



MC ELITE SERIES

CURRENT/VOLTAGE (MCA), 135Ω (MCP), FLOATING (MCF)
FOR TEMPERATURE, PRESSURE, VACUUM, OR HUMIDITY



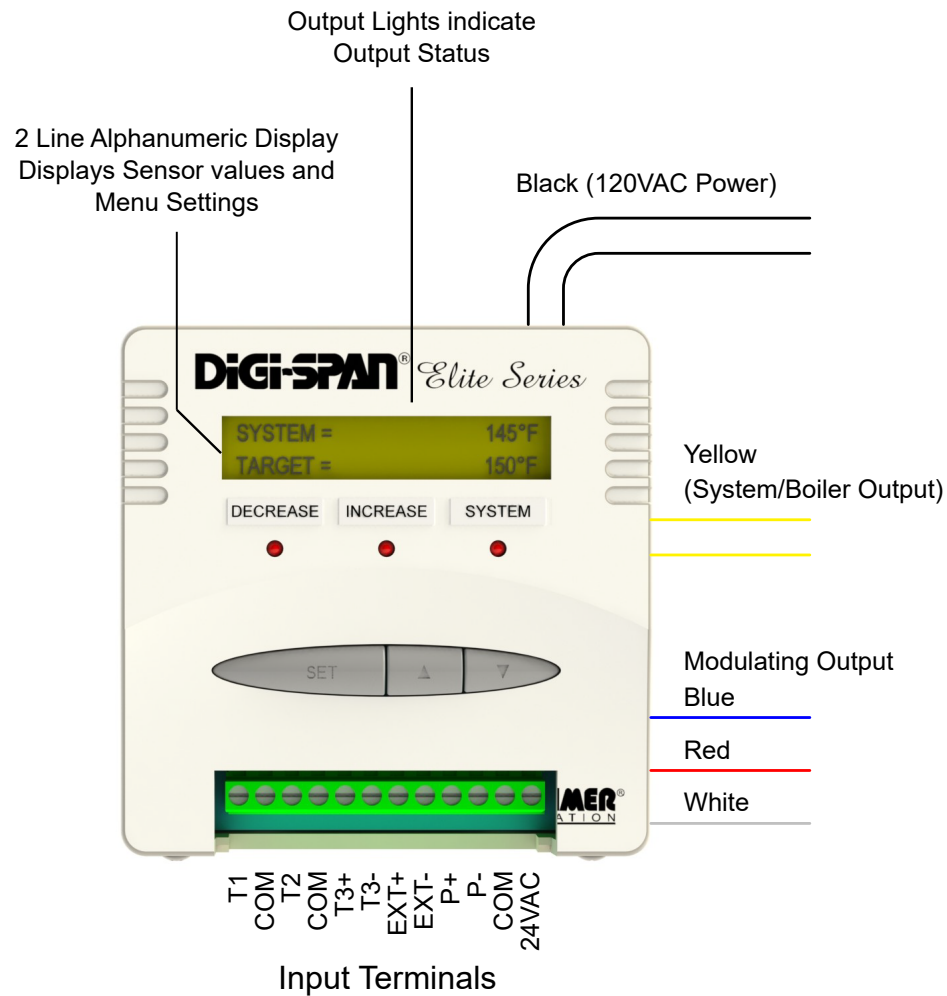
WARNING

This Heat-Timer control is strictly an operating control; it should never be used as a primary limit or safety control. All equipment must have its own certified limit and safety controls required by local codes. The installer must verify proper operation and correct any safety problems prior to the installation of this Heat-Timer control.

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MODEL	MODULATING OUTPUT		
	BLUE	RED	WHITE
MCA (4-20mA)	Not Used	Common	4-20mA
MCA (Voltage)	Voltage	Common	Not Used
MCP	135 ohms-B	135 ohms-R	135 ohms-W
MCF	Close	Common	Open

The MC Elite Series controls modulates valves, motors, variable speed drives, or boilers to accurately maintain a set point based on a PID logic; temperature, pressure, vacuum, or humidity. There are three different models, each provides a different modulating signal. The MCA Elite modulates current (4-20mA) or voltage motors. The MCP Elite modulates 135Ω motors. The MCF Elite modulates floating motors. In addition to the modulation, the MC Elite has an output relay to activate a boiler, cooling unit, or a pump. Like all Digi-Span Elites, the MC constantly displays the sensor's value and the target set point. Additional control parameters can also be displayed with the simple press of a button.

BOILER/COOLING UNIT OPERATION - (MCA/MCP ONLY)

When the MCA/MCP Elite is set to modulate a heating/cooling unit, it starts when the EXT+ and EXT- terminals are shorted. First, it will activate the heating/cooling unit output relay (Yellow wires) for the full Purge period. After the Purge ends, the PID starts to modulate the output until the system sensor value reaches the Target set point.

On a reduction in the demand the MCA/MCP Elite modulates the output down. If no additional output is needed, the control will modulate the unit to the OFF position (0% modulation). The output relay (Yellow Wires) will remain energized for the Run-On period. In this case, the Run-On acts as a soft-off period for the boiler/cooling unit.

VALVE OPERATION - (MCA/MCP ONLY)

When the MCA/MCP Elite is set to modulate a valve, it starts when the EXT+ and EXT- terminals are shorted. The control will activate the output relay (Yellow Wires) and start to modulate the valve to get the system sensor value to the Target set point. In many cases, the output relay will be controlling a pump.

On a reduction in the demand the MCA/MCP Elite will modulate the valve down. If no additional output is needed, the control will modulate the valve to the OFF position (0% modulation). The output relay (Yellow Wires) will remain energized for the Run-On period.

VALVE OPERATION - (MCF ONLY)

When the MCF Elite is set to modulate a valve, it starts when the EXT+ and EXT- terminals are shorted. The control will activate the output relay (Yellow Wires) and start to pulse the valve open or close to get the system sensor value to the Target set point. In many cases, the output relay will be controlling a pump.

On a reduction in the demand the MCF Elite will pulse the valve close. If no additional output is needed, the control will energize the Decrease output for 6 minutes to guarantee valve closure. The output relay (Yellow Wires) will remain energized for the Run-On period.

NOTICE

For the information regarding the various types of sensors used on the MC Series Digi Span along with the various parameters of the sensors reference the *Sensor Type Table* found on page 26.

03 RESET RATIO/OUTDOOR RESET

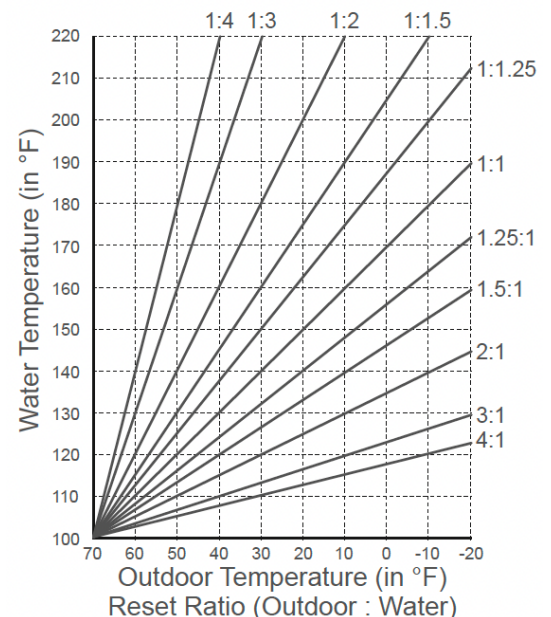
The MC Elite Series can operate based on a temperature set point or a pressure set point. When used in a Hydronic Heating application and TEMPERATURE was set as the Sensor Type, an Outdoor Reset option will be available as the Control Mode. See "Control Mode" on page 18. The Outdoor Reset gives the control the capability of changing the heating Target set point based on the outdoor temperature. See "Reset Ratio" on page 17.

To understand OUTDOOR RESET is to understand building heat loss. When a building is being heated, heat escapes through the walls, doors, and windows to the colder outside air. The amount of heat that escapes depends on the outside temperature. The colder the outside temperature, the more heat escapes. If you can input heat into the building at the exact same rate that it is lost out of the building, then the building space temperatures will remain constant. The Reset Ratio is an adjustment which allows you to achieve this equilibrium between heat input and heat loss by matching the amount of heat input based on your building heat loss.

The starting point for most baseboard systems is the 1:1 (Outdoor Air Temperature: Heating Water Temperature) ratio. This means that for every degree the outdoor temperature drops, the temperature of the heating water will increase one degree. The starting point of the curves is adjustable using the Water Offset, but comes factory selected at 70°F Outdoor Temp. and 100°F Water Temp. For example with a 1: 1 ratio, if the outdoor temperature is 50°F, this means the temperature has fallen 20° from the starting point of 70°F. Therefore, the heating water temperature will be increased 20° to 120°F.

Each building has different heat loss characteristics. A very well insulated building will not lose much heat to the outside air, and may need a Reset Ratio of 2:1 (Outdoor:Water). This means the outdoor temperature would have to drop 2 degrees to increase the water temperature 1 degree. On the other hand, a poorly insulated building or a building with insufficient radiation may need a Reset Ratio of 1:2 (Outdoor:Water). This means that for each degree the outdoor temperature dropped the water temperature will increase 2 degrees. The MC Elite Series has a full range of Reset Ratios to match any buildings heat loss characteristics.

