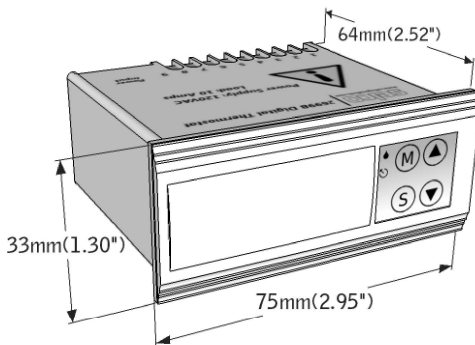


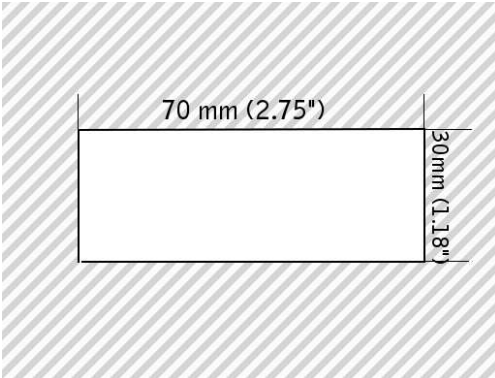


- Flexible temperature controller with high functionality software and four operations modes.
- Compact, easy-to-install enclosure.
- High temperature range to over 2,000°F.
- Support of multiple power and sensor inputs, multiple output types and a variety of selectable hardware configurations.
- Programmable set points across time for energy saving.

Dimensions - mm(inches)



Panel/Wall Cutout – mm(inches)



Double check power supply, inputs and outputs for application before installation. Install by qualified personnel according to local regulations. Separate power/load cables from digital/sensor lines.

Part Number Structure:

3699A - 1 2 3 4 - 5 6 7

1. Software

- S On/Off
- D On/Off with defrost
- T Timer
- P PID

2. Power Input

- 1 115 VAC 50/60 Hz
- 2 230 VAC 50/60 Hz
- 3 24 VDC/AC
- 4 12 VDC/AC

3. First Sensor Input

- 1 NTC Thermistor (-40°F/-40°C to 257° F/125°C)
- 2 Thermocouple E (140°F/60°C to 1562°F/850°C)
- 3 Thermocouple J (140°F/60°C to 1364°F/740°C)
- 4 Thermocouple K (140°F/60°C to 2012°F/1100°C)

4. Second Sensor Input

- 0 None
- 1 NTC Thermistor (-40°F/-40°C to 257° F/125°C)
- 2 Switch Input

5. First Output

- 1 10 A Relay
- 2 3 A Relay
- 3 12/24VDC for SSR ¹

6. Second Output/Alarm

- 0 None
- 1 3 A Relay
- 2 12/24VDC for SSR ¹
- 3 Internal Buzzer

7. Auxiliary Output

- 0 None
- 1 12/24VDC for SSR ^{1,2}

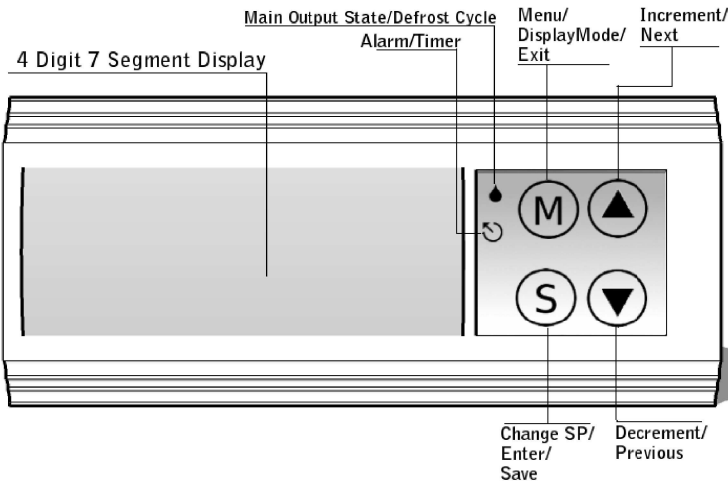
¹When power supply is 115V, 230V and 12VDC Output is 12VDC. When power supply is 24 VDC then output is 24VDC.

