
100
50,4
100
ZERO
SPAN
ERROR
3- 4- wire
Range I
Range II
0...20
4...20

interface

Timer and Switching Relays

Contents – Timer and switching relays

interface

Contents – Timer and switching relays

Timer and switching relays
Electronic timer relays, selection by function

interface

			NGM 1600	NGM 1004	NGM 1003	NGM 1002	NGMP 1001	DZD 92 L	KZL 92	KZL 91	KZL 72	KZL 71
CATALOG PAGE			698	702	706	710	714	803	718	718	721	721
DESIGN	Multi-function		●	●	●	●	●	●	●	●	●	●
	Single function											
	Multi-range		●	●	●	●	●	●	●	●	●	●
	Single range											
	Fixed time											
HOUSING	Panel mounting	48 x 48 mm										
		72 x 72 mm						●				
	Surface mounting	22.5 mm NGG	●	●	●	●	●					
		22.5 mm							●	●	●	●
		45 mm										
		6.2 mm										
FUNCTION												
Timer relays	ON-delay		●	●	●	●	●	●	●	●	●	●
	ON-delay (pulse signal)					●						
	OFF-delay		●	●			●	●	●	●		
	OFF-delay without auxiliary voltage											
	ON-delay and OFF-delay, symmetrical		●					●	●	●		
	ON-delay and OFF-delay, separately selectable											
Signal watchdog	Cyclic signal monitoring, OFF/ON sym. and selectable											
Interval ON relay	Interval ON		●	●	●	●	●	●	●	●	●	●
	Interval OFF		●	●				●				
	Interval ON and OFF		●				●		●	●		
Flasher relay	OFF start, symmetrical and fixed											
Repeat cycle timer	OFF start, symmetrical and selectable				●	●		●	●	●		
	OFF start, sym. and fixed, cycle time setting range					●						
	OFF start, OFF and ON separately selectable											
	ON start, symmetrical and selectable					●		●	●	●	●	●
	ON start, symmetrical and fixed			●		●	●					
	ON start, OFF and ON selectable separately											
	OFF and ON start, sym. and fixed, cycle time setting range		●		●							
	OFF or ON start, OFF and ON selectable separately											
Star-delta relay	Switch-over relay, interval ON		●		●							
	Switch-over relay, ON-delay				●							
Pulse relay	Pulse relay, ON-delay, one shot		●	●	●	●	●		●	●	●	●
	Pulse relay, OFF start, OFF time selectable, ON time fixed			●		●	●					
	Pulse relay, ON start, ON time selectable, OFF time fixed					●						
	Pulse relay, alternating, OFF or ON time selectable		●		●							
	One shot (interval ON)		●	●			●	●				
Pulse counter	Pre-set pulse counter, upward counting											
	Pre-set pulse counter, upward/downward counting											
Stepping relay	ON-OFF											
	ON-OFF and OFF-ON											
Coupling relay	Instantaneous change-over contact											
Latching relay	Protected against power failure											
CONTACTS	Timed change-over contact		2[1]	1	2[1]	1	1	2[2]	2[2]	1	2[2]	1
	Timed normally open contact											
	Instantaneous change-over contact		1[1]		1[1]			1[2]	1[2]		1[2]	
	Instantaneous normally open contact											
RATED VOLTAGE	Multi-voltage AC/DC 24 to 230 (240) V		●	●	●	●	●		●	●	●	●
SPECIAL FEATURES	Remote potentiometer connection						●					
	Protected against power failure											
	Additive (+), or additive/subtractive (±)		+	+			+	+				
	Immediate signal through B1 (B) or Reset (R)			B			B					
	Digital (D) or analog (A) settings		A	A	A	A	A	A/D	A	A	A	A

Timer and switching relays
Electronic timer relays, selection by function

UZD 51	NGY 71	NGYP 72-S	NGY 11	NGY 52	SSY 12	KSY 51	NGZ 71	NGZ 72	NGZ 72-S	NGZP 71	NGZP 72	NGZP 72-S	NGZ 11	NGZ 12	NGZ 12-S	NGZP 31	NGZP 32	NGZP 32-S	KZD 31 K	KZTH 11	NGZ 710	NGZ 720	NGZ 110	NGZ 210	NGZ 310	NGZ 320	KZT 510 K	NGD 31	NGW 11	NGB 11	NGB 12	KPT 11 KD	KPT 31 KD	SPT 72 D	UID 51	KID 31 K	SID 32	NGF 32	NGF 52	KSP 12	FLARE-TIMER-S	FLARE-TIMER-A
807	726	728	730	732	734	736	738	740	742	744	746	748	750	752	754	756	758	760	762	764	768	770	776	776	772	774	779	781	783	785	787	789	789	791	810	793	795	797	799	801	724	766
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R																																										
D	A	A																																								

[1] = 1 timed and 1 instantaneous change-over contact, or 2 timed change-over contacts, depending on the function
[2] = 1 timed and 1 instantaneous change-over contact, or 2 timed change-over contacts, selectable
[3] = Semiconductor

Timer and switching relays
Electromechanical timer relays, selection by function

interface

CATALOG PAGE		
DESIGN	Multi-range	
	Single range	
HOUSING	Panel mounting	72 x 72 mm
		96 x 96 mm
	Surface mounting	45 mm
		55 mm
		90 mm
		110 mm
FUNCTION		
Timer relays	ON-delay	
	ON-delay (pulse signal)	
	OFF-delay	
Repeat cycle timer	ON start, P/I selectable separately	
Stepping relay	ON-OFF	
	ON-OFF and OFF-ON	
Latching relay	Protected against power failure	
CONTACTS	Timed change-over contact	
	Timed normally open contact	
	Timed normally closed contact	
	Instantaneous change-over contact	
	Instantaneous normally open contact	
	Instantaneous normally closed contact	
	Change-over contact	
	Normally open contact (NO)	
	Normally closed contact (NC)	
SPECIAL FEATURES	Protected against power failure	
	Time accumulation	
	Mechanical resetting	
	TÜV Test Certificate for burner systems	
	Analog setting	

Timer and switching relays
Electromechanical timer relays, selection by function

	DZ 12-S L	DZN 12-S L	DZ 52-S G	DZ 52-S L	DZN 52-S L	DZ 72-S	DZ 74-2S	DZ 74-2S L	DZA 52-S L	DZA 53-S L	DZAN 52-S L	DZA 52 L	DZR 12-S L	DZR 52-S L	SZA 52-S	SZA 52	SZAN 52-S	SZA 54-2S	DZ 521 L	DZA 521 L	SZA 521	SPZA 52	SSF 32	SSF 52	SSF 62	SSP 56	SSP 72	SSP 33	SSP 34
	828	828	832	834	834	837	837	840	842	842	842	842	845	848	815	815	815	815	851	854	818	821	824	824	824	826	826	826	826
			●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●							
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	1	1	1	1	1	1			1		1		1	1	1		1		1	1	1								
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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							

° = after release of the mechanical interlock

The values listed in the following apply for all devices, provided that no contradictory indications are made for the individual devices in their technical data. The devices meet the current standards and regulations:

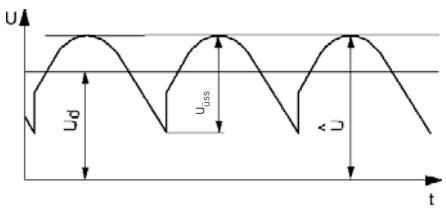
Standards
"Low-voltage switching devices"
EN 60947-5-1:2004

"Relays with defined time behavior (timer relays) for industrial applications"
EN 61812-1:1999

Rated voltage U_N
The voltage type is represented by the indication AC, DC or AC/DC of the relevant rated voltage.

V AC
These devices are designed for operation under AC voltage. The corresponding rated frequency is indicated.

V DC
These devices are designed for operation under DC voltage. We have indicated either the permissible amplitude and the maximum value of the voltage characteristic of the superimposed AC voltage according to DIN 41755-1 or the rated frequency. Devices for which a rated frequency has been indicated, can also be operated at an unfiltered voltage from a bridge rectification (no half-wave rectification). In this case the operating voltage is the root-mean-square value of the voltage.



U_d= arithmetic mean value
$u_{üss}$ = amplitude (peak-to-peak displacement)
û= absolute maximum value of the voltage characteristic = u_{max}

AC/DC
These devices are designed for operation under AC and DC voltage. They can be operated with an unfiltered voltage from a bridge rectification (no half-wave rectification). The operating voltage is the root-mean-square value of the voltage.

Operating voltage range
If the rated voltage is indicated as a range, for example 110 to 127 V and a permissible operating range between 0.8 and 1.1 x U_N, the operating range will extend from 0.8 x 110 V to 1.1 x 127 V.

Rated frequency
The devices can be operated within the indicated range, for example 50 to 60 Hz, without any restrictions. When 50 to 60 Hz is indicated, the devices have a frequency selector. When 50 or 60 Hz is indicated, the devices are designed for the relevant frequency. Operating range 0.95 to 1.05 x rated frequency. When a rated frequency range is indicated, for example 50 to 60 Hz, the permissible operating range is 0.95 x 50 Hz to 1.05 x 60 Hz.

Rated consumption
The rated consumption is indicated under reference conditions according to EN 61812-1. Devices that are designed for operation at AC voltage are specified in VA and W related to the rated frequency. If several rated frequencies are indicated, or a range, the indication will always refer to 50 Hz. For devices designed for operation with DC voltage, the values are indicated for a DC voltage without superimposition. For devices designed for operation under AC and DC voltage, the same values are indicated as for AC devices. When the consumption changes during the functional sequence, the highest value is always indicated. If the consumption of the devices can be higher for a short period of time, for example at power ON (DC system, economy connection), its value will be indicated in addition. Due to capacitors in the power supply, an increased switch-on peak occurs in electronic devices.

Release value
When the devices are operated through inductive proximity switches in 2-wire designs or through long lines in case of AC voltage, a residual voltage is still applied to the devices, although the excitation voltage has been switched off. For proper functioning of the devices this voltage must be smaller than the release value. LEDs for function indications may burn weakly in case of a residual voltage.

Half-wave rectification
Various devices are equipped with an internal half-wave rectification. As the devices must be adjusted for operation with 2-wire inductive proximity switches, their half-wave rectification value is indicated in the key data.

Inductive proximity switches in 2-wire design
Inductive proximity switches are subject to specified values for the residual current that is allowed to flow over the load when the switch is disabled. These maximum values contradict the requirement for power consumption of the triggered contactors and relays to be as low as possible. The market offers inductive proximity switches with far lower residual currents. In order to adjust them to the required data of the switches, a field device can be added to the load (mandatory for field devices with integrated half-wave rectification). Not all relays can be operated parallel to the control input, pulse input or zero input with an additional load. A corresponding indication is made for each device under Technical data.

Ambient temperature
Measured in a distance of 10 mm above the center of the upper housing surface.

Storage and transport temperature
– 25 °C to + 70 °C.

Operating mode
Continuous operation

Climate resistance
Tested according to DIN 50016 (humid alternating atmosphere with 24-hour cycle, 83 % relative humidity at 23 °C and 92 % relative humidity at 40 °C).

Vibration resistance
Tested according to EN 60068-2-6:1995; frequency range 10 to 55 Hz; amplitude 0.35 mm; acceleration 5 g, 20 frequency cycles per axis (1 h 45 min).

Installation position
any

Degree of protection
In accordance with EN 60529:2000. The protection degree for housing and connections is provided by the housing data in this section.

Recovery time
For proper functioning of the device, the value must not fall below the specified value. See the function diagram for additional information. This value does not imply that an interruption is permissible.

Standard of accuracy
According to EN 61812-1999.

Mean value of the fault
Deviation of the arithmetic mean value of all the measured values from the pre-selected value.

Analog time setting
The indications apply to the full scale value.

Digital time setting
The error in devices with digital time setting depends only on the absolute accuracy of the time basis used. The indications relate to the selected value.

Fixed times
The indications for devices with fixed times, such as flasher relay or interval ON relay, refer to the rated value.

Analog setting
The indications apply to the full scale value.

Fixed values
The indications apply to the rated value.

Dispersion
Dispersion means the difference between the smallest measured value and the largest measured value at a certain setting and constant values of the setting variables. The indications for mechanical devices relate to the full scale value. The indications for electronic devices relate to the pre-selected time value (note the indications under "Maintenance").

Influence of the energizing quantity / supply voltage
If an additional error is caused by changing the energizing quantity / supply voltage, this influence is indicated in % for each % of change to the energizing quantity / supply voltage. The rated value is the reference point. This indication applies for the entire operating range.

Influence of the ambient temperature
If an additional error is caused by changing the ambient temperature, this influence is indicated in % for each K of temperature change. The reference point is + 20 °C. This indication applies for the entire operating range.

Fault influence
If an influence occurs that exceeds the standard value, it must be indicated accordingly.

Settings:
Analog time setting, single-range devices with time factor
The time can be set infinitely. It results from the scale value multiplied by the time factor.

Analog, single-range devices
he time can be set infinitely. The scale values are absolute values related to the selected time unit.

Analog, multi-range devices
The time can be set infinitely within the selected time range. It results from the scale value multiplied by the selected time factor.

Digital
Never set all the selector switches to zero. The position of the selector switches should not be changed during the functional sequence, as otherwise this may cause functional faults.

Digital, single-range devices
The time can be set in decimal increments at the selector switch. The set values are absolute values related to the selected time unit. Integer values of the time unit can be set with selector switches with black number wheels. Decimal fractions of the time unit can be set with selector switches with red number wheels.

Digital, multi-range devices
The time can be set in decimal increments at the selector switch. The set values are absolute values related to the selected time unit. Integer values of the time unit can be set with selector switches with black number wheels. Decimal fractions of the time unit can be set with selector switches with red number wheels.

Remote time setting
On some devices, the time can also be set with remote potentiometers. The remote potentiometer is connected to the identified terminals. The time is set on the device itself to the end stop below the smallest value. Devices in standard design are delivered with the terminals for the remote potentiometer jumpered. This jumper must be removed prior to connecting the remote potentiometer. Devices with modified connections E, A, A1 and A2 are delivered without this jumper. If it is to be operated without remote potentiometer, the relevant connections must be jumpered. Remote potentiometers of the relevant resistance match all time ranges of the corresponding model; they have a relative scale without reference to the device's time range. Indications about the setting tolerance refer to the device taking into consideration the tolerance of the built-in setting resistance. The resistance tolerance of the remote potentiometer may cause deviations. The cable length between the device and the remote potentiometer will usually not have any influence. Follow the instructions regarding screening etc. of the corresponding application examples. The resistance value of the remote potentiometer matching the corresponding device is indicated on the type plate.

Creepage distances and clearances
DIN VDE 0110-1:1997 (EN 60664-1:2003)

Rated impulse voltage
See the "Technical data" of the device for the corresponding values.

Overvoltage category
See the "Technical data" of the device for the corresponding values.

Degree of pollution
Outdoors; inside the device: See the "Technical data" of the device for the corresponding values.

Rated voltage
See the "Technical data" of the device for the corresponding values.

Contacts
Output circuit according to EN 60947-5-1:2004

Contact material
The contact material is indicated in "Technical data". So far, we do not know any contact material that would be perfect for the variety of application options. The major characteristics of the most important contact materials are listed in the following descriptions.

Hard silver
Ag Cu has good conductivity, a high resistance to erosion and a low welding tendency. It is suitable for medium to high switching capacities. An especially sulfurous atmosphere facilitates the generation of oxide that may cause contact interruptions. Ag Cu is not suitable for switching voltages < 6 V.

Silver nickel
Ag Ni, an important material for inductive loads (6 – 380 V). Suitable for switch-on current between 10 mA and 100 A. The contacts have good resistance to erosion, a low welding tendency and higher contact resistances than Ag contacts.

Silver alloy, gold-plated
Silver alloys with a high resistance to erosion (Ag Ni, Ag Sn O_2) are used underneath the gold plating, so that the same life span as with Ag Ni, Ag Cd O or Ag Sn O_2 can be expected after the gold plating is punctured through higher or inductive loads. Low voltages and currents are safely switched with the gold plating. Please ensure that the gold layer, if required, is not destroyed by improper use prior to the contact's intended use.

Switching voltage
Rated value U_n: see the upper limit value under "Technical data": 1.1 x U_n

Current
Max. continuous current I_n: 5 A

Short-circuit protection
Fuse insert according to EN 60269-1:1998 and EN 60269-2:1995; utilization category gG, max. 6 A.
– gG identifies overall fuse inserts for general applications.

Breaking capacity
Standard contact material

AC load in W, VA				
Voltage V AC	24	42	115	230
cos φ 0.7 to 1	150	250	500	500
inductive cos φ ≈ 0.3	50	80	150	200

DC load in W				
Voltage V DC	24	60	115	230
R load	100	100	80	80
L load ≈ 200 ms	30	35	40	40

Contact life span and making capacity
Standard contact material
Load : AC 230 V, cos φ ≈ 0.3

Operating cycles Sch	Operating frequency Sch/h	Power ON	Power OFF
10^4	20	10 A	1 A
10^5	50	5 A	0.5 A
10^6	500	3 A	0.3 A
10^7	3000	1 A	0.1 A

Application category
In EN 60497-5-1:2004, application categories are indicated for auxiliary circuit switches. They clearly define the purpose of use of the switching devices in combination with the rated operating voltage U_e, the rated operating current I_e, the number of operating cycles and the test cycle.

Voltage type	Application category	Typical application
AC voltage	AC15	Controlling of electromagn. load (>72 VA)
DC voltage	DC13	Controlling of electromagn.

Rated operating voltage U_e and current I_e

	AC15	DC13
U_e	I_e	I_e
24 V	3 A	2 A
115 V	3 A	0.2 A
230 V	3 A	0.1 A
400 V	2 A	0.05 A

The permissible switching voltage U_n (see the Technical data) must be observed.

Terminal markings and position of the terminals
The terminal markings and position of the terminals of timer relays meet the requirements of DIN 46199 T5:01.76. Other devices meet the standard's requirements correspondingly. DIN 46199 T5:01.76 stipulates that with devices for operation under direct voltage the plus pole must be assigned to terminal A1. All devices designed for operation under DC voltage are protected against destruction in case of incorrect poling. If this protection is designed as bridge rectification, the devices will work properly even in case of incorrect poling. In this case, the circuit diagram of the corresponding devices will not show any polarity. If the poling protection is designed as half-wave rectification, the devices will not work in the case of incorrect poling. The polarity meeting DIN 46199 T5:01.76 is indicated in the circuit diagram. For an optimal interference suppression of devices designed for AC voltage, terminal A1 should be assigned to L1 and terminal A2 to N. When a control-power transformer is used, terminal A2 should always be assigned to the line common for all consumers. The circuit diagrams in the catalog the position of the terminals corresponds to the assignment on the device.

Maintenance
In view of the operating conditions and economic considerations, the devices should be regularly checked for proper functioning. All bearings of mechanical devices are sufficiently and specially lubricated for long operating hours. Electronic devices that are equipped with an electrolytic capacitor within the time circuit (capacitor interval ON relay, capacitor timer relay) may considerably prolong the times of their first few switching cycles after several months without operation.

EC directives and declaration of conformity
This general technical information applies for all the devices that may be covered by one of several of the following EC directives:

EC Machine Directive 98/37/EG
EC EMC Directive 89/336/EWG
EC Low-Voltage Directive 73/23/EWG

The conformity of the devices that meet the requirements of the corresponding EC directive is indicated by the CE mark of conformity on the type plate. Information about which directives and standards are met by the devices is provided by the EC Declaration of Conformity. If the devices identified as such do not meet all the directives during the directive's transition period, this will be mentioned in the documents that accompany the device. The devices without the EC mark of conformity meet the indicated standards. This indication functions as declaration of conformity in the sense of article 10 of the EC Low-Voltage Directive 73/23. The devices that were put on the market after 1995-12-31 must meet the requirements of the EMC Directive. In case of replacement devices that cannot be operated on their own and do not carry the CE mark, the user himself is responsible for the proper installation according to § 5 sec. 5 EMVG and for the fulfillment of the protection requirements according to § 4 sec. 1 EMVG. Wieland Electric GmbH will provide users with the EC declarations of conformity on request.

Safety instructions
Installation, start-up, modification and retrofit of all devices must be performed by an qualified personnel only! Disconnect the device/system from the load prior to starting any service. Follow the safety instructions of electrical engineering and the trade association. Negligence of the safety instructions may cause death, grievous bodily harm or severe material damage.

Changes
We reserve the right for technical changes that further technological advance.

interface

Timer and switching relays
Multi-function NGM 1600

interface

Multi-function multi-range timer relay

- Multi-voltage for AC/DC 24 up to 240 V
- 16 functions
- Setting range from 0.1 s to 300 h divided into 16 selectable time ranges
- 2 change-over contacts or 1 instantaneous change-over contact and 1 timed change-over contact (function-dependent)
- 3 LEDs for function display

c SP us being prepared: UL

Function

Setting the function

The function is set with the MODE selector switch and displayed by the function code in the window next to it. The code designation for the function can be found in the column "Function diagrams".

Setting the time delay

The time range is set with the RANGE selector switch and displayed in the window next to it. The desired delay time is set with a selecting wheel.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

Function diagrams

See the following pages for the function diagrams

Time ranges

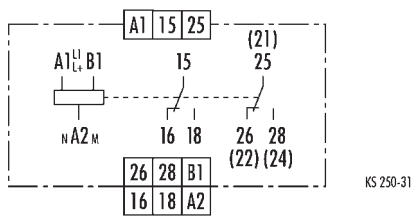
Setting range from 0.1 s to 300 h divided into:

<0.1 ... 1 s	5 ... 100 s	1.5 ... 30 min	0.5 ... 10 h
<0.15 ... 3 s	15 ... 300 s	3 ... 60 min	1.5 ... 30 h
<0.5 ... 10 s	50 ... 1000 s	5 ... 100 min	5 ... 100 h
<1.5 ... 30 s	0.5 ... 10 min	0.15 ... 3 h	15 ... 300 h

Notes

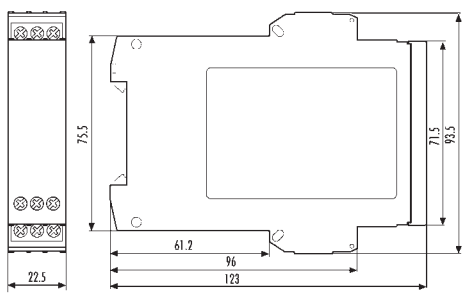
- The device is designed for multi-voltage. Connect phase L1 or L+ to terminal A1 and B1 and neutral N and/or M to terminal A2.
- You can change the function or delay time during operation. The change is effective immediately.

Circuit diagram



KS 250-31

Dimension diagram

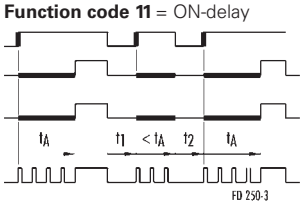


K 3-3

Interface

Function diagrams

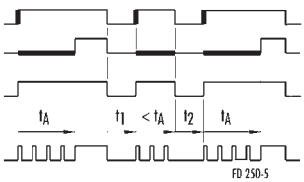
Function code 11 = ON-delay



A1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
25-28 Delayed contact
25-26 LED green
LED green Energizing quantity

t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

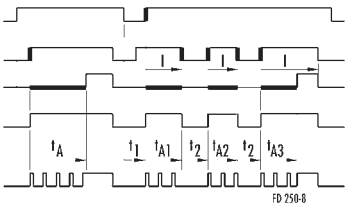
Function code 11-ON = ON-delay



A1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
21-24 Instantaneous contact
21-22 LED green
LED green Energizing quantity

t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Function code 11C-ON = ON-delay, accumulative y/n, with auxiliary supply

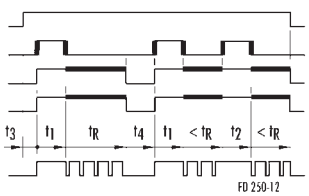


A1-A2 Auxiliary supply
B1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
21-24 Instantaneous contact
21-22 LED green
LED green Energizing quantity

t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

$$t_A = \sum_{B1\text{-}A2}^{n} t_{AX}$$

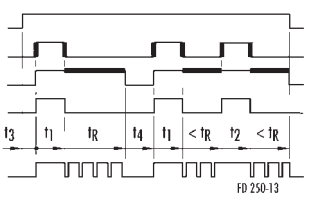
Function code 12 = OFF-delay, with auxiliary supply



A1-A2 Auxiliary supply
B1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
25-28 Delayed contact
25-26 LED green
LED green Energizing quantity

t_R = returning time
t_1 = make time, must be > minimum ON time 1
t_2 = make time, must be > minimum ON time 2
t_3 = time between switching on auxiliary supply and energizing quantity, must be > recovery time 1
t_4 = break time, must be > recovery time 2

Function code 12-ON = OFF-delay, with auxiliary supply

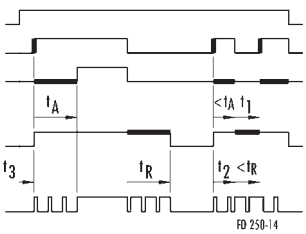


A1-A2 Auxiliary supply
B1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
21-24 Instantaneous contact
21-22 LED green
LED green Energizing quantity

t_R = returning time
t_1 = make time, must be > minimum ON time 1
t_2 = make time, must be > minimum ON time 2
t_3 = time between switching on auxiliary supply and energizing quantity, must be > recovery time 1
t_4 = break time, must be > recovery time 2

Function diagrams

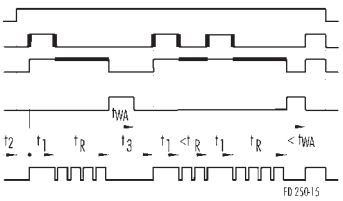
Function code 11-12 = ON-delay, OFF-delay, with auxiliary supply



A1-A2 Auxiliary supply
B1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
25-28 Delayed contact
25-26 LED green
LED green Energizing quantity

t_A = operating time
t_R = returning time
t_1 = break time, must be > recovery time 1
t_2 = make time, must be > minimum ON time 1
t_3 = time between switching on auxiliary supply and energizing quantity, must be < recovery time 2

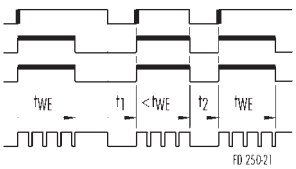
Function code 12-22 = OFF-delay and interval OFF, 0.5 s fixed interval time, with auxiliary supply



A1-A2 Auxiliary supply
B1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
25-28 Delayed contact
25-26 LED green
LED green Energizing quantity

t_R = returning time
t_{WA} = fixed interval OFF time
t_1 = make time, must be > minimum ON time 1
t_2 = time between switching on auxiliary supply and energizing quantity, must be > recovery time 1
t_3 = break time, must be > recovery time 2

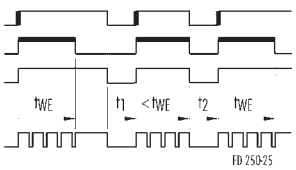
Function code 21 = interval ON



A1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
25-28 Delayed contact
25-26 LED green
LED green Energizing quantity

t_{WE} = interval ON time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

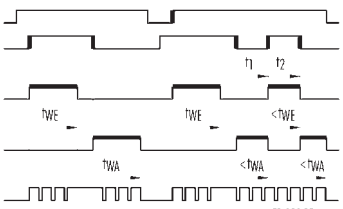
Function code 21-ON = interval ON



A1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
21-24 Instantaneous contact
21-22 LED green
LED green Energizing quantity

t_{WE} = interval ON time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Function code 21-22 = interval ON, interval OFF, with auxiliary supply

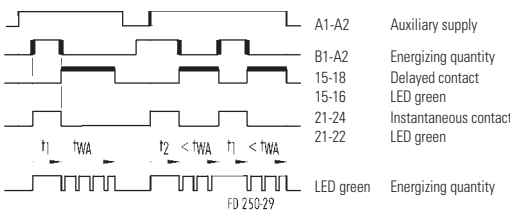


A1-A2 Auxiliary supply
B1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
25-28 Delayed contact
25-26 LED green
LED green Energizing quantity

t_{WE} = interval ON time
t_{WA} = interval OFF time
t_1 = break time, must be > recovery time 1
t_2 = make time, must be > minimum ON time 1

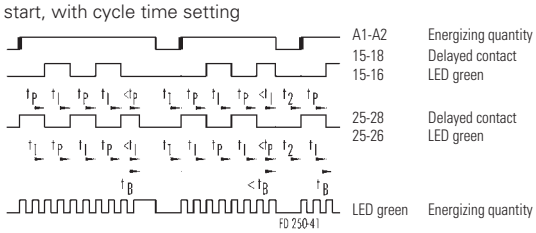
Function diagrams

Function code 22-ON = interval OFF, with auxiliary supply



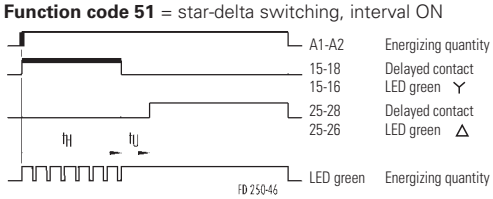
t_{WA} = interval OFF time
t_1 = make time, must be > minimum ON time 1
t_2 = make time, must be > minimum ON time 2

Function code 43-44 = clock-generating, 0.5 s fixed OFF and ON time, OFF/ON start, with cycle time setting



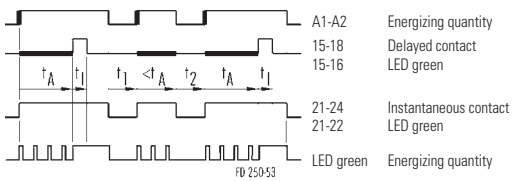
t_B = cycle time
t_p = fixed OFF time
t_I = fixed ON time
$t_I = t_p$
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Function code 51 = star-delta switching, interval ON



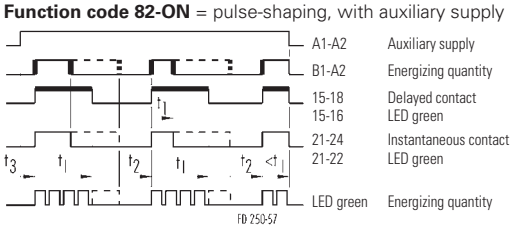
t_H = acceleration time
t_U = transit time 100 ms

Function code 81-1 s-ON = ON-delay, pulse-generating, 1 s fixed ON time



t_A = operating time
t_I = fixed ON time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

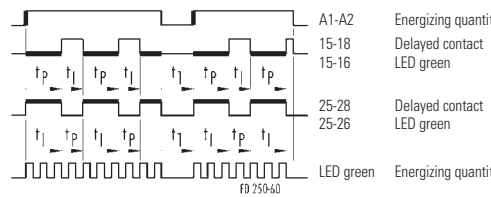
Function code 82-ON = pulse-shaping, with auxiliary supply



t_I = fixed ON time
t_1 = make time, must be > minimum ON time 1
t_2 = break time, must be > recovery time 1
t_3 = time between switching on auxiliary supply and energizing quantity, must be > recovery time 2

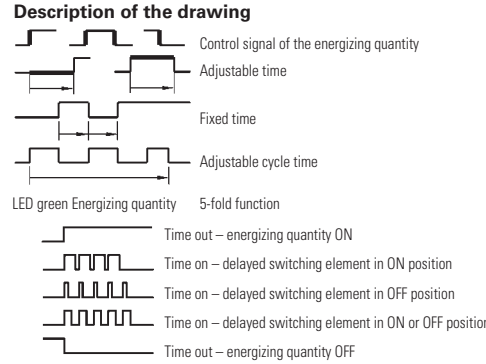
Function diagrams

Function code 83-84-1 s = pulse-generating, 1 s fixed ON or OFF time



t_p = OFF time
t_I = ON time
t_1 = break time, must be > recovery time 1

Description of the drawing



Function codes / times

Function code	Function diagram	Recovery time (ms) 1	2	3	Minimum ON time (ms) 1	2
11	250-3	≤ 50	≤ 50	–	–	–
11-ON	250-5	≤ 50	≤ 50	–	–	–
11C-ON	250-8	≤ 50	≤ 50	–	–	–
12	250-12	0	0	–	≤ 25	≤ 25
12-ON	250-13	0	0	–	≤ 25	≤ 25
11-12	250-14	≤ 25	0	–	≤ 25	–
12-22	250-15	0	t_{WA}+0	–	≤ 25	–
21	250-21	≤ 50	≤ 50	–	–	–
21-ON	250-25	≤ 50	≤ 50	–	–	–
21-22	250-27	≤ 25	–	–	≤ 25	–
22-ON	250-29	≤ 50	≤ 50	–	–	–
43-44	250-41	≤ 50	≤ 50	–	–	–
51	250-46	–	–	–	–	–
81-1s-ON	250-53	≤ 50	≤ 50	–	–	–
82-ON	250-57	0	0	–	≤ 25	–
83-84-1s	250-60	≤ 50	–	–	–	–

Technical data	NGM 1600
Product standard (timer relays)	EN 61812-1:1999-08
Relay function according to IEC 60050 (445)	Multi-function relay with multi-time range
Function display	3 LEDs green
Function diagram	See column "Function diagrams"
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110%
Rated frequency f_n	50 to 60 Hz ± 5%
Release value of the input voltage (power capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (B1-A2)	1 mA
Rated consumption on control connection (B1-A2)	< 0.25 W
Parallel loads permissible	A1-A2 yes / B1-A2 yes
Internal half-wave rectification	A1-A2 no / B1-A2 yes
Time circuit	
Time setting / number of time ranges	analog / 16
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2/3	See table "Function codes / times"
Minimum ON time 1/2	See table "Function codes / times"
Setting tolerance	≤ ± 5%
Repeatability (to set value)	≤ ± 0.01% + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002%
Influence of voltage (within range)	≤ ± 0.002%
Output circuit	
Contact assignment	2 change-over contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 to 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time at excitation of A1-A2	40 ms
Response time / release time at excitation of B1-A2	20 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Degree of protection according to IEC 60529 housing/terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-3
Circuit diagram of the terminals	KS 250-31
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 to 2.5 mm²
stranded with ferrules	1 x 0.4 – 4 or 2 x 0.2 to 1.5 mm²
Weight	0.13 kg
Accessories	–
Approvals	c SP us being prepared: UL

Overview of devices / Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
NGM 1600	AC/DC 24 – 240 V 50 – 60 Hz	See table "Time ranges"	R2.065.0040.0	1

Timer and switching relays
Multi-function NGM 1004

interface

Multi-function multi-range timer relay

- Multi-voltage for AC/DC 24 up to 240 V
- 10 functions
- Setting range from 0.1 s to 300 h divided into 16 selectable time ranges
- 1 change-over contact
- 2 LEDs for function display

c SP us being prepared: UL

Functions

Setting the function

The function is set with the MODE selector switch and displayed by the function code in the window next to it. The code designation for the function can be found in the column "Function diagrams".

Setting the time delay

The time range is set with the RANGE selector switch and displayed in the window next to it. The desired delay time is set with a selecting wheel.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

Function diagram

See the following pages for the function diagrams

Time ranges

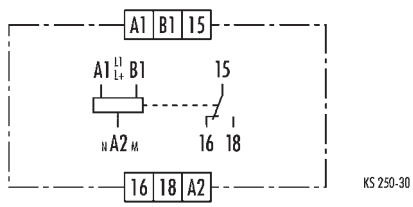
Setting range from 0.1 s to 300 h divided into:

<0.1 ... 1 s	5 ... 100 s	1.5 ... 30 min	0.5 ... 10 h
0.15 ... 3 s	15 ... 300 s	3 ... 60 min	1.5 ... 30 h
0.5 ... 10 s	50 ... 1000 s	5 ... 100 min	5 ... 100 h
1.5 ... 30 s	0.5 ... 10 min	0.15 ... 3 h	15 ... 300 h

Notes

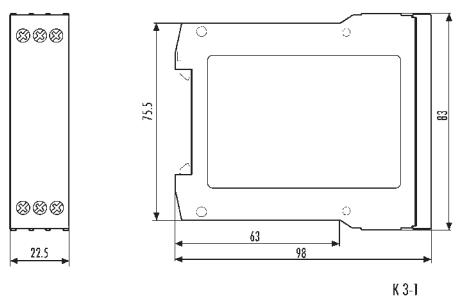
- The device is designed for multi-voltage. Connect phase L1 or L+ to terminal A1 and B1 and neutral N and/or M to terminal A2.
- You can change the function or delay time during operation. The change is effective immediately.

Circuit diagram



KS 250-30

Dimension diagram

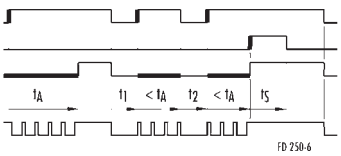


K 3-1

Interface

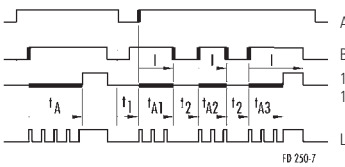
Function diagrams

Function code 11 = ON-delay, also immediate operation



t_A = operating time
t_S = immediate signal, must be > minimum ON time 1
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

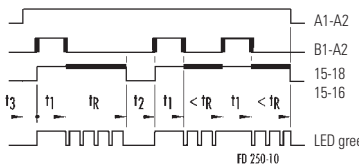
Function code 11-C = ON-delay, accumulative y/n, with auxiliary supply



t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

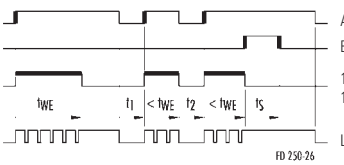
$$t_A = \sum_{I_{B1-A2}}^{n} t_{AX}$$

Function code 12 = OFF-delay, with auxiliary supply



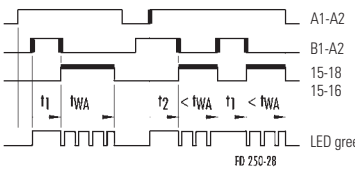
t_R = returning time
t_1 = make time, must be > minimum ON time 1
t_2 = break time, must be > recovery time 2
t_3 = time between switching on auxiliary supply and energizing quantity, must be > recovery time 1

Function code 21 = interval ON, also immediate release



t_{WE} = interval ON time
t_S = immediate signal, must be > minimum ON time 1
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

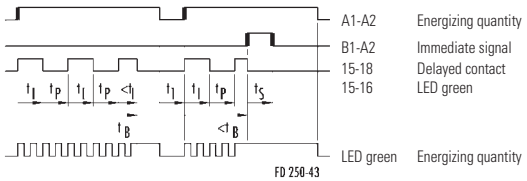
Function code 22 = interval OFF, with auxiliary supply



t_{WA} = interval OFF time
t_1 = make time, must be > minimum ON time 1
t_2 = make time, must be > minimum ON time 2

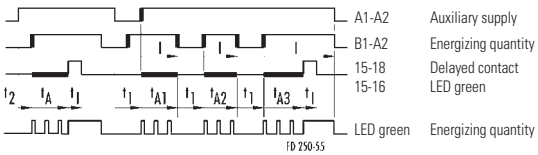
Function diagrams

Function code 44 = clock-generating, 0.5 s fixed ON and OFF time, ON start, with cycle time setting range, also immediate release



t_B = cycle time
t_I = fixed ON time
t_P = fixed OFF time
$t_I = t_P$
t_S = immediate signal, must be > minimum ON time 1
t_1 = break time, must be > recovery time 1 sein

Function code 81C-1 s = ON-delay, accumulative y/n, pulse-generating, 1 s fixed ON time, with auxiliary supply

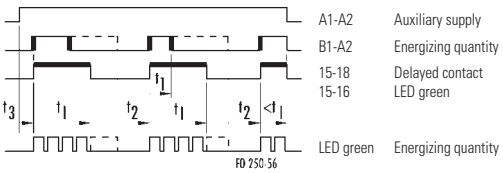


t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = time between switching on auxiliary supply and energizing quantity, must be > recovery time 2

$$t_A = \sum_{I_{B1-A2}}^{n} t_{AX}$$

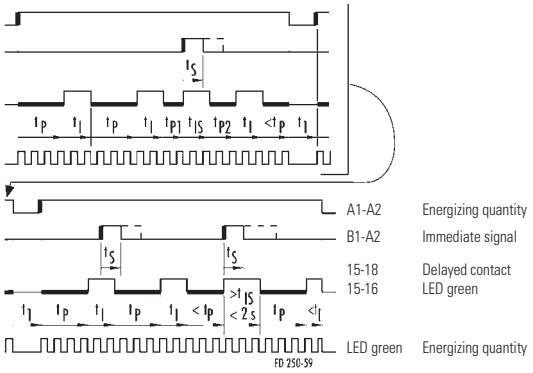
t_I = fixed ON time

Function code 82 = pulse-shaping, with auxiliary supply



t_I = ON time
t_1 = make time, must be > minimum ON time 1
t_2 = break time, must be > recovery time 1
t_3 = time between switching on auxiliary supply and energizing quantity, must be > recovery time 2

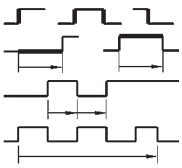
Function code 83-1 s = pulse-generating, 1 s fixed ON time, OFF start, also immediate pulse generation



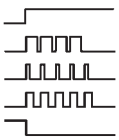
t_P = OFF time
$t_P = t_{P1} + t_{P2}$
t_I = fixed ON time
t_{IS} = fixed immediate put
t_S = immediate signal, must be > minimum ON time 1
t_1 = break time, must be > recovery time 1

Function diagram

Description of the drawing



Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time
LED green Energizing quantity
5-fold function



Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Function codes / times

Function code	Function diagram	Recovery time (ms)			Minimum ON time (ms)	
		1	2	3	1	2
11	250-6	≤ 50	≤ 50	–	≤ 25	–
11-C	250-7	≤ 50	≤ 50	–	–	–
12	250-10	0	0	–	≤ 25	–
21	250-26	≤ 50	≤ 50	–	≤ 25	–
22	250-28	–	–	–	≤ 25	≤ 50
44	250-43	≤ 50	–	–	≤ 25	–
81C-1s	250-55	≤ 50	≤ 25	0	–	–
81C-2s	250-55	≤ 50	≤ 25	0	–	–
82	250-56	0	0	–	≤ 25	–
83-1s	250-59	≤ 50	–	–	≤ 25	–

Timer and switching relays
Multi-function NGM 1004

Technical data	NGM 1004
Product standard (timer relays)	EN 61812-1:1999-08
Relay function according to IEC 60050 (445)	Multi-function relay with multi-time range
Function display	2 LEDs green
Function diagram	See column "Function diagrams"
Input circuit	
Rated voltage A1-A2	AC/DC 24 to 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110%
Rated frequency f_n	50 – 60 Hz ± 5%
Release value of the input voltage (power capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (B1-A2)	1 mA
Rated consumption on control connection (B1-A2)	< 0.25 W
Parallel loads permissible	A1-A2 yes / B1-A2 yes
Internal half-wave rectification	A1-A2 no / B1-A2 yes
Time circuit	
Time setting / number of time ranges	analog / 16
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2/3	See table "Function codes / times"
Minimum ON time 1/2	See table "Function codes / times"
Setting tolerance	≤ ± 5%
Repeatability (to set value)	≤ ± 0.01% + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002%
Influence of voltage (within range)	≤ ± 0.002%
Output circuit	
Contact assignment	1 change-over contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time at excitation of A1-A2	40 ms
Response time / release time at excitation of B1-A2	20 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Degree of protection according to IEC 60529 housing/terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-1
Circuit diagram of the terminals	KS 250-30
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm²
stranded with ferrules	1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm²
Weight	0.1 kg
Accessories	–
Approvals	cSAus being prepared: UL

Overview of devices / Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
NGM 1004	AC/DC 24 – 240 V 50 – 60 Hz	See table "Time ranges"	R2.065.0030.0	1

Timer and switching relays
Multi-function NGM 1003

interface

Multi-function multi-range timer relay

- Multi-voltage for AC/DC 24 up to 240 V
- 10 functions
- Setting range from 0.1 s to 300 h divided into 16 selectable time ranges
- 2 change-over contacts or 1 instantaneous change-over contact and 1 timed change-over contact (function-dependent)
- 3 LEDs for function display

c SP us being prepared: UL

Functions

Setting the function

The function is set with the MODE selector switch and displayed by the function code in the window next to it. The code designation for the function can be found in the column "Function diagrams".

Setting the time delay

The time range is set with the RANGE selector switch and displayed in the window next to it. The desired delay time is set with a selecting wheel.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

Function diagram

See the following pages for the function diagrams.

Time ranges

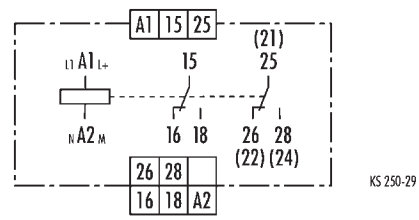
Setting range from 0.1 s to 300 h divided into:

<0.1 ... 1 s	5 ... 100 s	1.5 ... 30 min	0.5 ... 10 h
0.15 ... 3 s	15 ... 300 s	3 ... 60 min	1.5 ... 30 h
0.5 ... 10 s	50 ... 1000 s	5 ... 100 min	5 ... 100 h
1.5 ... 30 s	0.5 ... 10 min	0.15 ... 3 h	15 ... 300 h

Notes

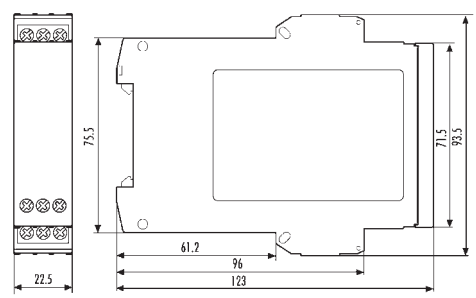
- The device is designed for multi-voltage. Connect phase L1 or L+ to terminal A1 and B1 and neutral N and/or M to terminal A2.
- You can change the function or delay time during operation. The change is effective immediately.

Circuit diagram



KS 250-29

Dimension diagram

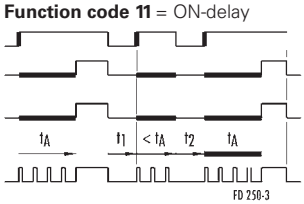


K 3-3

Interface

Function diagrams

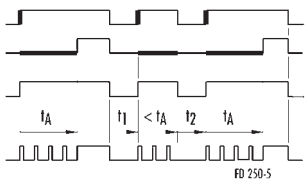
Function code 11 = ON-delay



A1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
25-28 Delayed contact
25-26 LED green
LED green Energizing quantity

t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

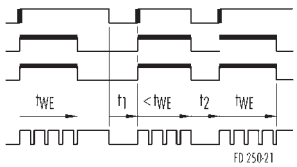
Function code 11-ON = ON-delay



A1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
21-24 Instantaneous contact
21-22 LED green
LED green Energizing quantity

t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

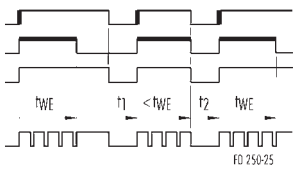
Function code 21 = interval ON



A1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
25-28 Delayed contact
25-26 LED green
LED green Energizing quantity

t_{WE} = interval ON time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

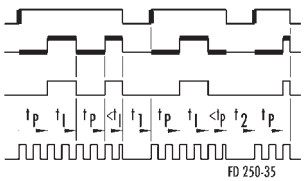
Function code 21-ON = interval ON



A1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
21-24 Instantaneous contact
21-22 LED green
LED green Energizing quantity

t_{WE} = interval ON time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Function code 41 = clock-generating, with OFF start

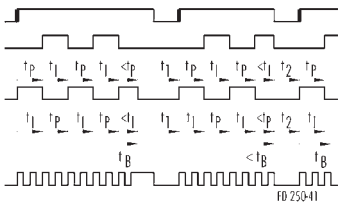


A1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
25-28 Delayed contact
25-26 LED green
LED green Energizing quantity

t_P = OFF time
t_I = ON time
$t_P = t_I$
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Function diagrams

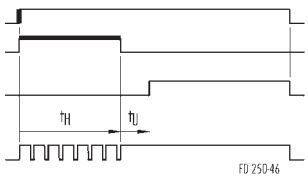
Function code 43-44 = clock-generating, 0.5 s fixed OFF and ON time, OFF/ON start, with cycle time setting



A1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
25-28 Delayed contact
25-26 LED green
LED green Energizing quantity

t_B = cycle time
t_P = fixed OFF time
t_I = fixed ON time
$t_1 = t_P$
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

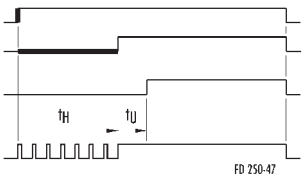
Function code 51 = star-delta switching, interval ON



A1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green Y
25-28 Delayed contact
25-26 LED green Δ
LED green Energizing quantity

t_H = acceleration time t_U = transit time 100 ms

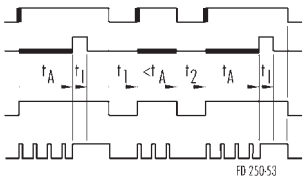
Function code 52 = star-delta switching, 2-fold ON-delay



A1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green Y
25-28 Delayed contact
25-26 LED green Δ
LED green Energizing quantity

t_H = acceleration time t_U = transit time 100 ms

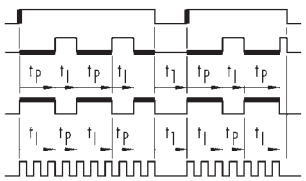
Function code 81-1 s-ON = ON-delay, pulse-generating, 1 s fixed ON time



A1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
21-24 Instantaneous contact
21-22 LED green
LED green Energizing quantity

t_A = operating time
t_I = fixed ON time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Function code 83-84-1 s = pulse-generating, 1 s fixed ON or OFF time

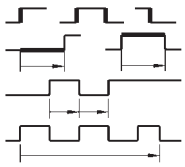


A1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
25-28 Delayed contact
25-26 LED green
LED green Energizing quantity

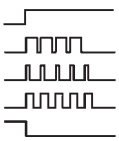
t_P = OFF time
t_I = ON time
t_1 = break time, must be > recovery time 1

Function diagram

Description of the drawing



Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time
LED green Energizing quantity
5-fold function



Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Function codes / times

Function code	Function diagram	Recovery time (ms)			Minimum ON time (ms)	
		1	2	3	1	2
11	250-3	≤ 50	≤ 50	–	–	–
11-ON	250-5	≤ 50	≤ 50	–	–	–
21	250-21	≤ 50	≤ 50	–	–	–
21-ON	250-25	≤ 50	≤ 50	–	–	–
41	250-35	≤ 50	≤ 50	–	–	–
43-44	250-41	≤ 50	≤ 50	–	–	–
51	250-46	–	–	–	–	–
52	250-47	–	–	–	–	–
81-1s-ON	250-53	≤ 50	≤ 50	–	–	–
83-84-1s	250-60	≤ 50	–	–	–	–

Timer and switching relays
Multi-function NGM 1003

Technical data	NGM 1003
Product standard (timer relays)	EN 61812-1:1999-08
Relay function according to IEC 60050 (445)	Multi-function relay with multi-time range
Function display	3 LEDs green
Function diagram	See column "Function diagrams"
Input circuit	
Rated voltage A1-A2	AC/DC 24 to 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 to 110%
Rated frequency f_n	50 – 60 Hz ± 5%
Release value of the input voltage (power capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes
Internal half-wave rectification	A1-A2 no
Time circuit	
Time setting / number of time ranges	analog / 16
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2/3	See table "Function codes / times"
Minimum ON time 1/2	See table "Function codes / times"
Setting tolerance	≤ ± 5%
Repeatability (to set value)	≤ ± 0.01% + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002%
Influence of voltage (within range)	≤ ± 0.002%
Output circuit	
Contact assignment	2 change-over contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 to 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time at excitation of A1-A2	40 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Degree of protection according to IEC 60529 housing/terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-3
Circuit diagram of the terminals	KS 250-29
Wire ranges stranded or solid stranded with ferrules	1 x 0.2 to 6 or 2 x 0.2 to 2.5 mm² 1 x 0.4 to 4 or 2 x 0.2 to 1.5 mm²
Weight	0.13 kg
Accessories	–
Approvals	c SP us being prepared: UL

Overview of devices / Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
NGM 1003	AC/DC 24 – 240 V 50 – 60 Hz	See table "Time ranges"	R2.065.0020.0	1

Timer and switching relays
Multi-function NGM 1002

interface

Multi-function multi-range timer relay

- Multi-voltage for AC/DC 24 up to 240 V
- 10 functions
- Setting range from 0.1 s to 300 h divided into 16 selectable time ranges
- 1 change-over contact
- 2 LEDs for function display

being prepared:

Function

Setting the function

The function is set with the MODE selector switch and displayed by the function code in the window next to it. The code designation for the function can be found in the column "Function diagrams".

Setting the time delay

The time range is set with the RANGE selector switch and displayed in the window next to it. The desired delay time is set with a selecting wheel.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

Function diagram

See the following pages for the function diagrams.

Time ranges

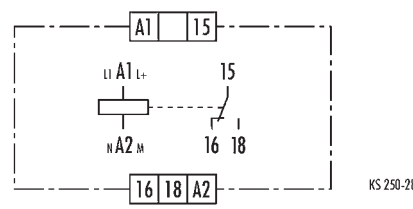
Setting range from 0.1 s to 300 h divided into:

<0.1 ... 1 s	5 ... 100 s	1.5 ... 30 min	0.5 ... 10 h
0.15 ... 3 s	15 ... 300 s	3 ... 60 min	1.5 ... 30 h
0.5 ... 10 s	50 ... 1000 s	5 ... 100 min	5 ... 100 h
1.5 ... 30 s	0.5 ... 10 min	0.15 ... 3 h	15 ... 300 h

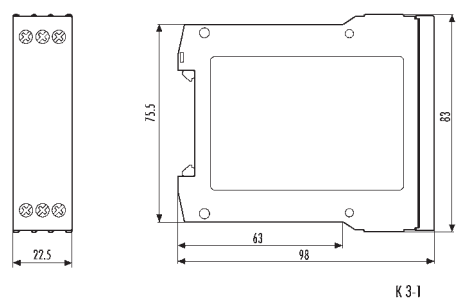
Notes

- The device is designed for multi-voltage. Connect phase L1 or L+ to terminal A1 and B1 and neutral N and/or M to terminal A2.
- You can change the function or delay time during operation. The change is effective immediately.

Circuit diagram

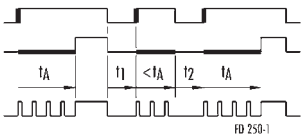


Dimension diagram



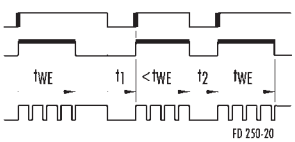
Function diagrams

Function code 11 = ON-delay



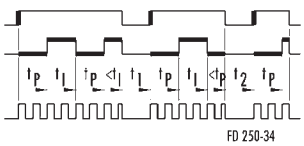
t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Function code 21 = interval ON



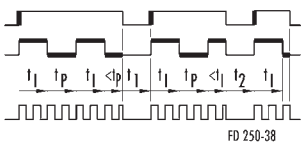
t_{WE} = interval ON time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Function code 41 = clock-generating, with OFF start



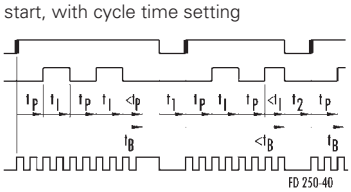
t_P = OFF time
t_I = ON time
$t_P = t_I$
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Function code 42 = clock-generating, with ON start



t_I = ON time
t_P = OFF time
$t_I = t_P$
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

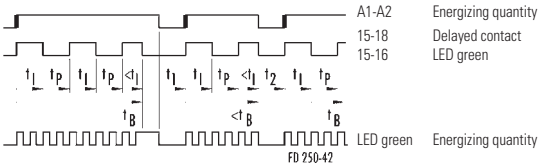
Function code 43 = clock-generating, 0.5 s fixed OFF and ON time, OFF/ON start, with cycle time setting



t_B = cycle time
t_P = fixed OFF time
t_I = fixed ON time
$t_I = t_P$
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

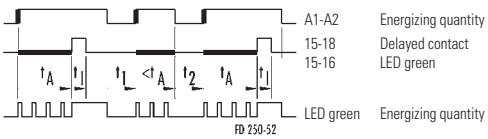
Function diagrams

Function code 44 = clock-generating, 0.5 s fixed ON and OFF time, ON start, with cycle time setting range



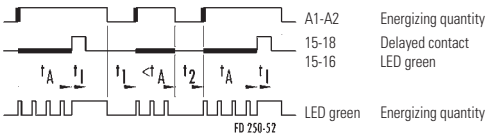
t_B = cycle time
t_P = fixed OFF time
t_I = fixed ON time
$t_I = t_P$
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Function code 81-1s = ON-delay, pulse-generating, 1 s fixed ON time



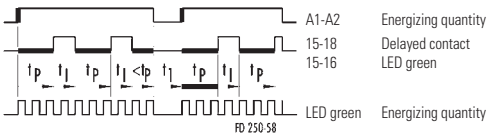
t_A = operating time
t_I = fixed ON time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Function code 81-2s = ON-delay, pulse-generating, 2 s fixed ON time



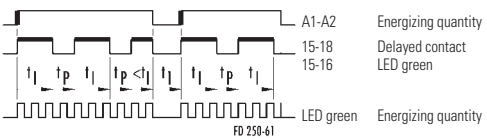
t_A = operating time
t_I = fixed ON time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Function code 83-1s = pulse-generating, OFF start, 1 s fixed ON time



t_P = OFF time
t_I = ON time
t_1 = break time, must be > recovery time 1

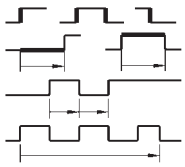
Function code 84-1s = pulse-generating, ON start, 1 s fixed OFF time



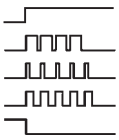
t_I = ON time
t_P = OFF time
t_1 = break time, must be > recovery time 1

Function diagram

Description of the drawing



Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time
LED green Energizing quantity
5-fold function



Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Function codes / times

Function code	Function diagram	Recovery time (ms)			Minimum ON time (ms)	
		1	2	3	1	2
11	250-1	≤ 50	≤ 50	–	–	–
21	250-20	≤ 50	≤ 50	–	–	–
41	250-34	≤ 50	≤ 50	–	–	–
42	250-38	≤ 50	≤ 50	–	–	–
43	250-40	≤ 50	≤ 50	–	–	–
44	250-42	≤ 50	≤ 50	–	–	–
81-1s	250-52	≤ 50	≤ 50	–	–	–
81-2s	250-52	≤ 50	≤ 50	–	–	–
83-1s	250-58	≤ 50	–	–	–	–
84-1s	250-61	≤ 50	–	–	–	–

Technical data	NGM 1002
Product standard (timer relays)	EN 61812-1:1999-08
Relay function according to IEC 60050 (445)	Multi-function relay with multi-time range
Function display	2 LEDs green
Function diagram	See column "Function diagrams"
Input circuit	
Rated voltage A1-A2	AC/DC 24 to 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110%
Rated frequency f_n	50 to 60 Hz ± 5%
Release value of the input voltage (power capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes
Internal half-wave rectification	A1-A2 no
Time circuit	
Time setting / number of time ranges	analog / 16
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2/3	See table "Function codes / times"
Minimum ON time 1/2	See table "Function codes / times"
Setting tolerance	≤ ± 5%
Repeatability (to set value)	≤ ± 0.01% + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002%
Influence of voltage (within range)	≤ ± 0.002%
Output circuit	
Contact assignment	1 change-over contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time at excitation of A1-A2	40 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Degree of protection according to IEC 60529 housing/terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-1
Circuit diagram of the terminals	KS 250-28
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 to 2.5 mm²
stranded with ferrules	1 x 0.4 – 4 or 2 x 0.2 to 1.5 mm²
Weight	0.1 kg
Accessories	–
Approvals	c SP us being prepared: UL

Overview of devices / Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
NGM 1002	AC/DC 24 – 240 V 50 – 60 Hz	See table "Time ranges"	R2.065.0010.0	1

Timer and switching relays
Multi-function NGMP 1001

interface

Multi-function multi-range timer relay with remote potentiometer connection

- Multi-voltage for AC/DC 24 up to 240 V
- 10 functions
- Setting range from 0.1 s to 300 h divided into 16 selectable time ranges
- Remote potentiometer connection
- 1 change-over contact
- 2 LEDs for function display

cSAus being prepared: UL

Functions

Setting the function

The function is set with the MODE selector switch and displayed by the function code in the window next to it. The code designation for the function can be found in the column "Function diagrams".

Setting the time delay

The time range is set with the RANGE selector switch and displayed in the window next to it. The desired delay time is set with a selecting wheel.

Connecting a remote potentiometer allows you to set parameters at greater distances. When a remote potentiometer is used, the time selecting wheel is to be set to the right-hand stop above the largest value. Operation without remote potentiometer does not require a jumper on the device.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

Function diagram

See the following pages for the function diagrams.

Time ranges

Setting range from 0.1 s to 300 h divided into:

<0.1 ... 1 s	5 ... 100 s	1.5 ... 30 min	0.5 ... 10 h
0.15 ... 3 s	15 ... 300 s	3 ... 60 min	1.5 ... 30 h
0.5 ... 10 s	50 ... 1000 s	5 ... 100 min	5 ... 100 h
1.5 ... 30 s	0.5 ... 10 min	0.15 ... 3 h	15 ... 300 h

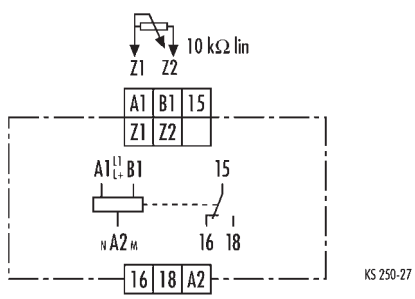
Accessories

Accessories: Remote potentiometer FP 10 k

Notes

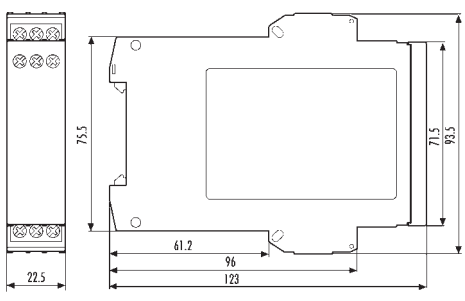
- The device is designed for multi-voltage. Connect phase L1 or L+ to terminal A1 and B1 and neutral N and/or M to terminal A2.
- You can change the function or delay time during operation. The change is effective immediately.

