

SECTION 6

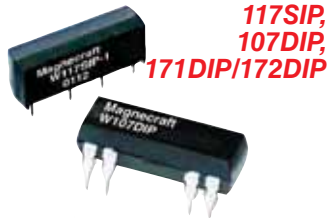


PRINTED CIRCUIT BOARD RELAYS AND REED RELAYS

1 TO 30 AMPERES



- 117SIP
- 107DIP
- 171DIP
- 172DIP
- 102VX/HVX
- 7
- 49
- 976
- 60
- 276



PRODUCT

L X W X H (INCHES)

0.290 x 0.280 x 0.750/0.275 x 0.300 x 0.750

0.65 x 0.76 x 2.67

0.410 x 0.410 x 0.553

FEATURES

- ✦ SPST - NO OR NC - EPOXY MOLDED CONSTRUCTION
- ✦ STANDARD 0.1 GRID SPACING

- ✦ SPST - NO EPOXY ENCAPSULATED HIGH VOLTAGE REED
- ✦ SWITCHING UP TO 10 MA @ 5,000 VDC
- ✦ 5 MA @ 10,000 VDC

- ✦ MICRO MINIATURE SIZE
- ✦ CONFORMS TO FCC PART 68.302, 1500V SURGERE SISTANCE, FCC 68.304, 1000V DIELECTRIC STRENGTH
- ✦ EXCELLENT R.F. SWITCHING CHARACTERISTICS
- ✦ HIGH SHOCK & VIBRATION RESISTANCE
- ✦ PRINTED CIRCUIT BOARD MOUNTING ON 0.1 GRID

COIL		UNITS			
Standard Voltage AC:		50/60 Hz	-	-	-
DC:			5/6, 12, 24	12, 24	5/6, 12, 24
Coil Power AC (60 Hz):	VA		Not applicable	Not applicable	Not applicable
Coil Power DC:	W		117SIP, 107DIP: 0.050 to 0.288, 171DIP: 0.050 to 0.270 172DIP: 0.125 to 0.540	0.5 to 1.5	0.2
Minimum Recommended Load:	W				0.75
CONTACTS			SPST-N. O., SPST-N. C.	SPST- N. O.	SPDT, DPDT
Contact Configuration:			Rhodium	Tungsten	Gold clad silver
Contact Material:					
Contact Resistance (Initial):	m Ohms		100	200	100
Contact Rating AC Amperes (AC1):	A		117SIP/107DIP/171DIP: 0.5, 172 DIP: 0.25	Not applicable	STST 2, DPDT 0.6
Contact Rating AC Voltage:	V		117SIP/107DIP:120, 171DIP/172 DIP: 60	Not applicable	STST 120, DPDT 100
Contact Rating DC Amperes (DC1):	A		0.5	0.010 / 0.005	2
Contact Rating DC Voltage:	V		117SIP/107DIP: 200,171DIP/172 DIP:100	5,000 / 10,000	24
Contact Rating:			4 to 10	Not applicable	
General Purpose Rating (75%-80%):	VA		Not applicable	Not applicable	
Horse Power (AC):	Hp		Not applicable	Not applicable	
TIMING					
Operate Time:	ms		1	1	4
Release Time:	ms		1	1	5
DIELECTRIC STRENGTH					
Coil to Contacts:	V rms		500	1200	500
Insulation Resistance:	megohms minimum@VDC		1000 @ 500	1000 @ 500	1000 @ 500
TEMPERATURE					
Operating, AC Lower:	°C		Not applicable	Not applicable	Not applicable
Operating, AC Upper:	°C		Not applicable	Not applicable	Not applicable
Operating, DC Lower:	°C		-40	- 40	- 35
Operating, DC Upper:	°C		+85	+85	+70
Storage, Lower:	°C		-40	- 40	- 40
Storage, Upper:	°C		+105	+105	+105
LIFE EXPECTANCY					
Electrical @ Rated Load (AC1):	operations		50,000,000	1,000,000	100,000
Mechanical @ no Load :	operations		100,000,000	10,000,000	100,000,000
MISCELLANEOUS					
Cover Protection Category:	IP		67	67	67
Weight:	grams		1	49	2.7
AGENCY APPROVALS					



PRINTED CIRCUIT BOARD RELAYS



49

MANUFACTURED UNDER
ISO 9002 QS 9000

1.25 x 0.759 x 1.14

- ✦ DUST COVERED
- ✦ APPROXIMATELY
1.1 CUBIC INCH VOLUME
- ✦ 3.5 AND 10 AMPERES
- ✦ PC BOARD MOUNT



976

MANUFACTURED UNDER
ISO 9002 QS 9000

1.161 x 0.512 x 1.000

- ✦ EPOXY SEALED
- IMMERSION CLEANABLE
- ✦ MEETS 8 MILLIMETER
SPACING COIL TO CONTACTS
- ✦ MEETS 4KV DIELECTRIC
WITHSTANDING VOLTAGE



60

1.10 x 0.600/0.895 x 0.745

- ✦ MINIATURE SIZE
- ✦ CONFORMS TO FCC PART
68.302, 1500V SURGE
RESISTANCE, FCC 68.304, 1000V
DIELECTRIC STRENGTH
- ✦ EXCELLENT R.F. SWITCHING
CHARACTERISTICS
- ✦ HIGH SHOCK & VIBRATION
RESISTANCE
- ✦ PRINTED CIRCUIT BOARD
MOUNTING ON 0.1 GRID



276

0.807 x 0.50 x 0.394

- ✦ SUBMINIATURE EPOXY
SEALED
- ✦ IMMERSION CLEANABLE
- ✦ STANDARD 0.1 GRID PATTERN
- ✦ SINGLE SIDE STABLE DESIGN
- ✦ 5KV SURGE RESISTANCE
COIL TO FRAME

UL Recognized
File No. E52197

UL Recognized
File No. E191122

UL Recognized
File No. E52197

UL Recognized
File No. E190964

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HOW REED RELAYS WORK

The term reed relay covers dry reed relays and mercury-wetted contact relays, all of which use hermetically sealed reed switches. In both types, the reeds (thin, flat blades) serve multiple functions - as conductor, contacts, springs, and magnetic armatures.

DRY REED RELAYS

Dry reed relays have become an important factor in the relay field. They have the advantage of being hermetically sealed and resistant to atmospheric contamination. They have fast operate and release times and when operated within their rated contact loads, have very long life. A typical dry reed switch capsule is shown in Figure 1.

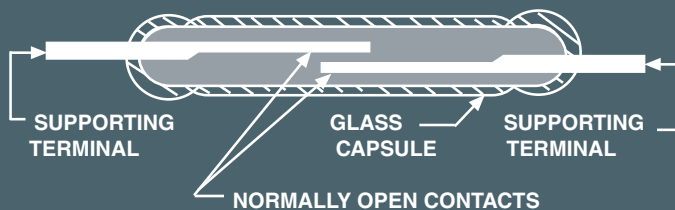


Figure 1. Construction of Switch Capsule of Typical Dry Reed switch (SPST-NO)

In the basic SPST-NO design, two opposing blades are sealed into a narrow glass capsule and overlapped at their free ends. The contact area is plated typically with rhodium to produce a low contact resistance when contacts are drawn together. The capsule is made of glass and filled with a dry inert gas and then sealed. The capsule is surrounded by an electromagnetic coil. When the coil is energized, the normally open contacts are brought together; when the coil voltage is removed, the blades separate by their own spring tension. Some reeds contain permanent magnets for magnetic biasing to achieve normally closed contacts (SPST-NC) or SPDT contact combinations. The current rating, which is dependent upon the size of the blade and the type and amount of plating, may range from low level to 1 amp. Effective contact protection is essential when switching loads other than dry resistive loads.

CONTACT COMBINATIONS.

The switches used in dry reed relays provide SPST-NO, SPST-NC, SPDT contact combinations. The SPST-NO corresponds with the basic switch capsule design (Fig.1). The SPST-NC results from a combination of the SPST-NO switch and a permanent magnet strong enough to pull the contacts closed but able to open when coil voltage is applied to the relay coil. In typical true SPDT designs, the armature is mechanically tensioned against the normally closed contact, and is moved to the normally open contact upon application of a magnetic field. The SPDT contact combination can also be achieved by joining a SPST-NO switch with an appropriately adjusted SPST-NC switch, and jumping one side of both switches together to form the movable contact system. Latching contacts, defined as contacts which remain in the position to which they were driven, and stay in that position when coil power is removed from the relay coil.

Latching switches are manufactured by using a SPST-NO contact, and biasing it with a permanent magnetic that is strong enough to hold the contacts closed, but not strong enough to hold the contact closed when coil power is applied to the coil. The switching process is then reversed by simply reversing the relay coil polarity to close the switch, or by employing a second coil with a reverse field.

MAGNETIC FIELDS

Reed relays in general can be characterized as susceptible to the influences of external magnetic fields. It is important to keep reed relays at a proper distance from each other because of the possibility of magnetic-interaction between them. Proper magnetic shielding must be used to contain stray magnetic fields. When installing reed relays into equipment, one should be aware of the devices within that equipment which can produce magnetic fields. The relays being installed into that equipment should be positioned as far away as possible from any stray magnetic fields and should be shielded to prevent false operations.

ELECTRICAL CHARACTERISTICS

SENSITIVITY: The input power required to operate dry reed relays is determined by the sensitivity of the particular reed switch used, by the number of switches operated by the coil, by the permanent magnet biasing (if used), and the efficiency of the coil and the effectiveness of its coupling to the blades. Minimum input required to effect closure ranges from the very low milliwatt level for a single sensitive capsule to several watts for multipole relays.

OPERATE TIME: The coil time constant, overdrive on the coil, and the characteristics of the reed switch determine operate time. With the maximum overdrive voltage applied to the coil, reed relays will operate in approximately the 200 microsecond range. When driven at rated coil voltage, usually the relays will operate at about one millisecond.

RELEASE TIME: With the coil unsuppressed, dry reed switch contacts release in a fraction of a millisecond. SPST-NO contacts will open in as little as 50 microseconds. Magnetically biased SPST-NC and SPDT switches reclose from 100 microseconds to 1 millisecond respectively. If the relay coil is suppressed, release times are increased. Diode suppression can delay release times for several milliseconds, depending on coil characteristics, coil voltage, and reed release characteristics.

CONTACT BOUNCE

Dry reed contacts bounce on closure as with any other hard contact relay. The duration of bounce on a Dry reed switch is typically very short, and is in part dependent on drive level. In some of the faster devices, the sum of the operate time and bounce is relatively constant. As drive is increased, the operate time decreases with bounce time increasing. The normally closed contacts of a SPDT switch bounce more than the normally open contacts. Magnetically biased SPST-NC contacts exhibit essentially the same bounce characteristics as SPST-NO switches.

