WERNER
Inventing Innovation...

Living Industrial Partnerships

PRODUCT SPECIFICATION

21 Series
General Purpose Relays

"Orange Marking Plate for AC Relays"

"Green Marking Plate for DC Relays"

www.wernerelektrik.com

General Purpose Relays

WERNER`s 21 Series General Purpose & Power Relays represent the most complete line of state-of-the-art high performance electrical switches, designed and manufactured to highest international industry standards. Mechanical lifetimes of up to 10 Million operations and electrical durability of up to 250.000 switching cycles under full load make WERNER Relays your best choice of all.

Features Overview

- All models designed applying MFMS design principles (Max Function Min Space)
- All models designed applying solid modeling and finite elements design methods
- All Power Relay Series are equipped with mechanical operation status indicator
- All models approved under CE standards
- All models design for heavy duty or even vibrating environments
- All models available for use with 50 Hz and 60 Hz cycles

Highlights

- All fixed contacts powered by WERNER AFT (Anti-Fuse-Technology)
- All Power Relays Series provide massive silver blade or pin contacts
- Power Relay Series with up to 10 Ampere Continuous Load Current
- Most models available in 6V, 12V, 24V, 110V & 220V AC or DC
- Most models available in DPDT, 3PDT as well as 4DPT
- Up to 7 types of operation status indication available

21 Series General Purpose & Power Relays by WERNER provide our highly demanding industrial customers out of all industry verticals worldwide with the most reliable devices in the industry. Combined with the vast selection of sockets in our 70 – 75 Product Series you will find an industrial solution exceeding your expectations whilst satisfying you're every need and design requirement.

General Purpose Relays

Features:

Switching Power of 3A, 5A, 7A & 10A
No Cadmium
Blade & PC Board mounting
Built-in LED
DPDT & 4PDT
Compact & small in size

Over voltage category

III, as per EN IEC 60947-5-1

Approvals

Approbations and Declaration of conformity

CE CE

Coil Specifications

DC Coil Ratings

Nominal Voltage (Vn)	Resistance (Ω) (Tolerence ± 10%)	Operating Range (V)			Rated Current Consumption of coil (mA)	Coil Power
		Drop-Out Voltage (Min.10% of Vn)	Vmin (80% of Vn)	Vmax (110% of Vn)		
6V	41	0.6	4.8	6.6	150	0.9W
12V	160	1.2	9.6	13.2	75	
24V	640	2.4	19.2	26.4	37.5	
48V	2640	4.8	38.4	52.8	19	
110V (100/110V)	11K	11	88	121	8.2	
120V (110/120V)	16K	12	96	132	7.5	
220V	54K	22	176	242	4.1	

AC Coil Ratings

Nominal Voltage (Vn)	Resistance (Ω) (Tolerence ± 10%)	Operating Range (V)			Rated Current Consumption of coil (mA)		Coil Power
		Drop-Out Voltage (Min.30% of Vn)	Vmin (80% of Vn)	Vmax (110% of Vn)	50Hz	60Hz	
24V	180	7.2	19.2	26.4	58.3	50	1.2VA (@60Hz) 1.4VA (@50Hz)
48V	640	14.4	38.4	52.8	29.2	25	
110V (100/110V)	3750	33	88	121	13	11	
120V (110/120V)	4430	36	96	132	12	10	
220V (200/220V)	12950	66	176	242	6.4	5.5	
230V	17000	69	184	253	-	-	
240V	18790	72	192	264	6	5	

Weight

Model No.	21.12 & 21.22 (DPDT)	21.14 & 21.24 (4PDT)
Weight (approx.)	35g	39g

Contact Ratings

Model	Continuous Current	Maximum Switching Power	Rated Load		
			Voltage (V)	Res. Load	Ind. Load
DPDT	5A	1100VA AC 150W	220V AC	5A	2.5 A
			30V DC	5A	2.5 A
	10A	2500VA AC 370W	220V AC	10A	5A
			30V DC	10A	5A
4PDT	3A	1200VA AC 150W	220V AC	3A	1.5A
			30V DC	3A	1.5A
	7A	1750VA AC 125W	220V AC	7A	3.5A
			30V DC	7A	3.5A

