JConn Inv. PID Controller Instruction Manual

This information is specific to the Mypin TA4 based controller sold by JConn Inv.
but it should work for most TA4 types - within limits.

Table of Contents

Overview and External Components

The Front Panel

Power Switch

Lighted when on

Status LEDs

Red LED ON – Process to Hot
Blue LED ON – Process to Cold
Green LED ON – Process within limits

The Mypin Controller

"Process Value" or 'PV' Display

When in Normal mode
Displays the **Current Temperature** as read by the sensor.

"Set Value" or 'SV' Display

When in Normal mode
Displays the **Desired Temperature** as set by the user.

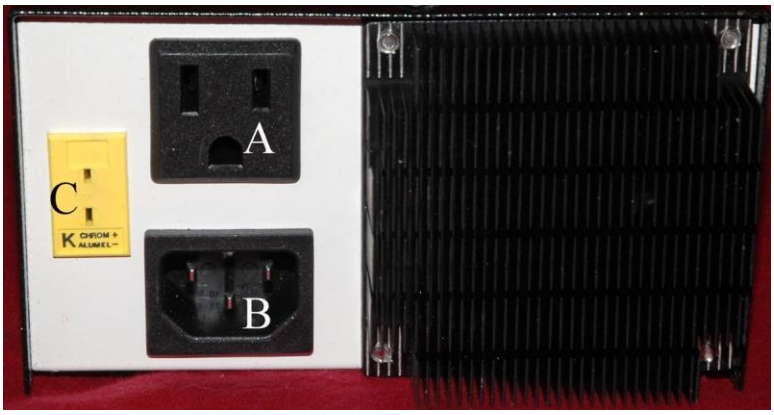
Status LEDs

'Out1' : Main Control On = Active
'Out2' : On = Alarm 2 Active
'AL1' : On = Alarm 1 Active
'AT' : On = Training Mode

Buttons

From Left to Right: 'SET' 'AT' 'UpArrow' 'DownArrow'

The Rear Panel



‘A’ = Power Output Jack
This goes to controlled device

‘B’ = Power Input Jack
Power In from wall

‘C’ = K type Thermocouple Jack

Next to these Jacks is the Heatsink.
Take care not to crush the fins.
Do not cover or obstruct the air flow to the sink.

Usage

Plug Device to be controlled into ‘Power Output Jack’.
Plug the power cord into ‘Power Input Jack’.
Plug power cord into a wall socket.
Plug Thermocouple into Thermocouple Jack.
If the Device to be controlled has a control knob – turn this to the Maximum setting.
The power switch on the front of the Unit now controls power to both the Unit and the Device.

Using the Unit to melt lead

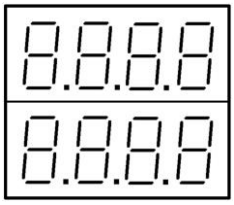
The thermocouple should be mounted so that the sensing tip is approximately ½” from the bottom of the melting pot. It should be <u>at least</u> ½” from the side of the pot as well.

Using the Unit for a Lube/sizer

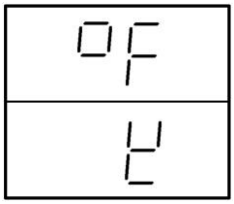
The thermocouple should be mounted so that the sensing tip is as close to the lube reservoir as practical.

The POST (Power On Self Test)

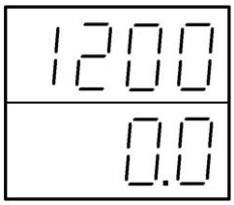
When Power is first applied to the unit, it enters it's POST.



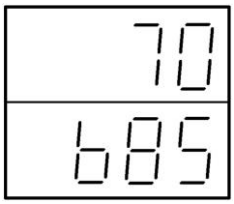
First All LED display segments as well as the 4 Status LEDS are lighted for Approximately 2 seconds.



Next the 'PV' display will show the Type of Temperature being displayed - ºC or ºF
At the same time the SV display will show the current input type:
See appendix A for the possible values of Input type.



After 2 seconds The displays will change.
PV will display 'Upper Input Limit'
This the maximum value the input can reach,
any greater and the unit will display an error code of "UUUU".
SV will display 'Lower Input Limit'
This the Minimum value input can reach, any less and the unit will display an error code.



After 2 seconds The displays will change.
PV will show current Measured Temperature.
SV will show the current set value.

The unit now begins normal operating mode.