Circuit diagram



KS 250-27

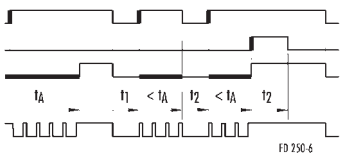
Dimension diagram



K 3-3

Function diagrams

Function code 11 = ON-delay, also immediate operation

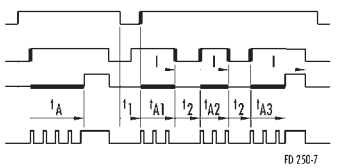


A1-A2 Energizing quantity
B1-A2 Immediate signal
15-18 Delayed contact
15-16 LED green

LED green Energizing quantity

t_A = operating time
t_S = immediate signal, must be > minimum ON time 1
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Function code 11C = ON-delay, accumulative y/n, with auxiliary supply



A1-A2 Auxiliary supply
B1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green

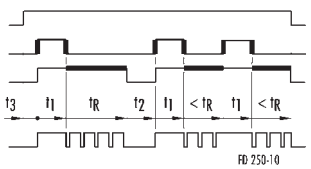
LED green Energizing quantity

t_A = operating time

$t_A = \sum_{B1\text{-}A2}^{n} t_{AX}$

t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Function code 12 = OFF-delay, with auxiliary supply

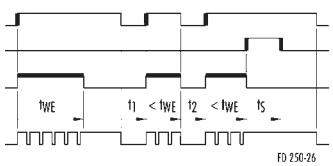


A1-A2 Auxiliary supply
B1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green

LED green Energizing quantity

t_R = returning time
t_1 = make time, must be > minimum ON time 1
t_2 = break time, must be > recovery time 2
t_3 = time between switching on auxiliary power and energizing quantity, must be > recovery time 1

Function code 21 = interval ON, also immediate release

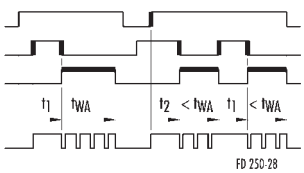


A1-A2 Energizing quantity
B1-A2 Immediate signal
15-18 Delayed contact
15-16 LED green

LED green Energizing quantity

t_{WE} = interval ON time
t_S = immediate signal, must be > minimum ON time 1
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Function code 22 = interval OFF, with auxiliary supply



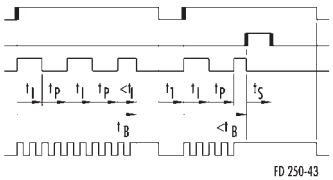
A1-A2 Auxiliary supply
B1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green

LED green Energizing quantity

t_{WA} = interval OFF time
t_1 = make time, must be > minimum ON time 1
t_2 = make time, must be > minimum ON time 2

Function diagrams

Function code 44 = clock-generating, 0.5 s fixed ON and OFF time, ON start, with cycle time setting range, also immediate release

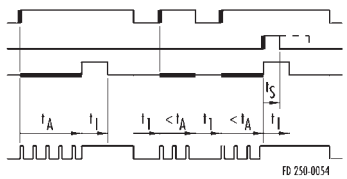


A1-A2 Energizing quantity
B1-A2 Immediate signal
15-18 Delayed contact
15-16 LED green

LED green Energizing quantity

t_B = cycle time
t_1 = fixed ON time
t_P = fixed OFF time
$t_1 = t_P$
t_S = immediate signal, must be > minimum ON time 1
t_1 = break time, must be > recovery time 1

Function code 81-1s = ON-delay, pulse-generating, 1 s fixed ON time, also immediate pulse generation

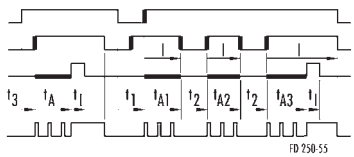


A1-A2 Energizing quantity
B1-A2 Immediate signal
15-18 Delayed contact
15-16 LED green

LED green Energizing quantity

t_A = operating time
t_1 = fixed ON time
t_S = immediate signal, must be > minimum ON time 1
t_1 = break time, must be > recovery time 1

Function code 81C-3s = ON-delay, accumulative y/n, pulse-generating, 3 s fixed ON time, with auxiliary supply



A1-A2 Auxiliary supply
B1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green

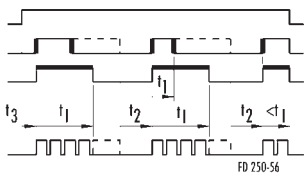
LED green Energizing quantity

t_A = operating time

$t_A = \sum_{B1\text{-}A2}^{n} t_{AX}$

t_1 = fixed ON time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2
t_3 = time between switching on auxiliary supply and energizing quantity, must be > recovery time 3

Function code 82 = pulse-shaping, with auxiliary supply



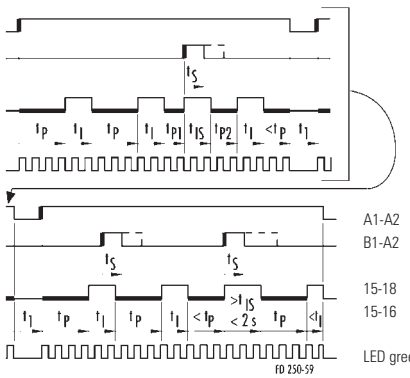
A1-A2 Auxiliary supply
B1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green

LED green Energizing quantity

t_1 = On time
t_1 = make time, must be > minimum ON time 1
t_2 = break time, must be > recovery time 2
t_3 = time between switching on auxiliary power and energizing quantity, must be > recovery time 2

Function diagrams

Function code 83-1s = pulse-generating, 1 s fixed ON time, OFF start, also immediate pulse generation



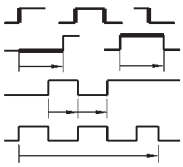
A1-A2 Energizing quantity
B1-A2 Immediate signal

15-18 Delayed contact
15-16 LED green

LED green Energizing quantity

t_P = OFF time
t_P = t_{P1} + t_{P2}
t_I = fixed ON time
t_{IS} = fixed immediate pulse time
t_S = immediate signal, must be > minimum ON time 1
t_1 = break time, must be > recovery time 1

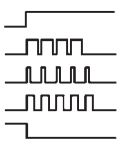
Description of the drawing



Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time

LED green Energizing quantity

5-fold function



Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Function codes / times

Function code	Function diagam	Recovery time (ms)			Minimum ON time (ms)	
		1	2	3	1	2
11	250-3	≤ 50	≤ 50	–	≤ 25	–
11C	250-5	≤ 50	≤ 25	–	–	–
12	250-10	0	0	–	≤ 25	–
21	250-26	≤ 50	≤ 50	–	≤ 25	–
22	250-28	–	–	–	≤ 25	≤ 50
44	250-43	≤ 50	–	–	≤ 25	–
81C-1s	250-55	≤ 50	≤ 25	0	–	–
81C-2s	250-55	≤ 50	≤ 25	0	–	–
82	250-56	0	0	–	≤ 25	–
83-1s	250-59	≤ 50	–	–	≤ 25	–

Timer and switching relays
Multi-function NGMP 1001

Technical data	NGMP 1001
Product standard (timer relay)	EN 61812-1:1999-08
Relay function according to IEC 60050 (445)	Multi-function relay with multi-time range
Function display	2 LEDs green
Function diagram	See column "Function diagrams"
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits f_n	70 – 110 %
Rated frequency f_n	50 – 60 Hz ± 5 %
Release value of the input voltage (power capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current Control connection (B1-A2)	1 mA
Rated consumption Control connection (B1-A2)	< 0.25 W
Parallel loads permissible	A1-A2 yes / B1-A2 yes
Internal half-wave rectification	A1-A2 no / B1-A2 yes
Time circuit	
Time setting / number of time ranges	analog (internal + external) / 16
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2/3	See table "Function codes / times"
Minimum ON time 1/2	See table "Function codes / times"
Setting tolerance	≤ ± 5 %
Repeatability (to set value)	≤ ± 0.01 % + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002 %
Influence of voltage (within range)	≤ ± 0.002 %
Output circuit	
Contact assignment	1 change-over contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time at excitation of A1-A2	40 ms
Response time / release time at excitation of B1-A2	20 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals Noise	IP 40 / IP 20
Immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-3
Circuit diagram of the terminals	KS 250-27
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm²
stranded with ferrules	1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm²
Weight	0.12 kg
Accessories	Remote potentiometer FP 10 k
Approvals	cSPus being prepared: UL

Overview of devices / Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
NGMP 1001	AC/DC 24 – 240 V 50 – 60 Hz	See table "Time ranges"	R2.065.0050.0	1

Timer and switching relays
Multi-function KZL 92, KZL 91

interface

Multi-function multi-range timer relay

- Multi-voltage for AC/DC 24 up to 230 V
- 8 functions
- Setting range from 0.1 s to 120 h divided into 7 time ranges
- KZL 92 = 1 instantaneous and 1 timed change-over contact or 2 timed change-over contacts (selectable)
- KZL 91 = 1 timed change-over contact

KZL 92

KZL 91

Time ranges

Setting range from 0.1 s to 120 h divided into:

0.1 s ... 1.2 s	0.1 h ... 1.2 h
1 s ... 12 s	1 h ... 12 h
0.1 min ... 1.2 min	10 h ... 120 h
1 min ... 12 min	

General information

The functions and time ranges are set on the front through selector switches.

Setting of the operating mode

Rotate the operating mode selector switch with a screwdriver until the desired operating mode appears in the "MODE" display window.

Functions for KZL 92, KZL 91:

- A = ON-delay (AV)
- B = repeat cycle starting with OFF (TP)
- B2 = repeat cycle starting with ON (TI)
- C = interval ON/OFF (EAW)
- D = OFF-delay (RV)
- E = interval ON (EW)
- G = ON-delay and OFF-delay (ARV)
- J = one shot (ON-delay) (AI)

Setting of the time and time range factor

Rotate the time selector switch located in the upper right corner of the operating panel to set the desired time (sec., min. or hrs.) The time unit will be shown in the display window over the time selecting wheel. The time range factor (0.1 or 1) is set by rotating the selector switch located in the upper left corner of the operating panel. The selected time range factor will be shown in the display window above the selector switch.

Setting of the operating time

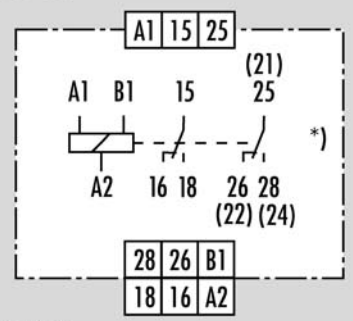
Use the time selecting wheel (ratio 0 – 12) to set the desired operating time.

Setting of the contact assignment

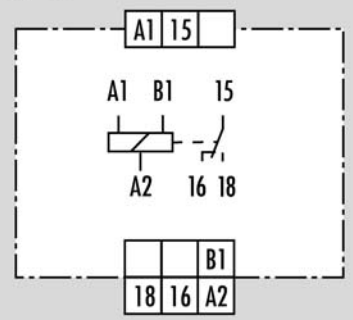
The function of the contacts for the model KZL 92 can be selected through a switch located at the bottom of the housing: 2 timed change-over contacts or 1 instantaneous and 1 timed change-over contact.

Circuit diagram

KZL 92 KS 0328/2



KZL 91 KS 0328/1



*) Instantaneous contacts have other terminal designations (e.g. 21 instead of 25)

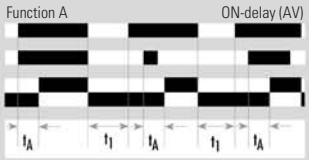
Interface

Function diagrams

KZL 92 (2 timed change-over contact)

FD 239-4/1

Function A — ON-delay (AV)

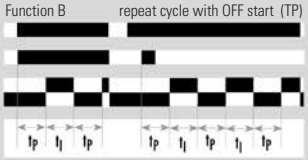


A1/A2 — Supply voltage, LED green
B1 — Energizing quantity
15/18, 25/28 / 15/16, 25/26 — Delayed contact, LED orange

t_A = operating time
t_I = break time, must be > recovery time

FD 239-4/2

Function B — repeat cycle with OFF start (TP)

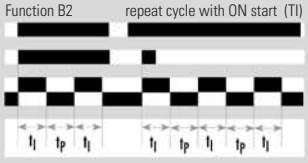


A1/A2 — Supply voltage, LED green
B1 — Energizing quantity
15/18, 25/28 / 15/16, 25/26 — t_P, LED orange

t_I = ON time, t_P = OFF time, $t_I = t_P$

FD 239-4/3

Function B2 — repeat cycle with ON start (TI)

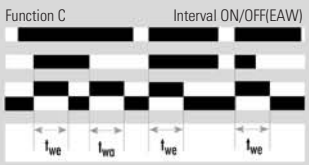


A1/A2 — Supply voltage, LED green
B1 — Energizing quantity
15/18, 25/28 / 15/16, 25/26 — t_I, LED orange

t_I = ON time, t_P = OFF time, $t_I = t_P$

FD 239-4/4

Function C — Interval ON/OFF(EAW)

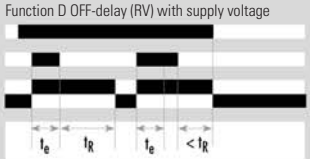


A1/A2 — Supply voltage, LED green
B1 — Energizing quantity
15/18, 25/28 / 15/16, 25/26 — t_{we}, t_{wa}, LED orange

t_{we} = interval ON time
t_{wa} = interval OFF time

FD 239-4/5

Function D OFF-delay (RV) with supply voltage

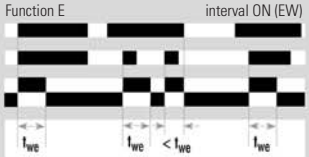


A1/A2 — Supply voltage, LED green
B1 — Energizing quantity
15/18, 25/28 / 15/16, 25/26 — Delayed contact, LED orange

t_R = returning time
t_e = make time, must be > minimum ON time

FD 239-4/6

Function E — interval ON (EW)

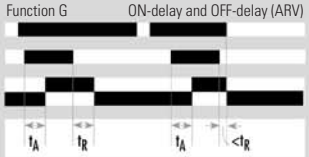


A1/A2 — Supply voltage, LED green
B1 — Energizing quantity
15/18, 25/28 / 15/16, 25/26 — t_{we}, LED orange

t_{we} = interval ON time

FD 239-4/7

Function G — ON-delay and OFF-delay (ARV)

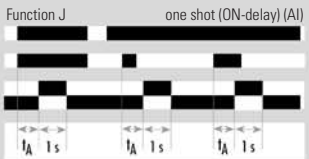


A1/A2 — Supply voltage, LED green
B1 — Energizing quantity
15/18, 25/28 / 15/16, 25/26 — Delayed contact, LED orange

t_A = operating time
t_R = returning time

FD 239-4/8

Function J — one shot (ON-delay) (AI)



A1/A2 — Supply voltage, LED green
B1 — Energizing quantity
15/18, 25/28 / 15/16, 25/26 — 1 s, LED orange

t_A = operating time

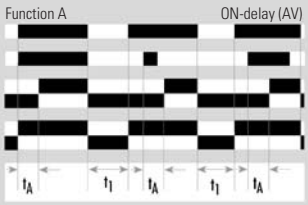
Function diagrams

KZL 92 (1 timed and 1 instantaneous change-over contact)

Corresponding function of the instantaneous contact for all selectable functions.

FD 239-4/9

Function A — ON-delay (AV)

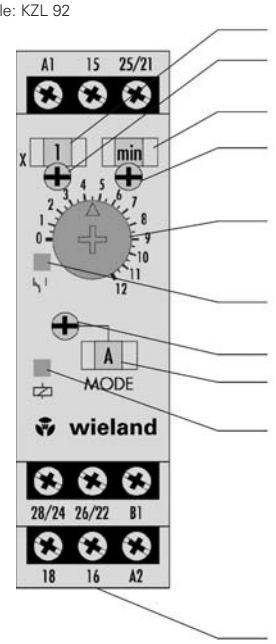


A1/A2 — Supply voltage, LED green
B1 — Energizing quantity
15/18 / 15/16 — Delayed contact, LED orange
21/24 / 21/22 — Instantaneous contact

t_A = operating time
t_I = break time, must be > recovery time

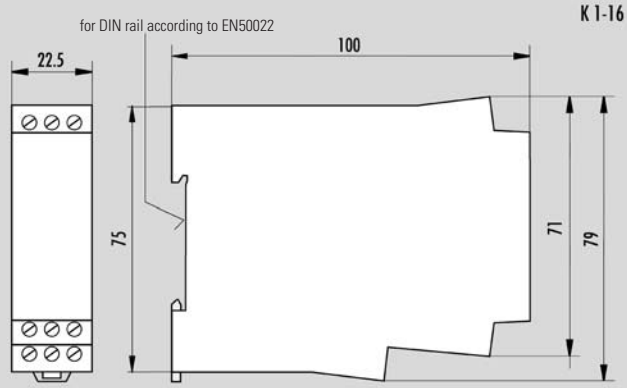
Displays and operating components

Example: KZL 92



Display window for time range factor
Selector switch for time range factor
Display window for time unit
Selector switch for time unit
Time selecting wheel
Output 15/18 (LED orange)
Function selector switch
Function display window
Rated voltage (LED green)
DIP switch (housing bottom) to select the contact assignment

Dimension diagram



Timer and switching relays
Multi-function KZL 92, KZL 91

interface

Technical data	KZL 92	KZL 91
Function type according to IEC 60050 (445)	Multi-function relay with 8 functions for multi-voltage – ON-delay timer relay – OFF-delay timer relay with supply voltage – Interval ON relay – ON-delay and OFF-delay timer relay – Repeat cycle starting with OFF/ON – Interval ON and OFF relay – One shot (ON-delay) relay	
Function display	1 LED green, 1 LED orange	
Function diagram	FD 239-4/1 – 9	
Power supply circuit		
Rated voltage U_N	AC/DC 24 – 230 V	
Rated consumption at 50 Hz and U_N 24 V AC	1.1 VA / 0.9 W	0.7 VA / 0.5 W
Rated consumption at U_N 24 V DC	0.8 W	0.5 W
Rated consumption at 50 Hz and U_N 230 V AC	2.8 VA / 1.6 W	2.3 VA / 1.5 W
Rated consumption at U_N 230 V DC	1.6 W	1.4 W
Starting current inrush A1/A2 at 24 V DC	ca. 250 mA	
Rated frequency	50 – 60 Hz	
Operating voltage range	0.85 – 1.1 x U_N	
Rated current B1 – Input at 50 Hz and U_N 24 V AC	0.1 mA	
Rated current B1 – Input at U_N 24 V DC	0.2 mA	
Rated current B1 – Input at 50 Hz and U_N 230 V AC	0.8 mA	
Rated current B1 – Input at U_N 230 V DC	1.5 mA	
Minimum ON time B1	50 ms	
Excitation voltage B1	High: 20.4 – 253 V AC/DC; Low: 0 – 2.4 V AC/DC	
Release value of the excitation voltage B1	< 8 V AC/DC	
Time circuit		
Time setting / number of time ranges	analog / 7	
Possible setting range	See table "Time ranges"	
Recovery time	≥ 100 ms	
Repeatability	± 1 % + ± 10 ms average value of all measured values	
Setting tolerance	± 10 % + ± 50 ms	
Influence of the energizing quantity or supply voltage	± 0.5 % + ± 10 ms	
Influence of the ambient temperature	± 2 % + ± 10 ms	
Output circuit		
Contact assignment	1 instantaneous and 1 timed change-over contact or 2 timed change-over contacts	1 timed change-over contact
Contact material	AgNi gold-flashed	
Rated operating voltage U_n	230/125 V AC/DC	
Max. continuous current I_n	5 A	
Application category according to EN 60947-5-1:1991	AC-13: U_e 250 V AC, I_e 5 A DC-13: U_e 24 V DC, I_e 0.1 A AC-15: U_e 250 V AC, I_e 3 A	
Permissible switching frequency	≤ 3600 switching cycles/h	
Mechanical life	10 x 10^6 switching cycles	
Electrical life	80 x 10^4 switching cycles at AC 5 A, 250 V, 360 switching cycles/h	
General information		
Creepage distances and clearances between the circuits	according to DIN VDE 0110-1:04.97	
Rated impulse voltage	4 kV	
Overvoltage category	III	
Degree of pollution	2 outside, 2 inside	
Rated voltage	250 V AC	
Test voltage **Ueff** 50 Hz according to DIN VDE 0110-1, table A.1	2.21 kV	
Protection degree housing/terminals according to DIN VDE 0470 sec. 1:11.92	IP 30 / IP 20	
Noise immunity according to IEC 61000-4	Test severity 3	
Ambient temperature, operating range	-10 – +55 °C	
Dimension diagram	K1-16	
Circuit diagram	KS 0328/2	KS 0328/1
Weight	0.12 kg	
Accessories	–	
Approvals		

Overview of devices / Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
KZL 91	AC/DC 24 – 230 V 50 – 60 Hz	See table "Time ranges"	R2.066.0030.1	1
KZL 92	AC/DC 24 – 230 V 50 – 60 Hz	See table "Time ranges"	R2.066.0040.0	1

Timer and switching relays
Multi-function KZL 72, KZL 71

Interface

Multi-function multi-range timer relay

- Multi-voltage for AC/DC 24 up to 230 V
- 4 functions
- Setting range from 0.1 s to 120 h divided into 7 time ranges
- KZL 72 = 1 instantaneous and 1 timed change-over contact or 2 timed change-over contacts (selectable)
- KZL 71 = 1 timed change-over contact

KZL 72

KZL 71

Time ranges

Setting range from 0.1 s to 120 h divided into:

0.1 s … 1.2 s	0.1 h … 1.2 h
1 s … 12 s	1 h … 12 h
0.1 min … 1.2 min	10 h … 120 h
1 min … 12 min	

General information

The functions and time ranges are set on the front through selector switches.

Setting of the operating mode

Rotate the operating mode selector switch with a screwdriver until the desired operating mode appears in the "MODE" display window.

Functions for KZL 72, KZL 71:

- A = ON-delay (AV)
- B2 = repeat cycle starting with ON (TI)
- E = interval ON (EW)
- J = one shot (ON-delay) (AI)

Setting of the time and time range factor

Rotate the time selector switch located in the upper right corner of the control panel to set the desired time (sec., min. or hrs.) The time unit will be shown in the display window over the time selecting wheel. The time range factor (0.1 or 1) is set by rotating the selector switch located in the upper left corner of the operating panel. The selected time range factor will be shown in the display window above the selector switch.

Setting of the operating time

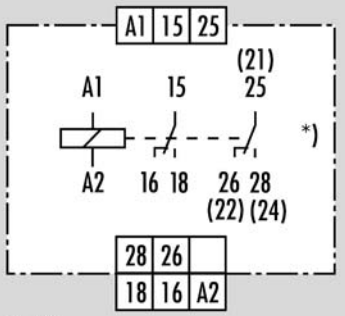
Use the time selecting wheel (ratio 0 – 12) to set the desired operating time.

Setting of the contact assignment

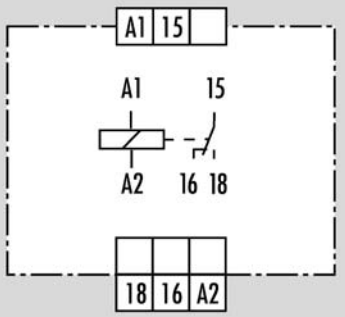
The function of the contacts for the model KZL 72 can be selected through a switch located at the bottom of the housing: 2 timed change-over contacts or 1 instantaneous and 1 timed change-over contact.

Circuit diagram

KZL 72 KS 0328/4



KZL 71 KS 0328/3



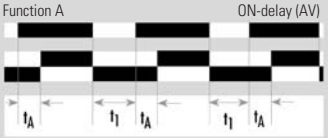
*) Instantaneous contacts have other terminal designations (e.g. 21 instead of 25)

Function diagrams

KZL 72 (2 timed change-over contacts)

FD 239-4/10

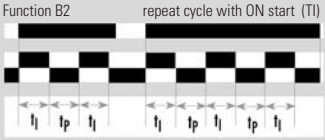
Function A — ON-delay (AV)



A1/A2 — Supply voltage, LED green
15/18, 25/28
15/16, 25/26 — Delayed contact, LED orange
t_A = operating time
t_I = break time, must be > recovery time

FD 239-4/11

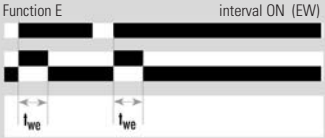
Function B2 — repeat cycle with ON start (TI)



A1/A2 — Supply voltage, LED green
15/18, 25/28
15/16, 25/26 — t_I, LED orange
t_I = ON time t_P = OFF time $t_I = t_P$

FD 239-4/12

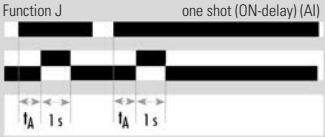
Function E — interval ON (EW)



A1/A2 — Supply voltage, LED green
15/18, 25/28
15/16, 25/26 — t_{WE}, LED orange
t_{WE} = interval ON time

FD 239-4/13

Function J — one shot (ON-delay) (AI)



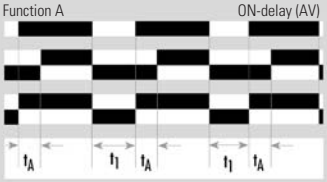
A1/A2 — Supply voltage, LED green
15/18, 25/28
15/16, 25/26 — 1 s, LED orange
t_A = operating time

KZL 72 (1 timed and 1 instantaneous change-over contact)

Corresponding function of the instantaneous contact for all selectable functions.

FD 239-4/14

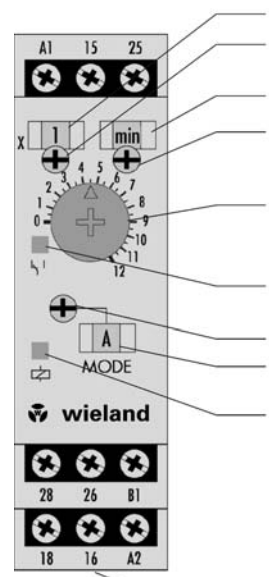
Function A — ON-delay (AV)



A1/A2 — Supply voltage, LED green
15/18
15/16 — Delayed contact, LED orange
21/24
21/22 — Instantaneous contact
t_A = operating time
t_I = break time, must be > recovery time

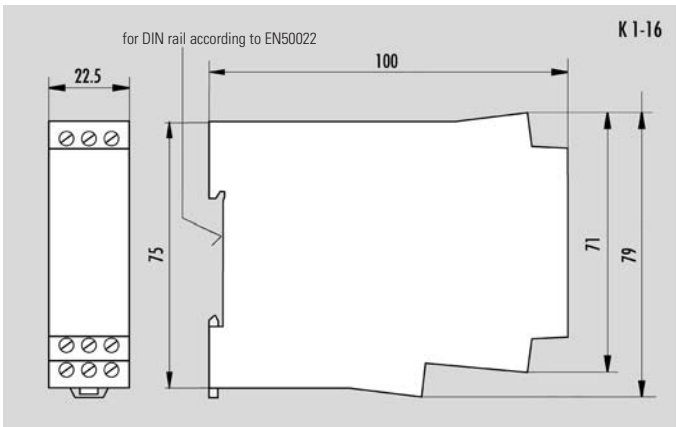
Displays and operating components

Example: KZL 72



Display window for time range factor
Selector switch for time range factor
Display window for time unit
Selector switch for time unit
Time selecting wheel
Output 15/18 (LED orange)
Function selector switch
Function display window
Rated voltage (LED green)
DIP switch (housing bottom) to select the contact assignment

Dimension diagram



Timer and switching relays
Multi-function KZL 72, KZL 71

Technical data	KZL 72	KZL 71
Function type according to IEC 60050 (445)	Multi-function relay with 4 functions for multi-voltage – ON-delay timer relay – Interval ON relay – Repeat cycle starting with ON – One shot (ON-delay) relay	
Function display	1 LED green, 1 LED orange	
Function diagram	FD 239-4/10 – 14	
Power supply circuit		
Rated voltage U_N	AC/DC 24 – 230 V	
Rated consumption at 50 Hz and U_N 24 V AC	1.1 VA / 0.9 W	0.7 VA / 0.6 W
Rated consumption at U_N 24 V DC	0.9 W	0.6 W
Rated consumption at 50 Hz and U_N 230 V AC	2.7 VA / 1.7 W	2.3 VA / 1.4 W
Rated consumption at U_N 230 V DC	1.4 W	1.4 W
Starting current inrush A1/A2 at 24 V DC	ca. 250 mA	
Rated frequency	50 – 60 Hz	
Operating voltage range	0.85 – 1.1 x U_N	
Release value of the excitation voltage A1/A2	< 8 V AC/DC	
Time circuit		
Time setting / number of time ranges	analog / 7	
Possible setting range	See table "Time ranges"	
Recovery time	≥ 100 ms	
Repeatability	± 1% + ± 10 ms average value of all measured values	
Setting tolerance	± 10% + ± 50 ms	
Influence of the energizing quantity or supply voltage	± 0.5% + ± 10 ms	
Influence of the ambient temperature	± 2% + ± 10 ms	
Output circuit		
Contact assignment	1 instantaneous and 1 timed change-over contact or 2 timed change-over contacts	1 timed change-over contact
Contact material	AgNi gold-flashed	
Rated operating voltage U_n	230/125 V AC/DC	
Max. continuous current I_n	5 A	
Application category according to EN 60947-5-1:1991	AC-13: U_e 250 V AC, I_e 5 A DC-13: U_e 24 V DC, I_e 0.1 A AC-15: U_e 250 V AC, I_e 3 A	
Permissible switching frequency	≤ 3600 switching cycles/h	
Mechanical life	10 x 10^6 switching cycles	
Electrical life	80 x 10^4 switching cycles at AC 5 A, 250 V, 360 switching cycles/h	
General information		
Creepage distances and clearances between the circuits	according to DIN VDE 0110-1:04.97	
Rated impulse voltage	4 kV	
Overvoltage category	III	
Degree of pollution	3 outside, 2 inside	
Rated voltage	250 V AC	
Test voltage U_{eff} 50 Hz according to DIN VDE 0110-1, table A.1	2.21 kV	
Protection degree housing/terminals according to DIN VDE 0470 sec. 1:11.92	IP 30 / IP 20	
Noise immunity according to IEC 61000-4	Test severity 3	
Ambient temperature, operating range	–10 – +55 °C	
Dimension diagram	K1-16	
Circuit diagram	KS 0328/4	KS 0328/3
Weight	0.12 kg	
Accessories	–	
Approvals		

Overview of devices / Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
KZL 71	AC/DC 24 – 230 V 50 – 60 Hz	See table "Time ranges"	R2.066.0010.0	1
KZL 72	AC/DC 24 – 230 V 50 – 60 Hz	See table "Time ranges"	R2.066.0020.0	1

Multi-function timer relay
- ON-delay
- One shot
- OFF start – flashing
- ON start – flashing
- OFF-delay
- Time range 0.1 sec – 300 sec

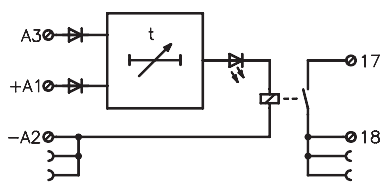
flare TIMER-S
Multi-function timer relay
Approvals:

Dimensions (mm): W x H x D
6.2 x 89 x 70

Time range	Type	Part No.	Std. Pack
0.1 – 300 sec, spring clamp connection	flare-TIMER-S-250250V6A	81.020.4100.0	10
Coil circuit			
Operating voltage	24 V DC + 25%/-20%		
Control voltage	24 V DC + 25%/-20%		
Nominal current	ca. 10 mA		
Time setting	At the front (behind the hinged marking tag carrier)		
Setting of function	DIP switch S1–S5/potentiometer		
Status display	LED green		
Repeatability	± 1% of selected range		
Switching behavior			
Max. switching voltage	250 V AC / 300 V DC		
Max. switching current	6 A AC / 2 A DC		
Max. switching capacity	1500 VA / 48 W		
Max. starting current	10 A; 4 sec.		
ON/OFF delay	1 ms / 5 ms		
Chatter time	2 ms		
Max. switching frequency	20 Hz		
Contact material	$AgSnO_2$		
Min. selectable voltage	12 V		
Min. selectable current	8 mA		
Mechanical life	2×10^7		
Electrical life 24 V DC / 2 A	6×10^5		
Electrical life 230 V AC / 6 A	8×10^4		
Rated voltage			
Isolation voltage of input/output	$4\ kV_{eff.}$		
Overvoltage category	III (according to HD 625.1S1)		
Degree of pollution	2 (according to HD 625.1S1)		
Ambient temperature	0 °C...+50 °C		
Storage temperature	–40 °C...+80 °C		
Protection type/mounting rail	IP 20 / TS35		
Standards/specifications	VDE 0160; VDE 0106 T101		
Emitted interference/interference immunity	EN 61000-6-3; EN 61000-6-2		
Wire range of screw terminals	–		
Wire range of spring clamp terminals			
fine-stranded	$0.14\ mm^2$ – $1.5\ mm^2$		
solid	$0.5\ mm^2$ – $2.5\ mm^2$		
CSA EX	Class I, Division 2, Groups A, B, C and D		
Accessories			
Pluggable jumper ($U_{max.}$ = 50 V, $I_{max.}$ = 2 A)		Z8.000.0200.8	10
8 digit marking tag, unmarked, 60 pcs.		Z4.242.5153.0	10

Wiring diagram for multi-function timer relay *flare* TIMER-S

Multi-function



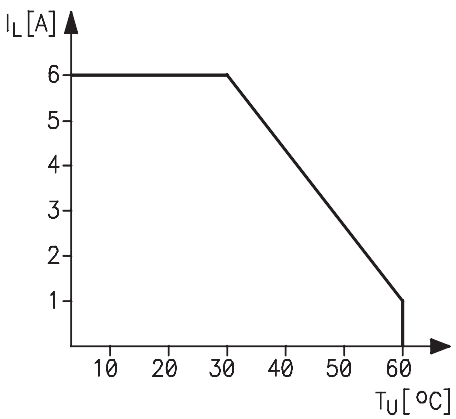
Setting the type of function

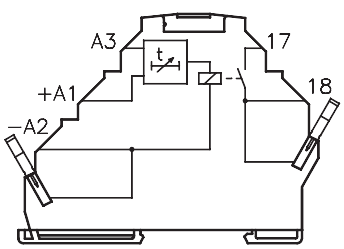
Function	DIP switch 1	2	3
ON-delay	ON	ON	ON
One shot	ON	OFF	ON
ON start, flashing	ON	ON	OFF
OFF start, flashing	ON	OFF	OFF
OFF-delay	OFF	OFF	OFF

Setting the time ranges

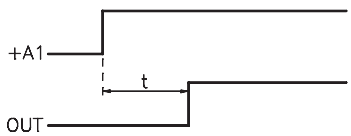
Timer range ± 20% t min	t max	DIP switch 4	5
0.1	1.2 sec	OFF	ON
0.4	5 sec	ON	OFF
3.5	40 sec	ON	ON
30	300 sec	OFF	OFF

Derating: timer relays

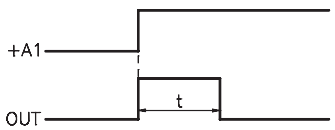




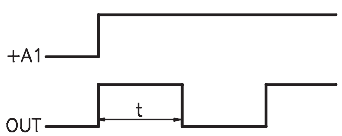
Contact assignment: timer relay



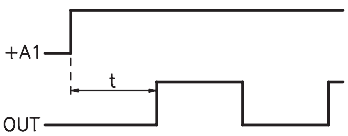
ON-delay



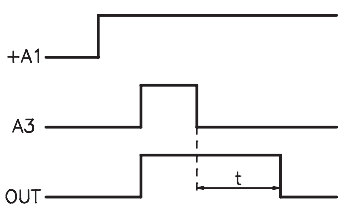
One shot



ON start, flashing



OFF start, flashing



OFF-delay

Timer and switching relays
Interval ON NGY 71

interface

Interval ON multi-range relay

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: interval ON (EW)
- Setting range from 0.1 s to 300 h divided into 16 selectable time ranges
- 1 change-over contact
- 2 LEDs for function display

c SP us being prepared: UL

Function

Setting the time delay

The time range is set with the RANGE selector switch and displayed in the window next to it. The desired delay time is set with a selecting wheel.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

Time ranges

Setting range from 0.1 s to 300 h divided into:

<0.1 ... 1 s	5 ... 100 s	1.5 ... 30 min	0.5 ... 10 h
0.15 ... 3 s	15 ... 300 s	3 ... 60 min	1.5 ... 30 h
0.5 ... 10 s	50 ... 1000 s	5 ... 100 min	5 ... 100 h
1.5 ... 30 s	0.5 ... 10 min	0.15 ... 3 h	15 ... 300 h

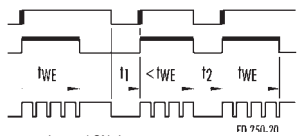
Notes

The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.

You can change the delay time during operation. The change is effective immediately.

Function diagram

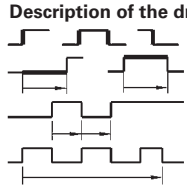
Function code 21 = interval ON



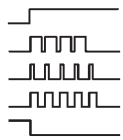
A1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
LED green Energizing quantity

t_{WE} = interval ON time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Description of the drawing

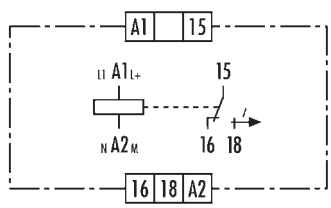


Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time
LED green Energizing quantity
5-fold function



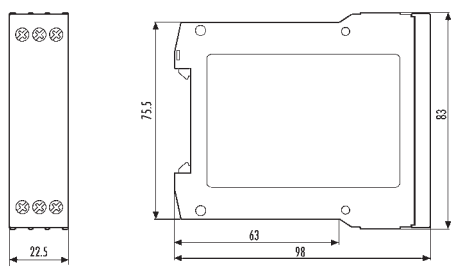
Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Circuit diagram



KS 250-13

Dimension diagram



K 3-1

Technical data	NGY 71
Product standard (timer relay)	EN 61812-1:1999-08
Function type of the relay according to IEC 60050	445-01-08
Function display	2 LEDs green
Function diagram	FD 250-20
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110 %
Rated frequency f_n	50 – 60 Hz ± 5 %
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes
Internal half-wave rectification	A1-A2 no
Time circuit	
Time setting / number of time ranges	analog / 16
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2	≤ 50 / ≤ 50 ms
Minimum ON time 1/2	– / – ms
Setting tolerance	≤ ± 5 %
Repeatability (to set value)	≤ ± 0.01 % + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002 %
Influence of voltage (within range)	≤ ± 0.002 %
Output circuit	
Contact assignment	1 change-over contact
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 106 switching cycles AC-15
Response time / release time on excitation of A1-A2	40 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage AC/DC	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-1
Circuit diagram of the terminals	KS 250-13
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm^2
stranded with ferrule	1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm^2
Weight	0.1 kg
Accessories	–
Approvals	c SP us being prepared: UL

Overview of devices / Part numbers

Type	Rated voltage	Time delay	Part No.	Std. Pack
NGY 71	AC/DC 24 – 240 V 50 – 60 Hz	See table "Time ranges"	R2.135.0180.0	1

Timer and switching relays
Interval ON NGYP 72-S

interface

Interval ON multi-range relay with remote potentiometer connection

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: interval ON (EW)
- Setting range from 0.1 s to 300 h divided into 16 selectable time ranges
- Remote potentiometer connection
- 1 instantaneous and 1 timed change-over contact
- LEDs for function display

c SP us being prepared: UL

Function

Setting the time delay

The time range is set with the RANGE selector switch and displayed in the window next to it. The desired delay time is set with a selecting wheel.

Connecting a remote potentiometer allows you to set parameters at greater distances. When a remote potentiometer is used, the time selecting wheel is to be set to the right-hand stop above the largest value. Operation without remote potentiometer does not require a jumper on the device.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

Time ranges

Setting range from 0.1 s to 300 h divided into:

<0.1 ... 1 s	5 ... 100 s	1.5 ... 30 min	0.5 ... 10 h
0.15 ... 3 s	15 ... 300 s	3 ... 60 min	1.5 ... 30 h
0.5 ... 10 s	50 ... 1000 s	5 ... 100 min	5 ... 100 h
1.5 ... 30 s	0.5 ... 10 min	0.15 ... 3 h	15 ... 300 h

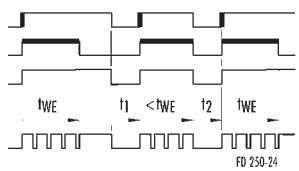
Notes

The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.

You can change the delay time during operation. The change is effective immediately.

Function diagram

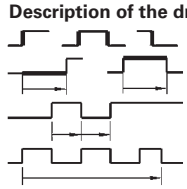
Function code 21-ON = interval ON



A1-A2	Energizing quantity
15-18	Delayed contact
15-16	LED green
21-24	Instantaneous contact
21-22	
LED green	Energizing quantity

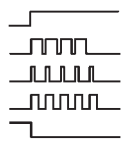
t_{WE} = interval ON time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Description of the drawing



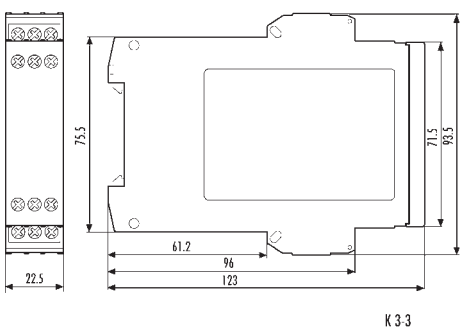
Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time

LED green Energizing quantity 5-fold function



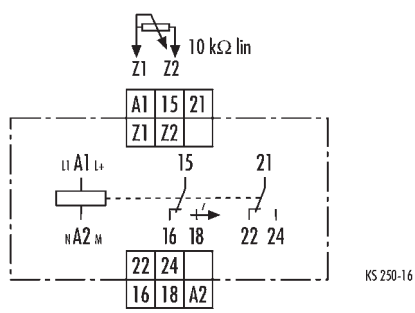
Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Dimension diagram



K 3-3

Circuit diagram



KS 250-16

Accessories

Remote potentiometer FP 10 k

Technical data	NGYP 72-S
Product standard (timer relay)	EN 61812-1:1999-08
Function type of the relay according to IEC 60050	445-01-08 + 445-04-05
Function display	2 LEDs green
Function diagram	FD 250-24
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110 %
Rated frequency f_n	50 – 60 Hz ± 5 %
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes
Internal half-wave rectification	A1-A2 no
Time circuit	
Time setting / number of time ranges	analog (internal + external) / 16
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2	≤ 50 / ≤ 50 ms
Minimum ON time 1/2	– / – ms
Setting tolerance	≤ ± 5 %
Repeatability (to set value)	≤ ± 0.01 % + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002 %
Influence of voltage (within range)	≤ ± 0.002 %
Output circuit	
Contact assignment	1 instantaneous and 1 timed change-over contact
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time on excitation of A1-A2	40 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-3
Circuit diagram of the terminals	KS 250-16
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm^2
stranded with ferrule	1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm^2
Weight	0.14 kg
Accessories	Remote potentiometer FP 10 k
Approvals	cULus being prepared: UL

Overview of devices / Part numbers

Typ	Rated voltage	Time delay	Part No.	Std. Pack
NGYP 72-S	AC/DC 24 – 240 V 50 – 60 Hz	See table "Time ranges"	R2.135.0320.0	1

Timer and switching relays
Interval ON NGY 11

interface

Interval ON fixed timer relay

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: interval ON (EW)
- Fixed time 0.5 s
- 1 change-over contact
- 2 LEDs for function display

cSPus being prepared: UL

Function

ON-delay time

The NGY 11 timer relay is supplied with a fixed interval ON time of 0.5 s.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

Time ranges

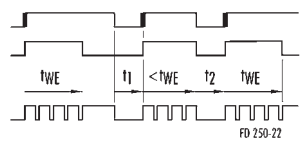
Fixed time 0.5 s

Note

The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.

Function diagram

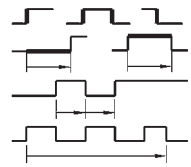
Function code 21 = interval ON



A1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
LED green Energizing quantity

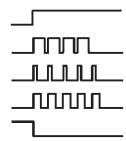
t_{WE} = fixed interval ON time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Description of the drawing



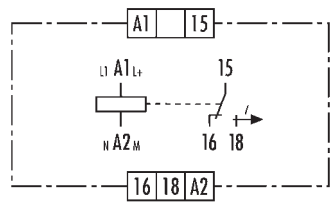
Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time

LED green Energizing quantity 5-fold function

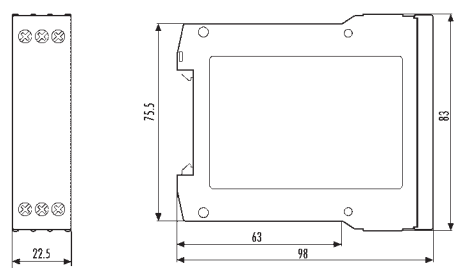


Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Circuit diagram



Dimension diagram



Technical data	NGY 11
Product standard (timer relays)	EN 61812-1:1999-08
Relay function according to IEC 60050	445-01-082
Function display	LEDs green
Function diagram	FD 250-22
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110 %
Rated frequency f_n	50 – 60 Hz ± 5 %
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes
Internal half-wave rectification	A1-A2 no
Time circuit	
Time setting / number of time ranges	analog / 1 fixed time
Setting ranges for time delay	0.5 s
Recovery time 1/2	≤ 50 / ≤ 50 ms
Minimum ON time 1/2	– / – ms
Repeatability	≤ ± 0.01 % + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002 %
Influence of voltage (within range)	≤ ± 0.002 %
Output circuit	
Contact assignment	1 change-over contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time on excitation of A1-A2	40 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-1
Circuit diagram of the terminals	KS 250-13
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm^2
stranded with ferrule	1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm^2
Weight	0.1 kg
Accessories	–
Approvals	cULus being prepared: UL

Overview of devices / Part numbers

Type	Rated voltage	Time delay	Part No.	Std. Pack
NGY 11	AC/DC 24 – 240 V 50 – 60 Hz	0.5 s	R2.135.0030.0	1

Timer and switching relays
Interval ON NGY 52

interface

Interval ON fixed timer relay

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: interval ON (EW)
- Fixed time 0.5 s
- 2 change-over contact
- 2 LEDs for function display

cSAus being prepared: UL

Function

ON-delay time

The NGY 52 timer relay is supplied with a fixed interval ON time of 0.5 s.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

Time ranges

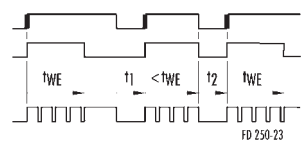
Fixed time 0.5 s

Note

The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.

Function diagram

Function code 21 = interval ON



A1-A2 Energizing quantity

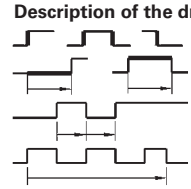
15-18, 25-28 Delayed contact

15-16, 25-26 LED green

LED green Energizing quantity

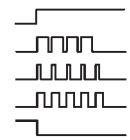
t_{WE} = fixed interval ON time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Description of the drawing



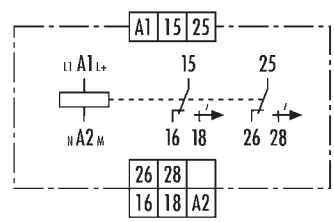
Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time

LED green Energizing quantity 5-fold function

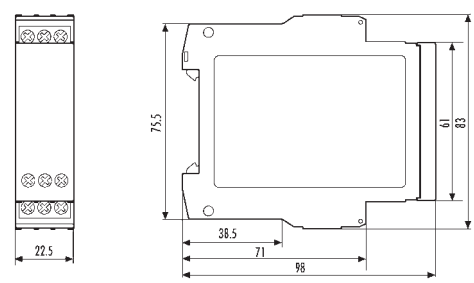


Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Circuit diagram



Dimension diagram



Technical data	NGY 52
Product standard (timer relays)	EN 61812-1:1999-08
Relay function according to IEC 60050	445-01-08
Function display	2 LEDs green
Function diagram	FD 250-23
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110 %
Rated frequency f_n	50 – 60 Hz ± 5 %
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes
Internal half-wave rectification	A1-A2 no
Time circuit	
Time setting / number of time ranges	analog / 1 fixed time
Setting ranges for time delay	0.5 s
Recovery time 1/2	≤ 50 / ≤ 50 ms
Minimum ON time 1/2	– / – ms
Repeatability	≤ ± 0.01 % + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002 %
Influence of voltage (within range)	≤ ± 0.002 %
Output circuit	
Contact assignment	2 change-over contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time on excitation of A1-A2	40 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-2
Circuit diagram of the terminals	KS 250-14
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm^2
stranded with ferrule	1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm^2
Weight	0.11 kg
Accessories	–
Approvals	cULus being prepared: UL

Overview of devices / Part numbers

Type	Rated voltage	Time delay	Part No.	Std. Pack
NGY 52	AC/DC 24 – 240 V 50 – 60 Hz	0.5 s	R2.135.0170.0	1

Timer and switching relays
Interval ON/OFF SSY 12

interface

Interval ON and/or OFF fixed timer relay

- Single voltage
- 1 function: Interval ON and/or OFF (EAW)
- Fixed interval time 0.5 s
- 1 interval change-over contact and 1 interval NO

Function

The function (interval ON, interval OFF, interval ON/OFF) is selectable with the jumpers on the terminals (see connection diagram).

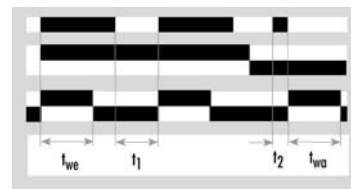
Jumper Z1/Z2 = interval ON
Jumper Z2/Z3 = interval OFF
No jumper = interval ON and OFF

Time ranges

Fixed interval time 0.5 s

Function diagram

FD 0015



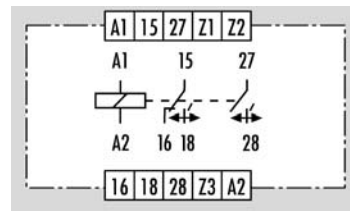
A1/A2 Supply voltage
Z1, Z2 with jumper
Z2/Z3 with jumper

15/18 Delayed contact
15/16

t_{we} = interval ON time
t_{wa} = interval OFF time
t_1 = break time, must be > recovery time 1
t_2 = make time, must be > minimum ON time 1

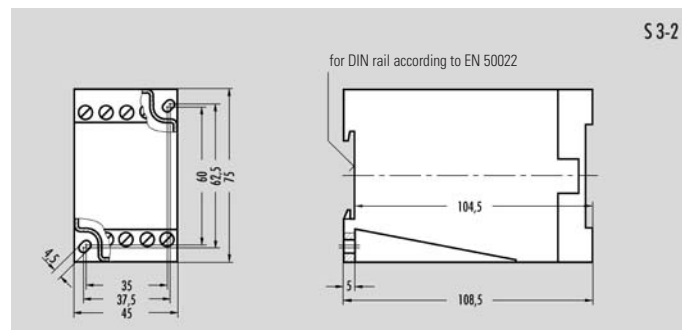
Circuit diagram

SSY 12



Jumper:
Z1/Z2 = interval ON
Z2/Z3 = interval OFF
None = interval ON and OFF

Dimension diagram



Technical data		SSY 12		
Function type according to IEC 60050 (445)		Electronic interval timer relay for single voltage; function selectable		
		– Interval ON relay		
		– Interval OFF relay		
Function display		–		
Function diagram		FD 0015		
Power supply circuit				
Rated voltage U_N	AC/DC	**24 V**	**110 – 127**	**V 230 V**
Rated consumption at 50 Hz and U_N (AC)		0.6 VA / 0.5 W	2.0 VA / 1.7 W	2.0 VA / 1.8 W
Rated consumption DC		0.3 W	1.1 W	1.3 W
Switch-on peak		0.3 A / 6 ms	0.1 A / 20 ms	0.1 A / 100 ms
Rated frequency		50 – 60 Hz		
Operating voltage range		0.8 – 1.1 x U_N		
Time circuit				
Time setting / number of time ranges		fest / 1		
Possible setting range		See table "Time ranges"		
Recovery time 1		approx. 250 ms at continuous operation, approx. 3 s after longer shutdown		
Minimum ON time (after applying the rated voltage)		approx. 3 s		
Release value		–		
Parallel loads permissible		yes		
Internal half-wave rectification		no		
Mean value of the fault		≤ ± 20 %		
Dispersion		≤ ± 1.5 % + ± 10 ms		
Influence of the energizing quantity, supply voltage		≤ 1.2 % / % Δ U_N		
Influence of the ambient temperature		≤ 0.5 % / K		
Output circuit				
Contact assignment		1 passing change-over contact and 1 passing NO		
Contact material		Ag alloy, gold-plated		
Rated operating voltage U_n		230/230 V AC/DC		
Max. continuous current I_n		5 A		
Application category according to EN 60947-5-1:1991		AC-15: U_e 230 V AC, I_e 2 A DC-13: U_e 24 V DC, I_e 2 A		
Permissible switching frequency		≤ 6000 switching cycles/h		
Mechanical life		30 x 10^6 switching cycles		
response time		ca. 20 ms		
release time		–		
General information				
Creepage distances and clearances between the circuits		according to DIN VDE 0110-1:04.97		
Rated impulse voltage		4 kV		
Overvoltage category		III		
Degree of pollution		3 outside, 2 inside		
Rated voltage		250 V AC		
Test voltage U_{eff} 50 Hz according to DIN VDE 0110-1, table A.1		2.21 kV		
Protection degree housing/terminals according to DIN VDE 0470 sec. 1:11.92		IP 30 / IP 20		
Noise immunity according to IEC 61000-4		Test severity 3		
Ambient temperature, operating range		–20 – +60 °C		
Dimension diagram		S 3-2		
Circuit diagram		KS 0115-1		
Weight		0.17 kg		
Accessories		–		
Approvals		–		

Overview of devices / Part numbers

Type	Rated voltage	Time delay	Part No.	Std. Pack
SSY 12	AC/DC 110 – 127 V 50 – 60 Hz	See table "Time ranges"	R2.133.0010.3	1
	AC/DC 24 V 50 – 60 Hz		R2.133.0020.3	1
	AC/DC 230 V 50 – 60 Hz		R2.133.0030.3	1

Interval ON and/or OFF fixed timer relay

- Single voltage
- 1 function: Interval ON and/or OFF (EAW)
- Fixed interval time 0.5 s
- 1 passing change-over contact

Function

The function (interval ON, interval OFF, interval ON/OFF) is selectable with the jumpers on the terminals (see connection diagram).

Jumper Z1/Z2 = interval ON
Jumper Z2/Z3 = interval OFF
No jumper = interval ON and OFF

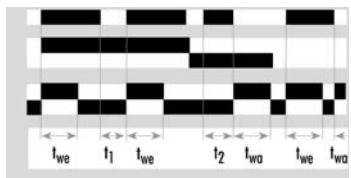
Time ranges

Fixed interval time 0.5 s

Function diagram

KSY 51 FD 0015

interval ON (EW)

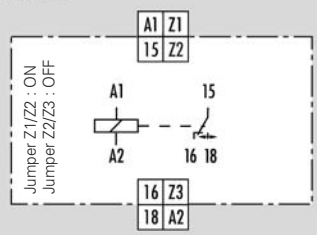


A1/A2	Supply voltage
Z1/Z2	with jumper
Z2/Z3	with jumper
15/18	Delayed contact
15/16	

t_{we} = interval ON time
t_{wa} = interval OFF time
t_1 = break time, must be > recovery time 1
t_2 = make time, must be > minimum ON time 1

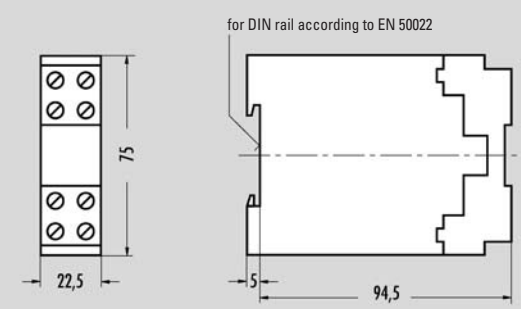
Circuit diagram

KSY 51 KS 0306/1 W3



Dimension diagram

K 1-12 W3



Timer and switching relays
Interval ON/OFF KSY 51

Technical data		KSY 51	
Function type according to IEC 60050 (445)		Electronic interval timer relay for single voltage; function selectable	
		– Interval ON relay	
		– Interval OFF relay	
Function display		–	
Function diagram		FD 0015	
Power supply circuit			
Rated voltage U_N	AC/DC	**24 V**	**230 V**
Rated consumption at 50 Hz and U_N (AC)		1.2 VA / 0.9 W	2.4 VA / 1.8 W
Rated consumption DC		0.6 W	1.0 W
Switch-on peak		0.7 A / 100 ms	0.2 A / 50 ms
Rated frequency		50 – 60 Hz	
Operating voltage range		0.85 – 1.1 x U_N	
Time circuit			
Time setting / number of time ranges		fixed / 1	
Possible setting range		See table "Time ranges"	
Recovery time 1		approx. 200 ms at continuous operation, approx. 3 s after longer shutdown	
Minimum ON time (after applying the rated voltage)		ca. 3 s	
Release value		–	
Parallel loads permissible		yes	
Internal half-wave rectification		no	
Mean value of the fault		≤ ± 35 %	
Dispersion		≤ ± 2 % + ± 10 ms	
Influence of the energizing quantity, supply voltage		≤ 1.2 % / % Δ U_N	
Influence of the ambient temperature		≤ 0.5 % / K	
Output circuit			
Contact assignment		1 passing change-over contact	
Contact material		Ag alloy, gold-plated	
Rated operating voltage U_n		230/230 V AC/DC	
Max. continuous current I_n		5 A	
Application category according to EN 60947-5-1:1991		AC-15: U_e 230 V AC, I_e 2 A DC-13: U_e 24 V DC, I_e 2 A	
Permissible switching frequency		≤ 3600 switching cycles/h	
Mechanical life		20 x 10^6 switching cycles	
response time		ca. 20 ms	
release time		–	
General information			
Creepage distances and clearances between the circuits		according to DIN VDE 0110-1:04.97	
Rated impulse voltage		4 kV	
Overvoltage category		III	
Degree of pollution		3 outside, 2 inside	
Rated voltage		250 V AC	
Test voltage U_{eff} 50 Hz according to DIN VDE 0110-1, table A.1		2.21 kV	
Protection degree housing/terminals according to DIN VDE 0470 sec. 1:11.92		IP 30 / IP 20	
Noise immunity according to IEC 61000-4		Test severity 3	
Ambient temperature, operating range		–20 – +60 °C	
Dimension diagram		K1-12 W3	
Circuit diagram		KS 0306/1 W3	
Weight		0.14 kg	
Accessories		–	
Approvals		–	

Overview of devices / Part numbers

Type	Rated voltage		Time delay	Part No.	Std. Pack
KSY 51	AC/DC 24 V	50 – 60 Hz	See table "Time ranges"	R2.135.0010.0	1
	AC/DC 230 V	50 – 60 Hz		R2.135.0020.0	1

Timer and switching relays
ON-delay NGZ 71

interface

ON-delay multi-range timer relay

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: ON-delay (AV)
- Setting range from 0.1 s to 300 h divided into 16 selectable time ranges
- 1 change-over contacts
- 2 LEDs for function display

c SP us being prepared: UL

Function

Setting the time delay

The time range is set with the RANGE selector switch and displayed in the window next to it. The desired delay time is set with a selecting wheel.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

Time ranges

Setting range from 0.1 s to 300 h divided into:

<0.1 ... 1 s	5 ... 100 s	1.5 ... 30 min	0.5 ... 10 h
0.15 ... 3 s	15 ... 300 s	3 ... 60 min	1.5 ... 30 h
0.5 ... 10 s	50 ... 1000 s	5 ... 100 min	5 ... 100 h
1.5 ... 30 s	0.5 ... 10 min	0.15 ... 3 h	15 ... 300 h

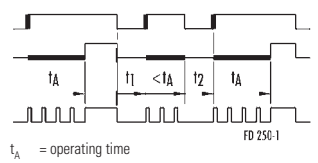
Note

The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.

You can change the delay time during operation. The change is effective immediately.

