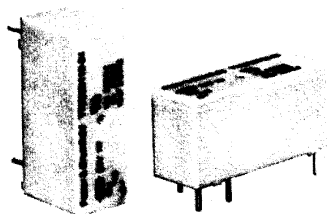


**SENSITIVE, LOW PROFILE, HI-CURRENT
RELAY DESIGNED TO MEET
INTERNATIONAL STANDARDS**



FEATURES

- High sensitivity – nominal coil power requirement is as low as 212mW.
- Low profile, .591 in. (15 mm) tall case uses only .465 in² (3cm²) of area on the printed circuit board, permitting high density circuit design.
- Power switching capability – contacts rated 14 amps in 1 Form A (SPST-NO) or 1 Form C (SPDT) arrangements.
- Designed to meet UL, CSA, VDE, SEMKO and SEV requirements.
- Designed to meet VDE 8mm spacing, 4kV dielectric, coil to contacts.
- Designed to meet 3 mm creepage between contacts.
- Conforms to: VDE 0110 – Insulation Group C (250V)
 - VDE 435 Part 201 – High current applications
 - VDE 0804 – Telecommunications equipment
 - VDE 0631 – Temperature controllers and limiters
 - VDE 0700 – Household appliances
 - VDE 0805/5.90 – Office machines
- Immersion cleanable[§], ultrasonically sealed case.
- Well suited for a broad range of applications e.g. HVAC, appliances, security and industrial control.

§ For additional details, refer to application note 13C265,
"Mounting, Termination and Cleaning of PC Board Relays."

CONTACT DATA @ 25 °C

Arrangements: 1 Form A (SPST-NO) and 1 Form C (SPDT).

Material: Silver-cadmium oxide.

Expected Mechanical Life: 20 million operations.

Expected Electrical Life:

- 100,000 operations at 8 amps, 240VAC.
- 50,000 operations at 14 amps NO / 5 amps NC, 120VAC Res.
- 30,000 operations at 7.2 FLA, 45 LRA, 120VAC.
- 10,000 operations at 5 FLA, 30 LRA, 240VAC.
- 30,000 operations at B300 pilot duty (360VA, 240VAC; 470VA, 120VAC).

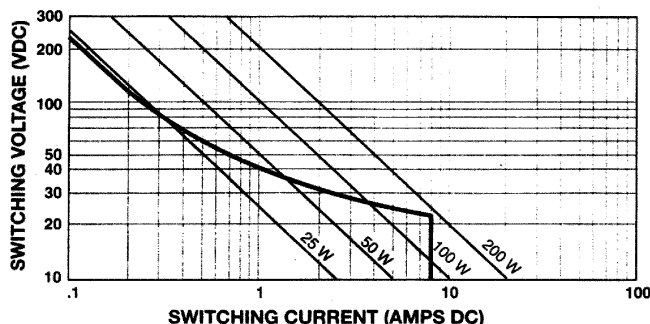
Contact Ratings (See Figure 1):

- Maximum Switched Voltage: 380VAC.
- Maximum Switched Current: 14/5 (N.O./N.C.) amps, AC resistive; 8 amps DC (see Fig. 1)
- Maximum Switched Power: 200W, DC; 2,000VA, AC.
- Minimum Required Contact Load: 12V, 100mA.

VDE Contact Ratings: 8 amps, 250VAC.

UL/CSA Contact Ratings: 10 amps, 240VAC; 8 amps 24VDC; 1/3 HP, 120VAC; 1/2 HP, 240VAC.

FIGURE 1 – DC SWITCHING LOAD LIMIT CURVE



INITIAL DIELECTRIC STRENGTH

Between Open Contacts: 1,000V rms.

Between Contacts and Coil: 4,000V rms, 8 mm.

T75 series

**14 AMP, PC BOARD
MINIATURE RELAY**

△ VDE-Reg. No. 3919

RU File E29244

SB File LR45064

COIL DATA

Voltage: 3 to 60VDC.

Maximum Power @ 25°C: 1W.

Nominal Power @ 25°C: 230mW, typ.

Temperature Rise: 85°C per Watt.

Duty Cycle: Continuous.

COIL DATA

	Nominal Voltage	DC Resistance in Ohms ±10%	Must Operate Voltage	Nominal Coil Current (mA)
DC Coils	3	40	2.1	75.0
	5	118	3.6	42.4
	6	165	4.3	36.4
	9	365	6.4	24.7
	12	650	8.5	18.5
	18	1,455	12.8	12.4
	24	2,270	17.2	10.6
	36	5,460	25.4	6.4
	48	8,790	34.5	5.5
	60	15,265	42.8	3.9

OPERATE DATA @ 25 °C

Must Operate Voltage: 72% of nom. voltage or less.

Must Release Voltage: 10% of nom. voltage or more.

Operate Time (Excluding Bounce): 6 ms, typ., at nom. voltage.

Release Time (Excluding Bounce): 2.5 ms, typ., at nom. voltage.

Maximum Switching Rate: 20 operations/second.

Maximum Continuous Operating Voltage: 225% of nom. voltage.

ENVIRONMENTAL DATA

Temperature Range:

Storage: -40°C to +130°C.

Operating: -40°C to +70°C.

MECHANICAL DATA

Termination: Printed circuit terminals.

Enclosures: Immersion cleanable, plastic sealed case.

Weight: 0.65 oz. (18.5 g) approximately.

7 RELAYS

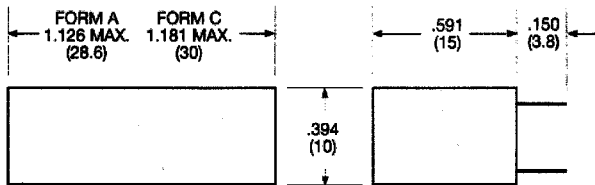
ORDERING INFORMATION

Typical Part Number➤							
T75	S	5	D	1	1	2	-12
1. BASIC SERIES: T75 = Low profile, printed circuit board relay.							
2. ENCLOSURE: S = Immersion cleanable, plastic sealed case.							
3. CONTACT ARRANGEMENT: 1 = 1 Form A (SPST-NO) 5 = 1 Form C (SPDT)							
4. COIL INPUT: D = DC voltage							
5. COIL CONFIGURATION: 1 = Single coil, non-latching (monostable)							
6. MOUNTING AND TERMINALS: 1 = Printed circuit terminals							
7. CONTACT MATERIAL: 2 = Silver-cadmium oxide (AgCdO)							
8. COIL VOLTAGE: 03 = 3VDC 06 = 6VDC 12 = 12VDC 24 = 24VDC 48 = 48VDC 05 = 5VDC 09 = 9VDC 18 = 18VDC 36 = 36VDC 60 = 60VDC							

STOCK ITEMS - The following items are normally maintained in stock for immediate delivery

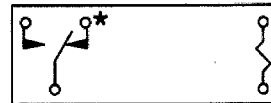
T75S5D112-05
T75S5D112-12
T75S5D112-24
T75S5D112-48

OUTLINE DIMENSIONS



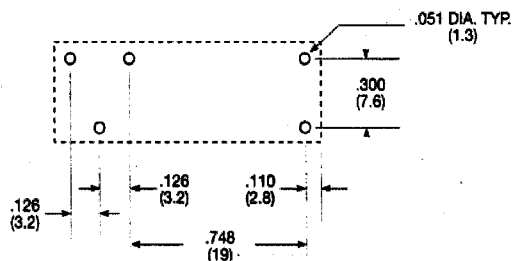
CONTACT TERMINALS: .023 x .040 (.58 x 1.02) REF.
COIL TERMINALS: .024 (.61) DIA. REF.

WIRING DIAGRAMS (Bottom Views)

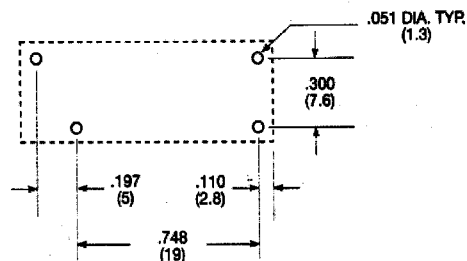


* ON SINGLE THROW MODELS, ONLY NECESSARY TERMINALS ARE PRESENT.

PC BOARD LAYOUTS (Bottom Views)



1 FORM C



1 FORM A



T77 series

10 AMP MINIATURE PCB RELAY

File E29244

File LR48471M83

FEATURES

- Small size for high density P.C. board mounting.
- 1 Form A contact arrangements.
- Creepage spacings of 6.5mm between contact and coil.
- Ideal for appliance, office equipment.
- 4,000VAC dielectric strength between contact and coil.

CONTACT DATA @ 20 C

Arrangements: 1 Form A (SPST-NO).

Material: Contact rating 3 - Silver

Contact rating 10 - Silver Alloy

Max. Switching Rate: 300 ops./min. (no load)
30 ops./min. (rated load).

Expected Mechanical Life: 10 million operations.

Expected Electrical Life: 100,000 operations.

Initial Contact Resistance: 100 milliohms max.

CONTACT RATINGS†

Item	Ratings	
Resistive Load (Cosθ = 1)	3	10
	250VAC 3A	120VAC 10A
	28VDC 3A	28VDC 10A
Inductive Load (Cosθ = 0.4)	250VAC 1A	
	28VDC 1A	
Max. Allow. Voltage	265VAC	265VAC
	30VDC	30VDC
Max. Allow. Power	720VA	1200VA
	90W	240W

†Ratings are for vented versions.

INITIAL DIELECTRIC STRENGTH

Between Open Contacts: 750VAC (1 minute).

Between Coil and Contacts: 4,000VAC (1 minute).

ORDERING INFORMATION

Typical Part Number>	T77	V	1	D	10	-24
1. BASIC SERIES: T77 = Miniature PCB relay.						
2. ENCLOSURE: V = Vented (Flux-Tight)* S = Plastic Epoxy Resin Sealed						
3. CONTACT ARRANGEMENT: 1 = (SPST-NO)						
4. COIL INPUT: D = DC Voltage						
5. CONTACT RATING: 3 = 3A 10 = 10A						
6. COIL VOLTAGE: 3 = 3VDC 5 = 5VDC 12 = 12VDC 24 = 24VDC						

*Not suitable for immersion cleaning processes.

STOCK ITEMS - The following items are maintained in stock.

T77V1D3-5	T77V1D10-5	T77S1D3-5	T77S1D10-5
T77V1D3-12	T77V1D10-12	T77S1D3-12	T77S1D10-12
T77V1D3-24	T77V1D10-24	T77S1D3-24	T77S1D10-24

COIL DATA @ 20 C

Voltage: 3 to 24VDC.

Resistance: See Coil Data Table.

Nominal Power: Contact rating 3 = 200mW.

Contact rating 10 = 450mW.

Coil Temperature Rise: Contact rating 3 = 35°C max.

Contact rating 10 = 40°C max.

Duty Cycle: Continuous.

COIL DATA @ 20°C

Rated Coil Voltage (VDC)	Coil Resistance (Ohms) ±10%		Must Operate Voltage (VDC)	Must Release Voltage (VDC)
	Contact rating 3	Contact ratings 10		
3	45	20	2.25	0.15
5	125	55	3.75	0.25
12	720	320	9.00	0.60
24	2,800	1,280	18.00	1.20

OPERATE DATA @ 20 C

Must Operate and Must Release Voltage: See Table above.

Operate Time: 10 ms, max.

Release Time: 4 ms, max.

ENVIRONMENTAL DATA

Temperature Range: -30°C to +55°C.

Vibration, Mechanical: 10 to 55 Hz., 1.5mm double amplitude.

Operational: 10 to 55 Hz., 1.5mm double amplitude.

Shock, Mechanical: 100g min.

Operational: 10g min.

Operating Humidity: 45 to 85% RH.

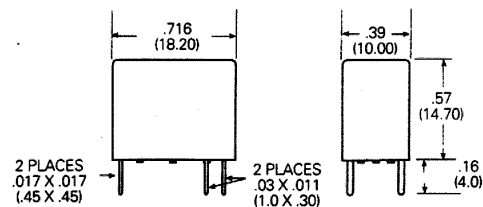
MECHANICAL DATA

Mounting: Printed circuit board.

Weight: 0.36 oz. (9 g).

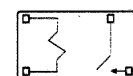
Sealing: Epoxy sealed or Flux-tight with open vent hole (not immersion cleanable).

OUTLINE DIMENSIONS

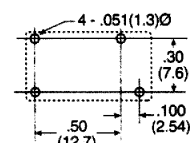


WIRING DIAGRAM (Bottom View)

1 Form A



SUGGESTED PC BOARD LAYOUT (Bottom View)





T7C series

12 AMP MINIATURE POWER PCB RELAY

File E29244

File LR48471M83

7

RELAYS

FEATURES

- 12 amp switching capacity.
- 1 Form C contact arrangements.
- Ideal for domestic appliances and office machines.
- Resists high temperature and various chemical solutions.

CONTACT DATA @ 20 °C

Arrangements: 1 Form C (SPDT).

Max. Switching Rate: 300 ops./min. (no load).
30 ops./min. (rated load)

Expected Mechanical Life: 10 million operations.

Expected Electrical Life: 100,000 operations.

Contact Resistance: 100 milliohms max.

Material: Silver-cadmium Oxide.

CONTACT RATINGS†

Load	Form C (N.O.)*	Form C (N.C.)*
Resistive (Cosθ = 1)	10A, 250VAC, 28VDC	5A, 240VAC, 28VDC
	12A, 120VAC	8A, 120VAC
Inductive (Cosθ = 0.4, L/R = 7ms)	4A, 120VAC, 24VDC	

*N.O. and N.C. loaded simultaneously.

†Tape must be removed from sealed models after cleaning to achieve these ratings.

INITIAL DIELECTRIC STRENGTH

Between Open Contacts: 750VAC (1 minute).

Between Coil and Contacts: 1,500VAC (1 minute).

COIL DATA @ 20 °C

Voltage: 3 to 48VDC.

Nominal Power: 360 milliwatts

510 milliwatts for 48VDC coil.

Coil Temperature Rise: 35°C max, at rated coil voltage.

Duty Cycle: Continuous.

COIL DATA @ 20°C

Rated Coil Voltage (VDC)	Coil Resistance (Ohms) +10%	Must Operate Voltage (VDC)	Must Release Voltage (VDC)
3	25	2.25	0.15
6	100	4.50	0.30
9	225	6.75	0.45
12	400	9.00	0.60
24	1,600	18.00	1.20
48	4,500	36.00	2.40

OPERATE DATA @ 20 °C

Operate Time: 15 ms, max.

Release Time: 5 ms, max.

ENVIRONMENTAL DATA

Temperature Range: -30°C to +55°C.

Insulation Resistance: 100 milliohms (500VDC).

Vibration, Mechanical: 10 to 55 Hz., 1.5mm double amplitude

Operational: 10 to 55 Hz., 1.5mm double amplitude.

Shock, Mechanical: 100g min.

Operational: 10g min.

Operating Humidity: 45 to 85% RH.

MECHANICAL DATA

Termination: Printed circuit terminals.

Weight: 0.42 oz. (12 g).

ORDERING INFORMATION

Typical Part Number>

T7C V 5 D -24

1. BASIC SERIES:

T7C = Miniature power relay.

2. ENCLOSURE:

V = Vented (Flux-tight)*

S = Immersion cleanable, tape sealed case

3. CONTACT ARRANGEMENT:

5 = 1 Form C (SPDT)

4. COIL INPUT:

D = DC Voltage

5. COIL VOLTAGE:

03 = 3VDC

06 = 6VDC

09 = 09VDC

12 = 12VDC

24 = 24VDC

48 = 48VDC

* Not suitable for immersion cleaning processes.

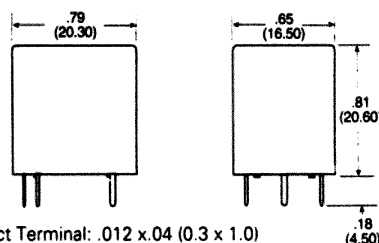
STOCK ITEMS - The following items are maintained in stock.

T7CS5D-06

T7CS5D-12

T7CS5D-24

OUTLINE DIMENSIONS



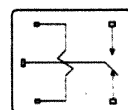
Movable Contact Terminal: .012 x .04 (0.3 x 1.0)

Stationary Contact Terminals: .02 x .04 (0.5 x 1.0)

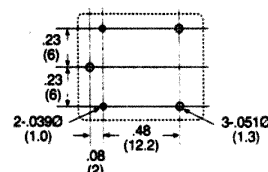
Coil Terminals: .0177 x .02 (0.45 x 0.5)

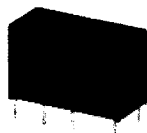
WIRING DIAGRAM (Bottom View)

1 Form C



SUGGESTED PC BOARD LAYOUT (Bottom View)





T85 series

HIGH SENSITIVITY, DIP PC BOARD RELAY

File E29244

File LR35579

FEATURES

- Ultra sensitive DC coils through 48 volts.
- Switches up to 2 amps.
- Standard DIP configuration mates with 16-pin socket.
- Bifurcated contacts in a 2 Form C arrangement.
- 1,500 volt surge strength – meets FCC Part 68.
- Well suited for application in telecommunications equipment, audio equipment and business machines.
- Immersion cleanable, plastic sealed case.

CONTACT DATA @ 20 °C

Contact Style	Series 4	Series 5
Arrangement:	Bifurcated 2 Form C (DPDT)	Bifurcated 2 Form C (DPDT)
Material: Stationary:	Gold overlay silver-palladium alloy	Gold overlay silver-nickel alloy
Movable:	Silver-palladium alloy	Gold overlay silver-nickel alloy
Initial Contact Resistance:	100 milliohms, max. @ 100mA, 6VDC	100 milliohms, max. @ 100mA, 6VDC
Ratings: Max. Switched Current:	1.25A, AC or DC	2A, AC or DC
Max. Switched Voltage:	60VDC, 120VAC	150VDC, 125VAC
Max. Switched Power:	24W or 60VA	30W or 62.5VA
Max. Carry Current:	2A, AC or DC	2A, AC or DC
Min. Switched Current:	10µA, AC or DC	10µA, AC or DC
Min. Switched Voltage:	50µV, AC or DC	50µV, AC or DC
Min. Switched Power:	25µW, AC or DC	25µW, AC or DC
Expected Mechanical Life:	20 million ops.	10 million ops.
Expected Electrical Life:	500,000 operations @ 1A, 24VDC, res. 200,000 operations @ .5A, 120VAC, res.	100,000 operations @ 2A, 30VDC 200,000 operations @ .4A, 120VAC

INITIAL DIELECTRIC STRENGTH

Between Open Contacts: 500V rms, 50/60 Hz., for 1 minute.
Between Poles: 1,000V rms, 50/60 Hz., for 1 minute.
 1,500V rms surge per FCC Part 68.
Between Coil and Contacts: 1,000V rms, 50/60 Hz., for 1 minute.
 1,500V rms surge per FCC Part 68.

INITIAL INSULATION RESISTANCE

Between Mutually Insulated Conductors: 10⁹ ohms @ 500VDC.

COIL DATA @ 20 °C

Voltage: 4.5 through 48VDC.
Nominal Power: See Coil Data table.

Maximum Coil Power: 725 milliwatts, for contact style series 4.
 800 milliwatts, for contact style series 5.
Temperature Rise: 110°C per watt, typical.
Duty Cycle: Continuous.

COIL DATA @ 20°C - FOR CONTACT STYLE SERIES 4

Nominal Voltage (VDC)	Resistance ±10% (Ohms)	Nominal Coil Power (mW)
4.5	135	150
5	167	150
6	240	150
9	540	150
12	960	150
24	2,880	200
48	7,680	300

COIL DATA @ 20°C - FOR CONTACT STYLE SERIES 5

Nominal Voltage (VDC)	Resistance ±10% (Ohms)	Nominal Coil Power (mW)
4.5	36	560
5	45	560
6	66	550
9	140	580
12	280	510
24	1,070	540
48	4,000	580

OPERATE DATA @ 20 °C

Must Operate Voltage: 70% of nominal voltage or less.
Must Release Voltage: 5% of nominal voltage or more.
Operate Time (Excluding Bounce)†: 6 ms, max.
Release Time (Excluding Bounce)†: 3 ms, max.
Operate Bounce: 3 ms, max.
Release Bounce: 4 ms, max.

† At or from Nominal Coil Voltage.

ENVIRONMENTAL DATA

Temperature Range: -30°C to +80°C, for contact style series 4.
 -40°C to +60°C, for contact style series 5.
Vibration, Operational: 10 g, 10-55 Hz.
Shock, Operational: 10 g for 11 ms, 1/2 sine wave.
Shock, Non-destructive: 100 g for 6 ms, 1/2 sine wave.

MECHANICAL DATA

Termination: DIP compatible, printed circuit terminals.
Enclosure: Sealed PBT plastic case.
Weight: 0.16 oz. (4.5 g) approximately.

7 RELAYS

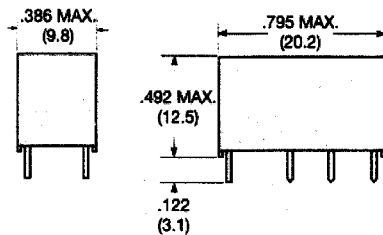
ORDERING INFORMATION

Typical Part Number >		T85	N	11	D	11	4	-12
1. BASIC SERIES:		T85 = Ultra sensitive, DIP PC board relay.						
2. ENCLOSURE:		N = Sealed plastic case.						
3. CONTACT ARRANGEMENT:		11 = 2 Form C (DPDT)						
4. COIL INPUT:		D = DC voltage.						
5. TERMINALS:		11 = Printed circuit terminals.						
6. CONTACT STYLE & MATERIAL:		4 = Bifurcated, silver-palladium (gold overlay on stationary), 1.25A max. 5 = Bifurcated, silver-nickel (gold overlay on stationary and moveable), 2A max.						
7. COIL VOLTAGE:		04 = 4.5VDC 06 = 6VDC 12 = 12VDC 48 = 48VDC 05 = 5VDC 09 = 9VDC 24 = 24VDC						

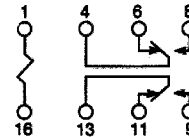
STOCK ITEMS - The following items are normally maintained in stock for immediate delivery

T85N11D114-05	T85N11D114-12	T85N11D115-05	T85N11D115-12
T85N11D114-06	T85N11D114-24	T85N11D115-06	T85N11D115-24
T85N11D114-09	T85N11D114-48	T85N11D115-09	T85N11D115-48

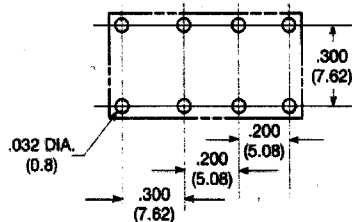
OUTLINE DIMENSIONS

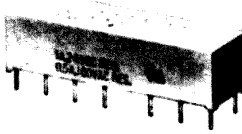


WIRING DIAGRAMS (Bottom Views)



PC BOARD LAYOUT (Bottom View)





FEATURES

- Meets FCC Part 68 isolation.
- 4 Form C contact arrangement.
- Standard 0.1" x 0.3" grid spacing in a DIP configuration.
- Standard or sensitive DC coils through 48 volts.
- Well suited for audio communications circuits, logic and process control, vending machines and office automation applications.
- Immersion cleanable, plastic sealed case.

CONTACT DATA

Arrangements: Bifurcated cross bar in 4 Form C (4PDT).
Material: Silver-palladium alloy (stationary contacts have gold overlay).
Ratings: Max. Switching Voltage: 120V, AC or DC.
 Max. Switching Power (resistive load): 24W DC, 60VA AC.
 Max. Switching Current: 1A, DC or AC.
 Min. Switching Current: .01mA, 10mVDC.
 Max. Carrying Current: 2A, DC or AC.
Expected Mechanical Life: 20 million operations.
Expected Electrical Life: 500,000 ops. @ 1A, 24VDC, resistive.
 200,000 ops. @ 0.5A, 120VAC, resistive.
Initial Contact Resistance: 100 milliohms, max., @ 100mA, 6VDC.

INITIAL DIELECTRIC STRENGTH

Between Open Contacts: 1,000V rms, 60 Hz.
 1,500V FCC Part 68 surge test.
Between Contact Sets: 1,500V rms, 60 Hz.
 1,500V FCC Part 68 surge test.
Contact to Coil: 1,500V rms, 60 Hz.; 1,500V FCC Part 68 surge test.

INITIAL INSULATION RESISTANCE

Between Mutually Insulated Conductors: 10^9 ohms @ 500VDC (except between dual coils).

COIL DATA @ 20 C

Voltage: 3 through 48VDC.
Maximum Continuous Coil Power: 800 milliwatts.
Temperature Rise: 77°C per watt, typ.

ORDERING INFORMATION

Typical Part Number	T84	S	17	D	2	1	4	-24
1. BASIC SERIES: T84 = High dielectric, PC board relay.								
2. CONSTRUCTION: S = Sealed.								
3. CONTACT ARRANGEMENT: 17 = 4 Form C (4PDT)								
4. COIL INPUT: D = DC Voltage.								
5. COIL SENSITIVITY: 2 = Sensitive. 4 = Standard (not available on single coil latch).								
6. FUNCTIONAL TYPE: 1 = Single coil non-latching. 2 = Single coil latching. 3 = Dual coil latching.								
7. CONTACT MATERIAL: 4 = Silver-palladium alloy.								
8. COIL VOLTAGE: 03 = 3VDC 05 = 5VDC 06 = 6VDC 12 = 12VDC 24 = 24VDC 48 = 48VDC								

STOCK ITEMS - The following items are maintained in stock.

T84S17D214-05	T84S17D234-05	T84S17D414-48
T84S17D214-12	T84S17D234-12	T84S17D434-05
T84S17D214-24	T84S17D234-24	T84S17D434-12
T84S17D214-48	T84S17D414-05	
T84S17D224-05	T84S17D414-12	
T84S17D234-03	T84S17D414-24	

T84 series

4 POLE, HIGH DIELECTRIC PC BOARD RELAY

File E29244

File LR35579

COIL DATA @ 20°C

	Resistance in Ohms $\pm 10\%$					
	Standard Coils			Sensitive Coils		
	Single Coil Non-Latching	Single Coil Latching	Dual Coil Latching (either coil)	Single Coil Non-Latching	Single Coil Latching	Dual Coil Latching (either coil)
Nom. Coil Power $\Rightarrow$ Voltage $\downarrow$	400mW	N/A	360mW	200mW	90mW	180mW
3	22.5	N/A	25	45	100	50
5	62.5	N/A	69	125	278	139
6	90	N/A	100	180	400	200
12	360	N/A	400	720	1,600	800
24	1,440	N/A	1,600	2,880	6,400	3,200
48	5,760	N/A	6,400	11,520	25,600	12,800

OPERATE DATA @ 20 C

Must Operate Voltage: 70% of nominal voltage or less.
Must Release Voltage (non-latching): 10% of nominal voltage or more.
(Latching): Must operate voltage applied to reset coil (dual) or negative voltage (single).
Operate Time (Excluding Bounce): 6 ms, max.
Release Time (Excluding Bounce): 4 ms, max.
Reset Time (Latching): 6 ms, max.
Bounce Time: 1 ms, approximately.
 † At or from Nominal Coil Voltage

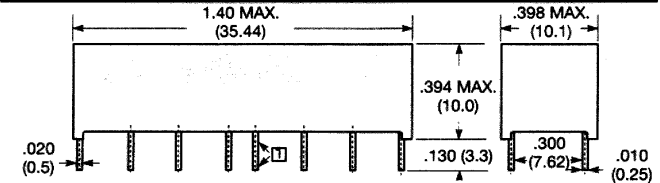
ENVIRONMENTAL DATA

Temperature Range: Standard Coil: -40°C to +70°C.
 Sensitive Coil: -40°C to +80°C.
Vibration: Operational and Non-destructive: 30 g from 10-500 Hz.
Shock: Operational: 50 g at 11 ms 1/2 sinusoidal impulse.
Non-destructive: 100 g at 11 ms 1/2 sinusoidal impulse.

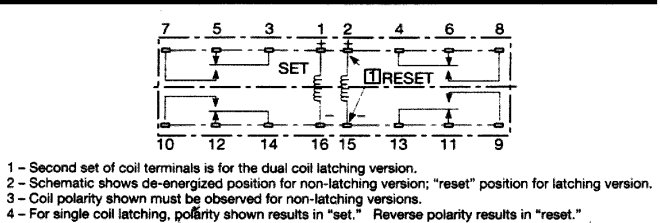
MECHANICAL DATA

Termination: Printed circuit terminals on 0.1" (2.54 mm) centers.
Enclosure: Sealed PBT plastic case.
Weight: 0.25 oz. (7 g) approximately.

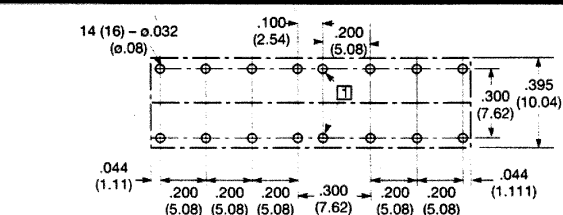
OUTLINE DIMENSIONS

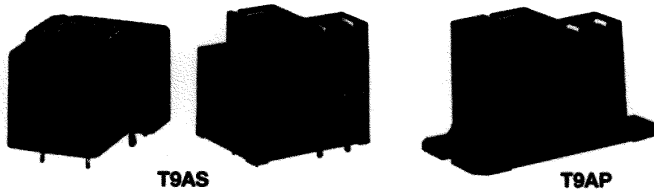


WIRING DIAGRAM (Bottom View)



PC BOARD LAYOUT (Bottom View)





T9A series

LOW COST 30 AMP PC BOARD OR PANEL MOUNT RELAY

File E22575

File LR15734

FEATURES

- Up to 30 amp switching in SPST and 20 amp in SPDT arrangements.
- Immersion cleanable^(note 6), plastic sealed case available.
- Meets UL 873 and UL 508 spacing - 1/8" through air, 1/4" over surface.
- Load connections made via 1/4" Q. C. terminals and safety wells accept insulated female Q. C. terminals (mounting codes 2 & 5).
- UL Class F insulation system standard.
- Well suited for various industrial, commercial and residential applications.

CONTACT DATA @ 25 °C

Arrangements: 1 Form A (SPST-NO) and 1 Form C (SPDT).

Material: Silver-cadmium oxide.

Mechanical Life: 10 million operations, typical.

TYPICAL ELECTRICAL LOAD & LIFE

Operations	Contact Load	Type of Load	Contact Form
100,000	30A @ 240VAC	UL General Purpose	Form A
100,000	25A @ 240VAC	Resistive Heater	Form A
100,000	20A/10A @ 240VAC	UL General Purpose	NO/NC Form C
100,000	20A/10A @ 240VAC	UL Resistive	NO/NC Form C
100,000	20A/10A @ 28VDC	Resistive	NO/NC Form C

Minimum Contact Load: 1A @ 5VDC or 12VAC.

Initial Contact Resistance: 75 milliohms, max., @ min. rated current (switched).

UL 508/873 & CSA CONTACT RATINGS

Voltage	Load Type	N.O. Contact	N.C. Contact
240VAC	General Purpose†	30A	15A
125VAC	Motor	1 HP	1/4 HP
120VAC	LRA/FLA	98A/22A	-
240VAC	Motor	2 HP	1/2 HP
240VAC	LRA/FLA ***††	80A/30A	30A/12A
240VAC	Tungsten *	TV-5	-
240VAC	Pilot Duty *	470VA	275VA
277VAC	Ballast	10A	3A
28VDC	Resistive	20A	10A

* Rated 6,000 operations.

** Higher UL & CSA ratings available.

† For Form C application, derate current to 20A (N.O.), 10A (N.C.).

†† For Form C application, derate current to 67%.

INITIAL DIELECTRIC STRENGTH

Between Open Contacts: 1,500V rms.

Between Contacts and Coil: 1,500V rms (Mounting Code 1).
2,500V rms (Mounting Codes 2 and 5).

INITIAL INSULATION RESISTANCE

Between Mutually Insulated Elements: 10⁹ ohms, min., @ 500VDC, 25°C and 50% R.H.

COIL DATA @ 25 °C

Voltage: 5 to 110VDC.

Nominal Coil Power: 1.0W, approx.

Maximum Coil Power: 2.8 Watt.

Maximum Coil Temperature^(note 5): Class F: 140°C.

Duty Cycle: Continuous.

COIL DATA

Nominal Voltage	DC Resistance ± 10% (Ohms)	Nominal Current (mA)	Nominal Voltage	DC Resistance ± 10% (Ohms)	Nominal Current (mA)
5	25	200	18	324	56
6	36	167	22	484	45
9	81	111	24	576	42
12	144	83	48	2,304	21
15	225	67	110	12,100	9

OPERATE DATA @ 25 °C

Must Operate Voltage: 75% of nominal voltage or less.

