SEQUENCING CONTROLS

For   • *Hydronic, Steam, or Motorized Valve Applications*
        • *Sequence Boilers based on Outdoor Reset or Set Point*
        • *Heating or Cooling with or without Output Pumps or Valves*

• *Sequence Outputs using PID Logic or OSS*
• *Domestic Hot Water with Priority Options*
• *Add up to two SQ-Extensions each with 8 Stages*

SQ-Elite Series and SQ-Extension

Description:

A Multi-Stage Output Sequencing Control for Hydronic, Steam, or Motorized Valve Applications Based on Outdoor Reset or a Set Point. The SQ-Elite comes in many models. It's available as an eight-stage hydronic or steam sequencing control. A new model provides six-stage hydronic sequencing in addition to motorized valve control. It incorporates many additional features and flexibilities that can be customized to each application's unique characteristics.

• *Hydronic Heating using Outdoor Reset or Set Point.* The SQ-Elite-8T control is designed to sequence multiple stages. When in heating mode, it can operate based on Outdoor Reset or a Set Point. Each of the options has a set of pre-configured, but adjustable settings to meet the precise needs of each heating application. When in cooling, multiple options are available including, having either one or multiple stages on per unit.

• *Multiple Rotation Options.* The SQ-Elite can rotate the lead output to promote even wear. It has three rotation options; Timed Rotation that is adjustable from one hour to 40 Days, Manual rotation, and First-On/First-Off.

• *Adding Stages.* The SQ-Elite controls up to eight outputs. However, it can be connected to up to two additional SQ-Extension panels, each with eight stages, increasing the number of controlled stages to 24.

• *PID or Over-Sized-System (OSS) Sequencing.* The normal sequencing offers an advanced PID logic to provide an efficient and adjustable sequencing that can fit most heating and cooling applications whether the outputs are to sequence normally, Lo/Hi/Lo/Hi, or in parallel, Lo/Lo/Hi/Hi. With numerous adjustable parameters like Last Stage Hold, Reaction Time, and Minimum Run Time to eliminate short cycling. The PID logic can be adjusted to meet your specific application. OSS has been designed to satisfy applications where fast response is required to match the load, as with process applications.

• *Standby Stages.* Each stage can be set individually to be automatically operated, fully on, off, or be considered as a Standby. The Standby Stage option considers the unit as a backup with an adjustable standby delay. This feature is great for less efficient equipment that can be used in periods of high demand.

• *Communicate with EMS (Energy Management Systems)* The SQ-Elite with its built-in Shutdown and Prove inputs, is capable of connecting to EMS. Moreover, using the 4-20mA EMS Interface, when purchased separately, the SQ-Elite can accept a set point as a 4-20mA signal from an EMS system.

• *Minimum Boiler Return.* When purchased separately, an optional return sensor can be connected to offer better management of return temperature to reduce boiler condensation and thermal shock.

• *System and Output Pumps with Adjustable Run-On Delay.* The SQ-Elite has a System Output Relay that can be configured to run a system pump. The relay can be adjusted to operate during unit operation or when below a specified Outdoor Cutoff. Furthermore, the SQ-Elite can be configured to control stage pumps, a Combustion Air Damper, and a DHW Pump.

• *Digital Display.* The SQ-Elite's bright graphical digital display names each system parameter in plain English and shows its precise value. The easy to follow menu system allows users to quickly make changes to any system setting without having to learn any codes or keyboard commands. The new brightly lit LCD display can be viewed from a distance in dimly lit areas.

• *Day and Night Schedule.* The control has an adjustable Night Setback setting to help reduce fuel consumption. The built-in schedule can be used to customize the operation for even further temperature control and fuel savings.

