



## LC5296-AT LC5248E-AT LC5296L-AT LC5248L-AT Auto-tune PID Controller

Masibus LC5296-AT / LC5248E-AT / LC5296L-AT / LC5248L-AT PID Controller series is designed to offer outstanding control performance in a compact package providing a comprehensive solution for a wide variety of applications: such as plastic manufacturing, packaging machinery and food processing applications requiring precise heat/cool control and processes protection alarming.

LC5296-AT / LC5248E-AT PID Controller offer a cost-effective alternative to implement loops in a PLC while at the same time improving loop performance. It accepts one universal process input suitable for thermocouple, RTD or linear mA/Volt. All inputs and outputs can be read directly over the modbus communication interface by the supervisory host system as well as process value can be retransmitted to remote PLC/DCS. This expands capabilities of available PLC/DCS and host supervisory system I/O, simplifies machine troubleshooting and remote diagnostics.

LC5296-AT / LC5248E-AT / LC5296L-AT / LC5248L-AT PID Controller With a fast responsive PID auto-tuning algorithm it is equipped with Heat/Cool relay or SSR output for control function. Auto-tuning adjusts the PID parameters for desired set-point according to the current process dynamics so it has no harmful effect on the current operation. It has flexibility to switch control to On-Off or manual mode for non-critical applications.

LC5296-AT / LC5248E-AT PID Controller has two outputs available providing a combination of relay (alarm output) and relay or SSR (control output) based on application requirement. Whereas LC5296L-AT / LC5248L-AT PID controller has 3 outputs providing combination of 2 Relay (alarm output) or SSR (control output)

Compact size and simple programming makes the installation and operation of controller easier and user-friendly.

### Features

- Auto-tune PID
- Universal input (TC, RTD, Volts, mA)
- 15 Alarm configurations
- RS485 Modbus communication (optional in LC5296-AT / LC5248E-AT model)
- Retransmission output (optional in LC5296-AT / LC5248E-AT model)
- Relay / SSR control output option
- Password protected configurations
- Auto/manual selection with bump less transfer
- Fail-safe design protecting the process in case of system malfunctioning
- Display brightness control
- Transmitter power supply in LC5296-AT/LC5296L-AT/LC5248E-AT model
- Function Key : selectable for RUN/STOP or auto/manual or none.(LC5296L-AT/LC5248L-AT)

### Applications

- Injection molding machines
- Plastic extrusion process
- Packaging machines
- Food processing applications

