

**TITCHA**<sup>®</sup>  
巨人电器

**RIKO**<sup>®</sup>



**TITCHA**<sup>®</sup> **RIKO**<sup>®</sup>

**温州市巨人电器有限公司**  
WENZHOU GIANT ELECTRICAL APPLIANCES CO.,LTD.

地址: 浙江省乐清市柳市镇凌云路96号  
Add: NO.96 Lingyun Street Liushi, Yueqing, Zhejiang  
电话Tel: 0086-577-62756580 62750400  
传真Fax: 0086-577-62752580  
邮编Post: 325604 网络实名: 巨人继电器  
www.giant-titcha.com or en.giant-titcha.com  
Sales-1@cn-giant.com Sales-2@cn-giant.com  
Sales-3@cn-giant.com Sales-4@cn-giant.com

柳市销售部  
地址: 浙江省乐清市柳市长兴路35号  
The sale shop at Liushi: NO.35 Changxing Street Liushi, Yueqing, Zhejiang  
电话Tel: 0086-577-62756382  
传真Fax: 0086-577-62756382

GIANT ELECTRICAL

# About GIANT

# GIANT ELECTRICAL

ISO9001:2000       

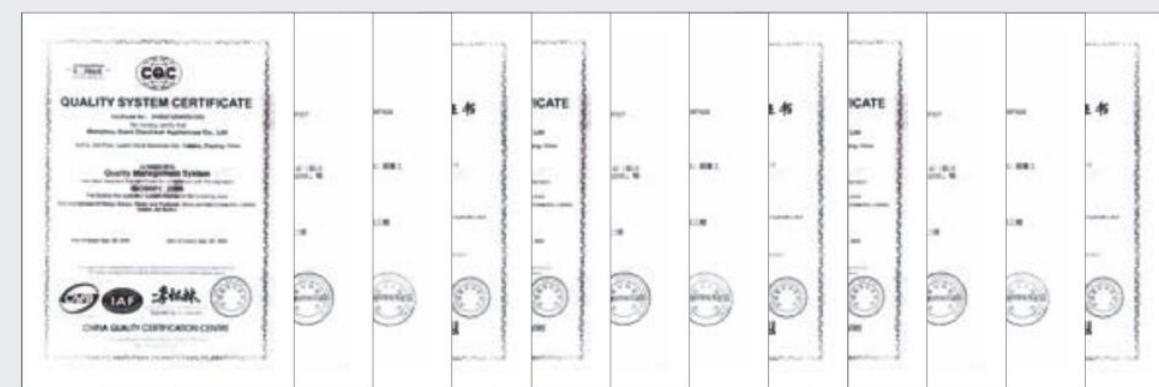
WENZHOU GIANT ELECTRICAL APPLIANCES CO.,LTD. located at Capital of Low Voltage Electrical Appliance in China-liushi Town, is a group manufacturer special for producing relays, with convenience of sea, land and air traffic.

Integrating scientific research, development, manufacturing and sales, the company engages in producing more than 1000 varieties of specifications such as miniature relays, relay sockets, electronics equipments, electric meters, low voltage electrical appliances, limited switches, AC contactor, etc. The products are widely used in automatic control fields of lathe equipment, instrument, meter, communication equipment, household electric equipment, office facility and so on.

The company possesses standard workshops, advanced production equipment, and a team of well-trained technical personnel. With fully new idea of surmounting self is fused into the enterprise. Quality consciousness of whole employees and perfect quality control system are running through each link of production during whole course. The company has approved "ISO9001:2000" Quality System. All main technical indea, are according to "IEC" international standard. Partial products have got America "UL" and European "CE" and "Four North European Countries" certificates. Wholly carrying out quality optimization and 5S service engineering, we have satisfied the customers and been accredited by them and set up high market prestige. The sales network of company is throughout China. Some products are exported to U.S.A., Russia, Brazil, France, UK, Japan, Malaysia, Singapore, Italy, HongKong and TAIWAN, etc.

We believe in that you will at one time get our consistent pursuit of Quality, Price, and Service. We will cautiously remember our GIANT conviction of "Your Satisfaction Being the Purpose We Strive for".

President of company, Mr.Fangping Liu, with whole employees, will serve the society by basing on enterprising spirit of "Survival through Quality First, Development through Scientific Innovation", sticking to the aim of "Prestige First and User Highest". Wholeheartedly welcome foreign and domestic regular and new customers and men of insight to our company for cooperation and talking about business. Let's create future brilliance basing on reciprocity principle



## Products CONTENTS

|                                                                      |       |
|----------------------------------------------------------------------|-------|
| Time relay and phase protector                                       | 1-14  |
| TR series time / phase failure /<br>phase sequence / level protector | 15-17 |
| Time Relays                                                          | 18-22 |
| Phase Reversal Relay                                                 | 23    |
| Water level switch                                                   | 24    |
| Timers                                                               | 25-28 |
| Mechanical Timer                                                     | 29    |
| Plug Timer                                                           | 30-32 |
| Contactors                                                           | 33-42 |



## Time Relay And Phase Protector

Adopts the advanced large-scale integrated circuits. Its shape and performance can be comparable to the similar one in Europe. There are a great number of advantages, such as the beautiful compact shape, wide timing range, high accuracy and reliability, low power consumption, long life, large capacity and easy installation. It can be used in all kinds of automatic control system.



## Time relay



TH-206

### Techniccal Parameter

|                    |                                   |
|--------------------|-----------------------------------|
| Type               | TH-206                            |
| Time accuracy      | ± 0.05%                           |
| Repeat error       | < 0.5%+20ms                       |
| Contact rating     | AC250V DC30V 8A                   |
| Rated voltage      | AC12-380V ± 10%, DC12-48V 50/60HZ |
| Action form        | ON-delay<br>Release-delay         |
| Number of contacts | SPDT(2)                           |
| Delay range        | 0.1S-99H                          |



TH-208

### Techniccal Parameter

|                    |                                                             |
|--------------------|-------------------------------------------------------------|
| Type               | TH-208                                                      |
| Time accuracy      | ± 0.05%                                                     |
| Repeat error       | <0.5%+20ms                                                  |
| Contact rating     | AC250V DC30V 8A                                             |
| Rated voltage      | AC12-380V ± 10%, DC12-48V 50/60Hz                           |
| Action form        | ON-delay with circulation<br>Release-delay with circulation |
| Number of contacts | SPDT(2)                                                     |
| Delay range        | 0.1S-10H                                                    |



TH-213

### Techniccal Parameter

|                    |                                   |
|--------------------|-----------------------------------|
| Type               | TH-213                            |
| Time accuracy      | ± 0.05%                           |
| Repeat error       | < 0.5%+20ms                       |
| Contact rating     | AC250V DC30V 8A                   |
| Rated voltage      | AC12-380V ± 10%, DC12-48V 50/60HZ |
| Action form        | ON-delay<br>Release-delay         |
| Number of contacts | SPDT(2)                           |
| Delay range        | 0.1M-9.9M                         |



TH-203

### Techniccal Parameter

|                    |                                   |
|--------------------|-----------------------------------|
| Type               | TH-203                            |
| Time accuracy      | ± 0.05%                           |
| Repeat error       | <0.5%+20ms                        |
| Contact rating     | AC250V DC30V 8A                   |
| Rated voltage      | AC12-380V ± 10%, DC12-48V 50/60Hz |
| Action form        | ON-delay<br>Release-delay         |
| Number of contacts | SPDT(2)                           |
| Delay range        | 0.1S-10H                          |



TH-216

### Techniccal Parameter

|                    |                                   |
|--------------------|-----------------------------------|
| Type               | TH-216                            |
| Time accuracy      | ± 0.05%                           |
| Repeat error       | < 0.5%+20ms                       |
| Contact rating     | AC250V DC30V 8A                   |
| Rated voltage      | AC12-380V ± 10%, DC12-48V 50/60HZ |
| Action form        | ON-delay Release-delay            |
| Number of contacts | SPDT(2)                           |
| Delay range        | 0.1S-10H                          |



TH-209

### Techniccal Parameter

|                    |                                   |
|--------------------|-----------------------------------|
| Type               | TH-209                            |
| Time accuracy      | ± 0.05%                           |
| Repeat error       | <0.5%+20ms                        |
| Contact rating     | AC250V DC30V 8A                   |
| Rated voltage      | AC12-380V ± 10%, DC12-48V 50/60Hz |
| Action form        | ON-delay<br>Release-delay         |
| Number of contacts | SPDT(2)                           |
| Delay range        | 0.1S-99H                          |



TH-217

### Techniccal Parameter

|                    |                                   |
|--------------------|-----------------------------------|
| Type               | TH-217                            |
| Time accuracy      | ± 0.05%                           |
| Repeat error       | < 0.5%+20ms                       |
| Contact rating     | AC250V DC30V 8A                   |
| Rated voltage      | AC12-380V ± 10%, DC12-48V 50/60HZ |
| Action form        | ON-delay Release-delay            |
| Number of contacts | SPDT(2)                           |
| Delay range        | 0.1S-10H                          |



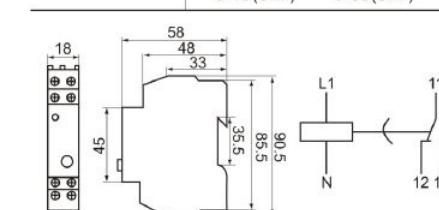
TH-209A

### Techniccal Parameter

|                    |                                   |
|--------------------|-----------------------------------|
| Type               | TH-209A                           |
| Time accuracy      | ± 0.05%                           |
| Repeat error       | <0.5%+20ms                        |
| Contact rating     | AC250V DC30V 8A                   |
| Rated voltage      | AC12-380V ± 10%, DC12-48V 50/60Hz |
| Action form        | ON-delay<br>Release-delay         |
| Number of contacts | SPDT(2)                           |
| Delay range        | 0.1S-99H                          |

### Techniccal Parameter

|                     |                                           |
|---------------------|-------------------------------------------|
| Operating Voltage   | AC12-380V DC12-24V 50/60Hz                |
| Ambient temperature | -10°C ~70°C                               |
| Delay range         | 0-6(S.M) 0-30(S.M)<br>0-15(S.M) 0-60(S.M) |



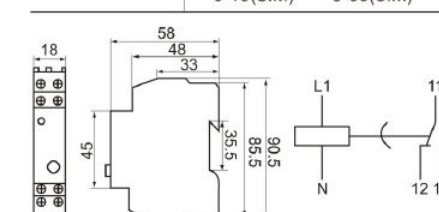
JK9261



JK9261-B

### Techniccal Parameter

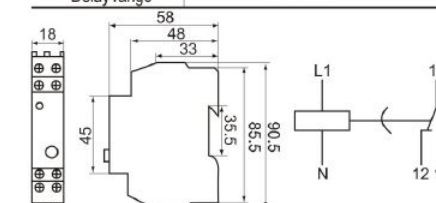
|                     |                                           |
|---------------------|-------------------------------------------|
| Operating Voltage   | AC12-380V DC12-24V 50/60Hz                |
| Ambient temperature | -10°C ~70°C                               |
| Delay range         | 0-6(S.M) 0-30(S.M)<br>0-15(S.M) 0-60(S.M) |



JK9261-E

### Techniccal Parameter

|                     |                            |
|---------------------|----------------------------|
| Operating Voltage   | AC12-380V DC12-24V 50/60Hz |
| Ambient temperature | -10°C ~70°C                |
| Delay range         | 3S-30H                     |



## Phase protector

### Techniccal Parameter

|                    |                                      |
|--------------------|--------------------------------------|
| Type               | TH-215                               |
| Contact rating     | AC250V DC30V 8A                      |
| Rated voltage      | Three-phase or three-phase four-wire |
| Number of contacts | SPDT(1)                              |
| Electrical life    | 10 <sup>5</sup>                      |
| Mechanical life    | 10 <sup>6</sup>                      |
| Altitude           | <2000M                               |



TH-215



TH-210

### Techniccal Parameter

|                    |                                      |
|--------------------|--------------------------------------|
| Type               | TH-210                               |
| Contact rating     | AC250V DC30V 8A                      |
| Rated voltage      | Three-phase or three-phase four-wire |
| Number of contacts | SPDT(1)                              |
| Electrical life    | 10 <sup>5</sup>                      |
| Mechanical life    | 10 <sup>6</sup>                      |
| Altitude           | <2000M                               |

### Techniccal Parameter

|                    |                                      |
|--------------------|--------------------------------------|
| Type               | TH-201                               |
| Contact rating     | AC250V DC30V 8A                      |
| Rated voltage      | Three-phase or three-phase four-wire |
| Number of contacts | SPDT(1)                              |
| Electrical life    | 10 <sup>5</sup>                      |
| Mechanical life    | 10 <sup>6</sup>                      |
| Altitude           | <2000M                               |



TH-201

## Time relay

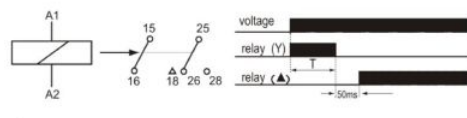


TAY

### Techniccal Parameter

|                   |                                                    |
|-------------------|----------------------------------------------------|
| Operating Voltage | AC12-380V 50/60Hz DC12-24V                         |
| Contact form      | Delay 1 conversion instantaneous 1 conversion      |
| Action form       | Power-on delay contact and momentary delay contact |
| Delay range       | 1S-5M                                              |

Wiring Diagram      Work Diagram

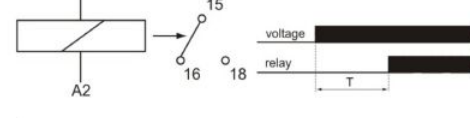


TAE

### Techniccal Parameter

|                   |                                                    |
|-------------------|----------------------------------------------------|
| Operating Voltage | AC12-380V 50/60Hz DC12-24V                         |
| Contact form      | Timed 1SPDT                                        |
| Action form       | Power-on delay contact and momentary delay contact |
| Delay range       | 1S-5M                                              |

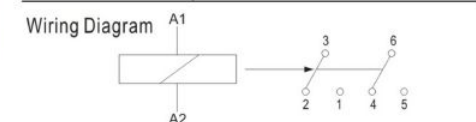
Wiring Diagram      Work Diagram



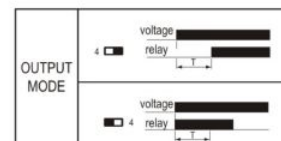
TAED

### Techniccal Parameter

|                   |                             |
|-------------------|-----------------------------|
| Operating Voltage | AC12-380V 50/60Hz DC12-24V  |
| Contact form      | Timed 2SPDT                 |
| Action form       | ON-delay      Release-delay |
| Delay range       | 0.1S-99H                    |



Work Diagram



## Phase protector

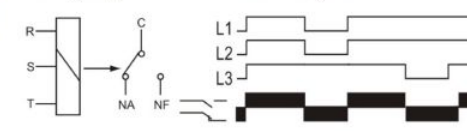


TPND

### Techniccal Parameter

|                     |                         |
|---------------------|-------------------------|
| Operating Voltage   | AC110-380V 50/60Hz      |
| Contact form        | 1SPDT                   |
| Action form         | Loss phase with contact |
| Ambient temperature | -20°C ~70°C             |

Wiring Diagram      Work Diagram

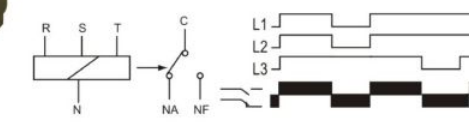


TPND-N

### Techniccal Parameter

|                     |                        |
|---------------------|------------------------|
| Operating Voltage   | AC110-380V 50/60Hz     |
| Contact form        | 1SPDT                  |
| Action form         | Phase-breaking contact |
| Ambient temperature | -20°C ~70°C            |

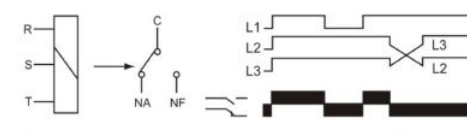
Wiring Diagram      Work Diagram



TPNC

### Techniccal Parameter

|                     |                                               |
|---------------------|-----------------------------------------------|
| Operating Voltage   | AC110-380V 50/60Hz                            |
| Contact form        | 1SPDT                                         |
| Action form         | Phase-breaking phase sequence drives contacts |
| Ambient temperature | -20°C ~70°C                                   |