Must Release Voltage: 10% of nominal voltage or more.

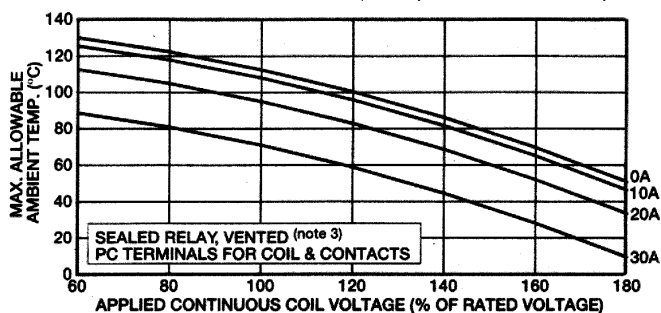
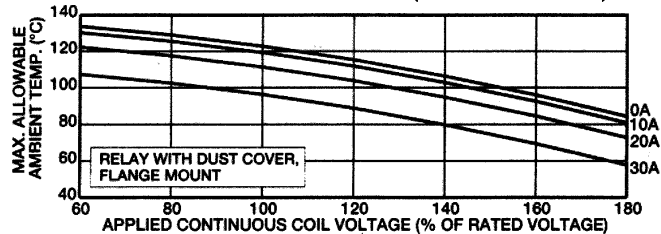
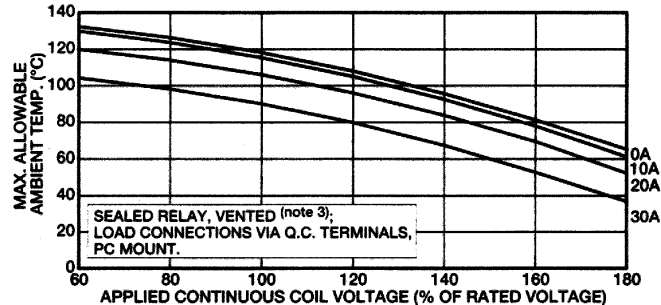
Operate Time (Including Bounce): 15 ms, max.

Release Time (Including Bounce): 15 ms, max.

§ At or From Nominal Coil Voltage

AMBIENT TEMPERATURE VS. COIL VOLTAGE

Data below are average values and should be verified in application. Tests were conducted within a 2' (.6 m) cube (still air); at nominal coil power @ 25°C; with normally open contact loaded; and with 4' (1.22 m) long, #10 AWG load wires. P.C. board relays were mounted to a 30A, single side P.C. board.



ENVIRONMENTAL DATA

Storage Temperature Range: -55°C to 130°C.

Operating Temperature Range^(note 1): -55°C to +85°C.

Vibration, Operational: 0.065" (1.65 mm) max. excursions from 10-55 Hz, with no contact opening >100µs.

Shock, Operational: 10 g for 11 ms with no contact opening >100µs.

Shock, Mechanical: 100 g.

MECHANICAL DATA

Termination: Printed circuit and quick connect terminals ^(note 4).

Enclosures (all have 94V-O flammability rating):

T9AP: Unsealed, plastic dust cover.

T9AS: Immersion cleanable, sealed plastic case ^(notes 2 & 3).

Weight: Q.C. version 1.2 oz. (33 g) approx. (mounting code 2 & 5).

Sealed Model T9AS: 0.9 oz. (26g) approx. (mounting code 1).

NOTES

- 1.) Operating ambient temperature must consider "Must Operate Voltage Change Over Temperature," Contact Temperature Rise, Coil Temperature Rise (If coil is not allowed to cool) and Maximum Coil Temperature. Specification ambient considers 20A load with coil cooled to ambient.
- 2.) Sealed relay terminals should not be bent.
- 3.) Remove knock-off nib after cleaning process for optimum life of sealed relays.
- 4.) Maximum soldering temperature is 500°F for 4 seconds.
- 5.) Class F coils are UL systems approved for maximum coil temperature of 140°C. by change of resistance method.

RELAYS

7

ORDERING INFORMATION

Typical Part Number➤							T9A	S	5	D	2	2	-12
1. BASIC SERIES: T9A = Low cost, printed circuit board/panel power relay.													
2. ENCLOSURE: P = Unsealed, plastic dust cover. S = Immersion cleanable, knock off nib, sealed plastic case.													
3. CONTACT ARRANGEMENT: 1 = 1 Form A (SPST-NO). 5 = 1 Form C (SPDT).													
4. COIL INPUT: D = DC Voltage													
5. MOUNTING & TERMINATION: 1 = Printed circuit board mounting; PC terminals for coil & contacts ^(a) . 2 = Printed circuit board mounting; PC terminals for coil & contacts, and .250" (6.35 mm) quick connects for contacts ^(a) . 5 = Flanged mounting; .187" (4.75 mm) quick connects for coil and .250" (6.35 mm) quick connects for contacts ^(b) .													
6. CONTACT MATERIAL: 2 = Silver-cadmium oxide.													
7. COIL VOLTAGE: 5 = 5VDC 6 = 6VDC 9 = 9VDC 12 = 12VDC 15 = 15VDC 18 = 18VDC 22 = 22VDC 24 = 24VDC 48 = 48VDC 110 = 110VDC													

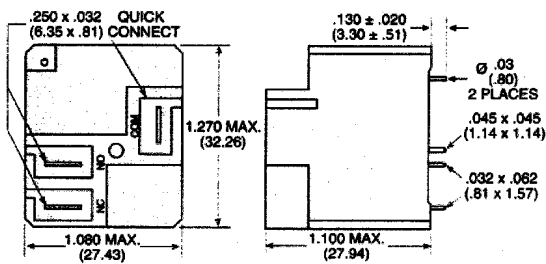
a) Only available with enclosure code "S".
b) Only available with enclosure code "P".

STOCK ITEMS - The following items are normally maintained in stock for immediate delivery

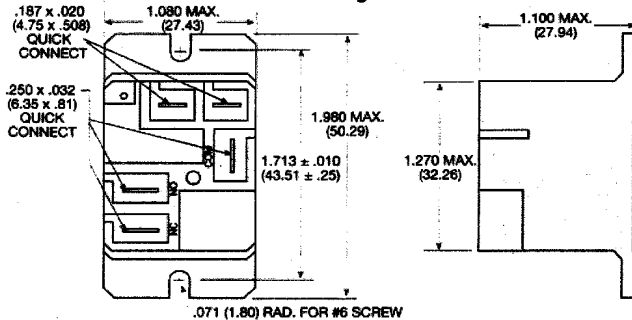
T9AP5D52-12	T9AS1D12-12	T9AS1D12-22	T9AS1D22-12	T9AS5D12-12	T9AS5D12-22	T9AS5D12-48	T9AS5D22-24
T9AP5D52-24	T9AS1D12-18	T9AS1D12-24	T9AS1D22-24	T9AS5D12-18	T9AS5D12-24	T9AS5D22-12	

OUTLINE DIMENSIONS

T9AS - Mounting & Termination Code 2

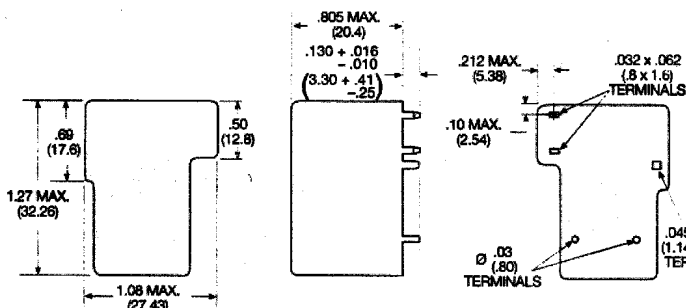


T9AP - Mounting & Termination Code 5

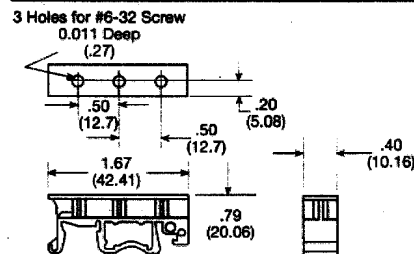


NOTE: Recommended mounting screw torque is 4.0-5.0 lbs.in when #6 screw is used.

T9AS - Mounting & Termination Code 1



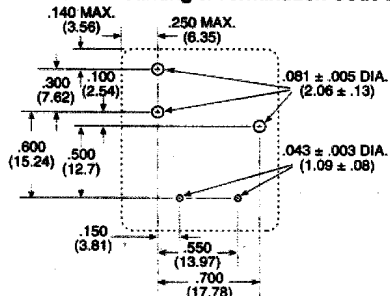
DIN MOUNT ADAPTER - 9T91A001



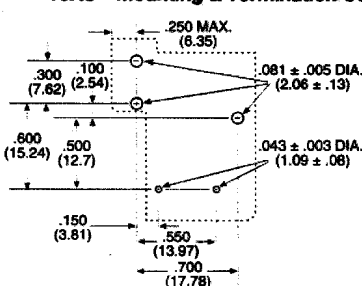
Note: Fits 35mm din track
Includes: 2 Din clips
2 Screws
Must be ordered in multiples of 50

PC BOARD LAYOUT (Bottom Views)

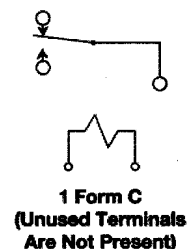
T9AP/S - Mounting & Termination Code 2

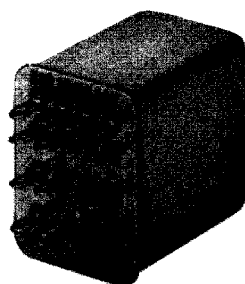


T9AS - Mounting & Termination Code 1

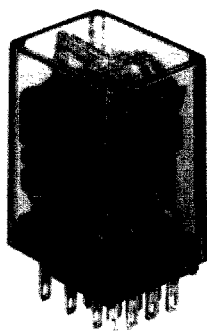


WIRING DIAGRAM (Bottom View)





KHS



KHAU

KHA series

GENERAL PURPOSE DRY CIRCUIT TO 5A MULTICONTACT AC OR DC RELAY

File E22575

File LR15734

FEATURES

- Miniature size from 2 pole to 4 pole. A 5 pole version is available as a special order.
- KHS hermetically sealed version UL Approved for Class 1 Division 2 hazardous locations.
- Various applications include process control, photocopier, and data processing.
- Low cost, semiautomated construction.

CONTACT DATA @ 25 °C

Arrangements: 2 Form C (DPDT), 4 Form C (4PDT).

Expected Life: 10 million operations, mechanical; 100,000 operations min. at rated loads. Ratings are based on tests of relays with ungrounded frames.

Initial Breakdown Voltage: 500V rms, 60 Hz., between open contacts.
1240V rms, 60 Hz., between all other elements.

CONTACT RATINGS

Contact Code	Material	Resistive Rating	
		Minimum	Maximum
1	Silver	100mA @ 12VAC/12VDC	3A @ 120VAC/28VDC
2*	Silver-cadmium oxide	500mA @ 12VAC/12VDC	5A @ 120VAC/28VDC
6	Bifurcated cross bar, gold overlay silver	Dry circuit	1A @ 120VAC/28VDC
8	Gold diffused silver	50mA @ 12VAC/12VDC	3A @ 120VAC/28VDC

Note: Relays should only carry a maximum of 15 amps continuously for all poles combined.

***Note:** KHS hermetically sealed version maximum rating is 5A @ 120VAC/28VDC.

COIL DATA @ 25 °C

Voltage: From 6 to 120V DC, and 6 to 240V AC, 50/60 Hz.

Nom. Power: DC coils - 0.9 watt; 0.5 watt minimum operate @ 25°C.
AC coils - 1.2 VA; 0.55 VA minimum operate @ 25°C.

Max. Power: DC coils - 2.0 watts @ 25°C.

Duty Cycle: Continuous.

Initial Breakdown Voltage: 500V rms, 60 Hz.

COIL DATA

DC Coils			AC Coils	
Nominal Voltage	Resistance in Ohms ±10% @ 25°C	Nominal Inductance in Henrys	Resistance in Ohms ±15%	Nominal AC Current in mA
5	32	.072	—	—
6	40	.08	10.5	200
12	160	.28	43	100
24	650	1.0	160	52
48	2,600	4.5	668	25
110 *	11,000	17.0	—	—
120 *	13,500	—	3,900	11.0
240	—	—	12,000	6.0

***Note:** For 220 and 240VDC, use series dropping 5W resistor of 11,000Ω.

OPERATE DATA @ 25 °C

Must-Operate Voltage: DC: 75% of nominal voltage.

AC: 85% of nominal voltage.

Operate Time: 13 milliseconds typical @ nominal voltage (excluding bounce).

Release Time: 6 milliseconds typical @ nominal voltage (excluding bounce).

ENVIRONMENTAL DATA

Temperature Range: -45°C to +70°C operate.

-60°C to +130°C storage.

MECHANICAL DATA

Mountings: #3-48 stud, sockets with printed circuit or solder terminals, or bracket plate with #6-32 threaded stud.

Termination: Printed circuit or solder/socket terminals.

Printed circuit terminals are available for KHS on a special order basis.

Enclosures: See Ordering Information table.

Weight: 1.6 oz. approx. (45 g)

ORDERING INFORMATION

Typical Part No. >

KHA

U

-17

A

1

1

B

-24

1. Basic Series (See Note 1)

2. Type:

E = Printed circuit terminals, nylon dust cover, contacts rated opposite polarity (UL & CSA).
S = Solder terminals, hermetically sealed steel case (UL & CSA). Note: Do not ground KHS frame without consulting factory for load levels. (Order as KHS, not KHAS.)
U = Solder terminals, clear polycarbonate dust cover, contacts rated same polarity (UL & CSA).

3. Contact Arrangement:

11 = 2 Form C (DPDT)
17 = 4 Form C (4PDT)

4. Operating Coil:

A = AC D = DC

5. Mounting and Termination:

Relay Type	E	S	U
Available Codes	1	1, 3, 4	1

1 = Socket mount, solder terminals on S, U, 7 types; printed circuit terminals on E, F types.

6. Contact Material:

Relay Type	E	S	U
Available Codes	1, 2, 3, 6, 8	1*, 2*, 3,	1, 2, 6, 8

*UL Rated 1/10 HP, 3A, 120VAC when used with mounting & termination 1.

1 = Silver. 3 = Gold-silver-nickel. 5 = Silver alloy.
2 = Silver-cadmium oxide. 4 = Palladium. 6 = Bifurcated crossbar, gold overlay silver. 8 = Gold diffused silver.

7. Options Available (None available with contact arrangement 20.):

Relay Type	E	S	U
Available Codes	B (DPDT only)	None	N B H L M

B = Push to test button.

N = Neon indicator. Only available with 120VAC or 110VDC coils. Not available with mounting & termination 4 or 8.

H = Neon indicator and push to test button. Only available with 120VAC or DC coils. Not available with mounting & termination 4 or 8.

L = LED indicator. Only available with 6-48VDC coils.

M = LED indicator and push-to-test button. Only available with 6-48VDC coils.

8. Coil Voltage:

6, 12, 24, 48, 120, 240**VAC
6, 12, 24, 48, 90, 110, 120VDC **240VAC coil is not available on KHS type relays.

Note 1: All KHA models available in KH construction. Specify KH instead of KHA.

STOCK ITEMS - The following items are normally maintained in stock for immediate delivery.

KHAE-17D12-24
KHAU-11A11-120
KHAU-11D11-24
KHAU-17A11-6
KHAU-17A11-12
KHAU-17A11-24
KHAU-17A11-120
KHAU-17A11N-120
KHAU-17A12-120
KHAU-17A13-120
KHAU-17A16-24
KHAU-17A16-120
KHAU-17A18-120
KHAU-17D11-5

KHAU-17D11-6
KHAU-17D11-12
KHAU-17D11-24
KHAU-17D11-48
KHAU-17D11-110
KHAU-17D12-12
KHAU-17D12-24
KHAU-17D12-48
KHAU-17D12-110
KHAU-17D16-12
KHAU-17D16-24
KHS-17A11-24

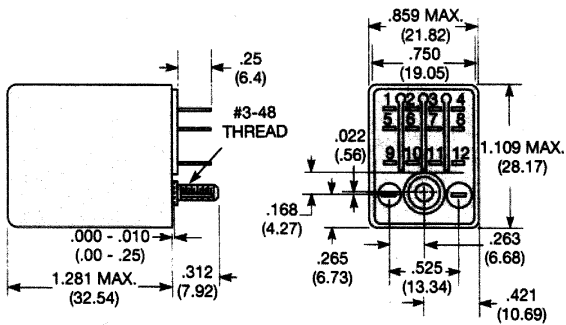
KHS-17A12-120
KHS-17A13-120
KHS-17D11-6
KHS-17D11-12
KHS-17D11-24
KHS-17D11-48
KHS-17D11-110
KHS-17D12-12
KHS-17D12-24
KHU-11D11-24

KHU-17A11-24
KHU-17A11-120
KHU-17A11N-120
KHU-17A12-120
KHU-17A13-120
KHU-17A18-120
KHU-17D11-5
KHU-17D11-6
KHU-17D11-12
KHU-17D11-24
KHU-17D11-48

KHU-17D11-110
KHU-17D12-12
KHU-17D12-24
KHU-17D12-110
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KHU-17D16-12
KHU-17D16-24
KHU-17D18-24

OUTLINE DIMENSIONS

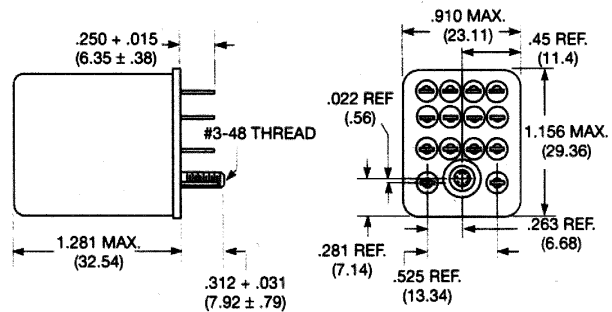
MOUNTING CODE 1 KHAU



PC terminal models have rivet, not stud.
Max. seated height in 27E006 socket is
1.37" (34.8 mm).

2 & 4 POLE

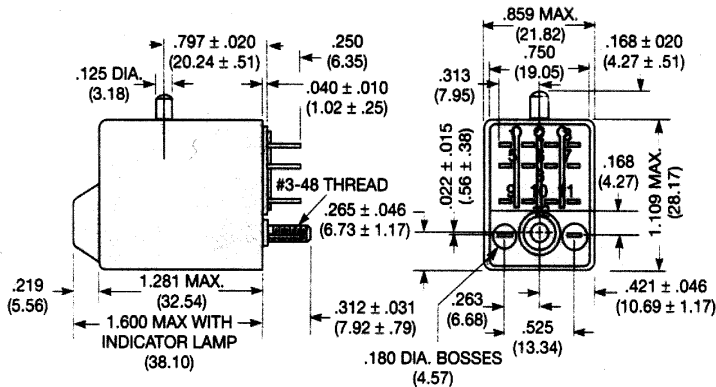
MOUNTING CODE 1 KHS only.



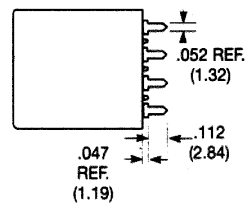
Class 1 Div. 2 Group A, B, C & D Hazards

2 & 4 POLE

MOUNTING CODE 1 NEON INDICATOR, PUSH-TO-TEST.

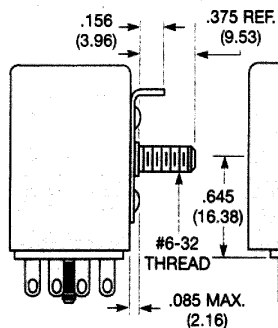


PRINTED CIRCUIT
TERMINALS

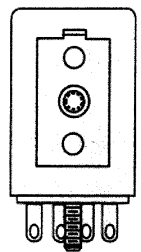


Printed circuit terminal thickness .022 (.558)

MOUNTING CODE 2 STUD ON BROAD SIDE

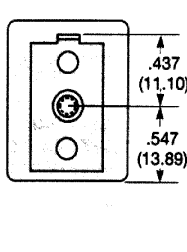


MOUNTING
CODE 3



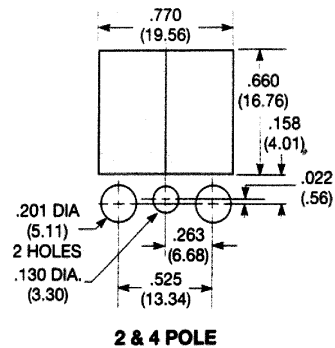
STUD ON
NARROW SIDE

MOUNTING
CODE 4



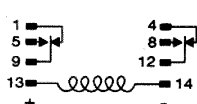
STUD ON
END

RECOMMENDED CHASSIS CUTOUT
FOR STUD MOUNT

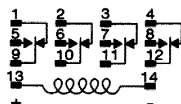


WIRING DIAGRAMS (Bottom Views)

2 POLE

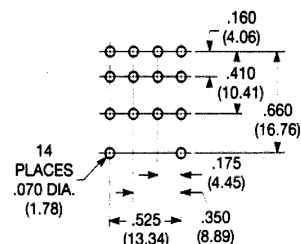


4 POLE



PC BOARD LAYOUT (Bottom View)

For KHAE, KHAF Relays
with PC terminals
and sockets with
PC terminals



SOCKETS FOR KHA AND KHS SERIES

All sockets are normally maintained in stock for immediate delivery.

For KHAU, KHAX, KHS Relays.

Relays with solder terminals are required for use with sockets.

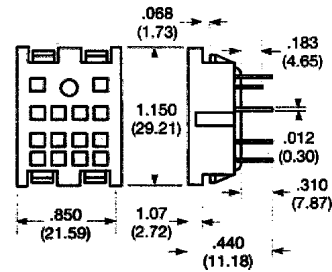
SOCKET DESCRIPTION

Industrial Part No.	No. of Poles	Terminal and Length	Grounding Provision	Socket Material
27E006*	4	Solder .375" (9.53 mm)	Yes	Phenolic
27E007*	4	P.C. .218" (5.54 mm)	Yes	Phenolic
27E023*	4	P.C. .218" (5.54 mm)	No	Phenolic
27E166**	4	Screw	Yes	Glass-filled Polyester
27E894**	4	Screw	No	Glass-filled Polyester
20C217 20C297		Relay Hold Down Spring Relay Hold Down Spring (use with 27E166 & 27E894)		

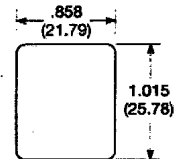
* UL Recognized, file E22575

** UL Recognized, file E59244

4-POLE SOCKET

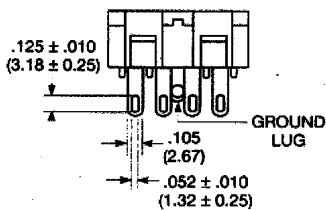


RECOMMENDED CHASSIS CUTOUTS FOR MOUNTING SOCKETS

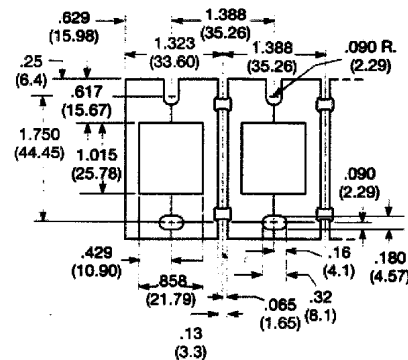


Recommended Chassis Thickness
.031 (.79) to .062 (1.57)
Socket punch Greenlee part
5015115.0, Type 731R available
(4-pole)

PIERCED SOLDER TERMINALS



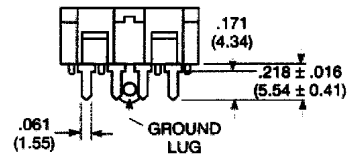
MOUNTING STRIP 37D633



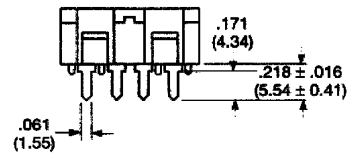
37D633 will mount eight solder terminal sockets
in one length of aluminum strip measuring 10.97" x 2.25" x .062
(278.6 x 57.15 x 1.57)

PRINTED CIRCUIT TERMINALS

218 (5.54 mm) Length

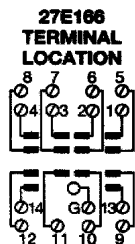
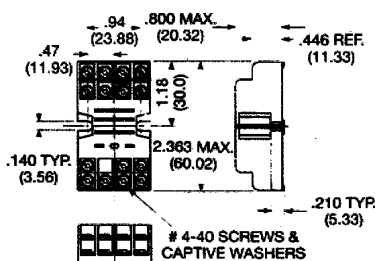


.312 (7.92 mm) Length

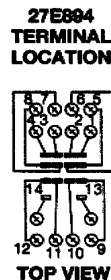
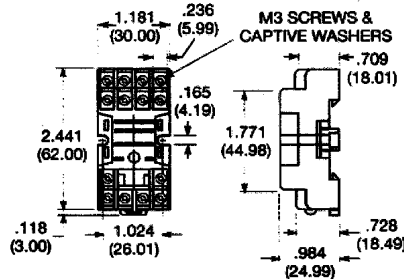


SCREW TERMINAL SOCKET 27E166

Relays with solder terminals are required for use with screw terminal sockets.



SCREW TERMINAL DIN RAIL, SNAP-MOUNT SOCKET 27E894 (Use with mounting track 24A110)



CAUTION Printed circuit sockets are manufactured with "floating" (Loose) terminals. This permits them to align with holes in the circuit board and with the relay terminals. During the mounting and soldering of the socket, vertical float should be eliminated and the terminals seated on the board. (This may be accomplished by inserting a dummy relay in the socket.) Failure to eliminate float may cause fracture of the solder joint or separation of the copper conductor from the printed circuit board when a relay is inserted in the socket after soldering.

HOLD DOWN SPRING 20C217





K10 series

15 AMP GENERAL PURPOSE MINIATURE RELAY

File E22575

File LR15734

7

RELAYS

FEATURES

- K10 - DPDT contact arrangement standard.
- AC and DC coils.
- Mounting options include socket, PCB, top flange.
- Push-to-test option available.
- UL Class B coil insulation system.

CONTACT DATA @ 25 °C

Materials: silver-cadmium oxide.

Expected Life: 10 million operations, mechanical; 100,000 operations minimum at rated loads.

CONTACT RATINGS

Contact Code	UL/CSA Ratings
5	15A @ 30VDC resistive 15A @ 120VAC resistive 1/3 HP @ 120VAC 1/2 HP @ 250VAC

INITIAL DIELECTRIC STRENGTH

Between Open Contacts: 1,000V rms.

Between Adjacent Contacts: 1,500V rms.

Between Contacts and Coil: 1,500V rms.

COIL DATA @ 25 °C

Nominal Power:

DC Coils: .9 Watts.

AC Coils: 1.2VA.

Maximum Power: 2.0 Watts.

Duty Cycle: Continuous.

Insulation: Class B: (130°C)

COIL DATA

Nominal Voltage	DC Coils		AC Coils	
	Resistance in Ohms ± 10%	Nominal Current in Milliamps	Resistance in Ohms ± 15%	Nominal Current in Milliamps
6	40	150	10.5	200
12	160	75	43	100
24	650	37	160	52
48	2,600	18.5	668	26
110	11,000	10	—	—
120*	—	—	3,900	11
240*	—	—	12,000	6

*For 220/240VDC operation, use 11,000 Ohm, 5 Watt dropping resistor in series with the 110VDC coil.

OPERATE DATA @ 25 °C

Must Operate Voltage:

DC Coils: 75% of nominal voltage.

AC Coils: 85% of nominal voltage.

Operate Time (Excluding Bounce): 13 milliseconds, typical, at nominal voltage.

Release Time (Excluding Bounce): 6 milliseconds, typical, at nominal voltage.

ENVIRONMENTAL DATA

Temperature Range:

Storage: -60°C to +105°C

Operating: -45°C to +70°C

MECHANICAL DATA

Mounting: Socket mount, printed circuit board, top flange,

Termination: .187" (4.75 mm) quick connect/solder terminals, or printed circuit terminals.

Enclosure: Smoke-color polycarbonate dust cover.

Weight: 1.8 oz. (51 g) approximately.

ORDERING INFORMATION

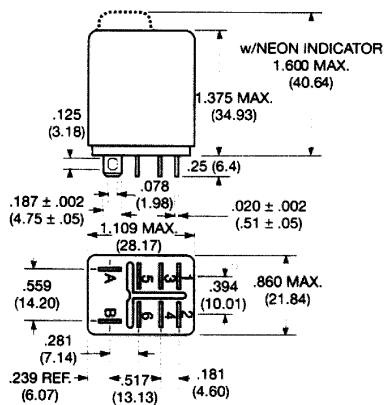
Typical Part No. >		K10	P	-11	D	1	5	-6
1. BASIC SERIES: K10 = 15 amp miniature relay.								
2. COVER: P = Polycarbonate (smoke color). L = Neon indicator, polycarbonate cover. N = Nylon (natural color). Available only with 120VAC or 110VDC coils.								
3. CONTACT ARRANGEMENT: 7 = 2 Form A (DPST-NO) 11 = 2 Form C (DPDT) 50 = 1 Form A + 1 Form B (SPST-NO + SPST-NC)								
4. COIL INPUT: A = 50/60 Hz. AC D = DC								
5. MOUNTING AND TERMINATION: 1 = Socket mount; .187" (4.75 mm) quick connect/solder terminals. 3 = Mounting plate with stud on narrow side; .187" (4.75 mm) quick connect/solder terminals. 4 = Mounting plate with stud on end of cover; .187" (4.75 mm) quick connect/solder terminals (Not available with neon indicator or 240VAC coil). 5 = Printed circuit terminals; .160" length. 7 = Printed circuit terminals; .120" length. T = Mounting bracket on end of cover; .187" (4.75 mm) quick connect/solder terminals. (Not available with neon indicator).								
6. CONTACT TYPE: 5 = 15 amp silver-cadmium oxide								
7. COIL VOLTAGE: To 240VAC or 110VDC, see coil data table.								

STOCK ITEMS - The following items are normally maintained in stock for immediate delivery.

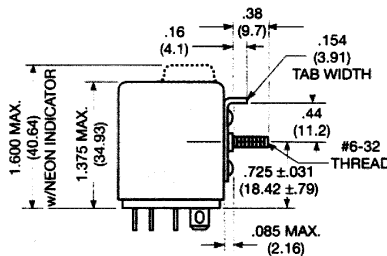
K10P-11A15-6	K10P-11AT5-120	K10P-11D55-12
K10P-11A15-12	K10P-11D15-6	K10P-11D55-24
K10P-11A15-24	K10P-11D15-12	K10P-11D55-110
K10P-11A15-48	K10P-11D15-24	K10P-11DT5-12
K10P-11A15-120	K10P-11D15-110	K10P-11DT5-24

OUTLINE DIMENSIONS

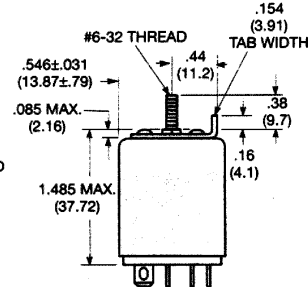
MOUNTING CODE 1
SOCKET MOUNT



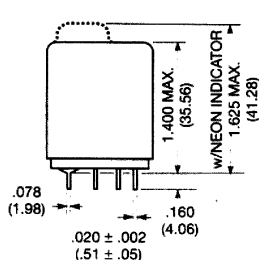
MOUNTING CODE 3
STUD ON NARROW SIDE



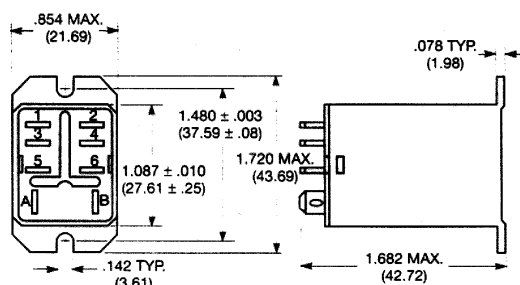
MOUNTING CODE 4
STUD ON END



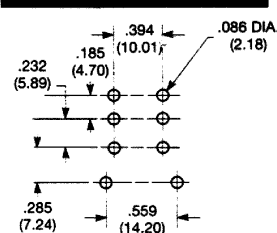
MOUNTING CODE 5
PRINTED CIRCUIT TERMINALS



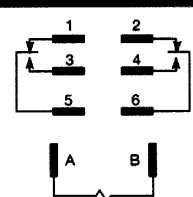
MOUNTING CODE T



PC BOARD LAYOUT



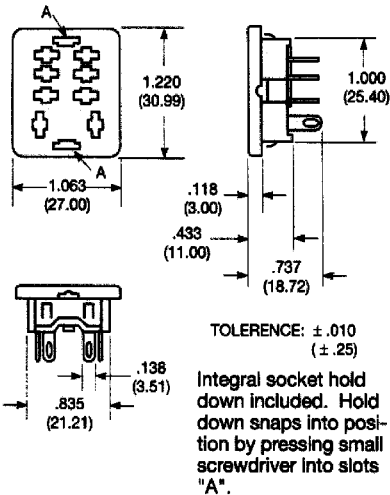
WIRING DIAGRAM



SOCKETS AND ACCESSORIES FOR K10 RELAYS

Sockets for K10 series relays are rated 10 amps, and are UL recognized, File E59244, and CSA certified, File LR15734.

