MG CO., LTD.
Make Greener automation

2026-02 | Rev. 0

EC-Z483

Temperature Controllers

From General-purpose Temperature Controllers To Specialized Modules for High-speed Industrial Networks Such As EtherCAT

❚ Universal input for thermocouple, RTD, DC current/voltage and potentiometer

❚ Convenient PC software to facilitate the parameter tuning while checking trend graphs

❚ Auto-tuning function for automatic PID parameter setting

Wall Mounted

New 1/16 DIN size

Panel/Flush Mounted

Main Specifications

	TEMPERATURE CONTROLLER			TEMPERATURE CONTROL MODULE	
	4-digit LED display type	5-digit LED display type	5-digit LED display type		
Model	**TC10CM**	**TC10NM**	**TC10EM**	**R3-TC2**	**R8-TC2**
GENERAL SPECIFICATIONS					
Number of control loops	One loop		Two loops		
Isolation	Pv1 to CT1 to Mv1 or Mv2 to Do1 or Do2 to Modbus to power	Pv1 to CT1 to Di1 or Di2 to Mv1 to Mv2 to Do1 or Do2 to Modbus to power	Pv1 to PV2 to CT1 to CT2 to Di1 or Di2 to Mv1 or Mv2 to Do1 or Do2 to Modbus to power	Pv1 to Pv2 to CT1 or CT2 to Di or Di2 to Mv1 or Mv2 to Do1 or Do2 to internal bus or internal power	Pv1 to Pv2 to Mv1 to Mv2 to exc. supply to CT1 or CT2 to internal bus or internal power
Control mode	Standard PID, heating and cooling control (ON/OFF, PID)				
Proportional band (P)	0.1 to 999.9 (temperature unit)	0.1 to 3200.0 (temperature unit)			
Integral time (I)	0 to 3999 sec.				
Derivative time (D)	0.0 to 999.9 sec.				
Auto-tuning method	Limit cycle method				
Alarm	Deviation high/low limit, absolute high/low limit, etc.				
Sampling cycle	100 msec.				
Control cycle	1.0 to 99.9 sec.				
Mv output range	-5 to +105 %				
INPUT SPECIFICATIONS					
●Universal input (Pv)					
DC current input	0 – 20 mA DC				
DC voltage input	-1000 to +1000 mV DC, -10 to +10 V DC				
Thermocouple	(PR), K (CA), E (CRC), J (IC), T (CC), B (RH), R, S, C (WRe 5-26), N, U, L, P (Platinel II)				
Potentiometer	0 to 4000 Ω				
Resistor	0 to 4000 Ω				
RTD (2-wire or 3-wire)	Pt 100 (JIS '97, IEC), Pt 500, Pt 1000, Pt 50 Ω, JPt 100 (JIS '89), Ni 508.4 Ω, CU 10 (25°C)				
●CT input	Clamp-on current sensor (Model: CLSE): 5 A, 50 A, 100 A, 200 A, 400 A, 600 A				
●Discrete Input (Di)	—	2 points			—
OUTPUT SPECIFICATIONS (Specify one output type when ordering)					
Control output (Mv, Do)	• 0 – 20 mA DC (2 points) + Open collector (2 points) • 0 – 10 V DC (2 points) + Open collector (2 points) • 12 V pulse (2 points) + Open collector (2 points)	• 0 – 20 mA DC (2 points) + Open collector (2 points) • 0 – 10 V DC (2 points) + Open collector (2 points) • 12 V pulse (2 points) + Open collector (2 points) • N.O. relay (2 points) + Open collector (2 points)	• 0 – 20 mA DC (2 points) + Auxiliary relay (2 points) • 0 – 10 V DC (2 points) + Auxiliary relay (2 points) • 12 V pulse (2 points) + Auxiliary relay (2 points) • N.O. relay (2 points) + Auxiliary relay (2 points)	• 0 – 20 mA DC (2 points) + Open collector (2 points) • 0 – 10 V DC (2 points) + Open collector (2 points) • 12 V pulse (2 points) + Open collector (2 points)	• 0 – 20 mA DC (2 points) • 0 – 10 V DC (2 points) • 12 V pulse (2 points)
INSTALLATION					
Operating temperature	-10 to +55°C (14 to 131°F)				
Operating humidity	30 to 90 %RH (non-condensing)	5 to 90 %RH (non-condensing)		30 to 90 %RH (non-condensing)	
Atmosphere	No corrosive gas or heavy dust				
Mounting	Panel flush mounting			Installation Base (Model: R3-BSx)	DIN rail
External dimensions	W48 × H48 × D100.5 mm (1.89" × 1.89"× 3.96")	W48 × H96 × D108 mm (1.89" × 3.8" × 4.25")	W96 × H96 × D108 mm (3.8" × 3.8" × 4.25")	W27.5 × H130 × D109 mm (1.08" × 5.12" × 4.29")	W24 × H115 × D59 mm (0.94" × 4.53" × 2.32")

Your local representative:

Website | Request Info

MG CO., LTD.
Make Greener automation

Specifications are subject to change without notice. When ordering, use the latest data sheets available at our web site: www.mgco.jp

www.mgco.jp

Large 19.5-mm-high (.77") LED display for PV value (TC10EM)
General-purpose temperature controller with highly legible displays

❚ Discrete inputs usable to switch PID bank or operation mode

❚ The TC10EM can provide for two control loops.
   Remote SP function is available for single loop control setting.

