



INDUSTRIAL RELAYS

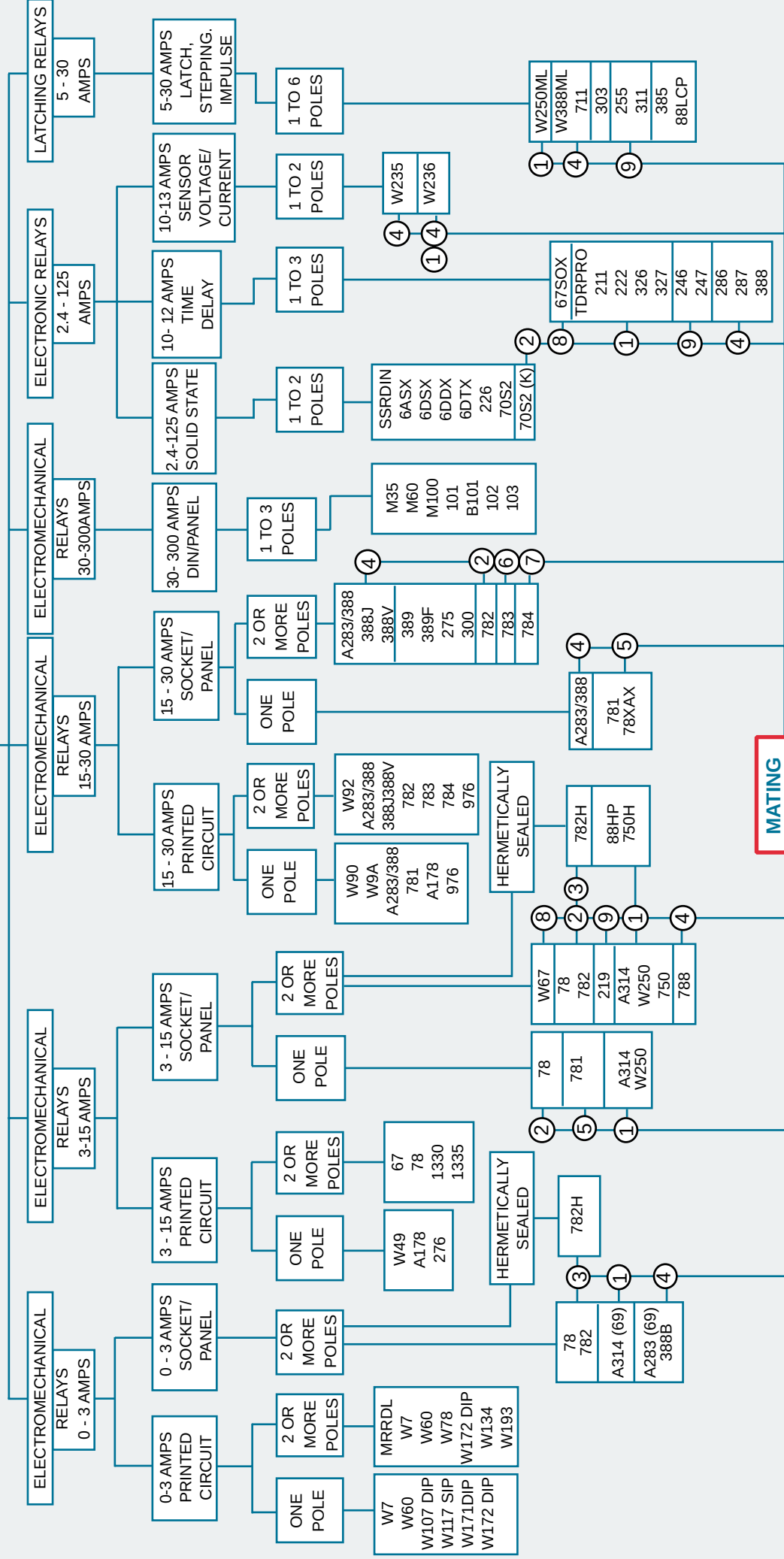
EDITION
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INDUSTRIAL RELAYS

RELAY DECISION TREE

CONTACT RATING



NUMERICAL PRODUCT INDEX

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• SSR 2 DIN-DC	Relay, Solid state, DC input, 280 AC output, SPST-NO, DIN/panel mt. SCR output - 10 - 25 Amps	2	8
• SSR 6 DIN-AC	Relay, Solid state, AC input, 660 AC output, SPST-NO, DIN/panel mt. SCR output - 10 - 25 Amps	2	8
• SSR 6 DIN-DC	Relay, Solid state, DC input, 660 AC output, SPST-NO, DIN/panel mt. SCR output - 10 - 25 Amps	2	8
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Socket Compatible and General Purpose Relays: 1 to 30 Amperes

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	Class -W92 Flange Clover 1 51- 52 522 30 Amp, epoxy sealed DPDT, .250" quick connect terminals
	Class -W67 Square Base 1 53 - 54 523 3, 5 Amp, plain cover DPDT, thru 8PDT solder plug-in or printed circuit terminals
	Class -219 Square Base 1 55- 56 524 10 Amp, plain cover 12 or 14 pin plug-in terminals with locking clip
	Class -750H Octal Base 1 57- 58 525 10, 12 Amp hermetically sealed metal can, class 1 division 2 DPDT, 3PDT solder plug-in terminals
	Class -88HP Octal Base 1 59 - 60 526 10, 12 Amp hermetically sealed metal can DPDT, 3PDT solder plug-in terminals
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SECTION 2

SELECTOR GUIDE Application Data

Solid State Relays: 10 to 125 Amperes

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	Class -6 ASX or DSX 2 9 - 11 532 10 -125 Amps, panel mount SPST-NO, AC & DC input. AC SCR output, 280, 560 & 660 V
	Class -6 DDX 2 9, 12 533 12, 25, 40 Amps, panel mount SPST-NO, DC input. DC mosfet output, 200V
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	Class -70S2 (N or S) 2 15, 17- 18 536 5, 6, 12, 25 Amp, compact flange mount SPST-NO, DC input, AC & DC output, 140. 280 AC, 60 DC
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Solid State Relays: 10 to 125 Amperes

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	Class MDR (Mercury displacement) & Application Data Up to 100 amps, hermetically sealed stainless steel tubes 1 to 3 PST-NO or NC, Box terminals	31	13 - 18	545
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	Class B101 100 Amp, DIN or panel mount contactor SPST-NO-DM or SPST-NC-DB, box terminals	3	21 - 22	547
	Class -101, 102, 103 100, 200, 300 Amp, panel mount contactor SPST-NO-DM or DB, DPST-DM or DB-DM, screw terminals	3	23 - 24	548
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Application Data

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	Class - TDRPRO Programmable 12 Amp, 8 or 11 pin octal plug-in, universal input voltages SPDT, DPDT, thumb wheel adjust, on, off, repeat, interval, one shot delay functions	4	9 - 10	553
	Class - W67 5 Amp miniature plug-in DPDT, .screw pot adjust, on delay	4	11	554
	Class - 222 Repeat cycle 10 Amp, 8 or 11 pin octal plug-in DPDT, knob adjust, on & off time independently adjustable	4	12	555
	Class - 388 10 Amp, 11 pin square base plug-in DPDT, external resistor or knob adjust, on or off & true off delay functions	4	13-17	556
	235 Current sensor 10 Amp, 11 pin square base plug-in SPDT, 1.5 to 15 amp sensing range, knob adjust	4	18	557
	Class - 286 & 287 10 Amp, 11 pin square base plug-in SPDT, DPDT, 3PDT, external resistor or knob adjust, on or off delay functions	4	19-20	558

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Time Delay Relays: 5 to 13 Amperes

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	Class -246 & 247 10 Amp, 12 or 14 pin plug-in with integral locking clip 2 to 4 pole contact configurations, Knob adjust, on or off delay functions,	4	23-24	560
	Class -236 Voltage sensor 10, 13 Amp, 11 pin square base or 8 pin octal plug-in SPDT, DPDT, knob or screw adjust, 20 to 552 volt adjustment ranges	4	25-26	561
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SELECTOR GUIDE Application Data

Latching, Sequence and Stepper Relays: 5 to 30 Amperes

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	Class W388ML/285 10 Amp, 11 pin square base plug-in DPDT, magnetic single or dual latching coils,	5	7 - 8	566
	Class -303 30 Amp, 11 pin square base, .250" quick connect terminals DPDT, SPDT-DM-DB, magnetic single latching coil.	5	9 - 11	567
	Class -B255 10 Amp, 12 pin plug-in with integral locking clip SPDT-3PDT or 4PST-NO or NC, magnetic single latching coil.	5	12, 14	568
	Class -385 15 Amp, DIN or panel mount Up to 6PDT, dual coil mechanical latch, .187 quick connect or solder terminals	5	15 - 17	569
	Class -88LCP 10 Amp, 20 pin octal plug-in 5PDT, dual coil mechanical latch	5	18	570
	Class -311 5 Amp, 12 pin plug-in with integral locking clip DPDT, single coil, sequence (stepping)	5	19 - 20	571
	CLASS -711 12 Amp, 11 pin square base plug-in DPDT, impulse sequencing, electronically steered	5	21 - 22	572
Cross Reference guide		5	23	573

SECTION 6

SELECTOR GUIDE Application Data

Reed Relays Printed Circuit & Coaxial Relays RF Switching

	Class -117SIP 0.5 Amp, single in-line pins Epoxy molded	6	7	576
	Class -107,171,172 DIP 0.5 to 2 Amps, dual in-line pins SPST-NO, SPST-NC, SPDT, DPDT, DPST-NO, epoxy molded	6	8 - 10 12 - 14	577
	Class -MRRDL Latching 0.5 to 2 Amp, dual in-line pins SPST-NO, SPST-NC, SPDT, DPDT, DPST-NO, epoxy molded	6	11	578
	Class -193 0.5 Amp, 0.1 pin grid spacing 3PST-NO, 4PST-No, 3PDT, 4PDT, epoxy encapsulated	6	15 - 16	579

SECTION 6 continued

Reed Relays Printed Circuit & Coaxial Relays RF Switching

	Class - 134 2 Amp, miniature mercury, 0.1 pin grid spacing SPDT, DPDT, epoxy encapsulated, position sensitive	6	17	580
	Class - 102VX & 102HVX 5 or 10, milliamps, epoxy sealed, high voltage switching SPDT-NO, flange mount, solder terminals	6	18	581
	Class - W120 Coaxial 150 Watts, 470 MHz, 50 ohm R.F switching. SPDT, RG58C/U Cable	6	19	582
	Cross Reference guide	6	20 - 21	583

SECTION 7

SELECTOR GUIDE

Printed Circuit Board Relays: 2 to 30 Amperes

	CLASS -1330/1335 5 Amp Miniature transparent dust covered DPDT	7	4	585
	Class -W90 30 Amp, epoxy sealed SPDT, SPST-NO, 0.1 Pin grid spacing	7	5 - 6	586
	Class -W9A 30 Amp, epoxy sealed SPDT, .250" quick connect & .187 coil quick connect terminals	7	7 - 8	587
	Class -W92 30 Amp, epoxy sealed DPDT, .250" quick connect terminals	7	9 - 10	588
	Class -W7 2 Amp, micro miniature, epoxy sealed SPDT, DPDT, 0.1 Pin grid spacing	7	11 - 12	589
	Class -W60 2 Amp, miniature, epoxy sealed SPDT, DPDT, 0.1 pin grid spacing	7	13 - 14	590
	Class -A178 10, 15 Amp, miniature, epoxy sealed SPDT, SPST-NO,	7	15 - 16	591
	Class -W49 3, 5, 10, Amp, dust cover SPDT, DPDT, panel or printed circuit mounting	7	17 - 18	592
	Class - 976 16, 20 Amp, slim line, epoxy sealed SPDT, SPST-NO,	7	19 - 20	593
	Class -276 7, 10 Amp Low profile, epoxy sealed SPDT, DPDT, 0.1 pin grid spacing	7	21	594
	Cross Reference guide	7	22 - 24	595

SECTION 8

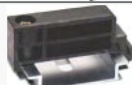
SELECTOR GUIDE

Sockets & Accessories: 5 to 16 Amperes

	Class -70-464-1 10 Amp, 600 V, 15 Amp, 300 V, 8 pin octal base DIN or panel mount, screw terminals	8	7	597
	Class -70-456-1 5 Amp, 600 V, 15 Amp, 300 V, 11 pin octal base DIN or panel mount, screw terminals	8	8	598
	Class -70-750D8-1 10 Amp, 600 V, 16 Amp, 300 V, logic style, 8 pin octal base DIN or panel mount, finger safe screw terminals	8	9	599
PHOTO NOT AVAILABLE	Class -70-750D11-1 5 Amp, 600 V, 16 Amp, 300 V, logic style, 11 pin octal base DIN or panel mount, finger safe screw terminals	8	10	600

SECTION 8 continued

Sockets & Accessories: 5 to 16 Amperes

	Class -70-169-1 15 Amp, 300 V, low profile, 8 pin octal base panel mount, screw terminals	6	11	601
	Class -70-170-1 15 Amp, 300 V, low profile, 11 pin octal base panel mount, screw terminals	6	12	602
	Class -70-459-1 10 Amp, 300 V, miniature, 8 pin base SPDT, DPDT, DIN or panel mount, screw terminals	8	13	603
	Class -70-461-1 10 Amp, 300V, miniature, 14 pin base 4PDT, miniature, 14 pin base	8	14	604
	Class -70-378-1, 70-379-1, 70-401-1, 70-402-1 5, 10 Amp, 300 V, miniature 8 & 14 pin base SPDT, DPDT, 4PDT, chassis mount solder & printed circuit terminals.	8	15	605
	Class -70-463-1 15 Amp, 300 V, Square 11 pin base SPDT, DPDT, 3PDT, DIN or panel mount, screw terminals	8	16	606
	Class -70-124-1 & -1, 70-178-1 & -2 15 Amp, 300 V, Square 11 pin base SPDT, DPDT, 3PDT, chassis mount QC, solder & printed circuit terminals.	8	17	607
	Class -70-781D-1 15 Amp, 300 V, Slim 5 pin base SPDT, DIN or panel mount, finger safe screw terminals	8	18	608
	Class -70-781F-1, 70-781T-1 15 Amp, 300 V, Slim 5 pin base SPDT, chassis mount solder & printed circuit terminals.	8	19	609
	Class -70-782D-1 16 Amp, 300 V, square 8 pin base SPDT, DPDT, DIN or dual panel mount, finger safe screw terminals	8	20	610
	Class -70-783D-1 16 Amp, 300 V, Square 11 pin base 3PDT, DIN or dual panel mount, finger safe screw terminals	8	21	611
PHOTO NOT AVAILABLE	Class -70-784D-1 16 Amp, 300 V, Square 14 pin base 4PDT, DIN or dual panel mount, finger safe screw terminals	8	22	612
	Class -70-78C-1 10 Amp, 300 V, Square 11 pin base 3PDT, DIN or panel mount, screw terminals	8	23	613
	Class -70-78D-1 10 Amp, 300 V, Square 14 pin base 4PDT, DIN or panel mount, screw terminals	8	24	614
	Class -70-303-1 thru 70-310-1 10 Amp, 300 V, Square 8 to 20 pin base DPDT to 8PDT, chassis mount solder & printed circuit terminals.	8	25, 26	615
	Class - 27390, 33377 10 Amp, 600 V, Square 12 & 14 pin base Panel mount screw terminals.	8	27	616
	70-SM Socket plug-in modules Circuits - Metal oxide varistor, Diode, L.E.D status lamp	8	28	617
	16-700DIN, 16-DCLIP-1 DIN rail, extruded aluminum, DIN rail end clip	8	29	618
Cross Reference guide		8	30	619
Socket Comparison Chart			31	620
Utilization Categories			32	621
Phone Directory, Warranty and Mission Statements			33	622
Family to Family			Inside back cover	

CE
Customer service
Cross reference

Mature product: Mature product series are no longer described in the body of this edition, as they no longer represent the most effective solution for many new design requirements. However many models within each of these series are currently available, for retrofit applications. Data sheet are still available from the Fax on Demand system. Call 1-800-891-2957 and Document 100 for listings from previous editions.



Magnecraft & Struthers-Dunn
Your Contact for Relays

SECTION 1

SOCKET COMPATIBLE AND
FLANGE MOUNTED RELAYS
1 TO 30 AMPERES



SOCKET COMPATIBLE & FLANGE MOUNT RELAYS

RELAY SERIES

FEATURES

CONTACT DATA

CONTACT CONFIGURATION:

CONTACT MATERIAL:

MAX. CONTACT RATING:

COIL DATA

STANDARD VOLTAGE

AC:

DC:

NOMINAL COIL POWER
VA: (VAC)
WATTS: (VDC)
INSULATION SYSTEM PER
UL STANDARD 1446

GENERAL DATA

AMBIENT TEMPERATURE
OPERATING:

STORAGE:

DIELECTRIC STRENGTH:
(COIL TO FRAME)

LIFE EXPECTANCY

ELECTRICAL:

MECHANICAL:

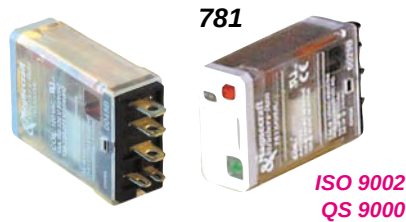
MATING SOCKETS

SEE SECTION 8

AGENCY APPROVALS

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L W H
1.521 x 0.551 x 1.082

- 0.187 QUICK CONNECT/ SOLDER PLUG-IN OR PRINTED CIRCUIT TERMINALS
- FLAG INDICATOR
- L.E.D. STATUS LAMP
- PUSH BUTTON
- FINGER GRIP COVER
- I.D. TAG/WRITE LABEL
- OPTIONAL FLANGE AND DIN ADAPTERS

SPDT

SILVER CADMIUM OXIDE,
GOLD FLASHED

15 AMP, 110/120 VAC 50/60Hz
15 AMP, 28 VDC
12 AMP, 220/277 VAC 50/60Hz

6,12, 24,120, 220/230, 240 VAC
6,12, 24, 48,110 VDC

0.9 VA
0.7 WATTS
CLASS "B" (130°C)

-40°C TO +70°C

-40°C TO +100°C

1500 V rms

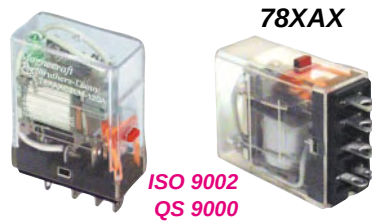
150,000 OPERATIONS
10,000,000 OPERATIONS

70-781D-1, 70-781F-1, 70-781T-1

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L W H
1.521 x 0.551 x 1.082

- 0.100 & 0.187 QUICK CONNECT/ SOLDER PLUG-IN OR PRINTED CIRCUIT TERMINALS
- OPTIONAL L.E.D. STATUS LAMP
- OPTIONAL PUSH BUTTON
- FINGER GRIP COVER
- OPTIONAL FLANGE AND DIN ADAPTERS

SPDT

SILVER CADMIUM OXIDE,
GOLD FLASHED

15 AMP, 110/120 VAC 50/60Hz
15 AMP, 28 VDC
12 AMP, 220/277 VAC 50/60Hz

6,12, 24,120, 220/230, 240 VAC
6,12, 24, 48,110 VDC

0.9 VA
0.7 WATTS
CLASS "B" (130°C)

-40°C TO +70°C

-40°C TO +100°C

1500 V rms

150,000 OPERATIONS
10,000,000 OPERATIONS

70-781D-1, 70-781F-1, 70-781T-1

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L W H
1.281 x 0.910 x 1.156

- 0.100 SOLDER PLUG-IN TERMINALS
- HERMETICALLY SEALED VACUUM BAKED AND DRY NITROGEN FILLED
- GRAY LACQUER FINISH OVER STEEL ENCLOSURE
- MEETS UL STANDARD FOR CLASS 1 DIVISION 2 HAZARDOUS LOCATIONS

4PDT

SILVER, GOLD OVERLAY (1 AMP)
SILVER, GOLD FLASHED (3 AMP)
SILVER CADMIUM OXIDE (5 AMP)

1 AMP, BIFURCATED
120/240 VAC/28 VDC
3 AMP, 120/240 VAC/28 VDC
5 AMP, 120/240 VAC/28 VDC

6,12, 24,120, 240 VAC
6,12, 24, 48,110 VDC

1.2 VA
0.9 WATTS
CLASS "B" (130°C)

-45°C TO +70°C

-60°C TO +130°C

1240 V rms

100,000 OPERATIONS
10,000,000 OPERATIONS

70-461-1, 70-378-1, 70-379-1

PAGE 14, 15



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782XBX/XDX

ISO 9002
QS 9000



782XBX

ISO 9002
QS 9000



783XCX

ISO 9002
QS 9000

L W H
1.61 x 0.858 x 1.410

L W H
1.61 x 0.858 x 1.410

L W H
1.61 x 0.858 x 1.410

- 0.100 QUICK CONNECT/ SOLDER PLUG-IN OR PRINTED CIRCUIT TERMINALS
- FLAG INDICATOR
- L.E.D. STATUS LAMP
- PUSH BUTTON WITH LOCK DOWN DOOR
- FINGER GRIP COVER
- I.D. TAG/WRITE LABEL
- OPTIONAL FLANGE AND DIN ADAPTERS AVAILABLE

- 0.187 QUICK CONNECT/ SOLDER PLUG-IN OR PRINTED CIRCUIT TERMINALS
- FLAG INDICATOR
- L.E.D. STATUS LAMP
- PUSH BUTTON WITH LOCK DOWN DOOR
- FINGER GRIP COVER
- I.D. TAG/WRITE LABEL
- OPTIONAL FLANGE AND DIN ADAPTERS

- 0.187 QUICK CONNECT/ SOLDER PLUG-IN OR PRINTED CIRCUIT TERMINALS
- FLAG INDICATOR
- PUSH BUTTON
- FINGER GRIP COVER
- I.D. TAG/WRITE LABEL
- OPTIONAL FLANGE AND DIN ADAPTERS

DPDT, 4PDT

DPDT

3PDT

SILVER, GOLD OVERLAY (3 AMP)
SILVER, GOLD FLASHED (3 AMP)
SILVER CADMIUM OXIDE,
GOLD FLASHED (10 AMP)

SILVER CADMIUM OXIDE,
GOLD FLASHED

SILVER CADMIUM OXIDE,
GOLD FLASHED

3 AMP, BIFURCATED, 120/240VAC/28 VDC
3 AMP, 120/240 VAC/28 VDC
10 AMP, 120/240 VAC/28 VDC
8 AMP, 220/277 VAC 50/60Hz

15 AMP, 110/120 VAC 50/60Hz
12 AMP, 220/277 VAC 50/60Hz
12 AMP, 28 VDC

15 AMP, 110/120 VAC 50/60Hz
12 AMP, 220/277 VAC 50/60Hz
12 AMP, 28 VDC

6,12, 24,120, 220/230, 240 VAC
6,12, 24, 48,110 VDC

6,12,24,120, 220/230, 240 VAC
6,12, 24,48,110 VDC

6,12, 24,120, 220/230, 240 VAC
6,12, 24, 48,110 VDC

1.2 VA
0.9 WATTS

CLASS "B" (130°C)

1.2 VA
0.9 WATTS

CLASS "B" (130°C)

1.7 VA
1.5 WATTS

CLASS "B" (130°C)

-40°C TO +70°C

-40°C TO +105°C

-40°C TO +70°C

-40°C TO +105°C

-30°C TO +70°C

-30°C TO +105°C

1500 V rms

1500 V rms

1500 V rms

200,000 OPERATIONS
10,000,000 OPERATIONS

200,000 OPERATIONS
10,000,000 OPERATIONS

150,000 OPERATIONS
10,000,000 OPERATIONS

70-461-1, 70-378-1, 70-379-1

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70-783D-1

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SOCKET COMPATIBLE & FLANGE MOUNT RELAYS

RELAY SERIES



L W H
1.61 x 0.858 x 1.410



L W H
1.40 x 0.858 x 1.10



L W H
1.40 x 0.858 x 1.10

FEATURES

- 0.187 QUICK CONNECT/ SOLDER PLUG-IN OR PRINTED CIRCUIT TERMINALS
- FLAG INDICATOR
- PUSH BUTTON
- FINGER GRIP COVER
- I.D. TAG/WRITE LABEL
- OPTIONAL FLANGE AND DIN ADAPTERS

- 0.100 OR 0.187 QUICK CONNECT/ SOLDER PLUG-IN OR PRINTED CIRCUIT TERMINALS
- OPPOSITE POLARITY ARC BARRIER BETWEEN ADJACENT POLES
- UL LISTED WHEN USED WITH 70-461-1 OR 70-459-1 SOCKETS

- 0.100 OR 0.187 QUICK CONNECT/ SOLDER PLUG-IN TERMINALS
- OPPOSITE POLARITY ARC BARRIER BETWEEN ADJACENT POLES

CONTACT DATA

CONTACT CONFIGURATION:

4PDT

SPDT, DPDT, 4PDT

3PDT, 4PDT

CONTACT MATERIAL:

SILVER CADMIUM OXIDE,
GOLD FLASHED

SILVER, GOLD OVERLAY (3 AMP)
SILVER, GOLD FLASHED (3 AMP)
SILVER CADMIUM OXIDE,
GOLD FLASHED (5,10 & 15 AMP)

SILVER CADMIUM OXIDE

MAX. CONTACT RATING:

15 AMP, 110/120 VAC 50/60Hz
12 AMP, 220/277 VAC 50/60Hz
12 AMP, 28 VDC

4PDT: 3 AMP, BIFURCATED
120/240 VAC/30 VDC, 3 AMP, 120 VAC/30 VDC
5 AMP, 120/240 VAC/30 VDC
DPDT: 10AMP,
SPDT: 15AMP, 120/240VAC/30VDC

10 AMP, 250 VAC, 50/60 Hz
10 AMP, 28 VDC

COIL DATA

STANDARD VOLTAGE

AC:
DC:

6,12,24,120, 220/230, 240 VAC
6,12, 24,48,110 VDC

6,12,24,120, 240 VAC
6,12, 24,48,110 VDC

6,12,24,120, 240 VAC
6,12, 24,48,110 VDC

NOMINAL COIL POWER
VA: (VAC)
WATTS: (VDC)
INSULATION SYSTEM PER
UL STANDARD 1446

2.0 VA
1.5 WATTS
CLASS "B" (130°C)

1.2 VA
0.9 -1.1 WATTS
CLASS "B" (130°C)

2 VA
1.4 WATTS
CLASS "B" (130°C)

GENERAL DATA

AMBIENT TEMPERATURE
OPERATING:

-30°C TO +70°C

-40°C TO +70°C

-25°C TO +40°C

STORAGE:

-30°C TO +105°C

-40°C TO +100°C

-25°C TO +100°C

DIELECTRIC STRENGTH:
(COIL TO FRAME)

1500 V rms

1500 V rms

1500 V rms

LIFE EXPECTANCY

ELECTRICAL:
MECHANICAL:

150,000 OPERATIONS
10,000,000 OPERATIONS

200,000 OPERATIONS
10,000,000 OPERATIONS

100,000 OPERATIONS
20,000,000 OPERATIONS

MATING SOCKETS
SEE SECTION 8

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70-402-1, 70-378-1, 70-379-1

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3PDT: 70-78C-1, 4PDT: 70-78D-1

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AGENCY APPROVALS



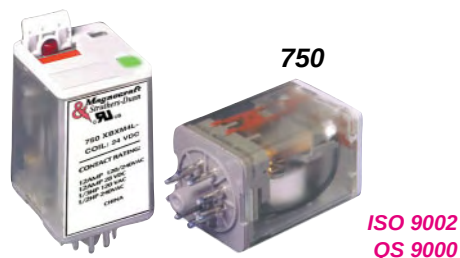
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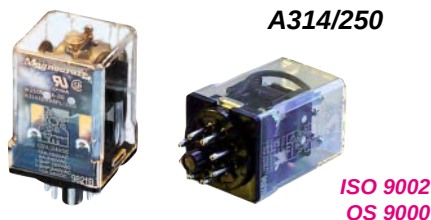
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750

ISO 9002
QS 9000



A314/250

ISO 9002
QS 9000



788

ISO 9002
QS 9000

L W H
2.150 x 1.375 x 1.410

- 8 & 11 PIN OCTAL BASE
- FLAG INDICATOR
- L.E.D. STATUS LAMP
- PUSH BUTTON WITH LOCK DOWN DOOR
- FINGER GRIP COVER
- I. D. TAG/WRITE LABEL
- UL LISTED WHEN USED WITH 70-464-1 OR 70-465-1 SOCKETS

L W H
2.25 x 1.37 x 1.37

- 8 & 11 PIN OCTAL BASE
- BLOWOUT MAGNET FOR DC SWITCHING TO 150 VDC
- UL LISTED WHEN USED WITH 70-464-1 OR 70-465-1 SOCKETS

L W H
2.28 x 1.375 x 1.410

- 0.187 QUICK CONNECT/ SOLDER PLUG-IN OR PRINTED CIRCUIT TERMINALS
- FLAG INDICATOR
- PUSH BUTTON WITH LOCK DOWN DOOR
- FINGER GRIP COVER
- I.D. TAG/WRITE LABEL
- UL LISTED WHEN USED WITH 70-463-1 SOCKET

DPDT, 3PDT

SILVER CADMIUM OXIDE,
GOLD FLASHED

SPDT, DPDT, 3PDT

SILVER CADMIUM OXIDE,
GOLD FLASHED

DPDT, 3PDT

SILVER CADMIUM OXIDE,
GOLD FLASHED

12 AMP, 120/240 VAC
12 AMP, 28 VDC

SPDT: 12 AMP,120/240VAC, 10 AMP, 28 VDC
DPDT: 12 AMP, 120 VAC, 10 AMP, 240 VAC,
10 AMP, 28 VDC
3PDT: 10 AMP, 120/240 VAC, 10 AMP, 28 VDC
DPDT: 3 AMP,150VDC WITH BLOWOUT MAGNET

12 AMP, 110/120 VAC 50/60Hz
12 AMP, 28 VDC

6,12,24,120, 220/230, 240 VAC
6,12, 24,48,110 VDC

24,120, 240 VAC
12, 24 VDC

6,12,24,120, 220/230, 240 VAC
6,12, 24,48,110 VDC

2-3.55 VA
1.4 WATTS

CLASS "B" (130°C)

2-2.75 VA
1.2 WATTS

2-3.55 VA
1.4 WATTS

CLASS "B" (130°C)

-30°C TO +50°C (AC)
-30°C TO +65°C (DC)
-30°C TO +100°C

-30°C TO +55°C (AC)
-30°C TO +70°C (DC)
-45°C TO +105°C

-30°C TO +50°C (AC)
-30°C TO +65°C (DC)
-30°C TO +100°C

2500 V rms

1500 V rms

2500 V rms

200,000 OPERATIONS
5,000,000 OPERATIONS

100,000 OPERATIONS
10,000,000 OPERATIONS

200,000 OPERATIONS
5,000,000 OPERATIONS

70-464-1, 70-465-1, 70-750D8-1,
70-750D11-1, 70-169-1, 70-170-1,

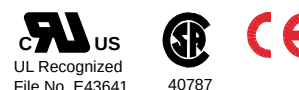
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70-750D11-1, 70-169-1, 70-170-1,

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70-463-1, 70-124-1,70-124-2,
70-178-1, 70-178-2

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RELAY SERIES

FEATURES
CONTACT DATA

CONTACT CONFIGURATION:

CONTACT MATERIAL:

MAX. CONTACT RATING:

COIL DATA

STANDARD VOLTAGE

AC:

DC:

 NOMINAL COIL POWER
 VA: (VAC)
 WATTS: (VDC)
 INSULATION SYSTEM PER
 UL STANDARD 1446

GENERAL DATA

 AMBIENT TEMPERATURE
 OPERATING:

STORAGE:

 DIELECTRIC STRENGTH:
 (COIL TO FRAME)

LIFE EXPECTANCY

ELECTRICAL:

MECHANICAL:

MATING SOCKETS

SEE SECTION 8

AGENCY APPROVALS
PAGE NUMBER

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 L W H
 1.90 x 1.53 x 1.40

- BASE PLUG-IN OR FLANGE MOUNT
- 0.187 QUICK CONNECT/ SOLDER PLUG-IN OR PRINTED CIRCUIT TERMINALS
- UL LISTED WHEN USED WITH 70-463-1 SOCKETS

SPDT, DPDT, 3PDT

 SILVER CADMIUM OXIDE,
 GOLD FLASHED

 15 AMP, 110/120 VAC 50/60Hz
 10 AMP, 28 VDC

 24,120, 240 VAC
 12, 24,110 VDC

 2.275 VA
 1.2 WATTS
 CLASS "B" (130°C)

 -30°C TO +50°C (AC)
 -30°C TO +65°C (DC)
 -30°C TO +100°C

2000 V rms

 100,000 OPERATIONS
 5,000,000 OPERATIONS

 70-463-1, 70-124-1, 70-124-2,
 70-178-1, 70-178-2

PAGE 16, 17



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 L W H
 1.90 x 1.53 x 1.40

- 0.187 QUICK CONNECT/ SOLDER PLUG-IN
- 388/A283 BUILT FOR DC SWITCHING TO 150 VDC
- UL LISTED WHEN USED WITH 70-463-1 SOCKET

DPDT, SPST-NO-DM

 SILVER CADMIUM OXIDE,
 GOLD FLASHED

 15 AMP, 120/240 VAC 50/60Hz
 10 AMP, 28 VDC
DPDT: 3 AMP, 150 VDC
SPST-NO-DM: 10 AMP, 150 VDC

 120 VAC
 12, 24,110 VDC

 2.275 VA
 1.2 WATTS
 CLASS "B" (130°C)

 -30°C TO +50°C (AC)
 -30°C TO +65°C (DC)
 -30°C TO +100°C

2000 V rms

 100,000 OPERATIONS
 5,000,000 OPERATIONS

 70-463-1, 70-124-1, 70-124-2 ,
 70-178-1, 70-178-2

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PAGE 30

 L W H
 1.90 x 1.53 x 1.40

- 0.187 QUICK CONNECT / SOLDER PLUG-IN TERMINALS
- FLAG INDICATOR
- PUSH BUTTON
- FINGER GRIP COVER
- UL LISTED WHEN USED WITH 70-463-1 SOCKET

DPDT, 3PDT

 SILVER CADMIUM OXIDE,
 GOLD FLASHED

DPDT: 20 AMP, 300 VAC 50/60Hz
 20 AMP, 28 VDC
3PDT: 16 AMP, 250 VAC 50/60Hz
 16 AMP, 28 VDC

 24, 120, 240 VAC
 12, 24 VDC

 2 - 3.5 VA
 1.44 WATTS
 CLASS "B" (130°C)

 -30°C TO +50°C (AC)
 -30°C TO +65°C (DC)
 -30°C TO +100°C

2200 V rms

 100,000 OPERATIONS
 5,000,000 OPERATIONS

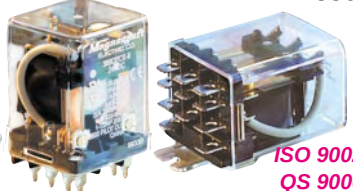
 70-463-1, 70-124-1, 70-124-2 ,
 70-178-1, 70-178-2

PAGE 16, 17



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SOCKET COMPATIBLE & FLANGE MOUNT RELAYS

388V	389F	389	300
 ISO 9002 QS 9000	 ISO 9002 QS 9000	 ISO 9002 QS 9000	 ISO 9002 QS 9000
L W H 1.90 x 1.53 x 1.40	L W H 1.90 x 1.53 x 1.40	L W H 1.90 x 1.53 x 1.40	L W H 1.90 x 1.53 x 1.40
0.187 QUICK CONNECT/ SOLDER PLUG-IN TERMINALS. - PUSH BUTTON - HIGH VOLTAGE SWITCHING - MEETS 8 mm EUROPEAN SPACING REQUIREMENTS 3 MILLIMETER CONTACT GAP - UL LISTED WHEN USED WITH 70-463-1 SOCKET	- FLANGE MOUNT, 0.250 QUICK CONNECT/ SOLDER TERMINALS - SWITCHING UP TO 25 AMP. - FLAG INDICATOR - PUSH BUTTON	- FLANGE MOUNT, 0.250 QUICK CONNECT/ SOLDER TERMINALS. - SWITCHING UP TO 30 AMPS	- FLANGE MOUNT, 0.250 QUICK CONNECT / SOLDER OR PRINTED CIRCUIT TERMINALS 2 MILLIMETER CONTACT GAPS - ARC BARRIER BETWEEN CONTACTS - OPTIONAL BLOWOUT MAGNET FOR HIGH VOLTAGE SWITCHING - OPTIONAL DIN RAIL CASE
DPST-NO, 3PST-NO	DPDT	SPDT, DPDT, 3PDT, SPST-NO-DM SPST-NO-NC-DM-DB	DPDT-SPDT-NO-NC-DM-DB
SILVER CADMIUM OXIDE, GOLD FLASHED	SILVER CADMIUM OXIDE, GOLD FLASHED	SILVER CADMIUM OXIDE, GOLD FLASHED	SILVER CADMIUM OXIDE, GOLD FLASHED
15 AMP, 120/240 VAC 50/60Hz 15 AMP, 28 VDC	25 AMP, 300 VAC 50/60Hz 13 AMP, 28 VDC	SPST-DM, SPST-DB-DM: 30 AMP, 300 VAC 50/60Hz, 30 AMP, 28 VDC SPDT, DPDT: 25 AMP 300 VAC 50/60Hz, 13 AMP, 28 VDC 3PDT: 20 AMP, 300 VAC, 50/60Hz, 13 AMP, 28 VDC	30 AMP, 120/240/277 VAC 50/60Hz 30 AMP, 28 VDC, 15 AMP, 600 VAC DPDT: 5 AMP, 150 VDC SPDT-DB-DM: 10 AMP, 150 VDC
24, 120, 240 VAC 12, 24 VDC	24, 120, 240 VAC 12, 24VDC	24, 120, 240 VAC 12, 24 VDC	6, 12, 24, 120, 240 VAC 6, 12, 24, 48, 110-125, 220-225 VDC
2 - 3.5 VA 3.0 WATTS CLASS "B" (130°C)	2 - 3.5 VA 1.44 WATTS CLASS "B" (130°C)	2 - 3.5 VA 1.44 WATTS CLASS "B" (130°C)	3.4 VA 2.0 WATTS CLASS "B" (130°C) CLASS "F" (155°C) AVAILABLE
-30°C TO + 50°C (AC) -30°C TO + 65°C (DC) -30°C TO + 100°C	-30°C TO + 50°C (AC) -30°C TO + 65°C (DC) -30°C TO + 100°C	-30°C TO + 50°C (AC) -30°C TO + 65°C (DC) -30°C TO + 100°C	-30°C TO + 50°C (AC) -30°C TO + 60°C (DC) -40°C TO + 105°C
2000 V rms	2200 V rms	2200 V rms	4000 V rms
100,000 OPERATIONS 5,000,000 OPERATIONS	100,000 OPERATIONS 5,000,000 OPERATIONS	100,000 OPERATIONS 5,000,000 OPERATIONS	100,000 OPERATIONS 10,000,000 OPERATIONS
70-463-1, 70-124-1, 70-124-2, 70-178-1, 70-178-2 PAGE 16, 17	—	—	—
 US UL Recognized File No. E43641  168986 	 US UL Recognized File No. E43641  168986 	 US UL Recognized File No. E43641  168986 	 US UL Recognized File No. E13224  50758
PAGE 33 - 34	PAGE 35 - 37	PAGE 35, 36 & 38	PAGE 39 - 40

RELAY SERIES

9A
92

W67

L W H
1.980 x 1.08 x 1.10

L W H
2.70 x 1.36 x 1.495

L W H
1.20 x 0.735 x 0.978 to 1.592

FEATURES

- EPOXY SEALED IMMERSION CLEANABLE WITH TAPE SEAL.
- PRINTED CIRCUIT BOARD OR FLANGE MOUNT STYLES.
- CLASS "F" INSULATION SYSTEM.
- 1/4" SPADE TERMINALS ACCEPT INSULATED 1/4" QUICK CONNECT TERMINALS. & 3/16" COIL QUICK CONNECT TERMINALS.
- OPTIONAL DIN RAIL ADAPTER AVAILABLE

- EPOXY SEALED IMMERSION CLEANABLE WITH TAPE SEAL.
- PRINTED CIRCUIT BOARD OR FLANGE MOUNT STYLES.
- CLASS "F" INSULATION SYSTEM.
- 1/4" SPADE TERMINALS ACCEPT 1/4" QUICK CONNECT TERMINALS
- OPTIONAL DIN RAIL ADAPTER AVAILABLE

- 0.100 SOLDER PLUG-IN OR PRINTED CIRCUIT TERMINALS
- UP TO 8 POLES SWITCHING PLUG-IN STYLES HAVE 3-48 UNC GROUND STUDS

CONTACT DATA

CONTACT CONFIGURATION:

SPST-NO. & SPDT
DPST-NO. & DPDT
DPDT THRU 8PDT

CONTACT MATERIAL:

SILVER CADMIUM OXIDE

SILVER CADMIUM OXIDE

SILVER GOLD OVERLAY

MAX. CONTACT RATING:

SPST-NO: 30 AMP, 240 VAC,
20 AMP, 28 VDC
SPDT: 30 AMP, 240 VAC
20 AMP, 28 VDC(NO),
15 AMP, 240 VAC, 10 AMP, 28 VDC (NC),

DPDT-NO: 30 AMP 277 VAC.
20 AMP 28 VDC
DPST-NO: 30 AMP 277 VAC.
20 AMP 28 VDC
DPDT-NC: 3 AMP 277 VAC. 28 VDC

 5 AMP, 120 VAC 50/60Hz/ 28 VDC
BIFURCATED
3AMP, 1240 VAC 50/60Hz / 28 VDC

COIL DATA

 STANDARD VOLTAGE
AC:
DC:

5, 12, 24, 48 & 110 VDC

 24, 120 & 240 VAC
12, 24, 48 & 110 VDC

 120 VAC
5, 12, 24, 48, 115 VDC

 NOMINAL COIL POWER
VA: (VAC)
WATTS: (VDC)
INSULATION SYSTEM PER
UL STANDARD 1446

 0.95 VA
2.8 WATTS MAX

 4 VA
1.7 WATTS

 1.5-2.5 VA
1-2.0 WATTS

GENERAL DATA

 AMBIENT TEMPERATURE
OPERATING:

- 55°C to +85°C

 DC: - 40°C to +85°C
AC: - 40°C to +65°C
- 55°C to +155 C

-55°C TO +70°C

STORAGE:

- 55°C to +130°C

-55°C TO +105°C

 DIELECTRIC STRENGTH:
(COIL TO FRAME)

2500 V rms

4000 V rms

1500 V rms

LIFE EXPECTANCY

 ELECTRICAL:
MECHANICAL:

 100,000 OPERATIONS
10,000,000 OPERATIONS

 5,000,000 OPERATIONS
100,000 OPERATIONS

 100,000 OPERATIONS
10,000,000 OPERATIONS

MATING SOCKETS

SEE SECTION 8

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70-303-1, 70-305-1, 70-307-1
70-309-1, 70-304-1, 70-306-1
70-308-1, 70-310-1
PAGE 26

AGENCY APPROVALS

PAGE NUMBER

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PAGE 43 - 44

PAGE 41 - 42

SOCKET COMPATIBLE & FLANGE MOUNT RELAYS

219

ISO 9002
QS 9000



750H



88HP



21



L W H 2.59 x 1.468 x 2.625 / 3.062	L W H 1.281 x 0.910 x 1.156	L W H 2.03 x 1.53 DIA	L W H 2.84 X 1.85 X 2.47
12 OR 14 PIN PLUG-IN WITH LOCKING CLIP - ENCAPSULATED COIL - WIDE RANGE OF CONTACT CONFIGURATIONS - WIDE CHOICE OF OPTIONS - UL LISTED WHEN USED WITH 70-463-1 SOCKET.	8 & 11 PIN OCTAL BASE - HERMETICALLY SEALED VACUUM BAKED AND DRY NITROGEN FILLED - GRAY LACQUER FINISH OVER STEEL ENCLOSURE - MEETS UL STANDARD FOR CLASS 1 DIVISION 2 HAZARDOUS LOCATIONS	8 & 11 PIN OCTAL BASE - HERMETICALLY SEALED VACUUM BAKED AND DRY NITROGEN FILLED - GRAY LACQUER FINISH OVER STEEL ENCLOSURE	- PLUG-IN BASE WITH POLARIZING PIN - SWITCHES TUNGSTEN LOADS UP TO 20 AMPS - MEETS NEMA STD. TS 2-1992 APPROVED BY D. O. T.
VARIOUS	DPDT, 3PDT	DPDT, 3PDT	DPDT
SILVER CADMIUM OXIDE. GOLD DIFFUSED	SILVER CADMIUM OXIDE GOLD DIFFUSED	SILVER CADMIUM OXIDE GOLD FLASHED	SILVER ALLOY
10 AMP, 120/240 VAC 50/60Hz 10 AMP, 28 VDC	DPDT: 12 AMP, 120 VAC 50/60Hz 8 AMP, 240VAC 50/60Hz, 10 AMP, 28VDC 3PDT: 10 AMP, 120 VAC 50/60Hz 6 AMP, 240VAC 50/60Hz, 10 AMP, 28VDC	DPDT: 12 AMP, 120 VAC 50/60Hz 8 AMP, 240VAC 50/60Hz, 10 AMP, 28VDC 3PDT: 10 AMP, 120 VAC 50/60Hz 6 AMP, 240VAC 50/60Hz, 10 AMP, 28VDC	30 AMP, 120/240 VAC 50/60Hz 20 AMP, 28 VDC 20 AMP, 120VAC 50/60Hz, TUNGSTEN 10 AMP, 240VAC 50/60Hz, TUNGSTEN
6, 12, 24, 120, 220/230, 240 VAC 6, 12, 24, 48, 110 VDC	12, 24, 120 VAC 12, 24, 110 VDC	120 VAC 12, 24 VDC	120 VAC RECTIFIED
1.2 VA 0.9 WATTS CLASS "B" (130°C)	2 - 2,75 VA 1.2 WATTS	3.0 VA 1.5 WATTS	4.0 VA CLASS "B" (130°C)
-40°C TO +70°C -40°C TO +105°C	-45°C TO +55°C (AC) -45°C TO +70°C (DC) -40°C TO +105°C	-30°C TO +50°C (AC) -30°C TO +60°C (DC) -30°C TO +105°C	-40°C TO +84°C -40°C TO +105°C
1500 V rms	1250 V rms	1250 V rms	1500 V rms
100,000 OPERATIONS 10,000,000 OPERATIONS	100,000 OPERATIONS 5,000,000 OPERATIONS	100,000 OPERATIONS 5,000,000 OPERATIONS	200,000 OPERATIONS 5,000,000 OPERATIONS
27390, 33377 PAGE 27	70-464-1, 70-465-1 PAGE 7, 8	70-464-1, 70-465-1, 70-750D8-1, 70-750D11-1, 70-169-1, 70-170-1, PAGE 7, 8, 9, 10, 11, 12	—
 			 
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FEATURES**FLAG INDICATOR:**

SHOWS RELAY STATUS IN MANUAL OR POWERED CONDITION.

