

# 59621-2 MaxVU Rail Limiter Concise Manual

## 1. INSTALLATION

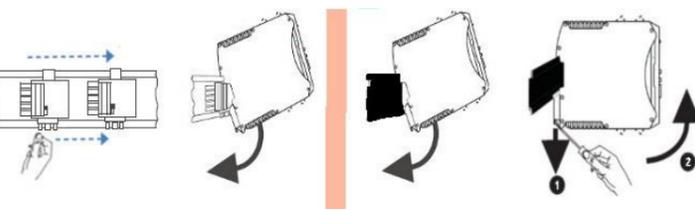
### Installation Guidance

- Installation should only be performed by technically competent personnel.
- Standards compliance shall not be impaired when fitting into the final installation.
- It is the responsibility of the installing engineer to ensure that the configuration is safe.
- Local regulations regarding the electrical installation & safety must be observed.
- Impairment of protection will occur if the product is used in a manner not specified by the manufacturer.
- Due to the low weight of this instrument there are no special lifting or carrying considerations.
- 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 position the equipment so that it is difficult to operate the disconnecting device.
- Ventilation slots must not be covered and adequate air circulation must be allowed.
- Use conductor sizes 30-12 AWG, minimum temp rating of cables to be 80C.



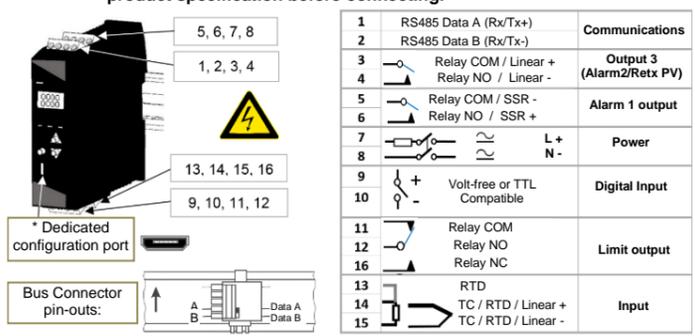
### Bus Connector (optional)

### Mounting & Unmounting



### Terminal Wiring

**CAUTION:** Check information label on housing for correct operating voltage before connecting supply to Power Inputs. Diagrams show all possible option combinations, check your exact product specification before connecting.



\* NEVER DIRECTLY CONNECT DEDICATED CONFIGURATION SOCKET TO A USB PORT.

## 2. FRONT PANEL

Ok / Up Select Down

Display turns off after 5, 15 or 30 minutes without key presses.

Display shows PV (process variable), units, LIM (Limit value), alarm/latch statuses, error & warning messages.

LEDs show Limit, Exceed and Alarm state: LM EX AL

### Navigation & Editing

See OPERATOR MODE section for available screens in Operator Mode.

Press or keys to navigate between parameters or menu items.

Press to highlight and edit a parameter value.

Press or to change the parameter value, then press within 60 seconds to confirm change.

**Note:** For security, no parameters can be changed from the Operator Mode.

**Navigating to Setup Mode or Advance Configuration from Operator Mode:**  
Setup Mode - press & .

Advanced Configuration - press & .

**Returning to Operator Mode:**  
Press & to move back one level. After 120 seconds without key presses the unit returns automatically to the first Operator Mode screen.

## 3. SETUP (& FIRST POWER UP)

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

Some parameters may be hidden depending on configuration & hardware. Alternatively press & to enter Setup from Operator screen and & to exit.

