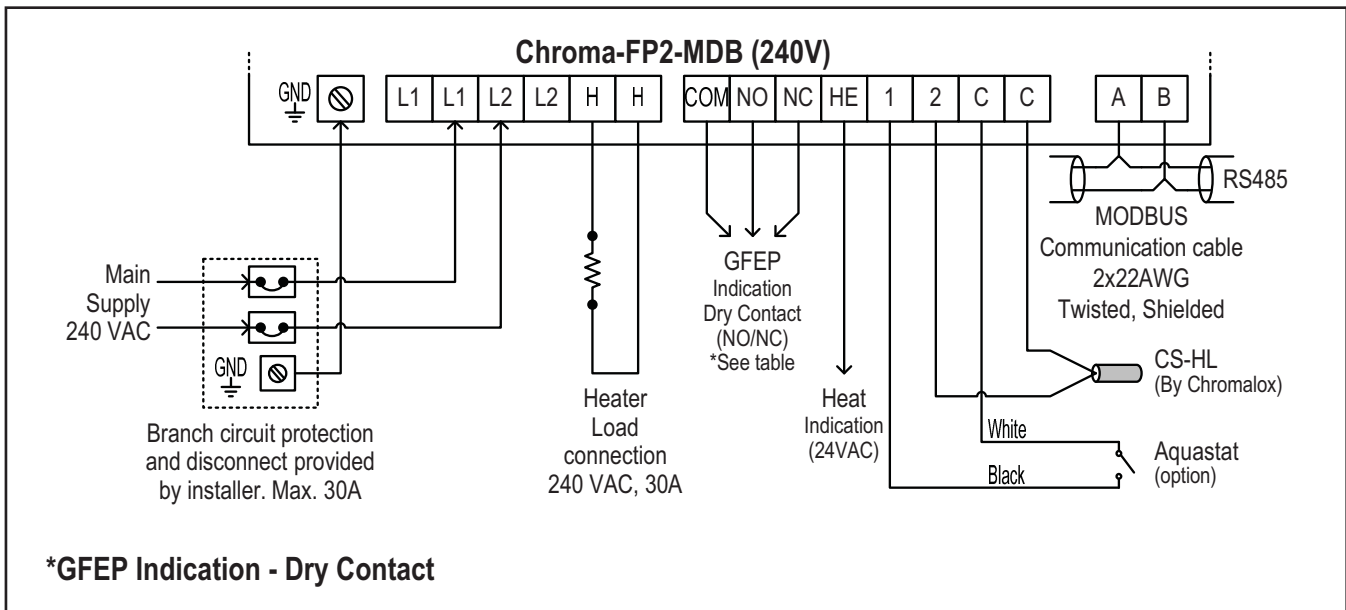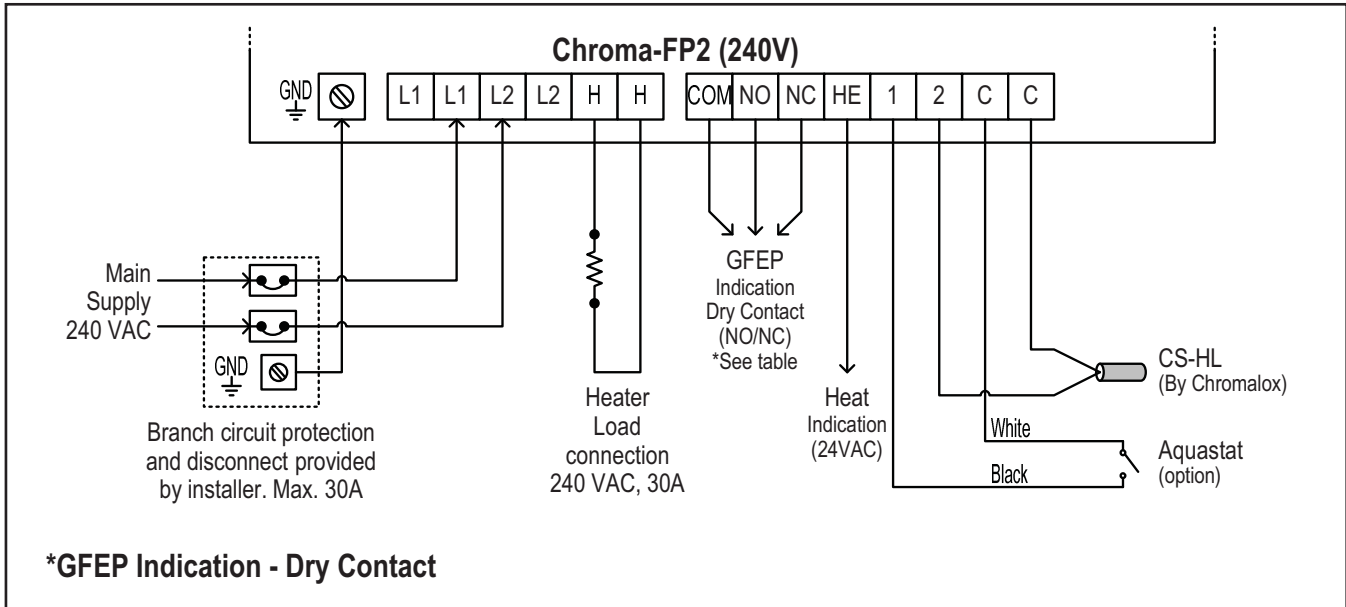|	NO-COM	NC - COM
GFEP Tripped	SHORT	OPEN
GFEP NOT Tripped OPEN	OPEN	SHORT