L.E.D. STATUS LAMP:

SHOWS COIL "ON" OR "OFF" STATUS. IDEAL IN LOW LIGHT CONDITIONS.

PUSH BUTTON:

ALLOWS FOR MANUAL OPERATION OF RELAY WITHOUT THE NEED FOR COIL POWER. IDEAL FOR FIELD SERVICE PERSONNEL TO TEST CONTROL CIRCUITS.

FINGER-GRIP COVER:

ALLOWS OPERATOR TO REMOVE RELAYS FROM SOCKETS MORE EASILY THAN CONVENTIONAL RELAYS.

I.D. TAG/WRITE LABEL:

USED FOR IDENTIFICATION OF RELAYS IN MULTI-RELAY CIRCUITS.

COVER ADAPTERS:

DIN RAIL ADAPTER OR TOP/BOTTOM FLANGE ADAPTER, ALLOWS THE 781 RELAY TO BE DIRECT MOUNTED TO A DIN RAIL OR PANEL.

BENEFITS**SPDT, 15 AMPS**c **UL** us
UL Recognized
File No. E43641

97899



COMPLIES WITH REQUIREMENTS OF

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

* IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION

* CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

**MANUFACTURED UNDER
ISO 9002 & QS 9000****GENERAL SPECIFICATIONS****COIL**

Pull-in Voltage:	75% of nominal voltage or less for DC coils, 80% of nominal voltage or less for AC coils
Dropout Voltage:	DC-10% min. AC-30% min. of nominal voltage or more
Max. Voltage:	110%
Resistance:	±15% measured @ 25°C.
Coil Power:	0.7 watts DC, 0.9 VA (60Hz) AC @ 25°C
Insulation System:	Class "B" (130°C per UL standard 1446)
Max. Coil Dissipation:	2.3 watts DC, 2.55 VA (60Hz) AC @ 25°C
Duty:	Continuous

CONTACTS

Contact Material:	Silver cadmium oxide, gold flashed
Contact Rating:	15 amps @ 110/120 VAC 50/60Hz 12 amps @ 220/277 VAC 50/60Hz, 15 amps @ 28 VDC 1/2Hp @ 110/120 V 50/60Hz. 1Hp @ 220/250 V 50/60Hz. B300 pilot duty 50/60Hz. 3000 VA max. Break; 10 amps max. Continuous and break; 15 amps max. Make; 300V 50/60Hz max.; (general purpose load, 0.75 to 1.0 power factor)

DIELECTRIC STRENGTH

Coil to Frame:	1500 V rms
Across Open Contacts:	1000 V rms
Contacts to Frame:	1500 V rms
Insulation Resistance:	100 megohms @ 500 VDC

TEMPERATURE

Operating:	-40°C to +70°C
Storage:	-40°C to +100°C

LIFE EXPECTANCY

Electrical:	150,000 operations @ rated resistive load
Mechanical:	10,000,000 operations @ no load

MISCELLANEOUS

Operating Position:	Any
Insulation Material:	Molded plastic
Enclosure:	Polycarbonate dust cover
Weight:	29 grams approx.

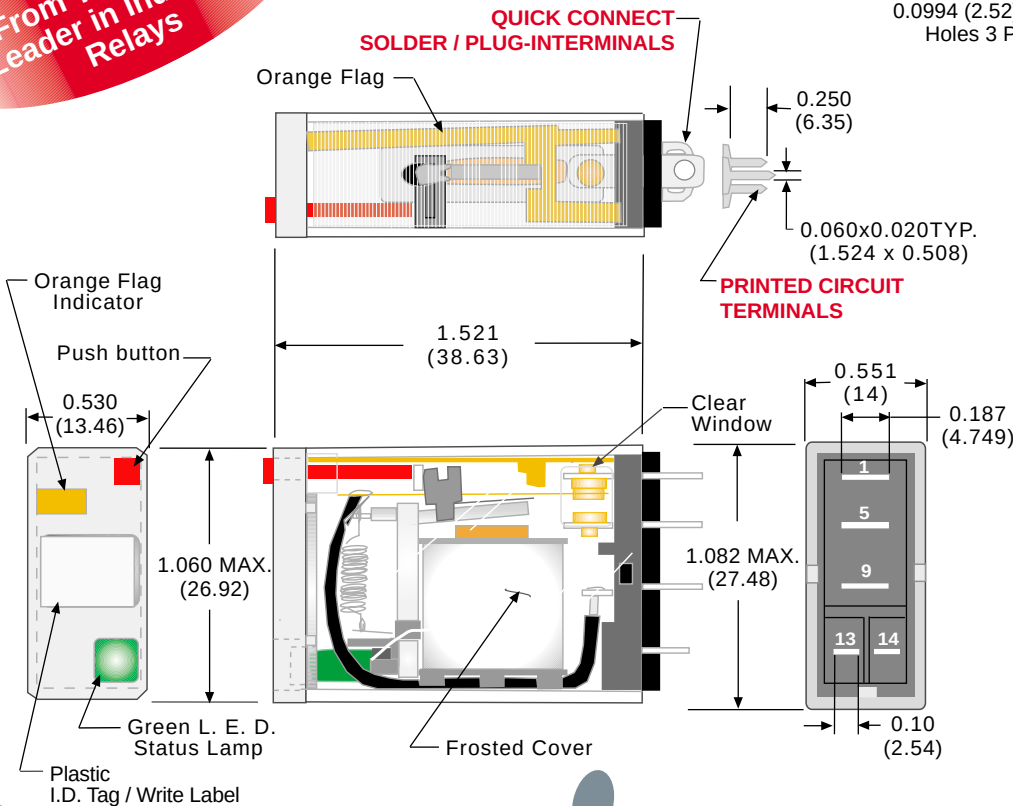
**STANDARD COVER****STANDARD COVER
WITH FLANGE ADAPTER
ON TOP 16-781C1
SEE ORDERING CODE****STANDARD COVER
WITH FLANGE ADAPTER
ON BOTTOM 16-781C1A
SEE ORDERING CODE****STANDARD COVER
WITH DIN ADAPTER
16-781C
SEE ORDERING CODE****Mating Sockets****70-781D-1: SCREW/DIN****70-781F-1: SOLDER****70-781T-1: PRINTED CIRCUIT**

See section 8, page 18, 19

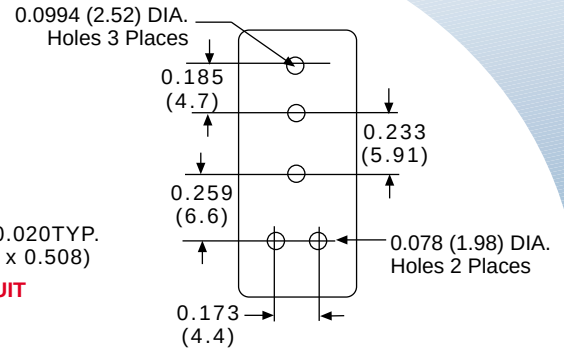
SPDT, 15 AMPS

NEW
From The Market
Leader in Industrial
Relays

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

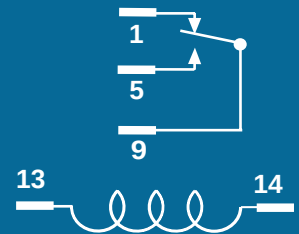


PRINTED CIRCUIT MOUNTING HOLE LAYOUT
(BOTTOM VIEW)



BI - POLAR
L.E.D. STATUS LAMP
ALLOWS FOR REVERSE
POLARITY APPLICATIONS

WIRING DIAGRAM
(VIEWED FROM PIN END)



ORDERING CODE FOR RELAYS

781 XAX **ML- 120A**

CLASS: _____

CONTACT CONFIGURATION:
SPDT: XAX

TERMINAL STYLE: _____
QUICK CONNECT SOLDER / PLUG-IN
TERMINALS: **NO CODE**
PRINTED CIRCUIT TERMINALS: **CODE T**

OPTIONS: _____
DIN RAIL FLANGE ADAPTER
(TOP MOUNTED ONLY): **CODE C**
TOP OR BOTTOM FLANGE ADAPTER
(TOP MOUNTED): **CODE C1**
TOP OR BOTTOM FLANGE ADAPTER
(BOTTOM MOUNTED): **CODE C1A**

STANDARD FEATURES: _____
PUSH BUTTON: **CODE M**
L. E. D. STATUS LAMP: **CODE L**

COIL VOLTAGE: _____
6, 12, 24, 120, 220/230, 240 ADD "A" FOR AC COILS
6, 12, 24, 48, 110 ADD "D" FOR DC COILS

COIL MEASURED @ 25°C

STANDARD PART NUMBERS SPDT	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED - SOLDER/PLUG-IN, 15 AMP		
781XAXML-24A	24 VAC, 50/60Hz	180 Ω
781XAXML-120A	120 VAC, 50/60Hz	4,430 Ω
781XAXML-240A	240 VAC, 50/60Hz	9,100 Ω
DC OPERATED - SOLDER/PLUG-IN, 15 AMP		
781XAXML-12D	12 VDC	120 Ω
781XAXML-24D	24 VDC	470 Ω
781XAXML-110D	110 VDC	10,000 Ω
AC OPERATED - PRINTED CIRCUIT, 15 AMP		
781XAXTML-120A	120 VAC, 50/60Hz	4,430 Ω
DC OPERATED - PRINTED CIRCUIT, 15 AMP		
781XAXTML-12D	12 VDC	120 Ω
781XAXTML-24D	24 VDC	470 Ω

RETROFITS IDEC RH1B-L & RH1V2-L. SEE END OF SECTION 1 FOR CROSS REFERENCE
CADMIUM-FREE CONTACTS AVAILABLE, CONTACT FACTORY FOR DETAILS

FEATURES**OPTIONAL L.E.D. STATUS LAMP:**

SHOWS COIL "ON" OR "OFF" STATUS. IDEAL IN LOW LIGHT CONDITIONS.

OPTIONAL PUSH BUTTON:

ALLOWS FOR MANUAL OPERATION OF RELAY WITHOUT THE NEED FOR COIL POWER. IDEAL FOR FIELD SERVICE PERSONNEL TO TEST CONTROL CIRCUITS.

FINGER-GRIP COVER:

ALLOWS OPERATOR TO REMOVE RELAYS FROM SOCKETS MORE EASILY THAN CONVENTIONAL RELAYS.

COVER ADAPTERS:

DIN RAIL ADAPTER OR TOP/BOTTOM FLANGE ADAPTER, ALLOWS THE 78 RELAY TO BE DIRECT MOUNTED TO A DIN RAIL OR PANEL.

BENEFITS**SPDT, 15 AMPS**

 UL Recognized
 File No. E43641

 97899



COMPLIES WITH REQUIREMENTS OF

- * IEC STANDARDS 947-4-1 AND 947-5-1 LOW VOLTAGE DIRECTIVE
- * IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION
- * CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

**MANUFACTURED UNDER
ISO 9002 & QS 9000**
STANDARD COVER
**STANDARD COVER
WITH FLANGE ADAPTER
ON TOP 16-781C1
SEE ORDERING CODE**
MAY ALSO BE ORDERED SEPARATELY
**STANDARD COVER
WITH FLANGE ADAPTER
ON BOTTOM 16-781C1A
SEE ORDERING CODE**
MAY ALSO BE ORDERED SEPARATELY
**STANDARD COVER
WITH DIN ADAPTER
16-781C
SEE ORDERING CODE**
MAY ALSO BE ORDERED SEPARATELY
Mating Sockets**70-781D-1: SCREW/DIN****70-781F-1: SOLDER****70-781T-1: PRINTED CIRCUIT**

See section 8, page 18, 19

GENERAL SPECIFICATIONS**COIL**

Pull-in Voltage: 75% of nominal voltage or less for DC coils,
80% of nominal voltage or less for AC coils

Dropout Voltage: DC-10% min. AC-30% min. of nominal voltage or more

Max. Voltage: 110%

Resistance: $\pm 15\%$ measured @ 25°C.

Coil Power: 0.7 watts DC, 0.9 VA (60Hz) AC @ 25°C

Insulation System: Class "B" (130°C per UL standard 1446)

Max. Coil Dissipation: 2.3 watts DC, 2.55 VA (60Hz) AC @ 25°C

Duty: Continuous

CONTACTS

Contact Material: Silver cadmium oxide, gold flashed

Contact Rating: 15 amps @ 110/120 VAC 50/60Hz
12 amps @ 220/277 VAC 50/60Hz,
15 amps @ 28 VDC 1/2Hp @ 110/120 V 50/60Hz.
1Hp @ 220/250 V 50/60Hz.
B300 pilot duty 50/60Hz.
3000 VA max. Break;
10 amps max. Continuous and break;
15 amps max. Make; 300V 50/60Hz max.;
(general purpose load, 0.75 to 1.0 power factor)

DIELECTRIC STRENGTH

Coil to Frame: 1500 V rms

Across Open Contacts: 1000 V rms

Contacts to Frame: 1500 V rms

Insulation Resistance: 100 megohms @ 500 VDC

TEMPERATURE

Operating: -40°C to +70°C

Storage: -40°C to +100°C

LIFE EXPECTANCY

Electrical: 150,000 operations @ rated resistive load

Mechanical: 10,000,000 operations @ no load

MISCELLANEOUS

Operating Position: Any

Insulation Material: Molded plastic

Enclosure: Polycarbonate dust cover

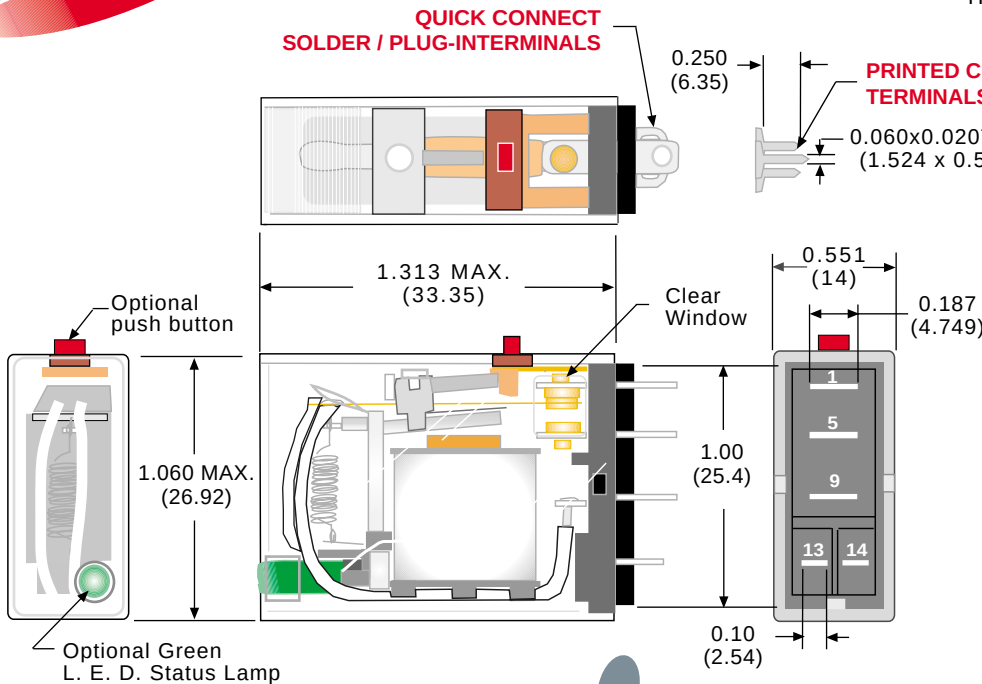
Weight: 25 grams approx.

SPDT, 15 AMPS

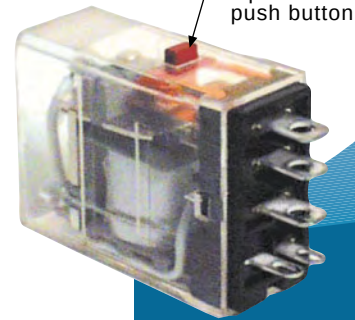
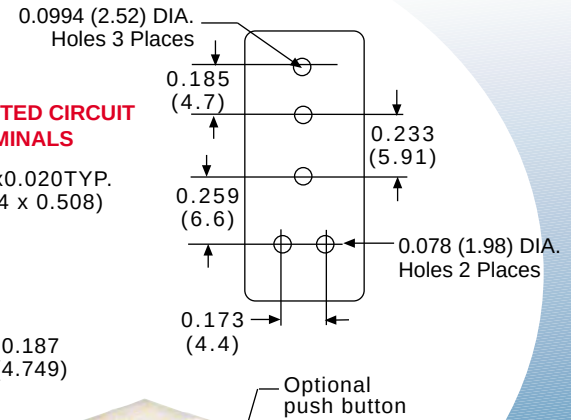
NEW
From The Market
Leader in Industrial
Relays

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



PRINTED CIRCUIT MOUNTING HOLE LAYOUT (BOTTOM VIEW)



OPTIONAL BI - POLAR
L.E.D. STATUS LAMP
ALLOWS FOR REVERSE
POLARITY APPLICATIONS

ORDERING CODE FOR RELAYS

78 XAX **C2 ML- 120A**

CLASS: _____

CONTACT CONFIGURATION: _____
SPDT: XAX

TERMINAL STYLE: _____
QUICK CONNECT SOLDER / PLUG-IN
TERMINALS: **NO CODE**
PRINTED CIRCUIT TERMINALS: **CODE T**

OPTIONS: _____
DIN RAIL FLANGE ADAPTER
(TOP MOUNTED ONLY): **CODE C**
TOP OR BOTTOM FLANGE ADAPTER
(TOP MOUNTED): **CODE C1**
TOP OR BOTTOM FLANGE ADAPTER
(BOTTOM MOUNTED): **CODE C1A**

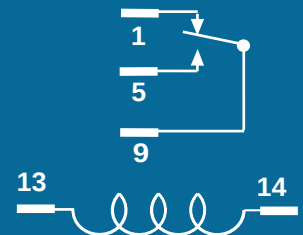
STANDARD FEATURES: _____
PLAN COVER: **CODE C2**

OPTIONAL FEATURES: _____
PUSH BUTTON: **CODE M**
L. E. D. STATUS LAMP: **CODE L**

COIL VOLTAGE: _____
6, 12, 24, 120, 220/230, 240 ADD "A" FOR AC COILS
6, 12, 24, 48, 110 ADD "D" FOR DC COILS

WIRING DIAGRAM

(VIEWED FROM PIN END)



COIL MEASURED @ 25°C

STANDARD PART NUMBERS SPDT	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED - SOLDER/PLUG-IN, 15 AMP		
78XAXC2-120A	120 VAC, 50/60Hz	4,430 Ω
DC OPERATED - SOLDER/PLUG-IN, 15 AMP		
78XAXC2-12D	12 VDC	120 Ω
78XAXC2-24D	24 VDC	470 Ω

RETROFITS IDEC RH1B- & RH1V2-.
SEE END OF SECTION 1 FOR CROSS REFERENCE

FEATURES**BENEFITS****VACUUM BAKED & DRY
NITROGEN FILLED**

REMOVES CONTAMINANTS AND PROVIDES A CLEAN & DRY ATMOSPHERE FOR CONTACTS.

**HERMETICALLY SEALED
METAL ENCLOSURE**

IDEAL FOR USE IN HAZARDOUS LOCATIONS. UL CERTIFIED FOR CLASS 1 DIVISION 2 GROUP A, B, C & D HAZARDS. WHEN RELAY IS USED WITH 70-461-1 SOCKET, THE HOLD-DOWN CLIP 16-1328 IS REQUIRED.

**CHOICE OF CONTACT RATINGS
1 AMP, 3 AMPS AND 5 AMPS**

PROVIDES FOR LOW LEVEL SWITCHING APPLICATIONS UP TO 5 AMPS POWER LOADS.

**PLUG-IN STYLE OR SIDE
MOUNTING STUD WITH
ANTI-ROTATION TAB**

WHEN USED WITH 70-461-1 SOCKET THE 782H CAN BE DIN RAIL MOUNTED OR PANEL MOUNTED. THE SIDE STUD PROVIDES FOR DIRECT MOUNT & SOLDERED WIRE APPLICATIONS.

4PDT, 1, 3 & 5 AMPS

UL **us**
UL Recognized
File No. E196240

SP **PENDING**

CE

COMPLIES WITH REQUIREMENTS OF

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

* IEC = INTERNATIONAL
ELECTROTECHNICAL COMMISSION

* CE TESTING AND EVALUATION
PERFORMED BY THE UNDERWRITERS
LABORATORIES AS A THIRD PARTY
PARTICIPANT

**MANUFACTURED UNDER
ISO 9001**

GENERAL SPECIFICATIONS**COIL**

Pull-in Voltage: 75% of nominal voltage or less for DC coils.
80% of nominal voltage or less for AC coils.
Dropout Voltage: DC-10% min. AC-30% min. of nominal voltage or more.
Max. Voltage: 110%
Resistance: $\pm 15\%$ measured @ 25°C.
Coil Power: 0.9 watts DC. 1.2 VA (60Hz) AC @ 25°C.
Insulation System: Class "B" (130°C per UL standard. 1446)
Max. Coil Dissipation: 2.0 watts DC, 2.5 VA (60Hz) AC. @ 25°C. 5 minutes maximum @ 25°C.
Duty: Continuous

CONTACTS

Contact Material: See ordering code
Contact Rating: See ratings table.

TIMING

Operate Time: 13 mS max @ nominal voltage
Release Time: 6 mS max @ nominal voltage

DIELECTRIC STRENGTH

Contacts to Coil: 1240 V rms
Across Open Contacts: 500 V rms
Contacts to Frame: 1240 V rms
Insulation Resistance: 100 megohms @ 500 VDC

TEMPERATURE

Operating: -45°C to + 70°C
Storage: -60°C to + 130°C

VIBRATION RESISTANCE

Functional: 10 to 55Hz; 6 g's (double amplitude)

SHOCK RESISTANCE

Functional: 10 g's (11mS)

LIFE EXPECTANCY

Electrical: 100,000 operations @ rated resistive load
Mechanical: 10,000,000 operations @ no load

MISCELLANEOUS

Operating Position: Any.
Insulation Material: Molded plastic
Enclosure: Grey metal case, hermetically sealed
Weight: 45 grams approx.

**CERTIFIED CLASS 1 DIVISION 2
FOR HAZARDOUS LOCATIONS**

**Mating Sockets**

70-461-1: SCREW/DIN

70-378-1: SOLDER

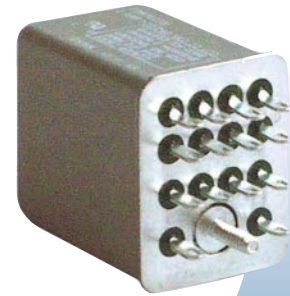
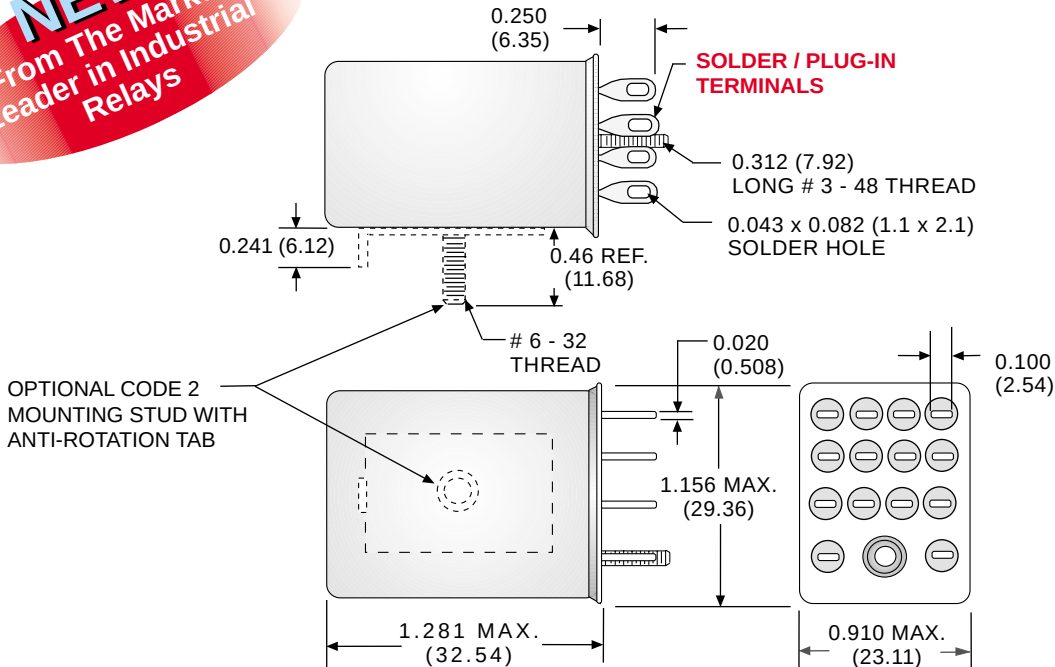
70-379-1: PRINTED CIRCUIT

See section 8, page 14, 15

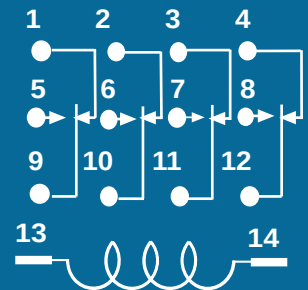
4PDT, 1, 3 & 5 AMPS

NEW
From The Market
Leader in Industrial
Relays

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

**WIRING DIAGRAM**

(VIEWED FROM PIN END)

**UL CONTACT LOAD RATINGS TABLE**

POLES	CURRENT OR HORSE POWER	LOAD VOLTAGE	LOAD VOLTAGE FREQUENCY	TYPE OF LOAD	MINIMUM LOAD
4 POLES	1 AMP	120/240	50/60 Hz	RESISTIVE	DRY CIRCUIT
	3 AMP	120/240	50/60 Hz	RESISTIVE	100 mA 12 VAC
	5 AMP	120/240	50/60 Hz	RESISTIVE	500 mA 12 VAC
	1 AMP	30	DC	RESISTIVE	DRY CIRCUIT
	3 AMP	30	DC	RESISTIVE	100 mA 12 VDC
	5 AMP	30	DC	RESISTIVE	500 mA 12 VDC

ORDERING CODE FOR RELAYS

782 XDX H 32 - 24D

CLASS: _____

CONTACT CONFIGURATION: _____
4PDT: XDX

HERMETICALLY SEALED: _____

CONTACT RATING: _____
1 AMP BIFURCATED: **CODE 32**
(SILVER CROSS BAR WITH GOLD OVERLAY)
3 AMP: **CODE 10**
(SILVER GOLD FLASHED)
5 AMP: **CODE 21**
(SILVER CADMIUM OXIDE)

TERMINALS & MOUNTING STYLE: _____
SOLDER/PLUG-IN: **NO CODE**
SOLDER WITH STUD ON BROAD SIDE: **CODE 2**

COIL VOLTAGE: _____
6, 12, 24, 120, 240 ADD "A" FOR AC COILS
6, 12, 24, 48, 110 ADD "D" FOR DC COILS

STANDARD PART NUMBERS 4PDT	COIL MEASURED @ 25°C	
	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED - SOLDER/PLUG-IN, 3 AMP		
782DXH10-24A	24 VAC, 50/60Hz	7160 Ω
782DXH10-120A	120 VAC, 50/60Hz	3,900 Ω
DC OPERATED - SOLDER/PLUG-IN, 3 AMP		
782DXH10-12D	12 VDC	160 Ω
782DXH10-24D	24 VDC	650 Ω
782DXH10-110D	110 VDC	11,000 Ω
AC OPERATED - SOLDER/PLUG-IN, 5 AMP		
782DXH21-120A	120 VAC, 50/60Hz	13,900 Ω
DC OPERATED - SOLDER/PLUG-IN, 5 AMP		
782DXH21-12D	12 VDC	160 Ω
782DXH21-24D	24 VDC	650 Ω

RETROFITS POTTER & BRUMFIELD KHS OR OMRON MY4H.
SEE END OF SECTION 1 FOR CROSS REFERENCE

FEATURES**BENEFITS****FLAG INDICATOR:**

SHOWS RELAY STATUS IN MANUAL OR POWERED CONDITION.

L.E.D. STATUS LAMP:

SHOWS COIL "ON" OR "OFF" STATUS. IDEAL IN LOW LIGHT CONDITIONS.

PUSH BUTTON:

ALLOWS FOR MANUAL OPERATION OF RELAY WITHOUT THE NEED FOR COIL POWER. IDEAL FOR FIELD SERVICE PERSONNEL TO TEST CONTROL CIRCUITS.

WHEN ACTIVATED, HOLDS PUSH BUTTON AND CONTACTS IN THE OPERATE POSITION. EXCELLENT FOR ANALYZING CIRCUIT PROBLEMS.

LOCK-DOWN DOOR:**FINGER-GRIP COVER:**

ALLOWS OPERATOR TO REMOVE RELAYS FROM SOCKETS MORE EASILY THAN CONVENTIONAL RELAYS.

I.D. TAG/WRITE LABEL:

USED FOR IDENTIFICATION OF RELAYS IN MULTI-RELAY CIRCUITS.

COVER ADAPTERS:

DIN RAIL FLANGE ADAPTER OR TOP/BOTTOM FLANGE ADAPTER, ALLOWS THE 782 RELAY TO BE DIRECT MOUNTED TO A DIN RAIL OR PANEL.

DPDT & 4PDT, 3, 10 & 15 AMPS

UL US
UL Recognized
File No. E43641

SP PENDING

CE PENDING

UL LISTED 367G
IND. CONT. EQ.

COMPLIES WITH REQUIREMENTS OF

C US

WHEN USED
WITH SOCKETS

70-459-1 OR

70-461-1

CURRENT LIMITED TO
RATING OF RELAY OR
SOCKET WHICHEVER
IS LESS.

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

* IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION

* CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

**MANUFACTURED UNDER
ISO 9002 & QS 9000**

GENERAL SPECIFICATIONS**COIL**

Pull-in Voltage: 75% of nominal voltage or less for DC coils, 80% of nominal voltage or less for AC coils

Dropout Voltage: DC-10% min. AC-30% min. of nominal voltage or more

Max. Voltage: 110%

Resistance: $\pm 15\%$ measured @ 25°C

Coil Power: 0.9 watts DC, 1.2 VA (60Hz) AC @ 25°C

Insulation System: Class "B" (130°C per UL standard 1446)

Max. Coil Dissipation: 2.3 watts DC, 2.55 VA (60Hz) AC @ 25°C

Duty: Continuous

CONTACTS

Contact Material: 3 amps bifurcated silver gold plated. 3 amps silver gold flashed, 10 & 15 amps, silver cadmium oxide, gold flashed

Contact Rating: **DPDT, 4PDT-** Bifurcated 3 amps @ 120/240 VAC 30 VDC. 1/16Hp (2.8 amp FLA), 120 VAC. Pilot duty - 5 amp make, 1/2 amp break, 3 amps continuous, 120 VAC

DPDT, 4PDT- 3 amps @ 120/240 VAC, 30 VDC, 1/6 Hp 120/240 VAC, C300 pilot duty.

DPDT, 4PDT- 10 amps @ 110/120 VAC, 8 amps 220/277 VAC. 8 amps 28 VDC, 1/3 Hp 250 VAC, B300 pilot duty.

DPDT- 15 amps @ 110/120 VA, 12 amps 220/277 VAC, 12 amps 28 VDC, 1/2Hp, 120VAC

1Hp 250 VAC, B300 pilot duty

DIELECTRIC STRENGTH

Coil To Frame: 1500 V rms

Across Open Contacts: 1000 V rms

Contacts To Frame: 1500 V rms

Insulation Resistance: 100 megohms @ 500 VDC

TEMPERATURE

Operating: -40°C to +70°C

Storage: -40°C to +105°C

LIFE EXPECTANCY

Electrical: 200,000 operations @ rated resistive load

Mechanical: 10,000,000 operations @ no load

MISCELLANEOUS

Operating Position: Any

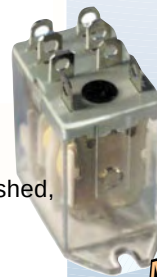
Insulation Material: Molded plastic

Enclosure: Polycarbonate dust cover

Weight: 36 grams approx



STANDARD COVER



STANDARD COVER
WITH FLANGE ADAPTER
ON TOP 16-782C1
SEE ORDERING CODE



STANDARD COVER
WITH FLANGE ADAPTER
ON BOTTOM 16-782C1A
SEE ORDERING CODE



STANDARD COVER
WITH DIN ADAPTER
16-782C
SEE ORDERING CODE

Mating Sockets

70-782D-1, 70-461-1,
70-459-1: SCREW/DIN
70-379-1, 70-378-1: SOLDER
70-401-1, 70-402-1:
PRINTED CIRCUIT

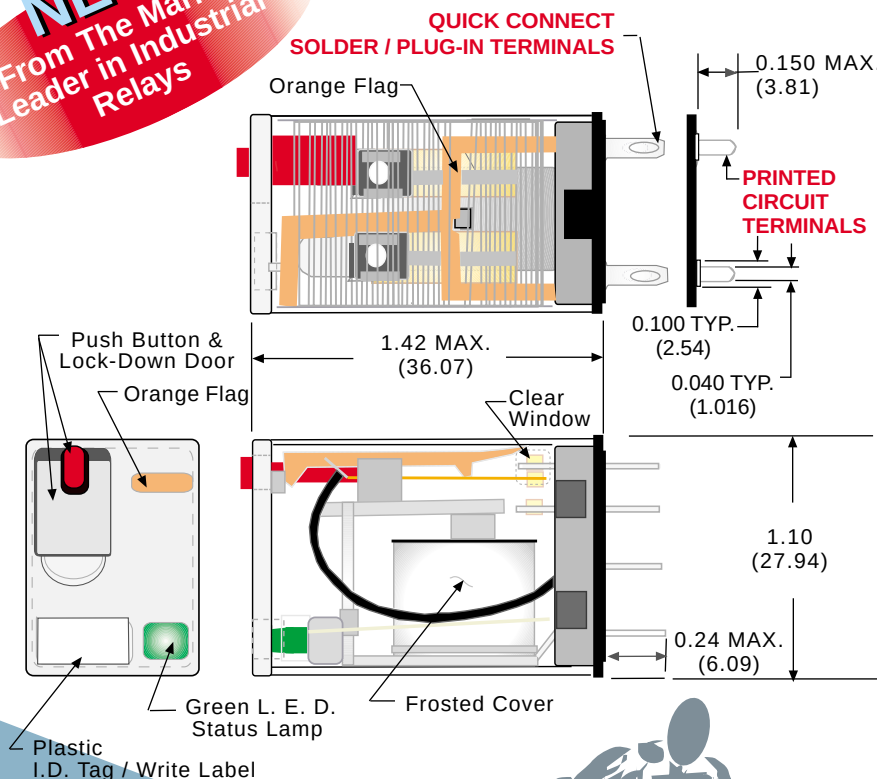
See section 8, page 13, 14, 15



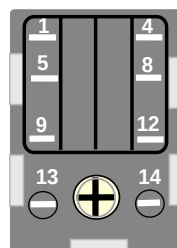
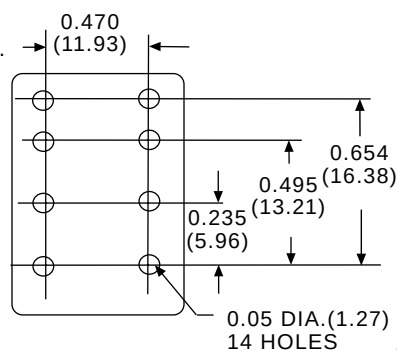
DPDT, 3 & 10 AMPS

NEW
From The Market
Leader in Industrial
Relays

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

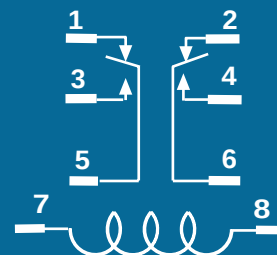


**PRINTED CIRCUIT
MOUNTING HOLE LAYOUT
(BOTTOM VIEW)**



AVAILABLE WITHOUT
LOCK-DOWN DOOR: CODE "M"

**WIRING DIAGRAM
(VIEWED FROM PIN END)**



ORDERING CODE FOR RELAYS

782 **XBX** **2** **M4L -120A**

CLASS: _____

CONTACT CONFIGURATION: _____
DPDT: XBX

TERMINAL STYLE: _____
QUICK CONNECTSOLDER/
PLUG-IN TERMINALS: **NO CODE**
PRINTED CIRCUIT TERMINALS: **CODE T**

CONTACT RATING: _____
3 AMP: **CODE 1**
10 AMP: **CODE 2**
3 AMP BIFURCATED CONTACT: **CODE 3**

OPTIONS: _____
DIN RAIL FLANGE ADAPTER (TOP MOUNTED ONLY): **CODE C**
TOP OR BOTTOM FLANGE ADAPTER
(TOP MOUNTED): **CODE C1**
TOP OR BOTTOM FLANGE ADAPTER
(BOTTOM MOUNTED): **CODE C1A**

STANDARD FEATURES: _____
PUSH BUTTON & LOCK-DOWN DOOR: **CODE M4**
L.E.D. STATUS LAMP: **CODE L**

OPTIONAL FEATURES: _____
PUSH BUTTON WITHOUT LOCK-DOWN DOOR: **CODE M**

COIL VOLTAGE: _____
6, 12, 24, 120, 220/230, 240 **ADD "A" FOR AC COILS**
6, 12, 24, 110 **ADD "D" FOR DC COILS**

BI - POLAR
L.E.D. STATUS LAMP
ALLOWS FOR REVERSE
POLARITY APPLICATIONS

**STANDARD
PART NUMBERS
DPDT**

AC OPERATED - SOLDER/PLUG-IN, 10 AMP

782XBX2M4L-24A	24 VAC, 50/60Hz	72 Ω
782XBX2M4L-120A	120 VAC, 50/60Hz	1,700 Ω
782XBX2M4L-240A	240 VAC, 50/60HZ	9,100 Ω

DC OPERATED - SOLDER/PLUG-IN, 10 AMP

782XBX2M4L-12D	12 VDC	120 Ω
782XBX2M4L-24D	24 VDC	470 Ω
782XBX2M4L-110D	110 VDC	10,000 Ω

AC OPERATED - SOLDER/PLUG-IN, 3 AMP, BIFURCATED

782XBX3M4L-24A	24 VAC, 50/60Hz	72 Ω
782XBX3M4L-120A	120 VAC, 50/60Hz	1,700 Ω
782XBX3M4L-240A	240 VAC, 50/60HZ	9,100 Ω

DC OPERATED - SOLDER/PLUG-IN, 3 AMP, BIFURCATED

782XBX3M4L-12D	12 VDC	120 Ω
782XBX3M4L-24D	24 VDC	470 Ω
782XBX3M4L-110D	110 VDC	10,000 Ω

COIL MEASURED @ 25°C

**NOMINAL
INPUT
VOLTAGE**

**NOMINAL
RESISTANCE
(OHMS)**

RETROFITS SCHRACK PT.
SEE END OF SECTION 1 FOR CROSS REFERENCE
CADMIUM-FREE CONTACTS AVAILABLE,
CONTACT FACTORY FOR DETAILS

