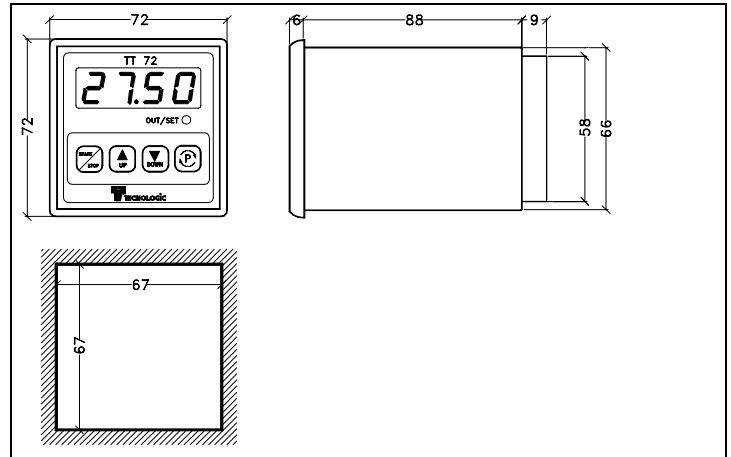
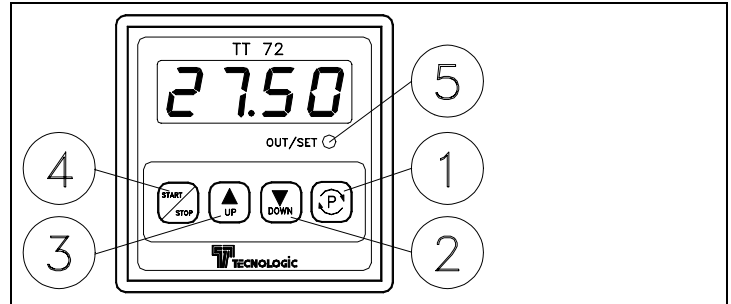


TT 72

MICROPROCESSOR-BASED DIGITAL ELECTRONIC TIMER



1.1 - FRONT PANEL



1 - Key P : Used for the set point setting and to program the functioning parameters

2 - Key DOWN : Used to decrease the values or to select parameters

3 - Key UP : Used to increase the values or to select parameters

4 - Key START/STOP : Used to Start, Stop or reset the count

5 - Led OUT/SET : Signalize when the output is on (on) or off (off) and signalize the set point or the parameters programming mode (flashing)

OPERATING INSTRUCTIONS

Vr. 02 (I - GB) - cod.: ISTR 03897

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1 - GENERAL DESCRIPTION

TT 72 is a programmable microprocessor based timer with 4 output functioning modes, 4 time scales, 4 functioning modes of counting enable, 2 counting modes, all programmable. The instrument can have an inside back up battery (optional) which permits the counting also without power supply. The counting state is visualised on 4 digits display while the output state is signalised by a led. The instrument has a relay output and 2 digital inputs for count enable (EN) and reset (RES). The programming of the instrument is possible by means of the 3 keys placed on the front while the counting is possible using the frontal key START/STOP or using the back inputs EN and RES.

1.2 - INSTRUMENT CODE

TT 72 a b cc

a = SUPPLY

Y : 24 VDC (V1)

O : 24 (V1) / 48 (V2) VAC

N : 110 (V1) / 230 (V2) VAC

b = INTERNAL BATTERY

- : Battery not present

B : Battery present

cc = SPECIAL CODES

2 - TECHNICAL DATA

ELECTRICAL DATA

Supply: 24 VDC (V1), 24(V1)/48(V2), 110(V1)/230(V2) VAC +/- 10%

Frequency AC: 50/60 Hz

Power consumption: 3 VA approx.

Input/s: 2 digital inputs non-optoisolated for Count Enable (EN) and Reset (RES) for voltage-free contacts

Output/s: Relay (8A-AC1, 3A-AC3 250 VAC)

Electrical life for relay output: 100000 operat.

Internal Battery: Optional, rechargeable Ni-Cd for count in case of power failure, with max autonomy of about 5 hrs.