² Only if First or second output is 12VDC

Technical Specifications:

Power Supply	2 VA max, 115 VAC 50/60Hz, 230 VAC 50/60Hz , 24 or 12 VDC or VAC. For 115 VAC and 230 VAC class 2 transformer is used with following agency approvals: UL 506, File E113449 UL 1585, File E175197 EN61558.
Inputs	<ul style="list-style-type: none"> ■ NTC Thermistor – Range -40°F/-40°C to 257° F/125°C. ■ Thermocouple E - 140°F/60°C to 1562°F/850°C. ■ Thermocouple J - 40°F/60°C to 1364°F/740°C. ■ Thermocouple K - 140°F/60°C to 2012°F/1100°C. ■ Switch Input. Contact Resistance 50 m Ohms max.
Outputs	<ul style="list-style-type: none"> ■ 10 A SPST-NO . UL Ratings 10A @ 250VAC and 10A @ 30VDC Resistive 100,000 Operations. 10LRA/1.5FLA @ 120VAC 5.4LRA/0.9FLA @ 240VAC Motor 30,000 Operations. UL file E29244, CSA File LR48471 ■ 3 A SPST-NO. UL Ratings 3A @ 250VAC and 3A @ 30VDC Resistive 100,000 Operations. 10LRA/1.5FLA @ 120VAC 5.4LRA/0.9FLA @ 240VAC Motor 30,000 Operations. UL file E29244, CSA File LR48471 ■ Supports one 12VDC@60mA output or 2 12VDC@30mA outputs for external Solid State Relays (TRIACS).
Operating Conditions	Temperature - 14°F/-10°C to 150°F/65°C. <80% rH Non-Condensing
Enclosure and connections	Plastic enclosure (ABS), Quick-connects for power supply input and screw terminals for rest of connections (1.5mm ² cable and 13.5A max current)
Display	4 digits 7 Segment (0.4"-10mm digit height) red color, 2 Led Alarm/Load indicators. 4 Push Buttons (Up, Down, Set, Menu).

User Interface:



Normal Operation:

Controller will start to run with current parameters after power-up. Current temperature is shown in the display.
First time power-up will use default values.

Basic operations:

Change Set point:	<ul style="list-style-type: none"> ◆ Press S button. <i>SP</i> will briefly appear before showing actual set-point temperature. ◆ Press ▲ or ▼ button until reaching desired new set-point. ◆ Press S to save new set point. The new set point will blink twice. ◆ If no button is pressed for 3 seconds, the controller will return to normal mode without changing set-point. ◆ Hold ▲ or ▼ for more than 2 seconds to accelerate change of set-point temperature.
Change Display Mode:	Press M to switch between <i>CLOCK</i> and current temperature sensed on main input.
Enter to Configuration Mode.	Press and hold M for about 3 seconds to enter to configuration Mode.
Reset to factory defaults:	Press and hold M and ▲ for 10 seconds. <i>FACTORY DEFAULT</i> message appears for 15 seconds and the controller automatically reboot.
Blinking	Temperature is below or above alarm thresholds.

Error Messages:

<i>SEnSor oPEn</i>	Probe is not properly connected – Check installation.
<i>SEnSor SHorT</i>	Probe is not properly connected – Check installation.
<i>OUt oF rAnGE</i>	Temperature reading out of range – Check if using correct sensor.

Configuration Mode:

Set system time, temperature set-point limits, mode operations, etc. In configuration mode, the control loop will pause until you return to normal operation. All parameters changed in this mode be saved in non-volatile memory.

Navigation through configuration mode:

M	<ul style="list-style-type: none"> ◆ If editing a parameter, the controller will return to the parameters menu. ◆ If navigating through parameter's menu, the controller will exit to the previous level. ◆ If pressed for more than 3 seconds, the controller will exit configuration mode and return to normal operation.
S	<ul style="list-style-type: none"> ◆ If editing parameter, the controller will save the current value or option in non-volatile memory. Display will blink twice before returning to parameters menu. ◆ If navigating through parameter's menu, the controller will enter to the next level of parameters or select parameter for editing.
▲	<ul style="list-style-type: none"> ◆ If editing parameter, the controller will increment value or go to next option. ◆ If navigating through parameter's menu, the controller will go to next parameter.
▼	<ul style="list-style-type: none"> ◆ If editing parameter, the controller will decrement value or go to previous option. ◆ If navigating through parameter's menu, the controller will go to previous parameter.

If no push button is pressed for 30 seconds (no activity) the controller will automatically leave configuration mode and return to normal operation.