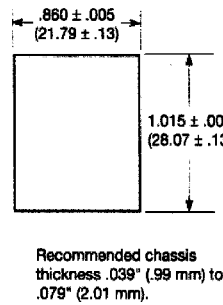
**27E488
PIERCED SOLDER TERMINALS**



**20C217
HOLD DOWN
SPRING FOR
27E488 & 27E489**

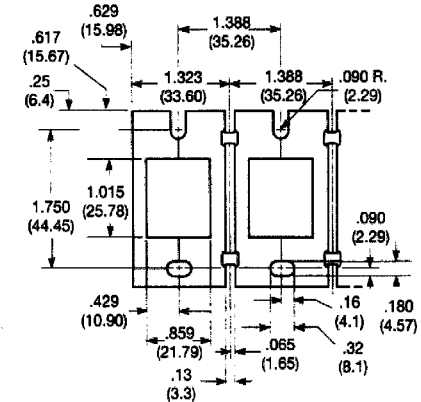


**CHASSIS CUTOOUT FOR
MOUNTING 27E488 SOCKET**



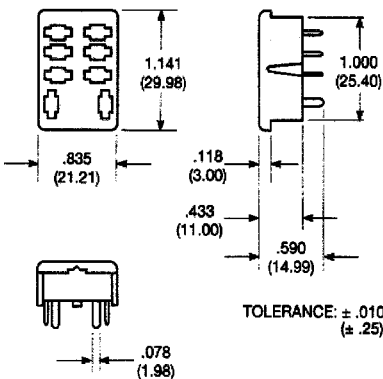
Socket punch
Greenlee part
5015115.0, Type 731R
available from
Greenlee Tool Co.,
Rockford, Illinois.

**37D633
MOUNTING STRIP**

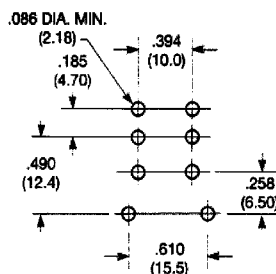


37D633 will mount eight 27E488 sockets in one length of aluminum strip measuring 10.97" x 2.25" x .062". (278.64 x 57.15 x 1.57)

**27E489
PRINTED CIRCUIT TERMINALS**



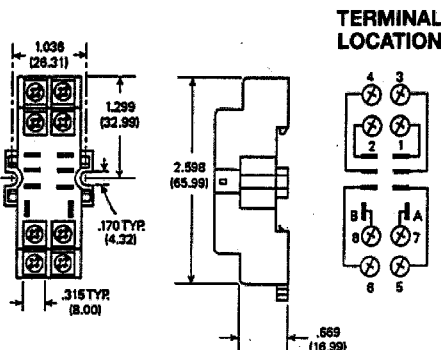
P.C. BOARD LAYOUT FOR SOCKET



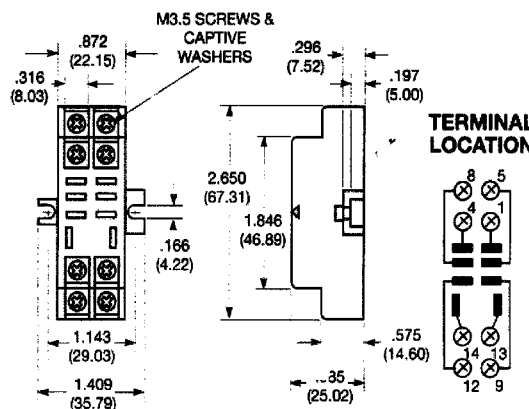
Note: P.C. terminal socket will also fit P.C. board layout for relay. However, in order to accomplish this, terminals must be formed accordingly.

CAUTION: Printed circuit sockets are manufactured with "floating" (loose) terminals. This permits them to align with holes in the circuit board and with the relay terminals. During the mounting and soldering of the socket, vertical float should be eliminated and the terminals seated on the board. (This may be accomplished by inserting a dummy relay in the socket.) Failure to eliminate float may cause fracture of the solder joint or separation of the copper conductor from the printed circuit board when a relay is inserted in the socket after soldering.

**27E895
SCREW TERMINALS, DIN RAIL SNAP-MOUNT
(Use with mounting track 24A110)**

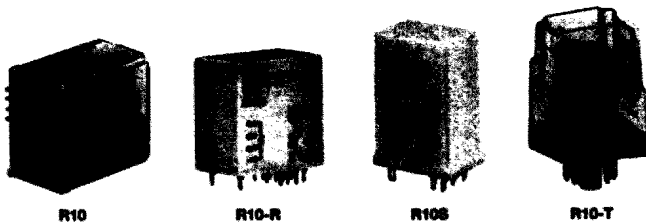


**27E487
SCREW TERMINALS**



**20C297
HOLD DOWN SPRING
FOR 27E895 & 27E487**





FEATURES

- Broad range of coil options provide sensitivity ranging from 25 to 750mW.
- Various contacts switch from dry circuit to 7.5 amps.
- Many mounting and termination options.
- LED indicator available as an option.

CONTACT DATA @ 25°C

Arrangements: 1 Form A (SPST - NO) through 8 Form C (8PDT) See Ordering Information tables for more details regarding availability.

CONTACT MATERIALS, STYLES & RATINGS @ 25°C+

Contact Code	Contact Material	Contact Style	Coil Codes Available	Contact Ratings		
				Min.	Typ.	Max.
W	Silver-Cadmium Oxide	Single Button	V, Q, S, J	500mA	-	7.5A†
X	Silver-Cadmium Oxide	Single Button	V, Q, S, J	500mA	-	5A§
M	Silver-Cadmium Oxide	Bifurcated	V, Q, S, J	500mA	-	5A§
Y	Fine Silver	Single Button	All	100mA	2A	3A
Z	Fine Silver	Bifurcated	All	1mA	100mA	2A
P	Gold overlay on Silver	Bifurcated Crossbar	All	Dry Circuit	1mA	3A
L	Gold-Platinum-Silver	Bifurcated Crossbar	All	Dry Circuit	500µA	250mA

† Ratings are at 28VDC or 155VAC unless otherwise specified. Total load must not exceed 30A per relay.

‡ Use ungrounded frame for AC loads of 5A or greater. Max. ratings are 7.5A at 115VAC and 4A at 28VDC for coil codes S and J.

§ Use ungrounded frame for AC loads of 5A or greater. Max. ratings are 5A at 115VAC and 3A at 28VDC for coil codes S and J.

UL HORSEPOWER CONTACT RATINGS (COIL CODE V ONLY)

Contact Code	No. of Poles	At 110-120VAC	At 220-240VAC
W	1, 2, 4	1/8 HP (3.8A)	1/6 HP (2.2A)
X	1, 2, 4, 6	1/20 HP (1.5A)	1/10 HP (1.5A)

Expected Mechanical Life: 100 million operations, typical. (Except contact code W: 1,000,000 operations, typical.)

TYPICAL EXPECTED LIFE FOR RESISTIVE LOADS @ 25°C

Type	Current	Voltage	Contact Style	Coil Code	Operations††
R10	7.5A	120VAC, 60 Hz.	W	V,S,J	7.5 · 10 ⁴
R10	7.5A	28VDC	W	V	7.5 · 10 ⁴
R10	5.0A	120VAC, 60 Hz.	X,M	V,S,J	5 · 10 ⁴
R10	5.0A	28VDC	X,M	V	5 · 10 ⁴
R10	4.0A	28VDC	W	S,J	2 · 10 ⁴
R10	3.0A	28VDC	X,M	S,J	2 · 10 ⁴
R10	3.0A	28VDC or 120VAC	P	V,S,J	3 · 10 ⁴
R10	2.0A	28VDC	P,Y,Z	V	1.5 · 10 ⁶
R10	2.0A	28VDC	P,Y,Z	S,J	6 · 10 ⁵
R10S	2.0A	28VDC	P,Y,Z	J	5 · 10 ⁵
R10	1.0A	28VDC	P,Y,Z	V,S,J	12 · 10 ⁶
R10	1.0A	28VDC	P,Y,Z	SS,JJ	5 · 10 ⁵
R10S	1.0A	28VDC	P,Y,Z	J	1 · 10 ⁶
R10	500mA	28VDC	P,Y,Z	SS,JJ	5 · 10 ⁶
R10	250mA	48VDC	L	SS,JJ	5 · 10 ⁵
R10	100mA	28VDC or 120VAC	P,Y,Z	V,S,J	1 · 10 ⁸
R10	100mA	48VDC	P,Z	SS,JJ	5 · 10 ⁶
R10	100mA	6VDC	P,L	SS,JJ	5 · 10 ⁷
R10S	100mA	28VDC or 120VAC	P,Y,Z	J	1 · 10 ⁶
R10	50mA	6VDC	P,Z	V,S,J	5 · 10 ⁷
R10S	30mA	6VDC	P,Z	J	5 · 10 ⁶
R10	1mA	6VDC	P,L	SS,JJ	5 · 10 ⁷
R10	10µA	10mV	L	V,S,J	5 · 10 ⁷
R10S	10µA	10mV	L	J	5 · 10 ⁶

†† Relay operated at rated coil voltage or 133% of pick-up current or higher.

INITIAL DIELECTRIC STRENGTH

Between Open Contacts: 500V rms, for contact codes P, Z and L.
1,000V rms for contact codes W, X, M and Y with coil code V.

Between All Other Conductors: 1,000V rms.

R10 series

GENERAL PURPOSE DRY CIRCUIT TO 7.5 AMP MULTICONTACT AC OR DC RELAY

- R10-E – Clear Dust Cover Version
- R10-R – Sealed, Immersion Cleanable Type
- R10S – Super Sensitive, Logic Compatible
- R10-T – Octal-style Plug-in Base

File E22575 (E29244 for R10S & R10-T)

File LR15734 (except 8 pole types)

CAPACITANCE

Between Contacts: 2 pf, typ.

Between Contacts and Coil: 2 pf, typ.

Between Coil and Frame: 30 pf, typ.

INITIAL INSULATION RESISTANCE

Between Mutually Insulated Elements: 10¹⁰ ohms @ 25°C, 50% RH.
Consult factory for optional acetal resin material rated 10¹² ohms.

COIL DATA @ 25°C (also see Coil Data tables)

Voltage: 3 to 115VDC and 6 to 115VAC.

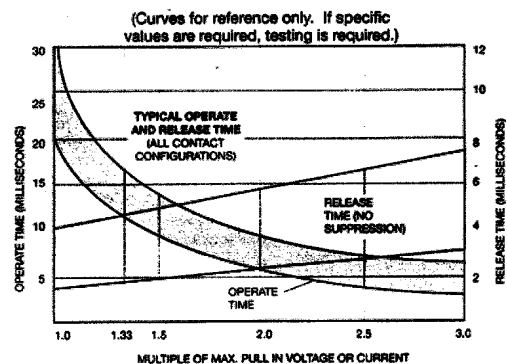
Maximum Coil Power: 2.2 Watts.

Coil Temperature Rise: 30°C per Watt.

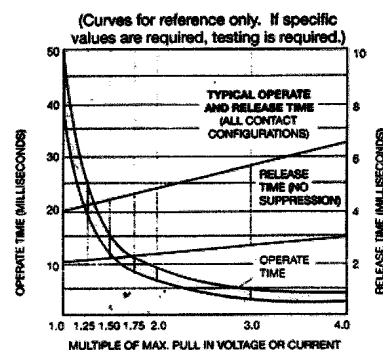
Maximum Coil Temperature: 105°C

OPERATE DATA @ 25°C

R10 RELAYS (DC ONLY) TYPICAL RANGES OF OPERATIONS



R10 ULTRA-SENSITIVE "SS" AND "JJ" TYPICAL RANGES OF OPERATION



ENVIRONMENTAL DATA

Storage Temperature Range: -55°C to +105°C.

Operating Temperature Range: -55°C to +75°C (except R10L: -55°C to +55°C).

MECHANICAL DATA

Terminal Finish: Tin plating standard.

Weight: 0.8 to 1.4 oz. (23 to 40 g) approximately.

ORDERING INFORMATION

Typical Part Number➤

R10 -E 1 Y 4 -V700

1. BASIC SERIES:

R10 = Relay with Form C contacts. R10A = Relay with Form A contacts.
R10B = Relay with Form B contacts. R10D = Relay with Form D contacts.
R10L = R10 with LED indicator (V & S coil adjustment only, to 48V only).
R10S = Super sensitive R10 (case and terminals E1 & E2 only, J coil adj. only).

2. CASE STYLE:

E = Non-sealed polycarbonate cover.
R = Immersion cleanable, tape sealed plastic case (R10 only [Form C], terminal code 2 & 9 only [std. PCB]).
No ground or stud included. Not available on R10A, R10B, R10D, R10L, or R10S.
T = Octal style base on non-sealed polycarbonate dust cover (terminals 1 & 2 only; 1 to 3 poles only).

3. TERMINALS & MOUNTING:

1 = Solder/plug-in terminals with #3-48 mounting stud; except 8-pin octal-type on R10-T.
2 = Printed circuit terminals (std.) .064" (1.62 mm) clearance, 1.25" (31.75 mm) seated ht.;
except 11-pin octal-type plug on R10-T.
3 = Top screw mounting with solder/plug in terminals, no mounting stud (not available on R10L).
5 = Printed circuit terminals .013" (.33 mm) clearance, 1.2" (30.48 mm) seated ht.
6 = Side mounting plate with #6-32 stud, solder/plug-in terminals (#3-48 stud not included).
7 = Narrow (.04" [1.02 mm] wide) printed circuit terminals .013" (.33 mm) clearance, 1.2" (30.48 mm) seated ht.
8 = Plug-in terminals (no solder hole) with #3-48 mounting stud.
9 = Non-shouldered, narrow (.04" [1.02 mm] wide) printed circuit terminals in a staggered arrangement (1 to 6 poles only).

4. CONTACT STYLE & RATING:

	W	X	Y	Z	P
	Single Contact	Single Contact	Single Contact	Bifurcated, Low Level Contacts	Bifurcated Crossbar, Dry Circuit Contacts
	V, Q, S & J Coil Adjustment Only				
	Max. 7.5A† Min. 500mA	Max. 5A‡ Min. 500mA	Typ. 2A Max. 3A Min. 100mA	Typ. 100mA Max. 2A Min. 1mA	Typ. 1mA Max. 3A Min. Dry Circuit
R10	X	X	X	X	X
R10A	X	X	X	X	X
R10B	X	X	X	X	X
R10D			X	X	X
R10L	X	X	X	X	X
R10-T	X	X	X	X	X
R10S			X	X	X

Ratings are at 28VDC or 115VAC. Total load must not exceed 30A per relay.

† Use ungrounded frame for AC loads of 5A or greater. Max. ratings are 7.5A at 115VAC and 4A at 28VDC for coil codes S & J.

‡ Use ungrounded frame for AC loads of 5A or greater. Max. ratings are 5A at 115VAC and 3A at 28VDC for coil codes S & J.

5. NUMBER OF POLES:

1 = 1 pole.
2 = 2 pole.
3 = 3 pole.
4 = 4 pole (not available on R10-T).
6 = 6 pole (not available with W contacts, on R10D or on R10 -T).
8 = 8 pole (available on case style E only; not available with W contacts or on R10D).

6. COIL (Refer to Coil Data Tables):

AC Voltage (available on R10, R10A, R10B and R10D only)
Specify nominal coil voltage followed by V (example: 24V).

DC Voltage
Specify coil adjustment code letter followed by coil resistance (example: V700).

STOCK ITEMS - The following items are normally maintained in stock for immediate delivery.

R10-E1L4-115V	R10-E1X2-V185	R10-E1Y2-J2.5K	R10-E1Z2-S800	R10-E2X2-V185	R10-T1Y2-J1.0K
R10-E1M6-V430	R10-E1X2-V2.5K	R10-E1Y2-J5.0K	R10-E1Z2-V185	R10-E2X2-V700	R10-T2P3-115V
R10-E1P2-115V	R10-E1X2-V28	R10-E1Y2-V15.0K	R10-E1Z2-V700	R10-E2X4-V185	R10-T2P3-V700
R10-E1P2-V185	R10-E1X2-V52	R10-E1Y2-V185	R10-E1Z4-115V	R10-E2X4-V700	R10L-E1X2-V185
R10-E1P2-V700	R10-E1X2-V700	R10-E1Y2-V2.5K	R10-E1Z4-J1.0K	R10-E2Y2-115V	R10L-E1X2-V700
R10-E1P4-115V	R10-E1X4-115V	R10-E1Y2-V28	R10-E1Z4-J2.5K	R10-E2Y2-J2.5K	R10L-E1X4-V185
R10-E1P4-V185	R10-E1X4-V15.0K	R10-E1Y2-V52	R10-E1Z4-V185	R10-E2Y2-V185	R10L-E1X4-V700
R10-E1P4-V700	R10-E1X4-V185	R10-E1Y2-V700	R10-E1Z4-V2.5K	R10-E2Y2-V700	R10L-E1X6-V430
R10-E1P6-V430	R10-E1X4-V2.5K	R10-E1Y4-J1.0K	R10-E1Z4-V700	R10-E2Y4-V185	R10L-E1Y2-V700
R10-E1W2-V185	R10-E1X4-V700	R10-E1Y4-J10.0K	R10-E1Z6-V1.5K	R10-E2Y4-V700	R10L-E1Y4-V700
R10-E1W2-V700	R10-E1X6-115V	R10-E1Y4-J2.5K	R10-E1Z6-V430	R10-E2Y6-V90	R10S-E1Y1-J1.0K
R10-E1W4-V185	R10-E1X6-V9.0K	R10-E1Y4-S450	R10-E1Z6-V9.0K	R10-E2Z4-V700	R10S-E1Y1-J2.5K
R10-E1W4-V2.5K	R10-E1X6-V90	R10-E1Y4-V2.5K	R10-E1Z8-V350	R10-E6X2-115V	R10S-E1Y1-J5.0K
R10-E1W4-V700	R10-E1X6-V430	R10-E1Y4-V52	R10-E2P2-V185	R10-E6X2-V185	R10S-E1Y2-J1.0K
R10-E1X2-115V	R10-E1X8-115V	R10-E1Y4-V700	R10-E2P4-V185	R10-E6X2-V700	R10S-E1Y2-J2.5K
R10-E1X2-24V	R10-E1Y1-SS1.0K	R10-E1Y6-V1.5K	R10-E2P4-V700	R10-R2X2-V185	R10S-E1Y2-J5.0K
R10-E1X2-S800	R10-E1Y1-SS220	R10-E1Y6-V430	R10-E2W2-V185	R10-R2X2-V700	R10S-E1Y2-J500
R10-E1X2-V15.0K	R10-E1Y2-115V	R10-E1Z2-115V	R10-E2W2-V700	R10-T1L2-115V	R10S-E1Y4-J1.0K
	R10-E1Y2-J1.0K		R10-E2X2-115V	R10-T1P2-115V	R10S-E2Y1-J1.0K
			R10-E2X2-S3.2K	R10-T1P2-V700	R10S-E2Y2-J2.5K

COIL DATA TABLES @ 25 °C

V STANDARD DC VOLTAGE ADJUSTMENT				
2.2 Watts Maximum Continuous Coil Dissipation @ 25°C				
VDC at 25°C		Coil Resistance at 25°C ± 10% (ohms)		
Nominal	Pick-up (Max.)	1, 2 & 4 Form A, B, C or D Pick-up 500mW	6 Form A, B or C Pick-up 850mW	8 Form A, B or C Pick-up 1000mW
3.0	2.25	10	6	5
5.0	3.75	28	16	14
6.0	4.5	52	25	20
12.0	9.0	185	90	72
24.0	18.0	700	430	350
48.0	36.0	2.5K	1.5K	1.25K
72.0	54.0	5.8K	3.5K	2.8K
115.0	86.0	15.0K	9.0K	8.0K

Q SPECIAL DC VOLTAGE ADJUSTMENT						
1 & 2 Form A, B, C or D			3 & 4 Form A, B, C or D			Nominal Voltage @ 25°C (VDC)
Coil Res. @ 25°C ± 10% (ohms)	Pick-up (Max.) @ 25°C (VDC)	Pick-up @ 25°C (mW)	Coil Res. @ 25°C ± 10% (ohms)	Pick-up (Max.) @ 25°C (VDC)	Pick-up @ 25°C (mW)	
52	3.1	180	32	3.8	450	5
110	4.5	185	52	4.2	340	6
450	9.2	190	185	8.4	380	12
1.8K	17.4	170	1.0K	17.2	295	24
7.5K	36.2	175	3.2K	31.1	300	48
15.0K	49.5	165	7.5K	49.3	325	72
30.0K	67.5	160	15.0K	67.5	300	115

S SENSITIVE DC VOLTAGE ADJUSTMENT						
2.2 Watts Maximum Continuous Coil Dissipation @ 25°C						
VDC at 25°C		Coil Resistance at 25°C ± 10% (ohms)				
Nominal	Pick-up (Max.)	1 & 2 Form A, B, C or D Pick-up 100mW	3 & 4 Form A, B, C or D Pick-up 175mW	6 Form A, B or C Pick-up 250mW	8 Form A, B or C Pick-up 400mW	
3.0	2.25	50	30	20	12	
5.0	3.75	140	80	56	35	
6.0	4.5	200	110	80	52	
12.0	9.0	800	450	320	200	
24.0	18.0	3.2K	1.8K	1.2K	800	
48.0	36.0	13.0K	7.5K	5.2K	3.2K	
72.0	54.0	28.0K	16.0	13.0K	7.5K	
115.0	86.0	50.0K	40.0K	30.0K	16.0K	

SS ULTRA-SENSITIVE VOLTAGE ADJUSTMENT (1-4 Pole Only)				
2.2 Watts Maximum Continuous Coil Dissipation @ 25°C				
VDC at 25°C		Coil Resistance at 25°C ± 10% (ohms)		
Nominal	Pick-up (Max.)	1 Form C Pick-up Power 20mW	2 Form C Pick-up Power 40mW	3 & 4 Form C, Pick-up Power 80mW
3.0	2.25	220	110	52
5.0	3.75	700	350	175
6.0	4.5	1.0K	500	250
12.0	9.0	4.0K	2.0K	1.0K
18.0	13.5	9.0K	4.5K	2.2K
24.0	18.0	15.0K	7.5K	3.7K
36.0	27.0	30.0K	15.0K	7.5K
48.0	36.0	—	30.0K	15.0K

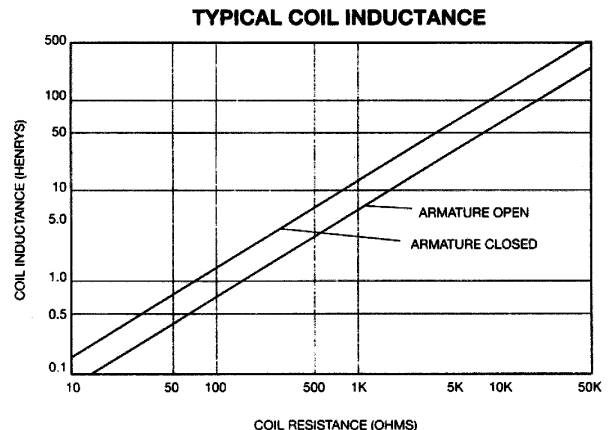
J SENSITIVE DC CURRENT ADJUSTMENT					
Must Operate Current (mA)					
All Applicable Types Except R10S					
Coil Resistance ±10% (ohms)	2 Form A, B, C or D Pick-up 85mW	4 Form A, B, C or D Pick-up 175mW	6 Form A, B, C or D Pick-up 250mW	8 Form A, B or C Pick-up 400mW	Max. Coil Current (mA)
1.0K	8.5	13.0	16.0	20.0	45.0
2.5K	5.8	8.4	10.0	13.0	28.0
5.0K	4.1	6.2	7.2	9.0	20.0
10.0K	3.1	4.5	5.0	6.4	14.0
15.0K	2.6	3.5	4.2	5.3	11.5
30.0K	1.7	2.5	2.9	3.7	8.3
R10S Types Only					
Coil Resistance ±10% (ohms)	1 Form C Pick-up 10mW	2 Form C Pick-up 20mW	4 Form C Pick-up 40mW		
500	4.5 (A)	6.3 (A)	9.0		
1.0K	3.2 (A)	4.5	6.5		
2.5K	2.0	2.9 (B)	4.1 (B)		
5.0K	1.4 (B)	2.0	2.9 (C)		
10.0K	1.0	1.4 (C)	2.0		
16.0K	0.8	1.2	1.4		
30.0K	0.6 (C)	0.8	1.2		

(A) Suggested for 5VDC operation.
(B) Suggested for 12VDC operation.
(C) Suggested for 24VDC operation.

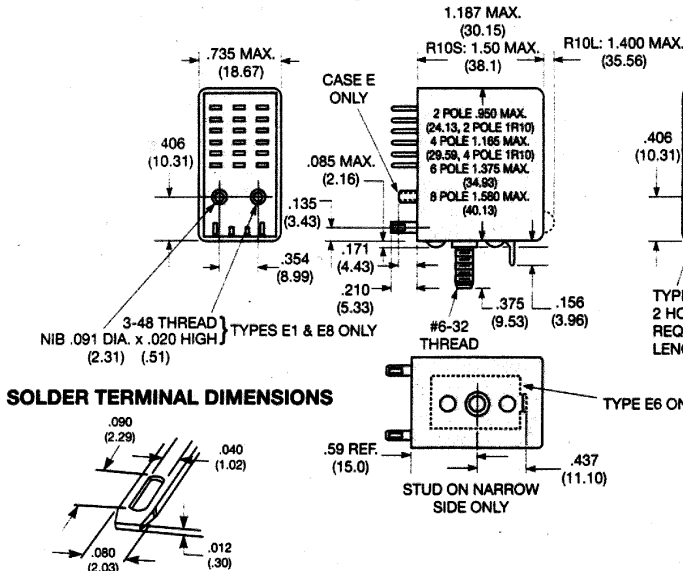
JJ ULTRA-SENSITIVE CURRENT ADJUSTMENT (1-4 Pole Only)				
Maximum Pick-Up Current (mA)				
Coil Resistance at 25°C ±10%	1 Form C Pick-Up Power 20mW	2 Form C Pick-Up Power 40mW	3 & 4 Form C Pick-Up Power 80mW	Maximum Continuous Coil Current (mA)
1.0K	4.5	6.5	9.0	45.0
2.5K	2.9	4.1	5.8	28.0
5.0K	2.1	2.9	4.1	20.0
10.0K	1.5	2.0	3.0	14.0
15.0K	1.2	1.7	2.4	11.5
30.0K	0.85	1.2	1.7	8.3

STANDARD AC OPERATED RELAYS				
Coil Resistance @ 25°C ± 20% (ohms)		Volts AC @ 25°C		
2 & 4 Form C	6 & 8 Form C	Pick-Up (max.)	Nominal	Maximum Continuous
25	15	5.0	6	7.2
120	90	9.0	12	14.5
500	350	18.0	24	30.0
2.0K	1.4K	36.0	48	60.0
9.0K	7.5K	86.0	115	130.0

NOTE: Dual coil diode rectified construction.

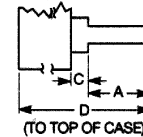


OUTLINE DIMENSIONS

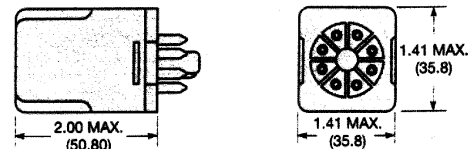


PC TERMINAL DIMENSIONS

	A	B	C	D	Arrang.
Type 2	.131	.050	.064	1.251	Inline
Type 5	.131	.050	.013	1.20	Inline
Type 7	.131	.040	.013	1.20	Inline
Type 9	.170	.040	.000	1.187	Staggered
Thickness	.012	.012	.012	.013	—



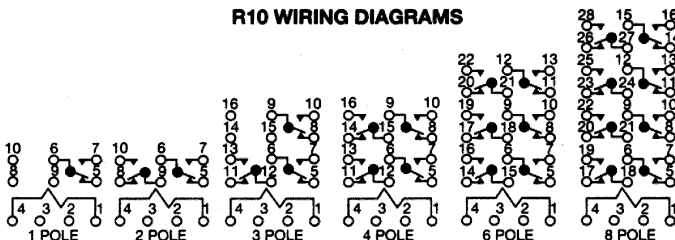
R10-T OUTLINE DIMENSIONS



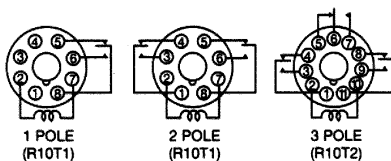
Available screw terminal sockets—27E122, 27E123, 27E891 and 27E892.

WIRING DIAGRAMS (Bottom Views)

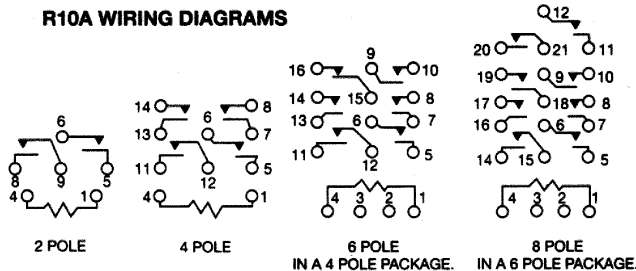
R10 WIRING DIAGRAMS



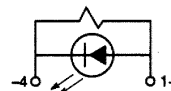
R10 - T WIRING DIAGRAMS



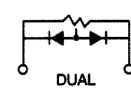
R10A WIRING DIAGRAMS



R10L WIRING DIAGRAM

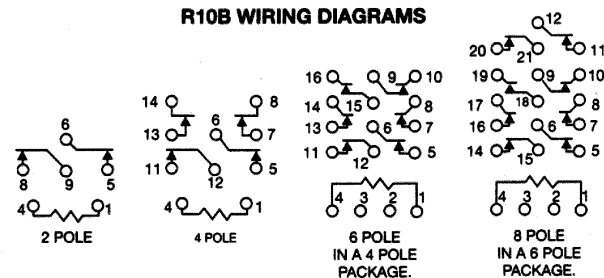


R10-AC WIRING DIAGRAM

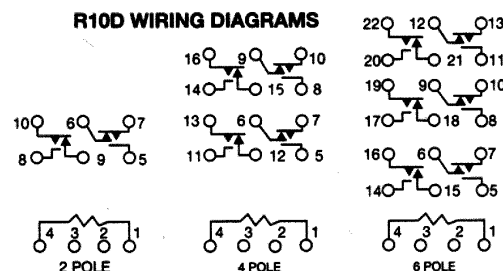


Note: Observe polarity indicated when wiring R10L — with LED

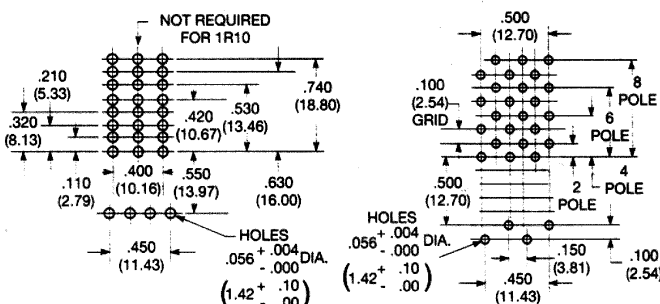
R10B WIRING DIAGRAMS



R10D WIRING DIAGRAMS



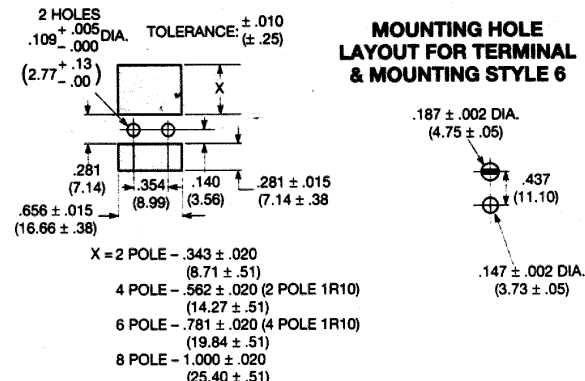
SUGGESTED PC BOARD LAYOUT (Component Side of Board)



TERMINAL TYPES E2 & R2

TERMINAL TYPES E9 & R9

SUGGESTED PANEL CUTOUT FOR RELAY OR SOCKET



R10 SOCKET & ACCESSORY INFORMATION



SOCKET SPECIFICATIONS

Contact Material:

Spring brass, tin plated or gold flashed.

