Proportional temperature regulator for variable speed fan

TC-2

Applic.: **Fan regulator**

TC-2 is a fan regulator (code 802E0050); it manages the indoor temperature in COOLING, generating a proportional signal (0-10V) suitable for a fanning system with one or more fans.

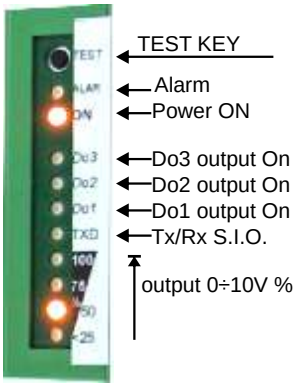
TC-2 extended version Code: 802E0040.
It consists of: 2 inputs for NTC probe, 3 PNP digital outputs, 4 isolated digital inputs NPN , 1 isolated RS-485 interface with Modbus RTU protocol.

FUNCTION

TC-2 acquires the temperature probe (NTC) and manages the proportional output (0-10V) as per regulation and alarm parameters set by PC or **TC-2 UTILITY**.

TC-2 diagnostics the status of: out range probe, open probe, short circuit. The state is displayed by the flashing Alarm LED and showed by the output Do1 activation (if equipped). When there is an out of range probe status, the output values % can be set as want.

TC-2 performs the **TEST** function: by pressing the test button the test cycle is activated for few seconds; during this period, the output value goes, step by step, from the minimum value% to the maximum value%. The test ends with the LEDs sequential lighting.



FRONT PANEL SPECIFICATIONS

When the **LED ON** is lighted, the TC-2 is correctly on
The lighted red **LED Alarm** indicates:
A) high temperature alarm.
B)S1 probe out of range (as indicated also by blinking leds 25% to 100%).

LED SIGNALS

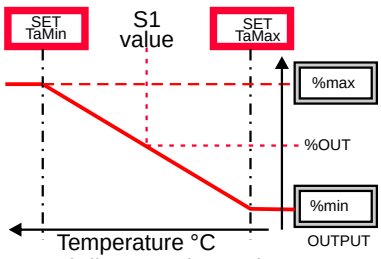
When the **LEDS Do1÷Do3** are lighted, the respective digital outputs are actived.

The **led TXD** is lighted when a serial communication is running.

The lighting leds <25% to 100% indicate the analog output % value.
The blinking leds <25% to 100% indicate the S1 probe out of range (as indicated also by the led alarm)

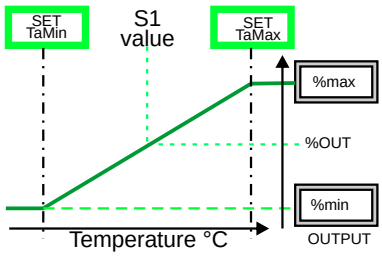
PROPORTIONAL REGULATION Heat / Cool

HEATING CONTROL
TC-2- code: 802E0040



The control diagram shows the proportionality inverse relationship between the temperature decrease and the output % value.

COOLING CONTROL
TC-2 code: 802E0040, 802E0050



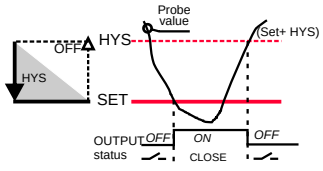
The control diagram shows the proportionality direct relationship between the temperature decrease and the output % value.

The control band is determined by the following values:
Set.TAMin ÷ Set.TAMax
OUT OUT ÷% Min% Max

When the condition “probe failure” or “probe out of range” persists for at least 10 seconds, the analog output % will be set as per the following data:
OUT%OVR for over range or open probe value
OUT%UND for under-range or short circuit value

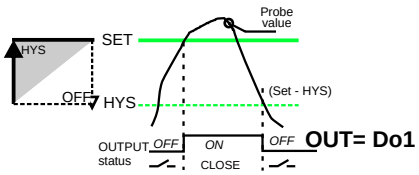
ALARMS / ON-OFF REGULATION on TA (probe S1)

LO_TA Alarm / Heat Regulat.
TC-2 code: 802E0040



When TA <= SET the alarm is ON
When TA >= [SET + HYS] the alarm is OFF

HI_TA Alarm / Cool Regulat.
TC-2 code: 802E0040



When TA >= SET the alarm is ON
When TA <= [SET - HYS] the alarm is OFF

The alarm outputs are delayed as per the following data “Rit. All. Can_1” =xx seconds

Digital inputs Id1 ÷ Id4; TC-2 code: 802E0040

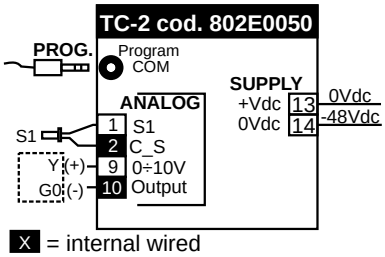
When **Id1**is active the regulation is off.
When **Id2** is active the cool regulation turns into heat regulation

Digital outputs Do1 ÷ Do3; TC-2 code:802E0040

The alarms can be assigned to any outputs (Do1÷ Do3) through **TC-2 utility**

Ably s.r.l. 40050 Funo di Argelato (Bologna) ITALY
Via de’ Giudei 41/43
Tel: +39 (051) 860064; Fax: +39 (051) 860074
e-mail: ably@ably.it
web: http://www.ably.it

ELECTRICAL CONNECTIONS



X = internal wired

Power supply: connect the positive voltage (+) to terminal [13], negative (-) to terminal [14]. Reversing the power TC-2 does not start.