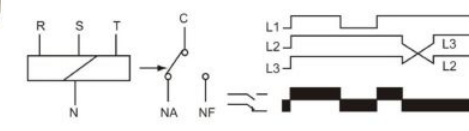


TPNC-N

### Techniccal Parameter

|                     |                                               |
|---------------------|-----------------------------------------------|
| Operating Voltage   | AC110-380V 50/60Hz                            |
| Contact form        | 1SPDT                                         |
| Action form         | Phase-breaking phase sequence drives contacts |
| Ambient temperature | -20°C ~70°C                                   |

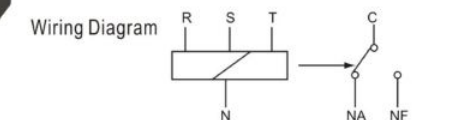
Wiring Diagram      Work Diagram



TPNF

### Techniccal Parameter

|                     |                         |
|---------------------|-------------------------|
| Operating Voltage   | AC110-380V 50/60Hz      |
| Contact form        | 1SPDT                   |
| Action form         | Loss phase with contact |
| Delay range         | 0.01S-10S               |
| Ambient temperature | -20°C ~70°C             |



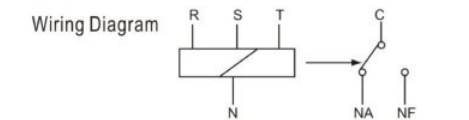
Work Diagram



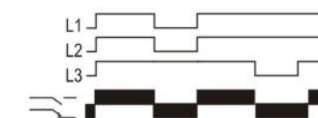
TPNF-E  
(NPR)

### Techniccal Parameter

|                     |                         |
|---------------------|-------------------------|
| Operating Voltage   | AC110-380V 50/60Hz      |
| Contact form        | 1SPDT                   |
| Action form         | Loss phase with contact |
| Delay range         | 0.01S-10S               |
| Ambient temperature | -20°C ~70°C             |



Work Diagram



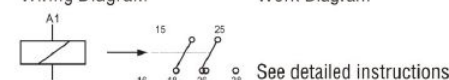


3RP-150

## Techniccal Parameter

|                   |                               |
|-------------------|-------------------------------|
| Operating Voltage | AC12-380V 50/60Hz AC/DC12-24V |
| Contact form      | SPDT(2) Timed 2SPDT Inst      |
| Action form       | Multi-output                  |
| Delay range       | 0.05S-100H                    |

## Wiring Diagram



## Work Diagram

See detailed instructions  
Operating Voltage  
Contact form  
Action form  
Delay range



3RP-155

## Techniccal Parameter

|                   |                               |
|-------------------|-------------------------------|
| Operating Voltage | AC12-380V 50/60Hz AC/DC12-24V |
| Contact form      | SPDT(2) Timed 2SPDT Inst      |
| Action form       | Multi-output                  |
| Delay range       | 0.05S-100H                    |

## Wiring Diagram



## Work Diagram

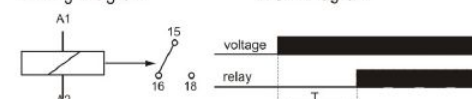


3RP-151

## Techniccal Parameter

|                   |                               |
|-------------------|-------------------------------|
| Operating Voltage | AC12-380V 50/60Hz AC/DC12-24V |
| Contact form      | SPDT(1) Timed 1SPDT Inst      |
| Action form       | On-delay                      |
| Delay range       | 0.05S-100H                    |

## Wiring Diagram



## Work Diagram

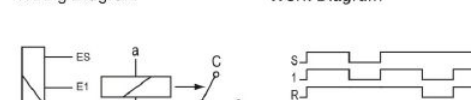


3RP-156

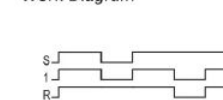
## Techniccal Parameter

|                     |                    |
|---------------------|--------------------|
| Operating Voltage   | AC110-380V 50/60Hz |
| Contact form        | 1SPDT              |
| Ambient temperature | -20°C ~70°C        |

## Wiring Diagram



## Work Diagram

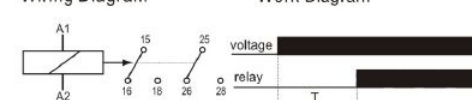


3RP-152

## Techniccal Parameter

|                   |                               |
|-------------------|-------------------------------|
| Operating Voltage | AC12-380V 50/60Hz AC/DC12-24V |
| Contact form      | SPDT(2) Timed 2SPDT Inst      |
| Action form       | On-delay                      |
| Delay range       | 0.05S-100H                    |

## Wiring Diagram



## Work Diagram

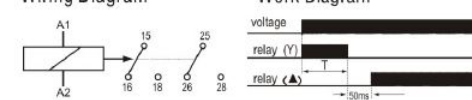


3RP-153

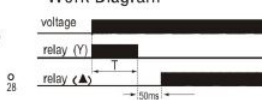
## Techniccal Parameter

|                   |                               |
|-------------------|-------------------------------|
| Operating Voltage | AC12-380V 50/60Hz AC/DC12-24V |
| Contact form      | SPDT(2) Timed 2SPDT Inst      |
| Action form       | On-delay                      |
| Delay range       | 0.05S-100H                    |

## Wiring Diagram



## Work Diagram



THT8-A1



THT8-A2

## Single-function time relay

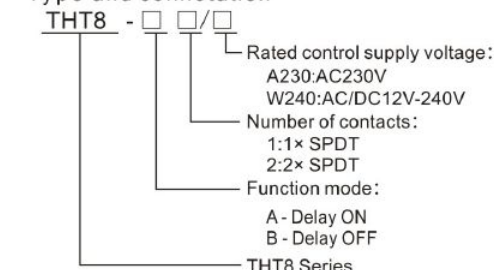
### General

- Applications
  - Suitable for applications where function and time requirements are know.
  - Time switch , possible to be used for pump decay time after switching heating off , switching of fans.
- Function Features
  - Single-function relay with possibility of time settling by a potentiometer.
  - Choice of 2 functions:
    - A:Delay ON
    - B:Delay OFF
  - Time scale 0.1 s - 10 days divided into 10 ranges.
  - Relay status is indicated by LED.
  - 1-MODULE,DIN rail mounting.

### Technical parameters

| Technical parameters             | THT8-A1/B1                                                  | THT8-A2/B2      |
|----------------------------------|-------------------------------------------------------------|-----------------|
| Function                         | A:delay ON ; B:delay OFF                                    |                 |
| Supply terminals                 | A1-A2                                                       |                 |
| Voltage range                    | AC/DC 12-240V(50-60Hz)                                      |                 |
| Burden                           | AC 0.09-3VA/DC 0.05-1.7W                                    |                 |
| Voltage range                    | AC 230V(50-60Hz)                                            |                 |
| Power input                      | AC max.6VA/1.3W                                             | AC max.6VA/1.9W |
| Supply voltage tolerance         | -15%; +10%                                                  |                 |
| Supply indication                | green LED                                                   |                 |
| Time ranges                      | 0.1s-10days,ON,OFF                                          |                 |
| Time setting                     | potentionmeter                                              |                 |
| Time deviation                   | 10%-mechanical setting                                      |                 |
| Repeat accuracy                  | 0.2%-set value stability                                    |                 |
| Temperature coefficient          | 0.05%/°C,at=20°C(0.05°F,at=68°F)                            |                 |
| Output                           | 1×SPDT                                                      | 2×SPDT          |
| Current rating                   | 1×16A(AC1)                                                  | 2×16A(AC1)      |
| Switching voltage                | 250VAC/24VDC                                                |                 |
| Min.breaking capacity DC         | 500mW                                                       |                 |
| Output indication                | red LED                                                     |                 |
| Mechanical life                  | 1×10 <sup>7</sup>                                           |                 |
| Electrical life(AC1)             | 1×10 <sup>5</sup>                                           |                 |
| Reset time                       | max.200ms                                                   |                 |
| Operating temperature            | -20°C to +55°C(-4°F to 131°F)                               |                 |
| Storage temperature              | -35°C to +75°C(-22°F to 158°F)                              |                 |
| Mounting/DIN rail                | Din rail EN/IEC 60715                                       |                 |
| Protection degree                | IP40 for front panel/IP20 terminals                         |                 |
| Operating position               | any                                                         |                 |
| Overvoltage cathegory            | III.                                                        |                 |
| Pollution degree                 | 2                                                           |                 |
| Max.cable size(mm <sup>2</sup> ) | solid wire max.1×2.5 or 2×1.5(with sleeve max.1×2.5(AWG 12) |                 |
| Dimensions                       | 90×18×64mm                                                  |                 |
| Weight                           | 1×SPDT:W240-60g,A230-59g                                    |                 |
|                                  | 2×SPDT:W240-81g,A230-79g                                    |                 |
| Standards                        | EN 61812-1,IEC6947-5-1                                      |                 |

### Type and connotation



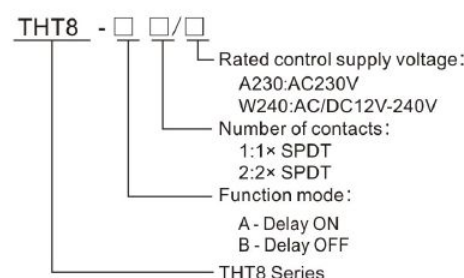


THT8-M1



THT8-M2

### ■ Type and connotation



## Multifunction time relay

### General

#### ■ Applications

- Multifunction time relay can be used for electrical appliances, control of lights, heating, motors, pumps and fans (10 functions, 10 time ranges, multi-voltage).

#### ■ Function Features

- 10 functions:
  - 5 time functions controlled by supply voltage
  - 4 time functions controlled by control input
  - 1 function of latching relay

### Technical parameters

| Technical parameters             | THT8-M1                                                     | THT8-M2                  |
|----------------------------------|-------------------------------------------------------------|--------------------------|
| Function                         | A,B,C,D,E,F,G,H,I,J                                         |                          |
| Supply terminals                 | A1-A2                                                       |                          |
| Voltage range                    | AC/DC 12-240V(50-60Hz)                                      |                          |
| Burden                           | AC 0.09-3VA/DC 0.05-1.7W                                    |                          |
| Voltage range                    | AC 230V(50-60Hz)                                            |                          |
| Power input                      | AC max.6VA/1.3W                                             | AC max.6VA/1.9W          |
| Supply voltage tolerance         | -15%; +10%                                                  |                          |
| Supply indication                | green LED                                                   |                          |
| Time ranges                      | 0.1s-10days,ON,OFF                                          |                          |
| Time setting                     | potentionmeter                                              |                          |
| Time deviation                   | 10%-mechanical setting                                      |                          |
| Repeat accuracy                  | 0.2%-set value stability                                    |                          |
| Temperature coefficient          | 0.05%/°C, at=20°C (0.05% °F, at=68°F)                       |                          |
| Output                           | 1×SPDT                                                      | 2×SPDT                   |
| Current rating                   | 1×16A(AC1)                                                  | 2×16A(AC1)               |
| Switching voltage                | 250VAC/24VDC                                                |                          |
| Min.breaking capacity DC         | 500mW                                                       |                          |
| Output indication                | red LED                                                     |                          |
| Mechanical life                  | 1×10 <sup>7</sup>                                           |                          |
| Electrical life(AC1)             | 1×10 <sup>5</sup>                                           |                          |
| Reset time                       | max.200ms                                                   |                          |
| Operating temperature            | -20°C to +55°C (-4°F to 131°F)                              |                          |
| Storage temperature              | -35°C to +75°C (-22°F to 158°F)                             |                          |
| Mounting/DIN rail                | Din rail EN/IEC 60715                                       |                          |
| Protection degree                | IP40 for front panel/IP20 terminals                         |                          |
| Operating position               | any                                                         |                          |
| Overvoltage cathegory            | III.                                                        |                          |
| Pollution degree                 | 2                                                           |                          |
| Max.cable size(mm <sup>2</sup> ) | solid wire max.1×2.5 or 2×1.5/with sleeve max.1×2.5(AWG 12) |                          |
| Dimensions                       | 90×18×64mm                                                  |                          |
| Weight                           | 1×SPDT:W240-60g,A230-59g                                    | 2×SPDT:W240-81g,A230-79g |
| Standards                        | EN 61812-1, IEC6947-5-1                                     |                          |



THT8-2T

## Double delay time relay

### General

#### ■ Applications

- For gradual switching of heavy powers (e.g. el. heating), prevents current strokes in the main.

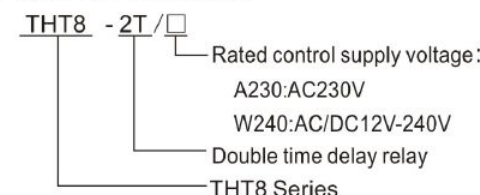
#### ■ Function Features

- 2x Delay ON (2 time relays in one)
- Time scale 0.1s - 10 days divided into 10 time ranges:
  - 0.1s - 1s / 1s - 10s / 0.1min - 1min / 1min - 10min / 0.1h - 1h / 1h - 10hrs / 0.1 day - 1 day / 1 day - 10 days / ON / OFF.
- Times t1 and t2 are independantly adjustable.
- t1 and t2 are switched on after supply voltage connection
- Relay status is indicated by LED.
- 1-MODULE, DIN rail mounting.

### Technical parameters

| Technical parameters             | THT8-2T                                                     |
|----------------------------------|-------------------------------------------------------------|
| Function                         | 2 x Delay ON                                                |
| Supply terminals                 | A1-A2                                                       |
| Voltage range                    | AC/DC 12-240V(50-60Hz)                                      |
| Burden                           | AC 0.09-3VA/DC 0.05-1.7W                                    |
| Voltage range                    | AC 230V(50-60Hz)                                            |
| Power input                      | AC max.6VA/1.9W                                             |
| Supply voltage tolerance         | -15%; +10%                                                  |
| Supply indication                | green LED                                                   |
| Time ranges                      | 0.1s-10days,ON,OFF                                          |
| Time setting                     | potentionmeter                                              |
| Time deviation                   | 10%-mechanical setting                                      |
| Repeat accuracy                  | 0.2%-set value stability                                    |
| Temperature coefficient          | 0.05%/°C, at=20°C (0.05% °F, at=68°F)                       |
| Output                           | 2×SPDT                                                      |
| Current rating                   | 2×16A(AC1)                                                  |
| Switching voltage                | 250VAC/24VDC                                                |
| Min.breaking capacity DC         | 500mW                                                       |
| Output indication                | red LED                                                     |
| Mechanical life                  | 1×10 <sup>7</sup>                                           |
| Electrical life(AC1)             | 1×10 <sup>5</sup>                                           |
| Reset time                       | max.200ms                                                   |
| Operating temperature            | -20°C to +55°C (-4°F to 131°F)                              |
| Storage temperature              | -35°C to +75°C (-22°F to 158°F)                             |
| Mounting/DIN rail                | Din rail EN/IEC 60715                                       |
| Protection degree                | IP40 for front panel/IP20 terminals                         |
| Operating position               | any                                                         |
| Overvoltage cathegory            | III.                                                        |
| Pollution degree                 | 2                                                           |
| Max.cable size(mm <sup>2</sup> ) | solid wire max.1×2.5 or 2×1.5/with sleeve max.1×2.5(AWG 12) |
| Dimensions                       | 90×18×64mm                                                  |
| Weight                           | W240-82g,A230-82g                                           |
| Standards                        | EN 61812-1, IEC6947-5-1                                     |

### ■ Type and connotation



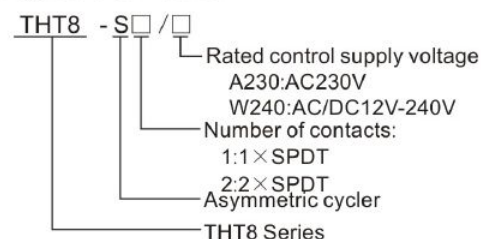


THT8-S1



THT8-S2

#### ■ Type and connotation



## Asymmetric cycler

### General

#### ■ Applications

- It is used for regular room ventilation, cyclic dehumidification, light control, circulating pumps, noon signs, etc.

#### ■ Function Features

- 2 time functions:
  - Cycler beginning with pulse
  - Cycler beginning with pause
- Function choice is done by an external jumper of terminals S-A1.
- Time scale 0.1 s - 100 days divided into 10 time ranges:  
(0.1 s - 1 s / 1 s - 10 s / 0.1 min - 1 min / 1 min - 10 min / 0.1 hrs - 1h / 1 hrs - 10 hrs / 0.1 day - 1 day / 1 day - 10 days / 3 days - 30 days / 10 days - 100 days).
- Relay status is indicated by LED.
- 1-MODULE, DIN rail mounting.