Setting the Temperature

With the unit in normal operating mode.
Press and release the "AT" button.
The right digit of the lower (SV) display (the '1s' digit) should flash, and leading zeros should appear in the upper (PV) display.

If you press the "AT" button again the '10's digit will flash.
If you press the "AT" button again the '100's digit will flash.
If you press the "AT" button again the '1000's digit will flash.
If you press the "AT" button again the '1's digit will flash.

Press and release "AT" until the desired digit flashes then use the up/down arrow buttons to set that digit to the desired value.
As soon as a change is made the SV will display "leading zeros"

Use the "AT" button to select the next digit to change.

Repeat to set other digits.

When the desired value is displayed in 'SV' - Press "SET" to lock those values in.

Auto Tuning the Controller

Auto Tuning can be done repeatedly, It does not harm the unit.

With everything plugged in, alloy in the pot, and the unit on.

Set the desired temperature.
Press and Hold 'AT" for at least 3 seconds, or until the "AT" LED lights.
When the "AT" LED extinguishes, the unit is trained.

Primary Parameter Menu

This is where most of the operational parameters of the unit are stored.

To enter the Menu, Press and hold the 'SET' button for more than 3 seconds.

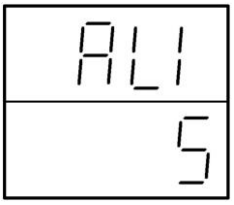
This will enter the menu. after that each press of 'SET' will advance to the next parameter in the menu.

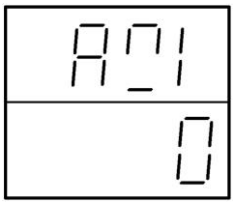
Once a parameter is selected, to change it is similar to setting temperature.
Press and release the 'AT' button.
Use 'UpArrow' or 'DownArrow' to modify value shown in SV.
Press 'Set' to lock in the change.

The Alarms

In a JConn Inv. Controller
These parameters control the LED warning system
Changing them will affect that warning system!

ALARM 1 ALARM Function 1

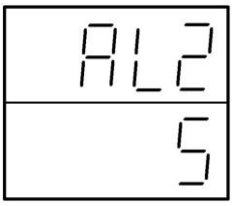


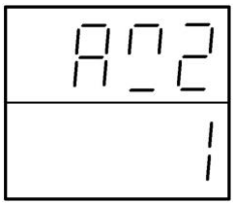


Associated with Alarm 1 is the next parameter.
This the 'Alarm 1 Function' Parameter.
'AL 1' contains the Temperature that is use by the Alarm,

How that number is used is determined by the 'Alarm Function' parameter.

ALARM 2 ALARM Function 2





Associated with Alarm 2 is the next parameter.
This the 'Alarm 2 Function' Parameter.
'AL 2' contains the Temperature that is use by the Alarm,

How that number is used is determined by the 'Alarm Function' parameter

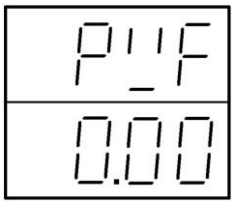
The Possible Values for Alarm Function Parameters are:

0. Deviation High
   The Alarm becomes Active when PV > (SV + Alarm)
1. Deviation Low
   The Alarm becomes Active when PV < (SV - Alarm)
2. Absolute High
   The Alarm becomes Active when the PV > Alarm
3. Absolute Low
   The Alarm becomes Active when the PV < Alarm
4. Section Outside
   The Alarm becomes Active when the PV is greater or less than (SV ± Alarm)
   example: with SV = 50 and Alarm = 5 : If PV < 45 or PV > 55 --- Alarm is Active.
5. Section Inside
   The Alarm becomes Active when the PV is NOT greater or less than (SV ± Alarm)
   example: with SV = 50 and Alarm = 5 : If PV < 45 or PV > 55 --- Alarm is NOT Active.
6. Sensor Broken
   The Alarm becomes Active when Input values are outside possible range for given sensor type.

In a JConn Inv. Controller
These parameters control the LED warning system
Changing them will affect that warning system!

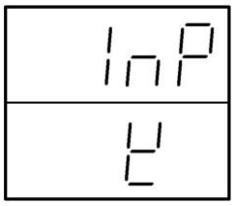
Alarm 1: Set to the number of degrees ABOVE the SV temperature the RED LED becomes Active.
Alarm 2: Set to the number of degrees BELOW the SV temperature the BLUE LED becomes Active.
The Green LED is On any time BOTH the Red and the Blue are Off.