APPLICATION DATA

CONTACT RESISTANCE

The reeds (blades) in a dry reed switch are made of magnetic material which has a high volume resistivity, terminal-to-terminal resistance is somewhat higher than in some other types of relays. Typical specification limits for initial resistance of a SPST-NO reed relay is 0.200 ohms max (200 milliohms).

INSULATION RESISTANCE

A dry reed switch made in a properly controlled internal atmosphere will have an insulation resistance of 10^{12} to 10^{13} ohms or greater. When it is assembled into a relay, parallel insulation paths reduce this to typical values of 10^{13} ohms. Depending on the particular manner of relay construction, exposure to high humidity or contaminating environments can appreciably lower final insulation resistance.

CAPACITANCE

Reed capsules typically have low terminal-to-terminal capacitance. However, in the typical relay structure where the switch is surrounded by a coil, capacitance from each reed to the coil act to increase capacitance many times. If the increased capacitance is objectionable, it can be reduced by placing a grounded electrostatic shield between the switch and coil.

DIELECTRIC WITHSTAND VOLTAGE

With the exception of the High-Voltage dry reed switches (capsules that are pressurized or evacuated), the dielectric strength limitation of relays is determined by the ampere turn sensitivity of the switches used. A typical limit is 200 VAC. The dielectric withstand voltage between switch and coil terminals is typically 500 VAC.

THERMAL EMF

Since thermally generated voltages result from thermal gradients within the relay assembly, relays built to minimize this effect often use sensitive switches to reduce required coil power, and thermally conductive materials to reduce temperature gradients. Latching relays, which may be operated by a short duration pulse, are often used if the operational rate is not changed for longer periods of time because coil power is not required to keep the relay in the on or off position after the initial turn on or turn off pulse.

NOISE

Noise is defined as a voltage appearing between terminals of a switch for a few milliseconds following closure of the contacts. It occurs because the reeds (blades) are moving in a magnetic field and because voltages are produced within them by magnetostrictive effects. From an application standpoint, noise is important if the signal switched by the reed is to be used within a few milliseconds immediately following closure of the contacts. When noise is critical in an application, a peak-to-peak limit must be established by measurement techniques, including filters which must be specified for that particular switching application.

ENVIRONMENTAL CHARACTERISTICS

Reed relays are used in essentially the same environments as other types of relays. Factors influencing their ability to function would be temperature extremes beyond specified limits

VIBRATION

The reed switch structure, with so few elements free to move, has a better defined response to vibration than other relay types. With vibration inputs reasonably separated from the resonant frequency, the reed relay will withstand relatively high inputs, 20 g's or more. At resonance of the reeds, the typical device can fail at very low input levels. Typical resonance frequency is 2000 hz.

SHOCK

Dry reed relays will withstand relatively high levels of shock. SPST-NO contacts are usually rated to pass 30 to 50 g's, 11 milliseconds, half sign wave shock, without false operation of contacts. Switches exposed to a magnetic field that keep the contacts in a closed position, such as in the biased latching form, demonstrate somewhat lower resistance to shock. Normally closed contacts of mechanically biased SPDT switches may also fail at lower shock levels.

TEMPERATURE

Differential expansion or contraction of reed switches and materials used in relay assemblies can lead to fracture of the switches. Reed relays are capable of withstanding temperature cycling or temperature shock over a range of at least -50 C to + 100 C. These limits should be applied to the application to prevent switch failure.

CONTACT PROTECTION

Tungsten lamp, inductive and capacitive discharge load are extremely detrimental to reed switches and reduce life considerably. Illustrated below are typical suppression circuits which are necessary for maximum contact life.



Figure 3

Initial cold filament turn-on current is often 16 times higher than the rated operating current of the lamp. A current limiting resistor in series with the load, or a bleeder resistor across the contacts will suppress the inrush current. The same circuits can be used with capacitive loads, as shown in Figure 3.



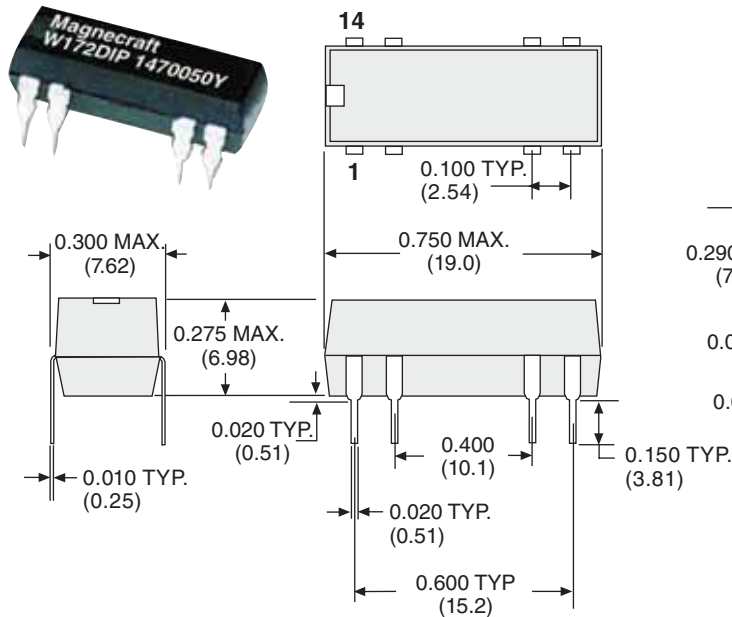
Figure 4

DC inductive loads call for either a diode or a thyristor to be placed across the load. These circuits are necessary to protect the contacts when inductive loads are to be switched in a circuit, as shown in Figure 4.

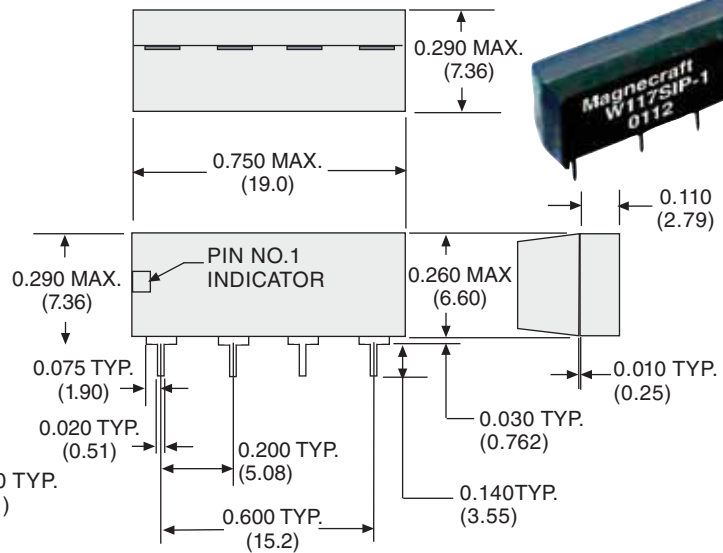
OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

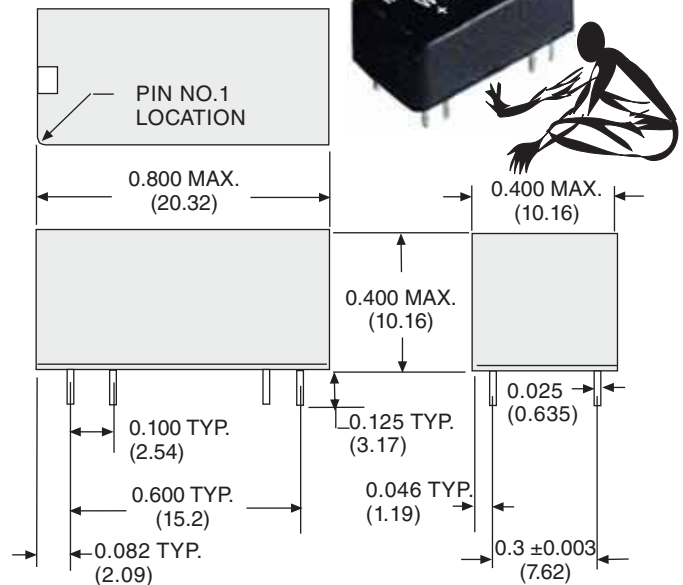
107DIP, 171DIP, 172DIP(SPDT)



117SIP



172DIP (DPDT)



GENERAL SPECIFICATIONS (@ 25°C)

	UNITS	
COIL		
Pull-in Voltage AC (50/60 Hz): ≤	% of nominal	Not applicable
Pull-in Voltage DC: ≤	% of nominal	80
Dropout Voltage AC (50/60 Hz): ≥	% of nominal	Not applicable
Dropout Voltage DC: ≥	% of nominal	10
Maximum Voltage:	% of nominal	110
Resistance:	% ±	10
Coil Power AC (60 Hz):	VA	Not applicable
Coil Power DC:	W	117SIP, 107DIP: 0.050 to 0.288 171DIP: 0.050 to 0.270 172DIP: 0.125 to 0.540
CONTACTS		
Contact Material:		RHODIUM
Contact Rating AC Amperes (AC1):	A	117SIP, 107DIP, 171DIP: 0.5 172 DIP: 0.25
Contact Rating AC Voltage:	V	117SIP, 107DIP: 120 171DIP, 172 DIP: 60
Contact Rating DC Amperes (DC1):	A	0.5
Contact Rating DC Voltage:	V	100
Contact Rating :	VA	117SIP, 107DIP, 171DIP: 10 172 DIP: SPDT 4, DPDT 10
General Purpose Rating (75%-80%):		Not applicable
Horse Power (AC):	HP	Not applicable
Pilot Duty (60 Hz):		Not applicable
VA Rating Make:	VA	Not applicable
VA Rating Break:	VA	Not applicable
Minimum Recommended Load:	ma	10 or 0.05 Watt
TIMING		
Operate Time:	ms	1
Release Time:	ms	1
DIELECTRIC STRENGTH		
Coil to Contacts:	V rms	500
Across Open Contacts:	V rms	150
Pole to Pole:	V rms	Not applicable
Contacts to Frame:	V rms	Not applicable
Insulation Resistance:	megohms minimum @VDC	1000 @ 500
VIBRATION RESISTANCE		
Functional:	g's	20

	UNITS	
SHOCK RESISTANCE		
Functional:	g's	50
TEMPERATURE		
Operating, AC Lower:	°C	Not applicable
Operating, AC Upper:	°C	Not applicable
Operating, DC Lower:	°C	-40
Operating, DC Upper:	°C	+85
Storage, Lower:	°C	-40
Storage, Upper:	°C	+105
LIFE EXPECTANCY		
Electrical @ Rated Load (AC1):	operations	50,000,000
Mechanical @ no Load :	operations	100,000,000
MISCELLANEOUS		
Operating Position:		Any
Insulation Material:		Glass
Enclosure Material:		Thermo set plastic
Cover Protection Category:	IP	67
Weight:	grams	1