Function diagram

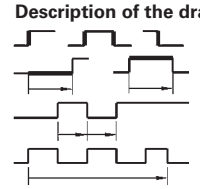
Function code 11 = ON-delay



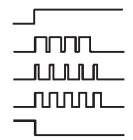
A1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
LED green Energizing quantity

t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Description of the drawing

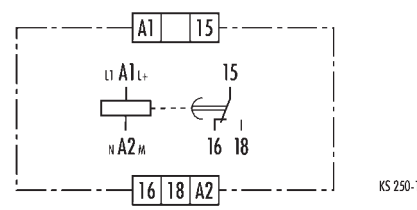


Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time
LED green Energizing quantity
5-fold function

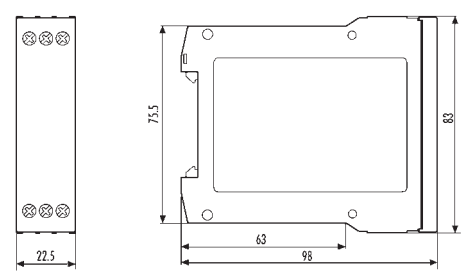


Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Circuit diagram



Dimension diagram



Technical data	NGZ 71
Product standard (timer relays)	EN 61812-1:1999-08
Relay function according to IEC 60050	445-01-02
Function display	2 LEDs green
Function diagram	FD 250-1
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110 %
Rated frequency f_n	50 – 60 Hz ± 5 %
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes
Internal half-wave rectification	A1-A2 no
Time circuit	
Time setting / number of time ranges	analog / 16
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2	≤ 50 / ≤ 50 ms
Minimum ON time 1/2	– / – ms
Setting tolerance	≤ ± 5 %
Repeatability (to set value)	≤ ± 0.01 % + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002 %
Influence of voltage (within range)	≤ ± 0.002 %
Output circuit	
Contact assignment	1 change-over contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A
	DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time on excitation of A1-A2	40 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-1
Circuit diagram of the terminals	KS 250-1
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm^2
stranded with ferrule	1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm^2
Weight	0.1 kg
Accessories	–
Approvals	c SP us being prepared: UL

Overview of devices / Part numbers

Type	Rated voltage	Time delay	Part No.	Std. Pack
NGZ 71	AC/DC 24 – 240 V 50 – 60 Hz	See table "Time ranges"	R2.065.0060.0	1

ON-delay multi-range timer relay

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: ON-delay (AV)
- Setting range from 0.1 s to 300 h divided into 16 selectable time ranges
- 2 change-over contact
- 2 LEDs for function display

c SP us being prepared: UL

Function

Setting the time delay

The time range is set with the RANGE selector switch and displayed in the window next to it. The desired delay time is set with a selecting wheel.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

Time ranges

Setting range from 0.1 s to 300 h divided into:

<0.1 ... 1 s	5 ... 100 s	1.5 ... 30 min	0.5 ... 10 h
0.15 ... 3 s	15 ... 300 s	3 ... 60 min	1.5 ... 30 h
0.5 ... 10 s	50 ... 1000 s	5 ... 100 min	5 ... 100 h
1.5 ... 30 s	0.5 ... 10 min	0.15 ... 3 h	15 ... 300 h

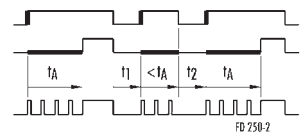
Note

The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.

You can change the delay time during operation. The change is effective immediately.

Function diagram

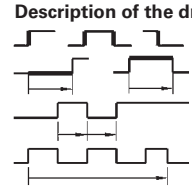
Function code 11 = ON-delay



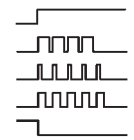
A1-A2	Energizing quantity
15-18, 25-28	Delayed contact
15-16, 25-26	LED green
LED green	Energizing quantity

t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Description of the drawing

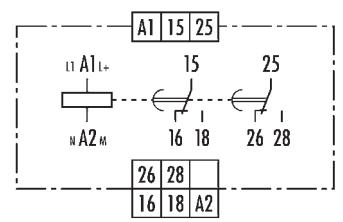


Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time
LED green Energizing quantity
5-fold function

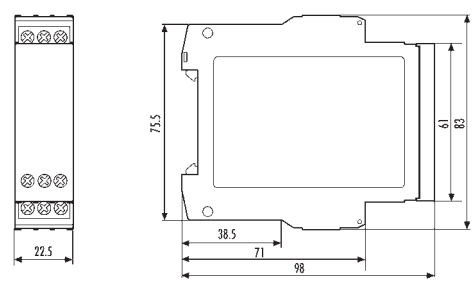


Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Circuit diagram



Dimension diagram



Interface

Technical data	NGZ 72
Product standard (timer relays)	EN 61812-1:1999-08
Relay function according to IEC 60050	445-01-02
Function display	2 LEDs green
Function diagram	FD 250-2
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110 %
Rated frequency f_n	50 – 60 Hz ± 5 %
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes
Internal half-wave rectification	A1-A2 no
Time circuit	
Time setting / number of time ranges	analog / 16
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2	≤ 50 / ≤ 50 ms
Minimum ON time 1/2	– / – ms
Setting tolerance	≤ ± 5 %
Repeatability (to set value)	≤ ± 0.01 % + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002 %
Influence of voltage (within range)	≤ ± 0.002 %
Output circuit	
Contact assignment	2 change-over contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A
	DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time on excitation of A1-A2	40 ms
Other data	according to IEC 60664-1
Creepage distances and clearances	
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-2
Circuit diagram of the terminals	KS 250-3
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm^2
stranded with ferrule	1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm^2
Weight	0.11 kg
Accessories	–
Approvals	c SP us being prepared: UL

Overview of devices / Part numbers

Type	Rated voltage	Time delay	Part No.	Std. Pack
NGZ 72	AC/DC 24 – 240 V 50 – 60 Hz	See table "Time ranges"	R2.065.0080.0	1

ON-delay multi-range timer relay

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: ON-delay (AV)
- Setting range from 0.1 s to 300 h divided into 16 selectable time ranges
- 1 instantaneous and 1 timed change-over contact
- 2 LEDs for function display

c SP us being prepared: UL

Function

Setting the time delay

The time range is set with the RANGE selector switch and displayed in the window next to it. The desired delay time is set with a selecting wheel.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

Time ranges

Setting range from 0.1 s to 300 h divided into:

<0.1 ... 1 s	5 ... 100 s	1.5 ... 30 min	0.5 ... 10 h
0.15 ... 3 s	15 ... 300 s	3 ... 60 min	1.5 ... 30 h
0.5 ... 10 s	50 ... 1000 s	5 ... 100 min	5 ... 100 h
1.5 ... 30 s	0.5 ... 10 min	0.15 ... 3 h	15 ... 300 h

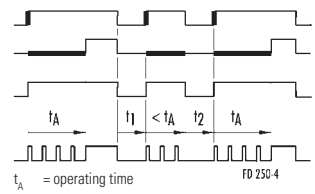
Notes

The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.

You can change the delay time during operation. The change is effective immediately.

Function diagram

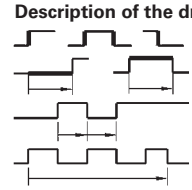
Function code 11-ON = ON-delay FD 250-4



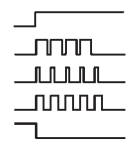
A1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
21-24 instantaneous contact
21-22
LED green Energizing quantity

t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Description of the drawing

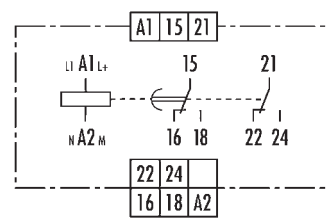


Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time
LED green Energizing quantity
5-fold function



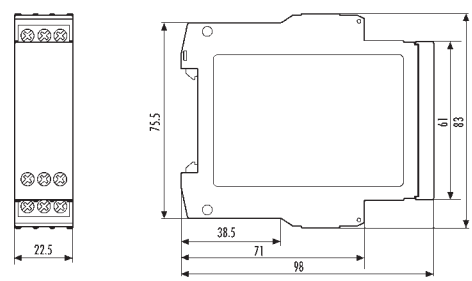
Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Circuit diagram



KS 250-5

Dimension diagram



K 3-2

Technical data	NGZ 72-S
Product standard (timer relays)	EN 61812-1:1999-08
Relay function according to IEC 60050	445-01-02 + 445-04-05
Function display	2 LEDs green
Function diagram	FD 250-4
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110 %
Rated frequency f_n	50 – 60 Hz ± 5 %
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes
Internal half-wave rectification	A1-A2 no
Time circuit	
Time setting / number of time ranges	analog / 16
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2	≤ 50 / ≤ 50 ms
Minimum ON time 1/2	– / – ms
Setting tolerance	≤ ± 5 %
Repeatability (to set value)	≤ ± 0.01 % + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002 %
Influence of voltage (within range)	≤ ± 0.002 %
Output circuit	
Contact assignment	1 instantaneous and 1 timed change-over contact
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A
	DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time on excitation of A1-A2	40 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-2
Circuit diagram of the terminals	KS 250-5
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm^2
stranded with ferrule	1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm^2
Weight	0.11 kg
Accessories	–
Approvals	c SP us being prepared: UL

Overview of devices / Part numbers

Type	Rated voltage	Time delay	Part No.	Std. Pack
NGZ 72-S	AC/DC 24 – 240 V 50 – 60 Hz	See table "Time ranges"	R2.065.0100.0	1

Timer and switching relays
ON-delay NGZP 71

interface

ON-delay multi-range timer relay with remote potentiometer connection

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: ON-delay (AV)
- Setting range from 0.1 s to 300 h divided into 16 selectable time ranges
- Remote potentiometer contact
- 1 change-over contact
- 2 LEDs for function display

cULus being prepared: UL

Function

Setting the time delay

The time range is set with the RANGE selector switch and displayed in the window next to it. The desired delay time is set with a selecting wheel.

Connecting a remote potentiometer allows you to set parameters at greater distances. When a remote potentiometer is used, the time selecting wheel is to be set to the right-hand stop above the largest value.
Operation without remote potentiometer does not require a jumper on the device.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

Time ranges

Setting range from 0.1 s to 300 h divided into:

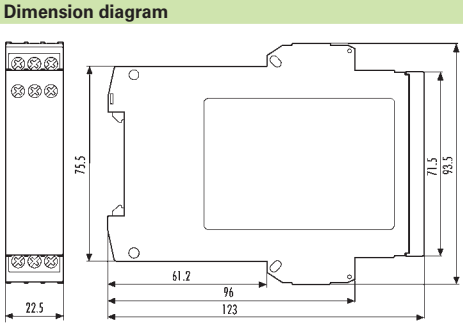
<0.1 ... 1 s	5 ... 100 s	1.5 ... 30 min	0.5 ... 10 h
0.15 ... 3 s	15 ... 300 s	3 ... 60 min	1.5 ... 30 h
0.5 ... 10 s	50 ... 1000 s	5 ... 100 min	5 ... 100 h
1.5 ... 30 s	0.5 ... 10 min	0.15 ... 3 h	15 ... 300 h

Notes

The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.

You can change the delay time during operation. The change is effective immediately.

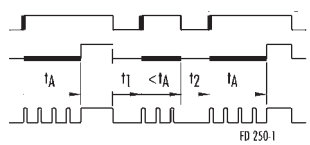
Dimension diagram



K 3-3

Function diagram

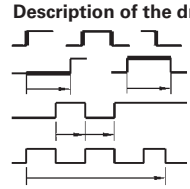
Function code 11 = ON-delay FD 250-1



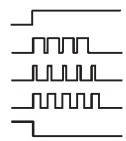
A1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
LED green Energizing quantity

t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Description of the drawing

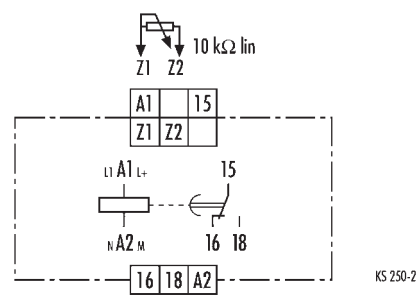


Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time
LED green Energizing quantity 5-fold function



Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Circuit diagram



KS 250-2

Accessories

Remote potentiometer FP 10 k

Timer and switching relays
ON-delay NGZP 71

Technical data	NGZP 71
Product standard (timer relay)	EN 61812-1:1999-08
Function type of the relay according to IEC 60050	445-01-02
Function display	2 LEDs green
Function diagram	FD 250-1
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110 %
Rated frequency f_n	50 – 60 Hz ± 5 %
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes
Internal half-wave rectification	A1-A2 no
Time circuit	
Time setting / number of time ranges	analog (internal + external) / 16
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2	≤ 50 / ≤ 50 ms
Minimum ON time 1/2	– / – ms
Setting tolerance	≤ ± 5 %
Repeatability (to set value)	≤ ± 0.01 % + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002 %
Influence of voltage (within range)	≤ ± 0.002 %
Output circuit	
Contact assignment	1 change-over contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time on excitation of A1-A2	40 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-3
Circuit diagram of the terminals	KS 250-2
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm^2
stranded with ferrule	1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm^2
Weight	0.12 kg
Accessories	Remote potentiometer FP 10 k
Approvals	cULus being prepared: UL

Overview of devices / Part numbers

Type	Rated voltage	Time delay	Part No.	Std. Pack
NGZP 71	AC/DC 24 – 240 V 50 – 60 Hz	See table "Time ranges"	R2.065.0110.0	1

ON-delay multi-range timer relay with remote potentiometer connection

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: ON-delay (AV)
- Setting range from 0.1 s to 300 h divided into 16 selectable time ranges
- Remote potentiometer connection
- 2 change-over contacts
- LEDs for function display

cSPus being prepared: UL

Function

Setting the time delay

The time range is set with the RANGE selector switch and displayed in the window next to it. The desired delay time is set with a selecting wheel.

Connecting a remote potentiometer allows you to set parameters at greater distances. When a remote potentiometer is used, the time selecting wheel is to be set to the right-hand stop above the largest value. Operation without remote potentiometer does not require a jumper on the device.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

Time ranges

Setting range from 0.1 s to 300 h divided into:

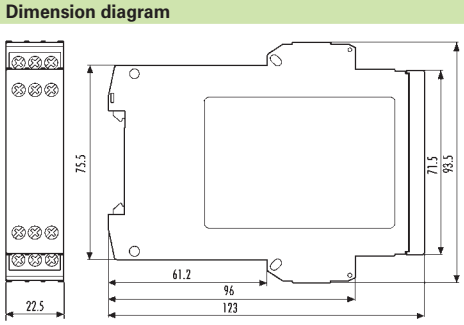
<0.1 ... 1 s	5 ... 100 s	1.5 ... 30 min	0.5 ... 10 h
0.15 ... 3 s	15 ... 300 s	3 ... 60 min	1.5 ... 30 h
0.5 ... 10 s	50 ... 1000 s	5 ... 100 min	5 ... 100 h
1.5 ... 30 s	0.5 ... 10 min	0.15 ... 3 h	15 ... 300 h

Notes

The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.

You can change the delay time during operation. The change is effective immediately.

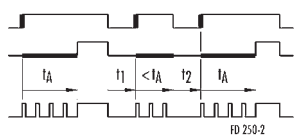
Dimension diagram



K 3-3

Function diagram

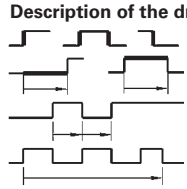
Function code 11 = ON-delay FD 250-2



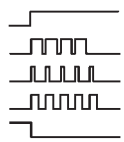
A1-A2 Energizing quantity
15-18, 25-28 Delayed contact
15-16, 25-26 LED green
LED green Energizing quantity

t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Description of the drawing

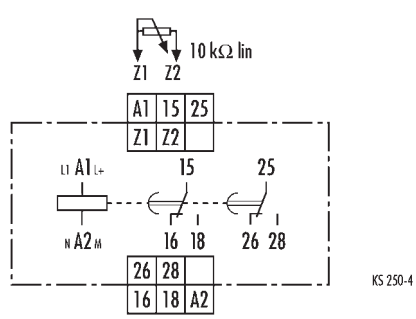


Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time
LED green Energizing quantity
5-fold function



Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Circuit diagram



KS 250-4

Accessories

Remote potentiometer FP 10 k

Timer and switching relays
ON-delay NGZP 72

Technical data	NGZP 72
Product standard (timer relay)	EN 61812-1:1999-08
Function type of the relay according to IEC 60050	445-01-02
Function display	2 LEDs green
Function diagram	FD 250-2
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110 %
Rated frequency f_n	50 – 60 Hz ± 5 %
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes
Internal half-wave rectification	A1-A2 no
Time circuit	
Time setting / number of time ranges	analog (internal + external) / 16
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2	≤ 50 / ≤ 50 ms
Minimum ON time 1/2	1/2 – / – ms
Setting tolerance	≤ ± 5 %
Repeatability (to set value)	≤ ± 0.01 % + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002 %
Influence of voltage (within range)	≤ ± 0.002 %
Output circuit	
Contact assignment	2 change-over contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	2 x 10^6 switching cycles AC-15
Response time / release time on excitation of A1-A2	40 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-3
Circuit diagram of the terminals	KS 250-4
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm^2
stranded with ferrule	1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm^2
Weight	0.14 kg
Accessories	Remote potentiometer FP 10 k
Approvals	cULus being prepared: UL

Overview of devices / Part numbers

Type	Rated voltage	Time delay	Part No.	Std. Pack
NGZP 72	AC/DC 24 – 240 V 50 – 60 Hz	See table "Time ranges"	R2.065.0120.0	1

Timer and switching relays
ON-delay NGZP 72-S

interface

ON-delay multi-range timer relay with remote potentiometer connection

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: ON-delay (AV)
- Setting range from 0.1 s to 300 h divided into 16 selectable time ranges
- Remote potentiometer connection
- 1 instantaneous and 1 timed change-over contact
- 2 LEDs for function display

cSAus in preparation: UL

Function

Setting the time delay

The time range is set with the RANGE selector switch and displayed in the window next to it. The desired delay time is set with a selecting wheel.

Connecting a remote potentiometer allows you to set parameters at greater distances. When a remote potentiometer is used, the time selecting wheel is to be set to the right-hand stop above the largest value. Operation without remote potentiometer does not require a jumper on the device.

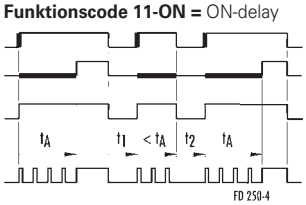
LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

Accessories

Remote potentiometer FP 10 k

Function diagram

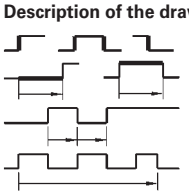
Funktionscode 11-ON = ON-delay



A1-A2	Energizing quantity
15-18	Delayed contact
15-16	LED green
21-24	Instantaneous contact
21-22	
LED green	Energizing quantity

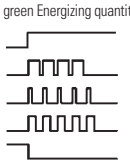
t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Description of the drawing



Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time

LED green Energizing quantity — 5-fold function



Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Time ranges

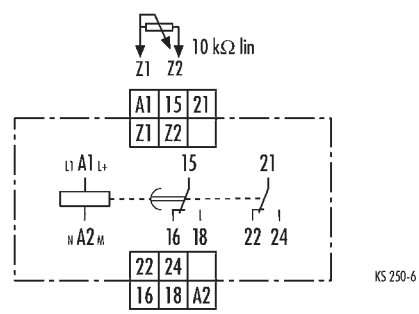
Setting range from 0.1 s to 300 h divided into:

<0.1 ... 1 s	5 ... 100 s	1.5 ... 30 min	0.5 ... 10 h
0.15 ... 3 s	15 ... 300 s	3 ... 60 min	1.5 ... 30 h
0.5 ... 10 s	50 ... 1000 s	5 ... 100 min	5 ... 100 h
1.5 ... 30 s	0.5 ... 10 min	0.15 ... 3 h	15 ... 300 h

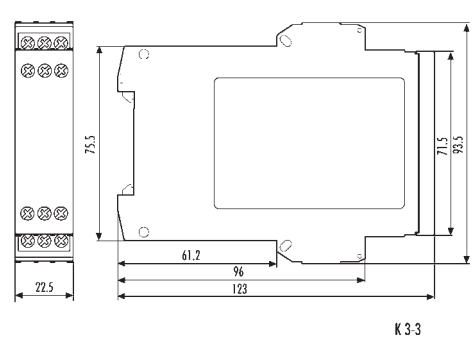
Notes

- The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.
- You can change the delay time during operation. The change is effective immediately.

Circuit diagram



Dimension diagram



Timer and switching relays
ON-delay NGZP 72-S

Technical data	NGZP 72-S
Product standard (timer relay)	EN 61812-1:1999-08
Relay function according to IEC 60050	445-01-02 + 445-01-05
Function display	2 LEDs green
Function diagram	FD 250-4
Input circuit	
Rated voltage A1-A2	AC/DC 24 to 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110 %
Rated frequency f_n	50 – 60 Hz ± 5 %
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes
Internal half-wave rectification	A1-A2 no
Time circuit	
Time setting / number of time ranges	analog (internal + external) / 16
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2	≤ 50 / ≤ 50 ms
Minimum ON time 1/2	– / – ms
Setting tolerance	≤ ± 5 %
Repeatability (to set value)	≤ ± 0.01 % + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002 %
Influence of voltage (within range)	≤ ± 0.002 %
Output circuit	
Contact assignment	1 instantaneous and 1 timed change-over contact
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A
	DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time at excitation of A1-A2	40 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-3
Circuit diagram of the terminals	KS 250-6
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm²
stranded with ferrules	1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm²
Weight	0.14 kg
Accessories	Remote potentiometer FP 10 k
Approvals	cULus in preparation: UL

Overview of the devices/Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
NGZP 72-S	AC/DC 24 – 240 V 50 – 60 Hz	See table "Time ranges"	R2.065.0130.0	1

Timer and switching relays
ON-delay NGZ 11

interface

ON-delay single-range timer relay

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: ON-delay (AV)
- 13 time ranges available from 0.1 s to 100 h
- 1 change-over contact
- 2 LEDs for function display

cSPus in preparation: UL

Function

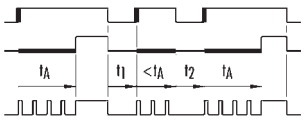
Setting the time delay

The desired delay time is set with a selecting wheel. It can be set using a screwdriver.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

Function diagram

Function code 11 = ON-delay

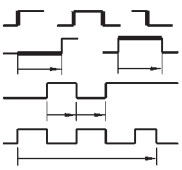


FD 250-1

A1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
LED green Energizing quantity

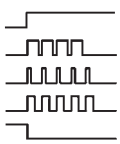
t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Description of the drawing



Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time

LED green Energizing quantity 5-fold function



Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Time ranges

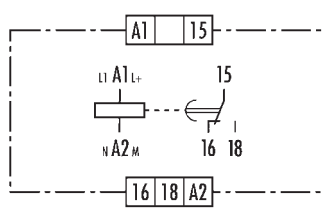
Available time ranges:

<0.1 ... 1 s	5 ... 100 s	0.5 ... 10 min	0.5 ... 10 h
0.15 ... 3 s	15 ... 300 s	1.5 ... 30 min	1.5 ... 30 h
0.5 ... 10 s	50 ... 1000 s	3 ... 60 min	5 ... 100 h
1.5 ... 30 s			

Notes

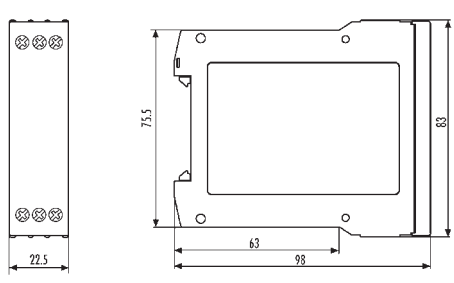
- The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.
- You can change the delay time during operation. The change is effective immediately.

Circuit diagram



KS 250-1

Dimension diagram



K 3-1

Timer and switching relays
ON-delay NGZ 11

Technical data	NGZ 11
Product standard (timer relay)	EN 61812-1:1999-08
Relay function according to IEC 60050	445-01-02
Function display	2 LEDs green
Function diagram	FD 250-1
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110 %
Rated frequency f_n	50 – 60 Hz ± 5 %
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes
Internal half-wave rectification	A1-A2 no
Time circuit	
Time setting / number of time ranges	analog / 1
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2	≤ 50 / ≤ 50 ms
Minimum ON time 1/2	– / – ms
Setting tolerance	≤ ± 5 %
Repeatability (to set value)	≤ ± 0.01 % + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002 %
Influence of voltage (within range)	≤ ± 0.002 %
Output circuit	
Contact assignment	1 change-over contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 at 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time at excitation of A1-A2	40 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-1
Circuit diagram of the terminals	KS 250-1
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 to 2.5 mm²
stranded with ferrules	1 x 0.4 – 4 or 2 x 0.2 to 1.5 mm²
Weight	0.1 kg
Accessories	–
Approvals	c SP us in preparation: UL

Overview of the devices/Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
NGZ 11	AC/DC 24 – 240 V 50 – 60 Hz	<0.1 ... 1 s	R2.064.0070.0	1
		0.15 ... 3 s	R2.064.0120.0	1
		0.5 ... 10 s	R2.064.0060.0	1
		1.5 ... 30 s	R2.064.0110.0	1
		5 ... 100 s	R2.064.0030.0	1
		15 ... 300 s	R2.064.0080.0	1
		50 ... 1000 s	R2.064.0010.0	1
		0.5 ... 10 min	R2.064.0050.0	1
		1.5 ... 30 min	R2.064.0100.0	1
		3 ... 60 min	R2.064.0130.0	1
		0.5 ... 10 h	R2.064.0040.0	1
		1.5 ... 30 h	R2.064.0090.0	1
		5 ... 100 h	R2.064.0020.0	1

Timer and switching relays
ON-delay NGZ 12

interface

ON-delay single-range timer relay

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: ON-delay (AV)
- 13 time ranges available from 0.1 s to 100 h
- 2 change-over contact
- 2 LEDs for function display

c SP us in preparation: UL

Function

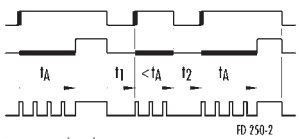
Setting the time delay

The desired delay time is set with a selecting wheel. It can be set using a screwdriver.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

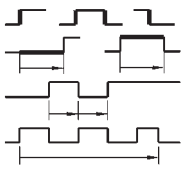
Function diagram

Function code 11 = ON-delay

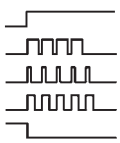


t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Description of the drawing



LED green Energizing quantity — 5-fold function



Time ranges

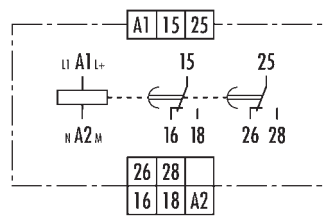
Available time ranges:

<0.1 ... 1 s	5 ... 100 s	0.5 ... 10 min	0.5 ... 10 h
0.15 ... 3 s	15 ... 300 s	1.5 ... 30 min	1.5 ... 30 h
0.5 ... 10 s	50 ... 1000 s	3 ... 60 min	5 ... 100 h
1.5 ... 30 s			

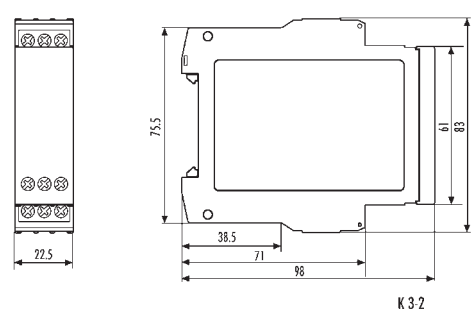
Notes

- The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.
- You can change the delay time during operation. The change is effective immediately.

Circuit diagram



Dimension diagram



Technical data	NGZ 12
Product standard (timer relay)	EN 61812-1:1999-08
Relay function according to IEC 60050	445-01-02
Function display	2 LEDs green
Function diagram	FD 250-2
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110%
Rated frequency f_n	50 – 60 Hz ± 5%
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes
Internal half-wave rectification	A1-A2 no
Time circuit	
Time setting / number of time ranges	analog / 1
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2	≤ 50 / ≤ 50 ms
Minimum ON time 1/2	- / - ms
Setting tolerance	≤ ± 5%
Repeatability (to set value)	≤ ± 0.01% + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002%
Influence of voltage (within range)	≤ ± 0.002%
Output circuit	
Contact assignment	2 change-over contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time at excitation of A1-A2	40 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-2
Circuit diagram of the terminals	KS 250-3
Wire ranges stranded or solid	1 x 0.2 to 6 or 2 x 0.2 to 2.5 mm²
Wire ranges stranded with ferrules	1 x 0.4 to 4 or 2 x 0.2 to 1.5 mm²
Weight	0.11 kg
Accessories	–
Approvals	cULus in preparation: UL

Overview of the devices/Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
NGZ 12	AC/DC 24 – 240 V 50 – 60 Hz	<0.1 ... 1 s	R2.064.0210.0	1
		0.15 ... 3 s	R2.064.0260.0	1
		0.5 ... 10 s	R2.064.0200.0	1
		1.5 ... 30 s	R2.064.0250.0	1
		5 ... 100 s	R2.064.0170.0	1
		15 ... 300 s	R2.064.0220.0	1
		50 ... 1000 s	R2.064.0150.0	1
		0.5 ... 10 min	R2.064.0190.0	1
		1.5 ... 30 min	R2.064.0240.0	1
		3 ... 60 min	R2.064.0270.0	1
		0.5 ... 10 h	R2.064.0180.0	1
		1.5 ... 30 h	R2.064.0230.0	1
		5 ... 100 h	R2.064.0160.0	1

Timer and switching relays
ON-delay NGZ 12-S

interface

ON-delay single-range timer relay

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: ON-delay (AV)
- 13 time ranges available from 0.1 s to 100 h
- 1 instantaneous and 1 timed change-over contact
- 2 LEDs for function display

cSAus in preparation: UL

Function

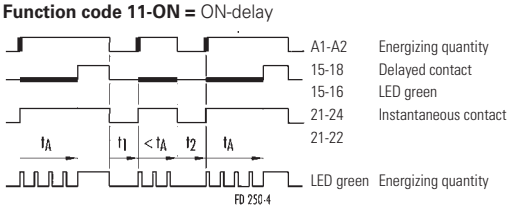
Setting the time delay

The desired delay time is set with a selecting wheel. It can be set using a screwdriver.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

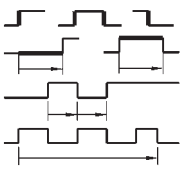
Function diagram

Function code 11-ON = ON-delay



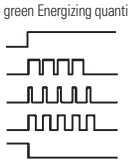
t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Description of the drawing



Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time

LED green Energizing quantity — 5-fold function



Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Time ranges

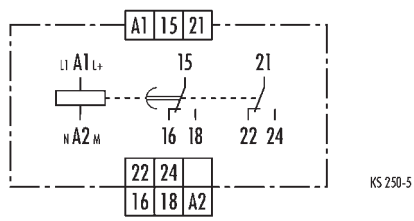
Available time ranges:

<0.1 ... 1 s	5 ... 100 s	0.5 ... 10 min	0.5 ... 10 h
0.15 ... 3 s	15 ... 300 s	1.5 ... 30 min	1.5 ... 30 h
0.5 ... 10 s	50 ... 1000 s	3 ... 60 min	5 ... 100 h
1.5 ... 30 s			

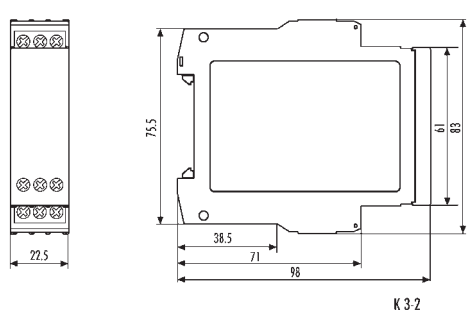
Notes

- The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.
- You can change the delay time during operation. The change is effective immediately.

Circuit diagram



Dimension diagram



Timer and switching relays
ON-delay NGZ 12-S

Technical data	NGZ 12-S
Product standard (timer relay)	EN 61812-1:1999-08
Relay function according to IEC 60050	445-01-02 + 445-04-05
Function display	2 LEDs green
Function diagram	FD 250-4
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110%
Rated frequency f_n	50 – 60 Hz ± 5%
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes
Internal half-wave rectification	A1-A2 no
Time circuit	
Time setting / number of time ranges	analog / 1
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2	≤ 50 / ≤ 50 ms
Minimum ON time 1/2	- / - ms
Setting tolerance	≤ ± 5%
Repeatability (to set value)	≤ ± 0.01% + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002%
Influence of voltage (within range)	≤ ± 0.002%
Output circuit	
Contact assignment	1 instantaneous and 1 timed change-over contact
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 to 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time at excitation of A1-A2	40 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-2
Circuit diagram of the terminals	KS 250-5
Wire ranges stranded or solid	1 x 0.2 to 6 or 2 x 0.2 to 2.5 mm^2
stranded with ferrules	1 x 0.4 to 4 or 2 x 0.2 to 1.5 mm^2
Weight	0.1 kg
Accessories	–
Approvals	cULus in preparation: UL

Overview of the devices/Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
NGZ 12-S	AC/DC 24 – 240 V 50 – 60 Hz	<0.1 ... 1 s	R2.064.0340.0	1
		0.15 ... 3 s	R2.064.0390.0	1
		0.5 ... 10 s	R2.064.0330.0	1
		1.5 ... 30 s	R2.064.0380.0	1
		5 ... 100 s	R2.064.0300.0	1
		15 ... 300 s	R2.064.0350.0	1
		50 ... 1000 s	R2.064.0280.0	1
		0.5 ... 10 min	R2.064.0320.0	1
		1.5 ... 30 min	R2.064.0370.0	1
		3 ... 60 min	R2.064.0370.0	1
		0.5 ... 10 h	R2.064.0310.0	1
		1.5 ... 30 h	R2.064.0360.0	1
		5 ... 100 h	R2.064.0290.0	1

Timer and switching relays
ON-delay NGZP 31

interface

ON-delay single-range timer relay with remote potentiometer connection

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: ON-delay (AV)
- 13 time ranges available from 0.1 s to 100 h
- Remote potentiometer connection
- 1 change-over contact
- 2 LEDs for function display

c SP us in preparation: UL

Function

Setting the time delay

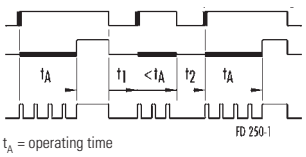
The desired delay time is set with a selecting wheel. It can be set using a screwdriver.

Connecting a remote potentiometer allows you to set parameters at greater distances. When a remote potentiometer is used, the time selecting wheel is to be set to the right-hand stop above the largest value. Operation without remote potentiometer does not require a jumper on the device.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

Function diagram

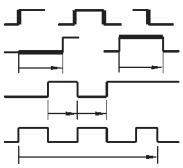
Function code 11 = ON-delay



A1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
LED green Energizing quantity

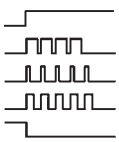
t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Description of the drawing



Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time

LED green Energizing quantity 5-fold function



Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Accessories

Remote potentiometer FP 10k

Time ranges

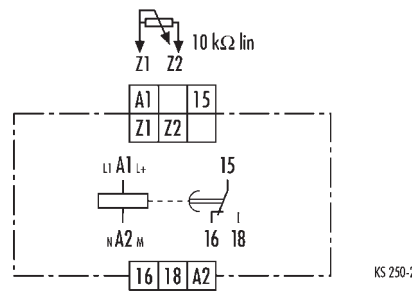
Available time ranges:

<0.1 ... 1 s	5 ... 100 s	0.5 ... 10 min	0.5 ... 10 h
0.15 ... 3 s	15 ... 300 s	1.5 ... 30 min	1.5 ... 30 h
0.5 ... 10 s	50 ... 1000 s	3 ... 60 min	5 ... 100 h
1.5 ... 30 s			

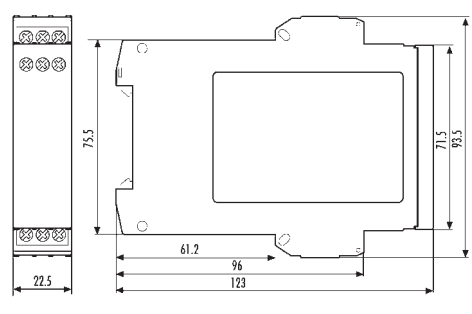
Notes

- The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.
- You can change the delay time during operation. The change is effective immediately.

Circuit diagram



Dimension diagram



Technical data	NGZP 31
Product standard (timer relay)	EN 61812-1:1999-08
Relay function according to IEC 60050	445-01-02
Function display	2 LEDs green
Function diagram	FD 250-1
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110%
Rated frequency f_n	50 – 60 Hz ± 5%
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes
Internal half-wave rectification	A1-A2 no
Time circuit	
Time setting / number of time ranges	analog (intern + extern) / 1
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2	≤ 50 / ≤ 50 ms
Minimum ON time 1/2	– / – ms
Setting tolerance	≤ ± 5%
Repeatability (to set value)	≤ ± 0.01% + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002%
Influence of voltage (within range)	≤ ± 0.002%
Output circuit	
Contact assignment	1 change-over contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time at excitation of A1-A2	40 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-3
Circuit diagram of the terminals	KS 250-9
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 to 2.5 mm²
stranded with ferrules	1 x 0.4 – 4 or 2 x 0.2 to 1.5 mm²
Weight	0.12 kg
Accessories	Remote potentiometer FP 10 k
Approvals	cULus in preparation: UL

Overview of the devices/Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
NGZP 31	AC/DC 24 – 240 V 50 – 60 Hz	<0.1 ... 1 s	R2.064.0480.0	1
		0.15 ... 3 s	R2.064.0530.0	1
		0.5 ... 10 s	R2.064.0470.0	1
		1.5 ... 30 s	R2.064.0520.0	1
		5 ... 100 s	R2.064.0440.0	1
		15 ... 300 s	R2.064.0490.0	1
		50 ... 1000 s	R2.064.0420.0	1
		0.5 ... 10 min	R2.064.0460.0	1
		1.5 ... 30 min	R2.064.0510.0	1
		3 ... 60 min	R2.064.0540.0	1
		0.5 ... 10 h	R2.064.0450.0	1
		1.5 ... 30 h	R2.064.0500.0	1
		5 ... 100 h	R2.064.0430.0	1

Timer and switching relays
ON-delay NGZP 32

interface

ON-delay single-range timer relay with remote potentiometer connection

- Multi-voltage for AC/DC 24 to 240 V
- 1 function: ON-delay (AV)
- 13 time ranges available from 0.1 s to 100 h
- Remote potentiometer connection
- 2 change-over contact
- 2 LEDs for function display

c SP us in preparation: UL

Function

Setting the time delay

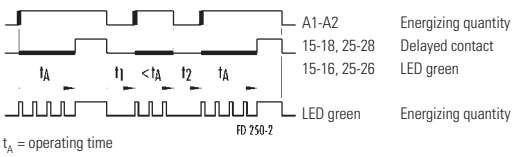
The desired delay time is set with a selecting wheel. It can be set using a screwdriver.

Connecting a remote potentiometer allows you to set parameters at greater distances. When a remote potentiometer is used, the time selecting wheel is to be set to the right-hand stop above the largest value. Operation without remote potentiometer does not require a jumper on the device.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

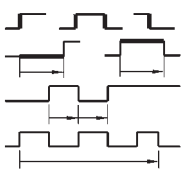
Function diagram

Function code 11 = ON-delay



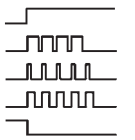
t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Description of the drawing



Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time

LED green Energizing quantity — 5-fold function



Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Accessories

Remote potentiometer FP 10k

Time ranges

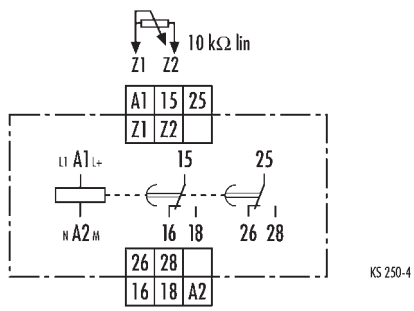
Available time ranges:

<0.1 ... 1 s	5 ... 100 s	0.5 ... 10 min	0.5 ... 10 h
0.15 ... 3 s	15 ... 300 s	1.5 ... 30 min	1.5 ... 30 h
0.5 ... 10 s	50 ... 1000 s	3 ... 60 min	5 ... 100 h
1.5 ... 30 s			

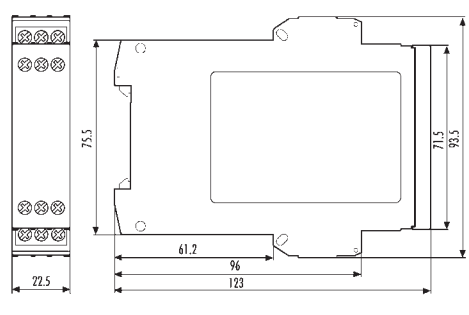
Notes

- The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.
- You can change the delay time during operation. The change is effective immediately.

Circuit diagram



Dimension diagram



Timer and switching relays
ON-delay NGZP 32

Technical data	NGZP 32
Product standard (timer relay)	EN 61812-1:1999-08
Relay function according to IEC 60050	445-01-02
Function display	2 LEDs green
Function diagram	FD 250-2
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110%
Rated frequency f_n	50 – 60 Hz ± 5%
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes
Internal half-wave rectification	A1-A2 no
Time circuit	
Time setting / number of time ranges	analog (intern + extern) / 1
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2	≤ 50 / ≤ 50 ms
Minimum ON time 1/2	– / – ms
Setting tolerance	≤ ± 5 %
Repeatability (to set value)	≤ ± 0.01% + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002%
Influence of voltage (within range)	≤ ± 0.002%
Output circuit	
Contact assignment	2 change-over contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time at excitation of A1-A2	40 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-3
Circuit diagram of the terminals	KS 250-4
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 to 2.5 mm²
Wire ranges stranded with ferrules	1 x 0.4 – 4 or 2 x 0.2 to 1.5 mm²
Weight	0.14 kg
Accessories	Remote potentiometer FP 10 k
Approvals	cULus in preparation: UL

Overview of the devices/Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
NGZP 32	AC/DC 24 – 240 V 50 – 60 Hz	<0.1 ... 1 s	R2.064.0610.0	1
		0.15 ... 3 s	R2.064.0660.0	1
		0.5 ... 10 s	R2.064.0600.0	1
		1.5 ... 30 s	R2.064.0650.0	1
		5 ... 100 s	R2.064.0570.0	1
		15 ... 300 s	R2.064.0620.0	1
		50 ... 1000 s	R2.064.0550.0	1
		0.5 ... 10 min	R2.064.0590.0	1
		1.5 ... 30 min	R2.064.0640.0	1
		3 ... 60 min	R2.064.0670.0	1
		0.5 ... 10 h	R2.064.0580.0	1
		1.5 ... 30 h	R2.064.0630.0	1
		5 ... 100 h	R2.064.0560.0	1

Timer and switching relays
ON-delay NGZP 32-S

interface

ON-delay single-range timer relay with remote potentiometer connection

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: ON-delay (AV)
- 13 time ranges available from 0.1 s to 100 h
- Remote potentiometer connection
- 2 change-over contact
- 2 LEDs for function display

c SP us in preparation: UL

Function

Setting the time delay

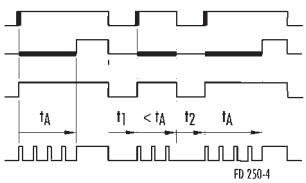
The desired delay time is set with a selecting wheel. It can be set using a screwdriver.

Connecting a remote potentiometer allows you to set parameters at greater distances. When a remote potentiometer is used, the time selecting wheel is to be set to the right-hand stop above the largest value. Operation without remote potentiometer does not require a jumper on the device.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

Function diagram

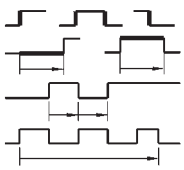
Function code 11-ON = ON-delay



A1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
21-24 Instantaneous contact
21-22
LED green Energizing quantity

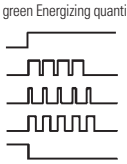
t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Description of the drawing



Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time

LED green Energizing quantity 5-fold function



Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Accessories

Remote potentiometer FP 10k

Time ranges

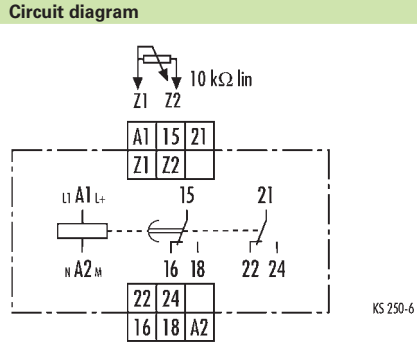
Avaiblable time range:

<0.1 ... 1 s	5 ... 100 s	0.5 ... 10 min	0.5 ... 10 h
0.15 ... 3 s	15 ... 300 s	1.5 ... 30 min	1.5 ... 30 h
0.5 ... 10 s	50 ... 1000 s	3 ... 60 min	5 ... 100 h
1.5 ... 30 s			

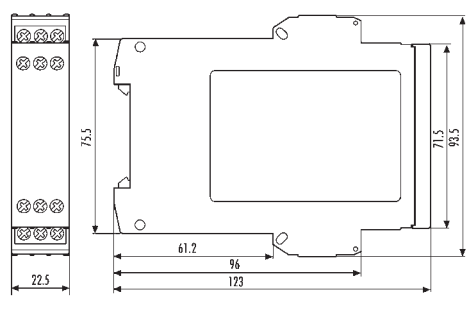
Notes

- The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.
- You can change the delay time during operation. The change is effective immediately.

Circuit diagram



Dimension diagram



Timer and switching relays
ON-delay NGZP 32-S

Technical data	NGZP 32-S
Product standard (timer relay)	EN 61812-1:1999-08
Relay function according to IEC 60050	445-01-02 + 445-04-05
Function display	2 LEDs green
Function diagram	FD 250-4
Input circuit	
Rated voltage A1-A2	AC/DC 24 to 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110%
Rated frequency f_n	50 – 60 Hz ± 5%
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes
Internal half-wave rectification	A1-A2 no
Time circuit	
Time setting / number of time ranges	analog (internal + external) / 16
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2	≤ 50 / ≤ 50 ms
Minimum ON time 1/2	– / – ms
Setting tolerance	≤ ± 5%
Repeatability (to set value)	≤ ± 0.01% + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002%
Influence of voltage (within range)	≤ ± 0.002%
Output circuit	
Contact assignment	1 instantaneous and 1 timed change-over contact
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time at excitation of A1-A2	40 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-3
Circuit diagram of the terminals	KS 250-6
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 to 2.5 mm²
Wire ranges stranded with ferrules	1 x 0.4 – 4 or 2 x 0.2 to 1.5 mm²
Weight	0.14 kg
Accessories	Remote potentiometer FP 10 k
Approvals	cULus in preparation: UL

Overview of the devices/Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
NGZP 32-S	AC/DC 24 – 240 V 50 – 60 Hz	<0.1 ... 1 s	R2.064.0740.0	1
		0.15 ... 3 s	R2.064.0790.0	1
		0.5 ... 10 s	R2.064.0730.0	1
		1.5 ... 30 s	R2.064.0780.0	1
		5 ... 100 s	R2.064.0700.0	1
		15 ... 300 s	R2.064.0750.0	1
		50 ... 1000 s	R2.064.0680.0	1
		0.5 ... 10 min	R2.064.0720.0	1
		1.5 ... 30 min	R2.064.0770.0	1
		3 ... 60 min	R2.064.0800.0	1
		0.5 ... 10 h	R2.064.0710.0	1
		1.5 ... 30 h	R2.064.0760.0	1
		5 ... 100 h	R2.064.0690.0	1

ON-delay single-range timer relay with digital time setting

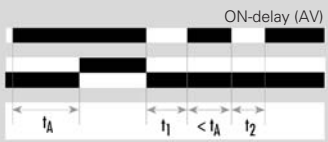
- Single voltage
- 1 function: ON-delay (AV)
- 1 time range with digital time selection
- 1 timed change-over contact
- 2 LEDs for function display

Function

The time can be set in decimal increments at the selector switch. The set values are absolute values related to the selected time unit.

Function diagram

FD 0026



A1/A2 Energizing quantity, LED rot
15/18
15/16 Delayed contact, LED green
t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

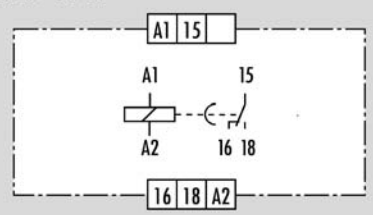
Time ranges

Available time ranges:

0.01 s	...	9.99 s
0.01 s	...	99.99 s
0.1 s	...	99.9 s
1 s	...	9999 s

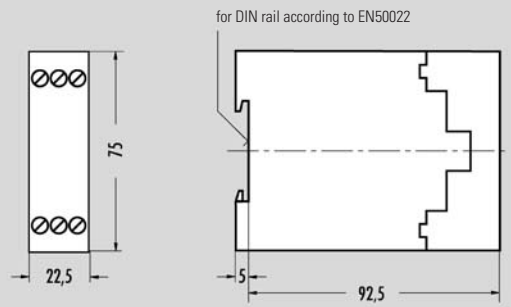
Circuit diagram

KZD 31 K KS 0080/2



Dimension diagram

K 1-8 W3



Technical data		KZD 31 K	
Function type according to IEC 60050 (445)		ON-delay timer relay with digital time setting	
Function display		1 green LED, 1 red LED	
Function diagram		FD 0026	
Power supply circuit			
Rated voltage U_N	AC/DC	**24 V**	
	AC		**230 V**
Rated consumption at 50 Hz and U_N (AC)		1.9 VA / 1.8 W	5.0 VA / 1.6 W
Rated consumption DC		1.3 W	
Switch-on peak		1.5 A / 2 ms	0.5 A / 0.5 ms
Rated frequency		50 – 60 Hz	
Operating voltage range		0.80 – 1.1 x U_N	
Time circuit			
Time setting / number of time ranges		digital / 1	
Possible setting range		See table "Time ranges"	
Recovery time 1/2		ca. 40 / ca. 80 ms	
Minimum ON time		–	
Release value		≥ 15% U_N	
Parallel loads permissible		yes	
Internal half-wave rectification		no	
Mean value of the fault		≤ ± 0.5% + ± 10 ms	
Dispersion		≤ ± 0.5% + ± 10 ms	
Influence of the energizing quantity, supply voltage		≤ 0.02% / % Δ U_N	
Influence of the ambient temperature		≤ 0.025% / K	
Output circuit			
Contact assignment		1 timed change-over contact	
Contact material		Ag alloy, gold-plated	
Rated operating voltage U_n		230/230 V AC/DC	
Max. continuous current I_n		5 A	
Application category according to EN 60947-5-1:1991		AC-15: U_e 230 V AC, I_e 2 A DC-13: U_e 24 V DC, I_e 2 A	
Permissible switching frequency		≤ 3600 switching cycles/h	
Mechanical life		20 x 10^6 switching cycles	
Response time		–	
Release time		ca. 25 ms	
General information			
Creepage distances and clearances between the circuits		according to DIN VDE 0110-1:04.97	
Rated impulse voltage		4 kV	
Overvoltage category		III	
Degree of pollution		3 outside, 2 inside	
Rated voltage		250 V AC	
Test voltage U_{eff} 50 Hz according to DIN VDE 0110-1, table A.1		2.21 kV	
Protection degree housing/terminals according to DIN VDE 0470 sec. 1:11.92		IP 30 / IP 20	
Noise immunity according to IEC 61000-4		Test severity 3	
Ambient temperature, operating range		–20 – +60 °C	
Dimension diagram		K1-8 W3	
Circuit diagram		KS 0080/2	
Weight		0.12 kg	
Accessories		–	
Approvals		–	

Overview of the devices/Part numbers

Type	ON-delay time	Rated voltage		Part No.	Std. Pack
KZD 31 K	0.01 … 9.99 s	AC 230 V	50 – 60 Hz	R2.054.0270.0	1
	0.01 … 99.99 s	AC/DC 24 V	50 – 60 Hz	R2.054.0150.0	1
	0.1 … 99.9 s	AC/DC 24 V	50 – 60 Hz	R2.054.0130.0	1
	1 … 9999 s	AC 230 V	50 – 60 Hz	R2.054.0110.0	1
		AC/DC 24 V	50 – 60 Hz	R2.054.0050.0	1

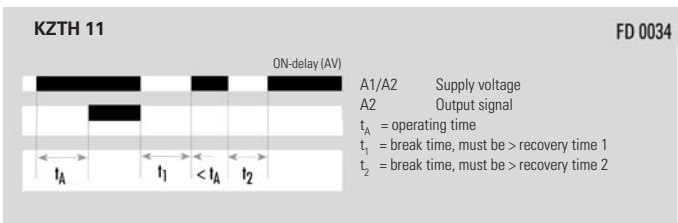
ON-delay single-range timer relay with semiconductor output (two-wire)

- Multi-voltage AC/DC 24 to 110 or 60 to 230 V
- 1 function: ON-delay (AV)
- 1 time range
- 1 semiconductor output

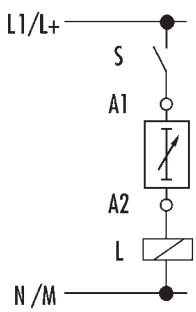
Function

Infinitely variable time setting is selected with a thumbwheel disc. The scale values are absolute values related to the selected time unit.

Function diagram



Application example



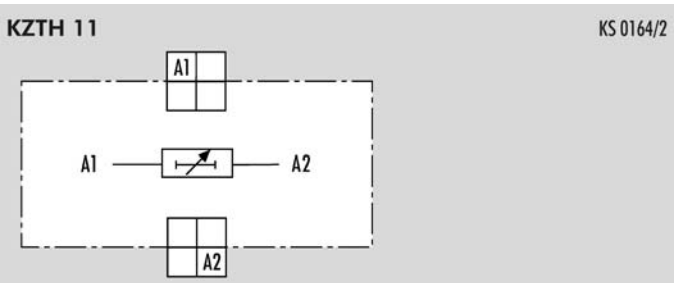
When the control contact S is closed, the KZTH 11 is energized through the load L and the countdown starts (see "Function diagram"). After the timing period has elapsed, the KZTH 11 connects the load L. The load L must be chosen so that even with lower supply voltage the holding current will not fall below 10 mA_{eff} and the maximum load current is ≤ 0.8 A_{eff}. At max. load current, a voltage drop ≤ 3.5 V_{eff} must be considered due to the KZTH.

Time ranges

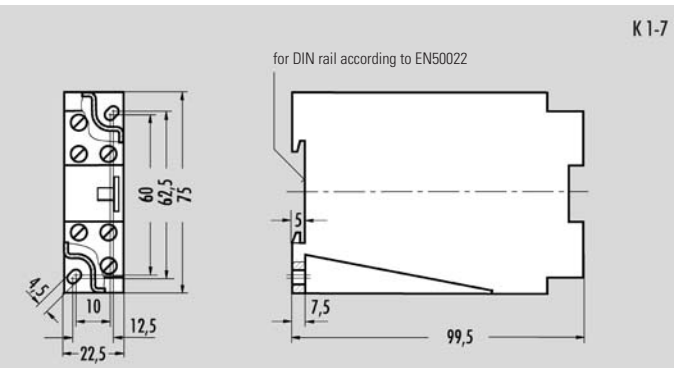
Available time ranges:

0.05 s ...	1 s
0.15 s ...	3 s
0.5 s ...	10 s
1.5 s ...	30 s
5 s ...	100 s

Circuit diagram



Dimension diagram



Interface

Technical data	KZTH 11	
Function type according to IEC 60050 (445)	ON-delay timer relay with semiconductor output for multi-voltage	
Function display	–	
Function diagram	FD 0034	
Power supply circuit		
Rated voltage U_N AC/DC	**24 – 110 V**	**60 – 230 V**
Rated consumption at 50 Hz and U_N (AC)	–	–
Rated consumption DC	–	–
Switch-on peak	–	–
Rated frequency	50 – 60 Hz	
Operating voltage range	0.8 – 1.1 x U_N	
Time circuit		
Time setting / number of time ranges	analog / 1	
Possible setting range	See table "Time ranges"	
Recovery time 1/2	ca. 50 / ca. 300 ms	
Minimum ON time	–	
Release value	–	
Parallel loads permissible	no	
Internal half-wave rectification	no	
Mean value of the fault	–	
Dispersion	≤ ± 1% + ± 10 ms	
Influence of the energizing quantity, supply voltage	–	
Influence of the ambient temperature	≤ 0.15% / K	
Output circuit		
Contact assignment	1 semiconductor	
Contact material	–	
Rated operating voltage U_n	–	
Max. load current	0.8 A_{eff}	
Max. impulse current, 1 half wave 50 Hz	30 A_s	
Holding current	≤ 15 mA_{eff}	
Voltage drop in the device	≤ 3.5 mV_{eff}	
Permissible switching frequency	≤ 3600 switching cycles/h	
Response time	–	
Release time	–	
General information		
Creepage distances and clearances between the circuits	according to DIN VDE 0110-1:04.97	
Rated impulse voltage	–	
Overvoltage category	–	
Degree of pollution	3 outside, 2 inside	
Rated voltage	–	
Test voltage U_{eff} 50 Hz according to DIN VDE 0110-1, table A.1	–	
Protection degree housing/terminals according to DIN VDE 0470 sec. 1:11.92	IP 30 / IP 20	
Noise immunity according to IEC 61000-4	Test severity 3	
Ambient temperature, operating range	–20 – +60 °C	
Dimension diagram	K1-7	
Circuit diagram	KS 0164/2	
Weight	0.11 kg	
Accessories	–	
Approvals	–	

Overview of the devices/Part numbers

Type	ON-delay time	Rated voltage	Part No.	Std. Pack
KZTH 11	0.05 ... 1 s	AC/DC 60 – 230 V 50 – 60 Hz	R2.060.0060.2	1
	0.15 ... 3 s	AC/DC 24 – 110 V 50 – 60 Hz	R2.060.0080.2	1
		AC/DC 60 – 230 V 50 – 60 Hz	R2.060.0090.2	1
	0.5 ... 10 s	AC/DC 24 – 110 V 50 – 60 Hz	R2.060.0040.2	1
		AC/DC 60 – 230 V 50 – 60 Hz	R2.060.0050.2	1
	1.5 ... 30 s	AC/DC 60 – 230 V 50 – 60 Hz	R2.060.0070.2	1
	5 ... 100 s	AC/DC 60 – 230 V 50 – 60 Hz	R2.060.0030.2	1

ON-delay timer relay
Time range 1 – 100 sec, 1 – 100 min

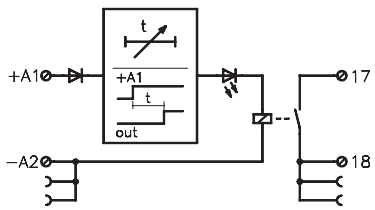
Dimensions (mm): W x H x D
6.2 x 89 x 70

flare TIMER-A
ON-delay timer relay
Approvals:

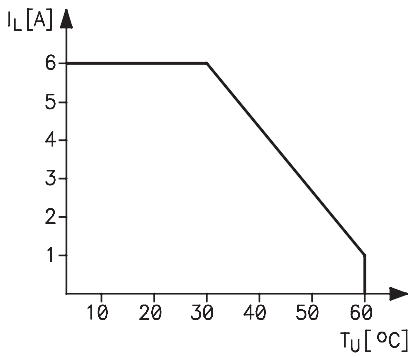
Time range	Type	Part No.	Std. Pack
0.1 – 300 sec			
1 – 100 sec, spring clamp connection			
1 – 100 min, spring clamp connection	***flare*** TIMER-A/0100-S-250V6A	81.020.4101.0	10
	flare TIMER-A/0060-S-250V6A	81.020.4102.0	10
Coil circuit			
Operating voltage	24 V DC +25%/-20%		
Control voltage (TRIGGER)	24 V DC +25%/-20%		
Rated current	ca. 10 mA		
Time setting	At the front (behind the hinged identification plate holder)		
Setting of function	Potentiometer		
Status display	LED green		
Repeatability	± 1% of selected range		
Switching characteristics			
Maximum switching voltage	250 V AC / 300 V DC		
Maximum switching current	6 A AC / 2 A DC		
Maximum switching capacity	1500 VA / 48 W		
Maximum inrush current	10 A; 4 sec.		
ON/OFF-delay	1 ms / 5 ms		
Chatter time	2 ms		
Maximum switching frequency	20 Hz		
Contact material	$AgSnO_2$		
Minimum selectable voltage	12 V		
Minimum selectable current	8 mA		
Mechanical life	2×10^7		
Electrical life 24 V DC / 2 A	6×10^5		
Electrical life 230 V AC / 6 A	8×10^4		
Rated voltage			
Isolation voltage of input/output	$4\ kV_{eff.}$		
Overvoltage category	III (according to HD 625.1S1)		
Degree of pollution	2 (according to HD 625.1S1)		
Ambient temperature	0 °C...+50 °C		
Storage temperature	–40 °C...+80 °C		
Degree of protection / mounting rail	IP 20 / TS35		
Standards / specifications	VDE 0160; VDE 0106 T101		
Emitted interference / noise immunity	EN 61000-6-3; EN 61000-6-2		
Wire range of screw terminals	–		
Wire range of spring clamp terminals			
finely stranded	0.14 mm^2 – 1.5 mm^2		
solid	0.5 mm^2 – 2.5 mm^2		
CSA EX	Class I, Division 2, Groups A, B, C and D		
Accessories			
Plug-in jumper ($U_{max.}$ = 50 V, $I_{max.}$ = 2 A)		Z8.000.0200.8	10
8 digit marker tag, unmarked, 60 pcs.		Z4.242.5153.0	10

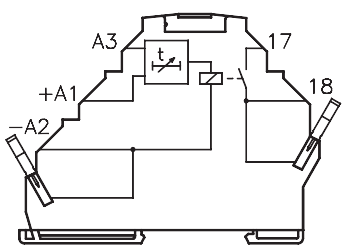
Block diagram for timer relay *flare* TIMER-A

ON-delay



Derating: timer relays





Contact assignment: timer relay

Timer and switching relays
OFF-delay NGZ 710

interface

OFF-delay multi-range timer relay with auxiliary supply

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: OFF-delay (RV) with auxiliary supply
- Setting range from 0.1 s to 300 h divided into 16 selectable time ranges
- 1 change-over contact
- 2 LEDs for function display

c SP us being prepared: UL

Function

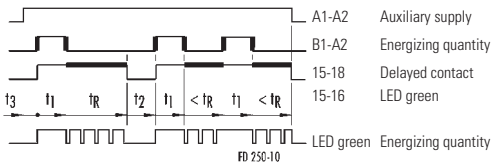
Setting the time delay

The time range is set with the RANGE selector switch and displayed in the window next to it. The desired delay time is set with a selecting wheel.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

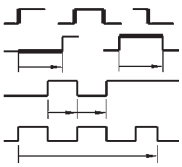
Function diagram

Function code 12 = OFF-delay, with auxiliary supply



t_R = returning time
t_1 = make time, must be > minimum ON time 1
t_2 = break time, must be > recovery time 2
t_3 = time between switching on auxiliary supply and energizing quantity, must be > recovery time 1

Description of the drawing



Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time
LED green Energizing quantity
5-fold function
Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Time ranges

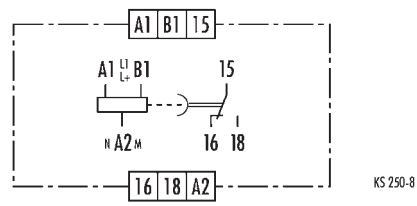
Available time ranges:

<0.1 ... 1 s	5 ... 100 s	1.5 ... 30 min	0.5 ... 10 h
0.15 ... 3 s	15 ... 300 s	3 ... 60 min	1.5 ... 30 h
0.5 ... 10 s	50 ... 1000 s	5 ... 100 min	5 ... 100 h
1.5 ... 30 s	0.5 ... 10 min	0.15 ... 3 h	15 ... 300 h

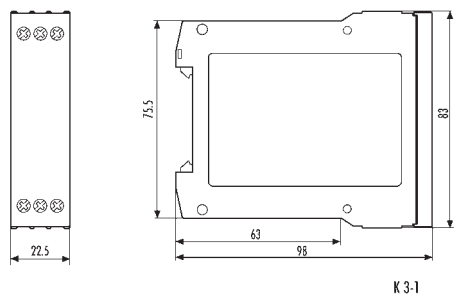
Notes

- The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.
- You can change the delay time during operation. The change is effective immediately.