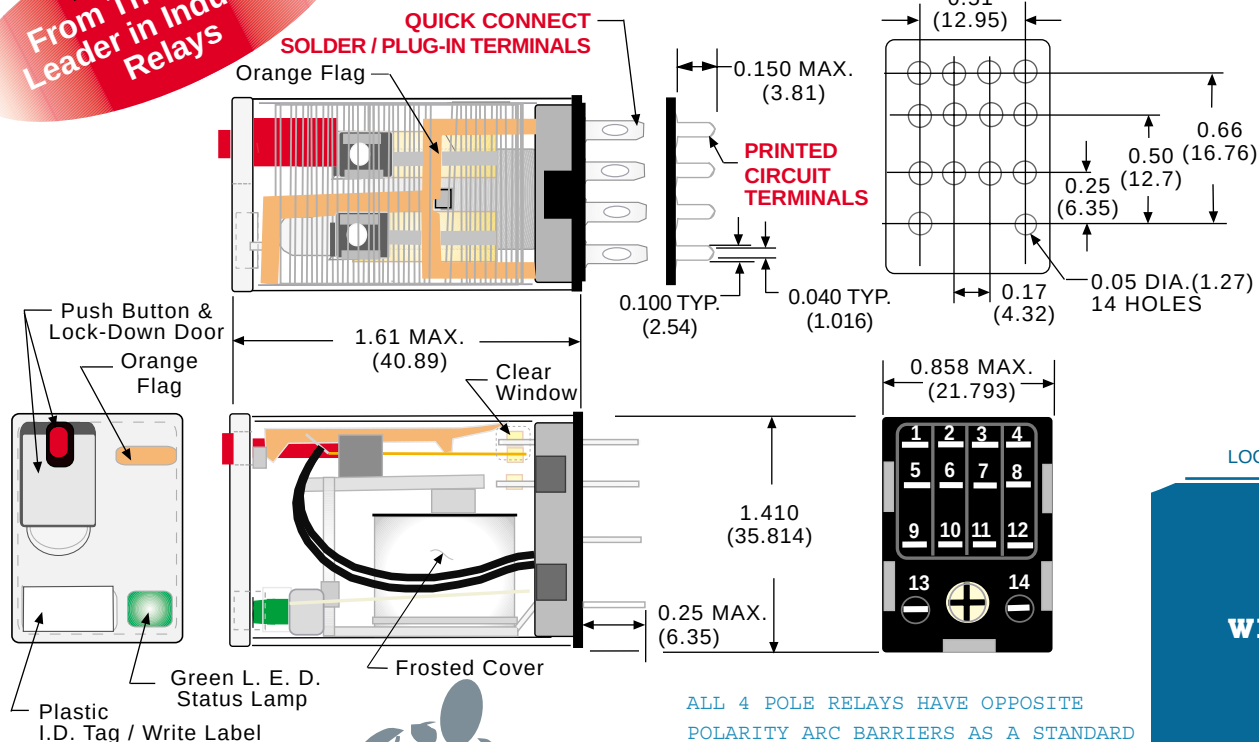
NEW
From The Market
Leader in Industrial
Relays

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

**PRINTED CIRCUIT
MOUNTING HOLE LAYOUT
(BOTTOM VIEW)**

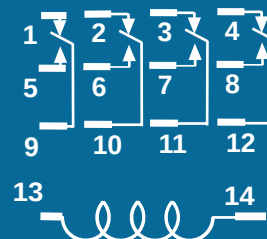
4PDT, 3 & 10 AMPS



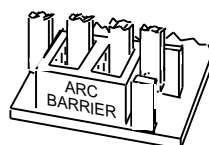
AVAILABLE WITHOUT
LOCK-DOWN DOOR: CODE "M"

WIRING DIAGRAM

(VIEWED FROM PIN END)



ALL 4 POLE RELAYS HAVE OPPOSITE
POLARITY ARC BARRIERS AS A STANDARD
FEATURE TO PROVIDE GREATER VOLTAGE
PROTECTION BETWEEN ADJACENT POLES



ORDERING CODE FOR RELAYS

**BI - POLAR
L.E.D. STATUS LAMP
ALLOWS FOR REVERSE
POLARITY APPLICATIONS**

782 XDX M4L- 120A

CLASS: _____

CONTACT CONFIGURATION: _____

4PDT: XDX

TERMINAL STYLE: _____
 QUICK CONNECTSOLDER/
 PLUG-IN TERMINALS: **NO CODE**
 PRINTED CIRCUIT TERMINALS: **CODE T**

CONTACT RATING: _____
 3 AMP: **CODE 1**
 10 AMP: **CODE 2**
 3 AMP BIFURCATED CONTACT: **CODE 3**

OPTIONS: _____

DIN RAIL FLANGE ADAPTER (TOP MOUNTED ONLY): **CODE C**

TOP OR BOTTOM FLANGE ADAPTER
(TOP MOUNTED): **CODE C1**

TOP OR BOTTOM FLANGE ADAPTER
(BOTTOM MOUNTED): **CODE C1A**

STANDARD FEATURES: _____
 PUSH BUTTON & LOCK-DOWN DOOR: **CODE M4**
 L.E.D. STATUS LAMP: **CODE L**

OPTIONAL FEATURES: _____
PUSH BUTTON WITHOUT LOCK-DOWN DOOR: **CODE M**

COIL VOLTAGE: 6, 12, 24, 120, 220/230, 240 ADD "A" FOR AC COILS
6, 12, 24, 110, 49 ADD "D" FOR DC COILS

STANDARD PART NUMBERS 4PDT

AC OPERATED - Q. C. SOLDER/PLUG-IN, 3 AMP

782XDX1M4L-24A	24 VAC, 50/60Hz	72 Ω
782XDX1M4L-120A	120 VAC, 50/60Hz	1,700 Ω
782XDX1M4L-240A	240 VAC, 50/60HZ	9,100 Ω

DC OPERATED - Q. C. SOLDER/PLUG-IN, 3 AMP

782XDX1M4L-12D	12 VDC	120 Ω
782XDX1M4L-24D	24 VDC	470 Ω
782XDX1M4L-110D	110 VDC	10,000 Ω

AC OPERATED - SOLDER/PLUG-IN, 10 AMP

782XDX2M4L-24A	24 VAC, 50/60Hz	72 Ω
782XDX2M4L-120A	120 VAC, 50/60Hz	1,700 Ω
782XDX2M4L-240A	240 VAC, 50/60HZ	9,100 Ω

DC OPERATED - SOLDER/PLUG-IN, 10 AMP

782DXD2M4L-12D	12 VDC	120 Ω
782DXD2M4L-24D	24 VDC	470 Ω
782DXD2M4L-110D	110 VDC	10,000 Ω

AC OPERATED - SOLDER/PLUG-IN, 3 AMP, BIFURCATED

782XDX3M4L-24A	24 VAC, 50/60Hz	72 Ω
782XDX3M4L-120A	120 VAC, 50/60Hz	1,700 Ω
782XDX3M4L-240A	240 VAC, 50/60HZ	9,100 Ω

DC OPERATED - SOLDER/PLUG-IN, 3 AMP, BIFURCATED

782DXD3M4L-12D	12 VDC	120 Ω
782DXD3M4L-24D	24 VDC	470 Ω
782DXD3M4L-110D	110 VDC	10,000 Ω

COIL MEASURED @ 25°C

**NOMINAL
INPUT
VOLTAGE**

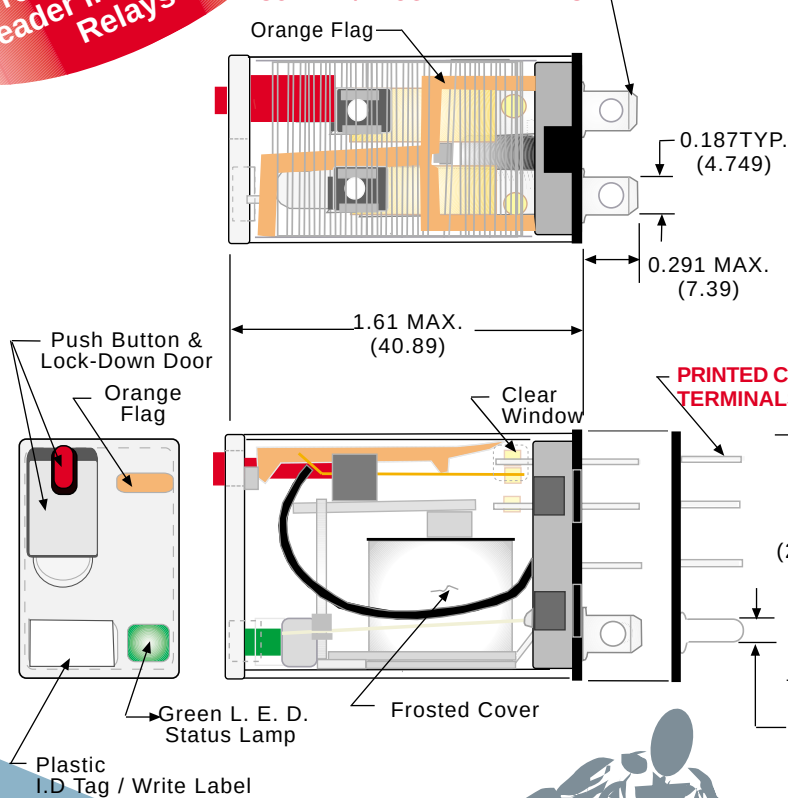
**NOMINAL
RESISTANCE
(OHMS)**

NEW
From The Market
Leader in Industrial
Relays

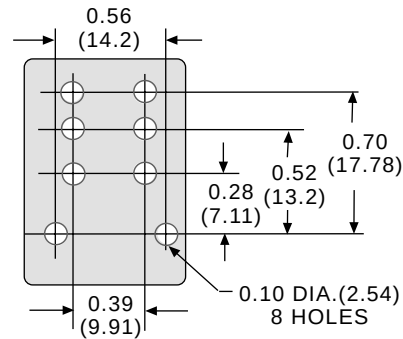
OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

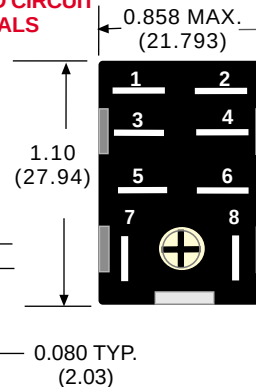
QUICK CONNECT SOLDER / PLUG-IN TERMINALS



PRINTED CIRCUIT MOUNTING HOLE LAYOUT (BOTTOM VIEW)



PRINTED CIRCUIT TERMINALS



DPDT, 15 AMPS



AVAILABLE WITHOUT
LOCK-DOWN DOOR: CODE "M"

ORDERING CODE FOR RELAYS

CLASS: 782

CONTACT CONFIGURATION: XBX
DPDT: XBX

TERMINAL STYLE: M4L-120A
QUICK CONNECT SOLDER/
PLUG-IN TERMINALS: NO CODE
PRINTED CIRCUIT TERMINALS: CODE T

OPTIONS:
DIN RAIL FLANGE ADAPTER
(TOP MOUNTED ONLY): CODE C
TOP OR BOTTOM FLANGE ADAPTER
(TOP MOUNTED): CODE C1
TOP OR BOTTOM FLANGE ADAPTER
(BOTTOM MOUNTED): CODE C1A

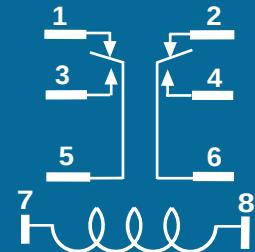
STANDARD FEATURES:
PUSH BUTTON & LOCK-DOWN DOOR: CODE M4
L. E. D. STATUS LAMP: CODE L

OPTIONAL FEATURES:
PUSH BUTTON WITHOUT LOCK-DOWN DOOR: CODE M

COIL VOLTAGE:
6, 12, 24, 120, 220/230, 240 ADD "A" FOR AC COILS
6, 12, 24, 48, 110 ADD "D" FOR DC COILS

BI - POLAR
L.E.D. STATUS LAMP
ALLOWS FOR REVERSE
POLARITY APPLICATIONS

WIRING DIAGRAM (VIEWED FROM PIN END)



COIL MEASURED @ 25°C

STANDARD PART NUMBERS DPDT	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED - SOLDER/PLUG-IN, 15 AMP		
782XBX M4L-24A	24 VAC, 50/60Hz	72 Ω
782XBX M4L-120A	120 VAC, 50/60Hz	1,700 Ω
782XBX M4L-240A	240 VAC, 50/60Hz	9,100 Ω
DC OPERATED - SOLDER/PLUG-IN, 15 AMP		
782XBX M4L-12D	12 VDC	120 Ω
782XBX M4L-24D	24 VDC	470 Ω
782XBX M4L-110D	110 VDC	10,000 Ω

RETROFITS SCHRACK PT.
SEE END OF SECTION 1 FOR CROSS REFERENCE

3PDT, 15 AMPS**FEATURES****BENEFITS****FLAG INDICATOR:**

SHOWS RELAY STATUS IN MANUAL OR POWERED CONDITION.

L.E.D. STATUS LAMP:

SHOWS COIL "ON" OR "OFF" STATUS. IDEAL IN LOW LIGHT CONDITIONS.

PUSH BUTTON:

ALLOWS FOR MANUAL OPERATION OF RELAY WITHOUT THE NEED FOR COIL POWER. IDEAL FOR FIELD SERVICE PERSONNEL TO TEST CONTROL CIRCUITS.

LOCK-DOWN DOOR:

WHEN ACTIVATED, HOLDS PUSH BUTTON AND CONTACTS IN THE OPERATE POSITION. EXCELLENT FOR ANALYZING CIRCUIT PROBLEMS.

FINGER-GRIP COVER:

ALLOWS OPERATOR TO REMOVE RELAYS FROM SOCKETS MORE EASILY THAN CONVENTIONAL RELAYS.

I.D. TAG/WRITE LABEL:

USED FOR IDENTIFICATION OF RELAYS IN MULTI-RELAY CIRCUITS.

COVER ADAPTERS:

DIN RAIL FLANGE ADAPTER OR TOP/BOTTOM FLANGE ADAPTER, ALLOWS THE 783 RELAY TO BE DIRECT MOUNTED TO A DIN RAIL OR PANEL.

GENERAL SPECIFICATIONS**COIL**

Pull-in Voltage:	75% of nominal voltage or less for DC coils, 80% of nominal voltage or less for AC coils
Dropout Voltage:	DC-10% min. AC-30% min. of nominal voltage or more
Max. Voltage:	110%
Resistance:	±15% measured @ 25°C
Coil Power:	1.5 watts DC, 1.7 VA (60Hz) AC @ 25°C
Insulation System:	Class "B" (130°C per UL standard 1446)
Max. Coil Dissipation:	3.0 watts DC, 3.4 VA (60Hz) AC. @ 25°C
Duty:	Continuous

CONTACTS

Contact Material:	Solid silver cadmium oxide (gold flashed)
Contact Rating:	15 amps, 110 - 120 VAC 50/60Hz, 12 amps, 28 VDC (30 amps max.) 12 amps, 220 - 277 VAC 50/60Hz (20 amps max.) 1/2Hp @ 120 VAC, 3/4 Hp @ 250 VAC, B300 pilot duty
Contact Resistance:	50 milliohms maximum initial resistance

DIELECTRIC STRENGTH

Contacts to Coil:	2500 V rms
Across open Contacts:	1000 V rms
Pole to Pole:	2500 V rms
Contacts to Frame:	2500 V rms
Insulation Resistance:	100 megohms min. @ 500 VDC

TEMPERATURE

Operating:	-30°C to +70°C
Storage:	-30°C to +105°C

VIBRATION RESISTANCE

Functional:	6 g's, 10 to 55 Hz (0.6 mm double amplitude)
-------------	--

SHOCK RESISTANCE

Functional:	10 g's
-------------	--------

LIFE EXPECTANCY

Electrical:	150,000 operations @ rated resistive load
Mechanical:	10,000,000 operations @ no load

MISCELLANEOUS

Operating Position:	Any
Insulation Material:	Molded plastic
Enclosure:	Polycarbonate dust cover
Weight:	60 grams approx.

**STANDARD**
**STANDARD COVER
WITH FLANGE ADAPTER
ON TOP 16-783C1
SEE ORDERING CODE**

**STANDARD COVER
WITH FLANGE ADAPTER
ON BOTTOM 16-783C1A
SEE ORDERING CODE**

**STANDARD COVER
WITH DIN ADAPTER
16-783C
SEE ORDERING CODE**

Mating Sockets
70-783D-1: SCREW/DIN
 See section 8, page 21

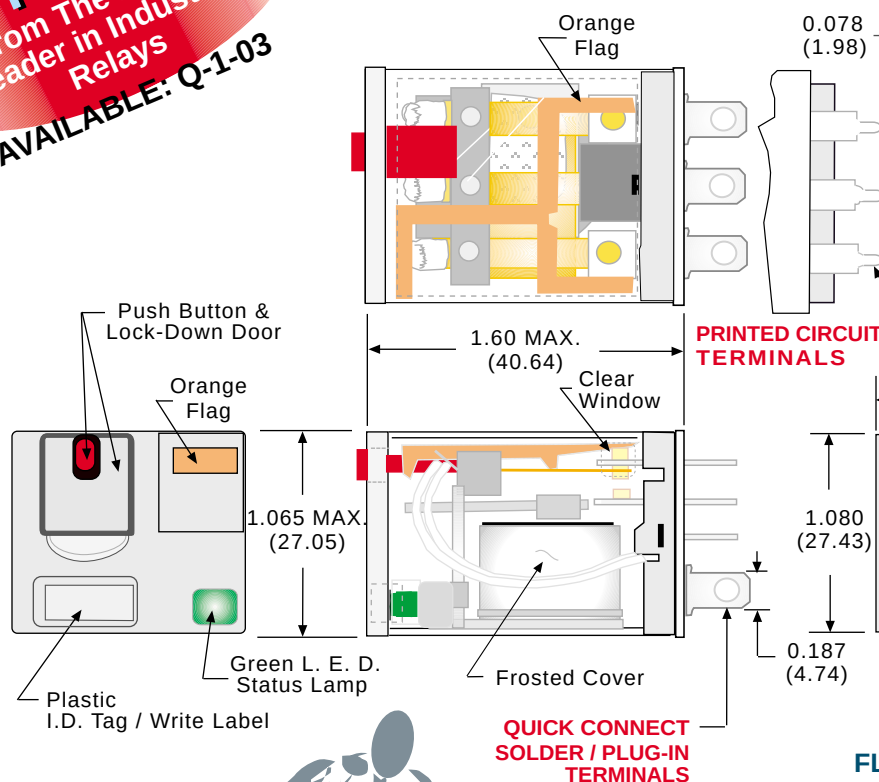


3PDT, 15 AMPS

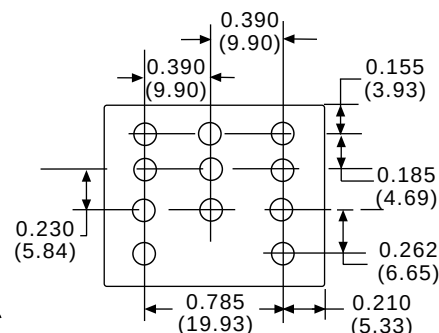
NEW
From The Market
Leader in Industrial
Relays
AVAILABLE: Q-1-03

OUTLINE DIMENSIONS

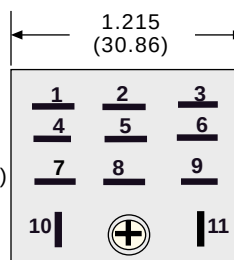
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



PRINTED CIRCUIT MOUNTING HOLE LAYOUT (BOTTOM VIEW)



PRINTED CIRCUIT TERMINALS



AVAILABLE WITHOUT
LOCK-DOWN DOOR: CODE "M"

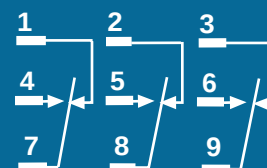
FLANGE ADAPTER 16-783C1



DIN ADAPTER 16-783C



WIRING DIAGRAM (VIEWED FROM PIN END)



11 12

ORDERING CODE FOR RELAYS

783 **XCX** **M4L -120A**

CLASS: _____

CONTACT CONFIGURATION: 3PDT: XCX

TERMINAL STYLE: _____
QUICK CONNECT SOLDER / PLUG-IN TERMINALS: NO CODE
PRINTED CIRCUIT TERMINALS: CODE T

OPTIONS: _____
TOP ADAPTER, DIN MOUNT: CODE C
TOP OR BOTTOM FLANGE ADAPTER (TOP MOUNTED): CODE C1
TOP OR BOTTOM FLANGE ADAPTER (BOTTOM MOUNTED): CODE C1A

STANDARD FEATURES: _____
PUSH BUTTON & LOCK DOWN DOOR: CODE M4
L.E.D. STATUS LAMP: CODE L

OPTIONAL FEATURES: _____
PUSH BUTTON WITHOUT LOCK-DOWN DOOR: CODE M

COIL VOLTAGE: _____
6, 12, 24, 120, 220/230, 240 ADD "A" FOR AC COILS
6, 12, 24, 48, 110 ADD "D" FOR DC COILS

COIL MEASURED @ 25°C

STANDARD PART NUMBERS	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED - SOLDER/PLUG-IN, 15 AMP		
783XCXM4L-24A	24 VAC, 50/60 Hz	84.5 Ω
783XCXM4L-120A	120 VAC, 50/60 Hz	2220 Ω
783XCXM4L-240A	240 VAC, 50/60 Hz	9120 Ω
DC OPERATED - SOLDER/PLUG-IN, 15 AMP		
783XCXM4L-12D	12 VDC	96 Ω
783XCXM4L-24D	24 VDC	380 Ω
783XCXM4L-110D	110 VDC	7340 Ω
AC OPERATED - PRINTED CIRCUIT, 15 AMP		
783XCXTM4L-120A	120 VAC, 50/60 Hz	2220 Ω
DC OPERATED - PRINTED CIRCUIT, 15 AMP		
783XCXTM4L-12D	12 VDC	96 Ω
783XCXTM4L-24D	24 VDC	388 Ω

4PDT, 15 AMPS**FEATURES****BENEFITS****FLAG INDICATOR:**

SHOWS RELAY STATUS IN MANUAL OR POWERED CONDITION.

L.E.D. STATUS LAMP:

SHOWS COIL "ON" OR "OFF" STATUS. IDEAL IN LOW LIGHT CONDITIONS.

PUSH BUTTON:

ALLOWS FOR MANUAL OPERATION OF RELAY WITHOUT THE NEED FOR COIL POWER. IDEAL FOR FIELD SERVICE PERSONNEL TO TEST CONTROL CIRCUITS.

LOCK-DOWN DOOR:

WHEN ACTIVATED, HOLDS PUSH BUTTON AND CONTACTS IN THE OPERATE POSITION. EXCELLENT FOR ANALYZING CIRCUIT PROBLEMS.

FINGER-GRIP COVER:

ALLOWS OPERATOR TO REMOVE RELAYS FROM SOCKETS MORE EASILY THAN CONVENTIONAL RELAYS.

I.D. TAG/WRITE LABEL:

USED FOR IDENTIFICATION OF RELAYS IN MULTI-RELAY CIRCUITS.

COVER ADAPTERS:

DIN RAIL FLANGE ADAPTER OR TOP/BOTTOM FLANGE ADAPTER, ALLOWS THE 784 RELAY TO BE DIRECT MOUNTED TO A DIN RAIL OR PANEL.

GENERAL SPECIFICATIONS**COIL**

Pull-in Voltage:	75% of nominal voltage or less for DC coils, 80% of nominal voltage or less for AC coils
Dropout Voltage:	DC-10% min. AC-30% min. of nominal voltage or more
Max. Voltage:	110%
Resistance:	±10% measured @ 25°C
Coil Power:	1.5 watts DC, 2.0 VA (60Hz) AC @ 25°C (4PDT)
Insulation System:	Class "B" (130°C per UL standard 1446)
Max. Coil Dissipation:	3.0 watts DC, 3.4 VA (60Hz) AC. @ 25°C
Duty:	Continuous.

CONTACTS

Contact Material:	Solid silver cadmium oxide (gold flashed)
Contact Rating:	15 amps, 110 - 120 VAC 50/60Hz, 12 amps, 28 VDC (30 amps max) 12 amps, 220 - 277 VAC 50/60Hz (20 amps max) 1/2Hp @ 120 VAC, 3/4 Hp @ 250 VAC, B300 pilot duty
Contact Resistance:	50 milliohms maximum initial resistance

DIELECTRIC STRENGTH

Contacts to Coil:	2500 V rms
Across open Contacts:	1000 V rms
Pole to Pole:	2500 V rms
Contacts to Frame:	2500 V rms
Insulation Resistance:	100 megohms min. @ 500 VDC

TEMPERATURE

Operating:	-30°C to +70°C
Storage:	-30°C to +105°C

VIBRATION RESISTANCE

Functional:	6 g's, 10 to 55 Hz (0.6 mm double amplitude)
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SHOCK RESISTANCE

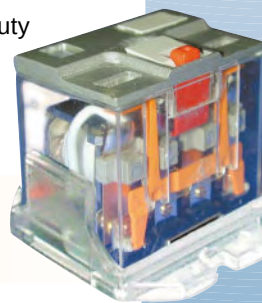
Functional:	10 g's
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LIFE EXPECTANCY

Electrical:	150,000 operations @ rated resistive load
Mechanical:	10,000,000 operations @ no load

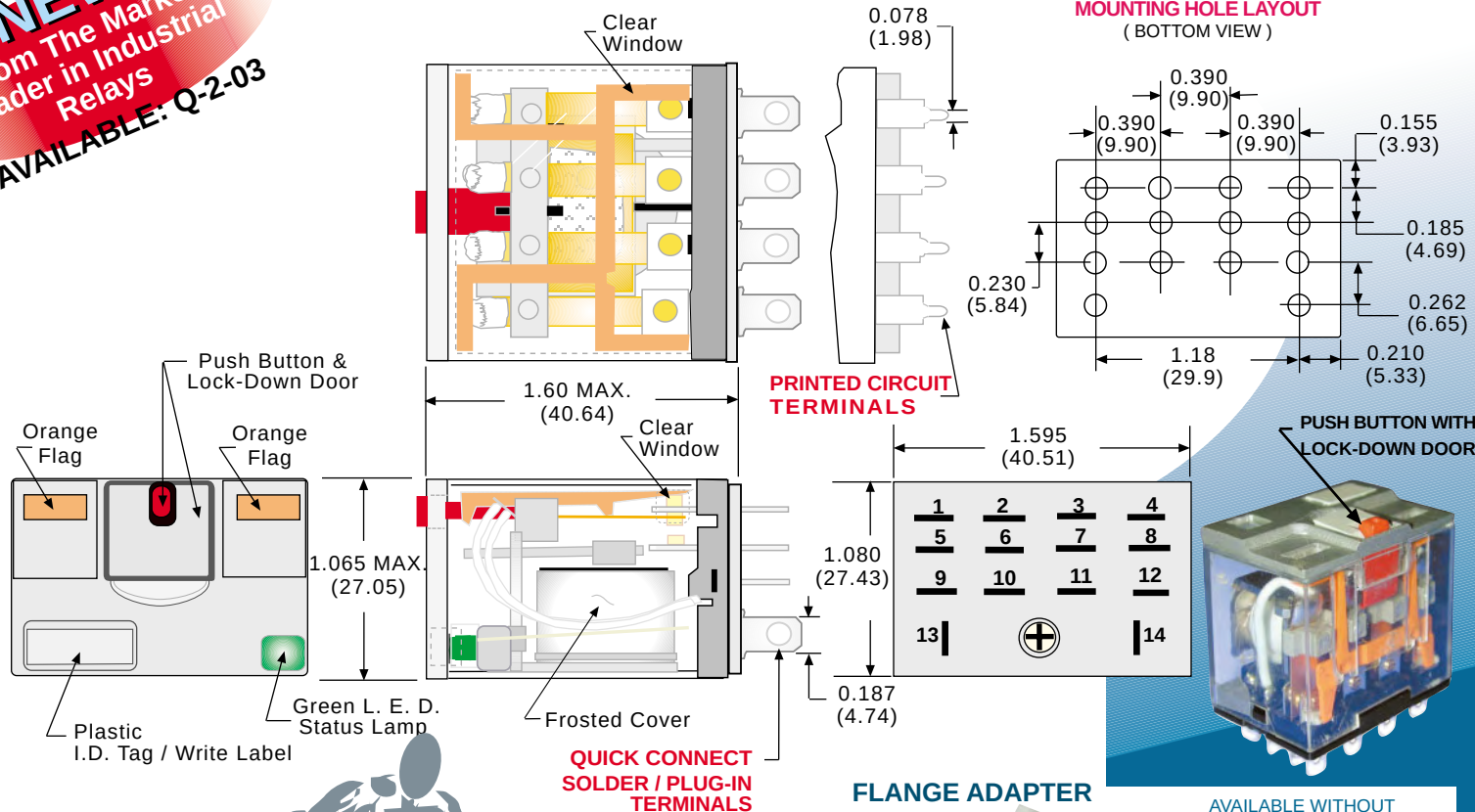
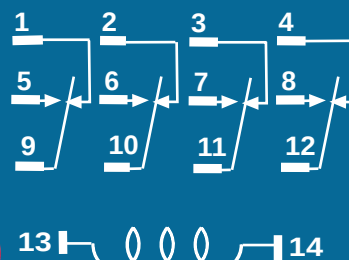
MISCELLANEOUS

Operating Position:	Any
Insulation Material:	Molded plastic
Enclosure:	Polycarbonate dust cover
Weight:	80 grams approx.

**STANDARD****STANDARD COVER
WITH FLANGE ADAPTER
ON TOP 16-784C1
SEE ORDERING CODE****MAY ALSO BE ORDERED SEPARATELY****STANDARD COVER
WITH FLANGE ADAPTER
ON BOTTOM 16-784C1A
SEE ORDERING CODE****MAY ALSO BE ORDERED SEPARATELY****STANDARD COVER
WITH DIN ADAPTER
16-784C
SEE ORDERING CODE****MAY ALSO BE ORDERED SEPARATELY**

Mating Sockets
70-784D-1: SCREW/DIN
 See section, 8 page 22



4PDT, 15 AMPS**OUTLINE DIMENSIONS**
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).**PRINTED CIRCUIT
MOUNTING HOLE LAYOUT**
(BOTTOM VIEW)**QUICK CONNECT
SOLDER / PLUG-IN
TERMINALS****FLANGE ADAPTER
16-784C1**AVAILABLE WITHOUT
LOCK-DOWN DOOR: CODE "M"BI - POLAR
L.E.D. STATUS LAMP
ALLOWS FOR REVERSE
POLARITY APPLICATIONS**DIN ADAPTER
16-784C****WIRING DIAGRAM**
(VIEWED FROM PIN END)**COIL MEASURED @ 25°C**

STANDARD PART NUMBERS	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED - SOLDER/PLUG-IN, 15 AMP		
784XDXM4L-24A	24 VAC, 50/60 Hz	84.5 Ω
784XDXM4L-120A	120 VAC, 50/60 Hz	2220 Ω
784XDXM4L-240A	240 VAC, 50/60 Hz	9120 Ω
DC OPERATED - SOLDER/PLUG-IN, 15 AMP		
784XDXM4L-12D	12 VDC	96 Ω
784XDXM4L-24D	24 VDC	380 Ω
784XDXM4L-110D	110 VDC	7340 Ω
AC OPERATED - PRINTED CIRCUIT, 15 AMP		
784XDXTM4L-120A	120 VAC, 50/60 Hz	2220 Ω
DC OPERATED - PRINTED CIRCUIT, 15 AMP		
784XDXTM4L-12D	12 VDC	96 Ω
784XDXTM4L-24D	24 VDC	388 Ω

ORDERING CODE FOR RELAYS

CLASS: 784

CONTACT CONFIGURATION: XDX
4PDT: XDX

TERMINAL STYLE: M4L -120A
QUICK CONNECT SOLDER / PLUG-IN
TERMINALS: NO CODE
PRINTED CIRCUIT TERMINALS: CODE T

OPTIONS:
TOP ADAPTER, DIN MOUNT: CODE C
TOP OR BOTTOM FLANGE ADAPTER
(TOP MOUNTED): CODE C1
TOP OR BOTTOM FLANGE ADAPTER
(BOTTOM MOUNTED): CODE C1A

STANDARD FEATURES:
PUSH BUTTON & LOCK DOWN DOOR: CODE M4
L.E.D. STATUS LAMP: CODE L

OPTIONAL FEATURES:
PUSH BUTTON WITHOUT LOCK-DOWN DOOR: CODE M

COIL VOLTAGE:
6, 12, 24, 120, 220/230, 240 ADD "A" FOR AC COILS
6, 12, 24, 48, 110 ADD "D" FOR DC COILS

GENERAL SPECIFICATIONS**COIL**

Pull-in Voltage :	75% of nominal voltage or less for DC coils, 80% of nominal voltage or less for AC coils
Dropout Voltage:	DC-10% min. AC-30% min. of nominal voltage or more
Max. Voltage :	110%
Resistance:	±15% measured @ 25°C
Coil Power:	0.9 - 1.1 watts DC., 1.0 - 1.2 VA (60Hz) AC. @ 25°C
Insulation System:	Class "B" (130°C per UL standard 1446)
Max. Coil Dissipation:	2.3 watts DC, 2.55 VA (60Hz) AC. 5 minutes max @ 40°C
Duty:	Continuous

CONTACTS

Contact Material:	3 amps bifurcated silver gold plated. 3 amps silver gold flashed, 5, 10 & 15 Amps, Silver cadmium oxide, gold flashed
Contact Rating:	SPDT: 15 Amps @ 120/240 VAC, 30 VDC, 1/3 Hp, 120 VAC. 1/2 Hp 240 VAC. DPDT: 10 Amps @120/240 VAC, 30 VDC. 1/3 Hp, 120 VAC. 1/2Hp 240 VAC 4PDT: Bifurcated 3 Amps @120/240 VAC, 30 VDC. 1/16 Hp (2.8 amps FLA), 120 VAC. Pilot duty - 5 amps make, 1/2 amps break, 3 amps continuous, 120 VAC. 4PDT: 3 amps @ 120 VAC, 30 VDC 1/10 Hp 120/240 VAC, C300 pilot duty 4PDT: 5 amps @ 120/240 VAC, 30 VDC 1/6 Hp 120/240 VAC, C300 pilot duty

DIELECTRIC STRENGTH

Coil To Frame:	1500 V rms
Across Open Contacts:	1000 V rms
Contacts To Frame:	1500 V rms
Insulation Resistance:	100 megohms @ 500 VDC

TEMPERATURE

Operating:	-40°C to +70°C
Storage:	-40°C to +105°C

VIBRATION RESISTANCE

Functional:	5 g, 10 to 55 Hz; 1 mm (double amplitude)
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SHOCK RESISTANCE

Functional:	20 g
Mechanical:	100 g

LIFE EXPECTANCY

Electrical:	200,000 operations @ rated resistive load
Mechanical:	10,000,000 operations @ no load

MISCELLANEOUS

Operating Position:	Any
Insulation Material:	Molded plastic
Enclosure:	Polycarbonate dust cover
Weight:	SPDT & DPDT 35 grams approx

**SPDT, DPDT & 4PDT,
3, 5, 10 & 15 AMPS**

UL **us**
UL Recognized
File No. E52197



LISTED 367G
IND. CONT. EQ.

C US
WHEN USED
WITH SOCKETS
70-459-1 OR 70-461-1

CURRENT LIMITED TO
RATING OF RELAY OR
SOCKET WHICHEVER
IS LESS.



COMPLIES WITH REQUIREMENTS OF

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

* IEC = INTERNATIONAL
ELECTROTECHNICAL COMMISSION

* CE TESTING AND EVALUATION
PERFORMED BY THE UNDERWRITERS
LABORATORIES AS A THIRD PARTY
PARTICIPANT

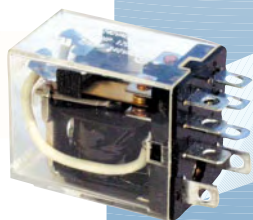
**MANUFACTURED UNDER
ISO 9002 & QS 9000**



**4PDT, QUICK
CONNECT
SOLDER/PLUG-IN**



**4PDT, PRINTED CIRCUIT
3, 5 OR 10 AMP**



**SPDT, DPDT, QUICK CONNECT
SOLDER/PLUG-IN
15 AMP**

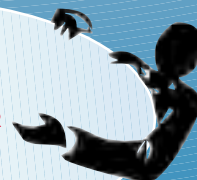


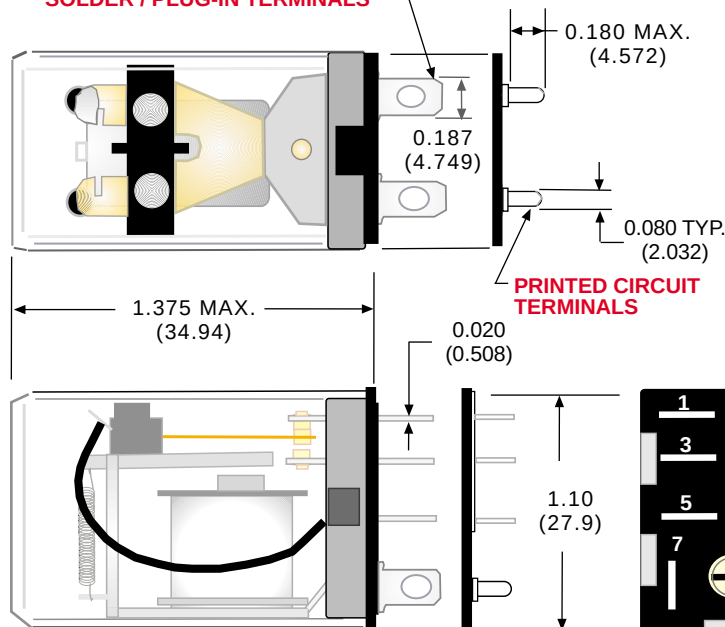
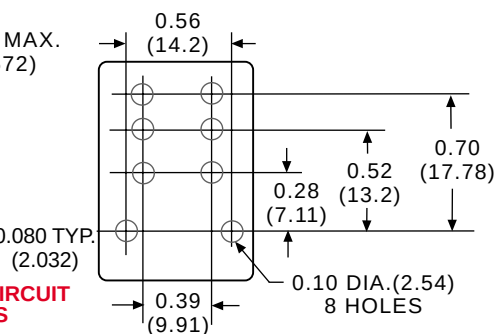
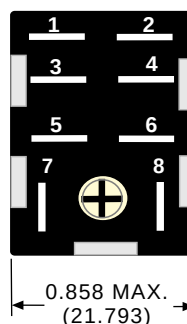
**SPDT, DPDT, PRINTED CIRCUIT
10 OR 15 AMP**

Mating Sockets

**70-782D-1, 70-459-1,
70-461-1: SCREW/DIN
70-401-1, 70-378-1: SOLDER
70-402-1, 70-379-1:
PRINTED CIRCUIT**

See section 8, page 13, 14, 15, 20



SPDT, 15 AMPS**OUTLINE DIMENSIONS**
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).**QUICK CONNECT
SOLDER / PLUG-IN TERMINALS****PRINTED CIRCUIT
MOUNTING HOLE LAYOUT**
(BOTTOM VIEW)**PRINTED CIRCUIT
TERMINALS****DIN ADAPTER
16-782C****FLANGE ADAPTER
16-782C1**

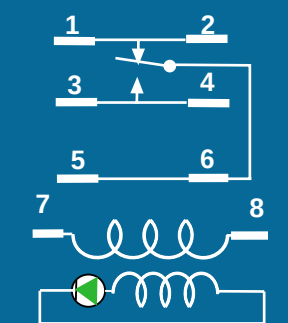
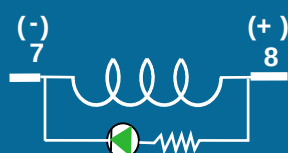
NEW SLOTTED PLAIN COVER, ALLOWS FOR INSTALLATION OF THE OPTIONAL TOP MOUNT DIN OR TOP/BOTTOM MOUNT FLANGE ADAPTERS. ADAPTERS ORDERED SEPARATELY



**OBSERVE POLARITY
WHEN L.E.D. STATUS LAMP
IS INSTALLED ACROSS COIL
(DC STYLES TYPICAL)**

WIRING DIAGRAMS

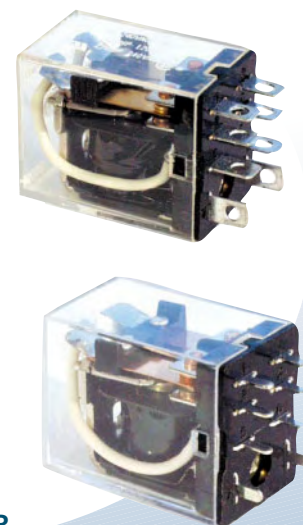
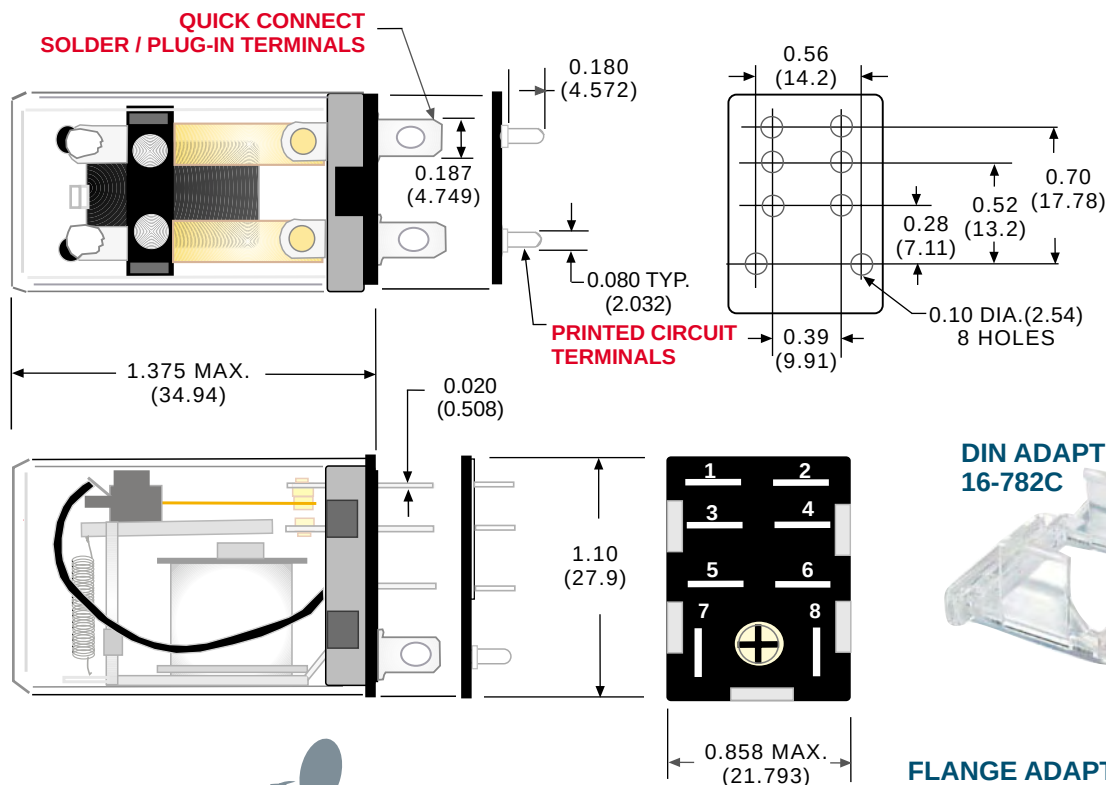
(VIEWED FROM PIN END)