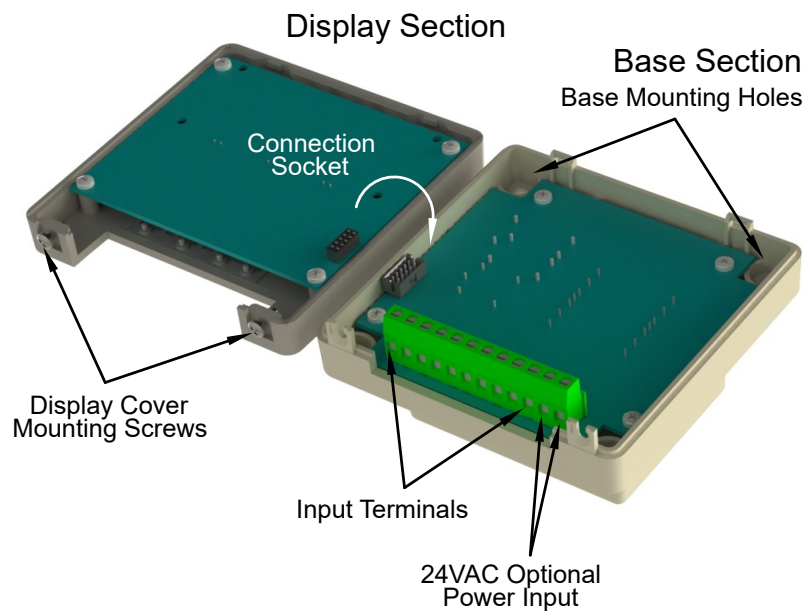
A heating curve that relies not only on Outdoor temperature but also on heat transfer units will improve heat comfort. The following are suggested starting settings for different heat transfer units based on average building insulation and heat loss:



Reset Ratio Curves

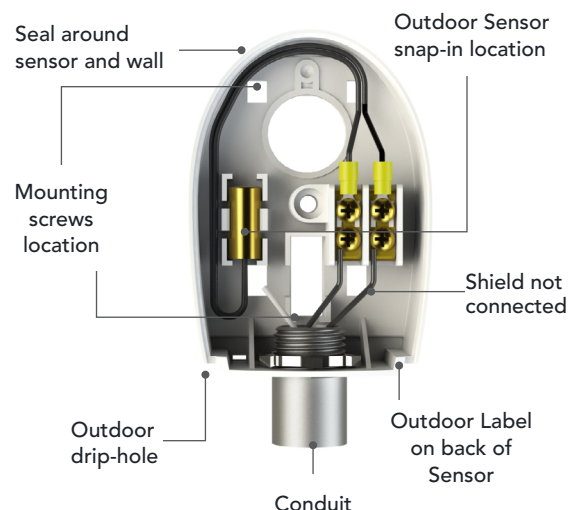
Transfer Unit	Reset Ratio	Offset	Heat Transmission
Radiators (Steel & Cast Iron)	1.00 : 1.00	0°F	Radiators & convection
Baseboard (Finned copper tube & Cast Iron)	1.00 : 1.00	0°F	Radiators & convection
Radiant (High Mass/Concrete)	4.00 : 1.00	-10°F	Radiators & convection
Radiant (Low Mass/Joists)	2.00 : 1.00	-10°F	Radiators & convection
Fan Coil Air Handlers	1.00 : 1.00	20°F	Convection

- The MC DIGI-Elite is designed to mount on a 1900 (4"x4") electrical box.
- If the MC-Elite is to be panel mounted, or if additional room is needed use the Plastic Wiring Enclosure (P/N 929135-00 with Switch) or (P/N 929137-00 without a Switch).
- Locate the MC-Elite in a location near the unit to be controlled.
- Mount the MC-Elite away from excessive heat or cold.
- Partially unscrew the Display Cover Mounting screws.
- Lift the Display Section away from the base to unplug the Connection Socket from the Base section.
- Use the (4) Base Mounting Holes to mount the Base Section on the 4x4 electrical box.
- Proceed with the power and output wiring instructions.
- When all wiring is completed mount Display Section back onto the Base Section. Tighten the Display Cover Mounting Screws.



OUTDOOR SENSOR INSTALLATION

- Only use the Heat-Timer sensor included with the unit (P/N 904220-00).
- Locate the sensor in the shade on the north side of the building. The sensor should never be in direct sunlight.
- Be sure the location is away from doors, windows, exhaust fans, vents, or other possible heat sources.
- The sensor should be mounted approximately 10' feet above ground level.
- Adhere the Outdoor Label provided to the back of the sensor base.
- Use the Enclosure Base bottom knockout for the conduit. Use the locknut to hold the conduit and enclosure base together. Screw the cover to the base.
- If screws are used to affix the enclosure to the wall, make sure to seal around the sensor and wall except from the bottom.
- The sensor wires can be extended up to 500' using shielded 2-conductor cable (#18/2). Do not ground the shield at the sensor but at the control using the terminal marked with an "O".
- Do not run sensor wires in conduit with line voltage wiring.



SYSTEM SENSOR

In a heating application the MC controller must be connected to a system temperature or system pressure sensor. The sensor connected must match the Sensor Type selected in the Startup menu. Sensors must be ordered separately.

SYSTEM PRESSURE/VACUUM SENSOR INSTALLATION

Locating the system pressure/vacuum sensor

- Install the System Pressure/Vacuum transducer (need to order separately) approximately 10' feet past the last boiler on the common supply header but before any takeoffs.
- When installing the pressure transducer, use a threaded Brass Isolation Tube (Brass Pigtail P/N 135020-00) to attach to the steam header.
- The Red and Black wires can be extended up to 500' using shielded 2-conductor cable. The ground, shield, and reference tube on the transducer are not used.

✓ NOTICE

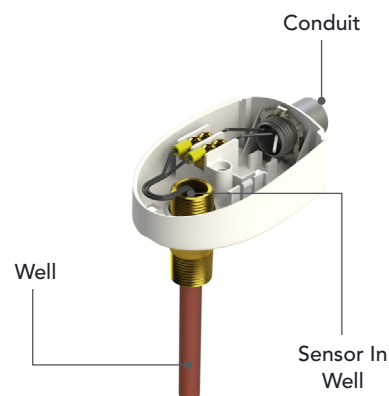
If the System Sensor cannot sense the correct system pressure being supplied to the building, the MC Digi Elite will not provide comfortable heat levels. Be sure that it is located on the main supply header before any takeoffs.

SYSTEM PRESSURE SENSORS (ORDERED SEPARATELY)

- Pressure Sensor 0-15 psig P/N 904316-00
- Pressure Sensor 0-30 psig P/N 904310-00
- Pressure Sensor 0-100 psig P/N 904312-00
- Pressure Sensor 0-200 psig P/N 904311-00
- Pressure Sensor 0-300 psig P/N 904313-00
- Vacuum Sensor 0-30" Hg P/N 904317-00

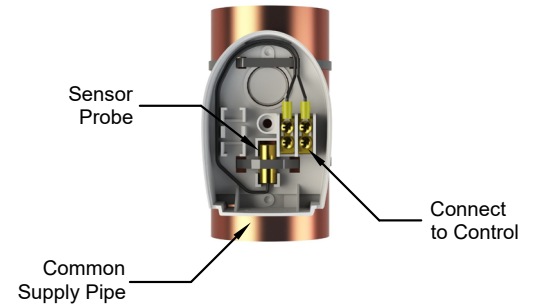
HEATING SYSTEM SENSOR (HSS) INSTALLATION

- Only use the Heat-Timer sensor included with the unit (P/N 904220-00).
- The sensor wires can be extended up to 500' using a shielded 2-conductor cable (Belden #8760 or equivalent (#18/2)). Do not ground the shield at the sensor but at the panel using one of the terminals marked with an "O".
- Do not run sensor wires in conduit with line voltage wiring.
- Install a 3/8" ID 1/2" NPT immersion well (P/N 904011-00 or equivalent).
- Insert the sensor in a well approximately 10' feet past the boiler on the supply header but before any major takeoffs.
- The sensor must be located where it sees the output of the boiler.
- The sensor can also be installed on the return to the boiler after all major returns and before the boiler. However, when setting the reset ratio and the offset, the user must consider the temperature drop across the building loop.



STRAP-ON HEATING SYSTEM SENSOR INSTALLATION

- Strap the sensor to the pipe. Make sure that the sensors concave surface matches the pipes concave surface.
- Strap pipe insulation around the sensor and pipe.
- Use plastic tie-wraps to hold the insulation and sensor to the pipe.



✓ NOTICE

If the HSS can not sense the correct heating system water temperature being supplied to the building, the boiler will not be able to provide comfortable heat levels. Be sure the HSS is located on a main supply pipe which can not easily be isolated from the system.

POWER WIRING

The MC Elite can be wired to either 120VAC using the two Black wires or 24VAC using the right most two terminals on the terminal block on bottom of the control. Heat-Timer recommends the installation of a Surge Suppressor and a Power Switch before the Power Line connection for safety and ease of service.

WARNING

The MC can accept only one source of power: 120vAC or 24vAC. If more than one power source is applied, the unit may be damaged.

WARNING

ELECTRICAL SHOCK HAZARD! Disconnect electrical power to the device before servicing or making any electrical connections. Failure to do so may result in severe personal injury or death. Use a separate circuit breaker for the control. Do not share the control power with other major equipment, pumps, or motors. Heat-Timer recommends the installation of a surge suppressor and a power switch before the power line connection.

Follow all local and state electrical codes when installing this unit. All wiring must meet or exceed local, state, or federal codes and requirements.

120VAC

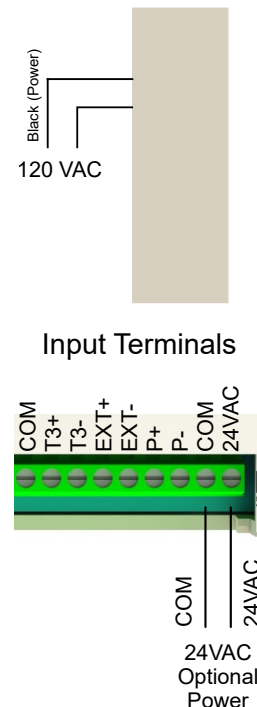
- Connect the 120VAC power to the two Black wires extending from the back of the MC Elite. Remember to use the power line from a different source than the equipment being controlled.

24VAC

- Use a dedicated transformer with at least a 5 VA output.
- Bring 24VAC to the two right most screws on the front of the MC Elite marked 24VAC and COM

WARNING

Use a separate circuit breaker for the control. Do not share the control power with other major equipment, pumps and motors.



INPUT WIRING

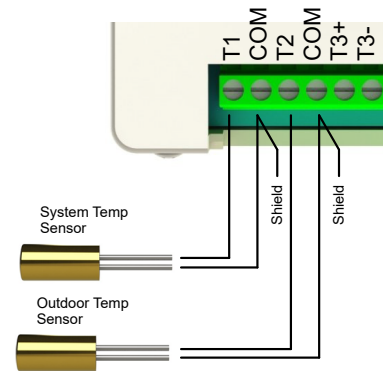
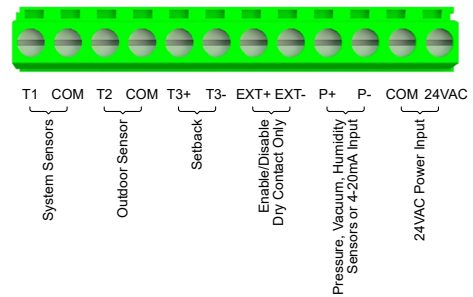
The MC Elite control will measure the sensor input based upon the options selected from the Sensor Type in Startup menu. All other sensor terminal inputs will be ignored.

SYSTEM TEMPERATURE SENSOR

Terminals (T1, COM)

- The sensor wires can be extended up to 500' using a shielded 2-conductor 18 AWG cable (Belden #8760 or equivalent).
- Cut the shield and do not connect it at the sensor end. Only connect it at the control end using any of the COM input terminals.
- The sensor wires can be extended up to 500' using a shielded 2-conductor 18 AWG cable (Belden #8760 or equivalent).
- Cut the shield and do not connect it at the sensor end. Only connect it at the control end using any of the COM input terminals.

