6020 & 8020 Temperature Controller Quick Start Manual – 0037-75555 (PK529)

This manual is intended to provide only the basic installation and operation instructions. The 6020 & 8020 Controllers are pre programmed with one of two Default Settings profiles depending on the controller design (see Section 6). Setpoint temperature may be established in Setup Mode (See Section 7).

Please refer to manual, PK530, for complete installation & operation details. The most current revision of PK530 may be found on the Chromalox website: www.chromalox.com

1. IMPORTANT SAFEGUARDS

⚠WARNING

ELECTRIC SHOCK HAZARD: Read and understand all instructions before installing, servicing or operating this controller. Failure to do so could result in equipment or property damage as well as personal injury and even death.

⚠CAUTION

Installation should be only performed by technically competent personnel. It is the responsibility of the installing engineer to ensure that the configuration is safe. Local regulations regarding electrical installation & safety must be observed - e.g. US National Electrical Code (NEC) and/or Canadian Electrical Code. Impairment of protection will occur if the product is used in a manner not specified by the manufacturer.

⚠WARNING

HIGH VOLTAGE is used in the operation of this equipment. DEATH ON CONTACT may result if personnel fail to observe safety precautions. Learn the areas containing high-voltage connections when installing or operating this equipment.

⚠WARNING

Be careful not to contact high-voltage connections when installing or operating this equipment. Before working inside the equipment, turn power off and ground all points of high voltage potential before touching.

⚠WARNING

ELECTRIC SHOCK HAZARD. Any installation involving control equipment must be performed by a qualified person and must be effectively grounded in accordance with the National Electrical Code to eliminate shock hazard.

2. INSTALLATION

Installation Guidance

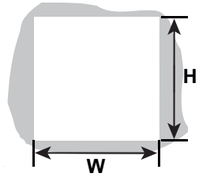
- Standards compliance shall not be impaired when fitted into the final installation.
- Designed to offer a minimum of Basic Insulation only.
- Ensure that supplementary insulation suitable for Installation Category II is achieved when fully installed.
- To avoid possible hazards, accessible conductive parts of the final installation should be protectively earthed in accordance with EN61010 for Class 1 Equipment.
- Output wiring should be within a Protectively Earthed cabinet.
- Sensor sheaths should be bonded to protective earth or not be accessible.
- Live parts should not be accessible without the use of a tool.
- When fitted to the final installation, an IEC/CSA APPROVED disconnecting device should be used to disconnect both LINE and NEUTRAL conductors simultaneously.
- Do not to position the equipment so that it is difficult to operate the disconnecting device.

Panel-Mounting

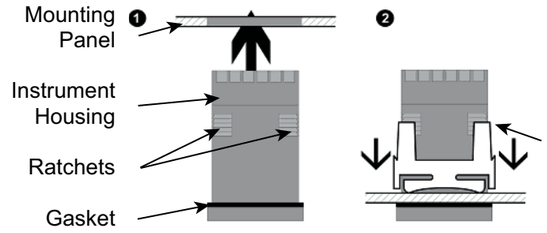
The mounting panel must be rigid, and may be up to 6.0mm (0.25inch) thick. Cutout sizes are:

1/16: Width = 45mm, Height = 45mm,
1/8: Width = 45mm, Height = 92mm

For n multiple instruments mounted sideby-side, cut-out width W is 48n-4mm.



Tolerance +0.5, -0.0 mm



❶ Insert instrument into the panel cut-out.

❷ Hold front bezel firmly (without pressing on display area), and fit mounting clamp. Push clamp forward, using a tool if necessary, until gasket is compressed and instrument is held firmly in position.

⚠CAUTION

For an effective IP65 seal against dust and moisture, ensure gasket is well compressed against the panel, with the 4 tongues located in the same ratchet slot.

