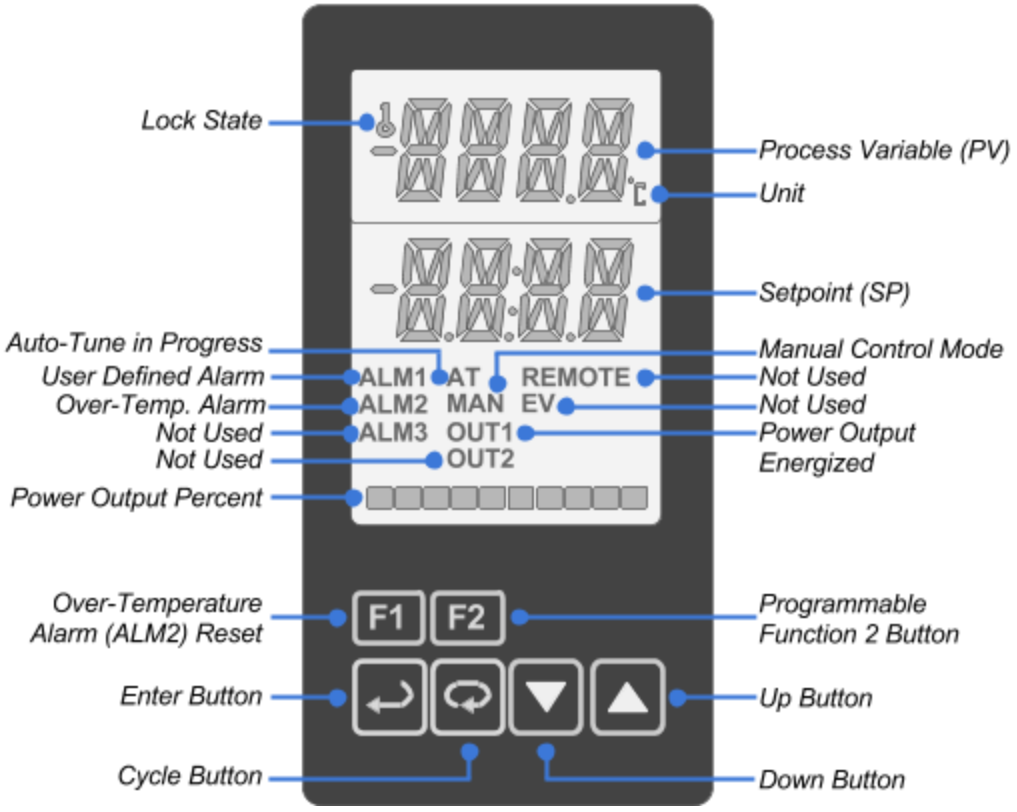
ISPA & IFPA Shift Controls Quick Reference Guide

This document is not a replacement for the operations manual. Please read the operations manual for installation, operating and safety information.

Refer to this document for common parameters and a brief explanation of controller programming.

Temperature Controller Overview

Figure 1 is the PID temperature controller, mounted in the front door of the enclosure.



Description of controller front panel buttons

F1 - programmable button, the default action is to reset a latched over-temperature alarm

F2 - programmable button, the default action is to return to main operation screen

Refer to the function key table, Table 5.4.2, of the operations manual for information on programming the function buttons.


Enter - multiple functions:

1. Press to confirm a changed value
2. Press for less than 3 seconds to enter the Regulation Mode menu (Level 2)
3. Press for more than 3 seconds to enter the Initial Setting Mode menu (Level 3)
4. Press to return to the Operation Level and the Main Display


Cycle - multiple functions:

1. Press to enter the Operation mode menu (Level 1)
2. Press to cycle between parameters within a menu
3. When editing a numeric value, press to change which digit to edit


Down - used to change numeric values or to cycle down between settings


Up - used to change numeric values or to cycle up between settings

When changing settings with the arrow buttons, the value will flash, indicating a change. Press the Enter button to confirm the change and save the new setting.

Press the Enter button to exit a menu structure and return to the main operating display.

Changing the Setpoint

Change the setpoint from the main operations display. If in a sub menu, press the enter button to return to the main operation display, showing the setpoint and process value.

Use the up and down arrows to adjust the setpoint. When editing the setpoint, the value will flash until pressing the enter button to confirm the value change.

Door mounted Control Switch

Control Switch (SAFE/RUN Switch)
The control switch has two positions, RUN and SAFE. The control switch function is to set the controller mode and to energize or de-energize the power disconnect contactor.

Run
When the switch is in the run position, the controller software is placed in a run mode, where its output is allowed to control the power controller. Run also closes the main power contactor, providing an electrical connection with the heater.

Safe
When the switch is in the safe position, the controller software is placed in a stop mode, where its output is forced to 0% output (off), regardless of the setpoint. Safe also opens the main power contactor, so that power can not be applied to the heater.

Latching Over-temperature Alarm

Over-temperature Disconnect Alarm (Alarm 2)
The over-temperature alarm value is set from the factory as the high range of the thermocouple input. The high limit value can be changed from parameter 'AL2H' (1-08) in the Operation Mode menu (Level 1).