**AC STYLES****DC STYLES****COIL MEASURED @ 25°C**

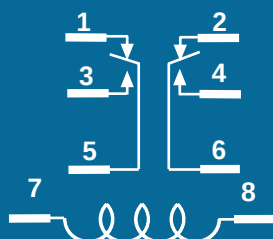
STANDARD PART NUMBERS SPDT	TOP FLANGE COVER	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED - SOLDER/PLUG-IN, 15 AMP			
W78ARCSX-108	78ARCSX-33	12 VAC, 50/60 Hz	46 Ω
W78ARCSX-109	78ARCSX-34	24VAC, 50/60 Hz	180 Ω
W78ARCSX-111	78ARCSX-36	120 VAC, 50/60 Hz	4430 Ω
W78ARCSX-112	78ARCSX-37	240 VAC, 50/60 Hz	15,700 Ω
AC OPERATED - SOLDER/PLUG-IN WITH INDICATOR LAMP, 15 AMP			
W78ARNCSX-8		24 VAC, 50/60 Hz	180 Ω
W78ARNCSX-9		120VAC, 50/60 Hz	4430 Ω
W78ARNCSX-10		240 VAC, 50/60 Hz	15,700 Ω
DC OPERATED - SOLDER/PLUG-IN, 15 AMP			
W78RCSX-96	78RCSX-31	6 VDC	40 Ω
W78RCSX-97	78RCSX-32	12 VDC	160 Ω
W78RCSX-98	78RCSX-33	24VDC	650 Ω
W78RCSX-100	78RCSX-35	110 VDC	11,000 Ω
DC OPERATED - SOLDER/PLUG-IN WITH INDICATOR LAMP, 15 AMP			
W78RNCSX-10		24 VDC	650 Ω
AC OPERATED - PRINTED CIRCUIT TERMINAL, 15 AMP			
W78ARPCX-81		12 VDC	46 Ω
W78ARPCX-82		24 VDC	180 Ω
W78ARPCX-84		110 VDC	4430 Ω
DC OPERATED - PRINTED CIRCUIT TERMINAL, 15 AMP			
W78RPCX-79		12 VDC	160 Ω
W78RPCX-83		24 VDC	650 Ω
W78RPCX-85		110 VDC	11,000 Ω

DPDT, 10 AMPS**OUTLINE DIMENSIONS**

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

**PRINTED CIRCUIT
MOUNTING HOLE LAYOUT
(BOTTOM VIEW)**

NEW SLOTTED PLAIN COVER, ALLOWS FOR INSTALLATION OF THE OPTIONAL TOP MOUNT DIN OR TOP/BOTTOM MOUNT FLANGE ADAPTERS. ADAPTERS ORDERED SEPARATELY

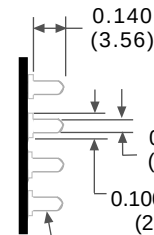
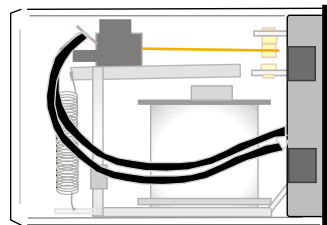
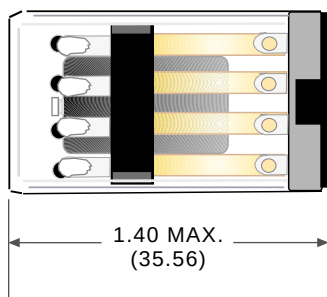
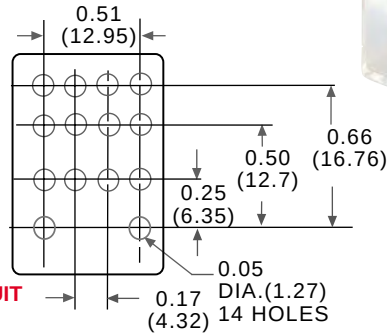
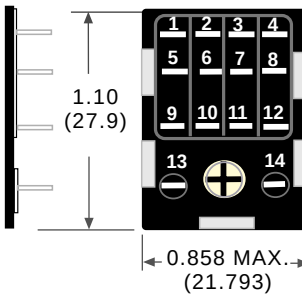
**WIRING DIAGRAM
(VIEWED FROM PIN END)****COIL MEASURED @ 25°C**

STANDARD PART NUMBERS DPDT	TOP FLANGE COVER	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED - SOLDER/PLUG-IN, 10 AMP			
W78ARCSX-7	78ARCSX-1	6 VAC, 50/60 Hz	12.2 Ω
W78ARCSX-9	78ARCSX-3	24VAC, 50/60 Hz	180 Ω
W78ARCSX-11	78ARCSX-5	120 VAC, 50/60 Hz	4430 Ω
W78ARCSX-12	78ARCSX-6	240 VAC, 50/60 Hz	15,700 Ω
DC OPERATED - SOLDER/PLUG-IN, 10 AMP			
W78RCSX-6	78RCSX-1	6 VDC	40 Ω
W78RCSX-7	78RCSX-2	12 VDC	160 Ω
W78RCSX-8	78RCSX-3	24VDC	650 Ω
W78RCSX-9	78RCSX-4	48 VDC	2,600 Ω
W78RCSX-10	78RCSX-5	110 VDC	11,000 Ω
AC OPERATED - PRINTED CIRCUIT. TERMINAL, 10 AMP			
W78ARPCX-5		120 VAC, 50/60 Hz	4430 Ω
W78ARPCX-6		240 VAC, 50/60 Hz	15,700 Ω
DC OPERATED - PRINTED CIRCUIT. TERMINAL, 10 AMP			
W78RPCX-1		6VDC	40 Ω
W78RPCX-2		12 VDC	160 Ω
W78RPCX-3		24 VDC	650 Ω

RETROFITS POTTER & BRUMFIELD K10.
SEE END OF SECTION 1 FOR CROSS REFERENCE

4PDT, 3 & 5 AMPS**OUTLINE DIMENSIONS**

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

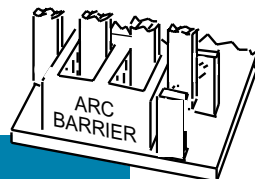
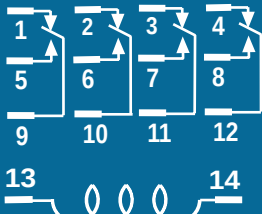
**PRINTED CIRCUIT
MOUNTING HOLE LAYOUT**
(BOTTOM VIEW)**QUICK CONNECT
SOLDER / PLUG-IN
TERMINALS****PRINTED CIRCUIT
TERMINALS****DIN ADAPTER
16-782C****FLANGE ADAPTER
16-782C1**

NEW SLOTTED PLAIN COVER,
ALLOWS FOR INSTALLATION OF
THE OPTIONAL TOP MOUNT DIN
OR TOP/BOTTOM MOUNT FLANGE
ADAPTERS. ADAPTERS ORDERED
SEPARATELY



SEE CLASS 782XDX FOR
PART NUMBERS WITH
L.E.D. STATUS LAMP
AND PUSH BUTTON

**ALL 4 POLE RELAYS HAVE
OPPOSITE POLARITY ARC
BARRIERS AS A STANDARD
FEATURE TO PROVIDE
GREATER VOLTAGE
PROTECTION BETWEEN
ADJACENT POLES**

**WIRING DIAGRAM**
(VIEWED FROM PIN END)

STANDARD PART NUMBERS 4PDT	TOP FLANGE COVER	COIL MEASURED @ 25°C	
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED - SOLDER/PLUG-IN, 3 AMP, BIFURCATED			
W78ATCSX-2	78ATCSX-8	12 VAC, 50/60 Hz	46 Ω
W78ATCSX-3	78ATCSX-9	24 VAC, 50/60 Hz	180 Ω
W78ATCSX-5	78ATCSX-11	120 VAC, 50/60 Hz	4430 Ω
W78ATCSX-6	78ATCSX-12	240 VAC, 50/60 Hz	15, 700 Ω
DC OPERATED - SOLDER/PLUG-IN, 3 AMP, BIFURCATED			
W78TCSX-1	78TCSX-6	6 VDC	40 Ω
W78TCSX-2	78TCSX-7	12 VDC	160 Ω
W78TCSX-3	78TCSX-8	24 VDC	650 Ω
W78TCSX-5	78TCSX-10	110 VDC	11,000 Ω
AC OPERATED - SOLDER/PLUG-IN, 3 AMP			
W78ACSX-2	78ACSX-9	12 VAC, 50/60 Hz	46 Ω
W78ACSX-3	78ACSX-10	24 VAC, 50/60 Hz	180 Ω
W78ACSX-5	78ACSX-12	120 VAC, 50/60 Hz	4430 Ω
W78ACSX-6	78ACSX-13	240 VAC, 50/60 Hz	15, 700 Ω
DC OPERATED - SOLDER/PLUG-IN, 3 AMP			
W78CSX-1	78CSX-8	6 VDC	40 Ω
W78CSX-2	78CSX-9	12 VDC	160 Ω
W78CSX-3	78CSX-10	24 VDC	650 Ω
W78CSX-6	78CSX-12	110 VDC	11,000 Ω
AC OPERATED PRINTED CIRCUIT, 3 AMP			
W78APCX-3		24 VAC, 50/60 Hz	180 Ω
W78APCX-5		120 VAC, 50/60 Hz	4430 Ω
DC OPERATED PRINTED CIRCUIT, 3 AMP			
W78PCX-2		12 VDC	160 Ω
W78PCX-3		24 VDC	650 Ω
W78PCX-6		110 VDC	11,000 Ω
AC OPERATED - SOLDER/PLUG-IN, 5 AMP			
W78KACSX-15		24 VAC, 50/60 Hz	180 Ω
W78KACSX-17		120 VAC, 50/60 Hz	4430 Ω
W78KACSX-18		240 VAC, 50/60 Hz	15, 700 Ω
DC OPERATED - SOLDER/PLUG-IN, 5 AMP			
W78KCSX-12		12 VDC	160 Ω
W78KCSX-13		24 VDC	650 Ω

RETROFITS POTTER & BRUMFIELD KHAU.
SEE END OF SECTION 1 FOR CROSS REFERENCE

3PDT & 4PDT, 10 AMPS

UL **us**
UL Recognized
File No. E52197

SP 40787

CE

COMPLIES WITH REQUIREMENTS OF

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

* IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION

* CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

GENERAL SPECIFICATIONS

COIL

Pull-in Voltage:	80% of nominal voltage or less for DC coils 85% of nominal voltage or less for AC coils
Dropout Voltage:	DC-10% min. AC-30% min. of nominal voltage or more
Max. Voltage:	110%
Resistance:	±10% measured @ 25°C
Coil Power:	1.4 watts DC, 2 VA (60Hz) AC @ 25°C (3PDT) 1.5 watts DC, 2.5 VA (60Hz) AC @ 25°C. (4PDT)
Insulation System:	Class "B" (130°C per UL standard 1446)
Max. Coil Dissipation:	3.0 watts DC, 3.4 VA (60Hz) AC. @ 25°C
Duty:	Continuous.

CONTACTS

Contact Material:	Silver cadmium oxide
Contact Rating:	10 Amps, 250 VAC 50/60Hz, 10 amps, 28 VDC
Contact Resistance:	50 milliohms maximum initial resistance

DIELECTRIC STRENGTH

Contacts to Coil:	1500 V rms
Across open Contacts:	1000 V rms
Pole to Pole:	1500 V rms
Contacts to Frame:	1500 V rms
Insulation Resistance:	100 megohms min. @ 500 VDC

TEMPERATURE

Operating:	-25°C to +40°C
Storage:	-25°C to +100°C

VIBRATION RESISTANCE

Functional:	5 g's, 10 to 55 Hz (1.5mm double amplitude)
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SHOCK RESISTANCE

Functional:	10 g's
Mechanical:	100 g's

LIFE EXPECTANCY

Electrical:	100,000 operations @ rated resistive load
Mechanical:	20,000,000 operations @ no load

MISCELLANEOUS

Operating Position:	Any
Insulation Material:	Molded plastic
Enclosure:	Polycarbonate dust cover
Weight:	50 grams for 3PDT, 70 grams for 4PDT approx.

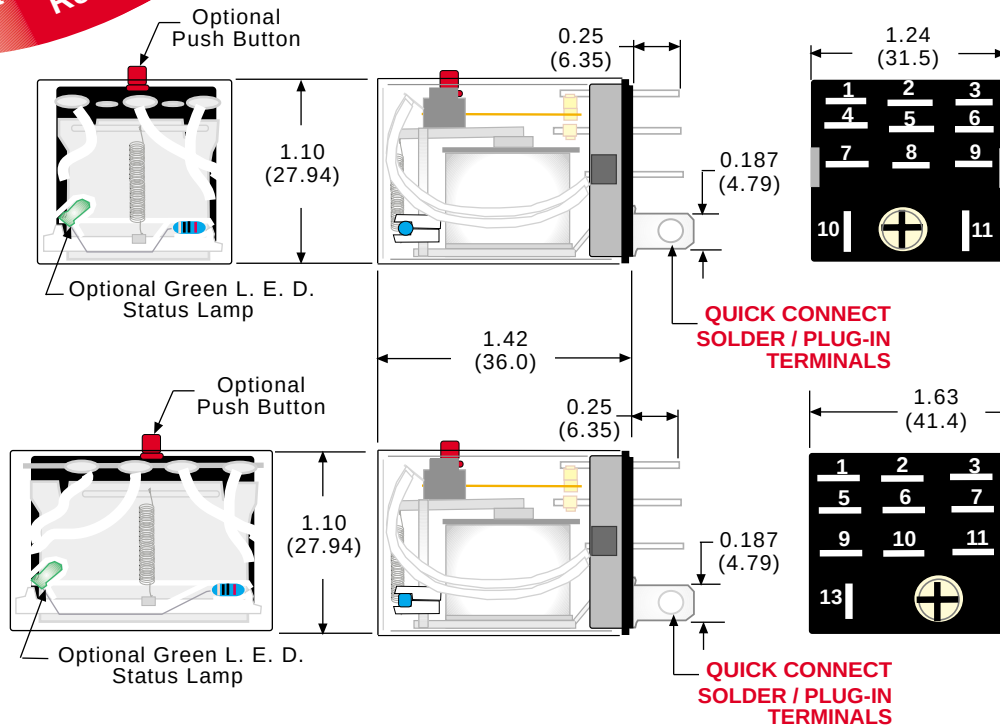


Mating Sockets
(3PDT) 70-78C-1: SCREW
(4PDT) 70-78D-1: SCREW
See section 8, page 23, 24

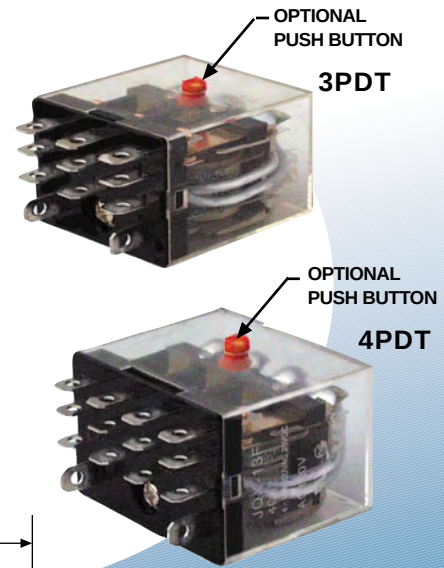


NEW
From The Market
Leader in Industrial
Relays

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

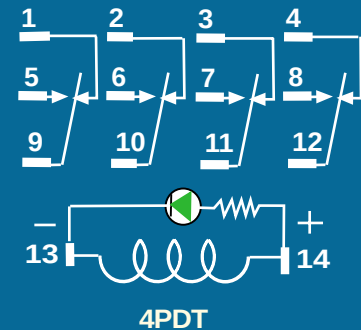
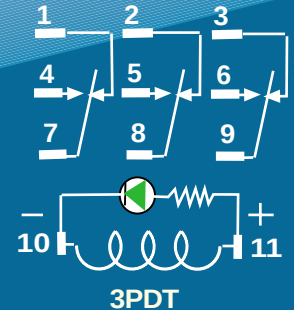


3PDT & 4PDT, 10 AMPS



AVAILABLE WITH TOP FLANGE COVER

WIRING DIAGRAMS
(VIEWED FROM PIN END)



OBSERVE POLARITY
WHEN L.E.D. STATUS LAMP
IS INSTALLED ACROSS COIL
(DC STYLES TYPICAL)

ORDERING CODE FOR RELAYS

78 **XCX** **-120A**

CLASS: _____

CONTACT CONFIGURATION: _____
3PDT: XCX, 4PDT: XDX

TERMINAL STYLE: _____
QUICK CONNECTSOLDER/
PLUG-IN TERMINALS: NO CODE

OPTIONS: _____
PLAIN COVER: NO CODE
TOP FLANGE COVER: CODE C3

OPTIONAL FEATURES: _____
PUSH BUTTON : CODE M
L.E.D. STATUS LAMP: CODE L

COIL VOLTAGE: _____
6, 12, 24, 120, 240 ADD "A" FOR AC COILS
6, 12, 24, 110 ADD "D" FOR DC COILS

STANDARD PART NUMBERS	CONTACT CONFIGU- RATION	COIL MEASURED @ 25°C	
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED - SOLDER/PLUG-IN, 10 AMP			
78XCX-120A	3PDT	120 VAC, 50/60 Hz	2700 Ω
DC OPERATED - SOLDER/PLUG-IN, 10 AMP			
78XCX-12D	3PDT	12 VDC	100 Ω
78XCX-24D	3PDT	24 VDC	400 Ω
AC OPERATED - SOLDER/PLUG-IN, 10 AMP			
78XDX-120A	4PDT	120 VAC, 50/60 Hz	2000 Ω
DC OPERATED - SOLDER/PLUG-IN, 10 AMP			
78XDX-12D	4PDT	12 VDC	96 Ω
78XDX-24D	4PDT	24 VDC	360 Ω

FEATURES

FLAG INDICATOR:

SHOWS RELAY STATUS IN MANUAL OR POWERED CONDITION.

L.E.D. STATUS LAMP:

SHOWS COIL "ON" OR "OFF" STATUS. IDEAL IN LOW LIGHT CONDITIONS.

PUSH BUTTON:

ALLOWS FOR MANUAL OPERATION OF RELAY WITHOUT THE NEED FOR COIL POWER. IDEAL FOR FIELD SERVICE PERSONNEL TO TEST CONTROL CIRCUITS.

LOCK-DOWN DOOR:

WHEN ACTIVATED, HOLDS PUSH BUTTON AND CONTACTS IN THE OPERATE POSITION. EXCELLENT FOR ANALYZING CIRCUIT PROBLEMS.

FINGER-GRIP COVER:

ALLOWS OPERATOR TO REMOVE RELAYS FROM SOCKETS MORE EASILY THAN CONVENTIONAL RELAYS.

I.D. TAG/WRITE LABEL:

USED FOR IDENTIFICATION OF RELAYS IN MULTI - RELAY CIRCUITS.

BENEFITS

DPDT & 3PDT, 12 AMPS

cUL us
UL Recognized
File No. E70550

SP 40787



LISTED 367G
IND. CONT. EQ.

C US
WHEN USED
WITH SOCKETS
70-464-1 OR
70-465-1

CURRENT LIMITED TO
RATING OF RELAY OR
SOCKET WHICHEVER
IS LESS.



COMPLIES WITH REQUIREMENTS OF

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

* IEC = INTERNATIONAL
ELECTROTECHNICAL COMMISSION

* CE TESTING AND EVALUATION
PERFORMED BY THE UNDERWRITERS
LABORATORIES AS A THIRD PARTY
PARTICIPANT

**MANUFACTURED UNDER
ISO 9002 & QS 9000**

GENERAL SPECIFICATIONS

COIL

Pull-in Voltage:	80% of nominal voltage or less for DC coils. 85% of nominal voltage or less for AC coils.
Dropout Voltage:	DC-10% min. AC-30% min. of nominal voltage or more.
Max. Voltage:	110%
Resistance:	±10% measured @ 25°C.
Coil Power:	1.4 watts DC, 2 VA to 3.55 VA (60Hz) AC @ 25°C.
Insulation System:	Class "B" (130°C per UL standard 1446).
Max. Coil Dissipation:	3.0 watts DC, 3.4 VA (60Hz) AC. @ 25°C.
Duty:	Continuous.

CONTACTS

Contact Material:	Silver cadmium oxide, gold flashed
Contact Rating:	12 Amps, 120 / 240 VAC 50/60Hz, 12 amps, 28 VDC. 1/3Hp 120 VAC, 1/2Hp 240 VAC.
Contact Resistance:	50 milliohms max. @10 amps, 120 VAC or 24 VDC contacts conditioned for 50 make and break operations @ 1 second "ON" & 1 second "OFF"

DIELECTRIC STRENGTH

Contacts to Coil:	2500 V rms
Across open Contacts:	1500 V rms
Pole to Pole:	2500 V rms
Contacts to Frame:	2500 V rms
Insulation Resistance:	100 megohms @ 500 VDC

TEMPERATURE

Operating:	-40°C to +50°C. (AC). -40°C +65°C. (DC)
Storage:	-40°C to +100°C

LIFE EXPECTANCY

Electrical:	200,000 operations @ rated resistive load
Mechanical:	5,000,000 operations @ no load

MISCELLANEOUS

Operating Position:	Any
Insulation Material:	Molded plastic.
Enclosure:	Polycarbonate dust cover.
Weight:	88 grams approx.



Mating Sockets

70-750D8-1, 70-750D11-1,
70-464-1, 70-465-1: SCREW/DIN
70-169-1, 70-170-1: SCREW/PANEL

See section 8, page 7 - 12

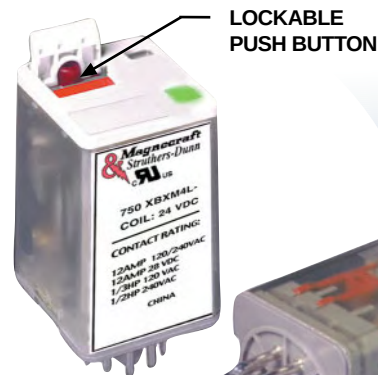
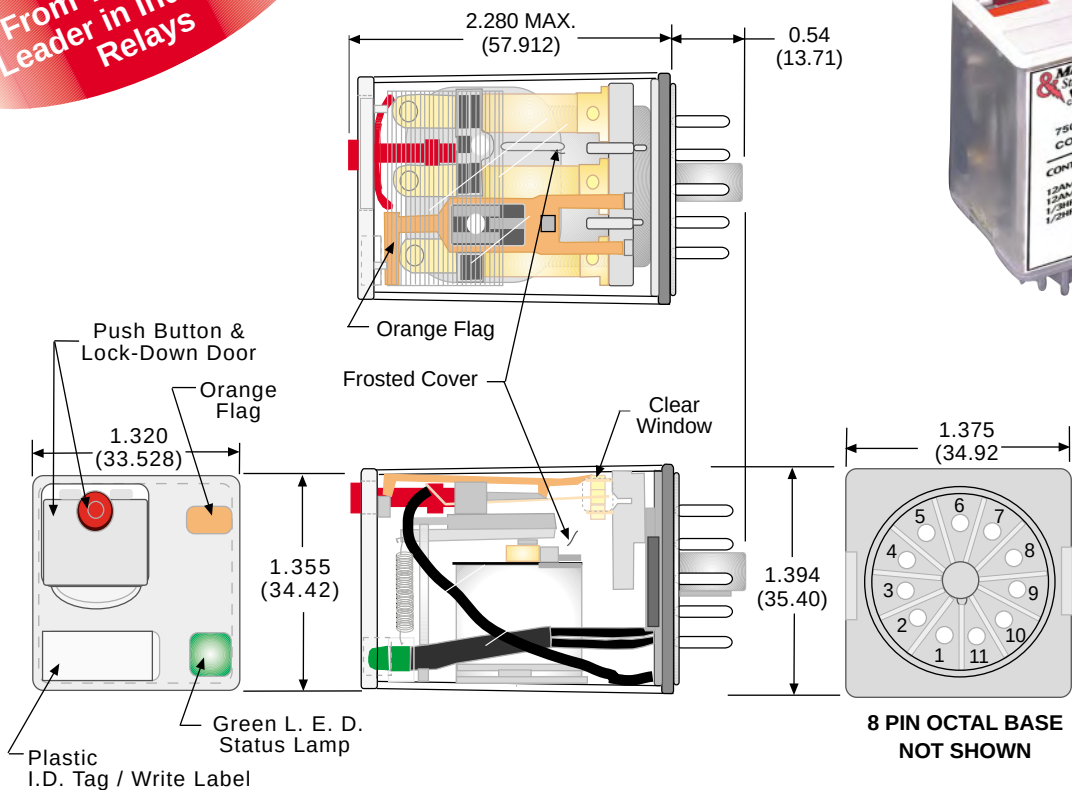


DPDT & 3PDT , 12 AMPS

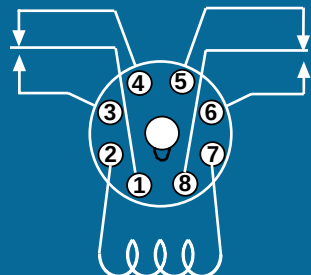
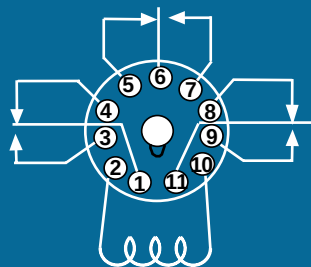
NEW
From The Market
Leader in Industrial
Relays

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



WIRING DIAGRAMS
(VIEWED FROM PIN END)



BI - POLAR
L.E.D. STATUS LAMP
ALLOWS FOR REVERSE
POLARITY APPLICATIONS

ORDERING CODE FOR RELAYS

CLASS: **750** **XBX** **M4L- 120A**

CONTACT CONFIGURATION: **DPDT: XBX**
3PDT: CX

STANDARD FEATURES: **PUSH BUTTON & LOCK DOWN DOOR: CODE M4**
L.E.D. STATUS LAMP: CODE L

OPTIONAL FEATURES: **PUSH BUTTON WITHOUT**
LOCK DOWN DOOR: CODE M

COIL VOLTAGE: **6, 12, 24, 120, 220 / 230, 240 ADD "A" FOR AC COILS**
6, 12, 24, 48, 110 ADD "D" FOR DC COILS

STANDARD PART NUMBERS	CONTACT CONFIGU- RATION	COIL MEASURED @ 25°C	
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED - 8 PIN OCTAL, 12 AMP			
750BXM4L-24A	DPDT	24 VAC, 50/60Hz	72 Ω
750BXM4L-120A	DPDT	120 VAC, 50/60Hz	1,700 Ω
750BXM4L-240A	DPDT	240 VAC, 50/60Hz	9,100 Ω
DC OPERATED - 8 PIN OCTAL, 12 AMP			
750BXM4L-12D	DPDT	12 VDC	120 Ω
750BXM4L-24D	DPDT	24 VDC	470 Ω
750BXM4L-110D	DPDT	110 VDC	10,000 Ω
AC OPERATED - 11 PIN OCTAL, 12 AMP			
750CXM4L-24A	3PDT	24 VAC, 50/60Hz	72 Ω
750CXM4L-120A	3PDT	120 VAC, 50/60Hz	1,700 Ω
750CXM4L-240A	3PDT	240 VAC, 50/60Hz	9,100 Ω
DC OPERATED - 11 PIN OCTAL, 12 AMP			
750CXM4L-12D	3PDT	12 VDC	120 Ω
750CXM4L-24D	3PDT	24 VDC	470 Ω
750CXM4L-110D	3PDT	110 VDC	10,000 Ω

CADMIUM-FREE CONTACTS AVAILABLE,
CONTACT FACTORY FOR DETAILS

UL CONTACT LOAD RATINGS TABLE

POLES	CURRENT OR HORSE POWER	LOAD VOLTAGE	LOAD VOLTAGE FREQUENCY	TYPE OF LOAD
1 POLES	12 AMP	120/240 VAC	50/60 Hz	RESISTIVE
	10 AMP	28 VDC	DC	RESISTIVE
2 POLES	12 AMP	120 VAC	DC	RESISTIVE
	10 AMP	240 VAC	50/60 Hz	RESISTIVE
3 POLES	10 AMP	28 VDC	DC	RESISTIVE
	10 AMP	120/240 VAC	50/60 Hz	RESISTIVE
1, 2 & 3 POLES	10 AMP	28 VDC	DC	RESISTIVE
	1/3 HP	120 VAC	50/60 Hz	MOTOR
	1/2 HP	240 VAC	50/60 Hz	MOTOR

CONTACT RATINGS WITH BLOW-OUT MAGNET FOR DC SWITCHING

POLES	CURRENT OR HORSE POWER	LOAD VOLTAGE	LOAD VOLTAGE FREQUENCY	TYPE OF LOAD
2 POLES	3 AMP	150 VDC	DC	RESISTIVE

**SPDT, DPDT & 3PDT
10 & 12 AMPS**UL Recognized
File No. E 43641LISTED 367G
IND. CONT. EQ.

C US

WHEN USED
WITH SOCKETS
70-464-1 OR
70-465-1

COMPLIES WITH REQUIREMENTS OF

* IEC STANDARDS 947-4-1 AND
947-5-1 LOW VOLTAGE DIRECTIVE* IEC = INTERNATIONAL
ELECTROTECHNICAL COMMISSION* CE TESTING AND EVALUATION
PERFORMED BY THE UNDERWRITERS
LABORATORIES AS A THIRD PARTY
PARTICIPANTCURRENT LIMITED TO
RATING OF RELAY OR
SOCKET WHICHEVER
IS LESS.**MANUFACTURED UNDER
ISO 9002 & QS 9000****GENERAL SPECIFICATIONS****COIL**

Pull-in Voltage:	80% of nominal voltage or less for DC coils, 85% of nominal voltage or less for AC coils
Dropout Voltage:	DC-10% min. AC-30% min. of nominal voltage or more
Max. Voltage:	110%
Resistance:	±10% measured @ 25°C
Coil Power:	1.2 watts DC. 2 VA -2.75 (60Hz) AC. @ 25°C
Insulation System:	Class "B" (130°C per UL standard 1446)
Max. Coil Dissipation:	3.0 watts DC. @ 25°C.
Duty:	Continuous.

CONTACTS

Contact Material:	Silver cadmium oxide, gold flashed std, gold diffused contacts available
Contact Rating:	See "UL CONTACT LOAD RATINGS TABLE"
Contact Resistance:	50 milliohms max. @10 amps, 120 VAC or 24 VDC contacts conditioned for 50 make and break operations @ 1 second "ON" & 1 second "OFF"

DIELECTRIC STRENGTH

Contacts to Coil:	1500 V rms
Coil to Frame:	1500 V rms
Across Open Contacts:	500 V rms
Pole to Pole:	1500 V rms
Contacts to Frame:	1500 V rms
Insulation Resistance:	1000 megohms @ 500 VDC

TEMPERATURE

Operating:	-45°C to +55°C (AC), -45°C to +70°C (DC)
Storage:	-40°C to +105°C

VIBRATION RESISTANCE

Functional:	10 to 55 Hz; 1 mm (double amplitude)
-------------	--------------------------------------

SHOCK RESISTANCE

Functional:	10 g's
Mechanical:	100 g's

LIFE EXPECTANCY

Electrical:	100,000 operations @ rated resistive load
Mechanical:	5,000,000 operations @ no load

MISCELLANEOUS

Operating Position:	Any
Insulation Material:	Molded plastic
Enclosure:	Polycarbonate dust cover
Terminals:	8 or 11 pin octal plug-in
Weight:	99.2 grams approx.

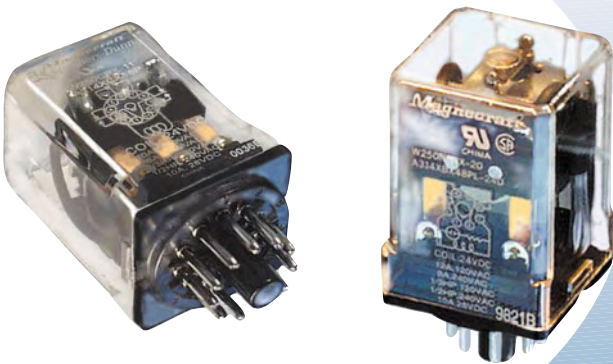
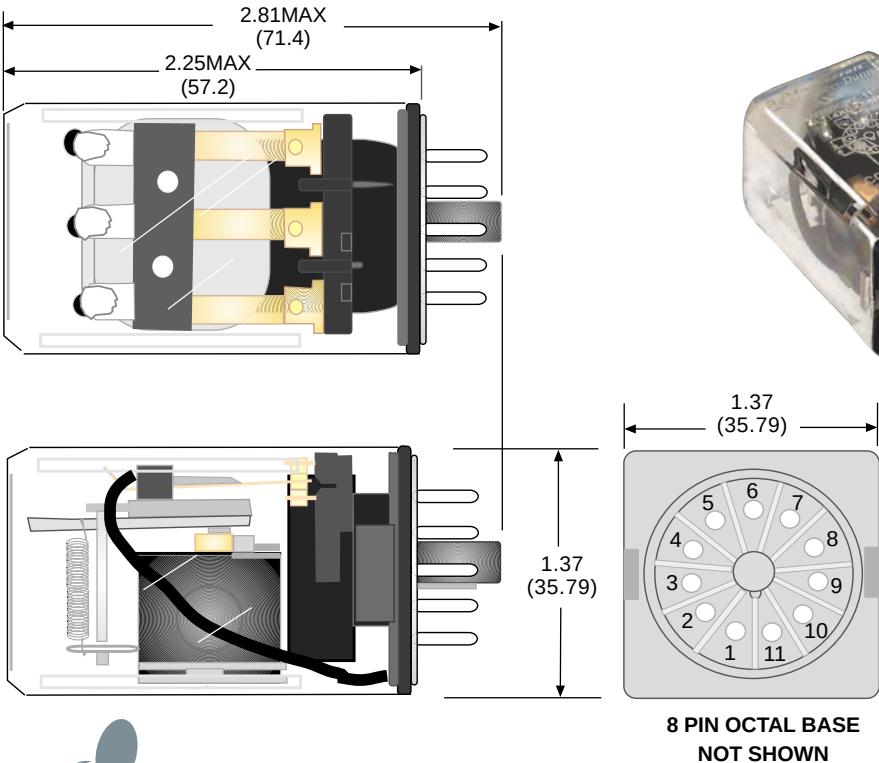
**Mating Sockets**70-750D8-1, 70-750D11-1,
70-464-1, 70-465-1: SCREW/DIN
70-169-1, 70-170-1: SCREW/PANEL
See section 8, page 7 - 12

SPDT, DPDT & 3PDT

10 & 12 AMPS

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



SEE CLASS 750 FOR

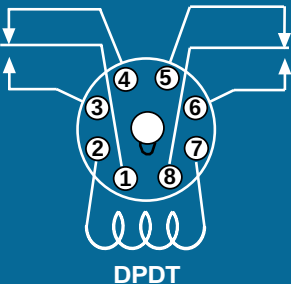
PART NUMBERS WITH

L.E.D. STATUS LAMP

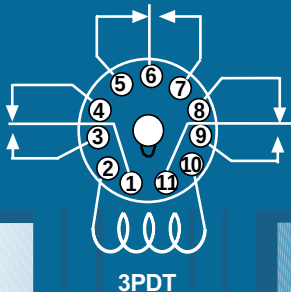
AND PUSH BUTTON

WIRING DIAGRAMS

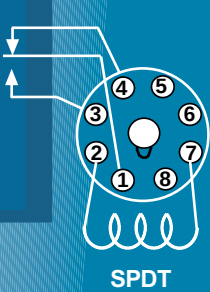
(VIEWED FROM PIN END)



DPDT



3PDT



SPDT

STANDARD PART NUMBERS		CONTACT CONFIGU- RATION	COIL MEASURED @ 25°C	
SERIES A314	CLASS 250CP		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED, 12AMP				
A314XAX48P-24A	W250ACPX-3	SPDT	24 VAC, 50/60Hz	85 Ω
A314XAX48P-120A	W250ACPX-4	SPDT	120VAC, 50/60Hz	1700 Ω
A314XBX48P-24A	W250ACPX-8	DPDT	24 VAC, 50/60Hz	85 Ω
A314XBX48P-120A	W250ACPX-9	DPDT	120VAC, 50/60Hz	1700 Ω
A314XBX48P-240A	W250ACPX-10	DPDT	220/240 VAC, 50/60Hz	9110 Ω
AC OPERATED, 10AMP				
A314XCX48P-24A	W250ACPX-13	3PDT	24 VAC, 50/60Hz	85 Ω
A314XCX48P-120A	W250ACPX-14	3PDT	120 VAC, 50/60Hz	1700 Ω
A314XCX48P-240A	W250ACPX-15	3PDT	220/240 VAC, 50/60Hz	9110 Ω
DC OPERATED, 12 AMP				
A314XAX48P-12D	W250CPX-2	SPDT	12 VDC	120 Ω
A314XAX48P-24D	W250CPX-3	SPDT	24 VDC	472 Ω
A314XBX48P-12D	W250CPX-6	DPDT	12VDC	120 Ω
A314XBX48P-24D	W250CPX-7	DPDT	24 VDC	472 Ω
DC OPERATED, 10 AMP				
A314XCX48P-12D	W250CPX-10	3PDT	12 VDC	120 Ω
A314XCX48P-24D	W250CPX-11	3PDT	24 VDC	472 Ω
AC OPERATED WITH BLOW - OUT MAGNET, 3 AMP FOR DC SWITCHING				
A314XBX48P69-24A		DPDT	24 VAC	85 Ω
A314XBX48P69-120A		DPDT	120VAC	1700 Ω
DC OPERATED WITH BLOW - OUT MAGNET, 3 AMP FOR DC SWITCHING				
A314XBX48P69-12D		DPDT	12 VDC	120 Ω
A314XBX48P69-24D		DPDT	24 VDC	472 Ω
A314XBX48P69-110D		DPDT	110 VDC	10,000Ω

RETROFITS POTTER & BRUMFIELD KRPA.

SEE END OF SECTION 1 FOR CROSS REFERENCE

FEATURES**BENEFITS****FLAG INDICATOR:**

SHOWS RELAY STATUS IN MANUAL OR POWERED CONDITION.

L.E.D. STATUS LAMP:

SHOWS COIL "ON" OR "OFF" STATUS. IDEAL IN LOW LIGHT CONDITIONS.

PUSHBUTTON:

ALLOWS FOR MANUAL OPERATION OF RELAY WITHOUT THE NEED FOR COIL POWER. IDEAL FOR FIELD SERVICE PERSONNEL TO TEST CONTROL CIRCUITS.

LOCK-DOWN DOOR:

WHEN ACTIVATED, HOLDS PUSH BUTTON AND CONTACTS IN THE OPERATE POSITION. EXCELLENT FOR ANALYZING CIRCUIT PROBLEMS.

FINGER-GRIP COVER:

ALLOWS OPERATOR TO REMOVE RELAYS FROM SOCKETS MORE EASILY THAN CONVENTIONAL RELAYS.

I.D. TAG/WRITE LABEL:

USED FOR IDENTIFICATION OF RELAYS IN MULTI - RELAY CIRCUITS.

DPDT & 3PDT, 12 AMPS

UL us
UL Recognized
File No. E70550

SP LR40787



LISTED 367G
IND. CONT. EQ.

C US
WHEN USED
WITH SOCKETS
70-463-1

CURRENT LIMITED TO
RATING OF RELAY OR
SOCKET WHICHEVER
IS LESS.

COMPLIES WITH REQUIREMENTS OF

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

* IEC = INTERNATIONAL
ELECTROTECHNICAL COMMISSION

* CE TESTING AND EVALUATION
PERFORMED BY THE UNDERWRITERS
LABORATORIES AS A THIRD PARTY
PARTICIPANT

**MANUFACTURED UNDER
ISO 9002 & QS 9000**

GENERAL SPECIFICATIONS**COIL**

Pull-in Voltage:	80% of nominal voltage or less for DC coils. 85% of nominal voltage or less for AC Coils
Dropout Voltage:	DC-10% min. AC-30% min. of nominal voltage or more
Max. Voltage:	110%
Resistance:	±10% measured @ 25°C
Coil Power:	1.4 watts DC, 2 VA to 3.55 VA (60Hz) AC @ 25°C
Insulation System:	Class "B" (130°C per UL standard 1446)
Max. Coil Dissipation:	3.0 watts DC, 3.4 VA (60Hz) AC. @ 25°C
Duty:	Continuous

CONTACTS

Contact Material:	Silver cadmium oxide, gold flashed
Contact Rating:	12 amps, 120 / 240 VAC 50/60Hz, 12 amps, 28 VDC. 1/3Hp 120 VAC, 1/2Hp 240 VAC.
Contact Resistance:	50 milliohms max. @ 10 amps, 120 VAC or 24 VDC contacts conditioned for 50 make and break operations @ 1 second "ON" & 1 second "OFF"

DIELECTRIC STRENGTH

Contacts to Coil:	2500 V rms
Across Open Contacts:	1500 V rms
Pole to Pole:	2500 V rms
Contacts to Frame:	2500 V rms
Insulation Resistance:	100 megohms @ 500 VDC

TEMPERATURE

Operating:	-40°C to +50°C. (AC), -40°C +65°C. (DC)
Storage:	-40°C to +100°C

LIFE EXPECTANCY

Electrical:	200,000 operations @ rated resistive load
Mechanical:	5,000,000 operations @ no load

MISCELLANEOUS

Operating Position:	Any
Insulation Material:	Molded plastic
Enclosure:	Polycarbonate dust cover
Weight:	88 grams approx.