SIP & DIP MINIATURE REED RELAYS



SPST NO OR NC, DPST NO, 0.5 AMP

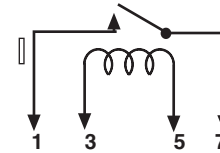
WIRING DIAGRAM (TOP VIEWED)

117SIP

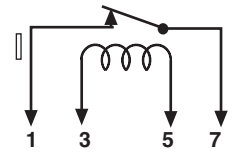


STANDARD PART NUMBERS	COIL MEASURED @ 25 °C		
	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL POWER (mW)
SPST - N. O., 0.5 AMP			
W117SIP-1	5	500 Ω	50
W117SIP-3	12	1000 Ω	144
W117SIP-5	24	2000 Ω	288
SPST - N. C., 0.5 AMP			
W117SIP-22	5	500 Ω	50
W117SIP-23	12	1200 Ω	120
W117SIP-24	24	2200 Ω	270
SPST - N. O. WITH CLAMPING DIODE, 0.5 AMP			
W117SIP-6	5	500 Ω	50
W117SIP-8	12	1000 Ω	144
W117SIP-10	24	2000 Ω	288
SPST - N. C. WITH CLAMPING DIODE, 0.5 AMP			
W117SIP-18	5	500 Ω	50
W117SIP-25	12	1200 Ω	120
W117SIP-26	24	2200 Ω	220

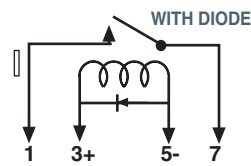
SPST - NO



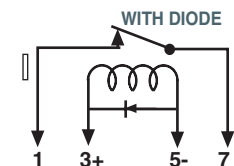
SPST - NC



SPST - NO



SPST - NC



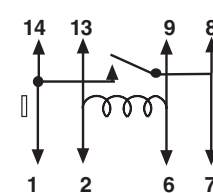
SPST - N. O., 0.5 AMP

W107DIP-1	5	500 Ω	50
W107DIP-3	12	1000 Ω	144
W107DIP-4	24	2000 Ω	288

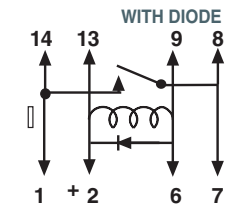
SPST - N. O. WITH CLAMPING DIODE, 0.5 AMP

W107DIP-5	5	500 Ω	50
W107DIP-7	12	1000 Ω	144
W107DIP-8	24	2000 Ω	288

SPST - NO



SPST - NO



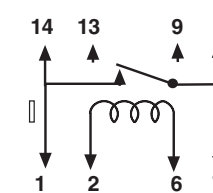
SPST - N. O., 0.5 AMP

W171DIP-2	5	500 Ω	50
W171DIP-4	12	1200 Ω	120
W171DIP-5	24	2200 Ω	270

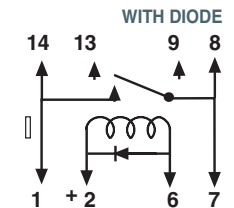
SPST - N. O. WITH CLAMPING DIODE, 0.5 AMP

W171DIP-7	5	500 Ω	50
W171DIP-9	12	1000 Ω	144
W171DIP-10	24	2200 Ω	270

SPST - NO



SPST - NO



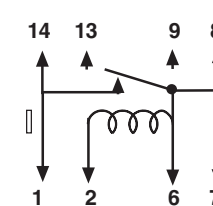
SPST - N. C., 0.5 AMP

W171DIP-12	5	200 Ω	50
W171DIP-14	12	1200 Ω	120
W171DIP-15	24	2200 Ω	270

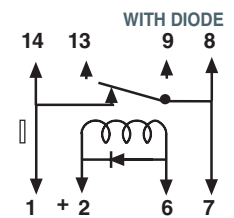
SPST - N. C. WITH CLAMPING DIODE, 0.5 AMP

W171DIP-17	5	500 Ω	50
W171DIP-19	12	1200 Ω	120
W171DIP-20	24	2200 Ω	270

SPST - NC



SPST - NC



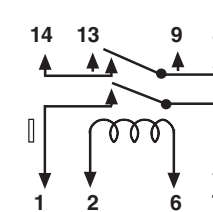
DPST - N. O., 0.5 AMP

W171DIP-21	5	500 Ω	50
W171DIP-23	12	1000 Ω	144
W171DIP-24	24	2200 Ω	270

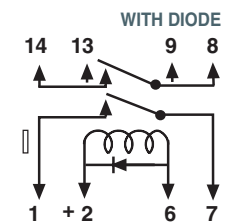
DPST - N. O. WITH CLAMPING DIODE, 0.5 AMP

W171DIP-25	5	500 Ω	50
W171DIP-27	12	1000 Ω	144
W171DIP-28	24	2200 Ω	270

DPST - NO



DPST - NO



WHEN SPACING SIP RELAYS, THE RELAYS REQUIRE 1/2 INCH SPACING FROM THE SIDE OF THE ADJACENT RELAYS.

DIP MINIATURE REED RELAYS

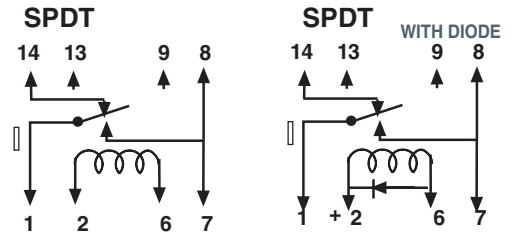


SPDT NO, DPDT, 0.25 AMP

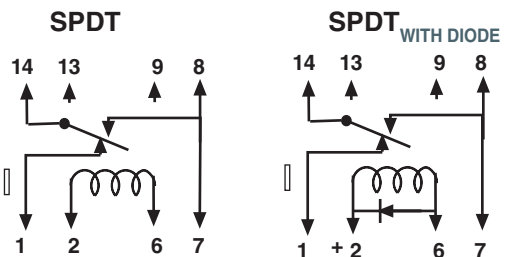


STANDARD PART NUMBERS	COIL MEASURED @ 25 °C		
	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL POWER (mW)
SPDT, 0.25 AMP			
W172DIP-1	5	200 Ω	125
W172DIP-3	12	500 Ω	300
W172DIP-4	24	2200 Ω	270
SPDT WITH CLAMPING DIODE, 0.25 AMP			
W172DIP-5	5	200 Ω	125
W172DIP-7	12	500 Ω	300
W172DIP-8	24	2200 Ω	270

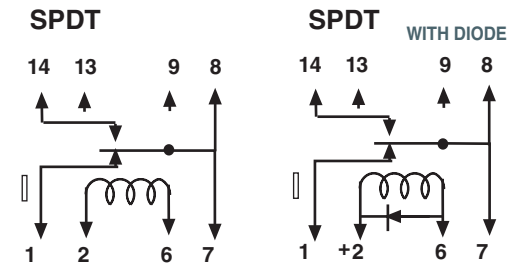
WIRING DIAGRAM (TOP VIEWED)



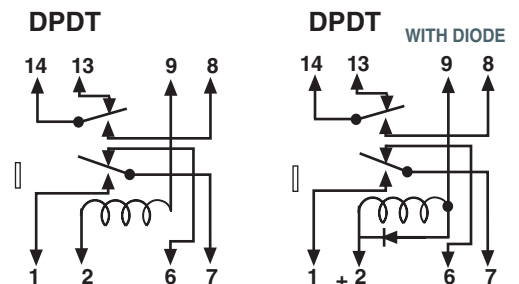
SPDT, 0.25 AMP			
W172DIP-31	5	200 Ω	125
W172DIP-33	12	500 Ω	290
W172DIP-34	24	2200 Ω	270
SPDT WITH CLAMPING DIODE, 0.25 AMP			
W172DIP-35	5	200 Ω	125
W172DIP-37	12	500 Ω	290
W172DIP-38	24	2200 Ω	270



SPDT, 0.25 AMP			
W172DIP-141	5	200 Ω	125
W172DIP-145	12	1000 Ω	144
W172DIP-146	24	3200 Ω	180
SPDT WITH CLAMPING DIODE, 0.25 AMP			
W172DIP-147	5	200 Ω	125
W172DIP-149	12	1000 Ω	144
W172DIP-150	24	3200 Ω	180

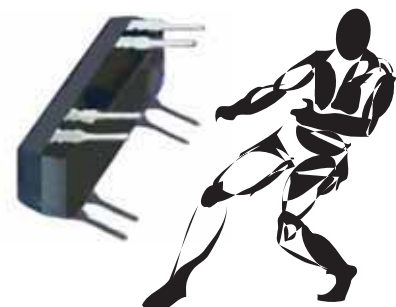


DPDT, 0.25 AMP			
W172DIP-17	5	46 Ω	540
W172DIP-19	12	266 Ω	540
W172DIP-20	24	1066 Ω	540
DPDT WITH CLAMPING DIODE, 0.25 AMP			
W172DIP-21	5	46 Ω	540
W172DIP-23	12	266 Ω	540
W172DIP-24	24	1066 Ω	540



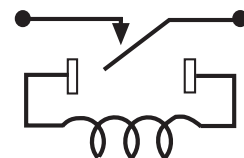
SEE END OF SECTION 6 FOR CROSS REFERENCE

WHEN SPACING DIP RELAYS, THE RELAYS REQUIRE 1/2 INCH SPACING FROM THE SIDE OF THE ADJACENT RELAYS.



SPST - N.O., 5 TO 10 MILLIAMPS

WIRING DIAGRAM (TOP VIEWED)



EPOXY ENCAPSULATED HIGH VOLTAGE REED.

