



LC5296-AT

Auto-tune PID Controller (96x96mm)

Masibus LC5296-AT is designed to offer outstanding control performance in a compact 96x96x75mm 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 offers 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.

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 without repeating process-cycle and so has no harmful effect on the current operating conditions. Controlling can also be shifted to On-Off mode for non critical applications.

Two relay outputs can be configured for 15 types of alarm functions. These relays can be also configured as heat/cool control operation. It has option of SMPS (85-265 VAC) and DC (18-36 VDC) power supply options.

Features

- Auto-tune PID
- Universal input (TC, RTD, Volts, mA)
- Accuracy 0.25% of F.S.
- 15 Alarm configurations
- RS485 Modbus Communication
- Retransmission with accuracy: 0.25% of F.S.
- Fail-safe Design protecting the process in case of system malfunctioning
- Display brightness control
- Transmitter Power Supply

Applications

- Injection Molding machines
- Plastic Extrusion process
- Packaging machines
- Food processing applications

Technical Specifications:

Input

| | |
|------------------------|---|
| Input Type | Thermocouple (E, J, K, T, B, R, S), RTD (Pt100), Current, Voltage |
| Display Range | Refer Table-1 |
| Accuracy | ±0.25% of FS ±1 Count |
| ADC Resolution | 16 bits |
| Display Resolution | 0.1 / 1.0 °C |
| Sampling Rate | 4 Samples/Sec |
| CJC Error | ±2.0 °C |
| Sensor open | All inputs except 0-5V |
| Sensor Burnout current | 0.25uA |
| RTD excitation current | 0.166mA (Approx) |
| NMRR | > 40dB |
| CMRR | > 120dB |
| Temp-co | < 150ppm/°C |
| Input Impedance | > 1MΩ |
| Max Voltage | 20VDC |

Display & Keys

| | |
|-----------------------|--------------------------------|
| Process Value | 0.56", Red 4-digit |
| Set Value | 0.4", Green 4-digit |
| Relay & Communication | Discrete LEDs |
| Keys | SET1, SET2, Increase, Decrease |

Output

Control

| | | |
|----------------|---------|---|
| Output Options | Relay | 2A @ 230VAC / 30VDC Single Change over (C, NO, NC) |
| | SSR | 18VDC, 20mA |
| | Voltage | 0/1-5V, 0-10V @2KΩ Min. |
| | Current | 0/4-20mA @500Ω Max. |

Alarm

| | |
|--------|---|
| Relays | 2 Nos. (Max) 2A @ 230VAC / 30VDC Single Change over (C, NO, NC) |
| SSR | 1 nos. 11VDC (10mA) |

Retransmission Output

| | |
|----------|-------------------------|
| Current | 0/4-20mA @500Ω Max. |
| Voltage | 0/1-5V, 0-10V @2KΩ Min. |
| Accuracy | 0.25% of FS |

Transmitter Supply 24VDC (±10%) @30mA (Current limited)

Communication Output

| | |
|-----------|--------------------|
| Interface | RS485 |
| Protocol | Modbus-RTU |
| Baud Rate | 9600, 19200, 38400 |

Environmental

| | |
|-----------------------|--------------------------|
| Operating temperature | 0-55 °C |
| Storage temperature | 0-80 °C |
| Humidity | 20-95% RH non-condensing |

Functional

| | |
|---------------------|--|
| Control Mode | P, PI, PID, and ON/OFF control for Relay-1/SSR |
|---------------------|--|

| Parameter | Range |
|-------------------|--|
| Proportional Band | 0 to 9999 |
| Integral Time | 0 to 1000 seconds |
| Derivative Time | 0 to 180 seconds |
| Cycle Time | SSR: 1 to 60 sec Relay: 10 to 300 sec |

Power Supply

| | |
|-------------------|------------------------|
| Standard | 85-260VAC / 125-300VDC |
| Optional | 18-36VDC |
| Power Consumption | 10 VA Approx. |

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

Dimensions:

| | |
|--------------------|--------------------------|
| Size | 96(W) x 96(H) x 75(D) mm |
| Front Bezel | 96 x 96 mm |
| Panel Cutout | 92.5 x 92.5 mm |
| Depth behind panel | 65 mm |

| | |
|----------------------|--------------------|
| Weight | 300 gms approx. |
| Enclosure Material | Molded ABS |
| Enclosure Protection | IP20 |
| Terminal Cable Size | 2.5mm ² |

Table-1: Display Range

| Input Type | Range |
|---------------------|------------------------------------|
| E | -200 to 1000 °C |
| J | -200 to 1200 °C |
| K | -200 to 1372 °C |
| T | -200 to 400 °C |
| B | 450 to 1820 °C |
| R | 0 to 1768 °C |
| S | 0 to 1768 °C |
| Pt100 | -200 to 850 °C, -199.0 to 850.0 °C |
| 0/1-5V | -1999 to 9999 |
| 0/4-20mA (Ext.250Ω) | |

Ordering Code

| Model | Input | Auxiliary Power Supply | Output | Options | |
|-----------|----------|---------------------------|---------------------|----------|----------|
| | | | | Output-1 | Output-2 |
| LC5296-AT | 1 E | U1 80-265VAC / 125-300VDC | 1 Relay-1 + Relay-2 | N None | N None |
| | 2 J | U2 18-36VDC | 2 SSR + Relay-2 | 1 4-20mA | 1 4-20mA |
| | 3 K | | | 2 0-20mA | 2 0-20mA |
| | 4 T | | | 3 1-5V | 3 1-5V |
| | 5 B | | | 4 0-5V | 4 0-5V |
| | 6 R | | | 5 0-10V | 5 0-10V |
| | 7 S | | | 6 RS485 | |
| | 9 Pt-100 | | | | |
| | C 1-5V | | | | |
| | D 0-5V | | | | |
| | E 4-20mA | | | | |
| | F 0-20mA | | | | |

Accessories: Two numbers mounting clamps

Head Office:

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

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Masibus Representative:

