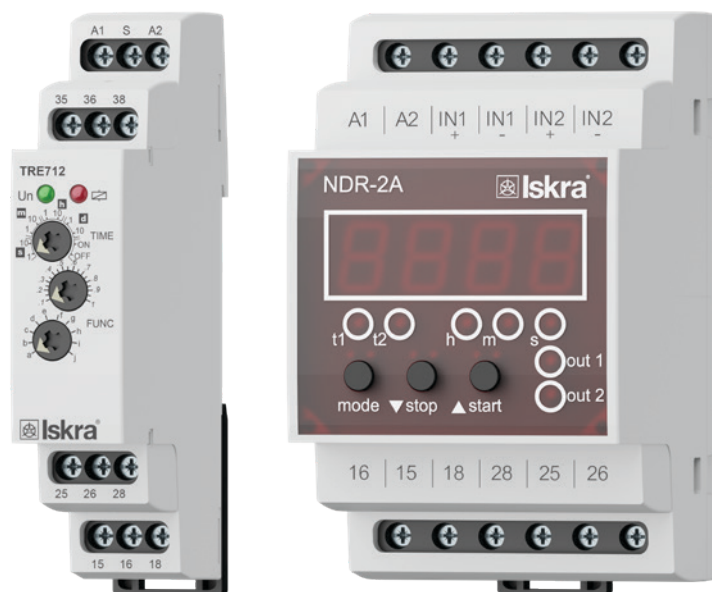


# Time relays

TRE series

NDR series



## Types

TRE704E	Star-delta switch
TRE706-4	Staircase switch
TRE707	Asymmetric cycler
TRE711	Multifunction time relay
TRE712	Multifunction time relay
NDR-2A	Programmable digital relay
NDR-2B	Programmable digital relay

## Applications

Time relays TRE series are suitable for many different applications. They can be one-function or multifunction and cover from simple to sophisticated time functions. They can be delivered in many varieties according to operating voltages and number of output contacts. Among them are also star-delta switch, bistable time relay and staircase switch.

Programmable digital time relays NDR series are suitable for programming more demanding time functions by using two independent timers.

# TRE704E

## Star-delta switch



### Description

TRE704E is a star-delta switch. Time T1 can be adjusted within the selected time range. It can be delivered in many varieties according to time range and operating voltage.

### Function description

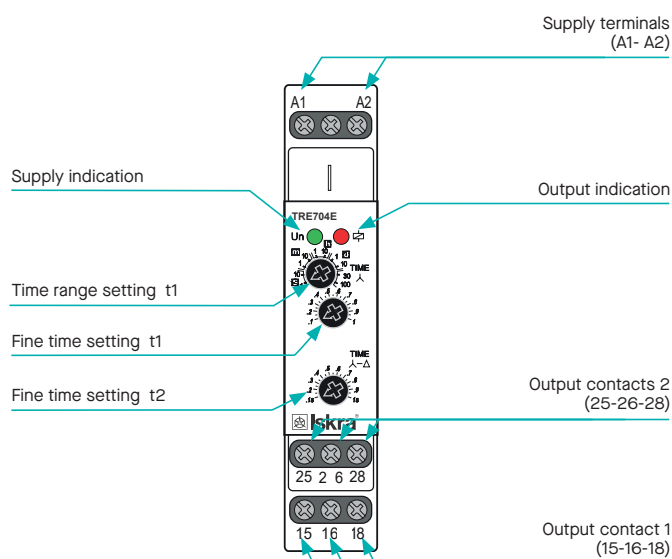
- ▶ It serves for delay ON of motors star/delta.
- ▶ Time t1 (star):
  - Time range setting by rotary switch
  - Fine time setting by potentiometer
- ▶ Time t2 (delay) between  $\Lambda/\Delta$ 
  - Fine time setting by potentiometer
- ▶ Multifunction red LED flashes or shines depending on the operating status.

Type	Control supply (V)	Supply terminals	Time range	Ordering No.	Weight (g)	Packaging (pcs)
TRE704E UNI 24 - 480	24 - 480	2	t1: 0.1 s - 100 days, t2: 0.1 s - 1 s	786.053.071	65	1

