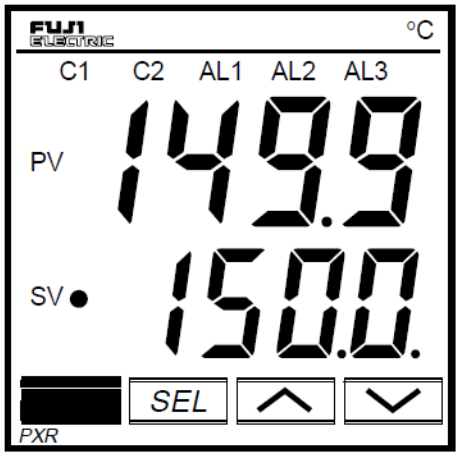
This Application Note is pertinent to the Commander HSK and Affinity drive Family

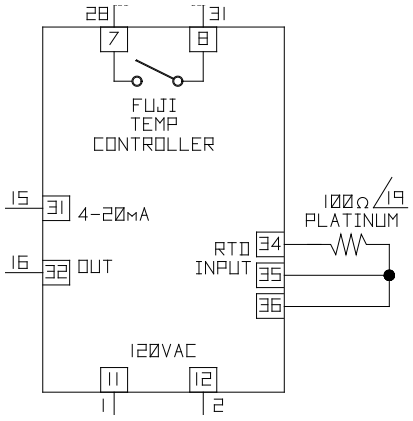
PXR Fuji Temp Controller Basic Programming Guide

This application note will guide you in programming the **PXR Fuji Temperature Control,** that comes as an option for the **Commander HSK** or **Affinity TowerPak**. There are **Three Parameters Blocks** for the **PXR Fuji Temperature Control** (*First Block, Second Block, and Third Block*). We will discuss how to access and change the necessary parameters for your specific application.



Wiring the RTD

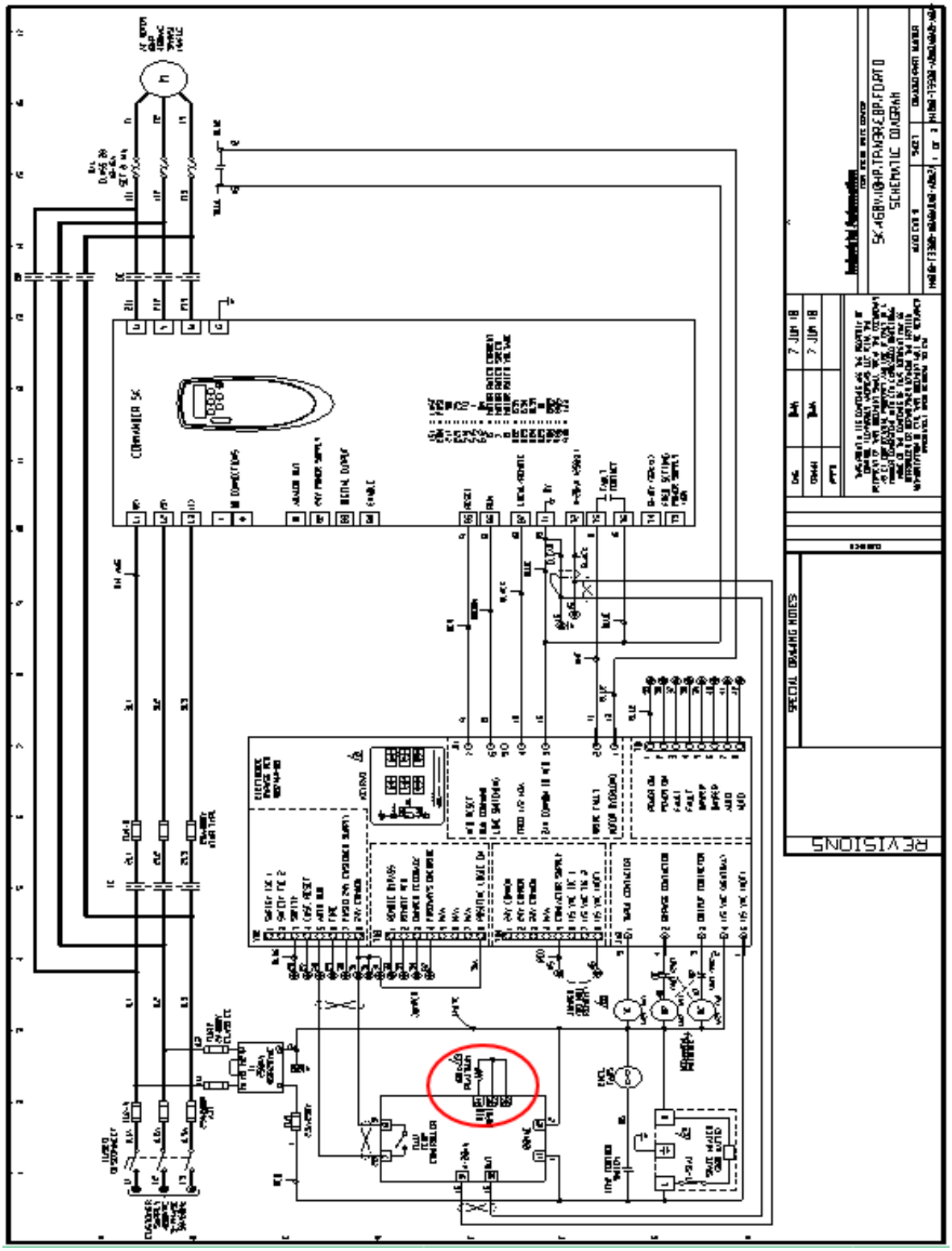
From factory, the **Start/Stop Logic** and **Speed Reference** are prewired from the **Fuji Temp Controller** to the drive. You will have to install the RTD on to the Temp controller, which will be connected on **Terminals 34, 35, & 36**. See below for a **Three-wire RTD Connection**.