Specifications

Operating Temperature	Blade Terminal	DPDT	-25 to +45°C (No freezing)	
		4PDT	-25 to +55°C (No freezing)	
Operating Temperature	PC Board Terminal	DPDT	-25 to +45°C (No freezing)	
		4PDT	-25 to +55°C (No freezing)	
Contact Resistance		DPDT	30mΩ maximum	
		4PDT	50mΩ maximum	
Operating Humidity		–	45 to 85% RH (no condensation)	
Insulation Resistance		–	100 MΩ minimum (500V DC megger)	
Dielectric Strength		DPDT 4PDT	Between live and dead parts:	2,200V AC, 1 minute
			Between contact and coil:	2,200V AC, 1 minute
			Between contacts of different poles:	2,200V AC, 1 minute
			Between contacts of the same pole:	1,000V AC, 1 minute
Vibration Resistance		–	Damage limits:	10 to 60Hz, amplitude 0.5 mm
			Operating extremes:	10 to 55Hz, amplitude 0.5 mm
Shock Resistance		–	Damage limits:	1,000m/s²
			Operating extremes:	200m/s²
Mechanical Durability		AC DC	10,000,000 operations minimum	
Electrical Durability		DPDT	500,000 operations minimum (220V AC, 5A)	
		4PDT	200,000 operations minimum (220V AC, 3A)	
Power Consumption (approx.)		DPDT 4PDT	AC: 1.4 VA (50 Hz), 1.2 VA (60 Hz) DC: 0.9W	
Operate Time		DPDT 4PDT	20ms maximum	
Release Time		DPDT 4PDT	20ms maximum	
Minimum Applicable Load		DPDT	5V DC, 1 mA (reference value)	
		4PDT	1V DC, 1 mA (reference value)	
Contact Material		DPDT	AgSnO2	
		4PDT	AgSnO2, AgNi	
Operating Frequency		–	Electrical:	2000 operations/hour maximum
			Mechanical:	20,000 operations/hour maximum

Measured at 20° C Operating temperature

Model Number Structure - General Purpose Relays

21.14.31.120

Series
21 Series General Purpose Relays

Terminal Type	
1	Plug-in
2	PCB

Number of Poles & Contact Rating	
2	DPDT - 5A
4	4PDT - 3A
5	DPDT - 10A
6	4PDT - 7A

Features	
0	Basic
1	LED Indicator
2	LED+Diode (DC, polarity positive to pin A2/14)
3	LED+Lockable Test Button+Mechanical Indicator
4	LED+Lockable Test Button+Mechanical Indicator +Diode (DC, polarity positive to pin A2/14)

Coil Rating	
006	6V (Only DC)
012	12V (Only DC)
024	24V
048	48V
110	110V (100/110V)
120	120V (110/120V
220	220V
230	230V (Only AC)
240	240V (Only AC)