## TRE704E characteristics

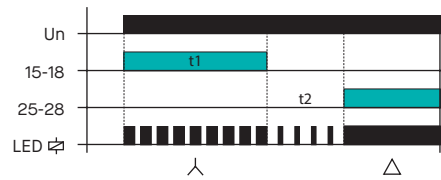
Technical data	TRE704E
Supply terminals	A1 - A2
Voltage range	AC / DC 12 - 240 V (AC 50-60 Hz)
Power input (max.)	2 VA / 1.5 W
Supply voltage tolerance	-15 %; +10 %
Supply indication	green LED
Time scale	t1: 0.1 s - 100 days, t2: 0.1 s - 1 s
Time setting	rotary switch and potentiometer
Time deviation	5% - mechanical setting
Repeat accuracy	0.2 % - set value stability
Temperature coefficient	0.01 %/°C, at = 20 °C (0.01 %/°F, at = 68 °F)
Number of contacts	2x changeover/SPDT (AgNi)
Current rating	16 A/AC1; 1 HP 240 Vac, 1/2 HP 120 Vac; PD. B300
Breaking capacity	4000 VA/AC1, 384 W/DC
Inrush current	30 A / < 3 s
Switching voltage	250 V AC/24 V DC
Max. power dissipation	1.2 W
Output indication	multifunction red LED
Mechanical life	10.000.000 ops.
Electrical life (AC1)	100.000 ops.
Reset time	max. 150 ms
Operating temperature	-20 .. 55 °C (-4 .. 131 °F)
Storage temperature	-30 .. 70 °C (-22 .. 158 °F)
Dielectric strength	
supply - output 1	4 kV AC
supply - output 2	4 kV AC
output 1 - output 2	4 kV AC
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP40 from front panel/IP20 terminals
Overvoltage category	III.
Pollution degree	2
Terminal wire capacity (mm²)	max. 1x 2.5, 2x1.5, with sleeve max. 1x 2.5 (AWG 12)
Dimensions	90 × 17.6 × 64 mm (3.5" × 0.7" × 2.5")
Weight	UNI - 78 g (2.8 oz.), 230 - 73 g (2.6 oz.)
Standards	EN 61812-1

## Description



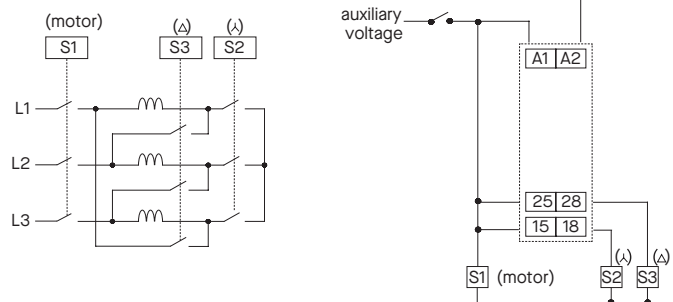
## Functions

STAR/DELTA timer

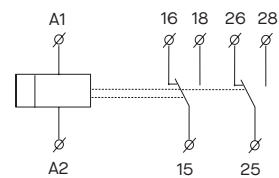


## Connection diagram

Start up of motor (  $\Delta$  -  $\Delta$  )



## Wiring



# TRE706-4

## Staircase switch



### Description

TRE706-4 is a staircase switch. Time can be adjusted in the range from 0.5 to 10 minutes. It is edge triggered, which means that it is broken-switch proof. Enhanced version B has the possibility of multiplying on time by factor 8. This fast-ON function is activated by holding the switch for prolonged time (6- to 8-seconds). This is very useful at cleaning, repairs etc.

### Function description

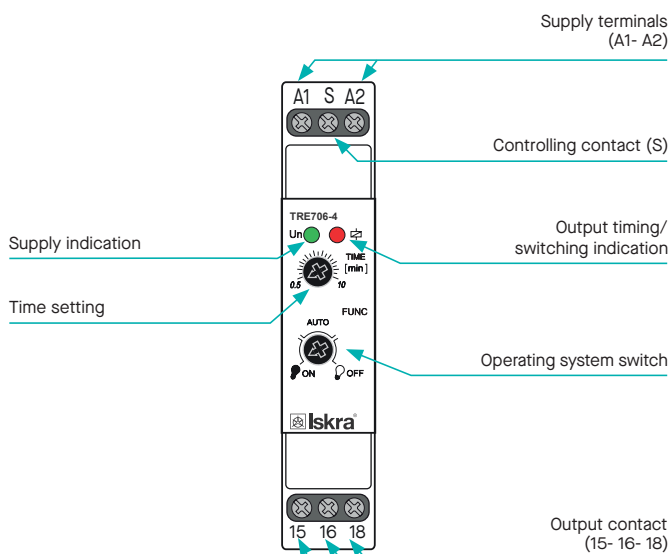
- ▶ Simple staircase switch used to control lighting in corridors, halls, staircases, common areas.
- ▶ Can also be used for delayed fan run-out e.g. in bathrooms, toilets, ...
- ▶ 3 functions:
  - ON (permanently closed) - e.g. when cleaning, moving
  - AUTO - STAIRCASE SWITCH without signalization
  - OFF (permanently open) - e.g. when replacing lights.
- ▶ Adjustable time range 0.5 to 10 minutes.
- ▶ Timing can be terminated by long pressing the control button (>2s).
- ▶ Possibility to connect control buttons with glow lamps (max. 100mA).
- ▶ Handles surge currents up to 80 A.
- ▶ 3-wire or 4-wire connection (input S can be controlled by potential A1 or A2).