### Technical parameters

| Technical parameters             | THT8-S1                                                     | THT8-S2         |
|----------------------------------|-------------------------------------------------------------|-----------------|
| Function                         | Asymmetric cycler time relay                                |                 |
| Supply terminals                 | A1-A2                                                       |                 |
| Voltage range                    | AC/DC 12-240V(50-60Hz)                                      |                 |
| Burden                           | AC 0.09-3VA/DC 0.05-1.7W                                    |                 |
| Voltage range                    | AC 230V(50-60Hz)                                            |                 |
| Power input                      | A230 AC max.6VA/1.3W                                        | AC max.6VA/1.9W |
| Supply voltage tolerance         | -15%; +10%                                                  |                 |
| Supply indication                | green LED                                                   |                 |
| Time ranges                      | 0.1s-10days                                                 |                 |
| Time setting                     | potentionmeter                                              |                 |
| Time deviation                   | 10%-mechanical setting                                      |                 |
| Repeat accuracy                  | 0.2%-set value stability                                    |                 |
| Temperature coefficient          | 0.05%/°C, at=20°C (0.05% °F, at=68°F)                       |                 |
| Output                           | 1×SPDT                                                      | 2×SPDT          |
| Current rating                   | 1×16A(AC1)                                                  | 2×16A(AC1)      |
| Switching voltage                | 250VAC/24VDC                                                |                 |
| Min.breaking capacity DC         | 500mW                                                       |                 |
| Output indication                | red LED                                                     |                 |
| Mechanical life                  | 1×10 <sup>7</sup>                                           |                 |
| Electrical life(AC1)             | 1×10 <sup>5</sup>                                           |                 |
| Reset time                       | max.200ms                                                   |                 |
| Operating temperature            | -20°C to +55°C(-4°F to 131°F)                               |                 |
| Storage temperature              | -35°C to +75°C(-22°F to 158°F)                              |                 |
| Mounting/DIN rail                | Din rail EN/IEC 60715                                       |                 |
| Protection degree                | IP40 for front panel/IP20 terminals                         |                 |
| Operating position               | any                                                         |                 |
| Overvoltage cathegory            | III.                                                        |                 |
| Pollution degree                 | 2                                                           |                 |
| Max.cable size(mm <sup>2</sup> ) | solid wire max.1×2.5 or 2×1.5/with sleeve max.1×2.5(AWG 12) |                 |
| Dimensions                       | 90×18×64mm                                                  |                 |
| Weight                           | 1×SPDT:W240-60g,A230-59g                                    |                 |
|                                  | 2×SPDT:W240-81g,A230-79g                                    |                 |
| Standards                        | EN 61812-1,IEC6947-5-1                                      |                 |



THT8-ST

## Delay ON star/delta

### General

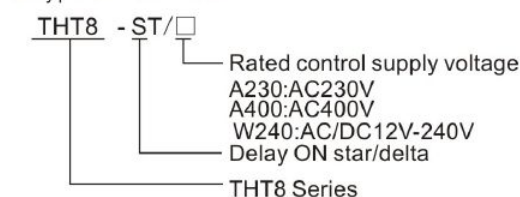
#### ■ Applications

- Designated for delay ON of motors star/delta.

#### ■ Function Features

- Time t1(star):  
time scale 0.1s - 10 min divided into 4 time ranges rough time setting by rotary switch.
- Time t2 (delay):  
time scale 0.1s - 1s  
time setting by potentiometer
- Relay status is indicated by LED.
- 1-MODULE, DIN rail mounting.

#### ■ Type and connotation



### Technical parameters

| Technical parameters             | THT8-ST                                                     |
|----------------------------------|-------------------------------------------------------------|
| Function                         | Delay ON star/delta                                         |
| Supply terminals                 | A1-A2                                                       |
| Voltage range                    | AC/DC 12-240V(50-60Hz)                                      |
| Burden                           | AC 0.3-2VA/DC 0.1-1.2W                                      |
| Voltage range                    | AC 230V/AC400V(50-60Hz)                                     |
| Power input                      | A230 AC max.6VA/1.3W                                        |
| Supply voltage tolerance         | -15%; +10%                                                  |
| Supply indication                | green LED                                                   |
| Time ranges                      | Range of time delay t1:0.1s - 10 min, Switch time t2:0.1-1s |
| Time setting                     | potentionmeter                                              |
| Time deviation                   | 10%-mechanical setting                                      |
| Repeat accuracy                  | 0.2%-set value stability                                    |
| Temperature coefficient          | 0.05%/°C, at=20°C (0.05% °F, at=68°F)                       |
| Output                           | 2 x SPDT                                                    |
| Current rating                   | 16A/AC1                                                     |
| Switching voltage                | 250VAC/24VDC                                                |
| Min.breaking capacity DC         | 500mW                                                       |
| Output indication                | red LED                                                     |
| Mechanical life                  | 1×10 <sup>7</sup>                                           |
| Electrical life(AC1)             | 1×10 <sup>5</sup>                                           |
| Reset time                       | max.200ms                                                   |
| Operating temperature            | -20°C to +55°C(-4°F to 131°F)                               |
| Storage temperature              | -35°C to +75°C(-22°F to 158°F)                              |
| Mounting/DIN rail                | Din rail EN/IEC 60715                                       |
| Protection degree                | IP40 for front panel/IP20 terminals                         |
| Operating position               | any                                                         |
| Overvoltage cathegory            | III.                                                        |
| Pollution degree                 | 2                                                           |
| Max.cable size(mm <sup>2</sup> ) | solid wire max.1×2.5 or 2×1.5/with sleeve max.1×2.5(AWG 12) |
| Dimensions                       | 90×18×64mm                                                  |
| Weight                           | W240-82g,A230-80g                                           |
| Standards                        | EN 61812-1,IEC60947-5-1                                     |



THT8-V6

## Phase Loss, Phase Sequence, Three-Phase Unbalance Protector General

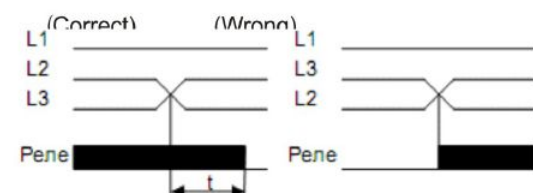
### Installation and Debugging

Firstly put the three-phase power "A, B, C" connect to the corresponding terminals "L1, L2, L3" respectively. After turning on the power, when the product in the normal working state, the two lights on the panel (LED) will light, green (LED) means power supply, red (LED) means working state. During operation in "A, B, C" three-phase, if any phase occurs the phenomenon of phase loss, phase sequence error, three-phase unbalance or over-voltage (voltage value can be set), the red indicator light (LED) does not light, in the same time, the relay in product will drive the external AC contactor, thus protecting the motor (or equipment)

### Installation Dimensions:



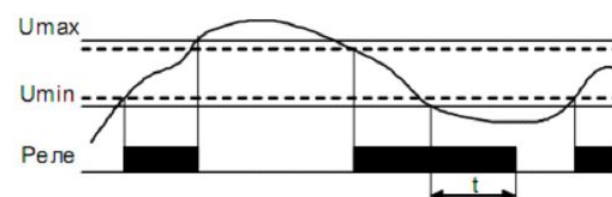
### Phase Sequence Wire Diagram:



### Phase Loss Wire Diagram:

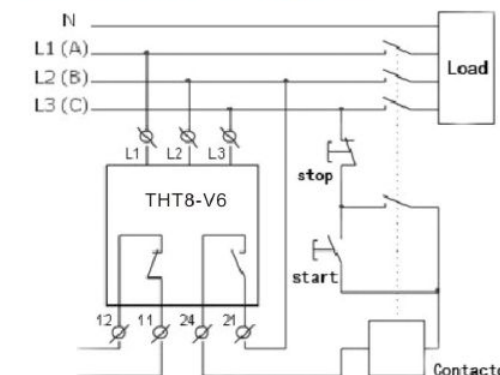


### Voltage Control Chart:



THT8-V6

## Phase Loss, Phase Sequence, Three-Phase Unbalance Protector Connection Diagram



### Technical parameters

| Technical parameters                                                   |                                                      | THT8-V6                          |            |
|------------------------------------------------------------------------|------------------------------------------------------|----------------------------------|------------|
| Rated Voltage(V)                                                       |                                                      | 100, 110,175, 220, 380, 400, 415 |            |
| Frequency (Hz)                                                         |                                                      | 50Hz                             |            |
| Min. Voltage                                                           |                                                      | 50, 55, 88, 110, 190, 200,208    |            |
| Max. Voltage                                                           |                                                      | 150, 165,262, 330, 530, 540, 560 |            |
| Consumption Power                                                      |                                                      | ≤ 2W                             |            |
| When the following situations occur, the protector will start to work. | Phaseloss occurs when there is a breakphase          | 0.1S-10S                         | Delay time |
|                                                                        | Phaseloss occurswhen thereis two breakphase          | 0.1S-10S                         |            |
|                                                                        | when there is three-phase voltageunbalanced (30± 2)% | 0.1S-10S                         |            |
|                                                                        | when the two-phases phase sequenceis disordered      | 0.1S                             |            |
|                                                                        | Whenthe rated voltage>130% ± 5                       | 0.1S                             |            |
| Error time                                                             |                                                      | Less than 10S                    |            |
| Output Contact                                                         |                                                      | 1P                               |            |
| Max. Contact Power                                                     |                                                      | 2000W                            |            |
| Max Resistive Load                                                     | AC250V, 50HZ                                         | 8A                               |            |
|                                                                        | DC30V                                                |                                  |            |
| Mechanical Life                                                        |                                                      | ≥ 10000times                     |            |
| Electrical Life                                                        |                                                      | ≥ 10000times                     |            |
| Temperature                                                            |                                                      | -40℃ — 55℃                       |            |
| Dimensions                                                             |                                                      | 17,5 x90 x66 M M                 |            |
| Relative Humidity                                                      |                                                      | 35— 80%                          |            |
| Altitude                                                               |                                                      | 2000M                            |            |
| Installation Location                                                  |                                                      | Anywhere                         |            |
| Weight                                                                 |                                                      | Less than 0.1KG                  |            |



THT8-V8

## Over and under voltage protection relay

### TECHNICAL PROPERTIES

| Measurement and Supply Circuit        |                                                                                                                                                               |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supply Voltage(Un)                    | :220,230V AC -010,-01/02/02F/02FA/M2<br>:400V AC-03/03F                                                                                                       |
| Supply Voltage Gap( $\Delta n$ )      | :Please refer to the side label on the device.                                                                                                                |
| Supply Frequency                      | :48 ... 63 Hz<br>:50/60 Hz,(-02FA)                                                                                                                            |
| Power Consumption(max)                | :30 VA/2 W(50Hz.)                                                                                                                                             |
| Measurement Method                    | :True RMS                                                                                                                                                     |
| Settings                              |                                                                                                                                                               |
| Over Voltage Setup(Umax.)             | :1.05...1.30×Un(% Scale)<br>:240...300V AC(-01/02/02F/M2)<br>:410...510V AC(-03/03F/02FA)                                                                     |
| Under Voltage setup(Umin.)            | :0.7...0.95×Un(% Scale)<br>:150...210V AC(-01/02/02F/M2)<br>:270...370V AC(-03/03F/02FA)                                                                      |
| Hysteresis(for Umax and Umin)         | :Un×%3 constant)                                                                                                                                              |
| Delay-Off(Delay)                      | :0.1...20 sec.(0.1...60sn.and 0.1...180sn,Manufactured if demanded)                                                                                           |
| Delay-On(Reset Delay)                 | :0.1...20 sec.(0.1...60sn.and 0.1...180sn,Manufactured if demanded)                                                                                           |
| Voltage Adjustment Accuracy           | :±3%                                                                                                                                                          |
| Repetition Accuracy(Voltage)          | :±0.5%                                                                                                                                                        |
| Accuracy of the Set Times             | :±5%+100 msd.                                                                                                                                                 |
| Repetition Accuracy(Time)             | :±3%                                                                                                                                                          |
| Output                                |                                                                                                                                                               |
| Output Type                           | :1 inverter,8A,250V,2000VA(CosΦ=1)                                                                                                                            |
| Electrical Life                       | :10 <sup>4</sup>                                                                                                                                              |
| Mechanical Life                       | :10 <sup>4</sup>                                                                                                                                              |
| Ambiant Conditions                    |                                                                                                                                                               |
| Operationg Temperature                | : -5℃...+55℃                                                                                                                                                  |
| Relative Humidity                     | :<%90(without condensation)                                                                                                                                   |
| Connection                            |                                                                                                                                                               |
| Cable Cross-sections for Terminals    | : 4mm <sup>2</sup> (12AWG) stranded rigi4 cable<br>: 6mm <sup>2</sup> ( 10AWG) solid conductor cable<br>: 2x2.5mm <sup>2</sup> ( 14AWG) solid conductor cable |
| Screw-On Force                        | : 0.5 Nm (4.5in.lbsl)                                                                                                                                         |
| Boby                                  |                                                                                                                                                               |
| Installation                          | : Inside the panel vertically or 4n to the rail                                                                                                               |
| Material Type                         | : Plastic Consistent with UL 94 V0                                                                                                                            |
| Protection Class                      | : IP 20 (Terminals), IP 40 (Front Panel)                                                                                                                      |
| Dimensions                            | : Type PK 28                                                                                                                                                  |
| Weight                                | : 100 gr. (Only -02FA 200gr.)                                                                                                                                 |
| Isolation                             |                                                                                                                                                               |
| Isolation Voltage(EN 60255-5)         | : 400 V                                                                                                                                                       |
| Isolation Coordination (EN 60255-5)   | : Exceeding Voltage Category III,<br>Pollution Degree 3                                                                                                       |
| Instant Burst Voltage(EN 60255-5)     | : 4 kV 12/50 uS                                                                                                                                               |
| Dielectric Resistance(EN 60255-5)     | : 2 kV AC 50 Hz 1 minute                                                                                                                                      |
| Isolation Resistance(EN 60255-5)      | : >500MOHM / 500V DC                                                                                                                                          |
| Followed Standards                    |                                                                                                                                                               |
| EN 60255-6                            | : Product Standard                                                                                                                                            |
| EN 61000-6-2                          | : Immunity                                                                                                                                                    |
| EN-6100-6-3,EN-6100-6-4               | : Emission                                                                                                                                                    |
| Directives/Regulations To Be Followed |                                                                                                                                                               |
| 73/23/EEC                             | LVD                                                                                                                                                           |
| 89/336/EEC                            | EMC                                                                                                                                                           |

## TR series time / phase failure / phase sequence / level protector

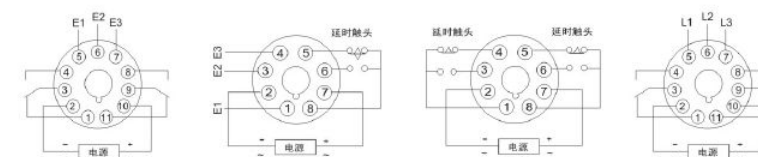


### Advantage

- ◆ Introduce foreign advanced technology and adopt large-scale single-chip microcomputer.
- ◆ Accurate, powerful and versatile.
- ◆ Wiring method.
- ◆ Broad voltage.
- ◆ Water level control switch.
- ◆ Time relay series.
- ◆ Phase sequence protector series.
- ◆ Three-phase four-wire phase sequence protector series.
- ◆ Overvoltage, undervoltage, phase failure, phase sequence and time programmable control protection series.

| Type           | TRP1N / TRP2 / TRP2N / TRP1 / TRTY / TRTE / TRP3 / TRP4 |          |          |          |               |              |
|----------------|---------------------------------------------------------|----------|----------|----------|---------------|--------------|
| Operation Type | On-delay                                                |          |          |          | Release-delay | Repeat cycle |
| Time range     | 0.01S-9999H                                             |          |          |          |               |              |
| Output contact | SPDT(1C)                                                | SPDT(2C) | SPDT(1C) | SPDT(2C) | SPDT(2C)      | SPDT(1C)     |
|                |                                                         |          | SPDT(1C) |          |               | SPDT(2C)     |

### Connection Diagram



## Time relay



TRTY

### Technical Parameter

|                   |                               |
|-------------------|-------------------------------|
| Operating Voltage | AC12-380V 50/60Hz AC/DC12-24V |
| Contact form      | 2 SPDT                        |
| Action form       | Multi-output                  |
| Delay range       | 0.05S-100H                    |

Wiring Diagram Work Diagram

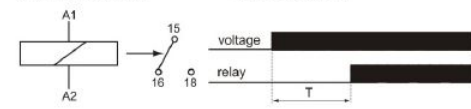


TRTE

### Technical Parameter

|                   |                               |
|-------------------|-------------------------------|
| Operating Voltage | AC12-380V 50/60Hz AC/DC12-24V |
| Contact form      | 1SPDT                         |
| Action form       | On-delay                      |
| Delay range       | 0.05S-100H                    |