Body Material: 2 and 4 pole: polyester.
6 and 8 pole: phenolic.

Voltage Drop: 30mV max. @ 10A.

Dielectric Strength: 1,000V rms.

Insulation Resistance: 10⁹ megohms.

Max. Current: 10A (except 27E215 and 27E216 are 1A, max.)

SOLDER OR PC TERMINAL SOCKETS

Rugged, molded socket body retains floating terminals of either solder or printed circuit pin configuration. PC terminal sockets are offered with pins in either 0.1" (2.54 mm) grid or in-line arrangement.

GROUNDING PROVISIONS

Pre-installed on sockets

Not for use at 5A AC and above.

Grounding Strip: Mounting stud of relay contacts grounding strip. Grounding strip is grounded with screw or rivet through round hole in socket.

Grounding Terminal (PC sockets only):

Mounting stud of relay contacts ground terminal through square hole in socket.



STRIP



TERMINAL

Caution:

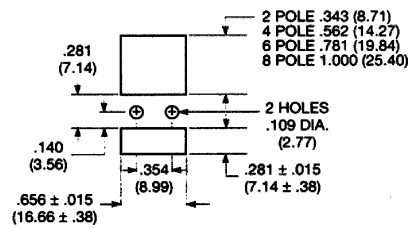
Printed circuit sockets are manufactured with "floating" (loose) terminals. This permits them to align with holes in the circuit board and with the relay terminals. During the mounting and soldering of the socket, vertical float should be eliminated and the terminals seated on the board. (This may be accomplished by inserting a dummy relay in the socket.) Failure to eliminate float may cause fracture of the solder joint or separation of the copper conductor from the printed circuit board when a relay is inserted in the socket after soldering.

ORDERING DATA - Stock items are boldfaced.

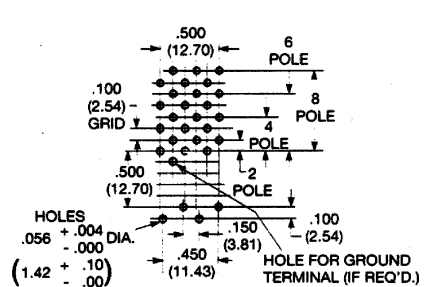
Socket Part No.	No. of Poles	Type of Terminal	Grounding Provision
Tin Plated			
27E125	2	Strip	Strip
27E126	4	Strip	Strip
27E127	6	Strip	Strip
27E211	8	Strip	Strip
27E162	2	None	None
27E163	4	None	None
27E164	6	None	None
27E241	8	None	None
27E128	2	Strip	Strip
27E129	4	Strip	Strip
27E130	6	Strip	Strip
27E254	8	Strip	Strip
27E212	2	PC Stag.	None
27E213	4	.180" long	None
27E271	6	(4.57 mm)	None
27E258	8	None	None
27E193	2	Terminal	Terminal
27E194	4	Terminal	Terminal
27E195	6	Terminal	Terminal
27E262	8	Terminal	Terminal
27E636	2	PC Stag.	Strip
27E637	4	.210" long	Strip
27E638	6	(5.33 mm)	Strip
27E631	2	Strip	Strip
27E632	4	Strip	Strip
27E340	6	PC In-line	Strip
27E342	2	.180" long	None
27E629	4	(4.57 mm)	None
27E630	6	None	None
27E338	4	Terminal	Terminal
27E633	2	PC In-line	Strip
27E634	4	.210" long	Strip
27E635	6	(5.33 mm)	Strip

All tolerances $\pm .010$ ($\pm .25$) unless otherwise noted.

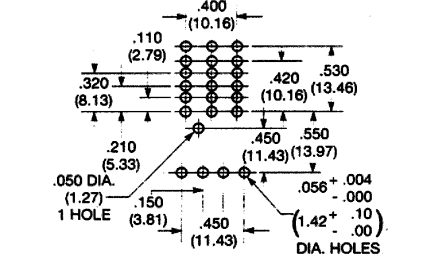
SUGGESTED PANEL CUTOUT



SUGGESTED BOARD LAYOUT (Component Side)



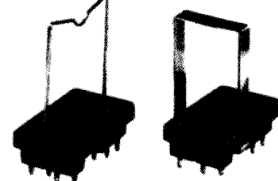
SUGGESTED BOARD LAYOUT (Component Side)



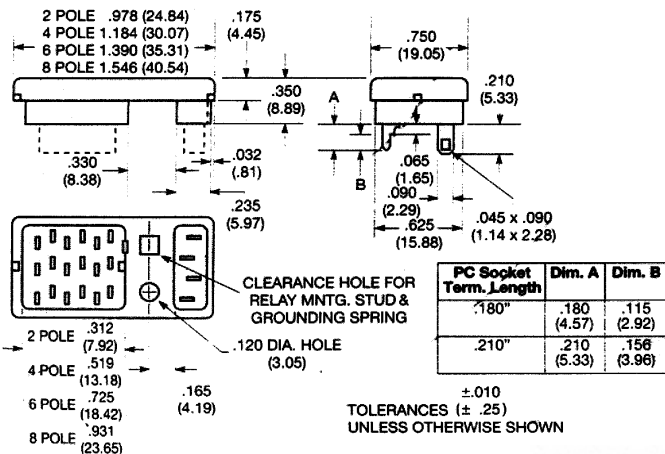
Hold Down Springs/Straps For Use With R10 Sockets

Part No.	No. of Poles	Description
20C249	2	Wire Hold Down Spring
20C250	4	Wire Hold Down Spring
20C251	6	Wire Hold Down Spring
20C266	8	Wire Hold Down Spring
20C259	All	Wire Hold Down Strap (PC only)
20C300	2 (R10S)	Hold Down Spring
20C301	4 (R10S)	Hold Down Spring

HOLD DOWN SPRING HOLD DOWN STRAP (PC Sockets Only)



SOLDER & PC TERMINAL SOCKET OUTLINE DIMENSIONS

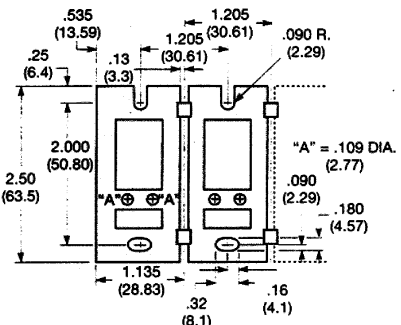
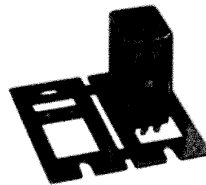


PC Socket Term. Length	Dim. A	Dim. B
.180"	.180 (4.57)	.115 (2.92)
.210"	.210 (5.33)	.156 (3.96)

$\pm .010$
TOLERANCES ($\pm .25$)
UNLESS OTHERWISE SHOWN

37D645 - MOUNTING STRIP

Strip of .060" (1.52 mm) aluminum contains ten pre-punched, breakaway mounting plates. Each plate accommodates a 2, 4, 6 or 8 pole solder terminal R10 relay or socket to facilitate chassis- or rack mounting.



R10 SOCKET & ACCESSORY INFORMATION (CONTINUED)

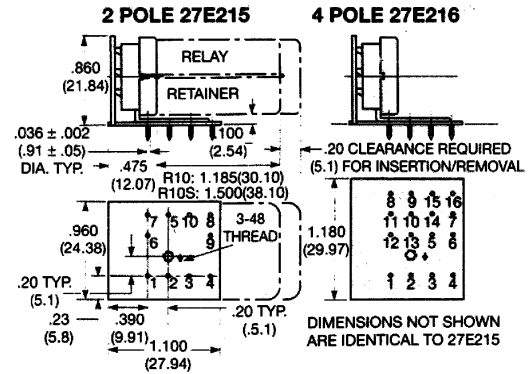
ORDERING DATA - Stock items are boldfaced.

Socket Part No.		No. of Poles	Type of Terminal	Grounding Provision
Tin Plated	Gold Flashed			
27E215	27E732	2	PC	Yes
—	27E734	4	Rt. Angle	Yes



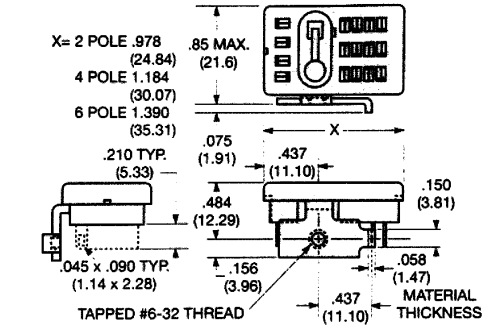
PC RIGHT ANGLE SOCKET

Allows relay to mount flat on PC board and reduces height from 1.720" (43.69 mm) to .860" (21.84 mm). 1A max. rating.



BRACKET MOUNT SOCKET

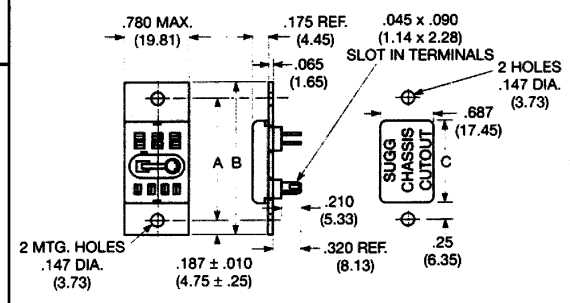
Allows solder terminal relay to mount flat on a chassis.



FLANGE MOUNT SOCKET

Solder terminal socket with tin-plated terminals and grounding strip pre-assembled on .065" (1.65 mm) steel mounting plate. Requires only one chassis cutout.

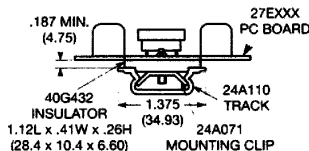
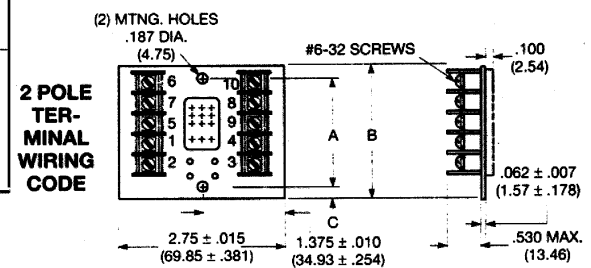
Part No.	No. of Poles	Dim. A Nom.	Dim. B Max.	Dim. C Min.
27E446	2	1.437 (36.50)	1.822 (46.27)	.937 (23.80)
27E447	4	1.687 (42.85)	2.072 (52.63)	1.125 (28.58)
27E448	6	1.875 (47.63)	2.260 (57.40)	1.343 (34.11)



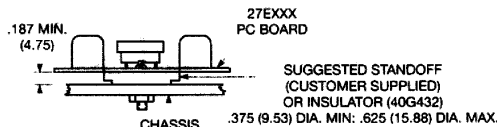
TRACK MOUNT SOCKET

Provides front wiring, screw terminal connections for R10 family relays. No grounding provision.

Part No.	No. of Poles	Dim. A Nom.	Dim. B Max.	Dim. C Nom.
27E460	2	1.800 (45.72)	2.230 (56.64)	.200 (5.08)
27E461	4	2.125 (53.98)	2.830 (71.88)	.337 (8.56)
27E462	6	2.812 (71.42)	3.830 (97.28)	.494 (12.55)

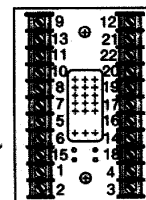


SUGGESTED TRACK MOUNTING

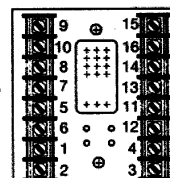


SUGGESTED CHASSIS MOUNTING

**6 POLE
TERMINAL
WIRING
CODE**



**4 POLE
TERMINAL
WIRING
CODE**





KRPA



KRP



KA

FEATURES

- Industry standard octal-type termination for quick installation.
- Contact arrangements from 1 Form C (SPDT - NO) to 3 Form C (3PDT).
- Indicator lamp and push-to-test options available on certain models.
- The KRPA series is the automated manufactured version of the KRP series.
- Hermetically sealed option available with KR UL recognized for Class I Div. 2 Hazardous locations, Groups A, B, C, D.

CONTACT DATA @ 25°C

Arrangements: See Ordering Information Table.

Materials: Silver or silver-cadmium oxide, with or without gold flashing.

Expected Life: 10 million operations min., mechanical; 100,000 operations min. @ rated loads.

KA, KRP, KRPA UL/CSA CONTACT RATINGS @ 25°C (KR not UL Rated)

Contact Code	Arrangement	Contact Rating
Y (Silver)	1, 2, 3 Poles	5A @ 120VAC 3A @ 240VAC 1/10HP @ 120VAC 1/6HP @ 240VAC
G&N (Silver-Cad. Oxide)	1, 2, 3 Poles	10A @ 240VAC 1/2 HP @ 240VAC 1/3HP @ 120VAC

KRP, KRPA FACTORY RATINGS

Contact Code	Arrangement	Contact Rating
Y	1, 2, 3 Poles	5A @ 28VDC, 120VAC, 80% PF
G&N	1, 2, 3 Poles	10A @ 28VDC, 120VAC, 80% PF 6A @ 250VAC

KA UL CONTACT RATINGS

Contact Code	Series	Contact Ratings
Y	KA ¹	5A @ 120VAC, 3A @ 240VAC, 1/10 HP @ 120VAC, 1/6 HP @ 240VAC
G	KA ²	10A @ 120VAC, 6A @ 240VAC 1/6 HP @ 120VAC, 1/3 HP @ 240VAC

¹Listed by C.S.A. for 5A @ 120VAC 80% PF

²Listed by C.S.A. for 10A @ 120VAC 80% PF

INITIAL DIELECTRIC STRENGTH

Between Open Contacts: 500V rms.

Between All Elements: 1,500V rms.

KRPA, KRP, KA series

5 to 10 AMP GENERAL PURPOSE RELAY

File E29244, E22575

File LR15734

COIL DATA @ 25°C

		Nominal Power	Maximum Power
KRP	AC	2VA	Open Models - 5VA Enclosed Models - 4VA
KRPA	DC	1.2W	Open Models - 4W Enclosed Models - 3W
KA	AC	2VA	Open Models - 4VA
	DC	125mW per movable arm	Open Models - 4W

Duty Cycle: Continuous.

Initial Insulation Resistance: KRP, KRPA - 1000 Megohms, min.

KA - 100 Megohms, min.

COIL DATA @ 25°C

	Nominal Voltage	DC Resistance (Ω) ±10%	Nominal Coil Current (mA)
DC Coils	6	32	188
	12	120	100
	24	472	51
	48	1,800	26.6
	110	10,000	11.5
	220	Use 110V relay with 10,000 Ω 5W Resistor in series	
AC Coils	6	6	335
	12	24	168
	24	85	84
	120	2,250	17.5
	240	9,110	8.75

OPERATE DATA @ 25°C

Must-Operate Voltage:

DC: 75% or less of nominal voltage.

AC: 85% or less of nominal voltage.

Operate Time (Excluding Bounce):

15 milliseconds typical @ nominal voltage.

Release Time (Excluding Bounce):

10 milliseconds typical @ nominal voltage.

ENVIRONMENTAL DATA

Temperature Range:

Open Models: AC: -45°C to +70°C

DC: -45°C to +85°C.

Enclosed Models: AC: -45°C to +55°C

DC: -45°C to +70°C

MECHANICAL DATA

Open Models: Solder Terminals.

Enclosed Models: Octal-Type Plug.

Enclosures: Transparent Polycarbonate.

Hermetically sealed metal case.

Also available with KR.

Weight: KA: 1.7 oz. (48.2 g) approximately.

KRPA, KRP: 3.0 oz. (85 g) approximately.

Note: See KRPA, KRP, KA, KR-E Ordering Information table.

ORDERING INFORMATION

Typical Part No. >

KRPA

-5

A

Y

-120

1. SERIES = KRPA (Newer version, enclosed)
KRP (Older version, enclosed)
KR (Hermetically sealed option 'E')
KA (Open style)

2. CONTACT ARRANGEMENT:

5 = 1 Form C (SPDT)
11 = 2 Form C (DPDT)
13 = 3 Form B (3PST-NC)
14 = 3 Form C (3PDT)

3. COIL INPUT:

A = AC, 50/60 Hz. DS = Diode Suppression (DC coil only)
D = DC

4. CONTACT RATING AND INDICATOR LAMP OPTION:

TYPE	KRPA	KRP	KR	KA
Codes Available	Y, G, N,	Y, G, N,	Y, G,	Y, G,

Leave Blank = Silver, no indicator lamp for hermetically sealed KR (option E below).

Y = Silver, no indicator lamp

G = Silver-cadmium oxide, no indicator lamp

N = Silver-cadmium oxide, with indicator lamp*

GF = Silver-cadmium oxide gold-flashed, no indicator lamp

LF = Silver gold-flashed contacts, with indicator lamp*

NF = Silver-cadmium oxide gold-flashed contacts, with indicator lamp*

5. OPTIONS:

Leave Blank = No options.

P = Push-to-test button (KRPA only).

E = Hermetically Sealed Option (KR only).

6. COIL VOLTAGE:

Up to 240VAC

Up to 125VDC

*Indicator Lamp not available on 25-90V coils. Only 120-240VAC and 110VDC models are UL recognized and CSA certified.

STOCK ITEMS - The following items are normally maintained in stock for immediate delivery.

KA-5AG-120	KR-11AE-120	KRP-11DG-110	KRPA-5DG-12	KRPA-11DG-12	KRPA-14DG-12
KA-5AY-24	KR-11AGE-120	KRP-11DG-125	KRPA-5DG-24	KRPA-11DG-24	KRPA-14DG-24
KA-5AY-120	KR-11DE-24	KRP-11DN-12	KRPA-5DG-110	KRPA-11DG-48	KRPA-14DG-48
KA-5DG-6	KR-11DGE-12	KRP-11DN-24	KRPA-5DY-12	KRPA-11DG-110	KRPA-14DG-110
KA-5DG-12	KR-11DGE-24	KRP-11DN-110	KRPA-5DY-24	KRPA-11DN-12	KRPA-14DN-24
KA-5DG-24	KR-14AGE-120	KRP-11DY-12	KRPA-11AG-6	KRPA-11DN-24	KRPA-14DY-24
KA-5DG-110	KR-14DGE-24	KRP-11DY-24	KRPA-11AG-12	KRPA-11DN-110	
KA-11AG-120	KRP-5AG-120	KRP-14AG-24	KRPA-11AG-24	KRPA-11DY-12	
KA-11AY-6	KRP-11AG-6	KRP-14AG-120	KRPA-11AG-120	KRPA-11DY-24	
KA-11AY-24	KRP-11AG-12	KRP-14AG-240	KRPA-11AG-240	KRPA-11DY-110	
KA-11AY-120	KRP-11AG-24	KRP-14AN-120	KRPA-11AN-12	KRPA-14AG-12	
KA-11DG-12	KRP-11AG-120	KRP-14AY-120	KRPA-11AN-24	KRPA-14AG-24	
KA-11DG-24	KRP-11AG-240	KRP-14DG-12	KRPA-11AN-120	KRPA-14AG-120	
KA-11DG-110	KRP-11AN-24	KRP-14DG-24	KRPA-11AN-240	KRPA-14AG-240	
KA-11DY-12	KRP-11AN-120	KRP-14DG-110	KRPA-11AY-6	KRPA-14AN-24	
KA-14AG-120	KRP-11AN-240	KRP-14DN-24	KRPA-11AY-12	KRPA-14AN-120	
KA-14AY-120	KRP-11AY-120	KRPA-5AG-24	KRPA-11AY-24	KRPA-14AN-240	
KA-14DG-12	KRP-11DG-12	KRPA-5AG-120	KRPA-11AY-120	KRPA-14AY-24	
KA-14DG-24	KRP-11DG-24	KRPA-5AY-120	KRPA-11AY-240	KRPA-14AY-120	
KA-14DG-110	KRP-11DG-48	KRPA-5DG-6	KRPA-11DG-6	KRPA-14AY-240	

7
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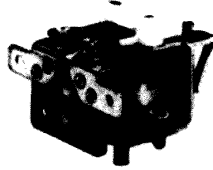
TOTAL

*Customer
Commitment*

**Today and
Tomorrow**



KRP-3-H



KR-3-H

KR-3-H/KRP-3-H series

**20 AMP
SMALL AC or DC RELAY**

File E22575

FEATURES

- 1 Form X (SPST - NO - DM) contact rating of 20A.
- Heavy copper alloy movable contact arms.
- Twin silver-cadmium oxide contacts.
- Many uses in automation controls and other applications requiring high current switching.

CONTACT DATA @ 25 C

Arrangement: 1 Form X (SPST - NO - DM).
Ratings: UL Rating: 20A @ 120VAC, 3/4 HP @ 120VAC.
Factory Rating: 20A @ 120VAC, 80% PF; 1 HP @ 120/240VAC.
Material: Twin, silver-cadmium oxide.
Expected Life: 2.5 million operations min., mechanical. 100,000 operations at rated contact load.

INITIAL DIELECTRIC STRENGTH

Between Open Contacts: 500V rms, 60 Hz. between all elements.

COIL DATA @ 25 C

See chart on previous page.
Nominal Power: DC Coils - 1.2W
AC Coils - 2.0VA
Initial Insulation Resistance: 1,000 megohms

OPERATE DATA @ 25 C

Must-Operate Voltage: DC: 75% of nominal voltage.
AC: 85% of nominal voltage.
Operate Time: 15 milliseconds approximate (Excluding Bounce)
Release Time: 10 milliseconds approximate (Excluding Bounce)

ENVIRONMENTAL DATA

Temperature Range: **Open Models:** AC: -45°C to +70°C.
DC: -45°C to +85°C.
Enclosed Models: AC: -45°C to +55°C.
DC: -45°C to +70°C.

MECHANICAL DATA

Mounting: One 6 - 32 stud and .250" (6.35 mm) locating tab on .438" (11.13 mm) centers. Socket mounting in KAP type enclosure available and designated KRP3-H.
Termination: KR-3-H: .250" (6.35 mm) quick connect terminals or solder on contacts. Solder only on coil.
KRP-3-H: Octal-type plug.
Enclosure: Can be furnished as KRP3-H in enclosure with octal-type mounting.
Weight: 2 oz. (57 g) approximately.

ORDERING INFORMATION

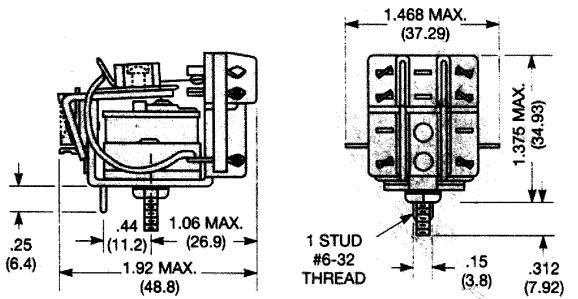
Typical Part No. >		KR	P	-3	D	H	-12
1. BASIC SERIES: KR							
2. TYPE: Leave blank = Open (20 amp models available only with Contact Arrangement 3 and Material H.) P = Enclosed (20 amp models available only with Contact Arrangement 3 and Material H.)							
3. CONTACT ARRANGEMENT: 3 = 1 Form X (SPST - NO - DM)							
4. COIL INPUT: A = AC D = DC							
5. CONTACT MATERIAL & RATING: H = Silver-cadmium oxide, 1/4" (6.35 mm) dia., 20 amps.							
6. COIL VOLTAGE: To 240VAC, 50/60 Hz. or 110VDC.							

STOCK ITEMS

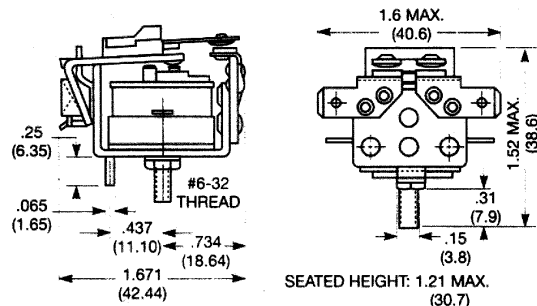
KR-3DH-24
KRP-3AH-120
KRP-3DH-12
KRP-3DH-24

OUTLINE DIMENSIONS

KA SERIES



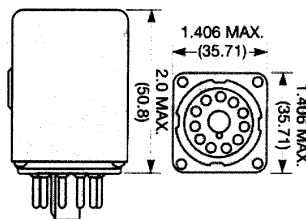
KR3-H



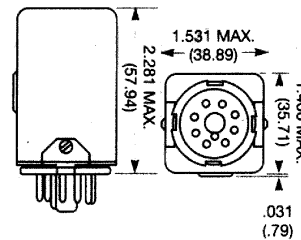
TOLERANCES ON .XX DECIMALS $\pm .02$ ($\pm .5$) UNLESS OTHERWISE SPECIFIED
TOLERANCES ON .XXX DECIMALS $\pm .005$ ($\pm .13$) UNLESS OTHERWISE SPECIFIED

KR SERIES ENCLOSURES

TYPE "P" CLEAR DUST COVER



For KRPA and KRP



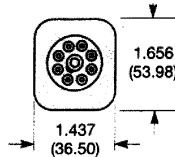
For KRP3-H

OPTIONAL HERMETICALLY SEALED ENCLOSURE



Height: 2.125" (53.98 mm) max.

Octal Plug



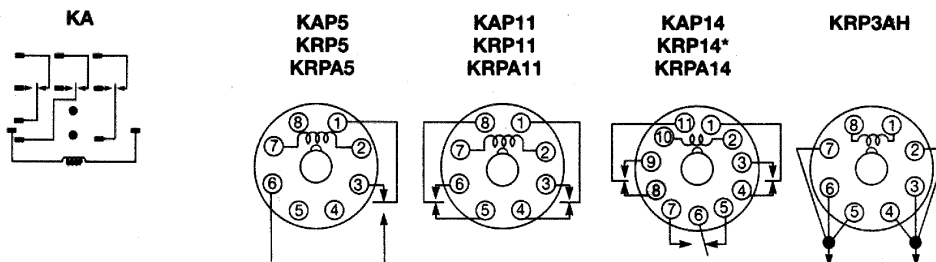
HOLD-DOWN SPRING



20C176 KRPA & KRP
20C206 KAP and KRP3

Durable stainless steel spring can be moved aside for relay removal or installation. Mounts with same machine screws or rivets that secure socket to chassis. Two .156" (3.96 mm) dia. holes required.

WIRING DIAGRAMS (Bottom Views)

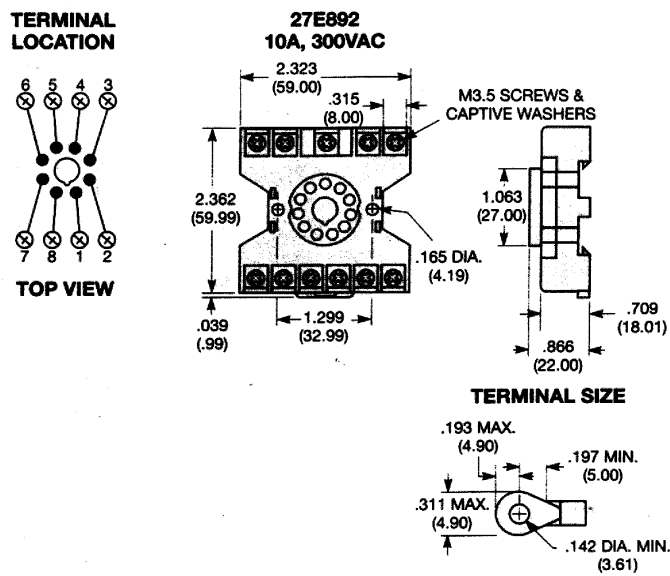
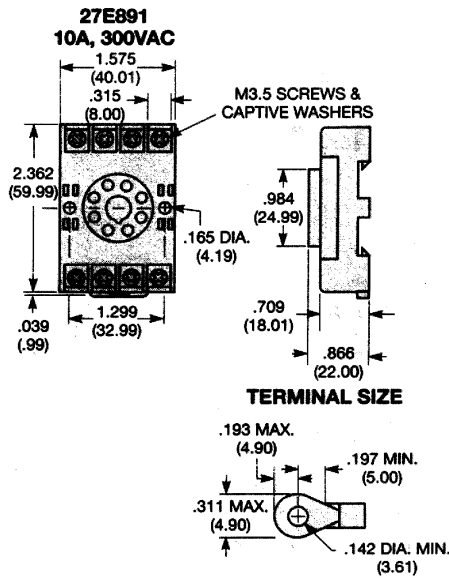


*The hermetically sealed KRP14 has pins 5 and 6 reversed.

SOCKETS FOR KRP, KRPA SERIES RELAYS

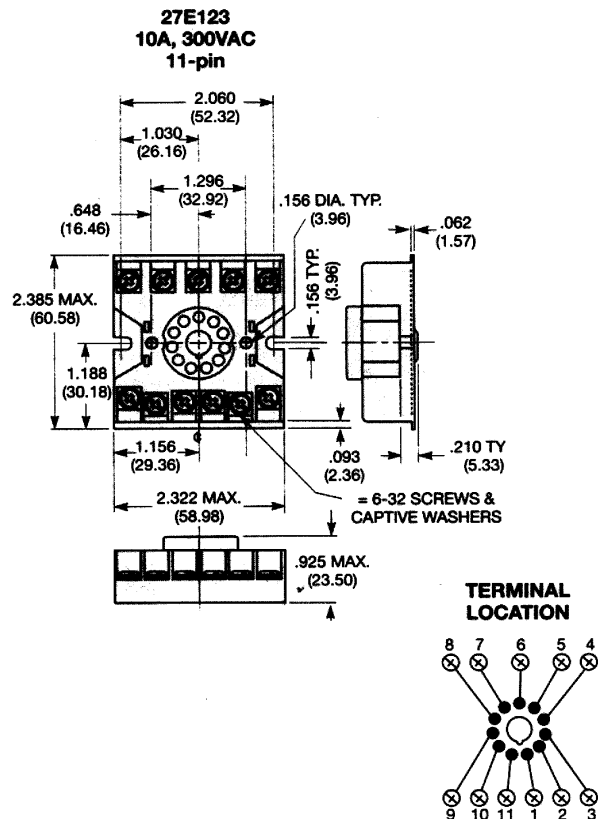
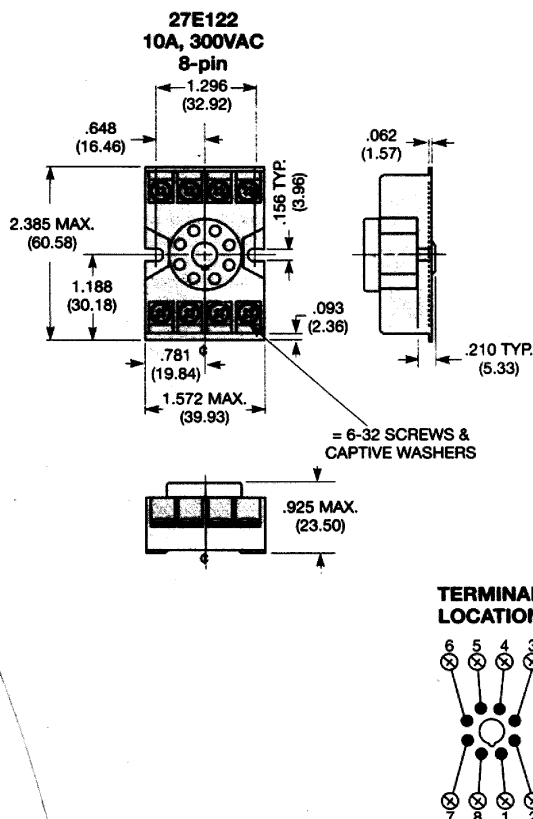
The following sockets are normally maintained in stock for immediate delivery.