Circuit diagram



Dimension diagram



Technical data	NGZ 710
Product standard (timer relay)	EN 61812-1:1999-08
Relay function according to IEC 60050	445-01-04 + 445-03-02
Function display	2 LEDs green
Function diagram	FD 250-10
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110 %
Rated frequency f_n	50 – 60 Hz ± 5 %
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (B1-A2)	1 mA
Rated consumption on control connection (B1-A2)	< 0.25 W
Parallel loads permissible	A1-A2 yes / B1-A2 yes
Internal half-wave rectification	A1-A2 no / B1-A2 yes
Time circuit	
Time setting / number of time ranges	analog / 16
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2 /3	0 / 0 / – ms
Minimum ON time 1/2	≤ 25 / – ms
Setting tolerance	≤ ± 5 %
Repeatability (to set value)	≤ ± 0.01 % + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002 %
Influence of voltage (within range)	≤ ± 0.002 %
Output circuit	
Contact assignment	1 change-over contact
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time at excitation of A1-A2	40 ms
Response time / release time at excitation of B1-A2	20 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-1
Circuit diagram of the terminals	KS 250-8
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm²
stranded with ferrules	1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm²
Weight	0.1 kg
Accessories	–
Approvals	c SP us being prepared: UL

Overview of the devices/Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
NGZ 710	AC/DC 24 – 240 V 50 – 60 Hz	See table "Time ranges"	R2.065.0070.0	1

Timer and switching relays
OFF-delay NGZ 720

interface

OFF-delay multi-range timer relay with auxiliary supply

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: OFF-delay (RV) with auxiliary supply
- Setting range from 0.1 s to 300 h divided into 16 selectable time ranges
- 2 change-over contact
- 2 LEDs for function display

c SP us being prepared: UL

Function

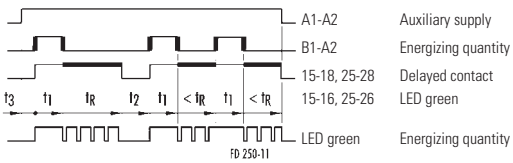
Setting the time delay

The time range is set with the RANGE selector switch and displayed in the window next to it. The desired delay time is set with a selecting wheel.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

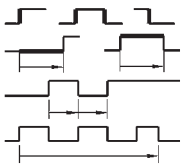
Function diagram

Function code 12 = OFF-delay, with auxiliary supply



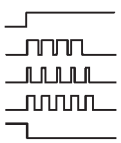
t_R = returning time
t_1 = make time, must be > minimum ON time 1
t_2 = break time, must be > recovery time 2
t_3 = time between switching on auxiliary supply and energizing quantity, must be > recovery time 1

Description of the drawing



Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time

LED green Energizing quantity — 5-fold function



Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Time ranges

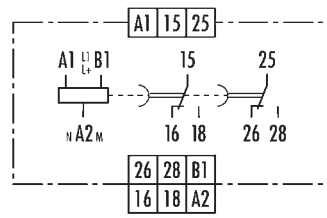
Setting range from 0.1 s to 300 h divided into:

<0.1 ... 1 s	5 ... 100 s	1.5 ... 30 min	0.5 ... 10 h
0.15 ... 3 s	15 ... 300 s	3 ... 60 min	1.5 ... 30 h
0.5 ... 10 s	50 ... 1000 s	5 ... 100 min	5 ... 100 h
1.5 ... 30 s	0.5 ... 10 min	0.15 ... 3 h	15 ... 300 h

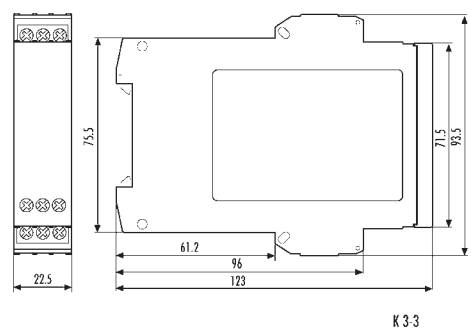
Notes

- The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.
- You can change the delay time during operation. The change is effective immediately.

Circuit diagram



Dimension diagram



Technical data	NGZ 720
Product standard (timer relay)	EN 61812-1:1999-08
Relay function according to IEC 60050	445-01-04 + 445-03-02
Function display	2 LEDs green
Function diagram	FD 250-11
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110 %
Rated frequency f_n	50 – 60 Hz ± 5 %
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (B1-A2)	1 mA
Rated consumption on control connection (B1-A2)	< 0.25 W
Parallel loads permissible	A1-A2 yes / B1-A2 yes
Internal half-wave rectification	A1-A2 no / B1-A2 yes
Time circuit	
Time setting / number of time ranges	analog / 16
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2 /3	0 / 0 / – ms
Minimum ON time 1/2	≤ 25 / – ms
Setting tolerance	≤ ± 5 %
Repeatability (to set value)	≤ ± 0.01 % + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002 %
Influence of voltage (within range)	≤ ± 0.002 %
Output circuit	
Contact assignment	2 change-over contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 to 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time at excitation of A1-A2	40 ms
Response time / release time at excitation of B1-A2	20 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-3
Circuit diagram of the terminals	KS 250-9
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm²
stranded with ferrules	1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm²
Weight	0.13 kg
Accessories	–
Approvals	c SP us being prepared: UL

Overview of the devices/Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
NGZ 720	AC/DC 24 – 240 V 50 – 60 Hz	See table "Time ranges"	R2.065.0090.0	1

Timer and switching relays
OFF-delay NGZ 310
interface

OFF-delay single-range timer relay with auxiliary supply

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: OFF-delay (RV)
- 13 time ranges available from 0.1 s to 100 h
- 1 change-over contact
- 2 LEDs for function display

cSPus being prepared: UL

Function

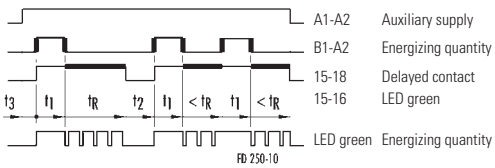
Setting the time delay

The desired delay time is set with a selecting wheel. It can be set using a screwdriver.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

Function diagram

Function code 12 = OFF-delay, with auxiliary supply

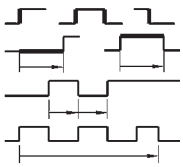


A1-A2 Auxiliary supply
B1-A2 Energizing quantity
15-18 Delayed contact
15-16 LED green
LED green Energizing quantity

FD 250-10

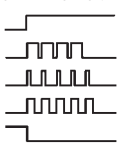
t_R = returning time
t_1 = make time, must be > minimum ON time 1
t_2 = break time, must be > recovery time 2
t_3 = time between switching on auxiliary supply and energizing quantity, must be > recovery time 1

Description of the drawing



Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time

LED green Energizing quantity 5-fold function



Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Time ranges

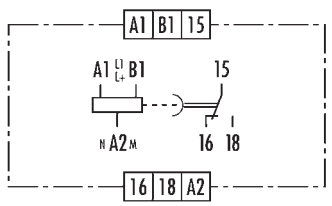
Available time ranges:

<0.1 ... 1 s	5 ... 100 s	0.5 ... 10 min	0.5 ... 10 h
0.15 ... 3 s	15 ... 300 s	1.5 ... 30 min	1.5 ... 30 h
0.5 ... 10 s	50 ... 1000 s	3 ... 60 min	5 ... 100 h
1.5 ... 30 s			

Notes

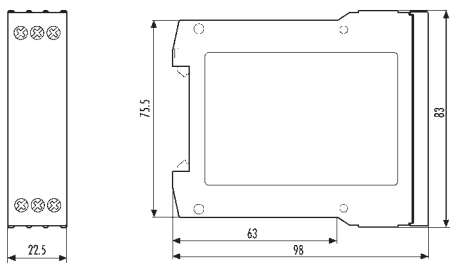
- The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.
- You can change the delay time during operation. The change is effective immediately.

Circuit diagram



KS 250-8

Dimension diagram



K 3-1

Timer and switching relays
OFF-delay NGZ 310

Technical data	NGZ 310
Product standard (timer relay)	EN 61812-1:1999-08
Relay function according to IEC 60050	445-01-04 + 445-03-02
Function display	2 LEDs green
Function diagram	FD 250-10
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110 %
Rated frequency f_n	50 – 60 Hz ± 5 %
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (B1-A2)	1 mA
Rated consumption on control connection (B1-A2)	< 0.25 W
Parallel loads permissible	A1-A2 yes / B1-A1 yes
Internal half-wave rectification	A1-A2 no / B1-A1 yes
Time circuit	
Time setting / number of time ranges	analog / 1
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2	0 / 0 ms
Minimum ON time 1/2	≤ 25 / – ms
Setting tolerance	≤ ± 5 %
Repeatability (to set value)	≤ ± 0.01 % + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002 %
Influence of voltage (within range)	≤ ± 0.002 %
Output circuit	
Contact assignment	1 change-over contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time at excitation of A1-A2	40 ms
Response time / release time at excitation of B1-A2	20 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-1
Circuit diagram of the terminals	KS 250-8
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm²
stranded with ferrules	1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm²
Weight	0.1 kg
Accessories	–
Approvals	c SP us being prepared: UL

Overview of the devices/Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
NGZ 310	AC/DC 24 – 240 V 50 – 60 Hz	<0.1 ... 1 s	R2.067.0320.0	1
		0.15 ... 3 s	R2.067.0370.0	1
		0.5 ... 10 s	R2.067.0310.0	1
		1.5 ... 30 s	R2.067.0360.0	1
		5 ... 100 s	R2.067.0280.0	1
		15 ... 300 s	R2.067.0330.0	1
		50 ... 1000 s	R2.067.0260.0	1
		0.5 ... 10 min	R2.067.0300.0	1
		1.5 ... 30 min	R2.067.0350.0	1
		3 ... 60 min	R2.067.0380.0	1
		0.5 ... 10 h	R2.067.0290.0	1
		1.5 ... 30 h	R2.067.0340.0	1
		5 ... 100 h	R2.067.0270.0	1

Timer and switching relays
OFF-delay NGZ 320

interface

OFF-delay single-range timer relay with auxiliary supply

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: OFF-delay (RV)
- 13 time ranges available from 0.1 s to 100 h
- 2 change-over contact
- 2 LEDs for function display

c SP us being prepared: UL

Function

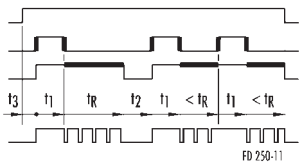
Setting the time delay

The desired delay time is set with a selecting wheel. It can be set using a screwdriver.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

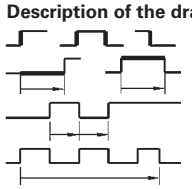
Function diagram

Function code 12 = OFF-delay, with auxiliary supply



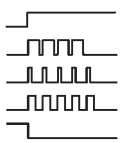
t_R = returning time
t_1 = make time, must be > minimum ON time 1
t_2 = break time, must be > recovery time 2
t_3 = time between switching on auxiliary supply and energizing quantity, must be > recovery time 1

Description of the drawing



Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time

LED green Energizing quantity — 5-fold function



Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Time ranges

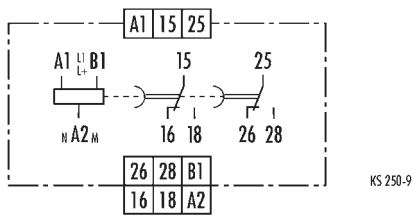
Available time ranges:

<0.1 ... 1 s	5 ... 100 s	0.5 ... 10 min	0.5 ... 10 h
0.15 ... 3 s	15 ... 300 s	1.5 ... 30 min	1.5 ... 30 h
0.5 ... 10 s	50 ... 1000 s	3 ... 60 min	5 ... 100 h
1.5 ... 30 s			

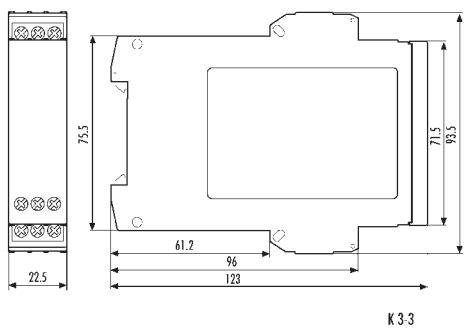
Notes

- The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.
- You can change the delay time during operation. The change is effective immediately.

Circuit diagram



Dimension diagram



Timer and switching relays
OFF-delay NGZ 320

Technical data	NGZ 320
Product standard (timer relay)	EN 61812-1:1999-08
Relay function according to IEC 60050	445-01-04 + 445-03-02
Function display	2 LEDs green
Function diagram	FD 250-11
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110 %
Rated frequency f_n	50 – 60 Hz ± 5 %
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (B1-A2)	1 mA
Rated consumption on control connection (B1-A2)	< 0.25 W
Parallel loads permissible	A1-A2 yes / B1-A1 yes
Internal half-wave rectification	A1-A2 no / B1-A1 yes
Time circuit	
Time setting / number of time ranges	analog / 1
Setting ranges for time delay	See table "Time ranges"
Recovery time 1/2	0 / 0 ms
Minimum ON time 1/2	≤ 25 / – ms
Setting tolerance	≤ ± 5 %
Repeatability (to set value)	≤ ± 0.01 % + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002 %
Influence of voltage (within range)	≤ ± 0.002 %
Output circuit	
Contact assignment	2 change-over contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time at excitation of A1-A2	40 ms
Response time / release time at excitation of B1-A2	20 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-3
Circuit diagram of the terminals	KS 250-9
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm²
stranded with ferrules	1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm²
Weight	0.13 kg
Accessories	–
Approvals	c SP us being prepared: UL

Overview of the devices/Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
NGZ 320	AC/DC 24 – 240 V 50 – 60 Hz	<0.1 ... 1 s	R2.067.0450.0	1
		0.15 ... 3 s	R2.067.0500.0	1
		0.5 ... 10 s	R2.067.0440.0	1
		1.5 ... 30 s	R2.067.0490.0	1
		5 ... 100 s	R2.067.0410.0	1
		15 ... 300 s	R2.067.0460.0	1
		50 ... 1000 s	R2.067.0390.0	1
		0.5 ... 10 min	R2.067.0430.0	1
		1.5 ... 30 min	R2.067.0480.0	1
		3 ... 60 min	R2.067.0510.0	1
		0.5 ... 10 h	R2.067.0420.0	1
		1.5 ... 30 h	R2.067.0470.0	1
		5 ... 100 h	R2.067.0400.0	1

Timer and switching relays
OFF-delay NGZ 110 / NGZ 210

interface

OFF-delay single-range timer relay without auxiliary supply

- 3 single voltages AC/DC available
- 1 function: OFF-delay (RV)
- 6 time ranges available from 0.05 to 300 s
- 1 change-over contact
- 1 LED for function display
- Configuration prior to use not required

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Function

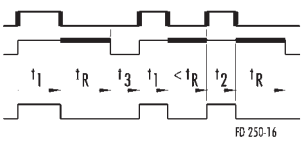
Setting the time delay

The desired delay time is set with a selecting wheel. It can be set using a screwdriver.

The LED shows the position of the excitation input.

Function diagram

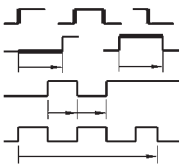
Function code 13 = OFF-delay, without auxiliary supply



A1-A2 Energizing quantity
15-18 Delayed contact
15-16
LED green Energizing quantity

t_R = returning time
t_1 = make time, must be > minimum ON time 1
t_2 = make time, must be > minimum ON time 2
t_3 = break time, must be > recovery time 1

Description of the drawing



Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time
LED green Energizing quantity
5-fold function
Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Time ranges

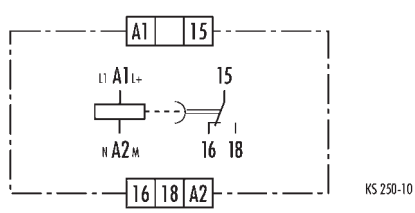
Available time ranges:

0.05 ...	1 s	1.5 ...	30 s
0.15 ...	3 s	5 ...	100 s
0.5 ...	10 s	15 ...	300 s

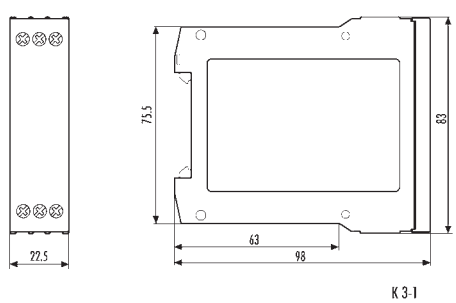
Notes

- The device is designed for single voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.
- You can change the delay time during operation. The change is effective immediately.

Circuit diagram



Dimension diagram



Timer and switching relays
OFF-delay NGZ 110 / NGZ 210

Technical data	NGZ 110			NGZ 210
Product standard (timer relay)	EN 61812-1:1999-08			
Relay function according to IEC 60050	445-01-03			
Function display	1 LED green			
Function diagram	FD 250-16			
Input circuit				
	AC/DC	AC	AC	DC
Rated voltage A1-A2	24 V	110 – 127 V	230 – 240 V	110 V
Rated consumption AC	0.1 VA	0.8 VA	1.3 VA	
Rated consumption at 50 Hz and $U_{A1/A2}$ (AC)	0.06 W	0.5 W	0.9 W	
Rated consumption DC	0.06 W			0.6 W
Switch-on peak	0.4 A / 40 ms	0.1 A / 40 ms	0.05 A / 150 ms	0.06 A / 15 ms
Rated voltage limits	80 – 110 %			
Rated frequency f_n	50 – 60 Hz ± 5 %			
Release value of the input voltage	–			
Parallel loads permissible	A1-A2 yes			
Internal half-wave rectification	A1-A2 yes			
Time circuit				
Time setting / number of time ranges	analog / 1			
Setting ranges for time delay	See table "Time ranges"			
Recovery time 1	approx. 250 ms			
Minimum ON time 1/2	approx. 200 / approx. 200 ms (at 300 s: approx. 500 / approx. 500 ms)			
Setting tolerance	≤ ± 5 %			
Repeatability (to set value)	≤ ± 1 % + ± 10 ms			
Influence of temperature (within range)	≤ ± 0.04 %			
Influence of voltage (within range)	≤ ± 0.05 %			
Output circuit				
Contact assignment	1 change-over contacts			
Contact material	AgNi 0.15+HVT			
Rated operating voltage	AC/DC 230/230 V			
Rated value for limiting continuous current I_{th}	5 A			
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 2 A DC-13 U_e DC 24 V, I_e 2 A			
Permissible switching frequency	≤ 3600 switching cycles/h			
Mechanical life	10 x 10^6 switching cycles			
Electrical life	1 x 10^5 switching cycles at rated load			
Response time / release time at excitation of A1-A2	15 ms			
Other data				
Creepage distances and clearances	according to IEC 60664-1			
Degree of pollution	3 outside, 2 inside			
Overvoltage category	III			
Rated voltage	AC/DC 275 V			
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20			
Noise immunity according to IEC 61000-4	Test severity 3			
Ambient temperature, operating range	–25 – +60 °C			
Dimension diagram (housing)	K 3-1			
Circuit diagram of the terminals	KS 250-10			
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm^2			
stranded with ferrules	1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm^2			
Weight	0.11 kg			
Accessories	–			
Approvals	c UL us being prepared: UL			

Timer and switching relays
OFF-delay NGZ 110 / NGZ 210

interface

Overview of the devices/Part numbers				
Type	**Rated voltage**	**ON-delay time**	**Part No.**	**Std. Pack**
NGZ 110	AC/DC 24 V 50 – 60 Hz	0.05 ... 1 s	R2.067.0090.0	1
		0.15 ... 3 s	R2.067.0180.0	1
		0.5 ... 10 s	R2.067.0060.0	1
		1.5 ... 30 s	R2.067.0150.0	1
		5 ... 100 s	R2.067.0030.0	1
		15 ... 300 s	R2.067.0120.0	1
	AC/DC 110 – 127 V 50 – 60 Hz	0.05 ... 1 s	R2.067.0070.0	1
		0.15 ... 3 s	R2.067.0160.0	1
		0.5 ... 10 s	R2.067.0040.0	1
		1.5 ... 30 s	R2.067.0130.0	1
		5 ... 100 s	R2.067.0010.0	1
		15 ... 300 s	R2.067.0100.0	1
	AC/DC 230 – 240 V 50 – 60 Hz	0.05 ... 1 s	R2.067.0080.0	1
		0.15 ... 3 s	R2.067.0170.0	1
		0.5 ... 10 s	R2.067.0050.0	1
		1.5 ... 30 s	R2.067.0140.0	1
		5 ... 100 s	R2.067.0020.0	1
		15 ... 300 s	R2.067.0110.0	1
NGZ 210	DC 110 V	0.05 ... 1 s	R2.067.0220.0	1
		0.15 ... 3 s	R2.067.0250.0	1
		0.5 ... 10 s	R2.067.0210.0	1
		1.5 ... 30 s	R2.067.0240.0	1
		5 ... 100 s	R2.067.0200.0	1
		15 ... 300 s	R2.067.0230.0	1

Timer and switching relays
ON-delay and OFF-delay KZT 510 K

ON-delay and OFF-delay multi-range timer relay

- Single voltage
- 2 functions: ON-delay and OFF-delay (ARV)
- Setting range from 0.05 s to 10 h divided into 10 time ranges
- 1 timed change-over contact
- 2 LEDs for function display

Function

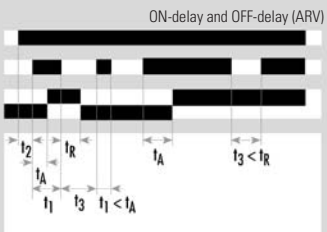
The time ranges and the time within the pre-selected range are selected on the front for the corresponding function. Different operating times can be selected for each function.

If the operating time (t_A) B1 is interrupted, the countdown will stop. This can be done until the energizing quantity is again applied to B1 and the residual time elapses. The operating time can be interrupted as often as required (time accumulation).

Function diagram

KZT 510 K — FD 0117

ON-delay and OFF-delay (ARV)



A1/A2 Supply voltage
B1 Energizing quantity, LED red
15/18, 15/16 Delayed contact, LED green

t_A = operating time t_R = returning time
t_1 = make time, must be > operating time
t_2 = time between applying the supply voltage and applying the energizing quantity, must be > recovery time 1
t_3 = time between interruption and resetting of the energizing quantity, must be t_R

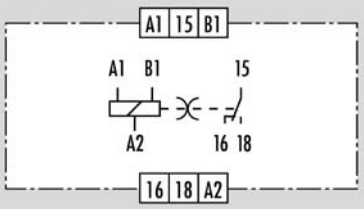
Time ranges

Setting range from 0.05 s to 10 h divided into:

0.05 s ...	1 s	15 s ...	300 s
0.15 s ...	3 s	50 s ...	1000 s
0.5 s ...	10 s	0.05 s ...	1 s
1.5 s ...	30 s	0.15 s ...	3 s
5 s ...	100 s	0.5 s ...	10 h

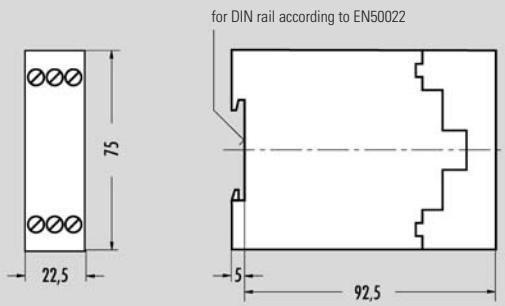
Circuit diagram

KZT 510 K — KS 0307/1



Dimension diagram

K 1-8 W3



Timer and switching relays
ON-delay and OFF-delay KZT 510 K

interface

Technical data		KZT 510 K	
Function type according to IEC 60050 (445)		– ON-delay timer relay – OFF-delay timer relay with supply voltage	
Function display		1 green LED, 1 red LED	
Function diagram		FD 0117	
Power supply circuit			
Rated voltage U_N	AC/DC	**24 V**	
	AC		**230 V**
Rated consumption at 50 Hz and U_N (AC)		2.0 VA / 1.8 W	9 VA / 2.2 W
Rated consumption DC		1.2 W	–
Inrush current		1.5 A / 2 ms	0.5 A / 3 ms
Rated current of the energizing quantity		ca. 13 mA	ca. 2 mA
Rated frequency		50 – 60 Hz	
Operating voltage range		0.80 – 1.1 x U_N	
Time circuit			
Time setting / number of time ranges		analog / 10	
Available setting range		See table "Time ranges"	
Recovery time 1/2		ca. 50 / – ms	
Minimum ON time		–	
Release value		≥ 15 % U_N	
Parallel loads permissible		yes	
Internal half-wave rectification		no	
Mean value of the error		–	
Dispersion		≤ ± 0.5 % + ± 10 ms	
Influence of the energizing quantity, supply voltage		≤ 0.005 % / % Δ U_N	
Influence of the ambient temperature		≤ 0.005 % / K	
Output circuit			
Contact assignment		1 timed change-over contact	
Contact material		Ag alloy, gold-plated	
Rated operating voltage U_n		230/230 V AC/DC	
Max. continuous current I_n		5 A	
Application category according to EN 60947-5-1:1991		AC-15: U_e 230 V AC, I_e 2 A DC-13: U_e 24 V DC, I_e 2 A	
Permissible switching frequency		≤ 3600 switching cycles/h	
Mechanical life		30 x 10^6 switching cycles	
Response time		–	
Release time		–	
General information			
Creepage distances and clearances between the circuits		according to DIN VDE 0110-1:04.97	
Rated impulse voltage		4 kV	
Overvoltage category		III	
Degree of pollution		3 outside, 2 inside	
Rated voltage		250 V AC	
Test voltage U_{eff} 50 Hz according to DIN VDE 0110-1, table A.1		2.21 kV	
Protection degree housing/terminal according to DIN VDE 0470 sec. 1:11.92		IP 30 / IP 20	
Noise immunity according to IEC 61000-4		Test severity 3	
Ambient temperature, operating range		–20 – +60 °C	
Dimension diagram		K1-8 W3	
Circuit diagram		KS 0307/1	
Weight		0.12 kg	
Accessories		–	
Approvals			

Overview of the devices/Part numbers

Type	Rated voltage		ON-delay time	Part No.	Std. Pack
KZT 510 K	AC/DC 24 V	50 – 60 Hz	See table "Time ranges"	R2.060.0010.1	1
	AC 230 V	50 – 60 Hz		R2.060.0010.1	1

Timer and switching relays
Star-delta relay NGD 31

Interface

Interval ON star-delta relay

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: star-delta switching, interval ON (EW)
- 4 time ranges available from 0.1 s to 100 s
- 2 normally open contacts
- 2 LEDs for function display

c SP us being prepared: UL

Function

Setting the time delay

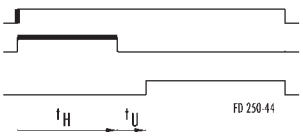
The desired delay time is set with a selecting wheel. It can be set using a screwdriver.

Method of operation: The NGD 31 has two sequentially switching delayed outputs for starting motors in star-delta mode. After expiration of the pre-selected acceleration time t_H for the star mode and a fixed transit time t_U the second contact switches into the operating position for the delta mode. When the energizing quantity switches off the contact switches into the OFF position.

The LEDs shows the switching position of the contacts. The countdown can be monitored on the LEDs.

Function diagram

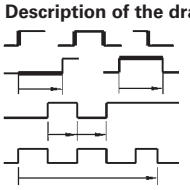
Function code 51 = star-delta switching, interval ON



Energizing quantity
Delayed contact
LED green Y
Delayed contact
LED green Δ

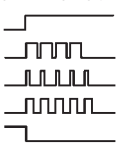
t_H = acceleration time
t_U = transit time 100 ms

Description of the drawing



Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time

LED green Energizing quantity — 5-fold function



Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Time ranges

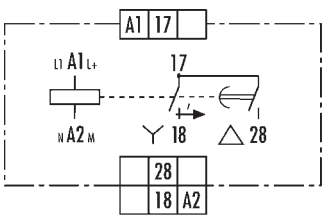
Available time ranges:

<0.1	...	1 s
0.5	...	10 s
1.5	...	30 s
5	...	100 s

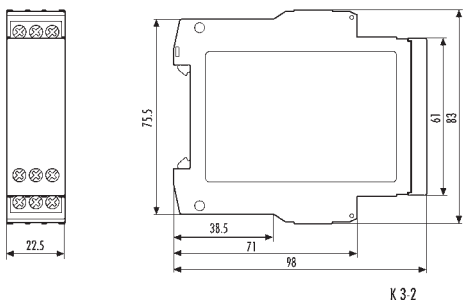
Notes

- The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.
- You can change the delay time during operation. The change is effective immediately.

Circuit diagram



Dimension diagram



Technical data	NGD 31
Product standard (timer relay)	EN 61812-1:1999-08
Relay function according to IEC 60050	445-01-10 + 445-01-08
Function display	2 LEDs green
Function diagram	FD 250-44
Input circuit	
Rated voltage A1-A2	AC/DC 24 to 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110 %
Rated frequency f_n	50 – 60 Hz ± 5 %
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes
Internal half-wave rectification	A1-A2 no
Time circuit	
Time setting / number of time ranges	analog / 1
Setting ranges for time delay	See table "Time ranges"
Permanently fixed transit time	100 ms ≤ ± 2 %
Setting tolerance	≤ ± 5 %
Repeatability (to set value)	≤ ± 0.01 % + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002 %
Influence of voltage (within range)	≤ ± 0.002 %
Output circuit	
Contact assignment	2 normally open contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 to 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time at excitation of A1-A2	40 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-2
Circuit diagram of the terminals	KS 250-21
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm²
stranded with ferrules	1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm²
Weight	0.11 kg
Accessories	–
Approvals	c SP us being prepared: UL

Overview of the devices/Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
NGD 31	AC/DC 24 – 240 V 50 – 60 Hz	<0.1 ... 1 s	R2.062.0030.0	1
		0.5 ... 10 s	R2.062.0020.0	1
		1.5 ... 30 s	R2.062.0040.0	1
		5 ... 100 s	R2.062.0010.0	1

Timer and switching relays
Signal watchdog NGW 11

Signal watchdog relay

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: Signal watchdog, with auxiliary supply
- 3 time ranges available from 0.5 s to 100 s
- 1 change-over contact
- 2 LEDs for function display

c SP us being prepared: UL

Function

Setting the time delay

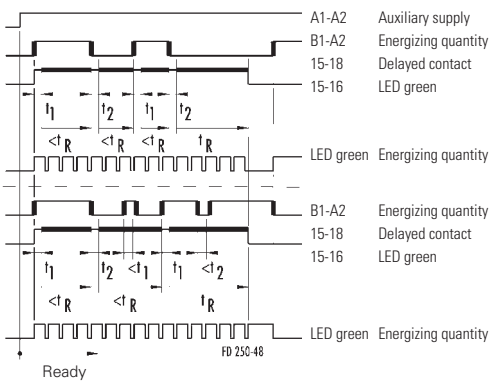
The desired delay time is set with a selecting wheel. It can be set using a screwdriver.

Method of operation: On the NGW 11 when the energizing quantity (B1-A2) as well as the auxiliary supply (A1-A2) is switched on, the timed change-over contact will immediately switch into the ON position and the countdown will start. The countdown will restart whenever the energizing quantity is switched off and on during the ON-delay time. If the break or make time of the energizing quantity is longer than the ON-delay time t, the timed change-over contact will switch into the OFF position. When the energizing quantity is switched on again after the countdown, the timed change-over contact will remain in the OFF position. The timed change-over contact will immediately switch into the OFF position, when the auxiliary supply is switched off.

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

Function diagram

Function code 14 = Signal watchdog, with auxiliary supply



t_R = returning time
t_1, t_2 = response time of the energizing quantity
t_1 = make time, must be > minimum ON time 1
t_2 = make time, must be > recovery time 1

Time ranges

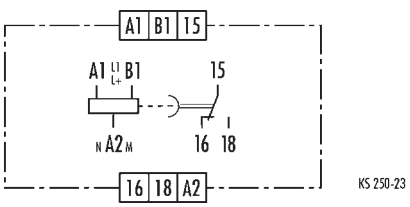
Available time ranges:

0.5 ... 10 s | 1.5 ... 30 s | 5 ... 100 s

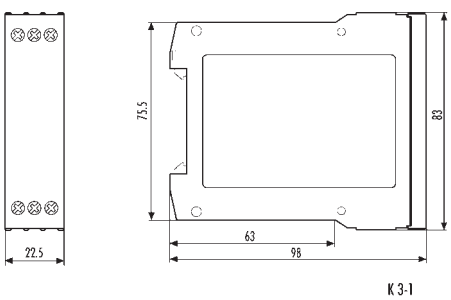
Notes

- The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.
- You can change the delay time during operation. The change is effective immediately.

Circuit diagram



Dimension diagram



Technical data	NGW 11
Product standard (timer relay)	EN 61812-1:1999-08
Relay function according to IEC 60050	445-01-04
Function display	2 LEDs green
Function diagram	FD 250-48
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 to 110 %
Rated frequency f_n	50 to 60 Hz ± 5 %
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (B1-A2)	1 mA
Rated consumption on control connection (B1-A2)	< 0.25 W
Parallel loads permissible	A1-A2 yes / B1-A2 yes
Internal half-wave rectification	A1-A2 no / B1-A2 yes
Time circuit	
Time setting / number of time ranges	analog / 1
Setting ranges for time delay	See table "Time ranges"
Recovery time 1	≤ 25 ms
Minimum ON time 1	≤ 25 ms
Setting tolerance	≤ ± 5 %
Repeatability (to set value)	≤ ± 0.01 % + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002 %
Influence of voltage (within range)	≤ ± 0.002 %
Output circuit	
Contact assignment	1 change-over contact
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time at excitation of A1-A2	40 ms
Response time / release time at excitation of B1-A2	20 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-1
Circuit diagram of the terminals	KS 250-23
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm²
stranded with ferrules	1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm²
Weight	0.1 kg
Accessories	–
Approvals	c SP us being prepared: UL

Overview of the devices/Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
NGW 11	AC/DC 24 – 240 V 50 – 60 Hz	0.5 ... 10 s	R2.105.0050.0	1
		1.5 ... 30 s	R2.105.0060.0	1
		5 ... 100 s	R2.105.0040.0	1

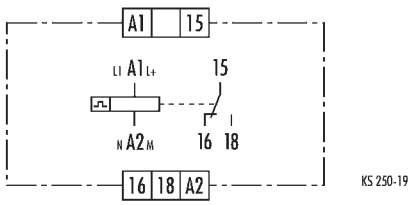
Timer and switching relays
Flasher relay NGB 11

Fixed time flasher relay

- Multi-voltage for AC/DC 24 to 240 V
- 1 function: symmetrical flashing, starts OFF
- Fixed time 0.5 s / 0.5 s
- 1 change-over contact
- 2 LEDs for function display

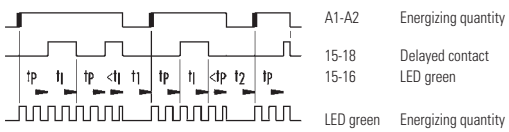
c SP us being prepared: UL

Circuit diagram



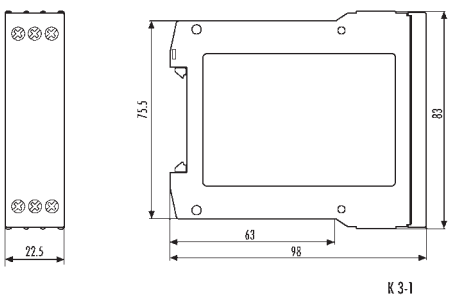
Function diagram

Function code 41 = flashing, with OFF start FD 250-32

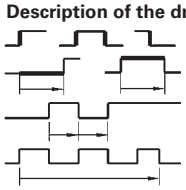


t_p = OFF time
t_1 = fixed ON time
t_p = t_1
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

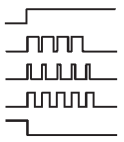
Dimension diagram



Description of the drawing



Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time
LED green Energizing quantity
5-fold function



Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Time ranges

Fixed time 0.5 s / 0.5 s

Notes

The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.

Function

ON-delay time

The NGB 11 timer relay is available with fixed ON and OFF time.
ON time = 0.5 s
OFF time = 0.5 s

LEDs show the state of the excitation input and the position of the contacts.
You can monitor the countdown on a flashing LED.

Technical data	NGB 11
Product standard (timer relay)	EN 61812-1:1999-08
Relay function according to IEC 60050	445-01-06
Function display	2 LEDs green
Function diagram	FD 250-32
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110 %
Rated frequency f_n	50 – 60 Hz ± 5 %
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes
Internal half-wave rectification	A1-A2 no
Time circuit	
Time setting / number of time ranges	analog / 1 Fixed time
Setting ranges for time delay	0.5 s / 0.5 s
Cycle start	OFF
Recovery time 1/2	≤ 50 / ≤ 50 ms
Repeatability (to set value)	≤ ± 0.01 % + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002 %
Influence of voltage (within range)	≤ ± 0.002 %
Output circuit	
Contact assignment	1 change-over contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A
	DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time at excitation of A1-A2	40 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-1
Circuit diagram of the terminals	KS 250-19
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm²
stranded with ferrules	1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm²
Weight	0.1 kg
Accessories	–
Approvals	c SP us being prepared: UL

Overview of the devices/Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
NGB 11	AC/DC 24 – 240 V 50 – 60 Hz	0.5 s / 0.5 s	R2.105.0010.0	1

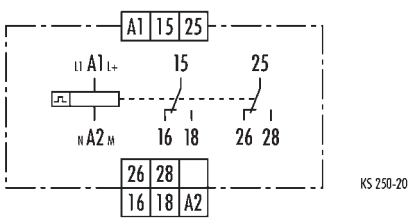
Timer and switching relays
Flasher relay NGB 12

Fixed time flasher relay

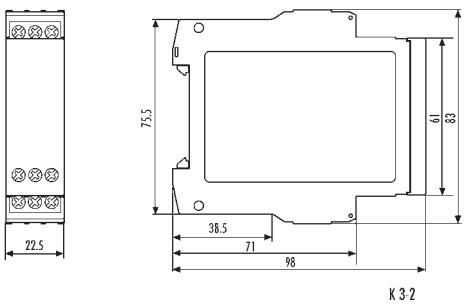
- Multi-voltage for AC/DC 24 to 240 V
- 1 function: symmetrical flashing, starts OFF
- Fixed time 0.5 s / 0.5 s
- 2 change-over contact
- 2 LEDs for function display

being prepared:

Circuit diagram



Dimension diagram



Time ranges

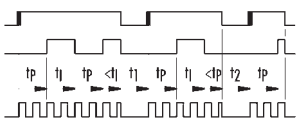
Fixed time 0.5 s / 0.5 s

Notes

The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.

Function diagram

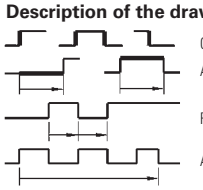
NGB 12 FD 250-33



A1-A2	Energizing quantity
15-18, 25-28	Delayed contact
15-16, 25-26	LED green
LED green	Energizing quantity

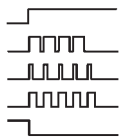
t_p = OFF time
t_1 = fixed ON time
t_p = t_1
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Description of the drawing



Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time

LED green Energizing quantity 5-fold function



Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Function

ON-delay time

The NGB 12 timer relay is available with fixed ON and OFF time.
ON time = 0.5 s
OFF time = 0.5 s

LEDs show the state of the excitation input and the position of the contacts. You can monitor the countdown on a flashing LED.

Technical data	NGB 12
Product standard (timer relay)	EN 61812-1:1999-08
Relay function according to IEC 60050	445-01-06
Function display	2 LEDs green
Function diagram	FD 250-33
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 to 110 %
Rated frequency f_n	50 to 60 Hz ± 5 %
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes
Internal half-wave rectification	A1-A2 no
Time circuit	
Time setting / number of time ranges	analog / 1 Fixed time
Setting ranges for time delay	0.5 s / 0.5 s
Cycle start	OFF
Recovery time 1/2	≤ 50 / ≤ 50 ms
Repeatability (to set value)	≤ ± 0.01 % + ± 10 ms
Influence of temperature (within range)	≤ ± 0.002 %
Influence of voltage (within range)	≤ ± 0.002 %
Output circuit	
Contact assignment	2 change-over contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time at excitation of A1-A2	40 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 to +60 °C
Dimension diagram (housing)	K 3-2
Circuit diagram of the terminals	KS 250-20
Wire ranges stranded or solid	1 x 0.2 to 6 or 2 x 0.2 to 2.5 mm^2
Wire ranges stranded with ferrules	1 x 0.4 to 4 or 2 x 0.2 to 1.5 mm^2
Weight	0.11 kg
Accessories	–
Approvals	c SP us being prepared: UL

Overview of the devices/Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
NGB 12	AC/DC 24 – 240 V 50 – 60 Hz	0.5 s / 0.5 s	R2.105.0020.0	1

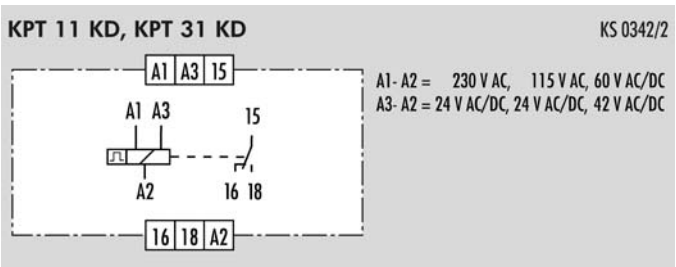
Timer and switching relays
Repeat cycle timers KPT 11 KD, KPT 31 KD

Multi-range repeat cycle timer

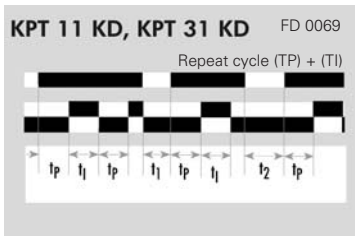
- Dual voltage
- 1 function: KPT 11 KD: repeat cycle starting with OFF (TP)
  KPT 31 KD: repeat cycle starting with ON (TI)
- Setting range from 0.05 s to 10 h divided into 10 time ranges
- 1 change-over contact
- 2 LEDs for function display

UL

Circuit diagram



Function diagram



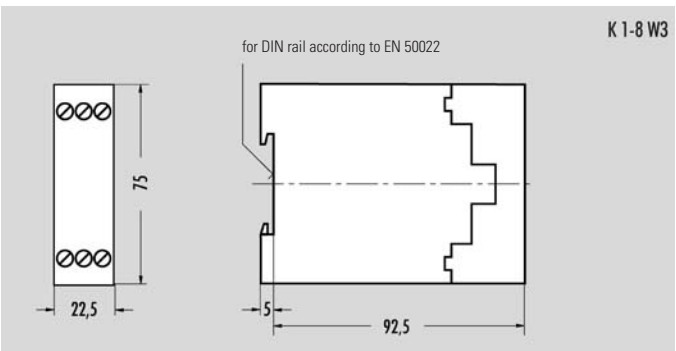
A1/A2, A3/A2 — Supply voltage

15/18, 15/16 — Switching element

t_i = I_p t_i = ON time t_p = OFF time

t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Dimension diagram



Function

Different OFF and ON times can be selected in decimal increments on the relay front by means of selector switches. The OFF and ON time within a range is set using the selector wheel.

The different supply voltages have to be connected to their respective assigned terminal.

Time ranges

Setting range from 0.05 s to 10 h divided into:

0.05 ...	1 s	15 ...	300 s
0.15 ...	3 s	50 ...	1000 s
0.5 ...	10 s	0.05 ...	1 h
1.5 ...	30 s	0.15 ...	3 h
5 ...	100 s	0.5 ...	10 h

Timer and switching relays
Repeat cycle timers KPT 11 KD, KPT 31 KD

interface

Technical data		KPT 11 KD			KPT 31 KD		
Function type according to EN 60050		Electronic multi-range repeat cycle timer			Electronic multi-range repeat cycle timer		
		starting with OFF for dual voltage –			starting with ON for dual voltage –		
		Repeat cycle with two different supply			Repeat cycle with two different supply		
		voltage terminals			voltage terminals		
Function display		1 LED green, 1 LED red					
Function diagram		FD 0069					
Power supply circuit							
Rated voltage U_N	AC/DC	**24 V**		**24 V**		**42 V**	**60 V**
	AC		**115 V**		**230 V**		
Rated consumption at 50 Hz and U_N (AC)		1.2 VA	5.5 VA	1.2 VA	7.5 VA	1.2 VA	1.5 VA
Rated consumption at 50 Hz and U_N (AC)		1.0 W	1.2 W	1.0 W	1.5W	1.0 W	1.3 W
Rated consumption DC		0.7 W		0.7 W	0.8 W		1.2 W
Inrush current		1.5 / 2	0.5 / 2	1.5 / 2	0.5 / 3	0.1 / 6	0.05 / 10
Rated frequency		50 – 60 Hz					
Operating voltage range		0.8 – 1.1 x U_N					
Time circuit							
Time setting / number of time ranges		analog / 10					
Available setting range		See table "Time ranges"					
Recovery time 1/2		ca. 40 / ca. 80 ms					
Minimum ON time		–					
Release value		≥ 15 % U_N					
Repeat cycle starting with		OFF			ON		
Parallel loads permissible		yes					
Internal half-wave rectification		no					
Mean value of the error		≤ ± 10 %					
Dispersion		≤ ± 0.5 % + ± 10 ms					
Influence of the energizing quantity, supply voltage		≤ 0.005 % / % Δ U_N					
Influence of the ambient temperature		≤ 0.005 % / K					
Output circuit							
Contact assignment		1 change-over contacts					
Contact material		Ag alloy, gold-plated					
Rated operating voltage U_n		230/230 V AC/DC					
Max. continuous current I_n		5 A					
Application category according to EN 60947-5-1:1991		AC-15: U_e 230 V AC, I_e 2 A DC-13: U_e 24 V DC, I_e 2 A					
Permissible switching frequency		≤ 6000 switching cycles/h					
Mechanical life		30 x 10^6 switching cycles					
Response time		–					
Release time		approx. 40 ms					
General information							
Creepage distances and clearances between the circuits		according to DIN VDE 0110-1:04.97					
Rated impulse voltage		4 kV					
Overvoltage category		III					
Degree of pollution		3 outside, 2 inside					
Rated voltage		250 V AC					
Test voltage Ueff 50 Hz according to DIN VDE 0110-1, table A.1		2.21 kV					
Protection degree housing/terminal according to DIN VDE 0470 sec. 1:11.92		IP 30 / IP 20					
Noise immunity according to IEC 61000-4		Test severity 3					
Ambient temperature, operating range		–20 – +60 °C					
Dimension diagram		K1-8 W3					
Circuit diagram		KS 0342/2					
Weight		0.12 kg					
Accessories		–					
Approvals		UL					

Overview of the devices/Part numbers

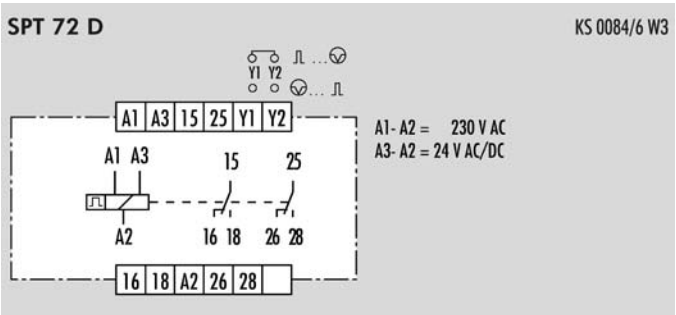
Type	ON-delay time	Rated voltage		Part No.	Std. Pack
KPT 11 KD	See table "Time ranges"	AC/DC 24 V und AC 115 V	50 – 60 Hz	R2.111.0010.3	1
		AC/DC 24 V und AC 230 V	50 – 60 Hz	R2.111.0020.3	1
		AC/DC 42 V und AC 60 V	50 – 60 Hz	R2.111.0030.3	1
KPT 31 KD	See table "Time ranges"	AC/DC 24 V und AC 115 V	50 – 60 Hz	R2.111.0040.1	1
		AC/DC 24 V und AC 230 V	50 – 60 Hz	R2.111.0050.1	1
		AC/DC 42 V und AC 60 V	50 – 60 Hz	R2.111.0060.1	1

Timer and switching relays
Repeat cycle timer SPT 72 D

Multi-range repeat cycle timer

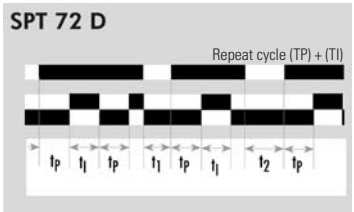
- Dual voltage
- 1 function: repeat cycle starting with OFF (TP) or
  repeat cycle starting with ON (TI)
- Setting range from 0.05 s to 10 h divided into 10 time ranges
- 2 change-over contact
- 2 LEDs for function display

Circuit diagram



Function diagram

FD 0069



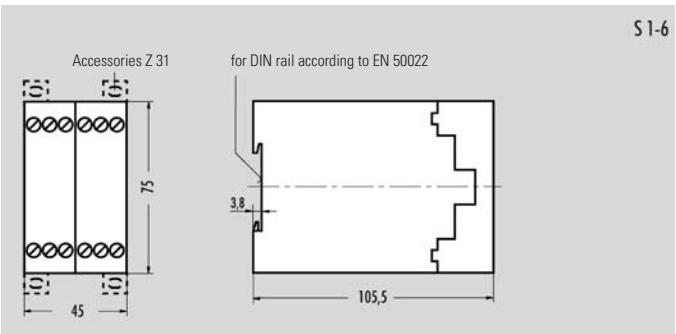
A1/A2, A3/A2 — Supply voltage

15/18; 25/28, 15/16; 25/26 — Switching element

t_I = I_p t_I = ON time t_p = OFF time

t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Dimension diagram



Function

Different OFF and ON times can be selected on the relay front by means of selector switches.
The OFF and ON time within a range is set using the selector wheels.
Starting with OFF or ON can be selected on the device through a jumper.

Time ranges

Setting range from 0.05 s to 10 h divided into:

0.05 …	1 s	15 …	300 s
0.15 …	3 s	50 …	1000 s
0.5 …	10 s	0.05 …	1 h
1.5 …	30 s	0.15 …	3 h
5 …	100 s	0.5 …	10 h

Technical data		SPT 72 D	
Function type according to IEC 60050		Electronic multi-range repeat cycle timer for dual voltage – Repeat cycle with two different supply voltage terminals	
Function display		1 LED green, 1 LED red	
Function diagram		FD 0069	
Power supply circuit			
Rated voltage U_N	AC/DC	**24 V**	
	AC		**230 V**
Rated consumption at 50 Hz and UN (AC)		1.7 VA / 1.5 W	8 VA / 1.6 W
Rated consumption DC		1.0 W	
Inrush current		1.5 A / 2 ms	0.5 A / 3 ms
Rated frequency		50 – 60 Hz	
Operating voltage range		0.85 – 1.1 x U_N	
Time circuit			
Time setting / number of time ranges		analog / 10	
Available setting range		See table "Time ranges"	
Recovery time 1/2		ca. 40 / ca. 80 ms	
Minimum on time		–	
Repeat cycle starting with		OFF / ON (selectable)	
Release value		≥ 15 % U_N	
Parallel loads permissible		yes	
Internal half-wave rectification		no	
Mean value of the error		≤ ± 10 %	
Dispersion		≤ ± 0.5 % + ± 10 ms	
Influence of the energizing quantity, supply voltage		≤ 0.005 % / % Δ U_N	
Influence of the ambient temperature		≤ 0.005 % / K	
Output circuit			
Contact assignment		2 change-over contacts	
Contact material		Ag alloy, gold-plated	
Rated operating voltage U_n		230/230 V AC/DC	
Max. continuous current I_n		5 A	
Application category according to EN 60947-5-1:1991		AC-15: U_e 230 V AC, I_e 2 A DC-13: U_e 24 V DC, I_e 2 A	
Permissible switching frequency		≤ 6000 switching cycles/h	
Mechanical life		30 x 10^6 switching cycles	
Response time		–	
Release time		ca. 40 ms	
General information			
Creepage distances and clearances between the circuits		according to DIN VDE 0110-1:04.97	
Rated impulse voltage		4 kV	
Overvoltage category		III	
Degree of pollution		3 outside, 2 inside	
Rated voltage		250 V AC	
Test voltage Ueff 50 Hz according to DIN VDE 0110-1, table A.1		2.21 kV	
Protection degree housing/terminal according to DIN VDE 0470 sec. 1:11.92		IP 30 / IP 20	
Noise immunity according to IEC 61000-4		Test severity 3	
Ambient temperature, operating range		–20 – +60 °C	
Dimension diagram		S 1-6	
Circuit diagram		KS 0084/6 W3	
Weight		0.18 kg	
Accessories		–	
Approvals			

Overview of the devices/Part numbers

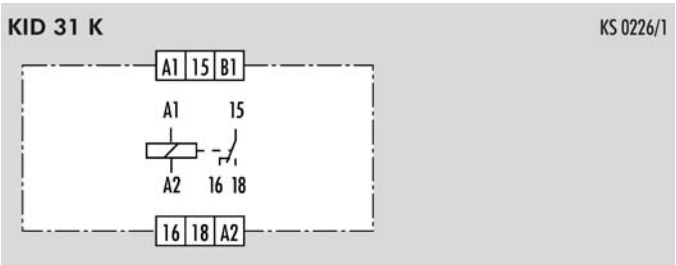
Type	ON-delay time	Rated voltage		Part No.	Std. Pack
SPT 72 D	See table "Time ranges"	AC/DC 24 V and AC 230 V	50 – 60 Hz	R2.113.0010.0	1

Timer and switching relays
Pre-set pulse counter KID 31 K

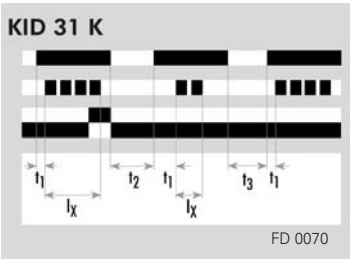
Digital pre-set pulse counter

- Single voltage
- 1 function: Pre-set pulse counter
- Upward counting, digital pulse pre-selection
- 1 change-over contact
- 2 LEDs for function display

Circuit diagram



Function diagram

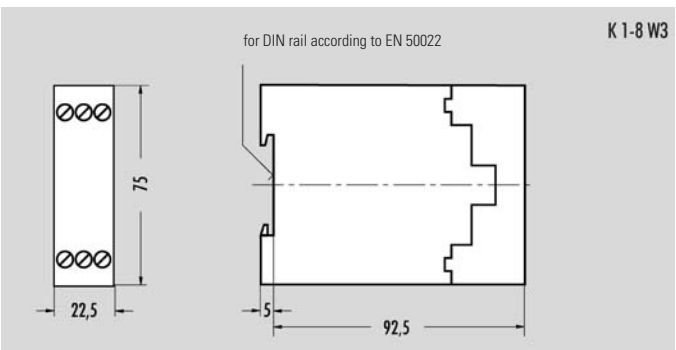


A1/A2 Supply voltage
B1 Pulse signal, LED red

15/18
15/16 Switching element, LED green

I_x = number of pre-selected pulses
I_1 = time between applying the supply voltage and first pulse to be counted must be > initial zero time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Dimension diagram



Pulse range

Available pulse ranges: 1 to 99

Function

When the supply voltage is applied, the pre-set pulse counter is set to zero. Pulses are counted through input B1. The arrival of a signal (B1) causes the red LED to light up. When the number of pulses counted coincides with the number pre-set by the decade switches, the output relay goes into its active position and the green LED lights up.

Technical data		KID 31 K	
Function type according to DIN VDE 0435 sec. 110:09.86		Electronic pre-set pulse counter for single voltage	
Function display		1 LED green, 1 LED red	
Function diagram		FD 0070	
Power supply circuit			
Rated voltage U_N	AC/DC	**24 V**	
Rated voltage U_N	AC		**230 V**
Rated consumption at 50 Hz and UN (AC)		1.9 VA / 1.8 W	5.3 VA / 1.8 W
Rated consumption DC		1.3 W	
Inrush current		1.5 A / 2 ms	0.5 A / 0.5 ms
Rated frequency		50 to 60 Hz	
Operating voltage range		0.8 to 1.1 x UN	
Time circuit			
Setpoint setting / number of setting ranges		digital / 1	
Available setting range		See table "Pulse ranges"	
Rated current of the energizing quantity		≤ 2 mA	
Recovery time 1/2		ca. 40 ms / ca. 80 ms	
Minimum ON time (after application of the rated voltage)		–	
Release value		≥ 15 % U_N	
Parallel loads permissible		no	
Internal half-wave rectification		yes	
Mean value of the error		–	
Dispersion		–	
Influence of the energizing quantity, supply voltage		–	
Influence of the ambient temperature		–	
Output circuit			
Contact assignment		1 change-over contacts	
Contact material		Ag alloy, gold-plated	
Rated operating voltage U_n		230/230 V AC/DC	
Max. continuous current I_n		5 A	
Application category according to EN 60947-5-1:1991		AC-15: U_e 230 V AC, I_e 2 A DC-13: U_e 24 V DC, I_e 2 A	
Permissible switching frequency		≤ 3600 switching cycles/h	
Mechanical life		20 x 10^6 switching cycles	
Response time		ca. 20 ms	
Release time		ca. 20 ms	
Initial zero time		ca. 30 ms	
Max. counting frequency		12.5 Hz	
Min. ON and OFF length		40 ms	
General information			
Creepage distances and clearances between the circuits		according to DIN VDE 0110-1:04.97	
Rated impulse voltage		4 kV	
Overvoltage category		III	
Degree of pollution		3 outside, 2 inside	
Rated voltage		250 V AC	
Test voltage Ueff 50 Hz according to DIN VDE 0110-1, table A.1		2.21 kV	
Protection degree housing/terminal according to DIN VDE 0470 sec. 1:11.92		IP 30 / IP 20	
Noise immunity according to IEC 61000-4		Test severity 3	
Ambient temperature, operating range		–20 to +60 °C	
Dimension diagram		K1-8 W3	
Circuit diagram		KS 0226/1	
Weight		0.12 kg	
Accessories		–	
Approvals		–	

Overview of the devices/Part numbers

Type	Pulse range	Rated voltage		Part No.	Std. Pack
KID 31 K	1 to 99	AC/DC 24 V	50 – 60 Hz	R2.213.0010.0	1
		AC 230 V	50 – 60 Hz	R2.213.0040.0	1

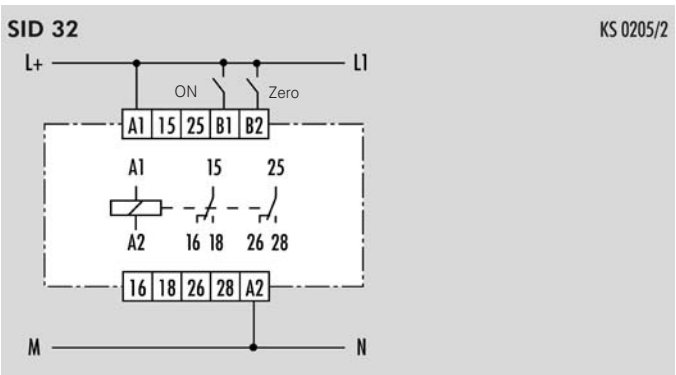
Timer and switching relays
Pre-set pulse counter SID 32

Interface

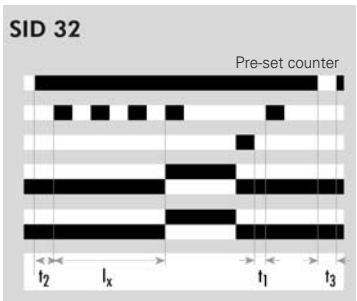
Digital pre-set pulse counter

- Single voltage
- 1 function: Pre-set pulse counter
- Upward counting, digital pulse pre-selection
- 2 change-over contact
- 2 LEDs for function display

Circuit diagram



Function diagram

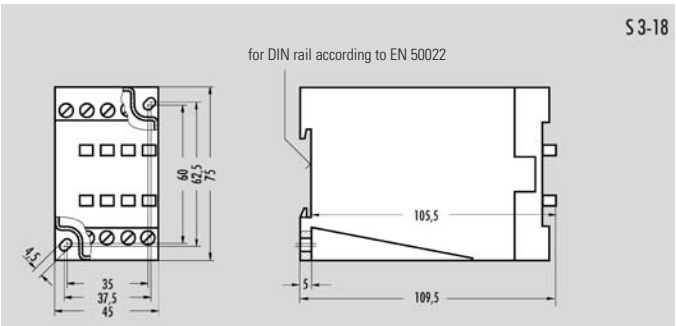


FD 0039

A1/A2	Supply voltage
B1	Pulse signal / LED red
B2	Zero signal
15/18	LED green
15/16	Switching element
25/28	Switching element
25/26	

t_1 = time between interruption of zero signal and first pulse to be counted must must be > recovery time 1
t_2 = break time, must be > recovery time 2
t_3 = break time, must be > recovery time 2 so that initial zeroing condition is fulfilled
I_x = number of pre-selected pulses

Dimension diagram



Function

When the supply voltage is applied, the pre-set pulse counter is set to zero in about 30 ms. The arrival of a signal (B1) causes the red LED to light up. When the number of pulses counted coincides with the number pre-set by the coding switches, the output relay goes into its active position and the green LED lights up. The counter will be set to zero if a pulse signal is applied to B2.