Wiring Diagram Work Diagram



## Phase protector

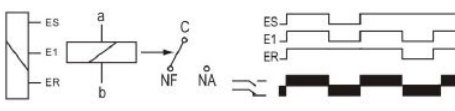


TRP1N

### Technical Parameter

|                     |                    |
|---------------------|--------------------|
| Operating Voltage   | AC110-380V 50/60Hz |
| Contact form        | 1SPDT              |
| Ambient temperature | -20°C ~70°C        |

Wiring Diagram Work Diagram

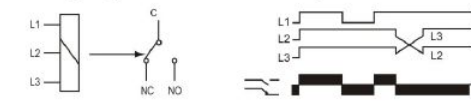


TRP2N

### Technical Parameter

|                   |                         |
|-------------------|-------------------------|
| Operating Voltage | AC110-380V 50/60Hz      |
| Contact form      | 1SPDT                   |
| Action form       | Loss phase with contact |
| Delay range       | -20°C ~70°C             |

Wiring Diagram Work Diagram

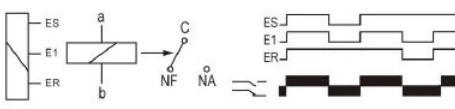


TRP1

### Technical Parameter

|                     |                    |
|---------------------|--------------------|
| Operating Voltage   | AC110-380V 50/60Hz |
| Contact form        | 1SPDT              |
| Ambient temperature | -20°C ~70°C        |

Wiring Diagram Work Diagram

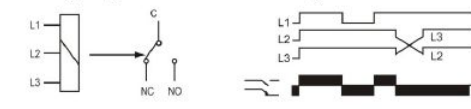


TRP2

### Technical Parameter

|                   |                         |
|-------------------|-------------------------|
| Operating Voltage | AC110-380V 50/60Hz      |
| Contact form      | 1SPDT                   |
| Action form       | Loss phase with contact |
| Delay range       | -20°C ~70°C             |

Wiring Diagram Work Diagram



TRP3

### Technical Parameter

|                   |                         |
|-------------------|-------------------------|
| Operating Voltage | AC110-380V 50/60Hz      |
| Contact form      | 1SPDT                   |
| Action form       | Loss phase with contact |
| Delay range       | 0.05S-100H              |

Wiring Diagram Work Diagram

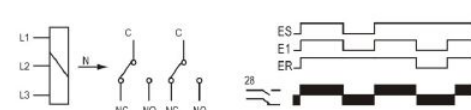


TRP4

### Technical Parameter

|                     |                    |
|---------------------|--------------------|
| Operating Voltage   | AC110-380V 50/60Hz |
| Contact form        | 1SPDT              |
| Ambient temperature | -20°C ~70°C        |

Wiring Diagram Work Diagram



### General Specifications

This product is a 6-segment time microprocessor, the range can be selected through the panel.

- 1) (k1): The working time can be adjusted from 0.01 times to 1 time
- 2) (k2): The off time can be adjusted from 0.01 times to 1 time
- 3) Scope: Please see the chart below  
Power on A1-A2, "pw r" led light and "OUT" led light are on, relay work (2 - 3 terminals shorted) until the set is reached the working time, the relay keeps working. Then "OUT" led when the light is off, the relay stops working (1~2 terminal is shorted) until it reaches to the set disconnect time, the "OUT" led light is on. This cycle.



TH-B90

### General Specifications

Supply voltage: 220 Vac  $\pm$  %20 (L-N)

B1,B2(Vac): 12  $\square$  ; 24  $\square$

B1,B2(Vdc): B1:+; B2:-

- Ranges:
- A : 60 sec / 60 sec
  - B : 10 m / 60 sec
  - C : 60 m / 60 sec
  - D : 10 m / 10 m
  - E : 60 m / 60 m
  - F : 10 h / 10 h

Power Consumption: < 7 VA

Ambient Temperature: -5°C ~+55°C

Contacts Type: Relay, 1CO, 10A/250 Vac(Omron)

Connection: Vertical inside panel of DIN 35rail

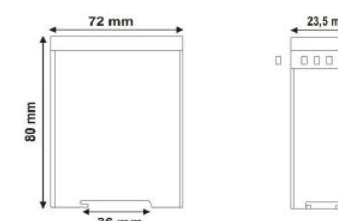


TH-B91



TH-B92

### Dimension



## Time Relays



### Application

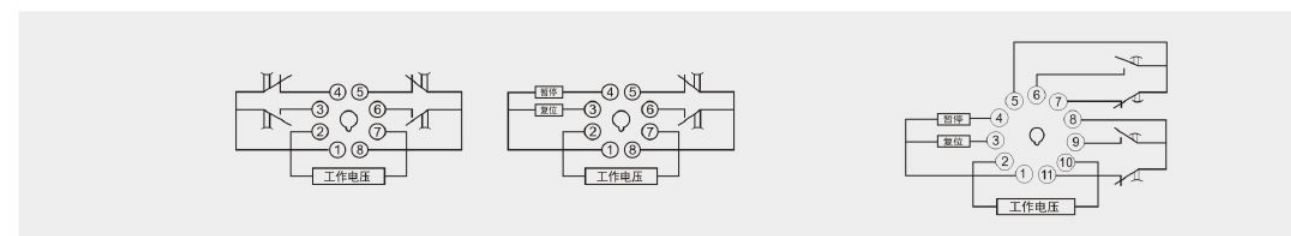
DH48S introduce aboard technology, supply advanced great-scale special IC and LED, according to aboard technology standard, can replace H5CN of OMRON company and same products, the product have beautiful outlook, wide time range, high precision, low power consumption, long life, big contact capacity viriures etc, are used in controlling element of auto control system.

### Techniccal Parameter

- ◆ Power: 85~110%
- ◆ Rated voltage: AC: 110V、220V、380V  
DC: 12V、24V
- ◆ Delaying control precision:  $<0.3\% \pm 0.05s$
- ◆ Contact rating: AC220 5A DC30V 5A(Resistive load)
- ◆ Mechanical life:  $\geq 10^6$  time
- ◆ Electrical life:  $\geq 10^5$  time
- ◆ Ambient temperatu re:  $-10^{\circ}\text{C} \sim +50^{\circ}\text{C}$
- ◆ Power consumption:  $\leq 5W$
- ◆ Altitude :  $<2000m$

| Type           | TH48S-1Z      | TH48S-2Z | TH48S-S-2Z   | TH48S-S-1Z |          |
|----------------|---------------|----------|--------------|------------|----------|
| Operation Type | Release-delay | On-delay | Repeat cycle |            |          |
| Time range     | 0.01S-9999H   |          |              |            |          |
| Output contact | SPDT(1C)      | SPDT(2C) | SPDT(1C)     | SPDT(1C)   | SPDT(2C) |

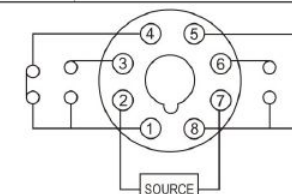
### Connection Diagram



ST2P-E

### Techniccal Parameter

|                |                                                                        |
|----------------|------------------------------------------------------------------------|
| Operation Type | AC12-380V 50/60Hz DC12-24V                                             |
| Contact        | Timed 1SPDT Inst. 1SPDT                                                |
| Operation      | On-delay with inst. contact                                            |
| Time range     | 1S, 2S, 6S, 12S, 30S, 60S<br>3M, 6M, 12M, 30M, 60M<br>3H, 6H, 12H, 24H |



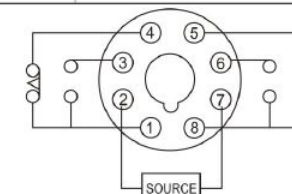
ST3P

### Techniccal Parameter

| Type           | ST3PA                                                                                                                                                                                           | ST3PC                | ST3PG    |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----------|
| Repeat accuary | $<0.5\%+20ms$                                                                                                                                                                                   |                      |          |
| Contact rating | AC220V 3A                                                                                                                                                                                       |                      |          |
| Rated voltage  | AC380V AC220V AC110V<br>DC12V DC24V DC48V;                                                                                                                                                      |                      |          |
| Operation Type | ON-delay                                                                                                                                                                                        |                      | Interval |
| Output contact | SPDT(2C)                                                                                                                                                                                        | SPDT(1C)<br>SPDT(1C) | SPDT(2C) |
| Time range     | A: 0.05-0.5s/5s/30s/3min<br>B: 0.1-1s/10s/60s/6min<br>C: 0.5-5s/50s/5min/30min<br>D: 1-10s/100s/10min/60min<br>E: 5-60s/10min/60min/6h<br>F: 0.25-2min/20min/2h/12h<br>G: 0.5-4min/40min/4h/24h |                      |          |

### Techniccal Parameter

|                |                                                                                 |
|----------------|---------------------------------------------------------------------------------|
| Operation Type | AC12-240V 50/60Hz DC12-24V                                                      |
| Contact        | ST4P-, ST4P-8: Timed 2SPDT                                                      |
| Operation      | Time-limit operation/self-restting/<br>external resetting                       |
| Time range     | (S, M, H, 10H)<br>0.05-0.5, 0.5-5H, 0.1-1, 1-10H<br>0.5-5, 5-50H, 1-10, 10-100H |



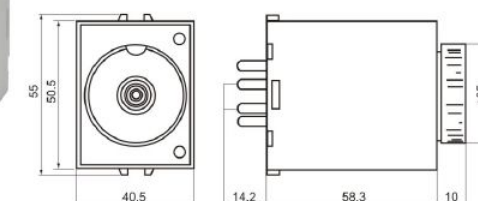
H3BA/ST4P



ST3PR

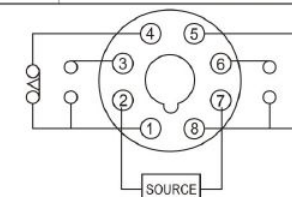
### Dimensions

ST3PA,C,F(FA),K,Y



### Techniccal Parameter

|              |                                                                                      |
|--------------|--------------------------------------------------------------------------------------|
| Voltage      | AC12-240V 50/60Hz DC12-24V                                                           |
| Contact      | Timed 1SPDT Inst. 1SPDT                                                              |
| Operation    | On-delay with inst. contact                                                          |
| Timing range | 1S, 2S, 3S, 6S, 10S, 12S, 30S, 60S<br>3M, 6M, 10M, 12M, 30M, 60M<br>3H, 6H, 12H, 24H |



AH2-Y/N



H3Y/ST6P

### Techniccal Parameter

| Type            | H3Y-2                      | H3Y-4                   |
|-----------------|----------------------------|-------------------------|
| Delayed Work    | Delayed Work               |                         |
| Automatic Reset | Automatic Reset            |                         |
| Delayed Action  | Delay 2 Conversion         | Delay 4 Conversion      |
| Delay Range     | 0.1s ~ 12h                 |                         |
| Rated Voltage   | AC380V<br>AC220V<br>AC110V | AC24V<br>DC24V<br>DC12V |



AH3- □

## Application

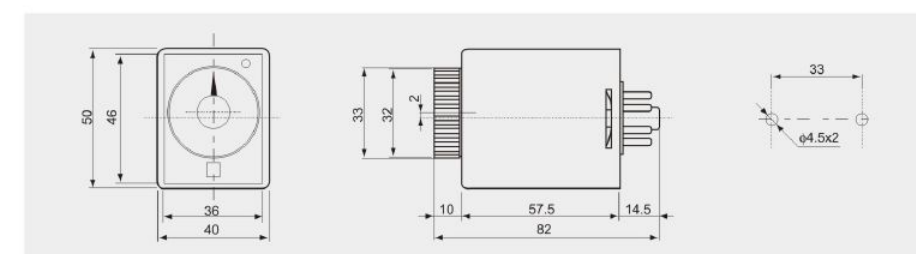
AH3 series electric time relays have small size, light weight, high delay accuracy, wide time range, good reliability, long life characteristics etc. The items complied with inter national standard are suitable for kinds of high precision and reliability auto control situation to delay control.

## Techniccal Parameter

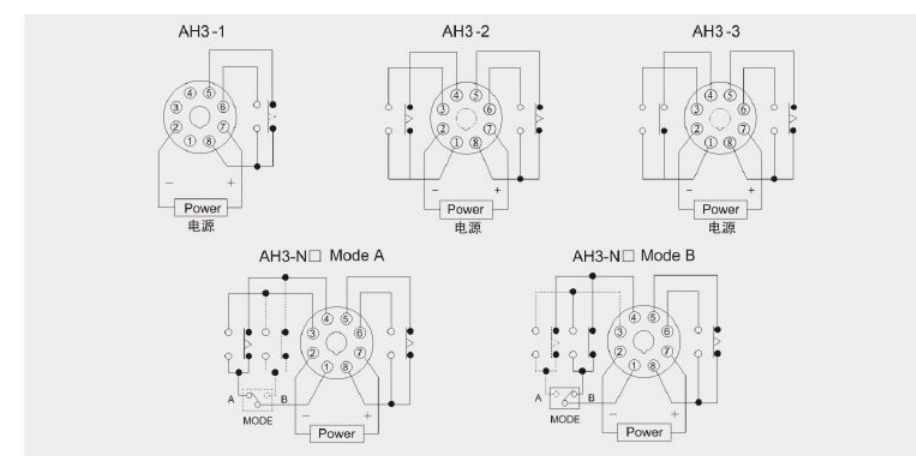
|                |                                                                    |          |                      |
|----------------|--------------------------------------------------------------------|----------|----------------------|
| Type           | Variable                                                           |          |                      |
| Repeat accuary | <0.5%+20ms                                                         |          |                      |
| Contact rating | AC220V3A                                                           |          |                      |
| Rated voltage  | AC380V AC220V AC110V; DC24V DC48V                                  |          |                      |
| Output contact | SPDT(1C)                                                           | SPDT(2C) | SPDT(1C)<br>SPDT(1C) |
| Type           | AH3-1                                                              | AH3-2    | AH3-3                |
| Time range     | SEC: 1、3、6、10、12、30、60<br>MIN: 3、6、10、12、30、60<br>HR: 3、6、10、12、30 |          |                      |

|                |                                   |                   |                   |                   |                   |
|----------------|-----------------------------------|-------------------|-------------------|-------------------|-------------------|
| Type           | Multi range variable              |                   |                   |                   |                   |
| Repeat accuary | <0.5%+20ms                        |                   |                   |                   |                   |
| Contact rating | AC220V3A                          |                   |                   |                   |                   |
| Rated voltage  | AC380V AC220V AC110V; DC24V DC48V |                   |                   |                   |                   |
| Output contact | Mode A/B                          |                   |                   |                   |                   |
| Type           | AH3-NA                            | AH3-NB            | AH3-NC            | AH3-ND            | AH3-NE            |
| Time range     | 1S/10S/<br>1M/10M                 | 3S/30S/<br>3M/30M | 6S/60S/<br>6M/60M | 1M/10M/<br>1H/10H | 3M/30M/<br>3H/30H |

## Dimensions



## Connection Diagram



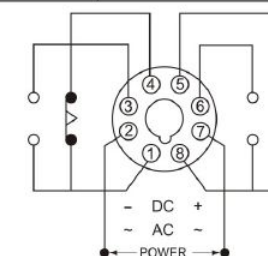
AH3-N □



AH2-Y/A

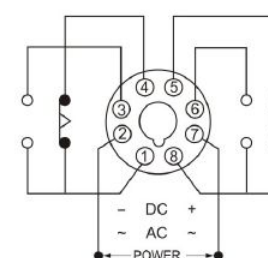
## Techniccal Parameter

|              |                                                                                       |
|--------------|---------------------------------------------------------------------------------------|
| Voltage      | AC12-380V 50/60Hz DC12-24V                                                            |
| Contact      | SPDT(2C)                                                                              |
| Timing range | A:1S,10S,1M,10M<br>B:3S,30S,3M,30M D:1M,10M,1H,10H<br>C:6S,60S,6M,60M E:3M,30M,3H,30H |



## Techniccal Parameter

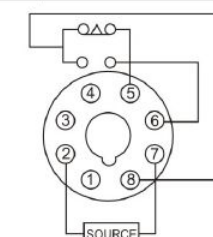
|              |                                                                                       |
|--------------|---------------------------------------------------------------------------------------|
| Voltage      | AC12-240V 50/60Hz DC12-24V                                                            |
| Contact      | Timed limit 2C<br>Timed limit 1C Instand. 1C                                          |
| Operation    | On-delay                                                                              |
| Timing range | A:1S,10S,1M,10M<br>B:3S,30S,3M,30M D:1M,10M,1H,10H<br>C:6S,60S,6M,60M E:3M,30M,3H,30H |