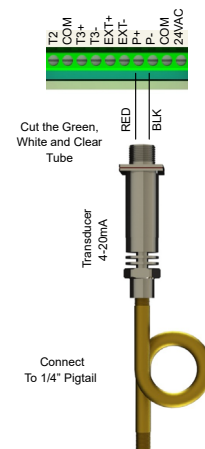
Input Terminals



PRESSURE OR VACUUM SYSTEM TRANSDUCER

Terminals (P+, P-)

- Connect the sensor's Red wire to the MC Elite terminal marked P+.
- Connect the sensor's Black wire to the MC Elite terminal marked P-.
- The sensor wires can be extended up to 500' by splicing with 18 gauge twisted pair cable.



WIRING THE SETBACK/BOOST

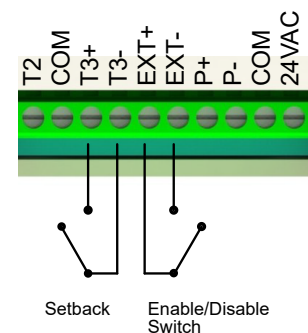
Terminals (T3+, T3-)

- The Setback feature can be used to provide the MC Elite with a lower Set Point when less output is required during night or unoccupied periods.
- The Setback is activated by closing/shorting the T3+ and T3- terminals using an external control, i.e., timer, control, or switch.
- The MC Elite accepts dry-contact input signals only.

WIRING THE ENABLE/DISABLE

Terminals (EXT+, EXT-)

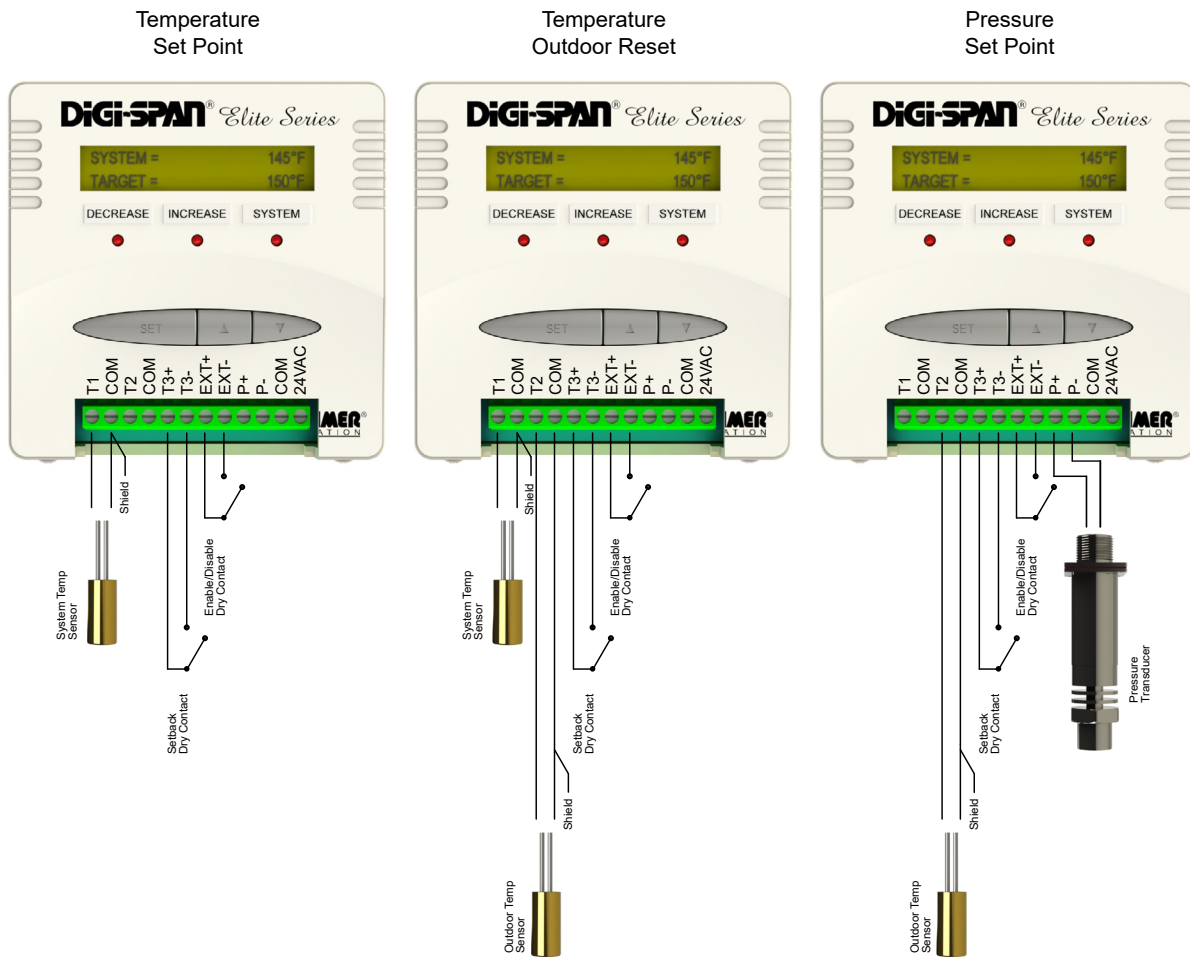
- The EXT+ and EXT- terminals are used to enable the system by connecting it to a thermostat, switch, or an external control.
- The controls requires these terminals to be shorted to operate the outputs. If no thermostat or control is connected to the EXT+ and EXT- terminals, leave the jumper supplied as a dry-contact to the terminals.



NOTICE

The EXT± input terminals must be shorted for the MC Elite to operate. DO NOT remove the factory installed EXT jumper unless it is replaced with an Enable Signal.

INPUT WIRING MODES



OUTPUT WIRING

OUTPUT WIRE COLORS TABLE

Control	Modulating Signal	Red	White	Blue	Yellow (System LED)
MCA	4-20mA	Common	TIME	4-20mA Signal	
	0-10V, 0-5V, 2-10V, 1-5V	Common			1
MCP	0-135Ω	R	W	B	Boiler/Pump
MCF	Floating (3-Point)	Valve Power Common	Open Signal	Close Signal	Boiler/Pump

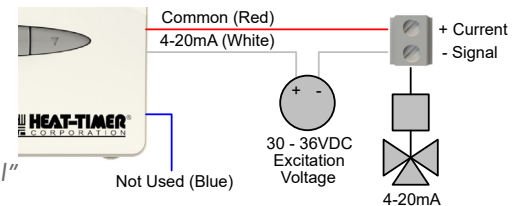
NOTICE

Output relays do not source any power. A separate power source must be used. Use the output relay to enable or disable the equipment.

WIRING A 4 - 20mA ACTUATOR OUTPUT

(MCA Only)

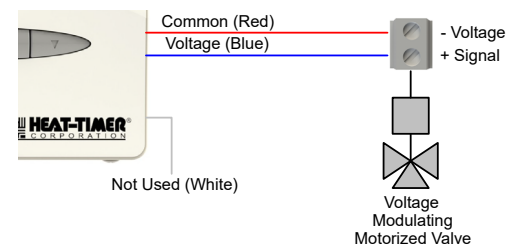
- An external voltage source is required for the 4-20mA signal. A separate filtered DC power supply providing between 30 to 36 VDC is needed.
- Set the Mod. Signal in the Startup menu to 4-20mA. See "Modulation Signal" on page 18.
- Connect the MCA Elite Red wire to the actuator (+) 4-20mA terminal.
- Connect the MCA Elite White wire to the (+) on the DC power supply.
- Connect the (-) on the DC power supply to the actuator (-) input.
- The maximum series resistance for the MCA is 1300Ω at 30VDC.
- DO NOT connect the Blue wire.



WIRING A VOLTAGE ACTUATOR OUTPUT

(MCA Only)

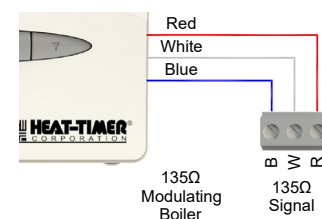
- Set the Mod. Signal in the Startup menu to one of the voltage options. See "Modulation Signal" on page 18.
- Connect the MCA Elite Blue wire to the actuator (+) voltage signal.
- Connect the MCA Elite Red wire to the actuator (-) voltage signal.
- The maximum current the MCA Elite can output is 5 mA.
- DO NOT connect the White wire.



WIRING THE 135Ω VALVE/BOILER OUTPUT

(MCP Only)

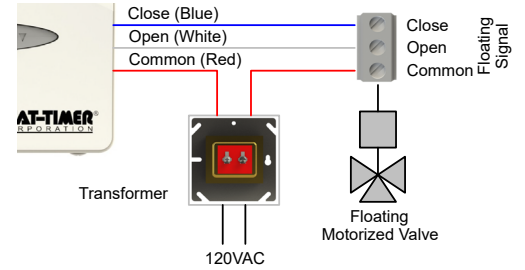
- The Red MCP Elite wire is Common and should be connected to the R terminal of the actuator.
- Connect the Blue (Close) and White (Open) MCP Elite wires consecutively to the actuator's B and W terminals.



WIRING THE FLOATING OUTPUT

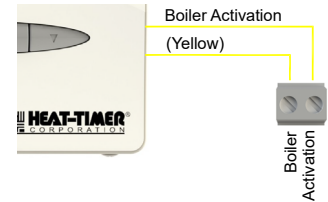
(MCF Only)

- The MCF Elite has 2 modulating output relays, each is rated at 1A inductive load or 1/8 HP.
- Connect the MCF Red wire to the power source (transformer).
- Connect the other the wire of the transformer to the actuator Common terminal.
- Connect the MCF White wire to the actuator (Open) terminal.
- Connect the MCF Blue wire to the actuator (Close) terminal.



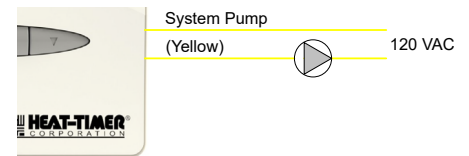
WIRING THE SYSTEM OUTPUT TO A BOILER

- If the boiler requires an activation signal, wire the two Yellow wires to the boiler circuit TT terminals.
- The MC Elite does not source any output power to the boiler.
- Select H/C unit from the Relay Output mode on the Startup menu. See "Relay Output" on page 18.



WIRING THE SYSTEM OUTPUT TO A PUMP

- The MC Elite will control the system pump up to 1 A (1/8 HP).
- Wire the two Yellow wires to the System Pump circuit.
- The MC Elite does not source any output power to the pump. The relay makes when energized to switch the power to the pump.
- Select Pump from the Relay Output mode on the Startup menu. See "Relay Output" on page 18.