**Mating Sockets**

70-463-1: SCREW/DIN

70-124-1: SOLDER

70-178-1, 70-178-2:

PRINTED CIRCUIT

70-124-2: QUICK CONNECT

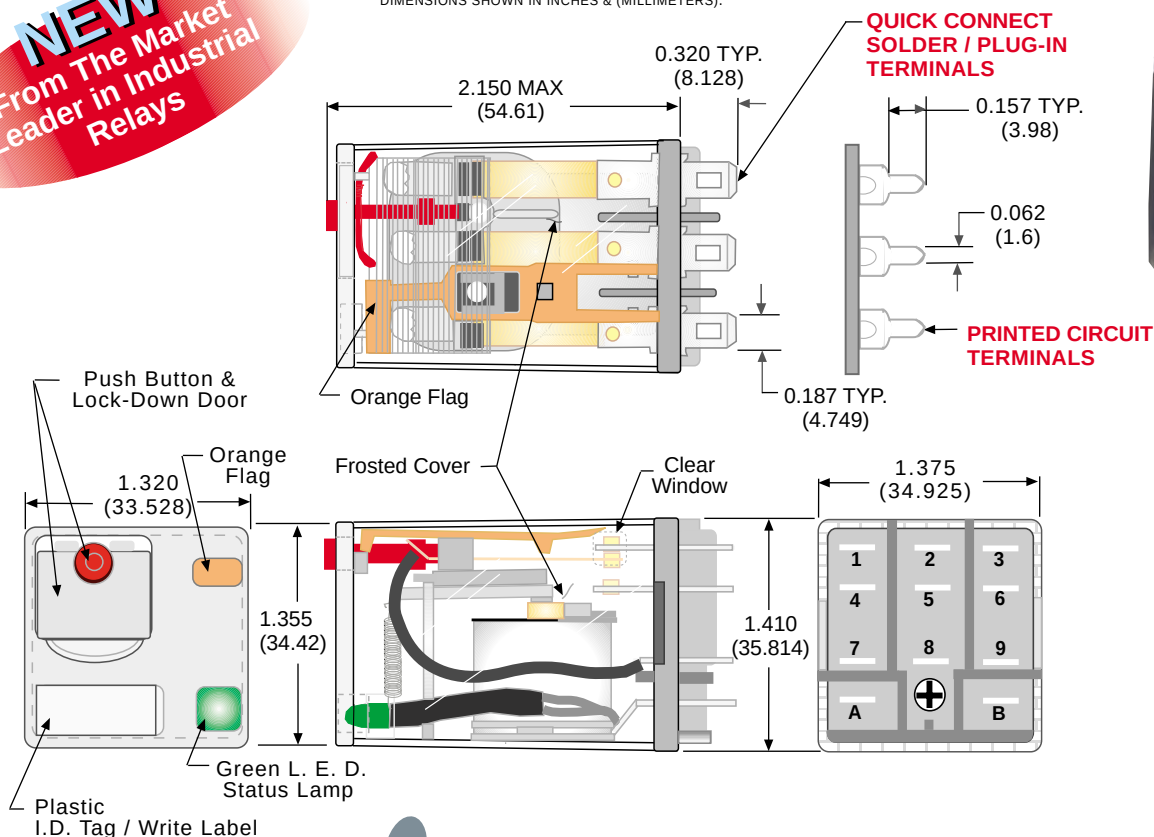
See section 8, page 16, 17



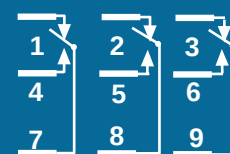
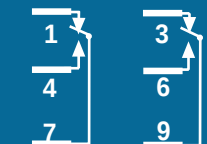
DPDT & 3PDT, 12 AMPS

NEW
From The Market
Leader in Industrial
Relays

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



WIRING DIAGRAMS
(VIEWED FROM PIN END)



**BI - POLAR
L.E.D. STATUS LAMP
ALLOWS FOR REVERSE
POLARITY APPLICATIONS**

ORDERING CODE FOR RELAYS

CLASS: 788

CONTACT CONFIGURATION: XBX

TERMINAL STYLE: M4L - 120A

STANDARD FEATURES:

- PUSH BUTTON & LOCK DOWN DOOR: **CODE M4**
- L.E.D. STATUS LAMP: **CODE L**

OPTIONAL FEATURES:

- PUSH BUTTON WITHOUT LOCK DOWN DOOR: **CODE M**

COIL VOLTAGE:

6, 12, 24, 120, 220 / 230, 240 **ADD "A" FOR AC COILS**

6, 12, 24, 48, 110 **ADD "D" FOR DC COILS**

STANDARD PART NUMBERS	CONTACT CONFIGU- RATION	COIL MEASURED @ 25°C	
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED - SOLDER/PLUG-IN, 12 AMP			
788XBXM4L-24A	DPDT	24 VAC, 50/60Hz	72 Ω
788XBXM4L-120A	DPDT	120 VAC, 50/60Hz	1,700 Ω
788XBXM4L-240A	DPDT	240 VAC, 50/60Hz	9,100 Ω
DC OPERATED - SOLDER/PLUG-IN, 12 AMP			
788XBXM4L-12D	DPDT	12 VDC	120 Ω
788XBXM4L-24D	DPDT	24 VDC	470 Ω
788XBXM4L-110D	DPDT	110 VDC	10,000 Ω
AC OPERATED - SOLDER/PLUG-IN, 12 AMP			
788XCXM4L-24A	3PDT	24 VAC, 50/60Hz	72 Ω
788XCXM4L-120A	3PDT	120 VAC, 50/60Hz	1,700 Ω
788XCXM4L-240A	3PDT	240 VAC, 50/60Hz	9,100 Ω
DC OPERATED - SOLDER/PLUG-IN, 12 AMP			
788XCXM4L-12D	3PDT	12 VDC	120 Ω
788XCXM4L-24D	3PDT	24 VDC	470 Ω
788XCXM4L-110D	3PDT	110 VDC	10,000 Ω

CADMIUM-FREE CONTACTS AVAILABLE,
CONTACT FACTORY FOR DETAILS

UL CONTACT LOAD RATINGS TABLE

POLES	CURRENT OR HORSE POWER	LOAD VOLTAGE	LOAD VOLTAGE FREQUENCY	TYPE OF LOAD
1 POLE THRU 3 POLES	15 AMP	120/240 VAC	50/60 Hz	RESISTIVE
	10AMP	28 VDC	DC	RESISTIVE
	1/3 HP	120 VAC	50/60 Hz	MOTOR
	1/2 HP	240 VAC	50/60 Hz	MOTOR

SPDT, DPDT & 3PDT, 15 AMPS

UL **us**
UL Recognized
File No. E13224

SP 168986

CE

UL LISTED 367G
IND. CONT. EQ.
C **US**
WHEN USED
WITH SOCKETS
70-463-1

COMPLIES WITH REQUIREMENTS OF

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

* IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION

* CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

CURRENT LIMITED TO
RATING OF RELAY OR
SOCKET WHICHEVER
IS LESS.

MANUFACTURED UNDER
ISO 9002 & QS 9000

GENERAL SPECIFICATIONS**COIL**

Pull-in Voltage:	80% of nominal voltage or less for DC coils 85% of nominal voltage or less for AC coils
Dropout Voltage:	10% of nominal voltage or more
Max. Voltage:	110%
Resistance:	± 10 % measured at 25°C
Coil Power:	1.2 watts for DC coils, 2 VA to 2.75 VA for AC @ 25°C
Insulation System:	Class "B" (130°C per UL standard 1446)
Maximum Coil Dissipation:	3.0 watts max. DC
Duty:	Continuous

CONTACTS

Contact Material:	0.187 silver cadmium oxide, gold flashed
Contact Resistance:	50 milliohms maximum initial resistance at rated current
Contact Ratings:	See "UL CONTACT LOAD RATINGS TABLE"

DIELECTRIC STRENGTH

Contacts to Coil:	2000 V rms
Across Open Contacts:	500 V rms
Pole to Pole	2000 V rms
Contacts to Frame:	2000 V rms
Insulation Resistance:	1000 megohms @ 500 VDC

TEMPERATURE

Operating:	-30°C to +50°C (AC), -30°C to +65°C (DC)
Storage	-30°C to 100°C

LIFE EXPECTANCY

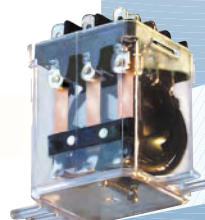
Electrical:	100,000 operations @ rated resistive load
Mechanical:	5,000,000 operations @ no load

MISCELLANEOUS

Operating Position:	Any
Insulation material:	Molded plastic
Enclosure:	Polycarbonate dust cover
Terminals:	0.187 x 0.032 quick connect flange or 0.187 x 0.020 solder/plug-in. Optional printed circuit terminals available
Weight:	88 grams approx.

**PLUG-IN****FLANGE MOUNT**

OPTIONAL P.C. TERMINAL
CONSULT FACTORY.

PRINTED CIRCUIT TERMINAL

OPTIONAL TOP FLANGE
COVER CONSULT FACTORY.

TOP FLANGE MOUNT

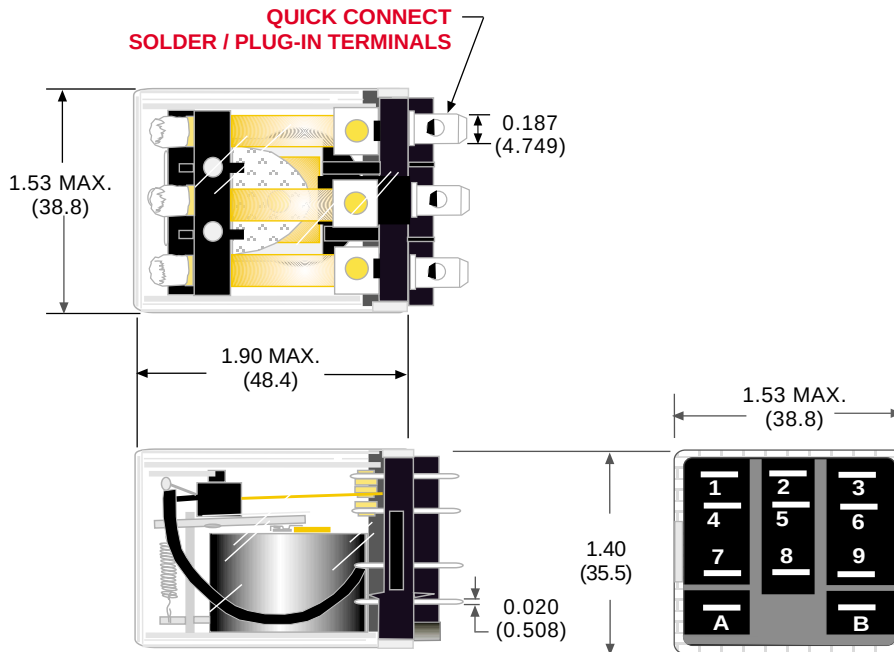
OPTIONAL DIN COVER
CONSULT FACTORY.

DIN MOUNT COVER**Mating Sockets****70-463-1: SCREW/DIN****70-124-1: SOLDER****70-178-1, 70-178-2: PRINTED CIRCUIT****70-124-2: QUICK CONNECT**

See section 8, page 16, 17

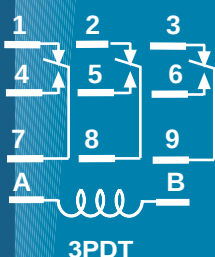
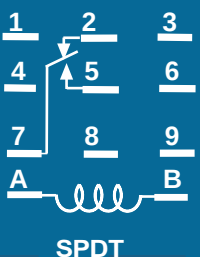
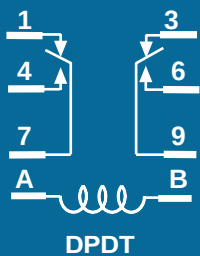
SPDT, DPDT & 3PDT, 15 AMPS

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



SEE CLASS 788 FOR
PART NUMBERS WITH
L.E.D. STATUS LAMP
AND PUSH BUTTON

WIRING DIAGRAMS
(VIEWED FROM PIN END)

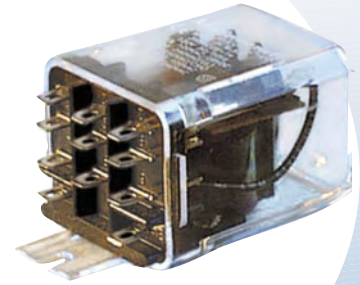
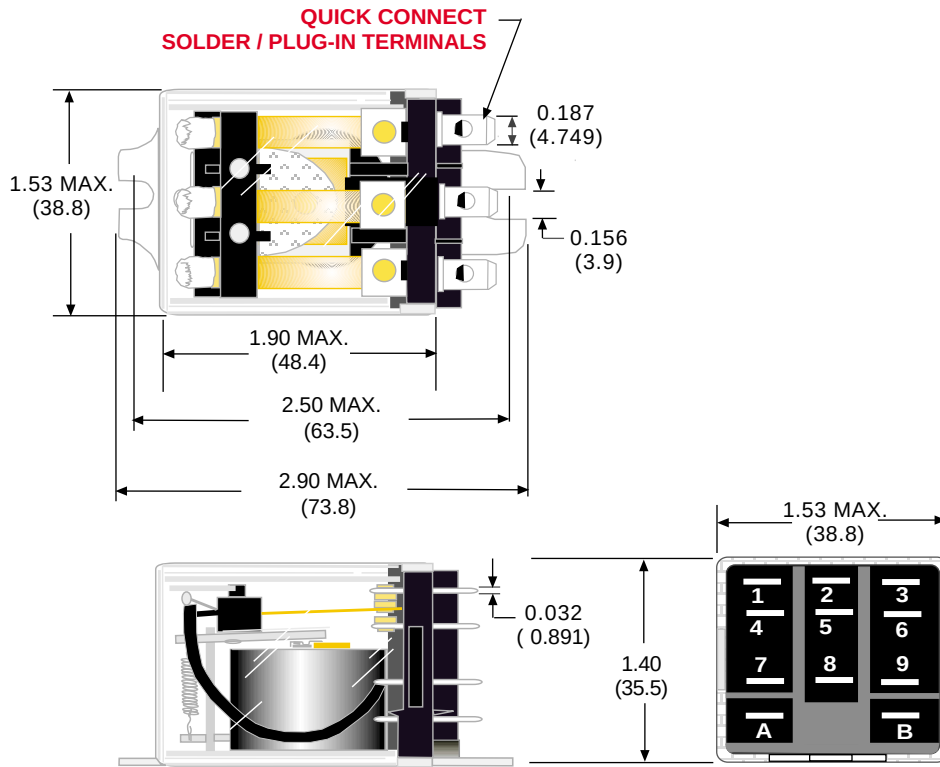


STANDARD PART NUMBERS		CONTACT CONFIGU- RATION	COIL MEASURED @ 25°C	
A283	W388		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED SOLDER/PLUG-IN, 15 AMP				
A283XAXC-120A	W388ACPX-4	SPDT	120 VAC, 50/60Hz	2250 Ω
A283XAXC-240A	W388ACPX-5	SPDT	220/240 VAC, 50/60Hz	9100 Ω
A283XBXC-24A	W388ACPX-8	DPDT	24 VAC, 50/60Hz	75 Ω
A283XBXC-120A	W388ACPX-9	DPDT	120 VAC, 50/60Hz	2250 Ω
A283XBXC-240A	W388ACPX-10	DPDT	220/240 VAC, 50/60Hz	9100 Ω
A283XCXC-24A	W388ACPX-13	3PDT	24 VAC, 50/60Hz	72 Ω
A283XCXC-120A	W388ACPX-14	3PDT	120 VAC, 50/60Hz	1700 Ω
A283XCXC-240A	W388ACPX-15	3PDT	220/240 VAC, 50/60Hz	7200 Ω
DC OPERATED SOLDER/PLUG-IN, 15 AMP				
A283XAXC-12D	W388CPX-2	SPDT	12 VDC	120 Ω
A283XAXC-24D	W388CPX-3	SPDT	24 VDC	472 Ω
A283XBXC-12D	W388CPX-6	DPDT	12 VDC	120 Ω
A283XBXC-24D	W388CPX-7	DPDT	24 VDC	472 Ω
A283XBXC-110D	W388CPX-8	DPDT	110 VDC	10,000 Ω
A283XCXC-12D	W388CPX-10	3PDT	12 VDC	120 Ω
A283XCXC-24D	W388CPX-11	3PDT	24VDC	472 Ω

RETROFITS POTTER & BRUMFIELD KUP.
SEE END OF SECTION 1 FOR CROSS REFERENCE

SPDT, DPDT & 3PDT, 15 AMPS

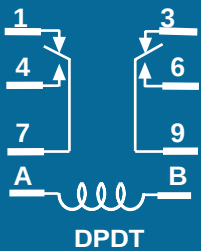
OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



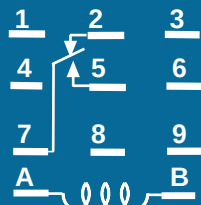
SEE CLASS 388J FOR
PART NUMBERS WITH
L.E.D. STATUS LAMP
AND PUSH BUTTON

WIRING DIAGRAMS

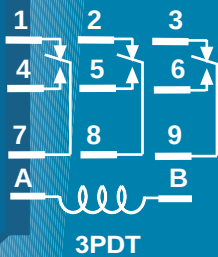
(VIEWED FROM PIN END)



DPDT



SPDT

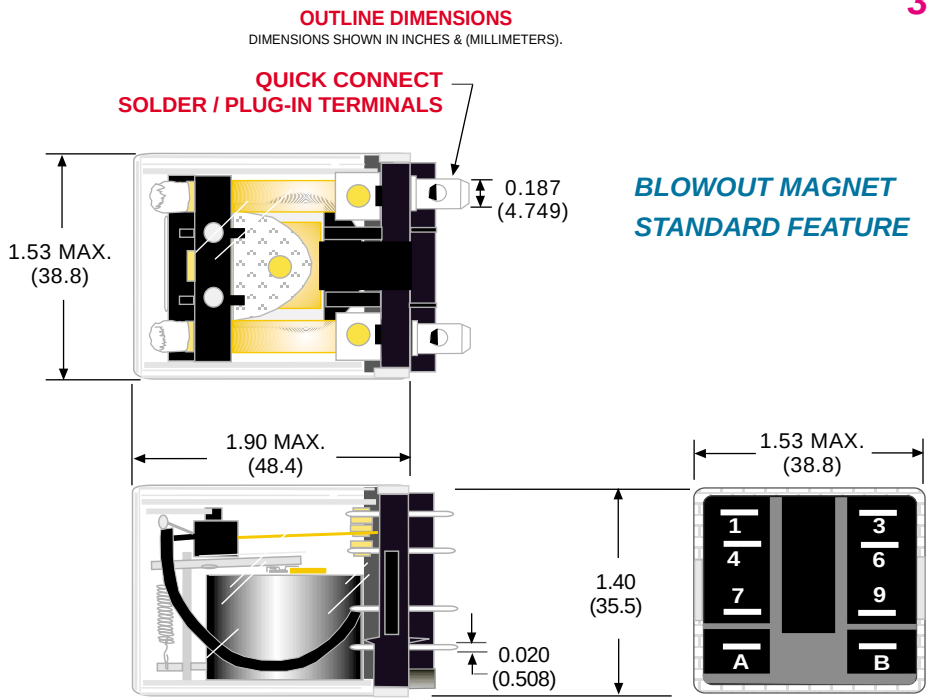


3PDT

STANDARD PART NUMBERS		CONTACT CONFIGU- RATION	COIL MEASURED @ 25°C	
A283	W388		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED, 15 AMP				
A283XAXC1-120A	W388ACQX-4	SPDT	120 VAC, 50/60Hz	2250 Ω
A283XAXC1-240A	W388ACQX-5	SPDT	220/240 VAC, 50/60Hz	9100 Ω
A283XBXC1-120A	W388ACQX-9	DPDT	120 VAC, 50/60Hz	2250 Ω
A283XBXC1-240A	W388ACQX-10	DPDT	220/240 VAC, 50/60Hz	9100 Ω
A283XCXC1-120A	W388ACQX-14	3PDT	120 VAC, 50/60Hz	1700 Ω
A283XCXC1-240A	W388ACQX-15	3PDT	220/240 VAC, 50/60Hz	7200 Ω
DC OPERATED, 15 AMP				
A283XAXC1-12D	W388CQX-2	SPDT	12 VDC	120 Ω
A283XAXC1-24D	W388CQX-3	SPDT	24 VDC	472 Ω
A283XBXC1-12D	W388CQX-6	DPDT	12 VDC	120 Ω
A283XBXC1-24D	W388CQX-7	DPDT	24 VDC	472 Ω
A283XBXC1-24D	W388CQX-11	3PDT	24 VDC	472 Ω

RETROFITS POTTER & BRUMFIELD KUP.
SEE END OF SECTION 1 FOR CROSS REFERENCE

DPDT & SPST-NO-DM,
3 & 10 AMPS, 150 VDC SWITCHING

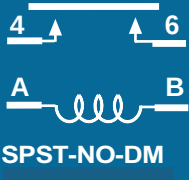
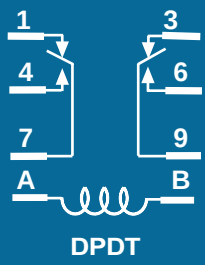


UL CONTACT LOAD RATINGS TABLE FOR DC SWITCHING

POLES	CURRENT OR HORSE POWER	LOAD VOLTAGE	TYPE OF LOAD
2 POLES	3 AMP	150 VDC	RESISTIVE
1 POLE (DM)	10 AMP	150 VDC	RESISTIVE

THE CLASS 388B/388DB STYLES HAVE THE SAME LOAD SPECIFICATIONS AS THE 388/A283 ENCLOSED PLUG-IN STYLE RELAYS PLUS THE ADDITIONAL LOAD RATINGS CHARTED IN TABLE ABOVE SEE 388/A283 GENERAL SPECIFICATIONS.

WIRING DIAGRAMS
(VIEWED FROM PIN END)



STANDARD PART NUMBERS		CONTACT CONFIGU- RATION	COIL MEASURED @ 25°C	
A283	W388B		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED WITH BLOWOUT MAGNET, 3 AMP				
A283XBX69C-120A	W388ABCPX-5	DPDT	120 VAC, 50/60 Hz	2250 Ω
DC OPERATED WITH BLOWOUT MAGNET, 3 AMP				
A283XBX69C-12D	W388BCPX-2	DPDT	12 VDC	120 Ω
A283XBX69C-24D	W388BCPX-3	DPDT	24 VDC	472 Ω
A283XBX69C-110D	W388BCPX-5	DPDT	110 VDC	10,000 Ω
AC OPERATED WITH BLOWOUT MAGNET, 10 AMP				
A283HXX69C-120A	W388ADBCPX-5	SPST-NO (DM)	120 VAC, 50/60 Hz	2250 Ω
DC OPERATED WITH BLOWOUT MAGNET, 10 AMP				
A283HXX69C-12D	W388DBCPX-2	SPST-NO (DM)	12 VDC	120 Ω
A283HXX69C-24D	W388DBCPX-3	SPST-NO (DM)	24 VDC	472 Ω
A283HXX69C-110D	W388DBCPX-5	SPST-NO (DM)	110 VDC	10,000 Ω

RETROFITS POTTER & BRUMFIELD KUEP.
SEE END OF SECTION 1 FOR CROSS REFERENCE

UL CONTACT LOAD RATINGS TABLE

POLES	CURRENT OR HORSE POWER	LOAD VOLTAGE	LOAD VOLTAGE FREQUENCY	TYPE OF LOAD
2 POLES	20 AMP	300 VAC	50/60 Hz	RESISTIVE
	20 AMP	28 VDC	DC	RESISTIVE
3 POLES	16 AMP	277 VAC	50/60 Hz	RESISTIVE
	16 AMP	28 VDC	DC	RESISTIVE
2 & 3 POLES	3/4 HP	120 VAC	50/60 Hz	MOTOR
	1 HP	208-600 VAC	50/60 Hz	MOTOR

UP TO 20 AMP SWITCHING

DPDT & 3PDT, 16 & 20 AMPS

cUL us
UL Recognized
File No. E43641

SP PENDING

UL LISTED 367G
IND. CONT. EQ.
C US
WHEN USED
WITH SOCKETS
70-463-1

COMPLIES WITH REQUIREMENTS OF

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

* IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION

* CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

CURRENT LIMITED TO
RATING OF RELAY OR
SOCKET WHICHEVER
IS LESS.

MANUFACTURED UNDER
ISO 9002 & QS 9000

GENERAL SPECIFICATIONS

COIL

Pull-in Voltage:	80% of nominal voltage or less. for DC coils 85% of nominal voltage or less for AC coils
Dropout Voltage:	10% of nominal voltage or more
Resistance:	± 10 % measured at 25°C
Coil Power:	1.2 watts for DC coils, 2 VA to 2.75 VA for AC @ 25°C
Insulation System:	Class "B" (130°C per UL standard 1446)
Maximum Coil Dissipation:	3.0 watts max. DC
Duty:	Continuous

CONTACTS

Contact material:	0.187 Silver cadmium oxide, gold flashed
Contact Resistance:	50 milliohms maximum initial resistance at rated current
Contact Ratings:	See "UL CONTACT RATINGS TABLE"

DIELECTRIC STRENGTH

Contacts to Coil:	2000 V rms
Across Open Contacts:	500 V rms
Pole to Pole:	2000 V rms
Contacts to Frame:	2000 V rms
Insulation Resistance:	1000 megohms @ 500 VDC

TEMPERATURE

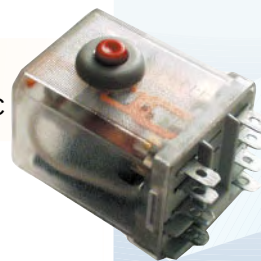
Operating:	-30°C to +50°C (AC), -30°C to +65°C (DC)
Storage:	-30°C to 100°C

LIFE EXPECTANCY

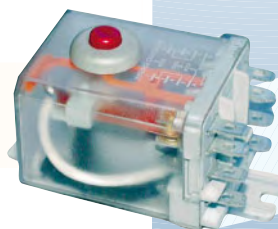
Electrical:	100,000 operations @ rated resistive load
Mechanical:	5,000,000 operations @ no load

MISCELLANEOUS

Operating Position:	Any
Insulation material:	Molded plastic
Enclosure:	Polycarbonate dust cover
Terminals:	0.187 x 0.032 quick connect flange or 0.187 x 0.20 plug. Optional printed circuit terminals available
Weight:	94 grams approx.



PLUG-IN



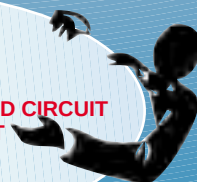
FLANGE MOUNT

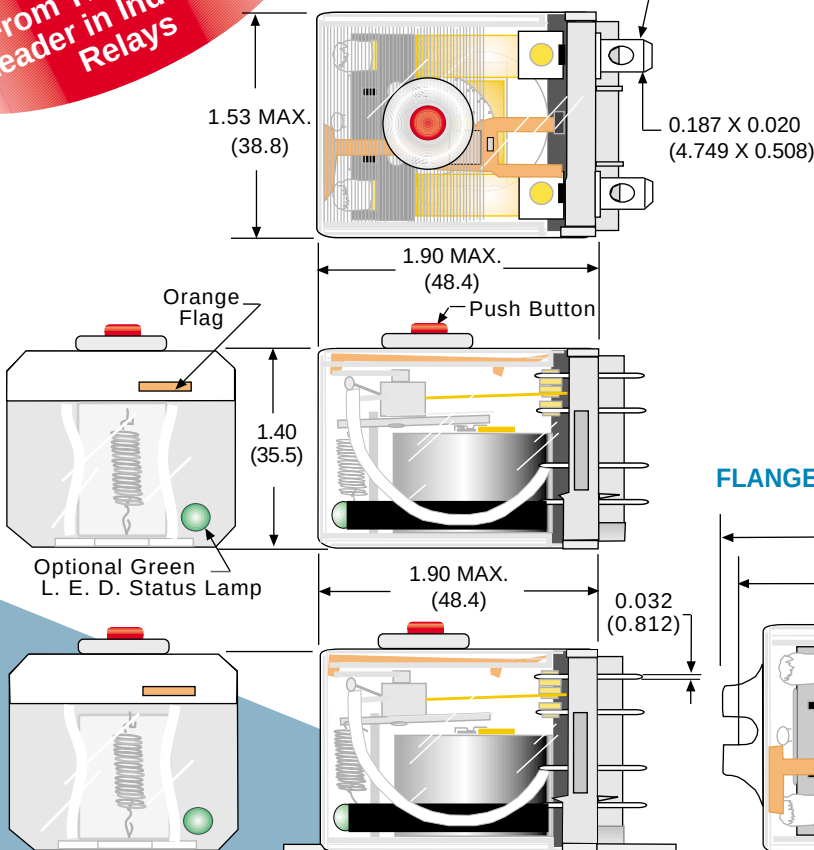
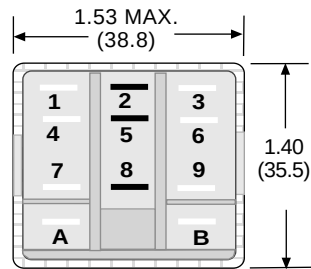
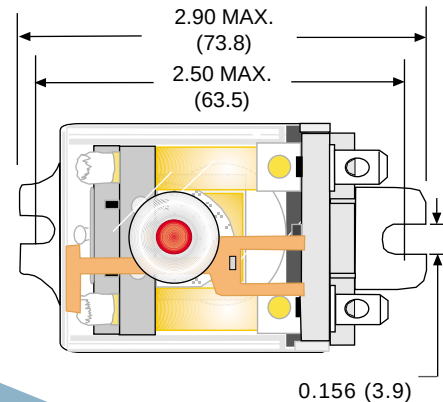
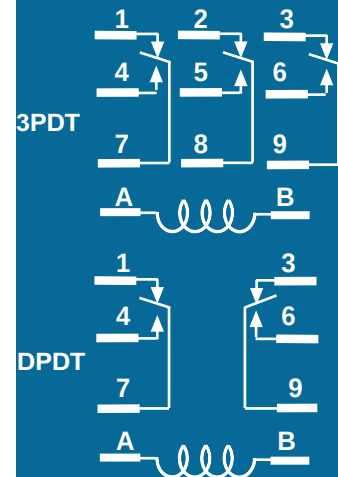


OPTIONAL DIN COVER

DIN MOUNT COVER

Mating Sockets
70-463-1: SCREW/DIN
70-124-1: SOLDER
70-178-1, 70-178-2: PRINTED CIRCUIT
70-124-2: QUICK CONNECT
See section 8, page 16, 17



DPDT & 3PDT, 16 & 20 AMPS**NEW**
From The Market
Leader in Industrial
Relays**PLUG-IN****QUICK CONNECT
SOLDER / PLUG-IN
TERMINALS****OUTLINE DIMENSIONS**
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).**FLAG INDICATOR &
PUSH BUTTON STANDARD
ON 388J RELAYS.****FLANGE COVER****WIRING DIAGRAMS**
(VIEWED FROM PIN END)**ORDERING CODE FOR RELAYS**

CLASS: 388J XCX C1 M- 240A
FLAG INDICATOR STANDARD FEATURE

CONTACT CONFIGURATION: DPDT: XBX, 3PDT: XCX

CONSTRUCTION STYLE: C1
* ENCLOSED, PLAIN COVER: **CODE C**
ENCLOSED, FLANGE COVER: **CODE C1**
ENCLOSED, 6-32 TAPPED CORE &
ANTI-ROTATION TAB: **CODE C2**
ENCLOSED 6-32 STUD & ANTI-ROTATION TAB: **CODE CS2**
ENCLOSED TOP FLANGE MOUNT: **CODE C3**
ENCLOSED DIN MOUNT: **CODE C4**

TERMINAL STYLE: T
† QUICK CONNECT SOLDER TERMINALS: **NO CODE**
PRINTED CIRCUIT TERMINALS: **CODE T**

OPTIONS: L M 69 V V1 V2
L.E.D. STATUS LAMP: **CODE L**
PUSH BUTTON: **CODE M**
MAGNETIC BLOWOUT: **CODE 69**
DC COIL SUPPRESSION: **CODE V**
AC COIL SUPPRESSION: **CODE V1**
RECTIFIED COIL: **CODE V2**

COIL VOLTAGE: 12 24 120 240 ADD "A" FOR AC COILS
6 12 24 48 110 ADD "D" FOR DC COILS

* Note: Code C recommended to be used with printed circuit terminals or Plug-in applications only.

† 0.187 Quick connect or Solder terminals are socket Compatible.

**STANDARD
PART
NUMBERS****CONTACT
CONFIGU-
RATION****COIL MEASURED @ 25°C****NOMINAL
INPUT
VOLTAGE** **NOMINAL
RESISTANCE
(OHMS)****AC OPERATED FLANGE MOUNT WITH PUSH BUTTON, 16AMP**

388JXCXC1M-240A	3PDT	240 VAC, 50/60Hz	7200 Ω
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388JXCXC1M-120A	3PDT	120 VAC, 50/60Hz	1700 Ω
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DC OPERATED FLANGE MOUNT WITH PUSH BUTTON, 16AMP

388JXCXC1M-12D	3PDT	12 VDC	120 Ω
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388JXCXC1M-24D	3PDT	24 VDC	470 Ω
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AC OPERATED PLUG-IN WITH PUSH BUTTON, 16AMP

388JXCXCM-240A	3PDT	240 VAC, 50/60Hz	7200 Ω
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388JXCXCM-120A	3PDT	120 VAC, 50/60Hz	1700 Ω
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DC OPERATED PLUG-IN WITH PUSH BUTTON, 16AMP

388JXCXCM-12D	3PDT	12 VDC	120 Ω
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388JXCXCM-24D	3PDT	24 VDC	470 Ω
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AC OPERATED FLANGE MOUNT WITH PUSH BUTTON, 20AMP

388JXBXC1M-240A	DPDT	240 VAC, 50/60Hz	9100 Ω
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388JXBXC1M-120A	DPDT	120 VAC, 50/60Hz	2250 Ω
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DC OPERATED FLANGE MOUNT WITH PUSH BUTTON, 20 AMP

388JXBXC1M-12D	DPDT	12 VDC	120 Ω
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388JXBXC1M-24D	DPDT	24 VDC	470 Ω
----------------	------	--------	-------

AC OPERATED PLUG-IN WITH PUSH BUTTON, 20 AMP

388JXBXCM-240A	DPDT	240 VAC, 50/60Hz	9100 Ω
----------------	------	------------------	--------

388JXBXCM-120A	DPDT	120 VAC, 50/60Hz	2250 Ω
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DC OPERATED PLUG-IN WITH PUSH BUTTON, 20 AMP

388JXBXCM-12D	DPDT	12 VDC	120 Ω
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388JXBXCM-24D	DPDT	24 VDC	470 Ω
---------------	------	--------	-------

RETROFITS SCHRACK RM. SEE END OF SECTION 1 FOR CROSS REFERENCE
CADMIUM-FREE CONTACTS AVAILABLE, CONTACT FACTORY FOR DETAILS

UL CONTACT LOAD RATINGS TABLE

POLES	CURRENT OR HORSE POWER	LOAD VOLTAGE	LOAD VOLTAGE FREQUENCY	TYPE OF LOAD
1 POLE THRU 3 POLES	15 AMP	120/240 VAC	50/60 Hz	RESISTIVE
	15 AMP	28 VDC	DC	RESISTIVE
	1/3 HP	120 VAC	50/60 Hz	MOTOR
	1/2 HP	240 VAC	50/60 Hz	MOTOR

BENEFITS OF 3mm CONTACT GAP DESIGN:

1. HIGH DIELECTRIC STRENGTH ACROSS CONTACTS.
2. IMPROVED ARC QUENCHING WHEN BREAKING HIGH CURRENT LOADS.
3. MEETS EUROPEAN SPACING REQUIREMENTS OF 8mm ACROSS SURFACES

DPST-NO, 3PST-NO, 15 AMPS



UL Recognized
File No. E43641



LISTED 367G
IND. CONT. EQ.
C US
WHEN USED
WITH SOCKET
70-463-1

COMPLIES WITH REQUIREMENTS OF

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

* IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION

* CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

CURRENT LIMITED TO RATING OF RELAY OR SOCKET WHICHEVER IS LESS.

**MANUFACTURED UNDER
ISO 9002 & QS 9000**

GENERAL SPECIFICATIONS

COIL

Pull-in Voltage: 80% of nominal voltage or less. for DC coils
85% of nominal voltage or less for AC coils
Dropout Voltage: 10% of nominal voltage or more
Resistance: $\pm 10\%$ measured at 25°C
Coil Power: 1.2 watts for DC coils, 2 VA to 2.75 VA for AC @ 25°C
Insulation System: Class "B" (130°C per UL standard 1446)
Maximum Coil Dissipation: 3.0 watts max. DC
Duty: Continuous

CONTACTS

Contact material: Silver cadmium oxide, gold flashed
Contact Resistance: 50 milliohms maximum initial resistance at rated current
Contact Ratings: See "UL CONTACT LOAD RATINGS TABLE"

DIELECTRIC STRENGTH

Contacts to Coil: 3 mm gap, 4000 V rms
Across Open Contacts: 3 mm gap, 1000 V rms
Pole to Pole: 2000 V rms
Contacts to Frame: 2000 V rms
Insulation Resistance: 1000 megohms @ 500 VDC

TEMPERATURE

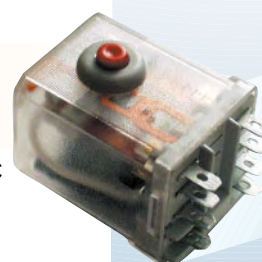
Operating: -30°C to +50°C (AC), -30°C to +65°C (DC)
Storage: -30°C to 100°C

LIFE EXPECTANCY

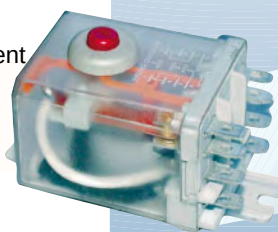
Electrical: 100,000 operations @ rated resistive load
Mechanical: 5,000,000 operations @ no load

MISCELLANEOUS

Operating Position: Any
Insulation material: Molded plastic
Enclosure: Polycarbonate dust cover
Terminals: 0.187 x 0.032 quick connect flange or 0.187 x 0.020 solder/plug-in. Optional printed circuit terminals available
Weight: 88 grams approx.



PLUG-IN



OPTIONAL FLANGE COVER

FLANGE MOUNT

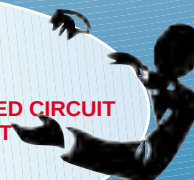


OPTIONAL DIN COVER

DIN MOUNT COVER

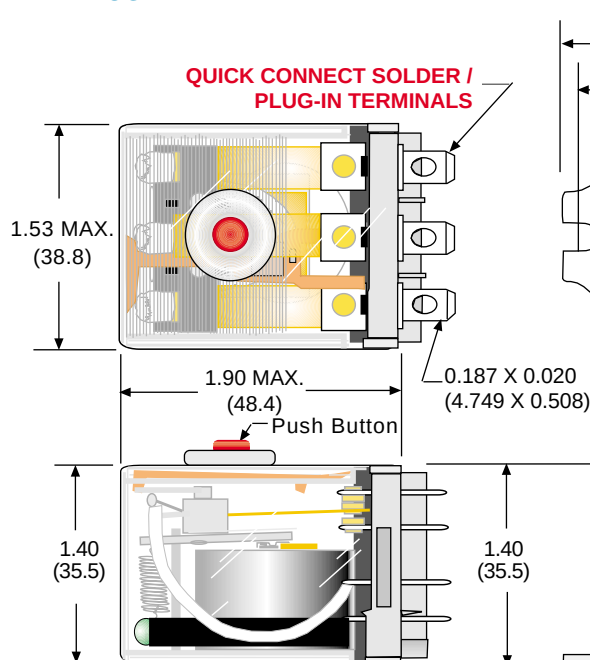
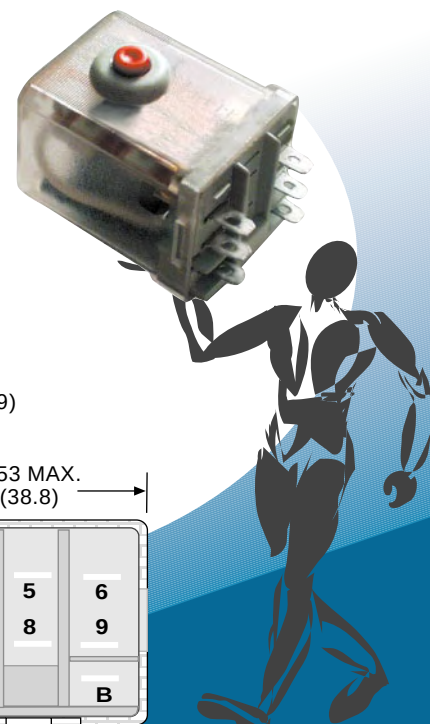
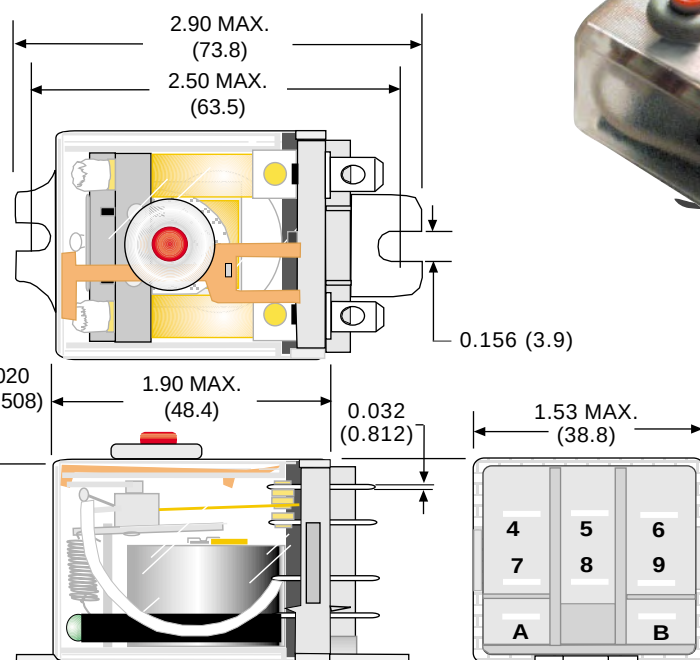
Mating Sockets

70-463-1: SCREW/DIN
70-124-1: SOLDER
70-178-1, 70-178-2: PRINTED CIRCUIT
70-124-2: QUICK CONNECT
See section 8, page 16, 17



DPST-NO, 3PST-NO, 15 AMPS**OUTLINE DIMENSIONS**

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

PLUG-IN**FLANGE COVER****ORDERING CODE FOR RELAYS**

CLASS: **388V CXX C1** **M 24A**

CONTACT CONFIGURATION:
BXX - (DPST-NO) 3 MM CONTACT GAP,
CXX - (3PST-NO) 3 MM CONTACT GAP,

CONSTRUCTION STYLE:
 * ENCLOSED, PLAIN COVER: **CODE C**
 ENCLOSED, FLANGE COVER: **CODE C1**
 ENCLOSED, 6-32 TAPPED CORE &
 ANTI-ROTATION TAB: **CODE C2**
 ENCLOSED 6-32 STUD & ANTI-ROTATION TAB: **CODE CS2**
 ENCLOSED TOP FLANGE MOUNT: **CODE C3**
 ENCLOSED DIN MOUNT: **CODE C4**

TERMINAL STYLE:
 † QUICK CONNECT SOLDER/PLUG-IN TERMINALS: **NO CODE**
 PRINTED CIRCUIT TERMINALS: **CODE T**

OPTIONS:
 L.E.D. STATUS LAMP: **CODE L**
 PUSH BUTTON: **CODE M**
 MAGNETIC BLOWOUT: **CODE 69**
 DC COIL SUPPRESSION: **CODE V**
 AC COIL SUPPRESSION: **CODE V1**
 RECTIFIED COIL: **CODE V2**

COIL VOLTAGE:

6, 12, 24, 120, 240 ADD "A" FOR AC COILS
 6, 12, 24, 48, 110 ADD "D" FOR DC COILS

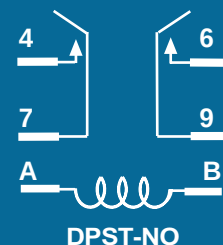
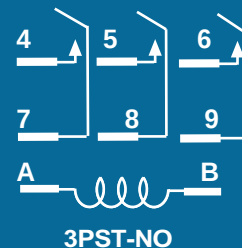
* Note: Code C recommended to be used with printed circuit terminals or Plug-in applications only.

† 0.187 Quick connect or Solder terminals are socket Compatible.