• *Domestic Hot Water.* With the use of a dry contact DHW input or a DHW sensor, which can be purchased separetly, the SQ-Elite can be configured to add Domestic Hot Water Pump Control. It offers a variety of DHW priority options.
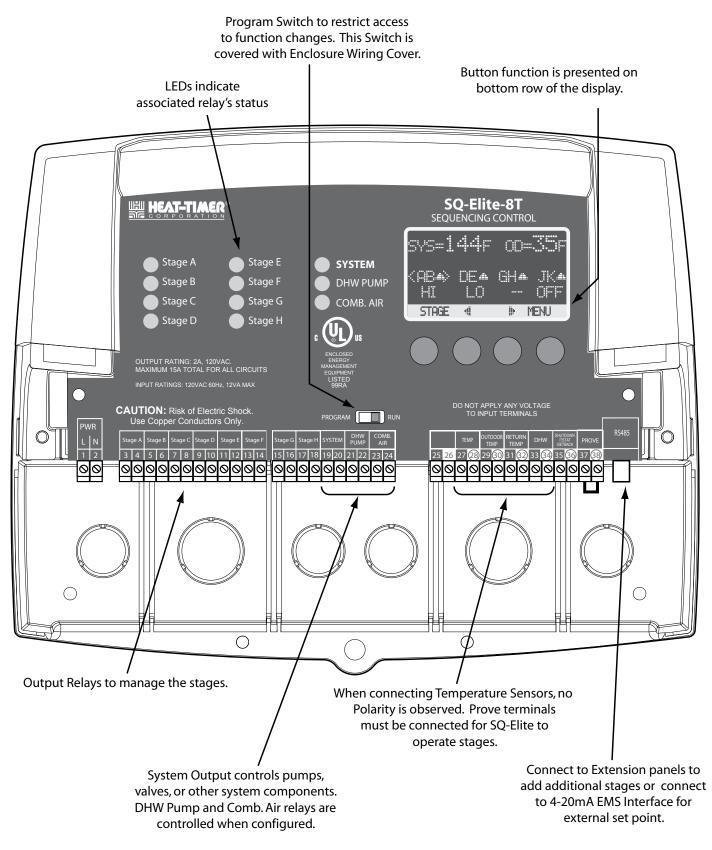
SQ-Elite Features:

- **Built-in Outdoor Reset or Set Point** - In a Hydronic application, the SQ-Elite will offer two set point setting options. It can either change the set point based on the outdoor temperature, Outdoor Reset for heating applications, or maintain a fixed Set Point. The Outdoor Reset offers a range of pre-configured reset ratios. In addition, a customizable reset curve can be configured for unique applications where a standard reset curve will not satisfy. In set point mode, it can accept a specified temperature or a 4-20mA signal as a set point from an EMS system, when purchased with the 4-20mA EMS Interface.

- **Hydronic, Steam, and Motorized Valve Options** - The SQ-Elite offers multiple solutions to most applications. Hydronic models come as a multi-stage hydronic sequencing control with DHW pump and stage-pump control, a multi-stage steam sequencing control, and finally, a multi-stage hydronic control with additional outputs to control a floating motorized valve.

- **Control Outputs and their Pumps or Valves** - A single control can be configured to control either the individual unit-stages or control the unit-stages and their pumps or valves.

- **Built-In Combustion Air Damper Control** - When the Combustion Air relay is used, the Prove can be used to check damper status and activate output stages.

- **Multiple Rotation Options** - The SQ-Elite will rotate stages using a variety of options. Either based on Time; ranging from 1 hour to 40 days in one hour increments, First-On/First-Off rotation; allows for the first stage to fire to be the first stage to turn off, and finally, manual rotation.

- **Standby Stage with Delay** - Now you can set individual stages to be continuously On, Off, Automatic, or Standby with an adjustable delay.

- **Adjustable Pump Delay** - Allows the System Pump, Stage-Pumps, and Combustion Air Damper an additional Run-On time.

- **External 4-20mA Set Point Option** - When connected to the 4-20mA EMS Interface, which can be purchased separately, the SQ-Elite will accept an external signal from an EMS/BMS system as a set point for either temperature or pressure applications.