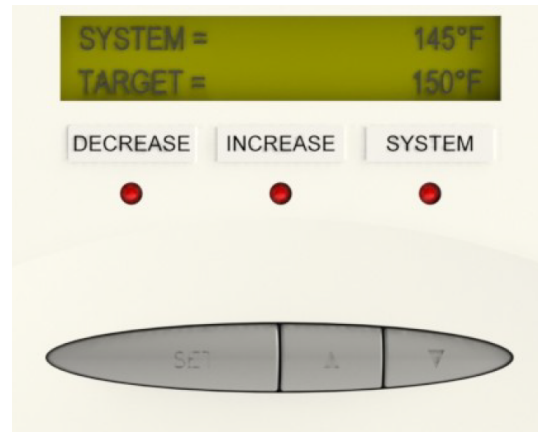
BUTTON AND NAVIGATING MENUS

The MC Elite has three buttons and their function is as follows:

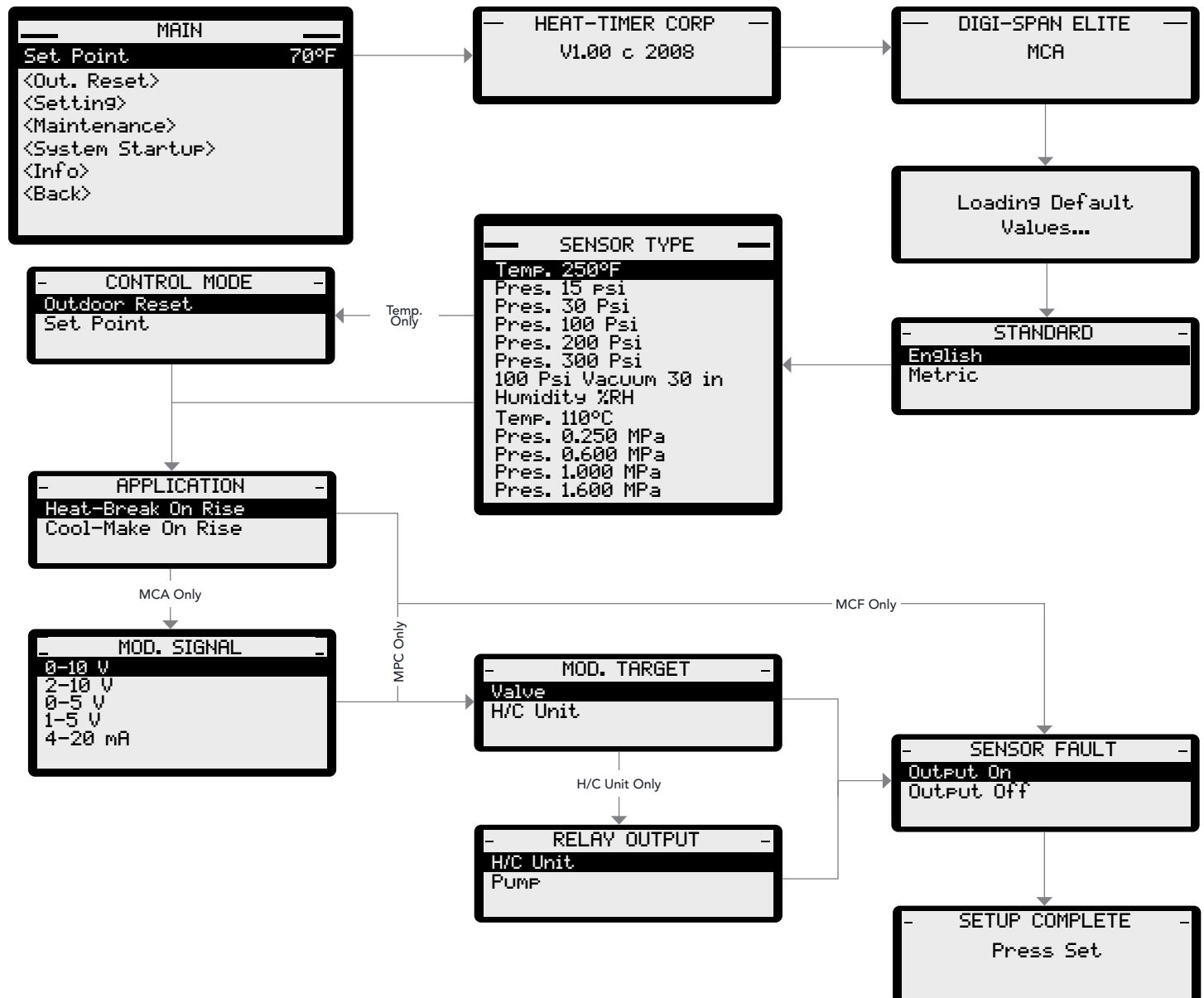
- The SET button function varies. When in the Default Screen, pressing the SET Button enters the MENU. When in the menus and settings, the SET Button accepts the selected entry or setting value.
- When in the menus, the ▲ and ▼ buttons will scroll through the menu options. Also, they can be used to change the setting of a specific function. i.e., change the Set Point, outdoor Cutoff, or System Trim.
- At the end of every menu there is a <Back> option that allows the user to go back one menu level. If the SET Button was held down for three seconds on the <Back> option, the display will go back to the default screen.

OUTPUT LED LIGHTS

- Each of the MC Elite has a S.P.S.T. (N.O.) System output relay to be used to activate a boiler, a cooling unit, or a pump. The relay is rated at 1 A (1/8 HP). The relay operation is represented by the right most LED light.
- The middle LED (INCREASE) will always indicate that the modulating signal is increasing (opening).
- The left most LED (DECREASE) will always represent that the modulation signal is decreasing (closing).



STARTUP MENU



08 SYSTEM STARTUP SETTINGS

- When the control is initiated for the first time or after a reset the control to factory defaults, it will start its operation with the STARTUP Menu. Later, the STARTUP menu can be accessed as an option from the main menu.
- An option must be accepted in each screen to move to the next screen until all STARTUP settings are completed.
- The SYSTEM STARTUP menu sets the main operating modes that apply to the application. These settings must be set by the installer.

STANDARD

English, Metric

Set: /MENU/<System Startup>/Standard

Default: English



- The MC Elite is capable of displaying all sensor and setting values in one of the two Standards.
- If English is selected, sensor types in °F (Fahrenheit), PSI (Pounds/Square inch), and Hg (Inches of Mercury for Vacuum) will be available.
- If Metric is selected, sensor types in °C (Celsius), MPa (Million Pascal), and mm (Millimeter of Mercury for Vacuum) will be available.
- %RH (Relative Humidity) will be available in both options..

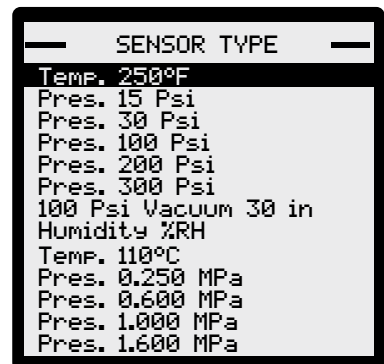
SENSOR TYPE

Temp.230°F/110°C, Pressure: 15PSI/0.13MPa 30PSI/0.25MPa, 100PSI/0.60MPa, 200psi/1 0Mpa, 300psi/1 6Mpa, vac 30hg/760mm, and humidity %rh

Default: Temp.230°F/110°C

Set: /<System Startup>/Standard/Sensor Type

- The Sensor Type available options depend on the Standard option selected from the previous menu.
- This option determines the type of Sensor that can be used. The MC Elite will measure the input terminals that are associated with the Sensor Type selected. See "Sensor Type Table" on page 26.



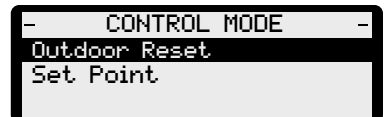
CONTROL MODE

(Only When Sensor Type=Temp.)

Outdoor Reset, Set Point

Set: /<System Startup>/Standard/Sensor Type/Control Mode

Default: Outdoor reset



- The new MC Elite has two heating logics. Outdoor Reset; varies the system temperature set point/target based on outdoor temperature. This selection adds several menu options to adjust and fine-tune the reset ratio curves: Reset Ratio, Offset, Min Water temp, Max Water temp, and outdoor Cutoff. In addition, a customized reset ratio curve will be available for specialized applications.
- Set Point; gives the installer the flexibility of selecting a fixed set point. In this case, the Outdoor Cutoff option will be available only if an outdoor sensor was installed.

APPLICATION

(Not Available with Outdoor Reset)

Heat-Break On Rise, Cool-Make On Rise

Set: /<System Startup>/Standard/Sensor Type/Control Mode/Application

Default: heat-BreakOnrise



- In Heat-Break-On-Rise mode, the control will start its System relay and modulate the output when the sensor value is below the Target.
- In Cool-Make-On-Rise mode, the control will start its System relay and modulate the output when the sensor value is above the Target.

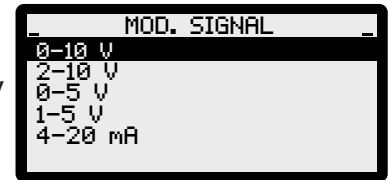
MODULATION SIGNAL

(MCA Only)

10v, 2-10v, 0-5v, 1-5v, and 4-20mA

Default: 10-v

Set: /<System Startup>/Standard/Sensor Type/Control Mode/.../Mod.Signal



- The MCA Elite can connect to a variety of modulating outputs that range from voltages to current.
- Select the Modulation Signal based on the equipment the MCA Elite is controlling.

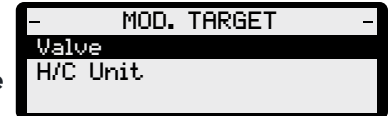
MODULATION TARGET

(MCA and MCP Only)

Valve, H/C Unit

Default: Valve

Set: /<System Startup>/Standard/Sensor Type/Control Mode/.../Mod. Target



- The MCA and MCP Elite controls can modulate either a valve or a Heating/Cooling unit. When Heating/Cooling unit is selected, a Relay Output option will be available to select the output relay functionality (See next setting). In addition, a Purge delay option will be added to the Settings menu. See "Purge" on page 25.
- However, when Valve is selected, the output relay will be assumed to operate a pump.