SPST-NO TUNGSTEN CONTACTS SWITCHES LOADS

UP 10 MA @ 5000 VOLTS DC CLASS 102HV SAME AS ABOVE EXCEPT:

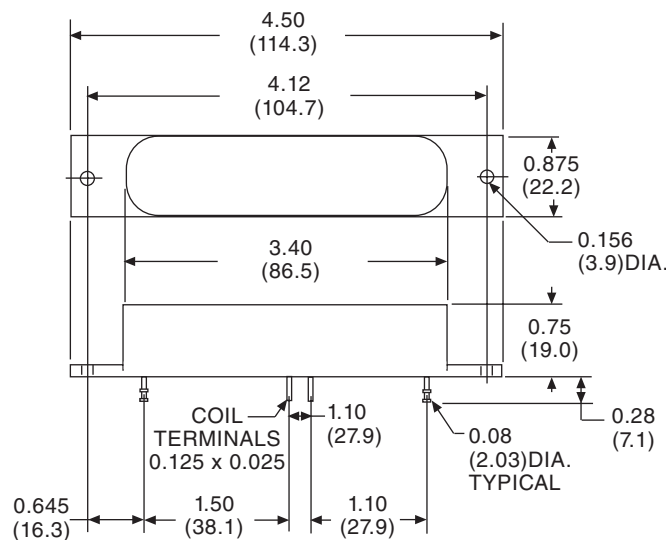
SWITCHES 10,000 VOLTS WITH LOADS UP TO 5 mA DC

GENERAL SPECIFICATIONS (@ 25°C)

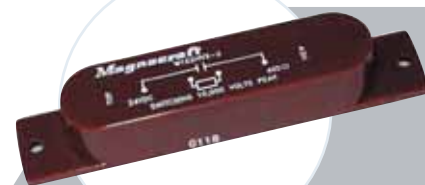
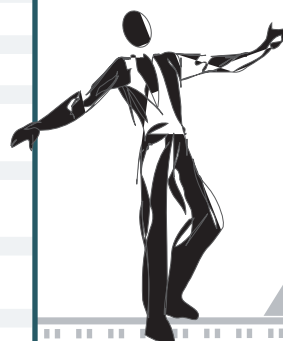
	UNITS	
COIL		
Pull-in Voltage AC (50/60 Hz):≤	% of nominal	Not applicable
Pull-in Voltage DC:≤	% of nominal	75
Dropout Voltage AC (50/60 Hz):≥	% of nominal	Not applicable
Dropout Voltage DC:≥	% of nominal	10
Maximum Voltage:	% of nominal	110
Resistance:	% ±	10
Coil Power AC (60 Hz):	VA	Not applicable
Coil Power DC:	W	0.5 to 1.5
CONTACTS		
Contact Material:		TUNGSTEN
Contact Rating AC Amperes (AC1):	A	Not applicable
Contact Rating AC Voltage:	V	Not applicable
Contact Rating DC Amperes (DC1):	A	0.010 / 0.005
Contact Rating DC Voltage:	V	5,000 / 10,000
Contact Rating :	VA	Not applicable
General Purpose Rating (75%-80%):		Not applicable
Horse Power (AC):	HP	Not applicable
Pilot Duty (60 Hz):		Not applicable
VA Rating Make:	VA	Not applicable
VA Rating Break:	VA	Not applicable
Minimum Recommended Load:	ma	Not applicable
TIMING		
Operate Time:	ms	1
Release Time:	ms	1
DIELECTRIC STRENGTH		
Coil to Contacts:	V rms	12,000
Across Open Contacts:	V rms	12,000
Pole to Pole:	V rms	12,000
Contacts to Frame:	V rms	Not applicable
Insulation Resistance:	megohms minimum@VDC	1000 @ 500
VIBRATION RESISTANCE		
Functional:	g's	10
SHOCK RESISTANCE		
Functional:	g's	30
TEMPERATURE		
Operating, AC Lower:	°C	Not applicable
Operating, AC Upper:	°C	Not applicable
Operating, DC Lower:	°C	-40
Operating, DC Upper:	°C	+85
Storage, Lower:	°C	-40
Storage, Upper:	°C	+105
LIFE EXPECTANCY		
Electrical @ Rated Load (AC1):	operations	1,000,000
Mechanical @ no Load :	operations	100,000,000
MISCELLANEOUS		
Operating Position:		Any
Insulation Material:		Glass
Enclosure Material:		Thermo set plastic
Cover Protection Category:	IP	67
Weight:	grams	49

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



Do not use wire heavier than #22 AWG. Excess stress on terminals could cause damage to internal components



STANDARD PART NUMBERS	COIL MEASURED @ 25 °C		
	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL POWER (mW)
5,000 VOLTS NORMALLY OPEN, 10 MILLIAMPS			
W102VX-49	6 VDC	70 Ω	500 mW
W102VX-50	12 VDC	250 Ω	580 mW
W102VX-51	24 VDC	1000 Ω	580 mW
10,000 VOLTS NORMALLY OPEN, 5 MILLIAMPS			
W102HVX-3	24 VDC	400 Ω	1.5 Watts

R.F. PERFORMANCE TABLE



THE CLASS 7
SUBMINIATURE HIGH
RELIABILITY INDUSTRIAL
GRADE RELAY HAS
EXCELLENT R.F.
SWITCHING
CHARACTERISTICS.

FREQUENCY (MHZ)	INSERTION LOSS (DB) COMMON TO N.O. OR N.C. CONTACTS	VSWR COMMON TO N.O. OR N.C. CONTACTS	ISOLATION (DB) N.O. OR N.C. CONTACTS TO COIL
10	0.05	1.03:1	65
50	0.10	1.04:1	50
100	0.30	1.05:1	42
200	0.50	1.06:1	35
300	0.60	1.07:1	31
400	0.65	1.08:1	29
500	0.75	1.10:1	28

- * AVAILABLE WITH SPDT OR DPDT BIFURCATED GOLD CLAD SILVER-PALLADIUM CROSS BAR CONTACTS- RATED FOR LOW LEVEL TO 2.0 AMP SWITCHING.
- * REQUIRES ONLY .155 SQUARE INCH OF CIRCUIT BOARD SPACE.
- * TOTAL VOLUME OF SLIGHTLY MORE THAN A CUBIC CENTIMETER.
- * CONFORMS TO FCC PART 68.302. 1500 V PEAK SURGE RESISTANCE.
- * CONFORMS TO FCC PART 68.304. 1000 V DIELECTRIC WITHSTANDING VOLTAGE.

GENERAL SPECIFICATIONS (@ 25°C)



	UNITS	
COIL		
Pull-in Voltage AC (50/60 Hz):≤	% of nominal	Not applicable
Pull-in Voltage DC:≤	% of nominal	80
Dropout Voltage AC (50/60 Hz):≥	% of nominal	Not applicable
Dropout Voltage DC:≥	% of nominal	10
Maximum Voltage:	% of nominal	120
Resistance:	% ±	10
Coil Power AC (60 Hz):	VA	Not applicable
Coil Power DC:	W	0.2
Maximum Coil Dissipation, DC:		0.75 Watt (DC)
CONTACTS		
Contact Material:	A	Gold clad silver
Contact Rating AC Amperes (AC1):	V	STST 2, DPDT 0.6
Contact Rating AC Voltage:	A	STST 120, DPDT 100
Contact Rating DC Amperes (DC1):	V	2
Contact Rating DC Voltage:	VA	24
TIMING		
Operate Time:	ms	4
Release Time:	ms	5
DIELECTRIC STRENGTH		
Coil to Contacts:	V rms	500
Across Open Contacts:	V rms	500
Pole to Pole:	V rms	500
Contacts to Frame:	V rms	Not applicable
Insulation Resistance:	megohms minimum @VDC	1000 @ 500

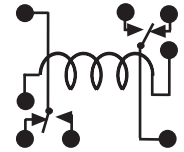
	UNITS	
VIBRATION RESISTANCE		
Functional:	g's	15
SHOCK RESISTANCE		
Functional:	g's	50
TEMPERATURE		
Operating, AC Lower:	°C	Not applicable
Operating, AC Upper:	°C	Not applicable
Operating, DC Lower:	°C	-35
Operating, DC Upper:	°C	+70
Storage, Lower:	°C	-35
Storage, Upper:	°C	+105
LIFE EXPECTANCY		
Electrical @ Rated Load (AC1):	operations	100,000
Mechanical @ no Load :	operations	100,000,000
MISCELLANEOUS		
Operating Position:		Any
Enclosure Material:		UL 94v-0 plastic epoxy seal
Cover Protection Category:	IP	67
Weight:	grams	2.7

7 PRINTED CIRCUIT BOARD SUBMINIATURE RELAY

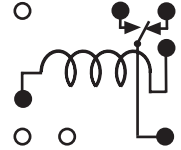


SPST & DPDT 2 AMPS

WIRING DIAGRAM (TOP VIEWED)



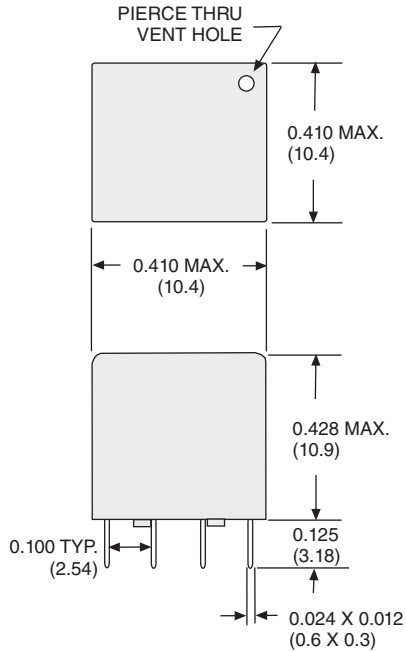
DPDT



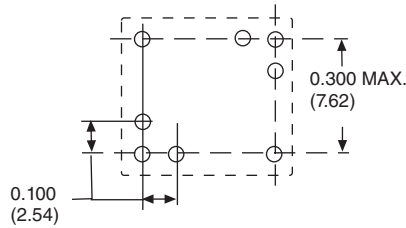
SPDT

OUTLINE DIMENSIONS

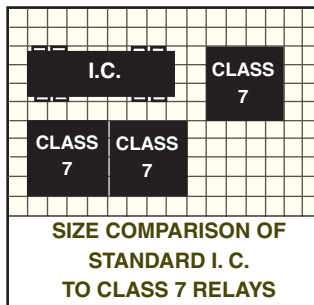
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



PRINTED CIRCUIT MOUNTING HOLE LAYOUT (BOTTOM VIEW)



TOP VIEW SHOWN AT ACTUAL SIZE ON 0.1 GRID



THE CLASS 7 RELAYS CAN BE DENSELY PACKED TOGETHER WITHOUT MAGNETIC INTERACTION FROM ADJACENT RELAYS.

STANDARD PART NUMBERS	CONTACT CONFIGURATION	COIL MEASURED @ 25 °C	
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
W7PCX-1	SPDT	5 VDC	75 Ω
W7PCX-3	SPDT	12 VDC	440 Ω
W7PCX-4	SPDT	24 VDC	1550 Ω
W7PCX-5	DPDT	5 VDC	75 Ω
W7PCX-7	DPDT	12 VDC	440 Ω
W7PCX-8	DPDT	24 VDC	1550 Ω

UL CONTACT LOAD RATINGS TABLE



ONLY 1.1 CUBIC INCHES.
 VARIETY OF MOUNTING
 CONFIGURATIONS.
 TAPPED MOUNTING
 HOLES (49R1C4).
 TV 5 RATING AVAILABLE.
 STANDARD PILOT DUTY
 240 VAC. MAGNETIC
 MOTOR CONTROLLER
 RATING 1/3 HP
 AT 120VAC.