- **Normal PID and Over-Sized-System (OSS) Sequencing** - Depending on the application, two control logics will be available. Normal PID offers a sequencing that is based on the rate of change. It is best suited for building heating or cooling applications. OSS provides faster response based on a variable load, which can be adjusted to fit most process applications.

- **External Setback/Scheduling** - External Setback signal acceptance has been provided as an option for applications that are not to follow a predetermined schedule. In addition, an adjustable Day/Night schedule has been provided primarily for building heating.

- **Domestic Hot Water Pump Control with Multiple Priority Options** - It can accept either a dry-contact or input from the option DHW sensor, can be purchased separately. On a DHW call the SQ-Elite will increase system target temperature and energize the DHW Pump relay. Depending on the Priority setting, the SQ-Elite will either dedicate all output to domestic hot water alone or in addition to heat (leaving system pump running during DHW call).

- **Built-in Prove and Shutdown** - The Prove can be used to check the status of other equipment, such as the end switch on a combustion air damper prior to firing the boilers. Furthermore, Shutdown can be activated from any safety control feed back.

- **Security** - The SQ-Elite has an integral programming switch that can only be accessed when wiring cover has been removed.

Item Description	Part #
SQ-Elite-8T (Temperature) Offers 8 Stages with or without Stage-Pumps	926730-00
SQ-Elite-MV (Temperature) Offers 6 Stages and Motorized Valve Control	926728-00
SQ-Elite-8S (Pressure) (Pressure Transducer sold Separately)	926737-00
SQ-Elite-Ext Adds 8 Additional Stages (Add a Maximum of two Extensions)	926732-00
4-20mA EMS Interface (Provides 4-20mA External Set Point Input)	926741-00
Boiler Return Sensors and DHW Sensors	Call Factory

SQ-Elite-8 PANEL

Program Switch to restrict access to function changes. This Switch is covered with Enclosure Wiring Cover.

Button function is presented on bottom row of the display.

LEDs indicate associated relay's status

HEAT-TIMER CORPORATION

SQ-Elite-8T
SEQUENCING CONTROL

SYS=144F OD=35F

<AB▲> DE▲ GH▲ JK▲
HI   LO   --- OFF

STAGE ◄ ► MENU

- Stage A
- Stage B
- Stage C
- Stage D
- Stage E
- Stage F
- Stage G
- Stage H

- **SYSTEM**
- DHW PUMP
- COMB. AIR

c UL us
ENCLOSED ENERGY MANAGEMENT EQUIPMENT LISTED 99RA

OUTPUT RATING: 2A, 120VAC.
MAXIMUM 15A TOTAL FOR ALL CIRCUITS

INPUT RATINGS: 120VAC 60Hz, 12VA MAX

CAUTION: Risk of Electric Shock.
Use Copper Conductors Only.

PROGRAM [ ] RUN

DO NOT APPLY ANY VOLTAGE
TO INPUT TERMINALS

PWR		Stage A	Stage B	Stage C	Stage D	Stage E	Stage F	Stage G	Stage H	SYSTEM	DHW PUMP	COMB. AIR			TEMP	OUTDOOR TEMP	RETURN TEMP	DHW	SHUTDOWN /TSTAT SETBACK	PROVE	RS485
L	N																				
1	2	3 4	5 6	7 8	9 10	11 12	13 14	15 16	17 18	19 20	21 22	23 24	25 26	27 28	29 30	31 32	33 34	35 36	37 38	

Output Relays to manage the stages.

When connecting Temperature Sensors, no Polarity is observed. Prove terminals must be connected for SQ-Elite to operate stages.

System Output controls pumps, valves, or other system components. DHW Pump and Comb. Air relays are controlled when configured.

Connect to Extension panels to add additional stages or connect to 4-20mA EMS Interface for external set point.