Protection class against electric shock: Class II for Front panel

Insulation: Reinforced insulation between the low voltage section (supply and relay output) and the front panel; Reinforced insulation between the low voltage section (supply and relay outputs) and the extra low voltage section (inputs).

MECHANICAL DATA

Housing: Self-extinguishing plastic, UL 94 V0

Dimensions: 72 x 72 mm DIN, depth 97 mm

Weight: 280 g approx.

Mounting: Flush in panel in 67 x 67 mm hole

Connections: extractable 2,5 mm² screw terminal block

Degree of protection of front panel: IP 54 mounted in panel with gasket

Pollution situation: Normal

Operating temperature: 0 ... 55 °C
Operating humidity: 30 ... 95 RH% without condensation
Storage temperature: -10 ... +60 °C

FUNCTIONAL DATA

Operation: 4 programmable modes: Delayed, Feedthrough, asymmetric times oscillator with start on or start off

Measurement range: 4 times scales: 9999 hrs., 99 hrs. 59 min., 59 min. 59 sec., 9 min. 59 sec. 9 tenths.

Display resolution: according to the scale used: hrs., min., sec., tenths.

Overall accuracy: +/- 0,1 %fs

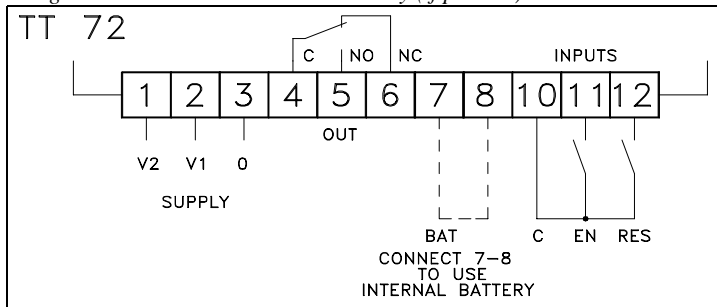
Action: IC type according to EN 60730-1

Compliance: ECC directive EMC 89/336 (EN 50081-1, EN 50082-1), ECC directive LV 73/23 and 93/68 (EN 60730-1 and EN 60730-2-7)

3 - INSTALLATION

MECHANICAL MOUNTING: The instrument, in DIN case 72 x 72 mm, is designed for panel mounting. Make an hole 67 x 67 mm and insert the instrument, fixing it with the provided special brackets. We recommend to mount the gasket to obtain an IP 54 front protection. Avoid to place the instrument in areas with humidity or dirt. Connect the instrument as far as possible from source of electromagnetic disturbances so as motors, remote control switches, relays, electrovalves, etc.

ELECTRICAL CONNECTIONS: Carry out the electrical wiring connecting only one wire for each terminal, according to the following diagram, check that the power supply is the same as indicated on the instrument and the loads current is not upper than the maximum current admitted. The instrument, being a built in equipment with permanent connection into a cabinet, is not furnished with internal device protecting from overcurrent: it's recommended, therefore, to properly protect all the electric circuits connected to the instrument, with devices (ex. fuses) proportionate to the circulating currents. It's strongly recommended to use cables with proper insulation, according to the working voltages and temperatures. Furthermore, the input cables has to be kept separate from line voltage wiring. If the input cables is screened, it has to be connected on the ground with only one side. It is advisable to check that the parameters are those desired before connecting the outputs to the actuators so as to avoid malfunctioning. Whenever a failure of the instrument could cause dangerous or damaging situations, it should be kept in mind that the plant has to be provided with additional devices to ensure the safety. When you choose the "b" parameter with option 2 (timer goes on operating in case of power failure) connect terminal blocks 7 and 8 together to activate the internal battery (if present).

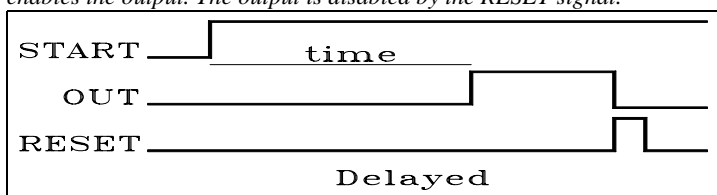


4 - OPERATING MODE

4.1 - OUTPUT OPERATING MODE

The instrument can be programmed by the parameter "F" to operate in any of the following 4 modes:

1 = **DELAYED**: On receiving the START signal, the instrument starts counting time. When the set time value has been reached, the instrument enables the output. The output is disabled by the RESET signal.