CONTACT MATERIAL	TYPE	LOAD	VOLTAGE
SILVER	3AMP	3 AMP	28 VDC, 120 VAC
		15 AMP	28 VDC, 150 VAC, N. O. ONLY
SILVER ALLOY	5AMP	5 AMP	28 VDC, 120 VAC
		TV-3	120 VAC
		PILOT DUTY	B300 (120/240 VAC)
SILVER ALLOY	10AMP	10 AMP	120/240 VAC
		10AMP	28 VDC
		10AMP	277 VAC
		1/3 HP	120 VAC
			240 VAC, N. O. ONLY
		1/8 HP	277 VAC, N. C. ONLY
		TUNGSTEN	2 AMP, 240W, 120 VAC, N. C. ONLY
			5 AMP, 600W, 120 VAC, N. O. ONLY
		1/4 HP	277 VAC, N. O. ONLY
		BALLAST	1.7 AMP @ 277 VAC
		1/6 HP	120/240 VAC, N. C. ONLY
		15 AMP	28 VDC, 150 VAC, N. O. ONLY
		480 VAC	2 AMP MAX, 240/270 VAC
		PILOT DUTY	B300 (120/240 VAC)
		TV-5	120 VAC, N. O. ONLY
TV-3	120 VAC		



GENERAL SPECIFICATIONS (@ 25°C)

	UNITS	
COIL		
Pull-in Voltage AC (50/60 Hz):≤	% of nominal	
Pull-in Voltage DC:≤	% of nominal	Not applicable
Dropout Voltage AC (50/60 Hz):≥	% of nominal	80
Dropout Voltage DC:≥	% of nominal	Not applicable
Maximum Voltage:	% of nominal	10
Resistance:	% ±	120
Coil Power AC (60 Hz):	VA	10
Coil Power DC:	W	Not applicable
Duty:		0.4 Continuous
CONTACTS		
Contact Material:		Silver gold clad plated/silver
Contact Rating AC Amperes (AC1):	A	3 / 5 / 10
Contact Rating AC Voltage:	V	120 / 120 / 270
Contact Rating DC Amperes (DC1):	A	3 / 5 / 10
Contact Rating DC Voltage:	V	28 / 28 / 28
Horse Power (AC):	Hp	1/3 @ 120
Pilot Duty (60 Hz):		B300
TIMING		
Operate Time:	ms	10
Release Time:	ms	7
DIELECTRIC STRENGTH		
Coil to Contacts:	V rms	1500
Across Open Contacts:	V rms	500
Pole to Pole:	V rms	1500
Contacts to Frame:	V rms	Not applicable
Insulation Resistance:	megohms minimum @VDC	1000 @ 500



	UNITS	
VIBRATION RESISTANCE		
Functional:	g's	1.65 DA 10-55Hz
SHOCK RESISTANCE		
Functional:	g's	10
TEMPERATURE		
Operating, AC Lower:	°C	Not applicable
Operating, AC Upper:	°C	Not applicable
Operating, DC Lower:	°C	-55
Operating, DC Upper:	°C	+85
Storage, Lower:	°C	-55
Storage, Upper:	°C	+130
LIFE EXPECTANCY		
Electrical @ Rated Load (AC1):	operations	100,000
Mechanical @ no Load :	operations	50,000
MISCELLANEOUS		
Operating Position:		Any
Enclosure Material:		UL 94v-0 plastic epoxy seal
Cover Protection Category:	IP	50
Weight:	grams	42

49 PRINTED CIRCUIT BOARD ENCLOSED RELAY

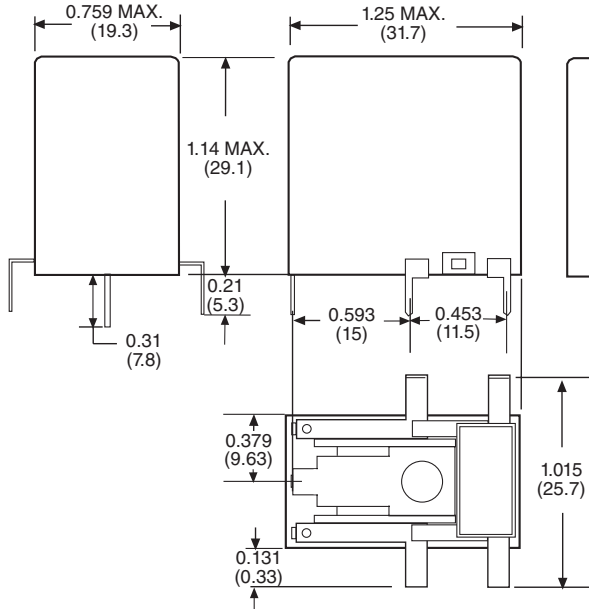


SPDT, 3, 5 & 10 AMPS

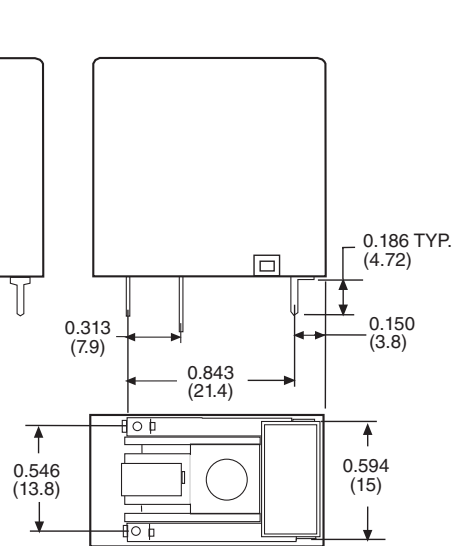
WIRING DIAGRAM (TOP VIEWED)

OUTLINE DIMENSIONS DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

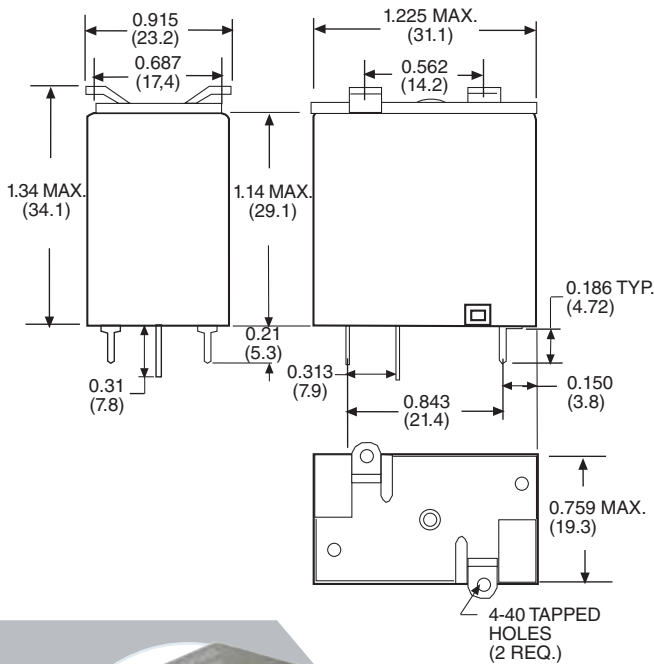
STYLE RE1C2



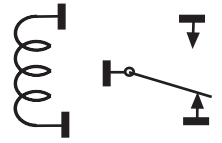
STYLE RE1C1



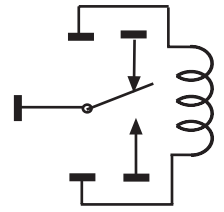
STYLE R1C4



STYLE RE1C1 R1C4



STYLE RE1C2



STANDARD PART NUMBERS	CONTACT CONFIGURATION	COIL MEASURED @ 25 °C	
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
STYLE RE1C1, 3 AMP			
W49RE1C1VG-3DC-SIL	SPDT	3 VDC	90 Ω
W49RE1C1VG-5DC-SIL	SPDT	5 VDC	235 Ω
W49RE1C1VG-12DC-SIL	SPDT	12 VDC	1350 Ω
W49RE1C2VF-6DC-SIL	SPDT	6 VDC	410 Ω
W49RE1C2VF-12DC-SIL	SPDT	12 VDC	1640 Ω
W49RE1C2VF-24DC-SIL	SPDT	24 VDC	6560 Ω
STYLE RE1C1 AND RE1C2, 5 AMP			
W49RE1C1VG-5DC-SCO	SPDT	5 VDC	235 Ω
W49RE1C1VG-12DC-SCO	SPDT	12 VDC	1350 Ω
W49RE1C1VG-24DC-SCO	SPDT	24 VDC	5400 Ω
W49RE1C2VF-6DC-SCO	SPDT	6 VDC	410 Ω
W49RE1C2VF-12DC-SCO	SPDT	12 VDC	1640 Ω
W49RE1C2VF-24DC-SCO	SPDT	24 VDC	6560 Ω
STYLE RE1C1, 10 AMP			
W49RE1C1VW-5DC-SCO	SPDT	5 VDC	100 Ω
W49RE1C1VW-12DC-SCO	SPDT	12 VDC	600 Ω
W49RE1C1VW-24DC-SCO	SPDT	24 VDC	2400 Ω
SOLDER TERMINALS, BRACKET MOUNTING STYLE RE1C4, 10 AMP			
W49R1C4VG-5DC-SCO	SPDT	5 VDC	235 Ω
W49R1C4VG-12DC-SCO	SPDT	12 VDC	1350 Ω
STYLE RE1C4, 10 AMP			
W49R1C4VW-5DC-SCO	SPDT	5 VDC	100 Ω
W49R1C4VW-24DC-SCO	SPDT	24 VDC	2400 Ω



UL CONTACT LOAD RATINGS TABLE

LOAD	LOAD VOLTAGE	DPDT FIGURE " A "	SPDT FIGURE " B "	SPDT FIGURE " C "
RESISTIVE	250 VAC	5 AMP	20 AMP (120 VAC)	12 AMP
	30 VDC	5 AMP	20AMP	12 AMP
	250 VAC	7 AMP (N.O.)	16 AMP (UL - TUV.)	10 AMP(TUV)
	30 VDC	7 AMP (N.O.)	16 AMP (UL - TUV.)	10 AMP(TUV)
INDUCTIVE	250 VAC	*2 AMP	*8 AMP	*5 AMP
	30 VDC	†2 AMP	†8 AMP	†5 AMP
TV		DPST - N.O.	SPST - N.O.	SPDT - N.O.
		TV - 3	TV - 8	TV - 5

* COSØ = 0.4 (TUV)

† L/R = 7mS (TUV)

**MANUFACTURED
UNDER
ISO 9002
& QS 9000**

UL CLASS "F" COIL INSULATION SYSTEM AVAILABLE.

AC COIL VOLTAGES.

UL RATED TV-3, TV-5 OR TV-8, N. O. ONLY.

CONTACTS RATED UP TO 20 AMP.

8 MILLIMETERS MINIMUM. CLEARANCE. COIL TO CONTACTS.

DIELECTRIC STRENGTH: 5,000 V rms.



