TIMER

MODEL : TMR 120

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<u>TIMER</u>

1.General Description

ICD's digital Timer is a micro controller based design suitable for time measurement in Hours and minutes. The instrument designed to accept external NO contact as i/p and the instrument starts decrementing from set value in seconds for all the 30 steps. The front key pad assembly accesses in programming the timing set value while the LED illuminations for time running status (RUN) and relay energisation status.

The display holds 5 digit 0.5" dimension with seven segment bright LED colour, one relay (RL1) output for control operation and key pad is roubst, feather touching. The relay contact can be rated for 5A at 230 VAC. The circuit employs flash controller IC's and its other supporting IC's for programming. The timer operates with an auxiliary voltage of 230 VAC.

The timer circuit is housed in a ABS plastic case enclosure of size 96 x 96 x 120 mm dimension and the mounting is suitable for flush panel.

2. FUNCTIONAL DESCRIPTION

When the instrument is powered by giving 230 VAC it works in run mode and displays 'I C d 06' for an instant and shows "start". This is the initial display page/end of program.

Program ON and OFF time settings for all the steps through key pad and get back to run mode. When an external NO contact is given, the instrument starts decrementing the programmed ON time value of the first step. The run LED will glow during ON and OFF time downcounting. When the ON time down counting starts, the relay will be activated with relay on LED indication. The relay will be deactivated when the ON time becomes zero and immediately OFF time commences for step1 and LED goes off .

When the step1 off time compltetes, the step2 ON time down counting starts with relay energisation and with LED indication. Again the relay will be deactivated when the ON time becomes zero and immediately OFF time commences for step1 and LED goes off . Again the process repeats for all the 30 steps. The run LED flash indicates that the ON and OFF time process is going on. The RL1 LED glows only when ON time of the steps is in progress. After finishing time process for all the steps, the instrument goes to initial position indicating program end and RL2 relay energises with LED indication. Again giving NO contact , the unit works as per the above procedure.
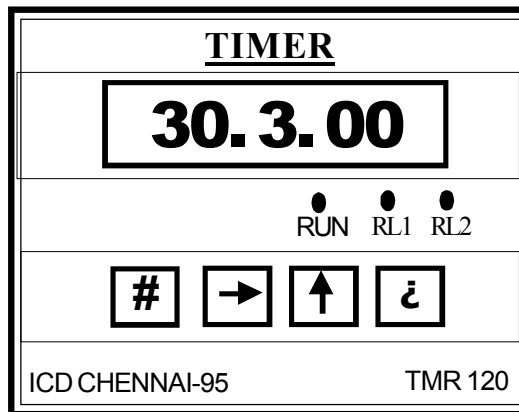
During the course of power interruption, the instrument retains its previous value and starts the downcounting from the previous value.
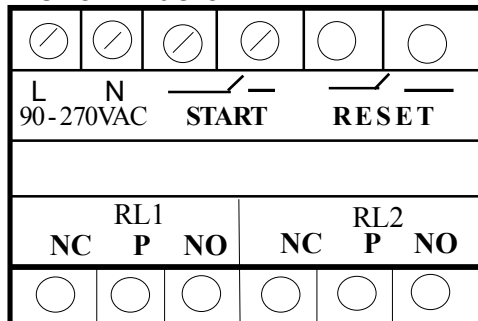
3. FRONT & REAR PANEL DETAILS

Front Panel

The front panel of the instrument has display window, 1x4 matrix key pad and LED indications.

1. The 5 digit 0.5" 7 segment red LED display window shows the step no. & on/off Time.

2. The 1x4 matrix keys are designed for programming setting parameter   in program mode.

4. A 3 mm red LED for process run indication and 2 nos. of 3mm LED's for ON time (RL1) and program end (RL2)

```
         TIMER

        30. 3. 00

           ●    ●    ●
          RUN  RL1  RL2

        #   →   ↑   ¿

ICD CHENNAI-95          TMR 120
```

Rear panel: Connect the instrument as per the diagram shown below

```
 ⊘   ⊘   ⊘   ⊘   ◯   ◯
 L    N        ⟋        ⟋
90-270VAC   START    RESET


       RL1              RL2
 NC   P   NO      NC   P   NO
 ◯   ◯   ◯       ◯   ◯   ◯
```

4. 1X4 MATRIX KEY PAD DESCRIPTION

1.Index key

The index (**#**) key operates in Program mode . By pressing this key displays the configuration Item display pages.

2. Shift key

The shift key is used to select the digit one by one on pressing it. The selected digit is shown by flashing that digit.

3.Increment key

The Increment key is used to Increment the selected digit. The   Increment key Increments the digit from 0 to 9 and then wraps down once again.

4. Enter key

Once the required values are set in the configuration items, press the Enter key to store it in memory. If the change is accepted the display Indicates 'E' otherwise an error message is displayed as 'Err'.