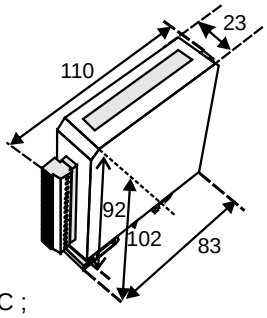
Temperature probes (Terminals 1 ÷ 3): The probes cables have to be put away from cables used to control inductive loads (relays and contactors, etc..) or connected with loads > 50Vac.

Output 0 ÷10V: control signal for the actuator (fan, inverter, power-actuated). Do not connect to electric potential. Apply the requirements as for "temperature probes"

MECHANICAL SPECIFICATIONS

Connections: disconnecting terminals, cables 0,25÷0,5 mm2
Box IP protection: IP 30;
Terminal IP protection: IP 10
Flammability class:UL 94,V0
Vibration: IEC68 part 2-6; IEC68 part 2-27

MOUNTING: for inside panel on din-omega bar
DIMENSIONS: H 102xL 22,5 D 110 mm
WEIGHT: about 80 g



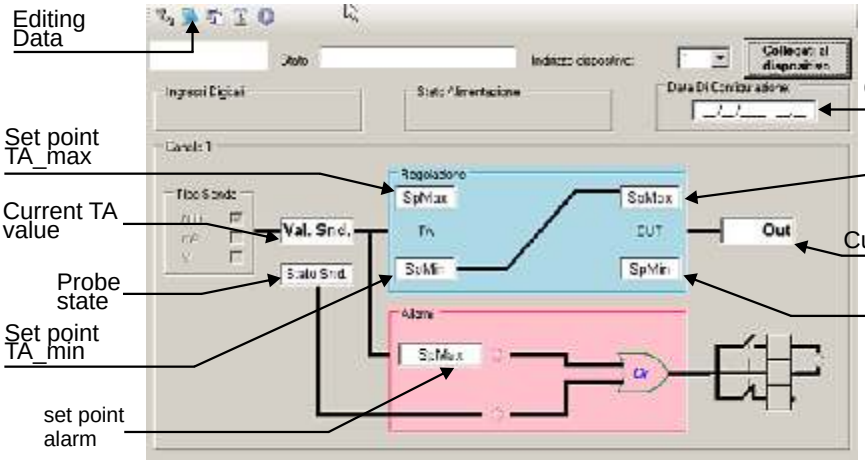
ELECTRICAL SPECIFICATIONS

SUPPLY: 48Vdc (36 ÷ 70Vdc) ; max Ripple 10%;
Absorbed power:.1 W (Max); Insulation 1KVdc
Probe input: Ntc 10Kohm @ 25°C; range -20÷80 °C;
Risolution: 0,1°; precision +/- 0,4°C
Analog output: 0÷10V on 10Kohm, precision +/-0,1V

AMBIENTAL SPECIFICATIONS

OPERATING TEMPERATURE: 0°C ÷ 60°C ;
STORAGE TEMPERATURE: -20°C ÷ 80°C
RELATIVE HUMIDITY DURING OPERATION: 95% Rh @ 60°C, not condensing; in STORAGE: 95% Rh @ 60°C, not condensing

PROGRAMMING through TC-2 utility



Programmed data

Factory setting

Data_____= Value
Abilitazione Canale___=1
SetP.All Can_1_____=57,0°C
Ist.All Can_1_____=3,0°C
Rit. All Can_1_____=30s
Aut. All Can_1_____=0
SetP.TA %MAX_1___=50,0°C
OUT %MAX_____=100%
SetP.TA %MIN_1____=30,0°C
OUT %MIN_____=14%
All UN %OUT_____=80%
All OV %OUT_____=80%
Inversione Rele____=1
Indirizzo Rete_____=1

TC2 utility is a program for Windows (XP, 98, 2000). By **TC2 utility,** connected in serial to the TC-2, it is possible to monitor the probe temperature value and status, the set parameters, the adjustments statement., etc., to upload the data from TC-2 to a PC file, to download the file data from a PC to TC-2 and to change the data.

ORDER CODES

Code	Description
802E0050	TC-2 appl. Fan regulator, 1 NTC 10K input range -20÷80°C; 1 0÷10V output; supply 48Vdc
10E10009	NTC probe 10K ø6x30mm. Wire 2x0.15 mm2 , length 40cm
TUTLTC2A	Programming KIT for TC-2 consisting of: TC-2 Utility , program for PC Windows; jack cable, USB/ Rs232 isolated converter, USB cable; documentation
002EP020	Programming and acquisition data tables for Modbus

Document code: 002EM050_ENG; Rev.: a); 31/03/2010

The symbol with a trash bin crossed out indicates that product must be treated separately from domestic waste at the end of its useful life and taken to a public recycling system for electrical and electronic equipment.
It is the responsibility of the owner to take the equipment to collection points.

This product is conforming to the directive 89/336 EECs and following amendments and to the Law Decrees n. 476/92 and n. 615/96 about *EMI compatibility for* **industrial environments**
EMISSION CEI EN 61000-6-4 (10/02)
IMMUNITY CEI EN 61000-6-2 (10/02)

Ably s.r.l. 40050 Funo di Argelato (Bologna) ITALY
Via de' Giudei 41/43
Tel: +39 (051) 860064; Fax: +39 (051) 860074
e-mail: ably@ably.it
web: http://www.ably.it

AZIENDA CON SISTEMA DI GESTIONE PER LA QUALITÀ CERTIFICATO DA DNV = UNI EN ISO 9001:2008 =