

Operating instructions

- Repeat Cycle LED Timer

0 742 701/ 0742 702/ 0 742 751/ 0 742 752

Your tico 742 timer is a unique instrument specifically designed for handling repetitive cyclical operations. This unit is highly flexible and can be field configured to operate in a number of different fashions. Unique features include the ability to set two separate times for On and Off operations, which can even be in different time bases, or input a time base with a percentage value. A batch count function keeps track of the number of completed cycles and can stop operation after the preset has been reached.

Inside this manual you will find complete information on the Control mode, which deals with viewing and changing the available setpoints, and Program Mode which is used to configure the basic operation of the timer, as well as set a variety of other useful features.

Also found in this manual are detailed timing diagrams and descriptions of the available operating functions to aid you in determining how to properly configure the unit to solve your application. Additionally included are key product specifications, warranty procedures and ordering information should you require additional units or accessories.



Features

- Repeat Cycle functionality with completely independent settings for On and Off times
- Batch Count function can trigger an output and stop the cycle
- Settings can be input as absolute time values or as a time base and percentage
- Simple button per digit interface
- Timing resolution down to 1 ms
- Programmable security levels prevent unauthorized setpoint or program changes
- Timed or latched batch output
- Programmable to begin with an On or an Off operation
- IEC IP65 rated front panel
- Highly visible 8 mm dual line LED display with 8 annunciator lights.

Safety and warning hints



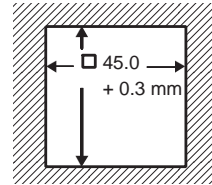
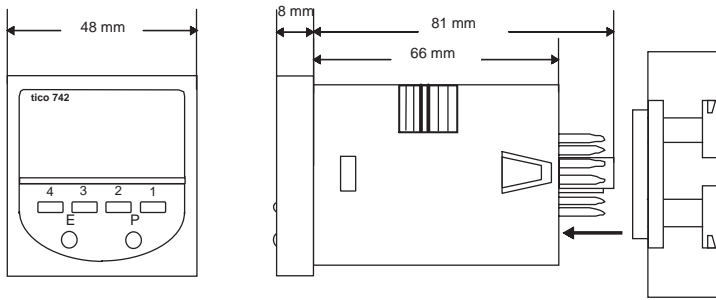
This symbol indicates passages in the text where you have to pay special attention so as to guarantee correct use and exclude any risk.

- This device is made and tested according to the valid standards of technics and has left the factory in a perfect safety state. To keep this state and secure operation without danger, the user has to observe the safety and warning hints, contained in this operation manual.



- There is no galvanic separation of the inputs from the power supply. The device must be protected against accidental contact if it is not supplied from a SELV source (see EN 60 950).
- Assembling and mounting of electrical devices are restricted to be done by skilled electricians! Skilled electrician is, who can judge the tasks deputed to him and foresee possible dangers, due to his special education, knowledge and experience and consciousness of the pertinent standards.
- Mount devices are only allowed to be operated when mounted.
- Finger protection at connection part of mount devices is to be secured when mounting!
- While mounting the device, it must be secured that the requirements, which are asked for the device in the pertaining standards for safety, are not affected in a negative way, so reducing the safety of this mount device.
- Mounting and assembling of device needs observation of the specifications of the local Energy Suppliers.
- Before switching on, make sure that the power and control voltages are not exceeding the values in accordance with the technical data.
- If it is to be assumed that operation without danger is not further possible, the device must be put out of operation and secured from unintentional operation! It must be assumed that an operation without danger is not further possible,
if the device shows damage,
if the device stops functioning,
after a longer stocking period under unfavourable conditions,
after heavy strain during transportation.
- If by a failure or a malfunction of the device, endangering of men or animals or damaging of facilities are possible, this must be avoided by additional safety measures (end switches, protection devices and etc.).
- Before opening any cover, the device must be switched voltagefree.
Hengstler Counters are intended for industrial applications.
- The mounting environment and nearby cabling have an important influence on the EMC (noise radiation and noise immunity) of the counter. When putting into operation, the EMC of the whole installation (unit) has to be secured. In particular, the relay outputs are to be protected from high noise radiation by suitable wiring.
- The range of applications for those products are industrial processes and controls, where the overvoltages applied to the product at the connection terminals are limited to values of the overvoltage category II.

