Icon Electronics

D3 53mm DIN rail mount | D4 72mm DIN rail mount | P44 48mmx48mm panel mount | P49 48mmx96mm panel mount

TEMPERATURE CONTROLLER TS3 PROBE

D3-TC 0/1/2
D4-TC 0/1/2
P44-TC 0/1/2
P49-TC 0/1/2

EXAMPLE: D3-TC0 = 0 RELAY

Operating instructions and Guarantee Certificate
www.iconelectronics.co.za

Description:

These devices are designed to interface with 3-wire digital temperature sensors (TS3 probes). They offer 0.1°C resolution with an accuracy of 1.2°C. Up to two temperature sensors may be connected to the device. The display may be set to indicate the temperature from either probe, the difference between them, or alternate between all three the above values. The relay(s) may be set to control from either probe, or the difference in temperature between the two.

The relays may be configured as either control or alarm functions in either heating or cooling applications. When configured for alarm applications, the latch facility may be used to keep the relay in the fault condition until the latch is removed.

The maximum and minimum temperatures are recorded for a period of 24 hours. This is useful when troubleshooting or analizing the overall system's performance.

The parameter settings may be locked and code protected to avoid changes from being made by unauthorized personnel.

The menu may be reduced to allow changes to only the most commonly adjusted parameters. This reduces the risk that one of the mode advanced parameters are accedentally changed.

The adjustable range of the temperature set points may be limited to avoid temperatures from being enetered that may cause damage to the overall system.

0 RELAY

These devices do NOT incorporate any relays and are used to display the temperature(s) read from the probe(s).

1 RELAY

These devices incorporate 1 relay. It may be used as either a control or alarm relay for either heating or cooling applications. (please see "relay operation modes" for further details). The relay is controlled by the Set point and hyteresis parameters.

2 RELAYS

These devices incorporate 2 relays. Each relay may be used as either a control or alarm relay for either heating or cooling applications. (please see "relay operation modes" for further details). The relays are configured independantly. (one may be set for control while the other is used as an alarm relay). When using multiple probes, each relay may be allocated to work with either probe.

Relay Operation modes:

Heating mode:

The relay is energised while the temperature rises to the set point value. When the set-point is reached, the relay de-energizes until the temperature drops below the set-point by the hysteresis amount of degrees.

Heating alarm mode:

Similar to heating mode except that the relay is de-energised until the set point is reached. Once energised, the temperature must drop below the set-point by the hysteresis amount before it will de-energise. The latch facility may be used to keep the relay energised until the latch is removed (even if the temperature has dropped sufficiently)

Cooling mode:

The relay is energised while the temperature drops to the set point value. When the set-point is reached, the relay de-energizes until the temperature rises above the set-point by the hysteresis amount of degrees.

Cooling alarm mode:

Similar to cooling mode except that the relay is de-energised until the set point is reached. Once energised, the temperature must rise above the set-point by the hysteresis amount before it will de-energise. The latch facility may be used to keep the relay energised until the latch is removed (even if the temperature has increased sufficiently)

Climate control mode (2 RELAY device ONLY):

Both relays are controlled via 1 set point & hysteresis parameter. Relay 1 works in heating mode while relay 2 works in cooling mode.

Display setup (default: Alternate) (only available in 2 sensor mode)

Select which value should be displayed during normal operation.

Sensor 1:	Sensor 1 temperature. (For Dual display devices, Sensor 1 temperature on upper display, set point 1 on lower display.)
Sensor 2:	Sensor 2 temperature. (For Dual display devices, Sensor 2 temperature on upper display, set point 1 on lower display.)
DIFF:	Sensor 1 temperature minus Sensor 2 temperature. For Dual display devices, Difference between Sensor 1 & Sensor 2 on upper display, set point 1 on lower display.
Sensor 1 & 2:	Only available on Dual display devices. Sensor 1 temperature on upper display, Sensor 2 temperature on lower display.
ALTernate	Alternate every 2 seconds between Sensor 1, sensor 2 and DIFF. (For Dual display devices, Sensor 1 & 2 is included in the alternating sequence.

Notes

1. The display will show "Err 1", "Err 2" or "Err d" if the sensor 1, 2 , or either sensor is not connected correctly, or is faulty.
2. To avoid damage to the sensor, ensure that it is connected correctly BEFORE applying power.
3. The latch facility is ONLY active when the relay is configured as either heating or cooling ALARM.

Adjustable parameters:

Please note: *Depending on the model of the device purchased, some of the parameters listed below may not be available*

1. Temperature set point "°C", (for TC2 "°C.r1" & "°C.r2") (default: 25.0)

   The relay is either energised or de-energised (depending on the relay function set in parameter 3) when the probe temperature reaches this value.