AH5B

## Techniccal Parameter

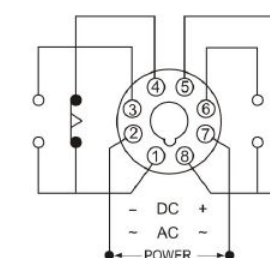
|              |                                                                                       |
|--------------|---------------------------------------------------------------------------------------|
| Voltage      | AC110-240V 50/60Hz DC12-24V                                                           |
| Contact      | SPDT(1C)                                                                              |
| Operation    | Delay time with circulation                                                           |
| Timing range | 1S, 2S, 6S, 10S, 12S, 30S, 60S<br>3M, 6M, 10M, 12M, 30M, 60M<br>3H, 6H, 10H, 12H, 24H |



ATDV/V/N

## Techniccal Parameter

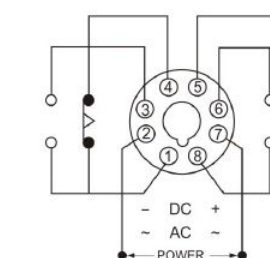
|              |                            |
|--------------|----------------------------|
| Voltage      | AC12-380V 50/60Hz DC12-24V |
| Contact      | Timed 2SPDT                |
| Operation    | On-delay                   |
| Timing range | 0.01S-999H                 |



ASY-2D/3D

## Techniccal Parameter

|              |                                                                                          |
|--------------|------------------------------------------------------------------------------------------|
| Voltage      | AC12-380V 50/60Hz DC12-24V                                                               |
| Contact      | Time limit 2C Time limit 1C Instant.1C<br>Time limit 1C 1+4 Gate, 1+3 Reset              |
| Operation    | On-delay                                                                                 |
| Timing range | 2SM: 9.9S, 99S, 9.9SM, 99M<br>2MH: 9.9M, 99M, 9.9H, 99H<br>3SM: 99.9M, 999M, 99.9H, 999H |



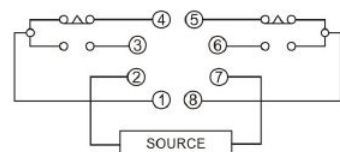
ASY-3SM



H3CT-8

## Techniccal Parameter

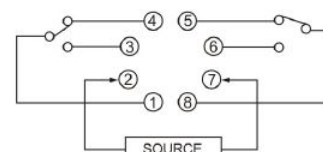
|              |                             |
|--------------|-----------------------------|
| Voltage      | AC12-380V 50/60Hz DC12-110V |
| Contact      | Timed 2SPDT                 |
| Operation    | Off-delay                   |
| Timing range | 0.05-300H                   |



H3CR-A8

## Techniccal Parameter

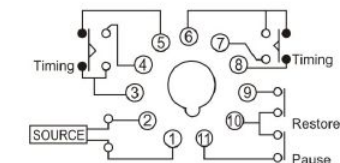
|              |                             |
|--------------|-----------------------------|
| Voltage      | AC12-380V 50/60Hz DC12-110V |
| Contact      | Timed 2SPDT                 |
| Operation    | On-delay                    |
| Timing range | 0.05-300H                   |



JS14S

## Techniccal Parameter

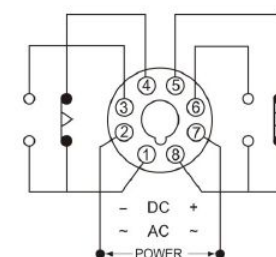
|              |                   |
|--------------|-------------------|
| Voltage      | AC12-380V 50/60Hz |
| Contact      | Timed 2SPDT       |
| Operation    | Off-dela          |
| Timing range | 0.01S-9999H       |



AH5R

## Techniccal Parameter

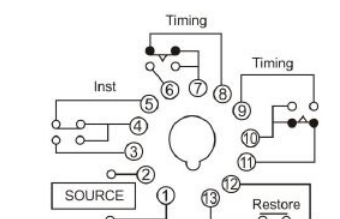
|              |                              |
|--------------|------------------------------|
| Voltage      | AC12-240V 50/60Hz DC12-24V   |
| Contact      | Timed limit 2C Time limit 1C |
| Operation    | On-delay                     |
| Timing range | 0.01S-9999H                  |



JS11S

## Techniccal Parameter

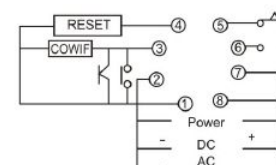
|              |                             |
|--------------|-----------------------------|
| Voltage      | AC12-380V 50/60Hz DC12-24V  |
| Contact      | Timed 2SPDT Inst. 1SPDT     |
| Operation    | On-delay with inst. contact |
| Timing range | 0.01S-9999H                 |



ASK-2D/3D

## Techniccal Parameter

|              |                                        |
|--------------|----------------------------------------|
| Voltage      | AC12-240V 50/60Hz DC12-24V             |
| Contact      | 1SPDT                                  |
| Operation    | Contact-pulse, photo electric enumer   |
| Timing range | 1D: 1-900<br>2D: 1-9900<br>3D: 1-99900 |



## Main function

- ◆ Reverse phase protection: detects the phase sequence in the three-phase power supply, and the phase sequence is reverse phase, that is, the load power supply is cut off.
- ◆ Phase loss protection: Any one phase power supply will be disconnected regardless of the condition, and the load power supply will be cut off.
- ◆ This protection relay uses voltage detection mode, independent of load current.



APR-3

## Techniccal Parameter

|                   |                                           |
|-------------------|-------------------------------------------|
| Type              | APR-3                                     |
| Rated voltage     | AC: 220V、240V、380V、415V、440V、480V、50/60Hz |
| Output contact    | 1C, 5A 250AC                              |
| Consumption power | ≤2W                                       |
| Weight            | 100g                                      |
| Temperature       | -10℃ ~+55℃                                |
| Relative humidity | 45 ~ 85%RH                                |
| Installation base | PF085A                                    |

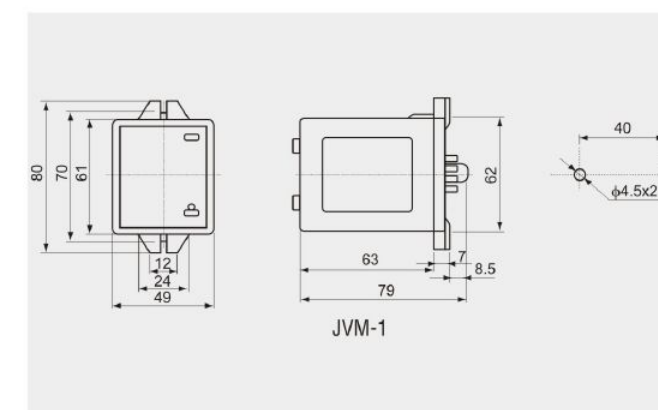
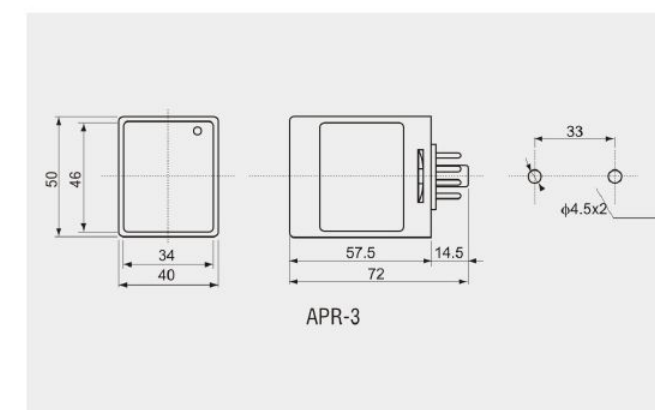


JVM-1

## Techniccal Parameter

|                   |                                           |
|-------------------|-------------------------------------------|
| Type              | JVM-1                                     |
| Rated voltage     | AC: 220V、240V、380V、415V、440V、480V、50/60Hz |
| Output contact    | 1C, 5A 250AC                              |
| Consumption power | ≤2W                                       |
| Weight            | 100g                                      |
| Temperature       | -10℃ ~+55℃                                |
| Relative humidity | 45 ~ 85%RH                                |
| Installation base | PF085A                                    |

## Dimensions





TH-218

## Technical Parameter

|                 |                                    |
|-----------------|------------------------------------|
| Type            | TH-218                             |
| Contact rating  | AC250V DC30V 5A                    |
| Rated voltage   | Three phase: AC110V 220V 380V 50Hz |
| Output contact  | SPDT(1)                            |
| Electrical life | 10 <sup>5</sup>                    |
| Mechanical life | 10 <sup>6</sup>                    |
| Altitude        | <2000M                             |



TPNG

## Technical Parameter

|                 |                                    |
|-----------------|------------------------------------|
| Type            | TPNG                               |
| Contact rating  | AC250V DC30V 5A                    |
| Rated voltage   | Three phase: AC110V 220V 380V 50Hz |
| Output contact  | SPDT(1)                            |
| Electrical life | 10 <sup>5</sup>                    |
| Mechanical life | 10 <sup>6</sup>                    |
| Altitude        | <2000M                             |



TPLC

## Technical Parameter

|                 |                                  |
|-----------------|----------------------------------|
| Type            | TPNG                             |
| Contact rating  | AC250V DC30V 5A                  |
| Rated voltage   | one phase: AC110V 220V 380V 50Hz |
| Output contact  | SPDT(1)                          |
| Electrical life | 10 <sup>5</sup>                  |
| Mechanical life | 10 <sup>6</sup>                  |
| Altitude        | <2000M                           |



TPL

## Technical Parameter

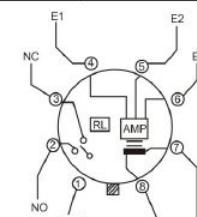
|                 |                                  |
|-----------------|----------------------------------|
| Type            | TPLC, TPL                        |
| Contact rating  | AC250V DC30V 5A                  |
| Rated voltage   | one phase: AC110V 220V 380V 50Hz |
| Output contact  | SPDT(1)                          |
| Electrical life | 10 <sup>5</sup>                  |
| Mechanical life | 10 <sup>6</sup>                  |
| Altitude        | <2000M                           |



FRC-12

## Technical Parameter

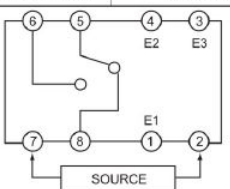
|                       |                            |
|-----------------------|----------------------------|
| Voltage               | AC36-380V 50/60Hz DC12-48V |
| Operating temperature | -10°C ~50°C                |



AFR-1

## Technical Parameter

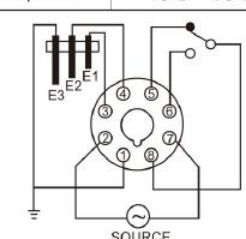
|                       |                   |
|-----------------------|-------------------|
| Voltage               | AC12-380V 50/60Hz |
| Operating temperature | -10°C ~50°C       |



A61F-GP

## Technical Parameter

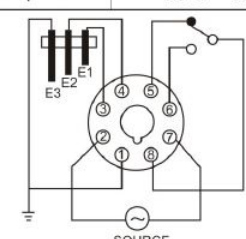
|                       |                   |
|-----------------------|-------------------|
| Voltage               | AC12-380V 50/60Hz |
| Operating temperature | -10°C ~ 70°C      |



C61F-GP

## Technical Parameter

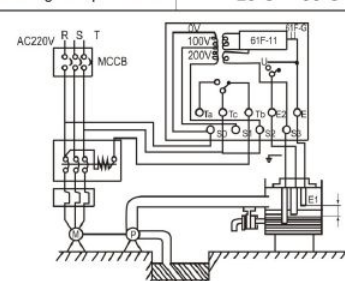
|                       |                      |
|-----------------------|----------------------|
| Voltage               | AC220V ± 10% 50/60Hz |
| Operating temperature | -20°C ~ 50°C         |



61F-G

## Technical Parameter

|                       |                      |
|-----------------------|----------------------|
| Voltage               | AC220V ± 10% 50/60Hz |
| Operating temperature | -20°C ~ 50°C         |



# Timers

Can be directly connected, with small size, low power consumption, big operating temperature range, anti-interference ability and so on. There are functions such as adjust the time and countdown.



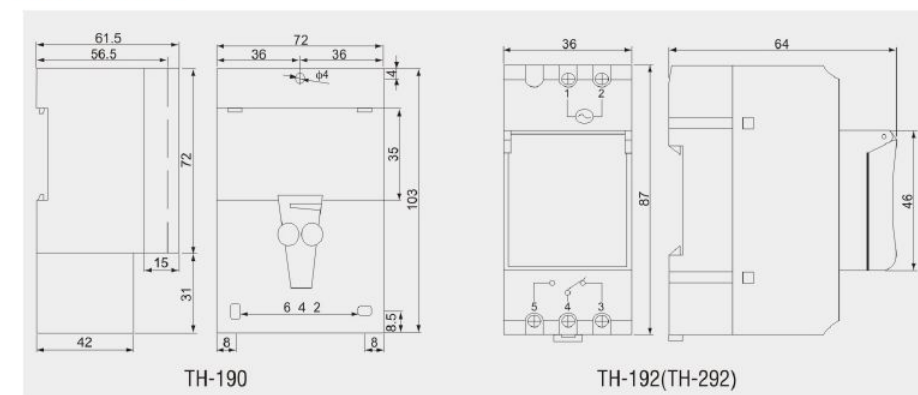
## Application

TH-190 和 TH-192 直接接线, 有体积小, 功耗低, 工作温度范围宽, 抗干扰能力强等特点。同时具有夏令时, 休眠, 自动调整时间和倒计时等多种功能。  
TH-190 and TH-192 can be directly connected, with small size, low power consumption, big operating temperature range, anti-interference ability and so on. There are functions such as adjust the time and countdown.

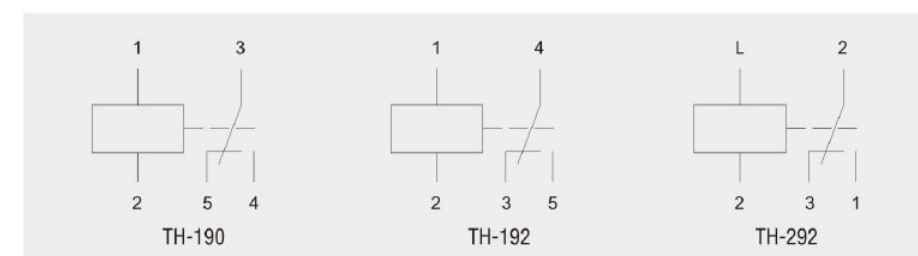
## Technical Parameter

| 型号 Type                                       | TH-190                    | TH-192     | TH-292     |
|-----------------------------------------------|---------------------------|------------|------------|
| 标准电压 Rated voltage                            | AC220V 50/60Hz            |            |            |
| 适用电源范围 Power range                            | 180-250V                  |            |            |
| 开关容量阻性负载<br>Resistive load switching capacity | 16A                       |            |            |
| 触点组数 Contact                                  | 1NO/1NC                   |            |            |
| 消耗功率 Power consumption                        | <2VA                      |            |            |
| 显示器件 Display                                  | LCD                       |            |            |
| 设定开关次数 Switching frequency                    | 16 次开和 16 次关              |            |            |
| 最小的开关时间 Min. switching time                   | 1 MIN                     |            | 1S         |
| 时控范围 Timing range                             | 1MIN~168HOUR              |            | 1S~168HOUR |
| 计时误差 Timing error                             | < ± 0.5s/d                |            |            |
| 电寿命 Electrical life                           | 105 ( 额定负载 ) (Rated load) |            |            |
| 机械寿命 Mechanical life                          | 107                       |            |            |
| 环境温度 Ambient temperature                      | -25℃ ~60℃                 | -30℃ ~80℃  |            |
| 温度 Temperature                                | -30℃ ~75℃                 | -40℃ ~100℃ |            |
| 相对湿度 Relative humidity                        | <95% RH                   |            |            |