Specifications:

Voltage Input: . . . . 120 VAC 60 Hz
Power Consumption: . . . . 12 VA Max
Operating Temperature: . . . . 20°F/-7°C to 120°F/49°C
Operating Humidity: . . . . 20% to 80%
Dimensions: . . . . 11"W x 9" H x 3 ¾
Weight: . . . . 2.5 pounds

SQ-Elite Specifications:

Lead Stage Rotation: . . . . Time (1 to 999 Hours (41 days)), Manual, First-On/First-Off
SQ-Elite-8 Outputs and LEDs: . . . . 11 N.O. S.P.S.T (8 Stages, 1 System, 1 DHW Pump, 1 Combustion Air)
SQ-Elite-MV Outputs and LEDs: . . . . . . 11 N.O. S.P.S.T (6 Stages, 2 System, 1 DHW Pump, 2 Motorized Valve)
SQ-Elite-8 Inputs: . . . . . 1 Sys (Press),1 Sys(Temp), 1 Outdoor, Return Temp, DHW Temp, Ext Setback/Shutdown, Prove
SQ-Elite-MV Inputs: . . . . 2 Sys(Temp), 1 Outdoor, Return Temp, DHW Temp/Prove, Ext Setback/Shutdown
Stage Modes: . . . . Auto, Standby, On, Off
Standby Time (PID only): . . . . 1 to 60 minutes
Output Relay Ratings: . . . . 2 Amp inductive, 6 Amp resistive at 120 VAC 60 Hz
Add-On SQ-Extension Panels: . . . . .up to two SQ-Extension Panels using RS485
Temperature Display: . . . . Fahrenheit or Celsius
Display: . . . . Graphical Alphanumeric (7 rows x 21 char. each)
Temperature Sensor Ranges: . . . . - minus 35°F/-37°C to 250°F/121°C
Pressure Sensor Ranges (-8S Only): . . . . . 0-30PSI, 0-100PSI, 0-200PSI, 0-300PSI, 0-30"Hg, 0-100% RH, 4-20mA
Outdoor Cutoff Range: . . . . 20°F/-7°C to 100°F/38°C, ON and OFF
Set Point: . . . . -10°F/-23°C to 230°F/110°C
External Set Point: . . . . -10°F/-23°C to 240°F/116°C using 4-20mA EMS Interface (optional)
Reset Ratio Range (Outdoor Reset Only): . . . . . (1:4) to (8:1) (Outdoor : System Water), and Custom Reset Ratio
Offset Adjustment (Outdoor Reset Only): . . . . minus -40°F/-22°C to plus 40°F/22°C
Minimum Target (Outdoor Reset Only): . . . . 70°F/21°C to 170°F/77°C
Maximum Target (Outdoor Reset Only): . . . . 90°F/32°C to 240°F/116°C
Reaction Time (PID only): . . . . 1 to 10 minutes
Minimum Run-Time (PID only): . . . . 0 to 60 minutes
Purge Delay (PID only): . . . . 0.0 to 10.0 minutes
Last Stage Hold (PID only): . . . . .0°F/0°C to 30°F/17°C
Throttle Range (OSS only): . . . . 2°F/1°C to 20°F/11°C
Domestic Hot Water Priority Options: . . . Parallel Piping with Priority or without Priority and Primary Secondary
Pump Run-On: . . . . 0 to 60 minutes
Pump Exercise: . . . . Yes or No
Schedules: . . . . 1 Day and 1 Night (Setback) settings per day
Night Setback: . . . . 0°F/0°C to 80°F/44°C
Power Backup: . . . . . . .Lithium coin battery, 100 days minimum 5 year replacement (Maintains Clock in power outages)
Season: . . . . .Winter and Summer

SQ-Extension Specifications:

Extension Numbering: . . . . Toggle Switch A or B
LED: . . 1 Power (Dual Color Green (A)/Red (B)), 1 Communication, 8 Stage Output relays (Dual Color Green (A)/Red (B))
Stage Outputs: . . . . 8 N.O. S.P.S.T.
Output Relay Ratings: . . . . 2 Amp inductive, 6 Amp resistive at 120 VAC 60 Hz
Connection to SQ-Elite and another SQ-Extension: . . . . Two RS485

ISO 9001:2000
CERTIFIED