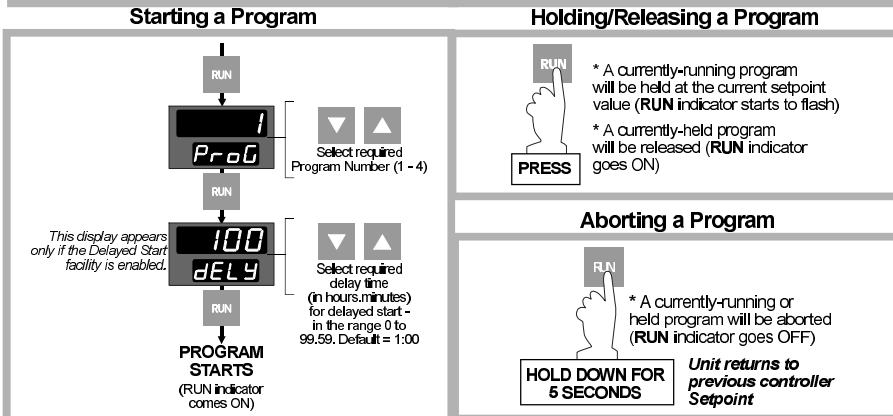
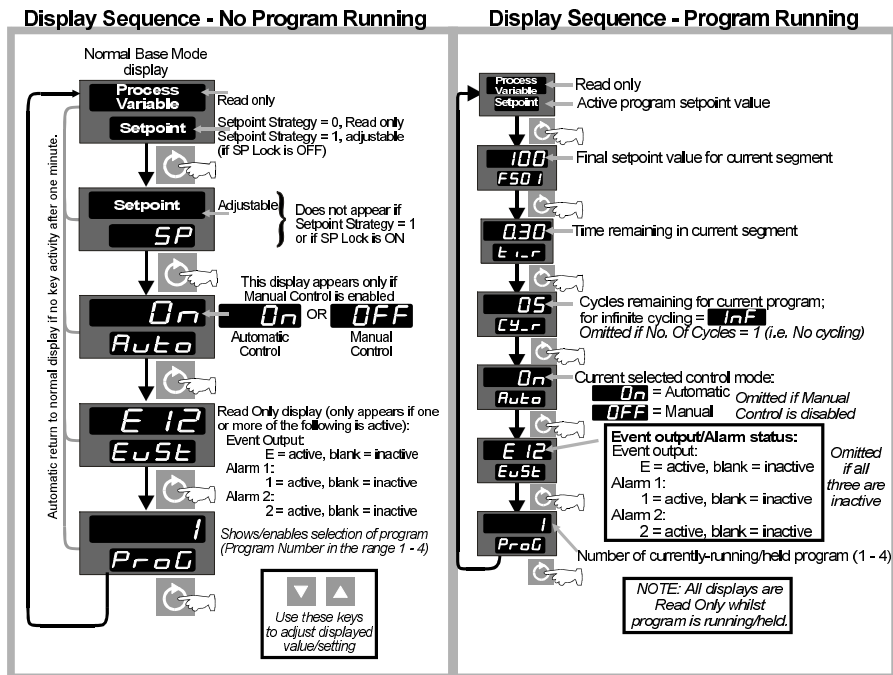


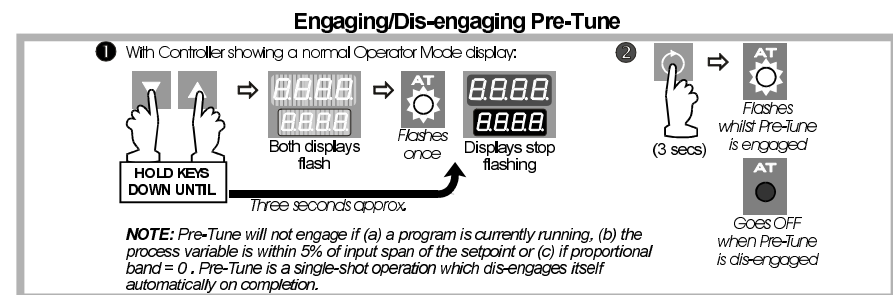
1-DIN PROFILER CONTROLLER CONCISE PRODUCT MANUAL (59228-2)

BASE MODE

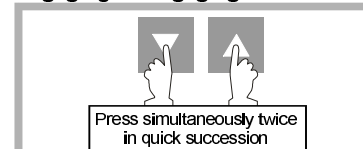
NOTE: Set all Base Mode, Configuration Mode and Set Up Mode parameters as desired before starting normal operations.