Type	Control supply (V)	Supply terminals	No. of functions	Time range	Ordering No.	Weight (g)	Packaging (pcs)
TRE706-4	230	A1 - A2	3	0.5 - 10 min	786.053.091	56	1

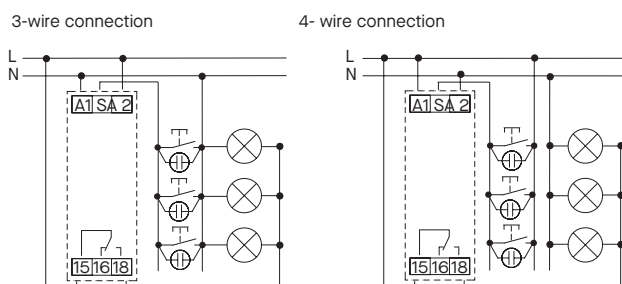
## TRE706-4 characteristics

Technical data	TRE706-4
Number of functions	3
Supply terminals	A1 - A2
Supply voltage	AC 230 V (50-60 Hz)
Consumption max.	3 VA/1.6 W
Max. dissipated power (Un + terminals)	4 W
Supply voltage tolerance	-15 %; +10 %
Supply indication	green LED
Time ranges	0.5 - 10 min
Time setting	potentiometer
Time deviation	5 % - mechanical setting
Repeat accuracy	5 % - set value stability
Temperature coefficient	0.01 %/°C, at = 20 °C (0.01 %/°F, at = 68 °F)
Changeover contacts	1x changeover (AgSnO2)
Rated current	16 A/AC1; 1 HP 240 Vac, 1/2 HP 120 Vac; PD. B300
Switching capacity	4000 VA/AC1, 384 W/DC
Inrush current	30 A/<3 s
Switching voltage	250 V AC/24 V DC
Output indication	red LED
Mechanical life	10.000.000 ops.
Electrical life (AC1)	100.000 ops.
Control voltage	AC 230 V
Power on input max.	4.5 VA/0.3 W
Control. terminals	A1-S or A2-S
Glow-tubes	yes
Max. Current of connected glow lamps	100 mA
Impulse length	min. 40 ms/max. unlimited
Reset time	max. 320 ms
Operating temperature	-20 .. +55 °C (-4 .. 131 °F)
Storage temperature	-30 .. +70 °C (-22 .. 158 °F)
Dielectric strength	4 kV (supply - output)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP40 from front panel/IP20 terminals
Overvoltage category	III.
Pollution degree	2
Max. cable size (mm²)	solid wire max. 1x 2.5 or 2x 1.5/ with sleeve max. 1x 2.5 (AWG 12)
Dimensions	90 × 176 × 64 mm (3.5" × 0.7" × 2.5")
Weight	56 g (2 oz.)
Standards	EN 61812-1

## Description

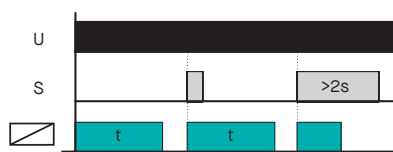


## Connection diagram



## Functions

When switching between functions, the red LED flashes.



**AUTO - STAIRCASE SWITCH** without signalization

By briefly pressing the control button, the device times the set time. You cannot extend the time interval by briefly pressing the button repeatedly.

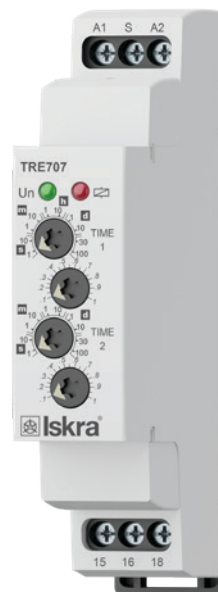
Function suitable for resistive loads (e.g. bulbs) and loads that do not tolerate frequent switching on and off (e.g. energy saving lamps).

### Notice:

- After the supply voltage has been connected, the device always performs 1 time cycle.
- The control input reacts to the potential of terminals A1 and A2.

# TRE707

## Asymmetric flasher



### Description

TRE707 asymmetric flasher is used for regular room ventilation, cyclic dehumidification, light control, circulating pumps, neon signs, etc.

### Function description

- ▶ Flasher with independent adjustable switch ON and switch OFF.
- ▶ Used for regular room ventilation, cyclic dehumidification, light control, circulating pumps, illuminated advertising, etc.
- ▶ 2 time functions:
  - 1) Asymmetric FLASHER - ON first
  - 2) Asymmetric FLASHER - OFF first
- ▶ Function choice is done by an external jumper of terminals S-A1.
- ▶ Time scale 0.1 s - 100 days divided into 10 time ranges.
- ▶ Time range setting via rotary switch.
- ▶ Fine time setting by potentiometer.
- ▶ Multifunction red LED flashes or shines depending on the operating status.

