

59572-6 MaxVU Standard Controller Concise manual

Risk of electric shock. Alternating or direct current could be present.

Caution, refer to the manual. Equipment protected through-out by double insulation.

1. INSTALLATION

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

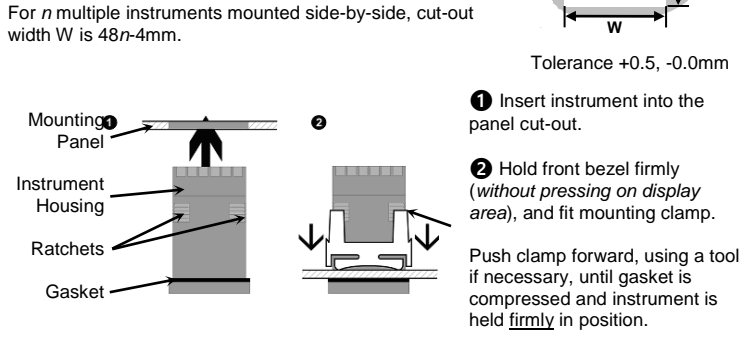
- ### Installation Guidance
- Standards compliance shall not be impaired when fitted into the final installation.
 - Installation should be only performed by technically competent personnel.
 - It is the responsibility of the installing engineer to ensure that the configuration is safe.
 - Local regulations 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 product used in a manner not specified by the manufacturer.
 - Designed to offer a minimum of Basic Insulation only.
 - Ensure supplementary insulation suitable for Installation Category II is achieved when 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. Cut-out sizes are:

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

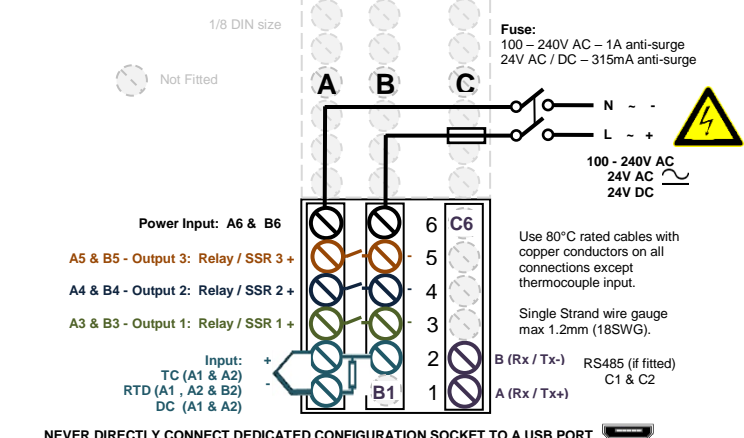
For *n* multiple instruments mounted side-by-side, cut-out width *W* is 48*n*-4mm.



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

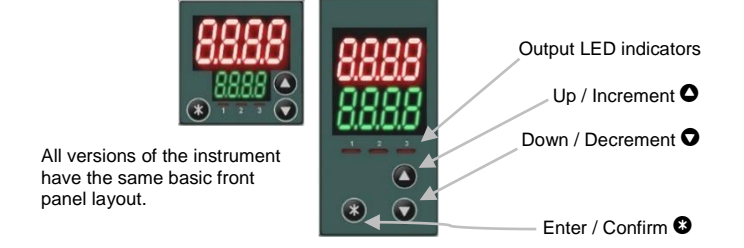
Rear Terminal Wiring

The diagram shows all product options, check configuration before wiring. Check information label on housing for correct operating voltage before connecting supply to Power Input



2. FRONT PANEL

Displays & Indicators



Keypad & General Navigation

Menu navigation, parameter editing and keypad use are described below. See the relevant manual sections for further information and exceptions.

General keypad usage & parameter editing:

Press **▲** or **▼** keys to navigate between parameters. To edit the parameter value, press *****. The parameter name (*lower display*) flashes when the value (*upper display*) can be adjusted. Press **▲** or **▼** to change the value. To confirm the change, press ***** within 60s otherwise the change is rejected.

Navigating to Setup or Advanced Configuration from User Mode:

- Press and hold ***** then press **▲** for Setup Mode.
- Press and hold ***** then press **▼** for Advanced Configuration.

Returning to User Mode:

- After 120 seconds without key activity the unit returns automatically to the User Mode screen.
- Press and hold ***** then press **▲** to exit or move back up one level.