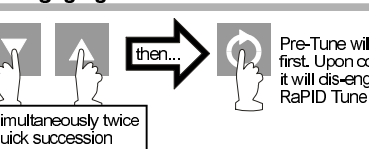
Tuning



Engaging/Disengaging RaPID Tune



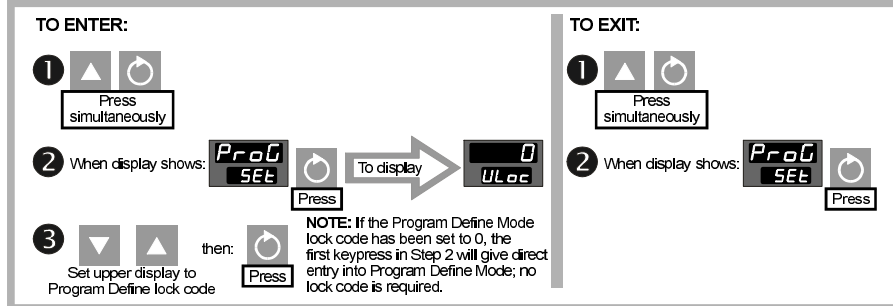
Engaging Pre-Tune and RaPID Tune



PROGRAM DEFINE MODE

NOTE: Set all Configuration Mode and Set Up Mode parameters as desired before defining programs.