SCREW TERMINAL, DIN RAIL SNAP-MOUNT SOCKETS (Use with mounting track 24A110)



Sockets have M3.5 screw terminals which accept up to two #12 AWG wires. Rated 10 amps @ 300VAC and meets UL 94V-O. Socket shipped with two 20C317 anchor clips.

SCREW TERMINAL SOCKETS





FEATURES

- JWD has dual in-line package (DIP) configuration. (14-pin DIP)
- JWS has single in-line package (SIP) configuration.
- Low cost, dry reed reliability with various contact arrangements.
- Wave solderable and immersion cleanable.
- Optional coil suppression diode.

CONTACT DATA @ 25 C

Arrangements: 1 Form A (SPST - NO) on JWD & JWS. 1 Form B (SPST - NC), 1 Form C (SPDT) and 2 Form A (DPST-NO) on JWD only.

Material: Ruthenium.

Expected Mechanical Life: 100 million operations.

Expected Electrical Life:

	Resistive Load	End of Life Criteria	No. of Operations
Forms A & B	20VDC, 500mA	500mV Loss	1 x 10 ⁶
	20VDC, 250mA	500mV Loss	20 x 10 ⁶
	Low Level (5VDC, 1mA)	50 Ohms	100 x 10 ⁶
Form C	12VDC, 500mA	500mV Loss	1 x 10 ⁶
	10VDC, 10mA	50 Ohms	25 x 10 ⁶
	Low Level (5VDC, 1mA)	50 Ohms	100 x 10 ⁶

Contact Ratings:

Maximum Switched Voltage: 100VDC for Forms A & B; 28VDC for Form C.

Maximum Switched Current: 500mA for all models.

Maximum Switched Power: 10W for Forms A & B; 3W for Form C.

Initial Contact Resistance: 200 milliohms, max. at 10mA, 6VDC.

INITIAL DIELECTRIC STRENGTH

Between Open Contacts: 250VDC for Forms A & B; 175VDC for Form C.

Between Contacts and Coil: 500VDC.

INITIAL INSULATION RESISTANCE

Between Mutually Insulated Conductors: 10¹⁰ ohms at 100VDC.

COIL DATA @ 25 C

See Ordering Information table.

OPERATE DATA @ 25 C

Operate Time (including Bounce)†: 1.5 ms, max.

Release Time (including Bounce)†: 0.5 ms, max., for Forms A & B; 3.0 ms, max., for Form C.

† At or from Nominal Coil Voltage.

ENVIRONMENTAL DATA

Temperature Range: -35°C to +85°C.

Shock: 100 g, max., in three planes for 8 ms, 1/2 wave pulse.

Vibration: 20 g, max., between 10 and 2,000 Hz.

MECHANICAL DATA

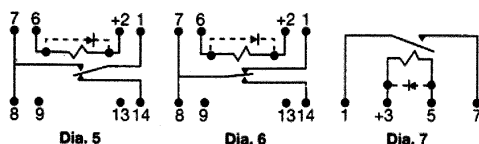
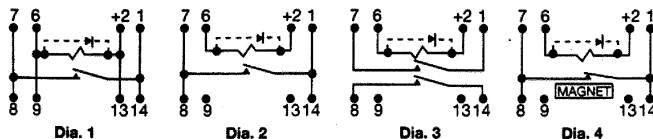
Termination: Printed circuit terminals on 0.100" (2.54 mm) grid centers.

Enclosure Type: Black molded epoxy package.

Weight: 0.08 oz. (2.3 g) approximately.

WIRING DIAGRAMS (Top Views)

Terminal numbers are for reference only and do not appear on relays.



JWD/JWS series

DUAL IN-LINE PACKAGE & SINGLE IN-LINE PACKAGE DRY REED RELAYS

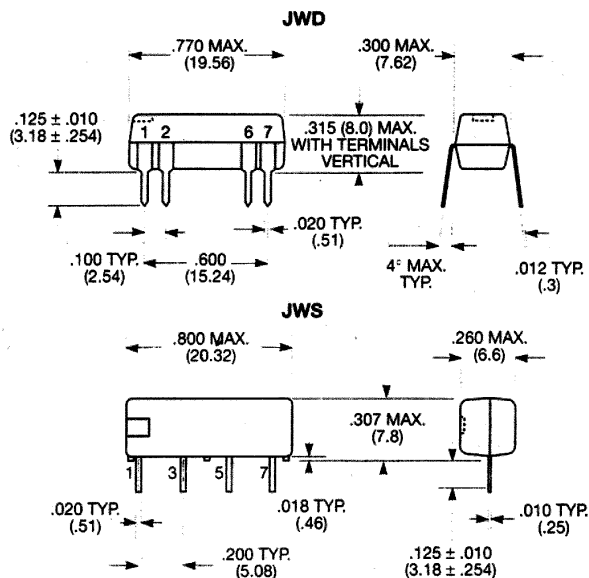
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RELAYS

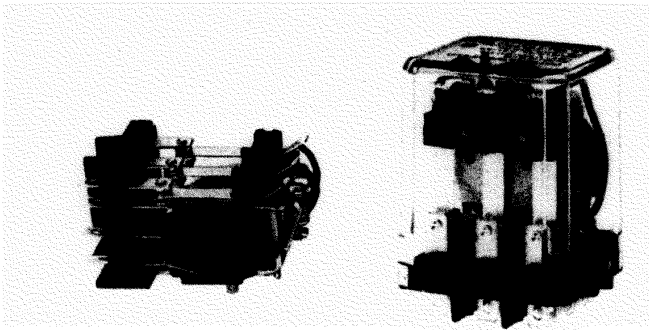
ORDERING INFORMATION - Boldface items are stocked.

Relay Part No.	Diode	Nom. Voltage (VDC)	Resistance ±10% (Ohms)	Must Operate Voltage (VDC)	Must Release Voltage (VDC)	Max. Voltage (VDC)	Nom. Coil Power (mW)	Wiring Dia. No.
JWD (DIP units) with 1 Form A (SPST-NO) contacts rated 10W max.								
JWD-107-1	No	5/6	500	3.8	0.5	19	50/72	1
JWD-107-5	Yes	5/6	500	3.8	0.5	19	50/72	1
JWD-107-3	No	12	1,200	9.6	1.0	19	120	1
JWD-107-7	Yes	12	1,200	9.6	1.0	19	120	1
JWD-171-5	No	24	2,150	19.2	2.0	40	268	2
JWD-171-10	Yes	24	2,150	19.2	2.0	40	268	2
JWD (DIP units) with 2 Form A (DPST-NO) contacts rated 10W max.								
JWD-171-21	No	5/6	200	3.8	0.5	14	125/180	3
JWD-171-25	Yes	5/6	200	3.8	0.5	14	125/180	3
JWD-171-23	No	12	500	9.6	1.0	19	288	3
JWD-171-27	Yes	12	500	9.6	1.0	19	288	3
JWD-171-24	No	24	2,200	19.2	2.0	40	262	3
JWD-171-28	Yes	24	2,200	19.2	2.0	40	262	3
JWD (DIP units) with 1 Form B (SPST-NC) contacts rated 10W max.								
JWD-171-12	No	5/6	500	3.8	0.5	7	50/72	4
JWD-171-17	Yes	5/6	500	3.8	0.5	7	50/72	4
JWD-171-14	No	12	1,200	9.6	1.0	16	120	4
JWD-171-19	Yes	12	1,200	9.6	1.0	16	120	4
JWD-171-15	No	24	2,200	19.2	2.0	40	262	4
JWD-171-20	Yes	24	2,200	19.2	2.0	40	262	4
JWD (DIP units) with 1 Form C (SPDT) contacts rated 3W max.								
JWD-172-1	No	5/6	200	3.8	0.5	12	125/180	5
JWD-172-5	Yes	5/6	200	3.8	0.5	12	125/180	5
JWD-172-3	No	12	500	9.6	1.0	19	288	5
JWD-172-7	Yes	12	500	9.6	1.0	19	288	5
JWD-172-4	No	24	2,200	19.2	2.0	38	262	5
JWD-172-8	Yes	24	2,200	19.2	2.0	38	262	5
JWD-172-155	No	5/6	200	3.8	0.5	12	125/180	6
JWD-172-159	Yes	5/6	200	3.8	0.5	12	125/180	6
JWD-172-157	No	12	1,000	9.6	1.0	19	144	6
JWD-172-161	Yes	12	1,000	9.6	1.0	19	144	6
JWD-172-158	No	24	2,150	19.2	2.0	38	268	6
JWD-172-162	Yes	24	2,150	19.2	2.0	38	268	6
JWS (SIP units) with 1 Form A (SPST-NO) contacts rated 10W max.								
JWS-117-1	No	5	500	3.8	0.5	16	50	7
JWS-117-6	Yes	5	500	3.8	0.5	16	50	7
JWS-117-3	No	12	530	9.6	1.0	19	272	7
JWS-117-8	Yes	12	530	9.6	1.0	19	272	7
JWS-117-13	No	12	1,850	9.6	1.0	30	78	7
JWS-117-18	Yes	12	1,850	9.6	1.0	30	78	7
JWS-117-5	No	24	2,150	19.2	2.0	36	268	7
JWS-117-10	Yes	24	2,150	19.2	2.0	36	268	7

OUTLINE DIMENSIONS



Note: Magnetic shielding may be required between relays when they are placed in very close proximity to one another.



FEATURES

- AC coils: 6-240VAC, 50/60 Hz. DC: 6-110VDC.
- Contact arrangement up to 4PDT.
- Wide selection of termination and mounting styles.
- PC terminals available.
- Push to test button and indicator lamps.
- KUEP incorporates a blow out magnet for high voltage DC switching.
- KUIP/KUGP are VDE approved.
- Complete line of sockets and DIN rail.
- Class B coil insulation.

CONTACT DATA @ 25 C

Arrangements: See respective ordering information table.
Materials: Fine silver (5 amp) silver-cadmium oxide (10 amp).
 Gold flash available as standard.
 Gold diffused and gold alloy on special order.
Expected Mechanical Life:

CONTACT RATINGS

Material	Arrangement	UL/CSA Ratings	Expected Life
Fine Silver	All	5 amps @ 28VDC or 240VAC 80% PF, 2.5 amp tungsten @120VAC, 1/2 amp @ 120VDC. 1/6 HP @120VAC, 1/3 HP @ 240VAC, 5 FLA, 15 LRA @ 250VAC (FLA covered by 30,000 operations).	100,000
Silver-Cadmium Oxide	1-2 Pole KUP KUIP KUGP KUEP All KUMP	10 amps @ 28VDC or 240VAC, 80% PF, 5 amp tungsten @ 120VAC, 3A 600VAC, 1/2 amp @ 120VDC. 1/3 HP @ 120VAC, 1/2 HP @ 240, 480, and 600VAC, 10 FLA 30 LRA @ 120VAC, 5 FLA, 15 LRA @ 250VAC. (FLA ratings covered by 30,000 operations)	100,000
	KUMP	15 amp @ 277VAC, 80% PF KUM KUMP	100,000
	3 Pole KUP KUIP	10 amp @ 28VDC or 120VAC, 80% PF, 6 2/3 amp @ 240VAC, 80% PF	100,000
	4 Pole	10 amp per pole not to exceed 30 amp total @ 28VDC, 120VAC, 80% PF, 6 2/3 amp @ 240VAC, 80% PF	100,000
	KUEP SPST-NO KUEP 2PST-NO KUEP 2PDT	10 amp @ 150VDC 5 amp @ 150VDC 3 amp @ 150VDC	100,000

(All other AC ratings apply KUEP)

INITIAL DIELECTRIC STRENGTH

Between Open Contacts: 1,200V rms; KUGP, 3,500V rms.
Between Adjacent Contacts: 2,200V rms.
Between Contacts and Coils: 2,200V rms; KUGP, KUIP, 3,750V rms.

KU series relays

KUP ENCLOSED RELAY

KUIP VDE 8 mm COIL TO CONTACTS

KUGP VDE 8 mm 3 mm GAP COIL TO CONTACTS

KUEP 10 AMP 150VDC LOAD SWITCHING

KUMP 15 AMP 277VAC

File E22575

File LR15734

0435 Registration 1792 (KUIP)

0435 Registration 1792 (KUGP)

License 81.12102.01

COIL DATA @ 25 C

Voltage: 6 to 110VDC and 6 to 240VAC.

Nominal Coil Power:

DC Coils: 1.2 Watts - KUP, KUIP, KUMP, 1 - 3 pole; KUEP, 1 pole.

DC Coils: 1.8 Watts - KUP, 4 pole; KUEP, 2 pole; KUGP.

AC Coils: 2.0VA - KUP, KUIP, 1 - 2 pole; KUEP, 1 pole.

AC Coils: 2.7VA - KUP, KUIP, 3 pole; KUEP, 2 pole; KUGP, KUMP.

COIL DATA

DC Volts Nominal	1.2 Watt		1.8 Watt	
	DC Ohms $\pm 10\%$	Nom. I ma	DC Ohms $\pm 10\%$	Nom. I ma
5	21	238	14	360
6	32.1	187	20	300
12	120	100	80	150
24	472	51	320	75
48	1,800	26.7	1,260	38
110	10,000	11	6,720	16

AC Volts Nominal	2VA		2.7VA	
	DC Ohms $\pm 15\%$	Nom. I ma	DC Ohms $\pm 15\%$	Nom. I ma
6	6	335	4.2	460
12	24	168	18	230
24	85	84	72	115
120	2,250	17.5	1,700	24
240	9,110	8.75	7,200	12

OPERATE DATA @ 25 C

Must Operate Voltage:

DC Coils: 75% of nominal voltage or less.

AC Coils: 85% of nominal voltage or less.

Operating Time (Excluding Bounce):

15 milliseconds, typical, at nominal voltage.

Release Time (Excluding Bounce):

10 milliseconds, typical, at nominal voltage.

ENVIRONMENTAL DATA

Temperature Range:

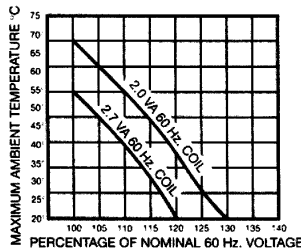
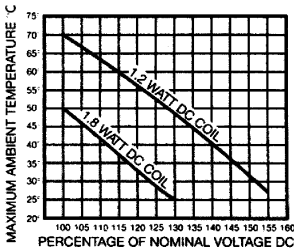
Operating: Enclosed Relays: -45°C to maximum listed in table below.

Open Relays: Add 15°C to maximum listed.

Max C°	+45°C	+50°C	+55°C	+70°C	+75°C	+80°C	+95°C
KUP	AC 3-4 pole	DC 4 pole	AC 1-2 pole	DC 1-3 pole			
KUIP			AC 3 pole		AC 1-2 pole	DC 1-3 pole	
KUGP			AC 2 pole	DC 2 pole			
KUEP	AC 2 pole	DC 2 pole	AC 1 pole	DC 1 pole			
KUMP	AC 3 pole		AC 1-2 pole	DC 1-3 pole			

ENVIRONMENTAL DATA (Continued)

Maximum Allowable Ambient Temperature vs Voltage (KU enclosed)



MECHANICAL DATA

Termination: Quick connect, solder and PC board.
Enclosure: Clear polycarbonate dust cover.
Weight: 3.0 oz. (85 g) approximately.

ORDERING INFORMATION

Typical Part No. >

**KU
KUP**

-14

A

1

5

F

-120

1. BASIC SERIES AND TYPE:

KU = Basic open relay.
KUP = Basic enclosed relay.

2. CONTACT ARRANGEMENT:

5 = 1C (SPDT)
11 = 2C (DPDT)
14 = 3C (3PDT)
17 = 4C (4PDT)

3. COIL INPUT:

A = AC 50/60 Hz. DS = Diode Suppression (DC coil only)
D = DC

4. MOUNTINGS:

Type	KU	KUP (through 3 poles)	KUP (4 pole models)
Codes Available	1,2,3,4,5	1,2,3,4,5,6,7,8,9 A,B,C,D,E,F,G,H,T	1,3,5,7,9,A,C,E,G
OPEN STYLE		1 = PLAIN CASE; 2 = with test button. 3 = with indicator lamp.* 4 = with test button & indicator lamp.* 5 = BRACKET MOUNT CASE;	B = with test button. D = with test button & indicator lamp.* F = with test button. H = with test button & indicator lamp.* T = TOP FLANGE CASE.
1 = #6-32 stud, .218" (5.54 mm) locating tab.			
3 = #6-32 tapped core, .125" (3.18 mm) locating tab.			
4 = #6-32 tapped core, .218" (5.54 mm) locating tab.			

*Indicator lamps are available on models with the following coils:
6-24VAC and DC, 110VDC and 120-240VAC. Only models with
120-240VAC coils are UL recognized.

5. TERMINAL & CONTACT MATERIAL:

Type	1 & 2 Pole Models	3 Pole Models	4 Pole Models
Codes Available	1,2,3,5, 6,7,J,K	1,2,3, 5,6,7	1**,3,4, 5**,7,9

1 = .187" (4.75 mm) quick-connect/solder; silver, 5 amps.
2 = .205" (5.21 mm) quick connect/solder; silver, 5 amps.
3 = .047" (1.19 mm) printed circuit; silver, 5 amps.
4 = .110" (2.79 mm) quick connect/solder; silver, 5 amps.
5 = .187" (4.75 mm) quick connect/solder; silver-cadmium oxide, 10 amps.
6 = .205" (5.21 mm) quick connect/solder; silver-

**4 pole KUP with .187" (4.75 mm) quick connect/solder terminals will not plug into sockets. Must use .110" (2.79 mm) quick connect solder terminals for socket mounting.

7 = .047" (1.19 mm) printed circuit; silver-cadmium oxide, 10 amps.
9 = 4 pole KU, KUP: .110" (2.79 mm) quick connect/solder; silver-cadmium oxide, 10 amps.
J = .250" (6.35 mm) quick connect; silver, 5 amps.
K = .250" (6.35 mm) quick connect; silver-cadmium oxide, 10 amps.

5A. GOLD FLASHED CONTACT OPTION:

F = Optional gold flashing for silver and silver-cadmium oxide contacts.

6. COIL VOLTAGE:

To 240VAC, 50/60 Hz. or 110VDC.

STOCK ITEMS - The following items are normally maintained in stock for immediate delivery.

KUP-5A15-24	KUP-11A11-120	KUP-11A55-120	KUP-11D55-12	KUP-14A25-120	KUP-14D15-6	KUP-14D55-12
KUP-5A15-120	KUP-11A15-6	KUP-11A15-120	KUP-11D55-24	KUP-14A35-120	KUP-14D15-12	KUP-14D55-24
KUP-5A15-240	KUP-11A15-12	KUP-11D11-24	KUP-11D55-48	KUP-14A45-120	KUP-14D15-24	KUP-14D55-110
KUP-5A55-120	KUP-11A15-24	KUP-11D15-5	KUP-11D55-110	KUP-14A55-6	KUP-14D15-48	KUP-17A19-120
KUP-5A55-240	KUP-11A15-120	KUP-11D15-12	KUP-14A11-120	KUP-14A55-12	KUP-14D15-110	KUP-17A55-24
KUP-5D15-12	KUP-11A15-240	KUP-11D15-24	KUP-14A15-12	KUP-14A55-24	KUP-14D17-24	KUP-17D19-24
KUP-5D15-24	KUP-11A25-120	KUP-11D15-110	KUP-14A15-24	KUP-14A55-120	KUP-14D25-24	KUP-17D55-24
KUP-5D55-12	KUP-11A35-120	KUP-11D35-24	KUP-14A15-120	KUP-14A55-240	KUP-14D35-24	
KUP-5D55-24	KUP-11A55-24	KUP-11D55-6	KUP-14A15-240	KUP-14D11-24		

ORDERING INFORMATION

VDE APPROVED DESIGN

Typical Part No. >

**KUIP
KUGP**

-11

A

1

5

-120

1. BASIC SERIES AND TYPE:

KUIP = Enclosed relay designed for General VDE 0435.*

KUGP = Enclosed relay with 3 mm open contact spacing. (Form A and Form X arrangements only)*

2. CONTACT ARRANGEMENT:

1 = 1 Form A (SPST-NO)

5 = 1 Form C (SPDT)*

7 = 2 Form A (DPST-NO)

11 = 2 Form C (DPDT)*

14 = 3 Form C (3PDT)*

3. COIL INPUT:

A = AC, 50/60 Hz.*

D = DC*

4. MOUNTINGS:

1 = PLAIN CASE, SOCKET MOUNT.*

T = TOP FLANGE CASE.*

5 = BRACKET MOUNT CASE.*

5. TERMINAL & CONTACT MATERIAL:

3 = .047" (1.19 mm) printed circuit board; silver.

5 = .187" (4.75 mm) quick connect/solder; silver-cadmium oxide.*

6. COIL VOLTAGE:

To 240VAC, 50/60 Hz. or 110VDC.

See coil data tables.

* Options included in VDE file.

STOCK ITEMS – The following items are normally maintained in stock for immediate delivery.

KUGP-7D55-24

KUIP-11D55-12

KUIP-14D15-12

KUIP-5A55-120

KUIP-11D55-24

KUIP-14D15-24

KUIP-11A55-120

KUIP-14A15-120

ORDERING INFORMATION

HIGH VOLTAGE DC SWITCHING

Typical Part No. >

KUEP

-3

A

1

5

-120

1. BASIC SERIES AND TYPE:

KUEP = Enclosed relay with magnetic blow-outs.

2. CONTACT ARRANGEMENT:

3 = 1X (SPST-NO-DM)

7 = 2A (DPST-NO)

11 = 2C (DPDT)

3. COIL INPUT:

A = AC 50/60 Hz.

D = DC

4. MOUNTINGS:

Type

KUE

KUEP

1 = PLAIN CASE;

3 = with indicator lamp.*

5 = BRACKET MOUNT CASE;

G = with indicator lamp.*

T = TOP FLANGE CASE.

*Indicator lamps are available on models with the following coils:
6-24VAC and DC, 110VDC and 120-240VAC. Only models with
120-240VAC coils are UL recognized.

5. TERMINAL & CONTACT MATERIAL:

5 = .187" (4.75 mm) quick connect/solder; silver-cadmium-oxide.

7 = .047" (1.19 mm) printed circuit; silver-cadmium-oxide.

6. COIL VOLTAGE:

To 240VAC, 50/60 Hz. or 110VDC.

STOCK ITEMS – The following items are normally maintained in stock for immediate delivery.

KUEP-3A15-120

KUEP-3D15-110

KUEP-11A15-120

KUEP-3D15-12

KUEP-7D15-12

KUEP-11D15-12

KUEP-3D15-24

KUEP-7D15-24

KUEP-11D15-24

15 AMP SWITCHING

Typical Part No. ➤

**KUM
KUMP**

-14

A

1

8

-120

1. BASIC SERIES AND TYPE:

KUM = 15 amp open relay
KUMP = 15 amp enclosed relay

2. CONTACT ARRANGEMENT:

- 1 = 1A (SPST-NO)
2 = 1B (SPST-NC)
3 = 1X (SPST-NO-DM)
4 = 1Y (SPST-NC-DB)
5 = 1C (SPDT)
6 = 1Z (SPDT-NC-NO [DB-DM])
7 = 2A (DPST-NO)
8 = 2B (DPST-NC)
11 = 2C (DPDT)
12 = 3A (3PST-NO)
13 = 3B (3PST-NC)
14 = 3C (3PDT)

3. COIL INPUT:

A = AC, 50/60 Hz. D = DC

4. MOUNTINGS:

Type	KUM	KUMP
OPEN STYLE		
1 = #6-32 stud, .218" (5.54 mm) locating tab.	1 = PLAIN CASE;	A = PLAIN CASE, #6-32 STUD LOCATING TAB;
2 = 2-hole bracket, #6-32 tapped.	2 = with test button.	B = with test button.
3 = #6-32 tapped core, .125" (3.18 mm) locating tab.	3 = with indicator lamp.*	C = with indicator lamp.*
4 = #6-32 tapped core, .218" (5.54 mm) locating tab.	4 = with test button & indicator lamp.*	D = with test button & indicator lamp.*
5 = #6-32 tapped core, no locating tab.	5 = BRACKET MOUNT CASE;	E = PLAIN CASE, TAPPED CORE, LOCATING TAB;
	6 = with test button.	F = with test button.
	7 = with indicator lamp.*	G = with indicator lamp.*
	8 = with test button & indicator lamp.*	H = with test button & indicator lamp.*
	9 = STUD ON END OF PLAIN CASE.	T = TOP FLANGE CASE.
	*Indicator lamps are available on models with the following coils: 6-24VAC and DC, 110VDC and 120-240VAC. Only models with 120-240VAC coils are UL recognized.	

5. TERMINAL & CONTACT MATERIAL:

Type	1 & 2 Pole Models	3 Pole Models
Codes Available	6,8,9,G	6,8,9

- 6 = .205" (5.21 mm) quick connect/solder; silver-cadmium-oxide.
8 = .187" (4.75 mm) quick connect/solder; silver-cadmium-oxide.
9 = .047" (1.19 mm) printed circuit; silver-cadmium-oxide.
G = .250" (6.35 mm) quick connect; silver-cadmium-oxide. (Not available on 3 pole models.)

6. COIL VOLTAGE:

To 240VAC, 50/60 Hz. or 110VDC

STOCK ITEMS – The following items are normally maintained in stock for immediate delivery.

KUMP-11A18-24
KUMP-11A18-120
KUMP-11A18-240

KUMP-11D18-12
KUMP-11D18-24
KUMP-11D18-110

KUMP-14A18-24
KUMP-14A18-120
KUMP-14D18-12

KUMP-14D18-24

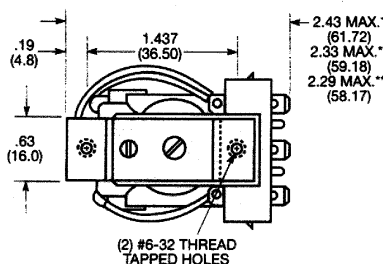
Relay Specialties

**If an item you need is not shown in this catalog, please call us today for more information.
Due to space limitations, it is impossible for us to describe all lines of standard material.**

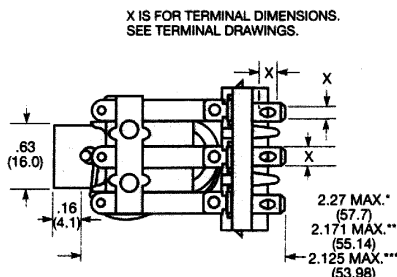
7 RELAYS

OUTLINE DIMENSIONS

OPEN RELAYS



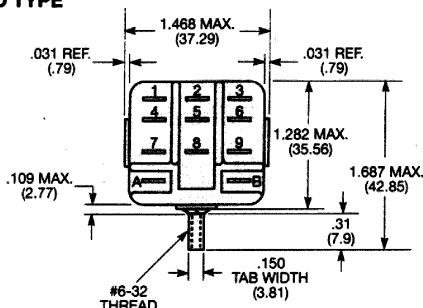
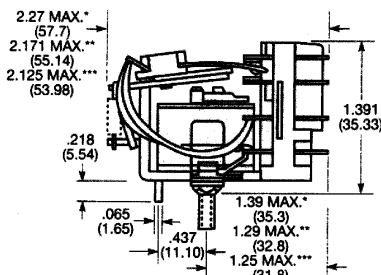
BRACKET TYPE



SEATED HEIGHTS FOR OPEN RELAYS

- 1.391" (35.33 mm) for #6-32 stud with .218" (5.54 mm) locating tab.
- 1.52" (38.6 mm) for bracket with 2 #6 32 tapped holes.
- 1.282" (32.56 mm) for #6-32 tapped core with .125" (3.18 mm) or .218" (5.54 mm) locating tab.
- 2.046" (51.97 mm) for relay with printed circuit terminals.

STUD TYPE



STUD TYPE also available with .125" (3.18 mm) tab, as well as without stud and locating tab. Models without stud have core tapped #6-32 THREAD, .25" (6.4 mm) minimum depth.

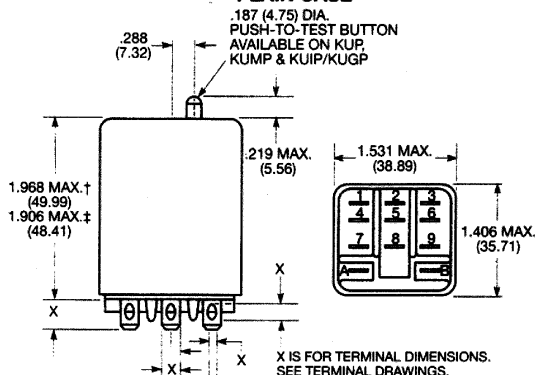
*Dimensions with .250" (6.35 mm) terminals.

**Dimensions with .110" (2.79 mm) or .205" (5.21 mm) terminals.

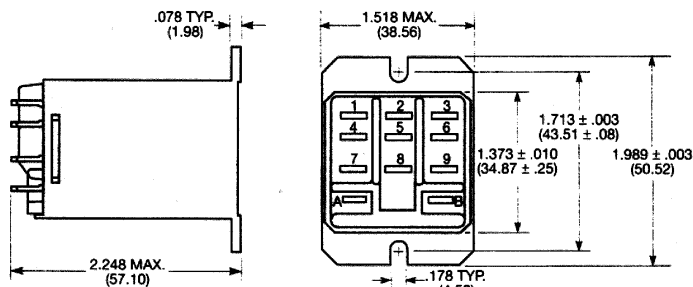
***Dimensions with .187" (4.75 mm) terminals.

ENCLOSED RELAYS

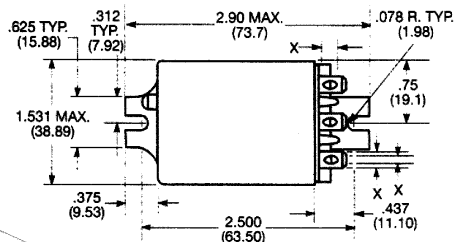
PLAIN CASE



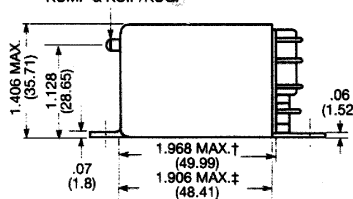
TOP FLANGE CASE



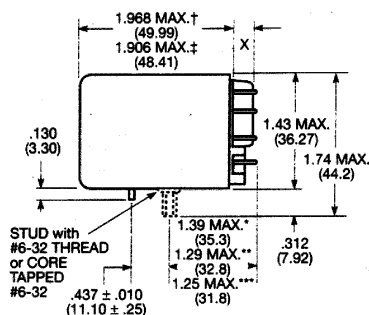
BRACKET MOUNT CASE



PUSH-TO-TEST BUTTON AVAILABLE ON KUP, KUMP & KUIP/KUGP



CORE AND STUD MOUNT CASES



†Dimensions with .250" (6.35 mm) terminals.

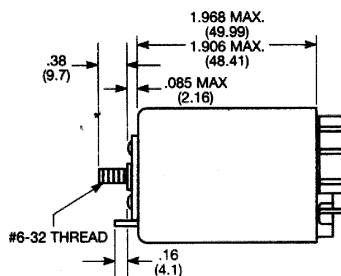
‡Dimensions with .110" (2.79 mm), .187" (4.75 mm and .205" 5.21 mm) terminals.

*Dimensions with .250" (6.35 mm) terminals.

**Dimensions with .110" (2.79 mm) or .205" (5.21 mm) terminals

***Dimensions with .187" (4.75 mm) terminals.

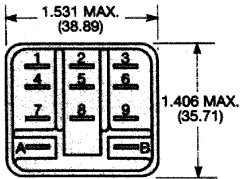
STUD ON END CASE



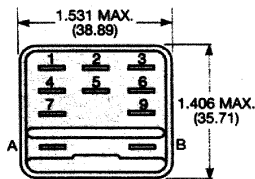
OUTLINE DIMENSIONS (Continued)

RELAY FRONT DIAGRAM

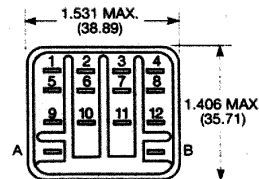
1-3 POLE RELAYS



RELAYS WITH
.250" (6.35 mm) TERMINALS

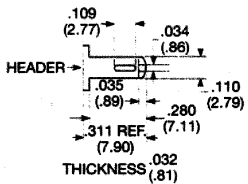


4 POLE RELAYS

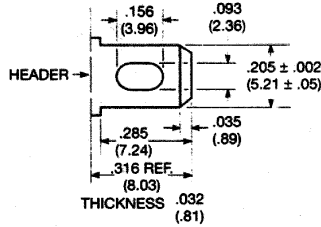


TERMINAL DIMENSIONS

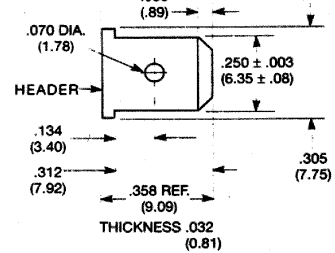
.110" (2.79 mm)
QUICK CONNECT



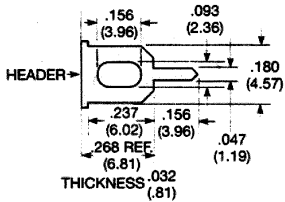
.205" (5.21 mm)
QUICK CONNECT



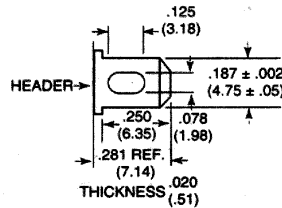
.250" (6.35 mm)
QUICK CONNECT



PRINTED
CIRCUIT

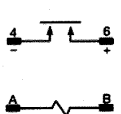


.187" (4.75 mm)
QUICK CONNECT

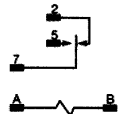


Note: All drawings shown oversized.

