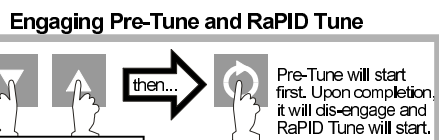
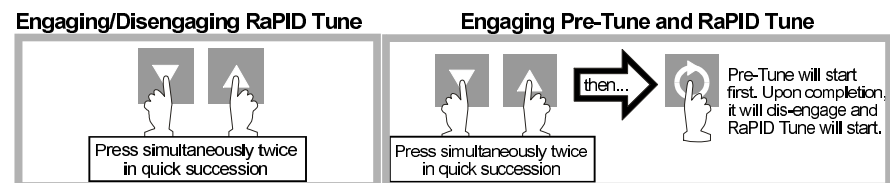
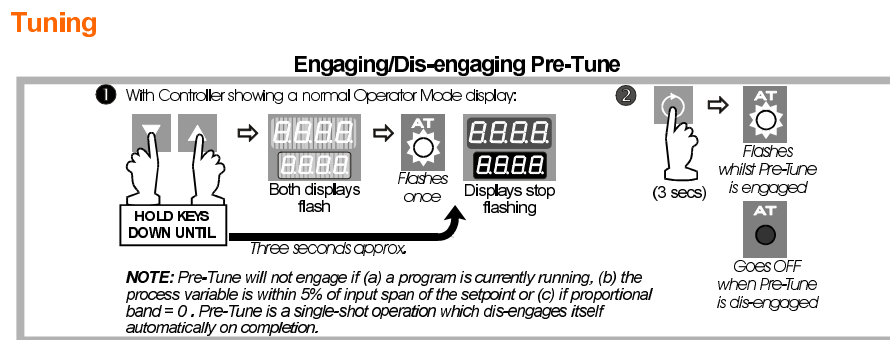
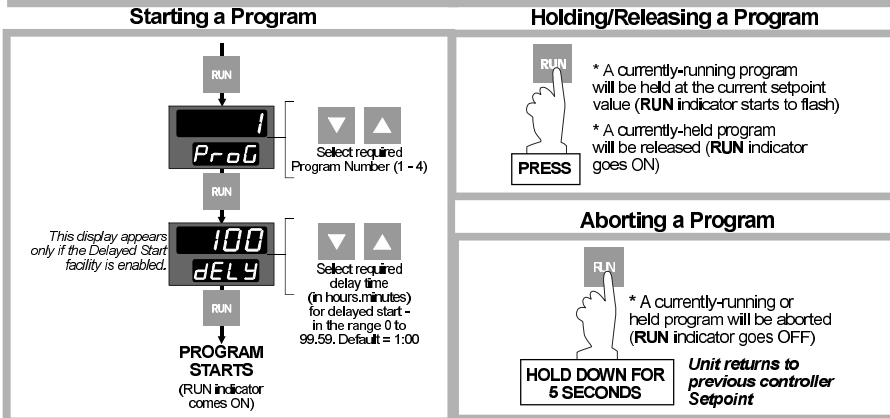
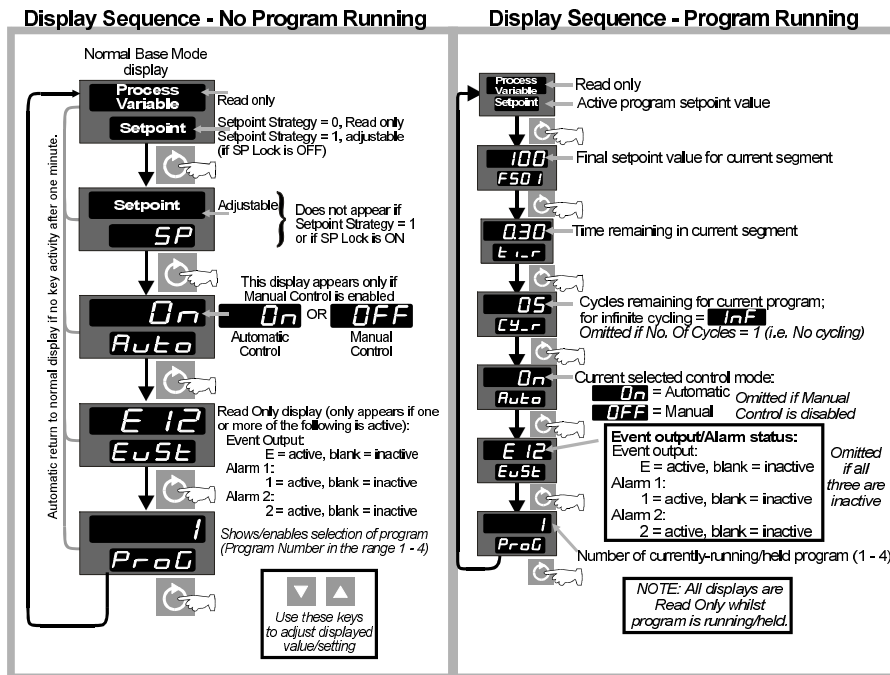