❚ Control outputs configurable to MV, PV or alarm

Modbus, 96 × 96 mm panel size
TEMPERATURE CONTROLLER
CE IP65

Model ▶ TC10EM

● Two PID controllers in one package.
● Universal input × 2 points,
   control output × 4 points,
   discrete input × 2 points,
   clamp-on current sensor (Model: CLSE) input × 2 points
● IP65 protection for the front panel

Modbus

New 1/16 DIN size

Modbus, 48 × 48 mm panel size
TEMPERATURE CONTROLLER
CE IP66

Model ▶ TC10CM

● One PID controller
● Universal input × 1 point, control output × 4 points,
   clamp-on current sensor (Model: CLSE) input × 1 point
● IP66 protection for the front panel

Modbus

Modbus, 48 × 96 mm panel size
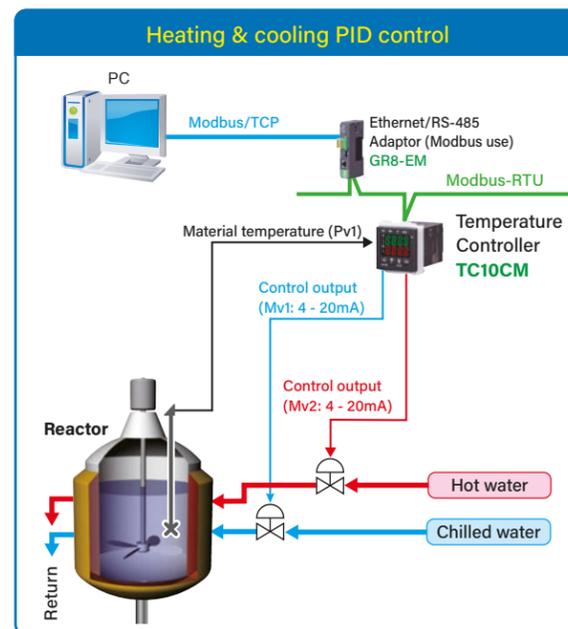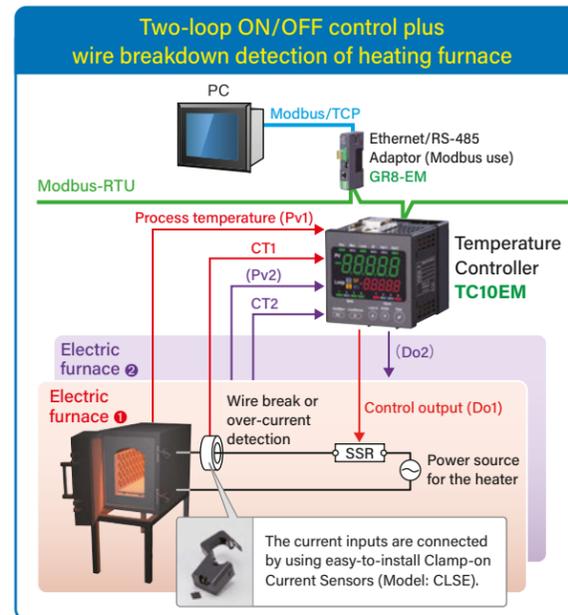## TEMPERATURE CONTROLLER
CE IP65

Model ▶ TC10NM

● One PID controller
● Universal input x 1 point, control output x 4 points,
   discrete input x 2 points,
   clamp-on current sensor (Model: CLSE) input x 1 point
● IP65 protection for the front panel

Modbus

Two-loop ON/OFF control plus wire breakdown detection of heating furnace

PC
Modbus/TCP
Modbus-RTU
Ethernet/RS-485 Adaptor (Modbus use) GR8-EM
Process temperature (Pv1)
CT1
(Pv2)
CT2
Temperature Controller TC10EM
(Do2)
Electric furnace ❷
Electric furnace ❶
Wire break or over-current detection
Control output (Do1)
SSR
Power source for the heater
The current inputs are connected by using easy-to-install Clamp-on Current Sensors (Model: CLSE).

Heating & cooling PID control

PC
Modbus/TCP
Ethernet/RS-485 Adaptor (Modbus use) GR8-EM
Modbus-RTU
Material temperature (Pv1)
Temperature Controller TC10CM
Control output (Mv1: 4 - 20mA)
Control output (Mv2: 4 - 20mA)
Reactor
Hot water
Chilled water
Return

PC CONFIGURATOR SOFTWARE

Trend of PV/MV and various status signals can be monitored in real time on the PC screen. Parameters can be saved and loaded to facilitate commissioning and calibration of the system.