GENERAL SPECIFICATIONS (@ 25°C)

	UNITS	
COIL		
Pull-in Voltage AC (50/60 Hz):	% of nominal	85
Pull-in Voltage DC: ≤	% of nominal	75
Dropout Voltage AC (50/60 Hz): ≥	% of nominal	30
Dropout Voltage DC: ≥	% of nominal	110
Maximum Voltage:	% of nominal	120
Resistance:	% ±	10
Coil Power AC (60 Hz):	VA	1.2
Coil Power DC:	W	5.4
Duty:		Continuous
CONTACTS		
Contact Material:		Silver alloy
Contact Rating AC Amperes (AC1):	A	See table
Contact Rating AC Voltage:	V	See table
Contact Rating DC Amperes (DC1):	A	See table
Contact Rating DC Voltage:	V	See table
Horse Power (AC):	Hp	10
Pilot Duty (60 Hz):		7
TIMING		
Operate Time:	ms	15
Release Time:	ms	10
DIELECTRIC STRENGTH		
Coil to Contacts:	V rms	5000
Across Open Contacts:	V rms	1000
Pole to Pole:	V rms	2500
Contacts to Frame:	V rms	Not applicable
Insulation Resistance:	megohms minimum @ VDC	1000 @ 500

	UNITS	
VIBRATION RESISTANCE		
Functional:	g's	1.65 DA 10-55Hz
SHOCK RESISTANCE		
Functional:	g's	10
TEMPERATURE		
Operating, AC Lower:	°C	-20
Operating, AC Upper:	°C	+55
Operating, DC Lower:	°C	-40
Operating, DC Upper:	°C	+80
Storage, Lower:	°C	-40
Storage, Upper:	°C	+80
LIFE EXPECTANCY		
Electrical @ Rated Load (AC1):	operations	100,000
Mechanical @ no Load :	operations	50,000
MISCELLANEOUS		
Operating Position:		Any
Enclosure Material:		Plastic, epoxy sealed, suitable for automatic circuit board processing. After cleaning process, pierce a small hole in cover for venting
Cover Protection Category:	IP	67
Weight:	grams	17

976 PRINTED CIRCUIT BOARD SLIM - LINE RELAY



SPDT & DPDT 5, 12 & 20 AMPS

WIRING DIAGRAM (TOP VIEWED)



FIG. "A"

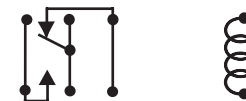
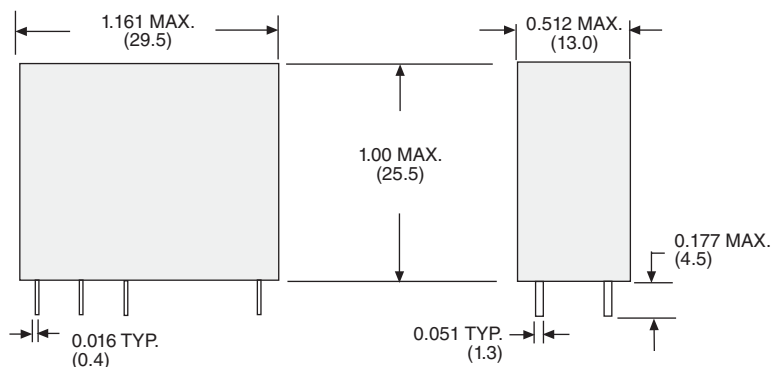


FIG. "B"



FIG. "C"

OUTLINE DIMENSIONS DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



PRINTED CIRCUIT MOUNTING HOLE LAYOUT (BOTTOM VIEW)

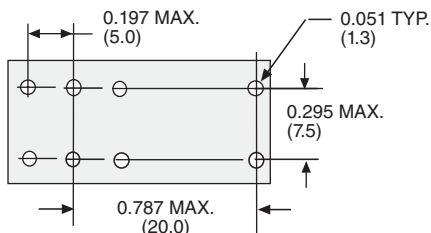


FIG. "A"

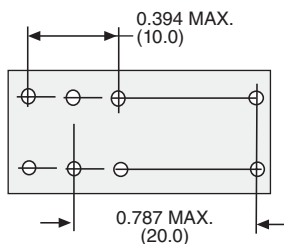


FIG. "B"

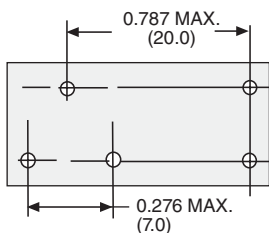
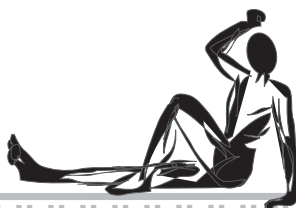


FIG. "C"



STANDARD PART NUMBERS	CONTACT CONFIGURATION	COIL MEASURED @ 25 °C	
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
DC OPERATED COIL, FIG. "A", 5 AMP			
976XBXH-5D / 76EURPCPX-61	DPDT	5 VDC	47 Ω
976XBXH-6D / 76EURPCPX-62	DPDT	6 VDC	68 Ω
976XBXH-12D / 76EURPCPX-63	DPDT	12 VDC	270 Ω
976XBXH-24D / 76EURPCPX-64	DPDT	24 VDC	1100 Ω
DC OPERATED COIL, FIG. "B", 20 AMP			
976XAX97H-5D / 76EURPCPX-146	SPDT	5 VDC	47 Ω
976XAX97H-6D / 76EURPCPX-147	SPDT	6 VDC	68 Ω
976XAX97H-12D / 76EURPCPX-148	SPDT	12 VDC	270 Ω
976XAX97H-24D / 76EURPCPX-149	SPDT	24 VDC	1100 Ω
DC OPERATED COIL, FIG. "C", 12 AMP			
976XAXH-5D / 76EURPCPX-14	SPDT	5 VDC	47 Ω
976XAXH-6D / 76EURPCPX-15	SPDT	6 VDC	68 Ω
976XAXH-12D / 76EURPCPX-16	SPDT	12 VDC	270 Ω
976XAXH-24D / 76EURPCPX-17	SPDT	24 VDC	1100 Ω
AC OPERATED COIL, FIG. "A", 5 AMP			
976XBXH-24A	DPDT	24 VAC	250 Ω
976XBXH-120A	DPDT	120 VAC	5,600 Ω
976XBXH-240A	DPDT	240 VAC	22000 Ω
AC OPERATED COIL, FIG. "B", 20 AMP			
976XAX97H-24A	SPDT	24 VAC	250 Ω
976XAX97H-120A	SPDT	120 VAC	5,600 Ω
976XAX97H-240A	SPDT	240 VAC	22000 Ω
AC OPERATED COIL, FIG. "C", 12 AMP			
976XAXH-24A	SPDT	24 VAC	250 Ω
976XAXH-120A	SPDT	120 VAC	5,600 Ω
976XAXH-240A	SPDT	240 VAC	22000 Ω



OTHER COIL VOLTAGES ARE AVAILABLE ON SPECIAL ORDER.
CONTACT FACTORY FOR SPECIAL REQUIREMENTS.

R.F. PERFORMANCE TABLE



FREQUENCY (MHZ)	INSERTION LOSS (DB) COMMON TO N.O. OR N.C. CONTACTS	VSWR COMMON TO N.O. OR N.C. CONTACTS	ISOLATION (DB) N.O. OR N.C. CONTACTS TO COIL
10	0.05	1.03:1	65
50	0.10	1.04:1	50
100	0.30	1.05:1	42
200	0.50	1.06:1	35
300	0.60	1.07:1	31
400	0.65	1.08:1	29
500	0.75	1.10:1	28

- * AVAILABLE WITH SPDT OR DPDT BIFURCATED GOLD CLAD SILVER-PALLADIUM CROSS BAR CONTACTS- RATED FOR LOW LEVEL TO 2.0 AMP SWITCHING.
- * REQUIRES ONLY .155 SQUARE INCH OF CIRCUIT BOARD SPACE.
- * TOTAL VOLUME OF LESS THAN A CUBIC CENTIMETER.
- * CONFORMS TO FCC PART 68.302. 1500 V PEAK SURGE RESISTANCE.
- * CONFORMS TO FCC PART 68.304. 1000 V DIELECTRIC WITHSTANDING VOLTAGE.

GENERAL SPECIFICATIONS (@ 25°C)



	UNITS	
COIL		
Pull-in Voltage AC (50/60 Hz):≤	% of nominal	Not applicable
Pull-in Voltage DC:≤	% of nominal	80
Dropout Voltage AC (50/60 Hz):≥	% of nominal	Not applicable
Dropout Voltage DC:≥	% of nominal	10
Maximum Voltage:	% of nominal	120
Resistance:	% ±	10
Coil Power AC (60 Hz):	VA	Not applicable
Coil Power DC:	W	0.33
Maximum Coil Dissipation, DC:		0.75 Watt (DC)
CONTACTS		
Contact Material:		Gold clad silver
Contact Rating AC Amperes (AC1):	A	STST 2, DPDT 0.6
Contact Rating AC Voltage:	V	STST 120, DPDT 100
Contact Rating DC Amperes (DC1):	A	2
Contact Rating DC Voltage:	V	24
TIMING		
Operate Time:	ms	4
Release Time:	ms	5
DIELECTRIC STRENGTH		
Coil to Contacts:	V rms	500
Across Open Contacts:	V rms	500
Pole to Pole:	V rms	500
Contacts to Frame:	V rms	Not applicable
Insulation Resistance:	megohms minimum @VDC	1000 @ 500

	UNITS	
VIBRATION RESISTANCE		
Functional:	g's	15
SHOCK RESISTANCE		
Functional:	g's	50
TEMPERATURE		
Operating, AC Lower:	°C	Not applicable
Operating, AC Upper:	°C	Not applicable
Operating, DC Lower:	°C	-35
Operating, DC Upper:	°C	+70
Storage, Lower:	°C	-35
Storage, Upper:	°C	+105
LIFE EXPECTANCY		
Electrical @ Rated Load (AC1):	operations	100,000
Mechanical @ no Load :	operations	100,000,000
MISCELLANEOUS		
Operating Position:		Any
Enclosure Material:		UL 94v-0 plastic epoxy seal
Cover Protection Category:	IP	67
Weight:	grams	SPDT: 2.5, DPDT: 9

60 PRINTED CIRCUIT BOARD MINIATURE RELAY



SPST & DPDT 2 MPS

WIRING DIAGRAM (TOP VIEWED)

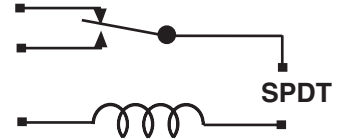


FIG. "A"