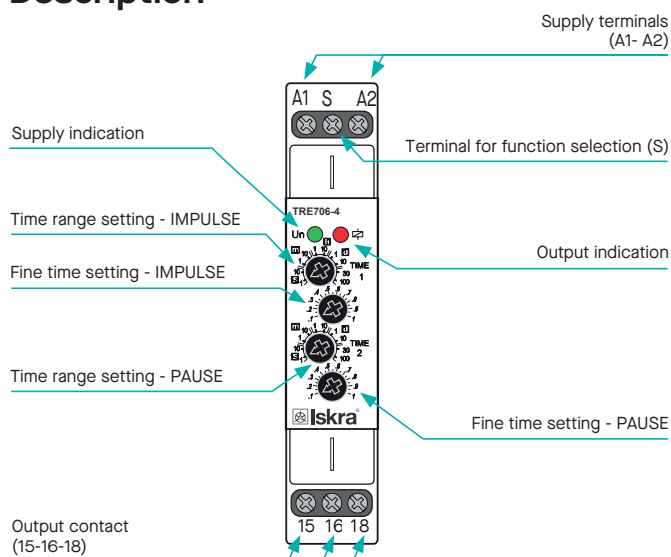
Type	Control supply (V)	No. of output contacts	Time range	Ordering No.	Weight (g)	Packaging (pcs)
TRE707 1 UNI	UNI	1	0.1 s - 100 days	786.053.056	67	1
TRE707 1 230 V AC	230	1	0.1 s - 100 days	786.053.057	64	1



## TRE707 characteristics

Technical data		TRE707
Number of functions		2 (second function is chosen by connecting S-A1)
Supply terminals		A1 - A2
Voltage range	UNI	AC/DC 12 - 240 V (AC 50 - 60 Hz)
Burden		AC 0.7 - 3 VA / DC 0.5 - 1.7 W
Voltage range	230	AC 230 V / 50 - 60 Hz
Power input (apparent input/loss input)		AC max. 12 VA / 1.3 W
Supply voltage tolerance		-15 %; +10 %
Supply indication		green LED
Time scale		0.1 s - 100 days
Time setting		rotary switch and potentiometer
Time deviation		5 % - mechanical setting
Repeat accuracy		0.2 % - set value stability
Temperature coefficient		0.01 % / °C, at = 20 °C
<b>Output</b>		
Number of contacts		1x changeover / SPDT (AgNi / Silver Alloy)
Current rating		16 A / AC1
Breaking capacity		4000 VA / AC1, 384 W / DC
Inrush current		30 A / < 3 s
Switching voltage		250 V AC1 / 24 V DC
Min. breaking capacity DC		500 mW
Output indication		multifunction red LED
Mechanical life		3 × 10 <sup>7</sup>
Electrical life (resistive)		0.7 × 10 <sup>5</sup>
Reset time		max. 150 ms
<b>Other information</b>		
Operating temperature		-20 ... +55 °C
Storage temperature		-30 ... +70 °C
Electrical strength		4 kV (supply - output)
Operating position		any
Mounting		DIN rail EN 60715
Protection degree		IP40 from front panel / IP20 terminals
Overvoltage category		III.
Pollution degree		2
Terminal wire capacity		solid wire max. 1 × 2.5 or 2 × 1.5 / with sleeve max. 1 × 2.5
Standards		EN 61812-1, EN 61010-1

## Description

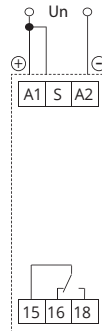


## Connection diagram

Asymmetric FLASHER - ON first

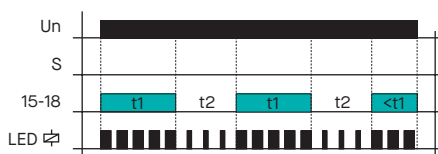


Asymmetric FLASHER - OFF first  
(jumper S-A1)

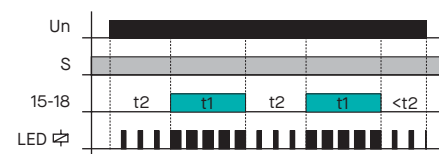


## Functions

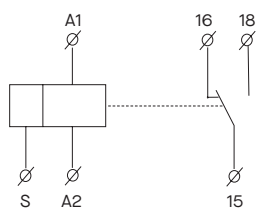
Asymmetric FLASHER - ON first



Asymmetric FLASHER - OFF first



## Wiring



# TRE711, TRE712

## Multifunction time relay

### Description

TRE711 and TRE712 multifunction time relays can be used for electrical appliances, control of lights, heating, motors, pumps and fans (10 functions, 10 time ranges, multi-voltage, 16 A or 3x 8 A contacts).