2. Hysteresis value "HYSt", (for TC2 "HYS.1" & "HYS.2") (default: 1)

   Once the temperature set point has been reached, the temperature must either rise or fall (Depending on the relay function set in parameter 3) by this amount before the relay is re-energized. .Range 1-20.0 °C

3. Relay Function "r.Fun", (for TC2 "Fn.r1" & "Fn.r2")

   Select the desired relay function: HEAT mode, COOL mode, HEAT ALARM, COOL ALARM, CLIMATE CONTROL (TC2 only). Please see notes for further details of these functions.

4. Sensor allocation for Relay "SENS, (for TC2 "Sn.r1" & Sn.r2") (default 1)

   Select which probe's temperature values will be compared to the relay's set point.Select from Sensor 1, Sensor 2 or the difference between Sensor 1 and Sensor 2.i.e if set to Sensor 1, the temperature at sensor 1 will be compared to the Setpoint. To switch the relay on the temperature difference between the two sensors, set to DIFF.

Menu operation (single display device):

All adjustments are made via the three front mounted buttons. Press the "MENU" button repeatedly until the desired setting is reached, press "SELECT" to display the current value of the selected parameter, or sub menu (if applicable). The "+" and "-" buttons are used to change the value. "ENTER" will return the device to the menu. The "BACK" button will exit the menu.

Menu operation (dual display device):

Press the menu "↺" button repeatedly until the desired setting is reached.

The "▲" and "▼" buttons are used to change the value. "↺" will display the next menu item. To exit the menu hold "↺" button for 3 seconds.

Menu options:

Exit the menu before making the following adjustments.

Lock / unlock parameters: (default: unlocked)

Press "BACK" ("▼"), **then** "ENTER" ("↺") and hold the 2 buttons until the desired option is displayed. The display cycles between "Loc" (no changes allowed) & "u.Loc" (parameters may be adjusted)

Full / reduced menu (default: Full)

Press "SELECT"("▲"), **then** "ENTER"("↺") and hold the 2 buttons until the desired option is displayed. The display cycles between "rEdu" (limited menu) & "Full" (all parameters are accessible)

Access Code: (default: no code)

Once the above options have been set as required, Press "BACK" and "SELECT" ("▼" and "▲") simultaneously until "CODE" is displayed. Now use the "+" & "-" ("▲" and "▼") to enter a code.

Once a code is entered, access to the options above is not permitted. To clear the code, re-enter the same code again. If the code is forgotten. Press and hold "+" & "-"

5.Maximum permissible value for parameter 1 and 2 “Hi” (default: 105.0)

This is the maximum value obtainable via parameters 1 and 2.

eg. if this value is set to 45.0, then parameters 1 and 2 cannot be set to values higher than 45 degrees. This function may be used to stops unauthorised personnel from adjusting the temperature setpoint above the limit allowed by the system.

6.Minimum permissible value for parameter 1 and 2 “Lo” (default: -10.0)

This is the minimum value obtainable via parameters 1 and 2. eg. if this value is set to 5.0, then parameters 1 and 2 cannot be set to values lower than 45 degrees.

7.Offset “OFSt” (for 2 sensor mode S1.OF, “S2.OF) (default: 0.0)

This value is added (or subtracted if negative) to the current temperature read from the probe. Use this parameter to calibrate the probe.

8.Number of Temperature Sensors connected “S.Cnt” (default: 1)

Select between 1 or 2 temperature sensors.

9.Display setup (default: Alternate) (only available in 2 sensor mode)

Select which value should be displayed during normal operation. Select from Sensor 1, Sensor 2, DIFFerence, Sensor 1 & Sensor 2 (dual display devices only), ALTernate. See notes for more details on how the displays are configured.

10.Sensor selection for 24 Hour monitor (only in 2 sensor mode) (default: Sensor 1)

When multiple sensors are connected to the device, select which values are to be monitored by parameters 11 and 12. (Sensor 1, Sensor 2, or Difference between Sensor 1 and Sensor 2)

11.Lowest value read during past 24 hours “24h.H”

The lowest temperature read during the past 24 hours is saved in memory. This value may be cleared.

12.Highest value read during past 24 hours “24h.H”

The highest temperature read during the past 24 hours is saved in memory. This value may be cleared.

13.Reset “RESt”

By selecting this setting, the device is reset to the factory defaults. Press “+” and “-” (“▲” and “▼”) simultaneously to reset.

Programming Example

To set the temperature at which relay 1 de-energizes to 30 °C:

SIngle display DEVICE:

Press “MENU” to display “°C 1”.

Press “SELECT” to view the current value. Use the “+” and “-” buttons to change the value to 30.0

Press “ENTER” to return to the menu.

Press “BACK” to exit the menu.

Dual display DEVICE:

Press “↺” to display “°C 1”.

Use “▼” and “▲” buttons to change the value to “30.0”.

Press and hold “↺” for 3 seconds to exit the menu.

