

# THERMOLINE

TEMPERATURE CONTROLLERS

## TC600 Temperature Controller



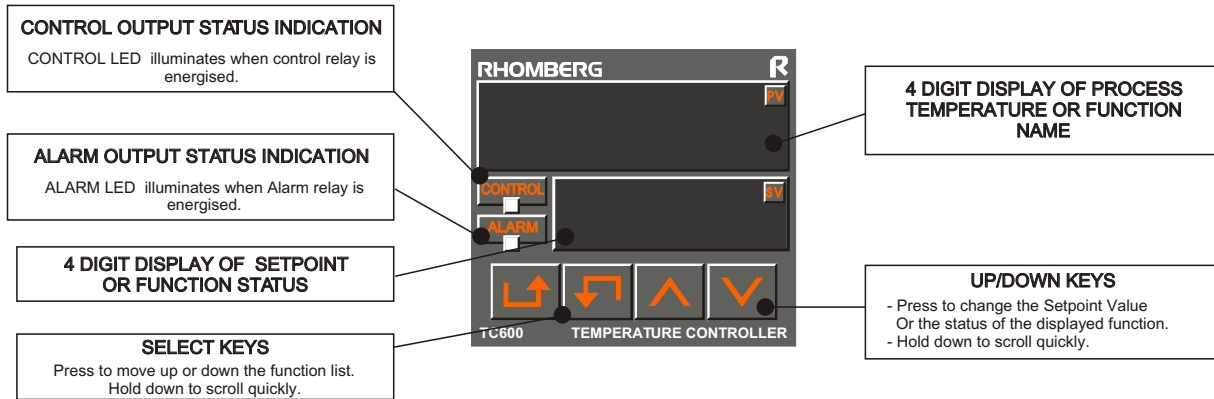
### FEATURES and BENEFITS

- User friendly installation and operation.
- Easily configuration via a simple text based function menu.
- Dual Display for simultaneous indication of both process temperature and setpoint.
- Selectable PID, ON/OFF or Trip and Recovery Control modes.
- PID algorithm control with Autotune function to ensures precision control.
- Full Autotune for PID control, calculating P, I, D, and Anti-reset wind-up terms.
- Adjustable PID relay cycle time for precision control of fast or slow processes.
- Adjustable ON/OFF control hysteresis, allowing greater flexibility when controlling non-critical processes.
- Trip and Recovery control mode allows two independently adjustable trip and Recovery levels with separate control outputs.
- Two independently programmable temperature alarm levels can be used in 12 different modes and are selectable as an upper alarm level, a lower alarm level or both. They can also be configured to operate as absolute or deviation alarm levels.
- Keypad programmable for use with 9 sensor types.
- Programmable relay action for heating or cooling applications to ensure fail-safe operation.
- Programmable operation in degrees Celsius or degrees Fahrenheit.
- A process protect feature , which when enabled, confines the setpoint to a range determined by the two alarm levels and prevents accidental changing of the setpoint to outside the alarm limits.
- Programmable process temperature offset that can be set to the difference between the process and sensor temperatures. This is used when the sensor cannot be positioned ideally.
- A unique 16 hour timer for batch processing.
- Keypad lock security feature to prevent unauthorised adjustments by providing three levels of security.
- An 8 Amp relay, SSR (Solid State Relay) drive or Analogue control output (0-20mA, 4-20mA, 0-5V, 0-10V)..
- Analogue and digital input filtering.
- A plug connector system that allows quick and easy connections.
- Multi-voltage (21 - 53V AC/DC, 85 - 265V AC/DC).
- Digitally calibrated.
- CE mark.



# TC600

## Temperature Controller



### TECHNICAL SPECIFICATIONS

GENERAL SPECIFICATIONS	
Operating Temperature	0 - 50°C
Humidity	5 - 85% non-condensing
Storage Temperature	-20°C to 70°C
Protection Class (Front Panel)	IP54
Protection Class (Rear Panel)	IP30
Connection	Plug-connector
Weight	250g
Standards	CE mark
Creepage Distance	VDE 0110 (Group C 250V) IEC 664/664A VDE 0435
Power Supply	21 - 53V AC/DC 85 - 265V AC/DC
Power Consumption	Less than 3VA