Heater Load Connection

Provide terminals L, N with up to 240 VAC, 30 AMP

Make sure the wire Gauge (AWG) is suitable for the circuit Amperage draw, as specified in the NEC/ CEC table 1.

⚠ CAUTION

*Incorrect voltage may cause fire or seriously damage the unit.*

Chroma-FP2 (240V)

GND | L1 | L1 | L2 | L2 | H | H | COM | NO | NC | HE | 1 | 2 | C | C

Main Supply 240 VAC

GND

Branch circuit protection and disconnect provided by installer. Max. 30A

Heater Load connection 240 VAC, 30A

GFEP Indication Dry Contact (NO/NC) *See table

Heat Indication (24VAC)

White

Black

CS-HL (By Chromalox)

Aquastat (option)

***GFEP Indication - Dry Contact**

Chroma-FP2-MDB (240V)

GND | L1 | L1 | L2 | L2 | H | H | COM | NO | NC | HE | 1 | 2 | C | C | A | B

RS485

MODBUS Communication cable 2x22AWG Twisted, Shielded

Main Supply 240 VAC

GND

Branch circuit protection and disconnect provided by installer. Max. 30A

Heater Load connection 240 VAC, 30A

GFEP Indication Dry Contact (NO/NC) *See table

Heat Indication (24VAC)

White

Black

CS-HL (By Chromalox)

Aquastat (option)

***GFEP Indication - Dry Contact**

|	NO-COM	NC - COM
GFEP Tripped	SHORT	OPEN
GFEP NOT Tripped OPEN	OPEN	SHORT

Operating Instructions

Turning the System ON and OFF

1. Press and hold the [ON] button for 0.5 seconds to turn the system ON or OFF.
2. The words "ON" or "OFF" will appear on display.
3. When ON, the green LED on the front panel will also turn ON.

ON
OFF
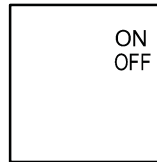
Selecting Temperature Scale

1. Press the [+] button for Celsius.
2. Press the [-] button for Fahrenheit.

°F
°C
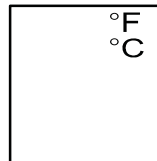
Selecting Automatic or Manual Mode

1. Press the [SELECT] button to switch between modes:

   "Automatic" Heating will start and stop automatically depending on the set point and ambient temperatures.

   "Manual ON" Heating will start regardless of the set point and ambient temperatures and will stop after a preset time (pls. refer to the "Manual ON" section in the tech. settings).

NOTE: Mode will always return to "Automatic" after switching the unit OFF and ON.

Auto   Manual
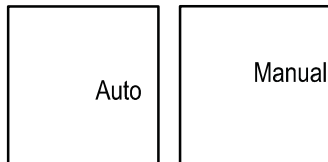
Heater Indication

Black icon – Heater ON

White icon – Heater OFF

Heater ON   Heater OFF

When ON, the red LED on the front panel indicating heater operation will also turn ON.

Snow Flake Icon and Digital Time Indication

A solid snow flake icon will appear on display during normal heater operation.

❄ 88:88

A blinking snow flake icon will appear on display during heater off delay or when manual mode is activated. The digital clock will count down the remaining time until the heater is turned off.