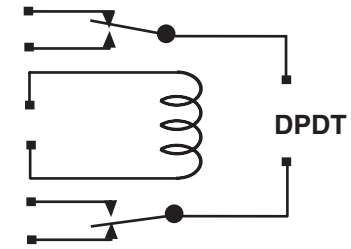
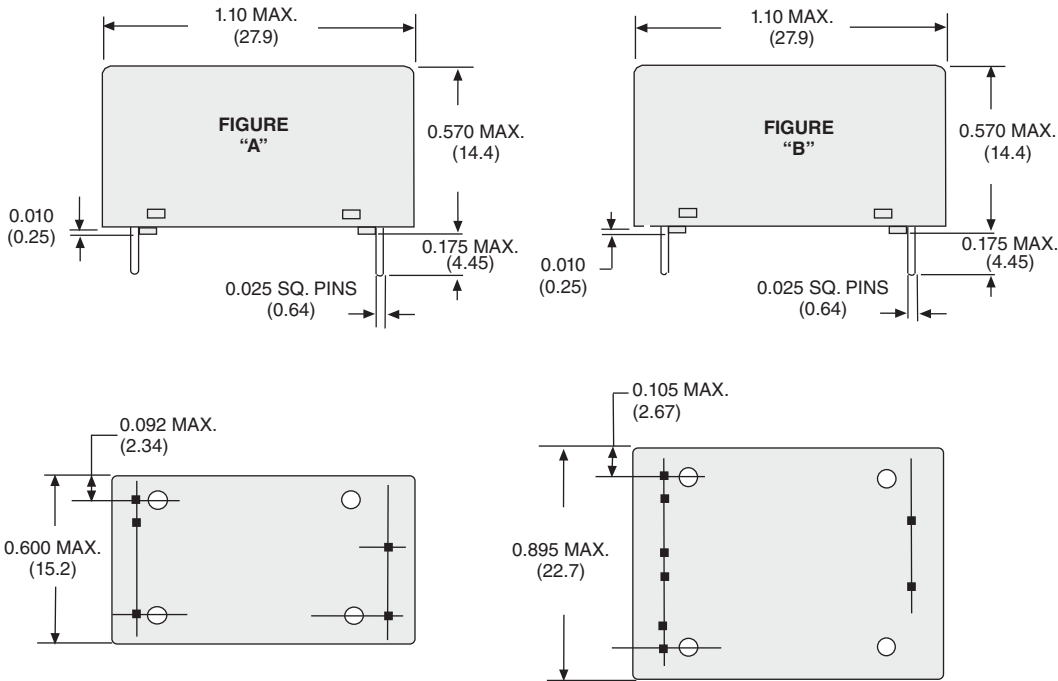
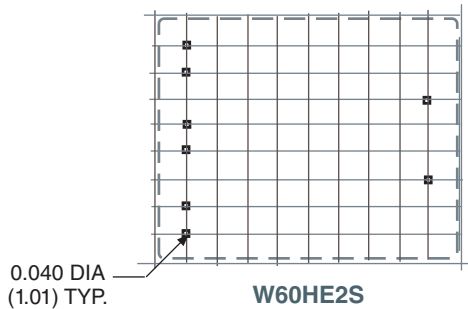
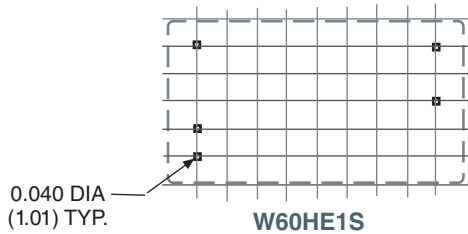


FIG. "B"

OUTLINE DIMENSIONS DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



PRINTED CIRCUIT MOUNTING HOLE LAYOUT (TOP VIEW SHOWN AT ACTUAL SIZE ON 0.1 GRID)



STANDARD PART NUMBERS	CONTACT CONFIGURATION	COIL MEASURED @ 25 °C	
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
FIG. "A"; 2 AMP			
W60HE1S-5DC	SPDT	5 VDC	75 Ω
W60HE1S-12DC	SPDT	12 VDC	440 Ω
W60HE1S-24DC	SPDT	24 VDC	1550 Ω
W60HE1S-48DC	SPDT	48 VDC	5250 Ω
FIG. "B"; 2 AMP			
W60HE2S-5DC	DPDT	5 VDC	75 Ω
W60HE2S-12DC	DPDT	12 VDC	440 Ω
W60HE2S-24DC	DPDT	24 VDC	1550 Ω
W60HE2S-48DC	DPDT	48 VDC	5250 Ω

SPST-N.O. & SPDT, 7 & 10 AMPS

WIRING DIAGRAM

UL
UL Recognized
File No. E190964



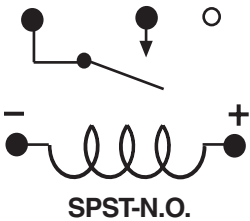
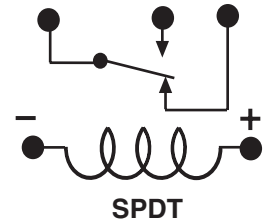
COMPLIES WITH REQUIREMENTS OF

* IEC STANDARDS 947-4-1 AND 947-5-1 LOW VOLTAGE DIRECTIVE

* IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION

UL CONTACT LOAD RATINGS TABLE

LOAD	LOAD VOLTAGE/ CURRENT	SPST-NO	SPDT
RESISTIVE	240 VAC 30 VDC	10 AMP 10 AMP	7 AMP 7 AMP
MOTOR	120 VAC	1/6 HP	1/10 HP
*POWER	WATTS (VDC)	300 WATTS 2500 VA	210 WATTS 1750 VA



GENERAL SPECIFICATIONS (@ 25°C)

	UNITS	
COIL		
Pull-in Voltage AC (50/60 Hz):	% of nominal	Not applicable
Pull-in Voltage DC:	% of nominal	70
Dropout Voltage AC (50/60 Hz):	% of nominal	Not applicable
Dropout Voltage DC:	% of nominal	10
Maximum Voltage:	% of nominal	110
Resistance:	% ±	10
Coil Power AC (60 Hz):	VA	Not applicable
Coil Power DC:	W	0.2
CONTACTS		
Contact Material:		Silver alloy
Contact Rating AC Amperes (AC1):	A	SPST NO: 10, SPDT: 7
Contact Rating AC Voltage:	V	240
Contact Rating DC Amperes (DC1):	A	SPST NO: 10, SPDT: 7
Contact Rating DC Voltage:	V	30
Contact Rating :	VA	SPST NO: 2500, SPDT: 1750
Horse Power (AC):	HP	SPST NO: 1/6 @ 120
Pilot Duty (60 Hz):		SPDT: 1/10 @ 120
TIMING		
Operate Time:	ms	10
Release Time:	ms	10
DIELECTRIC STRENGTH		
Coil to Contacts:	V rms	2000
Across Open Contacts:	V rms	1000
Pole to Pole:	V rms	Not applicable
Contacts to Frame:	V rms	Not applicable
Insulation Resistance:	megohms minimum @ VDC	1000 @ 500
VIBRATION RESISTANCE		
Functional:	g's	1.5 DA 10-55Hz
SHOCK RESISTANCE		
Functional:	g's	30
TEMPERATURE		
Operating, AC Lower:	°C	Not applicable
Operating, AC Upper:	°C	Not applicable
Operating, DC Lower:	°C	-40
Operating, DC Upper:	°C	+70
Storage, Lower:	°C	-40
Storage, Upper:	°C	+100
LIFE EXPECTANCY		
Electrical @ Rated Load (AC1):	operations	100,000
Mechanical @ no Load :	operations	10,000,000
MISCELLANEOUS		
Operating Position:		Any
Insulation Material:		Glass
Enclosure Material:		UL 94v-0 plastic epoxy seal
Cover Protection Category:	IP	67
Weight:	grams	5.5

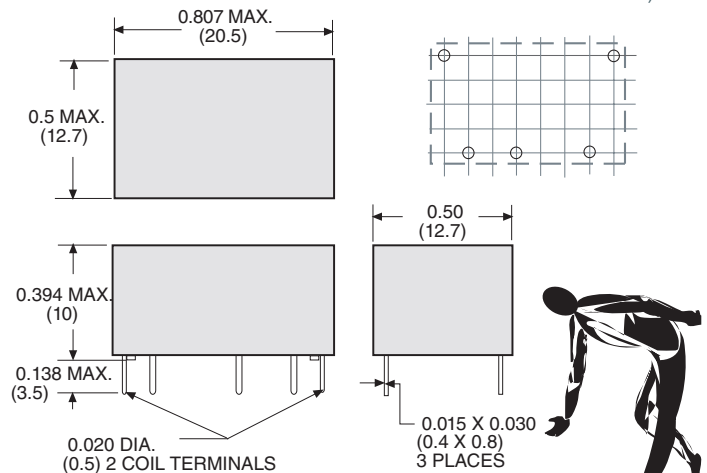
* Voltage and Power Ratings in the table Above are Independent Maximums and no Single Value is to be Exceeded.



DTL COMPATIBLE SINGLE-SIDE STABLE DESIGN.
5KV SURGE RESISTANCE COIL TO CONTACT MEETS
INTERNATIONAL SPACING OF 4 mm.

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



PRINTED CIRCUIT MOUNTING HOLE LAYOUT
(TOP VIEW SHOWN AT ACTUAL SIZE ON 0.1 GRID)

STANDARD PART NUMBERS	CONTACT CONFIGURATION	COIL MEASURED @ 25 °C	
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
10 AMP			
276AXXH-5D	SPST-NO	5 VDC	125 Ω
276AXXH-6D	SPST-NO	6 VDC	180 Ω
276AXXH-12D	SPST-NO	12 VDC	720 Ω
276AXXH-24D	SPST-NO	24 VDC	2880 Ω
7 AMP			
276XAXH-5D	SPDT	5 VDC	125 Ω
276XAXH-6D	SPDT	6 VDC	180 Ω
276XAXH-12D	SPDT	12 VDC	720 Ω
276XAXH-24D	SPDT	24 VDC	2880 Ω