BASE MODE

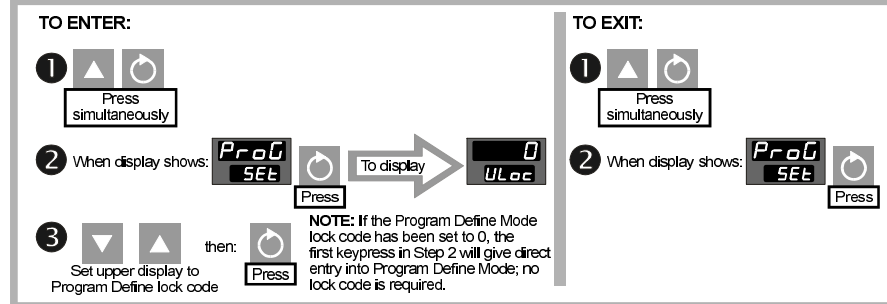
NOTE: Set all Base Mode, Configuration Mode and Set Up Mode parameters as desired before starting normal operations.



PROGRAM DEFINE MODE

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

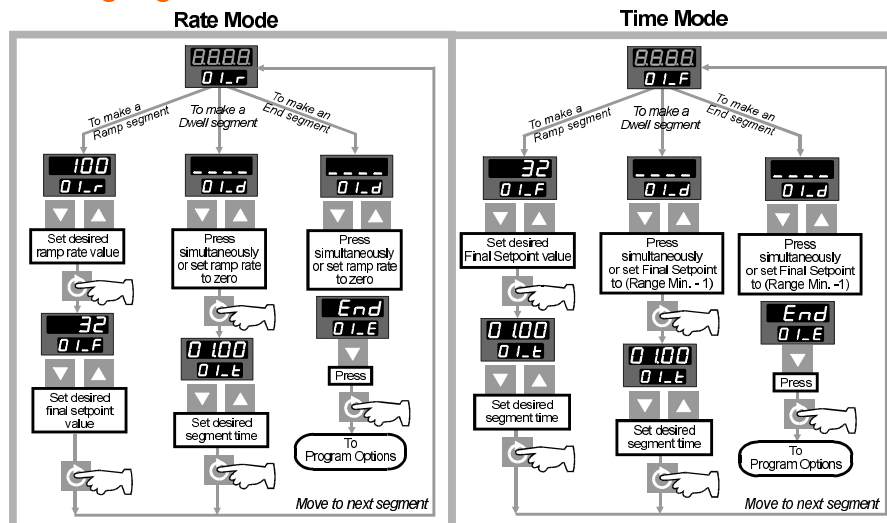
Entry/Exit



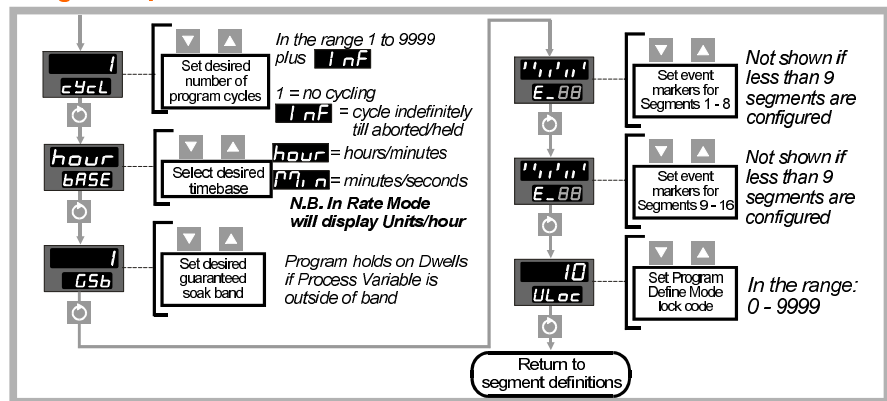
Basic Steps in Creating a Program

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

Defining Segments

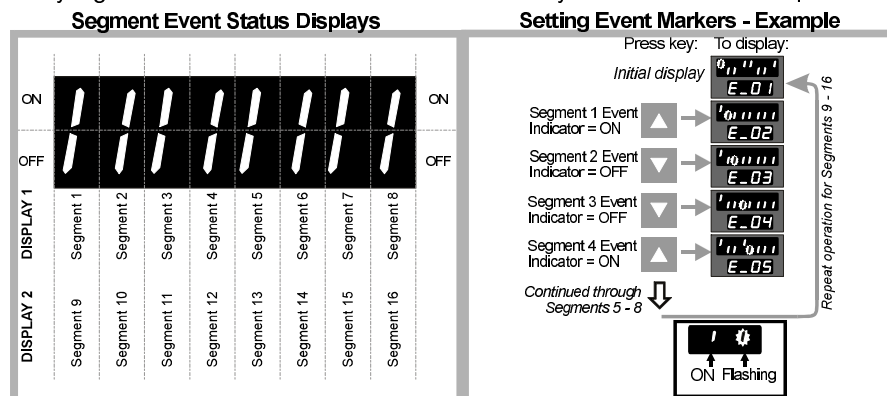


Program Options



Segment Event Status

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



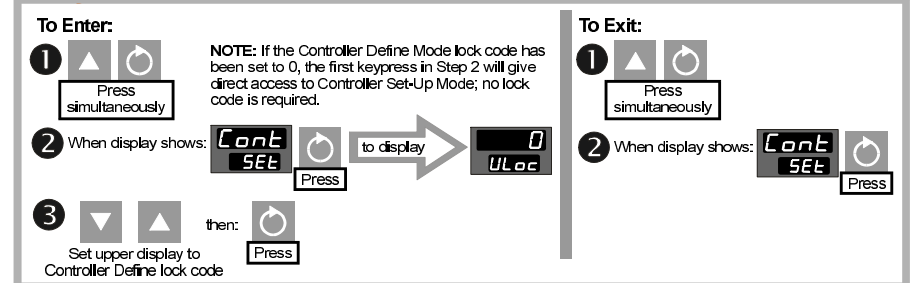
Default Values and Adjustment Ranges

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	FiLT	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	Out 1	Current Output 1 power level	0 to 100% (read only)
Output Power 2 ⁵	Out 2	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) ¹⁶	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 ¹	rSEt	Integral Time Constant	1sec to 99min 59sec and OFF
Rate ¹	rATE	Derivative Time Constant	00sec to 99min 59sec
Overlap/Deadband ^{1,5}	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) ¹	b, AS	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 ²	d, F1 d, F2 d, FF	Output 1 only Output 2 only Outputs 1 & 2	0.1% to 10.0% of input span