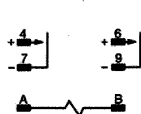
WIRING DIAGRAMS



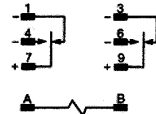
*1 FORM X



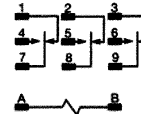
1 FORM C



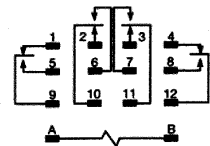
*2 FORM A



*2 FORM C



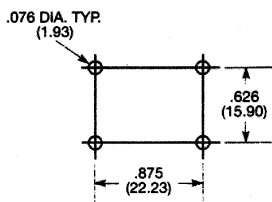
3 FORM C



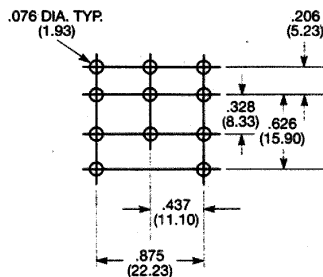
4 FORM C

*Recommended Load Polarity for Optimum Arc Suppression.

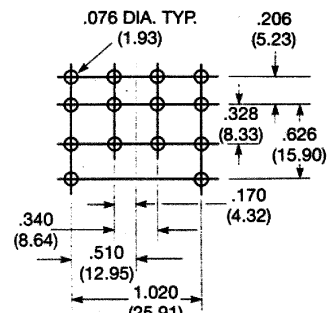
PC BOARD LAYOUTS (Bottom Views)



1 FORM X



3 POLE MODELS

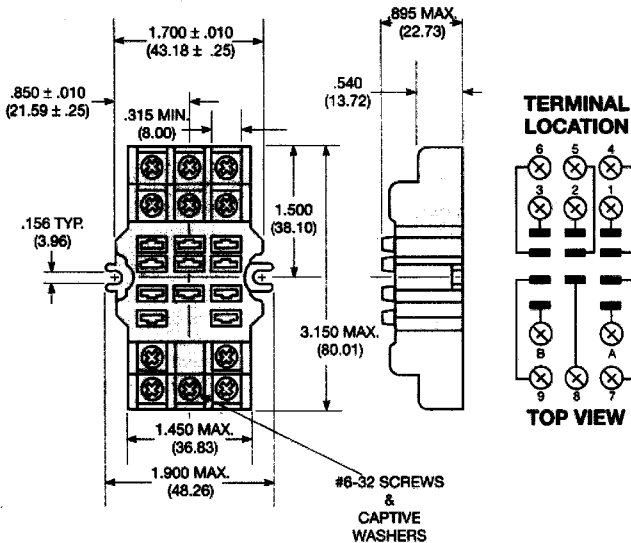


4 POLE MODELS

SOCKETS FOR KU SERIES RELAYS THROUGH 3 POLES (Continued)

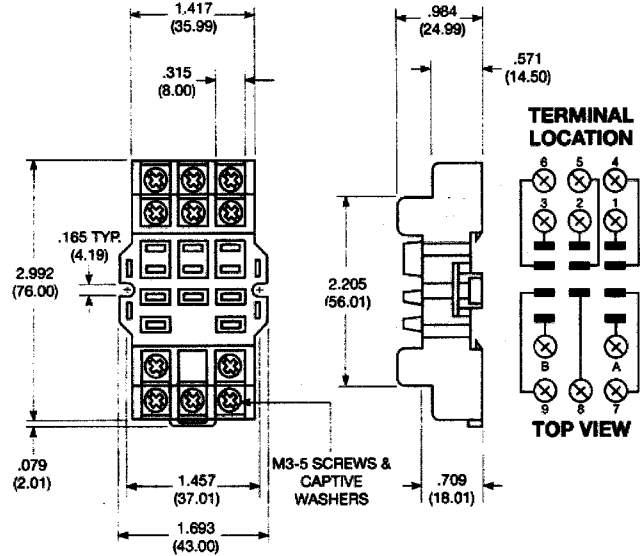
**27E121
SCREW TERMINAL SOCKET**

The 27E121 socket offers screw termination for KUEP, KUGP, KUIP, KUL, KUMP and KUP relays, through 3 poles, with .187" (4.75 mm) quick connect terminals. This socket stacks on 1.700" (43.18 mm) centers. When surface mounting, two #6-32 screws of suitable length are required. When track mounting, two 24A071 retainer clips (not shown) are required. The 27E121 is rated 15 amps and is UL recognized, File E59244, CSA certified, File LR15734.



**27E893
SCREW TERMINAL, DIN RAIL SNAP-MOUNT SOCKET
(use with mounting track 24A110)**

The 27E893 DIN rail, snap-mount socket offers screw termination for KUEP, KUGP, KUIP, KUL, KUMP and KUP relays, through 3 poles, with .187" (4.75 mm) quick connect terminals. This socket is constructed with a spring-loaded latch which allows it to be quickly snapped onto or removed from a "top hat" style mounting track. No special tools or extra hardware is required for installation. The 27E893 is UL rated 15 amps, 94V-0, File E59244 and CSA rated 10 amps, File LR15734. Two 20C317 hold-down spring anchor clips are packaged with each socket.



SOCKETS FOR KU SERIES 4 POLE RELAYS

**SOCKET SELECTION TABLE
Stock items are boldfaced.**

For 4 pole KUP relays with .110" (2.79 mm) quick connect termination.

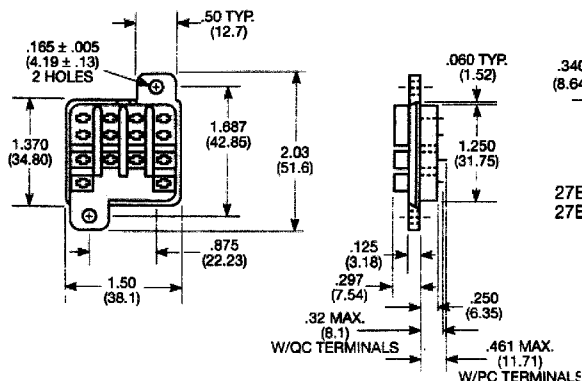
SOCKET	SOCKET TERMINATION	HOLD-DOWN SPRING
27E415	.187" (4.75 mm) quick connect	20C228 or 20C254
27E419	PC board	20C228 or 20C254
27E867*	Screw terminals	20C254

* Use 40G432 insulator pad or customer supplied alternative

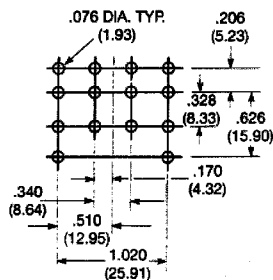
HARD MOUNT SOCKETS FOR 4 POLE RELAYS

27E415—with .187" (4.75 mm) quick connect/solder terminals.
27E419—with printed circuit terminals. See PC board layout at right.

Note: Only 4 pole KUP relays with .110" (2.79 mm) quick connect terminals can be used with 4 pole hard mount sockets.



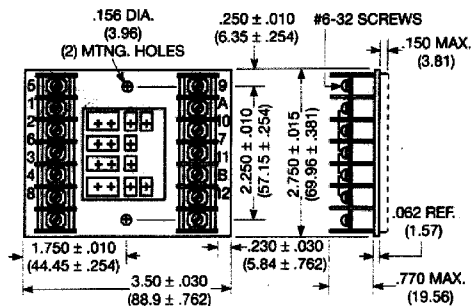
**SUGGESTED SOCKET
PC BOARD LAYOUT**



27E415 uses same chassis cutout as 27E043.

**SCREW TERMINAL SOCKET
FOR 4 POLE RELAYS**

27E867 offers screw termination for 4 pole KUP relays with .110" (2.79 mm) quick connect/socket mount terminals. Rated 10 amps and is UL recognized, File E59244.



SOCKETS FOR KU SERIES RELAYS THROUGH 3 POLES

SOCKET SELECTION TABLE
Stock items are boldfaced.

For KUP, KUEP, KUGP, KUIP, and KUMP relays, through 3 poles, with .187" (4.75 mm) quick connect termination.

SOCKET	SOCKET TERMINATION	HOLD-DOWN SPRING
27E043	Solder eyelet	20C228 or 20C254*
27E046	PC board, .144" (3.66 mm) terminals	20C228 or 20C254
27E067	.187" (4.75 mm) quick connect	20C228 or 20C254
27E121	Screw terminals	20C314 (2 per socket required)
27E305	PC board, .184" (4.67 mm) terminals	20C228 or 20C254
27E396	.187" (4.75 mm) quick connect*	20C254
27E893	Screw terminals†	20C318

* 20C228 held in place by socket hold-down screw where as 20C254 snaps onto socket.

† Snap-in mounting.

‡ DIN rail mounting.

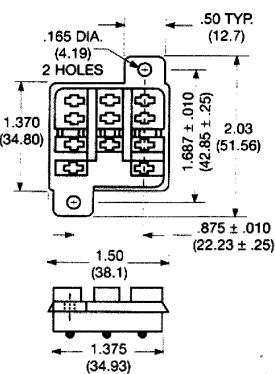
HARD MOUNT SOCKETS FOR RELAYS THROUGH 3 POLES

Nylon sockets with .187" (4.75 mm) quick connect, solder, printed circuit, wire wrap or no terminals are available for KUEP, KUGP, KUIP, KUMP, and KUP relays, through 3 poles, with .187" (4.75 mm) quick connect terminals. All are rated 15 amps and UL recognized, File E59244 and CSA certified File LR15734 (except 27E452, 10 amps).

27E043—with solder eyelet terminals.

27E067—with .187" (4.75 mm) quick connect terminals

27E452—with .032" (.81 mm) x .062" (1.57 mm) x .725" (18.42 mm) terminals for wire wrapping. Use 20 to 26 gauge wire depending on type of wrapping system.



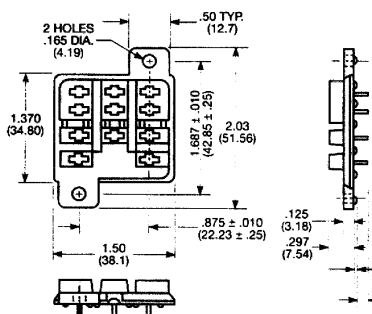
27E043

27E067

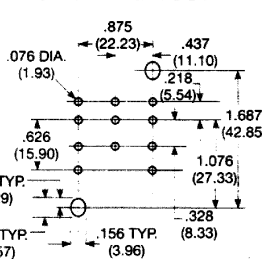
27E452

The 27E043, 27E067 and 27E452 use chassis cutout shown on this page.

**27E046, 27E305, 27E310
SOCKET WITH PRINTED CIRCUIT TERMINALS**



**SUGGESTED SOCKET
PC BOARD LAYOUT**

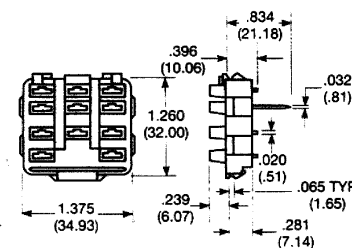


27E046 HAS TERMINALS .144" (3.66 mm) LONG.
27E305 HAS TERMINALS .184" (4.67 mm) LONG.
27E310 HAS TERMINALS .247" (6.27 mm) LONG.

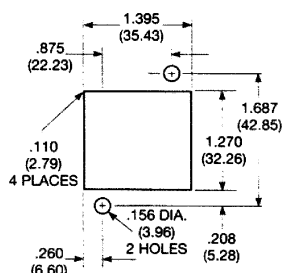
SNAP-IN SOCKETS FOR RELAYS THROUGH 3 POLES

Nylon snap-in sockets with .187" (4.75 mm) quick connect, solder, or wire wrap terminals are available for KUEP, KUGP, KUIP, KUMP, and KUP relays, through 3 poles, with .187" (4.75 mm) quick connect terminals. Snap-in sockets reduce labor by eliminating time consuming screw or rivet mounting. Preassembled wiring harnesses may also be used as the sockets are designed to snap into the chassis from either front or back. All are rated 15 amps and UL recognized, File E59244. The 27E396, 27E397 and 27E400 use chassis cutout shown on this page.

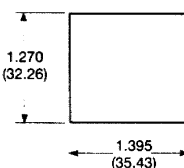
27E396—with .187" (4.75 mm) quick connect terminals.



**RECOMMENDED CHASSIS CUTOUT
FOR HARD MOUNT SOCKETS**



**RECOMMENDED CHASSIS CUTOUT
FOR SNAP-IN SOCKETS**



Recommended chassis thickness
.031" (.79 mm) to .062" (1.57 mm).

**7
RELAYS**



**S86R S86
Mounting
Style 1**



**S87R
Mounting
Style 1**



**S87R
Mounting
Style 2**

S86R/S87R series

**LOW COST
20 AND 10 AMP
INDUSTRIAL RELAYS**

File E22575
File LR15734

FEATURES

- Low cost.
- Contact forms to 2 Form C.
- Applications include spa controls, vending machines, HVAC, and machine tool controls.
- Variety of mounting styles.
- Sensitive coil version.

CONTACT DATA @ 25°C

S86R and S87R: 20 amps @ 277VAC; 60 LRA, 12 FLA, 1 HP @ 125VAC; 48 LRA, 8 FLA @ 240VAC; 2 HP @ 250VAC; Pilot Duty, 360VA @ 125/250VAC.

Materials: Silver and silver-cadmium oxide.

Expected Life: 1 million operations, mechanical; 50,000 operations at rated loads.

COIL DATA

Nominal Coil Voltage	Coil Resistance (Ohms) AC, ± 15% DC, ± 10%		Nominal Coil Current (mA) @ 25°C*	
S86R & S87R (AC)	All Models		All Models	
12VAC	8.0		330	
24VAC	32		165	
120VAC	800		33.0	
240VAC	3,200		16.5	
S87R (DC)				
6VDC	12.5	8	480	750
12VDC	50	32	240	375
24VDC	200	128	120	188
36VDC	450	288	80	125
48VDC	800	512	60	94
72VDC	1,800	1,150	40	63
125VDC	5,425	3,470	23	36

*Increase AC current values by 25% for mounting style 2 with single switch.

INITIAL DIELECTRIC STRENGTH

Initial Breakdown Voltage: 1,560V rms, 60 Hz.

OPERATE DATA

Must Operate Voltage:

DC Coils: 75% of nominal voltage @ +25°C.

AC Coils: 85% of nominal voltage @ +25°C.

Operating Position: Relay is designed for operation with plunger either vertical or horizontal; however, the relay is not designed for operation in an upside-down position.

COIL DATA @ 25°C

Nominal Power:

S86R: 4.0VA for AC models.

S87R: 2.9 Watts for single pole DC models.

4.5 Watts for double pole DC models.

4.0VA for AC models.

Insulation: Class B (130°C).

ENVIRONMENTAL DATA

Temperature Range: -10°C to +65°C.

Typical Part No. ➤

5

A

1

B

1

D

1

-120

S86R = Standard relay with AC or DC coil, 20 Amp contacts.
S86S = Sensitive relay with DC coil, 10 Amp contacts.
S87R = Standard relay with AC or DC coil, 20 Amp contacts.

1 = SPST-NO 5 = SPDT 8 = DPST-NC
2 = SPST-NC 7 = DPST-NO 11 = DPDT

A = AC (available on S86R and S87R)
D = DC

S86: 1 = Style 1

S87: 1 = Style 1
2 = Style 2

(See outline dimensions)

A = .187" (4.75 mm) Quick-connect/solder.
B = .250" (6.35 mm) Quick-connect/solder.

1 = Same side as switch terminals.
2 = Opposite side from switch terminals.

C = .187" (4.75 mm) Quick-connect/solder. (limited to 15A rating)
D = .250" (6.35 mm) Quick-connect/solder.

1 = Style 1

AC coils to 277VAC, 50/60 Hz.
DC coils to 125VDC.

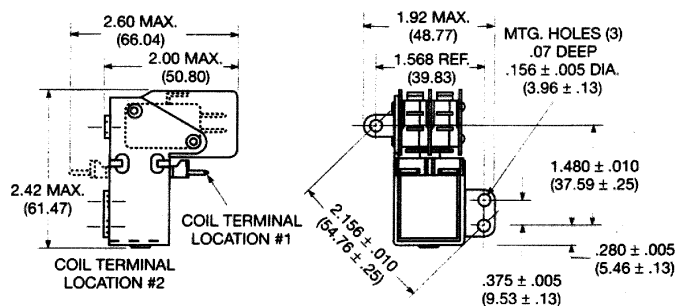
S86R5A1B1D1-120
S86R11A1B1D1120

S87R5A2B1D1-24
S87R5A2B1D1-120
S87R5A2B1D1-240
S87R5D2B1D1-12

S87R5D2B1D1-24
S87R11A2B1D1-24
S87R11A2B1D1120
S87R11A2B1D1240

S87R11D2B1D1-24

S86R AND S86S (2 pole shown) STYLE 1



Technical drawing of the MTG. BOSS showing three views: front, side, and top. The front view shows a rectangular block with a circular hole on the right side. Dimensions include a total width of 2.42 MAX. (61.5), a hole diameter of .166 DIA. (4.22), and a hole offset of .188 (4.78) from the right edge. The side view shows a height of 1.20 MAX. (30.5) and a total height of 2.07 MAX. (52.6). The top view shows a width of 1.62 MAX. (41.1) and a hole diameter of .158-.161 DIA. (4.01-4.09). A note indicates (1) MTG. HOLE.

Technical drawing of a coil terminal assembly. The drawing shows a side view of the assembly with various dimensions in inches and millimeters. Key features include a coil terminal location #1, a coil terminal location #2, and a central coil terminal. Dimensions are provided for the overall size, terminal positions, and internal features.

Dimensions (inches / millimeters):

- Overall width: 2.30 MAX. (58.4)
- Overall height: 2.60 MAX. (66.0)
- Top left corner radius: .125 ± .005 (3.18 ± .13)
- Top right corner radius: 1.671 (42.44)
- Top center hole diameter: .480 ± .005 (12.19 ± .13)
- Top right hole diameter: .186 (4.72) TYP.
- Top right hole diameter: .495 ± .005 (12.57 ± .13)
- Top right hole diameter: .196 (4.98) DIA. TYP.
- Top right hole diameter: .140 (3.56)
- Top right hole diameter: .1528 MAX. (38.81)
- Top right hole diameter: .1640 ± .005 (41.66 ± .13)
- Top right hole diameter: .547 ± .005 (13.39 ± .13)
- Top right hole diameter: .180 ± .030 (4.57 ± .76)
- Top right hole diameter: .094 ± .030 (2.39 ± .76)
- Top right hole diameter: 1.812 ± .005 (46.02 ± .13)
- Top right hole diameter: .197 ± .030 (5.00 ± .76)
- Top right hole diameter: 2.010 MAX. (51.05)
- Top right hole diameter: .186 (4.72) TYP.
- Top right hole diameter: .495 ± .005 (12.57 ± .13)
- Top right hole diameter: .196 (4.98) DIA. TYP.
- Top right hole diameter: .140 (3.56)
- Top right hole diameter: .1528 MAX. (38.81)
- Top right hole diameter: .1640 ± .005 (41.66 ± .13)
- Top right hole diameter: .547 ± .005 (13.39 ± .13)
- Top right hole diameter: .180 ± .030 (4.57 ± .76)
- Top right hole diameter: .094 ± .030 (2.39 ± .76)
- Top right hole diameter: 1.812 ± .005 (46.02 ± .13)
- Top right hole diameter: .197 ± .030 (5.00 ± .76)
- Top right hole diameter: 2.010 MAX. (51.05)

C = .187" (4.75 mm) Quick-connect
D = .250" (6.35 mm) Quick-connect

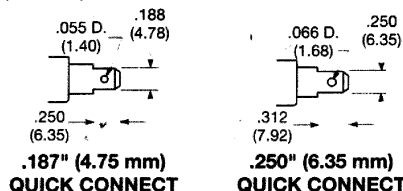


Diagram of a 3-position switch, Style 1, with terminals COM., N.C., and N.O. and a note "WITH COIL DEENERGIZED".

7 RELAYS



KUH series

30 AMP POWER RELAYS

File E22575

File LR15734-123

FEATURES

- AC coils 6-277VAC 50/60 Hz., DC 6-110VDC.
- Contact arrangement up to DPDT.
- .250" combination push-on/solder terminals or PC terminals.
- Side flange and top flange mounting.
- Designed to meet VDE space requirements.
- Class B coil insulation.

CONTACT DATA @ 25 °C

Arrangements: 1 Form C (SPDT) and 2 Form C (DPDT).

Material: Silver or silver-cadmium oxide.

Expected Mechanical Life: 10 million operations.

CONTACT RATINGS

Contact Arrangement	UL/CSA Ratings	Expected Life
1 Form C Single Pole Double Throw	30A 120/240VAC 1 HP @ 120VAC, 1 1/2 HP @ 240VAC 25A @ 28VDC	100,000 ops.
2 Form C Double Pole Double Throw	20A @ 120/240VAC 3/4 HP @ 120VAC 1 1/2 HP @ 240VAC 20A @ 28VDC 7A @ 120VAC (Tungsten)	100,000 ops.

INITIAL DIELECTRIC STRENGTH

Between Open Contacts: 1,200V rms.

Between Adjacent Contacts: 3,750V rms.

Between Contacts and Coil: 3,750V rms.

Between Coil and Frame: 2,000V rms.

COIL DATA @ 25 °C

Voltage: 6-110VDC and 6-277VAC.

Nominal Power:

DC Coils: 1.2 Watts.

AC Coils: 2.7VA.

Duty Cycle: Continuous.

Initial Insulation Resistance: 100 megohms, min.

Insulation: Class B, 130°C.

COIL DATA

	Nominal Voltage	DC Resistance in Ohms $\pm 10\%$	Must Operate Voltage	Nominal Coil Current (mA)
DC Coils	6	32.1	4.5	187
	12	120	9.0	100
	24	472	18.0	51
	48	1,800	36.0	26.7
	110	10,000	82.5	11
AC Coils	6	4.2	5.1	460
	12	18	10.2	230
	24	72	20.4	115
	120	1,700	102.0	24
	240	7,200	204.0	12
	277	10,250	235.5	9

* $\pm 15\%$ for AC coils.

OPERATE DATA @ 25 °C

Must Operate Voltage:

DC Coils: 75% of nominal.

AC Coils: 85% of nominal.

Operate Time (Excluding Bounce): 20 milliseconds, typical, at nominal voltage.

Release Time (Excluding Bounce): 20 milliseconds, typical, at nominal voltage.

ENVIRONMENTAL DATA

Temperature Range:

Operating: DC Coils:

Open: -45°C to +85°C.

Enclosed: -45°C to +70°C.

Operating: AC Coils:

Open: -45°C to +60°C.

Enclosed: -45°C to +45°C.

Shock: 15 Gs, 11 ms (non-operating).

Vibration: .065" double amplitude, 10-55 Hz.

MECHANICAL DATA

Termination: .250" quick connect/solder; and PC board.

Enclosure: Polycarbonate dust cover.

Weight: 3.2 oz. (92 g) approximately.

ORDERING INFORMATION

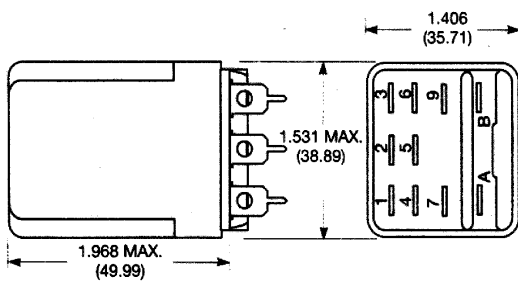
Typical Part No. >		KUH-	11	A	1	2	-120
1. BASIC SERIES AND TYPE: KUH = Enclosed 20/30 amp relay.							
2. CONTACT ARRANGEMENT & RATING: 1 = 1A (SPST-NO); 30 amps. 11 = 2C (DPDT); 20 amps. 5 = 1C (SPDT); 30 amps.							
3. COIL INPUT: A = AC, 50/60 Hz. D = DC							
4. MOUNTINGS: KUH 1 = PLAIN CASE 5 = BRACKET MOUNT CASE T = TOP FLANGE							
5. TERMINALS & CONTACT MATERIALS: 1 = .250" (6.35 mm) quick connect/solder; silver-cadmium oxide. 7 = .047" (1.19 mm) printed circuit; silver-cadmium oxide.							
6. COIL VOLTAGE: AC coils to 277VAC, 50/60 Hz. DC coils to 110VDC.							

STOCK ITEMS – The following items are normally maintained in stock for immediate delivery.

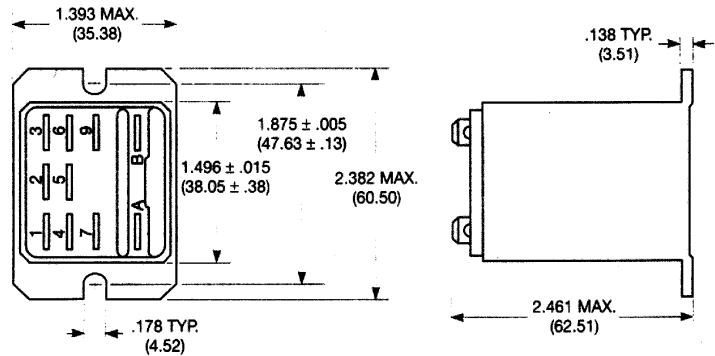
KUHP-5A51-24 KUHP-5AT1-120 KUHP-5D51-24 KUHP-5DT1-24 KUHP-11AT1-120 KUHP-11D51-24 KUHP-11DT1-24
 KUHP-5A51-120 KUHP-5D51-12 KUHP-5DT1-12 KUHP-11A51-24 KUHP-11D51-12 KUHP-11DT1-12

OUTLINE DIMENSIONS

ENCLOSED RELAYS
PLAIN CASE

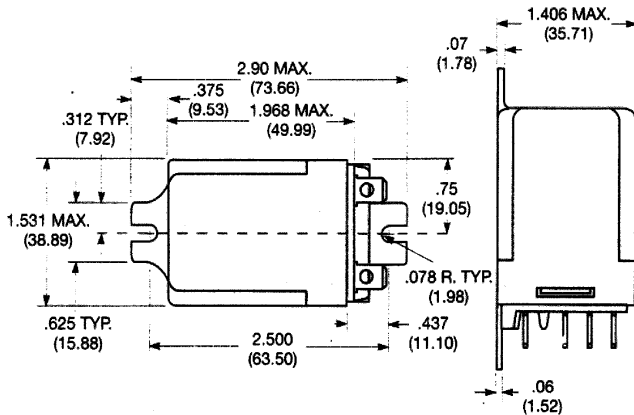


TOP FLANGE ENCLOSURE



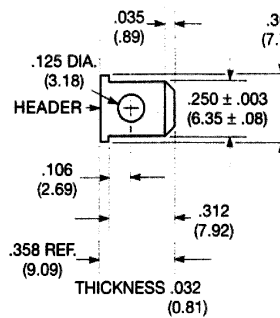
OUTLINE DIMENSIONS (Continued)

BRACKET MOUNT CASE

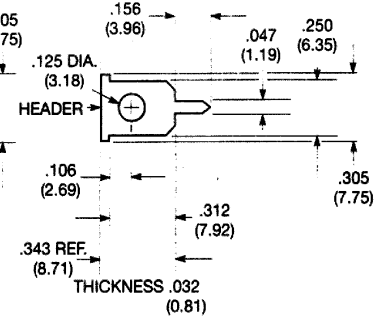


TERMINAL DIMENSIONS

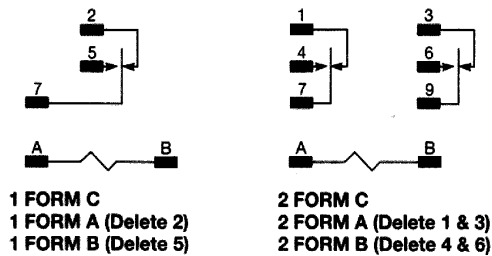
.250" (6.35 mm) QUICK
CONNECT/SOLDER



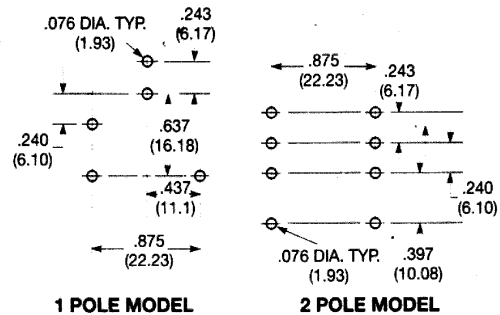
PRINTED CIRCUIT

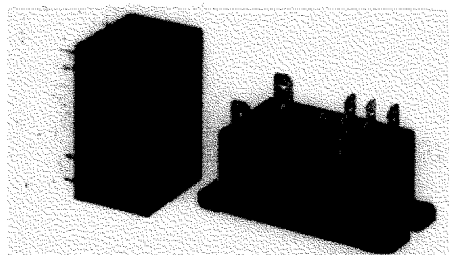


WIRING DIAGRAMS



PC BOARD LAYOUTS (Bottom Views)





FEATURES

- 30A DPST-NO and DPDT switching capabilities.
- Designed to control compressor loads to 3.5 tons, 25.3 FLA, 110 LRA.
- Extended life - >300,000 operations at 30A, 240VAC (DC coil).
>100,000 operations at 30A, 240VAC (AC coil).
- Meets requirements of UL873 and UL508 spacings.
- .315" (8 mm) through air, .375" (9.5 mm) over surface.
- Meets requirements of VDE 8 mm spacing, 4kV dielectric coil-to-contacts.
- Meets requirements of UL Class F construction.
- UL approved for 600VAC Switching (1.5HP).
- Conforms to VDE 0435, 0631, and 0700.

CONTACT DATA @ 25°C

Arrangements: 2 Form A (DPST-NO) and 2 Form C (DPDT).

Materials: Silver cadmium oxide.

Max. Load Rating:

Normally Open Contacts:

30A @ 120/277VAC, resistive;

10A @ 600VAC, resistive;

1 HP @ 120VAC, 2.5 HP @ 240VAC; 1.5 HP @ 480VAC, 1.5 HP @ 600VAC

22FLA, 96LRA @ 240VAC with AC coil;

25.3 FLA, 110 LRA @ 240VAC with DC coil⁽¹⁾;

3A @ 240VAC pilot duty;

20A @ 28VDC;

TV10 @ 120VAC.

VDE Rating (Flange Mount) 25A @ 400VAC, 100K Ops. (30K Ops. for Form C Models).

VDE Rating (PC Mount) 30A @ 400VAC, 100K Ops. (30K Ops. for Form C Models).

Normally Closed Contacts:

3A @ 28VDC or 277VAC, 2A @ 480VAC, 1A @ 600VAC.

VDE Rating (Flange or PC Mount) 3A @ 400VAC, 30K Ops.

Min. Load Rating:

Normally Open Contacts: 500mA @ 12VAC/VDC.

Normally Closed Contacts: 100mA @ 6VAC/VDC.

Expected Mechanical Life: 5 million operations.

Expected Electrical Life: 100,000 operations at rated load.

ARI 780-86 Endurance Test (section 6.6):

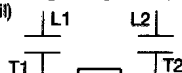
HVAC Definite Purpose Contactor Standard

Normally Open Contacts

Single Phase/Two Pole (Both poles together switching a single load)

110 LRA, 25.3 FLA, 200K Operations (DC Coil)

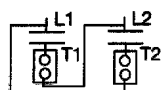
96 LRA, 22 FLA, 200K Operations (AC Coil).