▲.*Operational modes*

Run mode

It is the permanent display mode displays the step and on/off time in Hrs and minutes while down counting when external NO contact is available

Program mode

The set point which limits the operation of the timer is programmed in this mode.

Programming Instructions

The instrument is provided with pass word facility to prevent alteration of configuration items by unauthorised persons.

The configuration Items of the meter may be changed by following the sequence given below.

With power applied to the meter hold in the shift and Incr keys together for a moment. The display Indicates enter pass word as

```
E. - - - -
```

The valid password set in the configuration item,new password has to be entered by using Shift, Incr and enter keys (Refer changing the configuration items for using Shift, Incr and Enter keys). After valid pass word is entered the meter enters into program mode by showing it in display.
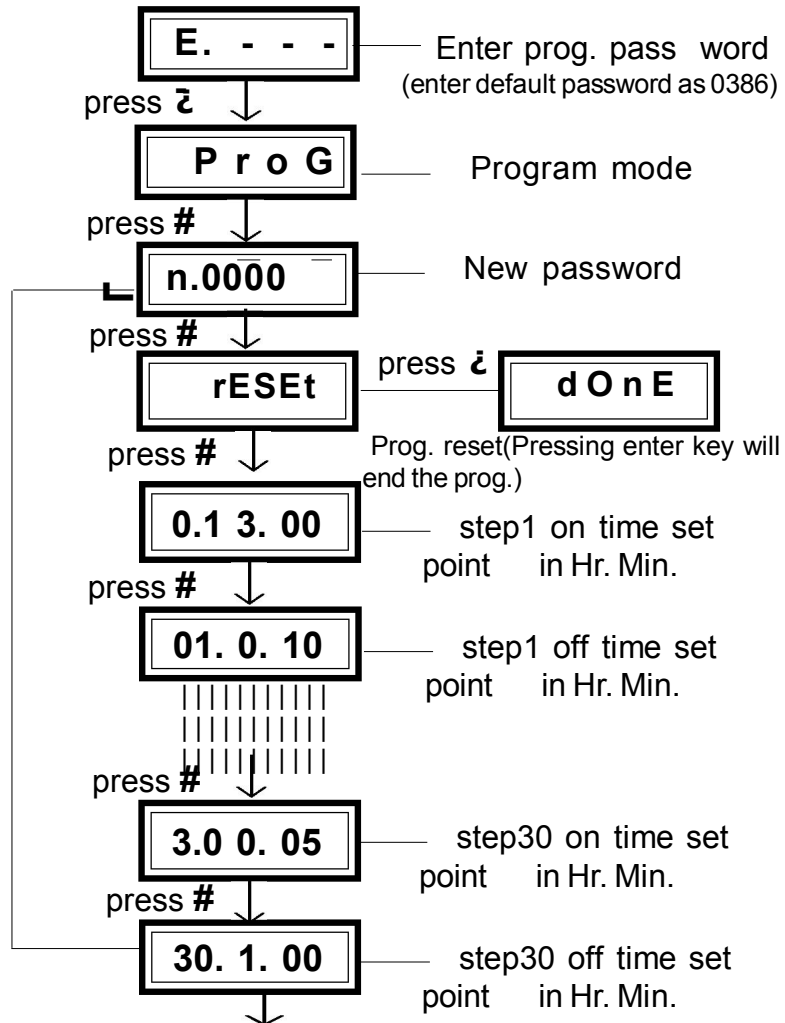
Special Note :

If the user enters the 'Prog. pass word' for the first time, or if the user fails to remember the password entered in 'New pass word', the default pass word 0386 can be entered. The configuration Items can be selected by pressing the Index (#) key.

```
P r o G
```

6.PROGRAM MODE DISPLAY PAGES

Press 4&5 together for a second to get into prog. mode

E. - - - —— Enter prog. pass word
(enter default password as 0386)

press ¿ ↓

P r o G —— Program mode

press # ↓

n.0000 —— New password

press # ↓

rESEt — press ¿ → **d O n E**

press # ↓
Prog. reset(Pressing enter key will
end the prog.)

0.1 3. 00 —— step1 on time set
point   in Hr. Min.

press # ↓

01. 0. 10 —— step1 off time set
point   in Hr. Min.

press # ↓

3.0 0. 05 —— step30 on time set
point   in Hr. Min.

press # ↓

30. 1. 00 —— step30 off time set
point   in Hr. Min.

↓

Once the configuration Item is programmed, hold in the ▶ & ▲ keys
together for 1 second to return to normal operating (Run) mode.

RUN MODE DISPLAY PAGES

powered

```
I C d 0 6
```

```
S t A r t
```
— Initial position /End of program.