Coil Type	
1	AC (50 / 60Hz)
2	DC

Model Number Selection

Appearance	Terminal Type	Types	Voltage	Model No. DPDT AC	Model No. DPDT DC
 DPDT	Blade	Basic	6V	–	21.12.02.006
			12V	–	21.12.02.012
			24V	21.12.01.024	21.12.02.024
			48V	21.12.01.048	21.12.02.048
			110V	21.12.01.110	21.12.02.110
			120V	21.12.01.120	21.12.02.120
			220V	21.12.01.220	21.12.02.220
			230V	21.12.01.230	–
			240V	21.12.01.240	–
		LED	6V	–	21.12.12.006
			12V	–	21.12.12.012
			24V	21.12.11.024	21.12.12.024
			48V	21.12.11.048	21.12.12.048
			110V	21.12.11.110	21.12.12.110
			120V	21.12.11.120	21.12.12.120
			220V	21.12.11.220	21.12.12.220
			230V	21.12.11.230	–
			240V	21.12.11.240	–
		LED & Diode DC Only	6V	–	21.12.22.006
			12V	–	21.12.22.012
			24V	–	21.12.22.024
			48V	–	21.12.22.048
			110V	–	21.12.22.110
			120V	–	21.12.22.120
			220V	–	21.12.22.220
 4PDT		LED & Check button	6V	–	21.12.32.006
			12V	–	21.12.32.012
			24V	21.12.31.024	21.12.32.024
			48V	21.12.31.048	21.12.32.048
			110V	21.12.31.110	21.12.32.110
			120V	21.12.31.120	21.12.32.120
			220V	21.12.31.220	21.12.32.220
			230V	21.12.31.230	–
			240V	21.12.31.240	–
		LED & Diode & Check button DC Only	6V	–	21.12.42.006
			12V	–	21.12.42.012
			24V	–	21.12.42.024
			48V	–	21.12.42.048
			110V	–	21.12.42.110
			120V	–	21.12.42.120
			220V	–	21.12.42.220

Model Number Selection

Model No.	
4PDT	
AC	DC
–	21.14.02.006
–	21.14.02.012
21.14.01.024	21.14.02.024
21.14.01.048	21.14.02.048
21.14.01.110	21.14.02.110
21.14.01.120	21.14.02.120
21.14.01.220	21.14.02.220
21.14.01.230	–
21.14.01.240	–
–	21.14.12.006
–	21.14.12.012
21.14.11.024	21.14.12.024
21.14.11.048	21.14.12.048
21.14.11.110	21.14.12.110
21.14.11.120	21.14.12.120
21.14.11.220	21.14.12.220
21.14.11.230	–
21.14.11.240	–
	21.14.22.006
	21.14.22.012
	21.14.22.024
	21.14.22.048
	21.14.22.110
	21.14.22.120
–	21.14.22.220
–	21.14.32.006
–	21.14.32.012
21.14.31.024	21.14.32.024
21.14.31.048	21.14.32.048
21.14.31.110	21.14.32.110
21.14.31.120	21.14.32.120
21.14.31.220	21.14.32.220
21.14.31.230	–
21.14.31.240	–
–	21.14.42.006
–	21.14.42.012
–	21.14.42.024
–	21.14.42.048
–	21.14.42.110
–	21.14.42.120
–	21.14.42.220

Model Number Selection

Appearance	Terminal Type	Types	Voltage	Model No. DPDT AC	Model No. DPDT DC
 DPDT	PC Board	Basic	6V	–	21.22.02.006
			12V	–	21.22.02.012
			24V	21.22.01.024	21.22.02.024
			48V	21.22.01.048	21.22.02.048
			110V	21.22.01.110	21.22.02.110
			120V	21.22.01.120	21.22.02.120
			220V	21.22.01.220	21.22.02.220
			230V	21.22.01.230	–
			240V	21.22.01.240	–
		LED	6V	21.22.11.006	21.22.12.006
			12V	21.22.11.012	21.22.12.012
			24V	21.22.11.024	21.22.12.024
			48V	21.22.11.048	21.22.12.048
			110V	21.22.11.110	21.22.12.110
			120V	21.22.11.120	21.22.12.120
			220V	21.22.11.220	21.22.12.220
			230V	21.22.11.230	–
			240V	21.22.11.240	–
		LED & Diode DC Only	6V	–	21.22.22.006
			12V	–	21.22.22.012
			24V	–	21.22.22.024
			48V	–	21.22.22.048
			110V	–	21.22.22.110
			120V	–	21.22.22.120
			220V	–	21.22.22.220
 4PDT		LED & Check button	6V	21.22.31.006	21.22.32.006
			12V	21.22.31.012	21.22.32.012
			24V	21.22.31.024	21.22.32.024
			48V	21.22.31.048	21.22.32.048
			110V	21.22.31.110	21.22.32.110
			120V	21.22.31.120	21.22.32.120
			220V	21.22.31.220	21.22.32.220
			230V	21.22.31.230	–
			240V	21.22.31.240	–
		LED & Diode & Check button DC Only	6V	–	21.22.42.006
			12V	–	21.22.42.012
			24V	–	21.22.42.024
			48V	–	21.22.42.048
			110V	–	21.22.42.110
			120V	–	21.22.42.120
			220V	–	21.22.42.220