Example: Changing High Set point Limit:

1. Press and hold **M** for around 3 seconds until you enter to configuration mode.
2. Press **▲** until you reach control settings category (*Ctrl*).
3. Press **S** to enter to next level of parameters.
4. Press **▲** until you reach high set point limit parameter (*CLUSP*).
5. Press **S** to change parameter.
6. Press **▲** and **▼** to set new high limit.
7. Press **S** to save on RAM and non-volatile memory.
8. Press **M** to exit control settings.
9. Press **M** for about 3 seconds to return to normal operation with changes.

Parameters list for ON/OFF version:

Parameter	Description	Unit	Default	Options	
				Min	Max
545t - System Time Parameters					
5.5t	Set current time	H:M	NA	0:00	23:59
5.hr	Display Time Hour mode	Option	24	12 - 12 Hour 24 - 24 hour	
Ctrl - Control Parameters					
C.SP	Current set-point. ◆ Changing set-point here will write in non-volatile memory.	°C °F	30 86	Set by C.LSP	Set by C.USP
C.LSP	Low set-point temperature limit	°C °F	-20 -4	Set by I.Slo	Setpoint
C.USP	High set-point temperature limit	°C °F	120 248	Setpoint	Set by I.Shi
C.dIF	Differential for ON/OFF control	°C °F	4 7	2	20
C.tP	Mode of ON/OFF	Option	Heat	HEAT - Reverse COOL - Direct	
INP1 - First Input Parameters					
I.SLo	Low sensing temperature input limit.	°C °F	NA	NA	NA
I.Shi	High sensing temperature input limit.	°C °F	NA	NA	NA
I.CAL	Calibration offset to sensing temperature.	°C °F	0 0	-10 -18	10 18
I.tP	Curve selection for thermistor. Thermocouple type.	Option	A J	Curve A,B,C,D,E,F. Type E,K,J	
OUT1 - First Output Parameters					
O.OtL	Output minimum ON time	M:S	00:00	00:00	60:00
O.OtU	Output maximum ON time	H:M	05:00	00:30	24:00
O.FtL	Output minimum OFF time	M:S	00:00	00:00	60:00
O.St	Output start-up delay time.	M:S	00:20	00:00	60:00
ALR - Alarm Parameters					
A.Lo	Low alarm temperature threshold.	°C °F	-20 -4	Set by I.Slo	Setpoint
A.Hi	High alarm temperature threshold.	°C °F	120 248	Setpoint	Set by I.Shi
A.dt	Time delay to activate alarm event	M:S	00:05	00:00	60:00

Parameter	Description	Unit	Default	Options	
				Min	Max
dISP - Display Parameters					
d.d95	Degrees Unit used	Option	°F	°C - Celsius °F - Fahrenheit	
d.rES	Sensing resolution	Option	0	0 - with out decimal 1 - with one decimal	
d.Sd	Show degree in last digit	Option	ON	on - On off - Off	
Prog - Programmed Set points					
P.t1	Set current time	H:M	NA	OFF	23:59
P.SP1	Set-point	°C °F	30 86	OFF	Set by C.USP
P.t2	Set current time	H:M	NA	OFF	23:59
P.SP2	Set-point	°C °F	30 86	OFF	Set by C.USP
P.t3	Set current time	H:M	NA	OFF	23:59
P.SP3	Set-point	°C °F	30 86	OFF	Set by C.USP

Parameters list for ON/OFF Defrost version:

ON/OFF defrost only works for refrigeration applications.