Input Offset Parameter



Adjusts the input to match actual temperature.
Has a Range of ±100º
Displayed Value = Measured Temperature - (This Value).
Example: Probe reads 65º but actual temp is 70º
Adjust this value to -5.

Input Device Type



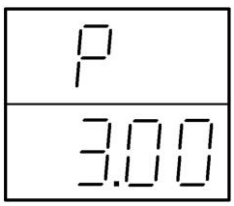
Select type of Input Sensor Device, default = 'K' thermocouple.

See Appendix A for Input Type Values

The P, I, and D Parameters

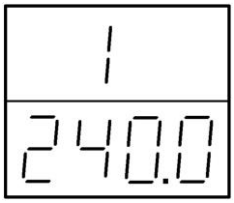
The letters stand for Proportional, Integral, and Derivative.

These are the values that make the controller 'Smart'.
These are also the values that change when you train the unit.



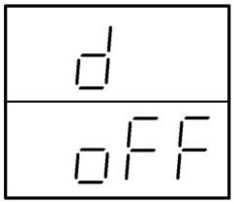
Range = 0.1 to 3600
If P= off, then the controller is a simple thermostat switch.

You can think of P as containing the present error.
This Parameter should not be "OFF" in a JConn Inv. controller.



Range = 0.1 to 3600

You can think of I as containing the average of past errors.
This Parameter should not be "OFF" in a JConn Inv. controller.



Range = 0.1 to 3600

You can think of D as containing the prediction of future errors.

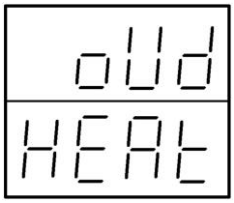
This Parameter should not be "OFF" in a JConn Inv. controller.

Once the unit is trained to a given device these values will be relatively constant.

When you want to change to a different device:

Write these values down.
When coming back to this particular device reenter these numbers.

Control Type



Determines whether the unit is a heating or cooling control.
"HEAt" Output is Active if SV < PV.
"COOL" Output is Active if SV > PV.

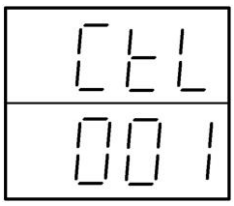
Control Hysteresis

Range = ±100
Not available when 'P' = OFF!

This parameter filters noise from the input.
The input must change by the specified amount before the control will act.

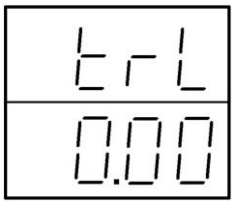
Output Mode

DO NOT CHANGE!



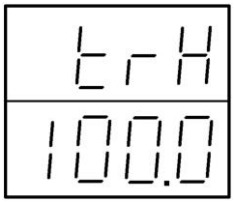
Relay = 020
SSR = 001
4-20mA = 000

Analog Output Low



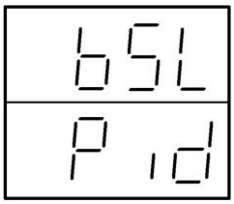
Minimum output percentage
DO NOT CHANGE
Only used on a 4-20mA controller

Analog Output High



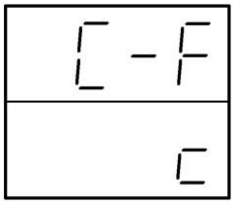
Maximum output percentage
DO NOT CHANGE
Only used on a 4-20mA controller

Control Type



'Pid' = PID control.
"tPV = 4-20mA control.
DO NOT CHANGE

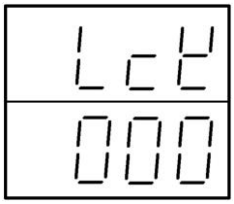
Temperature Units



Displayed Temperature Units

C = Degrees Celsius
F = Degrees Fahrenheit

Password



Set to 010 to disable changing of parameters.

Enable changes with 000.

Secondary Parameter Menu

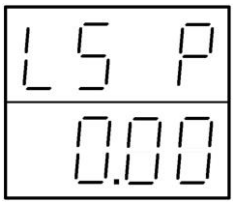
To enter the Menu, Simultaneously Press and Hold the 'UpArrow' and 'DownArrow' buttons for more than 3 seconds.

Press and release 'SET' to advance to the next parameter in the menu.

Once a parameter is selected, to change it is similar to setting temperature.