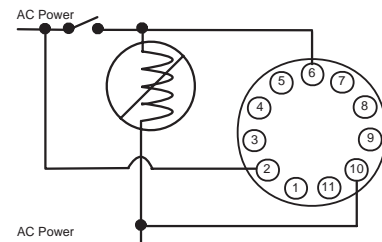
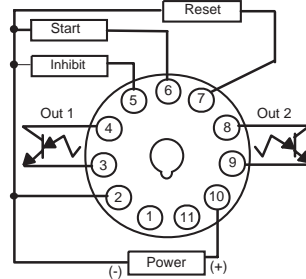
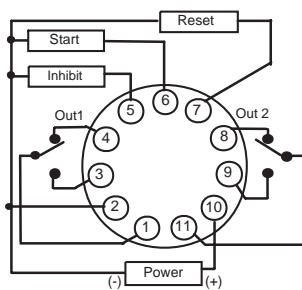
Installation



Einbauausschnitt
Panel Cutout

To wire the unit, an 11 pin socket is required. The unit can either be DIN rail mounted or panel mounted using the supplied mounting bracket. For panel mounting, place the unit in the cutout, then slide the bracket forward over the rear of the unit so that the tabs catch in the grooves on the housing and the bracket is as far forward as possible. Tighten the panel mount screws until there is a snug fit against the panel. Do not overtighten.

Wiring



WARNING:

Do not connect a coil in parallel with the start signal for the tico 742, as pictured at left. Such a connection will cause the start signal to be continuously active. This situation also applies to the Reset and Inhibit inputs.

Technical Data 0 742 701/702/751/752

Power Supply	0742 701/751: 100-240 VAC 50/60 Hz; +10% -15%; < 10 VA; typ. 4 VA 0742 702/752: 24 V AC/DC; +10%,-15%; <200 mA; typ. 100 mA
Display	LED display, 2 lines, 4 digits each line, indicators for input signals, output status and time ranges
Time Ranges	5 time ranges can be programmed: Hours, Minutes, Seconds, hh:mm, mm:ss; up to 9999 hours
Resolution	Settable for XXXX to XXX.X for Hours, Minutes and Seconds, resolution down to 0.001 seconds
Start input/ Reset input/ Inhibit input	Dry contact or NPN; Contact requirements <1kOhm; NPN requirements: VDE0 = 20V (min), ICBO = 0.5 μA (max)
Signal times	Start activation: > 20 ms; drop out > 80 ms Reset activation: > 20 ms; drop out > 80 ms Inhibit activation: > 20 ms; drop out > 80 ms Power interruption > 800 ms
Relay (0 742 70X)	2x Changeover contact 5 A, 120/240 VAC or 30 VDC; Reaction time approx. 15 ms
Transistor Outputs (0 742 75X)	NPN Open Collector; 30 VDC; 30 mA max.: opto isolated
Life	electrical 100,000 cycles, mechanical 10 million cycles
Mounting	Front panel mounting with mounting bracket or DIN rail mounting with socket, panel thickness max. 10 mm
Rating	Front Panel IP 65
Temperature	Operation: 0 °C to 55 °C Storage: -40 °C to + 90 °C
General	DIN EN 61010 part 1; Protection according to class II; Contamination level 2; Overvoltage category II

Operating

I/O Status Indicators

Illuminates to display when an input or output is active: "IN" for the start input, "O1" and "O2" for the timed outputs.

Preset 2 Indicator

Illuminates to indicate that Preset 2 is being shown on the lower display.

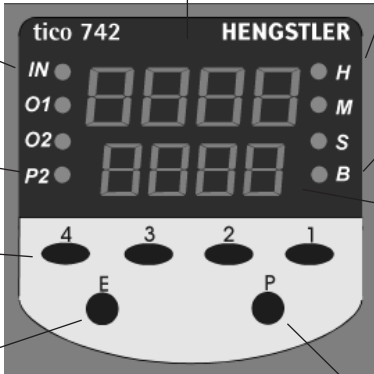
Numeric Keys

Each of the number keys is used to increment the value of the corresponding digit of the preset or parameter value

Edit Key

In Control Mode: With "P" key, resets the display value.
In Program Mode: Scrolls between the applicable choices for the currently displayed parameter.

Primary Display
In Control Mode: Displays the current time value associated with the displayed preset or the batch value (if configured).
In Program Mode: Display the Parameter Description.



Time Range Indicator

Illuminates to show the time base: H for hours, M for minutes, S for seconds. Multiple indicators will be illuminated when the time base is Hours: Minutes or Minutes:Seconds. During timing operation the illuminated LED will flash.

Batch Indicator

Illuminates to indicate that the Batch Count Value and Batch Preset are being displayed.