The **Temp Controller** provided by **Control Techniques**, will only accept **100 Ω Platinum RTD.**

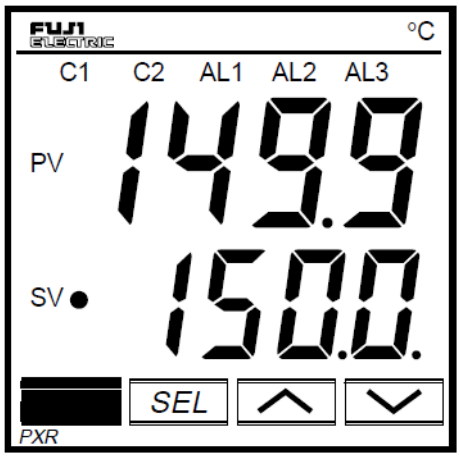
If using a **Two-wire RTD**, then place a jumper between **Terminals 35 & 36** and connect the **RTD** between **Terminals 34 & 35**.

Commander HSK TowerPak



Affinity TowerPak

Understanding the Front Panel



*If the Setpoint Value needs to be **Degrees Celsius**,
then Π–Φ will have to be changed to **°C,** in the **Second Block**.

Parameter display symbol	Parameter name	Description	Setting range
SV	**Setpoint Temperature** (Set Value)	**Displays the setpoint temperature in °C / °F. Depends on setting of Π–Φ**	Range Based on Settings of Π–ΣΛ & Π–ΣΥ
PV	**Measured Temperature** (Measurement value)	**Displays the currently measured temperature from RTD**	Read only
SEL	**Select/Enter**	**Allows access and data entry of Parameters**	–
^	**Up Arrow**	**Allows navigation and value changes of parameters**	–
v	**Down Arrow**	**Allows navigation and value changes of parameters**	–

Accessing the Parameter Blocks

Parameter Blocks	Press SEL for Approx.	Beginning parameter of Block	End of Parameter Block
First Block	one second	MANY	ΛoX
Second Block	three seconds	π	μoδ
Third Block	five seconds	Π–v1	δΠ13

Programming

Make the following changes, as per your spec, in the following Parameter Blocks. All settings in the following Parameter Blocks are suggestive settings. This setting may need to be changed based on your application.

First Block Parameters (Press and Hold SEL for approx. one second)

Parameter display symbol	Parameter name	Description	Setting range Factory Default Setting (*)	User's set value
Προб	**Ramp-soak control**		ΟΦΦ: Stop* ρΥν: Start ΗΛδ: Hold	ΟΦΦ
ΛαΧΗ	**Alarm latch cancel**	Cancels the alarm latch.	**0**: Keeps the alarm latch.* **1**: Opens up the alarm latch.	0
αρ	**Auto-tuning**	Used for setting the constants for π, I, δ and by auto-tuning.	**0**: OFF (Resets the auto-tuning or does not use it.)* **1**: ON (Performs the auto-tuning in the SV standard type.) **2**: ON (Performs the auto-tuning in low PV type (SV value-10% FS).)	0
ΑΛ1	**Set value of alarm 1**	Sets the temperature threshold at which the output relay opens. **See Note *1**	**Alarm type** is **deviation**: -100ºF to 100ºF (10º)*	5
ΛοΧ		Specifies whether or not to allow the change of parameters.	**0**: All settings are changeable both from the face panel and via communication.* **1**: All settings are unchangeable from the face panel, but changeable via communication. **2**: Only the SV is changeable from the face panel, and all settings are changeable via communication. **3**: All settings are changeable from the face panel, but unchangeable via communication. **4**: All settings are unchangeable from the face panel or via communication. **5**: Only the SV is changeable from the face panel, but all settings are unchangeable via communication.	0

Second Block Parameters (Press and Hold SEL for approx. three seconds)

Parameter display symbol	Parameter name	Description	Setting range Factory Default Setting (*)	User's set value
Π	**Proportional band**	Set to 0.0 to select the ON/OFF control (Two-position control).	0.0 to 999.9% (5.0)*	5.0
I	**Integral time**		0 to 3200 seconds (240)*	240