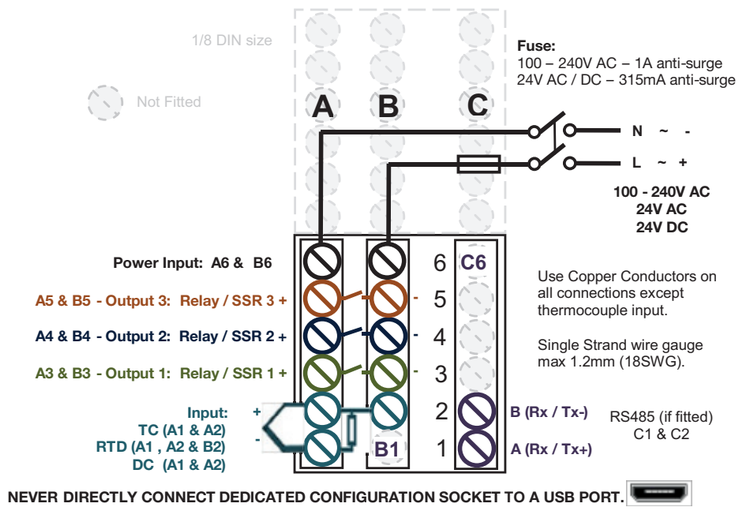
3. REAR TERMINAL WIRING

This diagram shows all possible option combinations.

Check the product configuration before wiring.

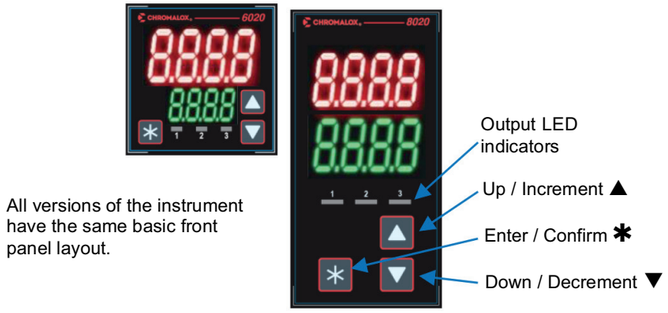
⚠CAUTION

Check information label on housing for correct operating voltage before connecting supply to Power Input.



4. FRONT PANEL

Display and Indication



All versions of the instrument have the same basic front panel layout.

Keypad & General Navigation

Menu navigation, parameter editing and keypad use are described below. *See the Full Installation and Operation Manual sections for further information and exceptions.*

General keypad usage & parameter editing:
Press ▲ or ▼ keys to navigate between parameters, To edit a parameter, press ✱. The Parameter name (*lower display*) flashes when the parameter above can be edited.
Press ▲ or ▼ to change the parameter value (*upper display*).

NOTE: Edited values stop changing at the parameters limits.

A further press of ▲ or ▼ past the parameter limit "wraps" the value back to the start (for example: 0, 1, 2… …98, 99,100 ▲ 0, 1, 2…)

To confirm the change, press ✱ within 60 seconds, otherwise the change is rejected.

5. MODE AND MENU STRUCTURE

There are 3 main modes (or menus) on the controller – User Mode, Setup Mode and Advanced Configuration Mode.

- User Mode – the live screen used for normal operation. The process variable can always be seen in this mode
- Setup Mode – allows access to the most often used parameters
- Advanced Configuration Mode – access all parameters via sub-menus

To navigate to Setup or Advanced Configuration from User Mode:
Press and hold down ✱ and press ▲ for Setup Mode
Press and hold down ✱ and press ▼ for Advanced Configuration Mode.

Returning to User Mode from other modes:
After 120 seconds without key activity the unit returns automatically to the 1st User mode screen - Or - Press and hold down ✱ and press ▲ to move back up one level.

Advanced Configuration Mode

The **Advanced Configuration Menu** provides access to all of the features available in these controllers. Here you will find the following sub-menus: User (USEr), Input (InPt), Calibration (CAL), Output (OUtP), Control (COnt), Setpoint (SPt ı), Alarm (ALM), Communications (Com), Display (d ıSP) and Product Information (InFo).

Please refer to the Full Installation & Operation Manual for these additional sub-menus and their settings.

Mode Access and Lock Codes
Separate lock codes can be set for the Setup Mode and for the Advanced Configuration Mode (Adu).

S.Loc Setup Mode lock code – default 10.
A.Loc Advanced Configuration Mode lock code – default 20.

6. DEFAULT SETTINGS

Two Default Setting profiles exist for the 20 Series controllers, which is contingent upon the Output 1 Selection: **SSR Drive *or* Relay**. Many of these settings are found in Section 7 - Setup Mode. Please see the table below for the default settings for each profile type:

Output 1:	SSR	Relay
Input Type	J T/C	
Input Units	˚F	
Resolution (Decimal Places)	No Decimal	
Input Scale, Upper Limit	1000	
Input Scale, Lower Limit	0	
Output 1 Use	Heat Output	
Output 2 Use	Alarm 1	
Output 3 Use (if present)	Alarm 2	
Alarm 1 Value	Off	
Alarm 2 Value	Off	