Set Value

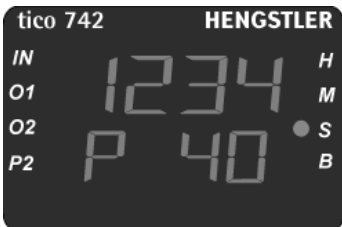
In Control Mode: Displays the settable value used to trigger the timed output(s) and the batch count (if configured).
In Program Mode: Displays the current selection for the chosen parameter.

Program Key

In Control Mode: Depressing the key will scroll the display among the preset and batch displays. Holding the key down for 3 seconds will shift the unit into Program Mode. With the "E" key, resets the displayed value
In Program Mode: Depressing the key will scroll the display from one parameter to the next. Holding the key down for 3 seconds will shift the unit to Control Mode.

Control Mode

Preset 1 Display



The lower display will indicate the value for Preset 1 in one of two manners:

In Standard Mode: Will display the time interval for the 1st operation of the cycle.

In Percentage Mode: Will display the % of the total time base (P2) applied to the 1st operation of the cycle.

Preset 2 Display



The lower display will indicate the value for Preset 2 in one of two manners:

In Standard Mode: Will display the time interval for the 2nd operation of the cycle.

In Percentage Mode: Will display the total time base for the cycle.

Batch Display



The upper display will indicate the current Batch Count Value, while the lower display will indicate the Batch Preset. A setting of "0" will disable output 2.

Note: The Batch Display will not appear if "int" is chosen as the function for Output 2 in Program Mode.

Program Mode

- Enter the Program Mode by holding down the "P" key for 3 seconds.
- Press the "P" key to move the top display from one parameter to the next
- Press the "E" key to scroll the bottom display through the available choices for that parameter
- While in Program Mode, the unit halts operation. Changes will only become effective after returning to Control Mode by holding down the "P" key for 3 seconds

Func
PERC



Operating Functions: Determines how the time periods for the repeat cycle will be set.

Choices are:

- **Percentage (PERC):** Preset one is input as a percentage of the total time base which is set in Preset 2.
- **Standard (STd):** Preset one represents the amount of time that output 1 will be "On" during the cycle. Output 2 represents the "Off" time in the cycle. The time range for each output is independent settable.

Note: The following parameter will not appear if "Standard" is chosen as the Operating Function. In that instance, Output 2 will default to "Batch Count".

out2
Int



Output 2 Operation: Determines the functionality of the 2nd output. Choices are:

- **Interval (Int):** Output 2 parallels the operation of Output 1.
- **Batch Count (bC):** Output 2 will be activated after a preset amount of Cycles is completed. The preset value is input in the Batch Count screen in Control Mode.

Note: The following parameter will not appear if "Percentage" and "Interval" are chosen for the first two settings.

bFnC
StoP



Batch Function: Determines how the time cycle will be affected when the Batch Count Preset is reached. Choices are:

- **Stop (StoP):** The timing cycle will halt after the number of cycles set for the Batch Count is completed. To activate another cycle, it is necessary to reset the unit and provide a start signal.
- **Continue (Cont):** The timing cycle will continue until a reset signal is received.

Note: The following parameter will not appear if "Percentage" and "Interval" are chosen for the first two settings.

bct
0000



Batch Count Output: Sets the duration of Output 2, within a range from 1 second to 9999 seconds. A setting of 0000 will latch the output until a reset signal is received.

1St
On



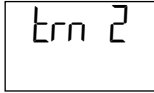
1st Operation: Determines whether the time cycle will start with an "On" operation (Output 1 active) or an "Off" operation (Output 1 inactive). Please note that since preset 1 and preset 2 apply to Operation 1 and Operation 2 respectively, changing this parameter will also affect the function of each preset (ie: Preset 1 will change from the On time to the Off time, if "Off" is chosen for this parameter).

Trn 1

Time Range 1: Sets the unit of measure for the time values that will be used for Preset 1. Choices are:

- Seconds
- Minutes
- Hours
- Minutes:Seconds
- Hours:Minutes

Note: The following parameter will not appear if "Minutes: Seconds" or "Hours:Minutes" is chosen for Time Range 1.



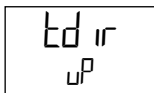
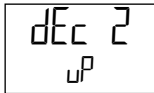
Decimal Position for Time Range 1: Determines the resolution of the selected time range. Settable from 0000 to 0.000

Note: The following parameter will not appear if "Percentage" is chosen as the Operating Function.