Single Phase Per Pole (Single Load per Pole)

110 LRA, 18 FLA, 200K Operations (DC Coil)

60 LRA, 20 FLA, 200K Operations (AC Coil).



NOTE: Vent hole tape must be removed to achieve all listed ratings.

INITIAL DIELECTRIC STRENGTH

Between Contacts and Coil: 4,000V rms, 50/60 Hz.

Between Open Contacts: 1,500V rms, 50/60 Hz.

Between Poles: 2,000V rms, 50/60 Hz.

INITIAL INSULATION RESISTANCE

Between Mutually Insulated Elements: 10⁹ ohms, min. @ 500VDC.

COIL DATA

Voltage: 6 through 110VDC and 24 through 277VAC.

Resistance: See Coil Data table.

Nom. Power: AC Coil: 4.0VA; DC Coil: 1.7W.

Coil Temp. Rise: 35°C/W.

Max. Coil Temp.: 140°C

Duty Cycle: Continuous

T92 series

TWO-POLE, 30 AMP PC BOARD OR PANEL MOUNT RELAY

File E22575

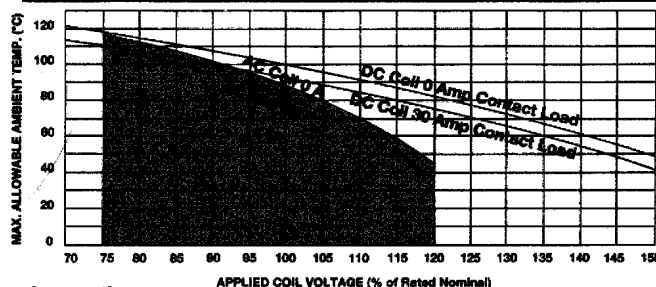
File LR15734

VDE - Reg. No. 5386

COIL DATA (@ 25°C Coil Temperature)

DC COILS (1.7W)					
Nom. Voltage (VDC)	DC Resist. ±10% (Ohms)		Nom. Voltage (VDC)	DC Resist. ±10% (Ohms)	
6	22		48	1,390	
12	86		110	7,255	
24	350				
AC COILS (4.0VA)					
Nom. Voltage (VAC)	Freq.	DC Resist. ±10% (Ohms)	Nom. Voltage (VAC)	Freq.	DC Resist. ±10% (Ohms)
12	60	9.1	110/120	50/60	950
12	50	11.2	120	50	1119
24	60	36.6	208	60	2841
24	50	44.4	220/240	50/60	3800
48	50	179.2	230/240	50	4355
100/110	50/60	793	250/277	50/60	5485

AMBIENT TEMPERATURE VS. COIL VOLTAGE



Assumptions

1. Thermal resistance = 35°C per Watt (DC only.)
2. Still air
3. Nominal coil resistance
4. Maximum mean coil temperature = 140°C using change of resistance method, Class F
5. Coil temperature rise due to load = 6.3°C @ 30 Amps
6. Curves are based on 1.7 W at 25°C (DC only.)

OPERATE DATA

Must Operate Voltage: AC Coil: 80% of nominal voltage or less.
DC Coil: 75% of nominal voltage or less.

Must Release Voltage: 10% of nominal voltage or more.

Initial Operate Time ⁽²⁾: 15 ms typical, (25 ms max. w/bounce).

Initial Release Time ⁽²⁾: 10 ms typical, (25 ms max. w/bounce).

Max Operating Frequency: 14 operations per minute.

ENVIRONMENTAL DATA

Temperature Range: Storage: -55°C to +155°C.

Operating: AC Coil: -40°C to +65°C.

DC Coil: -40°C to +85°C.

Vibration: 0.065" (1.65 mm) double amplitude for 10-55 Hz., functional.

Shock, Operational: 10g for 11 ms, 1/2 sine wave pulse with no contact opening > 100µs.

Shock, Mechanical: 100g for 11 ms, 1/2 sine wave pulse.

Flammability: UL 94-V0.

MECHANICAL DATA

Termination: Printed circuit terminals; .250" (6.35 mm) quick connects for coil and contacts; or .187" (4.75 mm) quick connects for coil and .250" (6.35 mm) quick connects for contacts.

Enclosure: Unsealed, plastic dust cover or immersion cleanable, tape sealed plastic cover.

Weight: 3 oz. (86 g) approximately.

CONDITIONS

All parametric, environmental and life tests are performed according to EIA Standard RS-407-A at standard test conditions (25°C ambient, 20-50% RH, 29.5 ± 1" Hg.) unless otherwise noted.

NOTES:

(1) FLA, LRA ratings are compatible with 3.5 ton compressor applications.

(2) Nominal voltage, no coil suppression, excluding bounce.

7 RELAYS

ORDERING INFORMATION

Typical Part Number➤

T92 S 11 D 1 2 -24

1. BASIC SERIES:

T92 = Printed circuit board / panel mount power relay.

2. ENCLOSURE:

P = Plastic dust cover (unsealed). S = Immersion cleanable, tape sealed plastic case (mntg code 1)
Top sealed, not immersion cleanable,
not tape sealed on bottom (mntg code 2, 3, & 4).

3. CONTACT ARRANGEMENT:

7 = 2 form A (DPST-NO). 11 = 2 form C (DPDT).

4. COIL INPUT:

A = AC voltage, 60 Hz. or 50/60 Hz. (See Coil Data Table) D = DC voltage. F = AC voltage, 50 Hz.

5. MOUNTING & TERMINATION:

1 = Printed circuit board mount; printed circuit board terminals for coil and contacts.
2 = Panel mount via flanged cover; .250" (6.35mm) x .032" (.81mm) quick connect terminals for coil and contacts.
3 = Panel mount via flanged cover; .187" (4.75mm) x .032" (.81mm) quick connect terminals for coil and .250" (6.35mm) for contacts.
4 = Panel mount via flanged cover; .187" (4.75mm) x .020" (.51mm) quick connect terminals for coil and .250" (6.35mm) for contacts.

6. CONTACT MATERIAL:

2 = Silver cadmium oxide.

7. COIL VOLTAGE: (See Coil Data Table)

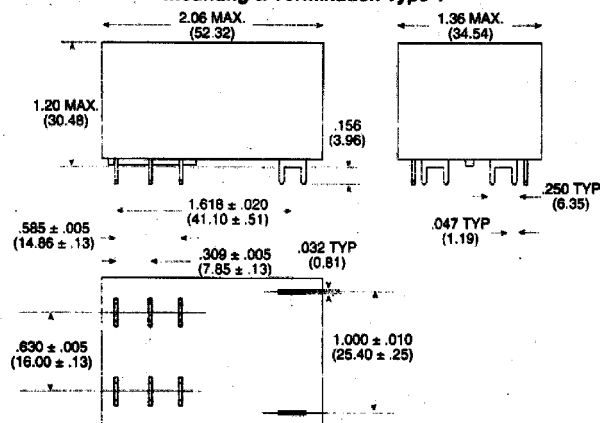
(DC)	6 = 6VDC	12 = 12VDC	24 = 24VDC	48 = 48VDC	110 = 110VDC
(60HZ)	12 = 12VAC	24 = 24VAC	208 = 208VAC		
(50HZ)	12 = 12VAC	24 = 24VAC	48 = 48VAC	120 = 120VAC	240 = 230/240VAC
(50/60HZ)	110 = 100/110VAC	120 = 110/120VAC	240 = 220/240VAC	277 = 250/277VAC	

STOCK ITEMS - The following items are normally maintained in stock for immediate delivery

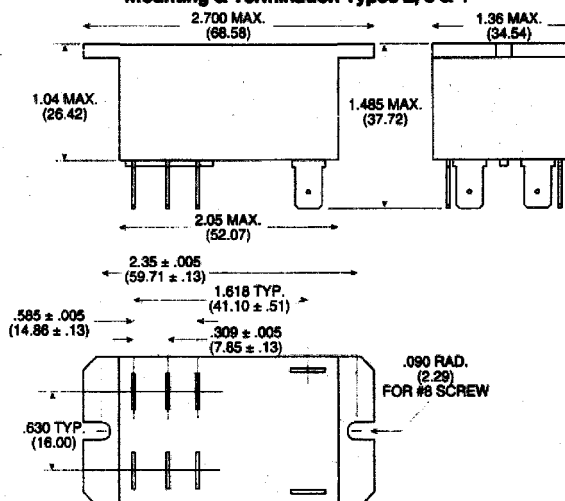
T92P7A22-24	T92P7D12-24	T92P11A22-120	T92P11D22-24	T92S7A22-240	T92S7D22-24	T92S11A22-240	T92S11D22-12
T92P7A22-120	T92P7D22-12	T92P11A22-240	T92S7A12-240	T92S7D12-12	T92S7D22-110	T92S11D12-12	T92S11D22-24
T92P7A22-240	T92P7D22-24	T92P11A22-277	T92S7A22-24	T92S7D12-24	T92S11A22-24	T92S11D12-24	
T92P7D12-12	T92P11A22-24	T92P11D22-12	T92S7A22-120	T92S7D22-12	T92S11A22-120	T92S11D12-110	

OUTLINE DIMENSIONS

Mounting & Termination Type 1

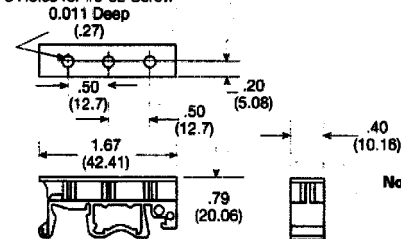


Mounting & Termination Types 2, 3 & 4



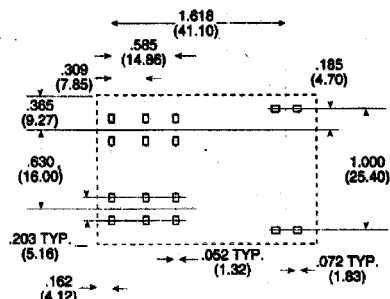
DIN MOUNT ADAPTER - 9T91A001

3 Holes for #6-32 Screw



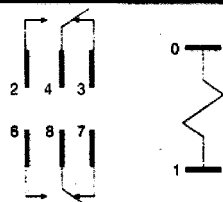
Note: Fits 35mm din track
Includes: 2 Din clips
2 Screws
Must be ordered in multiples of 50

SUGGESTED PC BOARD LAYOUT (Bottom View)

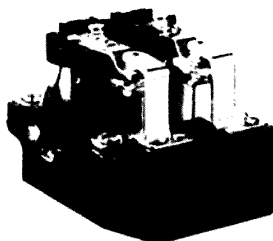


Note: An alternate PC board layout utilizes .076 ± .003 (1.93 ± .076) diameter holes on the same center-to-center spacing shown above. Use of the rectangular holes is recommended for improved solderability.

WIRING DIAGRAM



Only necessary terminals are present on single throw models.



PRD series

10 TO 50 AMP HEAVY DUTY AC OR DC POWER RELAY

Ⓛ File E22575 (Models With All Screw Terminals)

Ⓡ File E22575 (All Others)

Ⓢ File 15734

△ VDE-REG

AUXILIARY SNAP-ACTION SWITCH

Arrangements: 1 Form C (SPDT).

Rating: 5 amps at 120VAC, 60 Hz. @ 25°C.

Material: Silver.

FEATURES

- Contact ratings to 50 amps.
- Magnetic blowouts available for switching DC loads..
- Arrangements to DPDT.
- SPDT auxiliary switch available.
- Replaces PR series.

CONTACT DATA @ 25 C

Arrangements: Available to 2 Form C (DPDT). See ordering information table.

Ratings: See UL contact rating table.

Material: Silver and silver-cadmium oxide standard. Other materials available for special applications.

Expected Life: 100,000 operations at rated loads @25°C. Contact life increases at reduced loads or with appropriate arc suppression.

UL/CSA CONTACT RATINGS

Type	Supply		Contact Ratings
	AC	DC	
PRD 1,3,5	AY	DY	25 amps @ 277VAC 1 HP at 120VAC 2 HP at 250VAC 10 amps at 600VAC 7 amps at 50VDC Res.
	AG	DG	
PRD 1,3,5	AG	DG	30 amps at 277VAC Res. 1.5 HP at 120VAC 2HP at 250VAC 10 amp at 600VAC
PRD 7,11	AY	DY	25 amps at 240VAC 20 amps at 277VAC 1HP at 120VAC 2HP at 250VAC 7 amps at 50VDC Res. 10 amps at 600VAC
	AG	DG	
PRD 7,11	AG	DG	30 amps at 240VAC 20 amps at 277VAC 1.5 HP at 120VAC 2 HP at 250VAC 10 amps at 600VAC
PRD 3,7,11	AH	DH	20 amp at 125VDC 1/3 HP at 125VDC
	AJ	DJ	

UL RECOGNIZED LOAD/LIFE PARAMETERS FOR 50 AMP PRD

Type	Contact Ratings	Minimum Life
PRD3AP4	50 Amps, 277VAC max., General Purpose	100,000 Cycles
PRD3DP4	30 Amps, 277VAC max., Ballast	6,000 Cycles
	15 Amps, 277VAC max., Tungsten	6,000 Cycles
	102 LRA, 17 FLA, 240VAC	30,000 Cycles
	120 LRA, 20 FLA, 120VAC	30,000 Cycles
	1.5 HP at 120VAC	30,000 Cycles
	3 HP at 240VAC	30,000 Cycles

Note: Any PRD relay deviating electrically or physically from the standard models in the table is not UL or CSA listed. All horsepower ratings are for single phase motors

DC FACTORY CONTACT RATINGS

Type	Contact Ratings
PRD3AR4	60 Amps, 28VDC Res.
PRD3DR4	30 Amps, 125VDC Res.

INITIAL DIELECTRIC STRENGTH

Initial Breakdown Voltage: 2,000V rms minimum between all elements and ground. (2,200V rms on 600V ratings.)

COIL DATA @ 25 C

Voltage: From 6 to 220VDC, and 6 to 480VAC.

Resistance: See coil data table.

Nom. Power: DC coils: -2.0 watts @ 25°C.

AC coils: - 9.8VA @ 25°C.

Max Power: DC coils: - 8.0 watts @ 25°C.

Duty Cycle: Continuous.

Initial Insulation Resistance: 100 megohms, minimum.

COIL DATA

"DY" AND "DG" DC COILS			"AY" AND "AG" AC COILS (50-60HZ.)		
Nominal Volts	Resistance In Ohms ±10% @ 25°C	Nominal DC Current In Milliamps	Nom. Volts	DC Resis. In Ohms ±15% @ 25°C	Nominal AC Current In Milliamps
6	18	333	6	.86	1600
12	71	169	12	3.2	820
24	288	84	24	12.0	410
110	6050	18.2	120	290	85
220	use 110V relay with approx. 6,000 ohm 5W wire-wound		240	1200	43
			480	4500	22

OPERATE DATA @ +25 C

Must-Operate Voltage: DC: 75% of nominal voltage @ 25°C.

AC: 85% of nominal voltage @ 25°C.

ENVIRONMENTAL DATA

Temperature Range: AC: -55°C to +45°C

DC: -55°C to +80°C

MECHANICAL DATA

Mounting: Two .187"(4.75mm) diameter holes on 1.875" (47.63 mm) centers.

Termination: See ordering information tables for various options.

Enclosure: Metal dust cover, 35D013, available. Order separately.

Weight: 10 oz. (284 g) approximately.

7 RELAYS

ORDERING INFORMATION

Typical Part No. >

PRD

-7

A

Y

0

-120

1. TYPE:

PRD = Open relay.

PRDA = Open relay with aux. SPDT snap-action switch.

2. MAIN CONTACT ARRANGEMENT:

1 = SPST-NO

2 = SPST-NC

3 = SPST-NO-DM

5 = SPDT

7 = DPST-NO

7V = DPST-NO with 3mm contact gap.

11=DPDT

3. COIL INPUT:

A = 50/60 Hz.

D = DC

4. MAIN CONTACT MATERIAL:

Y = .312" (7.92mm) dia. silver

G = .312" (7.92mm) dia. silver cad.-oxide

†H = Silver w/magnetic blow out

†J = Silver cad.-oxide w/magnetic blow out

N = Tungsten stationary & silver cad.-oxide movable. Code 1,2,5,7,8 & 11 only

†Available with Code 3,7,8,8X.
& 11 contact arrangement only.

5. TERMINATION:

	PRD			PRDA (With Aux. SPDT Snap-Action Switch)		
CODE	0	1	3	A	B	L
MAIN	Screw Term.	.250" (6.35mm) QC	Screw Term.	Screw Term.	.250" (6.35mm) QC	Twin .250" (6.35mm) QC
COIL	Screw Term.	.250" (6.35mm) QC	.250" (6.35mm) QC	Screw Term.	.250" (6.35mm) QC	.250" (6.35mm) QC
AUX. SWITCH				Screw Term.	.250" (6.35mm) QC	.250" (6.35mm) QC

6. COIL VOLTAGE:

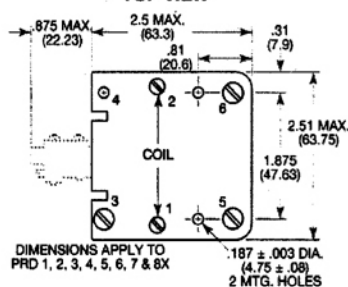
6, 12, 24, 110VDC

6, 12, 24, 120, 240, 480VAC, 50/60 Hz.

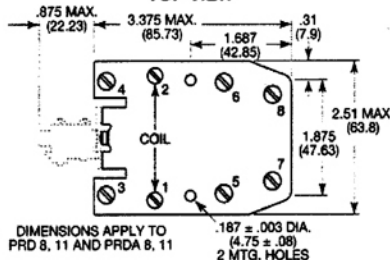
Coil voltages are available to 125VDC and 600VAC.

OUTLINE DIMENSIONS

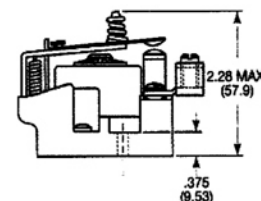
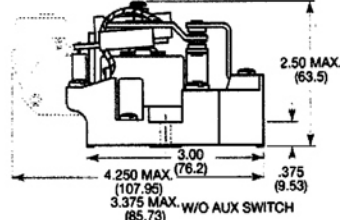
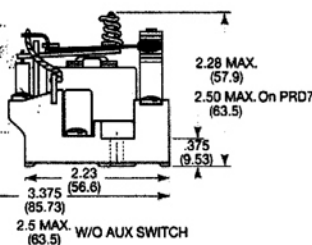
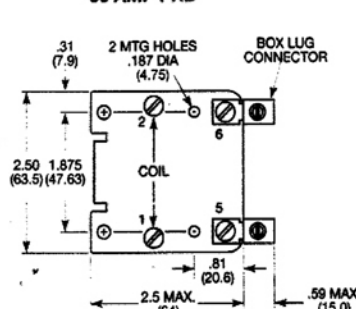
**PRD/PRDA SMALL BASE
TOP VIEW**

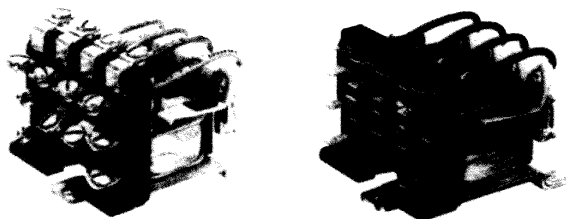


**PRD/PRDA LARGE BASE
TOP VIEW**



50 AMP PRD





FEATURES

- Contact ratings to 25 amps.
- 8-32 screw or .250 Q.C. termination.
- AC and DC coils available.
- 4PDT contact arrangement.
- Plastic and metal covers available.

CONTACT DATA @ 25 °C

Arrangements: 4 Form A (4PST-NO) and 4 Form C (4PDT).
Ratings: PM & PMT: 25 amps @ 277VAC, max.; 10 amps @ 28VDC;
 1 HP @ 120/240VAC, Single Phase.

Material: Silver-cadmium oxide.

Expected Life: 10 million operations, mechanical; 100,000 operations at rated loads @ 25°C.

INITIAL DIELECTRIC STRENGTH

Initial Breakdown Voltage: 2,000V rms minimum between all elements and ground.

COIL DATA @ 25 °C

Voltage: From 6 to 125 VDC and 12 to 480VAC, 50/60 Hz.

Nom. Power: DC: 4.4 Watts @ 25°C.

AC: 14VA @ 25°C.

Duty Cycle: Continuous.

Finish: Impregnated with high quality electrical varnish.

Initial Insulation Resistance: 100 megohms, minimum.

PM series

HEAVY DUTY 25 AMP MULTICONTACT AC OR DC POWER RELAY

④ File E22575 (PM & PMC)

⚡ File E22575 (PMF & PMT)

Ⓢ File 15734

DC Coils			AC Coils (50/60 Hz.)		
Nominal Voltage	DC Resis. In Ohms ±10% @ +25°C	Nominal Current in Milliamps	Nominal Voltage	DC Resis. In Ohms ±15% @ +25°C	Nominal Current in Milliamps
6	8.2	732			
12	33	364	12	1.4	1070
24	132	182	24	5.0	540
48	526	91	120	120	128
110	2760	40	240	587	61
125	3570	35			
220			Use a 110 volt relay with 2700 to 3300 ohm 5 watt wire wound resistor in series.		

OPERATE DATA @ 25 °C

Must-Operate Voltage: DC: 75% of nominal voltage @ +25°C.
 AC: 85% of nominal voltage @ +25°C.

ENVIRONMENTAL DATA

Temperature Range: AC: —55°C to +45°C @ nominal coil power.
 DC: —55°C to +55°C @ nominal coil power (+75°C available on special order).

MECHANICAL DATA

Mounting: Standard: Three holes; one front key-hole and two rear channel slots for #8-32 screws.

Special: Adaptor plate available for adapting these relays to a chassis pre-drilled for our PRD series relays.

Termination: PM : Heavy-duty screw type with #8-32 BH screw.

PMT : .250" (6.35 mm) quick connect terminals.

Insulating Material: Molded polyester alkyl.

Enclosure: PM & PMT: Plastic dust cover or metal enclosure available. Order separately.

Weight: 14 oz. (397 g) approximately.

ORDERING INFORMATION

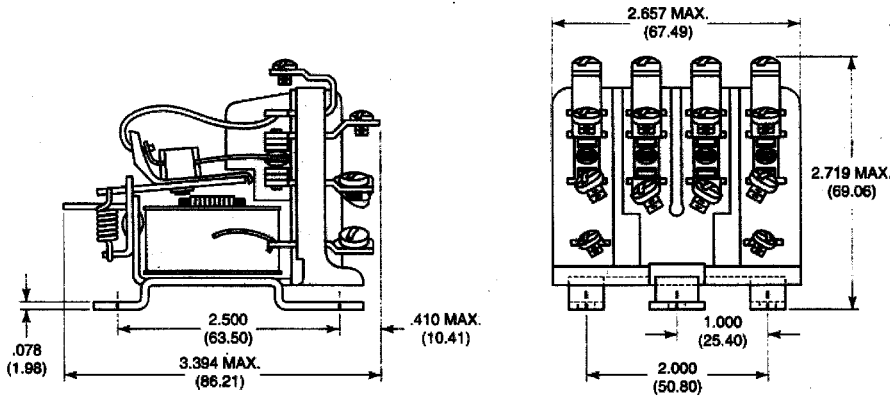
Typical Part No. >	PM	-17	A	Y	-120
1. BASIC SERIES: PM					
2. TYPE: Leave blank = Open relay with screw terminals. T = Open relay with .250" (6.35 mm) quick connect terminals.					
3. CONTACT ARRANGEMENT: 17 = 4 Form C (4PDT)					
4. COIL INPUT: A = AC D = DC					
5. CONTACT MATERIAL: Y = Silver-cadmium oxide.					
6. COIL VOLTAGE: To 240VAC or 125VDC (to 220V with resistor).					

STOCK ITEMS - The following items are normally maintained in stock for immediate delivery.

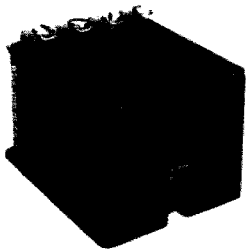
PM-17AY-24	PM-17DY-24
PM-17AY-120	PM-17DY-110
PM-17AY-240	PMT-17DY-24
PM-17DY-12	

OUTLINE DIMENSIONS

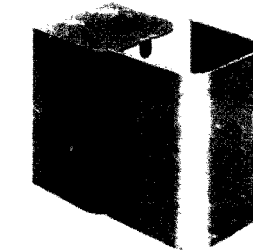
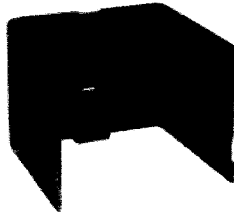
7 RELAYS



Tolerance: $\pm .010$ ($\pm .25$)



PM PLASTIC DUST COVER 35D203

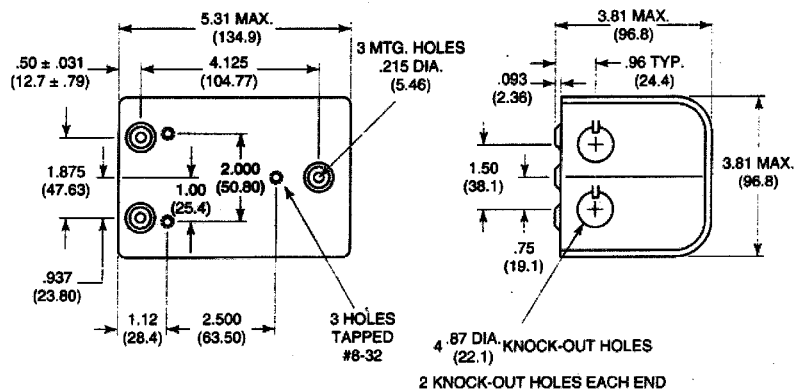


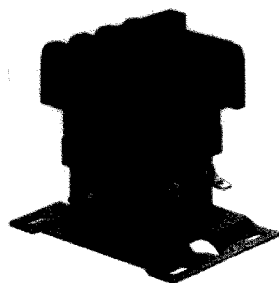
PM METAL COVER 35D227

Overall Dimensions in Inches (mm)

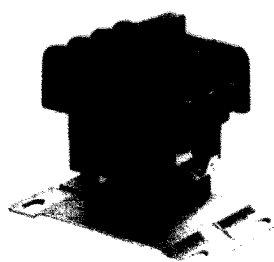
Part No.	Length	Width	Height
35D203	3.394* (86.21)	2.657* (67.49)	2.719* (69.06)
35D227	5.313 (134.95)	3.813 (96.85)	3.813 (96.85)

*When Mounted On Relay





P25 with DC coil



P25 with AC coil

FEATURES

- AC and DC coils.
- For controlling motors, power supplies, heating elements and lighting.
- Dust cover available.
- Auxiliary switch available.

CONTACT DATA @ 25 °C

Arrangements: Up to 3 Form X (3PST-NO-DM).

Ratings: See contact rating table.

Material: Silver-cadmium oxide.

Expected Life: 500,000 operations at full load.

AC coil: 2 million operations, mechanical.

DC coil: 5 million operations, mechanical.

Minimum Contact Load: 3A @ 120VAC.

MAIN CONTACT RATINGS @ +25°C, 60 HZ.

Type	Motor Rating in Amps, 3Ø3P or 1Ø2P				Resistive Rating (Electric Heat) @ 600V
	Full Load @ 600V	Locked Rotor			
		@ 240V	@ 480V	@ 600V	
P25	25A	150A	125A	100A	30A

Motor Rating in Horsepower			
Type	@ 120V	@ 240V	@ 440-600V
1Ø2P 3Ø3P	1.5HP 3HP	3HP 7.5HP	— 10HP

Notes: Models utilizing box lug terminals are restricted to the following ratings: 25 FLA, 150 LRA @ 250VAC; 30A @ 277VAC Resistive; Horsepower ratings shown in the table are valid up to 240VAC.

Tungsten Lamp Rating: 30A, 277VAC.

Electric Discharge Lamp Rating: 30A, 277VAC.

Heavy Duty Pilot Ratings @ 120V through 600V, 720VA max.

(Box lug nut units limited to 277VAC.)

AUXILIARY SNAP-ACTION SWITCH

Arrangements: Up to 2 Form C (DPDT).

Rating: 10 amps at 120VAC, 60 Hz. @ 25°C.

Material: Silver.

INITIAL DIELECTRIC STRENGTH

Initial Breakdown Voltage: 2,200V rms. minimum between all elements and between all elements and ground.

COIL DATA @ 25 °C

Voltage: From 6 to 240VDC and 24 to 600VAC, 50/60 Hz.

Power: DC, 4-8W; AC, 40VA inrush; 10VA, sealed.

Duty Cycle: Continuous.

Insulation Class: Class A, standard. Class B available.

Initial Insulation Resistance: 100 megohms, minimum.

P25 series

DEFINITE PURPOSE MAGNETIC CONTACTOR 25 AMPERE FULL LOAD 30 AMPERE RESISTIVE AC & DC COILS

File E22575

File LR15734

No. R 97069

COIL DATA

Nominal VDC	Resistance (Ohms ± 10% @ 25°C)	Must Operate* Volts	Maximum Operating Volts	Nominal Coil Current (ma) @ Nominal Voltage
12	34	9	15	353
24	133	18	30	180

AC Voltage Rating	Nominal		Must Operate	
	60 Hz.	50 Hz.	60 Hz.	50 Hz.
24	24	24	20.4	20.4
120	120	110	102	94
240	208/240	208/220	177	177

*Must operate is 75% of nominal voltage for any mounting position, applicable for vertical or horizontal mounting, but not for upside-down mounting.

**Units requiring less power can be provided for some applications.

Note: Coil suppression is recommended for all DC coil units, particularly 120 and 240VDC coils.

OPERATE DATA @ 25 °C

Must-Operate Voltage: See coil data tables.

ENVIRONMENTAL DATA

Temperature Range: AC: —55°C to +65°C

DC: —55°C to +55°C

Contact sales representative for higher temperature ratings.

MECHANICAL DATA

Mounting: No. 10 screws on 2.125" (53.98 mm) centers or universal mounting bracket.

Termination:

Contacts: 8-32 screw for No. 16 to No. 8 wire, dual .250" (6.35 mm) quick connect, box lug or captive pressure plate.

Coil: Combination 8-32 screw and .250" (6.35 mm) or .187" (4.75 mm) quick connect, combination captive pressure plate and .250" (6.35 mm) quick connect, or .250" (6.35 mm) quick connect.

Aux. Switch: .250" (6.35 mm) quick connect, .187" (4.75 mm) quick connect.

Weight: 14 oz. (397 g).