Output 1:	SSR	Relay
Heat Proportional Band	25˚F	
Hysteresis (deadband)		5˚F
Bias (Manual Reset)	25%	
Heat Cycle Time	1 sec	
Heat Power Limit	100%	
Auto Tune	Off	
Manual Control	Off	
Setpoint Upper Limit	1000˚F	
Setpoint Lower Limit	0˚F	
Setpoint	0˚F	

Default Settings Note: The above profiles were established to provide the most efficient settings for those users with Temperature applications. If one was to execute a "Reset to Defaults" action, as found in the Display (d iSP) Sub-menu, then the above settings would be replaced with the original factory parameter values. In this case, please refer to the full manual for procedures to complete the programming.

7. SETUP MODE

The **Setup Menu** contains commonly used parameter settings. To edit settings found in the **Setup Menu** (below), such as Setpoint, one must enter the **Setup Menu**.

From User Mode: Press and hold down ✱ and press ▲ for **Setup Mode**
S.Loc **Setup Mode** lock code – default 10.

Once in the **Setup Menu**, press ▲ or ▼ keys to navigate between parameters, To edit a parameter, press ✱. The Parameter name (*lower display*) flashes when the parameter above can be edited. Press ▲ or ▼ to change the parameter value (*upper display*).

To confirm the change, press ✱ within 60 seconds otherwise the change is rejected.

To change a setting not found in the **Setup Menu Table**, navigate to the **Advanced Configuration Menu**: (from **User Mode**): Press and hold down ✱ and press ▼.
A.Loc **Advanced Configuration Mode** lock code – default 20.

Setup Menu

Screen Name	Lower Display	Upper Display	Adjustment Range & Description		Default Value
Setup mode lock code	S.Loc	Visible when attempting to enter Setup unless, following a reset with power-down or lock code is OFF). Set value (1 to 9999) matching the defined lock code to allow entry to the following screens.			10
Input Type	tYPE	tC_J	J Thermocouple		tC_J
			-328 to 2192˚F -200 to 1200˚C	-199 to 999.9˚F -128 to 537.7˚C	
		tC_K	K Thermocouple		
			-400 to 2503˚F -400 to 1200˚C	-199 to 999.9˚F -128 to 537.7˚C	
		P100	PT100		
			-328 to 1472˚F -400 to 1200˚C	-199 to 999.9˚F -128 to 537.7˚C	
		Several additional **Thermocouple** types are available, such as B, C, L, N, R, S & T. Please refer to the full Installation and Operation Manual for details.			
		0_20	0 - 20 mA DC		
		0_40	0 - 40 mA DC		
		Several additional **Analog or Linear Input** types are available, such as 0-50, 10-50, 0-5, 1-5, 0-10 and 2-10. Please refer to the full Installation and Operation Manual for details.			

Screen Name	Lower Display	Upper Display	Adjustment Range & Description	Default Value
Input Units	Unit	F	Temperature displayed as °F.	F
		C	Temperature displayed as °C.	
Process Display Resolution	dECP.	0000	No decimal place	0000
		000.0	1 decimal place	
Input Scale, Upper Limit	ScuL	Scale Input Lower Limit +100 display units to range maximum. (Only visible in Setup Mode when a DC linear type is selected)		Input max Lin=1000
Input Scale, Lower Limit	ScLL	Range minimum to Scale Input Upper Limit -100 display units. (Only visible in Setup Mode when a DC linear type is selected)		Input min Linear=0
Output 1 Useage	Out1	HEAt	Heat Power	HEAt
		COOL	Cool Power	
		AL1	Alarm 1	
		AL2	Alarm 2	
		AL12	Alarm 1 or 2	
		LooP	Control Loop Alarm (2x integral time)	
Output 2 Usage	Out2	As Output 1 Usage		AL1
Output 3 Usage	Out3	As Output 1 Usage		AL2
Alarm 1 Adjust	AL_1	Range minimum to range maximum OFF disables the alarm. Default high alarm		OFF
Alarm 2 Adjust	AL_2	Range minimum to range maximum OFF disables the alarm. Default low alarm		OFF
Setpoint Adjust	SP	Target setpoint adjustable between setpoint upper and lower limits		0
Automatic Tuning Start / Stop	tunE	OFF	Use current PID control terms or manually tune	OFF
		PrE	Start a pre-tune routine	
		AtSP	Start the tune at setpoint	

8. MESSAGES & ERROR CODES

Some messages provide useful information about the process, others indicate error, or problem with the process variable signal or its wiring.

