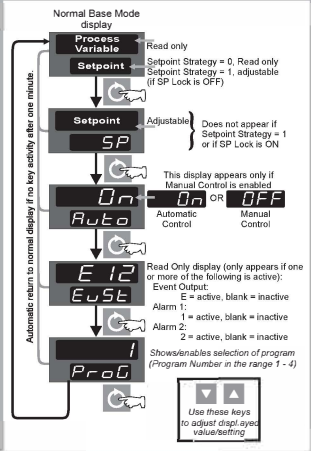


1-16 DIN PROFILER CONTROLLER CONCISE PRODUCT MANUAL (59228-4)

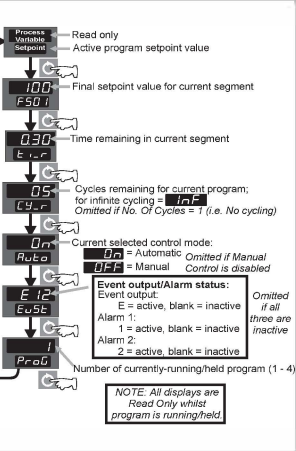
BASE MODE

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

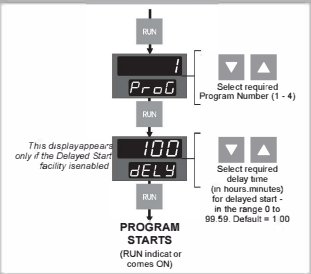
Display Sequence - No Program Running



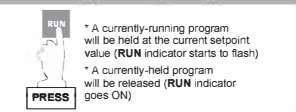
Display Sequence - Program Running



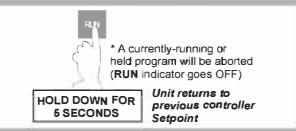
Starting a Program



Holding/Releasing a Program

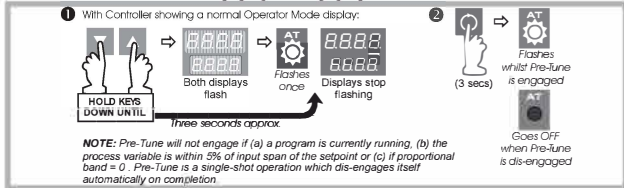


Aborting a Program

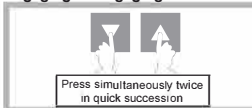


Tuning

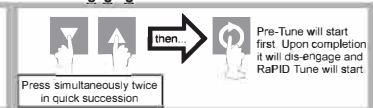
Engaging/Dis-engaging Pre-Tune



Engaging/Disengaging RaPID Tune



Engaging Pre-Tune and RaPID Tune

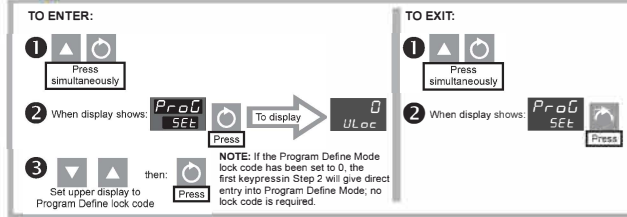


WARNING: This product can expose you to chemicals including arsenic, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov