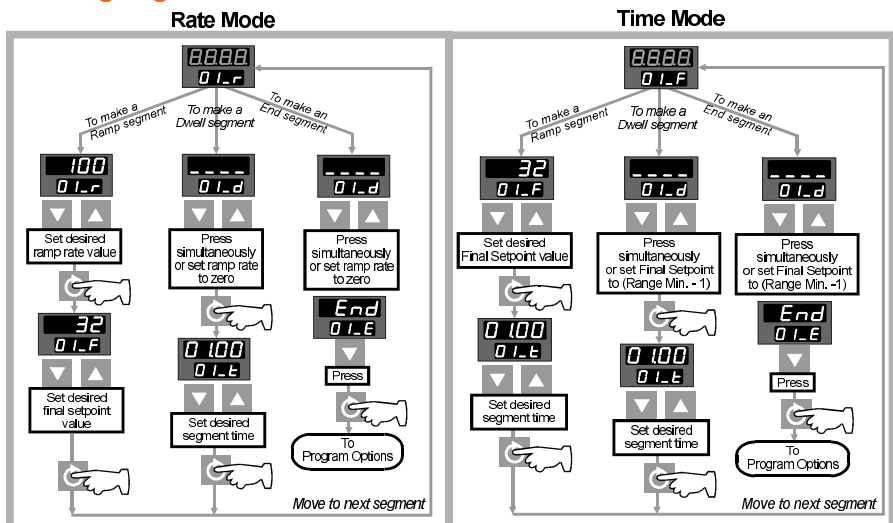
Entry/Exit



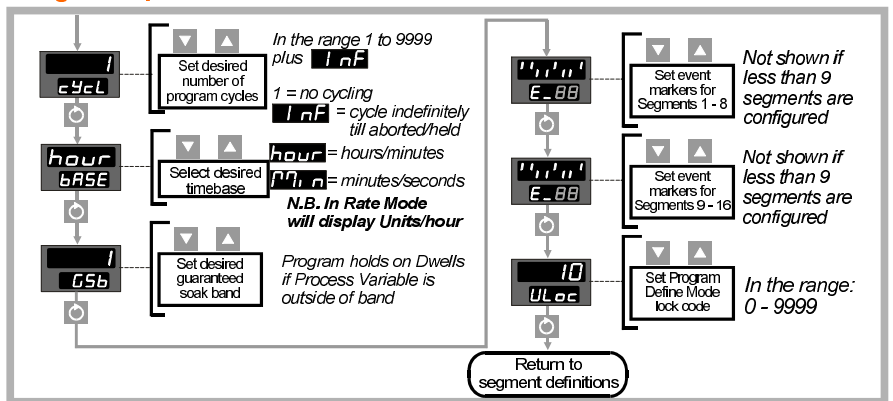
Basic Steps in Creating a Program

1. Define the program segments.
2. Set the Program Options as required.

Defining Segments

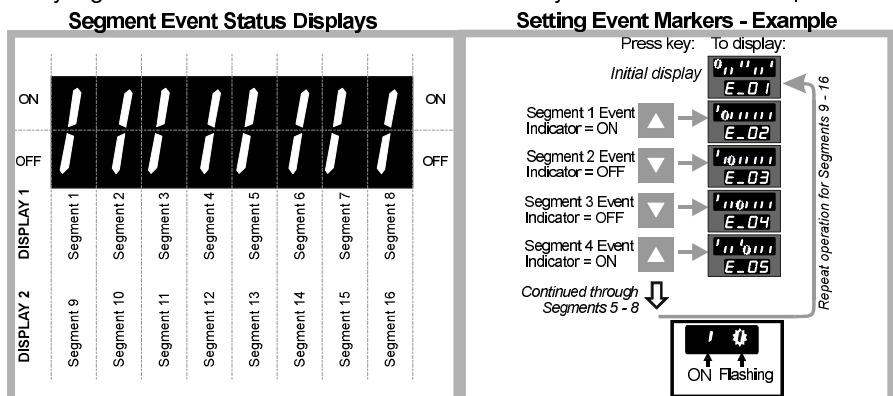


Program Options



Segment Event Status

Every segment has an associated event indicator which may be set ON or OFF as required.



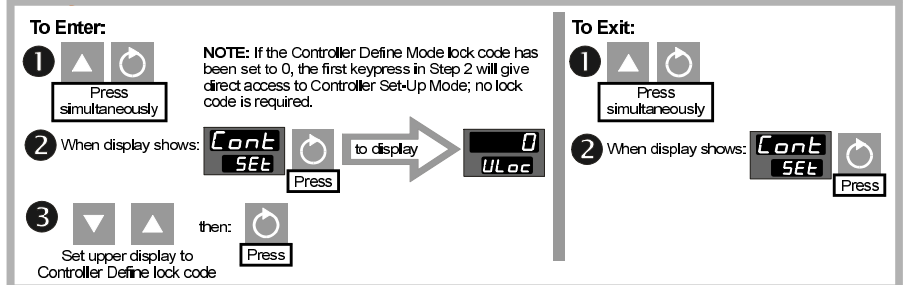
Default Values and Adjustment Ranges

Parameter	Range Minimum	Range Maximum	Default
Ramp Rate	0 (Dwell Segment) -1 (End Segment)	9999 then INF	100
Final (End of Ramp) Setpoint	Range Minimum	Range Maximum	Range Minimum
Segment Time	00:00	99:59	01:00
Number of Cycles	1	9999 then INF	1
Guaranteed Soak Band	1	Span plus OFF	OFF

CONTROLLER SET-UP MODE

NOTE: Set all Configuration Mode parameters as desired before adjusting Set Up Mode parameters.

Entry/Exit



NOTE: If, on entry into Controller Set-Up Mode, the upper display shows all decimal points ON, one or more Configuration Mode parameters have been changed, causing all Controller Set-Up Mode parameters to be defaulted. To clear this display, alter the value/setting of any Controller Set-Up Mode parameter.