The snow flake icon will disappear from display as long as the heater is turned off.
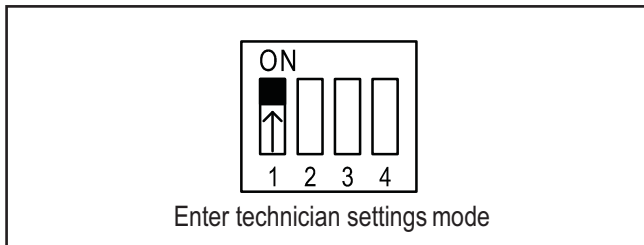
Technician Settings

Use the technician settings mode to view and adjust the following parameters:

|				
P01	Temperature set point		P06	Enable/Disable 2nd temperature sensor logic (Aquastat)
P02	Lower ambient temperature limit to stop heater		P07	Not in use
P03	Time delay before stopping the heater		P08	MODBUS MAC Address for home automation system (option)
P04	ON time for manual mode		P09	Commissioning / Test mode
P05	Not in use		Restore defaults	

Enter Technician Settings Mode

1. Disconnect power and open the internal door by releasing the two screws.

2. Move DIP switch S1 located on the side of thermostat to ON position.

3. Press the [SELECT] and [+] buttons simultaneously to move forward to the next technician parameter.

4. Press the [SELECT] and [-] buttons simultaneously to return to the previous technician parameter.

ON

1 2 3 4

Enter technician settings mode

Save Changes and Exit Technician Settings Mode

1. Move DIP switch S1 located on the side of thermostat to OFF position.

IMPORTANT: Changes made to technician parameters will not take effect as long as DIP switch S1 is in ON position.

ON

1 2 3 4

Save changes and exit technician settings mode
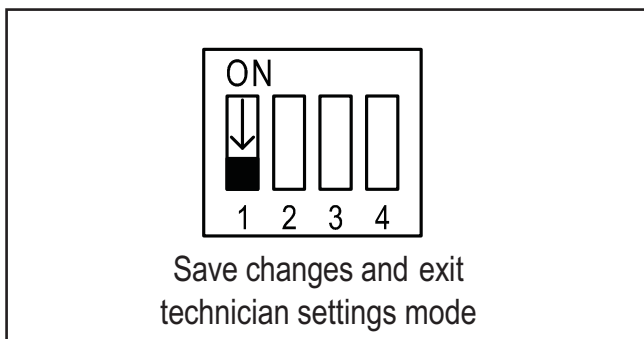
Parameters:

P01 - Temperature set point

1. Move DIP switch S1 located on the side of thermostat to ON position.

2. "P01" and the temperature set point will appear on display.

3. Use the [+] and [-] buttons to adjust the temperature set point.
   Range: 5...60°F / -15...+15°C, Default: 37°F / 3°C

As long as the ambient temperature is lower than the temperature set point P01, the Chroma-FP will turn ON.

37 °F

P01
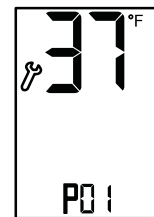
Temperature set point

**P02 - Lower limit temperature for heating**

1. Press the [SELECT] and [+] buttons simultaneously.

2. "P02" and the low limit temperature will appear on display.
   When the temperature on the temperature sensor drops below the low temperature limit, the heating system will stop.

3. Use the [+] and [-] buttons to adjust the temperature set point.
   Range: -40…+23°F / -40…-5°C Default: -40°F / -40°C

4. Press the [SELECT] and [+] buttons simultaneously again.

5. The word "ON" or "OFF" will appear on display.

6. Use the [+] and [-] buttons enable (ON) or disable (OFF) the P02 parameter.
   If disabled, the heating system will operate without low temperature limitations.

Low limit Temperature	P02 enabled	P02 disabled
-40°F P02	-40°F ON P02	-40°F OFF P02
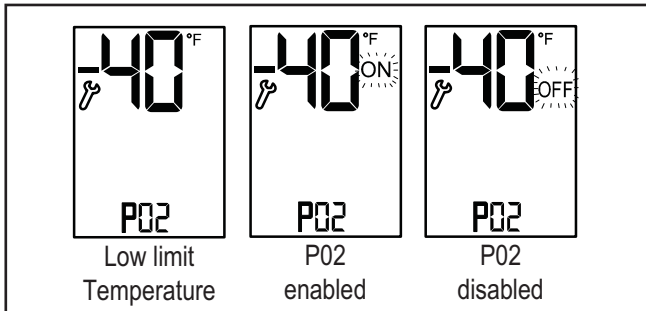
**P03 – Time delay before stopping the heater**

1. Press the [SELECT] and [+] buttons simultaneously.

2. "P03", "dL" and the time delay before stopping the heater (Hold ON) will appear on display. The hours will blink.