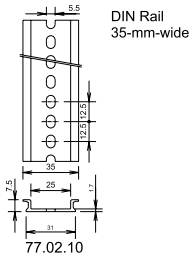
Model Number Selection

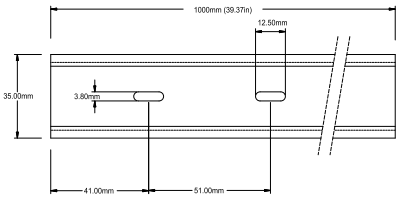
Model No.	
4PDT	
AC	DC
–	21.24.02.006
–	21.24.02.012
21.24.01.024	21.24.02.024
21.24.01.048	21.24.02.048
21.24.01.110	21.24.02.110
21.24.01.120	21.24.02.120
21.24.01.220	21.24.02.220
21.24.01.230	
21.24.01.240	
–	21.24.12.006
–	21.24.12.012
21.24.11.024	21.24.12.024
21.24.11.048	21.24.12.048
21.24.11.110	21.24.12.110
21.24.11.120	21.24.12.120
21.24.11.220	21.24.12.220
21.24.11.230	–
21.24.11.240	–
–	21.24.22.006
–	21.24.22.012
–	21.24.22.024
–	21.24.22.048
–	21.24.22.110
–	21.24.22.120
–	21.24.22.220
–	21.24.32.006
–	21.24.32.012
21.24.31.024	21.24.32.024
21.24.31.048	21.24.32.048
21.24.31.110	21.24.32.110
21.24.31.120	21.24.32.120
21.24.31.220	21.24.32.220
21.24.31.230	–
21.24.31.240	–
–	21.24.42.006
–	21.24.42.012
–	21.24.42.024
–	21.24.42.048
–	21.24.42.110
–	21.24.42.120
–	21.24.42.220

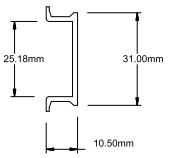
Accessories

DIN Rails


77.02.10







DIN Rail No.	Material	Length	Weight	Width
77.02.10	Aluminum	1000 mm	200 g	35 mm

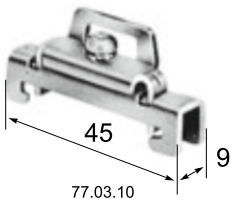
Sockets - Blade Terminal Models

Socket Specifications

Mounting Type		Terminal	Torque	Wire Size	Model No. 2 Poles	Model No. 4 Poles
DIN Rail	With Finger-safe	M3 screws - coil M3.5 screws - contact	5.5 - 9in•lbs	up to 2 - 14AWG	71.12.01	71.14.01
	Without Finger-safe	M3 screws - coil M3.5 screws - contact	5.5 - 9in•lbs	up to 2 - 14AWG	71.12.00	71.14.00
PCB Mount Socket	–	–	–	–	71.22	71.24

Poles	2 Poles			4 Poles		
	No Finger-safe	Finger-safe	PCB	No Finger-safe	Finger-safe	PCB
Voltage	250V	250V	250V	250V	250V	250V
A	7	10	7	7	10	7