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 ¹	OPh, 1	Limits Output 1 power level to protect the process	0% to 100% of full power
Output 1 Cycle Time (not with linear output)	CLt 1	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)	CLt 2	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 ³	h-AL 1	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 ³	L-AL 1	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 ³	b-AL 1	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 ³	d-AL 1	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	HHY 1	Defines a hysteresis band on the "safe" side of the Alarm 1 value	1 to 250 units
Process High Alarm 2 value ³	h-AL 2	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 ³	b-AL 2	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 ^{3,7}	L-AL 2	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

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

SERIAL (MODBUS) COMMUNICATIONS

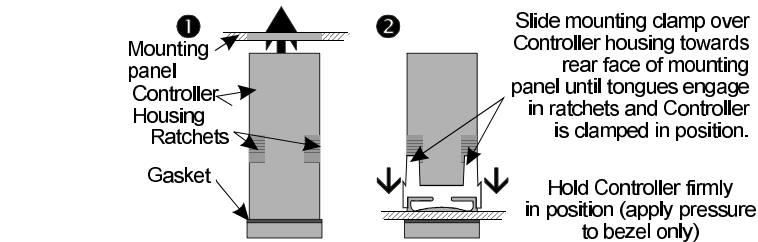
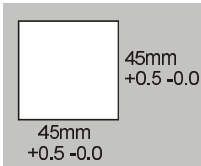
Refer to the full manual for details of this option, available from your supplier.