7 RELAYS

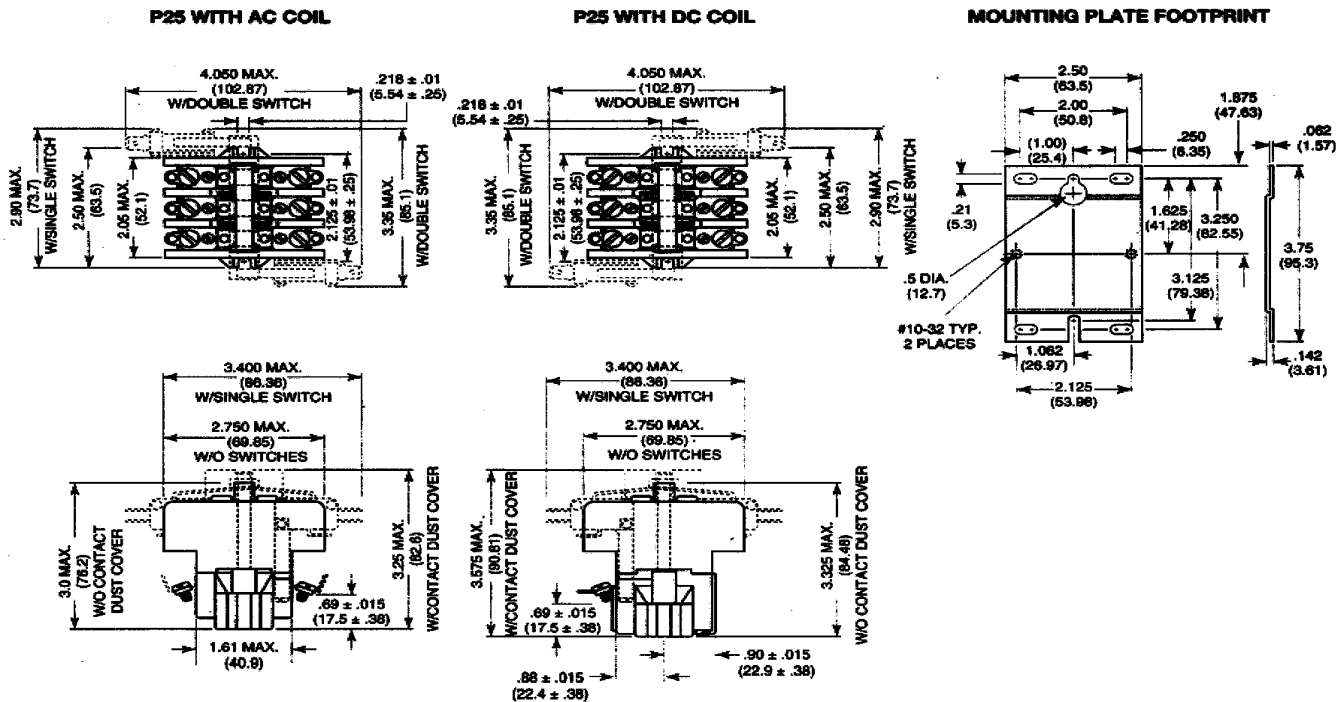
ORDERING INFORMATION

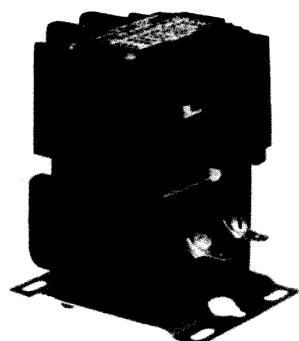
Typical Part No. >	P25	P	42	A	1	4	P	1	-240
1. TYPE: P25 Definite Purpose Contactor									
2. AUXILIARY SWITCH P = No Aux Switch C = 1 Form C (SPDT), silver contacts F = 2 Form C (DPDT), silver contacts Double pole contact forms require two switches.									
3. MAIN CONTACT ARRANGEMENT: 42 = 3 Form X (3PST-NO-DM) 43 = 2 Form X (DPST-NO-DM) & 1 Form Y (SPST-NC-DB)									
4. COIL CONTROL INPUT: A = Alternating Current, 50/60 Hz. D = Direct Current									
5. MOUNTING AND INSTALLED ACCESSORIES: 1 = Without Mounting Plate* 2 = With Mounting Plate 4 = With Mounting Plate and Dust Cover † *Order separately any mounting hardware which is to be bulk packed.									
6. MAIN CONTACT TERMINALS: 2 = 8-32 Screw Terminals 5 = 8-32 Screw with Captive Pressure Plate 3 = Dual .250" (6.35 mm) Quick Connect									
7. AUXILIARY CONTACT TERMINALS: P = No Auxiliary Switch D = .250" (6.35 mm) Quick Connect									
8. COIL TERMINALS: 1 = Combination 8-32 Screw Terminal and .250" (6.35 mm) Quick Connect 6-32 Screw Terminal available on DC Coils only.									
9. COIL VOLTAGE: 24, 120, 240, VAC 12, 24 VDC See Coil Data table.									

STOCK ITEMS: The following items are normally maintained in stock for immediate delivery.

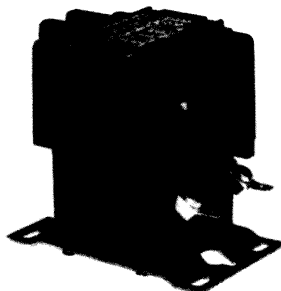
P25P42A12P1-120
P25P42A12P1-240
P25P42A22P1-120
P25P42A22P1-240
P25P42D22P1-12
P25P42D22P1-24

OUTLINE DIMENSIONS





DC Coil



AC Coil

P30/P40 series

DEFINITE PUPOSE MAGNETIC CONTACTOR

30/40 AMPERE FULL LOAD

40/50 AMPERE RESISTIVE

AC & DC COILS

File E22575

File LR15734

P30 No. R 97070

P40 No. R 97071

FEATURES

- AC and DC coils.
- Available with auxiliary switch.
- Variety of main contact terminals.
- For control of motors, power supplies, heating elements and lighting.

CONTACT DATA @ 25 °C

Arrangements: Up to 4 Form X (4PST-NO-DM)

Ratings: See contact rating table.

Material: Silver-cadmium oxide.

Expected Life: 200,000 operations at full load.

AC coil: 2 million operations, mechanical.

DC coil: 10 million operations, mechanical.

Minimum Contact Data: 3A @ 120VAC.

MAIN CONTACT RATINGS

Type	Motor Rating in Amps, 3Ø3P or 1Ø2P				Resistive Rating @ 600V	Tungsten Rating @ 277V
	Full Load @ 600V	Locked Rotor @ 240V	@ 480V	@ 600V		
P30	30A	180A	150A	120A	40A	40A
P40	40A	240A	200A	160A	50A	50A

P30 Electrical Discharge Lamp Control: 40A @ 240V (Delta), 40A @ 600V (Wye).

P40 Electrical Discharge Lamp Control: 50A @ 600V (Wye).

TYPE	Motor Rating in Horsepower			
		@ 120V	@ 240V	@ 440-600V
P30	1Ø2P	1.5HP	3HP	—
	3Ø3P	3HP	7.5HP	7.5HP
P40	1Ø2P	2HP	5HP	—
	3Ø3P	5HP	10HP	15HP

AUXILIARY SNAP-ACTION SWITCH

Arrangements: Up to 2 Form C (DPDT).

Rating: 10 amps at 120-250VAC @ 25°C.

Material: Silver.

INITIAL DIELECTRIC STRENGTH

Initial Breakdown Voltage: 2,200V rms minimum between all elements and between all elements to ground.

COIL DATA @ 25 °C

Voltage: From 6 to 240VDC, and 24 to 600VAC, 50/60 Hz.

Power: DC, 7.5 W; AC, 92VA, In rush; 12 VA Sealed.

Duty Cycle: Continuous.

Insulation Class: Class A, standard, Class B available.

Initial Insulation Resistance: 100 megohms, minimum.

COIL DATA

Nominal VDC	Resistance (Ohms ± 10% @ 25° C)	Must Operate* Volts	Maximum Operating Volts	Nominal Coil Current (ma) @ Nominal Voltage
6	5.2	4.5	7	1,154
12	20.8	9	15	577
24	84	18	30	286
48	334	36	57	144
60	529	45	72	113
120	2,110	90	144	57
240	9,000	180	288	26

AC Voltage Rating	Nominal 50/60 Hz.	Must Operate* 50/60 Hz.
24	24	20.4
120	110/120	94
240	208/240	177
277	277	236
480	440/480	374
600	550/600	468

*Applicable for vertical mounting, but not for upside-down mounting.

Note: Coil suppression is recommended for all DC coil units, particularly 120 and 240VDC coils.

OPERATE DATA

Must-Operate Voltage: See coil data tables.

ENVIRONMENTAL DATA

Temperature Range: -55°C to +65°C

MECHANICAL DATA

Mounting: Universal mounting bracket. See outline drawings.

Termination:

Contacts: Binder screw, box lug, captive pressure plate, combination screw and dual .250" (6.35 mm) quick connect. or combination box lug and dual .250" (6.35 mm) quick connect.

Coil: Combination 8-32 screw and .250" (6.35 mm) quick connect.

Aux. Switch: .250" (6.35 mm) quick connect, .187" (4.75 mm) quick connect.

Weight: 3 Pole Models: 25 oz. (709 g) approximately.

4 Pole Models: 28 oz. (794 g) approximately.

7 RELAYS

ORDERING INFORMATION

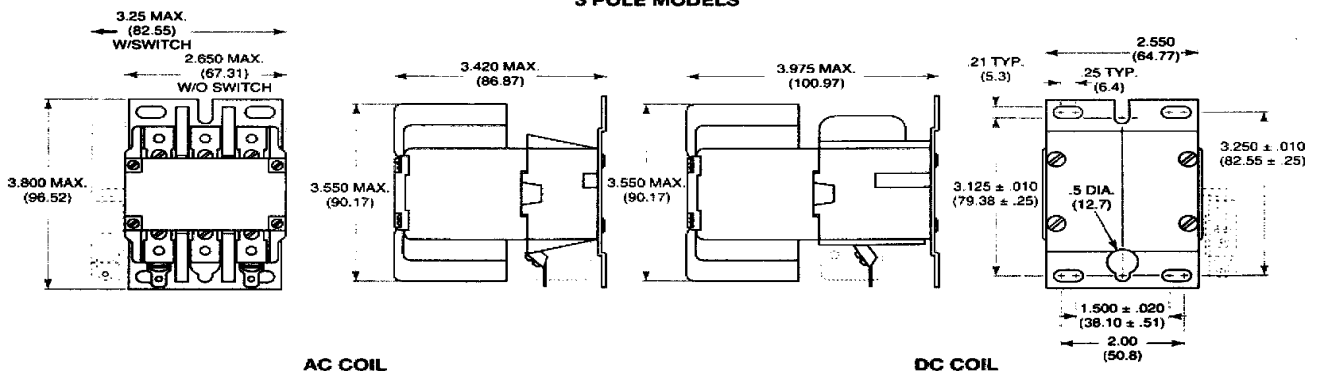
Typical Part No. >		P30	P	42	A	1	4	P	1	-240
1. TYPE: P30 = Definite Purpose Contactor, 30 amp. P40 = Definite Purpose Contactor, 40 amp.										
2. AUXILIARY SWITCH: P = No Aux. Switch C = 1 Form C (SPDT) F = 2 Form C (DPDT)										
3. MAIN CONTACT ARRANGEMENT: 42 = 3 Form X (3PST-NO-DM) 46 = 3 Form Y (3PST-NC-DB) 43 = 2 Form X (DPST-NO-DM) 47 = 4 Form X (4PST-NO-DM) & 1 Form Y (SPST-NC-DB) 48 = 2 Form X (DPST-NO-DM) 44 = 2 Form X (DPST-NO-DM) & 2 Form Y (DPST-NC-DB) 45 = 1 Form X (SPST-NO-DB) 49 = 4 Form Y (4PST-NC-DB) & 2 Form Y (DPST-NC-DB) Other contact arrangements are available.										
4. COIL CONTROL INPUT: A = Alternating Current, 50/60 Hz. D = Direct Current										
5. MOUNTING AND INSTALLED ACCESSORIES: 1 = Standard Mounting										
6. MAIN CONTACT TERMINALS: 2 = Screw Terminals 3 = Screw Terminals & Dual .250" (6.35 mm) Quick Connect **Order separately any hardware which is to be bulk packed.		4 = Box Lug 5 = Captive Pressure Plate 6 = Box Lug & Dual .250" (6.35 mm) Quick Connect								
7. AUXILIARY CONTACT TERMINALS: P = No Auxiliary Switch C = .187" (4.75 mm) Quick Connect D = .250" (6.35 mm) Quick Connect										
8. COIL TERMINALS: 1 = Combination 8-32" Screw Terminal and .250" (6.35 mm) Quick Connect										
9. COIL VOLTAGE: 24, 120, 240, VAC 12, 24, 120 VDC										

STOCK ITEMS - The following items are normally maintained in stock for immediate delivery.

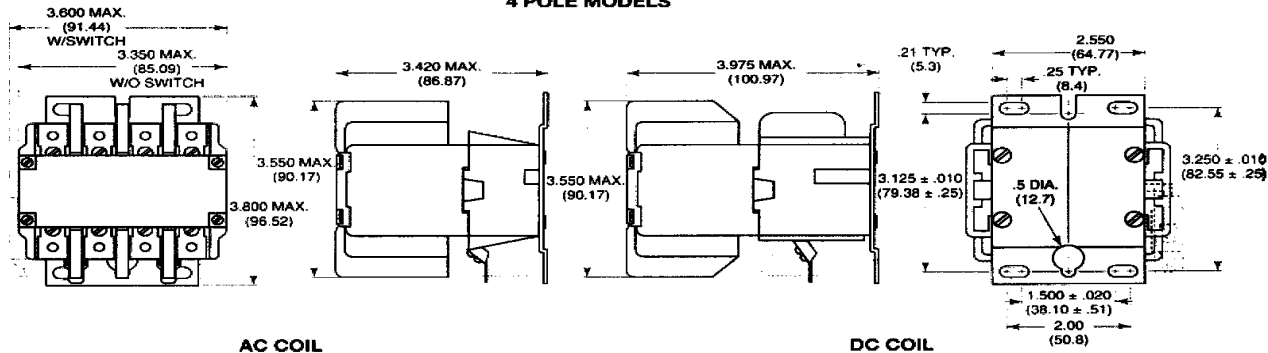
P30P42A12P1-120	P40C42A12D1-120
P30P42D12P1-24	P40P42A12P1-24
P30P47A12P1-120	P40P42A12P1-120
P30P47D12P1-24	P40P42A12P1-240
	P40P42D12P1-24

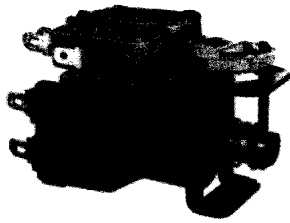
OUTLINE DIMENSIONS

3 POLE MODELS

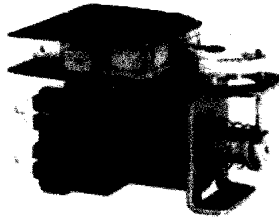


4 POLE MODELS





S89R



S90R

FEATURES

- Low cost, bistable impulse relay.
- Operates on 75ms min. pulse.
- Used in garage door controls, motor reversing and lighting controls.
- S89R available with plastic cover and octal plug-in base.

CONTACT DATA @ 25 C

Ratings:

S89R: 15 amps, 1/2 HP, 125/250VAC; 5 amps, 125VAC, tungsten filament lamp load; 1/2 amp, 125VDC; 1/4 amp, 250VDC.

Expected Life: 100,000 operations, mechanical; 50,000 operations at rated loads.

Ratings:

S90R:

Load	Minimum Life
20A, 120VAC or 7.5A, 277VAC, Tungsten.	10,000 Cycles
15A, 125VAC or 7A, 277VAC, Fluorescent.	10,000 Cycles
20A, 277VAC, 75-80% PF.	50,000 Cycles
1 HP, 125VAC, 50/60 Hz.	50,000 Cycles
2 HP, 250VAC, 50/60 Hz.	50,000 Cycles
12 FLA, 60 LRA, 120VAC.	50,000 Cycles
8 FLA, 48 LRA, 240VAC.	50,000 Cycles
Pilot Duty, 360VA, 125/250VAC.	50,000 Cycles

S89R/S90R series

**BISTABLE, IMPULSE RELAY
15 AND 20 AMP INDUSTRIAL RATING
CONTINUOUS COIL RATING**

File E22575

File LR15734

COIL DATA @ 25 C

Nominal Power:

DC Coils: 6.33 Watts @ +25°C.

AC Coils: 9VA @ +25°C.

Insulation: Class B (130°C).

Initial Breakdown Voltage: 1,500V rms, 60 Hz.

Must-Operate Voltage:

DC Coils: 75% of nominal voltage @ +25°C.

AC Coils: 85% of nominal voltage @ +25°C.

COIL DATA

Nominal Voltage	Resistance DC Ohms ±15% @ +25°C	Nominal Current mA
24VAC	8.7	375
120VAC	260	75
240VAC	1084	38
6VDC	5.8	1035
12VDC	22.5	533
24VDC	92	260

ENVIRONMENTAL DATA

Temperature Range: -10°C to +60°C.

MECHANICAL DATA

Weight: 7.75 oz. (241 g) approximately.

ORDERING INFORMATION

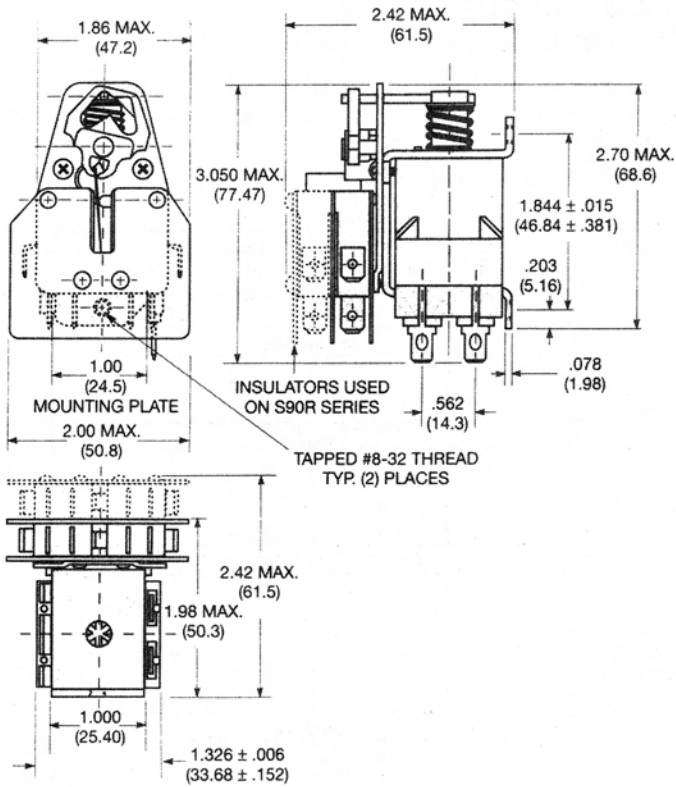
Typical Part No. >		S89R	5	A	B	D	1	-24
1. BASIC SERIES: S89R = 15A S90R = 20A								
2. CONTACT ARRANGEMENT: 5 = SPDT 11 = DPDT 17 = 4PDT								
3. COIL INPUT: A = AC D = DC								
4. COIL TERMINAL STYLE: A = .187" (4.75 mm) Quick connect/solder. B = .250" (6.35 mm) Quick connect/solder. P = Dust cover with octal plug-in base. (S89R only.)								
5. SWITCH TERMINAL STYLE: C = .187" (4.75 mm) Quick connect.* D = .250" (6.35 mm) Quick connect. P = Dust cover with octal plug-in base.* * S89R only.								
6. SWITCH TERMINAL CONFIGURATION: 1 = Style 1 (See outline drawings.)								
7. COIL VOLTAGE: 2, 4, 120, 240 VAC 6, 12, 24 VDC								

STOCK ITEMS - The following items are normally maintained in stock for immediate delivery.

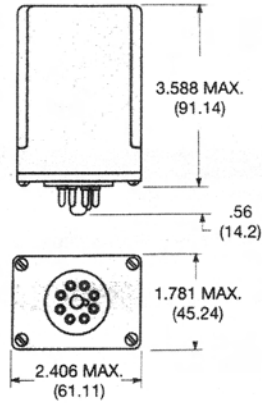
S89R5ABD1-24	S89R11AAC1-24	S89R11ABD1-120	S89R11DAC1-12	S90R5ABD1-120
S89R5ABD1-120	S89R11AAC1-120	S89R11APP1-120	S89R11DAC1-24	S90R11ABD1-24
S89R5DBD1-12	S89R11ABD1-24	S89R11DAC1-6	S89R11DBD1-12	S90R11ABD1-120

OUTLINE DIMENSIONS

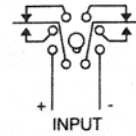
OPEN RELAYS



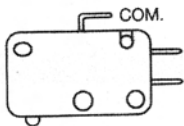
ENCLOSED RELAYS
S89 SERIES



WIRING DIAGRAM



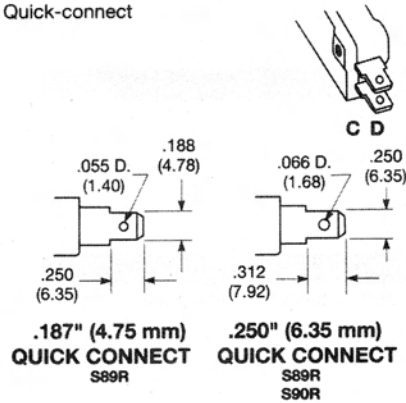
SWITCH TERMINAL CONFIGURATION

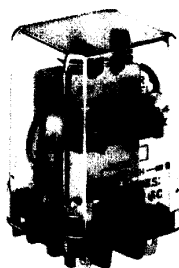


STYLE 1

SWITCH TERMINAL STYLE

C = .187" (4.75 mm) Quick-connect
D = .250" (6.35 mm) Quick-connect





KUL series

10 AMP MAGNETIC LATCHING RELAY

File E22575

File 15734

FEATURES

- Single or dual-wound DC coils or single-wound AC coils.
- Contact arrangements to 3PDT.
- Reset occurs by reversing polarity in a single coil relay or by energizing the reset winding in dual coil relays.
- Uses same sockets as other KU relays.
- Well suited for applications such as alarm systems, machine tools, battery chargers and process controls.

CONTACT DATA @ 25° C

Arrangements:

DC Single Coil: 1 Form C (SPDT), 2 Form C (DPDT) and 3 Form C (3PDT).

DC Dual Coil: 1 Form C (SPDT) and 2 Form C (DPDT).

AC Single Coil: 1 Form C (SPDT), 2 Form C (DPDT) and 3 Form C (3PDT).

Materials: Fine silver and silver-cadmium oxide.

Expected Life:

Mechanical: 10 million operations.

Electrical: 100,000 operations minimum at rated load.

CONTACT RATINGS

Contact Code	Arrangement	Ratings
5,6,7	1,2,3 poles	10A @ 28VDC or 240VAC, 80% PF; 1/4 HP @ 120VAC, 1/3 HP @ 240VAC

INITIAL DIELECTRIC STRENGTH

Between Open Contacts: 500V rms.

Between Adjacent Contacts: 1,500V rms.

Between Contacts and Coil: 1,500V rms.

COIL DATA @ 25° C

Duty Cycle: Continuous. (Latch and reset not to be energized simultaneously).

Initial Insulation Resistance: 100 megohms, minimum.

Initial Breakdown Voltage: 1500V rms, 60 Hz. between all elements.

Note: On single coil AC models one terminal is common. Latch/Reset function is accomplished by input in series with a diode to provide the correct polarity to the coil. To perform either function, the terminal not being used (Latch or Reset) must be open or isolated with no other path to common or ground.

COIL DATA

	Nominal Voltage	DC Resistance in Ohms $\pm 10\% \uparrow$	Must Operate Voltage	0.5 W Resistor
DC Coils	Single Coil			
	12	120	9.0	—
	24	472	18.0	—
	48	1,800	36.0	—
	Dual Coil*			
	12	90	9.0	—
AC Coils 50/60 Hz.	24	350	18.0	—
	48	1400	36.0	—
	Single Coil with Diodes**			
	12	37	10.2	150Ω
	24	176	20.4	680Ω
	120	3,700	102.0	15,000Ω
	240	17,900	204.0	68,000Ω
	Dual Coil			
	24	Latch	20.4	—
		Reset		
	120	100 2525	7800	102.0

* Dual coil available only with 1 or 2 Form C contacts. On standard dual coil relays, the latch and unlatch voltage must be the same. For unlike voltages, please contact your sales representative.

** Diodes and resistors included inside relay with 1 and 2 Form C contacts. For 3 Form C relays, the customer must furnish and wire diodes and resistors externally.

† $\pm 15\%$ for AC coils.

OPERATE DATA @ 25° C

Must Operate Voltage:

DC Coils: 75% of nominal voltage.

AC Coils: 85% of nominal voltage.

Operate Time: 25 milliseconds maximum at nominal voltage.

Release or Reset Time: 25 milliseconds maximum at nominal voltage.

ENVIRONMENTAL DATA

Temperature Range:

Storage: -45°C to +105°C.

Operating:

Single Coil AC & DC: -45°C to +70°C.

Dual Coil DC: -45°C to +50°C.

MECHANICAL DATA

Termination: .187" (4.75 mm), quick connect/solder

Sockets are available for use with .187" (4.75 mm) terminals.

Enclosure: Clear plastic polycarbonate heat and shock resistant case.

Weight: 3.4 oz. (96 g) approximately.

7 RELAYS

ORDERING INFORMATION

Typical Part No. >		KUL	-11	D	1	1	D	-12
1. BASIC SERIES: KUL magnetic latching relay								
2. CONTACT ARRANGEMENT: 5 = 1 Form C (SPDT) 11 = 2 Form C (DPDT) 14 = 3 Form C (3PDT)								
3. COIL INPUT: A = AC D = DC								
4. MOUNTING: 1 = Plain case 5 = Bracket mount case								
5. TERMINALS & CONTACT MATERIALS: 5 = .187" (4.75 mm) quick connect/solder; silver-cadmium oxide, 10 amps.								
6. NUMBER OF COILS S = Single coil D = Dual coil (1 & 2 pole models only)								
7. COIL VOLTAGES: Single coil— 24-240 VAC 12-48 VDC Dual coil— 12-48VDC, 24 or 120VAC (to 2 Form C)								

STOCK ITEMS - The following items are normally maintained in stock for immediate delivery.

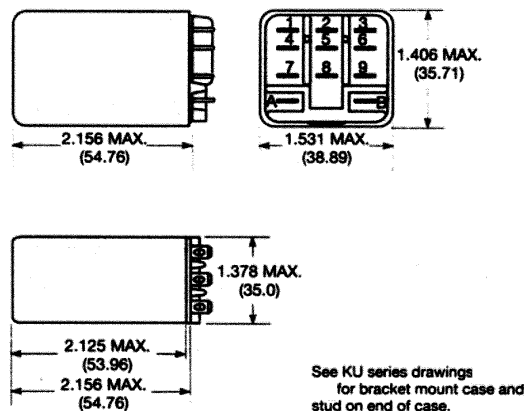
KUL-5A15S-120
KUL-11A15S-24

KUL-11A15S-120
KUL-11D15D-12

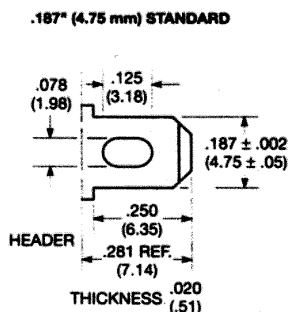
KUL-11D15D-24
KUL-11D15S-12

KUL-11D15S-24

OUTLINE DIMENSIONS



TERMINAL DIMENSIONS

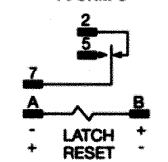


WIRING DIAGRAMS (Bottom Views)

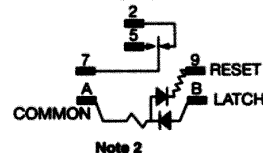
SINGLE COIL TYPE S

DUAL COIL TYPE D

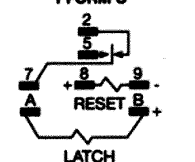
DC SINGLE COIL 1 FORM C



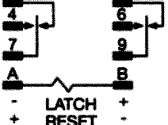
AC COIL 1 FORM C



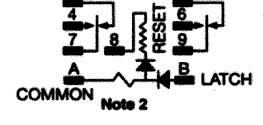
AC or DC DUAL COIL 1 FORM C



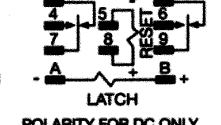
2 FORM C



2 FORM C

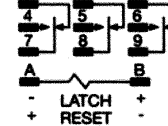


2 FORM C

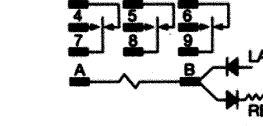


POLARITY FOR DC ONLY.

3 FORM C



3 FORM C



Note 1 Contact positions shown in diagrams is with the "RESET" input having been energized last.

Note 2 Do not connect any low impedance loads from terminal B to A.

Note 3 Resistor and diodes connected by customer. See Coil Data Chart on KUL Series engineering data page for resistor value. Recommended using 1N4007 diode.



KBP series

10 AMP DUAL COIL LATCHING RELAY

File E29244

FEATURES

- Dual coil latching relay accepts a momentary impulse to one coil to latch and a second impulse to the other coil to release.
- Enclosed in a clear polycarbonate dust cover.
- AC or DC coils.
- Contacts up to 5PDT.
- Mounts in 8, 11, or 20-pin octal-type plugs.

CONTACT DATA @ + 25 C

Arrangements: From 2- Form C (DPDT) to 5 Form C (5PDT), (3PDT each coil).

Ratings: 10 amps @ 120VAC.

Materials: 10 amp models: Silver-cadmium oxide.

Expected Life: 500,000 operations, mechanical; 50,000 operations minimum at rated loads.

INITIAL DIELECTRIC STRENGTH

Between Open Contacts: 500V rms.

Between Adjacent Contacts: 1,000V rms.

Between Contacts and Coil: 1,000V rms.

COIL DATA @ + 25 C

Nominal Power:

DC Coils: 2.7W.

AC Coils: 5.3VA to 4 pole; 7.8VA to 5 pole.

Maximum Power: DC coils - 4.0W.

Duty Cycle: Intermittent.

Initial Insulation Resistance: 100 megohms.

COIL DATA

	Nominal Voltage	Resistance in Ohms ±10% @ 25°C	Nominal Current Milliamperes
DC Coils (TO 5 POLE)	12	52.0	230
	24	230	104
	48	850	56.5
	110	4560	24
	220	Use 110 volt relay with 5000 Ohms, 5 watt resistor in series.	
	Nominal Voltage	Resistance in Ohms ±15% @ 25°C	Nominal Current Milliamperes
AC Coils	Up to 4 Pole Relays		
	24	42	210
	120	1030	44
	240	4100	22
	For 5 Pole Relays		
	24	27	325
	120	700	68

OPERATE DATA @ + 25 C

Must-Operate Voltage:

DC: 75% of nominal voltage.

AC: 85% of nominal voltage.

Operate Time: 25 milliseconds excluding bounce.

ENVIRONMENTAL DATA

Temperature Range:

Storage: 105°C.

Operating: -45°C to +85°C.

MECHANICAL DATA

Termination: See terminals table on next page.

Enclosures: Plastic dust cover standard. Hermetically sealed metal case available on special order.

Weight: 10.8 oz. (306 g) approximately.

7 RELAYS

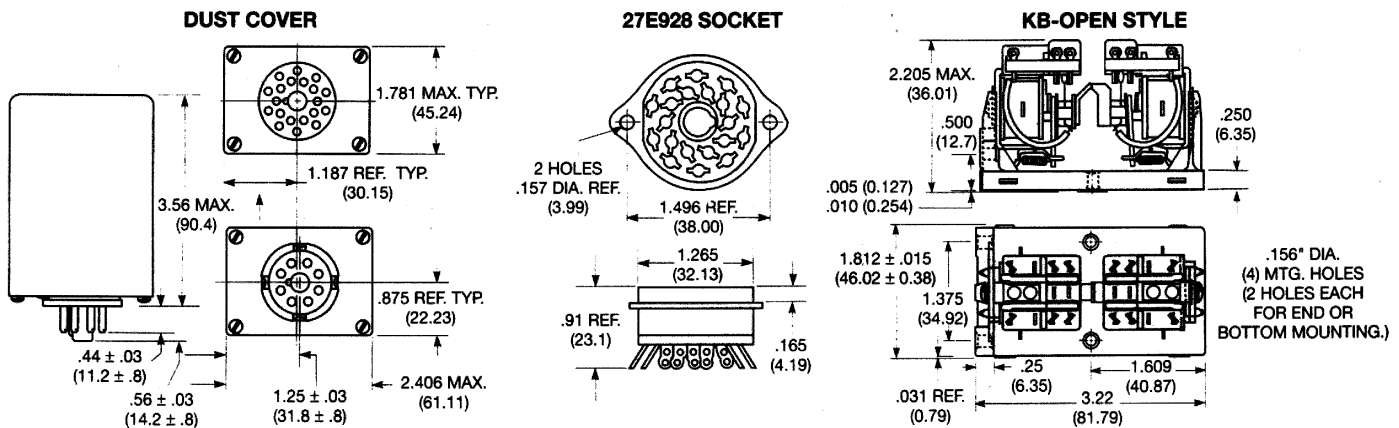
ORDERING INFORMATION

Typical Part Number >		KBP	-11	A	G	-24
1. TYPE: KBP = Enclosed, dual coil latching relay. KB = Open, dual coil latching relay.						
2. CONTACT ARRANGEMENT: 5 = 1 Form C (SPDT) 11 = 2 Form C (DPDT) 14 = 3 Form C (3PDT) 16 = 4 Form B (4PST-NC) 17 = 4 Form C (4PDT) 20 = 5 Form C (5PDT)						
3. COIL INPUT: A = AC D = DC						
4. CONTACT RATING: G = 10 amps @ 120VAC, 80% PF.						
5. COIL VOLTAGE: 12, 24, 48, 110VDC Specify the same latch and release coil voltage for standard KBP relays. Unlike coils available on special order. 12, 24, 120, 240VAC						

STOCK ITEMS - The following items are normally maintained in stock for immediate delivery.

KB-17AG-120	KB-17DG-12	KBP-11AG-120	KBP-11DG-110
	KBP-11A-120	KBP-11DG-24	KBP-20AG-120

OUTLINE DIMENSIONS



WIRING DIAGRAMS (Bottom View)

Note: shown with reset coil energized last.