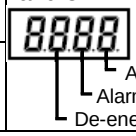
δ	**Derivative time**		0.0 to 999.9 seconds (60.0)*	60.0
Hψσ	**Hysteresis range for ON/OFF control**	Sets the hysteresis for ON/OFF control.	0 to 50%FS (equivalent of 1.0°C/ °F)*	1
Xρρλ	**Control algorithm**	Selects the control algorithm.	ΠΙΔ: Runs normal PID control.* ΦΥΖΨ: Runs PID control with fuzzy logic. ΣΕΛΦ: Runs PID control with self-running.	ΠΙΔ
Π–ν2	**Input signal code**	Set this parameter when changing the types of temperature sensors.	1 to 16 | (*1 sets it for PT100 RTD)	1
Π–ΣΛ	**Lower limit of measuring range**	Low End Temperature of RTD	-1999 to 9999	0
Π–ΣΥ	**Upper limit of measuring range**	Upper End Temperature of RTD	-1999 to 9999	140

Second Block Parameters (Cont.)

Parameter display symbol	Parameter name	Description	Setting range Factory Default Setting (*)	User's set value
π–Δπ	**Decimal point position**		0 to 2	0
π–ϕ	**°C / °F selection**		°C / °F	°ϕ
πυΟΦ	**PV offset**	Allows correction for the **PV** Display	-10 to 10%FS **(* 0)**	0
ΣΥΟΦ	**SV offset**	Allows correction for the **SV** Display	-50 to 50%FS **(* 0)**	0
Π–ΔΦ	**Time constant of input filter**		0.0 to 900.0 seconds **(* 5.0)**	5.0
ΑΛμ1	**Alarm type 1**	Sets the types of alarm operations.	0 to 34 **(*0/5)**	6
ΑΛΜ2	**Alarm type 2**	Sets the types of alarm operations.	0 to 34 **(*0/9)**	0

ΣρΑρ	**Status display of ramp-soak**		- **(* OFF)**	ΟΦΦ
ΠρΝ	**Selecting ramp-soak execute type**	Selects ramp-soak patterns.	**1**: Performs 1st to 4th segments.* **2**: Performs 5th to 8th segments. **3**: Performs 1st to 8th segments.	1
ΣΩ–1	**1st target value** or **Switching-SV value**	Sets the 1st target SV of ramp-soak operation **or** Selects switching-SV function for DI1.	Within the **SV** limit. **(*0%)**	0
ρν1ρ	**First ramp segment time**	Sets the first ramp segment time.	0 to 99h59m **(*0.00)**	0.00

Third Block Parameters (Press and Hold SEL for approx. five seconds)

Parameter display symbol	Parameter name	Description	Setting range Factory Default Setting (*)	User's set value
Π–ν1	**Control action**	Specifies control action and output at the input burn-out.	0 to 19	2
ΣΩ–Λ	**SV lower limiter**	Sets the Lower Limit of the **SV** in °C / °F. **Depends on setting of Π–Φ**	0 to 100%FS (*0%FS) **See Note *2**	40
ΣΩ–Η	**SV upper limiter**	Sets the Upper Limit of the **SV** in °C / °F. **Depends on setting of Π–Φ**	0 to 100%FS (*100%FS) **See Note *2**	100
Α1ηΨ	**Alarm 1 hysteresis**	Sets the hysteresis range of ON and OFF of alarm 1.	0 to 50%FS (*1)	1
Α2ηΨ	**Alarm 2 hysteresis**	Sets the hysteresis range of ON and OFF of alarm 2.	0 to 50%FS (*1)	1
Α1οΠ	**Alarm 1 options**	Sets the optional functions of alarms 1, 2 and 3. 	000 to 111 (*000) **See Note *3**	100
Α2οΠ	**Alarm 2 options**		000 to 111 (*000) **Sets Alarm to not used**	000

***Notes:**

1. Setting ΑΛΝ1 to **"6",** with Α1οΠ set 100, makes the output **stay closed** until **PV** drops below **SV** by the **amount set** in ΑΛ1, which is set to 5°F.
2. Sets the **Lowest** and **Highest Temperature** range the system process can handle.
3. Makes the **Alarm 1** Normally Closed.

Fault Description

Fault code	Possible cause	Control output
YYYY	① Thermocouple burnt out. ② RTD (A) line burnt out. ③ PV value exceeds Π–ΣΥ by 5% FS.	①The burn-out control output is set as the lower limit (standard): OFF or 4 mA or less ②The burn-out control output is set as the upper limit: ON or 20 mA or larger
ΛΛΛΛ	①The RTD line (B or C) burnt out. ②The RTD line (between A & B or A & C) is short. ③PV value is below Π–ΣΛ by 5%FS. ④1-5 Vdc or 4-20 mA DC wiring open or short.	

For more information click here **PXR Fuji Temp Controller Manual**.

Resources: can be found on our website: www.controltechniques.com
For help contact techsupport.cta@mail.nidec.com, or
call Technical Support at 952-995-8000, 24/7/365