



Temperature Controller
Auto-tune PID or ON/OFF control
Alarms, Programmable Sensor
4 digit dual display, incl. timer
Relay, SSR or 4-20mA drive

TC 600



ORDERING CODE

TYPE	SENSOR TYPE	SUPPLY VOLTAGE	CONTROL OUTPUT	ALARM OUTPUT
TC600	U0	240E	R	R
85 - 265 VAC/DC = 240E 24 - 48 VAC/DC = 024E			B = 4-20mA control output R = 8A/250VAC Relay output S = 10mA/8V Solid State Drive	
U0 = Universal (Programmable) Sensor Type				

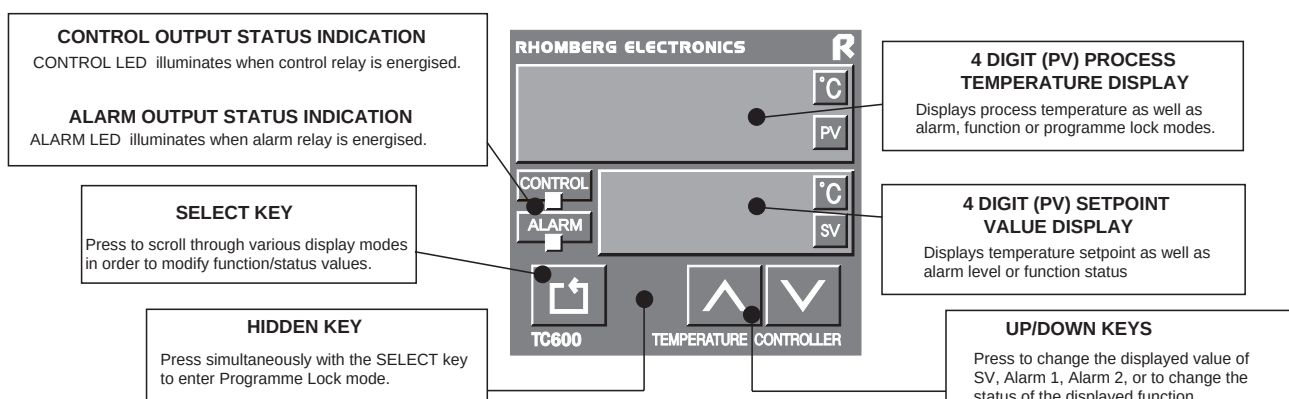


THERMOLINE

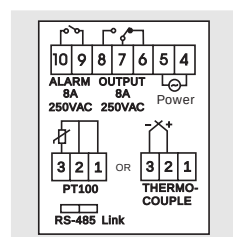
Features and Benefits

- User friendly installation and operation.
- 4 digit dual display.
- PID algorithm control with auto-tuning of the process which ensures precision control.
- ON/OFF control operation with a programmed hysteresis value to prevent the control relay from rapidly switching on and off.
- Programmable Trip and Recovery control mode to allow the independent control of two heating or cooling systems.
- Keypad programmable for use with 9 sensor types.
- A unique 16 hour timer for batch processing.
- An 8 Amp relay output, Solid State Relay (SSR) drive output, or Analogue control output (4 - 20mA standard, or 0 - 20mA, 0 - 5V on special order)
- Programmable relay action that allows for fail-safe operation.
- 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 be configured to operate as absolute or deviation alarm levels.
- Analogue and digital input filtering.
- RS485 (Modbus) serial data communication. The Temperature Controller can be monitored and configured from a remote controller (e.g. PLC or PC).
- A programme lock security feature to prevent unauthorised adjustments by providing four levels of security.
- A plug connector system that allows quick and easy connections.
- 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 process protection 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.
- Multi-voltage (24 - 48V AC/DC, or 85 - 265V AC/DC).
- Sensor failure detection and display of out of range error conditions which enables quick diagnosis of process or sensor faults.
- Digitally calibrated.

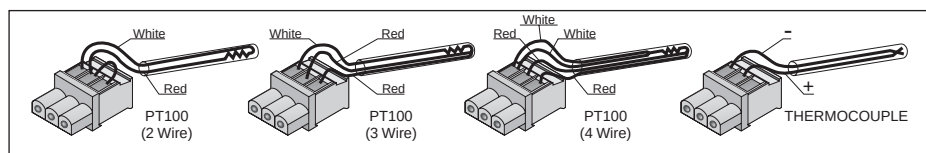
Description of Controls



■ Wiring and Connection



The following figure illustrates how the thermocouple or PT100 is connected.



■ Function Highlights

PID CONTROL WITH PROPORTIONAL BAND AUTO-TUNE

The Thermoline TC600 has been designed with a rugged and proven PID algorithm.

ON/OFF CONTROL WITH HYSTERESIS

A hysteresis parameter is programmed to prevent the control relay from rapidly switching on or off. This is set in degrees and is the difference between the output relay energise and de-energise.

TRIP & RECOVERY CONTROL MODE

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

PROGRAMMABLE SENSOR TYPE

The Thermoline TC600 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 C/O potential free relay contact, solid state drive, or 4-20mA control output. (0-5V or 0-10V on special order).

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 allows for fail-safe operation.

PROGRAMMABLE RELAY CYCLE TIME

The Thermoline TC600 has programmable relay cycle times.

PROGRAMMABLE PROCESS TEMPERATURE OFFSET

Often, when the sensor cannot be positioned ideally, the measured temperature is either lower or above 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 four levels of security. Once a function is locked out, it becomes inaccessible to a user until the lock is disabled.

SERIAL COMMUNICATIONS

The TC600 can be monitored/controlled by a personal computer/PLC via the RS485 link (Modbus protocol) allowing enhanced functionality.

■ 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	150g
Standards	CE
Creepage Distance	VDE 0110 (Group C 250V) IEC 664/664A VDE 0435
Power Supply	24 - 48V AC/DC $\pm$ 10% 85 - 265V AC/DC
Power Consumption	Less than 3VA

OUTPUT SPECIFICATIONS (specify when ordering)	
Control Output Options:	
Relay	250V AC, 8A, SPDT
SSR	10mA at 8V
Analogue	0 - 20mA
Analogue	4 - 20mA
Analogue	10mA at 0 - 5V
Analogue	10mA at 0 - 10V
Alarm Output Options	
Relay	250V AC, 8A, SPST (N.O.)
SSR Drive	10mA at 8V

CONTROLLER SPECIFICATIONS	
Settling Accuracy	1%
Linearisation Accuracy	$\pm$ 0.3%
Cold Junction Tracking	0.05°C per °C
Sampling Period	70ms
Control Method	PID, On/Off or Trip & Recovery
Control Relay Cycle Period (PID)	1 - 240s
Integral Time	36s
Derivative Time	5s
Hysteresis (On/Off Control)	0 - 99.9°C
Proportional Band	50°C
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, red or green
Resolution (PV, SV)	1°C (0.1°C between -9.9 & 99.9°C)
Temperature Display Range	-273°C to 2000°C

INPUT SPECIFICATIONS									
OPERATING TEMPERATURE	SENSOR TYPE								
	PT100	E	J	K	R	S	T	B	N
UPPER LIMIT	800	950	750	1250	1450	1450	380	1700	1300
LOWER LIMIT	-200	-200	-99	-200	-40	-40	-200	-99	-270