Parameter	Description	Unit	Default	Options	
				Min	Max
545t - System Time Parameters					
5.5t	Set current time	H:M	NA	0:00	23:59
5.hr	Display Time Hour mode	Option	24	12 - 12 Hour 24 - 24 hour	
Ctrl - Control Parameters					
C.SP	Current set-point ◆ Changing set-point here will write in non-volatile memory.	°C °F	5 41	Set by C.LSP	Set by C.USP
C.LSP	Low set-point temperature limit	°C °F	-20 -4	Set by I.Slo	Setpoint
C.USP	High set-point temperature limit	°C °F	120 248	Setpoint	Set by I.Shi
C.dIF	Differential for ON/OFF control	°C °F	4 7	2	20
C.dt	Defrost type – Timed to activate defrost time in certain interval or sensed to use additional input.	Option	Timed	tP t – Timed tP 5- Sensed using input 2	
C.dP	Defrost Priority – Activate defrost above compressor output delays .	Option	OFF	on – On off- Off	
C.dSP	Defrost set-point – Used for sensed mode.	°C °F	0 32	Set by C.LSP	Set by C.USP
C.ddF	Defrost differential – Used for sensed mode.	°C °F	4 7	2	20
C.d it	Defrost interval time – Used for timed mode. ◆ Interval time must be equal or bigger to min output time.	H:M	01:00	00:30	24:00
C.ddP	Defrost dripping delay.	M:S	00:00	00:00	60:00
C.dSt	Defrost on start up – Will turn on defrost on power up.	Option	OFF	on – On off- Off	
INP1 – First Input Parameters					
I.CAL	Calibration offset to sensing temperature.	°C °F	0 0	-10 -18	10 18
I.tP	Curve selection for thermistor.	Option	A	Type A,B,C,D,E,F.	

Parameter	Description	Unit	Default	Options	
				Min	Max
INP2 – Second Input Parameters (Defrost)					
I.CAL	Calibration offset to sensing temperature.	°C °F	0 0	-10 -18	10 18
I.tP	Curve selection for thermistor.	Option	A	Type A,B,C,D,E,F.	
OUT1 – First Output Parameters (Compressor)					
O.OtL	First Output minimum ON time	M:S	00:00	00:00	60:00
O.OtU	Output maximum ON time	H:M	05:00	00:30	24:00
O.FtL	Output minimum OFF time	M:S	00:00	00:00	60:00
O.St	Output start-up delay time.	M:S	00:20	00:00	60:00
OUT2 – Second Output Parameters (Evaporator)					
O.OtL	Output minimum ON time	M:S	00:00	00:00	60:00
O.OtU	Output maximum ON time	H:M	05:00	00:30	24:00
O.FtL	Output minimum OFF time	M:S	00:00	00:00	60:00
O.St	Output start-up delay time.	M:S	00:20	00:30	60:00
ALR – Alarm Parameters					
A.Lo	Low alarm temperature threshold.	°C °F	-20 -4	Set by I.Slo	Setpoint
A.Hi	High alarm temperature threshold.	°C °F	120 248	Setpoint	Set by I.Shi
A.dt	Time delay to activate alarm event	M:S	00:05	00:00	60:00
d.SP – Display Parameters					
d.d95	Degrees Unit used	Option	°F	°C - Celsius °F - Fahrenheit	
d.rES	Sensing resolution	Option	0	0 – with out decimal 1 – with one decimal	
d.Sd	Show degree in last digit	Option	ON	on – On off- Off	
d.dEF	Show Defrost - When defrost activate will display dEFr	Option	OFF	on – On off- Off	

Parameters list for TIMER version:

Parameter	Description	Unit	Default	Options	
				Min	Max
SYSt - System Time Parameters					
S.St	Set current time	H:M	NA	0:00	24:00
S.hr	Display Time Hour mode	Option	24	12 - 12 Hour 24 - 24 hour	
Ctrl - Control Parameters					
C.dt	Default timer time.	H:M	0:10	0:00	24:00
C.Lt	Timer upper limit.	H:M	0:30	0:01	24:00
C.Ut	Timer lower limit.	H:M	0:05	0:01	24:00
C.ISP	Idle set-point. Waiting for timer to start.	°C °F	30 86	OFF	Set by C.USP
C.RSP	Run set-point. When timer is running.	°C °F	30 86	Set by C.LSP	Set by C.USP
C.RSP	Differential for ON/OFF control	°C °F	4 7	2	20
C.ht	Hold timer until reach temperature.	Option	Heat	HEAt - Reverse COOL - Direct	
C.idt	Delay after time out to return to idle set-point.	H:M	0:05	0:01	24:00
INP1 - First Input Parameters					
I.SLo	Low sensing temperature input limit.	°C °F	NA	NA	NA
I.ShI	High sensing temperature input limit.	°C °F	NA	NA	NA
I.CAL	Calibration offset to sensing temperature.	°C °F	0 0	-10 -18	10 18
I.tP	Curve selection for thermistor. Thermocouple type.	Option	A J	Curve A,B,C,D,E,F. Type E,K,J	
OUT1 - First Output Parameters					
O.OtL	Output minimum ON time	M:S	00:00	00:00	60:00
O.OtU	Output maximum ON time	H:M	05:00	00:30	24:00
O.FtL	Output minimum OFF time	M:S	00:00	00:00	60:00
O.St	Output start-up delay time.	M:S	00:20	00:00	60:00