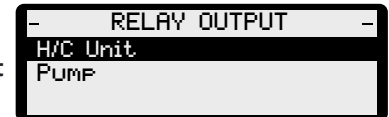
RELAY OUTPUT

(Available Only when Modulation Target=H/C Unit)

H/C Unit, Pump

Default: H/C Unit

Set: /<System Startup>/Standard/Sensor Type/Control Mode/.../Relay Output



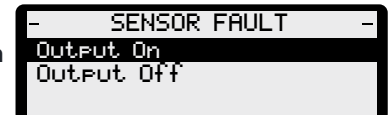
- If the Modulation Target was set to H/C Unit, the Relay Output selection will determine the type of equipment being controlled by the System output (Yellow wires).
- H/C Unit option is designed to control a boiler or a chiller. In this case, the relay acts as an activation signal whenever there is a need for the modulating unit to start. A Purge option will be available to start the relay before any modulation output. See "Purge" on page 25. In addition, the Run-On setting can act as a soft-off delay. See "Run-On" on page 25.
- If the Relay Output was set to Pump, it will be energized whenever the outdoor temperature is below the outdoor Cutoff in Heating or above the Outdoor cutoff in Cooling.

SENSOR FAULT

Output On, Output Off

Default: Output On

Set: /<System Startup>/Standard/Sensor Type/Control Mode/.../Sensor Fault



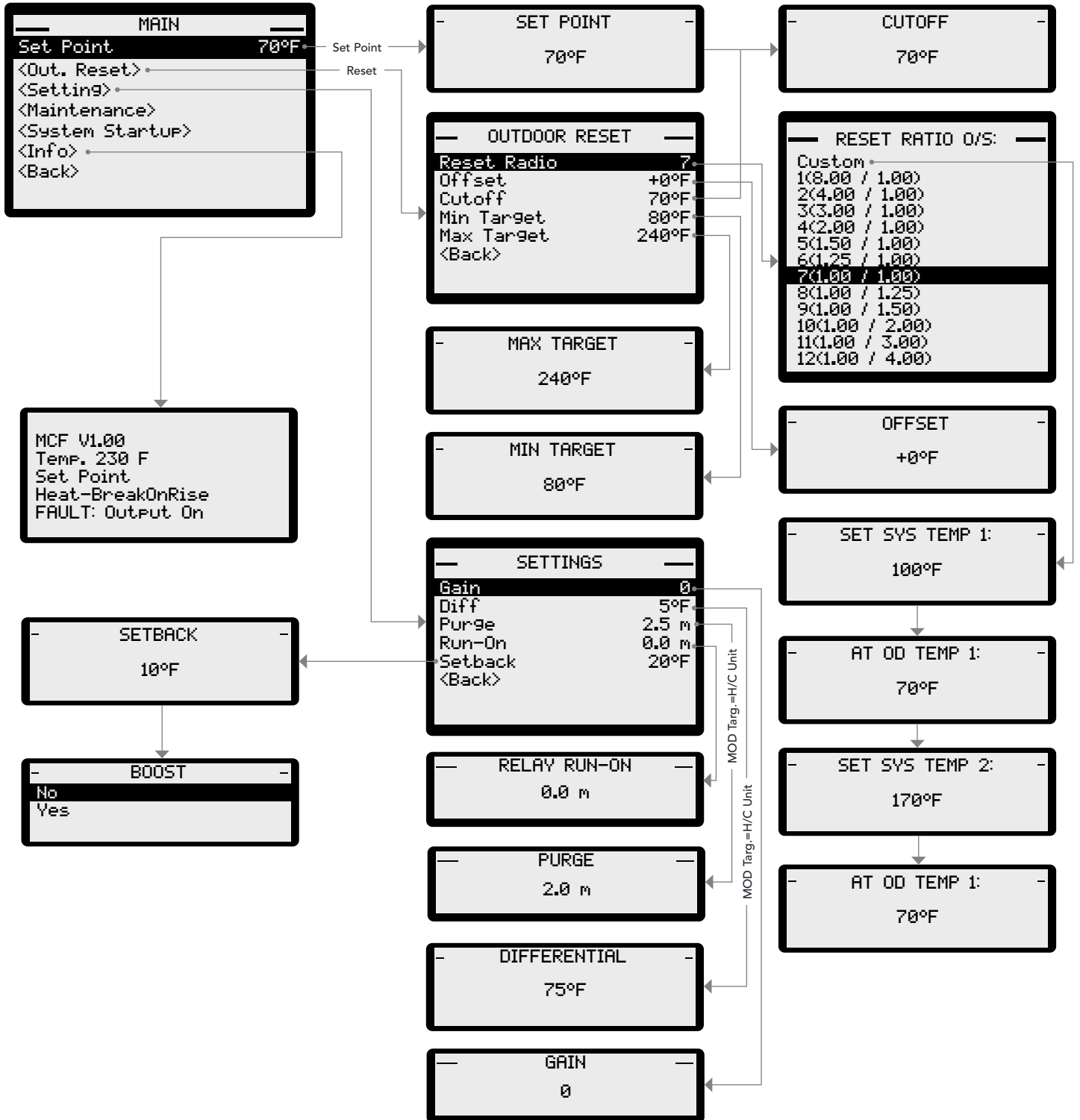
- The Sensor Fault setting determines the operating status of the modulation output and the System output relay when a sensor reads Short or Open. On a sensor fault, the Set Point will indicate FAULT TGT=ON or OFF to indicate the condition of the output and the faulty sensor will read Short or Open to indicate the condition of the sensor.

Reset Mode

- When Output-On is selected, the MC Elite will modulate its output to 100% (MCA and MCP Elite) or energize the Open relay (MCF Elite) when the System sensor reads Short or Open and the Outdoor is below the Outdoor Cutoff in heating or above the Outdoor Cutoff in Cooling. When the Outdoor sensor reads Short or Open, the MC Elite will change the Target to the Maximum Target.
- When Output-Off is selected, the MC Elite will modulate the output to 0% (MCA and MCP Elite) or energize the Close relay (MCF Elite) when the System sensor reads Short or Open. However, when the Outdoor sensor reads Short or Open, the MC Elite will change the Target to the Minimum Target.

Set Point Mode.

- When Output-On is selected, the MC Elite will modulate its output to 100% (MCA and MCP Elite) or energize the Open relay (MCF Elite) when the System sensor reads Short or Open.
- When Output-Off is selected, the MC Elite will modulate the output to 0% (MCA and MCP Elite) or energize the Close relay (MCF Elite) when the System sensor reads Short or Open.
- The Outdoor Sensor Short or Open status will not affect the control operation in Set Point Mode.



The OPERATING menus are for adjusting and fine-tuning the system for enhanced operation and more fuel savings. Different STARTUP Menu options will offer different OPERATING menus. To enter the OPERATING menu, press the SET button.

SET POINT

(Available when Control Mode = Set Point)

See Sensor Type Table on page 26

Set: /Set Point



- The Set Point option provides the user with an adjustable fixed Target to control the system.
- If an Outdoor Sensor was connected, the Outdoor Cutoff will show as the next menu.
- In temperature heating systems, the Set Point should be set above the boiler manufacturer minimum water temperature requirements to protect the boilers and compensate for the system piping temperature loss.

NOTICE

The Set Point must be set below the boiler Hi-Limit setting for better system control.

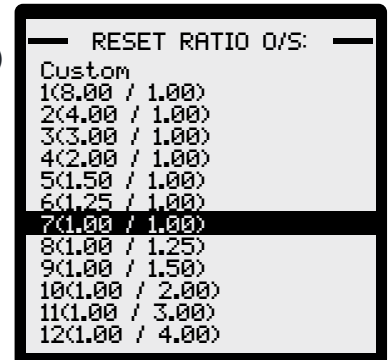
RESET RATIO

(Available when Control Mode = Outdoor Reset)

From 1(8.00°/1.00°) to 12(1.00°/4.00°), Custom

Default: 7(1.00°/1.00°)

Set: /<Out. Reset>/Reset Ratio



- The Reset Ratio changes the Target temperature based on the outdoor temperature. The colder it gets outside, the hotter the Target will be. The Ratio is measured as; Outdoor (O): System Water (S). See "Reset Ratio Concept" on page 6.
- With a 1.00:4.00 ratio, the System water temperature will increase rapidly as the outside temperature falls hitting the maximum default water temperature of 240°F at 35°F outdoor temperature. With a 4.00:1.00 ratio, the System water temperature will increase slowly as the outside temperature falls.
- The Reset Ratio controls the amount of heat entering the heating system based on the outdoor temperature. A higher numbered Reset Ratio will result in a higher Calculated water temperature. If the application has radiant heat, a lower numbered Reset Ratio curve should be selected. See "Radiation Type Settings" on page 6.
- If required: Adjust the Reset Ratio in cold weather. If the ambient building temperatures is too cold in cold weather, move the ratio to a higher selection. That is, if 1.00:1.00 was initially selected, change the selection to 1.00:1.25. If the building temperature is too warm in cold weather, move the ratio to a lower selection. That is, if 1.00:1.00 was initially selected, change the selection to 1.25:1.00.
- The Custom option gives the user the capability of creating a specialized Reset Ratio curve. The Offset, Minimum Target and Maximum Target settings will still apply to the customized curve.

CUSTOM RESET RATIO

SYS Temp 1, 2 (70°F/21°C) to (210°F/99°C)

OD Temp 1, 2 (-10°F/-23°C) to (100°F/38°C)

Default: 1(100°F/38°C)

Default: 2(170°F/77°C)

Default: 1(70°F/21°C)

Default: 2(0°F/-18°C)

Set: /<Out. Reset>/Reset Ratio/Custom

SET SYS TEMP 1:

100°F

AT OD TEMP 1:

70°F

- Use the Custom option when the standard reset ratios do not provide the perfect building heat-loss equilibrium.
- The Custom Reset Ratio requires the assignment of two points on the reset ratio diagram and use the line connecting the two points as the customized reset ratio curve. Each of the two points will need a specific System and Outdoor Temperature to identify it on the diagram. To Specify the first point, set Sys Temp 1 and OD Temp 1
 - Then, set Sys Temp 2 and OD Temp 2 to set the second point on the curve.
- The chart below shows a customized curve 6(O):5(S). If the outdoor temperature reaches 30°F, the system target will be 145°F.
- Remember that the Min Target and Max Target apply to all reset ratios including the custom reset ratio ones.