### Function description

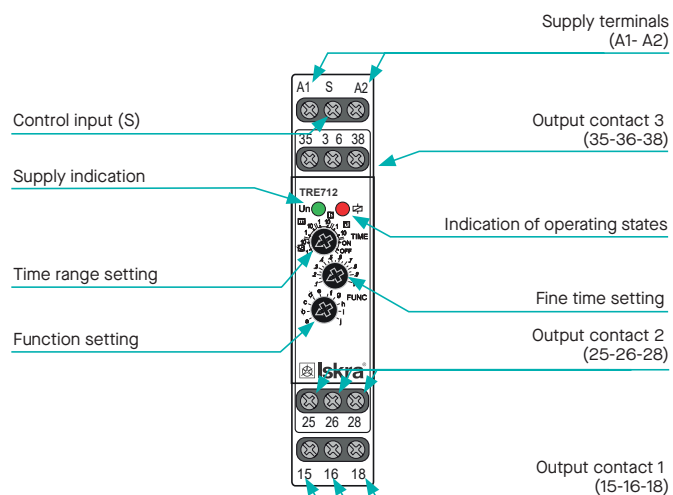
- ▶ Fulfills all requirements for time relays
- ▶ 10 functions:
  - 5 time functions controlled by supply voltage
  - 4 time functions controlled by control input
  - 1 function of latching relay
- ▶ Comfortable and well-arranged function and time-range setting by rotary switches
- ▶ **TRE711, TRE712:**
  - Universal supply voltage AC/DC 12 - 240 V or AC 230 V,
  - Output contact: **TRE711:** 1x changeover / SPDT 16 A;  
**TRE712:** 3x changeover / SPDT 8 A
- ▶ **TRE711 TO:**
  - Universal supply voltage AC 12 - 240 V AC 12 - 240 V, absolutely noise-less switching
  - 1x static contactless output (triac) 01.7 A (60 A / <10 ms), switches potential A1
- ▶ Multifunction red LED output indicator flashes or shines depending of status
- ▶ Time scale 0.1 s - 10 days divided into 10 ranges:
  - 0.1 s - 1 s
  - 1 s - 10 s
  - 0.1 min - 1 min
  - 1 min - 10 min
  - 0.1 hrs - 1 hr
  - 1 hrs - 10 hrs
  - 0.1 day - 1 day
  - 1 day - 10 days
  - only ON
  - only OFF

Type	Control supply (V)	No. of output contacts	Time range	Ordering No.	Weight (g)	Packaging (pcs)
TRE 711 UNI	UNI	1	0.1 s - 10 days	786.053.058	67	1
TRE 711 230V	230	1	0.1 s - 10 days	786.053.059	64	1
TRE 712 UNI	UNI	3	0.1 s - 10 days	786.053.060	93	1
TRE 712 230V	230	3	0.1 s - 10 days	786.053.061	87	1

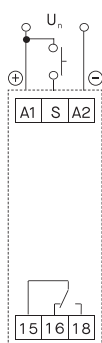
**TRE711, TRE712 characteristics**

Technical data		TRE711	TRE712
Number of functions		10	
Supply terminals		A1 - A2	
Voltage range	UNI	AC / DC 12 - 240 V (AC 50 - 60 Hz)	AC/DC 12 - 240 V (AC 50 - 60 Hz)
Burden		AC 0.7 - 3 VA / DC 0.5 - 1.7 W	AC 0.7 - 3 VA / DC 0.5 - 1.7 W
Voltage range	230	AC 230 V / 50 - 60 Hz	AC 230 V / 50 - 60 Hz
Consumption (apparent/loss)		AC max. 12 VA / 1.3 W	AC max. 12 VA / 1.3 W
Supply voltage tolerance		-15 %; +10 %	
Supply indication		green LED	
Time scale		0.1 s - 10 days	
Time setting		rotary switch and potentiometer	
Time deviation		5 % - mechanical setting	
Repeat accuracy		0.2 % - set value stability	
Temperature coefficient		0.01 % / °C, at = 20 °C	
Output			
Number of contacts		1x changeover / SPDT (AgNi / Silver Alloy)	3x changeover / SPDT (AgNi / Silver Alloy)
Current rating		16 A / AC1	8 A / AC1
Breaking capacity		2500 VA / AC1, 240 W / DC	
Inrush current		30 A / < 3 s	10 A / < 3 ms
Switching voltage		250 V AC1 / 24 V DC	
Min. breaking capacity DC		500 mW	
Output indication		multifunction red LED	
Mechanical life		3 × 10 <sup>7</sup>	
Electrical life (resistive)		0.7 × 10 <sup>7</sup>	
Control			
Power on control input		AC 0.025 - 0.2 VA / DC 0.1 - 0.7 W (UNI), AC 0.53 VA (AC 230 V), AC 0.025 - 0.2 VA (AC 12 - 240 V)	
Load between S-A2		Yes	
Control terminals		A1-S	
Glow tubes connections		Yes	
Max. amount of glow lamps connected to controlling input		UNI - x 230 V - max 20 pcs (measured with glow lamp 0.68 mA 230 V AC)	
Impulse length		min. 25 ms / max. unlimited	
Reset time		max. 150 ms	
Other information			
Operating temperature		-20 ... +55 °C	
Storage temperature		-30 ... +70 °C	
Electrical strength		4 kV (supply - output)	
Operating position		any	
Mounting		DIN rail EN 60715	
Protection degree		IP40 from front panel / IP20 terminals	
Overvoltage category		III.	
Pollution degree		2	
Terminal wire capacity		solid wire max. 2 × 2.5 or 1 × 4 / with sleeve max. 1 × 2.5 or 2 × 1.5	
Standards		EN 61812-1, EN 61010-1	