## Dimensions

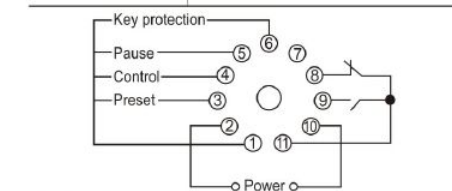


## Connection Diagram



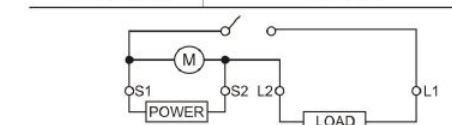
## Technical Parameter

|              |                   |
|--------------|-------------------|
| Voltage      | AC12-220V 50/60Hz |
| Contact      | Timed 1SPDT       |
| Operation    | Timers Operation  |
| Timing Range | 0.01S-99.9H       |



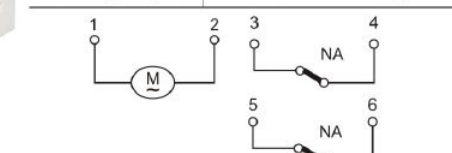
## Technical Parameter

|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | 1M-168H            |



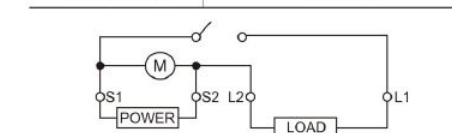
## Technical Parameter

|              |                      |
|--------------|----------------------|
| Voltage      | AC110-240V 50/60Hz   |
| Contact      | Timed 2SPDT 220V/10A |
| Operation    | 30H Timers Operation |
| Timing Range | Girculation of day   |



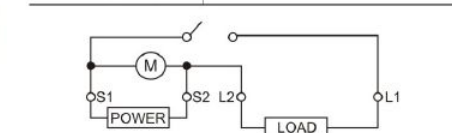
## Technical Parameter

|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | 1M-168H            |



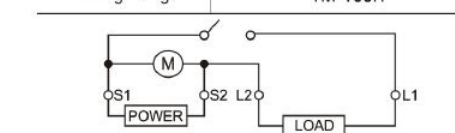
## Technical Parameter

|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | 1M-168H            |



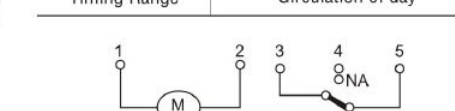
## Technical Parameter

|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | 1M-168H            |



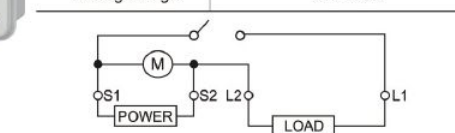
## Technical Parameter

|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | Girculation of day |



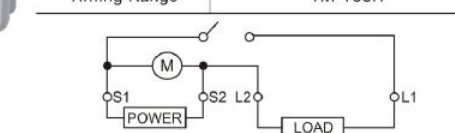
## Technical Parameter

|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | 1M-168H            |



## Technical Parameter

|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | 1M-168H            |

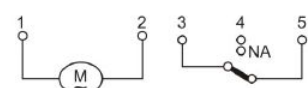




TH-188

## Technical Parameter

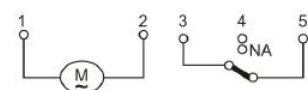
|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | Circulation of day |



TH-196

## Technical Parameter

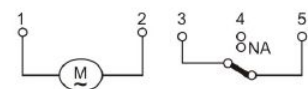
|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | Circulation of day |



TH-197

## Technical Parameter

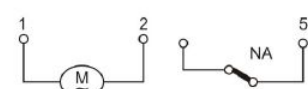
|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | Circulation of day |



THT-189P

## Technical Parameter

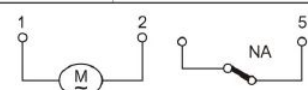
|              |                      |
|--------------|----------------------|
| Voltage      | AC110-240V 50/60Hz   |
| Contact      | Timed 1SPDT 220V/10A |
| Operation    | 30H Timers Operation |
| Timing Range | Circulation of day   |



THT-188P

## Technical Parameter

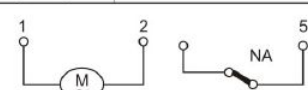
|              |                      |
|--------------|----------------------|
| Voltage      | AC110-240V 50/60Hz   |
| Contact      | Timed 1SPDT 220V/10A |
| Operation    | 30H Timers Operation |
| Timing Range | Circulation of day   |



THT-189P

## Technical Parameter

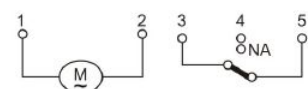
|              |                      |
|--------------|----------------------|
| Voltage      | AC110-240V 50/60Hz   |
| Contact      | Timed 1SPDT 220V/10A |
| Operation    | 30H Timers Operation |
| Timing Range | 1M-168H              |



TH-189

## Technical Parameter

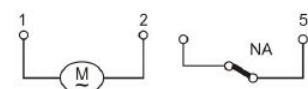
|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | Circulation of day |



THT-187P

## Technical Parameter

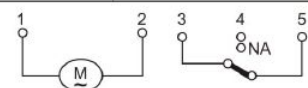
|              |                      |
|--------------|----------------------|
| Voltage      | AC110-240V 50/60Hz   |
| Contact      | Timed 1SPDT 220V/10A |
| Operation    | 30H Timers Operation |
| Timing Range | Circulation of day   |



TH-195

## Technical Parameter

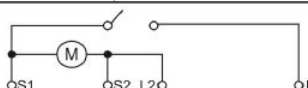
|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | Circulation of day |



TB-17

## Technical Parameter

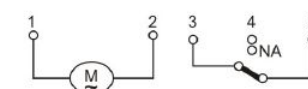
|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | 1M-168H            |



SUL181

## Technical Parameter

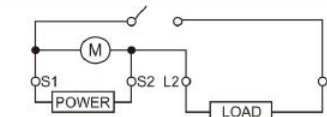
|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | Circulation of day |



ALST8

## Technical Parameter

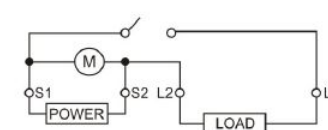
|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | 1M-168H            |



TB-38

## Technical Parameter

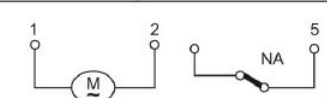
|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | Circulation of day |



THO-196

## Technical Parameter

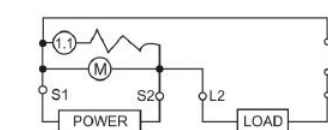
|              |                      |
|--------------|----------------------|
| Voltage      | AC110-240V 50/60Hz   |
| Contact      | Timed 1SPDT 220V/10A |
| Operation    | 30H Timers Operation |
| Timing Range | Circulation of day   |



TB-35

## Technical Parameter

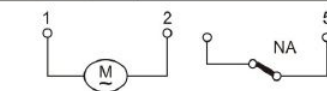
|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | Circulation of day |



TUL-180

## Technical Parameter

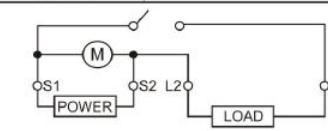
|              |                      |
|--------------|----------------------|
| Voltage      | AC110-240V 50/60Hz   |
| Contact      | Timed 1SPDT 220V/10A |
| Operation    | 30H Timers Operation |
| Timing Range | Circulation of day   |



TS-18

## Technical Parameter

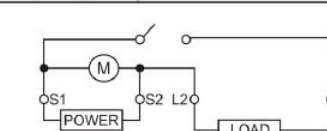
|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | 1M-168H            |



TUL-182

## Technical Parameter

|              |                      |
|--------------|----------------------|
| Voltage      | AC110-240V 50/60Hz   |
| Contact      | Timed 1SPDT 220V/10A |
| Operation    | 30H Timers Operation |
| Timing Range | Circulation of day   |





RIKO

NEW  
SERIES

## Plug Timer



外观及新型双专利产品

### Energy-saving Electronic Safety Converter

The energy-saving electronic safety converter has the unique characteristics, reasonable structure and safe use of individual characteristics. It strictly adheres to the quality in the development, production and inspection, and the timing body passes through many countries.

Certification, loved by users all over the world. Suitable for: smart phones, digital camera batteries, electric cars, office computers, LED electronic advertising, home, audio centers and industrial machine warm-up control, etc.

### Features

- ◆ Strong elasticity, normal insertion and removal 5000 times without loosening.
- ◆ Two-way flame retardant, inner core 750 degrees high temperature does not burn.
- ◆ High standard configuration, 365 days full load is not hot.
- ◆ Unique flexible time switch design, energy saving and environmental protection.
- ◆ With overload protector, raise the panel for heat dissipation.

Energy-saving timing plugging makes it easy to automatically control the appliance. You can use the timer to burn hot water in advance when you are busy, instead of waiting for you to go home, you can use it when you sleep at night.

The timer will automatically turn off the timer, or you can use the timer to heat the insulation at night to save power during the day. Daily power saving: 3 degrees, monthly power saving: 90 degrees, annual power saving: 1 080 degrees.

### Applicable Plug

National standard: China, Australia, New Zealand, etc.  
American Standard: United States, Canada, Japan, Taiwan, etc.  
European standard: Germany, Denmark, Finland, France, Norway, Poland, Portugal, South Korea, etc.  
British Standard: UK, Singapore, Hong Kong, etc.  
South African standard: South Africa, India, etc.  
Some products are only applicable to national standard, European standard, and American standard.  
The specific application is subject to the product.



## Plug Timer

### Instructions

1. Setup procedure: just dial the paddles, each paddle is 15 minutes, dial to the outside to turn on the power. For example: You want the appliance to work at 8:00-18:00, you can put it at 8:00 of the five picks are dialed outside.

2. Set the time: rotate the dial clockwise, so that the triangle arrow to the present moment. For example: it is 8:00 am. Please turn clockwise the dial is such that the triangular arrow points to the position of the scale "8" on the dial.

3. Immediately after setting the time, plug the timer into the power socket, then plug the appliance into the jack of the timer, and the appliance must be on.

4. Turn the red manual switch on the right side of the timer to the timing "☺" position, only the timing function, the controlled appliance will press the set program work between. If the manual switch is set to the "I" position, the power supply is long.bypass, the timer has no timing function and the appliance will always work.

Note: 1. When the paddle pointed to by the triangle arrow cannot be dialed out, just follow rotate the dial with the hour hand so that the triangle arrow avoids the dial you are dialing.

2. The mechanical timer has only the timer when the power is turned on.clock travel time function. If there is a power outage, reset the time.

### Time setting dial

Coarse adjustment: Turn the dial in the direction of the arrow to make the mark roughly aligned time before

Fine-tuning: continue to move the minute hand in the direction of the arrow to make the mark correctly to the current time.

### Week adjustment dial

Coarse adjustment: Turn the dial in the direction of the arrow to make the mark roughly aligned number of days and weeks;

Fine-tuning: continue to move the minute hand in the direction of the arrow to make the mark correctly to the current time.

### Set the switching time

(Daily programming, Tu type)

Example: (ON): 18:22 (OFF): 22 time 18:00.

### Set the switching time

(Weekly programming, Wu type)

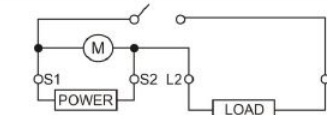
Example: Pass (ON): Monday to Friday from 8:00 to 22:00 on Saturday to Monday 14:00 to 24:00 (OFF): Monday to Friday 22 until 18 am.

### Technical specifications

|                                  |                 |
|----------------------------------|-----------------|
| Rated voltage, current and power | 10A 220VAC 50Hz |
| Operating temperature range      | -10°C ~+55°C    |
| Operation direction              | Clockwise       |
| Insulation resistance            | >100M Ω         |
| Time setting range               | 15M-24 H        |
| Inherent loss                    | ≤1 W            |

### Techniccal Parameter

|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | 1M-168H            |

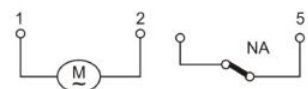




**THT-290M**

## Techniccal Parameter

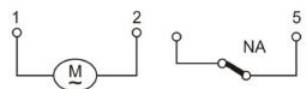
|              |                      |
|--------------|----------------------|
| Voltage      | AC110-240V 50/60Hz   |
| Contact      | Timed 1SPDT 220V/10A |
| Operation    | 30H Timers Operation |
| Timing Range | 1M-168H              |



**THT-195**

## Techniccal Parameter

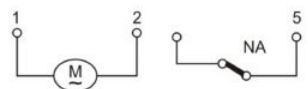
|              |                      |
|--------------|----------------------|
| Voltage      | AC110-240V 50/60Hz   |
| Contact      | Timed 1SPDT 220V/10A |
| Operation    | 30H Timers Operation |
| Timing Range | Girculation of day   |



**THE-196**

## Techniccal Parameter

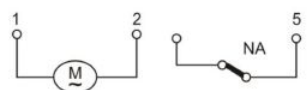
|              |                      |
|--------------|----------------------|
| Voltage      | AC110-240V 50/60Hz   |
| Contact      | Timed 1SPDT 220V/10A |
| Operation    | 30H Timers Operation |
| Timing Range | 1M-168H              |



**THU-197**

## Techniccal Parameter

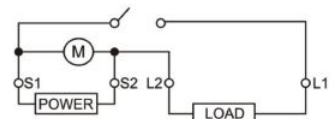
|              |                      |
|--------------|----------------------|
| Voltage      | AC110-240V 50/60Hz   |
| Contact      | Timed 1SPDT 220V/10A |
| Operation    | 30H Timers Operation |
| Timing Range | Girculation of day   |



**THU-198**

## Techniccal Parameter

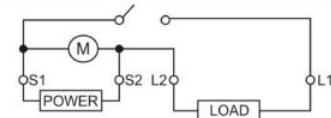
|              |                      |
|--------------|----------------------|
| Voltage      | AC110-240V 50/60Hz   |
| Contact      | Timed 1SPDT 220V/10A |
| Operation    | 30H Timers Operation |
| Timing Range | Girculation of day   |



**TH-161**

## Techniccal Parameter

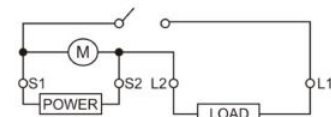
|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | 1M-168H            |



**TH-162**

## Techniccal Parameter

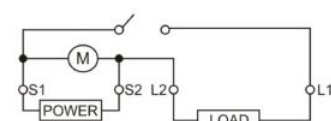
|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | 1M-168H            |



**TH-163**

## Techniccal Parameter

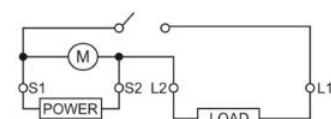
|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | 1M-168H            |



**TH-165**

## Techniccal Parameter

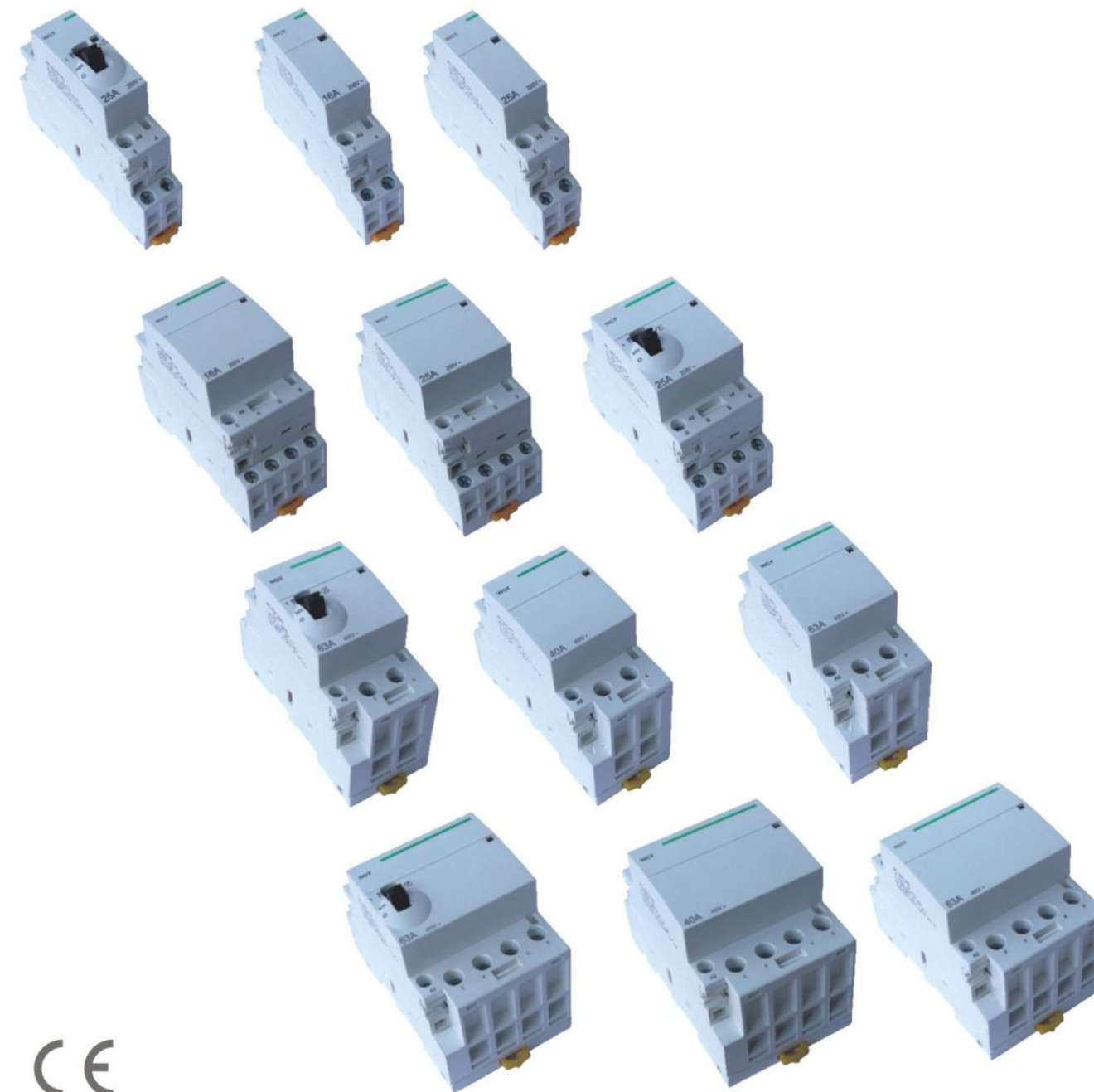
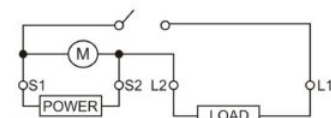
|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | 1M-168H            |



**TH-160**

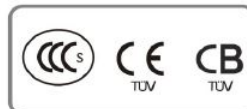
## Techniccal Parameter

|              |                    |
|--------------|--------------------|
| Voltage      | AC110-240V 50/60Hz |
| Contact      | Timed 1SPDT        |
| Operation    | Timers Operation   |
| Timing Range | 1M-168H            |



## Modular Contactor

EN 61095, IEC1095



WCT contactors are available in two versions:

- Contactors without manually-operated
- Contactors with manually-operated.