Specifications:

Temperature range:	- 20.0 °C to + 105.0 °C
Accuracy:	+-1.2 °C
Input voltage:	+-15% of rated input voltage
Led indication:	Relay 1 and relay 2 status
Probe:	3-wire digital
Probe length:	3m, extendable to 200m
	(With external 220uF 16V capacitor)

Please Note (for 1 and 2 relay devices ONLY):

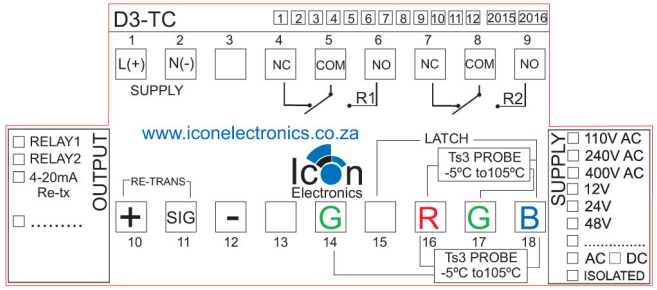
- As a power saving feature, the display dims if settings are not being made.
- Even though the device seems to operate correctly, the relay(s) will not energise if the input voltage is below the operating voltage.

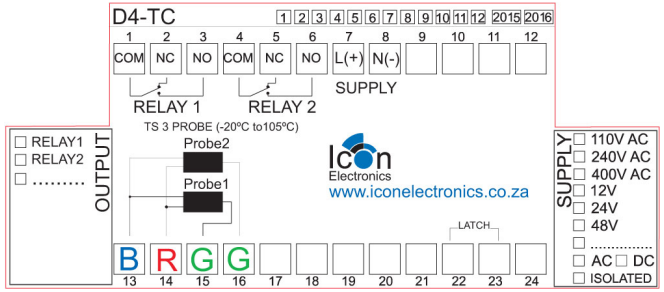
12 Month guarantee:

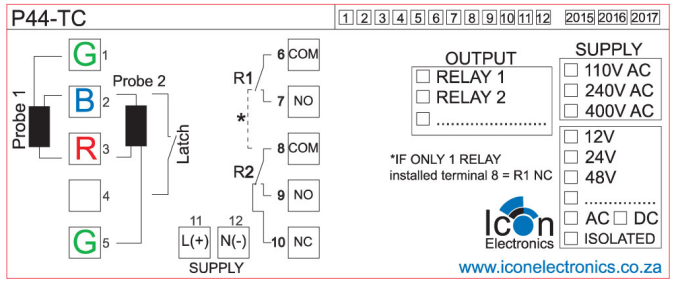
Our product is guaranteed for a 12 (twelve) month period from date of purchase. This guarantee is valid for defects arising from failure during specified conditions. This guarantee does not cover damage due to abuse, tampering or improper installation. Our company does not accept liability for any consequential damage or loss arising from product malfunction. Should this product prove to be defective, kindly return for inspection or repair.

Relay specifications:

Contact rating: 10A 250 VAC 2500VA
Mechanical life: 30 million operations
Electrical life: 250 000 operations (at maximum load)

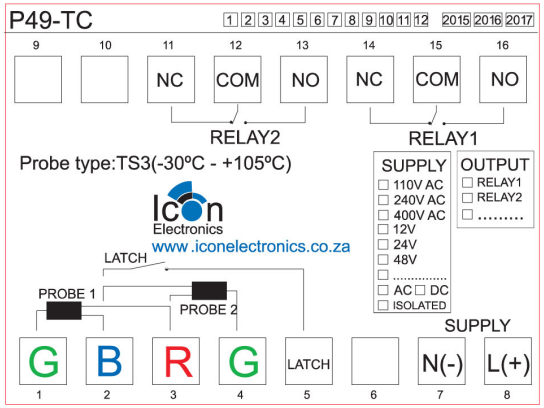






Note: Values in RED are only visible when the device is configured for 2 temperature sensors

	TC0 Parameter	TC0 Value		TC2 Parameter	TC2 Value
1			1	PCr 1	25.0
2			2	HYr 1	1.0
3			3	Fnr 1	HEAt
					COOL
					H. AL
					C. AL
					C.cnt
4			4	Snr 1	SEn.1
					SEn.2
					diFF
1			1	PCr2	25.0
2			2	HYr2	1.0
3			3	Fnr2	HEAt
					COOL
					H. AL
					C. AL
4			4	Snr2	SEn.1
					SEn.2
					diFF
5			5	H1	105.0
6			6	Lo	-25.0
7	S1.OF	0.0	7	S1.OF	0.0
7	S2.OF	0.0	7	S2.OF	0.0
8	S.Cnt	1	8	S.Cnt	1
9	diSP	ALt	9	diSP	ALt
		SEn.1			SEn.1
		SEn.2			SEn.2
		diFF			diFF
10	Sn24	SEn.1	10	Sn24	SEn.1
		SEn.2			SEn.2
		diFF			diFF
11	24hL	0.0	11	24hL	0.0
12	24hH	0.0	12	24hH	0.0
13	rESt	ConF	13	rESt	ConF



For further information, please visit us at: **www.iconelectronics.co.za**