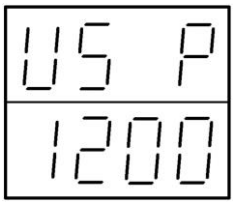
Press and release the 'AT' button.
Use 'UpArrow' or 'DownArrow' to modify value shown in SV.
Press 'Set' to lock in the change.

Low Input Limit



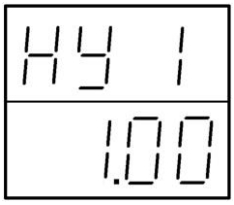
If input temperature is Below this value,
Unit will display an error code.
The 'Input Offset' parameter is included in this.
Example: If the temperature is 70º but the input offset is 80º
The unit 'sees' an input of -10º and will display an error !

High Input Limit



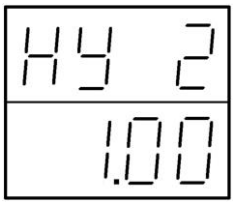
If input temperature is Above this value,
Unit will display an error code.
The 'Input Offset' parameter is included in this.
Example: If the temperature is 1190º but the input offset is -20º
The unit 'sees' an input of 1210º and will display an error !

Alarm 1 Hysteresis



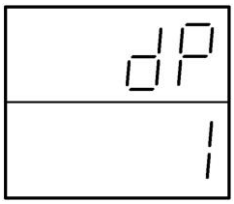
The amount above the set value before action is taken.
Range = ±90
Only used with Alarm functions 0 - 3

Alarm 2 Hysteresis



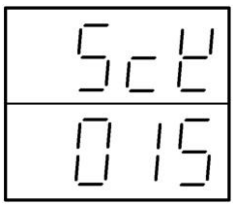
The amount above the set value before action is taken.
Range = ±90
Only used with Alarm functions 0 - 3

Decimal Point Display



Number of decimal places to display
0 = Decimal Point Not Displayed
1 = One Decimal Point Displayed

Password



Disable Changing Parameters

Trouble Shooting

The Unit does not power up

1. Check power cord connections.
2. Ensure Device is plugged into Unit.
3. Check that the power switch is on and lights
   If the switch doesn't light and the Control doesn't come on.:
   a. Ensure there is power to the Unit from the 'wall'
   b. Check the Fuse. The fuse is located inside the enclosure in the front right when viewed from the top/front.
      To open the enclosure:
      Be Sure Power Is Removed – Unplug Unit From the Wall
      remove small screw on top/ rear.
      Remove 4 screws from the sides of the unit.
      Replace fuse with a similarly rated fuse.
      10 Amp to 15 Amp depending on Unit Type.
      Reassemble the Enclosure Before Reapplying Power.

'UUUU' Shown in Process Value Display

This signifies an Input error - The possible causes are:

1. Sensor unplugged
2. Sensor wire(s) broken.
3. Temperature is out of range.
4. Incorrect S**ensor Type** setting.
5. Incorrect **Input Offset Value** set.

Displayed Temperature is not steady.

A Small slow fluctuation is to expected – a few degrees at most.

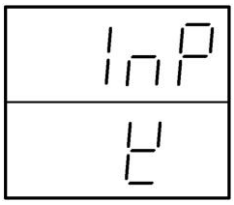
If However, the temperature jumps quickly by many tens or even Hundreds of degrees This signifies a bad sensor. The Thermocouple will need to be replaced.

Appendix A

Setting the Input Type Parameter:

The parameter is located in the Primary Settings Menu and is the sixth (6) Parameter in the list.

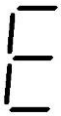
To Set the parameter, enter the primary menu, press and release 'SET' until the parameter below is shown.



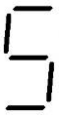
Shown is the symbol for the 'K' type thermocouple.
The 'K' type has a range from 0ºC - 1200ºC
This is the default setting.

Press and release the "AT" button - The right most digit in the SV display will flash.
Now use the 'UpArrow' and 'DownArrow' buttons to select the desired symbol.
Once the correct symbol is displayed, press 'SET' to lock the change in.

This symbol is for a 'J' type Thermocouple
This type has a range from 0ºC - 1200ºC



This symbol is for a 'E' type Thermocouple
This type has a range from 0ºC - 1000ºC



This symbol is for a 'S' type Thermocouple
This type has a range from 0ºC - 1600ºC

This symbol is for a 'Pt100' RTD type sensor
This type has a range from -199ºC - 600ºC

This symbol is for a 'Cu50' RTD type sensor
This type has a range from -50ºC - 150ºC