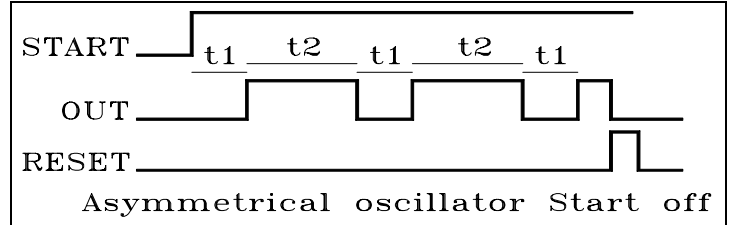


2 = **FEEDTHROUGH**: On receiving the START signal, the instrument enables the output port. The output is disabled when the set time value has

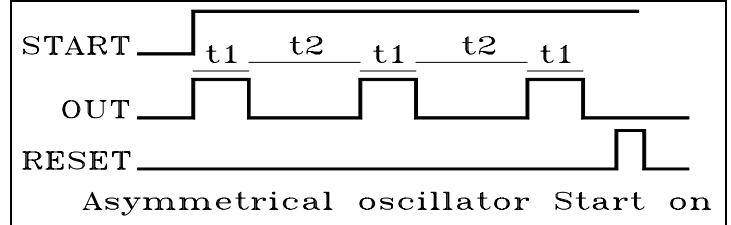
been reached. The output will be enabled again after the transmission of a RESET signal and a subsequent START signal.



3 = **ASYMMETRICAL OSCILLATOR START OFF**: This operating mode allows the user to enter two SET times, and therefore also involves the "S2" parameter. On receiving the START signal, the output remains disabled until the set time period t1 has expired. Then the output is enabled. The output is disabled again when the set time period t2 has expired. This procedure goes on until a RESET signal is transmitted.



4 = **ASYMMETRICAL OSCILLATOR START ON**: This operating mode is very similar to the previous one, the only difference being that after the START signal, the output is immediately enabled and remains enabled for the time period t1. Then the output is disabled and remains disabled for the time period t2. This procedure goes on until a RESET signal is transmitted.

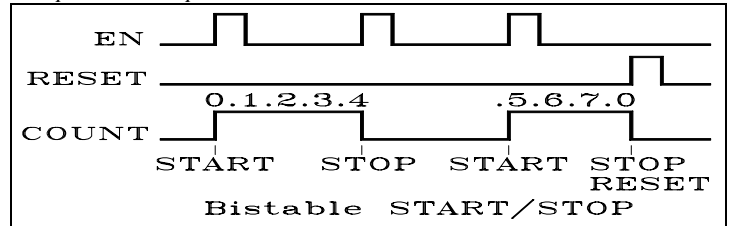


4.2 - EN INPUT OPERATING MODE

The start signal can be given by the frontal key START/STOP, which normally has bistable functioning, or by the EN input count enable.

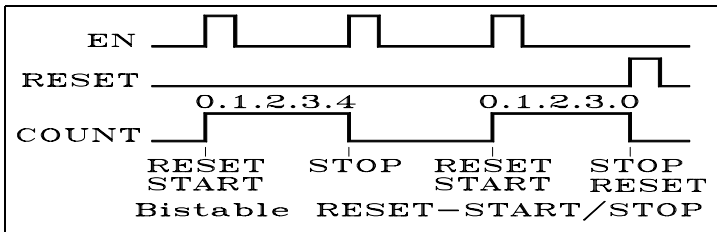
As regards the EN input, which enables time counting, the instrument can be programmed to operate in any of the following 4 modes:

1 = **BISTABLE START/STOP**: After resetting the timer using the RESET input, close the EN contact to start the timer. Now release the contact. When the contact is closed again, the timer stops on the current counting value. The timer starts again following another impulse to the EN input port. This procedure goes on until a RESET signal is transmitted or the set time period has expired.