OFFSET

(Available when Startup Control Mode = Outdoor Reset)

From -40°F/-22°C to +40°F/+22°C

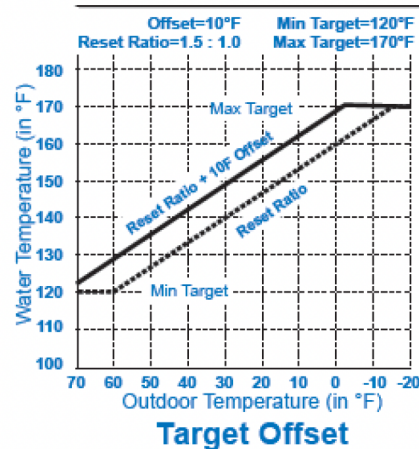
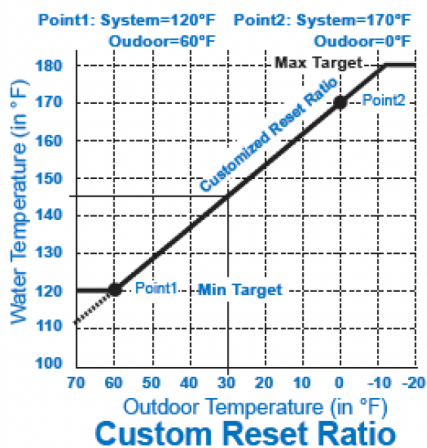
Set: /<Out. Reset>/Offset

Default: 0°F/0°C

OFFSET

+0°F

- The Offset setting adds or subtracts a fixed number of degree to the Target. For example, if the Set Point temperature was 130°F and the Offset was changed from 0° to +10°, then the Set Point temperature would increase to 140°F.
- If required: Adjust the Water Offset in mild weather.
- If the ambient building temperature is too warm in the mild weather, decrease the Offset. If the ambient building temperature is too cold in the mild weather, increase the Offset. The rule of thumb for baseboard radiation is to change the Offset 4°F for every 1°F you wish to change the building temperature. In radiant heat applications, change the Offset 1°F or 2°F for every 1°F you wish to change the building temperature. See "Radiation Type Settings" on page 6.



OUTDOOR CUTOFF

Off, 30°F/0°C to 75°F/25°C, On

Set: /Set Point/Cutoff

Set: /<Out. Reset>/Cutoff

Default: 70°F/21°C
in SET POINT mode
in RESET mode



- The Outdoor and Cutoff temperatures can be viewed from the default screen by clicking the ▲ or ▼ buttons.
- In heating, when the outdoor temperature falls to the adjustable Outdoor Cutoff temperature, the MC Elite will control the System relay to provide heat. However, in cooling, when the outdoor temperature rises to the adjustable Outdoor Cutoff temperature, the MC Elite will control the System relay to provide cooling.
- The Outdoor Cutoff setting has a built-in 2°F that is add to the Outdoor Cutoff when in heating mode. However, it is subtracted from the Outdoor Cutoff when in cooling mode.
- For example; In heating, when the outdoor temperature rises to the Outdoor Cutoff plus a 2°F differential, the MCA/MCP Elite will modulate the output to 0%. The MCF Elite will energize the Close relay for six minutes to guarantee valve closure. The System relay will remain active for the Run-On delay then de-energize.
- In addition to the temperature range of the Outdoor Cutoff setting, it can be set to ON or OFF. If ON is selected, the System relay will run regardless of the Outdoor temperature and the boilers will be active to hold the calculated water temperature. If OFF is selected, the System and Boiler relays will always be off.

MINIMUM TARGET

(Available when Control Mode = Outdoor Reset)

From 70°F/21°C to 170°F/77°C

Set: /Set Point/<Out. Reset>/Min. Tgt

Default: 80°F/27°C



- The Minimum Target Temperature must be set to the boiler manufacturer's specification. The MC Elite will calculate the Target based on the Outdoor temperature, the Reset Ratio, and the Offset value. The MC Elite will control the Boiler/Valve to hold the higher of either the calculated temperature or the Minimum Target temperature.
- The Minimum Target temperature must be at least 20°F lower than the Maximum Target temperature.

MAXIMUM TARGET

(Available when Control Mode = Outdoor Reset)

From 90°F/32°C to 240°F/116°C

Set: /Set Point/<Out. Reset>/Max. Tgt

Default: 240°F/116°C



- This is the highest Target temperature the MC Elite will circulate through the system.
- When used in a radiation system, it should be set according to the tubing or floor manufacturer's specification.
- The Maximum Target temperature must be at least 20°F higher than the Minimum Target temperature.

SETBACK

See Sensor Type Table on page 25

Set: /Settings>/Setback.

SETBACK
10°F

- The Setback feature can be used to provide the MC Elite with a lower Target in heating or higher Target in cooling when less output is required during nights or weekends.
- The Setback Target will appear on the main display indicating SBC TGT=140oF.
- For example; in heating, when the calculated temperature is 160°F and the Setback is set to 20°F, a setback call will change the Target to (160°F - 20°F) 140°F.
- If Boost was enabled, it will run after the Setback ends. See "Boost" on page 24.
- The Setback is activated by closing/shorting the T3+ and T3- terminals using an external timer, control, or a switch. See "Wiring the Setback/Boost" on page 11.

BOOST

No, Yes

Set: /Settings>/Setback/Boost.

Default: No

BOOST
No
Yes

- The morning Boost is designed to return the building to comfortable ambient temperatures after the Setback period. The MC Elite will accomplish this by running elevated set point in heating (will add Setback setting to the calculated Target) or reduced set point in cooling (will subtract Setback setting from the calculated Target) for 30 minutes after the opening of the setback terminals T3± terminals. That is, in heating, if the normal set point was 145°F and the Setback setting was 20°F, the boost will raise the system calculated temperature to 165°F for 30 minutes after the setback.
- The Boost Set Point will appear on the main display indicating BST TGT=165F .

GAIN

From -10 to +10

Set: /<Settings>/Gain

Default: 0

GAIN
0

- The Gain adjusts the aggressiveness of the MC Elite PID logic. It does that by controlling the amount of modulation required in response to the changes of the system temperature/pressure when it deviates from the Target.
- A Gain of 0 is a good starting point for all systems.
- If during normal load conditions, the system value tends to oscillate, decrease the Gain by two numbers (for example, from 0 to -2). Wait for at least 15 minutes before evaluating the effect on the system.
- If, during normal load conditions the system value tends to remain consistently below the Target in heating (or consistently above the Target in cooling), increase the Gain by two numbers (for example, from 0 to 2). Wait for at least 15 minutes before evaluating the effect on the system.

DIFFERENTIAL

(Available when Mod. Target = H/C Unit on MCA/MCP)

See Sensor Type Table on page 26

Set: /<Settings>/Diff.

DIFFERENTIAL
75°F

- The Differential is a band around the Target where the MCA/MCP Elite will make small or no changes to the heating/cooling unit.
- A smaller Differential setting normally result in tighter control of the set point but will tend to oscillate the system. Larger Differential values normally provide a more stable system performance, but the system may deviate further from the set point.

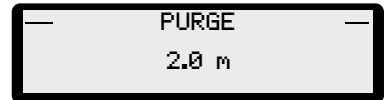
PURGE

(Available when Mod. Target = H/C Unit on MCA/MCP)

0 0 to 10 0 minutes

Set: /<Settings>/Purge

Default: 2 minutes



- Most units must go through a purge cycle before they are brought on line.
- When the MCA/MCP Elite activates a unit, it does not start to calculate its output until the Purge delay is over. This allows the unit to fully come on and begin producing output.
- The Purge delay helps prevent short cycling of newly activated units. Once the unit is activated, it MUST run through the entire Purge period before starting to modulate. The message Purge:30 sec will display the Purge countdown.
- The Purge setting MUST be set to the time required by the unit's manufacturer specification.

RUN-ON

From 0 min to 60 min

Set: /Settings>/Setback.

Default: 2 minutes

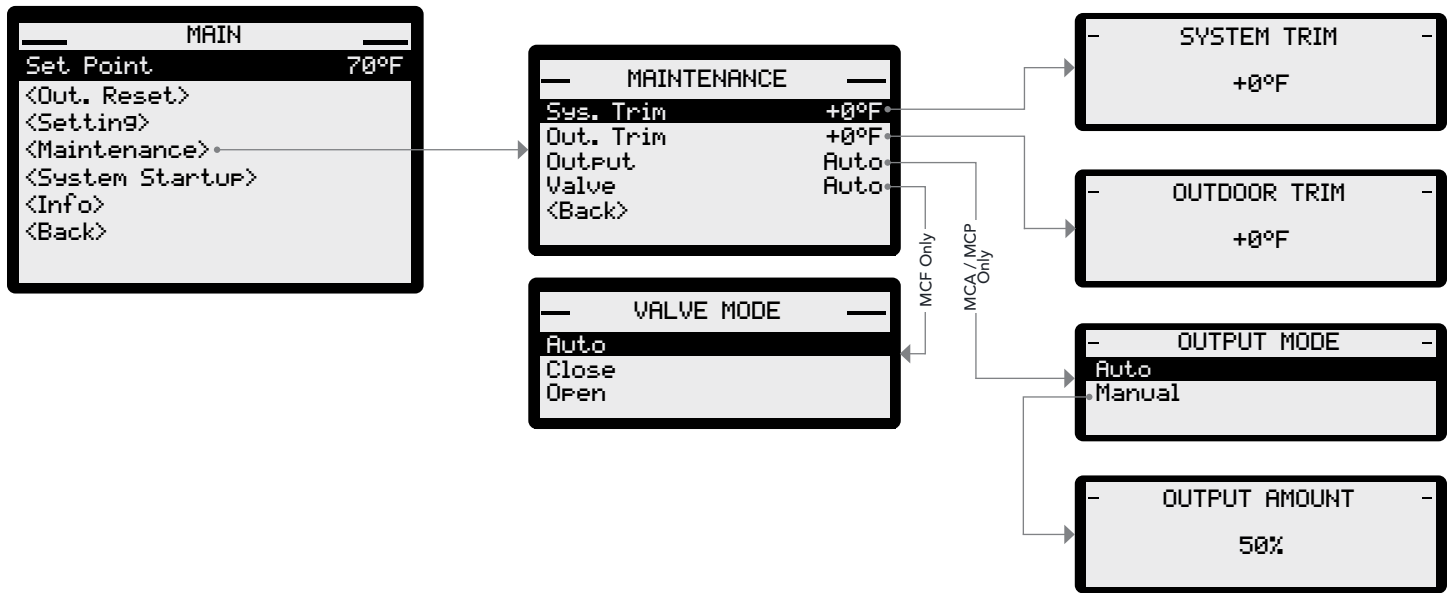


- If the Relay Output was set to Pump, the System relay will energize whenever the outdoor temperature is below the outdoor Cutoff in heating or above it in cooling. See *"Relay Output"* on page 19. When the outdoor temperature increases 2°F above the outdoor Cutoff or when the EXT+ and EXT- terminal inputs are opened, the output relay will stay on for the Run-On period. This allows the system to dissipate the residual energy within its units back into the system.
- The Run-On time should be set based on the size and type of the equipment controlled.