Accessories

Cover	Z 29	sealable transparent cover

Pulse ranges

Available pulse ranges:
1 to 99
1 to 999

Technical data		SID 32	
Function type		Electronic pre-set pulse counter for single voltage	
Function display		1 LED green, 1 LED red	
Function diagram		FD 0039	
Power supply circuit			
Rated voltage U_N	AC	**110 – 127 V**	**220 – 240 V**
Rated consumption at 50 Hz and UN (AC)		2.8 VA / 1.1 W	6.0 VA / 1.6 W
Inrush current		–	
Rated frequency		50 – 60 Hz	
Operating voltage range		0.8 – 1.1 x U_N	
Time circuit			
Setpoint setting / number of setting ranges		digital / 1	
Available setting range		See table "Pulse ranges"	
Rated current of the energizing quantity		≤ 2 mA	
Recovery time 1/2		ca. 20 ms / ca. 50 ms	
Minimum ON time (after application of the rated voltage)		–	
Release value		–	
Parallel loads permissible		no	
Internal half-wave rectification		yes	
Mean value of the error		–	
Dispersion		–	
Influence of the energizing quantity, supply voltage		–	
Influence of the ambient temperature		–	
Output circuit			
Contact assignment		2 change-over contacts	
Contact material		Ag alloy, gold-plated	
Rated operating voltage U_n		230/230 V AC/DC	
Max. continuous current I_n		5A	
Application category according to EN 60947-5-1:1991		AC-15: U_e 230 V AC, I_e 2 A DC-13: U_e 24 V DC, I_e 2 A	
Permissible switching frequency		≤ 3600 switching cycles/h	
Mechanical life		30 x 10^6 switching cycles	
Response time		≤ 20 ms	
Release time		≤ 20 ms	
Initial zero time		ca. 20 ms	
Max. counting frequency		12.5 Hz	
Min. ON and OFF length		40 ms	
Min. zero time		20 ms	
General information			
Creepage distances and clearances between the circuits		according to DIN VDE 0110-1:04.97	
Rated impulse voltage		4 kV	
Overvoltage category		III	
Degree of pollution		3 outside, 2 inside	
Rated voltage		250 V AC	
Test voltage Ueff 50 Hz according to DIN VDE 0110-1, table A.1		2.21 kV	
Protection degree housing/terminal according to DIN VDE 0470 sec. 1:11.92		IP 30 / IP 20	
Noise immunity according to IEC 61000-4		Test severity 3	
Ambient temperature, operating range		–20 – +60 °C	
Dimension diagram		S 3-18	
Circuit diagram		KS 0205/2	
Weight		0.18 kg	
Accessories		Cover Z 29	
Approvals		–	

Overview of the devices/Part numbers

Type	Pulse range	Rated voltage		Part No.	Std. Pack
SID 32	1 to 99	AC 110 – 127 V	50 – 60 Hz	R2.213.0030.0	1
		AC 220 – 240 V	50 – 60 Hz	R2.213.0020.0	1
	1 to 999	AC 220 – 240 V	50 – 60 Hz	R2.213.0050.0	1

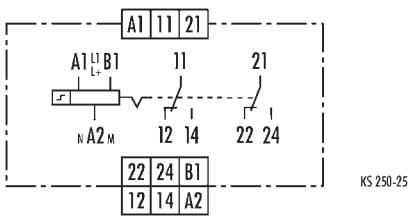
Timer and switching relays
Stepping relay NGF 32

Stepping relay with auxiliary supply

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: stepping ON-OFF
- 2 change-over contacts
- 2 LEDs for function display

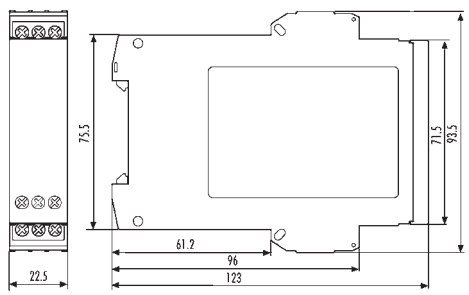
being prepared:

Circuit diagram



KS 250-25

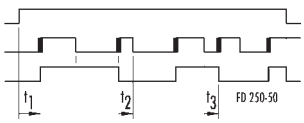
Dimension diagram



K 3-3

Function diagram

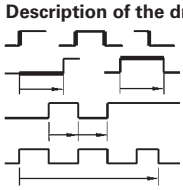
Function code 98 = stepping ON-OFF, with auxiliary supply



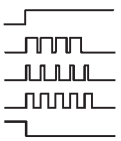
A1-A2	Auxiliary supply
B1-A2	Energizing quantity LED green
11-14, 21-24	Switching element LED green
11-12, 21-22	

t_1 = time between switching on auxiliary power and energizing quantity, must be > recovery time 1
t_2 = make time, must be > minimum ON time 1
t_3 = break time, must be > recovery time 2

Description of the drawing



Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time
LED green Energizing quantity
5-fold function



Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Function

After the auxiliary supply (A1-A2) has been switched on, the stepping relay switches its two change-over contacts into the ON position with the rising edge of the energizing quantity (B1-A2).
The change-over contacts are returned into the OFF position with the next rising edge of the energizing quantity. This occurs alternately when the energizing quantity is switched on. When the auxiliary supply is switched off the change-over contacts switch into the OFF position. LEDs show the state of the excitation input and the position of the contacts.

Notes

The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.

Technical data	NGF 32
Product standard (timer relay)	EN 61812-1:1999-08
Relay function according to IEC 60050 (445)	Stepping relay with auxiliary supply
Function display	2 LEDs green
Function diagram	FD 250-50
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 – 110 %
Rated frequency f_n	50 – 60 Hz ± 5 %
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes
Internal half-wave rectification	A1-A2 no
Function times	
Recovery time 1/2	0 / ≤ 25 ms
Minimum ON time 1/2	≤ 25 / – ms
Output circuit	
Contact assignment	2 change-over contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time at excitation of A1-A2	40 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-3
Circuit diagram of the terminals	KS 250-25
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm^2
stranded with ferrules	1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm^2
Weight	0.13 kg
Accessories	–
Approvals	c SP us being prepared: UL

Overview of the devices/Part numbers

Type	Rated voltage	ON-delay time	Part No.	Std. Pack
NGF 32	AC/DC 24 – 240 V 50 – 60 Hz	–	R2.173.0020.0	1

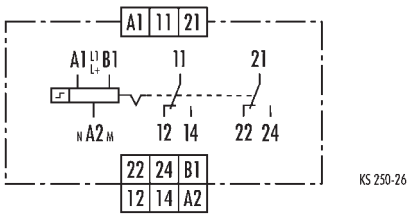
Interface

Stepping relay with auxiliary supply

- Multi-voltage for AC/DC 24 up to 240 V
- 1 function: stepping ON-OFF / OFF-ON
- 2 change-over contacts
- 2 LEDs for function display

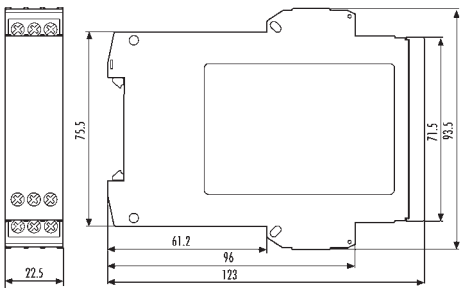
c SP us being prepared: UL

Circuit diagram



KS 250-26

Dimension diagram



K 3-3

Function

After the auxiliary supply (A1-A2) has been switched on, the stepping relay switches the first of its two change-over contacts into the ON position with the rising edge of the energizing quantity (B1-A2). With the next rising edge the first change-over contact switches into the OFF position and the second one into to ON position. This occurs alternately when the energizing quantity is switched on. When the auxiliary supply is switched off both change-over contacts switch into the OFF position.

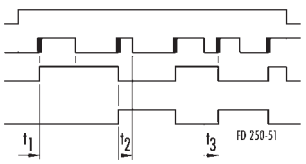
LEDs show the state of the excitation input and the position of the contacts.

Notes

The device is designed for multi-voltage. Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.

Function diagram

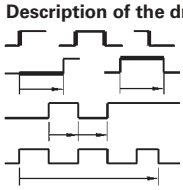
Function code 99 = stepping ON-OFF/OFF-ON, with auxiliary supply



A1-A2	Auxiliary supply
B1-A2	Energizing quantity LED green
11-14	Switching element LED green
11-12	
21-24	Switching element LED green
21-22	

t_1 = time between switching on auxiliary power and energizing quantity, must be > recovery time 1
t_2 = make time, must be > minimum ON time 1
t_3 = break time, must be > recovery time 2

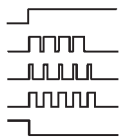
Description of the drawing



Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time

LED green Energizing quantity

5-fold function



Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Technical data	NGF 52
Product standard (timer relay)	EN 61812-1:1999-08
Relay function according to IEC 60050 (445)	Stepping relay with auxiliary supply
Function display	2 LEDs green
Function diagram	FD 250-51
Input circuit	
Rated voltage A1-A2	AC/DC 24 – 240 V
Rated consumption AC	3.5 VA / 1.7 W
Rated consumption DC	1.6 W
Rated voltage limits	70 to 110 %
Rated frequency f_n	50 to 60 Hz ± 5 %
Release value of the input voltage (line capacity approx. 150 pF/m)	≥ AC/DC 10 V; permissible line capacity 0.2 µF
Rated current on control connection (A1)	1 mA
Rated consumption on control connection (A1)	< 0.25 W
Parallel loads permissible	A1-A2 yes / B1-A2 yes
Internal half-wave rectification	A1-A2 no / B1-A2 yes
Function times	
Recovery time 1/2	0 / ≤ 25 ms
Minimum ON time 1/2	≤ 25 / – ms
Output circuit	
Contact assignment	2 change-over contacts
Contact material	AgNi 90/10
Rated operating voltage	AC/DC 24 – 240 V
Rated value for limiting continuous current I_{th}	5 A
Minimum contact load	≥ AC/DC 5 V / ≥ 10 mA
Application category according to IEC 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A
Permissible switching frequency	≤ 3600 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12 x 10^6 switching cycles AC-15
Response time / release time at excitation of A1-A2	40 ms
Response time / release time at excitation of B1-A2	20 ms
Other data	
Creepage distances and clearances	according to IEC 60664-1
Degree of pollution	3 outside, 2 inside
Overvoltage category	III
Rated voltage	AC/DC 275 V
Protection degree according to IEC 60529 housing / terminals	IP 40 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–25 – +60 °C
Dimension diagram (housing)	K 3-3
Circuit diagram of the terminals	KS 250-26
Wire ranges stranded or solid	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm^2
stranded with ferrules	1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm^2
Weight	0.13 kg
Accessories	–
Approvals	c SP us being prepared: UL

Overview of the devices/Part numbers

Type	ON-delay time	Rated voltage	Part No.	Std. Pack
NGF 52	–	AC/DC 24 – 240 V 50 – 60 Hz	R2.173.0030.0	1

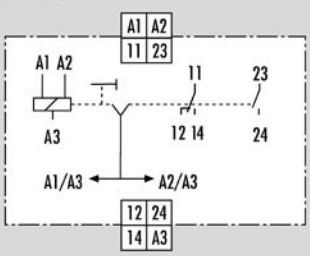
Interface

Electronic trigger action relay

- Single voltage
- 1 function: trigger action relay
- 1 change-over contact, 1 normally open contact

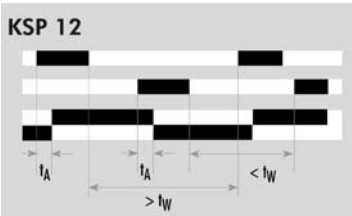
Circuit diagram

KSP 12 KS 5189/2



Function diagram

KSP 12 FD 0128

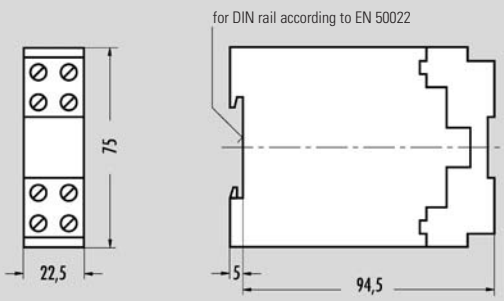


A2/A3	Supply voltage
A1/A3	Supply voltage
11/14, 23/24 11/12	Switching element

t_A = Response time
t_W = Recovery time

Dimension diagram

K 1-12 W3



Function

Upon application of the supply voltage to terminals A2/A3 the relay contacts 11/14, 23/24 are closed. After removal of the supply voltage, the contacts maintain their position.

Upon application of the supply voltage to terminals A1/A3 the relay contacts switch: 11/12 closes and 23/24 opens. After removal of the supply voltage, the contacts maintain their position.

The relay can also be manually activated using the lever on the front.

The simultaneous excitation of both circuits is not permissible.

Technical data		KSP 12			
Function type according to IEC 60050		Electronic trigger action relay for single voltage – Trigger action relay			
Function display		Contact position indicator			
Function diagram		FD 0128			
Power supply circuit					
Rated voltage U_N	AC/DC	**24 V**	**42 – 48 V**	**110 – 120 V**	**220 – 240 V**
Rated consumption at 50 Hz and U_N (AC) (50 ms after response)		0.6 VA / 0.4 W	0.8 VA / 0.6 W	1.1 VA / 0.7 W	1.1 VA / 0.7 W
Rated consumption DC (50 ms after response)		0.4 W	0.4 W	0.5 W	0.4 W
Inrush current		–	–	–	–
Peak current at 50 Hz and U_N (AC) (response)		≤ 110 mA	≤ 110 mA	≤ 40 mA	≤ 38 mA
Peak current at DC (response)		ca. 80 mA	ca. 80 mA	ca. 30 mA	ca. 25 mA
Rated frequency		50 to 60 Hz			
Operating voltage range		0.8 – 1.1 x U_N			
Time circuit					
Time setting / number of time ranges		– / –			
Available setting range		–			
Recovery time		3 s			
Minimum on time		30 ms			
Release value		–			
Parallel loads permissible		yes			
Internal half-wave rectification		yes			
Mean value of the error		–			
Dispersion		–			
Influence of the energizing quantity, supply voltage		–			
Influence of the ambient temperature		–			
Output circuit					
Contact assignment		1 change-over contact, 1 normally open contact			
Contact material		Ag gold-flashed			
Rated operating voltage U_n		230/230 V AC/DC			
Max. continuous current I_n		5 A			
Application category according to EN 60947-5-1:1991		AC-15: U_e 230 V AC, I_e 3 A			
		DC-13: U_e 24 V DC, I_e 2 A			
Permissible switching frequency		≤ 1200 switching cycles/h			
Mechanical life		1 x 10^6 switching cycles			
Response time		≤ 25 ms at AC, ≤ 10 ms at DC			
Release time		–			
General information					
Creepage distances and clearances between the circuits		according to DIN VDE 0110-1:04.97			
Rated impulse voltage		4 kV			
Overvoltage category		III			
Degree of pollution		3 outside, 2 inside			
Rated voltage		250 V AC			
Test voltage Ueff 50 Hz according to DIN VDE 0110-1, table A.1		2.21 kV			
Protection degree housing/terminal according to DIN VDE 0470 sec. 1:11.92		IP 30 / IP 20			
Noise immunity according to IEC 61000-4		Test severity 3			
Ambient temperature, operating range		–20 – +60 °C			
Dimension diagram		K1-12 W3			
Circuit diagram		KS 5189/2			
Weight		0.12 kg			
Accessories		–			
Approvals		–			

Overview of the devices/Part numbers

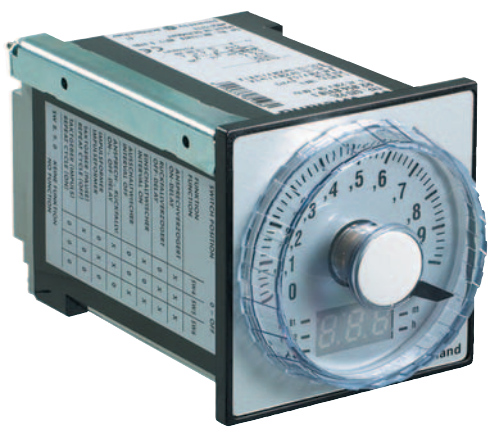
Type	Rated voltage		Part No.	Std. Pack
KSP 12	AC/DC 24 V	50 – 60 Hz	R2.156.0010.2	1
	AC/DC 42 – 48 V	50 – 60 Hz	R2.156.0020.2	1
	AC/DC 110 – 120 V	50 – 60 Hz	R2.156.0030.2	1
	AC/DC 220 – 240 V	50 – 60 Hz	R2.156.0040.2	1

Timer and switching relays
Multi-function DZD 92 L

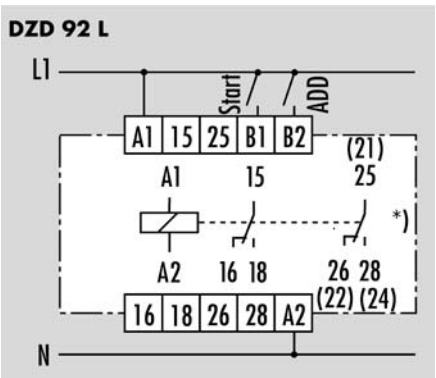
Interface

Multi-function multi-range timer relay

- Single voltage
- 8 functions
- Setting range from 0.05 s to 100 h divided into 7 time ranges
- 1 instantaneous and 1 timed change-over contact or 2 timed changeover contacts (selectable)



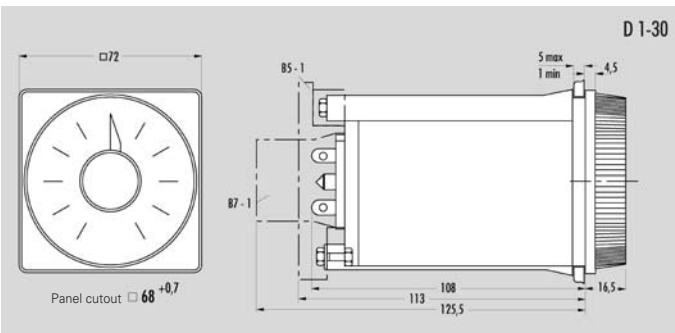
Circuit diagram



KS 0323/1

*) Instantaneous contacts have other terminal designations (e.g. 21 instead of 25)

Dimension diagram



Displays

B1	LED red, lights up when the energizing quantity is applied
B2	LED red, lights up when the energizing quantity for the additive operation is applied
K	LED red, lights up when the time contact is switched over
s; m; h	red LEDs for the range display, indicates the selected time range and flashes during countdown
	3-digit LED display for the selected setpoint value, or for the display of the actual value during countdown

Function

The functions, time ranges and contact assignments are set by means of a dual in-line switch located at the rear of the device (see "Settings").
Infinitely variable time setting within a range is selected by means of a transparent rotary switch.
The selected setpoint value is digitally indicated on a 3-digit LED display (with 7 segments).
The current actual value is displayed analog (with 11 LEDs above the scale values) and also digitally (on an LED display).

Functionen:

• ON-delay	(AV)
• OFF-delay	(RV)
• Interval ON	(EW)
• Interval OFF	(AW)
• ON-delay and OFF-delay	(ARV)
• One shot	(IF)
• Repeat cycle starting with OFF	(TP)
• Repeat cycle starting with ON	(TI)

Time ranges

Setting range from 0.05 s to 10 h divided into:

0.05 s	... 1 s		3 min	... 1 h	
0.5 s	... 10 s		30 min	... 10 h	
3 s	... 1 min		0.05 h	... 1 h	
30 s	... 10 min		5 h	... 100 h	

Accessories

Female connector plate	B 5	for panel and surface mounting
Pin holder	B 7	for panel mounting
Cover	DA 1	for panel cutout
Lockable cover	V 4	
Seal	Z 1	for panel mounting

Function diagrams

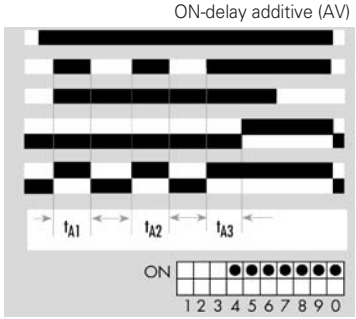
DZD 92 L — ON-delay (AV) — FD 127/1

A1/A2 Supply voltage
B1 Energizing quantity, LED (B1) red
B2 Additive operation, LED (B2) red
15/18 (25/28) Delayed contact
15/16 (25/26) LED (K) red
21/24 Instantaneous change-over contact
21/22

t_A = operating time

Program switches
(1 instantaneous and 1 timed change-over contact)

ON-delay additive (AV) — FD 127/2

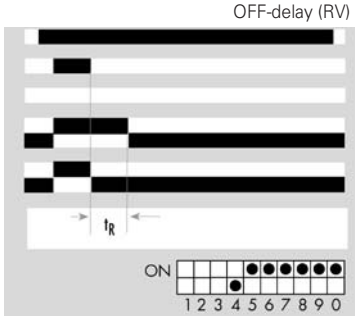


A1/A2 Supply voltage
B1 Energizing quantity, LED (B1) red
B2 Additive operation, LED (B2) red
15/18 (25/28) Delayed contact
15/16 (25/26) LED (K) red
21/24 Instantaneous change-over contact
21/22

$t_A = \sum_1^n t_{AX}$

Program switches
(1 instantaneous and 1 timed change-over contact)

OFF-delay (RV) — FD 127/3

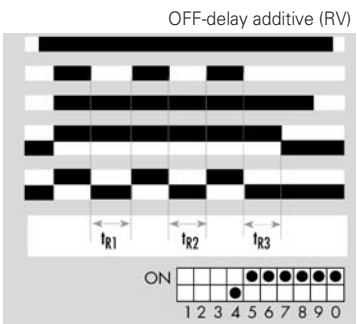


A1/A2 Supply voltage
B1 Energizing quantity, LED (B1) red
B2 Additive operation, LED (B2) red
15/18 (25/28) Delayed contact
15/16 (25/26) LED (K) red
21/24 Instantaneous change-over contact
21/22

t_R = selected returning time

Program switches
(1 instantaneous and 1 timed change-over contact)

OFF-delay additive (RV) — FD 127/4

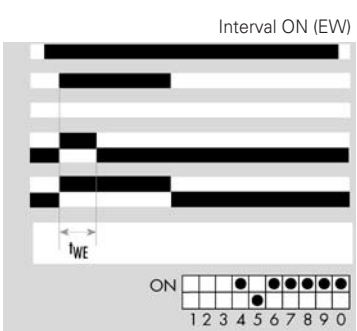


A1/A2 Supply voltage
B1 Energizing quantity, LED (B1) red
B2 Additive operation, LED (B2) red
15/18 (25/28) Delayed contact
15/16 (25/26) LED (K) red
21/24 Instantaneous change-over contact
21/22

$t_R = \sum_1^n t_{RX}$

Program switches
(1 instantaneous and 1 timed change-over contact)

Interval ON (EW) — FD 127/5



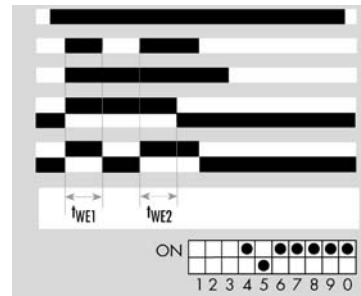
A1/A2 Supply voltage
B1 Energizing quantity, LED (B1) red
B2 Additive operation, LED (B2) red
15/18 (25/28) Delayed contact
15/16 (25/26) LED (K) red
21/24 Instantaneous change-over contact
21/22

t_{WE} = selected interval ON time

Program switches
(1 instantaneous and 1 timed change-over contact)

Function diagrams

DZD 92 L — Interval ON additive (EW) — FD 127/6

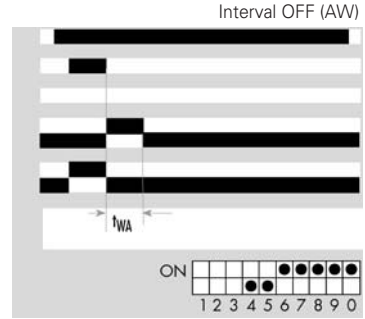


A1/A2 Supply voltage
B1 Energizing quantity, LED (B1) red
B2 Additive operation, LED (B2) red
15/18 (25/28) Delayed contact
15/16 (25/26) LED (K) red
21/24 Instantaneous change-over contact
21/22

$t_{WE} = \sum_1^n t_{WEX}$

Program switches
(1 instantaneous and 1 timed change-over contact)

Interval OFF (AW) — FD 127/7

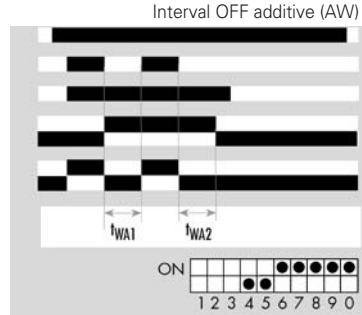


A1/A2 Supply voltage
B1 Energizing quantity, LED (B1) red
B2 Additive operation, LED (B2) red
15/18 (25/28) Delayed contact
15/16 (25/26) LED (K) red
21/24 Instantaneous change-over contact
21/22

t_{WA} = selected interval OFF time

Program switches
(1 instantaneous and 1 timed change-over contact)

Interval OFF additive (AW) — FD 127/8

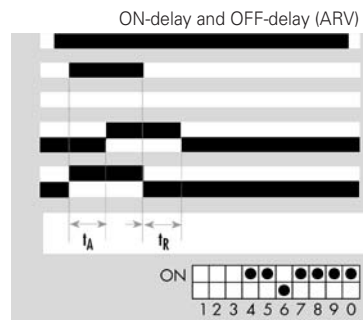


A1/A2 Supply voltage
B1 Energizing quantity, LED (B1) red
B2 Additive operation, LED (B2) red
15/18 (25/28) Delayed contact
15/16 (25/26) LED (K) red
21/24 Instantaneous change-over contact
21/22

$t_{WA} = \sum_1^n t_{WAX}$

Program switches
(1 instantaneous and 1 timed change-over contact)

ON-delay and OFF-delay (ARV) — FD 127/9

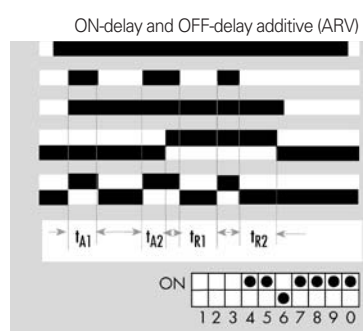


A1/A2 Supply voltage
B1 Energizing quantity, LED (B1) red
B2 Additive operation, LED (B2) red
15/18 (25/28) Delayed contact
15/16 (25/26) LED (K) red
21/24 Instantaneous change-over contact
21/22

t_A = selected interval OFF time
t_R = selected returning time

Program switches
(1 instantaneous and 1 timed change-over contact)

ON-delay and OFF-delay additive (ARV) — FD 127/10



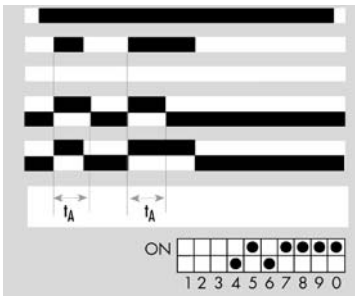
A1/A2 Supply voltage
B1 Energizing quantity, LED (B1) red
B2 Additive operation, LED (B2) red
15/18 (25/28) Delayed contact
15/16 (25/26) LED (K) red
21/24 Instantaneous change-over contact
21/22

$t_A = \sum_1^n t_{AX} = t_R = \sum_1^n t_{RX}$

Program switches
(1 instantaneous and 1 timed change-over contact)

Function diagrams

DZD 92 L One shot (IF) FD 127/11

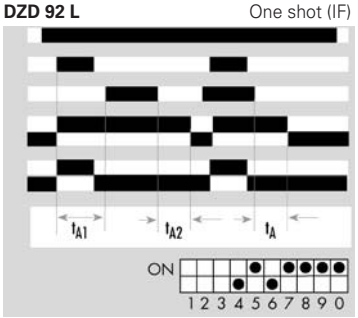


A1/A2 Supply voltage
B1 Energizing quantity, LED (B1) red
B2 Additive operation, LED (B2) red
15/18 (25/28) Delayed contact
15/16 (25/26) LED (K) red
21/24 Instantaneous change-over contact
21/22

t_A = selected operating time

Program switches
(1 instantaneous and 1 timed change-over contact)

DZD 92 L One shot (IF) FD 127/12

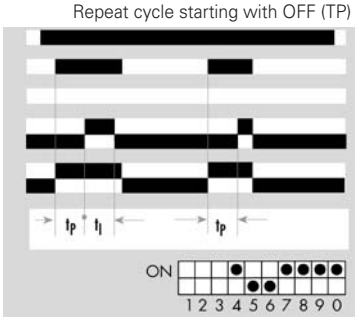


A1/A2 Supply voltage
B1 Energizing quantity, LED (B1) red
B2 Additive operation, LED (B2) red
15/18 (25/28) Delayed contact
15/16 (25/26) LED (K) red
21/24 Instantaneous change-over contact
21/22

t_A = selected operating time $t_A = \sum_{1}^{n} t_{AX}$

Program switches
(1 instantaneous and 1 timed change-over contact)

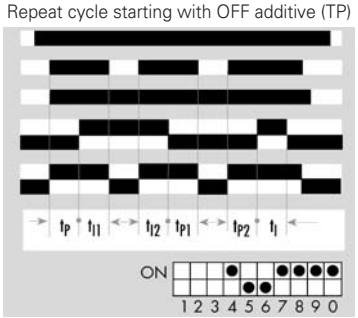
Repeat cycle starting with OFF (TP) FD 127/13



A1/A2 Supply voltage
B1 Energizing quantity, LED (B1) red
B2 Additive operation, LED (B2) red
15/18 (25/28) Delayed contact
15/16 (25/26) LED (K) red
21/24 Instantaneous change-over contact
21/22
t_I = ON time
t_P = OFF time

Program switches
(1 instantaneous and 1 timed change-over contact)

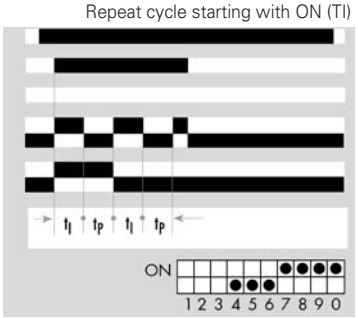
Repeat cycle starting with OFF additive (TP) FD 127/14



A1/A2 Supply voltage
B1 Energizing quantity, LED (B1) red
B2 Additive operation, LED (B2) red
15/18 (25/28) Delayed contact
15/16 (25/26) LED (K) red
21/24 Instantaneous change-over contact
21/22
t_I = ON time
t_P = OFF time $t_I = \sum_{1}^{n} t_{IX} = t_P = \sum_{1}^{n} t_{PX}$

Program switches
(1 instantaneous and 1 timed change-over contact)

Repeat cycle starting with ON (TI) FD 127/15



A1/A2 Supply voltage
B1 Energizing quantity, LED (B1) red
B2 Additive operation, LED (B2) red
15/18 (25/28) Delayed contact
15/16 (25/26) LED (K) red
21/24 Instantaneous change-over contact
21/22
t_I = ON time
t_P = OFF time

Program switches
(1 instantaneous and 1 timed change-over contact)

Function diagrams

DZD 92 L Repeat cycle starting with ON additive (TI) FD 127/11

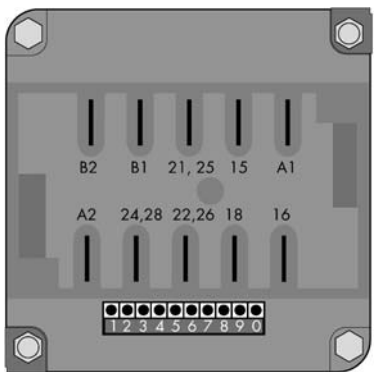
A1/A2 Supply voltage
B1 Energizing quantity, LED (B1) red
B2 Additive operation, LED (B2) red
15/18 (25/28) Delayed contact
15/16 (25/26) LED (K) red
21/24 Instantaneous change-over contact
21/22
t_I = ON time
t_P = OFF time $t_I = \sum_{1}^{n} t_{IX} = t_P = \sum_{1}^{n} t_{PX}$

Program switches
(1 instantaneous and 1 timed change-over contact)

t_1 = must be > recovery time 1
t_2 = must be > recovery time 2
t_3 = make time, must be > minimum ON time

Settings

The functions, time ranges and contact assignments are set by means of a dual in-line switch with 10 ON/OFF DIP switches located at the rear of the device.



Position of the switches		1	2	3	4	5	6	7	8	9	0
Time range	**Resolution**										
0.05 s to 1 s	0.01 s	❍	❍	❍							
0.5 s to 10 s	0.05 s	●	❍	❍							
3 s to 1 min	0.5 s	❍	●	❍							
30 s to 10 min	5 s	●	●	❍							
3 min to 1 h	0.5 min	❍	❍	●							
30 min to 10 h	5 min	●	❍	●							
5 h to 100 h	0.5 h	❍	●	●							
Function											
ON-delay time					❍	❍	❍				
OFF-delay					●	❍	❍				
Interval ON					❍	●	❍				
Interval OFF					●	●	❍				
ON-delay and											
OFF-delay					❍	❍	●				
One shot					●	❍	●				
Repeat cycle											
starting with OFF					❍	●	●				
Repeat cycle											
starting with ON					●	●	●				
Contacts											
1 timed and											
1 instantaneous change-over contact								❍			
2 timed change-over contact								●			

Position of the switches: ● = ON (cam lever up), switches 8 to 0 are not used

Technical data	DZD 92 L
Function type according to IEC 60050 (445)	Analog adjustable multi-function relay for single voltage
	– ON-delay timer relay
	– OFF-delay timer relay with supply voltage
	– Interval ON relay
	– Interval OFF relay
	– ON-delay and OFF-delay timer relay
	- One shot
	- Repeat cycle
Function display	6 LEDs red, 3-digit LED display red, digit size 7.6 mm
Power supply circuit	
Rated voltage U_N	See "Overview of devices"
Rated consumption at 50 Hz and UN (AC)	4.7 VA / 4.6 W
Rated consumption DC	2.6 W
Rated frequency	50 – 60 Hz
Operating voltage range	0.8 to 1.1 x U_N
Rated current of the energizing quantity (B1)	8 mA
Time circuit	
Time setting / number of time ranges	analog/7
Available setting range	See table "Time ranges"
Response time of the energizing quantity (B1)	≤ 20 ms; ≤ 2 ms at 24 V DC
Release time of the energizing quantity (B1)	≤ 20 ms; ≤ 3 ms at 24 V DC
Recovery time	≤ 40 / ≤ 60 ms; ≤ 40 / ≤ 10 ms at 24 V DC
Minimum on time	≤ 40 ms; ≤ 5 ms at 24 V DC
Release value	≤ 15 % UN
Parallel loads permissible	yes
Internal half-wave rectification	no
Mean value of the error	≤ 1 % ± 10 ms
Dispersion	≤ ± 0.5 % + ± 10 ms
Influence of the energizing quantity, supply voltage	≤ 0.005 % / % Δ U_N
Influence of the ambient temperature	≤ 0.005 % / K
Output circuit	
Contact assignment	1 instantaneous and 1 timed change-over contact or 2 timed change-over contacts
Contact material	Ag alloy, gold-plated
Rated operating voltage U_n	250/300 V AC/DC
Max. continuous current I_n	5 A
Application category according to EN 60947-5-1:1991	AC-15: U_e 230 V AC, I_e 2 A DC-13: U_e 24 V DC, I_e 2 A
Permissible switching frequency	≤ 6000 switching cycles/h
Mechanical life	30 x 10^6 switching cycles
Response time	ca. 10 ms
Release time	ca. 10 m
General information	
Creepage distances and clearances between the circuits	according to DIN VDE 0110-1:04.97
Rated impulse voltage	4 kV
Overvoltage category	III
Degree of pollution	3 outside, 2 inside
Rated voltage	250 V AC
Test voltage Ueff 50 Hz according to DIN VDE 0110-1, table A.1	2.21 kV
Protection degree housing/terminal according to DIN VDE 0470 sec. 1:11.92	IP 30 / IP 20
Noise immunity according to IEC 61000-4	Test severity 3
Ambient temperature, operating range	–20 – +60 °C
Weight	0.4 kg
Accessories	B 5, B 7, DA 1, V 4, Z 1
Approvals	–

Overview of the devices/Part numbers

Type	ON-delay time	Rated voltage		Part No.	Std. Pack
DZD 92 L	See table "Time ranges"	DC 24 V		R2.054.0340.1	1
		AC 24 V	50 – 60 Hz	R2.054.0320.1	1
		AC 42 V	50 – 60 Hz	R2.054.0330.1	1
		AC 115 V	50 – 60 Hz	R2.054.0300.1	1
		AC 230 V	50 – 60 Hz	R2.054.0310.1	1

Timer and switching relays
Multi-function UZD 51

Digital multi-function multi-range timer relay

- Multi-voltage for AC 100 to 240 V, single voltage for AC/DC 24 V
- 8 functions
- 2-color high-contrast LCD displays
- Setting range digital from 0.001 s to 999.9 h divided into 8 time ranges
- Protected against power failure
- 1 timed change-over contact

Function

The functions and the time ranges are set by means of a dual in-line switch located on the right lateral side of the device. The time is pre-set at the front. The selected setpoint is digitally indicated on a 4-digit yellow LCD display and the actual value is digitally indicated on a 4-digit red LCD display. The setpoint settings are protected against power failure and recovery.

Setting of the function, time range and pre-set time

1. Setting of the function and time range

The new settings are active after switching the supply voltage off and on.

Dual-in-line switch

	Range	Dual-in-line switch	
		OFF	ON
1	Functions	See table 1	
2			
3			
4	Minimum ON time	20 ms	1 ms
5	Setting of the countdown	additive	subtractive
6	Time ranges	See table 2	
7			
8			

Table 1: Setting the function

DIP switch no.			Functions
1	2	3	Mode
ON	ON	ON	A: ON-delay (AV)
OFF	OFF	OFF	A2: ON-delay (AV)
ON	OFF	OFF	B: ON-delay (AV) caused by energizing quantity
OFF	ON	OFF	C: OFF-delay (RV) with energizing quantity
ON	ON	OFF	D: Interval ON (EW) with energizing quantity
OFF	OFF	ON	E: ON-delay (AV) (pulse signal)
ON	OFF	ON	F: Repeat cycle starting with OFF (TP)
OFF	ON	ON	G: ON-delay (AV) (with time addition or subtraction)

Table 2: Setting the time range

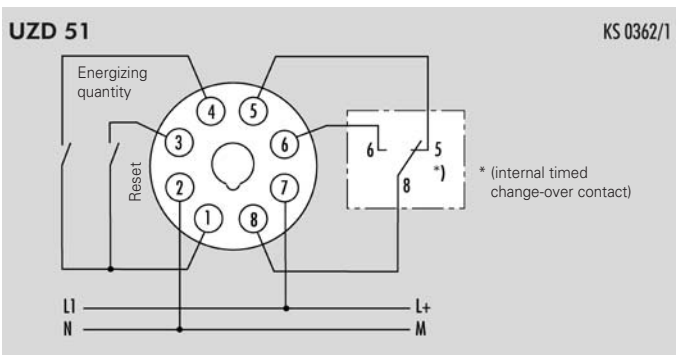
DIP switch no.			Time range		
1	2	3			
ON	ON	ON	0.00 s	to	9.999 s
OFF	OFF	OFF	0.01 s	to	99.99 s
ON	OFF	OFF	0.1 s	to	999.9 s
OFF	ON	OFF	1 s	to	9999 s
ON	ON	OFF	10 s	to	99 min 59 s
OFF	OFF	ON	0.1 min	to	999.9 min
ON	OFF	ON	1 min	to	99 h 59 min
OFF	ON	ON	0.1 h	to	999.9 h

Time ranges

Setting range from 0.001 s to 999.9 h divided into:

0.001 s...999.9 s	10 s...99 min 59 s
0.01 s...99.99 s	0.1 min...999.9 min
0.1 s...999.9 s	1 min...99 h 59 min
1 s...9999 s	0.1 h...999.9 h

Circuit diagram



Notes

- Set the function and time range prior to installing the device.
- Press the LOCK key to avoid unintentional modifications to the set values.
- Modifications to the setpoint value during the countdown are not permissible.
- Use gold-plated contacts to achieve proper control.
- Semiconductor input possible; see "Technical data"

Accessories

Pin holder	AT8-DF8S	for DIN-rail
Pin holder	AT8-RR	for panel mounting

Function

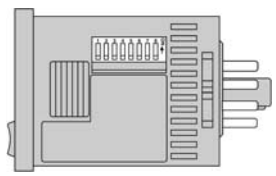
Setting of the pre-set time

The time is pre-set using the four keys on the front.

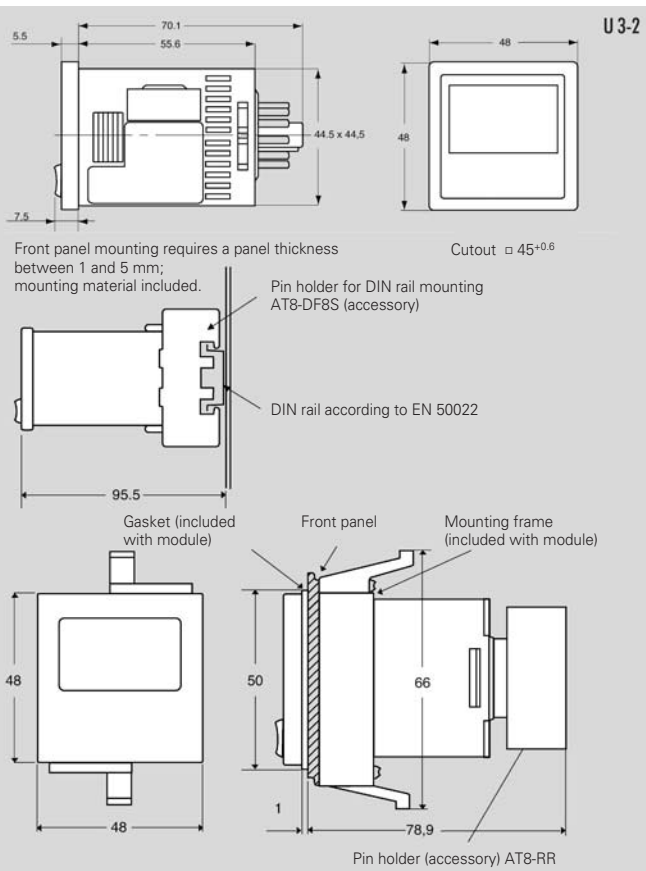
Front view

1 – LCD display for the current actual value
2 – LCD display for the selected setpoint value
3 – LED display that flashes during countdown
4 – Indicator for energized output
5 – Indicator for controlled reset input
6 – Lock indicator
7 – Display of the selected time range
8 – UP keys, additive modification to the selected setpoint value
9 – DOWN keys, subtractive modification to the selected setpoint value
10 – RESET switch, clears the actual value and resets the output
11 – LOCK switch, locks the RESET key, the UP and DOWN keys

Dual-in-line switch



Dimension diagram



Function diagrams

UZD 51

FD 0239-5/1

Mode: A ON-delay (AV)

2/7 Supply voltage
4/1 Energizing quantity
3/1 Reset
8/6 8/5 Delayed contact

t_A = operating time

FD 0239-5/2

Mode: A2 ON-delay (AV)

2/7 Supply voltage
4/1 Energizing quantity
3/1 Reset
8/6 8/5 Delayed contact

t_A = operating time $t_A = t_1 + t_2 + t_3$

FD 0239-5/3

Mode: B ON-delay (AV) caused by ergizing quantity

2/7 Supply voltage
4/1 Energizing quantity
3/1 Reset
8/6 8/5 Delayed contact

t_A = operating time
Energizing quantity > t_A

FD 0239-5/4

Mode: E ON-delay (AV) (pulse signal)

2/7 Supply voltage
4/1 Energizing quantity
3/1 Reset
8/6 8/5 Delayed contact

t_A = operating time

FD 0239-5/5

Mode: G ON-delay (AV) (time addition or subtraction)

2/7 Supply voltage
4/1 Energizing quantity
3/1 Reset
8/6 8/5 Delayed contact

t_A = operating time $t_A = t_1 + t_2 + t_3$
t_A = operating time $t_A = t_1 - t_2 - t_3$

FD 0239-5/6

Mode: C OFF-delay (RV)

2/7 Supply voltage
4/1 Energizing quantity
3/1 Reset
8/6 8/5 Delayed contact

t_R = returning time

FD 0239-5/7

Mode: D Interval ON (EW)

2/7 Supply voltage
4/1 Energizing quantity
3/1 Reset
8/6 8/5 Delayed contact

t_{WE} = interval ON time

FD 0239-5/8

Mode: F Repeat cycle (TP)

2/7 Supply voltage
4/1 Energizing quantity
3/1 Reset
8/6 8/5 Delayed contact

t_P = Off time

Reset through connecting terminals 3/1 or pressing the RESET key on the front panel

Timer and switching relays
Multi-function UZD 51

Technical data		UZD 51
Function type according to IEC 60050 (445)		Multi-function relay with 8 functions for multi-voltage or single voltage – ON-delay timer relay – OFF-delay timer relay with supply voltage – Interval ON relay – Repeat cycle
Function display		4-digit red LCD display for actual value, digit size 7 mm, 4-digit yellow LCD display for setpoint value, digit size 5.5 mm, Text indications
Function diagrams		FD 0239-5/1 bis 8
Power supply circuit		
Rated voltage U_N	AC/DC	24 V
	AC	100 – 240 V
Rated consumption set to 50 Hz and U_N	AC	10 VA
Rated consumption	DC	3 W
Rated frequency		50 – 60 Hz
Operating voltage range		0.85 – 1.1 x U_N
Residual ripple of the rated voltage U_N		≤ 20 %
Time circuit		
Electrical isolation from power supply circuit		no
Time setting / number of time ranges		4-digit digital / 8
Possible setting range		See table "Time ranges"
Setting of the operating time (selectable)		additive, subtractive
Repeat cycle starting with		OFF
Repeatability		± 0.005 % + 50 ms
Setting tolerance		± 0.005 % + 50 ms
Influence of the energizing quantity or supply voltage		± 0.005 % + 50 ms
Minimum ON time (selectable) Reset / energizing quantity		20 ms / 1 ms (only with semiconductor input)
Recovery time		≤ 100 ms
Semiconductor input (open collector) at terminal 3 or 4		V_{CEO} 20 V min., I_C 20 mA, I_{CBO} 6 µA max
Input voltage		12 – 40 V DC
Max. input resistance (operated state)		≤ 1 kΩ
Max. input resistance (open state)		≥ 100 kΩ
Max. residual voltage (operated state)		≤ 2 V
Output circuit		
Contact assignment		1 timed change-over contacts
Contact material		Ag alloy, gold-plated
Switching voltage U_n		230/30 V AC/DC
Max. continuous current I_n		5 A
Application category in accordance with EN 60947-5-1:1991		AC-15: U_e 250 V AC, I_e 0.75 A DC-13: U_e 30 V DC, I_e 2 A
Permissible switching frequency		≤ 3600 switching cycles/h
Mechanical life		20 x 10^6 switching cycles
Electrical life		1 x 10^6 switching cycles
General information		
Creepage distances and clearances between the circuits		according to DIN VDE 0110-1:04.97
Rated impulse voltage		4 kV
Overvoltage category		III
Degree of pollution		3 outside, 2 inside
Rated voltage		300 V AC
Test voltage U_{eff} 50 Hz according to DIN VDE 0110-1, table A.1		2.21 kV
Protection degree housing/terminals according to DIN VDE 0470 sec. 1:11.92		IP 66 (only with rubber gasket) / IP 20
Noise immunity according to IEC 61000-4		Test severity 3
Ambient temperature, operating range		–10 – +55 °C
Dimension diagram		U 3-1
Circuit diagram		KS 0362/1
Weight		0.11 kg
Accessories		Pin holders AT8-DF8S, AT8-RR
Approvals		

Overview of the devices/Part numbers

Type	ON-delay time	Rated voltage		Part No.	Std. Pack
UZD 51	See table "Time ranges"	AC/DC 24 V	50 – 60 Hz	R2.173.0030.0	1
		AC 110 – 240 V	50 – 60 Hz	R2.063.0020.0	1

Timer and switching relays
Pre-set pulse counter UID 51

interface

Digital multi-function pre-set pulse counter

- Device for multi-voltage AC 100 to 240 V
  for single voltage AC/DC 24 V
- 5 input and 7 output modes; any combination possible
- 2-color high-contrast LCD displays
- Protected against power failure
- 1 normally open contact

Function

The functions are set by means of a dual in-line switch located on the right lateral side of the device. The setpoint value is set through four switches and is digitally indicated on a 4-digit yellow LCD display and the actual value is digitally indicated on a 4-digit red LCD display. The setpoint settings are protected against power failure and recovery.

1. Setting of the operating modes (input and output mode)

Dual-in-line switch

	Function	Dual-in-line switch	
		OFF	ON
1 2 3	Output mode	See table 1	
4	Min. reset input signal width	20 ms	1 ms
5	Max. count rate	30 kHz	5 kHz
6 7 8	Input mode	See table 2	

Table 1: Output mode

DIP switch no.			Output mode
1	2	3	
ON	ON	ON	ON pulse, SHOT-A
OFF	OFF	OFF	ON pulse, SHOT-B
ON	OFF	OFF	ON pulse, SHOT-C
OFF	ON	OFF	ON pulse, SHOT-D
ON	ON	OFF	Holding function, HOLD-A
OFF	OFF	ON	Holding function, HOLD-B
ON	OFF	ON	Holding function, HOLD-C
OFF	ON	ON	– (DIP Err appears on the display)

Table 2: Input mode

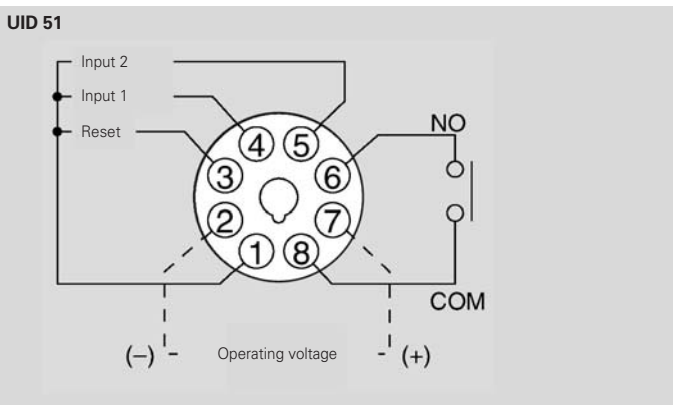
DIP switch no.			Input mode
6	7	8	
ON	ON	ON	Additive input
OFF	OFF	OFF	Subtractive input
ON	OFF	OFF	Direction input
OFF	ON	OFF	Independent inputs
ON	ON	OFF	Phase input
OFF	OFF	ON	– (DIP Err appears on the display)
ON	OFF	ON	– (DIP Err appears on the display)
OFF	ON	ON	– (DIP Err appears on the display)

Pulse range

Available pulse ranges:
– 999 to + 9999

Circuit diagram

UID 51



•Notes

- Set the function prior to installing the device.
- Press the LOCK key to avoid unintentional modifications to the set values.
- Modifications to the setpoint value during the counting operation are permissible.
- Use gold-plated contacts to achieve proper control.
- Semiconductor input possible; see "Technical data"

Accessories

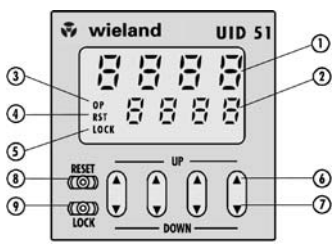
Pin holder	AT8-DF8S	for DIN-rail
Pin holder	AT8-RR	for panel mounting

Function

Setting of the setpoint

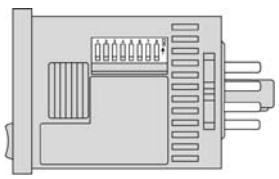
The setpoint is set using the four switches on the front.

Front view

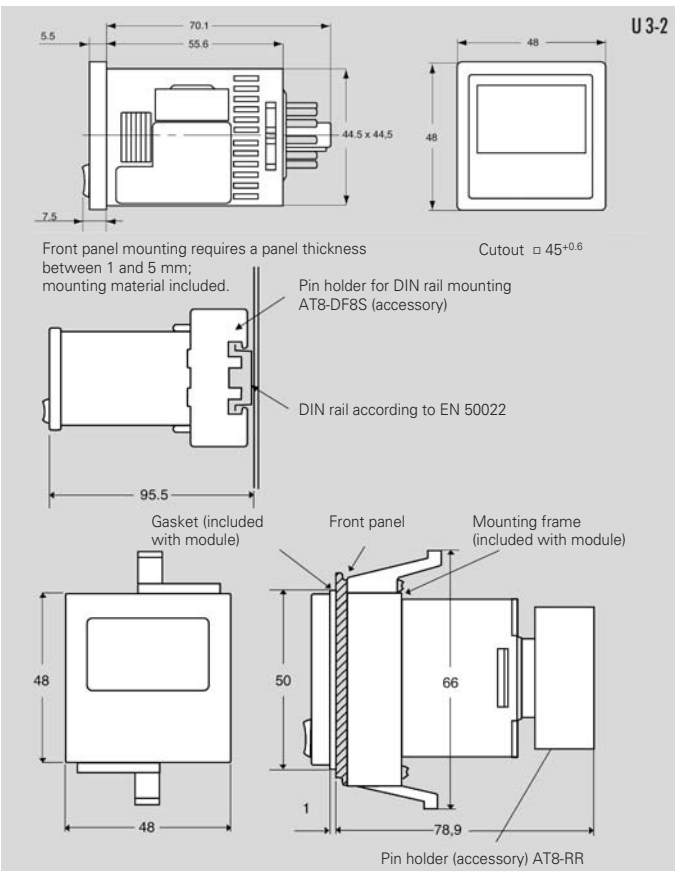


1 – LCD display for the current actual value
2 – LCD display for the selected setpoint value
3 – Indicator for energized output
4 – Indicator for controlled reset input
5 – Lock indicator
6 – UP keys, additive modification to the selected setpoint value
7 – DOWN keys, subtractive modification to the selected setpoint value
8 – RESET switch, clears the actual value and resets the output
9 – LOCK switch, locks the RESET key, the UP and DOWN keys

Dual-in-line switch



Dimension diagram

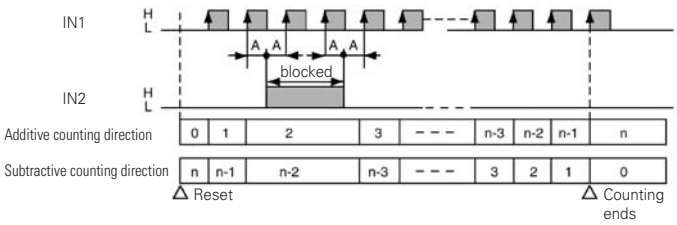


Function diagrams

Input modes

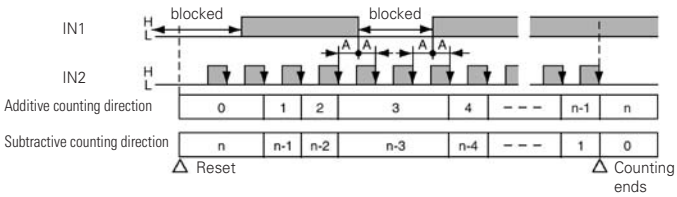
UP Addition

IN1 or IN2 mutually function as input gate for one another.
IN1 counting input, IN2 input gate.
"A" must be larger than the minimum input signal width.



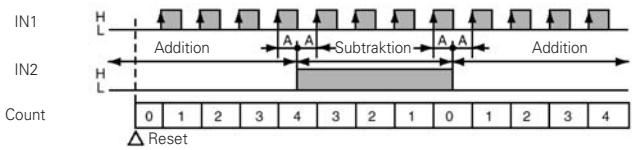
DOWN Subtraction

IN1 or IN2 mutually function as input gate for one another.
IN2 counting input, IN1 input gate.
"A" must be larger than the minimum input signal width.



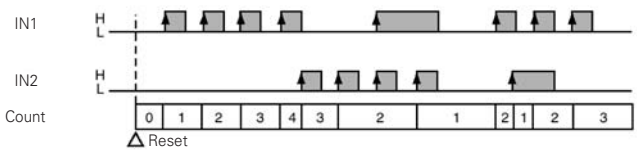
DIR Direction

IN1 is the counting input and IN2 is the direction input. IN2 adds at the low level and subtracts at the high level.
"A" must be larger than the minimum input signal width.



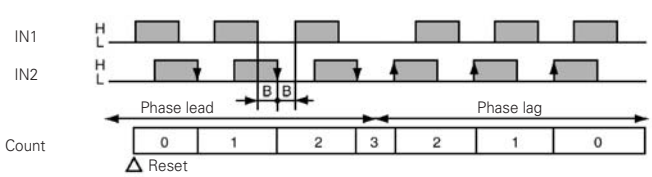
IND Independent

IN1 additive input, IN2 subtractive input.
IN1 and IN2 are completely independent of one another.



PHASE Phase

The counting direction is additive if the IN1 phase is leading IN2, and subtractive if the IN2 phase is leading IN1.
"B" must be larger than the minimum input signal width.

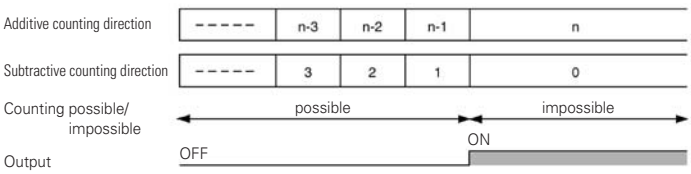


Function diagrams

Output modes

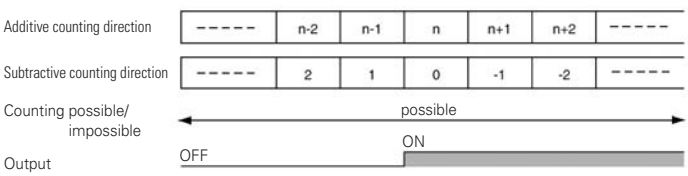
HOLD-A Output holding function

The output is held after termination of the counting operation until a reset is made. The display will not change during this time.



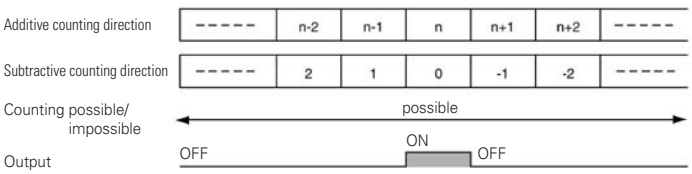
HOLD-B Output holding function / overcounting I

The output is held after termination of the counting operation until a reset is made. Continuation of the counting operation is possible nevertheless.



HOLD-C Output holding function / overcounting II

The output is held after termination of the counting operation until the next counting signal is present. Continuation of the counting operation is possible nevertheless.

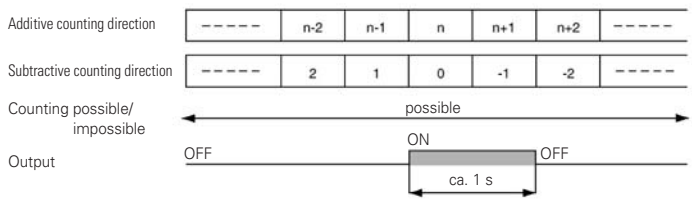


Function diagrams

Output modes

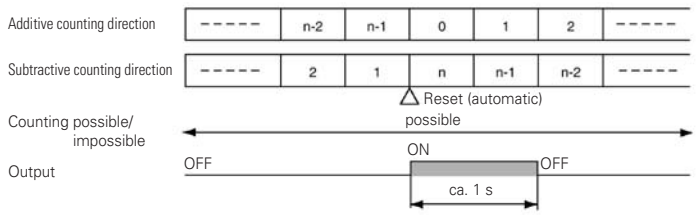
SHOT-A ON pulse / overcounting

The output is held for a fixed time (approx. 1 s) after termination of the counting operation. Continuation of the counting operation is possible nevertheless.



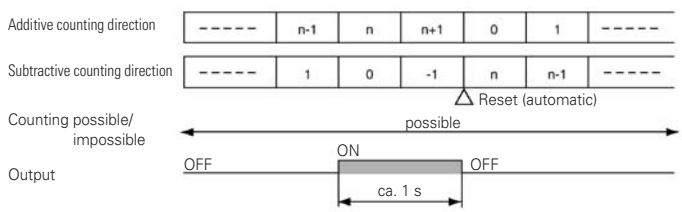
SHOT-B ON pulse / new counting I

The output is held for a fixed time (approx. 1 s) after termination of the counting operation. Continuation of the counting operation is possible nevertheless. Reset is displayed at the same time the counting operation is terminated. Restart is impossible as long as the output is held.