The over-temperature alarm has the same functionality as the Control switch. When the over-temperature alarm value is exceeded, two things happen. First, the controller is set to the Stop mode to turn off the controller's output. Second, the main power contactor is opened, electrically disconnecting the heater load.

The factory default mode for the over-temperature alarm is latching, meaning the operator must press the 'F1' key on the front of the controller to acknowledge and reset the alarm and re-enable the controller to Run mode . Until the alarm is reset, the controller will remain in the Stop mode and the power contactor will remain open.

Common Parameters

Please refer to the operations manual for detailed information on all menu parameters. Tables 1-3 highlight a *sub-set* of common parameters common for initial setup.

5.1 Operation Mode Menu (Level 1)

Press the Enter button to exit a menu structure and return to the main operating display.
Press the Cycle button to enter the Operation Mode menu and cycle between parameters.

Table 1 Basic Operation Mode Parameters

Operation Mode Parameters - Cycle button to scroll between parameters Note: Not all parameters are always accessible. For example, if alarm 3 mode is not configured, its high and low alarm values will not be available to edit.				
Parameter Name (Parameter Number)	Display Symbol	Description	Factory Default Value	Customer Value
Operation Mode, Main Display	1234	Process Value (PV) - Measured process temperature (upper line) Setpoint (SP) - Target process temperature (lower line)	N/A	
SP (1-04)	SP	Number of decimal places. Change to 0 to display temperatures over 999.9	1	
AL2H (1-08) Accessible when 'ALA2' in alarm mode 1,2,4,5,7,8	AL2H	Alarm 2 (over-temperature alarm) high temperature value	High range of thermocouple input: 1300 deg C, type K 1200 deg C, type J 2372 deg F, type K 2192 deg F, type J	

5.2 Regulation Mode Menu (Level 2)

Press the Enter button for less than 3 seconds, to enter the regulation mode menu.
Scroll through Regulation Mode parameters by pressing the Cycle button.
Press the Enter button to exit a menu structure and return to the main operating display.

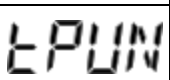
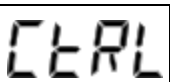
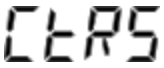
Table 2 Regulation Mode Parameters (Tuning)

Regulation Mode Parameters - cycle button to scroll between parameters Note: Not all parameters are always accessible.				
PID Tuning See Appendix B for more information on PID algorithms and their tuning parameters See Appendix C for more information on auto-tuning				
Parameter Name (Parameter Number)	Display Symbol	Description	Factory Default Value	Customer Value
The following tuning parameters are only accessible when the 'CtRL' parameter (3-05) is set to 'PID' (default value) or 'FUZZ'				
At (2-01) Accessible when: 1. 'tUNE' parameter set to At (default) 2.'R-S' in RUN mode (front control switch in Run)		Auto-tune mode on or off. On enables the auto-tune sequence, to calculate tuning parameters. Initiates cycles of 100% and 0% output.	Off	
Pn (2-06) Where n (0-5) is the number of the selected PID tuning group, from the 'PID' parameter		The corresponding proportional value of the selected PID tuning group, 0-5.	P0 = 47.6 P1 = 19.9 P2 = 42.9 P3 = 47.6 P4 = 47.6 P5 = 47.6	
In (2-07) Where n (0-5) is the number of the selected PID tuning group, from the 'PID' parameter		The corresponding integral value of the selected PID tuning group, 0-5.	I0 = 260 seconds I1 = 186 I2 = 58 I3 = 260 I4 = 260 I5 = 260	
dn (2-08) Where n (0-5) is the number of the selected PID tuning group, from the 'PID' parameter		The corresponding derivative value of the selected PID tuning group, 0-5.	D0 = 41 seconds D1 = 46 D2 = 14 D3 = 41 D4 = 41 D5 = 41	

5.3 Initial Setting Mode Menu (Level 3)

Press the Enter button for more than 3 seconds, to enter the initial setting mode menu.
Scroll through initial setting mode parameters by pressing the Cycle button.
Press the Enter button to exit a menu structure and return to the main operating display.

Table 3 Initial Setting Mode Parameters (Sensor Input and Control Modes)

Initial Setting Mode Parameters - Cycle button to scroll between parameters Note: Not all parameters are always accessible.				
Sensor Input Configuration				
Parameter Name (Parameter Number)	Display Symbol	Description	Factory Default Value	Customer Value
INPt (3-01)		Sensor input type. K type thermocouple, -200 C - 1300 C, J type thermocouple -100 C - 1200 C. See the sensor input types table, Table 5.4.1, below for full list of options.	K (J thermocouple wiring optional)	
tPUN (3-02)		Temperature units for the PV measurement, C or F.	C	
Control Modes				
CtRL (3-05)		Controller mode: 'PID' - PID algorithm 'oNoF' - on/off control (N/A) 'MANU' - manual output control 'FUZZ' - Fuzzy logic '2PID' - 2 output PID control (N/A)	PID	
CtRS (3-06)		Setpoint Control mode: 'CoNS' - Constant setpoint 'PRoG' - Ramp/Soak programming - see Appendix D 'SLoP' - Setpoint slope control ('SVSL' parameter (2-18) in Regulation Mode menu defines rising slope rate)	CoNS	