The breadth of the iCT contactor range satisfies most application cases.  
WCT contactors can be combined with auxiliary control, protection and indication functions.

## Contactors

### WCT 2P



manual control

### WCT 4P



- WCT contactors can be used to remote control applications in alternative networks:
  - lighting, heating, ventilation, roller blinds, sanitary hot water
  - mechanical ventilation systems, etc
  - load-shedding of non-priority circuits

## Contactors



### Indication WCTs

- This auxiliary allows indication or control of the "open" or "closed" position of the contactor power contacts



### Dual control WCTc

- Used to control a contactor in impulse-type mode or to combine latched or impulse-type control orders

## Contactors auxiliaries

| Choice of 50 Hz contactors |                 |    |     |     |    |    |     |
|----------------------------|-----------------|----|-----|-----|----|----|-----|
| Type                       | Contactor       |    |     |     |    |    |     |
| Rating                     | A               | 16 | 20  | 25  | 40 | 63 | 100 |
| Auxiliaries                |                 |    |     |     |    |    |     |
| WCTs indication auxiliary  | Yes             |    | Yes | Yes |    |    |     |
| WCTc control auxiliary     | By yellow clips | No | No  | No  |    |    |     |

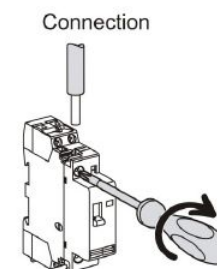
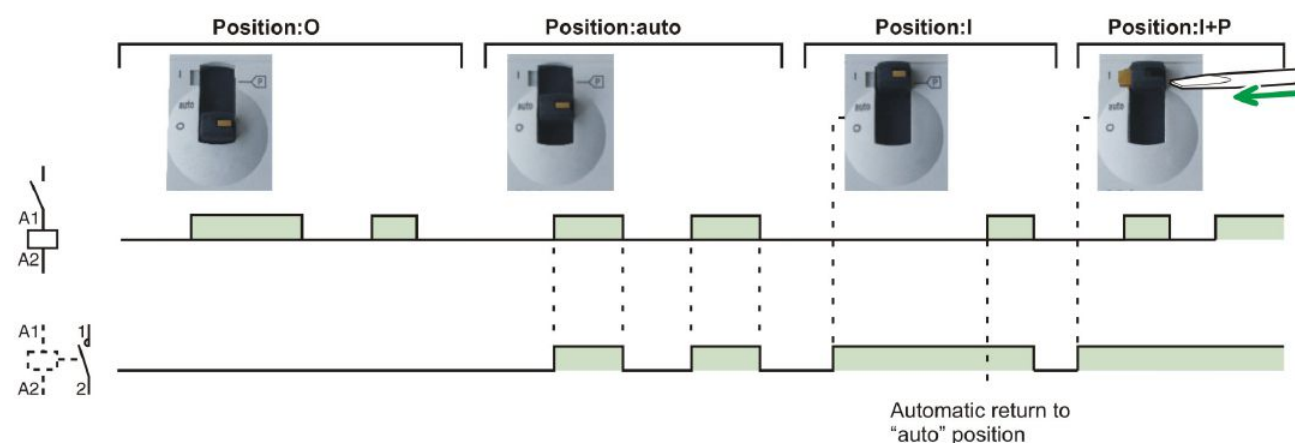
## Catalogue numbers

| WCT contactors-50Hz |                    |      |                                |         |                          |
|---------------------|--------------------|------|--------------------------------|---------|--------------------------|
| Type                | Rating(In)<br>AC7a | AC7b | Control voltage<br>(VAC)(50Hz) | Contact | Width in 9 mm<br>modules |
| 1P<br>              | 16A                | 6A   | 12                             | 1NO     | 2                        |
|                     |                    |      | 24                             | 1NO     | 2                        |
|                     |                    |      | 48                             | 1NO     | 2                        |
|                     |                    |      | 220                            | 1NO     | 2                        |
|                     |                    |      | 230...240                      | 1NO     | 2                        |
|                     | 25A                | 8.5A | 220                            | 1NO     | 2                        |
|                     |                    |      | 230...240                      | 1NO     | 2                        |
| 2P<br>              | 16A                | 6A   | 12                             | 2NO     | 2                        |
|                     |                    |      | 24                             | 2NO     | 2                        |
|                     |                    |      | 48                             | 2NO     | 2                        |
|                     |                    |      | 220                            | 2NO     | 2                        |
|                     |                    |      | 230...240                      | 2NO     | 2                        |
|                     | 20A                | 6A   | 12                             | 1NO+1NC | 2                        |
|                     |                    |      | 14                             | 1NO+1NC | 2                        |
|                     |                    |      | 220                            | 1NO+1NC | 2                        |
|                     |                    |      | 230...240                      | 1NO+1NC | 2                        |
|                     |                    |      | 230...240                      | 2NO     | 2                        |
|                     | 25A                | 8.5A | 24                             | 2NO     | 2                        |
|                     |                    |      | 48                             | 2NO     | 2                        |
|                     |                    |      | 220                            | 2NO     | 2                        |
|                     |                    |      | 230...240                      | 2NO     | 2                        |
|                     |                    |      | 230...240                      | 2NC     | 2                        |
|                     | 40A                | 15A  | 220...240                      | 2NO     | 4                        |
|                     |                    |      | 24                             | 2NO     | 4                        |
|                     |                    |      | 220...240                      | 2NO     | 4                        |
|                     | 100A               | -    | 220...240                      | 2NO     | 6                        |
| 3P<br>              | 16A                | 6A   | 220...240                      | 3NO     | 4                        |
|                     | 25A                | 8.5A | 220...240                      | 3NO     | 4                        |
|                     | 40A                | 15A  | 220...240                      | 3NO     | 6                        |
|                     | 63A                | 20A  | 220...240                      | 3NO     | 6                        |
|                     |                    |      |                                |         |                          |
| 4P<br>              | 16A                | 6A   | 24                             | 4NO     | 4                        |
|                     |                    |      | 220...240                      | 4NO     | 4                        |
|                     |                    |      | 220...240                      | 2NO+2NC | 4                        |
|                     | 20A                | 6A   | 220...240                      | 4NO     | 4                        |
|                     |                    |      | 24                             | 4NO     | 4                        |
|                     |                    |      | 220...240                      | 4NO     | 4                        |
|                     | 25A                | 8.5A | 24                             | 4NC     | 4                        |
|                     |                    |      | 220...240                      | 4NC     | 4                        |
|                     |                    |      | 220...240                      | 2NO+2NC | 4                        |
|                     | 40A                | 15A  | 220...240                      | 4NO     | 6                        |
|                     |                    |      | 220...240                      | 4NC     | 6                        |
|                     |                    |      | 24                             | 4NO     | 6                        |
|                     | 63A                | 20A  | 220...240                      | 4NO     | 6                        |
|                     |                    |      | 24                             | 4NC     | 6                        |
|                     |                    |      | 220...240                      | 4NC     | 6                        |
|                     | 100A               |      | 220...240                      | 2NO+2NC | 6                        |
|                     |                    |      | 220...240                      | 3NO+1NC | 6                        |
|                     |                    |      | 220...240                      | 4NO     | 12                       |

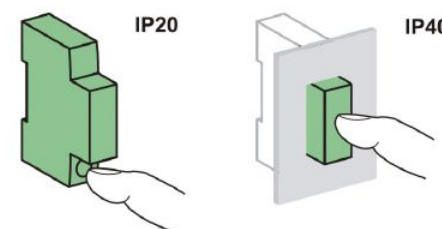
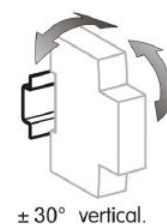
## Catalogue numbers

| WCT manual control contactor 50 Hz |                    |      |                                  |         |                          |
|------------------------------------|--------------------|------|----------------------------------|---------|--------------------------|
| Type                               | Rating(In)<br>AC7a | AC7b | Control voltage<br>(V AC)(50 Hz) | Contact | Width in 9 mm<br>modules |
| <b>2P</b><br><br>                  | 16A                | 6A   | 220                              | 2NO     | 2                        |
|                                    |                    |      | 230...240                        | 2NO     | 2                        |
|                                    |                    |      | 220                              | 1NO+1NC | 2                        |
|                                    |                    |      | 230...240                        | 1NO+1NC | 2                        |
|                                    | 25A                | 8.5A | 24                               | 2NO     | 2                        |
|                                    |                    |      | 24                               | 2NC     | 2                        |
|                                    |                    |      | 220                              | 2NO     | 2                        |
|                                    |                    |      | 230...240                        | 2NO     | 2                        |
|                                    | 40A                | 15A  | 24                               | 2NO     | 2                        |
|                                    |                    |      | 220...240                        | 2NO     | 4                        |
|                                    | 63A                | 20A  | 24                               | 2NO     | 4                        |
|                                    |                    |      | 220...240                        | 2NO     | 4                        |
| <b>3P</b><br><br>                  | 25A                | 8.5A | 220...240                        | 3NO     | 4                        |
|                                    | 40A                | 15A  | 220...240                        | 3NO     | 6                        |
| <b>4P</b><br><br>                  | 25A                | 8.5A | 24                               | 4NO     | 4                        |
|                                    |                    |      | 24                               | 4NC     | 4                        |
|                                    |                    |      | 220...240                        | 4NO     | 4                        |
|                                    |                    |      | 24                               | 4NO     | 6                        |
|                                    | 40A                | 15A  | 24                               | 4NC     | 6                        |
|                                    |                    |      | 220...240                        | 4NO     | 6                        |
|                                    |                    |      | 24                               | 4NO     | 6                        |
|                                    |                    |      | 220...240                        | 4NO     | 6                        |
|                                    | 63A                | 20A  | 24                               | 4NO     | 6                        |
|                                    |                    |      | 220...240                        | 4NO     | 6                        |

## Operation(Manual control contactor)



Clip on DIN rail 35 mm.

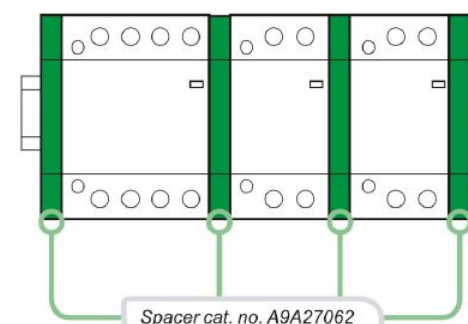


| Type | Rating   | Lenght tripping | Circuit | Tightening torque | Copper cables |                                                                              |
|------|----------|-----------------|---------|-------------------|---------------|------------------------------------------------------------------------------|
|      |          |                 |         |                   | Rigid         | Flexible or ferrule                                                          |
| WCT  | PZ1:4 mm | 16-100A         | 9mm     | Control           | 0.8N.m        | 1.5to 2.5mm:<br>2 × 1.5mm <sup>2</sup>                                       |
|      |          |                 |         |                   |               | 1.5to 2.5mm:<br>2 × 2.5mm <sup>2</sup>                                       |
|      | PZ2:6 mm | 16 and 25A      | 14mm    | Power             | 3.5N.m        | 1.5to 6mm <sup>2</sup><br>1 to 4mm <sup>2</sup>                              |
|      |          |                 |         |                   |               | 6 to 25 mm <sup>2</sup><br>6 to 35mm <sup>2</sup>                            |
| WCTc | PZ1:4mm  | -               | 9mm     | -                 | 0.8N.m        | 1.5to 2.5mm:<br>2×1.5mm <sup>2</sup><br>1.5to 2.5mm:<br>2×2.5mm <sup>2</sup> |

## Technical data

| Power circuit                                                                  |                             |                                            |
|--------------------------------------------------------------------------------|-----------------------------|--------------------------------------------|
| Voltage rating(Ue)                                                             | 1P,2P                       | 250V AC                                    |
|                                                                                | 3P,4P                       | 400V AC                                    |
| Frequency                                                                      |                             | 50Hz or 60Hz                               |
| Endurance(O-C)                                                                 |                             |                                            |
| Electrical                                                                     |                             | 100,000 cycles                             |
| Maximum number of switching operation a day                                    |                             | 100                                        |
| Additional characteristics                                                     |                             |                                            |
| Insulation vnlage(Ui)                                                          |                             | 500 V AC                                   |
| Pollution degree                                                               |                             | 2                                          |
| Rated impulse withstand voltage(Uimp)                                          |                             | 2.5kV(4 kV for 12/24/48V AC)               |
| Degree of protection (IEC 60529)                                               | Device only                 | IP20                                       |
|                                                                                | Device in modular enclosure | IP40                                       |
| Operating temperature                                                          |                             | -5 °Cto+60°C <sup>(1)</sup>                |
| Storage temperature                                                            |                             | -40°Cto+70°C                               |
| Tropicalization(IEC 60068-1)                                                   |                             | Treatment 2(relative humidity 95% at 55 °C |
| ELSV compliance(Extra Low Safety Voltage)for 12/24/48vac versions              |                             |                                            |
| The product control conforms to the SELV(safety extra low voltage)requirements |                             |                                            |

(1)In the case of contactor mounting in a enclosure for which the interior temperature is in range between 50°Cand 60°C,it is necessary to use a spacer, between each contactor

