



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 / LC5296L-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 [#] (Option) (only in LC5296-AT model)			
Input Type	Thermocouple (E, J, K, T, B, R, S), RTD (Pt100), Current, 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)			
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		LC5296L-AT / LC5248L-AT	
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	Power Supply			
Max Voltage	20VDC	Standard	85-260VAC / 100-300VDC		
Display & Keys		Optional	18-36VDC		
Process Value	LC5296-AT	LC5296L-AT	LC5248E-AT	LC5248L-AT	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) 5VA Approx. (LC5296L-AT / LC5248L-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	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				
Keys	SET1, SET2, Increase, Decrease, A/M	Enter, Increase, Decrease, A/M	Enter, Increase, Decrease, A/M	Enter, Increase, Decrease, A/M	Physical
Status LEDs	Relay & Communication, A/M	Relay & SSR	Relay & SSR	Relay & SSR	LC5296-AT/ LC5296L-AT
Output		LC5248E-AT	LC5248L-AT		Dimension (in mm)(H x W x D)
Control Type	On/Off, P, PI, Auto tune PID				96 x 96 x 75
Manual offset	±50% of P band				48 x 48 x 120
Proportional band	0.0 to 999.9 or 0 to 9999				48 x 48
Integral time	0(off) to 1000 Sec				48 x 48
Derivative time	0(off) to 180 Sec				45 x 45
Cycle time	For SSR: 1 to 60 Sec For Relay: 10 to 300 Sec (Hyst in on/off mode)				92.5 x 92.5
Relay Control Output					Depth behind Panel (in mm)
Relays	1 No.				65
Type	Single Change over (C, NO, NC), For LC5248L-AT(C, NO)				115
Rating	5A @ 230VAC / 30VDC				77
SSR Control Output (Optional)					Weight (approx.)
Rating	11V DC@20mA				300g
Resolution	10ms				120g
Analogue MV Output (Optional in LC5296-AT / LC5248E-AT)					120g
Current	0-20mA/4-20mA@500Ω max				Enclosure Material
Voltage	0-5V/ 1-5V/ 0-10V @3 KΩ Min				Molded ABS
Accuracy	0.25% of FS				Enclosure Protection
					IP20
					Terminal Cable Size
					2.5mm ²
					Environmental
					Operating Temperature
					0 to 55 °C
					Storage temperature
					0 to 80°C
					Humidity
					30-95% RH (non-condensing)
					Table-1: Display Range
					Input
					Input Type
					Range
					E
					-200 to 1000 °C
					J
					-200 to 1200°C
					K
					-200 to 1372°C
					Thermocouple
					T
					-200 to 400°C
					B
					450 to 1800°C
					R
					0 to 1768 °C
					S
					0 to 1768 °C
					RTD
					PT-100 (3 wire)
					-200 to 850 °C, -199.0 to 850.0 °C
					Linear
					1-5V/0-5V/0-10V DC
					0/4-20mA (Ext 250 Ω)
					-1999 to 9999

Ordering Code					Ordering Code				
Model	Input	Power Supply	Control Output	Optional	Model	Input	Power Supply	Output	
LC5296-AT	1 E	U1 85-260VAC/100-300VDC	1 Relay	1 (AO1*) 2 (AO2**or RS485)	LC5296L-AT	1 E	U1 85-260VAC/100-300VDC	1	Relay1+Relay2
LC5248E-AT	2 J	U2 18-36VDC	2 SSR		LC5248L-AT	2 J	U2 18-36VDC	2	Relay1+SSR
	3 K					3 K		3	Relay1+Relay2+SSR
	4 T					4 T			
	5 B					5 B			
	6 R					6 R			
	7 S					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 [#]					X Default I/P type [#]			
					*Configurable as MV or PV				
					** PV only				
					# Not available in LC5248E-AT model				
					## Default I/P type configured from factory is 1-5VDC				