Mounting Clips



Mounting Clips No.	Rails	Width	Weight
77.03.10	77.02.10	45 mm	15.2 g

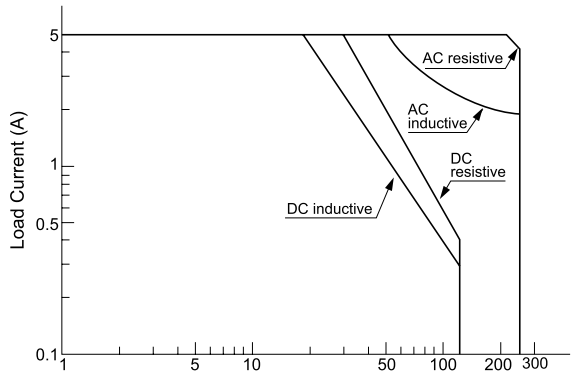
Applicable Clips

Appearance	Description	Relay	Suitable For DIN Mount Socket
	Leaf Spring (top latch)	21.12 & 21.22 (DPDT)	71.03.01
		21.14 & 21.24 (4PDT)	
	Wire Spring	21.12 & 21.22 (DPDT)	21.WC
		21.14 & 21.24 (4PDT)	

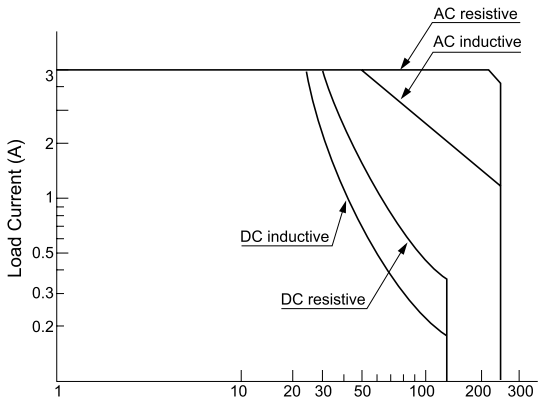
* For Suitable relay please check Sockets catalogue