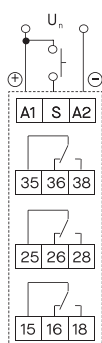
## Description



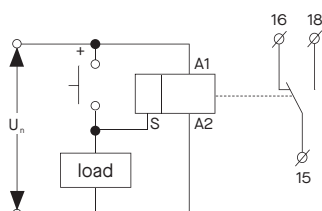
## Connection diagram



TRE711

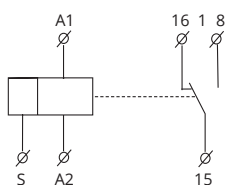


TRE712

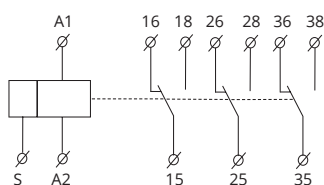


**Possibility to connect load onto controlling input**  
 It is possible to connect the load (e.g.: contactor) between terminals S-A2, without any interruption of correct relay function.

## Wiring

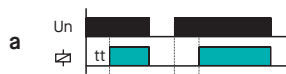


TRE711



TRE712

## Functions



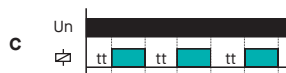
### ON Delay

When the input voltage U is applied, timing delay t begins. Relay contacts R change state after time delay is complete. Contacts R return to their shelf state when input voltage U is removed. Trigger switch is not used in this function.



### Interval ON

When input voltage U is applied, relay contacts R change state immediately and timing cycle begins. When time delay is complete, contacts return to shelf state. When input voltage U is removed, contacts will also return to their shelf state. Trigger switch is not used in this function.



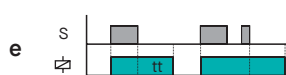
### Flasher - OFF first

When input voltage U is applied, time delay t begins. When time delay t is complete, relay contacts R change state for time delay t. This cycle will repeat until input voltage U is removed. Trigger switch is not used in this function.



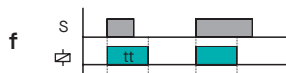
### Flasher - ON first

When input voltage U is applied, relay contacts R change state immediately and time delay t begins. When time delay t is complete, contacts return to their shelf state for time delay t. This cycle will repeat until input voltage U is removed. Trigger switch is not used in this function.



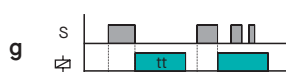
### OFF Delay (S Break)

Input voltage U must be applied continuously. When trigger switch S is closed, relay contacts R change state. When trigger switch S is opened, delay t begins. When delay t is complete, contacts R return to their shelf state. If trigger switch S is closed before time delay t is complete, then time is reset. When trigger switch S is opened, the delay begins again, and relay contacts R remain in their energized state. If input voltage U is removed, relay contacts R return to their shelf state.



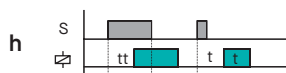
### Single Shot

Upon application of input voltage U, the relay is ready to accept trigger signal S. Upon application of the trigger signal S, the relay contacts R transfer and the preset time t begins. During time-out, the trigger signal S is ignored. The relay resets by applying the trigger switch S when the relay is not energized.



### Single Shot falling edge

Upon application of input voltage U, the relay is ready to accept trigger signal S. Upon application of the trigger signal S, the relay contacts R transfer and the preset time t begins. At the end of the preset time t, the relay contacts R return to their normal condition unless the trigger switch S is opened and closed prior to time out t (before preset time elapses). Continuous cycling of the trigger switch S at a rate faster than the preset time will cause the relay contacts R to remain closed. If input voltage U is removed, relay contacts R return to their shelf state.



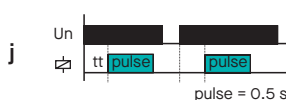
### On/Off Delay

Input voltage U must be applied continuously. When trigger switch S is closed, time delay t begins. When time delay t is complete, relay contacts R change state and remain transferred until trigger switch S is opened. If input voltage U is removed, relay contacts R return to their shelf state.



### Memory latch

Input voltage U must be applied continuously. Output changes state with every trigger switch S closure. If input voltage U is removed, relay contacts R return to their shelf state.



### Pulse generator

Upon application of input voltage U, a single output pulse of 0.5 seconds is delivered to relay after time delay t. Power must be removed and reapplied to repeat pulse. Trigger switch is not used in this function.

### Note:

1. Output contacts of TRE 712 do not allow switching of different phases or 3-phase voltages (voltage > 250 V).
2. When mounting into steal-plated switchboards, it is necessary to keep a safety distance of min. 3 mm from terminal's screws 35-36-38 and 25-26-28 towards the shutter of a switchboard.