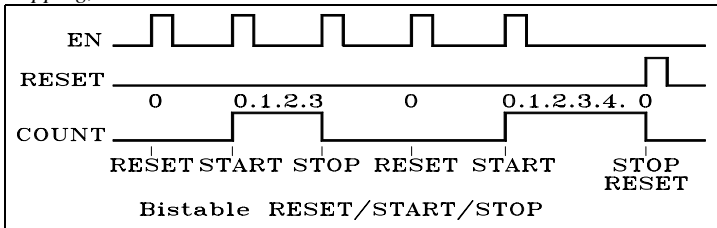


2 = **BISTABLE RESET-START/STOP**: This operating mode is very similar to that of the front START/STOP key and depends also from "t" parameter which has 2 possible functioning modes:

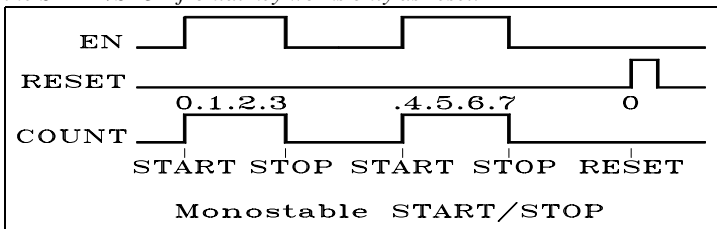
"t" = 1 - **RESET-START / STOP**: the first impulse on EN input reset and start the timer, at the second impulse, if it is given before the end of the time, the timer stops (if the output was activated now will be disabled), otherwise, if it is given after the end of the time, the second pulse activates a new counting cycle.



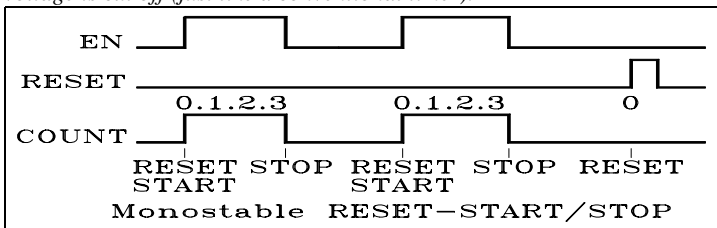
"t" = 2 - RESET / START / STOP: at the first pulse on EN input the timer is resetted, at the second the counting starts, at the third pulse the counting is stopping, and so on.



3 = MONOSTABLE START/STOP: After being reset by means of the RESET input, the timer starts when the EN contact is closed and stops when the contact is opened. At this point, if the contact is closed again, the timer will re-start from the current value, and so on until a RESET signal is transmitted or the set time period has expired. In this functioning mode the START/STOP frontal key works only as reset.



4 = MONOSTABLE RESET-START/STOP: By closing the EN input and keeping it closed, the timer is resetted and starts the counting, at the opening of the EN input the counting is stopped. This operating mode is recommended when the user wants to control the timer using voltage signals. In fact, with an appropriate interface (eg. an external relay) the timer is reset and starts counting when voltage is supplied, and stops when voltage is cut off (just like a conventional timer).



5 - PROGRAMMING

5.1 - PROGRAMMING OF SET-POINTS

Press key P then release it, led OUT/SET will flash and Set value will be show on display. To modify press key UP so as to increase value or DOWN so as to decrease it. These keys count one digit at a time but if the keys are pressed for over one second the value increases or decreases rapidly and after two seconds the speed increases even more, so as to reach the desired value immediately. The oscillator functioning modes ("F"=3 or "F"=4) needs a second set, for programming this pressing key P again and releasing it, the led OUT/SET will flash faster, the display will show the second time set and will be possible to modify it by the key UP or DOWN. The outgoing from the Set programming mode occurs automatically by not pressing any key for about 5 seconds, thus the counting value will again be displayed.

P.A.: During the counting is possible to show the set but isn't possible to modify it.

5.2 - PROGRAMMING OF PARAMETERS

To accede to the operating parameters it is necessary to press key P holding it down for about 5 seconds, after which the led OUT/SET will flash and the first parameter with his set will be visualized on the display.