SENSOR TYPE TABLE

STANDARD	SENSOR TYPE	SET POINT		DIFERENTIAL		SETBACK	
		RANGE	DEFAULT	RANGE	DEFAULT	RANGE	DEFAULT
Sys Temp English	Temp. 250 °F	-10°F to 230°F	70 °F	1°F to 40 °F	5 °F	0°F to 10 °F	10 °F
Outdoor English	Temp. 250 °F	Read Only					
Sys Press. English	Pressure 15 PSI	0.0 to 15.0 PSI	5.0 PSI	0.2 to 5.0 PSI	1.0 PSI	0.0 to 5.0 PSI	1.5 PSI
Sys Press. English	Pressure 30 PSI	0.0 to 30.0 PSI	10.0 PSI	0.5 to 10.0 PSI	2.0 PSI	0.0 to 10.0 PSI	3.0 PSI
Sys Press. English	Pressure 100 PSI	0 to 100 PSI	30 PSI	1 to 30 PSI	7 PSI	0 to 30 PSI	10 PSI
Sys Press. English	Pressure 200 PSI	0 to 200 PSI	60 PSI	1 to 60 PSI	10 PSI	0 to 60 PSI	20 PSI
Sys Press. English	Pressure 300 PSI	0 to 300 PSI	80 PSI	1 to 90 PSI	20 PSI	0 to 90 PSI	30 PSI
Sys Press. English	Vacuum 30 Hg	0.0 to 30.0 Hg	10.0 Hg	0.5 to 10.0 Hg	2 Hg	0.0 to 1.0 Hg	3.0 Hg
PSys Temp. Metric	Temp. 120 °F	23°C to 110°C	21°C			0°C to 44°C	6°C
Outdoor Metric	Temp. 120 °F	Read Only					
Sys Press. Metric	Pressure 0.130MPa	0.0 to 0.13 MPa	0.5MPa	0.001 to 0.100 MPa	0.02 MP	0.0 to 0.1 MPa	0.025 MPa
Sys Press. Metric	Pressure 0.250 MPa	0.0 to 0.25 MPa	0.10 MPa	0.001 to 0.100 MPa	0.02 MP	0.0 to 0.1 MPa	0.025 MPa
Sys Press. Metric	Pressure 0.600 MPa	0.0 to 0.6 MPa	0.2 MPa	0.002 to 0.200 MPa	0.03 MP	0.0 to 0.20 MPa	0.06 MPa
Sys Press. Metric	Pressure 1.000 MPa	0.0 to 1 MPa	0.3 MPa	0.005 to 0.300 MPa	0.05 MP	0.0 to 0.30 MPa	0.10 MPa
Sys Press. Metric	Pressure 1.600 MPa	0.0 to 1.6 MPa	0.5 MPa	0.005 to 0.500 MPa	0.10 MP	0.0 to 0.50 MPa	0.16 MPa
Sys Press. Metric	Vacuum 760 mm	0.0 to 760 mm	250 mm	10 to 250 mm	50 mm	0 to 250 mm	80 mm
Humidity	Humidity	0 to 100% RH	60% RH	1 to 30% RH	7% RH	0 to 30% RH	10% RH

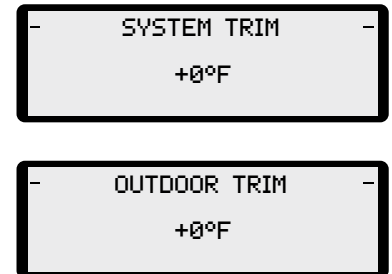
MAINTENANCE MENUS



SYSTEM AND OUTDOOR TRIM

Set: /<Maintenance>/Sys. Trm or Out. Trim

- The Heat-Timer system sensors are very accurate, and normally require no calibration. However, sometimes it may be desirable to make small adjustments to the displayed value.
- Do not use the Trim setting to make the Outdoor sensor match the one reported on the radio or TV. The outdoor temperature can vary widely over a broadcast range.



METRIC	SENSOR TYPE	TRIM RANGE	METRIC	SENSOR TYPE	TRIM RANGE	DEFAULT
Sys Temp English	Temp. 250 °F	-20°F to +20°F	Sys Temp. Metric	Temp. 120 °F	-11°C to +110°C	+0°F
Outdoor English	Temp. 250 °F	-20°F to +20°F	Outdoor Metric	Temp. 120 °F	-11°C to +110°C	+0°F
Sys Press. English	Pressure 15 PSI	-1.5 to +1.5	Sys Press. Metric	Pressure 0.130MPa	-0.013 to +0.013 MPa	+0.0 PSI
Sys Press. English	Pressure 30 PSI	-3.0 to +3.0 PSI	Sys Press. Metric	Pressure 0.250 MPa	-0.025 to +0.025 MPa	+0.0 PSI
Sys Press. English	Pressure 100 PSI	-10 to +10 PSI	Sys Press. Metric	Pressure 0.600 MPa	-0.06 to +0.06 MPa	+0.0 PSI
Sys Press. English	Pressure 200 PSI	-20 to +20 PSI	Sys Press. Metric	Pressure 1.000 MPa	-0.1 to +0.1 MPa	+0.0 PSI
Sys Press. English	Pressure 300 PSI	-30 to +30 PSI	Sys Press. Metric	Pressure 1.600 MPa	-0.16 to +0.16 MPa	+0.0 PSI
Sys Press. English	Vacuum 30 Hg	-3.0 to +3.0 Hg	Sys Press. Metric	Vacuum 760 mm	-80 to +80 mm	+0 Hg

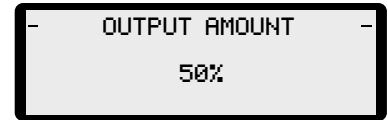
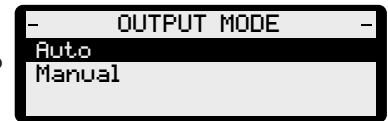
OUTPUT MODE

(Available on MCA/MCP Only)

Auto, Manual

Set: /<Maintenance>/Output

Default: Auto



- The Manual Output Mode provides a way to bypass the control logic to adjust the modulating output manually.
- The Output mode is primarily used for equipment testing and troubleshooting.
- When set to Manual, the Output Amount menu can be adjust the amount of manual modulation as a percent of the total range.
- When in Manual, the output will modulate to the set percent regardless of the Enable/Disable, the outdoor Cutoff, or sensor fault status.
- To revert to control PID operation, the Output Mode must be set to Auto.

VALVE MODE

(Available on MCF Only)

Auto, Close, Open

Set: /<Maintenance>/Valve

Default: Auto



- The Valve Mode provides a way to manually bypass the control PID logic and open or close the valve.
- The Valve mode is primarily used for equipment testing and troubleshooting.
- To revert to control PID operation, the Output Mode must be set to Auto.

SETTING THE CONTROL TO FACTORY DEFAULT

To Reset the MC Elite control to its original factory defaults, power down the control. Hold down the SET and ▼ buttons while powering the control back on until the "Loading Default Values" screen appears. The Display will direct you to the Startup menu after the defaults are loaded to program the control. See "Startup Menus" on page 17.

SENSORS AND LEDS

NO DISPLAY OR LED LIGHTS

Check the power to the MC Elite. The MC Elite requires 120VAC power to the Black wires or 24VAC to the right-most terminals. Turn the power off and back on to restore the display. If unsuccessful, make sure that the control's Display Cover is securely mounted to the Base.

SYSTEM OR OUTDOOR READS OPEN OR SHORT

If the sensor reads OPEN, short the sensor input terminals. The display should read SHORT. If it doesn't, the MC Elite may be damaged. If it does read SHORT, either the sensor is damaged or its wiring is not continuous. Check the sensor wiring. If the sensor reads SHORT, remove the wires from the input terminals. The display should read OPEN. If it doesn't read OPEN, the MC Elite may be damaged. If it does read OPEN, the sensor is damaged and needs to be replaced.

TEMPERATURE SENSOR READS AN INCORRECT TEMPERATURE

Remove the sensor wires from the input terminals. The display should change to read OPEN. If it doesn't, the MC Elite may be damaged. Take an ohm reading across the detached sensor wires. The ohm reading should correspond to the Temperature Sensor Chart. If the difference is within 5°F adjust the sensor Trim. Otherwise, the sensor may be damaged.

PRESSURE SENSOR CHART

Input (in mA)	0-30 PSI/ HG Range	0-100 PSI/ RH% Range	0-200 PSI Range	0-300 PSI Range
4	0	0	0	0
4.08			1	
4.16		1	2	
4.53	1			10
5.07	2			20
5.6	3	10	20	30
7.2	6	20	40	60
8.8	9	30	60	90
10.4	12	40	80	120
12	15	50	100	150
13.6	18	60	120	180
15.2	21	70	140	210
16.8	24	80	160	240
18.4	27	90	180	270
20	30	100	200	300

SYSTEM SENSOR READS AN INCORRECT PRESSURE

First make sure that the pressure transducer installed matches the Sensor Type selected from the Startup Menu. See "Sensor Type" on page 18. Then check if the reading is a specified amount above or below the actual pressure, adjust it using the System Trim. If the reading is SHORT, remove the wires from the sensor terminals. The display should change to read OPEN. If it does not, the MC Elite may be damaged. Otherwise, if it does, then the pressure transducer is damaged and needs to be replaced.

NO HEAT - ALL LEDS ARE OFF

Check the outdoor temperature and the Outdoor Cutoff readings. If the outdoor temperature is above the Outdoor Cutoff, the MC Elite will not give heat. See "Outdoor Cutoff" on page 23. If the display shows TSTAT OPEN then, check the EXT+ and EXT- terminals. If the terminals are not jumped together, the MC Elite will not give heat. See "Wiring the Enable/Disable" on page 11.

NO HEAT - SYSTEM LED IS ON

First, make sure that the system pump is running. Disconnect the MC Elite's Yellow wires. Then, test for continuity across the Yellow wires. If the wires are continuous, the MC Elite is calling for the System Pump to run and the problem is not with the MC Elite. Check the power source to the pump and the pump operation.

ACTUATOR RESPONSE

MCA ELITE DOES NOT MOVE THE 4-20MA ACTUATOR

Check the Set Point (page 21) and Differential (page 24) settings. If the System Sensor reading is within the Differential band, the MCA Elite may not adjust the modulation position. Otherwise, check the external DC power supply for a voltage between 30 to 36VDC. Then, measure the current. It should measure between 4 and 20mA. If it does not, the MCA Elite may be damaged.

MCA ELITE DOES NOT MOVE THE VOLTAGE ACTUATOR

First, check that the modulation signal of the actuator match the Modulation signal setting in the Startup menu. See *“Modulation Signal”* on page 18. Check the Set Point (page 21) and Differential (page 24) settings. If the System Sensor reading is within the Differential band, the MCA Elite may not adjust the motor position. If this is not the case, use a DC volt meter to measure voltage from the Blue and Red MCA Elite output wires. The meter should register a voltage within the voltage range selected from the Modulation Signal in the Startup menu. If it does not, MCA Elite may be damaged.

