



LC5296-AT LC5248E-AT LC5296L-AT LC5248L-AT LC5296V-AT

Auto-tune PID Controller

Masibus LC5296-AT / LC5248E-AT / LC5296L-AT / LC5248L-AT / LC5296V-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 / LC5296V-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 / LC5296V-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 / LC5296V-AT PID Controller has outputs available providing a combination of relay (alarm output) and relay or SSR (control output) or Motorized valve Forward/Reverse without feedback (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 / LC5296V-AT model)
- Retransmission output (optional in LC5296-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 /LC5296V-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 [#] (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	Communication Output (Optional in LC5296-AT/LC5248E-AT/LC5296V-AT)																																														
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	Alarm Output																																														
Sensor Burnout current	0.25μA	LC5296-AT/LC5248E-AT/LC5296V-AT LC5296L-AT / LC5248L-AT																																														
RTD excitation current	0.166 mA (Approx.)	Relays	2 (If control o/p is AO) or 1 (If control o/p is Relay / SSR) or Not available (If control o/p is F/R without feedback)																																													
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/LC5296V-AT)	Transmitter supply In LC5296-AT/LC5296L-AT/ LC5248E-AT /LC5296V-AT model only 24V DC (±10%) @26mA (Current limited)																																														
Input Impedance	> 1MΩ (Voltage) / 250Ω (Current)	Power Supply																																														
Max Voltage	20VDC	Standard	85-260VAC / 100-300VDC																																													
Display & Keys		Optional	18-36VDC																																													
<table border="1"> <thead> <tr> <th></th> <th>LC5296-AT</th> <th>LC5296L-AT</th> <th>LC5248E-AT</th> <th>LC5248L-AT</th> <th>LC5296V-AT</th> </tr> </thead> <tbody> <tr> <td>Process Value</td> <td>0.56", 7 segment, Red LED, 4 digits</td> <td>0.56", 7 segment, Red LED, 4 digits</td> <td>0.4", 7 segment, Red LED, 4 digits</td> <td>0.4", 7 segment, Red LED, 4 digits</td> <td>0.36", 7 segment, Red LED, 4 digits</td> </tr> <tr> <td>Set Value</td> <td>0.4", 7 segment, Green LED, 4 digits</td> <td>0.4", 7 segment, Green LED, 4 digits</td> <td>0.28", 7 segment, Green LED, 4 digits</td> <td>0.31", 7 segment, Green LED, 4 digits</td> <td>0.31", 7 segment, Green LED, 4 digits</td> </tr> <tr> <td>Keys</td> <td>SET1, SET2, Increase, Decrease, A/M</td> <td>Enter, Increase, Decrease, A/M</td> <td>Enter, Increase, Decrease, A/M</td> <td>Enter, Increase, Decrease, A/M</td> <td>Enter, Increase, Decrease, A/M</td> </tr> <tr> <td>Status LEDs</td> <td>Relay, Communication, A/M & SSR</td> <td>Relay & SSR</td> <td>Relay, Communication, A/M & SSR</td> <td>Relay & SSR</td> <td>Relay, Communication, A/M & SSR</td> </tr> </tbody> </table>			LC5296-AT	LC5296L-AT	LC5248E-AT	LC5248L-AT	LC5296V-AT	Process Value	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	0.36", 7 segment, Red LED, 4 digits	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	0.31", 7 segment, Green LED, 4 digits	Keys	SET1, SET2, Increase, Decrease, A/M	Enter, Increase, Decrease, A/M	Enter, Increase, Decrease, A/M	Enter, Increase, Decrease, A/M	Enter, Increase, Decrease, A/M	Status LEDs	Relay, Communication, A/M & SSR	Relay & SSR	Relay, Communication, A/M & SSR	Relay & SSR	Relay, Communication, A/M & SSR	Power Consumption	10 VA Approx. (LC5296-AT/LC5248E-AT/LC5296V-AT) 5VA Approx. (LC5296L-AT / LC5248L-AT)															
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		Isolation (Withstanding voltage)																																														
		Between primary terminals* and secondary terminals**: At least 1500 V AC for 1 minute Between primary terminals* and grounding terminal: At least 1500 V AC for 1 minute Between grounding terminal and secondary terminals**: At least 1500 V AC for 1 minute Between secondary terminals**: At least 500 V AC for 1 minute																																														
		* Primary terminals indicate power terminals and relay output terminals. ** Secondary terminals indicate analog I/O signal and Communication O/P.																																														
		Insulation resistance: 20MΩ or more at 500 V DC between power terminals and grounding terminal																																														
		Physical																																														
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		Storage temperature 0 to 80°C																																														
		Humidity 30-95% RH (non-condensing)																																														
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	Linear	1-5V/0-5V/0-10V DC 0/4-20mA (Ext 250 Ω)																																														
		Control Output																																														
Control Type	On/Off, P, PI, Auto tune PID																																															
Manual offset	±50% of P band																																															
Proportional band	0.0 to 999.9 or 0 to 9999																																															
Integral time	0(off) to 1000 Sec																																															
Derivative time	0(off) to 180 Sec																																															
Cycle time	For SSR 1 to 60 Sec For Relay 10 to 300 Sec (Hyst in on/off mode)																																															
Relay Control Output																																																
Relays	1 No or 2 Nos in case of F/R without feed back o/p																																															
Type	Single change over (C, NO, NC), For LC5248L-AT (C, NO)																																															
Rating	5A @ 230VAC / 30VDC																																															
SSR Control Output (Optional in lieu of Relay control o/p)																																																
Rating	11V DC@20mA																																															
Resolution	10ms																																															
Analogue MV Output (Optional in LC5296-AT/LC5248E-AT/LC5296V-AT)																																																
Current	0-20mA/4-20mA@500Ω max																																															
Voltage	0-5V/ 1-5V/ 0-10V @3 KΩ Min																																															
Accuracy	0.25% of FS																																															
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 None 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 [#]	LC5248L-AT	2 J	U2 18-36VDC	2 Relay1+SSR																																								
LC5296V-AT	3 K		3 AO1*	2 0-20 mA 2 0-20 mA [#]		3 K		3 Relay1+Relay2+SSR																																								
	4 T		4 Relay - On/Off	3 1-5 V 3 1-5 V [#]		4 T																																										
	5 B		5 F/R without feedback	4 0-5 V 4 0-5 V [#]		5 B																																										
	6 R			5 0-10 V 5 0-10 V [#]		6 R																																										
	7 S			6 RS485		7 S																																										
	9 Pt-100					9 Pt-100																																										
	C 4-20 mA	*Configurable as MV or PV				C 4-20 mA																																										
	D 0-20 mA	** PV only				D 0-20 mA																																										
	E 1-5 V	# Not available in LC5248E-AT/LC5296V-AT model				E 1-5 V																																										
	F 0-5 V	** Default I/P type configured from factory is 1-5VDC				F 0-5 V																																										
	G 0-10 V	^When AO1 is selected as control o/p type, than in Output option AO1 type must be selected from ordering code				G 0-10 V																																										
	X Default I/P type [#]					X Default I/P type [#]																																										
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. Doc. Ref. LC5296-AT/LC5248E-AT/LC5296L-AT/LC5248L-AT/LC5296V-AT_RS5_1120																																												