3. Use the [+] and [-] buttons to adjust the hours of the time delay.

   Range: 0000...9999 minutes Default: 120 minutes

Note 1. The time delay countdown will start when the ambient temperatures rises above the set point temperature.

Note 2. The staggering sequence will continue during the time delay period.

dL
0120
P03
Time delay
(minutes)
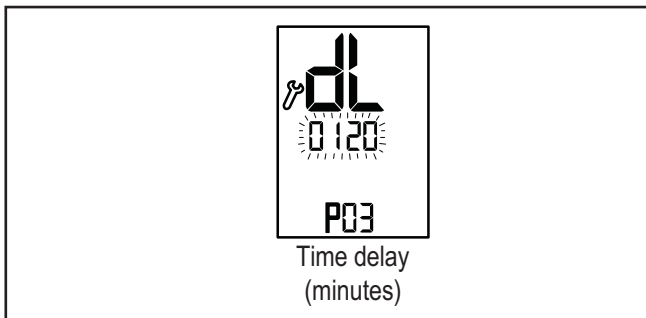
P04 - Manual mode ON time

1. Press the [SELECT] and [+] buttons simultaneously.

2. "P04", "On" and the time "Manual ON" mode time period will appear on display. The hours will blink.

3. The delay time parameter defines a time frame in which the heater remains ON after receiving an "Manual ON" command.

4. Use the [+] and [-] buttons to adjust the hours of the working time.
   Range: 00...99 hours Default: 03 hours

5. Press the [SELECT] and [+] buttons simultaneously again. The minutes will blink.

6. Use the [+] and [-] buttons to adjust the minutes of the working time.
   Range: 00...59 minutes Default: 00 minutes

dL
0180
P04
Manual ON
(minutes)
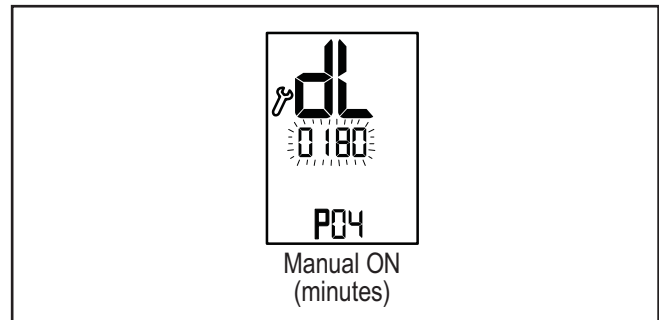
P05 -Not in Use

1. Press the [SELECT] and [+] buttons simultaneously.

2. "P05" will appear on display.

3. Proceed to P06.

P06 – Enable/Disable Temperature sensor / Aquastat logic

1. Press the [SELECT] and [+] buttons simultaneously.

2. "P06" and the number "0" or "1" will appear on display.

3. Use the [+] and [-] buttons to select between:

   "0" Logic set by both TEMPERATURE SENSOR and AQUASTAT (default).

   "1" Logic set by TEMPERATURE sensor only.

   "2" Logic set by AQUASTAT sensor only

Logic by temperature sensor & aquastat	Logic by temperature sensor only	Logic by aquastat sensor only
0 P06	1 P06	2 P06
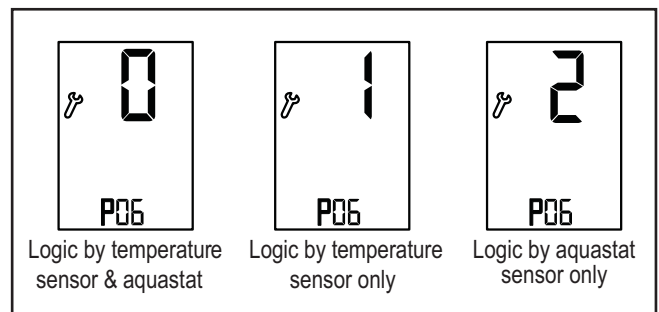
P07 – Not in use

1. Press the [SELECT] and [+] buttons simultaneously.

2. "P07" will appear on display.

3. Proceed to P08.

**P08 - MODBUS MAC Address
(for MDB models only)**

1. Press the [SELECT] and [+] buttons simultaneously.

2. "P08" and the MODBUS MAC Address will appear on display.