3 MILLIMETER CONTACT GAP.
 PUSH BUTTON STANDARD.

WIRING DIAGRAMS

(VIEWED FROM PIN END)

**DPST-NO****3PST-NO****COIL MEASURED @ 25°C**

STANDARD PART NUMBERS	CONTACT CONFIGURATION	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED PLUG-IN WITH PUSH BUTTON 3mm GAP, 15AMP			
388VCXXCM-220/240A	3PST-NO	220-240 VAC,50/60Hz	9100 Ω
388VCXXCM-120A	3PST-NO	120 VAC,50/60Hz	1100 Ω
388VCXXCM-24A	3PST-NO	24 VAC,50/60Hz	75 Ω
388VBXXCM-220/240A	DPST-NO	220-240 VAC,50/60Hz	9100 Ω
388VBXXCM-120A	DPST-NO	120 VAC,50/60Hz	1100 Ω
388VBXXCM-24A	DPST-NO	24 VAC,50/60 Hz	75 Ω
DC OPERATED PLUG-IN WITH PUSH BUTTON 3mm GAP, 15AMP			
388VCXXCM-24D	3PST-NO	24 VDC	240 Ω
388VCXXCM-12D	3PST-NO	12 VDC	120 Ω
388VBXXCM-24D	DPST-NO	24 VDC	240 Ω
388VBXXCM-12D	DPST-NO	12 VDC	120 Ω

RETROFITS POTTER & BRUMFIELD KUGP.
 SEE END OF SECTION 1 FOR CROSS REFERENCE

DIELECTRIC STRENGTH CHART (V rms)

	SPDT	DPDT	3PDT	SPDT-DM,DB,DM-DB
COIL TO FRAME	1600	1600	1600	1600
ACROSS OPEN CONTACTS	1000	1000	1000	1500
CONTACT TO FRAME	1600	1600	1600	1600
COIL TO CONTACTS	2200	2200	1600	2200
POLE TO POLE	-	2200	1600	-
CONTACTS TO METAL MOUNTING PLATE (COVER INSTALLED)	2200	2200	1600	2200
COIL TO METAL MOUNTING PLATE (COVER INSTALLED)	2200	2200	2200	2200

20, 25 & 30 AMPS

UL **us**
UL Recognized
File No. E 43641

CSA 168986



COMPLIES WITH REQUIREMENTS OF

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

* IEC = INTERNATIONAL
ELECTROTECHNICAL COMMISSION

* CE TESTING AND EVALUATION
PERFORMED BY THE UNDERWRITERS
LABORATORIES AS A THIRD PARTY
PARTICIPANT

MANUFACTURED UNDER
ISO 9002 & QS 9000

FLANGE MOUNT**GENERAL SPECIFICATIONS****COIL**

Pull-in Voltage:	80% of nominal voltage or less. for DC coils 85% of nominal voltage or less for AC coils
Dropout Voltage:	10% of nominal voltage or more
Resistance:	± 10 % measured @ 25°C
Coil Power:	1.44 watts for DC coils, 2 VA to 3.5 VA for AC coils
Insulation System:	Class "B" Coil system. (130°C per UL standard 1446)
Max. Coil Dissipation:	2.5 watts max. DC
Duty:	Continuous

CONTACTS

Contact Material:	0.250 silver cadmium oxide, gold flashed
Contact Rating:	See next page
Contact Resistance:	50 Milliohms maximum initial resistance at rated current

TIMING

Operate Time:	20 mS max. @ nominal voltage
Release Time:	20 mS max. @ nominal voltage

DIELECTRIC STRENGTH

Dielectric Strength	See "DIELECTRIC STRENGTH CHART "
Insulation Resistance:	1,000 megohms min. @ 500 VDC

TEMPERATURE

Operating:	-30°C to +50°C (AC), -30°C to +65°C (DC)
Storage:	-30°C to 100°C

LIFE EXPECTANCY

Electrical:	100,000 Operations @ rated resistive load
Mechanical:	5,000,000 Operations @ no load

MISCELLANEOUS

Operating Position:	Any
Insulation Material:	Molded plastic
Enclosure:	Polycarbonate dust cover
Terminals:	0.250 x 0.032 quick connect/solder terminals Optional printed circuit terminals. (0.090 x 0.032) available
Weight:	94 grams approx with cover



OPTIONAL P.C. TERMINAL
CONSULT FACTORY.

PRINTED CIRCUIT
TERMINAL



OPTIONAL TOP FLANGE COVER
CONSULT FACTORY.

TOP FLANGE MOUNT



OPTIONAL DIN COVER
CONSULT FACTORY.

DIN MOUNT COVER



CLASS 389 LOAD RATINGS

POLES	ENCLOSED STYLE 1, 2 AND 3 POLE			
	CURRENT OR HORSEPOWER	LOAD VOLTAGE	LOAD VOLTAGE FREQUENCY	TYPE OF LOAD
1 POLE	13A	28	DC	RESISTIVE
	20A	15	DC	RESISTIVE
	25A	300	50/60 Hz	RESISTIVE
	5A	600	50/60 Hz	RESISTIVE
	20A	277	50/60 Hz	BALLAST
	1HP	120	50/60 Hz	MOTOR
	1-1/2HP	208/240	50/60 Hz	MOTOR
	1HP	480/600	50/60 Hz	MOTOR
	660VA	120	50/60 Hz	PILOT DUTY
	915VA	208	50/60 Hz	PILOT DUTY
	960VA	240	50/60 Hz	PILOT DUTY
	765VA	480/600	50/60Hz	PILOT DUTY
	•B600		50/60Hz	PILOT DUTY
2 POLES	13A	28	DC	RESISTIVE
	20A	15	DC	RESISTIVE
	25A	300	50/60 Hz	RESISTIVE
	5A	600	50/60 Hz	RESISTIVE
	20A	277	50/60 Hz	BALLAST
	1HP	120	50/60 Hz	MOTOR
	1-1/2HP	208/240	50/60 Hz	MOTOR
	1HP	480/600	50/60 Hz	MOTOR
	660VA	120	50/60 Hz	PILOT DUTY
	915VA	208	50/60 Hz	PILOT DUTY
	960VA	240	50/60 Hz	PILOT DUTY
	765VA	460/600	50/60Hz	PILOT DUTY
	B600		50/60Hz	PILOT DUTY
3 POLES	13A	28	DC	RESISTIVE
	15A	28	DC (NO)	RESISTIVE
	20A	15	DC	RESISTIVE
	20A	150	50/60 Hz	RESISTIVE
	††15A	250	50/60 Hz	RESISTIVE
	†10A	300	50/60 Hz	RESISTIVE
	20A	150	50/60 Hz	BALLAST
	6-2/3HP	277	50/60 Hz	BALLAST
	1/2HP	120	50/60Hz	MOTOR
	1/2HP	208/240	50/60 Hz	MOTOR
	1HP	240	50/60 Hz	MOTOR
	3/4HP	120	50/60Hz	MOTOR
	470VA	120/240	50/60Hz	PILOT DUTY
	445VA	208	50/60Hz	PILOT DUTY
	B300		50/60Hz	PILOT DUTY

CLASS 389D LOAD RATINGS

POLE	ENCLOSED STYLE 1, 2 AND 3 POLE			
	CURRENT OR HORSE POWER	LOAD VOLTAGE	LOAD VOLTAGE FREQUENCY	TYPE OF LOAD
1 POLE	30A	28	DC	RESISTIVE
	30A	300	50/60 Hz	RESISTIVE
	10A	600	50/60 Hz	RESISTIVE
	1HP	120	50/60 Hz	MOTOR
	1-1/2HP	200 thru 600	50/60 Hz	MOTOR
	765VA	120	50/60 Hz	PILOT DUTY
	915VA	208	50/60 Hz	PILOT DUTY
	960VA	240,480,600	50/60 Hz	PILOT DUTY
	A600		50/60 Hz	PILOT DUTY

CLASS 389 BALLAST LOAD RATINGS

POLES	ENCLOSED STYLE
SPDT	20 AMP 277 VAC 50/60Hz
DPDT	20 AMP 277 VAC 50/60Hz
3PDT	20 AMP 150 VAC 50/60Hz 6 2/3 AMP 277 VAC 50/60Hz
DOUBLE BREAK DOUBLE MAKE (1 FORM X & Z)	
SPDT	25 AMP 277 VAC 50/60Hz

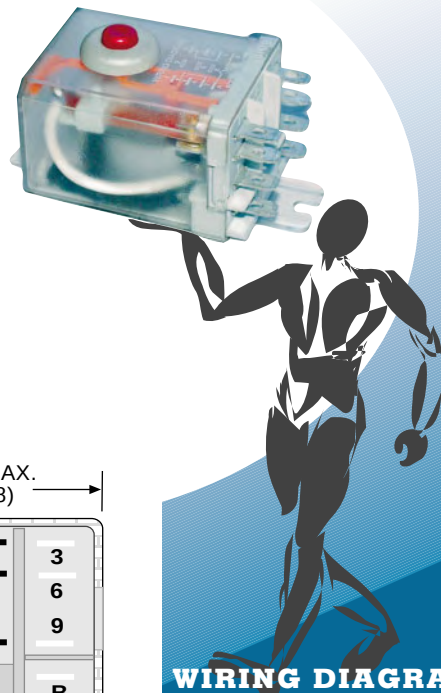
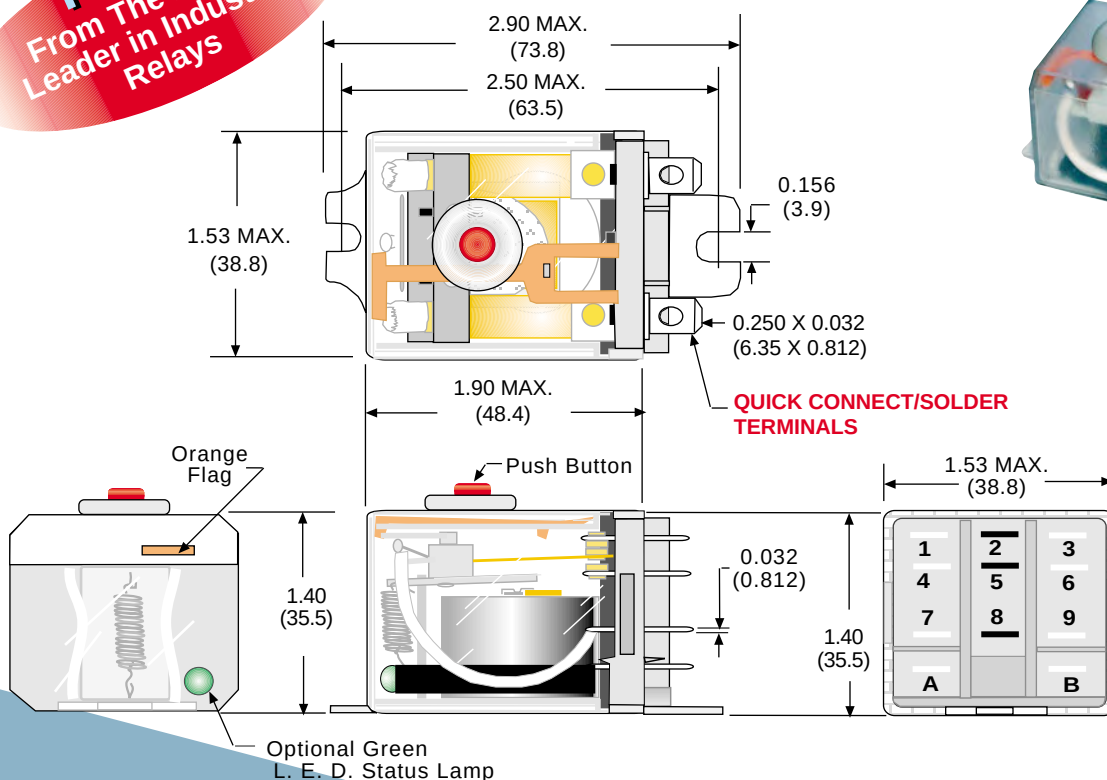
†† UL APPLIANCE
RATED. ALL OTHER
RATINGS NOT SO
MARKED ARE
INDUSTRIAL RATED
† CSA RATING ONLY,
NOT UL

**1, 2 & 3 POLE NEMA PILOT DUTY CONTACT RATINGS**

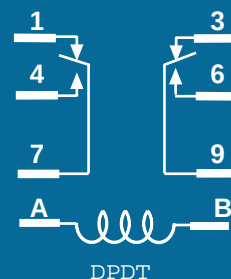
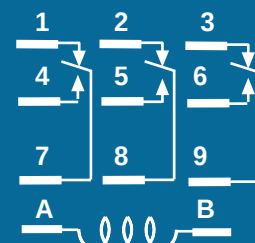
NEMA CONTACT CODE DESIGNATION	THERMAL CONTINUOUS TEST CURRENT AMPERES	MAXIMUM CURRENT, AMPERES									
		120 VOLTS 50/60Hz		240 VOLTS 50/60Hz		480 VOLTS 50/60Hz		600 VOLTS 50/60Hz		MAXIMUM VOLT-AMPERES	
		MAKE	BREAK	MAKE	BREAK	MAKE	BREAK	MAKE	BREAK	MAKE	BREAK
A600	10	60	6.00	30	3.00	15	1.50	12	1.20	7200	720
B300	5	30	3.00	15	1.50					3600	360
B600	5	30	3.00	15	1.50	0.75	0.75	0.6	0.6	3600	360

DPDT, 3PDT, 20 & 25 AMPS**NEW**
From The Market
Leader in Industrial
Relays**OUTLINE DIMENSIONS**

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

**WIRING DIAGRAMS**

(VIEWED FROM PIN END)

**ORDERING CODE FOR RELAYS****389F XCX C1 M - 120A****CLASS:** _____
FLAG INDICATOR STANDARD FEATURE**CONTACT CONFIGURATION:** _____
DPDT: XB, 3PDT: XC**CONSTRUCTION STYLE:** _____
* ENCLOSED, PLAIN COVER: **CODE C**
ENCLOSED, FLANGE COVER: **CODE C1**
ENCLOSED, 6-32 TAPPED CORE &
ANTI-ROTATION TAB: **CODE C2**
ENCLOSED 6-32 STUD &
ANTI-ROTATION TAB: **CODE CS2**
ENCLOSED TOP FLANGE MOUNT: **CODE C3**
ENCLOSED DIN MOUNT: **CODE C4****TERMINAL STYLE:** _____
0.250 QUICK CONNECT SOLDER TERMINALS: **NO CODE**
PRINTED CIRCUIT TERMINALS: **CODE T****OPTIONS:** _____
L.E.D. STATUS LAMP: **CODE L**
PUSH BUTTON: **CODE M**
MAGNETIC BLOWOUT: **CODE 69**
DC COIL SUPPRESSION: **CODE V**
AC COIL SUPPRESSION: **CODE V1**
RECTIFIED COIL: **CODE V2****COIL VOLTAGE:** _____
6, 12, 24, 120, 240 **ADD "A" FOR AC COILS**
6, 12, 24, 48, 110-125, 220-250 **ADD "D" FOR DC COILS****FLAG INDICATOR
& PUSH BUTTON
STANDARD ON
389F RELAYS.****STANDARD
PART
NUMBERS****CONTACT
CONFIGU-
RATION****COIL MEASURED @ 25°C****NOMINAL
INPUT
VOLTAGE****NOMINAL
RESISTANCE
(OHMS)****AC OPERATED FLANGE MOUNT WITH PUSH BUTTON, 20 AMP**

389FXCXC1M-240A	3PDT	240 VAC, 50/60Hz	4600 Ω
389FXCXC1M-120A	3PDT	120 VAC, 50/60Hz	1200 Ω

AC OPERATED FLANGE MOUNT WITH PUSH BUTTON, 25 AMP

389FXBXC1M-240A	DPDT	240 VAC, 50/60Hz	7200 Ω
389FXBXC1M-120A	DPDT	120 VAC, 50/60Hz	1700 Ω

DC OPERATED FLANGE MOUNT WITH PUSH BUTTON, 20 AMP

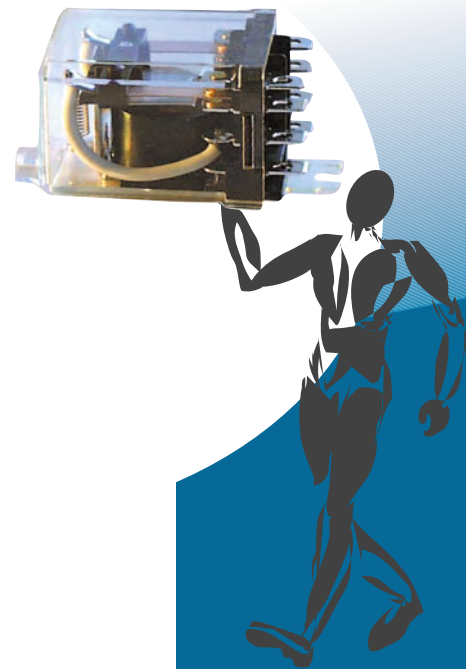
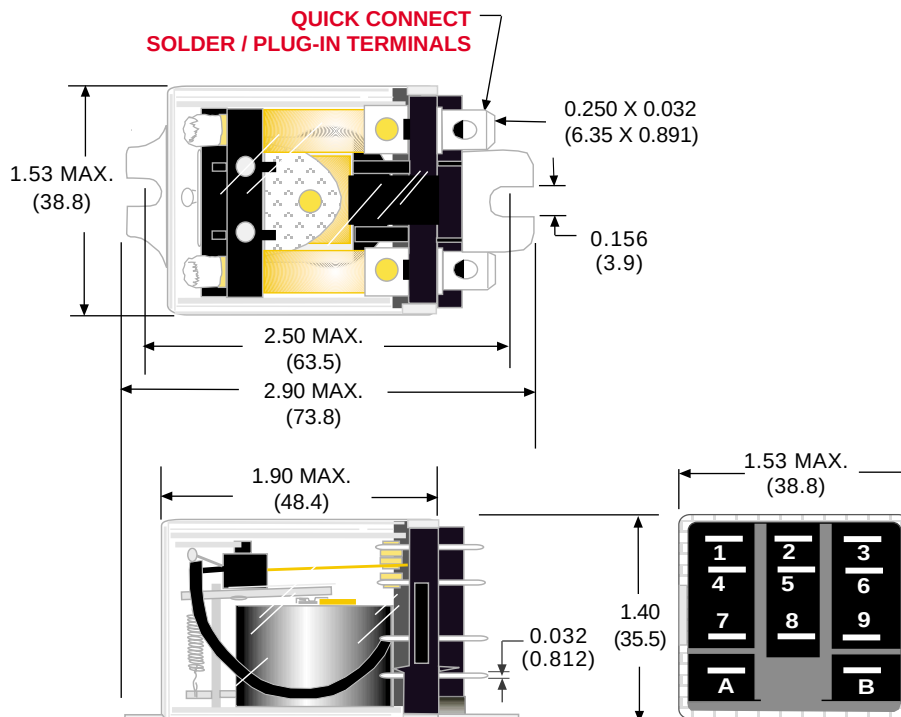
389FXCXC1M-12D	3PDT	12 VDC	100 Ω
389FXCXC1M-24D	3PDT	24 VDC	400 Ω

DC OPERATED FLANGE MOUNT WITH PUSH BUTTON, 25 AMP

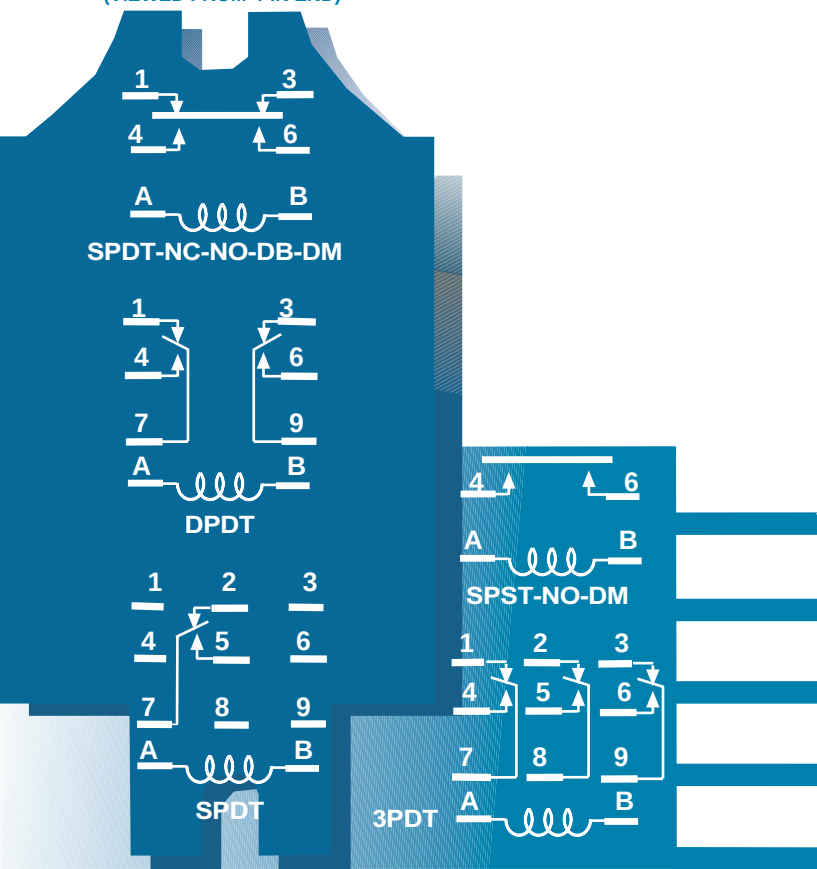
389FXBXC1M-12D	DPDT	12 VDC	100 Ω
389FXBXC1M-24D	DPDT	24 VDC	400 Ω

* Note: Code C recommended to be used with printed circuit terminals or only.

RETROFITS SCHRACK RM.
SEE END OF SECTION 1 FOR CROSS REFERENCE

20, 25 & 30 AMPS**OUTLINE DIMENSIONS**
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).**WIRING DIAGRAMS**

(VIEWED FROM PIN END)

**COIL MEASURED @ 25°C**

STANDARD PART NUMBERS	CONTACT CONFIGU- RATION	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED FLANGE MOUNT, 30AMP			
W389ADCX-4	SPST-NO (DM)	120 VAC,50/60Hz	1100 Ω
W389ADCX-5	SPST-NO (DM)	220/240 VAC,50/60Hz	4300 Ω
W389ADZCX-3	SPDT-NO-NC (DM-DB)	24 VAC,50/60Hz	44 Ω
W389ADZCX-4	SPDT-NO-NC (DM-DB)	120 VAC,50/60Hz	1100 Ω
DC OPERATED FLANGE MOUNT, 30 AMP			
W389DCX-2	SPST-NO (DM)	12 VDC	100 Ω
W389DCX-3	SPST-NO (DM)	24 VDC	400 Ω
W389DZCX-2	SPST-NO-NC (DM-DB)	12 VDC	100 Ω
W389DZCX-3	SPST-NO-NC (DM-DB)	24VDC	400 Ω
AC OPERATED FLANGE MOUNT, 25 AMP			
W389ACX-4	SPDT	120 VAC,50/60Hz	1700 Ω
W389ACX-8	DPDT	24 VAC,50/60Hz	72 Ω
W389ACX-9	DPDT	120 VAC,50/60Hz	1700 Ω
W389ACX-10	DPDT	220/240 VAC,50/60Hz	7200 Ω
AC OPERATED FLANGE MOUNT, 20 AMP			
W389ACX-14	3PDT	120 VAC,50/60Hz	1200 Ω
W389ACX-15	3PDT	220/240 VAC,50/60Hz	4600 Ω
DC OPERATED FLANGE MOUNT, 25 AMP			
W389CX-2	SPDT	12 VDC	100 Ω
W389CX-3	SPDT	24VDC	400 Ω
W389CX-7	DPDT	12 VDC	100 Ω
W389CX-8	DPDT	24VDC	400 Ω
DC OPERATED FLANGE MOUNT, 20 AMP			
W389CX-12	3PDT	12 VDC	100 Ω
W389CX-13	3PDT	24VDC	400 Ω

RETROFITS POTTER & BRUMFIELD KUMP & KUHF.
SEE END OF SECTION 1 FOR CROSS REFERENCE

FEATURES

OPTIONAL BLOWOUT MAGNET
WIDE SPACING BETWEEN STATIONARY CONTACT TERMINALS

ARC BARRIERS BETWEEN CONTACTS

2 MILLIMETER CONTACT GAPS

IMPROVED DIELECTRIC STRENGTH BETWEEN CONTACT

WIDE SELECTION OF MOUNTING OPTIONS

HIGH VOLTAGE DC SWITCHING

CLEARANCE FOR FULLY BOOTED QUICK CONNECT TERMINALS

IMPROVED DIELECTRIC STRENGTH BETWEEN CONTACT SETS.

8 MILLIMETER CREEPAGE AND CLEARANCE TO MEET INTERNATIONAL REQUIREMENTS.

4000 Vrms DIELECTRIC BETWEEN MUTUALLY INSULATED CONDUCTIVE ELEMENTS AND FRAME.

ALLOWS INSTALLATIONS TO BE "CUSTOMIZED"

BENEFITS

**DPDT, UP TO 30 AMPS
UP TO 600 VAC OR 150 VDC**



UL Recognized
File No. E13224



50758

**MANUFACTURED UNDER
ISO 9002 & QS 9000**

GENERAL SPECIFICATIONS**COIL**

Pull-in Voltage: 80% of nominal voltage or less for DC coils
Dropout Voltage: 85% of nominal voltage or less for AC Coils
Max. Voltage: 110%
Resistance: $\pm 10\%$ measured @ 25°C
Coil Power: 2.0 watts DC, 3.0 VA (60Hz) AC. @ 25°C
Insulation System: Class "B" (130°C per UL standard 1446), Class "F" (155°C available)
Max. Coil Dissipation: 3.0 watts DC., 3.4 VA (60Hz) AC
Duty: Continuous

CONTACTS

Contact Material: Silver cadmium oxide, gold flashed
Contact Rating: 30 amps @ 120, 240, 277 VAC. 20 amps @ 480 VAC (general purpose)
15 amps @ 600 VAC (resistive load). 30 amps @ 28 VDC (resistive load).
1 Hp @ 120 VAC 50/60 Hz. 2 Hp @ 208, 240, 480, 600 VAC.
50/60 Hz (motor load).

Code 69

DPDT: 5 amps @ 150 VDC;
SPDT-DM-DB: 10 amps @ 150 VDC; 20 amps @ 72 VDC

TIMING

Operate Time: 20 ms max. @ nominal voltage
Release Time: 15 ms max. @ nominal voltage

DIELECTRIC STRENGTH

Contacts To Coil: 4000 V rms; (8mm creepage)
Coil To Frame: 4000 V rms
Across Open Contacts: 1000 V rms
Contact To Frame: 4000 V rms

TEMPERATURE

Operation: -30°C to +50°C. (AC), -30°C to +60°C. (DC)
Storage: -40°C to +105°C

LIFE EXPECTANCY

Electrical: 100,000 operations @ rated resistive load
Mechanical: 10,000,000 operations @ no load

MISCELLANEOUS

Operating Position: Any
Enclosure: Polycarbonate dust cover
Weight: 85 grams approx.



FLANGE MOUNT



OPTIONAL TOP FLANGE COVER

TOP FLANGE MOUNT



OPTIONAL DIN COVER

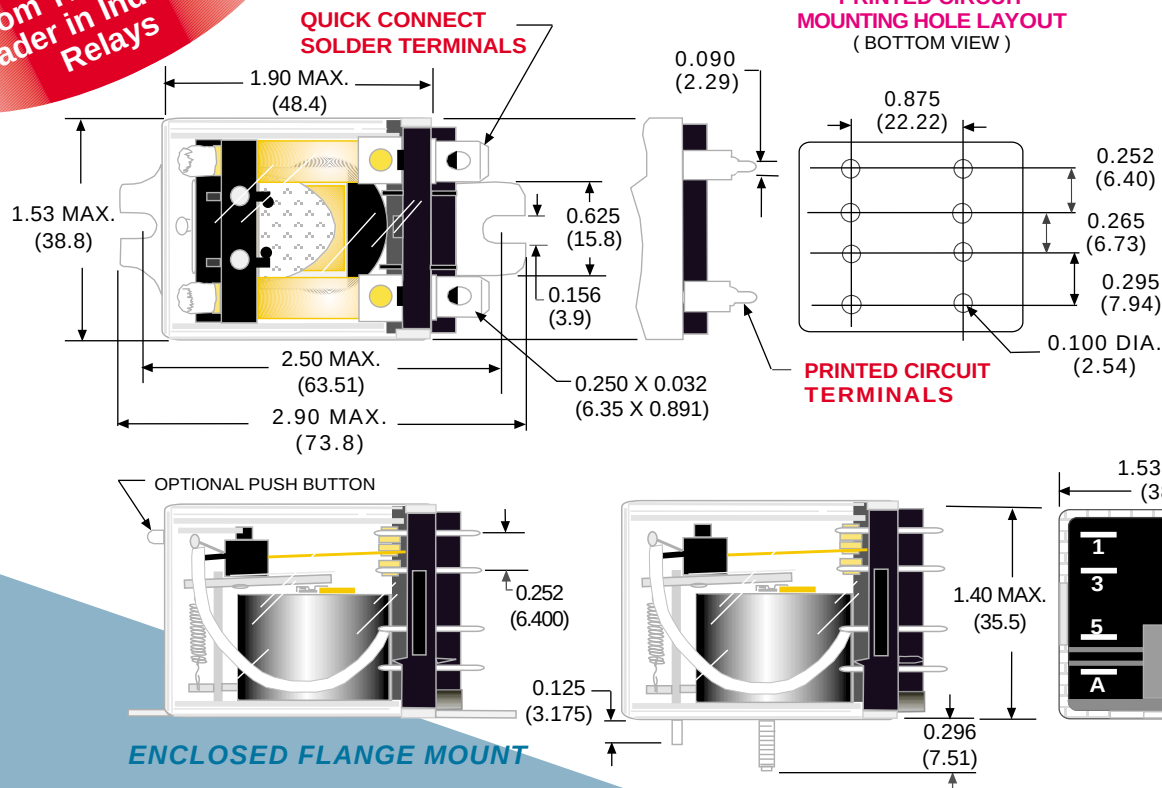
DIN MOUNT COVER



NEW
From The Market
Leader in Industrial
Relays

**DPDT, UP TO 30 AMPS
UP TO 600 VAC OR 150 VDC**

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



ORDERING CODE FOR RELAYS

TEMPERATURE RATING:
†† 130°C COIL: **CODE B**
155°C COIL: **CODE F**

CLASS: _____

CONTACT CONFIGURATION:
DPDT: **XBX**

CONSTRUCTION STYLE:
* ENCLOSED, PLAIN COVER: **CODE C**
ENCLOSED, FLANGE COVER: **CODE C1**
ENCLOSED, 6-32 TAPPED CORE &
ANTI-ROTATION TAB: **CODE C2**
ENCLOSED 6-32 STUD & ANTI-ROTATION TAB: **CODE CS2**
ENCLOSED TOP FLANGE MOUNT: **CODE C3**
ENCLOSED DIN MOUNT: **CODE C4**

TERMINAL STYLE:
† QUICK CONNECT SOLDER TERMINALS: **NO CODE**
PRINTED CIRCUIT TERMINALS: **CODE T**

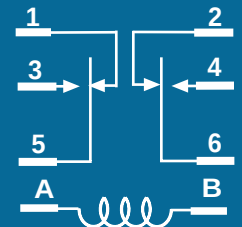
OPTIONS:
L.E.D. STATUS LAMP: **CODE L**
PUSH BUTTON: **CODE M**
MAGNETIC BLOWOUT: **CODE 69**
DC COIL SUPPRESSION: **CODE V**
AC COIL SUPPRESSION: **CODE V1**
RECTIFIED COIL: **CODE V2**

COIL VOLTAGE: _____

6, 12, 24, 120, 240 ADD "A" FOR AC COILS
6, 12, 24, 48, 110-125, 220-250 ADD "D" FOR DC COILS

**OPTIONAL 6-32
STUD OR TAPPED
CORE WITH
ANTI-ROTATION TAB.**

WIRING DIAGRAM
(VIEWED FROM PIN END)



COIL MEASURED @ 25°C

STANDARD PART NUMBERS	CONTACT CONFIGURATION	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED, 30 AMP			
300XBXC1-240A	DPDT	240 VAC, 50/60Hz	7200 Ω
300XBXC1-120A	DPDT	120 VAC, 50/60Hz	1700 Ω
300XBXC1-24A	DPDT	24 VAC, 50/60Hz	72 Ω
300XBXC1-12A	DPDT	12 VAC, 50/60Hz	18 Ω
DC OPERATED, 30 AMP			
300XBXC1-110D	DPDT	110 VDC	10,000 Ω
300XBXC1-24D	DPDT	24 VDC	470 Ω
300XBXC1-12D	DPDT	12 VDC	51 Ω
DC OPERATED, 30 AMP WITH MAGNETIC BLOWOUT			
300XB69C1-125D	DPDT	110 VDC	10,000 Ω
300XB69C1-24D	DPDT	24 VDC	470 Ω
300XB69C1-12D	DPDT	12 VDC	51 Ω

* Note: Code C recommended to be used with printed circuit terminals only.
†† Standard coil temperature Rating. Code letter not required in part number.
Add code letter required in part number when a higher nonstandard coil temperature rating is required.

UL CONTACT LOAD RATINGS TABLE

LOAD	LOAD VOLTAGE	SPST	SPDT		OPERATIONS
		N.O. LOAD	N.O. LOAD	N.C. LOAD	
GENERAL PURPOSE	240 VAC	30AMP	30AMP	15AMP	100,000
RESISTIVE	28 VDC	30AMP	30AMP	10AMP	100,000
MOTOR	125 VAC	1 HP	1 HP	1/4 HP	1,000
	240 VAC	2 HP	2 HP	1/2 HP	6,000
FLA/LRA ‡	120 VAC	22/98AMP	22/98AMP	-	100,000
	240 VAC	30/80AMP	30/80AMP	12/30AMP	30,000
TUNGSTEN	240 VAC	TV - 5	TV - 5	-	25,000
BALLAST	277 VAC	10AMP	10AMP	3AMP	6,000
PILOT DUTY	240 VAC	470 VAC	470 VAC	275 VAC	6,000

‡ FLA = Full load amps, LRA = Locked rotor amps.

SPST-N.O. & SPDT 30 AMPS

cULus
UL Recognized
File No. E43641

CLASS "F" INSULATION. FLANGE MOUNTED. EPOXY SEALED WITH REMOVABLE TAPE SEAL OVER VENT HOLE (REMOVED AFTER CLEANING)

GENERAL SPECIFICATIONS**COIL**

Pull-in Voltage: 80% of nominal voltage or less for AC, 75% of nominal voltage or less for DC
 Dropout Voltage: 10% of Nominal Voltage or more
 Max. Coil Voltage: 120% max
 Power Consumption: 2.8 watts max
 Insulation System: Class "F" (155°C)
 Coil Resistance: ±10% measured @ 25°C
 Duty: Continuous

CONTACT

Contact Material: Silver cadmium oxide
 Switching Voltage: 277 VAC, 28VDC max
 Contact Resistance: 75 milliohms @ 1 amp rated current
 Minimum Load: 1A, 5VDC, 12VAC

TIMING

Operate Time: DC: 15 mS typ. including bounce
 Release Time: DC: 15 mS typ. including bounce

DIELECTRIC STRENGTH

Contacts to Coil: 2500V rms
 Between Open Contacts: 1500 V rms
 Insulation Resistance: 1000 mΩ min. @ 500 VDC, 25°C 50% RH

TEMPERATURE

Operating: -55-55°C to +85°C
 Storage: -55°C to +130°C

VIBRATION RESISTANCE

Functional: 10 to 55Hz 1.65 mm max.
 No contact opening > 100 μS

SHOCK RESISTANCE

Functional: 10 g's for 11 mS, no contact opening > 100 μS
 Mechanical: 100 g's

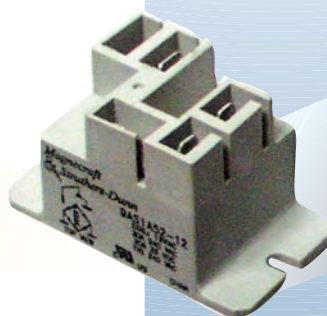
LIFE EXPECTANCY

Electrical: 100,000 operations @ rated resistive load
 Mechanical: 10,000,000 operations @ no load

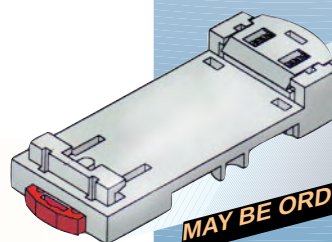
MISCELLANEOUS

Operating Position: Any
 Enclosure: Epoxy sealed immersion cleanable suitable for automatic circuit board processing, max. Exposure soldering temperature is 4 sec. @ 500°F
 94V-O flammability rating
 Terminals: 1/4" quick connect & safety wells accept insulated female quick connect terminals
 Weight: 33 grams approx.

MEETS UL 508,
UL 873 AND
UL 1950 - 1/8"
THRU AIR - 1/4"
OVER SURFACE



STANDARD FLANGE COVER



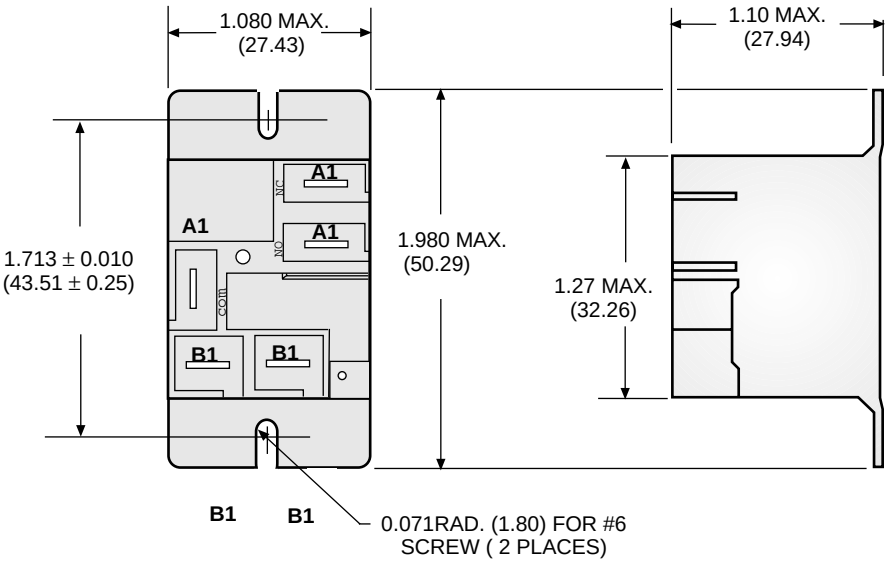
OPTIONAL DIN ADAPTER

MAY BE ORDERED SEPARATELY

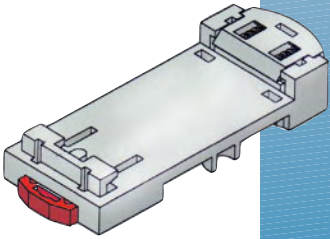


OUTLINE DIMENSIONS

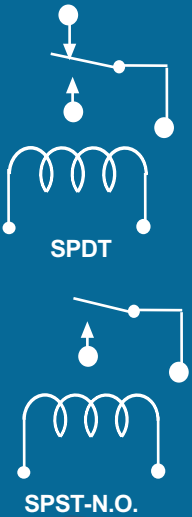
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



A1 = 0.250 X 0.032 (6.35 X 0.81) Quick Connect Terminal
B1 = 0.187 x 0.020 (4.78 x 0.508) Quick Connect Terminal



WIRING DIAGRAM
(BOTTOM VIEW)



STANDARD PART NUMBERS	CONTACT CONFIGU- RATION	COIL MEASURED @ 25°C	
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
FLANGE MOUNT, 30 AMP			
W9AS1D52-5	SPST-NO	5 VDC	25 Ω
W9AS1D52-12	SPST-NO	12 VDC	144 Ω
W9AS1D52-24	SPST-NO	24 VDC	576 Ω
W9AS1D52-110	SPST-NO	110 VDC	12100 Ω
FLANGE MOUNT, 20 AMP			
W9AS5D52-5	SPDT	5 VDC	25 Ω
W9AS5D52-12	SPDT	12 VDC	144 Ω
W9AS5D52-24	SPDT	24 VDC	576 Ω
W9AS5D52-110	SPDT	110 VDC	12100 Ω
FLANGE MOUNT, 30 AMP			
W9AS1A52-24	SPST-NO	24 VAC	
W9AS1A52-120	SPST-NO	120 VAC	
W9AS1A52-240	SPST-NO	240 VAC	
FLANGE MOUNT, 20 AMP			
W9AS5A52-24	SPDT	24 VAC	
W9AS5A52-120	SPDT	120 VAC	
W9AS5A52-240	SPDT	240 VAC	

UL CONTACT LOAD RATINGS TABLE

RATING	LOAD VOLTAGE	DPST-N.O. & DPDT	DPDT	OPERATIONS
		N.O. LOAD	N.C. LOAD	
RESISTIVE LOAD	120/277 VAC	30 AMP	3 A MP	6,000
	28 VDC	20 AMP	3 A MP	100,000
MOTOR	120 VAC	1 HP	-	1000
	240 VAC	3 HP	-	1000
TUNGSTEN	120 VAC	TV-10	-	25,000
LRA/FLA‡	240 VAC	96/22	-	30,000
		110/25.3	-	
PILOT DUTY	240 VAC	3 AMP	-	6,000

DPST-N.O. & DPDT 30 AMPS

cULus
UL Recognized
File No. E43641

Note:

Vent tape must be removed to achieve listed ratings
‡ FLA = full load amps, LRA = Locked rotor amps.

GENERAL SPECIFICATIONS**COIL**

Pull-in Voltage: 80% of nominal voltage or less for AC coils, 75% of nominal voltage or less for DC coils,
Dropout Voltage: 10% of nominal voltage or more
Max. Operating Frequency: 14 operations per minute
Nominal Power: AC coil: 4.0VA, DC coil: 1.7W
Insulation System: Class "F" (155°C)
Coil Resistance: ±10% measured @ 25°C
Duty: Continuous

CONTACT

Contact Material: Silver cadmium oxide
Contact Load Ratings: See: "UL CONTACT LOAD RATINGS TABLE"
Contact Resistance: 100,000,000 @ initial rated current (switched)
Minimum Load: N.O. 500 mA @ 12 VAC/VDC
N.C. 100 mA @ 6 VAC/VDC

TIMING

Operate Time: DC: 15 mS typ. 25ms W/ Bounce
Release Time: DC: 10 mS typ. 25 ms W/ Bounce

DIELECTRIC STRENGTH

Between Open Contacts: 1500 V rms
Contacts to Coil: 4000V rms
Insulation Resistance: 10³ meg Ω min. @ 500 VDC, 25°C 50% RH

TEMPERATURE

Operating: AC coil rectified: -40°C to +85°C,
DC: -40°C to +85°C
Storage: -55°C to +155°C

VIBRATION RESISTANCE

Functional: 0.065 (1.65 mm) double
Amplitude -10 thru 55 Hz

SHOCK RESISTANCE

Functional: 10 g's for 11 mS, 1/2 sign wave pulse with no contact opening >100µs
Mechanical: 100 g for 11 ms 1/2 sine wave pulse

LIFE EXPECTANCY

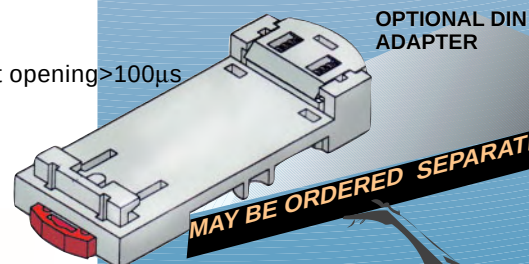
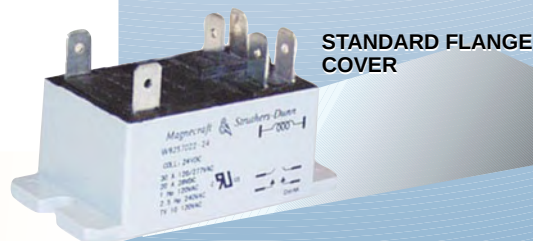
Electrical: 100,000 operations @ rated resistive load
Mechanical: 5,000,000 operations @ no load

MISCELLANEOUS

Operating Position: Any
Enclosure: Epoxy sealed immersion cleanable tape sealed plastic cover
Flammability: 94V-O flammability rating
Weight: 86 grams approx.