EMC PROTECTION RATING	
Radiated Susceptibility	IEC 801-3, Class 3
Radiated Emission	CISPR11, Class B
Conducted Susceptibility	IEC 255-22-1, Class II
Conducted Emission	CISPR11, Class B

OUTPUT SPECIFICATIONS	
<b>Control Output Options:</b>	
Relay	250V AC, 8A, SPDT
SSR Drive	8-28V DC at 10mA
Analogue	0 - 20mA
Analogue	4 - 20mA
Analogue	0 - 5V at 10mA
Analogue	0 - 10V at 10mA
<b>Alarm Output Options:</b>	
Relay	250V AC, 8A, SPST (N.O.)
SSR Drive	8-28V DC at 10mA

CONTROLLER SPECIFICATIONS	
Setting Accuracy	1%
Linearisation Accuracy	±0.3%
Cold Junction Tracking	0.05°C per °C
Sampling Period	70ms
Control Method	PID, On/Off or Trip & Recovery
PID Control Relay Cycle Period	1 - 240secs
On/Off Control/Hysteresis	0 - 99.9°
Proportional Band	50°
Integral Time	36s
Derivative Time	5s
Timer Range	1 - 999 minutes
Timer Accuracy	0.1% of preset time
Timer Resolution	1 minute

DISPLAY SPECIFICATIONS	
PV Display Type	4 x 10mm, Red
SV Display Type	4 x 7mm, Green
Resolution (PV, SV)	1°C (0.1° from -9.9° to 99.9°)
Temperature Display Range	-99 to 999°C

INPUT SPECIFICATIONS										
Operating Temperature	Sensor Type									
		PT100	E	J	K	R	S	T	B	N
Upper Limit	°C	800	950	750	1250	1450	1450	380	1700	1300
	°F	1472	1742	1382	2282	2642	2642	716	3092	2372
Lower Limit	°C	-200	-200	-99	-200	-40	-40	-200	50	-270
	°F	-328	-328	-146	-328	-40	-40	-328	122	-454

### FUNCTION HIGHLIGHTS

#### PID CONTROL WITH AUTOTUNE FUNCTION

The Thermoline TC515 has been designed with a rugged and proven PID algorithm.

#### ON/OFF CONTROL WITH HYSTERESIS

The hysteresis parameter is programmed to prevent the control relay from rapidly switching on or off.

#### TRIP & RECOVERY CONTROL MODE

This programmable control mode allows the independent control of two heating or cooling systems.

#### PROGRAMMABLE SENSOR TYPE

The Thermoline TC515 may be configured for use with 9 sensor types by simply selecting the appropriate sensor, using the keypad.

#### VERSATILE CONTROL OUTPUT

There is a choice of relay, solid state drive, 0 - 20mA, 4 - 20mA, 0 - 5V or 0 - 10V control output.

#### VERSATILE ALARM OUTPUT

Two independent temperature alarms may be used in 12 different modes. There is a choice to use an upper alarm level, a lower alarm level or both, configured to operate as absolute or deviation alarm levels. In addition, the 8A relay (optional solid state relay available) output can be programmed for normally open or normally closed operation.

#### PROCESS PROTECTION FEATURE

This unique feature offers added safety to critical processes. When protection is enabled, the setpoint is confined to a range determined by the two alarm levels. This prevents operators from accidentally changing to a setpoint outside the alarm limits.

#### PROGRAMMABLE RELAY ACTION

Programmable relay action for heating and cooling application allows for fail-safe operation.

#### PROGRAMMABLE PID RELAY CYCLE TIME

The Thermoline TC515 has adjustable PID relay cycle times for precision control of fast or slow processes.

#### PROGRAMMABLE PROCESS TEMPERATURE OFFSET

Often, when the sensor cannot be positioned ideally, the measured temperature is either above or below the actual process temperature. In order to alleviate this, the process offset is programmed to the difference between the process and sensor temperatures.

#### PRESELECT TIMER FOR BATCH PROCESSING

Use this option to maintain the setpoint for the preselected time, and thereafter to shut the process down.

#### PROGRAMME LOCK SECURITY FEATURE

This is used to prevent unauthorised adjustments by providing three levels of security. Once a function is locked out, it becomes inaccessible to a user until the lock is disabled.

**RHOMBERG**  
a Winters company