Configurator Mode Parameter List

Parameter	Legend	Function	Adjustment Range
Input Filter Time Constant	FILF	Removes extraneous pulses from process (PV) input	OFF, 0.5 secs to 100.0 secs in 0.5-second increments
Process Variable Offset	OFFS	Offset PV + actual PV = PV value used	±input span
Output Power 1	OUT1	Current Output 1 power level	0 to 100% (read only)
Output Power 2	OUT2	Current Output 2 power level	0 to 100% (read only)
Proportional Band 1 (PB1)	PB1	Proportion of input span over which Output 1 power level is proportional to the PV value	0.0 to 999.9% of input span
Proportional Band 2 (PB2)	PB2	Proportion of input span over which Output 1 power level is proportional to the PV value	0.0 to 999.9% of input span
Reset	RSET	Integral Time Constant	1sec to 99min 59sec and OFF
Rate	RATE	Derivative Time Constant	00sec to 99min 59sec
Overlap/Deadband	OL	Portion of PB1 + PB2 in which both outputs are active (overlap - positive value) or inactive (deadband - negative value)	-20% to +20% of PB1 + PB2
Manual Reset (Bias)	BIAS	Bias (percentage of output power) applied to output power	0% to 100% (Output 1 only); -100% to +100% (Output 1 & Output 2)
ON/OFF Differential	DIFF	Output 1 only	0.1% to 10.0% of input span
	DIFF	Output 2 only	
	DIFF	Outputs 1 & 2	
Setpoint Lock	SPL	Enables/disables setpoint (SP) adjustment in Base Mode	OFF - SP adjustable ON - SP not adjustable
Recorder Output Scale Maximum (if option is fitted)	ROPH	Process variable or setpoint value (as appropriate) for which the recorder output is a maximum	-1999 to 9999 (decimal point position as for input range)
Recorder Output Scale Minimum (if option is fitted)	ROPL	Process variable or setpoint value (as appropriate) for which the recorder output is a minimum	-1999 to 9999 (decimal point position as for input range)
Output 1 Power Limit	OPH1	Limits Output 1 power level to protect the process	0% to 100% of full power
Output 1 Cycle Time (not with linear output)	CT1	Limits the frequency of operation of the output relay to optimise relay lifetime	0.5, 1, 2, 4, 8, 16, 32, 64, 128, 256 or 512 seconds
Output 2 Cycle Time (not with linear output)	CT2	Limits the frequency of operation of the output relay to optimise relay lifetime	0.5, 1, 2, 4, 8, 16, 32, 64, 128, 256 or 512 seconds
Process High Alarm 1 value	H.A1	If Alarm 1 is a Process High Alarm, the value of process variable at or above which the alarm will be active	Input Range Minimum to Input Range Maximum
Process Low Alarm 1 value	L.A1	If Alarm 1 is a Process Low Alarm, the value of process variable at or below which the alarm will be active	Input Range Minimum to Input Range Maximum
Band Alarm 1 value	B.A1	If Alarm 1 is a Band Alarm, the band of process variable value, centred on the setpoint, outside which the alarm will be active	0 to input span from (program) setpoint
Deviation Alarm 1 value	D.A1	If Alarm 1 is a Deviation Alarm, gives a value above (positive) or below (negative) the setpoint. If the process variable deviates from the setpoint by a margin greater than this value, the alarm becomes active.	±(input span) from (program) setpoint
Alarm 1 Hysteresis	HHY1	Defines a hysteresis band on the "safe" side of the Alarm 1 value	1 to 250 units
Process High Alarm 2 value	H.A2	If Alarm 2 is a Process High Alarm, the value of process variable at or above which the alarm will be active	Input Range Minimum to Input Range Maximum
Process Low Alarm 2 value	L.A2	If Alarm 2 is a Process Low Alarm, the value of process variable at or below which the alarm will be active	Input Range Minimum to Input Range Maximum
Band Alarm 2 value	B.A2	If Alarm 2 is a Band Alarm, the band of process variable value, centred on the setpoint, outside which the alarm will be active	0 to input span from (program) setpoint

Parameter	Legend	Function	Adjustment Range
Deviation Alarm 2 value ³	dAL2	If Alarm 2 is a Deviation Alarm, gives a value above (positive) or below (negative) the setpoint. If the process variable deviates from the setpoint by a margin greater than this value, the alarm becomes active.	±(input span) from (program) setpoint
Alarm 2 Hysteresis	HH42	Defines a hysteresis band on the "safe" side of the Alarm 2 value	1 to 250 units
Scale Range Decimal Point Position ⁴	rPnt	Defines decimal point position	0 (xxxx), 1 (xxx.x), 2 (xx.xx) or 3 (x.xxx)
Scale Range Maximum ⁴	rhi	Defines the scaled input value when the process variable input is at its maximum value	-1999 to 9999
Scale Range Minimum ⁴	rLo	Defines the scaled input value when the process variable input is at its minimum value	-1999 to 9999
Manual Control Enable/Disable	PoEn	Enables/disables selection of manual control	0 (disabled) or 1 (enabled)
Setpoint Strategy	SPSt	Determines whether or not the setpoint is adjustable in the normal Base Mode display	0 = not adjustable 1 = adjustable
Communications Write Enable/Disable ⁵	LoEn	Enables/disables changing of parameter values via the communications link	0 (disabled) or 1 (enabled)
Controller Set-Up Mode Lock Code	Loc	Defines the four-digit code required to enter Controller set-Up Mode	0 to 9999

NOTES

- Not operative if Proportional Band = 0.
- Switching differential for ON/OFF control output (centred about Setpoint).
- Optional; only one legend will appear for each alarm.
- Only applicable if a DC linear input is fitted.
- Only applicable if Output 2 is fitted as a secondary control (COOL) output.
- Applicable only if the Communications Option is fitted.
- When a program is running, respective to program setpoint.