Switching Capacity

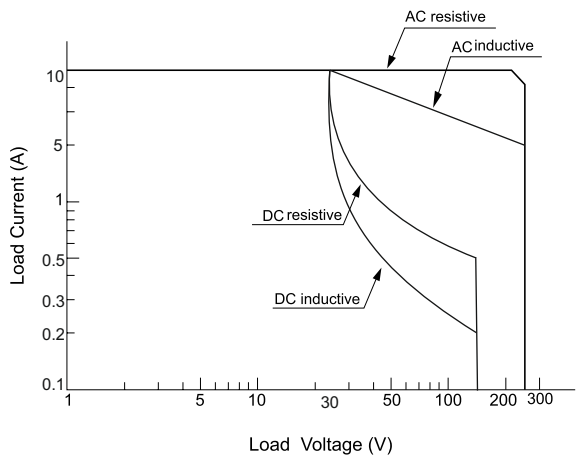
DPDT	4PDT



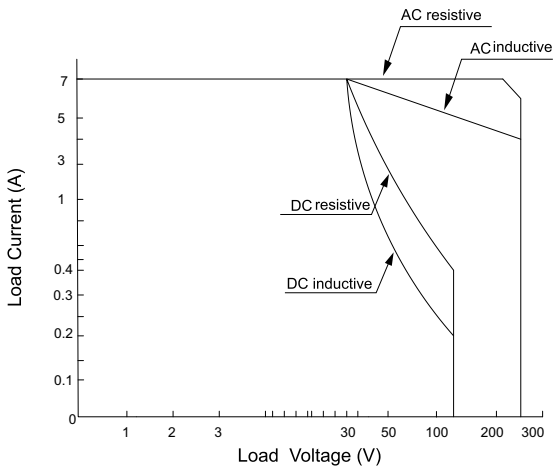
21.12 & 21.22
DPDT



21.14 & 21.24
4PDT



21.15 & 21.25
DPDT

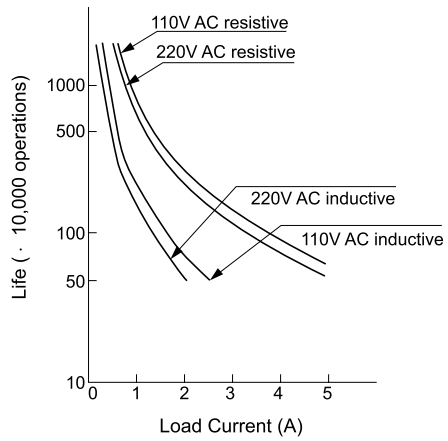


21.16 & 21.26
4PDT

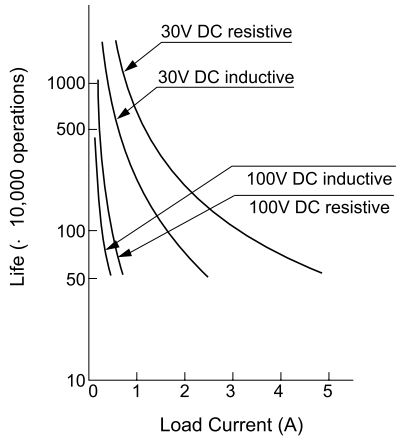
Electrical Characteristics

21.12 & 21.22 (DPDT)

AC

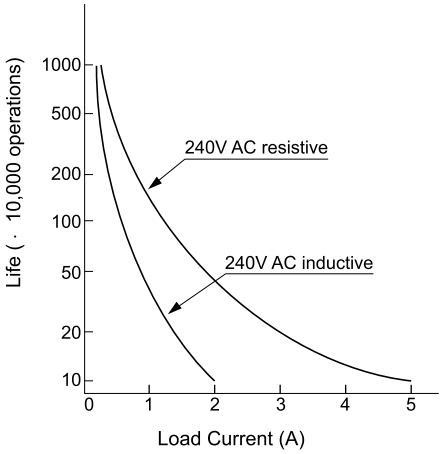


DC

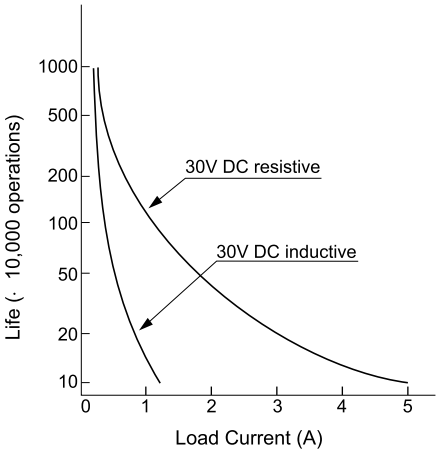


21.14 & 21.24 (4PDT)

AC



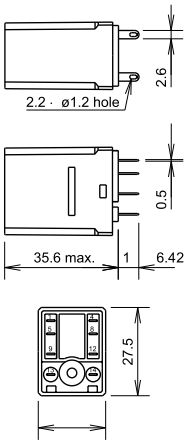
DC



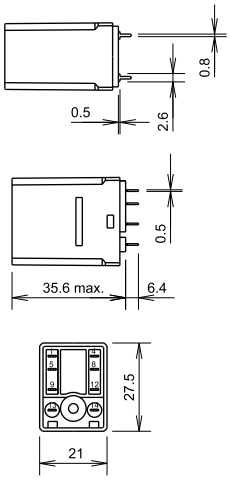
Dimensions

Blade Terminal	PC Board Terminal
21.12 (DPDT)	21.22 (DPDT)

DPDT

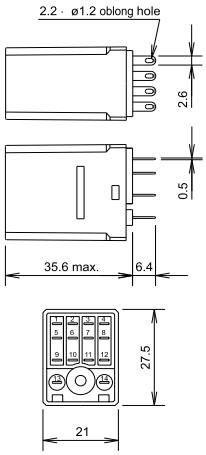


DPDT

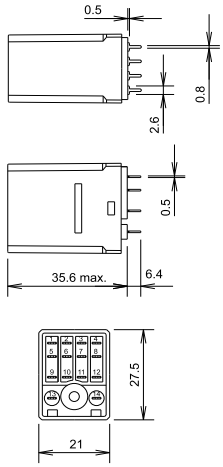


21.14 (4PDT)	21.24 (4PDT)