Setup Lock	Enter code & press	Default 10
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Parameter	Description	Default Value	
>Input Type	J Thermocouple *	K Thermocouple	
	-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		
Linear dc			
0 - 20mA	4 - 20mA		
0 - 50mV	10 - 50mV		
0 - 5V	1 - 5V		
0 - 10V	2 - 10V		
>Input Units	°C or °F (hidden when a linear input is used)	°C	
* Maximum of 1 decimal place for temperature inputs marked.			
>Input Decimal Place	0000 *	0000	
Scaled Range only visible when input is a linear type.			
>Input Scale Range Maximum	Maximum for application working range.	1000	
>Input Scale Range Minimum	Minimum for application working range.	0	
>Limit Type	<b>High</b> - device will limit when PV is greater than the Limit value. (PV>Limit Value) <b>Low</b> - device will limit when PV is less than the Limit value. (PV<Limit value).	High	
>Limit Value	The exceed value at which the Limit output will trip.	-240	
PV Retrans parameters only visible if Output 3 is Linear.			
>PV Retrans Type	0-10V 2-10V 0-20mA 4-20mA 0-5V 1-5V	0-10V	
>PV Retrans Scale Range Maximum	Maximum PV value corresponding to maximum linear output.	Input type Max	
> PV Retrans Scale Range Minimum	Minimum PV value corresponding to minimum linear output.	Input type Min	
>Alarm 1 Value	Range minimum to range maximum, or OFF (maximum +1). OFF disables alarm. Default PV High alarm type.	1373	

Alarm 2 visible if Output 3 is Relay or SSR Drive.		
Parameter	Description	Default Value
>Alarm 2 Value	Same options as Alarm 1. Default PV Low alarm type.	-240
>Coms Unit Address	Modbus address from 1 to 255	1
>Coms Baud Rate	1200, 2400, 4800, 9600, 19200 & 38400	9600
>Coms Parity	Odd, Even or None	None
Press  &  to exit.		
When you exit, if necessary, press  and  to clear any Pop Up Alerts.		

## 4. OPERATOR MODE

Name	Details	
User Screen		PV - top LIM - bottom Temperature Unit - right.
Alarm State		To clear latches press  then  to select Yes. Press  to accept.
Latch State		Press  to accept.
Maximum PV	To clear press  then  to select Yes. Press  to accept.	Screens show the Maximum & Minimum PV reached.
Minimum PV		

### Warnings & Error Messages

**Caution:** Do not continue your process until any issues are resolved.

Name	Details	
Pop up Alerts: Warnings and Confirmations		For example, Pop Up Alert for Alarm 1. Pop Up Alerts need to be acknowledged. Press  and  to clear Pop Up Alert.

Pop up Alerts: **Alarm 1, Alarm 2, Alarm 1 & 2, Starting Calibration, Calibration Ongoing, Calibration Fail, Setup not Completed & Limit Exceeded.**

LIMIT	Alternates with PV to show Limit is active.
ALARM	Alternates with PV to show Alarm is active.
LATCH	(Alternates with PV.) One or more outputs are latched on, and no alarm is active.
HIGH	Process variable input > 5% over-range.
LOW	Process variable input > 5% under-range.
OPEN	Break detected in process variable input sensor, wiring or wrong input type selected. Shows OPEN until resolved, activates Limit exceed state..
ERROR	Selected input range is not calibrated. Shows ERROR until resolved, activates Limit exceed state.

## 5. SAFETY & WARNING SYMBOLS

- Risk of electric shock.
- Alternating or direct current could be present.
- Caution, refer to the manual.
- Equipment protected through-out by double insulation.

## 6. SPECIFICATIONS

**Important:** Check your product code for exact hardware fitted.

### PROCESS 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: ±0.25% of full range, ±1LSD.

Sampling Rate: 4 per second.

Impedance: >1MΩ resistive, except dc mA (5Ω) and V (47kΩ)

Sensor Break Detection: Thermocouple, RTD, 4 to 20mA, 10 to 50mV, 2 to 10V and 1 to 5V ranges only. Limit output triggers when a sensor break is detected.

### DIGITAL INPUT (Isolated or Non-Isolated version)

Signal: Non-isolated version - Open or Closed contacts only. Isolated version - Open (2 to 24Vdc) or Closed (<0.8Vdc).

Functions: **Reset Limit Output & Latched Alarms.** An Open condition detected at power-on, or a Closed to Open transition during operation = **Reset**. Reset occurs only if the Limit Exceed/Alarm condition is not present at time of reset. Annunciator outputs always reset.