SERIAL (MODBUS) COMMUNICATIONS

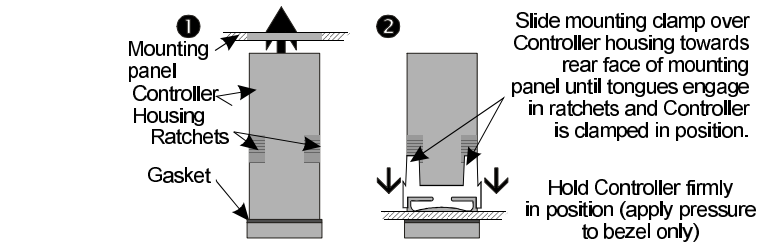
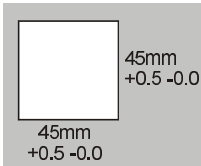
Refer to the full manual for details of this option, available from your supplier.

INSTALLATION

CAUTION: Installation and configuration should be performed only by personnel who are technically-competent and authorised to do so. Local Regulations regarding electrical installation & safety must be observed.

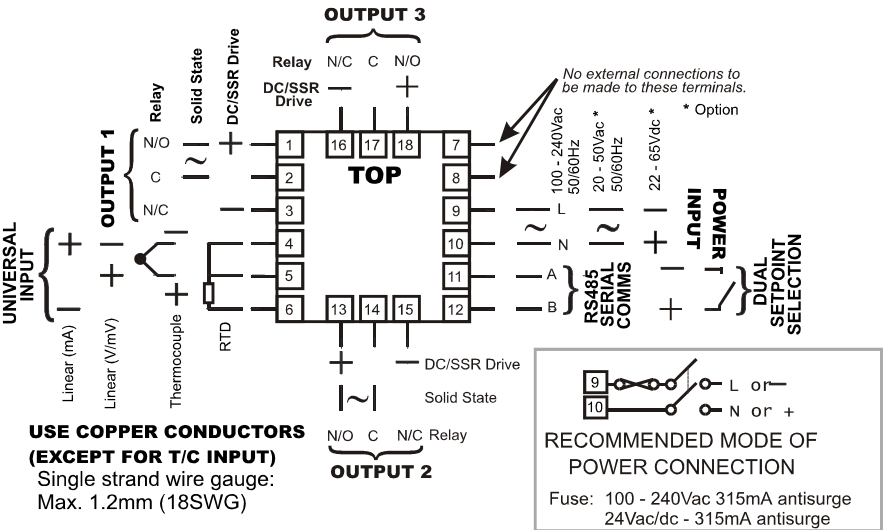
Panel-Mounting

The mounting panel must be rigid and may be up to 6.0mm (0.25 inches) thick. The cut-outs required for the Controllers are shown on the right. Controllers may be mounted side-by-side in a multiple installation for which the cut-out width (for n Controllers) is (48n-4)mm or (1.89n - 0.16) inches.



Caution: Do not remove the panel gasket. It is a seal against dust and moisture

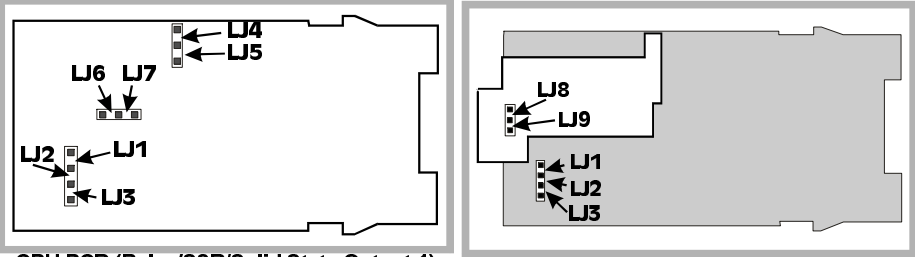
Rear Terminals



- OUTPUT 1:** Always primary control (HEAT) output - Relay, SSR Drive, Solid State or DC.
- OUTPUT 2:** Secondary control (COOL) or Alarm Output - Relay, SSR Drive or Solid State. Event output or program active output - Relay, SSR Drive or Solid State.
- OUTPUT 3:** Alarm Output - Relay or SSR Drive. Recorder Output - DC only for setpoint or process variable.