When external pulse is given

```
01. 3. 00
```
— First step on time.

```
01. 1. 00
```
— First step off time.

```
02. 3. 00
```
— Second step on time.

```
02. 1. 00
```
— Second step off time.

auto scroll \ \ \ \ \ \

```
30. 3. 00
```
— 30th step on time.

```
30. 1. 00
```
— 30th step off time.
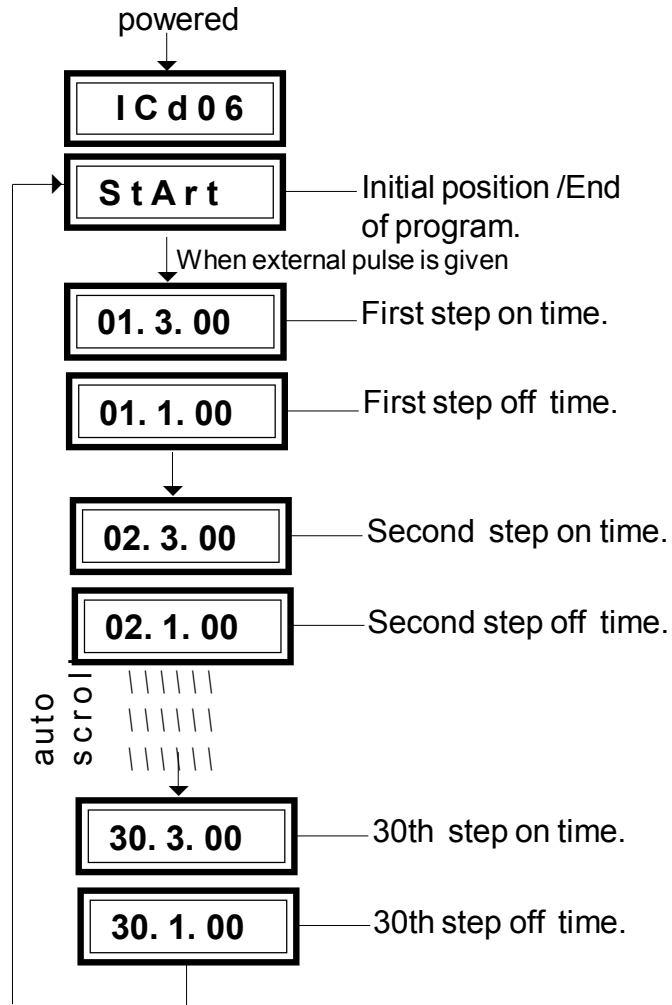
When the instrument is powered , it starts from step no.1 and after completion of ON & off duration it goes to step2. Like this it completes maximum steps programmed. If on and off duration of any one step is set to zero, then the timer ends the prog. to previous step

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7.TECHNICAL SPECIFICATION

Type	:	ICD Microcontroller based **pro grammable TIMER for furnace application**
No. of steps	:	30
Each step consists of	:	One ON time
		One OFF time
ON time set duration	:	1min. to 3.00 Hrs.
OFF time duration	:	1 min. to 3.00Hrs.
Setting Resolution	:	1 Minute
Display	**:**	2 digit 0.5" 7 segment red LED
		for step no. indication
		3 digit 0.5" 7 segment red LED
		for ON & OFF time
Accuracy	**:**	±0.25% OFS
Start of the Program	:	By potential free NO contact pro-vided on back panel
Prog. ending by manual	:	Through key pad
Time Setting Through	**:**	Key pad (4 keys namely Index, Shift, Increment and and Enter)
Control Output	**:**	1 C/o potential free contact from a relay for ON/OFF control of a solenoid (RL 1)
		1 C/o potential free contact for end of program (RL 2)

Contact Rating   **:**   3A at 230VAC

Relay Status Indication **:**   By LED lamps for solenoid ON and Program end

<u>Operation</u>

It starts from step no.1 after completion of ON & OFF duration, it goes to step2. Like this, it completes maximum steps programmed. The last step of the program can be set as 00, which indicates as the end of the program and then program stops.

Power failure protection :   A non-volatile memory chip is available to store the all data, which is undisturbed even under power failure condition.

Aux. Power Supply   **:**   90-270V AC, 50Hz

Ambient Temperature **:**   0 - 55 degree celcius

Box dimension   **:**   96 (H) x 96(W) x 120 (D) mm

Mounting   **:**   Panel

Enclosure   :   ABS plastic case

COMMISSIONING OF TIMER

Before fixing the unit into the panel

➢ Read operating manual, if queries arised contact ICD's sales representative.

➢ Visualize the unit for any physical damage, which may be caused during the transportation.

➢ If severely damaged, unpack the instrument and contact ICD's factory or its representative.

➢ After physical inspection, complete the external wiring and switch ON the unit for preliminary check (if necessary).

➢ The display page shows the process time.

➢ Program the required Setting parameters.

➢ After the complete satisfaction, fix the instrument into the panel and complete the external wiring.

Excess voltage can damage the instrument , lesser voltage can cause improper functioning.