### OUTPUTS

**Relay**  
Contacts: Limit (Output 1) Form C SPDT 2A @250vac or Other (Output 2 or 3) Form A SPST relay, 2A @ 250Vac.

Lifetime: >150,000 operations at rated voltage/current, resistive load.

**SSR Driver**  
Capability: SSR drive voltage >10V at 20mA

**Output 3 option only: DC (Linear) for PV Retransmit**  
Types: 0 to 20mA, 4 to 20mA, 0 to 5V, 0 to 10V or 2 to 10V  
Load Resistance: Current Output 500Ω max, Voltage Output 500Ω min.  
Resolution: 8 bits in 250ms (10 bits in 1s typical, >10 bits in >1s typical).

### RS485 SERIAL COMMUNICATIONS

Data Rate: 1200, 2400, 4800, 9600, 19200 or 38400 bps.  
Protocol: Modbus RTU.

### OPERATING CONDITIONS

Usage: For indoor use only, DIN-rail mounted in suitable enclosure

Ambient Temperature: <95% humidity 0°C to 55°C (Operating), -10°C to 80°C (Storage).

Relative Humidity: 20% to 95% non-condensing.

Altitude: < 2000m

Supply Voltage & Power: Mains power version - 100 to 240Vac ±10%, 50/60Hz, 9VA  
Low voltage version - 24Vac +10/-15% 50/60Hz 9VA or 24Vdc +10/-15% 5W.

### ENVIRONMENTAL

Standards: CE, FM 3545, UL & cUL.

EMI: EN61326-1:2013, Table 2 & Class A.

**Warning:** This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Safety: UL61010-1 Edition 3, EN61010-1 Version 2010, Pollution Degree 2 & Installation Class 2.

Protection Rating: IP20.

### PHYSICAL

Unit Size: Height - 99mm; Width - 22.5mm; Depth - 121mm

Ventilation: A minimum space of 80mm must be allowed above and below each unit.

Weight: 0.20kg maximum

### ISOLATION

	PSU	Universal Input	Relay	SSR	Linear	RS485 Comms	Non-Isolated Digital Input	Isolated Digital Input	Configuration Port
PSU	Not Applicable								
Universal Input		Not Applicable							
Relay			Not Applicable						
SSR				Not Applicable					
Linear					Not Applicable				
RS485 Comms						Not Applicable			
Non-Isolated Digital Input							Not Applicable		
Isolated Digital Input								Not Applicable	
Configuration Port									Reinforced Isolation

## 7. 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 Navigation

Enter by pressing **◀** & **▶**. Press **↶** or **↷** to navigate to the required menu, then press **◻** to enter.

Press **◻** & **↶** to exit up 1 level. Depending upon which menu you enter it may be necessary to exit 2 or 3 levels for Operator Mode.

### Advanced Configuration main menu

<b>Advanced Lock</b>	Enter code & press <b>◻</b>	Default <b>20</b>
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Menus	Description
<b>Input</b>	Configure the process input.
<b>User Calibration</b>	Single or two-point calibration adjustments for the process input.
<b>Outputs</b>	Configuration parameters for the outputs and alarms.
<b>Communication</b>	Modbus communications settings.
<b>Display</b>	Lock codes and Factory Default.
<b>Information</b>	View serial number & manufacturing details.

### Input

Parameter	Description	Default Value
<b>Input Type</b>	See Input Type table in SETUP (& FIRST POWER UP).	<b>K Thermocouple</b>
<b>Units</b>	Display °C or °F (hidden when a linear input is used)	<b>°C</b>
<b>Decimal Place</b>	<b>0000</b>	<b>0000</b>
	<b>000.0</b>	
	<b>00.00</b> <b>0.000</b>	
<b>Scale Range Maximum</b>	Maximum for application working range	Max allowed for Input Type.
<b>Scale Range Minimum</b>	Minimum for application working range	Min allowed for Input Type.
<b>Filter Time</b>	<b>OFF</b> or <b>0.5</b> to <b>100.0</b> seconds in <b>0.5</b> increments	<b>2.0</b>
<b>CJC Enable</b>	<b>Enable</b> Enables the internal thermocouple CJC (Cold Junction Compensation).	<b>Enable</b>
	<b>Disable</b> Disables the internal CJC. External compensation must be provided for thermocouples.	