Input/Output Type Selection

To access link jumpers, REMOVE ALL POWER, grip the side edges of the front panel and pull the instrument out of its housing, *noting its orientation*. To replace, align the CPU PCB and PSU PCB (see right) with their guides in the housing, then slowly push the instrument into position.

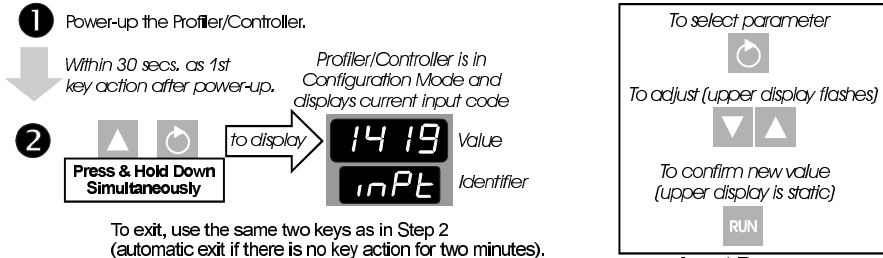


CPU PCB (Relay/SSR/Solid State Output 1)

Input Type	Link Jumpers (CPU PCB)	Output Type	Link Jumpers (PSU PCB)
RTD DC (mV) Touple DC (mA) DC (V)	None (parked) None (parked) LJ3 LJ2 LJ1	DC (0 - 10V) DC (0 - 20mA) DC (0 - 5V) DC (4 - 20mA)	LJ8 LJ9 LJ8 LJ9
Output 1 Type: Relay Solid State SSR Drive DC (0 - 10V) DC (0 - 20mA) DC (0 - 5V) DC (4 - 20mA)	LJ5 & LJ6 LJ5 & LJ6 LJ4 & LJ7 LJ8 LJ9 LJ8 LJ9	DC Output 2/3 Option PCB	LJ9 LJ8