3. SETUP MODE (FIRST POWER UP)

When first powered up or after a factory reset (default) the instrument enters Setup Mode. The device remains in Setup, or will keep powering up back into Setup Mode, until all parameters have been reviewed and the user exits the Setup Mode.

Setup mode lock code **S.Loc** Enter lock code to continue. Default is **10**.

Screen Name	Lower Display	Upper Display	Adjustment Range & Description	Default Value
Input Type	TYPE	TC-J	J Thermocouple *	TC-J
			-200 – 1200°C	-128.8 – 537.7°C
			-328 – 2192°F	-199.9 – 999.9°F
			K Thermocouple *	
			-240 – 1373°C	-128.8 – 537.7°C
			-400 – 2503°F	-199.9 – 999.9°F
			PT100 *	
			-199 – 800°C	-128.8 – 537.7°C
			-328 – 1472°F	-199.9 – 999.9°F
			B Thermocouple	
			100 – 1824°C	
			211 – 3315°F	
			C Thermocouple	
			0 – 2320°C	
32 – 4208°F				
L Thermocouple *				
0 – 762°C	0.0 – 537.7°C			
32 – 1403°F	32.0 – 999.9°F			
N Thermocouple				
0 – 1399°C				
32 – 2551°F				
R Thermocouple				
0 – 1795°C				
32 – 3198°F				
S Thermocouple				
0 – 1762°C				
32 – 3204°F				
T Thermocouple *				
-240 – 400°C	-128.8 – 400.0°C			
-400 – 752°F	-199.9 – 752.0°F			
0 – 20mA linear dc				
0_20				
4 – 20mA linear dc				
4_20				
0 – 50mV linear dc				
0_50				
10 – 50mV linear dc				
10_50				
0 – 5V linear dc				
0_5				
1 – 5V linear dc				
1_5				
0 – 10V linear dc				
0_10				
2 – 10V linear dc				
2_10				
Input Units	Un t	C	Temperature displayed as °C.	C
		F	Temperature displayed as °F.	
Process Display Resolution	dEc.P	0000	No decimal places	0000
			1 decimal place	
			2 decimal places	Not available for temperature inputs.
			3 decimal places	
Scaled Range 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
Scaled Range 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 Lin=0

Output 1 Usage	OUT 1	HEAT	Heat Power	HEAT		
		COOL	Cool Power			
		AL 1	Alarm 1			
		AL 2	Alarm 2			
		AL 12	Alarm 1 or 2			
Output 2 Usage	OUT 2	As Output 1 Usage		AL 1		
		Output 3 Usage	OUT 3	As Output 1 Usage		AL 2
				Alarm 1 Value	AL_1	Range minimum to range maximum OFF disables the alarm. Default high alarm
Alarm 2 Value	AL_2	Range minimum to range maximum OFF disables the alarm. Default low alarm	-240			
Setpoint Value	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.			
		ALSP	Start the tune at setpoint.			

4. USER MODE (NORMAL OPERATION)

Screen Name	Lower Display	Upper Display	Screen Usage and Visibility
"Indicator" enabled	Warnings / Errors	Process Variable	If Indc parameter is enabled, setpoint is hidden but warnings or errors may still appear.
Basic Setpoint Control 1st Screen (Automatic Mode)	Effective Setpoint	Process Variable	Basic Setpoint Control enabled – automatic control. Press ▲ or ▼ to instantly adjust setpoint. If ramping, the target setpoint is shown while adjusting. OFF replaces the setpoint if control is disabled.
Basic Setpoint Control 1st Screen (Manual Mode)	Manual Power	Process Variable	Basic Setpoint Control enabled - manual control. Press ▲ or ▼ to instantly adjust manual power. The power value is shown as Pxxx.
The following screens are not shown when Basic Setpoint Control enabled (see the display sub-menu d.ISP in Advance configuration – Section 6)			
User 1st Screen (Automatic Mode)	Effective Setpoint	Process Variable	Available in automatic control mode. If ramping, the target setpoint is shown while adjusting. OFF replaces setpoint if control is disabled. dLY replaces setpoint if control delayed.
User 1st Screen (Manual Mode)	Manual Power	Process Variable	Available in manual control mode. Manual Power value is shown as Pxxx.
Important: To appear in the User Mode the visibility setting for any of the parameters below must be SHLWJ in the OPtE sub-menu.			
Alarm Status	ALSt	Active Alarms	Active only when alarms are active. 1 = Alarm 1 active 2 = Alarm 2 active L = Loop Alarm active. Any combination can be displayed here
Latch Status	LAth	Latched Outputs	Active only when an output is latched on. 1 = Output 1 2 = Output 2 3 = Output 3 Clear by pressing * .
Maximum PV	MA	Value	Clear by pressing * .
Minimum PV	MI	Value	
Control Enable	CnE	OFF	Control output(s) disabled. (except in manual mode)
		On	Control output(s) enabled. PID or On-Off control available.
Manual Control Enable	MnCE	OFF	Instrument in automatic control mode (manual control OFF).
		On	Manual control ON. Power is shown as Pxxx in 1st User screen.
Time On Remaining	On t	Time left for ON timer	Active only when the ON Timer is decrementing. When time = 0 control is disabled. Screen persists until time = 0.
Delay Time Remaining	d_t	Time left for delay timer	Active only when the Delay time is decrementing. When this time expires control is enabled.