PROGRAM DEFINE MODE

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

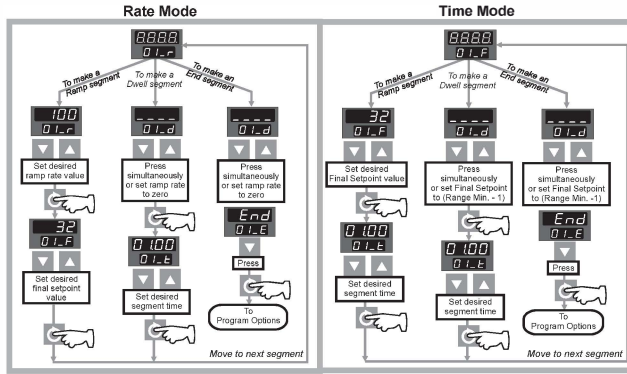
Entry/Exit



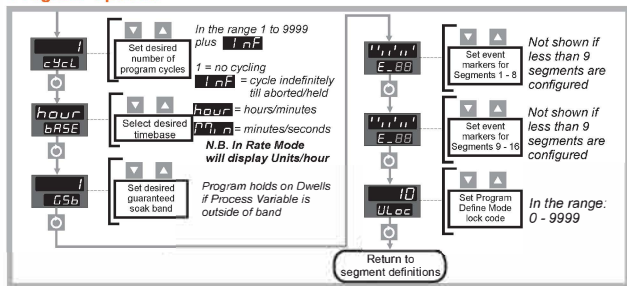
Basic Steps in Creating a Program

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

Defining Segments

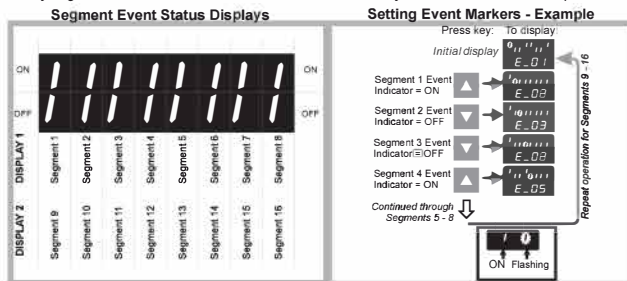


Program Options



Segment Event Status

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



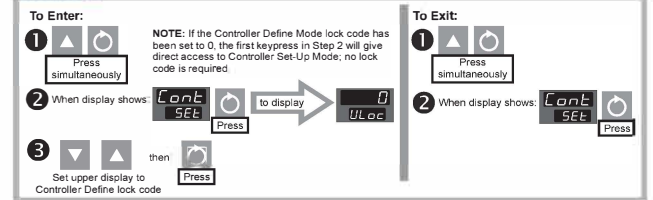
Default Values and Adjustment Ranges

Parameter	Range Minimum	Range Maximum	Default
Ramp Rate	0 (Dwell Segment)	9999 then INF	100
Final (End of Ramp) Setpoint	-1 (End Segment)	Range Maximum	Range Minimum
Segment Time	00.00	99.99	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	FLTR	Removes extraneous pulses from PV input.	OFF, 0.5 secs to 100.0 increments
Process Variable Offset	OFFS	Offset PV + actual PV = PV value used	:input span
Output Power 1	OPW1	Current Output 1 power level	0 to 100% (read only)
Output Power 2	OPW2	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	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	RES1	Integral Time Constant	1sec to 99min 59sec and OFF
Rate 1	RATE	Derivative Time Constant	0.05sec to 99min 59sec
Overlap/Deadband 1.5	OLDB	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	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 1	DOFF1	Output 1 only	0.1% to 10.0% of input span
	DOFF2	Output 2 only	
	DOFF3	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 1	OPH1	Limits Output 1 power level to protect the process	0% to 100% of full power
Output 1 Cycle Time (not with linear output)	OLT1	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)	OLT2	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	HRA1	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	LRA1	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	BRA1	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	DRA1	If Alarm 1 is a Deviation Alarm, gives a value above (positive) or below (negative) the setpoint by which the process variable deviates from this value, the alarm becomes active	±(input span) from (program) setpoint
Alarm 1 Hysteresis	AH1	Defines a hysteresis band on the "safe" side of the Alarm 1 value	1 to 250 units
Process High Alarm 2 value	HRA2	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	LRA2	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	BRA2	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	d-AR2	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	hHY2	Defines a hysteresis band on the "safe" side of the Alarm 2 value.	1 to 250 units
Scale Range Decimal Point Position	rPnt	Defines the scaled input value when the process variable input is at its maximum value.	0 (xxxx), 1 (xxx.x), 2 (xx.xx) or 3 (x.xxx)
Scale Range Maximum	rMx	Defines the scaled input value when the process variable input is at its minimum value.	-1999 to 9999
Scale Range Minimum	rLm	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	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

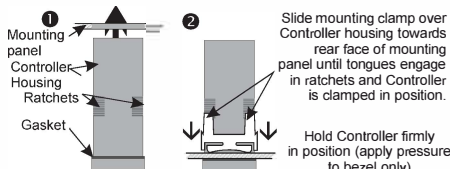
Refer to the full manual for details of this option, available from your supplier.