CROSS REFERENCE GUIDE

MAGNECRAFT & STRUTHERS-DUNN	POTTER & BRUMFIELD	GORDOS	HAMLIN	MEDER	CLARE	COTO	
W117SIP-1	JWS-117-1	741A-9	3621A0500	SIL05-1A75-71L	DSS41A05	90010500	
W117SIP-3	JWS-117-3	741A-3	3621A1200	SIL12-1A75-71L	DSS41A12	90011201	
W117SIP-5	JWS-117-5	741A-7	3621A2400	SIL24-1A75-71L	DSS41A24		
W117SIP-22	JWS-117-12	741B-3			DSS41B05		
W117SIP-23	JWS-117-14	741B-5			DSS41B12		
W117SIP-24	JWS-117-15	741B-8			DSS41B24		
W117SIP-6	JWS-117-6	741B-10	3621A0510	SIL05-1A75-71D	DSS41A05B		
W117SIP-8	JWS-117-8	741A-4	3621A1210	SIL12-1A75-71D	DSS41A12B		
W117SIP-10	JWS-117-110	741A-8	3621A2410	SIL24-1A75-71D	DSS41A24B		
W117SIP-18	JWS-117-17	741B-4			DSS41B05B		
W117SIP-25	JWS-117-19	741B-6			DSS41B12B		
W117SIP-26	JWS-117-30	741B-8			DSS41B24B		
MAGNECRAFT & STRUTHERS-DUNN	POTTER & BRUMFIELD	GORDOS		MEDER	CLARE		
W107DIP-1	JWD-107-1	831A-3		DIP05-1A75-11L	PRMA10037		
W107DIP-3	JWD-107-3	831A-5		DIP12-1A75-11L	PRMA10038		
W107DIP-4		831A-7		DIP24-1A75-11L	PRMA10039		
W107DIP-5	JWD-107-5	831A-4		DIP05-1A75-11D	PRMA10037B		
W107DIP-7	JWD-107-7	831A-6		DIP12-1A75-11D	PRMA10038B		
W107DIP-8		831A-8		DIP24-1A75-11D	PRMA10039B		
MAGNECRAFT & STRUTHERS-DUNN	POTTER & BRUMFIELD	GORDOS	HAMLIN	MEDER	CLARE	COTO	COTO SPARTIN
W171DIP-2		831A-3	721A0500	DIP05-1A75-11L	PRMA1A05	80010500	8L01-05-001
W171DIP-4		831A-5	721A1200	DIP12-1A75-11L	PRMA1A12	80011200	8L01-12-001
W171DIP-5	JWD-171-5	831A-7	721A2400	DIP24-1A75-11L	PRMA1A24		8L01-24-001
W171DIP-7		831A-4	721A0510	DIP05-1A75-11D	PRMA1A05B	80010510	8L01-05-011
W171DIP-9		831A-6	721A1210	DIP12-1A75-11D	PRMA1A12B	80011210	8L01-12-011
W171DIP-10	JWD-171-10	831A-8	721A2410	DIP24-1A75-11D	PRMA1A24B		8L01-24-011
W171DIP-12	JWD-171-12	831B-3	721B0500	DIP05-1B75-11L	PRMA1B05	80210500	8L21-05-001
W171DIP-14	JWD-171-14	831B-5	721B1200	DIP12-1B75-11L	PRMA1B12	80211200	8L21-12-001
W171DIP-15	JWD-171-15	831B-7	721B2400	DIP24-1B75-11L	PRMA1B24		8L21-24-001
W171DIP-17	JWD-171-17	831B-4	721B0510	DIP05-1B75-11D	PRMA1B05B	80210510	8L21-05-011
W171DIP-19	JWD-171-19	831B-6	721B1210	DIP12-1B75-11D	PRMA1B12B	80211210	8L21-12-011
W171DIP-20	JWD-171-20	831B-8	721B2410	DIP24-1B75-11D	PRMA1B24B		8L21-24-011
W171DIP-21	JWD-171-21	832A-3	722A0500	DIP05-2A75-21L	PRMA2A05	80020500	8L02-05-001
W171DIP-23	JWD-171-23	832B-5	722A1200	DIP12-2A75-21L	PRMA2A12	80021200	8L02-12-001
W171DIP-24	JWD-171-24	832B-7	722A2400	DIP24-2A75-21L	PRMA2A24		8L02-24-001
W171DIP-25	JWD-171-25	832B-4	722A0510	DIP05-2A75-21D	PRMA2A05B	80020510	8L02-05-011
W171DIP-27	JWD-171-27	832B-6	722A1210	DIP12-2A75-21D	PRMA2A12B	80021210	8L02-12-011
W171DIP-28	JWD-171-28	831B-8	722A2410	DIP24-2A75-21D	PRMA2A24B		8L02-24-011
MAGNECRAFT & STRUTHERS-DUNN	POTTER & BRUMFIELD	GORDOS	HAMLIN	MEDER	CLARE	COTO	
W172DIP-1	JWD-172-1	836C-1	721R0500				
W172DIP-3	JWD-172-3	836C-3	721R1200				
W172DIP-4	JWD-172-4	836C-5	721R2400				
W172DIP-5	JWD-172-5	836C-2	721R0510				
W172DIP-7	JWD-172-7	836C-4	721R1210				
W172DIP-8	JWD-172-8	836C-6	721R2410				
W172DIP-17		835C-1					
W172DIP-19		835C-3					
W172DIP-20		835C-5					
W172DIP-21		835C-2					
W172DIP-23		835C-4					
W172DIP-24		835C-6					
W172DIP-141	JWD-172-155	831C-1	721C0500	DIP05-1C75-51L	PRMA1C05	80410500	
W172DIP-145	JWD-172-157	831C-3	721C1200	DIP12-1C75-51L	PRMA1C12	80411200	
W172DIP-146	JWD-172-158	831C-5	721C2400	DIP24-1C75-51L	PRMA1C24		
W172DIP-147	JWD-172-159	831C-2	721C0510	DIP05-1C75-51D	PRMA1C05B	80410510	
W172DIP-149	JWD-172-161	831C-4	721C1210	DIP12-1C75-51D	PRMA1C12B	80411210	
W172DIP-150	JWD-172-162	831C-6	721C2410	DIP24-1C75-51D	PRMA1C24B		
W172DIP-31		831C-1	721E0500			80510500	
W172DIP-33		831C-3	721E1200			80511200	
W172DIP-34		831C-5	721E2400				

THE CROSS REFERENCE IS INTENDED TO MATCH FOOT PRINT, INTERNAL WIRING, AND CONTACT LOAD RATINGS. CONSTRUCTION FEATURES AND GENERAL SPECIFICATIONS SHOULD BE COMPARED IF EXACT REPLACEMENT IS REQUIRED.

MAGNECRAFT & STRUTHERS-DUNN

HAMLIN

COTO

W172DIP-35	721E0510	80510510
W172DIP-37	721E1210	80511210
W172DIP-38	721E2410	

MAGNECRAFT & STRUTHERS-DUNN

MIDTEX

W7PCX-1	MMS105	
W7PCX-3	MMS102	
W7PCX-4	MMS124	
W7PCX-5	MMS205	
W7PCX-7	MMS212	
W7PCX-8	MMS224	

MAGNECRAFT & STRUTHERS-DUNN

CORNELL DUBILIER

W49RE1C1VG-3DC-SIL	653-3K	
W49RE1C1VG-5DC-SIL	653-6K	
W49RE1C1VG-12DC-SIL	653-12K	
W49RE1C1VG-5DC-SCO	603-6B	
W49RE1C1VG-12DC-SCO	603-12B	
W49RE1C1VG-24DC-SCO	603-24B	
W49RE1C1VW-5DC-SCO	613-6B	
W49RE1C1VW-12DC-SCO	613-12B	
W49RE1C1VW-24DC-SCO	613-24B	

MAGNECRAFT & STRUTHERS-DUNN

POTTER & BRUMFIELD

OMRON

AMERICAN ZETTLER

AROMAT

976XBXH-5D / 76EURCPCX-61	RTE24005F	G2R-24-DC5	AZ733-2C-5DE	JW2SN-DC5V
976XBXH-6D / 76EURCPCX-62	RTE24006F	G2R-24-DC6	AZ733-2C-6DE	JW2SN-DC6V
976XBXH-12D / 76EURCPCX-63	RTE24012F	G2R-24-DC12	AZ733-2C-12DE	JW2SN-DC12V
976XBXH-24D / 76EURCPCX-64	RTE24024F	G2R-24-DC24	AZ733-2C-24DE	JW2SN-DC24V
976XAX97H-5D / 76EURCPCX-146	RTD14005F	G2R-1-E-DC5	AZ755-1C-5DE	NOT AVAILABLE
976XAX97H-6D / 76EURCPCX-147	RTD14006F	G2R-1-E-DC6	AZ755-1C-6DE	NOT AVAILABLE
976XAX97H-12D / 76EURCPCX-148	RTD14012F	G2R-1-E-DC12	AZ755-1C-12DE	NOT AVAILABLE
976XAX97H-24D / 76EURCPCX-149	RTD14024F	G2R-1-E-DC24	AZ755-1C-24DE	NOT AVAILABLE
976XAX97H-48D / 76EURCPCX-150	RTD14048F	G2R-1-E-DC48	AZ755-1C-48DE	NOT AVAILABLE
976XAXH-5D / 76EURCPCX-14	RTB14005F	G2R-14-DC5	NOT AVAILABLE	JW1FSN-DC5V
976XAXH-6D / 76EURCPCX-15	RTB14006F	G2R-14-DC6	NOT AVAILABLE	JW1FSN-DC6V
976XAXH-12D / 76EURCPCX-16	RTB14012F	G2R-14-DC12	NOT AVAILABLE	JW1FSN-DC12V
976XAXH-24D / 76EURCPCX-17	RTB14024F	G2R-14-DC24	NOT AVAILABLE	JW1FSN-DC24V
976XAXH-48D / 76EURCPCX-18	RTB14048F	G2R-14-DC48	NOT AVAILABLE	JW1FSN-DC48V

110VDC COIL AVAILABLE ON CLASS 976

976XBXH-24A	RTE24524	G2R-24-AC24
976XBXH-120A	RTE24615	G2R-24-AC120
976XBXH-240A	RTE24730	G2R-24-AC240
976XAX97H-24A	RTD34524	G2R-1-E-AC24
976XAX97H-120A	RTD34615	G2R-1-E-AC120
976XAX97H-240A	RTD34730	G2R-1-E-AC240
976XAXH-24A	RTB14524	G2R-14-AC24
976XAXH-120A	RTB14615	G2R-14-AC120
976XAXH-240A	RTB14730	G2R-14-AC240

MAGNECRAFT & STRUTHERS-DUNN

POTTER & BRUMFIELD

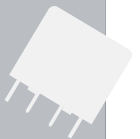
W60HE1S-5DC	R50E2Y1-5V
W60HE1S-12DC	R50E2Y1-12V
W60HE1S-24DC	R50E2Y1-24V
W60HE1S-48DC	R50E2Y1-48V
W60HE2S-5DC	R50E2Y2-5V
W60HE2S-12DC	R50E2Y2-12V
W60HE2S-24DC	R50E2Y2-24V
W60HE2S-48DC	R50E2Y2-48V

FOR REED RELAYS APPLICATION ENGINEERING ASSISTANCE

Joe Zintel, PRODUCT MANAGER

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EMAIL: jzintel@magnecraft.com



THE CROSS REFERENCE IS INTENDED TO MATCH FOOT PRINT, INTERNAL WIRING, AND CONTACT LOAD RATINGS. CONSTRUCTION FEATURES AND GENERAL SPECIFICATIONS SHOULD BE COMPARED IF EXACT REPLACEMENT IS REQUIRED.