Warning Messages & Error Codes

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	Pxxx	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)
Automatic Tuning	tunE	Normal	Tuning is active (alternates with setpoint).
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.
	tE-1	Normal	PV is within 5% of the scaled range from setpoint
	tE-2		Setpoint is ramping
	tE-3		Control is ON/OFF (not PID)
	tE-4		Control is manual (not Auto)
	tE-5		Tune at Setpoint not able to run
	tE-6		Sensor break
	tE-7		Timer running
tE-8	Control is disabled		

5. SPECIFICATIONS

UNIVERSAL INPUT

Thermocouple Calibration: ±0.25% of full range, ±0.4% of full range below 110°C with 1dp ranges, ±1LSD (±1°C for Thermocouple CJC). BS4937, NBS125 & IEC584.

PT100 Calibration: ±0.25% of full range, ±0.4% of full range above 520°C with 1dp ranges, ±1LSD. BS1904 & DIN43760 (0.00385Ω/°C).

DC Calibration: ±0.2% of full range, ±1LSD.

Sampling Rate: 4 per second.

Impedance: >10MΩ 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 and cUL.

EMI: EN61326-1:2013.

Safety Considerations: UL61010-1 Edition 3, Pollution Degree 2 and Installation Class 2.

Front Panel Sealing: Front to IP65 when correctly mounted.

PHYSICAL

Front Bezel Size: 1/16 Din = 48 x 48 mm or 1/8 Din = 48 x 96 mm

Depth Behind Panel: 67mm with sealing gasket fitted.

Weight: 0.20kg maximum

6. ADVANCED CONFIGURATION

Advanced Configuration gives access to all possible parameters; however, the device hides parameters that are irrelevant to your exact product specification & configuration.

Advanced Configuration Mode Navigation

Press ⬅ or ➡ to navigate to the required sub-menu, then press ↵ to enter.

Advanced Configuration Main Menu

Table with columns: Screen Name, Lower Display, Upper Display, Sub-Menu Usage and Visibility. Rows include User Settings, Input Setup, Input Calibration, Output Setup, Control Setup, Setpoint & Timer Setup, Alarm Setup, Communications Setup, Display Settings, Operator Setup, Product Information.

User Sub-Menu: USEr

Provides access to Output Control Enable / Disable.

Table with columns: Screen Name, Lower Display, Upper Display, Adjustment Range & Description, Default Value. Rows include Alarm Status, Latch Status, Maximum PV, Minimum PV, Control Enable, Manual Control Enable.

Input Sub-Menu: InPt

Table with columns: Screen Name, Lower Display, Upper Display, Adjustment Range & Description, Default Value. Rows include Input Type, Input Units, Process Display Resolution, Scaled Range Upper Limit, Scaled Range Lower Limit, Input Filter Time, Cold Junction Compensation.

Input Calibration Sub-Menu: CAL

Single or two point calibration adjustments for the process input. If the error is not constant across the sensor range, measure the error at a low point and high point in the process, and use two point calibration to correct it.

Table with columns: Screen Name, Lower Display, Upper Display, Adjustment Range & Description, Default Value. Rows include Single Point Offset, Low Calibration Point, Low Offset, High Calibration Point, High Offset.