⚠CAUTION

Do not continue with the process until the issue is resolved.

Screen Name	Lower Display	Upper Display	Screen Meaning and Visibility
Alarm Active	Normal	-AL-	One or more alarms are active (alternates with PV). Optional – _see d iSP
Output Latched	Normal	Ltch	One or more output are latched on (alternates with PV), and no alarm is active
Input Over Range	Normal	-hh-	Process variable input >5% over-range.
Input Under Range	Normal	-ll-	Process variable input >5% under-range.
Input Sensor Break	OFF	OPEn	Break detected in process variable input sensor or wiring.
Un-calibrated Input	OFF	Err	Selected input range has not been calibrated.
Manual Power	PHHH	Normal	Manual power value replaces the setpoint.
Setpoint Ramping	SPr	Normal	Setpoint ramp is active (alternates with setpoint)
Control Disabled	OFF	Normal	Control is disabled, control outputs are off.
Control Delayed	dLY	Normal	Visible if control delayed by Delayed Start Time (d_t 1)
Automatic Tuning	tunE	Normal	Tuning is active (alternates with setpoint).

Screen Name	Lower Display	Upper Display	Screen Meaning and Visibility
Automatic Tuning Errors	If the tune fails the display alternates between the tune error code and the setpoint. Remains visible until tune set to off.		
	tEr1	Normal	PV is within 5% of setpoint
	tEr2		Setpoint is ramping
	tEr3		Control is ON/OFF
	tEr4		Control is manual
	tEr5		Pulse tune not able to run
	tEr6		Sensor break
	tEr7		Timer running
	tEr8		Sensor break

9. SPECIFICATIONS

UNIVERSAL INPUT	
Thermocouple Calibration:	±0.25% of full range, ±1LSD (±1°C for Thermocouple CJC). BS4937, NBS125 & IEC584.
PT100 Calibration:	±0.25% of full range, ±1LSD. BS1904 & DIN43760 (0.00385Ω/Ω/°C).
DC Calibration:	±0.2% of full range, ±1LSD.
Sampling Rate:	4 per second.
Impedance:	>10MW resistive, except DC mA (5Ω) and V (47kΩ).
Sensor Break Detection:	Thermocouple, RTD, 4 to 20mA, 2 to 10V and 1 to 5V ranges only. Control outputs turn off.
Isolation:	Isolated from all outputs (except SSR driver) by at least BASIC isolation. Universal input must not be connected to operator accessible circuits if relay outputs are connected to a hazardous voltage source. Supplementary insulation or input grounding would then be required. Isolated from Mains Power Input by basic isolation.
OUTPUTS	
RELAYS (OPTIONAL)	
Contacts:	SPST Form A relay; current capacity 2A at 250VAC.
Lifetime:	>150,000 operations at rated voltage/current, resistive load.
Isolation:	Basic Isolation from universal input and SSR outputs.
SSR Drivers (OPTIONAL)	
Drive Capability:	SSR drive voltage >10V at 20mA
Isolation:	Not isolated from universal input or other SSR driver outputs.
SERIAL COMMUNICATIONS (OPTIONAL)	
Physical:	RS485, at 1200, 2400, 4800, 9600, 19200 or 38400 bps.
Protocols:	Modbus RTU.
Isolation:	Basic safety isolation from Universal input and SSR. Basic safety isolation to Mains and Relay Circuits.
OPERATING CONDITIONS	
Usage	For indoor use only, mounted in suitable enclosure
Ambient Temperature:	0°C to 55°C (Operating), –20°C to 80°C (Storage).
Relative Humidity:	20% to 95% non-condensing.
Altitude	<2000m
Supply Voltage and Power:	100 to 240VAC ±10%, 50/60Hz, 7.5VA (for mains powered versions), or 24VAC +10/-15% 50/60Hz 7.5VA or 24VDC +10/-15% 5W (for low voltage versions).
ENVIRONMENTAL	
Standards:	CE, UL, cUL
EMI:	Complies with EN61326 (Susceptibility and Emissions).
Safety Considerations:	Complies with EN61010-1
Front Panel Sealing:	Front to IP65 when correctly mounted, Rear of panel to IP20.
PHYSICAL	
Front Bezel Size:	1/16 Din = 48 x 48 mm, 1/8 Din = 48 x 96 mm
Depth Behind Panel:	67mm with sealing gasket fitted.
Weight:	0.20kg maximum

PK529
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