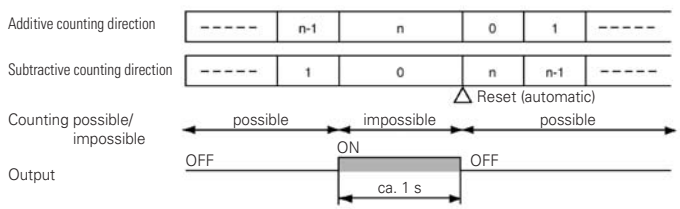
SHOT-C ON pulse / new counting II

The output is held for a fixed time (approx. 1 s) after termination of the counting operation. Continuation of the counting operation is possible nevertheless. Reset is displayed as soon as the output is switched off.



SHOT-D ON pulse / holding function

The output is held for a fixed time (approx. 1 s) after termination of the counting operation. Counting is interrupted during this time. Reset is displayed as soon as the output is switched off.



Technical data		UID 51
Function type		Multi-function pulse counter with 5 input and 7 output functions for multi-voltage or single voltage
Function display		4-digit red LCD display for actual value, digit size 7 mm, 4-digit yellow LCD display for setpoint value, digit size 5.5 mm, Text indications
Function diagrams		See column "Function diagrams"
Power supply circuit		
Rated voltage U_N	AC/DC	24 V
	AC	100 – 240 V
Rated consumption set to 50 Hz and U_N	AC	10 VA / 3 W
Rated consumption	DC	3 W
Rated frequency		50 – 60 Hz
Operating voltage range		0.85 – 1.1 x U_N
Residual ripple of the rated voltage U_N		≤ 20 %
Time circuit		
Electrical isolation from power supply circuit		no
Setpoint setting / number of setpoint ranges		4-digit digital
Possible setting range		See table "Pulse ranges"
Setting of the counting modes		additive, subtractive
Counting rate		30 Hz / 5 Hz (selectable with DIP switch)
Min. counting pulse		16.7 ms at 30 Hz / 0.1 ms at 5 kHz, ON time:OFF time = 1:1
Reset input		Signal reset / pressing a key, Min. input time 1 ms / 20 ms (selectable with DIP switch)
Locking input		Min. input signal width: 20 ms
Input signal		Contact or open collector input / input impedance: max. 1 kΩ, residual input voltage: max. 2 V, Open impedance: min. 100 kΩ, max. voltage load: DC 40 V
Output circuit		
Contact assignment		1 normally open contacts
Contact material		Ag alloy, gold-flashed
Switching voltage U_n		230/30 V AC/DC
Max. continuous current I_n		5 A
Application category in accordance with EN 60947-5-1:1991		AC-15: U_e 250 V AC, I_e 0.75 A DC-13: U_e 30 V DC, I_e 2 A
Permissible switching frequency		≤ 3600 switching cycles/h
Mechanical life		20 x 10^6 switching cycles
General information		
Creepage distances and clearances between the circuits		according to DIN VDE 0110-1:04.97
Rated impulse voltage		4 kV
Overvoltage category		III
Degree of pollution		3 outside, 2 inside
Rated voltage		250 V AC
Test voltage U_{eff} 50 Hz according to DIN VDE 0110-1, table A.1		2.21 kV
Protection degree housing/terminals according to DIN VDE 0470 sec. 1:11.92		IP 66 (only with rubber gasket) / IP 20
Ambient temperature, operating range		–10 – +55 °C
Dimension diagram		U 3-2
Circuit diagram		–
Weight		0.11 kg
Accessories		Pin holders AT8-DF8S, AT8-RR
Approvals		–

Overview of devices/part numbers

Type	Rated voltage		Pulse range	Part No.	Std. Pack
UID 51	AC 24 V	50 – 60 Hz	-999 bis +9999	R2.213.0060.0	1
	AC 110 – 240 V	50 – 60 Hz		R2.213.0070.0	1

Overview of devices/part numbers					
Type	**Rated voltage**	**Specification**	**Part No.**	**Std. Pack**	**Successor type**
DZD 31 G-189	AC 220 V 50 – 60 Hz	9.99 s	R2.054.0080.0	1	–
DZD 31 G-189	AC 220 V 50 – 60 Hz	99.9 s	R2.054.0030.0	1	–
DZD 32-S L-228	AC 220 – 240 V 50 – 60 Hz	99.99 s	R2.054.0250.0	1	DZD 92 L, DZD 72..
DZD 72 LK	AC 110 – 127 V 50 – 60 Hz	99.99 h	R2.054.0230.0	1	DZD 92 L
	AC 220 – 240 V 50 – 60 Hz	99.99 h	R2.054.0040.0	1	
	AC/DC 24 V 50 – 60 Hz	99.99 h	R2.054.0060.0	1	
	AC/DC 48 V 50 – 60 Hz	99.99 h	R2.054.0210.0	1	
	AC/DC 60 V 50 – 60 Hz	99.99 h	R2.054.0140.0	1	
DZD 72-S LK	AC 110 – 127 V 50 – 60 Hz	99.99 h	R2.054.0240.0	1	DZD 92 L
	AC 220 – 240 V 50 – 60 Hz	99.99 h	R2.054.0010.0	1	
	AC/DC 24 V 50 – 60 Hz	99.99 h	R2.054.0070.0	1	
	AC/DC 48 V 50 – 60 Hz	99.99 h	R2.054.0290.0	1	
	AC/DC 60 V 50 – 60 Hz	99.99 h	R2.054.0120.0	1	
ESP 22	DC 110 V	–	R2.152.0180.0	1	–
UZD 31	AC/DC 24 V 50 – 60 Hz	9.99 min	R2.054.0420.0	1	UZD 51
	AC 110 – 127 V 50 – 60 Hz	9.99 s	R2.054.0090.0	1	
	AC 230 V 50 – 60 Hz	9.99 s	R2.054.0280.0	1	
	AC/DC 24 V 50 – 60 Hz	9.99 s	R2.054.0400.0	1	
	AC 230 V 50 – 60 Hz	9.9 s	R2.054.0390.0	1	
	AC 230 V 50 – 60 Hz	99.9 s	R2.054.0180.0	1	
	AC/DC 24 V 50 – 60 Hz	99.9 s	R2.054.0380.0	1	
	AC 230 V 50 – 60 Hz	99.99 s	R2.054.0370.0	1	
	AC/DC 24 V 50 – 60 Hz	99.99 s	R2.054.0410.0	1	
	AC/DC 24 V 50 – 60 Hz	999.9 min	R2.054.0020.0	1	
	AC/DC 24 V 50 – 60 Hz	999.9 s	R2.054.0100.0	1	
NGD 32	AC/DC 24 – 240 V 50 – 60 Hz	5 s – 100 s	R2.062.0050.0	1	NGM 1003
		0.5 s – 10 s	R2.062.0060.0	1	
		0.1 s – 1 s	R2.062.0070.0	1	
		1.5 s – 30 s	R2.062.0080.0	1	
NGF 31	AC/DC 24 – 240 V 50 – 60 Hz	–	R2.173.0010.0	1	NGF 32
NGY 31	AC/DC 24 – 240 V 50 – 60 Hz	50 s – 1000 s	R2.135.0040.0	1	NGY 71
		5 h – 100 h	R2.135.0050.0	1	
		5 s – 100 s	R2.135.0060.0	1	
		0.5 h – 10 h	R2.135.0070.0	1	
		0.5 min – 10 min	R2.135.0080.0	1	
		0.5 s – 10 s	R2.135.0090.0	1	
		0.1 s – 1 s	R2.135.0100.0	1	
		15 s – 300 s	R2.135.0110.0	1	
		1.5 h – 30 h	R2.135.0120.0	1	
		1.5 min – 30 min	R2.135.0130.0	1	
		1.5 s – 30 s	R2.135.0140.0	1	
		0.15 s – 3 s	R2.135.0150.0	1	
		3 min – 60 min	R2.135.0160.0	1	
NGYP 32-S	AC/DC 24 – 240 V 50 – 60 Hz	50 s – 1000 s	R2.135.0190.0	1	NGYP 72-S
		5 h – 100 h	R2.135.0200.0	1	
		5 s – 100 s	R2.135.0210.0	1	
		0.5 h – 10 h	R2.135.0220.0	1	
		0.5 min – 10 min	R2.135.0230.0	1	
		0.5 s – 10 s	R2.135.0240.0	1	
		0.1 s – 1 s	R2.135.0250.0	1	
		15 s – 300 s	R2.135.0260.0	1	
		1.5 h – 30 h	R2.135.0270.0	1	
		1.5 min – 30 min	R2.135.0280.0	1	
		1.5 s – 30 s	R2.135.0290.0	1	
		0.15 s – 3 s	R2.135.0300.0	1	
		3 min – 60 min	R2.135.0310.0	1	
SZTZ 120	AC 220 – 240 V 50 – 60 Hz	0.25 s	R2.057.0010.0	1	–
		0.45 s	R2.057.0020.0	1	–
SZTZ 220	DC 24 V	0.45 s	R2.057.0030.1	1	–
UZD 1001	AC 118 V 50 – 60 Hz	0.01 h – 99.99 h	R2.054.0190.0	1	UZD 51
	AC 230 V 50 – 60 Hz		R2.054.0260.0	1	
	AC 24 V 50 – 60 Hz		R2.054.0200.0	1	
	AC 42 V 50 – 60 Hz		R2.054.0160.0	1	–
UZD 1002	DC 24 V	0.01 h – 99.99 h	R2.054.0170.0	1	UZD 51

Timer and switching relays
ON-delay SZA 52-S / SZA 52 / SZAN 52-S / SZA 54-2S

ON-delay multi-range electromechanical timer relay

- Devices for single voltage
- Function: ON-delay (AV), SZAN 52-S protected against power failure
- 1 setting range divided into 6 time ranges
- Contact assignment: SZA 52-S = 1 timed and 1 instantaneous change-over contact
  SZAN 52-S = 1 timed and 1 instantaneous change-over contact
  SZA 52 = 2 timed change-over contact
  SZA 54-2S = 1 timed and 1 instantaneous normally closed contact (NC)
  1 timed and 1 instantaneous normally open contact (NO)

General information

- The electromechanical timer relays are equipped with synchronous motors and solenoid clutches.
- The time ranges are set on the front through selector switches. Infinitely variable time setting within a range is selected by means of a transparent rotary switch.
- The countdown indicator moves during operation from the set time value towards zero.

Function

Upon excitation of motor and solenoid the instantaneous contact is put in the ON position and the countdown starts. When the pre-set time has elapsed, the time contact is actuated and the motor is switched off. After de-excitation, the solenoid, time element and all contacts will switch into the OFF position. If a voltage interruption occurs during the countdown, the solenoid, instantaneous contact and time element will fall into the OFF position.

The **timer relay protected against power failure SZAN 52-S** has the same function as described above, but upon excitation the solenoid clutch is locked by a blocking pawl so that even in a no-volt condition the elapsed time is preserved.
The countdown can be interrupted as often as desired. The instantaneous contact remains in the ON position even during voltage interruption. When the pre-set time has elapsed, the blocking pawl is released, the timed contacts are actuated and the motor is switched off.

Actuation by impulse: The timer relay protected against power failure can be actuated by an impulse applied to the clutch, as the locking action of the blocking pawl is immediate (separate motor and coil connections). The countdown starts when the motor is energized. After impulse actuation the instantaneous contact goes into the ON position until the countdown ends. When the time has elapsed, it falls back into the OFF position. The timed contact only opens for approx. 10 ms. The timed change-over contact cannot be switched into its closed position.

Accessories

Cover	Z 29	sealable transparent cover

Time ranges

Available setting ranges:

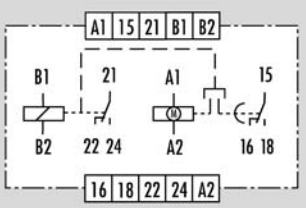
0.1 s to 1000 s
divided into 6 time ranges
0.1…3 s
0.3…10 s
1…30 s
3.3…100 s
10…300 s
33…1000 s

0.1 s to 30 h
divided into 6 time ranges
0.1…3 s
1…30 s
0.1…3 min
1…30 min
0.1…3 h
1…30 h

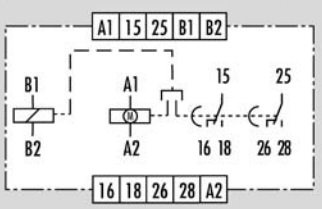
0.2 s to 60 h
divided into 6 time ranges
0.2...6 s
2...60 s
0.2...6 min
2...60 min
0.2...6 h
2...60 h

Circuit diagrams

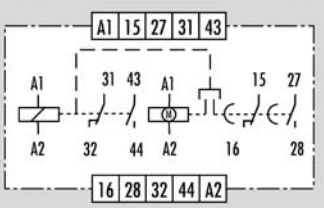
SZA 52-S, SZAN 52-S KS 5102/3



SZA 52 KS 5153/2



SZA 54-2S KS 5155/2

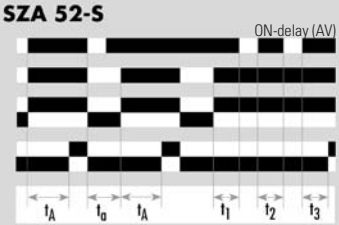


Timer and switching relays
ON-delay SZA 52-S / SZA 52 / SZAN 52-S / SZA 54-2S

interface

Function diagrams

SZA 52-S — FD 0008

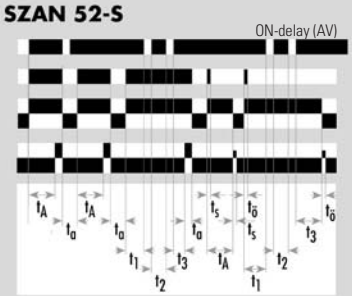


A1/A2 Supply voltage
B1/B2 Energizing quantity
21/24, 21/22 Instantaneous contact
15/18, 15/16 Delayed contact

t_A = operating time
t_a = break time, must be > returning time of the time element

operating time $= \sum_{1}^{n} t_x$

SZAN 52-S — FD 0033



A1/A2 Supply voltage
B1/B2 Energizing quantity
21/24, 21/22 Instantaneous contact
15/18, 15/16 Delayed contact

t_A = operating time
t_a = break time, must be > returning time of the switching element
t_s = closing time, must be > minimum excitation time
t_o = opening time, refers only to the NC contact, the NO contact is not switched

operating time $t_A = \sum_{1}^{n} t_x$

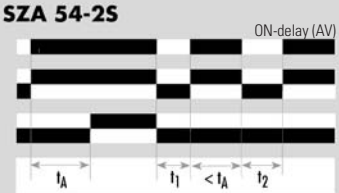
SZA 52 — FD 0011

A1/A2 Supply voltage
B1/B2 Energizing quantity
15/18; 25/28, 15/16; 25/26 Delayed contact

t_A = operating time
t_a = break time, must be > returning time of the time element

operating time $= \sum_{1}^{n} t_x$

SZA 54-2S — FD 0040



A1/A2 Supply voltage
43/44, 31/32 Instantaneous contact
27/28, 15/16 Delayed contact

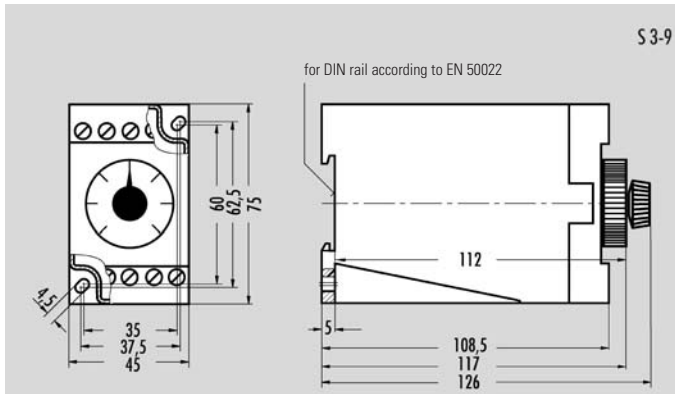
t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Notes

- With a frequency switch located at the bottom of the housing the relay can be adapted to the relevant frequency (50 or 60 Hz). The factory pre-setting is 50 Hz.
- Except for type SZA 54-2S, the relays have separate motor and solenoid connections which makes the following operating modes possible:
  1. Time accumulation: By separate actuation of the solenoid clutch and the motor, elapsed time can be stored and/or various time segments accumulated.
  2. Rapid start: Reduction of time dispersion to a minimum by keeping the motor constantly at operating voltage while only the solenoid clutch is de-energized and energized after the time has elapsed. Motor starting irregularities are thus avoided. For operating times above 60 s, the rapid start no longer has any effect on time dispersion.
  3. Standard operation: Simultaneous excitation and de-excitation of solenoid clutch and motor. Recommended for operating times above 60 s.
- Maximum repeatability is achieved with multi-range models by selecting the shortest possible time range.
- The time range on the devices has to be selected in the OFF position to avoid possible timing errors and incorrect contact switching.

Dimension diagram

S 3-9



Overview of the devices/Part numbers

Type	Setting range	Rated voltage		Part No.	Std. Pack
SZA 52-S	0.1 s … 1000 s	AC 24 V	50/60 Hz	R2.026.0360.0	1
		AC 110 – 115 V	50/60 Hz	R2.026.0100.0	1
		AC 230 V	50/60 Hz	R2.026.0160.0	1
	0.1 s … 30 h	AC 24 V	50/60 Hz	R2.026.0260.0	1
		AC 110 – 115 V	50/60 Hz	R2.026.0010.0	1
		AC 230 V	50/60 Hz	R2.026.0350.0	1
	0.2 s … 60 h	AC 24 V	50/60 Hz	R2.026.0080.0	1
		AC 42 V	50/60 Hz	R2.026.0090.0	1
		AC 48 V	50/60 Hz	R2.026.0250.0	1
		AC 110 – 115 V	50/60 Hz	R2.026.0130.0	1
		AC 230 V	50/60 Hz	R2.026.0070.0	1
SZAN 52-S	0.1 s … 1000 s	AC 24 V	50/60 Hz	R2.026.0030.0	1
		AC 230 V	50/60 Hz	R2.026.0050.0	1
	0.1 s … 30 h	AC 24 V	50/60 Hz	R2.026.0340.0	1
		AC 110 – 115 V	50/60 Hz	R2.026.0270.0	1
		AC 230 V	50/60 Hz	R2.026.0020.0	1
	0.2 s … 60 h	AC 24 V	50/60 Hz	R2.026.0300.0	1
		AC 110 – 115 V	50/60 Hz	R2.026.0290.0	1
		AC 230 V	50/60 Hz	R2.026.0310.0	1
SZA 52	0.2 s … 60 h	AC 24 V	50/60 Hz	R2.026.0170.0	1
		AC 110 – 115 V	50/60 Hz	R2.026.0200.0	1
		AC 230 V	50/60 Hz	R2.026.0220.0	1
SZA 54-2S	0.2 s … 60 h	AC 24 V	50/60 Hz	R2.026.0150.0	1
		AC 110 – 115 V	50/60 Hz	R2.026.0180.0	1
		AC 125 – 127 V	50/60 Hz	R2.026.0060.0	1
		AC 230 V	50/60 Hz	R2.026.0330.0	1

Timer and switching relays
ON-delay SZA 52-S / SZA 52 / SZAN 52-S / SZA 54-2S

Technical data	SZA 52-S	SZAN 52-S	SZA 52	SZA 54-2S
Function type according to DIN VDE 0435 sec. 110:04.89	Electromechanical timer relay for single voltage			
	Item 3.13: ON-delay timer relay	Item 3.14: ON-delay timer relay protected against power failure	Item 3.13: ON-delay timer relay	Item 3.12: ON-delay timer relay
Function display	Pointer for operating time			
Function diagram	FD 0008	FD 0033	FD 0011	FD 0040
Power supply circuit				
Rated voltage U_N	See "Overview of devices"			
Rated consumption: motor at 50 Hz and UN (AC)	ca. 1.3 VA / ca. 1.1 W			
Rated consumption: coil at 50 Hz and UN (AC)	ca. 1.0 VA / ca. 0.9 W			
Rated frequency	50 and 60 Hz selectable on the device			
Operating voltage range	0.8 – 1.1 x U_N			
Time circuit				
Time setting / number of time ranges	analog / 6			
Available time ranges	s. Tabelle „Time ranges"			
Recovery time	≤ 250 ms			
Minimum ON time	–	30 ms	–	–
Release value	≥ 15 % U_N			
Parallel loads permissible	yes			
Internal half-wave rectification	yes			
Error (average related to the full scale value)	during standard operation: Setting range > 6 s; ± 1.5 % Setting range 6 s; ± 2 % Setting range 3 s; ± 3 %			
Dispersion	Standard operation	Rapid start		
Setting range 0.3 – 6 s	± 0.06 s	± 0.03 s		
Setting range 3 – 60 s	± 0.22 s	± 0.19 s		
Max. operating time ≥ 60 s	± 0.3 % related to the full scale value			
Output circuit				
Contact assignment	1 timed and 1 instantaneous change over contact	1 timed and 1 instantaneous change over contact	2 timed change-over	timed and 1 instantaneous NC, 1 timed and 1 instantaneous NO
Contact material	Ag Cu			
Rated operating voltage U_n	AC/DC 230 V			
Max. continuous current I_n	5 A			
Application category according to EN 60947-5-1:1991	AC-15: U_e 230 V AC, I_e 2 A DC-13: U_e 24 V DC, I_e 2 A			
Permissible switching frequency	≤ 3600 switching cyclese/h			
Mechanical life	3 x 10^6 switching cycles or 10^4 motor operation hours			
Response time	≤ 25 ms			
Release time	≤ 60 ms			
General information				
Creepage distances and clearances between the circuits	according to DIN VDE 0110-1:04.97			
Rated impulse voltage	4 kV			
overvoltage category	III			
Degree of pollution	3 outside 2 inside			
Rated voltage	AC 250 V			
Test voltage Ueff 50 Hz according to DIN VDE 0110-1, table A.1	2.21 kV			
Protection degree housing/terminals according to DIN VDE 0470 sec. 1:11.92	IP 30/IP 20			
Emitted interference	EN 50081-1:03.93, -2:03.94			
Noise immunity	EN 50082-2:1995			
Ambient temperature, operating range	–10 – +55 °C			
Dimension diagram	S 3-9			
Circuit diagram	KS 5102/3	KS 5102/3	KS 5153/2	KS 5155/2
Weight	0.35 kg			
Accessories	Z 29			
Approvals	GL UL CSA			

OFF-delay multi-range electromechanical timer relay with auxiliary supply

- Device for single voltage
- Function: OFF-delay (RV)
- 1 setting range divided into 6 time ranges
- Contact assignment: 1 timed and 1 instantaneous change-over contact

General information

- The electromechanical timer relay is equipped with synchronous motor and solenoid clutch.
- The time ranges are set on the front through selector switches. Infinitely variable time setting within a range is selected by means of a transparent rotary switch.
- The countdown indicator moves during operation from the set time value towards zero.

Function

Upon application of the supply voltage at the motor and of the energizing quantity at the coil, the timed and the instantaneous contacts will switch. When the coil is de-energized, the countdown begins and the instantaneous contact falls back into the OFF position.

The countdown can be interrupted as often as desired without clearing the elapsed time. When the pre-set time has elapsed, the time contact falls back into the OFF position.

Time accumulation: Only by actuating the motor are the resulting operating times accumulated, meaning that the elapsed times are stored.

Notes

- With a frequency switch located at the bottom of the housing the relay can be adapted to the relevant frequency (50 or 60 Hz). The factory pre-setting is 50 Hz.
- Maximum repeatability is achieved with multi-range models by selecting the shortest possible time range.
- The time range on the devices has to be selected in the OFF position to avoid possible timing errors and incorrect contact switching.

Time ranges

Available time ranges:

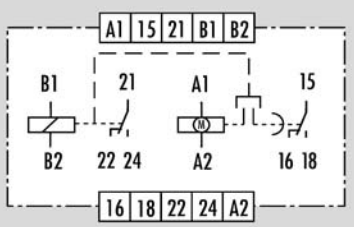
0.1 s to 1000 s
divided into 6 time ranges
0.1…3 s
0.3…10 s
1…30 s
3.3…100 s
10…300 s
33…1000 s

0.1 s to 30 h
divided into 6 time ranges
0.1…3 s
1…30 s
0.1…3 min
1…30 min
0.1…3 h
1…30 h

0.2 s to 60 h
divided into 6 time ranges
0.2...6 s
2...60 s
0.2...6 min
2...60 min
0.2...6 h
2...60 h

Circuit diagram

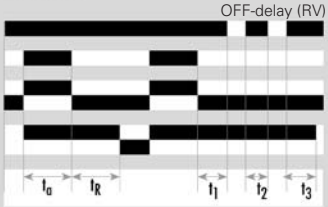
SZA 521 KS 5125/3



Function diagram

SZA 521 FD 0012

OFF-delay (RV)



A1/A2	Supply voltage
B1/B2	Energizing quantity
21/24 21/22	Instantaneous contact
15/18 15/16	Delayed contact

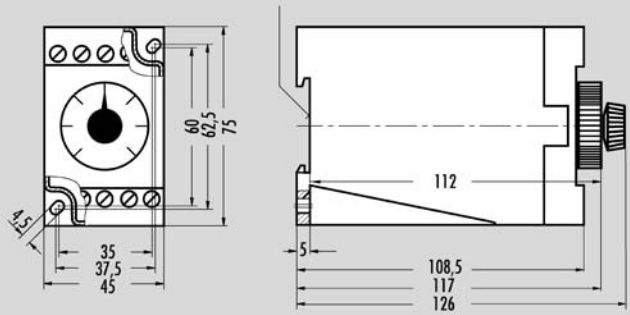
t_R = returning time
t_a = make time, must be > minimum time

Returning time during additive operation $t_R = \sum_{1}^{n} t_x$

Dimension diagram

S 3-9

for DIN rail according to EN 50022



Accessories

Cover	Z 29	sealable transparent cover

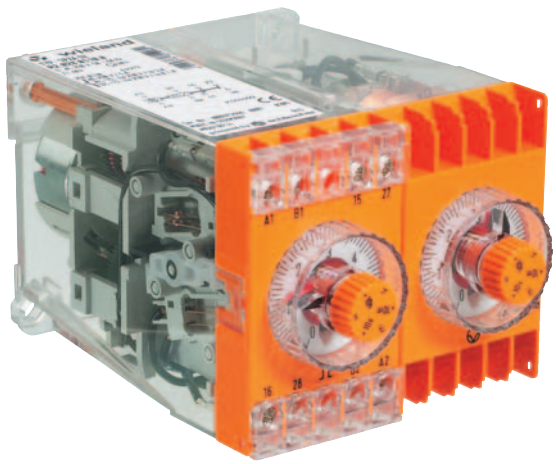
Overview of the devices/Part numbers

Type	Setting range	Rated voltage		Part No.	Std. Pack
SZA 521	0.1 s … 1000 s	AC 24 V	50/60 Hz	R2.026.0210.0	1
		AC 110 – 115 V	50/60 Hz	R2.026.0110.0	1
		AC 230 V	50/60 Hz	R2.026.0230.0	1
	0.1 s … 30 h	AC 24 V	50/60 Hz	R2.026.0280.0	1
		AC 110 – 115 V	50/60 Hz	R2.026.0240.0	1
		AC 230 V	50/60 Hz	R2.026.0320.0	1
	0.2 s … 60 h	AC 24 V	50/60 Hz	R2.026.0140.0	1
		AC 42 V	50/60 Hz	R2.026.0190.0	1
		AC 110 – 115 V	50/60 Hz	R2.026.0120.0	1
		AC 230 V	50/60 Hz	R2.026.0040.0	1

Technical data	SZA 521
Function type according to DIN VDE 0435 sec. 110:04.89	Electromechanical timer relay for single voltage Item 3.17: OFF-delay timer relay
Function display	Pointer for operating time
Function diagram	FD 0012
Power supply circuit	
Rated voltage U_N	See "Overview of devices"
Rated consumption: motor at 50 Hz and UN (AC)	ca. 1.3 VA / ca. 1.1 W
Rated consumption: coil at 50 Hz and UN (AC)	ca. 1.0 VA / ca. 0.9 W
Rated frequency	50 and 60 Hz selectable on the device
Operating voltage range	0.8 – 1.1 x U_N
Time circuit	
Time setting / number of time ranges	analog/6
Available time ranges	s. Tabelle „Time ranges"
Recovery time	–
Minimum ON time	150 ms
Release value	≥ 15 % U_N
Parallel loads permissible	yes
Internal half-wave rectification	yes
Error (average related to the full scale value)	during standard operation: Setting range 6 s; ± 1.5 % Setting range 6 s; ± 2 % Setting range 3 s; ± 3 %
Dispersion	Standard operation Rapid start
Setting range 0.3 – 6 s	± 0.06 s ± 0.03 s
Setting range 3 – 60 s	± 0.22 s ± 0.19 s
Max. operating time ≥ 60 s	± 0.3 % related to the full scale value
Output circuit	
Contact assignment	1 timed and 1 instantaneous change-over contact
Contact material	Ag Cu
Rated operating voltage U_n	AC/DC 230 V
Max. continuous current I_n	5 A
Application category according to EN 60947-5-1:1991	AC-15: U_e 230 V AC, I_e 2 A DC-13: U_e 24 V DC, I_e 2 A
Permissible switching frequency	≤ 3600 switching cyclese/h
Mechanical life	3 x 10^6 switching cycles or 10^4 motor operation hours
Response time	≤ 25 ms
Release time	≤ 60 ms
General information	
Creepage distances and clearances between the circuits	according to DIN VDE 0110-1:04.97
Rated impulse voltage	4 kV
overvoltage category	III
Degree of pollution	3 outside 2 inside
Rated voltage	AC 250 V
Test voltage Ueff 50 Hz according to DIN VDE 0110-1, table A.1	2.21 kV
Protection degree housing/terminals according to DIN VDE 0470 sec. 1:11.92	IP 30/IP 20
Emitted interference	EN 50081-1:03.93, -2:03.94
Noise immunity	EN 50082-2:1995
Ambient temperature, operating range	–10 – +55 °C
Dimension diagram	S 3-9
Circuit diagram	KS 5125/3
Weight	0.35 kg
Accessories	B 5, B 7, BT 421, DA 1, V 4, Z 1
Approvals	GL VDE SP

Multi-range repeat cycle timer

- Function: Repeat cycle (TI) starting with ON
- ON and OFF times can be selected independently of one another
- 1 setting range divided into 6 time ranges
- Contact assignment: 1 normally open, 1 normally closed



General information

- The electromechanical repeat cycle timer is equipped with two independent time elements whose delay times (ON and OFF) elapse one after the other. This occurs as long as the supply voltage is applied.
- Upon de-excitation, the timer relay whose time has just elapsed, falls back into its initial state. Upon voltage recovery, the countdown will start from the beginning, meaning with the ON time.
- The time ranges are set on the front through selector switches. Infinitely variable time setting within a range is selected by means of a transparent rotary switch.

Function

After the supply voltage is supplied to terminals A1/A2 and the energizing quantity to B1/B2, the countdown of the ON timer relay starts and the output contacts (1 NO and 1 NC contact) are switched. After the time has elapsed, the OFF timer relay is energized, self-locks and lets the ON timer relay fall back into its initial position while the output contacts switch into the OFF position. After the OFF time has elapsed, the relay is no longer self-locked. The OFF timer relay falls back into the initial position and reactivates the ON timer relay.

Notes

- With a frequency switch located at the bottom of the housing the relay can be adapted to the relevant frequency (50 or 60 Hz). The factory pre-setting is 50 Hz.
- Maximum repeatability is achieved with multi-range models by selecting the shortest possible time range.
- The time range on the devices has to be selected in the OFF position to avoid possible timing errors and incorrect contact switching.

Time ranges

Available setting ranges for ON and OFF time (see "Overview of devices" for the possible combinations):

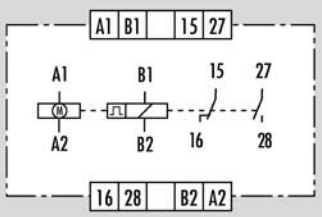
0.1 s to 1000 s
divided into 6 time ranges
0.1…3 s
0.3…10 s
1…30 s
3.3…100 s
10…300 s
33…1000 s

0.1 s to 30 h
divided into 6 time ranges
0.1…3 s
1…30 s
0.1…3 min
1…30 min
0.1…3 h
1…30 h

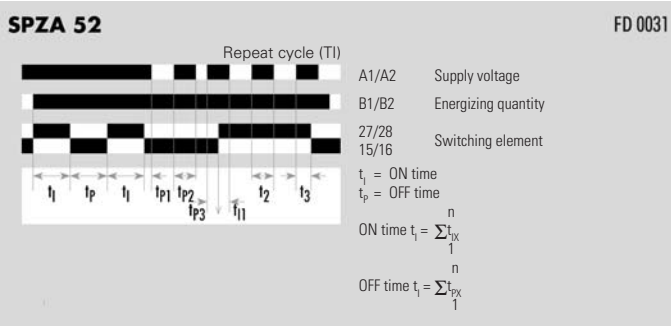
0.2 s to 60 h
divided into 6 time ranges
0.2...6 s
2...60 s
0.2...6 min
2...60 min
0.2...6 h
2...60 h

Circuit diagram

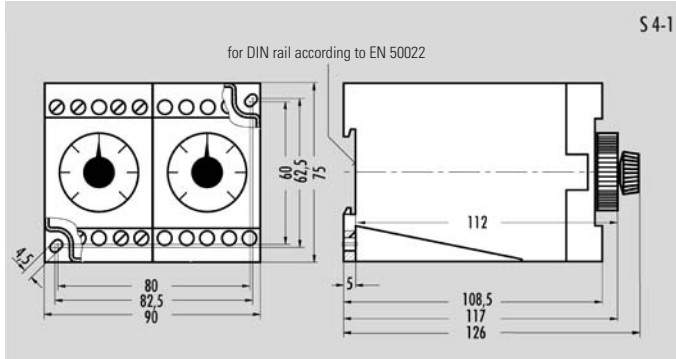
SPZA 52 KS 5166/2



Function diagram



Dimension diagram



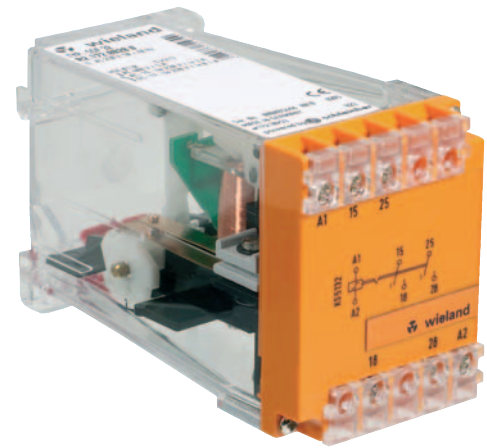
Overview of devices/part numbers

Type	Setting range ON time	Setting range OFF time	Rated voltage		Part No.	Std. Pack
SPZA 52	0.1 s … 1000 s	0.1 s … 1000 s	AC 24 V	50/60 Hz	R2.028.0090.0	1
			AC 110 – 115 V	50/60 Hz	R2.028.0010.0	1
			AC 230 V	50/60 Hz	R2.028.0120.0	1
		0.1 s … 30 h	AC 110 – 115 V	50/60 Hz	R2.028.0020.0	1
			AC 230 V	50/60 Hz	R2.028.0030.0	1
		0.2 s … 60 h	AC 230 V	50/60 Hz	R2.028.0040.0	1
	0.1 s … 30 h	0.1 s … 30 h	AC 24 V	50/60 Hz	R2.028.0050.0	1
			AC 110 – 115 V	50/60 Hz	R2.028.0060.0	1
			AC 230 V	50/60 Hz	R2.028.0100.0	1
	0.2 s … 60 h	0.2 s … 60 h	AC 24 V	50/60 Hz	R2.028.0070.0	1
			AC 110 – 115 V	50/60 Hz	R2.028.0080.0	1
			AC 230 V	50/60 Hz	R2.028.0110.0	1

Technical data	SPZA 52
Function type according to DIN VDE 0435 Section 110:04.89	Electromechanical repeat cycle timer for single voltage Item 3.9: Repeat cycle
Function display	Pointer for operating time
Function diagram	FD 0031
Power supply circuit	
Rated voltage U_N	See "Overview of devices"
Rated consumption: motor at 50/60 Hz and U_N (AC)	ca. 1.0/1.9 VA/ca. 0.9/0.8 W
Rated consumption: coil at 50/60 Hz and U_N (AC)	ca. 1.3/1.2 VA/ca. 1.1/1.0 W
Rated frequency	50 and 60 Hz selectable on the device
Operating voltage range	0.8 – 1.1 x U_N
Time circuit	
Time setting / number of time ranges	analog/6
Available time ranges	See "Overview of devices"
Recovery time	≤ 250 ms
Minimum ON time	–
Release value	≤ 15 % U_N
Parallel loads permissible	yes
Internal half-wave rectification	yes
Error (average related to the full scale value)	during standard operation: Setting range 6 s; ± 1.5 %
Dispersion	Standard operation / Rapid start
Setting range 0.3 – 6 s	± 0.06 s / ± 0.03 s
Setting range 3 – 60 s	± 0.22 s / ± 0.19 s
Max. operating time ≥ 60 s	± 0.3 % related to the full scale value
Output circuit	
Contact assignment	1 normally open, 1 normally closed
Contact material	Ag Cu
Rated operating voltage U_n	AC/DC 230 V
Max. continuous current I_n	5 A
Application category according to EN 60947-5-1:1991	AC-15: U_e 230 V AC, I_e 2 A DC-13: U_e 24 V DC, I_e 2 A
Permissible switching frequency	≤ 3600 switching cyclese/h
Mechanical life	30×10^6 switching cycles or 3×10^4 motor operation hours
Response time	≤ 30 ms
Release time	≤ 80 ms
General information	
Creepage distances and clearances between the circuits	according to DIN VDE 0110-1:04.97
Rated impulse voltage	5 kV
overvoltage category	III
Degree of pollution	3 outside 2 inside
Rated voltage	AC 250 V
Test voltage Ueff 50 Hz according to DIN VDE 0110-1, table A.1	2.21 kV
Protection degree housing/terminals according to DIN VDE 0470 sec. 1:11.92	IP 30/IP 20
Emitted interference	EN 50081-1:03.93, -2:03.94
Noise immunity	EN 50082-2:1995
Ambient temperature, operating range	–10 – +55 °C
Dimension diagram	S 4-1
Circuit diagram	KS 5166/2
Weight	0.7 kg
Accessories	–
Approvals	–

Stepping relay

- Devices for single voltage
- Function: Stepping relay
- Contact assignment:
  SSF 32 = 2 NO contacts, simultaneously switched in an ON-OFF cycle
  SSF 52 = 1 NO contact and 1 NC contact,
  reciprocally switched in an ON-OFF cycle
  SSF 62 = 1 NO contact and 1 NC contact,
  reciprocally switched in an ON-OFF cycle



Function

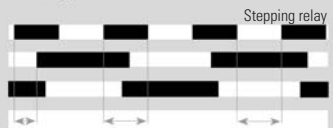
Upon each excitation of the relay coil, a star wheel is advanced by one step. The switch cams that actuate the contacts are rigidly connected to the star wheel axis.

Function diagram

SSF 32 FD 5007-5

A1/A2 Energizing quantity
15/18, 25/28 normally open contact
t_M = Recovery time
t_A = Response time
t_W = Recovery time

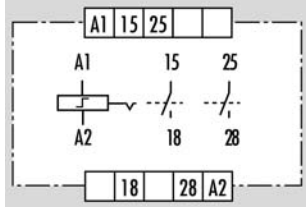
SSF 52, SSF 62 FD 5007-7



A1/A2 Energizing quantity
15/18 normally open contact
25/28 normally open contact
t_M = Recovery time
t_A = Response time
t_W = Recovery time

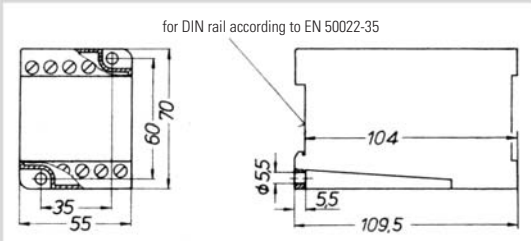
Circuit diagram

SSF 32, SSF 52, SSF 62 KS 5132



Dimension diagram

S 1-5



Overview of the devices/Part numbers

Type	Switching cycle	Rated voltage		Part No.	Std. Pack
SSF 32	simultaneous	AC 24 V	50 – 60 Hz	R2.172.0010.0	1
		AC 110 – 120 V	50 – 60 Hz	R2.172.0030.0	1
		AC 230 V	50 – 60 Hz	R2.172.0020.0	1
SSF 52	reciprocal	AC 24 V	50 – 60 Hz	R2.172.0060.0	1
		AC 110 – 120 V	50 – 60 Hz	R2.172.0050.0	1
		AC 230 V	50 – 60 Hz	R2.172.0090.0	1
SSF 62	reciprocal	DC 24 V		R2.172.0070.0	1

Timer and switching relays
Electromechanical stepping relay SSF 32 / SSF 52 / SSF 62

Technical data	SSF 32	SSF 52	SSF 62
Function type according to DIN VDE 0435 Section 110:04.89	Stepping relay for single voltage Item 2.1: Stepping relay		
Function display	–		
Function diagram	FD 5007-5	FD 5007-7	FD 5007-7
Power supply circuit			
Rated voltage U_N	See "Overview of devices"		
Rated consumption: motor at 50 Hz and UN (AC)	ca. 3.8 VA/ca. 3.3 W	ca. 3.8 VA/ca. 3.3 W	–
Rated consumption: motor U_N (DC)	–	–	ca. 2.2 W
Rated frequency	50 – 60 Hz	50 – 60 Hz	–
Operating voltage range	0.8 – 1.1 x U_N		
Time circuit			
Recovery time	≤ 60 ms	≤ 60 ms	≤ 40 ms
Minimum ON time	–		
Release value	≥ 15 % U_N		
Parallel loads permissible	yes		
Internal half-wave rectification	yes	yes	nein
Error (average related to the full scale value)	–		
Dispersion	–		
Influence of the energizing quantity, supply voltage	–		
Influence of the ambient temperature	–		
Output circuit			
Contact assignment	2 normally open contacts	1 NO contact and	1 NO contact and
		1 NC contact	1 NC contact
Contact material	Ag Cu		
Rated operating voltage U_n	AC/DC 400 V		
Max. continuous current I_n	5 A		
Application category according to EN 60947-5-1:1991	AC-15: U_e 230 V AC, I_e 2 A		
	DC-13: U_e 24 V DC, I_e 2 A		
Permissible switching frequency	≤ 3600 switching cyclese/h		
Mechanical life	5 x 10^6 switching cycles		
Response time	≤ 30 ms		
Release time	–		
General information			
Creepage distances and clearances between the circuits	according to DIN VDE 0110-1:04.97		
Rated impulse voltage	5 kV		
overvoltage category	III		
Degree of pollution	3 outside 2 inside		
Rated voltage	AC 400 V		
Test voltage Ueff 50 Hz according to DIN VDE 0110-1, table A.1	2.21 kV		
Protection degree housing/terminals according to DIN VDE 0470 sec. 1:11.92	IP 30/IP 20		
Emitted interference	EN 50081-1:03.93, -2:03.94		
Noise immunity	EN 50082-2:1995		
Ambient temperature, operating range	–10 – +55 °C		
Dimension diagram			
Circuit diagram	KS 5132		
Weight	0.2 kg		
Accessories	–		
Approvals	–		

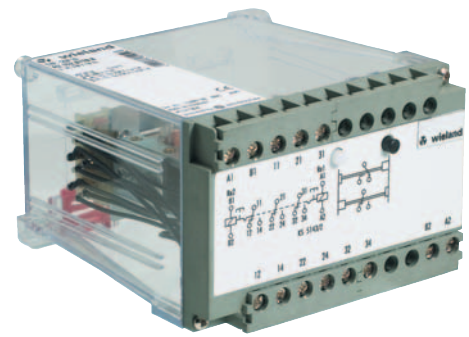
Timer and switching relays
Electromechanical latching relays SSP 56 / SSP 72 / SSP 33 / SSP 34

interface

Latching relay

- Devices for single voltage
- Function: latching relay
- Contact assignment:
  SSF 56 = 3 NO contacts and 3 NC contacts
  SSP 72 = 2 change-over contacts
  SSP 33 = 3 change-over contacts
  SSP 34 = 4 change-over contacts

SSP 56, SSP 72



SSP 33, SSP 34

Function

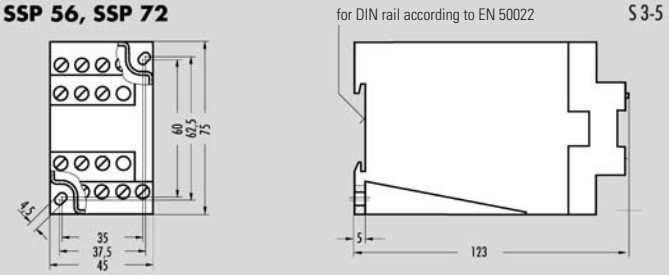
The latching relays consist of two separate, mechanically interlocked solenoid systems. Upon momentary or continued excitation of the solenoid system, the contacts with which it is equipped switch into the ON position. At the same time, the pawls mounted on the relay armature will lock so that the contacts retain their ON position even in case of a voltage failure or voltage interruption. When the solenoid system that is not equipped with contacts is energized, the interlock is released and the contacts revert into their OFF position.
On the models SSP 56 and SSP 72 a lever on the front panel permits manual adjustment of the solenoid system and indicates the position of the solenoid and/or of the contacts. On the models SSP 33 and SSP 34 there are 2 push buttons for this purpose.
The relay contacts have no standard position. If the coils are energized simultaneously, the contacts maintain their ON position.

Function diagram

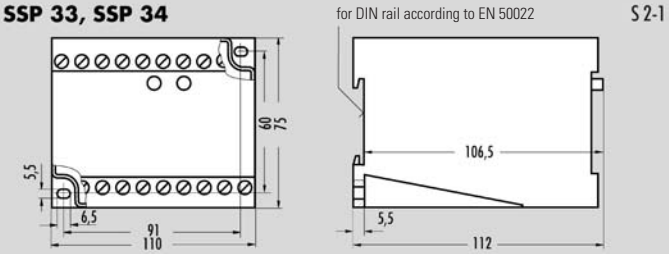
SSP xx FD 0022a

Dimension diagrams

SSP 56, SSP 72 for DIN rail according to EN 50022 S 3-5

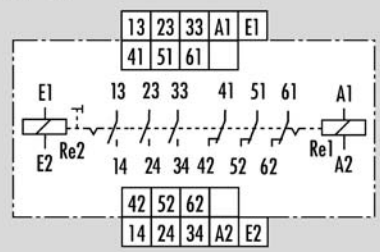


SSP 33, SSP 34 for DIN rail according to EN 50022 S 2-1

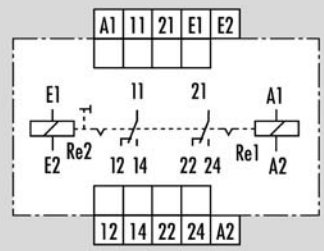


Circuit diagrams

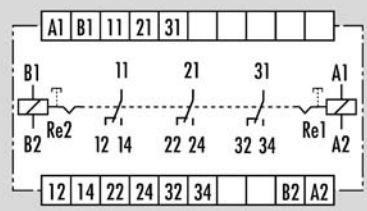
SSP 56 KS 5161/2



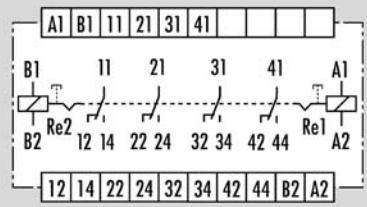
SSP 72 KS 5172/2



SSP 33 KS 5143/2



SSP 34 KS 5137/2



Timer and switching relays
Electromechanical latching relays SSP 56 / SSP 72 / SSP 33 / SSP 34

Interface

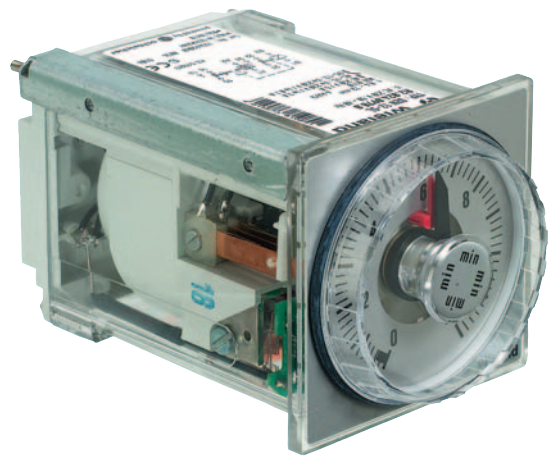
Technical data	SSP 56	SSP 72	SSP 33	SSP 34
Function type according to DIN VDE 0435 Section 110:04.89	Electromechanical latching relay for single voltage Item 2.4: Bistable relays			
Function display	Adjusting lever	Adjusting lever	Push buttons	Push buttons
Function diagram	FD 0022a			
Power supply circuit				
Rated voltage U_N	See "Overview of devices"			
Rated consumption for Re 1 at 50 Hz and U_N (AC) switching on	ca. 13 VA / ca. 4.5 W	ca. 13 VA / ca. 4.5 W	ca. 18 VA / ca. 6.5 W	ca. 18 VA / ca. 6.5 W
Rated consumption for Re 1 at 50 Hz and U_N (AC) holding	ca. 4 VA / ca. 1.5 W	ca. 4 VA / ca. 1.5 W	ca. 5.2 VA / ca. 1.8 W	ca. 5.2 VA / ca. 1.8 W
Rated consumption for Re 2 at 50 Hz and U_N (AC) switching on	ca. 10.5 VA / ca. 3.5 W			
Rated consumption for Re 2 at 50 Hz and U_N (AC) holding	ca. 3 VA / ca. 1 W			
Rated frequency	See "Overview of devices"			
Operating voltage range	0.8 – 1.1 x U_N			
Time circuit				
Time setting / number of time ranges	–/–			
Available time ranges	–			
Recovery time	–			
Minimum ON time	–			
Release value	≥ 15 % U_N			
Parallel loads permissible	yes			
Internal half-wave rectification	no			
Output circuit				
Contact assignment	3 NO contacts and 3 NC contacts	2 change-over contacts	3 change-over contacts	4 change-over contacts
Contact material	Ag Cu			
Rated operating voltage U_n	AC/DC 400 V			
Max. continuous current I_n	5 A			
Application category according to EN 60947-5-1:1991	AC-15: U_e 230 V AC, I_e 2 A DC-13: U_e 24 V DC, I_e 2 A			
Permissible switching frequency	≤ 3600 switching cyclese/h			
Mechanical life	10 x 10^6 switching cycles			
Response time	≤ 20 ms			
Release time	≤ 25 ms			
General information				
Creepage distances and clearances between the circuits	according to DIN VDE 0110-1:04.97			
Rated impulse voltage	5 kV			
overvoltage category	III			
Degree of pollution	3 outside 2 inside			
Rated voltage	400 V AC			
Test voltage Ueff 50 Hz according to DIN VDE 0110-1, table A.1	2.7 kV			
Protection degree housing/terminals according to DIN VDE 0470 sec. 1:11.92	IP 30 / IP 20			
Emitted interference	EN 50081-1:03.93, -2:03.94			
Noise immunity	EN 50082-2:1995			
Ambient temperature, operating range	–10 – +55 °C			
Dimension diagram	S 3-5	S 3-5	S 2-1	S 2-1
Circuit diagram	KS 5161/2	KS 5172/2	KS 5143/2	KS 5137/2
Weight	0.5 kg	0.5 kg	0.6 kg	0.6 kg
Accessories	–	–	–	–
Approvals	–	–		

Overview of the devices/Part numbers

Type	Rated voltage		Part No.	Std. Pack
SSP 56	AC 24 V	50 Hz	R2.153.0140.0	1
	AC 42 V	50 Hz	R2.153.0080.0	1
	AC 48 V	50 Hz	R2.153.0040.0	1
	AC 110 V	50 Hz	R2.153.0050.0	1
	AC 110 V	60 Hz	R2.153.0070.0	1
	AC 120 – 131 V	60 Hz	R2.153.0130.0	1
	AC 230 V	50 Hz	R2.153.0100.0	1
	AC 230 V	60 Hz	R2.153.0030.0	1
SSP 72	AC 24 V	50 Hz	R2.153.0090.0	1
	AC 110 – 115 V	60 Hz	R2.153.0100.0	1
	AC 230 V	50 Hz	R2.153.0020.0	1
SSP 33	AC 24 V	50 Hz	R2.152.0090.0	1
	AC 230 V	50 Hz	R2.152.0170.0	1
SSP 34	AC 110 V	50 Hz	R2.152.0110.0	1
	AC 230 V	50 Hz	R2.152.0070.0	1

ON-delay single-range timer relay, electromechanical

- Devices for single voltage
- Function: ON-delay (AV), DZN 12-S L protected against power failure
- 1 time range
- Contact assignment: 1 timed and 1 instantaneous change-over contact



72 x 72

General information

- The electromechanical timer relays are equipped with synchronous motors and solenoid clutches.
- Infinitely variable time setting within a range is selected by means of a transparent rotary switch. The countdown indicator moves during operation from the set time towards zero.

Function

Upon excitation of motor and solenoid the instantaneous contact is actuated/put in the ON position and the countdown starts. When the pre-set time has elapsed, the time contact is actuated and the motor is switched off. After de-excitation, the solenoid, time element and all contacts will switch into the OFF position. If a voltage interruption occurs during the countdown, the solenoid, instantaneous contact and time element will fall into the OFF position.

The **timer relay protected against power failure SZAN 12-S** has the same function as described above, but upon excitation the solenoid clutch is locked by a blocking pawl so that even in a no-volt condition the elapsed time is preserved. The countdown can be interrupted as often as desired. The instantaneous contact remains in the ON position even during voltage interruption. When the pre-set time has elapsed, the blocking pawl is released and the timed contact is actuated.

Actuation by impulse: The timer relay protected against power failure can be actuated by an impulse applied to the clutch, as the locking action of the blocking pawl is immediate (separate motor and coil connections). The countdown starts when the motor is energized. After impulse actuation the instantaneous contact goes into the ON position until the countdown ends. When the time has elapsed, it falls back into the OFF position. The timed contact only opens for about 10 ms. The timed change-over contact cannot be switched into its closed position.

Resetting: Mechanical resetting to 0 is possible for these devices.

Resetting of DZN 12-S L: Electrical and mechanical resetting to 0 is only possible for this device, if the mechanical interlock is released. If resetting is necessary after an interruption of the countdown, the rotary switch must be turned to 0.

Notes

- With a frequency switch located at the bottom of the housing the relay can be adapted to the relevant frequency (50 or 60 Hz). The factory pre-setting is 50 Hz.
- The relays have separate motor and solenoid connections which makes the following operating modes possible:
  - 1. Time accumulation: By separate actuation of the solenoid clutch and the motor, elapsed time can be stored and/or various time segments accumulated.
  - 2. Rapid start: Reduction of time dispersion to a minimum by keeping the motor constantly at operating voltage while only the solenoid clutch is de-energized and energized after the time has elapsed. Motor starting irregularities are thus avoided. For operating times above 60 s, the rapid start no longer has any effect on time dispersion.
  - 3. Standard operation Simultaneous excitation and de-excitation of solenoid clutch and motor. Recommended for operating times above 60 s.
- Maximum repeatability is achieved with multi-range models by selecting the shortest possible time range.
- The time range on the devices has to be selected in the OFF position to avoid possible timing errors and incorrect contact switching.

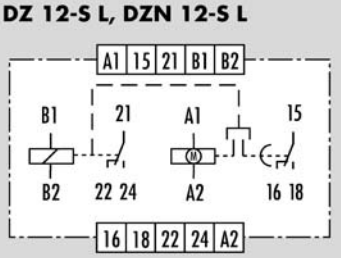
Time ranges

Available time ranges:

0.05...1	s	1...30	min
0.1...3	s	2...60	min
0.2...	s	4...120	min
0.4...12	s	0.1...3	h
1...30	s	0.2...6	h
2...60	s	0.4...12	h
3.3...100	s	1...30	h
0.1...3	min	2...60	h
0.2...6	min	4...120	h
0.4...12	min		

Circuit diagram

DZ 12-S L, DZN 12-S L KS 5102/3

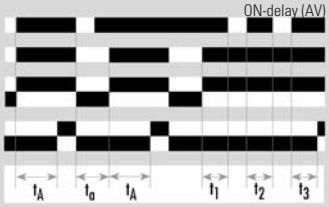


Interface

Function diagrams

DZ 12-S L

FD 0008



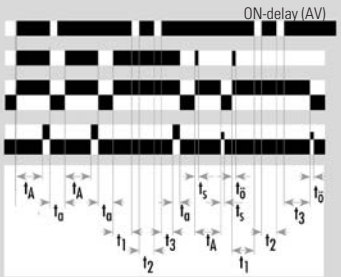
A1/A2 Supply voltage
B1/B2 Energizing quantity
21/24, 21/22 Instantaneous contact
15/18, 15/16 Delayed contact

t_A = operating time
t_a = break time, must be > returning time of the time element

operating time = $\sum_{1}^{n} t_x$

DZN 12-S L

FD 0033



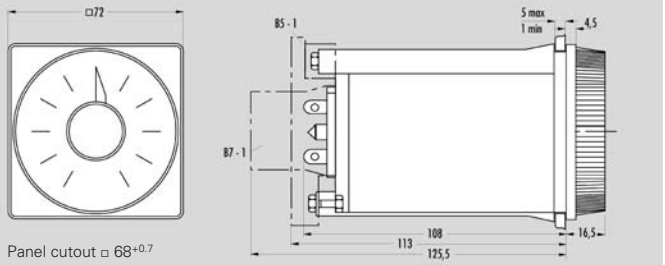
A1/A2 Supply voltage
B1/B2 Energizing quantity
21/24, 21/22 Instantaneous contact
15/18, 15/16 Delayed contact

t_A = operating time
t_a = break time, must be > returning time of the switching element
t_s = closing time, must be > minimum excitation time
t_0 = opening time, refers only to the NC contact, the NO contact is not switched

operating time $t_A = \sum_{1}^{n} t_x$

Dimension diagram

D 1-18



Panel cutout □ $68^{+0.7}$

Accessories

Female connector plate mounting	B 5	for panel and surface
Pin holder	B 7	for panel mounting
Adapter	BT 421	for rail mounting of the female connector plate B 5
Cover	DA 1	for panel cutout
Lockable cover	V 4	
Gasket	Z 1	for panel mounting

Overview of the devices/Part numbers

Type	Setting range	[1]	Rated voltage		Part No.	Std. Pack
DZ 12-S L	0.05 … 1 s		AC 230 V	50/60 Hz	R2.024.1020.0	1
	0.1 … 3 s		AC 110 – 115 V	50/60 Hz	R2.024.0100.0	1
			AC 230 V	50/60 Hz	R2.024.1760.0	1
	0.2 … 6 s		AC 110 – 115 V	50/60 Hz	R2.024.0620.0	1
			AC 230 V	50/60 Hz	R2.024.0830.0	1
	0.4 … 12 s		AC 110 – 115 V	50/60 Hz	R2.024.1950.0	1
			AC 230 V	50/60 Hz	R2.024.1000.0	1
		SP	AC 110 – 115 V	50/60 Hz	R2.024.0420.0	1
	1 … 30 s		AC 24 V	50/60 Hz	R2.024.0810.0	1
			AC 110 – 115 V	50/60 Hz	R2.024.0090.0	1
			AC 230 V	50/60 Hz	R2.024.1010.0	1
		SP	AC 110 – 115 V	50/60 Hz	R2.024.1660.0	1
	2 … 60 s		AC 110 – 115 V	50/60 Hz	R2.024.0780.0	1
			AC 230 V	50/60 Hz	R2.024.1220.0	1
	3.3 … 100 s		AC 230 V	50/60 Hz	R2.024.0440.0	1
	0.1 … 3 min		AC 110 – 115 V	50/60 Hz	R2.024.0530.0	1
			AC 230 V	50/60 Hz	R2.024.0120.0	1
		SP	AC 110 – 115 V	50/60 Hz	R2.024.0060.0	1
	0.2 … 6 min		AC 110 – 115 V	50/60 Hz	R2.024.0790.0	1
			AC 230 V	50/60 Hz	R2.024.0900.0	1
		SP	AC 110 – 115 V	50/60 Hz	R2.024.0020.0	1
	0.4 … 12 min		AC 24 V	50/60 Hz	R2.024.0840.0	1
			AC 48 V	50/60 Hz	R2.024.1520.0	1
			AC 110 – 115 V	50/60 Hz	R2.024.0540.0	1
			AC 230 V	50/60 Hz	R2.024.0850.0	1
		SP	AC 110 – 115 V	50/60 Hz	R2.024.1650.0	1
		SP	AC 230 V	50/60 Hz	R2.024.0040.0	1
	1 … 30 min		AC 110 – 115 V	50/60 Hz	R2.024.0520.0	1
			AC 230 V	50/60 Hz	R2.024.1160.0	1
		SP	AC 110 – 115 V	50/60 Hz	R2.024.0960.0	1
	2 … 60 min		AC 110 – 115 V	50/60 Hz	R2.024.0550.0	1
			AC 230 V	50/60 Hz	R2.024.0390.0	1
		SP	AC 110 – 115 V	50/60 Hz	R2.024.0010.0	1
	4 … 120 min		AC 110 – 115 V	50/60 Hz	R2.024.0340.0	1
			AC 230 V	50/60 Hz	R2.024.1120.0	1
	0.1 … 3 h		AC 110 – 115 V	50/60 Hz	R2.024.1070.0	1
			AC 230 V	50/60 Hz	R2.024.1890.0	1
	0.2 … 6 h		AC 110 – 115 V	50/60 Hz	R2.024.1060.0	1
			AC 230 V	50/60 Hz	R2.024.0720.0	1
		SP	AC 110 – 115 V	50/60 Hz	R2.024.1590.0	1
	0.4 … 12 h		AC 110 – 115 V	50/60 Hz	R2.024.1510.0	1
			AC 230 V	50/60 Hz	R2.024.1080.0	1
		SP	AC 110 – 115 V	50/60 Hz	R2.024.1580.0	1
	1 … 30 h		AC 110 – 115 V	50/60 Hz	R2.024.1630.0	1
			AC 230 V	50/60 Hz	R2.024.0700.0	1
	2 … 60 h		AC 110 – 115 V	50/60 Hz	R2.024.0370.0	1
			AC 230 V	50/60 Hz	R2.024.0800.0	1
	4 … 120 h		AC 230 V	50/60 Hz	R2.024.1130.0	1
DZN 12-S L	0.4 … 12 min		AC 24 V	50/60 Hz	R2.024.1490.0	1
			AC 230 V	50/60 Hz	R2.024.0970.0	1

[1] Devices with SP approvals

Timer and switching relays
ON-delay DZ 12-S L / DZN 12-S L

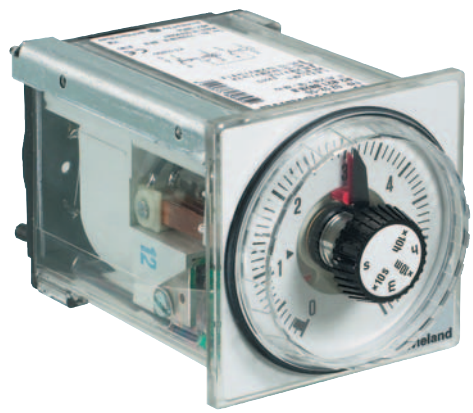
Technical data	DZ 12-S L	DZN 12-S L
Function type according to DIN VDE 0435 sec. 110:04.89	Electromechanical timer relay for single voltage Item 3.13: ON-delay timer relay protected against power failure	Electromechanical timer relay for single voltage Item 3.14: ON-delay timer relay protected against power failure
Function display	Pointer for operating time	Pointer for operating time
Function diagram	FD 0008	FD 0033
Power supply circuit		
Rated voltage U_N	See "Overview of devices"	
Rated consumption: motor at 50 Hz and UN (AC)	ca. 1.3 VA / ca. 1.1 W	
Rated consumption: coil at 50 Hz and UN (AC)	ca. 4.5 VA / ca. 3.8 W	
Rated frequency	50 and 60 Hz selectable on the device	
Operating voltage range	0.8 – 1.1 x U_N	
Time circuit		
Time setting / number of time ranges	analog / 1	
Available time ranges	See table „Time ranges"	
Recovery time	≤ 250 ms	
Minimum ON time	–	30 ms
Release value	≥ 15 % U_N	
Parallel loads permissible	yes	
Internal half-wave rectification	yes	
Error (average related to the full scale value)	during standard operation:	
	Setting range > 6 s; ± 1.5 %	
	Setting range 6 s; ± 2 %	
	Setting range 3 s; ± 3 %	
	Setting range 1 s; ± 8 %	
Dispersion	Standard operation Rapid start	
Setting range 0.03 – 1 s	± 0.045 s ± 0.015 s	
Setting range 0.3 – 10 s	± 0.09 s ± 0.06 s	
Setting range 3.3 – 100 s	± 0.54 s ± 0.51 s	
Max. operating time ≥ 3 min	± 0.5 % related to the full scale value	
Output circuit		
Contact assignment	1 timed and 1 instantaneous change-over contact	
Contact material	Ag Cu	
Rated operating voltage U_n	AC/DC 230 V	
Max. continuous current I_n	5 A	
Application category according to EN 60947-5-1:1991	AC-15: U_e 230 V AC, I_e 2 A DC-13: U_e 24 V DC, I_e 2 A	
Permissible switching frequency	≤ 3600 switching cyclese/h	
Mechanical life	30×10^6 switching cycles or 3×10^4 motor operation hours	
Response time	≤ 30 ms	
Release time	≤ 60 ms	
General information		
Creepage distances and clearances between the circuits	according to DIN VDE 0110-1:04.97	
Rated impulse voltage	4 kV	
overvoltage category	III	
Degree of pollution	3 outside 2 inside	
Rated voltage	AC 250 V	
Test voltage Ueff 50 Hz according to DIN VDE 0110-1, table A.1	2.21 kV	
Protection degree housing/terminals according to DIN VDE 0470 sec. 1:11.92	IP 30 / IP 20	
Emitted interference	EN 50081-1:03.93, -2:03.94	
Noise immunity	EN 50082-2:1995	
Ambient temperature, operating range	–10 – +55 °C	
Dimension diagram	D 1-18	
Circuit diagram	KS 5102/3	
Weight	0.6 kg	
Accessories	B 5, B 7, BT 421, DA 1, V 4, Z 1	
Approvals		

Timer and switching relays
ON-delay DZ 52-S G

interface

ON-delay multi-range electromechanical timer relay

- Device for single voltage
- Function: ON-delay (AV)
- 1 setting range divided into 5 or 6 time ranges
- Contact assignment: 1 timed change-over contact and 1 instantaneous NO contact



72 x 72

General information

- The electromechanical timer relay is equipped with synchronous motor and solenoid clutch.
- The time ranges are set on the front through selector switches. Infinitely variable time setting within a range is selected by means of a transparent rotary switch.
- The countdown indicator moves during operation from the set time value towards zero.