Time Range 2: Sets the unit of measure for the time values that will be used for Preset 2. Choices are:

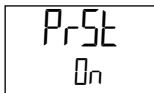
- Seconds
- Minutes
- Hours
- Minutes:Seconds
- Hours:Minutes

Note: The following parameter will not appear if "Minutes:Seconds" or "Hours:Minutes" is chosen for Time Range 2.

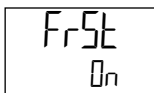


Decimal Position for Time Range 2: Determines the resolution of the selected time range. Settable from 0000 to 0.000.

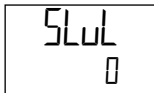
Timing Direction: Determines whether the time values for Preset 1 and 2 will increment from zero and change the state of the output at the set value (uP) or decrement from the set value and change the state of the output at zero (dn).



Power Reset Enable: After a loss of power, the unit can be programmed to either reset upon reapplication of power (On) or continue from the point of power interruption (OFF).



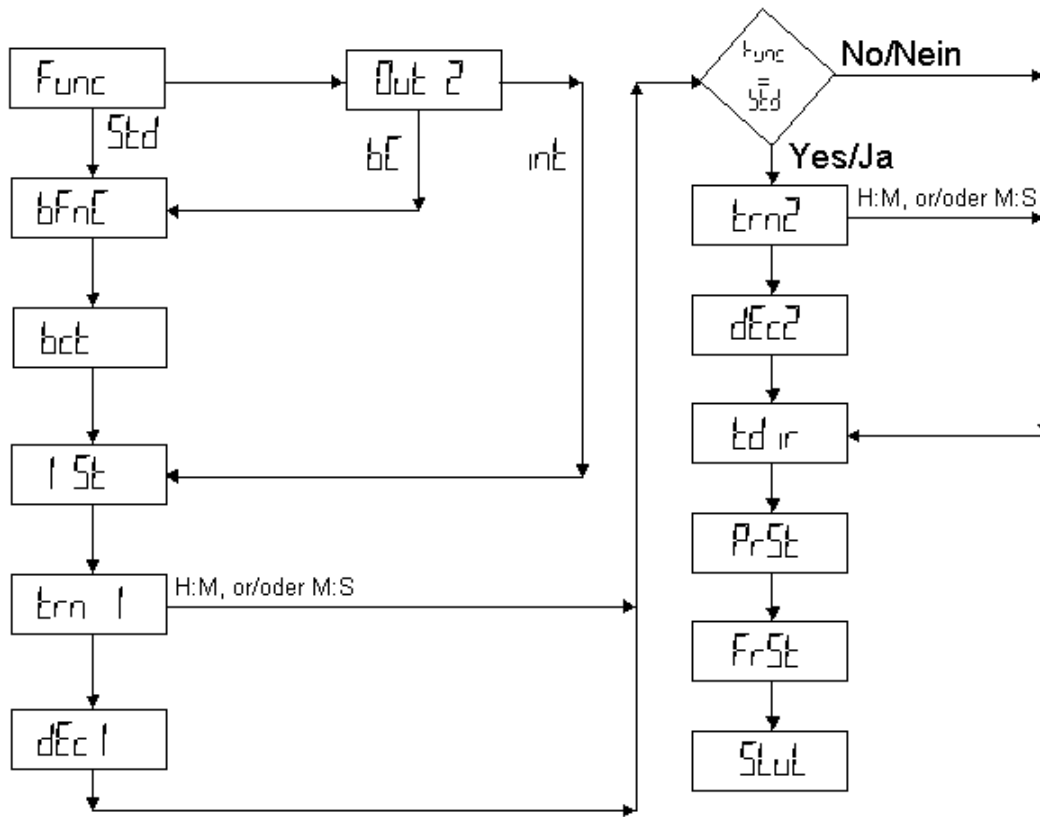
Front Panel Reset Enable: When active (On), the timing operation can be reset in Control Mode by simultaneously pressing the "E" and "P" keys. If inactive (OFF), the timing operation can only be reset through the remote input.