3. Use the [+] and [-] buttons to set the MAC Address of the unit.

4. Setting the MAC address for the unit will make it available through the home automation system. Range: 0 – 60.

   Select "0" for NO COMMUNICATION system (default).

MODBUS
MAC Address
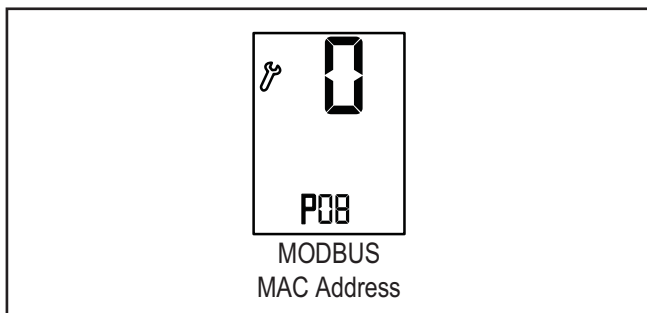
P09 – Test conditions mode / Technician commissioning mode

Turn ON test conditions to check the functionality of the system regardless of temperature sensors parameters (i.e. during the summer).

In test conditions, the Ambient temperature is always -7°C/19°F.

1. Press the [SELECT] and [+] buttons simultaneously.

2. "P09" will appear on display. The hours will blink.

3. Use the [+] button to enter test/commissioning mode – the word "Test" will appear on display.

4. Use the [-] button to manually exit test/commissioning mode – the word "Test" will disappear from display.

Note: If the technician did not manually exit test/commissioning mode, the unit will automatically return to normal mode after 5 hours.

Test
conditions mode
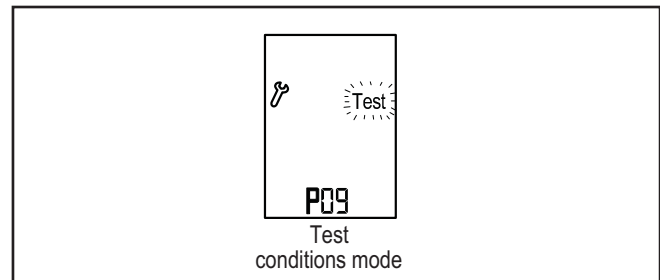
Save changes and return to normal display

In order to save changes and return to normal display, move DIP switch S1 back to OFF position.

IMPORTANT: Changes made to technician parameters will not take effect as long as DIP switch S1 is in ON position.

Save changes and exit
technician settings mode
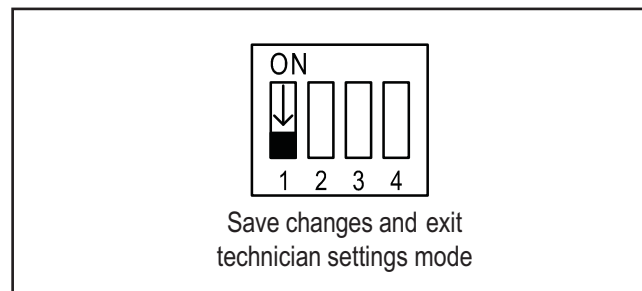
Restore Default Values

IMPORTANT: Make sure the unit is turned OFF (the word "OFF" should appear on display).

1. Move DIP switch S1 to ON position.
2. Press and hold the [ON] button for 10 seconds. The thermostat will beep.
3. Move DIP switch S1 back to OFF position.

DIP Switch Settings

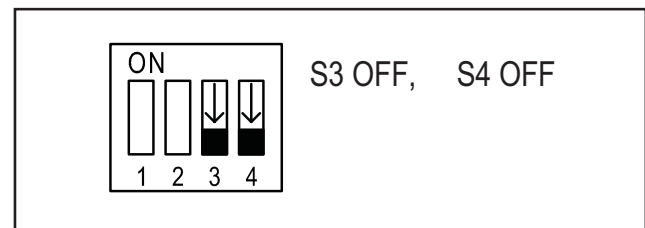### DIP switch S2 - Short measuring times (test only)

Use DIP switch S2 to short the measuring times as follows:

- "ON" - Short measuring times – for test/commissioning only (measuring times will be divided to 60).
- "OFF" - Normal operation.

Short measuring times:
A real 1 hour will take 1 minute and a real 1 minute will take 1 second.

DIP switches S3 and S4 – Not in use – must remain OFF

ON

1 2 3 4

S3 OFF,   S4 OFF

Chromalox, Inc.
1347 Heil Quaker Boulevard
Lavergne, TN 37086
(615) 793-3900
www.chromalox.com