Output Setup Sub-Menu: OUTP

Table with columns: Screen Name, Lower Display, Upper Display, Adjustment Range & Description, Default Value. Rows include Output 1 Usage, Output 1 Alarm Action, Output 2 Usage, Output 2 Alarm Action, Output 3 Usage, Output 3 Alarm Action, LED Indicator 1, LED Indicator 2, LED Indicator 3.

Control Sub-Menu: CONt

PID control tuning & configuration parameters. Hidden if no control outputs are set.

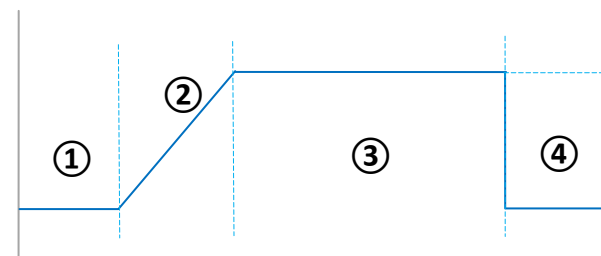
Table with columns: Screen Name, Lower Display, Upper Display, Adjustment Range & Description, Default Value. Rows include Heat Proportional Band, Cool Proportional Band, Automatic reset, Rate, Overlap/Deadband, ON/OFF differential, Loop Alarm Time, Manual Reset, Heat Cycle Time, Cool Cycle Time, Heat and Cool output Inhibit.

Table with columns: Screen Name, Lower Display, Upper Display, Adjustment Range & Description, Default Value. Rows include Heat Power Limit, Cool Power Limit, Power Up Action, Automatic Tuning Start/Stop.

Setpoint & Timer Sub-Menu: SPt

Setpoint and timer settings. The timer can apply a delay before enabling control; a controlled ramp towards the target setpoint; a limit to the time at target setpoint before disabling control. Timer is not available in basic mode.

Table with columns: Screen Name, Lower Display, Upper Display, Adjustment Range & Description, Default Value. Rows include Timer Enable, Delayed Start Time, Ramp Rate, On Time, Setpoint Upper Limit, Setpoint Lower Limit.



- ① At switch on or from control enable the unit will delay enabling control until the start timer (Delayed Start Time) expires.
② The setpoint then ramps from the current PV to the setpoint at the Setpoint Ramp Rate.
③ When a ramp rate is not defined the active setpoint will step directly to the target setpoint. Once the active setpoint reaches the target setpoint, the 'on' timer (On Time) starts.
④ When the on timer expires the control switches off.
If no time is defined for the on timer, control continues indefinitely unless manually disabled.

Alarm Sub-Menu: ALM

Table with columns: Screen Name, Lower Display, Upper Display, Adjustment Range & Description, Default Value. Rows include Alarm 1 Type, Alarm 1 Value, Alarm 1 Hysteresis, Alarm 2 Type, Alarm 2 Value, Alarm 2 Hysteresis, Alarm Inhibit.

Table with columns: Screen Name, Lower Display, Upper Display, Adjustment Range & Description, Default Value. Rows include Alarm Notification, Sensor Break Alarm.

Communications Sub-Menu: COM

Modbus communications settings. Only shown if RS485 option is fitted

Table with columns: Screen Name, Lower Display, Upper Display, Adjustment Range & Description, Default Value. Rows include Modbus Address, Baud Rate, Parity.

Display Sub-Menu: dISP

Enable Basic Setpoint Control & change lock codes. ** Refer to the User Mode section 4.

Table with columns: Screen Name, Lower Display, Upper Display, Adjustment Range & Description, Default Value. Rows include Setup Lock Code, Advanced Configuration Lock Code, Basic Setpoint Control Enable/Disable, Indicator Enable/Disable, Reset to Defaults.

Operator Sub-Menu: OPt

Controls what appears in the User Mode when Basic Setpoint Control is disabled.

Table with columns: Screen Name, Lower Display, Upper Display, Sub-Menu Usage and Visibility, Default Value. Rows include PV Maximum, PV Minimum, Alarm Status, Latch Status, Control Enabled, Manual Control Enabled, Time On Remaining, Delay Time Remaining.

Product Information Sub-Menu: InFo (Read-Only view)

Table with columns: Screen Name, Lower Display, Description. Rows include Product Revision, Firmware Type, Firmware Issue, Serial Number 1, Serial Number 2, Serial Number 3, Date of Manufacture.