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.

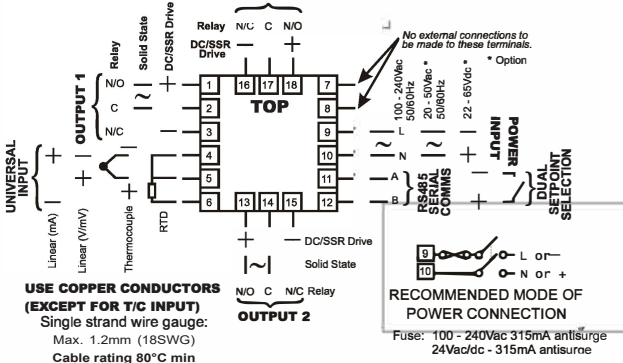
Panel-Mounting

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.
WARNING: This product can expose you to chemicals including arsenic, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov

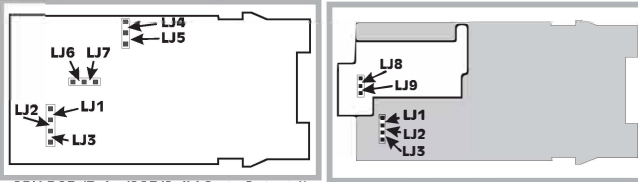
Rear Terminals



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

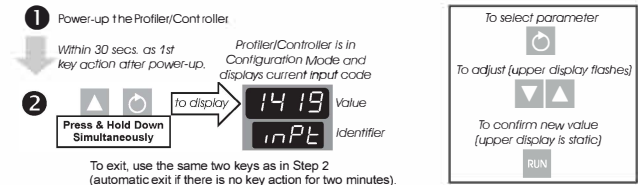
To access link jumpers, REMOVE ALL POWER, grip the side edges of the front panel and pull the instrument out of its housing, noting its orientation. To replace, align the CPU PCB and PSU PCB (see right) with their guides in the housing, then slowly push the instrument into position.



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

CONFIGURATION MODE

Entry/Exit



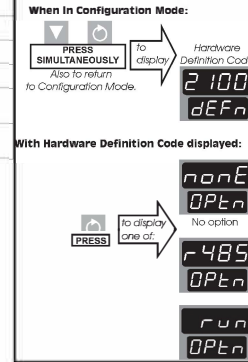
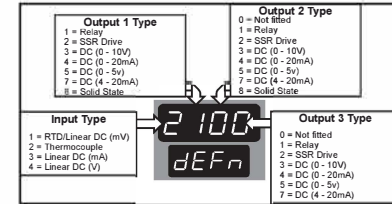
Configuration Mode Parameter Sequence

Parameter	Legend	Description
Input Range	INPR	A four-digit code (see table on right).
Output 1 Action	OUT1	Reverse-acting
Alarm 1 Type	ALAR1	Process High Alarm
Alarm 2 Type	ALAR2	Process Low Alarm
Program Ramp Mode	PRMP	Rate Mode
Output 2 Usage (if fitted)	USE2	Output 2 COOL output
Output 3 Usage (if fitted)	USE3	Alarm 1 OR Alarm 2, direct
LEDs Usage	LEDU	Alarm 1 OR Alarm 2, reverse
Guaranteed Soak Enable/Disable	SOAK	Alarm 1 AND Alarm 2, direct
Delayed Start Enable/Disable	DELST	Alarm 1 OR Alarm 2, direct
Power Loss Recovery	POWR	Alarm 1 AND Alarm 2, reverse