# NDR

## Programmable digital relay

### Types

NDR-2A  
NDR-2B



### Description

NDR-2A, NDR-2B - multifunction programmable digital relay with 4-digit red LED display.

### Function description

- ▶ Control and setting are done by 3 buttons, user-friendly menu, absolute accuracy in timer setting, time countdown on a display, galvanically separated START and STOP control inputs with UNI supply
- ▶ Thanks to its complexity, it is possible to program also more demanding time functions by using 2 independent times.
- ▶ 2 independent times, with combination of 2 inputs and 2 outputs
- ▶ **NDR-2A:** 16 functions, choice of functions of the other relay, 30 memory places for most frequently used times
- ▶ **NDR-2B:** 10 functions, 1 output of 10 functions can be assigned to each relay = 2 relays in one device
- ▶ 2 independent times in range: 0.01 s - 100 hrs
- ▶ 3-MODULE, DIN rail mounting

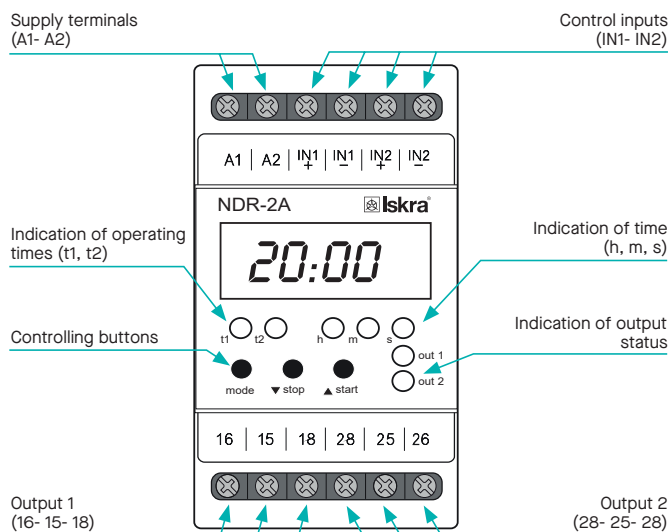
Type	Control supply (V)	No. of output contacts	Time range	Ordering No.	Weight (g)	Packaging (pcs)
NDR-2A UNI	UNI	2	0.01 s - 100 hrs	786.050.826	144	1
NDR-2B 230 V	230	2	0.01 s - 100 hrs	786.050.841	147	1

## NDR characteristics

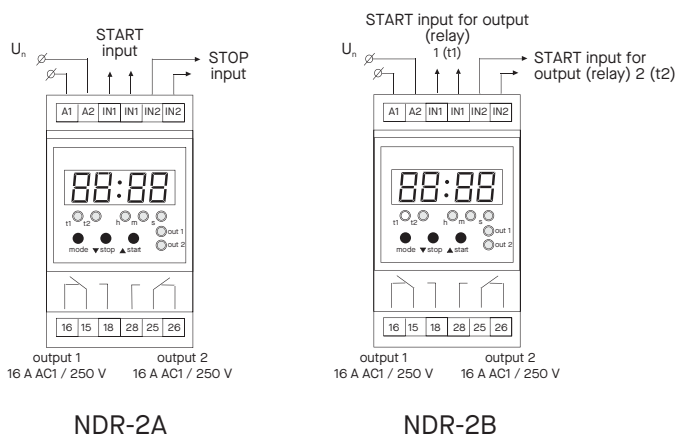
Technical data		NDR-2A	NDR-2B
Number of functions		16	10
Supply terminals		A1 - A2	
Voltage range	UNI	AC/DC 12 - 240 V (AC 50 - 60 Hz)	
Burden		AC 0.5 - 2.5 VA / DC 0.4 - 2.5 W	
Voltage range	230	-	
Consumption (apparent / loss)		AC 230 V / 50 - 60 Hz	
		AC max. 16 VA / 2.5 W	
Supply voltage tolerance		-15 %; +10 %	
Time ranges		0.01 s - 100 hrs	
Repeat accuracy		± 0.2 % - set value stability	
Temperature coefficient		0.01 % / °C at = 20 °C	
Output			
Number of contacts		2x changeover / SPDT (AgNi / Silver Alloy)	
Current rating		16 A / AC1	
Breaking capacity		4000 VA / AC1, 384 W / DC	
Inrush current		30 A / < 3 s	
Switching voltage		250 V AC1 / 24 V DC	
Output indication		red LED	
Mechanical life		3 × 10 <sup>7</sup>	
Electrical life (resistive)		0.7 × 10 <sup>5</sup>	
Control			
Control input burden		AC 0.01 - 0.25 VA (UNI), AC 0.25 VA (230 V)	
Glow lamps		No	
Control impulse length		min. 1 ms / max. unlimited	
Reset time		max. 200 ms	
Display color		red	
Number and height of digits		4 positions with separating colon, height 10 mm	
Luminance		2200 - 3800 ucd	
Light wavelength		635 nm	
Brightness setting		range 20 - 100 % in 10 steps adjustable	
Memory - memory locations		30 (NDR-2A) / 20 (NDR-2B) for times ranges + service function	
Data stored for		min. 10 years	
Other information			
Operating temperature		-20 ... +55 °C	
Storage temperature		-30 ... +70 °C	
Electrical strength		4 kV (supply - output)	
Operating position		any	
Mounting		DIN rail EN 60715	
Protection degree		IP40 from front panel	
Overvoltage category		III.	
Pollution degree		2	
Terminal wire capacity		solid wire max. 1x 2.5 mm <sup>2</sup> or 2x1.5 mm <sup>2</sup> / with sleeve max. 1x1.5 mm <sup>2</sup>	
Standards		EN 61812-1, EN 61010-1	