### User Calibration

Single-point offset or two-point calibration adjustment for process input. Can be used together, if required.

Parameter	Description	Default Value
<b>Offset</b>	Shifts the input value up or down by a single offset amount across the entire range.	<b>0</b>
<b>Low Point</b>	Enter value at which the low point error was measured.	Lower Limit
<b>Low Offset</b>	Enter equal, but opposite offset value to the observed low point error.	<b>0</b>
<b>High Point</b>	Enter value at which the high point error was measured.	Upper Limit
<b>High Offset</b>	Enter an equal, but opposite offset value to the observed high point error.	<b>0</b>

### Outputs

Parameter	Description	Default Value
<b>&gt;Limit Output</b>		
<b>Type</b>	<b>High</b> = Limit output trips when PV over Limit value. (PV>Limit Value). <b>Low</b> = Limit output trips when PV under Limit value. (PV<Limit value).	<b>High</b>
<b>Value</b>	The exceed value at which the Limit output will trip. Variable within the Scaled Range set in Input.	<b>-240</b>
<b>Output Latching</b>	<b>OFF</b> – Limit Output doesn't latch <b>ON</b> - Limit Output latches & needs to be cleared.	<b>ON</b>
<b>Startup latch</b>	<b>Reset Latch</b> <b>Always Latch</b> <b>Last Latch</b>	<b>Last Latch</b>
<b>&gt;Alarm 1</b>		
<b>Type</b>	<b>None</b> <b>PV High</b> <b>PV Low</b> <b>Deviation</b> <b>Annunciator</b>	<b>PV High</b>

Parameter	Description	Default Value
<b>Value</b>	Range minimum to range maximum, or OFF (maximum +1). <b>OFF</b> disables alarm. Default <b>PV High</b> alarm type.	<b>1373</b>
<b>Hysteresis</b>	<b>0</b> to full span.	<b>1</b>
<b>Action</b>	<b>Direct</b> - Output active when alarm is active. <b>Reverse</b> - Output active when alarm is not active.	<b>Direct</b>
<b>Output Latching</b>	<b>OFF</b> - Alarm doesn't latch <b>ON</b> - Alarm latches & needs to be cleared. * Default when <b>Annunciator</b> is <b>ON</b> .	<b>OFF *</b>
<b>Startup latch</b>	<b>Reset Latch</b> <b>Always Latch</b> <b>Last Latch</b>	<b>Last Latch</b>
<b>&gt;Alarm 2</b> Alarm 2 visible if Output 3 is <b>Relay</b> or <b>SSR Drive</b> .		
<b>Type</b>	Same options as Alarm 1.	<b>PV Low</b>
<b>Value</b>		<b>-240</b>
<b>Hysteresis</b>		<b>Off</b>
<b>Action</b>		<b>Direct</b>
<b>Output Latching</b>		<b>OFF</b>
<b>Startup latch</b>	<b>Reset Latch</b> <b>Always Latch</b> <b>Last Latch</b>	<b>Last Latch</b>
<b>&gt;PV Retrans</b> <b>PV Retrans</b> parameters only visible if Output 3 is <b>Linear</b> .		
<b>Output type</b>	<b>0-10V</b> <b>0-5V</b> <b>2-10V</b> <b>0-20mA</b> <b>4-20mA</b> <b>1-5V</b>	<b>0-10V</b>
<b>Scale Range Maximum</b>	Display value for maximum output, -1999 to 9999	Input type Max
<b>Scale Range Minimum</b>	Display value for minimum output, -1999 to 9999	Input type Min
<b>&gt;Alarm Options</b>		
<b>&gt; Alm Options</b>	Inhibit Alarms on Start up.	
<b>Start-up Inhibit</b>	<b>None</b> <b>Alarm 1</b> <b>Alarm 2</b> <b>Alarm 1 &amp; 2</b>	<b>None</b>
<b>&gt; Alm Options</b>	<b>OFF</b> or <b>ON</b>	
<b>Sensor Break</b>	<b>ON</b> - triggers Alarm outputs when sensor break is detected.	<b>ON</b>

### Communications

Only shown when RS485 option is fitted.