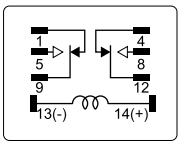
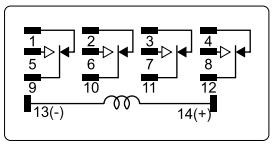
4PDT



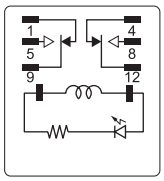
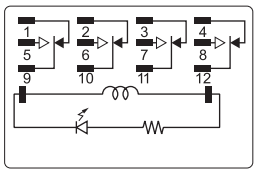
4PDT



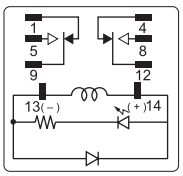
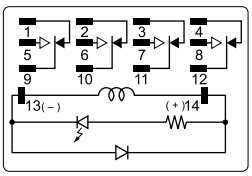
Basic Type - Internal Connection (Bottom View)

DPDT	4PDT
	

LED Type - Internal Connection (Bottom View)

DPDT	4PDT
	

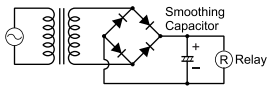
LED & Diode Type - Internal Connection (Bottom View)

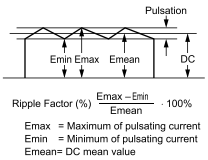
DPDT	4PDT
	

* Measured below 24V AC/DC

Instructions

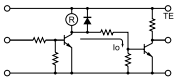
Apply rated voltage to the relay coil to ensure correct relay type.
When using a power supply containing a ripple voltage, suppress the ripple factor within 6% however, a complete DC voltage is best for the coil power to make sure of stable relay operation.
Pickup voltage and dropout voltage depend on the ripple factor when power is supplied through a rectification circuit. Include a smoothing capacitor for better operation.



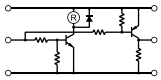


Special consideration should be taken when driving an element at the same time as the relay operation for the circuit design. Leakage current (Io) flows through the relay coil while the relay is off. Leakage current causes coil release failure or adversely affects the vibration resistance and shock resistance. It is advisable to design a circuit as shown.

Incorrect

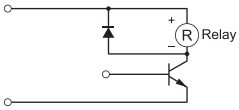


Correct



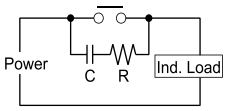
Connecting a diode to suppress at the back electromotive force prevents a high-voltage pulse which is generated when the relay coil is turned off, causing transistor to deteriorate or break, make sure the coil release time is slightly longer. To shorten the coil release time, connect a Zener diode which is slightly higher than the power voltage, between the collector and emitter of the transistor.

Back emf suppressing diode

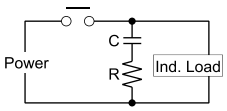


Protection

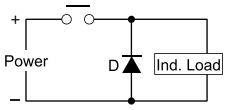
When an inrush current flows through the load, the contact may become welded. The contact ratings show maximum values, Make sure that these values are not exceeded. Contact a contact protection circuit, such as a current limiting resistor as a optional solution.



This protection circuit can be used when the load impedance is smaller than the RC impedance in an AC load power circuit.
R: Resistor of approximately the same resistance value as the load
C: 0.1 to 1 μF

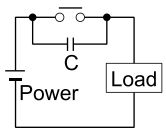
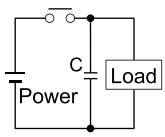


This protection circuit can be used for both AC and DC load power circuits.
R: Resistor of approximately the same resistance value as the load
C: 0.1 to 1 μF



This protection circuit can be used for DC load power circuits. Use a diode with the following ratings.
Reverse withstand voltage: Power voltage of the load circuit x 10
Forward current: More than the load current.