# TECHNICAL SPECIFICATIONS

Input		Analogue PV Output <sup>#</sup> (Option) (only in LC5296-AT model)			
Input Type	Thermocouple (E, J, K, T, B, R, S), RTD (Pt100), Current (Ext. 250Ω), Voltage	Current	0-20mA/ 4-20mA @500Ω Max		
Display Range	Refer Table-1	Voltage	0-5V/ 1-5V/ 0-10V @3 KΩ Min		
Accuracy	±0.25% of FS ±1 count for TC, RTD input ±0.1% of FS ±1 digit for linear input	Accuracy	0.25% FS		
ADC Resolution	16 bits	<b>Communication Output (Optional in LC5296-AT / LC5248E-AT Only)</b>			
Display Resolution	0.1 / 1.0 °C	Interface	RS485		
Sampling Rate	5 Samples/Sec	Protocol	Modbus RTU		
CJC Error	±2.0 °C	Baud Rate	9600, 19200, 38400		
Sensor open	All inputs except 0-5V / 0-10 V	<b>Alarm Output</b>			
Sensor Burnout current	0.25µA	<b>LC5296-AT / LC5248E-AT</b>		<b>LC5296L-AT / LC5248L-AT</b>	
RTD excitation current	0.166 mA (Approx.)	Relays	1 (If control output is Relay/ SSR) or 2 (If control output is AO)		1 (If control output is Relay) or 2 (If control output is SSR)
NMRR	> 40dB	Type	Single Change over (C, NO, NC), For LC5248L-AT(C, NO)		
CMRR	> 120dB	Rating	5A @ 230VAC / 30VDC		
Temp-co	< 100ppm for Input to Display < 150ppm for Input to retransmission output (LC5296-AT/ LC5248E-AT)	Transmitter supply In LC5296-AT/ LC5296L-AT/LC5248E-AT model only 24V DC (±10%) @26mA (Current limited)			
Input Impedance	> 1MΩ (Voltage) / 250Ω (Current)	<b>Power Supply</b>			
Max Voltage	20VDC	Standard	85-260VAC / 100-300VDC		
<b>Display &amp; Keys</b>		Optional	18-36VDC		
Process Value	<b>LC5296-AT</b>	<b>LC5296L-AT</b>	<b>LC5248E-AT</b>	<b>LC5248L-AT</b>	Power Consumption
	0.56", 7 segment, Red LED, 4 digits	0.56", 7 segment, Red LED, 4 digits	0.4", 7 segment, Red LED, 4 digits	0.4", 7 segment, Red LED, 4 digits	10 VA Approx. (LC5296-AT / LC5248E-AT)
Set Value	0.4", 7 segment, Green LED, 4 digits	0.4", 7 segment, Green LED, 4 digits	0.28", 7 segment, Green LED, 4 digits	0.31", 7 segment, Green LED, 4 digits	5VA Approx. (LC5296L-AT / LC5248L-AT)
	Keys	SET1, SET2, Increase, Decrease, A/M	Enter, Increase, Decrease, A/M	Enter, Increase, Decrease, A/M	<b>Isolation (Withstanding voltage)</b>
Status LEDs	Relay, Communication, A/M & SSR	Relay & SSR	Relay, Communication, A/M & SSR	Relay & SSR	Between primary terminals* and secondary terminals**: <b>At least 1500 V AC for 1 minute</b> Between primary terminals* and grounding terminal: <b>At least 1500 V AC for 1 minute</b> Between grounding terminal and secondary terminals**: <b>At least 1500 V AC for 1 minute</b> Between secondary terminals**: <b>At least 500 V AC for 1 minute</b> * Primary terminals indicate power terminals and relay output terminals. ** Secondary terminals indicate analog I/O signal and Communication O/P. <b>Insulation resistance:</b> 20MΩ or more at 500 V DC between power terminals and grounding terminal
<b>Physical</b>					
		<b>LC5296-AT/ LC5296L-AT</b>	<b>LC5248E-AT</b>	<b>LC5248L-AT</b>	
Dimension (in mm)(H x W x D)		96 x 96 x 75	48 x 48 x 120	48 x 48 x 85	
Front bezel (in mm)(H x W)		96 x 96	48 x 48	48 x 48	
Panel cutout (in mm) (H x W)		92.5 x 92.5	44 x 44	45 x 45	
Depth behind panel (in mm)		65	115	77	
Weight (approx.)		300g	120g	120g	
Enclosure material		Molded ABS			
Enclosure protection		IP20			
Terminal cable size		2.5mm <sup>2</sup>			
<b>Environmental</b>					
Operating temperature		0 to 55 °C			
Storage temperature		0 to 80°C			
Humidity		30-95% RH (non-condensing)			
<b>Table-1: Display Range</b>					
<b>Input</b>	<b>Input Type</b>	<b>Range</b>			
Thermocouple	E	-200 to 1000 °C			
	J	-200 to 1200°C			
	K	-200 to 1372°C			
	T	-200 to 400°C			
	B	450 to 1800°C			
RTD	R	0 to 1768 °C			
	S	0 to 1768 °C			
	PT-100 (3 wire)	-200 to 850 °C, -199.0 to 850.0 °C			
Linear	1-5V/0-5V/0-10V DC	-1999 to 9999			
	0/4-20mA (Ext 250 Ω)				

Ordering Code					Ordering Code				
Model	Input	Power Supply	Control Output	Output Option	Model	Input	Power Supply	Output	
LC5296-AT	1 E	U1 85-260VAC/100-300VDC	1 Relay	1 (AO1*) 2 (AO2**or RS485) None N None	LC5296L-AT	1 E	U1 85-260VAC/100-300VDC	1 Relay1+Relay2	
LC5248E-AT	2 J	U2 18-36VDC	2 SSR	1 4-20 mA 1 4-20 mA <sup>#</sup>	LC5248L-AT	2 J	U2 18-36VDC	2 Relay1+SSR	
	3 K		3 AO1*	2 0-20 mA 2 0-20 mA <sup>#</sup>		3 K		3 Relay1+Relay2+SSR	
	4 T		4 Relay - On/Off	3 1-5 V 3 1-5 V <sup>#</sup>		4 T			
	5 B			4 0-5 V 4 0-5 V <sup>#</sup>		5 B			
	6 R			5 0-10 V 5 0-10 V <sup>#</sup>		6 R			
	7 S			6 RS485		7 S			
	9 Pt-100					9 Pt-100			
	C 4-20 mA					C 4-20 mA			
	D 0-20 mA					D 0-20 mA			
	E 1-5 V					E 1-5 V			
	F 0-5 V					F 0-5 V			
	G 0-10 V					G 0-10 V			
	X Default I/P type <sup>##</sup>					X Default I/P type <sup>##</sup>			

Head Office: Masibus Automation And Instrumentation Pvt. Ltd.  
B-30, GIDC Electronics Estate, Sector-25, Gandhinagar-382044, Gujarat, India.  
Tel: +91 79 23287275-77, Fax: +91 79 23287281.  
E-mail: sales@masibus.com, Web: www.masibus.com

All specifications are subject to change without notice due to continuous improvements.  
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