Function

Upon excitation of motor and solenoid the instantaneous contact is actuated/put in the ON position and the countdown starts. When the pre-set time has elapsed, the time contact is actuated. After de-excitation, the solenoid, time element and instantaneous contact will switch into the OFF position. If a voltage interruption occurs during the countdown, the solenoid, time element and instantaneous contact will fall into the OFF position.

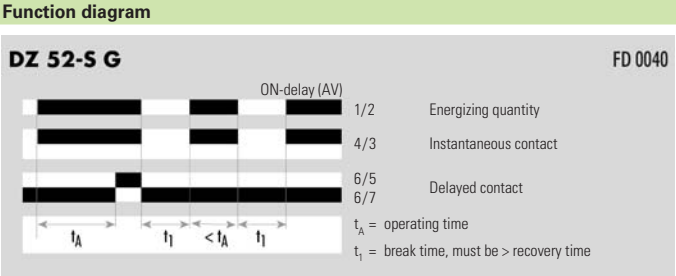
Notes

- With a frequency switch located at the bottom of the housing the relay can be adapted to the relevant frequency (50 or 60 Hz). The factory pre-setting is 50 Hz.
- Maximum repeatability is achieved with multi-range models by selecting the shortest possible time range.
- The time range on the devices has to be selected in the OFF position to avoid possible timing errors and incorrect contact switching.

Accessories

Female connector plate	B 4	for panel and surface mounting
Cover	DA 1	for panel cutout
Lockable cover	V 4	
Gasket	Z 1	for panel mounting

Function diagram



Time ranges

Available time ranges

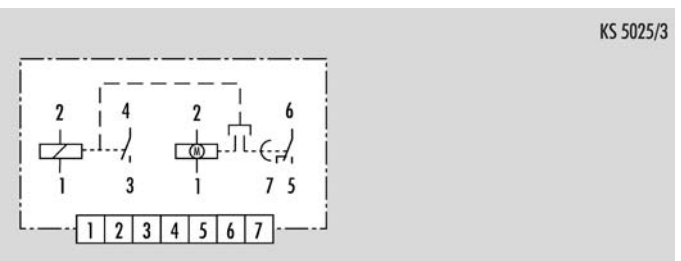
0.03 s to 100 s
divided into 5 time ranges
0.03…1 s
0.1…3 s
0.3…10 s
1…30 s
3.3…100 s

0.1 s to 30 h
divided into 6 time ranges
0.1…3 s
1…30 s
0.1…3 min
1…30 min
0.1…3 h
1…30 h

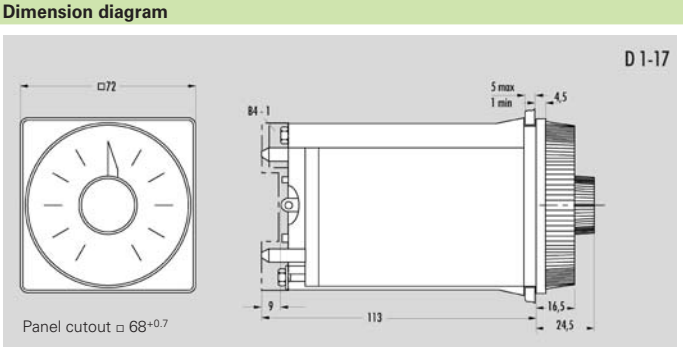
0.1 s to 1000 s
divided into 6 time ranges
0.1…3 s
0.3…10 s
1…30 s
3.3…100 s
10…300 s
33…1000 s

0.2 s to 60 h
divided into 6 time ranges
0.2…6 s
2…60 s
0.2…6 min
2…60 min
0.2…6 h
2…60 h

Circuit diagram



Dimension diagram



Timer and switching relays
ON-delay DZ 52-S G

Technical data	DZ 52-S G
Function type according to DIN VDE 0435 Section 110:04.89	Electromechanical timer relay for single voltage Item 3.12: ON-delay timer relay
Function display	Pointer for operating time
Function diagram	FD 0040
Power supply circuit	
Rated voltage U_N	See "Overview of devices"
Rated consumption: motor at 50 Hz and UN (AC)	ca. 1.3 VA/ca. 1.1 W
Rated consumption: coil at 50 Hz and UN (AC)	ca. 4.5 VA/ca. 3.8 W
Rated frequency	50 and 60 Hz selectable on the device
Operating voltage range	0.8 – 1.1 x U_N
Time circuit	
Time setting / number of time ranges	analog/6 or 5
Available time ranges	See table „Time ranges"
Recovery time	≤ 250 ms
Minimum ON time	–
Release value	≥ 15 % U_N
Parallel loads permissible	yes
Internal half-wave rectification	yes
Error (average related to the full scale value)	Setting range > 6 s; ± 1.5 %
	Setting range 6 s; ± 2 %
	Setting range 3 s; ± 3 %
Dispersion	
Setting range 0.03 to 1 s	± 0.045 s
Setting range 0.3 to 10 s	± 0.09 s
Setting range 3.3 to 100 s	± 0.54 s
Max. operating time ≥ 3 min	± 0.5 % related to the full scale value
Output circuit	
Contact assignment	1 timed change-over contact and 1 instantaneous NO contact
Contact material	Ag Cu
Rated operating voltage U_n	AC/DC 230 V
Max. continuous current I_n	5 A
Application category according to EN 60947-5-1:1991	AC-15: U_e 230 V AC, I_e 2 A DC-13: U_e 24 V DC, I_e 2 A
Permissible switching frequency	≤ 3600 switching cyclese/h
Mechanical life	30 x 10^6 switching cycles or 3 x 10^4 motor operation hours
Response time	≤ 30 ms
Release time	≤ 60 ms
General information	
Creepage distances and clearances between the circuits	according to DIN VDE 0110-1:04.97
Rated impulse voltage	4 kV
overvoltage category	III
Degree of pollution	3 outside 2 inside
Rated voltage	AC 250 V
Test voltage Ueff 50 Hz according to DIN VDE 0110-1, table A.1	2.21 kV
Degree of protection: housing front panel / housing rear panel / tab connector	IP 55/IP 20/IP 00
Emitted interference	EN 50081-1:03.93, -2:03.94
Noise immunity	EN 50082-2:1995
Ambient temperature, operating range	–10 – +55 °C
Dimension diagram	D 1-17
Circuit diagram	KS 5025/3
Weight	0.6 kg
Accessories	B 4, DA 1, V 4, Z 1
Approvals	

Overview of the devices/Part numbers

Type	Setting range	Rated voltage		Part No.	Std. Pack
DZ 52-S G	0.03 s … 100 s	AC 110 – 115 V	50/60 Hz	R2.021.0070.0	1
		AC 230 V	50/60 Hz	R2.021.0010.0	1
	0.1 s … 1000 s	AC 110 – 115 V	50/60 Hz	R2.021.0060.0	1
		AC 230 V	50/60 Hz	R2.021.0050.0	1
	0.1 s … 30 h	AC 110 – 115 V	50/60 Hz	R2.021.0080.0	1
		AC 230 V	50/60 Hz	R2.021.0030.0	1
	0.2 s … 60 h	AC 110 – 115 V	50/60 Hz	R2.021.0090.0	1
		AC 230 V	50/60 Hz	R2.021.0020.0	1

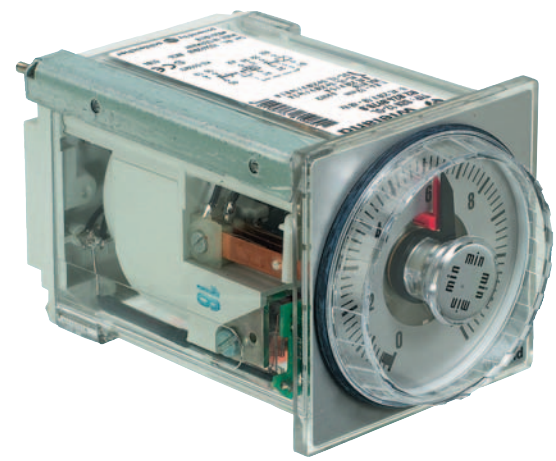
Timer and switching relays
ON-delay DZ 52-S L / DZN 52-S L

interface

ON-delay multi-range electromechanical timer relay

- Devices for single voltage
- Function: ON-delay (AV), DZN 52-S L protected against power failure
- 1 setting range divided into 5 or 6 time ranges
- Contact assignment: 1 timed and 1 instantaneous change-over contact

72 x 72



General information

- The electromechanical timer relays are equipped with synchronous motors and solenoid clutches.
- The time ranges are set on the front through selector switches. Infinitely variable time setting within a range is selected by a transparent rotary switch.
- The countdown indicator moves during operation from the set time towards zero.

Function

Upon excitation of motor and solenoid the instantaneous contact is put in the ON position and the countdown starts. When the pre-set time has elapsed, the time contact is actuated and the motor is switched off. After de-excitation, the solenoid, time element and all contacts will switch into the OFF position. If a voltage interruption occurs during the countdown, the solenoid, instantaneous contact and time element will fall into the OFF position.

The **timer relay protected against power failure DZN 52-S L** has the same function as described above, but upon excitation the solenoid clutch is locked by a blocking pawl so that even in a no-volt condition the elapsed time is preserved. The countdown can be interrupted as often as desired. The instantaneous contact remains in the ON position even during voltage interruption. When the pre-set time has elapsed, the blocking pawl is released, the timed contacts are actuated and the motor is switched off.

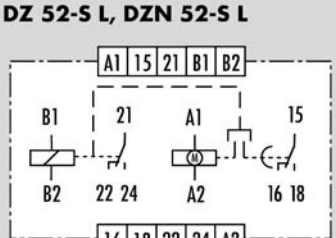
Actuation by impulse: The timer relay protected against power failure can be actuated by an impulse applied to the clutch, as the locking action of the blocking pawl is immediate (separate motor and coil connections). The countdown starts when the motor is energized. After impulse actuation the instantaneous contact goes into the ON position until the countdown ends. When the time has elapsed, it falls back into the OFF position. The timed contact only opens for about 10 ms. The timed change-over contact cannot be switched into its closed position.

Resetting: Mechanical resetting to 0 is possible for these devices.

Resetting of DZN 52-S L: Electrical and mechanical resetting to 0 is only possible for this device, if the mechanical interlock is released. If resetting is necessary after an interruption of the countdown, the rotary switch must be turned to 0.

Circuit diagram

DZ 52-S L, DZN 52-S L KS 5102/3



Notes

- With a frequency switch located at the bottom of the housing the relay can be adapted to the relevant frequency (50 or 60 Hz). The factory pre-setting is 50 Hz.
- The relays have separate motor and solenoid connections which makes the following operating modes possible:
  1. Time accumulation: By separate actuation of the solenoid clutch and the motor, elapsed time can be stored and/or various time segments accumulated.
  2. Rapid start: Reduction of time dispersion to a minimum by keeping the motor constantly at operating voltage while only the solenoid clutch is de-energized and energized after the time has elapsed. Motor starting irregularities are thus avoided. For operating times above 60 s, the rapid start no longer has any effect on time dispersion.
  3. Standard operation: Simultaneous excitation and de-excitation of solenoid clutch and motor. Recommended for operating times above 60 s.
- Maximum repeatability is achieved with multi-range models by selecting the shortest possible time range.
- The time range on the devices has to be selected in the OFF position to avoid possible timing errors and incorrect contact switching.

Time ranges

Available setting ranges

0.03 s to 100 s
divided into 5 time ranges

0.03	…	1 s
0.1	…	3 s
0.3	…	10 s
1	…	30 s
3.3	…	100 s

0.1 s to 1000 s
divided into 6 time ranges

0.1	…	3 s
0.3	…	10 s
1	…	30 s
3.3	…	100 s
10	…	300 s
33	…	1000 s

0.1 s to 30 h
divided into 6 time ranges

0.1	…	3 s
1	…	30 s
0.1	…	3 min
1	…	30 min
0.1	…	3 h
1	…	30 h

0.2 s to 60 h
divided into 6 time ranges

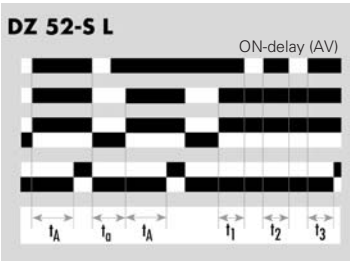
0.2	…	6 s
2	…	60 s
0.2	…	6 min
2	…	60 min
0.2	…	6 h
2	…	60 h

Timer and switching relay
ON-delay DZ 52-S L / DZN 52-S L

Interface

Function diagrams

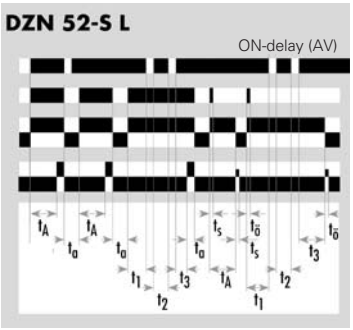
DZ 52-S L



A1/A2	Supply voltage	FD 0008
B1/B2	Energizing quantity	
21/24 21/22	Instantaneous contact	
15/18 15/16	Delayed contact	
t_A =	operating time	
t_a =	break time, must be > returning time of the time element	

$$\text{operating time} = \sum_{1}^{n} t_x$$

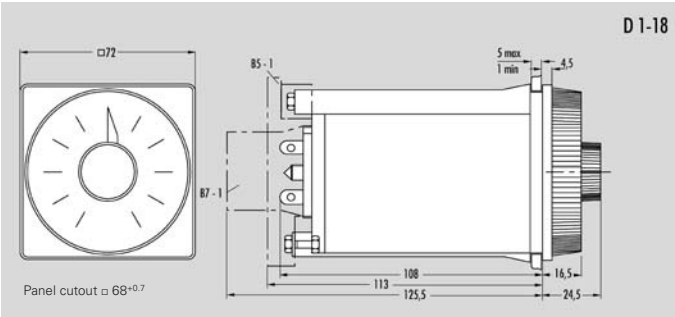
DZN 52-S L



A1/A2	Supply voltage	FD 0033
B1/B2	Energizing quantity	
21/24 21/22	Instantaneous contact	
15/18 15/16	Delayed contact	
t_A =	operating time	
t_a =	break time, must be > returning time of the time element	
t_s =	closing time, must be > minimum excitation time	
t_a =	opening time, refers only to the NC contact, the NO contact is not switched	

$$\text{operating time } t_A = \sum_{1}^{n} t_x$$

Dimension diagram



Accessories

Female connector plate	B 5	for panel and surface mounting
Pin holder	B 7	for panel mounting
Adapter	BT 421	for rail mounting of the female connector plate B 5
Cover	DA 1	for panel cutout
Lockable cover	V 4	
Seal	Z 1	for panel mounting

Overview of devices/part numbers

Type	Setting range	Rated voltage	Part No.	Std. Pack
DZ 52-S L	0.03 s… 100 s	AC 24 V 50/60 Hz	R2.024.0640.0	1
		AC 110 – 115 V 50/60 Hz	R2.024.1940.0	1
		AC 230 V 50/60 Hz	R2.024.1110.0	1
	0.1 s… 1000 s	AC 110 – 115 V 50/60 Hz	R2.024.1210.0	1
		AC 230 V 50/60 Hz	R2.024.1140.0	1
	0.1 s… 30 h	AC 24 V 50/60 Hz	R2.024.0080.0	1
		AC 110 – 115 V 50/60 Hz	R2.024.1960.0	1
		AC 116 – 120 V 50/60 Hz	R2.024.1700.0	1
		AC 230 V 50/60 Hz	R2.024.0630.0	1
	0.2 s… 60 h	AC 24 V 50/60 Hz	R2.024.1900.0	1
		AC 42 V 50/60 Hz	R2.024.0950.0	1
		AC 110 – 115 V 50/60 Hz	R2.024.0580.0	1
		AC 116 – 120 V 50/60 Hz	R2.024.0360.0	1
		AC 125 – 127 V 50/60 Hz	R2.024.1640.0	1
		AC 230 V 50/60 Hz	R2.024.1170.0	1
DZN 52-S L	0.03 s… 100 s	AC 24 V 50/60 Hz	R2.024.0990.0	1
		AC 110 – 115 V 50/60 Hz	R2.024.1790.0	1
		AC 230 V 50/60 Hz	R2.024.1550.0	1
	0.1 s… 1000 s	AC 24 V 50/60 Hz	R2.024.1690.0	1
		AC 110 – 115 V 50/60 Hz	R2.024.1670.0	1
		AC 230 V 50/60 Hz	R2.024.1340.0	1
	0.1 s… 30 h	AC 24 V 50/60 Hz	R2.024.0600.0	1
		AC 110 – 115 V 50/60 Hz	R2.024.0480.0	1
		AC 230 V 50/60 Hz	R2.024.1030.0	1
	0.2 s… 60 h	AC 24 V 50/60 Hz	R2.024.1450.0	1
		AC 110 – 115 V 50/60 Hz	R2.024.1330.0	1
		AC 230 V 50/60 Hz	R2.024.0930.0	1

Timer and switching relay
ON-delay DZ 52-S L / DZN 52-S L

interface

Technical data	DZ 52-S L	DZN 52-S L
Function according to DIN VDE 0435 sec. 110:04.89	Electromechanical timer relay for single voltage Item 3.13: ON-delay timer relay	Electromechanical timer relay for single voltage Item 3.14: ON-delay timer relay protected against power failure
Function display	Pointer for operating time	Pointer for operating time
Function diagram	FD 0008	FD 0033
Power supply circuit		
Rated voltage U_N	See "Overview of devices"	
Rated consumption: motor at 50 Hz and UN (AC)	ca. 1.3 VA/ca. 1.1 W	
Rated consumption: coil at 50 Hz and UN (AC)	ca. 4.5 VA/ca. 3.8 W	
Rated frequency	50 and 60 Hz selectable on the device	
Operating voltage range	0.8 – 1.1 x U_N	
Time circuit		
Time setting / number of time ranges	analog/5 or 6	
Available time ranges	See table "Time ranges"	
Recovery time	≤ 250 ms	
Minimum ON time	–	30 ms
Release value	≥ 15 % U_N	
Parallel loads permissible	yes	
Internal half-wave rectification	yes	
Error (average related to the full scale value)	during standard operation:	
	Setting range > 6 s; ± 1.5 % Setting range 6 s; ± 2 % Setting range 3 s; ± 3 % Setting range 1 s; ± 8 %	
Dispersion	Standard operation / Rapid start	
Setting range 0.03 – 1 s	± 0.045 s / ± 0.015 s	
Setting range 0.3 – 10 s	± 0.09 s / ± 0.06 s	
Setting range 3.3 – 100 s	± 0.54 s / ± 0.51 s	
Max. operating time ≥ 3 min	± 0.5 % related to the full scale value	
Output circuit		
Contact assignment	1 timed and 1 instantaneous change-over contact	
Contact material	Ag Cu	
Rated operating voltage U_n	AC/DC 230 V	
Max. continuous current I_n	5 A	
Application category according to EN 60947-5-1:1991	AC-15: U_e 230 V AC, I_e 2 A	
	DC-13: U_e 24 V DC, I_e 2 A	
Permissible switching frequency	≤ 3600 switching cyclese/h	
Mechanical life	30 x 10^6 switching cycles or 3 x 10^4 motor operation hours	
Response time	≤ 30 ms	
Release time	≤ 60 ms	
General information		
Creepage distances and clearances between the circuits	according to DIN VDE 0110-1:04.97	
Rated impulse voltage	4 kV	
overvoltage category	III	
Degree of pollution	3 outside 2 inside	
Rated voltage	AC 250 V	
Test voltage Ueff 50 Hz according to DIN VDE 0110-1, table A.1	2.21 kV	
Protection degree housing/terminals in according with DIN VDE 0470 sec. 1:11.92	IP 30/IP 20	
Emitted interference	EN 50081-1:03.93, -2:03.94	
Noise immunity	EN 50082-2:1995	
Ambient temperature, operating range	-10 – +55 °C	
Dimension diagram	D 1-18	
Circuit diagram	KS 5102/3	
Weight	0.6 kg	
Accessories	B 5, B 7, BT 421, DA 1, V 4, Z 1	
Approvals		

Timer and switching relays
ON-delay DZ 72-S, DZ 74-2S

ON-delay multi-range electromechanical timer relay

- Devices for single voltage
- Function: ON-delay (AV)
- 1 setting range divided into 5 or 6 time ranges
- Contact assignment: DZ 72-S = 1 timed and 1 instantaneous change-over contact
  DZ 74-2S = 1 instantaneous and 1 timed NC contact, 1 instantaneous and 1 timed NO contact

96 x 96

General information

- The electromechanical timer relays are equipped with synchronous motors and solenoid clutches.
- The time ranges are set on the front through selector switches. Infinitely variable time setting within a range is selected by a transparent rotary switch.
- The countdown indicator moves during operation from the set time value towards zero.

Function

Upon excitation of motor and solenoid the instantaneous contact is put into the ON position and the countdown starts. When the pre-set time has elapsed, the time contact is actuated and the motor is switched off. After de-excitation, the solenoid, time element and all contacts will switch into the OFF position. If a voltage interruption occurs during the countdown, the solenoid, instantaneous contact and time element will fall into the OFF position.

Notes

- With a frequency switch located at the bottom of the housing the relay can be adapted to the relevant frequency (50 or 60 Hz). The factory pre-setting is 50 Hz.
- Model DZ 72-S has separate motor and coil connection, which makes the following operating modes possible:
  1. Time accumulation: By separate actuation of the solenoid clutch and the motor, elapsed time can be stored and/or various time segments accumulated.
  2. Rapid start: Reduction of time dispersion to a minimum by keeping the motor constantly at operating voltage while only the solenoid clutch is de-energized and energized after the time has elapsed. Motor starting irregularities are thus avoided. For operating times above 60 s, the rapid start no longer has any effect on time dispersion.
  3. Standard operation: Simultaneous excitation and de-excitation of solenoid clutch and motor. Recommended for operating times above 60 s.
- Maximum repeatability is achieved with multi-range models by selecting the shortest possible time range.
- The time range on the devices has to be selected in the OFF position to avoid possible timing errors and incorrect contact switching.

Time ranges

Available setting ranges

0.03 s to 100 s
divided into 5 time ranges

0.03	…	1 s
0.1	…	3 s
0.3	…	10 s
1	…	30 s
3.3	…	100 s

0.1 s to 1000 s
divided into 6 time ranges

0.1	…	3 s
0.3	…	10 s
1	…	30 s
3.3	…	100 s
10	…	300 s
33	…	1000 s

0.1 s to 30 h
divided into 6 time ranges

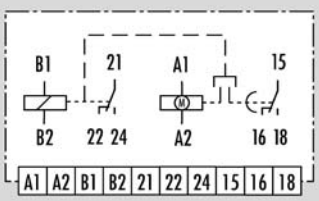
0.1	…	3 s
1	…	30 s
0.1	…	3 min
1	…	30 min
0.1	…	3 h
1	…	30 h

0.2 s to 60 h
divided into 6 time ranges

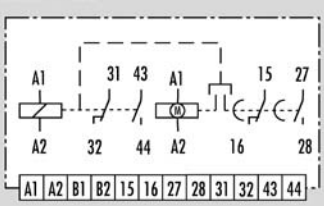
0.2	…	6 s
2	…	60 s
0.2	…	6 min
2	…	60 min
0.2	…	6 h
2	…	60 h

Circuit diagrams

DZ 72-S KS 5102/6



DZ 74-2S KS 5063/3



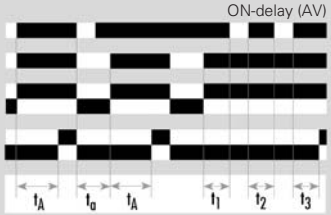
Timer and switching relays
ON-delay DZ 72-S, DZ 74-2S

interface

Function diagram

DZ 72-S, DZ 74-2S

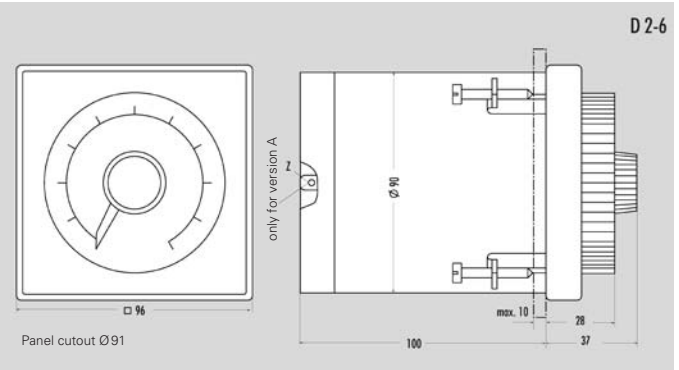
ON-delay (AV)



A1/A2	Supply voltage	FD 0008
B1/B2	Energizing quantity	
21/24 21/22	Instantaneous contact	
15/18 15/16	Delayed contact	
t_A =	operating time	
t_a =	break time, must be > returning time of the time element	

$$\text{operating time} = \sum_{1}^{n} t_x$$

Dimension diagram



Accessories

Lockable cover	V 2
Seal	Z 2

Overview of devices/part numbers

Type	Setting range	Rated voltage		Part No.	Std. Pack
DZ 72-S	0.03 s … 100 s	AC 230 V	50/60 Hz	R2.024.0560.0	1
	0.1 s … 1000 s	AC 230 V	50/60 Hz	R2.024.1460.0	1
	0.1 s … 30 h	AC 24 V	50/60 Hz	R2.024.0590.0	1
		AC 110 – 115 V	50/60 Hz	R2.024.0490.0	1
		AC 230 V	50/60 Hz	R2.024.0910.0	1
	0.2 s … 60 h	AC 24 V	50/60 Hz	R2.024.0660.0	1
		AC 110 – 115 V	50/60 Hz	R2.024.0500.0	1
		AC 230 V	50/60 Hz	R2.024.0880.0	1
DZ 74-2S	0.03 s … 100 s	AC 230 V	50/60 Hz	R2.024.1870.0	1
	0.1 s … 1000 s	AC 110 – 115 V	50/60 Hz	R2.024.1530.0	1
		AC 230 V	50/60 Hz	R2.024.1090.0	1
	0.1 s … 30 h	AC 24 V	50/60 Hz	R2.024.0680.0	1
		AC 110 – 115 V	50/60 Hz	R2.024.0510.0	1
		AC 230 V	50/60 Hz	R2.024.0980.0	1
	0.2 s … 60 h	AC 24 V	50/60 Hz	R2.024.0890.0	1
		AC 110 – 115 V	50/60 Hz	R2.024.0570.0	1
		AC 230 V	50/60 Hz	R2.024.1040.0	1

Timer and switching relays
ON-delay DZ 72-S, DZ 74-2S

Technical data	DZ 72-S	DZ 74-2S
Function type according to DIN VDE 0435 sec. 110:04.89	Electromechanical timer relay for	Electromechanical timer relay for
	single voltage	single voltage
	Item 3.13: ON-delay timer relay	Item 3.12: ON-delay timer relay
Function display	Pointer for operating time	
Function diagram	FD0008	
Power supply circuit		
Rated voltage U_N	See "Overview of devices"	
Rated consumption: motor at 50 Hz and UN (AC)	ca. 1.3 VA/ca. 1.1 W	
Rated consumption: coil at 50 Hz and UN (AC)	ca. 4.5 VA/ca. 3.8 W	
Rated frequency	50 and 60 Hz selectable on the device	
Operating voltage range	0.8 – 1.1 x U_N	
Time circuit		
Time setting / number of time ranges	analog/6 or 5	
Available time ranges	See table "Time ranges"	
Recovery time	≤ 250 ms	
Minimum ON time	–	
Release value	≥ 15 % U_N	
Parallel loads permissible	yes	
Internal half-wave rectification	yes	
Error (average related to the full scale value)	during standard operation: Setting range > 6 s; ± 1.5 % Setting range 6 s; ± 2 % Setting range 3 s; ± 3 % Setting range 1 s; ± 8 %	
Dispersion	Standard operation / Rapid start	
Setting range 0.03 – 1 s	± 0.045 s / ± 0.015 s	
Setting range 0.3 – 10 s	± 0.09 s / ± 0.06 s	
Setting range 3.3 – 100 s	± 0.54 s / ± 0.51 s	
Max. operating time ≥ 3 min	± 0.5 % related to the full scale value	
Output circuit		
Contact assignment	1 timed and 1 instantaneous change-over contact	1 instantaneous and 1 timed NC contact,
		1 instantaneous and 1 timed NO contact
Contact material	Ag Cu	
Rated operating voltage U_n	AC/DC 230 V	
Max. continuous current I_n	5 A	
Application category according to EN 60947-5-1:1991	AC-15: U_e 230 V AC, I_e 2 A	
	DC-13: U_e 24 V DC, I_e 2 A	
Permissible switching frequency	≤ 3600 switching cyclese/h	
Mechanical life	30 x 10^6 switching cycles or	
	3 x 10^4 motor operation hours	
Response time	≤ 30 ms	
Release time	≤ 60 ms	
General information		
Creepage distances and clearances between the circuits	according to DIN VDE 0110-1:04.97	
Rated impulse voltage	4 kV	
overvoltage category	III	
Degree of pollution	3 outside 2 inside	
Rated voltage	AC 250 V	
Test voltage Ueff 50 Hz according to DIN VDE 0110-1, table A.1	2.21 kV	
Protection degree housing front panel / housing rear panel / tab connector	IP 55/IP 20/IP 00	
Emitted interference	EN 50081-1:03.93, -2:03.94	
Noise immunity	EN 50082-2:1995	
Ambient temperature, operating range	-10 – +55 °C	
Dimension diagram	D 2-6	
Circuit diagram	KS 5102/6	KS 5063/3
Weight	0.6 kg	
Accessories	V2, Z 2	
Approvals	–	

ON-delay multi-range electromechanical timer relay

- Device for single voltage
- Function: ON-delay (AV)
- 1 setting range divided into 6 time ranges
- Contact assignment: 1 instantaneous and 1 timed NC contact, 1 instantaneous and 1 timed NO contact

96 x 96

General information

- The electromechanical timer relays are equipped with synchronous motors and solenoid clutches.
- The time ranges are set on the front through selector switches. Infinitely variable time setting within a range is selected by a transparent rotary switch.
- The countdown indicator moves during operation from the set time value towards zero.

Notes

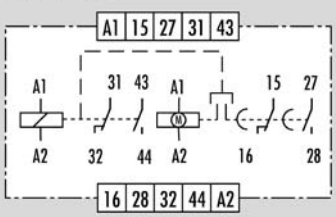
- With a frequency switch located at the bottom of the housing the relay can be adapted to the relevant frequency (50 or 60 Hz). The factory pre-setting is 50 Hz.
- Maximum repeatability is achieved with multi-range models by selecting the shortest possible time range.
- The time range on the devices has to be selected in the OFF position to avoid possible timing errors and incorrect contact switching.

Function

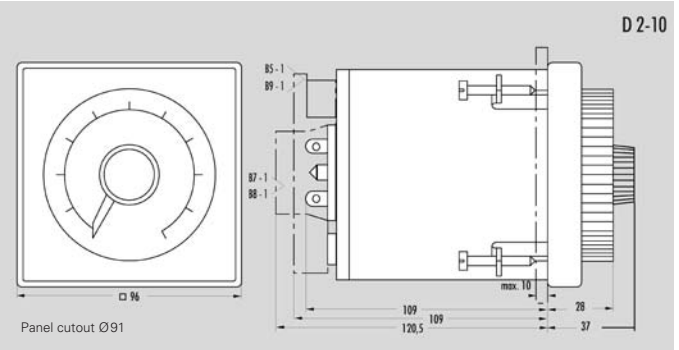
Upon excitation of motor and solenoid the instantaneous contact is put into the ON position and the countdown starts. When the pre-set time has elapsed, the time contact is actuated and the motor is switched off. After de-excitation, the solenoid, time element and all contacts will switch into the OFF position. If a voltage interruption occurs during the countdown, the solenoid, instantaneous contact and time element will fall into the OFF position.

Circuit diagram

DZ 74-2S L KS 5155/2

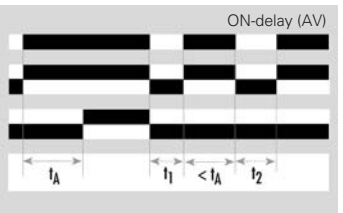


Dimension diagram



Function diagram

DZ 74-25 L



A1/A2	Energizing quantity	FD 0040
43/44 31/32	Instantaneous contact	
27/28 15/16	Delayed contact	
t_A =	operating time	
t_1 =	break time, must be > recovery time 1	
t_2 =	break time, must be > recovery time 2	

Time ranges

Available setting ranges:

0.01 s to 30 h
divided into 6 time ranges

0.1	...	3 s
1	...	30 s
0.1	...	3 min
1	...	30 min
0.1	...	3 h
1	...	30 h

0.02 s to 60 h
divided into 6 time ranges

0.2	...	6 s
2	...	60 s
0.2	...	6 min
2	...	60 min
0.2	...	6 h
2	...	60 h

Accessories

Female connector plate	B 5 or B9	for panel and surface mounting
Pin holder	B 7 or B8	for panel mounting
Adapter	BT 421	for rail mounting of the female connector plate B 5
Cover	DA 1	for panel cutout
Lockable cover	V 2	
Seal	Z 2	for panel mounting

Timer and switching relays
ON-delay DZ 74-2S L

Technical data	DZ-74-2S L
Function type according to DIN VDE 0435 sec. 110:04.89	Electromechanical timer relay for single voltage Item 3.12: ON-delay timer relay
Function display	Pointer for operating time
Power supply circuit	
Rated voltage U_N	See "Overview of devices"
Rated consumption: motor at 50 Hz and UN (AC)	ca. 1.3 VA/ca. 1.1 W
Rated consumption: coil at 50 Hz and UN (AC)	ca. 4.5 VA/ca. 3.8 W
Rated frequency	50 and 60 Hz selectable on the device
Operating voltage range	0.8 – 1.1 x U_N
Time circuit	
Time setting / number of time ranges	analog/6
Available time ranges	See table "Time ranges"
Recovery time	≤ 250 ms
Minimum ON time	–
Release value	≥ 15 % U_N
Parallel loads permissible	yes
Internal half-wave rectification	yes
Error (average related to the full scale value)	during standard operation: Setting range > 6 s; ± 1.5 % Setting range 6 s; ± 2 % Setting range 3 s; ± 3 % Setting range 1 s; ± 8 %
Dispersion	Standard operation / Rapid start
Setting range 0.03 – 1 s	± 0.045 s / ± 0.015 s
Setting range 0.3 – 10 s	± 0.09 s / ± 0.06 s
Setting range 3.3 – 100 s	± 0.54 s / ± 0.51 s
Max. operating time ≥ 3 min	± 0.5 % related to the full scale value
Output circuit	
Contact assignment	1 instantaneous and 1 timed NC contact, 1 instantaneous and 1 timed NO contact
Contact material	Ag Cu
Rated operating voltage U_n	2 AC/DC 30 V
Max. continuous current I_n	5 A
Application category according to EN 60947-5-1:1991	AC-15: U_e 230 V AC, I_e 2 A
	DC-13: U_e 24 V DC, I_e 2 A
Permissible switching frequency	≤ 3600 switching cyclese/h
Mechanical life	30 x 10^6 switching cycles or 3 x 10^4 motor operation hours
Response time	≤ 30 ms
Release time	≤ 60 ms
General information	
Creepage distances and clearances between the circuits	according to DIN VDE 0110-1:04.97
Rated impulse voltage	4 kV
overvoltage category	III
Degree of pollution	3 outside 2 inside
Rated voltage	AC 250 V
Test voltage Ueff 50 Hz according to DIN VDE 0110-1, table A.1	2.21 kV
Protection degree housing front panel / housing rear panel / tab connector	IP 55/IP 20/IP 00
Emitted interference	EN 50081-1:03.93, -2:03.94
Noise immunity	EN 50082-2:1995
Ambient temperature, operating range	-10 – +55 °C
Dimension diagram	D 2-10
Circuit diagram	KS 5155/2
Weight	0.6 kg
Accessories	B 5, B 7, B 8, B 9, BT 421, DA 1, V 2, Z 2
Approvals	

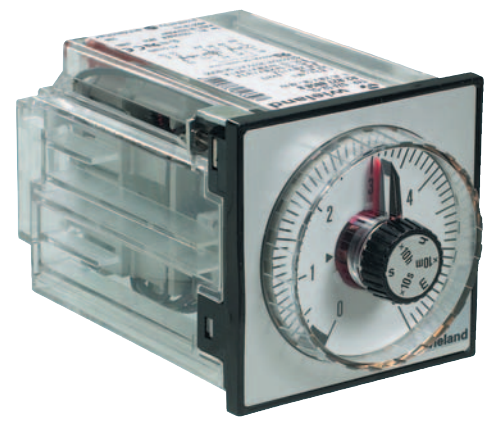
Overview of devices/part numbers

Type	Setting range	Rated voltage		Part No.	Std. Pack
DZ 74-2S L	0.1 s… 30 h	AC 24 V	50/60 Hz	R2.024.1920.0	1
		AC 110 – 115 V	50/60 Hz	R2.024.1770.0	1
		AC 230 V	50/60 Hz	R2.024.1720.0	1
	0.2 s… 60 h	AC 24 V	50/60 Hz	R2.024.1830.0	1
		AC 110 – 115 V	50/60 Hz	R2.024.1750.0	1
		AC 230 V	50/60 Hz	R2.024.0190.0	1

Timer and switching relays
ON-delay DZA 52-S L / DZA 53-S L / DZAN 52-S L / DZA 52 L

interface

ON-delay multi-range electromechanical timer relay



- Devices for single voltage
- Function: ON-delay (AV), DZAN 52-S L protected against power failure
- 1 setting range divided into 6 time ranges
- Contact assignment: DZA 52-S L = 1 timed and 1 instantaneous change-over contact
  DZAN 52-S L = 1 timed and 1 instantaneous change-over contact
  DZA 53-S L = 2 timed change-over contacts and 1 instantaneous NO contact
  DZA 52 L = 2 timed change-over contacts

72 x 72

General information

- The electromechanical timer relays are equipped with synchronous motors and solenoid clutches.
- The time ranges are set on the front through selector switches. Infinitely variable time setting within a range is selected by a transparent rotary switch.
- The countdown indicator moves during operation from the set time towards zero.

Function

Upon excitation of motor and solenoid the instantaneous contact is put into the ON position and the countdown starts. When the pre-set time has elapsed, the time contact is actuated and the motor is switched off. After de-excitation, the solenoid, time element and all contacts will switch into the OFF position. If a voltage interruption occurs during the countdown, the solenoid, instantaneous contact and time element will fall into the OFF position.

The **timer relay protected against power failure DZAN 52-S L** has the same function as described above, but upon excitation the solenoid clutch is locked by a blocking pawl so that even in a no-volt condition the elapsed time is preserved. The countdown can be interrupted as often as desired. The instantaneous contact remains in the ON position even during voltage interruption. When the pre-set time has elapsed, the blocking pawl is released, the timed contacts are actuated and the motor is switched off.

Actuation by impulse: The timer relay protected against power failure can be actuated by an impulse applied to the clutch, as the locking action of the blocking pawl is immediate (separate motor and coil connections). The countdown starts when the motor is energized. After impulse actuation the instantaneous contact goes into the ON position until the countdown ends. When the time has elapsed, it falls back into the OFF position. The timed contact only opens for approx. 10 ms. The timed change-over contact cannot be switched into its closed position.

Resetting: Mechanical resetting to 0 is possible for these devices.

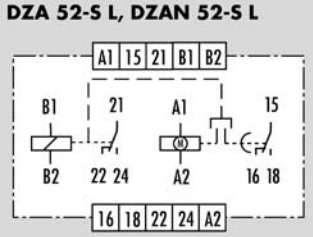
Resetting of DZAN 52-S L: Electrical and mechanical resetting to 0 is only possible for this device, if the mechanical interlock is released. If resetting is necessary after an interruption of the countdown, the resetting lever located on the front (right hand top corner) must be turned in the direction of the arrow.

Accessories

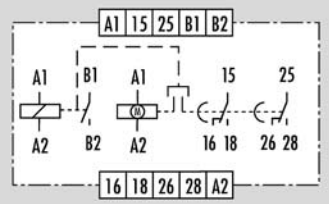
Female connector plate	B 5	for panel and surface mounting
Pin holder	B 7	for panel mounting
Adapter	BT 421	for rail mounting of the female connector plate B 5
Cover	DA 1	for panel cutout
Lockable cover	V 4	
Seal	Z 2	for panel mounting

Circuit diagrams

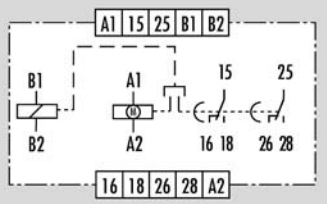
DZA 52-S L, DZAN 52-S L KS 5102/3



DZA 53-S L KS 5151/2



DZA 52 L KS 5153/2



Time ranges

Available setting ranges:

0.1 s to 1000 s
divided into 6 time ranges

0.1	… 3	s
0.3	… 10	s
1	… 30	s
3.3	… 100	s
10	… 300	s
33	… 1000	s

0.1 s to 30 h
divided into 6 time ranges

0.1	… 3	s
1	… 30	s
0.1	… 3	min
1	… 30	min
0.1	… 3	h
1	… 30	h

0.2 s to 60 h
divided into 6 time ranges

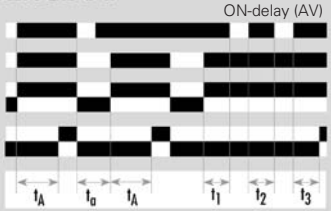
0.2	… 6	s
2	… 60	s
0.2	… 6	min
2	… 60	min
0.2	… 6	h
2	… 60	h

Timer and switching relays
ON-delay DZA 52-S L / DZA 53-S L / DZAN 52-S L / DZA 52 L

Function diagrams

DZA 52-S L

ON-delay (AV)



A1/A2 Supply voltage FD 0008

B1/B2 Energizing quantity

21/24, 21/22 Instantaneous contact

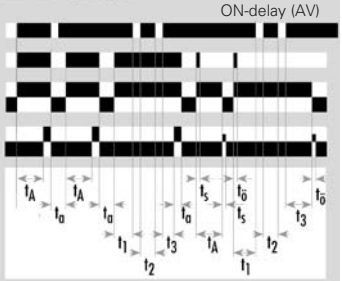
15/18, 15/16 Delayed contact

t_A = operating time
t_a = break time, must be > returning time of the time element

$$\text{operating time} = \sum_{1}^{n} t_x$$

DZAN 52-S L

ON-delay (AV)



A1/A2 Supply voltage FD 0033

B1/B2 Energizing quantity

21/24, 21/22 Instantaneous contact

15/18, 21/22 Delayed contact

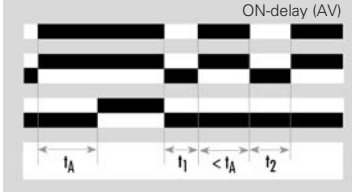
t_A = operating time
t_a = break time, must be > returning time of the time element
t_s = closing time, must be > minimum excitation time
t_a = opening time, refers only to the NC contact, the NO contact is not switched

$$\text{operating time} = \sum_{1}^{n} t_x$$

Function diagrams

DZA 53-S L

ON-delay (AV)



A1/A2 Energizing quantity FD 0040

B1/B2 Instantaneous contact

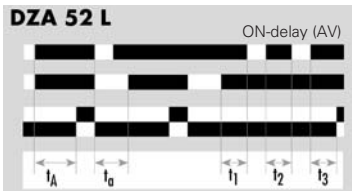
15/18, 25/28, 15/16, 25/26 Delayed contact

t_A = operating time
t_a = break time, must be > returning time of the time element
t_S = closing time, must be > minimum excitation time
t_0 = opening time, refers only to the NC contact, the NO contact is not switched

$$\text{operating time } t_A = \sum_{1}^{n} t_x$$

DZA 52 L

ON-delay (AV)



A1/A2 Supply voltage FD 0011

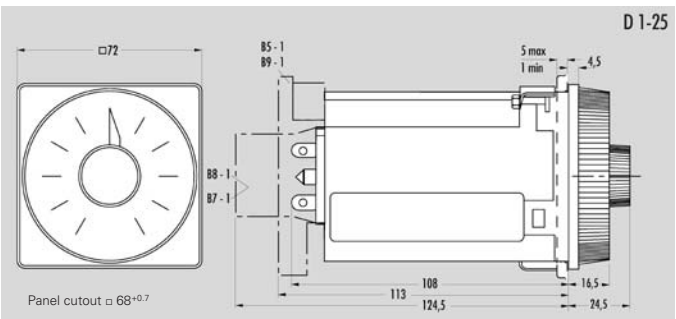
B1/B2 Energizing quantity

15/18, 25/28, 21/22, 25/26 Delayed contact

t_A = operating time
t_a = break time, must be > returning time of the time element
t_s = closing time, must be > minimum excitation time
t_a = opening time, refers only to the NC contact, the NO contact is not switched

$$\text{operating time } t_A = \sum_{1}^{n} t_x$$

Dimension diagram



Notes

- With a frequency switch located at the bottom of the housing the relay can be adapted to the relevant frequency (50 or 60 Hz). The factory pre-setting is 50 Hz.
- The relays have separate motor and solenoid connections which makes the following operating modes possible:
  1. Time accumulation: By separate actuation of the solenoid clutch and the motor, elapsed time can be stored and/or various time segments accumulated.
  2. Rapid start: Reduction of time dispersion to a minimum by keeping the motor constantly at operating voltage while only the solenoid clutch is de-energized and energized after the time has elapsed. Motor starting irregularities are thus avoided. For operating times above 60 s, the rapid start no longer has any effect on time dispersion.
  3. Standard operation: Simultaneous excitation and de-excitation of solenoid clutch and motor. Recommended for operating times above 60 s.
- Maximum repeatability is achieved with multi-range models by selecting the shortest possible time range.
- The time range on the devices has to be selected in the OFF position to avoid possible timing errors and incorrect contact switching.

Overview of devices/part numbers

Type	Setting range	Rated voltage		Part No.	Std. Pack
DZA 52-S L	0.1 s … 1000 s	AC 24 V	50/60 Hz	R2.027.0210.0	1
		AC 110 – 115 V	50/60 Hz	R2.027.0030.0	1
		AC 125 – 127 V	50/60 Hz	R2.027.0040.0	1
		AC 230 V	50/60 Hz	R2.027.0090.0	1
	0.1 s … 30 h	AC 24 V	50/60 Hz	R2.027.0320.0	1
		AC 110 – 115 V	50/60 Hz	R2.027.0270.0	1
		AC 125 – 127 V	50/60 Hz	R2.027.0300.0	1
		AC 230 V	50/60 Hz	R2.027.0070.0	1
	0.2 s … 60 h	AC 24 V	50/60 Hz	R2.027.0330.0	1
		AC 42 V	50/60 Hz	R2.027.0170.0	1
		AC 48 V	50/60 Hz	R2.027.0220.0	1
		AC 110 – 115 V	50/60 Hz	R2.027.0250.0	1
		AC 125 – 127 V	50/60 Hz	R2.027.0240.0	1
		AC 230 V	50/60 Hz	R2.027.0050.0	1
DZAN 52-S L	0.1 s … 1000 s	AC 24 V	50/60 Hz	R2.027.0280.0	1
		AC 110 – 115 V	50/60 Hz	R2.027.0230.0	1
		AC 230 V	50/60 Hz	R2.027.0190.0	1
	0.1 s … 30 h	AC 24 V	50/60 Hz	R2.027.0110.0	1
		AC 110 – 115 V	50/60 Hz	R2.027.0120.0	1
		AC 230 V	50/60 Hz	R2.027.0080.0	1
	0.2 s … 60 h	AC 24 V	50/60 Hz	R2.027.0140.0	1
		AC 110 – 115 V	50/60 Hz	R2.027.0180.0	1
		AC 230 V	50/60 Hz	R2.027.0020.0	1
DZA 53-S L	0.2 s … 60 h	AC 230 V	50/60 Hz	R2.027.0260.0	1
DZA 52 L	0.2 s … 60 h	AC 24 V	50/60 Hz	R2.027.0200.0	1
		AC 110 – 115 V	50/60 Hz	R2.027.0130.0	1
		AC 230 V	50/60 Hz	R2.027.0060.0	1

Timer and switching relays
ON-delay DZA 52-S L / DZA 53-S L / DZAN 52-S L / DZA 52 L

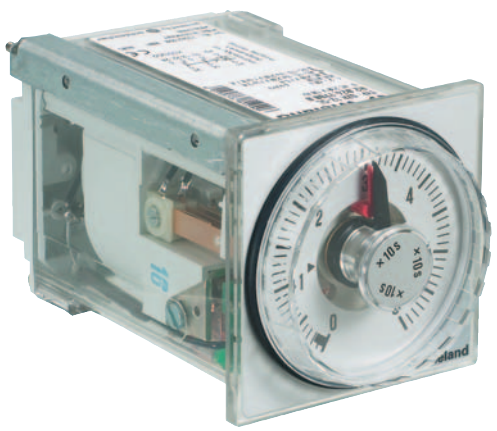
Technical data	DZA 52-S L	DZAN 52-S L	DZA 53-S L	DZA 52 L
Function type according to DIN VDE 0435 sec. 110:04.89	Electromechanical timer relay for single voltage			
	Item 3.13: ON-delay timer relay	Item 3.14: ON-delay timer relay protected against power failure	Item 3.12: ON-delay timer relay	Item 3.13: ON-delay timer relay
Function display	Pointer for operating time			
Function diagram	FD 0008	FD 0033	FD 0040	FD 0011
Power supply circuit				
Rated voltage U_N	See "Overview of devices"			
Rated consumption: motor at 50 Hz and UN (AC)	ca. 1.3 VA / ca. 1.1 W			
Rated consumption: coil at 50 Hz and UN (AC)	ca. 1.0 VA / ca. 0.9 W			
Rated frequency	50 and 60 Hz selectable on the device			
Operating voltage range	0.8 – 1.1 x U_N			
Time circuit				
Time setting / number of time ranges	analog / 6			
Available time ranges	See table "Time ranges"			
Recovery time	≤ 250 ms			
Minimum ON time	–	30 ms	–	–
Release value	≥ 15 % U_N			
Parallel loads permissible	yes			
Internal half-wave rectification	yes			
Error (average related to the full scale value)	during standard operation:			
	Setting range > 6 s; ± 1.5 %			
	Setting range 6 s; ± 2 %			
Dispersion	Standard operation	Rapid start		
Setting range 0.3 – 6 s	± 0.06 s	± 0.03 s		
Setting range 3 – 60 s	± 0.22 s	± 0.19 s		
Max. operating time ≥ 60 s	± 0.3 % related to the full scale value			
Output circuit				
Contact assignment	1 timed and 1 instantaneous change-over contact	1 timed and 1 instantaneous change-over contact	2 timed change-over contacts and 1 instantaneous NO	2 timed change-over contact
Contact material	Ag Cu			
Rated operating voltage Un	AC/DC 230 V			
Max. continuous current I_n	5 A			
Application category according to EN 60947-5-1:1991	AC-15: U_e 230 V AC, I_e 2 A			
	DC-13: U_e 24 V DC, I_e 2 A			
Permissible switching frequency	≤ 3600 switching cyclese/h			
Mechanical life	30 x 10^6 switching cycles or 3 x 10^4 motor operation hours			
Response time	≤ 25 ms			
Release time	≤ 80 ms			
General information				
Creepage distances and clearances between the circuits	according to DIN VDE 0110-1:04.97			
Rated impulse voltage	4 kV			
overvoltage category	III			
Degree of pollution	3 outside 2 inside			
Rated voltage AC	AC 250 V			
Test voltage Ueff 50 Hz according to DIN VDE 0110-1, table A.1	2.21 kV			
Protection degree housing front panel / housing rear panel / tab connector	IP 54/IP 20/IP 00			
Emitted interference	EN 50081-1:03.93, -2:03.94			
Noise immunity	EN 50082-2:1995			
Ambient temperature, operating range	-10 – +55 °C			
Dimension diagram	D 1-25			
Circuit diagram	KS 5102/3	KS 5102/3	KS 5151/2	KS 5153/2
Weight	0.4 kg			
Accessories	B 5, B 7, B 8, B 9, BT 421, DA 1, V 2, Z 2			
Approvals	GL UL CSA			

Timer and switching relays
ON-delay DZR 12-S L

ON-delay single-range electromechanical timer relay for burner control system with TÜV Test Certificate

- Device for single voltage
- Function: ON delay (AV) for burner control system with TÜV Test Certificate
- 1 time range
- Contact assignment: 1 timed and 1 instantaneous change-over contact

72 x 72



General information

- Infinitely variable time setting within a range is selected by a transparent rotary switch.
- The countdown indicator moves during operation from the set time value towards zero.

Notes

- The jumper marked on the circuit diagram with a dotted line between terminals 16 and 24 must be connected by the user.
- The use of this device version is permitted for safety times that may not be prolonged in case of device failure.

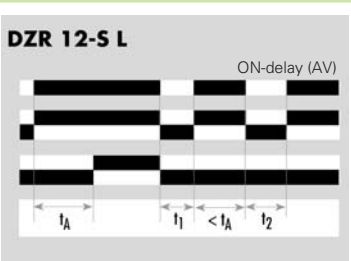
Function

Upon excitation of motor and solenoid the geared axis is coupled with the time element, the instantaneous contact is put into the ON position and the countdown starts. When the pre-set time has elapsed, the time contact is actuated.

After de-excitation, the solenoid, time element and all contacts will switch into the OFF position.
If a voltage interruption occurs during the countdown, the solenoid, instantaneous contact and time element will fall into the OFF position.

Under the precondition that the timed and instantaneous contacts are switched in series, the electromechanical timer relay is permitted for use in steam tank control circuits designed according to the specification of the VdTÜV Direction Sheet No. 452. The function of the relay then corresponds to that of a long-time interval ON relay.