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.

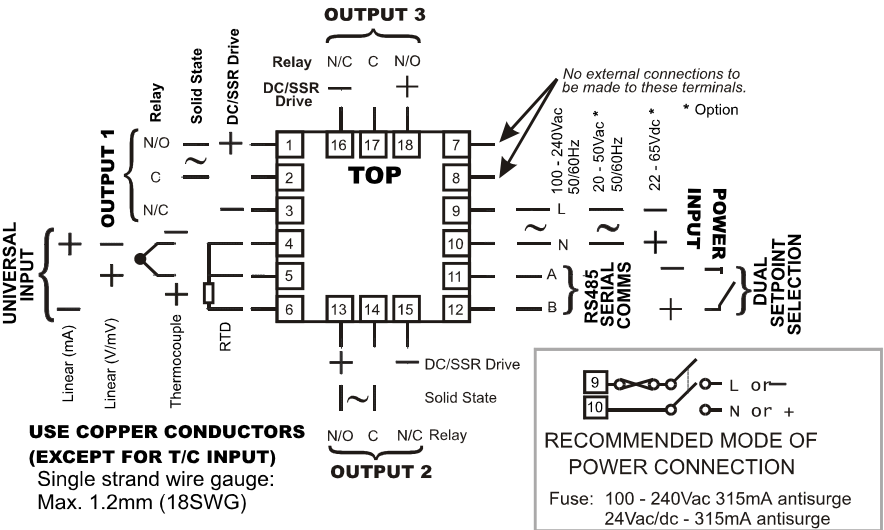
Panel-Mounting

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

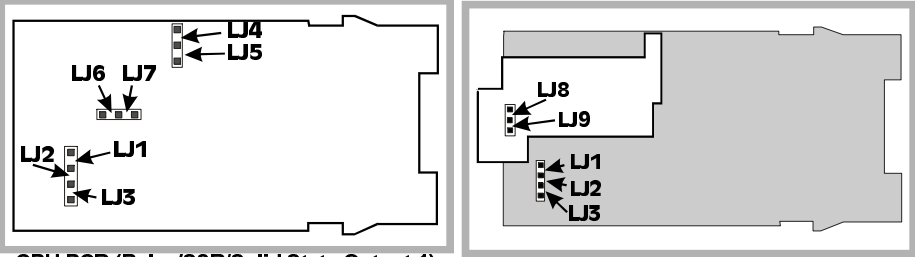
Rear Terminals



- 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.

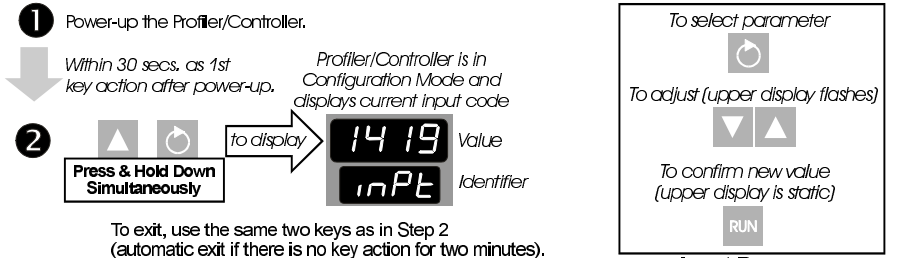


CPU PCB (Relay/SSR/Solid State Output 1)