MCP ELITE DOES NOT MOVE THE 135Ω ACTUATOR

Check the Set Point (page 21) and Differential (page 24) settings. If the System Sensor reading is within the Differential band, the MCP Elite may not adjust the modulation position. If this is not the case, the MCP Elite output can be tested with an ohm meter. Disconnect the MCP Elite modulation output wires (Red, White, and Blue). If the System value has been below the Set Point, then an ohm reading between the Red to Blue wires should be less than 25Ω and the reading from Red to White should be more than 110Ω. If the system value has been above the set point, then an ohm reading from the Red to Blue wires should be more than 110Ω and the reading from Red to White should be less than 25Ω. If the above tests fail, then the MCP Elite is damaged.

MCF ELITE DOES NOT MOVE THE FLOATING ACTUATOR

First check the valve wiring. The MCF Elite does not source power to the actuator. Instead, a separate source of power must be wired to the actuator. See *“Wiring the Floating Output”* on page 14. Next, remove any wires connected to the Red, White, and Blue output wires. Switch the control Valve Mode to Close. There should be no continuity across the White and Red wires. If continuity exist, the MCF Elite may be damaged. There should be continuity across the Red and Blue wires. If continuity does not exist, the MCF Elite may be damaged.

MC ELITE DOES NOT CONTROL THE SYSTEM TO HOLD THE SET POINT

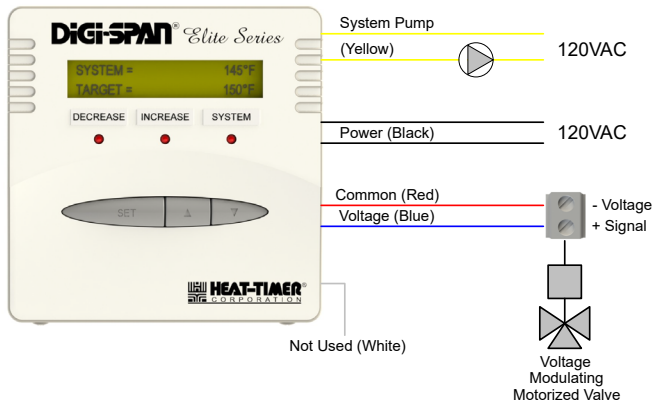
If the system temperature/pressure is overshooting or undershooting the Set Point by a small amount, increase the Differential (page 24) value. If the system temperature/pressure significantly overshoots and undershoots the Set Point, decrease the Gain (page 24) setting by one or two points. If the system temperature/pressure is almost always below the Set Point, increase the Gain setting by one or two points. Wait approximately 15 minutes after each change before evaluating the system.

TEMPERATURE SENSOR

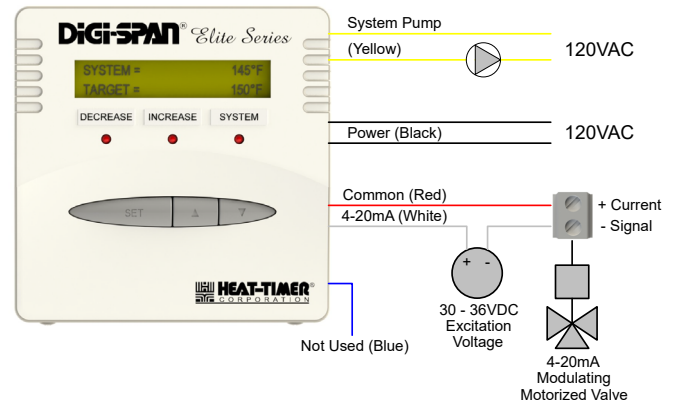
TEMPERATURE		VALUE (IN OHMS)
°F	°C	
Open		150000
-30	-34	117720
-20	-29	82823
-10	-23	59076
0	-18	42683
10	-12	31215
20	-7	23089
25	-4	19939
30	-1	17264
35	2	14985
40	4	13040
45	7	11374
50	10	9944
55	13	8714
60	16	7653
70	21	5941
80	27	4649
90	32	3667
100	38	2914
110	43	2332
120	49	1879
130	54	1524
140	60	1243
150	66	1021
160	71	842
170	77	699
180	82	583
190	88	489
200	93	412
210	99	349
220	104	297
230	110	253
240	116	217
250	121	187
SHORT		100

13 MC ELITE OUTPUT MODES WIRING

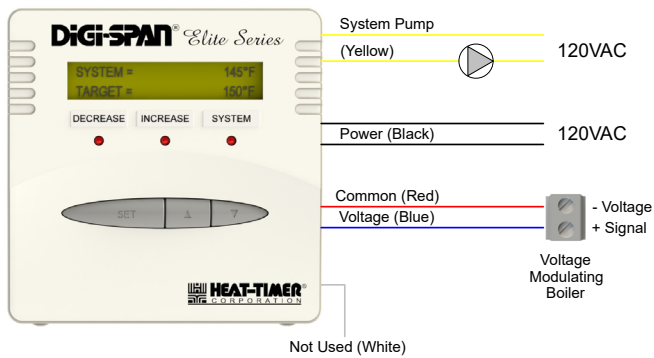
MCA Modulating a Voltage Actuator



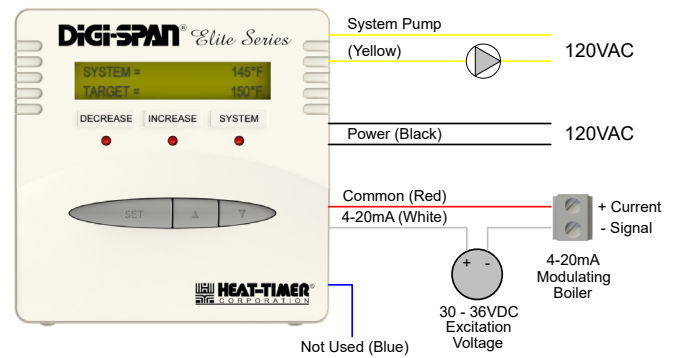
MCA Modulating a 4-20mA Actuator



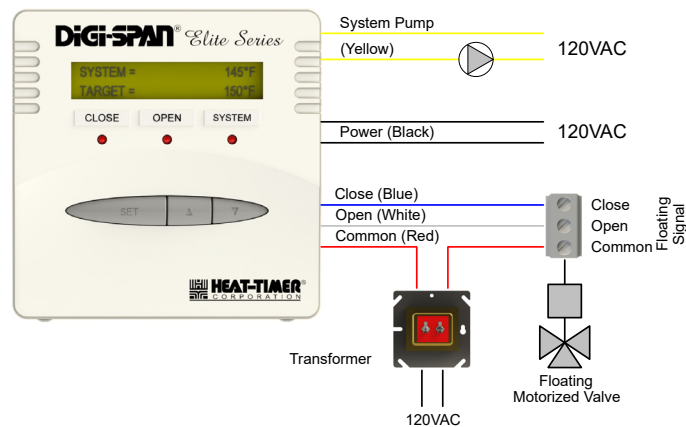
MCA Modulating a Voltage Boiler



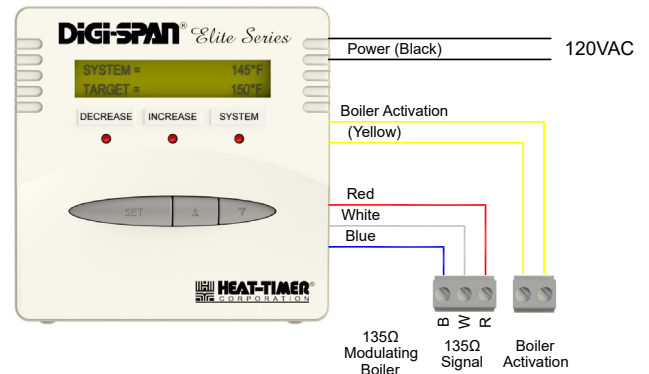
MCA Modulating a 4-20mA Boiler



MCF Modulating a Floating Actuator



MCP Modulating a 135Ω Boiler



14 SPECIFICATIONS

Voltage Input	120 VAC 60 Hz(2 Black wires) /24VAC 60 Hz (24VAC terminals) (Only One Power Source)
Power Consumption	5 VA Max
Operating Temperature	from 20°F to 120°F
Operating Humidity	From 0% to 80%
Dimensions	4"W x 4" H x 2 ½
Weight	1 pounds
Display	Back Lite 2 Line Alphanumeric LCD Display
Standard	English or Metric
Output relay ratings	1 Amp inductive (Maximum of 1/8 HP), 6Amp resistive at 120 VAC 60 Hz
Control Modes	Outdoor Reset, Set Point
Reset ratios	12 Standard ranging from 8:1 to 1:4 (Outdoor: System), and one Custom
Setback	from 0°F (0°C) to 80°F (44°C)
Boost	Yes (30Min), No
Sensor Fault Operating Options	Output On or Output Off
Sensor Operating range Temp	from -35°F (-37°C) to 250°F (121°C)
Sensor Operating range Pressure	from 0 PSI to 30 PSI from 0 PS lto 100 PSI from 0 PS lto 200 PSI from 0 PS lto 300 PSI
Sensor Operating range Vacuum	from 0.0 Hg to 30.0 Hg
Offset	from -40°F (-22°C) to 40°F (+22°C)
Minimum target	from 70°F (21°C) to 170°F (77°C)
Maximum target	from 90°F (32°C) to 240°F (116°C)
Set point	from -10°F (-23°C) to 230°F (110°C)
Setback Input	Terminals T3+, T3-
Buttons	3 (Set, Up, Down)
Enable/Disable	Terminals EXT+, EXTpump
Run-On	from 0 to 60 minutes
LED	3 LEDs (Left=Decrease/Close Middle=Increase/Open Right=System Relay)

MCA SPECIFICATIONS

MCA System Relay Output	1 S.P.S.T (Yellow = Output 1)
MCA Modulating Output	4-20mA (Requires External Excitation) (Red=Com, White=Signal) Voltage (0-10VDC, 2-10VDC, 0-5VDC, 1-5VDC) (Red=Com, Blue=Voltage)
Purge Delay	from 0.0 to 10.0 minutes

MCP SPECIFICATIONS

MCp system relay Output	1 S.P.S.T (Yellow = Output 1)
MCp Modulating Output	(Red=Common, White=Open, Blue=Close)
Purge Delay	from 0.0 to 10.0 minutes

MCP SPECIFICATIONS

MCF system relay Output	1 S.P.S.T (Yellow = Output 1)
MCF Modulating Output relay Wire Colors	(Red=Common, White=Open, Blue=Close)

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