masibus
A Sonepar Company

TC5396
TC5348

Auto-Tune PID Controller

Large & Bright Display

Advanced. Efficient. Economical

RoHS

Masibus PID Controller series TC5396 and TC5348 are designed to offer advanced performance at a competitive price, the controller comes with a Large White LED display plus 10 segment bargraph for display of MV, universal input, multiple output options, ideally suited for a wide range of applications such as plastic processing machines, packaging machinery and food processing applications. The controller has four relay outputs which can be configured as control, auxiliary and alarm.

PID Controller series TC5396 and TC5348 improve process efficiency and quality, input is truly universal, configurable for any thermocouple, RTD or mA/Volt. All inputs and outputs parameters are accessible over modbus communication interface option, retransmission option can be used for recording/datalogging.

PID Controller series TC5396 and TC5348 have an advanced auto-tuning function and can be set-up in different control modes from on-off, PID and valve position control without feedback, control output type options include relay, SSR and analog, manual mode override allows operator to manually control the process.

PID Controller series TC5396 and TC5348 have extended alarm capability, 15 different alarm modes are possible for each alarm output, the four relays can be configured for control output or alarm based on the actuator type.

The unit is easy to configure, operate and password protected, parameters that require frequent changes can be user selected and grouped in first level of access for quick parameterization.

Features

- Advanced Auto-tune PID algorithm
- Universal input (TC, RTD, Volts, mA)
- 15 Alarm configurations
- RS-485 Modbus communication (Optional)
- Variety of retransmission output (Optional)
- Relay or SSR control output option
- User customized configuration level for quick access
- Auto/Manual selection with bump less transfer
- Auto-tune PID, On-Off or valve position control
- PV bias for input correction
- Programmable digital filter
- Manual reset to prevent overshoot
- Selectable ramp and 1 soak

Applications

- Injection molding machines
- Packaging machines
- Food and beverages
- Industrial ovens
- Plastic industry
- Hot stamping machines

TECHNICAL SPECIFICATIONS

Input 1 PV 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 for TC, RTD input ±0.1% of FS ±1 digit for linear input
ADC Resolution	16 bits
Display Resolution	0.1 / 1.0 °C
Sampling Rate	5 Samples/Sec.
CJC Error	±2.0 °C
Sensor Open Protection	All inputs except 0-5V / 0-10V
Sensor Burnout Current	0.25uA
RTD Excitation Current	≈ 0.16mA
NMRR	> 40dB
CMRR	> 120dB
Temp-co	< 100ppm/°C
Input Impedance	> 1MΩ
Max Voltage	20VDC

Display & Keys

	TC5396	TC5348
Process Value	0.8", 7 Segment, White LED, 4 digits	0.4", 7 Segment, White LED, 4 digits
Set Value	0.4", 7 Segment, Green LED, 4 digits	0.28", 7 Segment, Green LED, 4 digits
Manipulated Value	10 segment bar Orange LED	NA
Keys	Enter, A/M, Increase, Decrease,	
Status LEDs	For Relay, Communication, A/M, Auto tune	

Output

Control Type	
Control Type	On/Off, P, PI, Auto tune PID, Valve position control (Without feedback)
Manual Offset	±50% of P band
Proportional Band	0.1 to 200.0 %
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)

Output Type	TC5396	TC5348
Relay-1	10A @ 230VAC/28VDC	5A@230VAC/30VDC
Relay-2	5A@230VAC/30VDC	5A@230VAC/30VDC
Relay-3,4	5A@230VAC/30VDC	NA
SSR	Optional (In lieu of RL1)	Yes# (Std.)

#If SSR is selected as a Control o/p then RL1 will function as an Alarm o/p

Relay Output (RL1)	
Function	Control
Type	Single Change over (C, NO, NC)

Relay Output (RL2)	TC5396	TC5348
Function	Alarm	
Type (Single Change over)	C, NO, NC	C, NO

Relay Output (RL3, RL4)##	
Function	Alarm
Type	Single change over (C, NO)

##For TC5396

SSR Output	
Function	Control
Rating	11V DC@20mA
Analog Output 1-AO1 (Option)	
Function	Control, retransmission
Current	0-20mA/ 4-20mA @500Ω Max.
Voltage	0-5V/ 1-5V/ 0-10V @3 KΩ Min.
Accuracy	0.25% FS
Analog Output 2-AO2 (Option)	
Function	Retransmission
Current	0-20mA/ 4-20mA@500Ω Max.
Voltage	0-5V/ 1-5V/ 0-10V @3 KΩ Min.
Accuracy	0.25% of FS
Communication Output-RS-485 (Option)	
Function	Read/Write all parameters
Protocol	Modbus RTU
Baud Rate	9600, 19200, 38400
Transmitter Supply	24V DC (±10%) @26mA (Current limited) For TC5396

Power Supply

Standard	85-260VAC, 50-60 Hz / 100-300VDC
Optional	18-36VDC
Power Consumption	8 VA Approx.

Isolation (Withstanding voltage)

- Between primary terminals* 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

Physical

	TC5396	TC5348
Mounting Type	Panel	
Dimension (in mm) (H x W x D)	100 x 100 x 55	50 x 50 x 98
Front Bezel (in mm) (H x W)	100 x 100	50 x 50
Panel Cutout (in mm) (H x W)	92 x 92	45 x 45
Depth Behind Panel (in mm)	52	95
Weight (Approx.)	300g	110g
Enclosure Material	ABS (Front: Polycarbonate)	
Enclosure Protection	IP20	
Terminal & Cable Size	Barrier type terminal 2.5mm^2	

Environmental

Operating Temperature	0-55 °C
Storage Temperature	0-80 °C
Humidity	30-95% RH non-condensing

Table-1: Display Range

Input	Input Type	Range
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
	R	0 to 1768 °C
	S	0 to 1768 °C
RTD	PT-100 (3 wire)	-200 to 850 °C*
Linear	1-5V/0-5V/0-10V DC	-1999 to 9999
	0/4-20mA (Ext 250 Ω)	

*0.1 °C selectable for range -199.9 to 999.9

Ordering code

Model	Input		Power Supply		Option-1 (RL1/SSR)		Option-2 (AO1)		Option-3 (AO2/RS-485)	
TC5396	1	E	U1	85-265VAC / 100-300VDC	1	Relay	N	None	N	None
TC5348	2	J	U2	18-36VDC	2	SSR	1	4-20 mA	1	4-20 mA
	3	K					2	0-20 mA	2	0-20 mA
	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	RS-485
	9	Pt-100								
	E	1-5V (4-20mA**)								
	F	0-5V (0-20mA**)								
	G	0-10V								

**Ext. 250 Ohm

Head Office: Masibus Automation And Instrumentation Pvt. Ltd.
B-30, GIDC Electronics Estate, Sector-25, Gandhinagar-382024, Gujarat, India.
Tel: +91 79 23287275-77, Fax: +91 79 23287281.
E-mail: sales@masibus.com, Web: www.masibus.com

Doc. Ref. TC5396, TC5348/R1F/0424