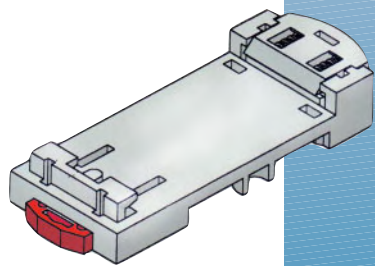
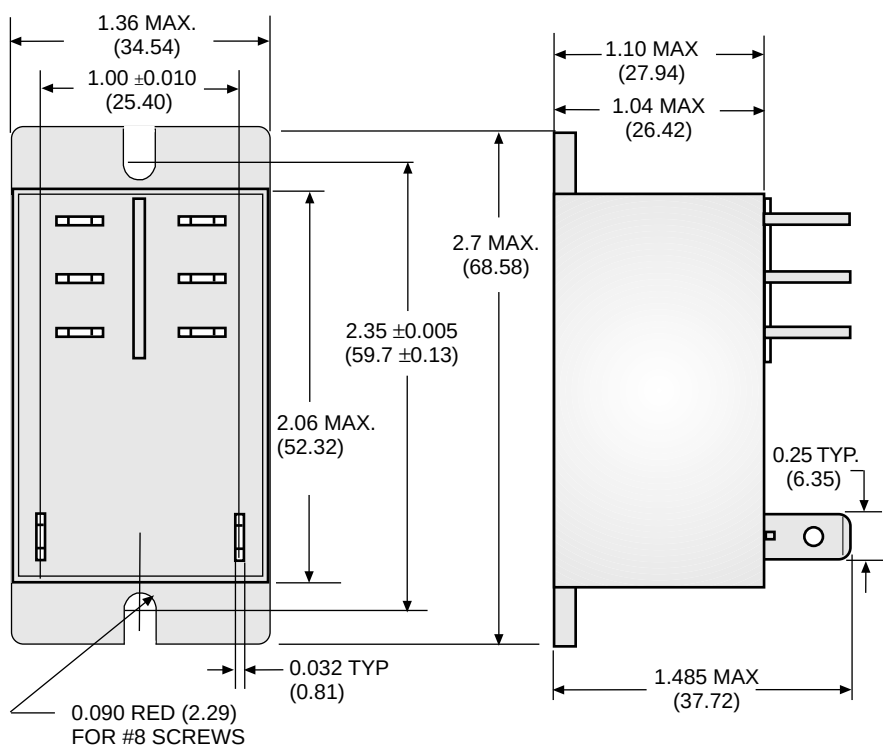
**CLASS "F" INSULATION. EPOXY
SEALED WITH REMOVABLE TAPE
SEAL OVER VENT HOLE
(REMOVED AFTER CLEANING).**

MEETS UL 873
AND UL 508
SPACING - (8MM)
THRU AIR, (9.5 MM)
OVER SURFACE

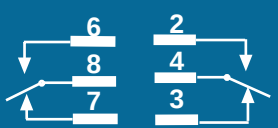
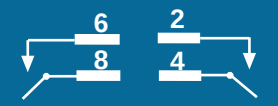


DPST-N.O. & DPDT 30 AMPS

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



WIRING DIAGRAM
(VIEWED FROM PIN END)



STANDARD PART NUMBERS	CONTACT CONFIGU- RATION	COIL MEASURED @ 25°C	
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED COIL FLANGE MOUNT, 30 AMP			
W92S7A22-24	DPST-NO	24 VAC	-
W92S7A22-120	DPST-NO	120 VAC	-
W92S7A22-240	DPST-NO	240 VAC	-
W92S11A22-24	DPDT	24 VAC	-
W92S11A22-120	DPDT	120 VAC	-
W92S11A22-240	DPDT	240 VAC	-
DC OPERATED COIL FLANGE MOUNT, 30 AMP			
W92S7D22-12	DPST-NO	12 VDC	86 Ω
W92S7D22-24	DPST-NO	24 VDC	350 Ω
W92S7D22-110	DPST-NO	110 VDC	7,255 Ω
W92S11D22-12	DPDT	12 VDC	86 Ω
W92S11D22-24	DPDT	24 VDC	350 Ω
W92S11D22-110	DPDT	110 VDC	7,255 Ω

UL CONTACT LOAD RATINGS TABLE

POLES	CURRENT OR HORSE POWER	LOAD VOLTAGE	LOAD VOLTAGE FREQUENCY	TYPE OF LOAD	MINIMUM LOAD
1 POLE THRU 8 POLES	5 AMP	120 VAC	50/60 Hz	RESISTIVE	
	5 AMP	28 VDC	DC	RESISTIVE	50 mA, 6 VDC
	3 AMP	120 VAC	50/60 Hz	RESISTIVE	
	3 AMP	28 VDC	DC	RESISTIVE	10 mA, 6 VDC

DPDT THRU 8PDT, 3 & 5 AMPS

UL **us**
UL Recognized
File No. E52197

CS 168986

Standard **Class 67** miniature industrial relays are designed for applications requiring DPDT to 8PDT contacts where space and weight are of prime importance. Shatter resistant, see-thru plastic covers are utilized to protect against dust, tampering and electrical shock. The 67T models have Bifurcated Contacts and are designed for low level switching applications.

GENERAL SPECIFICATIONS**COIL**

Pull-in Voltage : 80% of nominal voltage or less
 Dropout Voltage: DC-10% min. of nominal voltage or more
 Max. Voltage : 110%
 Resistance: $\pm 10\%$ measured @ 25°C
 Coil Power: 0.5-1.5 watts DC, 1.5 VA-2 VA (60 Hz) AC @ 25°C
 Max. Coil Dissipation: 2.2 watts @ 25°C
 Duty: Continuous

CONTACTS

Contact Material: Silver gold overlay
 Coil Resistance: 50 megohms max
 Contact Rating: See "**UL CONTACT LOAD RATING TABLE**"

CAPACITANCE

Between contacts: 2 pf, typ
 Contacts to Coil: 2 pf, typ
 Contacts to Frame: 30 pf, typ

TIMING

Operate Time: DPDT=12mS, 4PDT=14mS,
 6PDT=16mS, 8PDT=18mS
 Release Time: 8 mS

DIELECTRIC STRENGTH

Contacts to Coil: 1500 V rms
 Coil to Frame: 1000 V rms
 Across Open Contacts: 500 V rms
 Contacts to Frame: 1500 V rms
 Insulation Resistance: 1000 megohms @ 500 VDC

TEMPERATURE

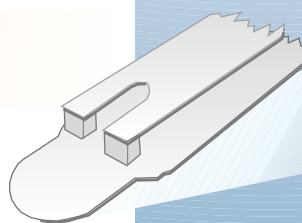
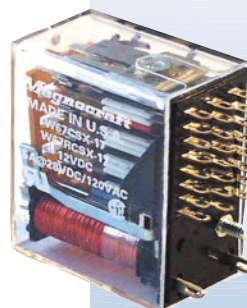
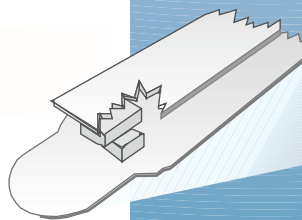
Operating: -55°C to +70°C
 Storage: -55°C to +105°C

LIFE EXPECTANCY

Electrical: 200,000 operations @ rated resistive load
 Mechanical: 1,000,000 operations @ no load

MISCELLANEOUS

Operating Position: Any
 Insulation Material: Molded plastic
 Enclosure: Polycarbonate dust cover
 Weight: 22 to 40 grams approx.

**BIFURCATED CONTACTS**
(LOW LEVEL APPLICATIONS)**STANDARD CONTACTS**
(5 AMP CROSS BAR)**Mating Sockets**

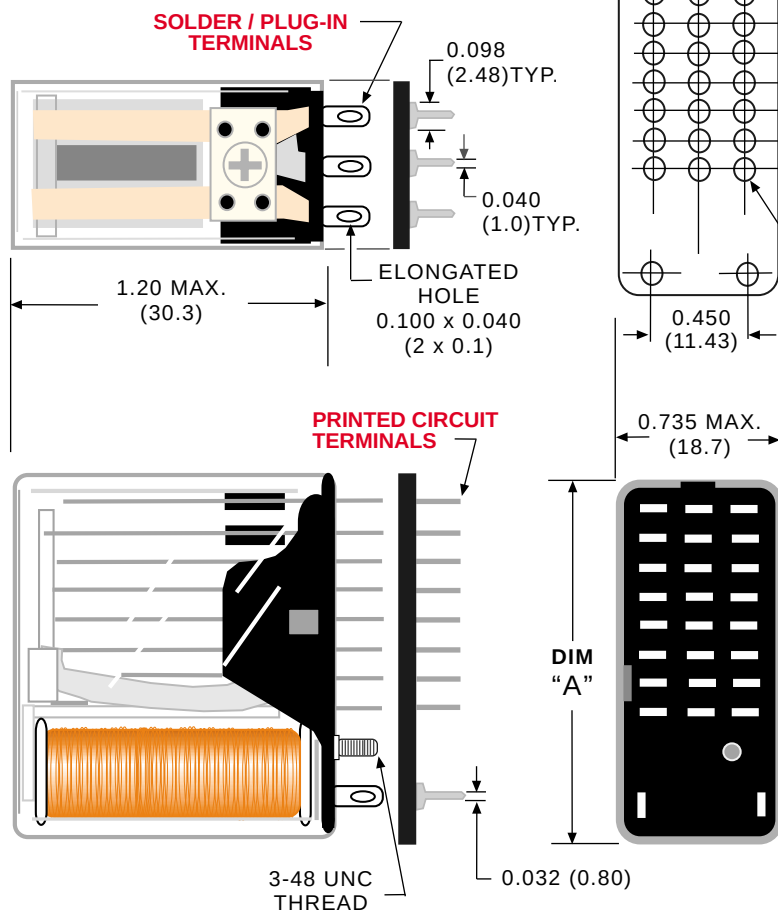
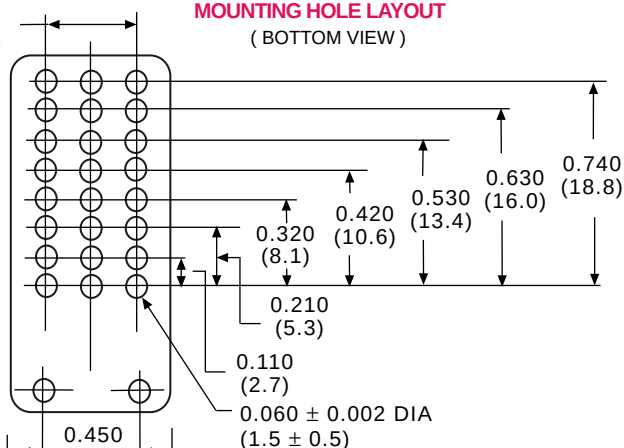
70-303-1, 70-305-1, 70-307-1,
 70-309-1: **SOLDER**
 70-304-1, 70-306-1, 70-308-1,
 70-310-1: **PRINTED CIRCUIT**
 See section 8, page 25, 26



DPDT THRU 8PDT, 3 & 5 AMPS

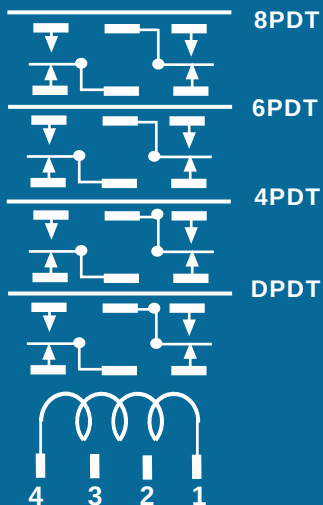
OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

PRINTED CIRCUIT
MOUNTING HOLE LAYOUT
(BOTTOM VIEW)

COIL MEASURED @ 25°C

STANDARD PART NUMBERS	CONTACT CONFIGURATION	NOMINAL INPUT VOLTAGE OR	NOMINAL RESISTANCE (OHMS)
DC OPERATED COIL - SOLDER/PLUG-IN, 5 AMP			
W67RCSX-1	DPDT	5 VDC	52 Ω
W67RCSX-2	DPDT	12 VDC	185 Ω
W67RCSX-3	DPDT	24 VDC	700 Ω
W67RCSX-4	DPDT	48 VDC	2,500 Ω
W67RCSX-5	DPDT	110 VDC	15,000 Ω
W67RCSX-6	4PDT	5 VDC	52 Ω
W67RCSX-7	4PDT	12 VDC	185 Ω
W67RCSX-8	4PDT	24 VDC	700 Ω
W67RCSX-9	4PDT	48 VDC	2,500 Ω
W67RCSX-10	4PDT	110 VDC	15,000 Ω
W67RCSX-12	6PDT	12 VDC	90 Ω
W67RCSX-13	6PDT	24 VDC	430 Ω
W67RCSX-17	8PDT	12 VDC	72 Ω
W67RCSX-18	8PDT	24 VDC	350 Ω
DC OPERATED COIL-BIFURCATED CONTACTS, 3 AMP			
W67TRCSX-2	DPDT	12 VDC	185 Ω
W67TRCSX-3	DPDT	24 VDC	700 Ω
W67TRCSX-7	4PDT	12 VDC	185 Ω
W67TRCSX-8	4PDT	24 VDC	700 Ω
W67TRCSX-12	6PDT	12 VDC	90 Ω
W67TRCSX-13	6PDT	24 VDC	430 Ω
W67TRCSX-17	8PDT	12 VDC	72 Ω
W67TRCSX-18	8PDT	24 VDC	350 Ω
DC OPERATED PRINTED CIRCUIT, 5 AMP			
W67RPCSX-2	DPDT	12 VDC	185 Ω
W67RPCSX-3	DPDT	24 VDC	700 Ω
W67RPCSX-7	4PDT	12 VDC	185 Ω
W67RPCSX-8	4PDT	24 VDC	700 Ω
W67RPCSX-12	6PDT	12 VDC	90 Ω
W67RPCSX-13	6PDT	24 VDC	430 Ω
AC OPERATED COIL - SOLDER/PLUG-IN, 5 AMP			
W67ARCSX-5	DPDT	120 VAC, 50/60Hz	9000 Ω
W67ARCSX-10	4PDT	120 VAC, 50/60Hz	8000 Ω
W67ARCSX-15	6PDT	120 VAC, 50/60Hz	8000 Ω
DC OPERATED COIL ULTRA SENSITIVE - SOLDER/PLUG-IN, 3 AMP			
W67SCSX-1	DPDT	9.4 MADC	1,000 Ω
W67SCSX-2	DPDT	6.4 MADC	2,500 Ω
W67SCSX-3	DPDT	4.5 MADC	5,000 Ω
W67SCSX-6	4PDT	13.7 MADC	1,000 Ω
W67SCSX-7	4PDT	9.1 MADC	2,500 Ω
W67SCSX-8	4PDT	6.5 MADC	5,000 Ω

WIRING DIAGRAM
(VIEWED FROM PIN END)

DIMENSIONS

CONTACT CONFIGURATION	"A" DIM
8PDT	1.592 (40.4)
6PDT	1.374 (34.9)
4PDT	1.156 (29.4)
DPDT	0.978 (24.8)

UL CONTACT LOAD RATINGS TABLE

POLES	CURRENT OR HORSE POWER	LOAD VOLTAGE	LOAD VOLTAGE FREQUENCY	TYPE OF LOAD
ALL STYLES	10 AMP	120 VAC	50/60 Hz	RESISTIVE
	5 AMP	240 VAC	50/60 Hz	RESISTIVE
	10 AMP	28 VDC	DC	RESISTIVE
	0.5 AMP	125 VDC	DC	RESISTIVE
	3 AMP	120 VAC	50/60 Hz	INDUCTIVE
	1 AMP	240 VAC	50/60 Hz	INDUCTIVE
	3 AMP	28 VDC	DC	INDUCTIVE
	0.1 AMP	125 VDC	DC	INDUCTIVE
SUFFIX "69" WITH BLOWOUT MAGNET FOR DC SWITCHING (NOT UL OR CSA)				
SPST-NO	1.5 AMP	125 VDC	DC	RESISTIVE
SPST-NO-DM	4 AMP	125 VDC	DC	RESISTIVE
SPST-NO	0.5 AMP	250 VDC	DC	RESISTIVE
SPST-NO-DM	1.5 AMP	250 VDC	DC	RESISTIVE
SPST-NO	0.5 AMP	125 VDC	DC	INDUCTIVE
SPST-NO-DM	1.5 AMP	125 VDC	DC	INDUCTIVE
SPST-NO	150 mA	250 VDC	DC	INDUCTIVE
SPST-NO-DM	0.5 AMP	250 VDC	DC	INDUCTIVE

COIL SPECIFICATIONS @ 25°C

AC RELAYS 50/60 HZ (COIL DATA @ 60HZ VOLTAGE)					DC RELAYS, 1.8 WATTS (2.5 W @ 125 VDC)			
Nominal Voltage	Resistance Ohms $\pm 10\%$	Milliamperes		Impedance Ohms	Nominal Voltage	Resistance Ohms $\pm 10\%$	Milliamperes	
		Inrush (Open)	Sealed (Pull-In)				Cold	Hot
6	1.1	1500	840	7.2	6	15.5	385	304
12	4.2	750	410	27	12	63.5	189	147
24	15.5	375	200	120	24 (28)*	250	96	77
120	540	75	40	2700	32	375	86	62
240	2100	32	17	13,400	115/125*	6200	20	16

12 & 14 PIN, 10 AMPS

cUL us
UL Recognized
File No. E13224

SP 168986

UL LISTED 367G
IND. CONT. EQ.

CUL
WHEN USED
WITH SOCKETS
27390 OR 33377

CURRENT LIMITED TO
RATING OF RELAY OR
SOCKET WHICHEVER
IS LESS.

CONTACTS CAN
SWITCH 30 AMP
LOADS AND CARRY
10 AMPS
CONTINUOUSLY AT
VOLTAGES SHOWN
IN UL CONTACT LOAD
RATINGS TABLE.

* 24 VDC AND 115 VDC RELAYS HAVE NAME
PLATES STAMPED 24-28 AND 115-125 VDC
RESPECTIVELY. THESE RELAYS OPERATE AT
80% OF THE LOWER VOLTAGES AND OPERATE
WITHIN ALLOWABLE TEMPERATURE RISES AT
110% OF HIGHER VOLTAGES.
250 VDC: USE 125 VDC RELAY AND SERIES
RESISTOR (6000 Ω , 5 W) NOT SUPPLIED.

GENERAL SPECIFICATIONS**COIL**

Pull-in Voltage: 85% of nominal voltage or less for AC coils.
80% of nominal voltage or less for DC coils.
Max. Voltage: 110%
Insulation System: Class "B" (130°C per UL standard 1446).

CONTACTS

Contact Material: Silver cadmium oxide, gold diffused

TIMING

Operate Time: 25 mS max. @ nominal voltage.
Release Time: 20 mS max. @ nominal voltage.

DIELECTRIC STRENGTH

All Mutually Insulated Points: 1500 V rms

TEMPERATURE

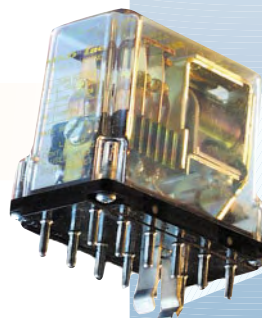
Operation: -40°C to +60°C
Storage: -40°C to +130°C.

LIFE EXPECTANCY

Electrical: 100,000 operations @ rated resistive load
Mechanical: 10,000,000 operations @ no load

MISCELLANEOUS

Operating Position: Vertical, contacts up
Enclosure: Polycarbonate dust cover.
Weight: 241 grams approx.



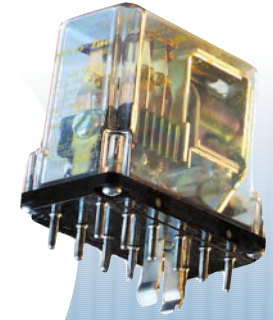
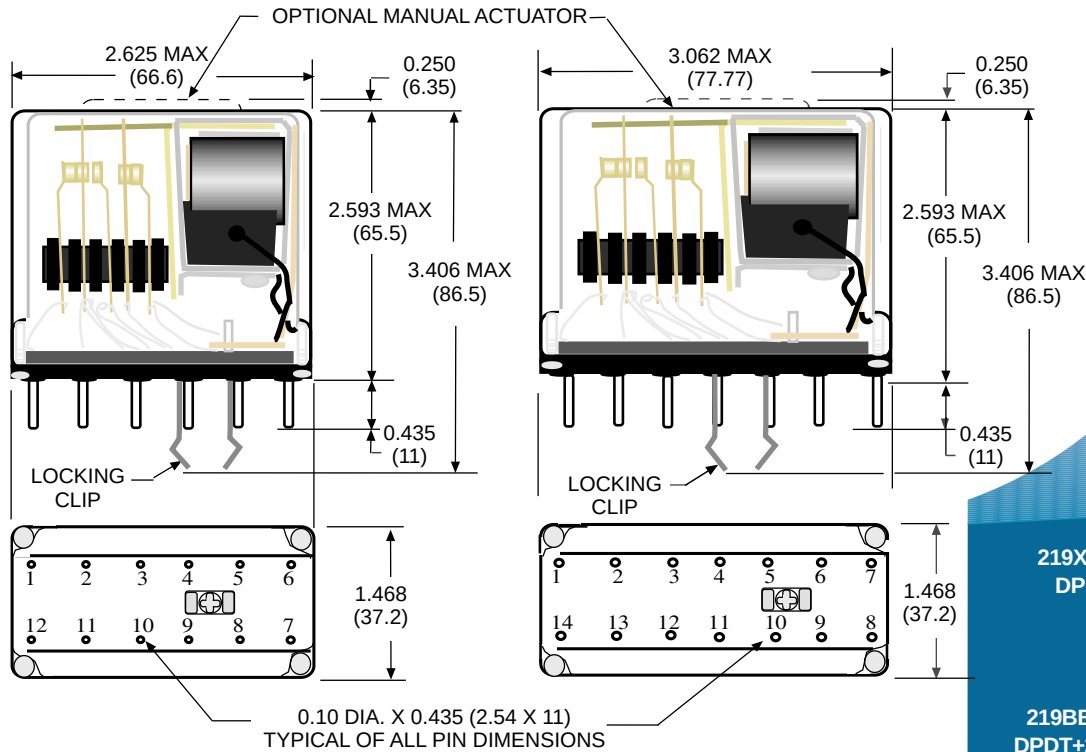
Mating Sockets
27390, 33377: SCREW/PANEL
See section 8, page 27



12 & 14 PIN, 10 AMPS

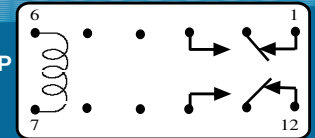
OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

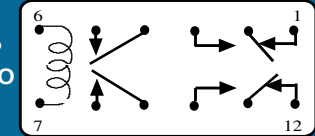


WIRING DIAGRAMS (VIEWED FROM PIN END)

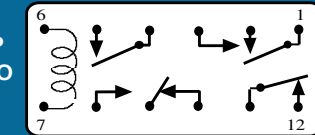
**219XBXP
DPDT**



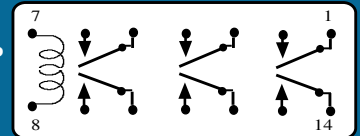
**219BBXP
DPDT+2 NO**



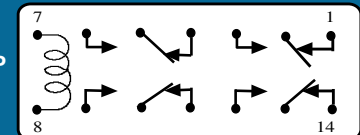
**219ABAP
DPDT+1NO
& 1NC**



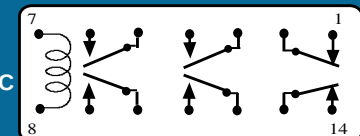
**219FXXP
6P-NO**



**219DXDP
4PDT**



**219DXBP
4P-NO+2P-NC**



ORDERING CODE FOR RELAYS

CLASS: 219 **CONTACT CONFIGURATION:** XBXP **STANDARD FEATURES:** P **OPTIONAL FEATURES:** L **COIL VOLTAGE:** -24D

CLASS:

CONTACT CONFIGURATION:

DPDT: **XBXP**
DPDT +1 POLE: NO & 1 POLE NC: **ABA**
2 POLE: NO & DPDT: **BBXP**
4 PDT: **XXD**
6 POLE: NO: **FXXP**
4 POLE: NO & 2 POLE: NC: **DXBP**

STANDARD FEATURES:

POLYCARBONATE COVER: **CODE P**

OPTIONAL FEATURES:

STATUS LAMP: **CODE L**
MANUAL ACTUATOR: **CODE M**
BIFURCATED CONTACTS: **CODE 33**
PERM. MAGNET BLOWOUT: **CODE 69**

COIL VOLTAGE:

6, 12, 24, 120, 240 **ADD "A" FOR AC COILS**
6, 12, (24-28), 32, 115/125 **ADD "D" FOR DC COILS**

COIL VOLTAGES & FREQUENCIES MUST BE SPECIFIED.

Make before break and other contact configurations available limited only by the number of terminal pins. Contact factory.

**THE SERIES 219
GENERAL PURPOSE
INDUSTRIAL PLUG-IN
RELAYS FEATURE
12 PIN AND 14 PIN
BASES. THE COIL IS
ENCAPSULATED
FOR PROTECTION.
NUCLEAR QUALIFIED
VERSIONS ARE
AVAILABLE.
CONSULT FACTORY.**

12 PIN MODELS	CONTACT CONFIGU- RATION	14 PIN MODELS	CONTACT CONFIGU- RATION
219BBXP	DPDT + 2 NO	219XDXP	4PDT
219XBXP	DPDT	219FXXP	6P-NO
219ABAP	DPDT + 1 NO & 1 NC	219DXBP	4P-NO + 2P-NC

FEATURES**VACUUM BAKED & DRY
NITROGEN FILLED**

REMOVES CONTAMINANTS AND PROVIDES A CLEAN & DRY ATMOSPHERE FOR CONTACTS.

**HERMETICALLY SEALED
METAL ENCLOSURE**

IDEAL FOR USE IN HAZARDOUS LOCATIONS. UL CERTIFIED FOR CLASS 1 DIVISION 2 GROUP A, B, C & D HAZARDS. WHEN RELAY IS USED WITH 70-464-1 OR 70-465-1 SOCKETS.

**PLUG-IN STYLE
MOUNTING**

WHEN USED WITH 70-464-1 OR 70-465-1 SOCKETS, THE 750H CAN BE DIN RAIL MOUNTED OR PANEL MOUNTED.

BENEFITS

**DPDT, 12 AMPS
3PDT, 10 AMPS**



UL Recognized
File No. E43641

**CERTIFIED CLASS 1 DIVISION 2
FOR HAZARDOUS LOCATIONS**

GENERAL SPECIFICATIONS**COIL**

Pull-in Voltage:	80% of nominal voltage or less for DC coils, 85% of nominal voltage or less for AC coils
Dropout Voltage:	10% min. of nominal voltage or more
Max. Voltage:	110%
Resistance:	±10% measured @ 25°C
Coil Power:	1.2 watts DC, 2 VA to 2.75 VA (60Hz) AC @ 25°C
Max. Coil Dissipation:	3.0 watts DC @ 25°C
Duty:	Continuous

CONTACTS

Contact Material:	Silver cadmium oxide, gold flashed
Contact Rating:	10 amps, 120 VAC / 6 Amps, 240 VAC 50/60Hz for 3 pole 12 amps, 120 VAC / 8 Amps, 240 VAC 50/60Hz for 2 pole 1/3Hp 120VAC, 1/2Hp 240VAC. 10 amps, 30 VDC,
Contact Resistance:	50 milliohms max. Initial at rated current

TIMING

Operate Time:	15 mS max @ nominal voltage
Release Time:	10 mS max @ nominal voltage

DIELECTRIC STRENGTH

Contacts to Coil:	1250 V rms
Across open Contacts:	500 V rms
Pole to Pole:	1250 V rms
Contacts to Frame:	1250 V rms
Insulation Resistance:	1000 megohms min. @ 500 VDC

TEMPERATURE

Operating:	-45°C to +55°C. (AC). -45°C to +70°C. (DC)
Storage:	-45°C to +105°C

VIBRATION RESISTANCE

Functional:	6 g's, 10 to 55 Hz (double amplitude)
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SHOCK RESISTANCE

Functional:	5 g's
Mechanical:	20 g's

LIFE EXPECTANCY

Electrical:	100,000 operations @ rated resistive load
Mechanical:	5,000,000 operations @ no load

MISCELLANEOUS

Operating Position:	Any
Insulation Material:	Molded plastic
Enclosure:	Grey metal case, hermetically sealed
Weight:	130 grams approx

**Mating Sockets**

**70-750D8-1, 70-750D11-1,
70-464-1, 70-465-1: SCREW/DIN
70-169-1, 70-170-1: SCREW/PANEL**

See Section 8, page 7 - 12

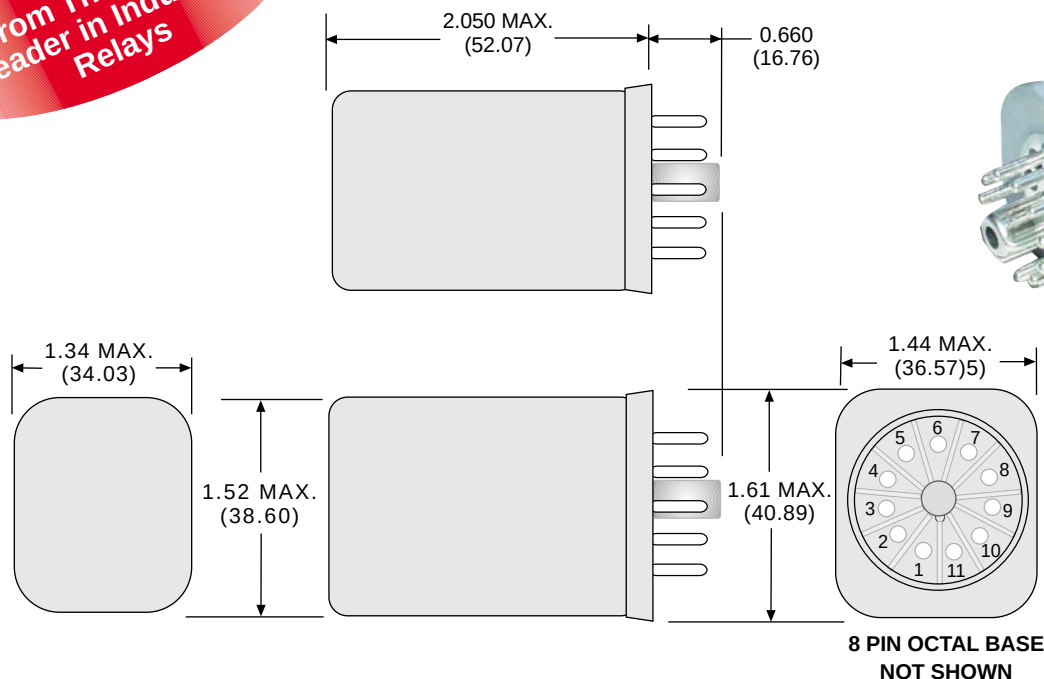


NEW
From The Market
Leader in Industrial
Relays

DPDT, 12 AMPS
3PDT, 10 AMPS

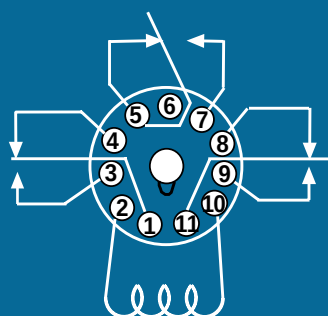
OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

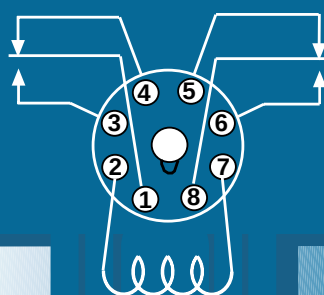


WIRING DIAGRAMS

(VIEWED FROM PIN END)



3PDT



DPDT

COIL MEASURED @ 25°C

STANDARD PART NUMBERS	CONTACT CONFIGURATION	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED - 8 PIN OCTAL, 12 AMP			
750XBXH-12A	DPDT	12 VAC, 50/60Hz	72 Ω
750XBXH-24A	DPDT	24 VAC, 50/60Hz	1,700 Ω
750XBXH-120A	DPDT	120 VAC, 50/60Hz	9,100 Ω
DC OPERATED - 8 PIN OCTAL, 12 AMP			
750XBXH-12D	DPDT	12 VDC	120 Ω
750XBXH-24D	DPDT	24 VDC	470 Ω
750XBXH-110D	DPDT	110 VDC	10,000 Ω
AC OPERATED - 11 PIN OCTAL, 10 AMP			
750XCXH-12A	3PDT	12 VAC, 50/60Hz	72 Ω
750XCXH-24A	3PDT	24 VAC, 50/60Hz	1,700 Ω
750XCXH-120A	3PDT	120 VAC, 50/60Hz	9,100 Ω
DC OPERATED - 11 PIN OCTAL, 10 AMP			
750XCXH-12D	3PDT	12 VDC	120 Ω
750XCXH-24D	3PDT	24 VDC	470 Ω
750XCXH-110D	3PDT	110 VDC	10,000 Ω

CONTACT LOAD RATINGS TABLE

POLES	CURRENT OR HORSE POWER	LOAD VOLTAGE	LOAD VOLTAGE FREQUENCY	TYPE OF LOAD
2 POLES	12 AMP	120 VAC	50/60 Hz	RESISTIVE
	8 AMP	240 VAC	50/60 Hz	RESISTIVE
	10 AMP	28 VDC	DC	RESISTIVE
3 POLES	10 AMP	120 VAC	50/60 Hz	RESISTIVE
	6 AMP	240 VAC	50/60 Hz	RESISTIVE
	10 AMP	28 VDC	DC	RESISTIVE
2 & 3 POLES	1/3 HP	120 VAC	50/60 Hz	MOTOR
	1/2 HP	240 VAC	50/60 Hz	MOTOR

**8 OR 11 PIN OCTAL PLUG-IN,
10 & 12 AMPS**

VACUUM BAKED, DRY NITROGEN FILLED AND SOLDER SEALED. ELECTRONICALLY LEAK TESTED TO PROVIDE A CONTAMINATION - FREE, DRY ATMOSPHERE FOR THE CONTACTS

GENERAL SPECIFICATIONS**COIL**

Pull-in Voltage: 80% of nominal voltage or less. for DC coils
85% of nominal voltage or less. for AC coils

Dropout Voltage: 10% of nominal voltage or more.

Coil Resistance: $\pm 10\%$ measured @ 25 °C

Nominal Power: 1.5 watts for DC coils, 3 VA for AC coils

Max. Coil Dissipation: 3.0 watts max. DC

Duty: Continuous

CONTACTS

Contact Material: 0.187 Silver cadmium oxide, gold flashed

Contact Resistance: 50 milliohms maximum initial resistance at rated current

TIMING

Operate Time: 25 mS or less at nominal voltage

Release Time: 20 mS or less at nominal voltage

DIELECTRIC STRENGTH

Contacts to Coil: 1250 V rms

Across Open Contacts: 1000 V rms

Pole to Pole: 1250 V rms

Contacts to Frame: 1250 V rms

Coil to Case: 1250 V rms

Contacts to Case: 1250 V rms

Insulation Resistance: 1,000 megohms min. @ 500 VDC

TEMPERATURE

Operating: -10°C to +50°C (AC), -10°C to +60°C (DC)

Storage: -30°C to 105°C

SHOCK RESISTANCE

Operating: 5 g's

Non Operating: 20 g's

VIBRATION RESISTANCE

Operating: 10 Hz to 55 Hz, 5 g's (double amplitude)

MISCELLANEOUS

Operating Position: Any

Enclosure: Grey metal case, hermetically sealed

Terminals: 8 or 11 pin octal plug-in

Weight: 141.7 grams approx.

**Mating Sockets**

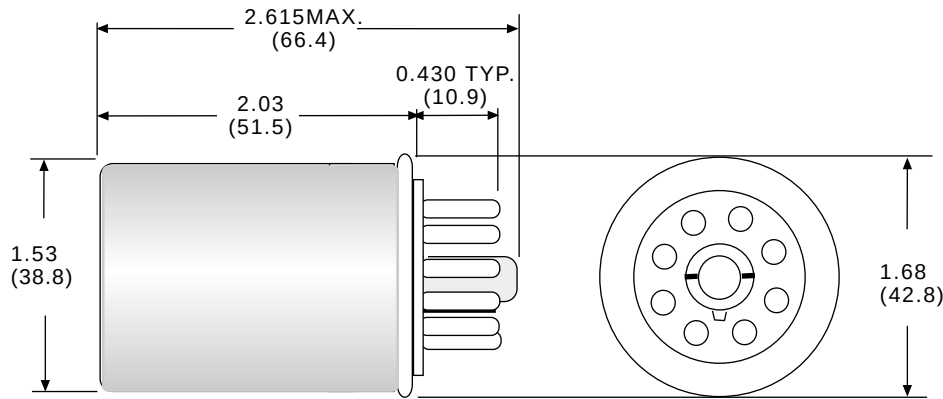
70-750D8-1, 70-750D11-1,
70-464-1, 70-465-1: SCREW/DIN
70-169-1, 70-170-1: SCREW/PANEL
See section 8, page 7 - 12



**8 OR 11 PIN OCTAL PLUG-IN,
10 & 12 AMPS**

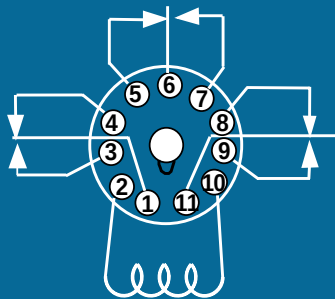
OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

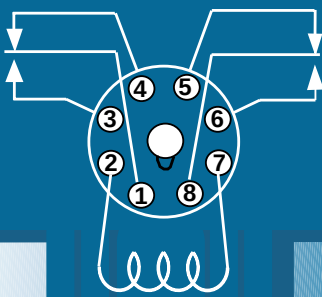


WIRING DIAGRAMS

(VIEWED FROM PIN END)



3PDT

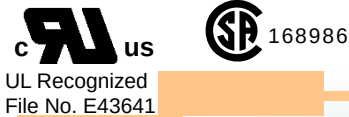


DPDT

STANDARD PART NUMBERS	CONTACT CONFIGU- RATION	COIL MEASURED @ 25°C	
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED 8 PIN, 12 AMP			
W88AHPX-24	DPDT	120 VAC	1000 Ω
AC OPERATED 11 PIN, 10 AMP			
W88AHPX-36	3PDT	120 VAC	1000 Ω
DC OPERATED 8 PIN, 12 AMP			
W88HPX-33	DPDT	12 VDC	100 Ω
W88HPX-34	DPDT	24 VDC	400 Ω
DC OPERATED 11 PIN, 10 AMP			
W88HPX-51	3PDT	24 VDC	400 Ω

DPDT, 30 AMPS

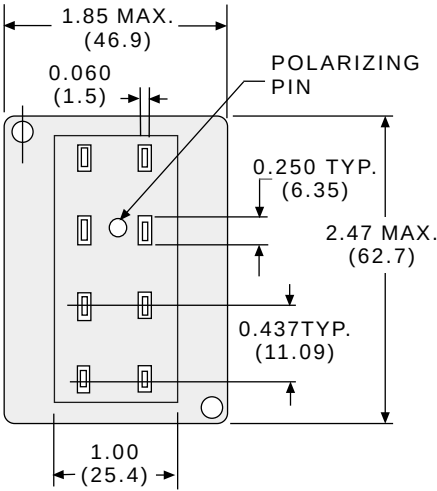
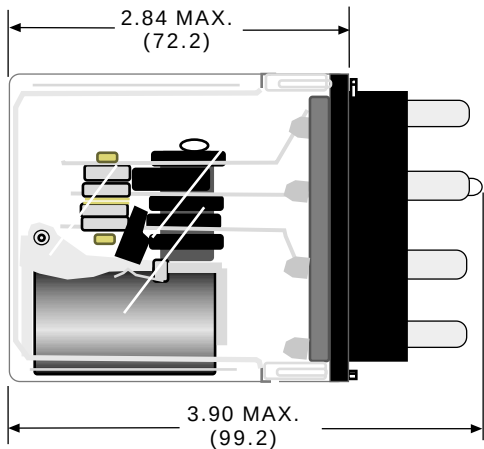
BENEFITS		MAGNECRAFT: W21ACPX-2	MIDTEX: TYPE 136
CURRENT RATING:		30 AMPS @ 120/240 VAC, 20 AMPS @ 28 VDC	15 AMPS @ 120 VAC, 15 AMPS @ 28 VDC
HORSEPOWER RATING:		1-1/2 HP @ 120 VAC, 2 HP @ 240 VAC	1/4HP @ 120 VAC, NOT UL RATED
TUNGSTEN LOAD RATING:		2.4 KW @ 240 VAC	1 KW @ 120/240 VAC
ELECTRICAL LIFE @ RATED LOAD:		200,000 OPERATIONS	100,000 OPERATIONS



MANUFACTURED UNDER ISO 9002

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



EXCEEDS NEMA STD. TS 2- 1992 APPROVED BY D.O.T FOR:
 California Minnesota
 Georgia New York
 Illinois Texas
 Oregon Colorado
 Maryland Missouri
 North Carolina



BENEFITS OF RECTIFIED COIL DESIGN:

1. Chatter Free Operation in Brownout Conditions Down to 85 VAC and Will not Overheat up to 140VAC.
2. Less Power Consumption and Less Heating.

GENERAL SPECIFICATIONS

COIL

Pull-in Voltage:	65% of nominal voltage @ 20°C or less for AC coils
Dropout Voltage:	10% of nominal voltage or more
Coil Insulation:	Class "B" System (130°C per UL standard 1446)
Nominal Power:	4.0 VA

CONTACTS

Contact Material:	Silver alloy
Contact Rating:	30 amps, 120/240 VAC (resistive). 25 Amps, 120/240 VAC (CSA) 20 amps, 28 VDC (resistive). 1-1/2 Hp, 120 VAC, 2Hp, 240VAC 20 amps, 120 VAC (tungsten lamp) 10 amps, 240 VAC (tungsten lamp)

DIELECTRIC STRENGTH

Across Open Contacts:	500 V rms
Contact to Coil:	1500 V rms
Contact to Frame:	1500 V rms

TEMPERATURE

Operating:	-40°C to +84°C
Storage:	-40°C to +105°C

LIFE EXPECTANCY

Electrical:	200,000 operations @ 20 amps tungsten, 120 VAC
Mechanical:	5,000,000 operations @ no load

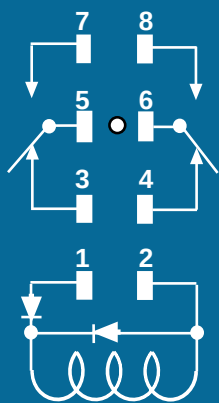
MISCELLANEOUS

Enclosure:	Clear polycarbonate
Operating Position:	Vertical, contacts up or horizontal
Weight:	204.7 grams approx.