Input Ranges	Type	Range	Code
T/C (R)	T/C (R)	0 - 1650°C	1127
T/C (S)	T/C (S)	32 - 3002°F	1128
T/C (S)	T/C (S)	-200 - 1940°F	1227
T/C (S)	T/C (S)	32 - 3000°F	1228
T/C (J)	T/C (J)	0.0 - 205.4°C	1415
T/C (J)	T/C (J)	32.0 - 401.7°F	1416
T/C (J)	T/C (J)	0 - 450°C	1417
T/C (J)	T/C (J)	32 - 842°F	1418
T/C (J)	T/C (J)	0 - 781°C	1419
T/C (J)	T/C (J)	32 - 1401°F	1420
T/C (T)	T/C (T)	-200 - 200°C	1525
T/C (T)	T/C (T)	-328 - 503°F	1526
T/C (T)	T/C (T)	0 - 260.8°C	1541
T/C (T)	T/C (T)	32.0 - 501.9°F	1542
T/C (K)	T/C (K)	-200 - 760°C	6726
T/C (K)	T/C (K)	-328 - 1398°F	6727
T/C (K)	T/C (K)	-200 - 1373°C	6709
T/C (K)	T/C (K)	-328 - 2503°F	6710
T/C (L)	T/C (L)	0.0 - 205.7°C	1815
T/C (L)	T/C (L)	32.0 - 402.2°F	1816
T/C (L)	T/C (L)	0 - 450°C	1817
T/C (L)	T/C (L)	32 - 841°F	1818
T/C (L)	T/C (L)	0 - 762°C	1819
T/C (L)	T/C (L)	32 - 1402°F	1820
T/C (B)	T/C (B)	211 - 3315°F	1934
T/C (B)	T/C (B)	100 - 1824°C	1938
T/C (N)	T/C (N)	0 - 1999°C	5371
T/C (N)	T/C (N)	32 - 1402°F	5324
T/C	T/C	0 - 2316°C	5111
(C/W/S)	(C/W/S)	32 - 4201°F	5112
(C/W/S)	(C/W/S)	32 - 4201°F	2297
RTD	RTD	0 - 800°C	7220
RTD	RTD	32 - 1471°F	7221
RTD	RTD	32 - 571°F	2299
RTD	RTD	-100.9 - 100.0°C	2230
RTD	RTD	-149.7 - 211.9°F	2231
RTD	RTD	0 - 300°C	2251
RTD	RTD	0.0 - 100.9°C	2295
RTD	RTD	32.0 - 213.6°F	2296
RTD	RTD	-200 - 206°C	2297
RTD	RTD	-328 - 402°F	2298
RTD	RTD	-100.9 - 537.3°C	7222
RTD	RTD	-149.7 - 899.1°F	7223
DC	DC	0 - 20mA	3413
DC	DC	4 - 20mA	3414
DC	DC	0 - 50mV	4443
DC	DC	10 - 50mV	4499
DC	DC	0 - 5V	4445
DC	DC	1 - 1V	4434
DC	DC	0 - 10V	4446
DC	DC	2 - 10V	4450

Parameter	Legend	Description
Start On (initial SP value at program start)	STOn	Setpoint at current PV value
Comms Protocol (if fitted)	hMod	MODBUS with odd parity
Comms Baud Rate	PRba	MODBUS with even parity
Comms Address	Addr	1200, 2400, 4800 or 9600 Baud
Comms Enable/Disable	ENba	In the range 1 - 255
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

Specification	Value		
UNIVERSAL INPUT			
Input impedance:	Greater than 1MΩ resistive, except for DC mA (4.7k) 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:	EN61326:2013. This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.		
Safety Considerations	UL61010-1 Edition 3 & EN61010 version 2010.		
Front Panel Sealing:	IP66		
PHYSICAL			
Dimensions:	Depth - 110mm (behind panel) Front Panel: Width - 48mm, Height - 48mm		
Mounting Terminals:	Plug-in with panel mounting fixing strap. Panel cut-out 45mm x 45mm. Screw type (combination head).		
Weight:	0.21kg maximum		
SAFETY AND WARNING SYMBOLS			
	Risk of electric shock.		Caution, refer to the manual.
	Alternating or direct current could be present.		Equipment protected through-out by double insulation.