TC10EM, TC10CM, TC10NM ·············· **Model: TC10CFG**
R3-TC2 ································· **Model: R3CON**
R8-TC2 ································· **Model: RCFG**

·PC Configurator Cable (Model: COP-US) is required to connect the module to a PC.

·The PC Configurator Software can be downloaded for free of charge from our website.

Monitoring/control system can be easily built
in combination with the R3 Series I/O modules

❚ Temperature control module installed inside a control panel

❚ Temperature control module handled as one of the R3 Series I/O modules
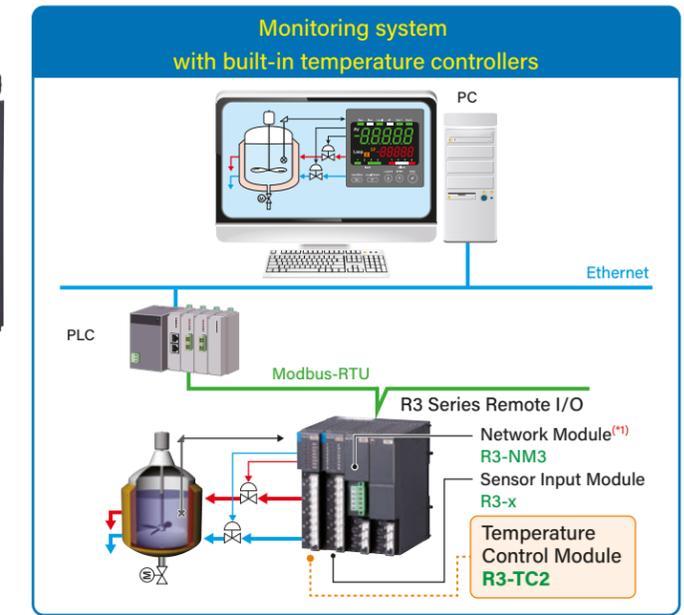
R3 Series Remote I/O
TEMPERATURE CONTROL MODULE

Model ▶ R3-TC2

● Two PID controllers in one package
● Universal input × 2 points, control output × 4 points,
   discrete input × 2 points,
   clamp-on current sensor (Model: CLSE) input × 2 points

Modbus

Monitoring system with built-in temperature controllers

PC
Ethernet
PLC
Modbus-RTU
R3 Series Remote I/O
Network Module[*1] R3-NM3
Sensor Input Module R3-x
Temperature Control Module R3-TC2

(*1) Only the R3-NM3 is compatible with Temperature Control Modules.

Direct control of temperature
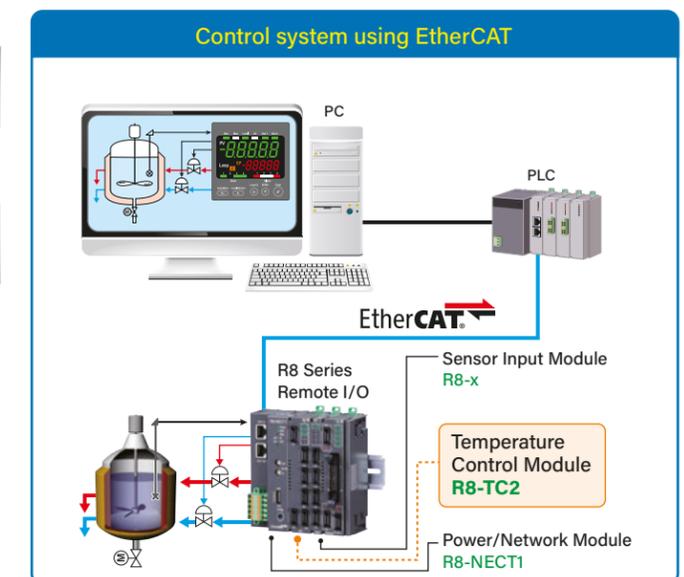# via high-speed industrial open network such as EtherCAT

❚ Temperature control module installed inside a control panel

❚ Communication data such as control parameters can be transmitted cyclically
   thanks to the high-speed capability of EtherCAT

R8 Series Remote I/O
TEMPERATURE CONTROL MODULE
CE

Model ▶ R8-TC2

● Two PID controllers in one package
● Universal input × 2 points,
   control output × 2 points,
   clamp-on current sensor (Model: CLSE) input × 2 points
● Compatible to various open network protocols

EtherCAT   EtherNet/IP
Modbus   CC-Link
DeviceNet

Control system using EtherCAT

PC
PLC
EtherCAT
R8 Series Remote I/O
Sensor Input Module R8-x
Temperature Control Module R8-TC2
Power/Network Module R8-NECT1