Parameter Name	Description	Default Value
<b>Unit Address</b>	Modbus address from <b>1</b> to <b>255</b>	<b>1</b>
<b>Baud Rate</b>	Coms data rate in kbps <b>1200, 2400, 4800, 9600, 19200 &amp; 38400.</b>	<b>9600</b>
<b>Parity</b>	Parity checking: <b>Odd, Even</b> or <b>None</b>	<b>None</b>

### Display

Lock codes & Factory Defaults.

Parameter Name	Description	Default Value
<b>Setup Unlock Code</b>	View & adjust Setup lock code. From <b>1</b> to <b>9999</b> or <b>Off</b> for no lock code.	<b>10</b>
<b>Advanced Unlock Code</b>	View & adjust Advanced lock code. From <b>1</b> to <b>9999</b> or <b>Off</b> for no lock code.	<b>20</b>
<b>Screen Timeout</b>	Screensaver time <b>5, 15</b> or <b>30</b> mins.	<b>5</b>
<b>Selected language</b>	Display language, 2 available – <b>English</b> plus either <b>German</b> or <b>French</b> .	<b>English</b>
<b>Reset to Defaults</b>	Reset parameters back to factory defaults. To clear press <b>◻</b> then <b>↷</b> to select <b>Yes</b> . Press <b>◻</b> to accept.	

### Information (Read-Only)

Parameter Name	Description
<b>PRL</b>	The hardware/software revision level.
<b>DOM</b>	Date of manufacture ( <i>mmyy</i> ).
<b>FW Version</b>	The firmware version number & code type.
<b>FW Type</b>	
<b>Serial</b>	Instrument serial number.
<b>Out1</b> <b>Out2</b> <b>Out3</b>	<b>Relay</b> <b>SSR</b> (SSR driver) or <b>Relay</b> . <b>None, SSR</b> (SSR driver), <b>Relay</b> or <b>Linear</b> .
<b>Comm</b> <b>DI</b>	Comms option - <b>Fitted</b> or <b>None</b> . Digital Input options – <b>Iso</b> (isolated) or <b>NonIs</b> (non-isolated)

### What is a Limiter / Limit Controller?

A protective device that will shut down a process at a preset Exceed Condition, in order to prevent possible damage to equipment or products. A 'fail-safe' latching relay is used, which cannot be reset by the operator until the process is back in a safe condition. This signal may be applied from the instrument keypad, digital input or command via Serial Communication. Limit controllers work independently of the normal process controller. Limit Controllers have specific approvals for safety critical applications. They are recommended for any process that could potentially become hazardous under fault conditions.

### What does Exceed Condition mean?

A state that occurs when the Process Variable exceeds the Limit Setpoint value. E.g. if the PV is above the Limit SP when set for high limit action, or below the Limit SP for low limit action. The Limit Controller can be used to shut down the process when this condition occurs, and cannot be reset until the Exceed Condition has passed.

### What does 'Latching' mean?

An output that once it becomes active requires a reset signal before it will deactivate. This output is available on Limit controllers and indicator alarms. To successfully deactivate a latched output, the alarm or limit condition that caused the relay to become active must first be removed, then a reset signal can be applied. This signal may be applied from the instrument keypad, Digital Input or command via Serial Communication.

### What is the PV Retransmit Output?

A linear DC Voltage or mA output signal proportional to the Process Variable (e.g. process temperature), for use by external devices, such as a Data Recorder or PLC. This output can be scaled to transmit any portion of the input, but it is normally scaled so the reading matches on the device receiving the signal.

### What is an Annunciator?

A special type of alarm output that is linked to a Limit Controller's main Limit Output. An Annunciator output will activate when an Exceed condition occurs, and will remain active until a reset instruction is received, or the Exceed condition has passed. Unlike the Limit Output, an Annunciator can be reset even if the Exceed condition is present.

Please refer to the full manual for further information on any topic.