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

CONFIGURATION MODE

Entry/Exit

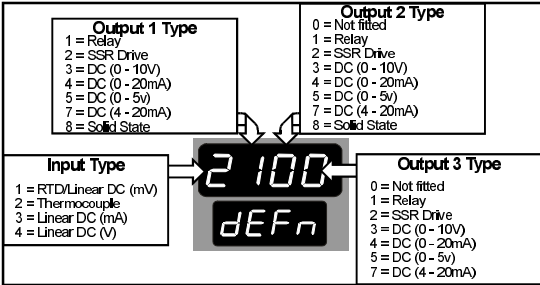


Configuration Mode Parameter Sequence

Parameter	Legend	Description	Type	Range	Code
Input Range	inPt	A four-digit code (see table on right)	T/C (R)	0 - 1650°C	1127
Output 1 Action	Out1	Reverse-acting	T/C (R)	32 - 3002°F	1128
		Direct-acting	T/C (S)	0 - 1649°C	1227
			T/C (S)	32 - 3000°F	1228
Alarm 1 Type	ALA 1	Process High Alarm	T/C (J)	0.0 - 205.4°C	1415
		Process Low Alarm	T/C (J)	32.0 - 401.7°F	1416
		Deviation Alarm	T/C (J)	0 - 450°C	1417
		Band Alarm	T/C (J)	32 - 842°F	1418
		No alarm	T/C (J)	0 - 761°C	1419
Alarm 2 Type	ALA 2	As for Alarm 1 Type.	T/C (J)	32 - 1401°F	1420
Alarm Inhibit	inhi	No alarms inhibited	T/C (T)	-200 - 262°C	1525
		Alarm 1 inhibited	T/C (T)	-328 - 503°F	1526
		Alarm 2 inhibited	T/C (T)	0.0 - 260.6°C	1541
		Alarm 1 & Alarm 2 inhibited	T/C (T)	32.0 - 501.0°F	1542
Program Ramp Mode	TYPE	Rate Mode	T/C (K)	-200 - 760°C	6726
		Time Mode	T/C (K)	-328 - 1399°F	6727
Output 2 Usage (if fitted)	USE 2	Output 2 COOL output	T/C (K)	-200 - 1373°C	6709
		Alarm 2 output, direct	T/C (K)	-328 - 2503°F	6710
		Alarm 2 output, reverse	T/C (L)	0.0 - 205.7°C	1815
		Alarm 1 OR Alarm 2, direct	T/C (L)	32.0 - 402.2°F	1816
		Alarm 1 OR Alarm 2, reverse	T/C (L)	0 - 450°C	1817
		Alarm 1 AND Alarm 2, direct	T/C (L)	32 - 841°F	1818
		Alarm 1 AND Alarm 2, reverse	T/C (L)	0 - 762°C	1819
		Profile Active output, direct	T/C (L)	32 - 1403°F	1820
		Profile Active output, reverse	T/C (B)	211 - 3315°F	1934
		Event Output, direct	T/C (B)	100 - 1824°C	1938
Output 3 Usage (if fitted)	USE 3	Alarm 1 output, direct	T/C (N)	0 - 1399°C	5371
		Alarm 1 output, reverse	T/C (N)	32 - 2550°F	5324
		Alarm 1 OR Alarm 2, direct	T/C (N)	0 - 2316°C	5111
		Alarm 1 OR Alarm 2, reverse	T/C (N)	32 - 4201°F	5112
		Alarm 1 AND Alarm 2, direct	T/C (N)	0 - 2316°C	5111
		Alarm 1 AND Alarm 2, reverse	T/C (N)	32 - 4201°F	5112
		Recorder Output - SP H	RTD	0 - 800°C	7220
		Recorder Output - PV H	RTD	32 - 1471°F	7221
		Profile Active output, direct	RTD	32 - 571°F	2229
		Profile Active output, reverse	RTD	-100.9 - 100.0°C	2230
		Event Output, direct	RTD	-149.7 - 211.9°F	2231
			RTD	0 - 300°C	2251
			RTD	0.0 - 100.9°C	2295
			RTD	32.0 - 213.6°F	2296
			RTD	-200 - 206°C	2297
			RTD	-328 - 402°F	2298
			RTD	-100.9 - 537.3°C	7222
			RTD	-149.7 - 999.1°F	7223
			DC	0 - 20mA	3413
			DC	4 - 20mA	3414
			DC	0 - 50mV	4443
			DC	10 - 50mV	4499
			DC	0 - 5V	4445
			DC	1 - 5V	4434
			DC	0 - 10V	4446
			DC	2 - 10V	4450

Parameter	Legend	Description
Start On (initial SP value at program start)	SELP	Setpoint at current PV value
Comms. Protocol (if fitted)	baud	MODBUS with odd parity
Comms. Baud Rate	baud	MODBUS with even parity
Comms. Address	Addr	MODBUS with no parity
CJC Enable/Disable	CJC	1200, 2400, 4800 or 9600 Baud
Controller Set-Up Mode Lock Code	LocL	In the range 1 - 255
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