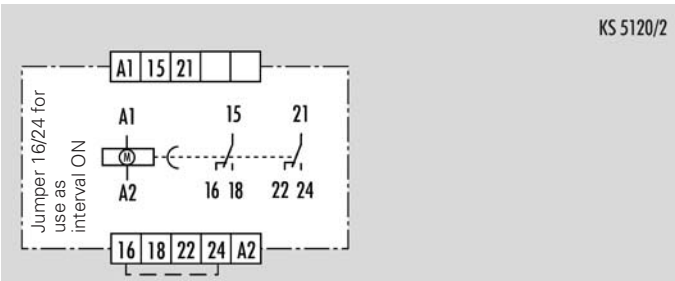
Function diagram



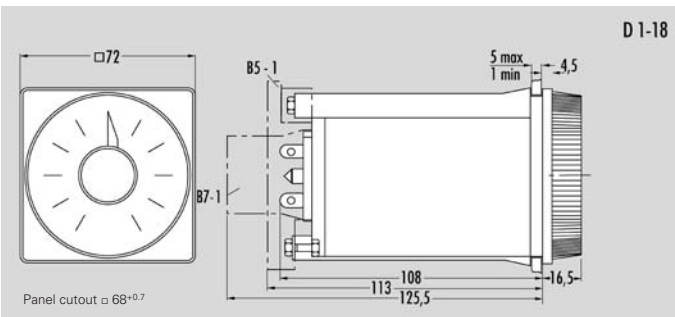
A1/A2	Energizing quantity	FD 0040
21/24 21/22	Instantaneous contact	
15/18 15/16	Delayed contact	

$t_{A=}$ operating time
$t_{1=}$ break time, must be > recovery time 1
$t_{2=}$ break time, must be > recovery time 2

Circuit diagram



Dimension diagram



Accessories

Female connector plate	B 5	for panel and surface mounting
Pin holder	B 7	for panel mounting
Adapter	BT 421	for rail mounting of the female connector plate B 5
Cover	DA 1	for panel cutout
Lockable cover	V 4	
Seal	Z 1	for panel mounting

Time ranges

Available setting ranges:

0.03 …	1 s	1 …	30 min
0.1 …	3 s	2 …	60 min
0.2 …	6 s	4 …	120 min
0.4 …	12 s	0.1 …	3 h
1 …	30 s	0.2 …	6 h
2 …	6 h	0.4 …	12 h
3.3 …	100 s	0.8 …	24 h
0.1 …	3 min	1 …	30 h
0.2 …	6 min	2 …	60 h
0.4 …	12 min		

Overview of devices/part numbers

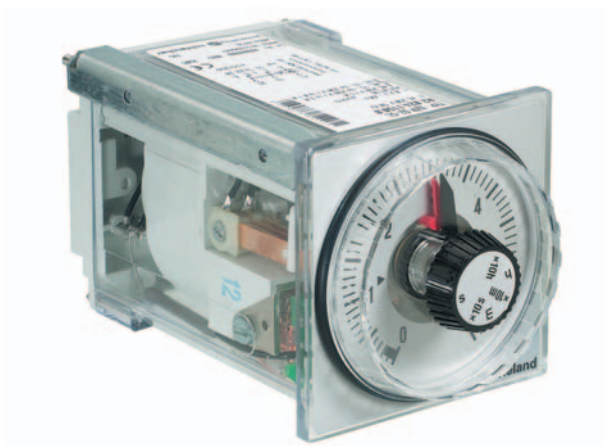
Type	Setting range	Rated voltage		Part No.	Std. Pack
DZR 12-S L	0.03 … 1 s	AC 230 V	50 Hz	R2.024.0920.0	1
	0.1 … 3 s	AC 110 – 115 V	50 Hz	R2.024.0460.0	1
		AC 110 – 115 V	60 Hz	R2.024.0220.0	1
		AC 230 V	50 Hz	R2.024.1500.0	1
	0.2 … 6 s	AC 110 – 115 V	50 Hz	R2.024.1370.0	1
		AC 110 – 115 V	60 Hz	R2.024.0250.0	1
		AC 230 V	50 Hz	R2.024.0670.0	1
	0.4 … 12 s	AC 24 V	50 Hz	R2.024.1620.0	1
		AC 110 – 115 V	50 Hz	R2.024.1470.0	1
		AC 110 – 115 V	60 Hz	R2.024.0240.0	1
		AC 230 V	50 Hz	R2.024.0870.0	1
	1 … 30 s	AC 110 – 115 V	50 Hz	R2.024.1280.0	1
		AC 110 – 115 V	60 Hz	R2.024.0130.0	1
		AC 230 V	50 Hz	R2.024.1910.0	1
	2 … 60 s	AC 110 – 115 V	50 Hz	R2.024.1480.0	1
		AC 110 – 115 V	60 Hz	R2.024.0350.0	1
		AC 230 V	50 Hz	R2.024.1780.0	1
	3.3 … 100 s	AC 110-115 V	50 Hz	R2.024.0470.0	1
		AC 110-115 V	60 Hz	R2.024.0260.0	1
		AC 230 V	50 Hz	R2.024.1710.0	1
	0.1 … 3 min	AC 110 – 115 V	50 Hz	R2.024.1390.0	1
		AC 110 – 115 V	60 Hz	R2.024.0270.0	1
		AC 230 V	50 Hz	R2.024.0750.0	1
	0.2 … 6 min	AC 110 – 115 V	50 Hz	R2.024.0410.0	1
		AC 110 – 115 V	60 Hz	R2.024.0170.0	1
		AC 230 V	50 Hz	R2.024.0050.0	1
	0.4 … 12 min	AC 110 – 115 V	50 Hz	R2.024.1810.0	1
		AC 110 – 115 V	60 Hz	R2.024.0210.0	1
		AC 230 V	50 Hz	R2.024.1190.0	1
		AC 230 V	60 Hz	R2.024.0310.0	1
	1 … 30 min	AC 110 – 115 V	50 Hz	R2.024.1800.0	1
		AC 110 – 115 V	60 Hz	R2.024.0230.0	1
		AC 230 V	50 Hz	R2.024.0690.0	1
	2 … 60 min	AC 110 – 115 V	50 Hz	R2.024.1380.0	1
		AC 110 – 115 V	60 Hz	R2.024.0450.0	1
		AC 230 V	50 Hz	R2.024.1180.0	1
	4 … 120 min	AC 110 – 115 V	50 Hz	R2.024.1930.0	1
		AC 110 – 115 V	60 Hz	R2.024.0330.0	1
		AC 230 V	50 Hz	R2.024.0730.0	1
	0.1 … 3 h	AC 230 V	50 Hz	R2.024.1300.0	1
	0.2 … 6 h	AC 110 – 115 V	60 Hz	R2.024.0650.0	1
		AC 230 V	50 Hz	R2.024.1200.0	1
	0.4 … 12 h	AC 230 V	50 Hz	R2.024.1680.0	1
	0.8 … 24 h	AC 110 – 115 V	50 Hz	R2.024.0160.0	1
		AC 230 V	50 Hz	R2.024.0150.0	1
	1 … 30 h	AC 230 V	50 Hz	R2.024.1320.0	1
	2 … 60 h	AC 110 – 115 V	60 Hz	R2.024.0180.0	1
		AC 230 V	50 Hz	R2.024.1350.0	1

Technical data	DZR 12-S L
Function type according to DIN VDE 0435 sec. 110:04.89	Electromechanical timer relay for single voltage Item 3.12: ON-delay timer relay according to the requirements of VdTÜV Direction Sheet
Function display	No. 452 for limitation of the safety time
Function diagram	Pointer for operating time
Power supply circuit	FD 0040
Rated voltage U_N	
Rated consumption at 50 Hz and U_N (AC)	See "Overview of devices"
Rated frequency	ca. 3.2 VA / ca. 2.9 W
Operating voltage range	50 or 60 Hz
Time circuit	0.8 – 1.1 x U_N
Time setting / number of time ranges	
Available time ranges	analog / 1
Recovery time	See "Overview of devices"
Minimum ON time	≥ 250 ms
Release value	–
Parallel loads permissible	≥ 15 % U_N
Internal half-wave rectification	yes
Error (average related to the full scale value)	– Setting range 1 s; ± 8 % Setting range 3 s; ± 3 % Setting range 6 s; ± 2 %
Dispersion	Setting range ≥ 10 s; ± 1.5 %
Setting range 0.03 – 1s	± 0.045 s
Setting range 0.3 – 10 s	± 0.09 s
Setting range 3.3 – 100 s	± 0.54 s
Max. operating time ≥ 3 min	± 0.5 % related to the full scale value
Output circuit	1 timed and 1 instantaneous change-over contact
Contact assignment	
Contact material	Ag Cu
Rated operating voltage Un	AC/DC 230 V
Max. continuous current I_n	5 A
Application category according to EN 60947-5-1:1991	AC-15: U_e 230 V AC, I_e 2 A
Permissible switching frequency	DC-13: U_e 24 V DC, I_e 2 A
Mechanical life	≤ 3600 switching cyclese/h 30 x 10^6 switching cycles or
Response time	3 x 10^4 motor operation hours
Release time	≤ 30 ms
General information	≤ 60 ms
Creepage distances and clearances between the circuits	
Rated impulse voltage	according to DIN VDE 0110-1:04.97
overvoltage category	4 kV
Degree of pollution	III
Rated voltage	3 outside 2 inside
Test voltage Ueff 50 Hz according to DIN VDE 0110-1, table A.1	AC 250 V
Protection degree housing front panel / housing rear panel / tab connector	2.21 kV
Emitted interference	IP 55/IP 20/IP 00
Noise immunity	EN 50081-1:03.93, -2:03.94
Ambient temperature, operating range	EN 50082-2:1995
Dimension diagram	–10 – +55 °C
Circuit diagram	D 1-18
Weight	KS 5120/2
Accessories	0.6 kg
Approvals	B 5, B 7, BT 421, DA 1, V 4, Z 1
	–

ON-delay multi-range electromechanical timer relay for burner control system with TÜV Test Certificate

- Device for single voltage
- Function: ON delay (AV) for burner control system with TÜV Test Certificate
- 1 setting range divided into 5 or 6 time ranges
- Contact assignment: 1 timed and 1 instantaneous change-over contact

72 x 72



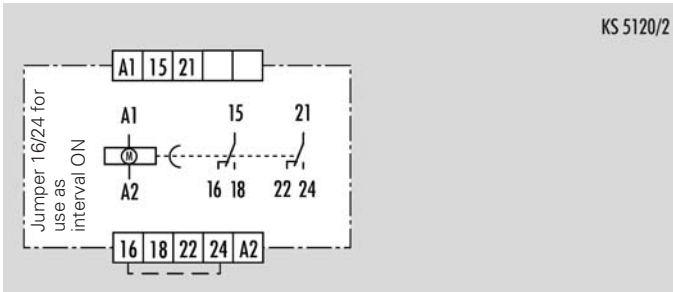
Function

Upon excitation of motor and solenoid the geared axis is coupled with the time element, the instantaneous contact is put into the ON position and the countdown starts. When the pre-set time has elapsed, the time contact is actuated.

After de-excitation, the solenoid, time element and all contacts will switch into the OFF position. If a voltage interruption occurs during the countdown, the solenoid, instantaneous contact and time element will fall into the OFF position.

Under the precondition that the timed and instantaneous contacts are switched in series, the electromechanical timer relay is permitted for use in steam tank control circuits designed according to the specification of the VdTÜV Direction Sheet No. 452. The function of the relay then corresponds to that of a long-time interval ON relay.

Circuit diagram



Notes

- The jumper marked on the circuit diagram with a dotted line between terminals 16 and 24 must be connected by the user.
- The use of this device version is permitted for safety times that may not be prolonged in case of device failure.

General information

- The time ranges are set on the front through selector switches. Infinitely variable time setting within a range is selected by a transparent rotary switch.
- The countdown indicator moves during operation from the set time value towards zero.

Time ranges

Available setting ranges:

0.3 s to 100 s
divided into 5 time ranges

0.03	…	1	s
0.1	…	3	s
0.3	…	10	s
1	…	30	s
3.3	…	100	s

0.1 s to 1000 s
divided into 6 time ranges

0.1	…	3	s
0.3	…	10	s
1	…	30	s
3.3	…	100	s
10	…	300	s
33	…	1000	s

0.1 s to 30 h
divided into 6 time ranges

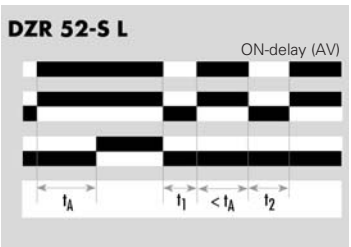
0.1	…	3	s
1	…	30	s
1	…	30	min
0.1	…	3	h
1	…	30	h

0.2 s to 60 h
divided into 6 time ranges

0.2	…	6	s
2	…	60	s
0.2	…	6	min
2	…	60	min
0.2	…	6	h
2	…	60	h

Timer and switching relays
ON-delay DZR 52-S L

Function diagram

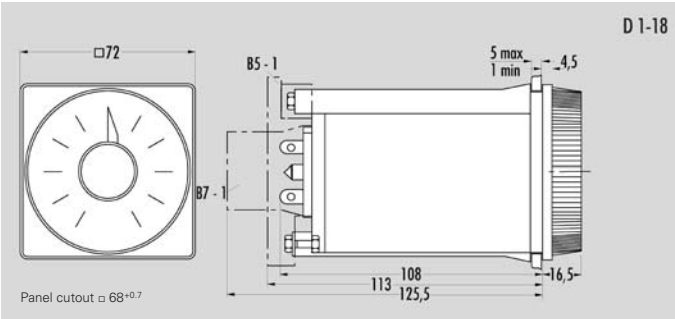


A1/A2 Energizing quantity FD 0040

21/24 Instantaneous contact
21/22
15/18 Delayed contact
15/16

t_A = operating time
t_1 = break time, must be > recovery time 1
t_2 = break time, must be > recovery time 2

Dimension diagram



Overview of devices/part numbers

Type	Setting range	Rated voltage		Part No.	Std. Pack
DZR 52-S L	0.03 s… 100 s	AC 110 – 115 V	50 Hz	R2.024.1740.0	1
		AC 230 V	50 Hz	R2.024.0070.0	1
	0.1 s…1000 s	AC 110 – 115 V	50 Hz	R2.024.1820.0	1
		AC 230 V	50 Hz	R2.024.1310.0	1
	0.1 s… 30 h	AC 24 V	50 Hz	R2.024.1400.0	1
		AC 110 – 115 V	50 Hz	R2.024.1880.0	1
		AC 110 – 115 V	60 Hz	R2.024.0200.0	1
		AC 230 V	50 Hz	R2.024.0860.0	1
	0.2 s… 60 h	AC 24 V	50 Hz	R2.024.1570.0	1
		AC 110 – 115 V	50 Hz	R2.024.1730.0	1
		AC 110 – 115 V	60 Hz	R2.024.0110.0	1
		AC 230 V	50 Hz	R2.024.1150.0	1

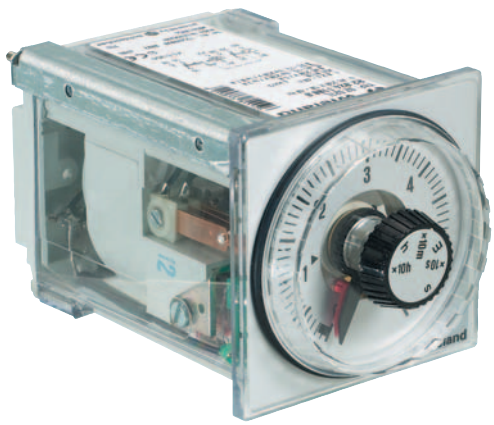
Technical data	DZR 52-S L
Function type according to DIN VDE 0435 sec. 110:04.89	Electromechanical timer relay for single voltage Item 3.12: ON-delay timer relay according to the requirements of VdTÜV Direction Sheet No. 452 for limitation of the safety time
Function display	Pointer for operating time
Function diagram	FD 0040
Power supply circuit	
Rated voltage U_N	See "Overview of devices"
Rated consumption at 50 Hz and U_N (AC)	ca. 3.2 VA / ca. 2.9 W
Rated frequency	50 or 60 Hz
Operating voltage range	0.8 – 1.1 x U_N
Time circuit	
Time setting / number of time ranges	analog / 6 or 5
Available time ranges	See table "Time ranges"
Recovery time	≥ 250 ms
Minimum ON time	–
Release value	≥ 15 % U_N
Parallel loads permissible	yes
Internal half-wave rectification	–
Error (average related to the full scale value)	Setting range 1 s; ± 8 % Setting range 3 s; ± 3 % Setting range 6 s; ± 2 % Setting range ≥ 10 s; ± 1.5 %
Dispersion	
Setting range 0.03 – 1s	± 0.045 s
Setting range 0.3 – 10 s	± 0.09 s
Setting range 3.3 – 100 s	± 0.54 s
Max. operating time ≥ 3 min	± 0.5 % related to the full scale value
Output circuit	
Contact assignment	1 timed and 1 instantaneous change-over contact
Contact material	Ag Cu
Rated operating voltage Un	AC/DC 230 V
Max. continuous current I_n	5 A
Application category according to EN 60947-5-1:1991	AC-15: U_e 230 V AC, I_e 2 A DC-13: U_e 24 V DC, I_e 2 A
Permissible switching frequency	≤ 3600 switching cyclese/h
Mechanical life	30 x 10^6 switching cycles or 3 x 10^4 motor operation hours
Response time	≤ 30 ms
Release time	≤ 60 ms
General information	
Creepage distances and clearances between the circuits	according to DIN VDE 0110-1:04.97
Rated impulse voltage	4 kV
overvoltage category	III
Degree of pollution	3 outside 2 inside
Rated voltage	AC 250 V
Test voltage Ueff 50 Hz according to DIN VDE 0110-1, table A.1	2.21 kV
Protection degree housing front panel / housing rear panel / tab connector	IP 55/IP 20/IP 00
Emitted interference	EN 50081-1:03.93, -2:03.94
Noise immunity	EN 50082-2:1995
Ambient temperature, operating range	–10 – +55 °C
Dimension diagram	D 1-18
Circuit diagram	KS 5120/2
Weight	0.6 kg
Accessories	B 5, B 7, BT 421, DA 1, V 4, Z 1
Approvals	–

Timer and switching relays
OFF-delay DZ 521 L

OFF-delay multi-range electromechanical timer relay

- Device for single voltage
- Function: OFF-delay (RV)
- 1 setting range divided into 5 or 6 time ranges
- Contact assignment: 1 timed and 1 instantaneous change-over contact

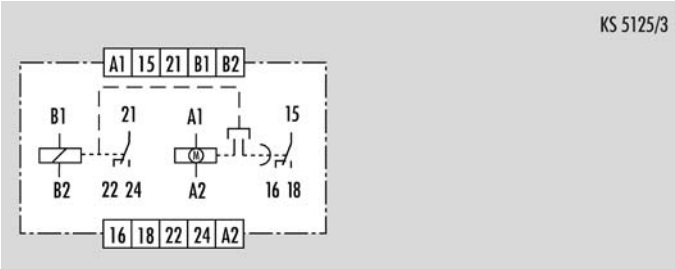
72 x 72



General information

- The electromechanical timer relay is equipped with synchronous motor and solenoid clutch.
- The time ranges are set on the front through selector switches. Infinitely variable time setting within a range is selected by a transparent rotary switch.
- The countdown indicator moves during operation from the set time value towards zero.

Circuit diagram



Notes

- With a frequency switch located at the bottom of the housing the relay can be adapted to the relevant frequency (50 or 60 Hz). The factory pre-setting is 50 Hz.
- Maximum repeatability is achieved with multi-range models by selecting the shortest possible time range.
- The time range on the devices has to be selected in the OFF position to avoid possible timing errors and incorrect contact switching.

Function

Upon application of the supply voltage at the motor and of the energizing quantity at the coil, the timed and the instantaneous contacts will switch. When the coil is de-energized, the countdown begins and the instantaneous contact falls back into the OFF position.

The countdown can be interrupted as often as desired without clearing the elapsed time. When the pre-set time has elapsed, the time contact falls back into the OFF position.

Time accumulation: Only by actuating the motor are the resulting operating times accumulated, meaning that the elapsed times are stored.

Resetting: If resetting is necessary after an interruption of the countdown, the time selector must be turned beyond the 0 marking to the end stop.

Time ranges

Available setting ranges:

0.3 s to 100 s
divided into 5 time ranges

0.03	…	1 s
0.1	…	3 s
0.3	…	10 s
1	…	30 s
3.3	…	100 s

0.1 s to 30 h
divided into 6 time ranges

0.1	…	3 s
1	…	30 s
1	…	30 min
0.1	…	3 h
1	…	30 h

0.1 s to 1000 s
divided into 6 time ranges

0.1	…	3 s
0.3	…	10 s
1	…	30 s
3.3	…	100 s
10	…	300 s
33	…	1000 s

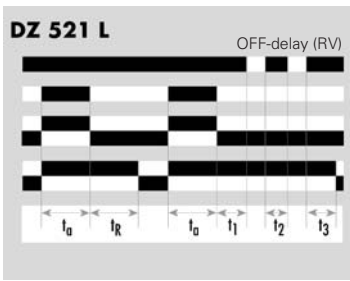
0.2 s to 60 h
divided into 6 time ranges

0.2	…	6 s
2	…	60 s
0.2	…	6 min
2	…	60 min
0.2	…	6 h
2	…	60 h

Timer and switching relays
OFF-delay DZ 521 L

interface

Function diagram

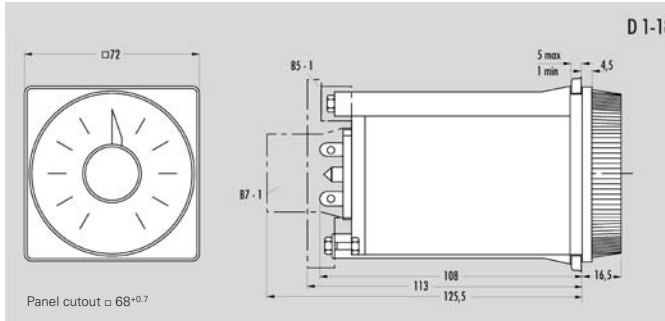


A1/A2	Supply voltage	FD 0012
B1/B2	Energizing quantity	
21/24 21/22	Instantaneous contact	
15/18 15/16	Delayed contact	

t_R = returning time
t_a = make time, must be > minimum time
t_2 = break time, must be > recovery time 2

Returning time during additive operation

Dimension diagram



Accessories

Female connector plate	B 5	for panel and surface mounting
Pin holder	B 7	for panel mounting
Adapter	BT 421	for rail mounting of the female connector plate B 5
Cover	DA 1	for panel cutout
Lockable cover	V 4	
Seal	Z 1	for panel mounting

Overview of devices/part numbers

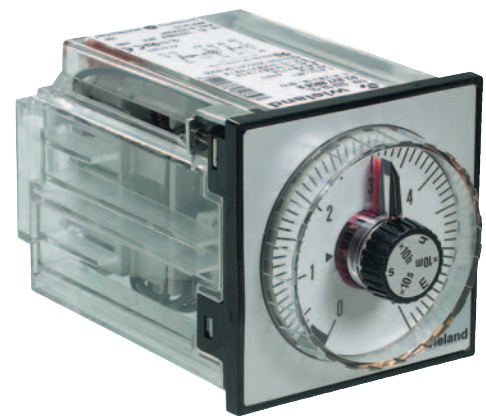
Type	Setting range	CSA [1]	Rated voltage		Part No.	Std. Pack
DZ 521 L	0.03 s … 100 s		AC 110 – 115 V	50/60 Hz	R2.024.1560.0	1
			AC 230 V	50/60 Hz	R2.024.1410.0	1
	0.1 s … 1000 s		AC 110 – 115 V	50/60 Hz	R2.024.1540.0	1
			AC 230 V	50/60 Hz	R2.024.1430.0	1
	0.1 s … 30 h		AC 110 – 115 V	50/60 Hz	R2.024.0320.0	1
			AC 230 V	50/60 Hz	R2.024.1050.0	1
		CSA	AC 110 – 115 V	50/60 Hz	R2.024.0030.0	1
	0.2 s … 60 h		AC 110 – 115 V	50/60 Hz	R2.024.1440.0	1
			AC 230 V	50/60 Hz	R2.024.1100.0	1
		CSA	AC 110 – 115 V	50/60 Hz	R2.024.0300.0	1
Devices with CSA approvals						

Timer and switching relays
OFF-delay DZ 521 L

Technical data	DZ 521 L
Function type according to DIN VDE 0435 sec. 110:04.89	Electromechanical timer relay for single voltage
	Item 3.17: OFF-delay additive timer relay
Function display	Pointer for operating time
Function diagram	FD 0012
Power supply circuit	
Rated voltage U_N	See "Overview of devices"
Rated consumption: motor at 50 Hz and UN (AC)	ca. 1.3 VA / ca. 1.1 W
Rated consumption: coil at 50 Hz and UN (AC)	ca. 4.5 VA / ca. 3.8 W
Rated frequency	50 and 60 Hz selectable on the device
Operating voltage range	0.8 – 1.1 x U_N
Time circuit	
Time setting / number of time ranges	analog / 6 or 5
Available setting ranges	See "Overview of devices"
Recovery time	–
Minimum ON time	250 ms
Release value	≥ 15 % U_N
Parallel loads permissible	yes
Internal half-wave rectification	yes
Error (average related to the full scale value)	during standard operation: Setting range > 6 s; ± 1.5 % Setting range 6 s; ± 2 % Setting range 3 s; ± 3 %
Dispersion	Standard operation / Rapid start
Setting range 0.03 – 1 s	± 0.045 s / ± 0.015 s
Setting range 0.3 – 10 s	± 0.09 s / ± 0.06 s
Setting range 3.3 – 100 s	± 0.54 s / ± 0.51 s
Max. operating time ≥ 3 min	± 0.5 % related to the full scale value
Output circuit	
Contact assignment	1 timed and 1 instantaneous change-over contact
Contact material	Ag Cu
Rated operating voltage Un	Un AC/DC 230 V
Max. continuous current I_n	I_n 5 A
Application category according to EN 60947-5-1:1991	AC-15: U_e 230 V AC, I_e 2 A DC-13: U_e 24 V DC, I_e 2 A
Permissible switching frequency	≤ 3600 switching cyclese/h
Mechanical life	30 x 10^6 switching cycles or 3 x 10^4 motor operation hours
Response time	≤ 30 ms
Release time	≤ 60 ms
General information	
Creepage distances and clearances between the circuits	according to DIN VDE 0110-1:04.97
Rated impulse voltage	4 kV
overvoltage category	III
Degree of pollution	3 outside 2 inside
Rated voltage	AC 250 V
Test voltage Ueff 50 Hz according to DIN VDE 0110-1, table A.1	2.21 kV
Protection degree housing/terminal according to DIN VDE 0470 sec. 1:11.92	IP 30/IP 20
Emitted interference	EN 50081-1:03.93, -2:03.94
Noise immunity	EN 50082-2:1995
Ambient temperature, operating range	–10 to +55 °C
Dimension diagram	D 1-18
Circuit diagram	KS 5125/3
Weight	0.6 kg
Accessories	B 5, B 7, BT 421, DA 1, V 4, Z 1
Approvals	

OFF-delay multi-range electromechanical timer relay

- Device for single voltage
- Function: OFF-delay (RV)
- 1 setting range divided into 6 time ranges
- Contact assignment: 1 timed and 1 instantaneous change-over contact



72 x 72

General information

- The electromechanical timer relay is equipped with synchronous motor and solenoid clutch.
- The time ranges are set on the front through selector switches. Infinitely variable time setting within a range is selected by a transparent rotary switch.
- The countdown indicator moves during operation from the set time towards zero.

Function

Upon application of the supply voltage at the motor and of the energizing quantity at the coil, the timed and the instantaneous contacts will switch. When the coil is de-energized, the countdown begins and the instantaneous contact falls back into the OFF position. The countdown can be interrupted as often as desired without clearing the already elapsed time. When the pre-set time has elapsed, the time contact falls back into the OFF position.

Time accumulation: Only by actuating the motor are the resulting operating times accumulated, meaning that the elapsed times are stored.

Resetting: If resetting is necessary after an interruption of the countdown, the time selector must be turned beyond the 0 marking to the end stop.

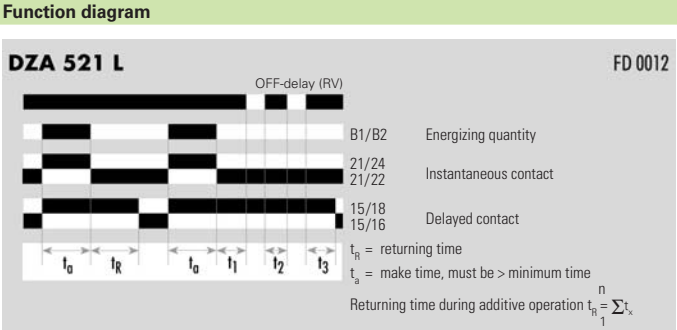
Notes

- With a frequency switch located at the bottom of the housing the relay can be adapted to the relevant frequency (50 or 60 Hz). The factory pre-setting is 50 Hz.
- Maximum repeatability is achieved with multi-range models by selecting the shortest possible time range.
- The time range on the devices has to be selected in the OFF position to avoid possible timing errors and incorrect contact switching.

Accessories

Female connector plate	B 5	for panel and surface mounting
Pin holder	B 7	for panel mounting
Adapter	BT 421	for rail mounting of the female connector plate B 5
Cover	DA 1	for panel cutout
Lockable cover	V 4	
Seal	Z 1	for panel mounting

Function diagram

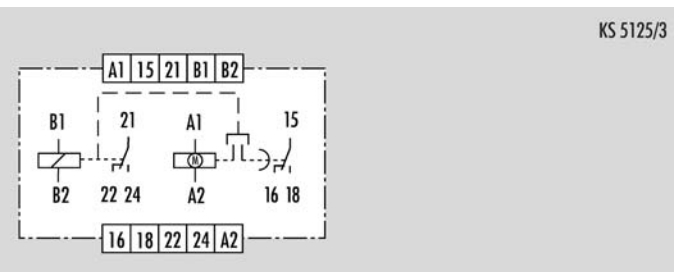


Time ranges

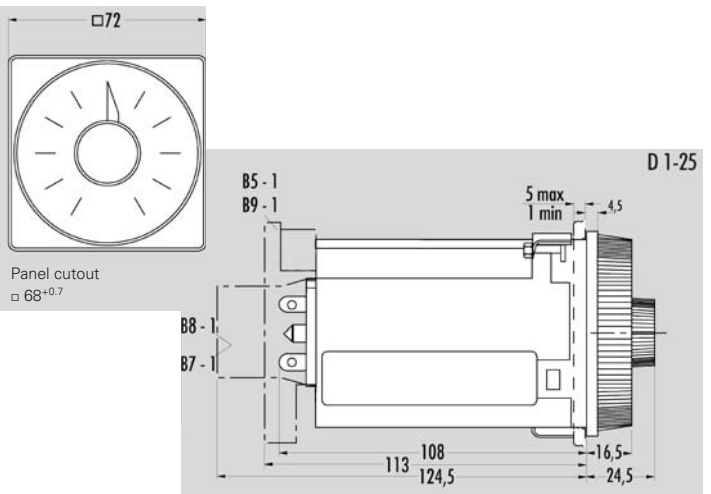
Available setting ranges:

0.1 s to 30 h	**0.2 s to 60 h**
divided into 6 time ranges	divided into 6 time ranges
0.1…3 s	0.2...6 s
1…30 s	2...60 s
0.1…3 min	0.2...6 min
1…30 min	2...60 min
0.1…3 h	0.2...6 h
1…30 h	2...60 h

Circuit diagram



Dimension diagram



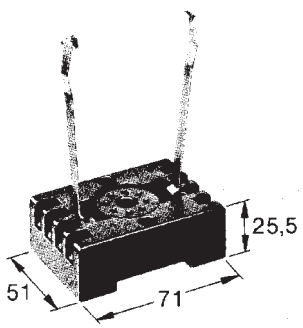
Timer and switching relays
OFF-delay DZA 521 L

Technical data	DZA 521 L
Function type according to DIN VDE 0435 sec. 110:04.89	Electromechanical timer relay for single voltage Item 3.17: OFF-delay additive timer relay
Function display	Pointer for operating time
Function diagram	FD 0012
Power supply circuit	
Rated voltage U_N	See "Overview of devices"
Rated consumption: motor at 50 Hz and U_N (AC)	ca. 1.3 VA/ca. 1.1 W
Rated consumption: coil at 50 Hz and U_N (AC)	ca. 1.0 VA/ca. 0.9 W
Rated frequency	50 and 60 Hz selectable on the device
Operating voltage range	0.8 – 1.1 x U_N
Time circuit	
Time setting / number of time ranges	analog/5 or 6
Available setting ranges	See table "Time ranges"
Recovery time	≤ 250 ms
Minimum ON time	150 ms
Release value	≥ 15 % U_N
Parallel loads permissible	yes
Internal half-wave rectification	yes
Error (average related to the full scale value)	during standard operation:
	Setting range > 6 s; ± 1.5 %
	Setting range 6 s; ± 2 %
	Setting range 3 s; ± 3 %
Dispersion	Standard operation / Rapid start
Setting range 0.03 – 1 s	± 0.045 s / ± 0.015 s
Setting range 0.3 – 10 s	± 0.09 s / ± 0.06 s
Setting range 3.3 – 100 s	± 0.54 s / ± 0.51 s
Max. operating time ≥ 3 min	± 0.5 % related to the full scale value
Output circuit	
Contact assignment	1 timed and 1 instantaneous change-over contact
Contact material	Ag Cu
Rated operating voltage Un	AC/DC 230 V
Max. continuous current I_n	5 A
Application category according to EN 60947-5-1:1991	AC-15: U_e 230 V AC, I_e 2 A DC-13: U_e 24 V DC, I_e 2 A
Permissible switching frequency	≤ 3600 switching cyclese/h
Mechanical life	30 x 10^6 switching cycles or 3 x 10^4 motor operation hours
Response time	≤ 25 ms
Release time	≤ 80 ms
General information	
Creepage distances and clearances between the circuits	according to DIN VDE 0110-1:04.97
Rated impulse voltage	4 kV
overvoltage category	III
Degree of pollution	3 outside 2 inside
Rated voltage	AC 250 V
Test voltage Ueff 50 Hz according to DIN VDE 0110-1, table A.1	2.21 kV
Protection degree housing/terminals in according with DIN VDE 0470 sec. 1:11.92	IP 30/IP 20
Emitted interference	EN 50081-1:03.93, -2:03.94
Noise immunity	EN 50082-2:1995
Ambient temperature, operating range	–10 – +55 °C
Dimension diagram	D 1-25
Circuit diagram	KS 5125/3
Weight	0.4 kg
Accessories	B 5, B 7, BT 421, DA 1, V 4, Z 1
Approvals	GL, UL, CSA

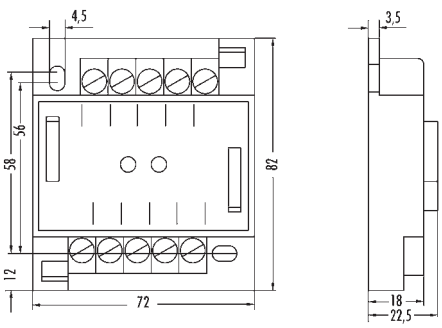
Overview of devices/part numbers

Type	Setting range	Rated voltage		Part No.	Std. Pack
DZA 521 L	0.1 s … 30 h	AC 24 V	50/60 Hz	R2.027.0290.0	1
		AC 110 – 115 V	50/60 Hz	R2.027.0310.0	1
		AC 230 V	50/60 Hz	R2.027.0100.0	1
	0.2 s … 60 h	AC 24 V	50/60 Hz	R2.027.0160.0	1
		AC 110 – 115 V	50/60 Hz	R2.027.0150.0	1
		AC 230 V	50/60 Hz	R2.027.0010.0	1

Discontinued types						
Type	**Rated voltage**		**Specification**	**Part No.**	**Std. Pack**	**Successor type**
DZR 12-S L-231	AC 24 V	50 Hz	30 min	R2.024.1610.0	1	–
DZR 13-S L-189/1	AC 230 V	50 Hz	60 min	R2.024.1840.0	1	–
DZR 13-S L-189/2	AC 230 V	50 Hz	120 min	R2.024.1270.0	1	–
DZR 13-S L-196/1	AC 230 V	50 Hz	600 min	R2.024.1230.0	1	–
DZR 13-S L-196/2	AC 230 V	50 Hz	120 min	R2.024.1290.0	1	–
DZR 13-S L-196/3	AC 230 V	50 Hz	24 h	R2.024.1240.0	1	–
DZR 13-S L-196/5	AC 230 V	50 Hz	26 h	R2.024.1260.0	1	–
DZR 13-S L-196/8	AC 230 V	50 Hz	72 h	R2.024.1250.0	1	–
MSP 33	AC 24 V	50 Hz	–	R2.152.0010.0	1	–
	AC 230 V	50 Hz	–	R2.152.0130.0	1	–
MSP 34	AC 230 V	50 Hz	–	R2.152.0020.0	1	SSP
MZ 54	AC 24 V	50/60 Hz	60 h	R2.011.0050.0	1	–
	AC 110 – 115 V	50/60 Hz	60 h	R2.011.0030.0	1	–
	AC 230 V	50/60 Hz	60 h	R2.011.0020.0	1	–
MZ 54 F	AC 110 – 115 V	50/60 Hz	60 h	R2.011.0040.0	1	–
	AC 230 V	50/60 Hz	60 h	R2.011.0010.0	1	–
PSW 82	AC 110 V	50/60 Hz	29 s, 615 s	R2.073.0010.0	10	–
PSW 84	AC 110 V	50/60 Hz	25 s, 357 s	R2.073.0020.0	10	–
SSP 43	DC 24 V	–	–	R2.152.0100.0	1	KSP 12
	DC 60 V	–	–	R2.152.0150.0	1	
	DC 110 V	–	–	R2.152.0160.0	1	
	DC 220 V	–	–	R2.152.0120.0	1	
SSP 64	DC 24 V	–	–	R2.153.0060.0	1	KSP 12
	DC 60 V	–	–	R2.153.0120.0	1	
	DC 110 V	–	–	R2.153.0150.0	1	
	DC 220 V	–	–	R2.153.0110.0	1	



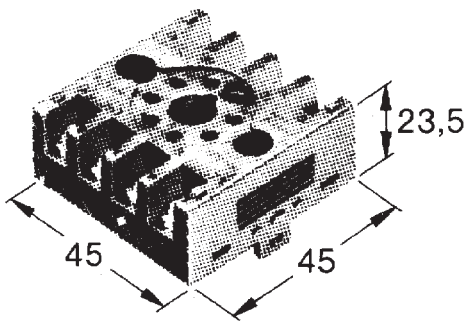
Dimensions in mm



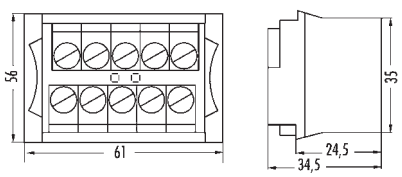
Dimensions in mm

Pin holder AT8-DF8S		Std. Pack
Function	Pin holder for DIN-rail mounting	
Degree of protection according to DIN VDE 0470 sec. 1:11.92	Front: IP 20 Terminals: IP 10	
Connections	Tab connector with self-lifting connection washer Conductor cross section	
Conductor cross section solid fine-stranded with ferrules	 1 or 2 x 0.75 – 2.5 mm² 1 or 2 x 0.5 – 1.5 mm²	
Weight	0.1 kg	
Part No.	R9.211.0060.0	1

Female connector plate B 5		Std. Pack
Function	Female connector for panel and surface mounting	
Material	Noryl, glass fiber reinforced (PPO mod.)	
Flammability	according to UL Standard 94 V-0	
Degree of protection according to DIN VDE 0470 sec. 1:11.92	Front: IP 20 Terminals: IP 10	
Connections	Screw terminals Tab connector with self-lifting connection washer	
Conductor cross section solid fine-stranded with ferrules	 1 or 2 x 0.75 – 2.5 mm² 1 or 2 x 0.5 – 1.5 mm²	
Weight	0.075 kg	
Part No.	R9.211.0080.0	1



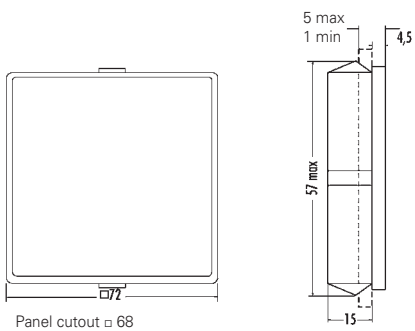
Dimensions in mm

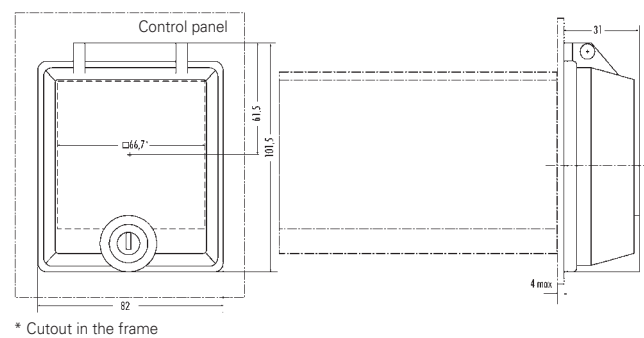


Dimensions in mm

Pin holder AT8-RR		Std. Pack
Function	Pin holder, connectable on both sides	
Degree of protection according to DIN VDE 0470 sec. 1:11.92	Front: IP 20 Terminals: IP 10	
Connections	Screw terminals Tab connector with self-lifting connection washer	
Conductor cross section solid fine-stranded with ferrules	 1 or 2 x 0.75 – 2.5 mm² 1 or 2 x 0.5 – 1.5 mm²	
Weight	0.1 kg	
Part No.	R9.211.0070.0	1

Pin holder B 7		Std. Pack
Function	Pin holder for panel mounting	
Material	Noryl, glass fiber reinforced (PPO mod.)	
Flammability	according to UL Standard 94 V-0	
Degree of protection according to DIN VDE 0470 sec. 1:11.92	Front: IP 20 Terminals: IP 10	
Connections	Screw terminals Tab connector with self-lifting connection washer	
Conductor cross section solid fine-stranded with ferrules	 1 or 2 x 0.75 – 2.5 mm² 1 or 2 x 0.5 – 1.5 mm²	
Weight	0.05 kg	
Part No.	R9.211.0200.0	1



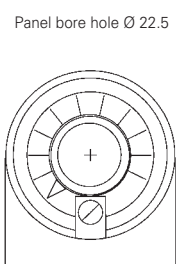


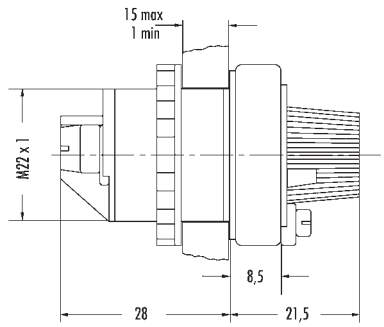
Dimensions in mm

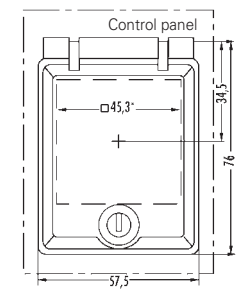
Dimensions in mm

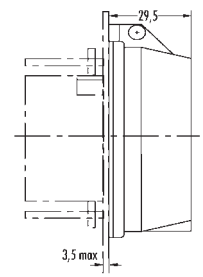
Cover DA 1		Std. Pack
Function	Cover for panel cutout	
Material	Polycarbonate (PC)	
Flammability	according to UL Standard 94 V-0	
Weight	0.03 kg	
Standard pack	10 pieces	
Part No.	R9.211.0230.0	1

Sealable cover V 4		Std. Pack
Function	Lockable cover	
Material	Polycarbonate (PC)	
Flammability	according to UL Standard 94 V-0	
Weight	0.11 kg	
Part No.	R9.211.0170.0	1







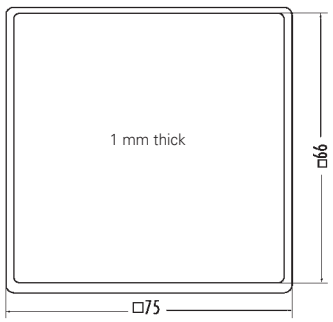


Dimensions in mm

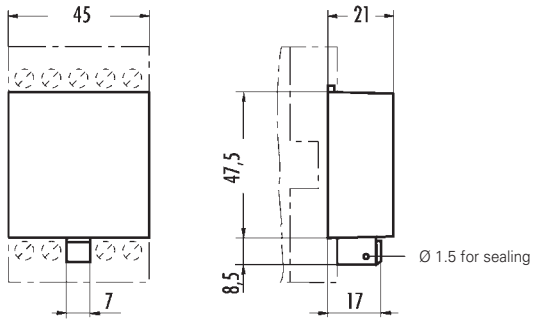
Dimensions in mm

Remote potentiometer FP 10k		Std. Pack
Function	Remote potentiometer for time setting	
Material	Polybutylenterephthalate (PBT)	
Flammability	according to UL Standard 94 V-0	
Degree of protection according to DIN VDE 0470 sec. 1:11.92	Front: IP 54 Terminals: IP 10	
Connections	Screw terminals Tab connector with self-lifting connection washer	
Conductor cross section solid fine-stranded with ferrules	 1 or 2 x 0.75 – 2.5 mm² 1 or 2 x 0.5 – 1.5 mm²	
Weight	0.025 kg	
Part No.	R9.211.0010.0	1

Sealable cover V 5		Std. Pack
Function	Lockable cover, transparent	
Material	Polycarbonate (PC)	
Flammability	according to UL Standard 94 V-0	
Weight	0.07 kg	
Part No.	R9.211.0300.0	1



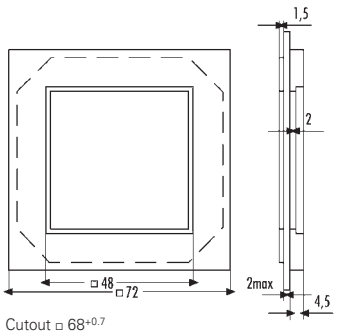
Dimensions in mm



Dimensions in mm

Gasket Z 1		Std. Pack
Function	Gasket for panel mounting	
Standard pack	5 pieces	
Part No.	R9.211.0190.0	1

Cover Z 29		Std. Pack
Function	sealable transparent cap for housing S 3-1, S 3-2, S 3-9, S 3-12	
Material	Polycarbonate (PC)	
Color	transparent	
Flammability	according to UL Standard 94 V-1	
Weight	0.01 kg	
Standard pack	5 pieces	
Part No.	R9.211.0090.0	5

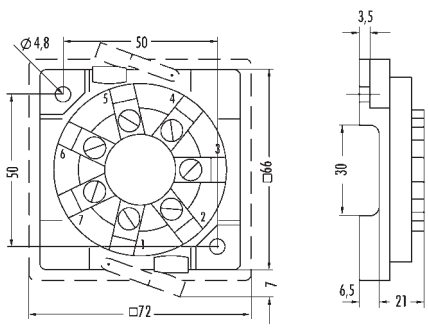


Cutout □ $68^{+0.7}$

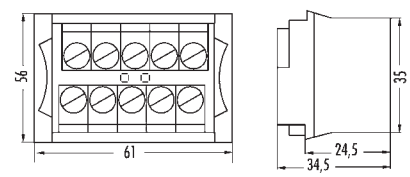
Dimensions in mm

Additional front frame Z 19		Std. Pack
Function	Additional front frame	
Material	Thermoplast, gray Sheet steel, nickel-plated	
Weight	0.07 kg	
Part No.	R9.211.0050.0	1

Accessories for discontinued types			
Discontinued type	**Part No.**	**Std. Pack**	**Successor type**
DA 1-101	R9.211.0030.0	10	–
K 1-5/5	R9.210.0020.0	1	NGG housings
SN 18	R9.216.0010.0	1	–
V 4-101	R9.211.0020.0	1	–



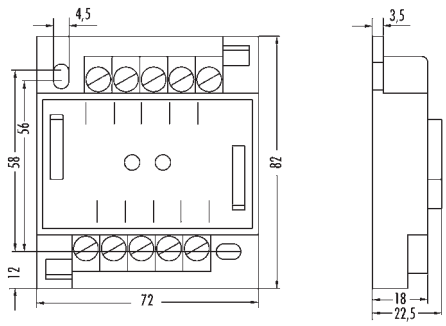
Dimensions in mm



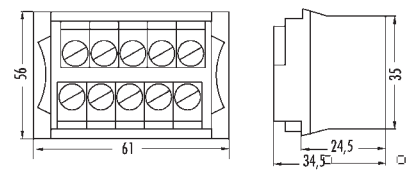
Dimensions in mm

Female connector plate B 4		**Std. Pack**
Function	Female connector for panel and surface mounting	
Material	Polybutylenterephthalate (PBT)	
Flammability	according to UL Standard 94 V-0	
Degree of protection	Front: IP 20	
according to DIN VDE 0470 sec. 1:11.92	Terminals: IP 10	
Connections	Screw terminals	
	Tab connector with self-lifting connection washer	
Conductor cross section		
solid	1 or 2 x 0.75 – 2.5 mm^2	
fine-stranded with ferrules	1 or 2 x 0.5 – 1.5 mm^2	
Weight	0.055 kg	
Part No.	R9.211.0290.0	1

Pin holder B 7		**Std. Pack**
Function	Pin holder for panel mounting	
Material	Noryl, glass fiber reinforced (PPO mod.)	
Flammability	according to UL Standard 94 V-0	
Degree of protection	Front: IP 20	
according to DIN VDE 0470 sec. 1:11.92	Terminals: IP 10	
Connections	Screw terminals	
	Tab connector with self-lifting connection washer	
Conductor cross section		
solid	1 or 2 x 0.75 – 2.5 mm^2	
fine-stranded with ferrules	1 or 2 x 0.5 – 1.5 mm^2	
Weight	0.05 kg	
Part No.	R9.211.0200.0	1



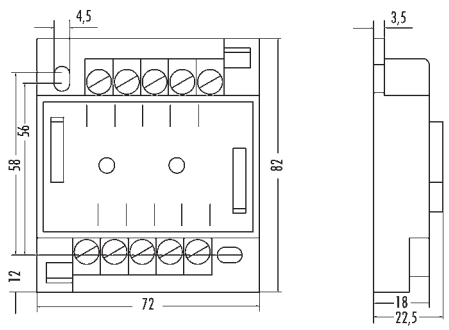
Dimensions in mm



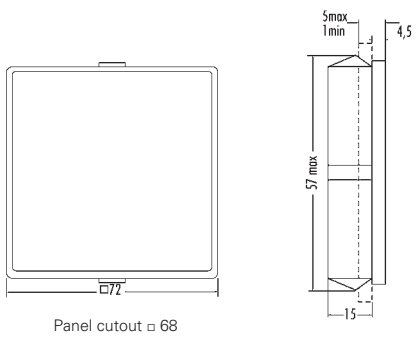
Dimensions in mm

Female connector plate B 5		**Std. Pack**
Function	Female connector for panel and surface mounting	
Material	Noryl, glass fiber reinforced (PPO mod.)	
Flammability	according to UL Standard 94 V-0	
Degree of protection	Front: IP 20	
according to DIN VDE 0470 sec. 1:11.92	Terminals: IP 10	
Connections	Screw terminals	
	Tab connector with self-lifting connection washer	
Conductor cross section		
solid	1 or 2 x 0.75 – 2.5 mm^2	
fine-stranded with ferrules	1 or 2 x 0.5 – 1.5 mm^2	
Weight	0.075 kg	
Part No.	R9.211.0080.0	1

Pin holder B 8		**Std. Pack**
Function	Pin holder for panel mounting	
Material	Noryl, glass fiber reinforced (PPO mod.)	
Flammability	according to UL Standard 94 V-0	
Degree of protection	Front: IP 20	
according to DIN VDE 0470 sec. 1:11.92	Terminals: IP 10	
Connections	Screw terminals	
	Tab connector with self-lifting connection washer	
Conductor cross section		
solid	1 or 2 x 0.75 – 2.5 mm^2	
fine-stranded with ferrules	1 or 2 x 0.5 – 1.5 mm^2	
Weight	0.05 kg	
Part No.	R9.211.0250.0	1



Dimensions in mm

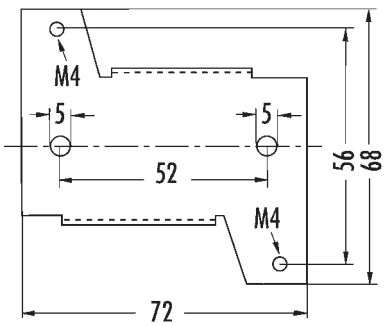


Panel cutout □ 68

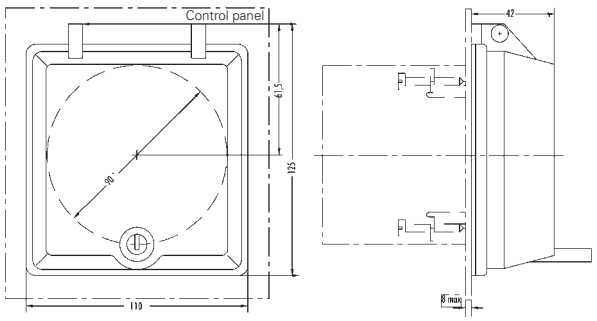
Dimensions in mm

Female connector plate B 9	**Std. Pack**
Function	Female connector for panel and surface mounting
Material	Noryl, glass fiber reinforced (PPO mod.)
Flammability	according to UL Standard 94 V-0
Degree of protection	Front: IP 20
according to DIN VDE 0470 sec. 1:11.92	Terminals: IP 10
Connections	Screw terminals
	Tab connector with self-lifting connection washer
Conductor cross section	
solid	1 or 2 x 0.75 – 2.5 mm²
fine-stranded with ferrules	1 or 2 x 0.5 – 1.5 mm²
Weight	0.055 kg
Part No.	R9.211.0240.0 1

Cover DA 1	**Std. Pack**
Function	Cover for panel cutout
Material	Polycarbonate (PC)
Flammability	according to UL Standard 94 V-0
Weight	0.03 kg
Standard pack	10 pieces
Part No.	R9.211.0230.0 1



Dimensions in mm

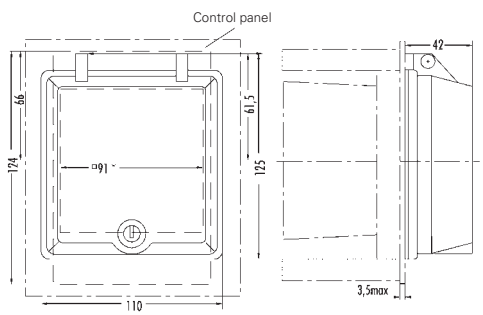


* Hole diameter in the frame

Dimensions in mm

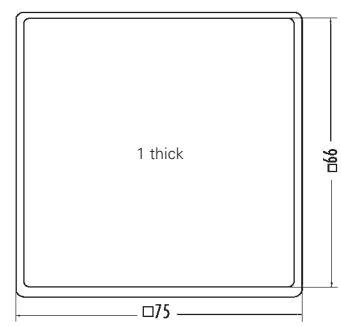
Adapter BT 421	**Std. Pack**
Function	Adapter for rail mounting of the female connector plates B 5 and B 9
Standard pack	10 pieces
Part No.	R9.211.0260.0 10

Sealable cover V 2	**Std. Pack**
Function	Lockable cover
Material	Polycarbonate (PC)
Flammability	according to UL Standard 94 V-0
Weight	0.11 kg
Part No.	R9.211.0270.0 1



* Cutout in the frame

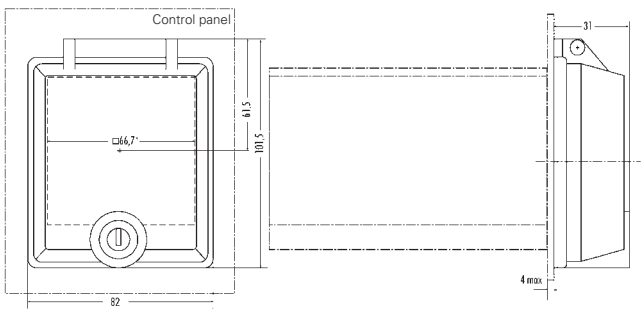
Dimensions in mm



Dimensions in mm

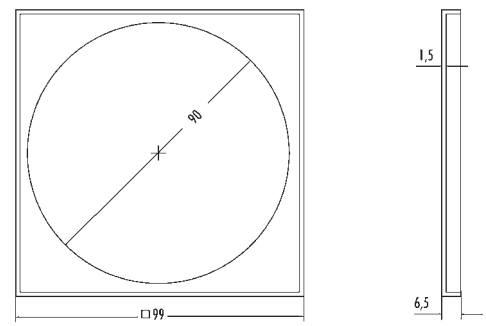
Sealable cover V 3	Std. Pack
Function	Lockable cover
Material	Polycarbonate (PC)
Flammability	according to UL Standard 94 V-0
Weight	0.1 kg
Part No.	R9.211.0280.0 1

Gasket Z 1	Std. Pack
Function	Gasket for panel mounting
Standard pack	5 pieces
Part No.	R9.211.0190.0 1



* Cutout in the frame

Dimensions in mm



Dimensions in mm

Sealable cover V 4	Std. Pack
Function	Lockable cover
Material	Polycarbonate (PC)
Flammability	according to UL Standard 94 V-0
Weight	0.11 kg
Part No.	R9.211.0170.0 1

Gasket Z 2	Std. Pack
Function	Gasket for panel mounting
Part No.	R9.211.0180.0 1

Accessories for discontinued types

Discontinued type	Part No.	Std. Pack	Successor type
DA 1-101	R9.211.0030.0	10	–
K 1-5/5	R9.210.0020.0	1	NGG housings
SN 18	R9.216.0010.0	1	–
V 4-101	R9.211.0020.0	1	–

Electronic three-phase contactor

The semiconductor relays can also switch inductive field devices such as motors with zero voltage feed-through on or off.

Dimensions (mm): W x H x D
45 x 75 x 110

cemos-SSAC3-400 V – 2 A
Electronic three-phase contactor

Description	Type	Part No.	Std. Pack
Electronic three phase contactor			
Electronic reversing contactor	cemos-SSAC3-400V-2A	80.020.6000.0	1
Input			
Operating voltage	24 V AC/DC +10%/-15%		
Nominal input current AC/DC	ca. 44/21 mA		
Nominal input power	ca. 1 VA/0.5 W		
Voltage range for "OFF"	0...10 V AC/DC		
Interlocking of control inputs			
Reversing time (delay) left/right			
Protection circuit of input	Overvoltage protection		
Status display	Green LED		
Output			
Nominal switching voltage	400 V AC		
Maximum switching voltage	500 V AC		
Minimum switching voltage	100 V AC		
Peak reverse voltage	1200 Vs		
Critical rate of rise voltage	500 V/µs		
Critical on-state voltage	1.1 V		
Maximum current	2 A		
Minimum current	150 mA		
Maximum peak current (10 ms)	230 A		
Typical residual current	6 mA		
Power factor cos φ	≥ 0.5		
Zero-sequence voltage switch	yes		
I^2t value	265 A^2s		
Semiconductor fuse	FF		
Maximum motor power	0.75 W		
Protection circuit of output	RCV circuit		
Maximum pickup delay	10 ms		
Maximum dropout delay	10 ms		
Maximum switching frequency, resistive	10 Hz		
Maximum switching frequency, inductive	5 Hz		
Isolation voltage between input/output	4 kV_{eff}		
Ambient temperature	0 °C – +50 °C		
Storage temperature	-25 °C – +55 °C		
Type of protection/mounting rail	IP 20/TS 35		
Wire range			
finely stranded	0.5 mm^2 – 2.5 mm^2		
single core	0.5 mm^2 – 4 mm^2		
Position of mounting rail	horizontal		
Norms/specifications	VDE 0160		
Emitted interference	EN 50081		
Interference immunity	EN 50082		

Electronic reversing contactor

The electronic reversing contactor switches three-phase motors on or off and also reverses the direction of rotation.

It also provides characteristics such as mutual ON interlock as well as a fixed minimum change-over time between clockwise and counterclockwise rotation.

cemos-SSPHC-400 V – 2.5 A
Electronic reversing contactor

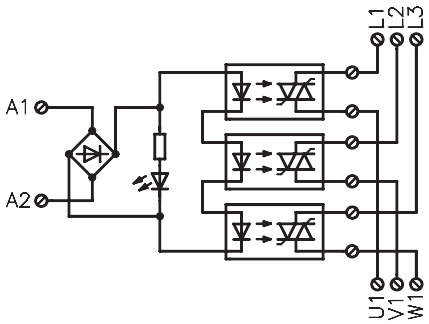
Dimensions (mm): W x H x D
45 x 75 x 110

Description	Type	Part No.	Box Qty
Electronic reversing contactor	cemos-SSPHC-400V-2.5A	80.020.6003.0	1
Input			
Operating voltage	24 V AC/DC +10%/-15%		
Nominal input current AC/DC	ca. 23 mA		
Nominal input power	ca. 0.6 W		
Voltage range for "OFF"	0...10 V DC		
Interlocking of control inputs	yes		
Reversing time (delay) left/right	ca. 100 ms		
Protection circuit of input	Overvoltage protection		
Status display	Green LED		
Output			
Nominal switching voltage	400 V AC		
Maximum switching voltage	500 V AC		
Minimum switching voltage	100 V AC		
Peak reverse voltage	1200 Vs		
Critical rate of rise voltage	500 V/µs		
Critical on-state voltage	1.1 V		
Maximum current	2.5 A		
Minimum current	150 mA		
Maximum peak current (10 ms)	230 A		
Typical residual current	6 mA		
Power factor cos φ	≥ 0.5		
Zero-sequence voltage switch	yes		
I^2t value	265 A^2s		
Semiconductor fuse	FF		
Maximum motor power	1.1 kW		
Protection circuit of output	RCV circuit		
Maximum pickup delay	10 ms		
Maximum dropout delay	10 ms		
Maximum switching frequency, resistive	10 Hz		
Maximum switching frequency, inductive	2 kHz		
Isolation voltage between input/output	4 kV_{eff}		
Ambient temperature	0 °C – +50 °C		
Storage temperature	-25 °C – +55 °C		
Type of protection/mounting rail	IP 20/TS 35		
Wire range			
finely stranded	0.5 mm^2 – 2.5 mm^2		
single core	0.5 mm^2 – 4 mm^2		
Position of mounting rail	horizontal		
Norms/specifications	VDE 0160		
Emitted interference	EN 50081		
Interference immunity	EN 50082		

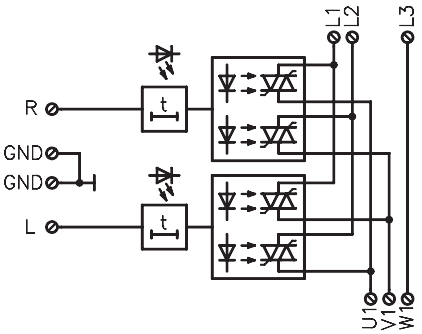
Electronic contactors

Circuit diagrams and Derating curves

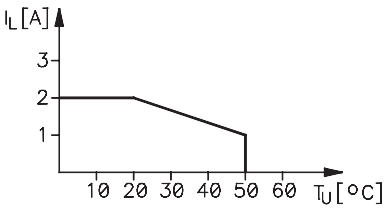
Electronic three-phase contactor



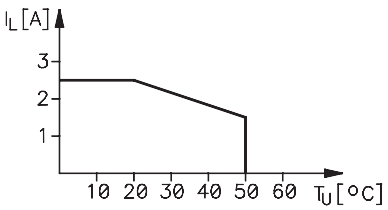
Electronic reversing contactor



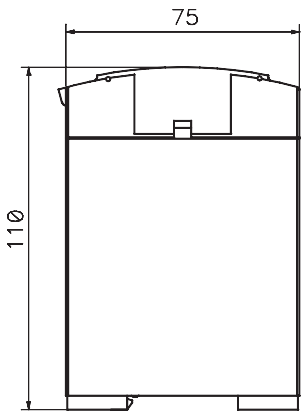
Derating of three phase-contactor



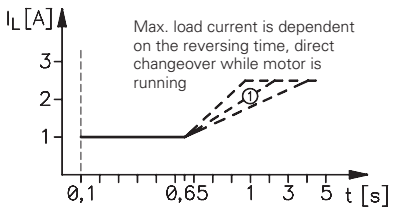
Reversing contactor in static mode



Electronic three-phase contactor and Electronic reversing contactor



Reversing contactor in dynamic mode



① Curve dependent on motor torque