Prevents

	This protection circuit is very effective in arc suppression when opening the contact however, the capacitor is charged while the contacts are opened else the capacitor is discharged through the contacts, increasing the possibility of contact welding.
	This protection circuit is very effective in arc suppression when opening the contact however, a current flows to charge the capacitor, causing contact welding when the contacts are closed.

Safety Precautions

Do not drop, shock or remove the relay cover to maintain the initial characteristics.
The relay cover cannot be removed from the base during normal operation.
Use the relay in environments free from dust, condensation, dioxide or hydrogen sulfide.

Make sure that the coil voltage does not exceed applicable coil voltage range.
Prevent usage of relays in the vicinity of strong magnetic field, as that my cause in malfunctioning of relays.

Failure to turn off power before wiring, installation, removal and
maintenance may cause electrical shock or fire hazard.

Attention on specifications and rated values to prevent electrical shock or fire hazard.
Use wires of the proper size to meet voltage and current requirements.

Tighten the terminal screws on the relay socket to the proper tightening torque.

Prevent using the check button as a switch.
The durability of the check button is a minimum of 200 operations.
It is advisable to apply a positive voltage to terminals of neighboring poles and a negative voltage to the other terminals of neighboring poles when using DC loads on 4PDT relays to prevent the possibility of short circuits.

A soldering iron of 30 to 60W would be recommended when soldering the relay terminals and the preferred
time to complete soldering is within 4 seconds approximately.

Terms And Conditions

Please read this catalog before purchasing any products. Please consult your *WERNER* representative for any clarifications or comments.

Application Considerations

WERNER shall not be responsible for conformity with any regulations, codes or standards that apply to use of the products. *WERNER* shall provide applicable third party certification documents identifying ratings and limitations of use that apply to the products in case of the customer's request.

Prevent use the products for an application involving risk to life or property. Be sure that the *WERNER's* products are properly rated and installed for the overall system or equipment.

WERNER shall not be responsible for the user's programming of a programmable products.

Warranty

WERNER's warranty represents that the products are free from defects in materials and workmanship for a period of one year.

WERNER shall not be responsible for any special loss of profit, commercial loss, indirect or consequential damages relevant to products.

WERNER shall not be responsible for repair, warranty or any claims regarding the products unless *WERNER's* Analysis conform that the products were properly stored, installed, handled, maintained and not a the results from accident, insufficient, abuse, misuse, natural disaster, improper installation excessive electrical supply, environmental conditions or abnormal mechanical.

Disclaimers

WERNER shall practice to change type/model numbers when published ratings or features are changed, however some specifications of the products may be changed without any notice.

When in doubt, please consult with your *WERNER* representative to confirm actual specifications of products.

WERNER shall change product specifications and accessories at any time based on improvements and other reasons.

The information in this catalog has been carefully checked. However, *WERNER* take no responsibilities for clerical, typographical or proofreading errors.

WERNER | Inventing Innovation

Product specifications are subject to change without notice.

Thank you for choosing *WERNER* products.

Copyright WERNER Electric. All Right Reserved.

Note :-

WERNER

Inventing Innovation...

Headquarters:

Werner Electric Private Limited

#278/C, Hebbal Industrial Area, Mysore-570018, India

Tel: +91 73539 47299, E-mail: info@wernerelektrik.com

Werner Malaysia Sdn Bhd,

45-2, Jalan Tiara 2B, Bandar Baru Klang,

41150, Klang, Selangor, Malaysia.

Tel: +60 13 533 3348, E-mail: info@wernerelektrik.com

Werner Elektrik Türkiye

Ayazağa Mah. Mimar Sinan Sok. Seba Office Boulevard.

D Blok. No.: 21D/45 Sariyer / İstanbul, Türkiye.

Tekefon: +90 539 829 25 07 , E-posta: info@wernerelektrik.com

www.wernerelektrik.com