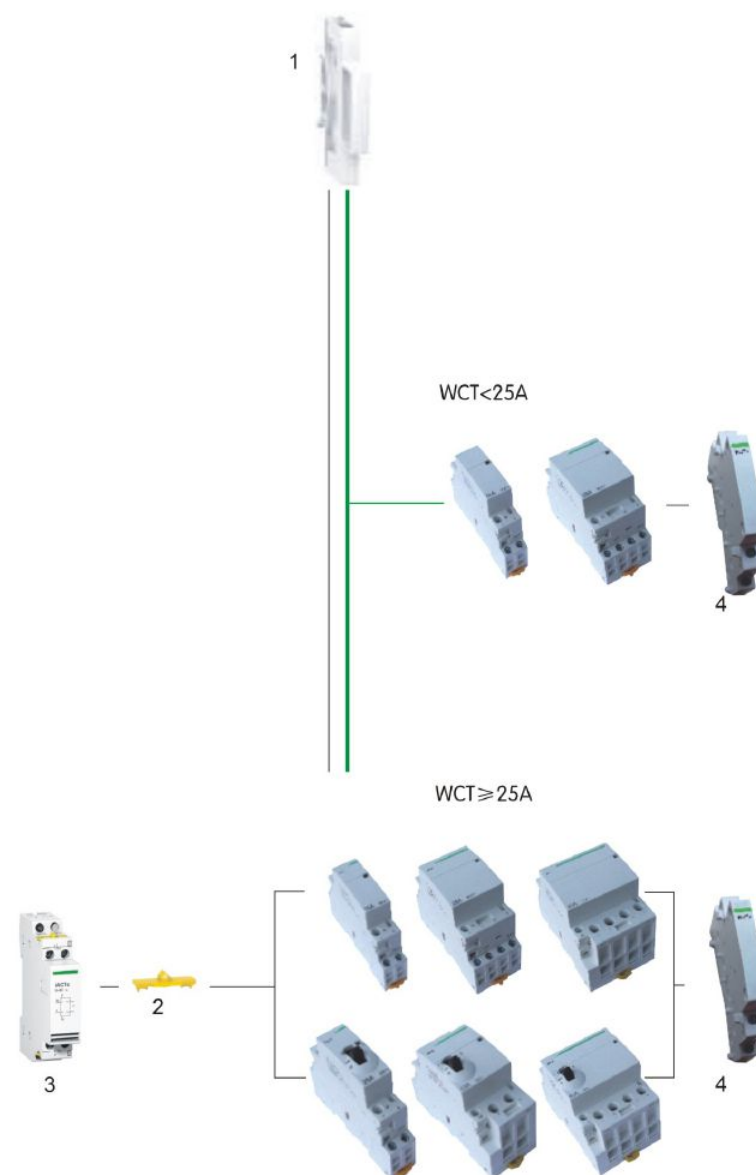


## Mounting accessories

- 1 9 mm spacer
- 2 Yellow clips

## Auxiliaries

| Indication            |                       |
|-----------------------|-----------------------|
| 3 WCTs                | 1NO+1NC<br>1CO<br>2NO |
| Double control inputs |                       |
| 4 WCTc                | 230VAC<br>24VAC       |

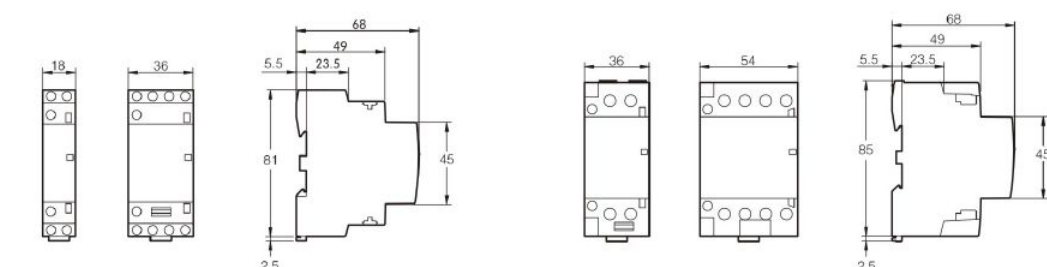


|                                       | Indication                                                                                                                                                                                            | Control                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Auxiliaries                           | WCTs                                                                                                                                                                                                  | WCTc                                                                                                                                                                                                                                                                                                                                              |
| Type                                  | Indication<br>With Open/Close auxiliary contact                                                                                                                                                       | Impulse/latched control                                                                                                                                                                                                                                                                                                                           |
|                                       |                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                   |
| Function                              | <ul style="list-style-type: none"> <li>This auxiliary allows indication of the "open" or "closed" position of the contactor power contacts</li> </ul>                                                 | <ul style="list-style-type: none"> <li>This auxiliary, combined with contactors, enables them to be controlled by 2 order types: <ul style="list-style-type: none"> <li>impulse order for local control (input T)</li> <li>latched order for centralised control (input X)</li> <li>the last order received takes priority</li> </ul> </li> </ul> |
| Wiring diagrams                       |                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                   |
| Mounting                              | <ul style="list-style-type: none"> <li>Mounted to the right of WCT</li> </ul>                                                                                                                         | <ul style="list-style-type: none"> <li>Mounted to the left of WCT by yellow clips<sup>(1)</sup></li> </ul>                                                                                                                                                                                                                                        |
| Technical specifications              |                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>Mains power outages: <ul style="list-style-type: none"> <li>&lt;1 s: keeps its initial status</li> <li>≥5 s: reset</li> <li>put back into operation by manual operation on input X or T.</li> </ul> </li> <li>Minimum impulse duration: 250 ms</li> </ul>                                                  |
| Control voltage (Ue)                  | VAC 24...240<br>VDC 24...130                                                                                                                                                                          | 230...240   24...48                                                                                                                                                                                                                                                                                                                               |
| Operating frequency                   | Hz 50/60                                                                                                                                                                                              | 50/60                                                                                                                                                                                                                                                                                                                                             |
| Width in 9 mm modules                 |                                                                                                                                                                                                       | 2                                                                                                                                                                                                                                                                                                                                                 |
| Auxiliary contact (breaking capacity) | <ul style="list-style-type: none"> <li>Minimum: 10mA at 24V DC/AC-COSφ=1</li> <li>Maximum: <ul style="list-style-type: none"> <li>5A at 240V AC-COSφ=1</li> <li>1 A at 130V DC</li> </ul> </li> </ul> | -                                                                                                                                                                                                                                                                                                                                                 |
| Number of contacts                    | 1NO+1NC                                                                                                                                                                                               | -                                                                                                                                                                                                                                                                                                                                                 |
| Operating temperature                 | °C -5°C to +50°C                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                   |
| Storage temperature                   | °C -40°C to +70°C                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                   |

## Consumption

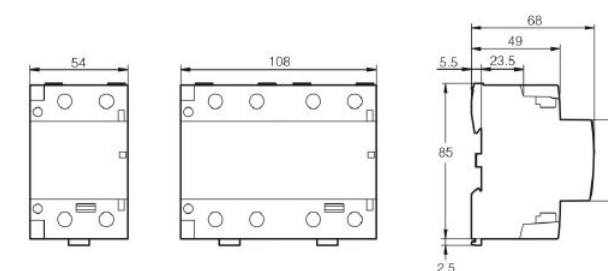
| WCT contactors-50Hz |            |      |                                  |             |        |               |
|---------------------|------------|------|----------------------------------|-------------|--------|---------------|
| Type                | Rating(In) |      | Control voltage<br>(V AC)(50 Hz) | Consumption |        | Max.<br>power |
| 1P                  | AC7a       | AC7b |                                  | Holding     | Inrush |               |
|                     | 16A        | 5A   | 12                               | 3.8VA       | 15VA   | 1.3W          |
|                     |            |      | 24                               | 3.8VA       | 15VA   | 1.3W          |
|                     |            |      | 48                               | 3.8VA       | 15VA   | 1.3W          |
|                     |            |      | 220                              | 3.8VA       | 15VA   | 1.3W          |
|                     |            |      | 230...240                        | 2.7VA       | 9.2VA  | 1.2W          |
|                     | 25A        | 8.5A | 220                              | 3.8VA       | 15VA   | 1.3W          |
|                     |            |      | 230...240                        | 2.7VA       | 9.2VA  | 1.2W          |
|                     |            |      |                                  |             |        |               |
| 2P                  | 16A        | 5A   | 12                               | 3.8VA       | 15VA   | 1.3W          |
|                     |            |      | 24                               | 3.8VA       | 15VA   | 1.3W          |
|                     |            |      | 48                               | 3.8VA       | 15VA   | 1.3W          |
|                     |            |      | 220                              | 3.8VA       | 15VA   | 1.3W          |
|                     |            |      | 230...240                        | 2.7VA       | 9.2VA  | 1.3W          |
|                     |            |      | 12                               | 3.8VA       | 15VA   | 1.3W          |
|                     |            |      | 24                               | 3.8VA       | 15VA   | 1.3W          |
|                     |            |      | 220                              | 3.8VA       | 15VA   | 1.3W          |
|                     |            |      | 230...240                        | 2.7VA       | 9.2VA  | 1.2W          |
|                     |            |      |                                  |             |        |               |
|                     | 20A        | 6.4A | 230...240                        | 2.7VA       | 9.2VA  | 1.2W          |
|                     |            |      | 24                               | 3.8VA       | 15VA   | 1.3W          |
|                     | 25A        | 8.5A | 48                               | 3.8VA       | 15VA   | 1.3W          |
|                     |            |      | 220                              | 3.8VA       | 15VA   | 1.3W          |
|                     |            |      | 230...240                        | 2.7VA       | 9.2VA  | 1.2W          |
|                     |            |      | 220                              | 3.8VA       | 15VA   | 1.3W          |
|                     |            |      | 230...240                        | 2.7VA       | 9.2VA  | 1.2W          |
|                     | 40A        | 15A  | 220...240                        | 4.6VA       | 34VA   | 1.6W          |
|                     |            |      | 24                               | 4.6VA       | 34VA   | 1.6W          |
|                     | 63A        | 20A  | 220...240                        | 4.6VA       | 34VA   | 1.6W          |
|                     |            |      | 220...240                        | 4.6VA       | 34VA   | 1.6W          |
|                     | 100A       | -    | 220...240                        | 6.5VA       | 53VA   | 2.1W          |
| 3P                  | 16A        | 5A   | 220...240                        | 4.6VA       | 34VA   | 1.6W          |
|                     | 25A        | 8.5A | 220...240                        | 4.6VA       | 34VA   | 1.6W          |
|                     | 40A        | 15A  | 220...240                        | 6.5VA       | 53VA   | 2.1W          |
|                     | 63A        | 20A  | 220...240                        | 6.5VA       | 53VA   | 2.1W          |
| 4P                  | 16A        | 5A   | 24                               | 4.6VA       | 34VA   | 1.6W          |
|                     |            |      | 220...240                        | 4.6VA       | 34VA   | 1.6W          |
|                     |            |      | 220...240                        | 4.6VA       | 34VA   | 1.6W          |
|                     |            |      | 220...240                        | 4.6VA       | 34VA   | 1.6W          |
|                     |            |      | 220...240                        | 4.6VA       | 34VA   | 1.6W          |
|                     | 20A        | 6.4A | 220...240                        | 4.6VA       | 34VA   | 1.6W          |
|                     |            |      | 24                               | 4.6VA       | 34VA   | 1.6W          |
|                     |            |      | 220...240                        | 4.6VA       | 34VA   | 1.6W          |
|                     | 25A        | 8.5A | 24                               | 4.6VA       | 34VA   | 1.6W          |
|                     |            |      | 220...240                        | 4.6VA       | 34VA   | 1.6W          |
|                     |            |      | 220...240                        | 4.6VA       | 34VA   | 1.6W          |
|                     |            |      | 220...240                        | 4.6VA       | 34VA   | 1.6W          |
|                     |            |      | 220...240                        | 4.6VA       | 34VA   | 1.6W          |
|                     | 40A        | 15A  | 220...240                        | 6.5VA       | 53VA   | 2.1W          |
|                     |            |      | 220...240                        | 6.5VA       | 53VA   | 2.1W          |
|                     |            |      | 220...240                        | 6.5VA       | 53VA   | 2.1W          |
|                     | 63A        | 20A  | 24                               | 6.5VA       | 53VA   | 2.1W          |
|                     |            |      | 220...240                        | 6.5VA       | 53VA   | 2.1W          |
|                     |            |      | 220...240                        | 6.5VA       | 53VA   | 2.1W          |
|                     |            |      | 220...240                        | 6.5VA       | 53VA   | 2.1W          |
|                     |            |      | 220...240                        | 6.5VA       | 53VA   | 2.1W          |
|                     | 100A       | -    | 220...240                        | 13VA        | 106VA  | 4.2W          |

## Dimensions(mm)

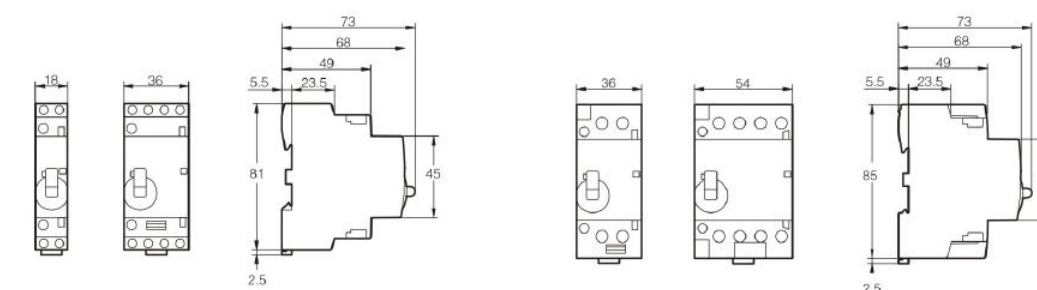


WCT16/25A

WCT 40/63A

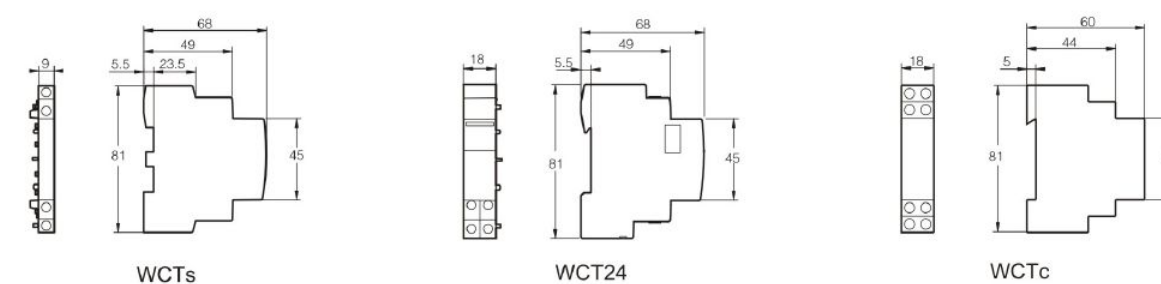


WCT 100A



WCT manual control contactor 16/25A

WCT manual control contactor 40/63A



WCTs

WCT24

WCTc



Ratings

- ◆ Ambient temperature:-5℃ ~+40℃ ;
- ◆ Elevation:≤2000m
- ◆ Humidity:≤50% at 40℃ ,≤90%at monthly temperature of+25℃
- ◆ Pollution Degree:3rd;
- ◆ Mounting type:type III ;
- ◆ Angle between mounting surface and vertical surface:≤5;
- ◆ Screw mounting.

Techniccal Parameter

| Items                                     | TXAC1-40 | TX10 | TX20 | TX30 | TX40 | TX40-2 |
|-------------------------------------------|----------|------|------|------|------|--------|
| Rated insulating voltage Ui(V)            | 660      | 660  | 660  | 660  | 660  | 660    |
| Rated operating volt Ue(V)                | 220      | 220  | 220  | 220  | 220  | 220    |
| Rated thermal current under lth(A)        | 25       | 25   | 35   | 45   | 55   | 55     |
| Rated operating current under AC-8a Ie(A) | 16       | 16   | 25   | 32   | 40   | 40     |
| Rated operating current under AC-8b Ie(A) | 8        | 8    | 12.5 | 16   | 20   | 20     |

| System | Rated volt.Ue(V) | Making & breaking conditions |       |       |                 |
|--------|------------------|------------------------------|-------|-------|-----------------|
| AC-8a  | 220              | Ic/Ie                        | Ur/Ue | cos Φ | Operating times |
| AC-8b  |                  | 1.0                          | 1.05  | 0.80  | 30000           |
|        |                  | 6.0                          |       | 0.35  | 6000            |

| System | Rated volt. Ue(V) | Rated Current.Ie(A) | Making conditions |       |       | breaking conditions |       |       | Service Life(times) | Operating frequency (Times/h) |
|--------|-------------------|---------------------|-------------------|-------|-------|---------------------|-------|-------|---------------------|-------------------------------|
|        |                   |                     | Ic/Ie             | Ur/Ue | Cos Φ | Ic/Ie               | Ur/Ue | Cos Φ |                     |                               |
| AC-8a  | 220               | Ie<17               | 6                 | 1     | 0.65  | 1.0                 | 0.17  | 0.65  | 300                 | 60                            |
|        |                   | Ie≥17               |                   |       | 0.35  |                     |       | 0.35  |                     |                               |
| AC-8b  | 220               | Ie<17               | 6                 | 1     | 0.65  | 6.0                 | 1     | 0.65  | 120                 | 20                            |
|        |                   | Ie≥17               |                   |       | 0.35  |                     |       | 0.35  |                     |                               |