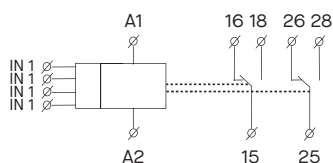
## Functions



## Connection diagram



## Wiring



### Time data

Time range	0.01 s - 99 hrs 59 min 59 s 99 ms
Min. time step	0.01 s
Time deviation	0.01 % of set value
Setting error	0 %
Setting, reset accuracy	100 %
Digital places	selected via program

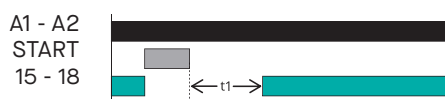
## Functions



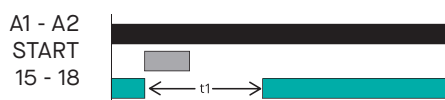
1. Delay ON



2. Delay OFF



3. Delay on after switching off control contact



4. Delay on by closing control contact



5. Delay off after switching off control contact



6. Delay off by closing control output



7. Delay off by opening control contact with instant output



8. Delay off by closing control contact with delayed output



9. Cycler beginning with impulse



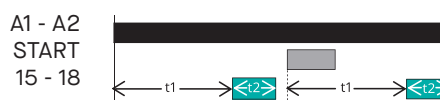
10. Cycler beginning with pause



11. Cycler beginning with impulse with variable interval



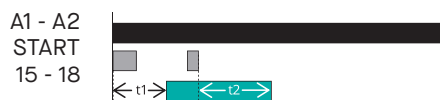
12. Cycler beginning with pause with variable interval



13. Generator with impulse



14. Changeover star/delta



15A. Shift of pulse by 2 times



16B. Shift of pulse by 2 times



16A. Extended impulse by 2 times



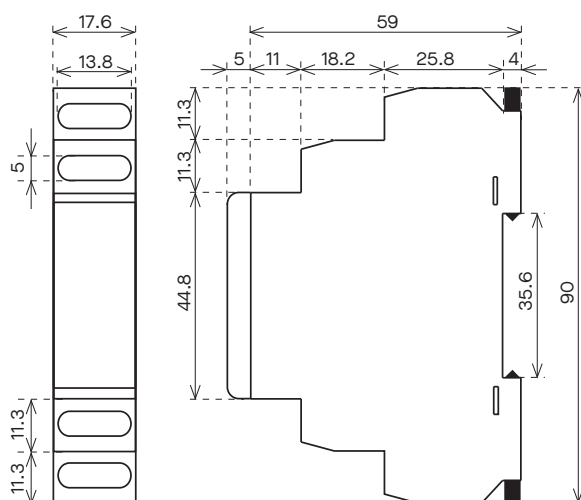
16B. Extended impulse by 2 times

### Recommendation:

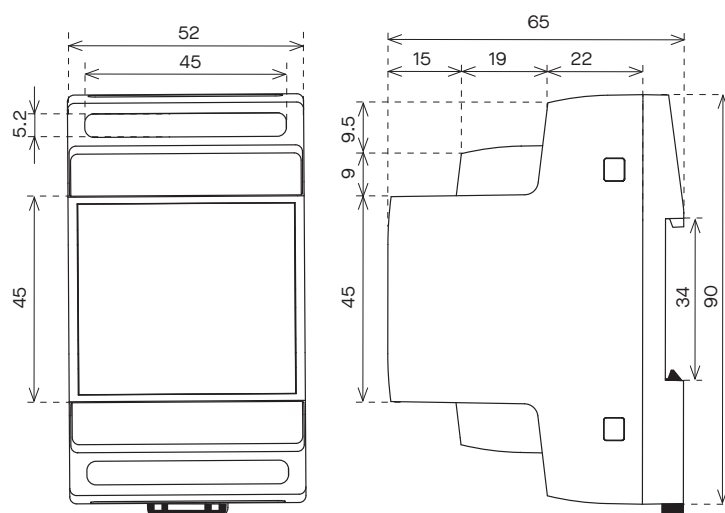
NDR-2B is replacing by 2 simple time relays = 2 in one.

## Dimensions

### 1-module design



### 3-module design



### CRT151H, CRT160H, CRT161H