CONFIGURATION MODE

Entry/Exit

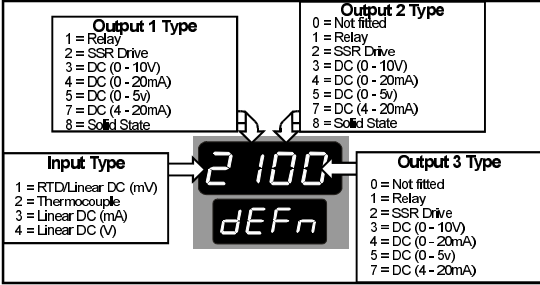


Configuration Mode Parameter Sequence

Parameter	Legend	Description	Type	Range	Code
Input Range	inPTE	A four-digit code (see table on right)	T/C (R)	0 - 1650°C	1127
Output 1 Action	Out1	Reverse-acting Direct-acting	T/C (R)	32 - 3002°F	1128
Alarm 1 Type	ALA 1	Process High Alarm Process Low Alarm Deviation Alarm Band Alarm No alarm	T/C (S)	0 - 1649°C	1227
Alarm 2 Type	ALA 2	As for Alarm 1 Type.	T/C (S)	32 - 3000°F	1228
Alarm Inhibit	inhi	No alarms inhibited Alarm 1 inhibited Alarm 2 inhibited Alarm 1 & Alarm 2 inhibited	T/C (J)	0.0 - 205.4°C	1415
Program Ramp Mode	TYPE	Rate Mode Time Mode	T/C (J)	32.0 - 401.7°F	1416
Output 2 Usage (if fitted)	USE2	Output 2 COOL output Alarm 2 output, direct Alarm 2 output, reverse Alarm 1 OR Alarm 2, direct Alarm 1 OR Alarm 2, reverse Alarm 1 AND Alarm 2, direct Alarm 1 AND Alarm 2, reverse Profile Active output, direct Profile Active output, reverse Event Output, direct	T/C (J)	0 - 450°C	1417
Output 3 Usage (if fitted)	USE3	Alarm 1 output, direct Alarm 1 output, reverse Alarm 1 OR Alarm 2, direct Alarm 1 OR Alarm 2, reverse Alarm 1 AND Alarm 2, direct Alarm 1 AND Alarm 2, reverse Recorder Output - SP H Recorder Output - PV H Profile Active output, direct Profile Active output, reverse Event Output, direct	T/C (J)	32 - 842°F	1418
LEDs Usage	LEDs	Ramp direction: ▲ = positive ▼ = negative ◆ = dwell ▲ = Output 1 ON ▼ = Output 2 ON	T/C (J)	0 - 761°C	1419
Guaranteed Soak Enable/Disable	SoAP	Enabled (Manual holds at end of dwell until RUN key is pressed)	T/C (J)	32 - 1401°F	1420
Delayed Start Enable/Disable	DELY	Enabled (Manual holds at end of dwell until RUN key is pressed)	T/C (T)	-200 - 262°C	1525
Power Loss Recovery	REC	Cold Start (return to Controller SP) Warm Start (resumes program)	T/C (T)	-328 - 503°F	1526

Parameter	Legend	Description
Start On (initial SP value at program start)	StOn	Setpoint at current PV value Setpoint at Controller SP value
Comms. Protocol (if fitted)	baud	MODBUS with odd parity MODBUS with even parity MODBUS with no parity
Comms. Baud Rate	baud	1200, 2400, 4800 or 9600 Baud
Comms. Address	addr	In the range 1 - 255
CJC Enable/Disable	CJC	Enabled Disabled
Controller Set-Up Mode Lock Code	Loc	Read Only display of lock code
Program Define Mode Lock Code	LocP	Read Only display of lock Code

Hardware Definition Code



SPECIFICATION

Input impedance:	Greater than 1MΩ resistive, except for DC mA (4.7Ω) and DC V (47kΩ)
Isolation:	Isolated from all outputs (except SSR Drive) at 240V AC.
REMOTE RUN/HOLD INPUT (OPTION)	
Type:	Voltage-free or TTL-compatible; edge-sensitive. ON-OFF: current program will run. OFF-ON: current program will be held.
Voltage-free operation:	Contacts open = OFF (minimum contact resistance = 5000Ω). Contacts closed = ON (maximum contact resistance = 50Ω).

OUTPUTS

Relay	
Contact Type/Rating:	Single Pole Double Throw (SPDT); 2A resistive at 120/240V AC.
Lifetime:	>500,000 operations at rated voltage/current. Isolated from all other inputs/outputs.

SSR Drive/TTL	
Drive Capability:	SSR >4.2V into 1KΩ minimum.
Isolation:	Not isolated from input or other SSR Drive outputs.

Solid State	
Operating Voltage Range:	20 - 280V rms (47 - 63Hz).
Current Rating:	0.01 - 1A (full cycle rms on-state @ 25°C); derates linearly above 40°C to 0.5A @ 80°C. Isolated from all other inputs/outputs.

DC	
Resolution:	8 bits in 250ms (10 bits in 1S typical, >10 bits in >1S typical).
Isolation:	Isolated from all other inputs/outputs.

OPERATING CONDITIONS FOR INDOOR USE

Ambient Temperature (Operating):	0°C to 55°C.
Ambient Temperature (Storage):	-20°C to 80°C.
Relative Humidity:	20% - 95% non-condensing.
Supply Voltage:	100 240Vac 50/60Hz (standard) 7.5VA 20 - 50V AC 50/60Hz (option) 7.5VA or 22 - 65V DC (option) 5W maximum

ENVIRONMENTAL

Approvals:	CE, UL, CUL.
EMC:	Certified to EN61326.

Safety Considerations:	Complies with EN61010-1:1993.
Front Panel Sealing:	To IP66.

PHYSICAL

Dimensions:	Depth - 110mm (behind panel) Front Panel: Width - 48mm, Height - 48mm
Mounting:	Plug-in with panel mounting fixing strap. Panel cut-out 45mm x 45mm.
Terminals:	Screw type (combination head).
Weight:	0.21kg maximum