Parameter	Description	Unit	Default	Options	
				Min	Max
ALr - Alarm Parameters					
A.Lo	Low alarm temperature threshold.	°C °F	-20 -4	Set by I.Slo	Setpoint
A.HI	High alarm temperature threshold.	°C °F	120 248	Setpoint	Set by I.Shi
A.dt	Time delay to activate alarm event	M:S	00:05	00:00	60:00
dISP - Display Parameters					
d.d95	Degrees Unit used	Option	°F	°C - Celsius °F - Fahrenheit	
d.rES	Sensing resolution	Option	0	0 - with out decimal 1 - with one decimal	
d.Sd	Show degree in last digit	Option	ON	ON - On OFF - Off	
d.tr	Timer resolution	Option	Sec	Seconds - Display M:S Minutes - Display H:M	
d.tr	Countdown mode	Option	Desc.	Descending Ascending	

Parameters list for PID version:

PID version only works for heating applications with resistive actuator and using SSR output.

Parameter	Description	Unit	Default	Options	
				Min	Max
Syst - System Time Parameters					
<i>S.st</i>	Set current time	H:M	NA	0:00	24:00
<i>S.hr</i>	Display Time Hour mode	Option	24	12 - 12 Hour	24 - 24 hour
Ctrl - Control Parameters					
<i>C.SP</i>	Current set-point. ♦ Changing set-point here will write in non-volatile memory.	°C °F	5 41	Set by C.LSP	Set by C.USB
<i>C.LSP</i>	Low set-point temperature limit	°C °F	-20 -4	Set by I.Slo	Setpoint
<i>C.USB</i>	High set-point temperature limit	°C °F	120 248	Setpoint	Set by I.Shi
<i>C.EL</i>	Error Linearity	Option	Normal 1	Normal - 1 $e^{ e } - 2$	
<i>C.db</i>	Actuator Dead Band	Option	0.0	0.0, 0.83, 1.66, 2.5, 3.33, 4.16, 5.0	
<i>C.SP</i>	Control response speed.	Option	1.0	0.2, 0.25, 0.33, 0.5, 1.0, 2.0, 3.0, 4.0, 5.0	
<i>C.tn</i>	Control tuning type	Option	Normal 1	Fast - 0 Normal - 1 Medium - 2 Robust - 3	
INPI - First Input Parameters					
<i>I.SLo</i>	Low sensing temperature input limit.	°C °F	NA	NA	NA
<i>I.Shi</i>	High sensing temperature input limit.	°C °F	NA	NA	NA
<i>I.CAL</i>	Calibration offset to sensing temperature.	°C °F	0 0	-10 -18	10 18
<i>I.tP</i>	Curve selection for thermistor. Thermocouple type.	Option	A J	Curve A,B,C,D,E,F. Type E,K,J	

Parameter	Description	Unit	Default	Options	
				Min	Max
ALR - Alarm Parameters					
<i>A.Lo</i>	Low alarm temperature threshold.	°C °F	-20 -4	Set by I.Slo	Setpoint
<i>A.Hi</i>	High alarm temperature threshold.	°C °F	120 248	Setpoint	Set by I.Shi
<i>A.dt</i>	Time delay to activate alarm event	M:S	00:05	00:00	60:00
dISP - Display Parameters					
<i>d.d95</i>	Degrees Unit used	Option	°F	°C - Celsius °F - Fahrenheit	
<i>d.rES</i>	Sensing resolution	Option	0	0 - with out decimal 1 - with one decimal	
<i>d.Sd</i>	Show degree in last digit	Option	ON	on - On off - Off	
Prog - Programmed Set Points					
<i>P.t1</i>	Set current time	H:M	NA	OFF	24:00
<i>P.SP1</i>	Set-point	°C °F	30 86	OFF	Set by C.USB
<i>P.t2</i>	Set current time	H:M	NA	OFF	24:00
<i>P.SP2</i>	Set-point	°C °F	30 86	OFF	Set by C.USB
<i>P.t3</i>	Set current time	H:M	NA	OFF	24:00
<i>P.SP3</i>	Set-point	°C °F	30 86	OFF	Set by C.USB