At this point key P can be released and by pressing UP or DOWN the desired parameter can be selected. To modify this value pressing P holding it down and press UP or DOWN so as to increase or decrease the value. Once the desired value has been set release P and by pressing UP or DOWN it is therefore possible to choose another one and modify it as previously mentioned. To outgoing from the programming mode no key is to be pressed for about 20 seconds, the instrument will automatically return to normal functioning mode, visualizing the counting value.

P.A.: During the counting isn't possible to enter in the parameters programming mode.

6 - DESCRIPTION OF PARAMETERS

F - OPERATING MODE. Permits the user to select the operating mode of the output as regards counting. The 4 mode are:

- 1 = Delayed
- 2 = Feedthrough
- 3 = Asymmetrical Oscillator Start Off
- 4 = Asymmetrical Oscillator Start On

S1 - SET 1 TIME RANGE. This parameter allows the user to select the full range of the time settable in the operating modes (par. "F") 1 and 2, and to select the full range of the t1 time period in the operating modes 3 and 4, according to the following options:

- 1 = 9999 hrs.
- 2 = 99 hrs. 59 min.
- 3 = 99 min. 59 sec.
- 4 = 9 min. 59 sec. 9 tenths

S2 - SET 2 TIME RANGE. This parameter only involves the operating modes (par. "F") 3 and 4, and is used to select the full range of the t2 time period. The options are the same as for the "S1" parameter.

C - COUNTING MODE. Permits the user to choose the UP or DOWN mode, ie. whether the display must show the time which has passed or the remaining time. The options are:

- 1 = UP mode
- 2 = DOWN mode

b - BACK-UP MODE. This parameter determines the instrument reaction in the case of power failure. The options are:

- 1 = Timer stops and memorized the counting current value
- 2 = Timer goes on counting (only with internal battery present and enabled)
- 3 = Timer reset the counting

When option 1 has been chosen, the instrument goes off and the counting current value is saved. When the power supply is restored, the timer can will start working from the saved value.

When option 2 has been chosen, in the case of power failure the display and the output will go off, but the timer will continue to count. The timer operation is signalized by the blinking of the decimal point led, as during normal working. Note that the mode 2 is enabled only if the internal battery is present and activated by the connection of terminal blocks 7 and 8.

In case 3 finally, at the missing of power supply, the instrument stops the counting and does not memorize the reached value, so that at the returning of power supply the instrument will be in the reset conditions.

E - EN INPUT OPERATING MODE. Allows the user to select the operating mode of the Count Enable (EN) external input. The options are:

- 1 = Bistable Start/Stop
- 2 = Bistable Reset-Start/Stop
- 3 = Monostable Start/Stop
- 4 = Monostable Reset-Start/Stop

t - START/STOP KEY OPERATING MODE: This parameter permits to decide the operating mode of the frontal START/STOP key and the possibilities are:

- 1 = RESET-START/STOP
- 2 = RESET/START/STOP
- 3 = RESETonly

6.1 - PARAMETERS TABLE

Par.	Description	Range	Def.	Notes
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F	Operating mode	1 - 2 - 3 - 4	1	
S1	Full range t1	1 - 2 - 3 - 4	1	
S2	Full range t2	1 - 2 - 3 - 4	1	
C	Counting mode	1 - 2	1	
b	Back-up mode	1 - 2 - 3	1	
E	EN input operating mode	1 - 2 - 3 - 4	1	
t	START/STOP key operating mode	1 - 2 - 3	1	

7 - PROBLEMS, MAINTENANCE AND WARRANTY

HOW TO CLEAN: We recommend to avoid abrasive cleaners or containing solvents which could damage the instrument.

WARRANTY AND REPAIRS: The instrument is under warranty against construction vices or defected material, noticed within 12 months from delivery date. The warranty is limited to the repairs or to the substitution of the instrument. The eventual opening of the housing, the violation of the instrument or the wrong use and installation of the product means the automatically decay of the warranty. In case of defected instrument, noticed in warranty period or out of warranty, do contact our sales department to obtain the shipment authorisation. The defected product must be shipped to **TECNOLOGIC** with the detailed description of the failures found and without any fees or charge for Tecnologic, save different agreements.