Security Level: 4 different levels of security are available:

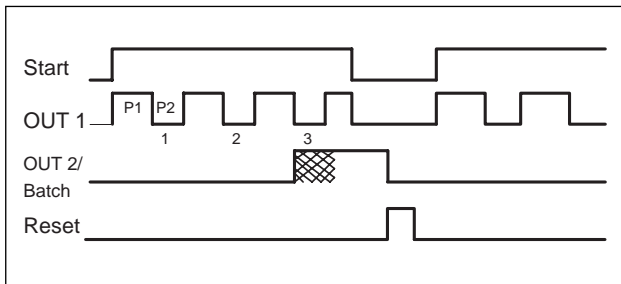
- 0 = Full Access
- 1 = SP Locked Out
- 2 = Access to Program Mode only by holding the "P" key for 10 seconds
- 3 = SP Locked Out and access to Program Mode only by holding the "P" key for 10 seconds

Program Mode Overview

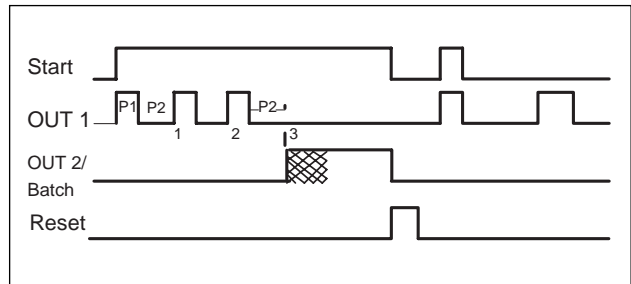


Timing Diagrams

Repeat Cycle - Batch/Continue



Repeat Cycle - Batch/Stop



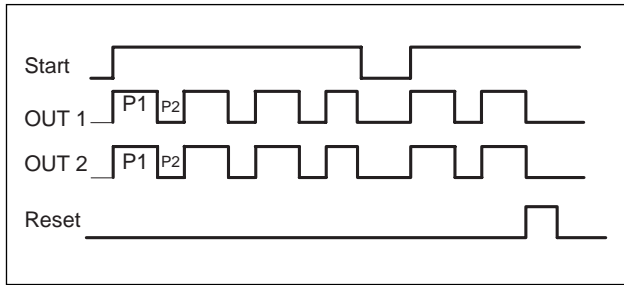
	Activates	Deactivates
Cycle Timing	On leading edge of start signal	On deassertion of the Start Signal or Reset
Batch Count	Accumulates after each complete cycle	On reaching the Batch Count Preset Value or Reset
Output 1	On leading edge of start signal or after completion of P1 - based on programming	On completion of P1 or Reset
Output 2	When the Batch Count Value equals the Batch Preset	On completion of the Batch Count Time or Reset

	Activates	Deactivates
Cycle Timing	On leading edge of start signal	On completion of the Batch Count Value, deassertion of the Start Signal or Reset
Batch Timing	Accumulates after each complete cycle	On reaching the Batch Count Preset Value or Reset
Output 1	On leading edge or start signal or after completion of P1-based on programming	On completion of P1 or Reset
Output 2	When the Batch Count Value equals the Batch Preset	On completion of the Batch Count Time or Reset

The inhibit input will halt the timing functions while asserted, but leave the outputs in their current state. Setting the Batch Count Preset to zero will disable output 2.

An Inhibit input will halt all timing functions, but leave the outputs in their current state. If the start input is applied during Reset, a new timing cycle will begin on the trailing edge of the Reset signal.

Repeat Cycle - Interval



	Activates	Deactivates
Cycle Timing	On leading edge of start signal	On deassertion of the Start Signal or Reset
Output 1	On leading edge of start signal or after completion of P1-based on programming	On completion of P1 or Reset
Output 2	Mirror output 1	Mirror output 1

The inhibit input will halt the timing functions while asserted, but leave the outputs in their current state.

Order Information

0 742 501 TICO 742 Multifunction, LED, 100-240 VAC
0 742 502 TICO 742 Multifunction, LED, 24 VACDC

0 742 201 TICO 742 High Performance, Relay, 100-240 VAC
0 742 202 TICO 742 High Performance, Relay, 24 VAC DC
0 742 251 TICO 742 High Performance, Transistor, 100-240 VAC
0 742 252 TICO 742 High Performance, Transistor, 24 VAC DC

0 742 701 TICO 742 Repeat cycle, Relay, 100-240 VAC
0 742 702 TICO 742 Repeat cycle, Relay, 24 VAC DC
0 742 751 TICO 742 Repeat cycle, Transistor, 100-240 VAC
0 742 752 TICO 742 Repeat cycle, Transistor, 24VACDC

Hints

To wire the unit an 11 pin socket is required. The unit can then either be DIN rail mounted, or panel mounted using the mounting bracket included in the package.

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DQS-zertifiziert nach DIN EN ISO 9001
Reg. Nr. 1540-01