MOUNTING:
 FITS STANDARD
 8 PIN JONES PLUG

SWITCHES TUNGSTEN
 LAMP LOADS UP TO
 20 AMPS

WIRING DIAGRAM
 (VIEWED FROM PIN END)



RECTIFIED COIL

COIL MEASURED @ 25°C

STANDARD PART NUMBER	CONTACT CONFIGURATION	NOMINAL INPUT VOLTAGE	NOMINAL POWER
W21ACPX-2	DPDT	120 VAC, 50/60Hz	4.0 VA

AC RECTIFIED - PLUG-IN, 30 AMP



SECTION 1 CROSS REFERENCE GUIDE

MAGNECRAFT & STRUTHERS-DUNN	IDEC			
781XAXML-24A	RH1B-L-AC24			
781XAXML-120A	RH1B-L-AC120			
781XAXML-240A	RH1B-L-AC240			
781XAXML-12D	RH1B-L-DC12			
781XAXML-24D	RH1B-L-DC24			
781XAXML-110D	RH1B-L-DC110			
781XAXTML-120A	RH1V2-L-AC120			
781XAXTML-12D	RH1V2-L-DC12			
781XAXTML-24D	RH1V2-L-DC24			
MAGNECRAFT & STRUTHERS-DUNN	IDEC			
78XAXC2-240A	RH1B-U-AC120			
78XAXC2-12D	RH1B-U-DC12			
78XAXC2-24D	RH1B-U-DC24			
MAGNECRAFT & STRUTHERS-DUNN	TYCO / POTTER & BRUMFIELD	OMRON		
782XDXH10-24A	KHS17A11-24	MY4H-US-24VAC		
782XDXH10-120A	KHS17A11-120	MY4H-US-120VAC		
782XDXH10-12D	KHS17D11-12	MY4H-US-12VDC		
782XDXH10-24D	KHS17D11-24	MY4H-US-24VDC		
782XDXH10-110D	KHS17D11-110	-		
782XDXH21-120A	KHS17A12-120	-		
782XDXH21-12D	KHS17D12-12	-		
782XDXH21-24D	KHS17D12-24	-		
MAGNECRAFT & STRUTHERS-DUNN	FINDER	TYCO / SCHRACK (PT REPLACES ZT)		ALLEN-BRADLEY
782XDX2M4L-24A	55.32.8024.20.54	PT570524	ZT570524	700-HC24A24-1-4
782XDX2M4L-120A	55.32.8120.20.54	PT570615	ZT570615	700-HC24A1-1-4
782XDX2M4L-240A	55.32.8240.20.54	PT570730	ZT570730	700-HC24A2-1-4
782XDX2M4L-12D	55.32.9012.20.54	PT570012	ZT570012	700-HC24Z12-1-4
782XDX2M4L-24D	55.32.9024.20.54	PT570024	ZT570024	700-HC24Z24-1-4
782XDX2M4L-110D	55.32.9110.20.54	PT570110	ZT570110	700-HC24Z1-1-4
782XBX2M4L-24A	56.32.8024.20.54	PT270524	ZT270524	
782XBX2M4L-120A	56.32.8120.20.54	PT270615	ZT270615	
782XBX2M4L-240A	56.32.8240.20.54	PT270730	ZT270730	
782XBX2M4L-12D	56.32.9012.20.54	PT270012	ZT270012	
782XBX2M4L-24D	56.32.9024.20.54	PT270024	ZT270024	
782XBX2M4L-110D	56.32.9110.20.54	PT270110	ZT270110	
782XBM4L-24A	55.34.8024.20.54	PT270524	ZT270524	
782XBM4L-120A	55.34.8120.20.54	PT270615	ZT270615	
782XBM4L-240A	55.34.8240.20.54	PT270730	ZT270730	
782XBM4L-12D	55.34.9012.20.54	PT270012	ZT270012	
782XBM4L-24D	55.34.9024.20.54	PT270024	ZT270024	
782XBM4L-110D	55.34.9110.20.54	PT270110	ZT270110	
MAGNECRAFT & STRUTHERS-DUNN	IDEC			
783XCXM4L-24A	RH3B-ULC-AC24			
783XCXM4L-120A	RH3B-ULC-AC120			

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



SECTION 1 CROSS REFERENCE GUIDE

MAGNECRAFT & STRUTHERS-DUNN	IDEC				
783XCXM4L-240A	RH3B-ULC-AC240				
783XCXM4L-12D	RH3B-ULC-DC12				
783XCXM4L-24D	RH3B-ULC-DC24				
783XCXM4L-110D	RH3B-ULC-DC110				
783XCXTM4L-120A	RH3V2-ULC-AC120				
783XCXTM4L-12D	RH3V2-ULC-DC12				
783XCXTM4L-24D	RH3V2-ULC-DC24				
MAGNECRAFT & STRUTHERS-DUNN	IDEC	OMRON			
784XDXM4L-24A	RH4B-ULC-AC24	LY414N-AC24			
784XDXM4L-120A	RH4B-ULC-AC120	LY414N-AC120			
784XDXM4L-240A	RH4B-ULC-AC240	LY414N-AC240			
784XDXM4L-12D	RH4B-ULC-DC12	LY414N-DC12			
784XDXM4L-24D	RH4B-ULC-DC24	LY414N-DC24			
784XDXM4L-110D	RH4B-ULC-DC110	LY414N-DC110			
784XDXTM4L-120A	RH4V2-ULC-AC120	-			
784XDXTM4L-12D	RH4V2-ULC-DC12	-			
784XDXTM4L-24D	RH4V2-ULC-DC24	-			
MAGNECRAFT & STRUTHERS-DUNN	TYCO / POTTER & BRUMFIELD	IDEC	OMRON	AROMAT	ALLEN - BRADLEY
W78ATCSX-2	KHAU17A96-12	RY42S-U-AC12V	MY4Z-AC12	HC4D-AC12	
W78ATCSX-3	KHAU17A96-24	RY42S-U-AC24V	MY4Z-AC24	HC4D-AC24	700-HC54A24
W78ATCSX-5	KHAU17A96-120	RY42S-U-AC110/120V	MY4Z-AC120	HC4D-AC120	700-HC54A1
W78ATCSX-6	KHAU17A96-240	RY42S-U-AC220/240V	MY4Z-AC240	HC4D-AC240	
W78TCSX-1	KHAU17D96-6	RY42S-U-DC6V	MY4Z-DC6	HC4D-DC6	
W78TCSX-2	KHAU17D96-12	RY42S-U-DC12V	MY4Z-DC12	HC4D-DC12	700-HC54Z12
W78TCSX-3	KHAU17D96-24	RY42S-U-DC24V	MY4Z-DC24	HC4D-DC24	700-HC54Z24
W78TCSX-5	* KHAU17D16-110	RY42S-U-DC100/110V	MY4Z-DC110	HC4D-DC110	
W78ACSX-2	* KHAU17A11-12	RY4S-U-AC12V	MY4-AC12		700-HC14A12
W78ACSX-3	* KHAU17A11-24	RY4S-U-AC24V	MY4-AC24		700-HC14A24
W78ACSX-5	* KHAU17A11-120	RY4S-U-AC110/120V	MY4-AC120		700-HC14A1
W78ACSX-6	* KHAU17A11-240	RY4S-U-AC220/240V	MY4-AC240		700-HC14A2
W78CSX-1	* KHAU17D11-6	RY4S-U-DC6V	MY4-DC6		700-HC14Z06
W78CSX-2	* KHAU17D11-12	RY4S-U-DC12V	MY4-DC12		700-HC14Z12
W78CSX-3	* KHAU17D11-24	RY4S-U-DC24V	MY4-DC24		700-HC14Z24
W78CSX-6	* KHAU17D11-110	RY4S-U-DC100/110V	MY4-DC110		700-HC14Z1
W78APCX-3	KHAE17A11-24	RY4V-U-AC24V	MY4-02-AC24		
W78APCX-5	KHAE17A11-120	RY4V-U-AC110/120V	MY4-02-AC120		
W78PCX-2	KHAE17D11-12	RY4V-U-DC12V	MY4-02-DC12		
W78PCX-3	KHAE17D11-24	RY4V-U-DC24V	MY4-02-DC24		
W78PCX-6	KHAE17D11-110	RY4V-U-DC100/110V	MY4-02-DC110		
W78KACSX-15	KHAU17A12-24	RY4S-U-AC24V		HC4-AC24	700-HC24A24
W78KACSX-17	KHAU17A12-120	RY4S-U-AC110/120V		HC4-AC120	700-HC24A1
W78KACSX-18	KHAU17A12-240	RY4S-U-AC220/240V		HC4-AC240	700-HC24A2
W78KCSX-12	KHAU17D12-12	RY4S-U-DC12V		HC4-DC12	700-HC24Z12
W78KCSX-13	KHAU17D12-24	RY4S-U-DC24V		HC4-DC24	700-HC24Z24
W78ARCSX-7	K10P11A15-6	RH2B-U-AC6V	LY2-AC6		700-HF32A06
W78ARCSX-9	K10P11A15-24	RH2B-U-AC24V	LY2-AC24		700-HF32A24

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

* 91 STYLE SAME AS 11 STYLE EXCEPT NO STUD



SECTION 1 CROSS REFERENCE GUIDE

MAGNECRAFT & STRUTHERS-DUNN	TYCO / POTTER & BRUMFIELD	IDEC	OMRON	ALLEN - BRADLEY
W78ARCSX-11	K10P11A15-120	RH2B-U-AC110/120V	LY2-AC120	700-HF32A1
W78ARCSX-12	K10P11A15-240	RH2B-U-AC220/240V	LY2-AC240	700-HF32A2
W78RCSX-6	K10P11D15-6	RH2B-U-DC6V	LY2-DC6	700-HF32Z06
W78RCSX-7	K10P11D15-12	RH2B-U-DC12V	LY2-DC12	700-HF32Z12
W78RCSX-8	K10P11D15-24	RH2B-U-DC24V	LY2-DC24	700-HF32Z24
W78RCSX-9	K10P11D15-48	RH2B-U-DC48V	LY2-DC48	700-HF32Z48
W78RCSX-10	K10P11D15-110	RH2B-UL-DC100/110V	LY2-DC110	700-HF32Z1
W78ARPCX-5	K10P11A55-120	RH2V2-U-AC110/120V	LY2-0-AC120	
W78ARPCX-6	K10P11A55-240	RH2V2-U-AC220/240V	LY2-0-AC240	
W78RPCX-1	K10P11D55-6	RH2V2-U-DC6V	LY2-0-DC6	
W78RPCX-2	K10P11D55-12	RH2V2-U-DC12V	LY2-0-DC12	
W78RPCX-3	K10P11D55-24	RH2V2-U-DC24V	LY2-0-DC24	
W78ARCSX-108			LY1-AC12	
W78ARCSX-109			LY1-AC24	
W78ARCSX-111			LY1-AC120	
W78ARCSX-112			LY1-AC240	
W78ARNCSX-8			LY1N-AC24	
W78ARNCSX-9			LY1N-AC120	
W78ARNCSX-10			LY1N-AC240	
W78RCSX-96			LY1-DC6	
W78RCSX-97			LY1-DC12	
W78RCSX-98			LY1-DC24	
W78RCSX-100			LY1-DC110	
W78RNCSX-10			LY1N-DC24	
W78ARPCX-81			LY1-0-AC12	
W78ARPCX-82			LY1-0-AC24	
W78ARPCX-84			LY1-0-AC120	
W78RPCX-79			LY1-0-DC12	
W78RPCX-83			LY1-0-DC24	
W78RPCX-85			LY1-0-DC110	
MAGNECRAFT & STRUTHERS-DUNN	TYCO / POTTER & BRUMFIELD	IDEC	OMRON	
78XCX-120A		RH3B-U-AC120	LY3-AC120	
78XCX-12D		RH3B-U-DC12	LY3-DC12	
78XCX-24D		RH3B-U-DC24	LY3-DC24	
78XDX-120A		RH4B-U-AC120	LY4-AC120	
78XDX-12D		RH4B-U-DC12	LY4-DC12	
78XDX-24D		RH4B-U-DC24	LY4-DC24	
MAGNECRAFT & STRUTHERS-DUNN	TYCO / POTTER & BRUMFIELD	TYCO / SCHRACK	OMRON	ALLEN - BRADLEY
750BXM4L-24A	KRPA-11ANFP-24	MT228024	MK2PN-S-AC24	700HA32A24-1-4
750BXM4L-120A	KRPA-11ANFP-120	MT228115	MK2PN-S-AC120	700HA32A1-1-4
750BXM4L-240A	KRPA-11ANFP-240	MT228230	MK2PN-S-AC240	700HA32A2-1-4L
750BXM4L-12D	KRPA-11DNFP-12	MT223012	MK2PN-S-DC12	700HA32Z12-1-4
750BXM4L-24D	KRPA-11DNFP-24	MT223024	MK2PN-S-DC24	700HA32Z24-1-4
750BXM4L-110D	KRPA-11DNFP-110	MT223110	MK2PN-S-DC110	700HA32Z1-1-4
750CXM4L-24A	KRPA-14ANFP-24	MT328024	MK3PN-S-AC24	700HA33A24-1-4
750CXM4L-120A	KRPA-14ANFP-120		MK3PN-S-AC120	700HA33A1-1-4

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SECTION 1 CROSS REFERENCE GUIDE

MAGNECRAFT & STRUTHERS-DUNN		TYCO / POTTER & BRUMFIELD	TYCO / SCHRACK	OMRON	ALLEN - BRADLEY
750XCXM4L-240A		KRPA-14ANFP-240	MT328230	MK3PN-S-AC240	700HA33A2-1-4L
750XCXM4L-12D		KRPA-14DNFP-12	MT323012	MK3PN-S-DC12	700HA33Z12-1-4
750XCXM4L-24D		KRPA-14DNFP-24	MT323024	MK3PN-S-DC24	700HA33Z24-1-4
750XCXM4L-110D		KRPA-14DNFP-110	MT323110	MK3PN-S-DC110	700HA33Z1-1-4
MAGNECRAFT & STRUTHERS-DUNN		TYCO / POTTER & BRUMFIELD	IDEC		DELTRON
A314XAX48P-24A	W250ACPX-3	KRPA-5AG (or GF) -24	-		20106-82
A314XAX48P-120A	W250ACPX-4	KRPA-5AG (or GF) -120	-		20106-84
MAGNECRAFT & STRUTHERS-DUNN		TYCO / POTTER & BRUMFIELD	IDEC		DELTRON
A314XBX48P-24A	W250ACPX-8	KRPA-11AG (or GF) -24	RR2P-U-AC24V		20108-82
A314XBX48P-120A	W250ACPX-9	KRPA-11AG (or GF) -120	RR2P-U-AC120V		20108-84
A314XBX48P-240A	W250ACPX-10	KRPA-11AG (or GF) -240	RR2P-U-AC240V		20108-85
A314XCX48P-24A	W250ACPX-13	KRPA-14AG (or GF) -24	RR3PA-U-AC24V		20110-82
A314XCX48P-120A	W250ACPX-14	KRPA-14AG (or GF) -120	RR3PA-U-AC120V		20110-84
A314XCX48P-240A	W250ACPX-15	KRPA-14AG (or GF) -240	RR3PA-U-AC240V		20110-85
A314XAX48P-12D	W250CPX-2	KRPA-5DG (or GF) -12			20112-81
A314XAX48P-24D	W250CPX-3	KRPA-5DG (or GF) -24			20112-82
A314XBX48P-12D	W250CPX-6	KRPA-11DG (or GF) -12	RR2P-U-DC12V		20114-81
A314XBX48P-24D	W250CPX-7	KRPA-11DG (or GF) -24	RR2P-U-DC24V		20114-82
A314XCX48P-12D	W250CPX-10	KRPA-14DG (or GF) -12	RR3PA-U-DC12V		20116-81
A314XCX48P-24D	W250CPX-11	KRPA-14DG (or GF) -24	RR3PA-U-DC24V		20116-82
MAGNECRAFT & STRUTHERS-DUNN		TYCO / POTTER & BRUMFIELD	ALLEN - BRADLEY		
788XBM4L-24A		KUP-11A45 (or F) -24	700HB32A24-1-4		
788XBM4L-120A		KUP-11A45- (or F) 120	700HB32A1-1-4		
788XBM4L-240A		KUP-11A45- (or F) 240	700HB32A2-1-4L		
788XBM4L-12D		KUP-11D45- (or F) 12	700HB32Z12-1-4		
788XBM4L-24D		KUP-11D45- (or F) 24	700HB32Z24-1-4		
788XBM4L-110D		KUP-11D45- (or F) 110	700HB32Z1-1-4		
788XCXM4L-24A		KUP-14A45- (or F) 24	700HB33A24-1-4		
788XCXM4L-120A		KUP-14A45- (or F) 120	700HB33A1-1-4		
788XCXM4L-240A		KUP-14A45- (or F) 240	700HB33A2-1-4L		
788XCXM4L-12D		KUP-14D45- (or F) 12	700HB33Z12-1-4		
788XCXM4L-24D		KUP-14D45- (or F) 24	700HB33Z24-1-4		
788XCXM4L-110D		KUP-14D45- (or F) 110	700HB33Z1-1-4		
MAGNECRAFT & STRUTHERS-DUNN		TYCO / POTTER & BRUMFIELD	IDEC	OMRON	DELTRON
W388ACPX-3	A283XAXC-24A	KUP5A15 (or F) - 24	RR1BA-U-AC24V	MJN1C-AC24	20306-82
W388ACPX-4	A283XAXC-120A	KUP5A15 (or F) - 120	RR1BA-U-AC120V	MJN1C-AC120	20306-84
W388ACPX-5	A283XAXC-240A	KUP5A15 (or F) - 240	RR1BA-U-AC240V	MJN1C-AC240	20306-85
W388ACPX-8	A283XBXC-24A	KUP11A15 (or F) - 24	RR2BA-U-AC24V	MJN2C-AC24	20307-82
W388ACPX-9	A283XBXC-120A	KUP11A15 (or F) - 120	RR2BA-U-AC120V	MJN2C-AC120	20307-84
W388ACPX-10	A283XBXC-240A	KUP11A15 (or F) - 240	RR2BA-U-AC240V	MJN2C-AC240	20307-85
W388ACPX-13	A283XCXC-24A	KUP14A15 (or F) - 24	RR3B-U-AC24V	MJN3C-AC24	20308-82
W388ACPX-14	A283XCXC-120A	KUP14A15 (or F) - 120	RR3B-U-AC120V	MJN3C-AC120	20308-84
W388ACPX-15	A283XCXC-240A	KUP14A15 (or F) - 240	RR3B-U-AC240V	MJN3C-AC240	20308-85
W388CPX-2	A283XAXC-12D	KUP5D15 (or F) - 12	RR1BA-U-DC12V	MJN1C-DC12	20309-81
W388CPX-3	A283XAXC-24D	KUP5D15 (or F) - 24	RR1BA-U-DC24V	MJN1C-DC24	20309-82

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SECTION 1 CROSS REFERENCE GUIDE

MAGNECRAFT & STRUTHERS-DUNN		TYCO / POTTER & BRUMFIELD	IDEC	OMRON	DELTROL
W388CPX-6	A283XBXC-12D	KUP11D15 (or F) - 12	RR2BA-U-DC12V	MJN2C-DC12	20310-81
W388CPX-7	A283XBXC-24D	KUP11D15 (or F) - 24	RR2BA-U-DC24V	MJN2C-DC24	20310-82
W388CPX-8	A283XBXC-110D	KUP11D15 (or F) - 110	RR2B-U-DC110V	MJN2C-DC110	20310-84
W388CPX-10	A283XCXC-12D	KUP14D15 (or F) - 12	RR3B-U-DC12V	MJN3C-DC12	20311-81
W388CPX-11	A283XCXC-24D	KUP14D15 (or F) - 24	RR3B-U-DC24V	MJN3C-DC24	20311-82
W388ACQX-4	A283XAXC1-120A	KUP5A55 (or F) - 120	RR1BA-US-AC120V	MJN1CF-AC120	20545-84
W388ACQX-5	A283XAXC1-240A	KUP5A55 (or F) - 240	RR1BA-US-AC240V	MJN1CF-AC240	20545-85
W388ACQX-9	A283XBXC1-120A	KUP11A55 (or F) - 120	RR2BA-US-AC120V	MJN2CF-AC120	20546-84
W388ACQX-10	A283XBXC1-240A	KUP11A55 (or F) - 240	RR2BA-US-AC240V	MJN2CF-AC240	20546-85
W388ACQX-14	A283XCXC1-120A	KUP14A55 (or F) - 120	RR3B-US-AC120V	MJN3CF-AC120	20547-84
W388ACQX-15	A283XCXC1-240A	KUP14A55 (or F) - 240	RR1BA-US-DC240V	MJN3CF-AC240	20547-85
W388CQX-2	A283XAXC1-12D	KUP5D55 (or F) - 12	RR1BA-US-DC12V	MJN1CF-DC12	20551-81
W388CQX-3	A283XAXC1-24D	KUP11D55 (or F) - 24	RR2BA-US-DC24V	MJN1CF-DC24	20551-82
W388CQX-6	A283XBXC1-12D	KUP11D55 (or F) - 12	RR2BA-US-DC12V	MJN2CF-DC12	20552-81
W388CQX-7	A283XBXC1-24D	KUP11D55 (or F) - 24	RR2B-US-DC24V	MJN2CF-DC24	20552-82
W388CQX-11	A283XCXC1-24D	KUP14D55 (or F) - 24	RR3B-US-DC24V	MJN3CF-DC24	20553-82
W388ABCPX-5	A283XBX69C-120A	KUEP-11A15-120			
W388BCPX-2	A283XBX69C-12D	KUEP-11D15-12			
W388BCPX-3	A283XBX69C-24D	KUEP-11D15-24			
W388BCPX-5	A283XBX69C-110D	KUEP-11D15-110			
W388ADBCPX-5	A283HXX69C-120A	KUEP-3A15-120			
W388DBCPX-2	A283HXX69C-12D	KUEP-3D15-12			
W388DBCPX-3	A283HXX69C-24D	KUEP-3D15-24			
W388DBCPX-5	A283HXX69C-110D	KUEP-3D15-110			
MAGNECRAFT & STRUTHERS-DUNN	TYCO / POTTER & BRUMFIELD	TYCO / SCHRACK	FINDER		
388JXCXC1M-240A	KUMP-14A68-240	RM333740			
388JXCXC1M-120A	KUMP-14A68-120	RM333615			
388JXCXC1M-12D	KUMP-14D68-12	RM333012			
388JXCXC1M-24D	KUMP-14D68-24	RM333024			
388JXCXCM-240A	KUMP-14A28-240	RM332740		6233 8240 0040	
388JXCXCM-120A	KUMP-14A28-120	RM332615		6233 8120 0040	
388JXCXCM-12D	KUMP-14D28-12	RM332012		6233 9012 0040	
388JXCXCM-24D	KUMP-14D28-24	RM332024		6233 9024 0040	
388JXBXC1M-240A	KUMP-11A68-240	RM233740			
388JXBXC1M-120A	KUMP-11A68-120	RM233615			
MAGNECRAFT & STRUTHERS-DUNN	TYCO / POTTER & BRUMFIELD	TYCO / SCHRACK	FINDER		
388JXBXC1M-12D	KUMP-11D68-12	RM233012			
388JXBXC1M-24D	KUMP-11D68-24	RM233024			
388JXBXCM-240A	KUMP-11A28-240	RM232740		6232 8240 0040	
388JXBXCM-120A	KUMP-11A28-120	RM232615		6232 8120 0040	
388JXBXCM-12D	KUMP-11D28-12	RM232012		6232 9012 0040	
388JXBXCM-24D	KUMP-11D28-24	RM232024		6232 9024 0040	
MAGNECRAFT & STRUTHERS-DUNN	TYCO / POTTER & BRUMFIELD	TYCO / SCHRACK	FINDER		
388VCXXCM-220/240A	KUGP-12A15-240	RM632740		62.33 8240.0310	
388VCXXCM-120A	KUGP-12A15-120	RM632615		62.33 8120.0310	

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MAGNECRAFT & STRUTHERS-DUNN	TYCO / POTTER & BRUMFIELD	TYCO / SCHRACK	FINDER	
388VCXXCM-24A	KUGP-12A15-24	RM632524	62.32 8024.0310	
388VBXXCM-220/240A	KUGP-7A15-240	RM532740	62.22 8240.0310	
388VBXXCM-120A	KUGP-7A15-120	RM532615	62.23 8120.0310	
388VBXXCM-24A	KUGP-7A15-24	RM532524	62.23 8024.0310	
388VCXXCM-24D	KUGP-12D15-24	RM632024	62.32 9024.0310	
388VCXXCM-12D	KUGP-12D15-12	RM632012	62.32 9012.0310	
388VBXXCM-24D	KUGP-7D15-24	RM532024	62.32 9024.0310	
388VBXXCM-12D	KUGP-7D15-12	RM532012	62.33 9012.0310	
MAGNECRAFT & STRUTHERS-DUNN		TYCO / SCHRACK	FINDER	
389FXCXC1M-240A		RM735740	6283 8240 0040	
389FXCXC1M-120A		RM735615	6283 8120 0040	
389FXBXC1M-240A		RM835740	6282 8240 0040	
389FXBXC1M-120A		RM835615	6282 8240 0040	
389FXCXC1M-12D		RM735024	6283 9024 0040	
389FXCXC1M-24D		RM735012	6283 9012 0040	
389FXBXC1M-12D		RM835024	6282 9024 0040	
389FXBXC1M-24D		RM835012	6282 9012 0040	
MAGNECRAFT & STRUTHERS-DUNN	TYCO / POTTER & BRUMFIELD	TYCO / SCHRACK		DELTROL
W389ADCX-4	KUMP-3A5G-120	RMD 05 615		20840-84
W389ADCX-5	KUMP-3A5G-240	RMD 05 740		20840-85
W389ADZCX-3	KUMP-6A5G-24	RMC 05 524		
W389ADZCX-4	KUMP-6A5G-120	RMC 05 615		
W389DCX-2	KUMP-3D5G-12	RMD 05 012		20848-81
W389DCX-3	KUMP-3D5G-24	RMD 05 024		20848-82
W389DZCX-2	KUMP-6D5G-12	RMC 05 012		
W389DZCX-3	KUMP-6D5G-24	RMC 05 024		
W389ACX-4	KUHP-5A51-120			
W389ACX-8	KUHP11A51-24			
W389ACX-9	KUHP11A51-120			
W389ACX-10	KUHP11A51-240			
W389ACX-14	-			
W389ACX-15	-			
W389CX-2	KUHP5D51-12			
W389CX-3	KUHP5D51-24			
W389CX-7	KUHP11D51-12			
W389CX-8	KUHP11D51-24			
W389CX-12	-			
W389CX-13	-			
MAGNECRAFT & STRUTHERS-DUNN				DELTROL
300XBXC1-240A				20844-82
300XBXC1-120A				20844-84
300XBXC1-24A				20844-85
300XBXC1-12A				20852-81
300XBXC1-110D				20852-82
300XBXC1-24D				20852-84

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MAGNECRAFT & STRUTHERS-DUNN	TYCO / POTTER & BRUMFIELD	AMERICAN ZETTLER		
W9AS1D52-5	T9AS1D52-5	AZ2280-1A-5DEF		
W9AS1D52-12	T9AS1D52-12	AZ2280-1A-12DEF		
W9AS1D52-24	T9AS1D52-24	AZ2280-1A-24DEF		
W9AS1D52-48	T9AS1D52-48	AZ2280-1A-48DEF		
W9AS1D52-110	T9AS1D52-110	AZ2280-1A-110DEF		
W9AS5D52-5	T9AS5D52-5	AZ2280-1C-5DEF		
W9AS5D52-12	T9AS5D52-12	AZ2280-1C-12DEF		
W9AS5D52-24	T9AS5D52-24	AZ2280-1C-24DEF		
W9AS5D52-48	T9AS5D52-48	AZ2280-1C-48DEF		
W9AS5D52-110	T9AS5D52-110	AZ2280-1C-110DEF		
W9AS1A52-24		AZ2280-1A-24AEF		
W9AS1A52-120		AZ2280-1A-120AEF		
W9AS1A52-240		AZ2280-1A-240AEF		
W9AS5A52-24		AZ2280-1C-24AEF		
W9AS5A52-120		AZ2280-1C-120AEF		
W9AS5A52-240		AZ2280-1C-240AEF		
MAGNECRAFT & STRUTHERS-DUNN	TYCO / POTTER & BRUMFIELD	AMERICAN ZETTLER	OMRON	AROMAT
W92S7D22-12	T92P7D22-12	AZ2800-2A-12D	G7L-2A-TUB-CB-DC12	HE2aN-Q-DC12V
W92S7D22-24	T92P7D22-24	AZ2800-2A-24D	G7L-2A-TUB-CB-DC24	HE2aN-Q-DC24V
W92S7D22-110	T92P7D22-110	AZ2800-2A-110D	G7L-2A-TUB-CB-DC110	HE2aN-Q-DC110V
W92S11D22-12	T92P11D22-12	AZ2800-2C-12D		
W92S11D22-24	T92P11D22-24	AZ2800-2C-24D		
W92S11D22-110	T92P11D22-110	AZ2800-2C-110D		
W92S7A22-24	T92P7A22-24	AZ2800-2A-24AE	G7L-2A-TUB-CB-AC24	HE2aN-Q-AC24V
W92S7A22-120	T92P7A22-120	AZ2800-2A-120AE	G7L-2A-TUB-CB-AC120	HE2aN-Q-AC120V
W92S7A22-240	T92P7A22-240	AZ2800-2A-240AE	G7L-2A-TUB-CB-AC240	HE2aN-Q-AC240V
W92S11A22-24	T92P11A22-24	AZ2800-2C-24AE		
W92S11A22-120	T92P11A22-120	AZ2800-2C-120AE		
W92S11A22-240	T92P11A22-240	AZ2800-2C-240AE		
MAGNECRAFT & STRUTHERS-DUNN	TYCO / POTTER & BRUMFIELD			
W67RCSX-1	R10E1(X or Y)2-V28			
W67RCSX-2	R10E1(X or Y)2-V185			
W67RCSX-3	R10E1(X or Y)2-V700			
W67RCSX-4	R10E1(X or Y)2-V2.5K			
W67RCSX-5	R10E1(X or Y)2-V15.0K			
W67RCSX-6	R10E1(X or Y)4-V28			
W67RCSX-7	R10E1(X or Y)4-V185			
W67RCSX-8	R10E1(X or Y)4-V700			
W67RCSX-9	R10E1(X or Y)4-V2.5K			
W67RCSX-10	R10E1(X or Y)4-V15.0K			
W67RCSX-12	R10E1(X or Y)6-V90			
W67RCSX-13	R10E1(X or Y)6-V430			
W67RCSX-17	R10E1(X or Y)8-V72			
W67RCSX-18	R10E1(X or Y)8-V350			
W67TRCSX-2	R10E1(P or Z)2-V185			
W67TRCSX-3	R10E1(P or Z)2-V700			

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MAGNECRAFT & STRUTHERS-DUNN	TYCO / POTTER & BRUMFIELD
W67TRCSX-7	R10E1(P or Z)4-V185
W67TRCSX-8	R10E1(P or Z)4-V700
W67TRCSX-12	R10E1(P or Z)6-V90
W67TRCSX-13	R10E1(P or Z)6-V430
W67TRCSX-17	R10E1(P or Z)8-V72
W67TRCSX-18	R10E1(P or Z)8-V350
W67RPCX-2	R10E2(X or Y)2-V185
W67RPCX-3	R10E2(X or Y)2-V700
W67RPCX-7	R10E2(X or Y)4-V185
W67RPCX-8	R10E2(X or Y)4-V700
W67RPCX-12	R10E2(X or Y)6-V90
W67RPCX-13	R10E2(X or Y)6-V430
W67ARCSX-5	R10E1(X or Y)2-120V
W67ARCSX-10	R10E1(X or Y)4-120V
W67ARCSX-15	R10E1(X or Y)6-120V
W67SCSX-1	R10SE1(X or Y)2-J1.0K
W67SCSX-2	R10SE1(X or Y)2-J2.5K
W67SCSX-3	R10SE1(X or Y)2-J5.0K
W67SCSX-6	R10SE1(X or Y)4-J1.0K
W67SCSX-7	R10SE1(X or Y)4-J2.5K
W67SCSX-8	R10SE1(X or Y)4-J5.0K
MAGNECRAFT & STRUTHERS-DUNN	TYCO / POTTER & BRUMFIELD
750XBXH-12A	KR11AGE (or GF) 12
750XBXH-24A	KR11AGE (or GF) 24
750XBXH-120A	KR11AGE (or GF) 120
750XBXH-12D	KR11DGE (or GF) 12
750XBXH-24D	KR11DGE (or GF) 24
750XBXH-110D	KR11DGE (or GF) 110
750XCXH-12A	KR14AGE (or GF) 12
750XCXH-24A	KR14AGE (or GF) 24
750XCXH-120A	KR14AGE (or GF) 120
750XCXH-12D	KR14DGE (or GF) 12
750XCXH-24D	KR14DGE (or GF) 24
750XCXH-110D	KR14DGE (or GF) 110
MAGNECRAFT & STRUTHERS-DUNN	MIDTEX
W21ACPX-2	136-62T3A1

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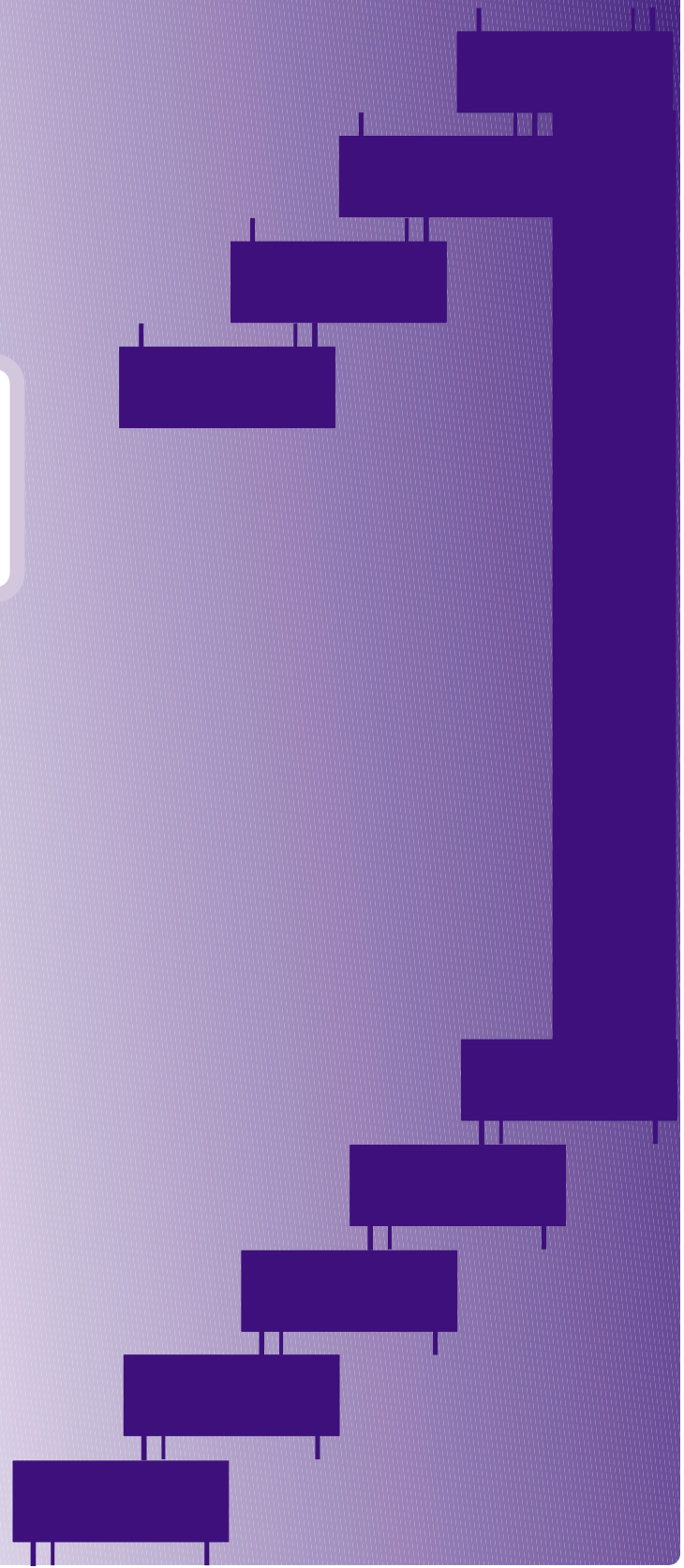
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SECTION 2

**SOLID STATE RELAYS (SSR)
2.5 TO 125 AMPERES**



RELAY SERIES



SSRDIN

L.E.D. STATUS LAMP

L W H
4.015 x 1.180 x 4.527



6 (ASX)

L.E.D. STATUS LAMP

L W H
2.25 x 1.75 x 0.78



6 (DSX)

L.E.D. STATUS LAMP

L W H
2.25 x 1.75 x 0.78

FEATURES

- AC & DC INPUT
- AC OUTPUT
- 10 OR 25 AMP LOADS
- PHOTO ISOLATED, ZERO VOLTAGE SWITCHING
- 4000V rms ISOLATION INPUT TO OUTPUT
- INTERNAL RC (SNUBBER) NETWORK
- RFI SUPPRESSION
- INTEGRAL SAFETY COVER, AND HEATSINK.
- DIN RAIL MOUNTING

- AC INPUT
- AC OUTPUT
- UP TO 125 AMP LOADS
- PHOTO ISOLATED, ZERO VOLTAGE SWITCHING
- 4000V rms ISOLATION INPUT TO OUTPUT
- INTERNAL RC (SNUBBER) NETWORK
- RFI SUPPRESSION
- SAFETY COVER STANDARD

- DC INPUT
- AC OUTPUT
- UP TO 125 AMP LOADS
- PHOTO ISOLATED, ZERO VOLTAGE SWITCHING
- 4000V rms ISOLATION INPUT TO OUTPUT
- INTERNAL RC (SNUBBER) NETWORK
- RFI SUPPRESSION
- SAFETY COVER STANDARD

OUTPUT DATA

OUTPUT CONFIGURATION:

SPST-NO

SPST-NO

SPST-NO

LOAD VOLTAGE:
LOAD CURRENT MAX.:

280, 660 VAC
10 & 25 AMPS

280, 560 OR 660 VAC
10 TO 125 AMPS

280, 560 OR 660 VAC
10 TO 125 AMPS

OUTPUT DEVICE:
MINIMUM LOAD:

BACK TO BACK SCRS
50 TO 250 MILLIAMPS

BACK TO BACK SCRS
50 TO 500 MILLIAMPS

BACK TO BACK SCRS
50 TO 500 MILLIAMPS

INSULATION
CHARACTERISTICS
DIELECTRIC STRENGTH:

4000 V rms

4000 V rms

4000 V rms

INPUT DATA

INPUT VOLTAGE RANGE:

90 TO 280 VAC, 3 TO 32 VDC

90 TO 280 VAC

3 TO 32 VDC

INPUT CURRENT:

16 mA TYPICAL

20 mA TYPICAL

16 mA TYPICAL

MUST TURN OFF VOLTAGE:

10 VAC OR 1 VDC

10 VAC

1 VDC

GENERAL DATA

AMBIENT TEMPERATURE
OPERATIONAL:
STORAGE:

- 30°C TO +80°C
- 40°C TO +100°C

- 40°C TO +80°C
- 40°C TO +100°C

- 40°C TO +80°C
- 40°C TO +100°C

RESPONSE TIME
OPERATE MAX.:
RELEASE MAX.:
INSULATION RESISTANCE:
TERMINALS:

AC: 40 mS, DC 10 mS
AC: 80 mS, DC 10 mS
10¹⁰ Ω
SCREW

40 mS
80 mS
10¹⁰ Ω
SCREW

40 mS
80 mS
10¹⁰ Ω
SCREW

AGENCY APPROVALS



UL Recognized
File No. E52197



UL Recognized
File No. E52197



CE APPROVED ON
SELECT MODELS



UL Recognized
File No. E52197



CE APPROVED ON
SELECT MODELS

PAGE NUMBER

PAGE 8

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6 (DDX)



L.E.D. STATUS LAMP

6 (DTX)



L.E.D. STATUS LAMP

6 (DTX)



L.E.D. STATUS LAMP

L W H
2.25 x 1.75 x 0.78

- DC INPUT
- DC OUTPUT
- UP TO 40 AMP LOADS
- ISOLATED, 2500 V rms ISOLATION INPUT TO OUTPUT
- RFI SUPPRESSION
- SAFETY COVER STANDARD
- L.E.D. STATUS LAMP

L W H
2.25 x 1.75 x 0.78

- DC INPUT
- AC OUTPUT
- UP TO 40 AMP LOADS
- PHOTO ISOLATED ZERO VOLTAGE SWITCHING
- 4000 V rms ISOLATION INPUT TO OUTPUT
- INTERNAL RC (SNUBBER) NETWORK
- SAFETY COVER STANDARD

L W H
2.25 x 1.75 x 0.78

- DC INPUT
- AC TRIAC OUTPUT
- 10 AMP LOADS
- PHOTO ISOLATED ZERO VOLTAGE SWITCHING
- 4000V rms ISOLATION INPUT TO OUTPUT
- INTERNAL RC (SNUBBER) NETWORK
- RFI SUPPRESSION

SPST-NO

200 VDC
12, 25 & 40 AMPS

MOSFET
20 MILLIAMPS

2500 V rms

3.5 TO 32 VDC
10 mA TYPICAL
1 VDC

- 40°C TO +80°C
- 40°C TO +100°C

600 uSec
2.6 mSec
10¹⁰ Ω
SCREW

SPST-NO, SPST-NC

280 OR 560 VAC
10, 25 OR 40 AMPS

TRIAC
50 TO 250 MILLIAMPS

4000 V rms

3 TO 32 VDC
2 mA TYPICAL
1 VDC

- 40°C TO +80°C
- 40°C TO +100°C

40 mS
80 mS
10¹⁰ Ω
SCREW

DPST-NO

280 VAC
10 AMPS

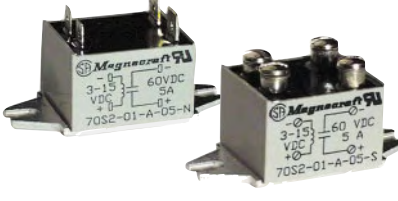
TRIAC
50 MILLIAMPS

4000 V rms

3.5 TO 32 VDC
2 mA TYPICAL
1 VDC

- 40°C TO +80°C
- 40°C TO +100°C

40 mS
80 mS
10¹⁰ Ω
QUICK CONNECTS

RELAY SERIES	70S2 “V” STYLE 	70S2 “N” & “S” STYLES 	70S2 “F” & “M” STYLES 
	L W H 1.70 x 0.400 x 1.00	L W H 2.20 x 1.00 x 0.864	L W H 2.20 x 1.00 x 0.85
FEATURES	- DC INPUT - AC OR DC OUTPUT 3 AMP LOADS - OPTICALLY ISOLATED - SINGLE IN-LINE PACKAGE	- DC INPUT - AC OR DC OUTPUT - UP TO 25 AMP LOADS - OPTICALLY ISOLATED - COMPACT SIZE	- DC INPUT - AC OR DC OUTPUT - UP TO 10 AMP LOADS - OPTICALLY ISOLATED - PRINTED CIRCUIT TERM OR PANEL MOUNT
	FORMERLY GRAYHILL	FORMERLY GRAYHILL	FORMERLY GRAYHILL
OUTPUT DATA OUTPUT CONFIGURATION:	SPST-NO	SPST-NO	SPST-NO
LOAD VOLTAGE: LOAD CURRENT MAX.:	50, 140, 280 VAC, 60 VDC 3 AMPS	140 OR 280 VAC, 60 VDC 6, 12 OR 25 AMPS	140 OR 280 VAC OR 60 VDC 3, 4, 6 & 10 AMPS
OUTPUT DEVICE: MINIMUM LOAD:	TRIAC (AC) OR TRANSISTOR (DC) 65 MILLIAMPS	TRIAC (AC) OR TRANSISTOR (DC) 65 MILLIAMPS	TRIAC (AC) OR TRANSISTOR (DC) 65 MILLIAMPS
INSULATION CHARACTERISTICS DIELECTRIC STRENGTH:	2500 V rms	2500 V rms	2500 V rms
INPUT DATA INPUT VOLTAGE RANGE: INPUT CURRENT: MUST TURN OFF VOLTAGE:	3 TO 32 VDC 1.0 to 19 mA TYPICAL 1 VDC	3 TO 30 VDC 1.0 TO 19 mA TYPICAL 1 VDC	3 TO 30 VDC 1.0 TO 16 mA TYPICAL 1 VDC
GENERAL DATA AMBIENT TEMPERATURE OPERATIONAL: STORAGE: RESPONSE TIME OPERATE MAX.: RELEASE MAX.: INSULATION RESISTANCE: TERMINALS:	- 40°C TO +100°C - 40°C TO +125°C 8.3 ms 8.3 ms 10 ¹⁰ Ω PRINTED CIRCUIT	- 40°C TO +100°C - 40°C TO +125°C 8.3 ms 8.3 ms 10 ¹⁰ Ω QUICK CONNECTS OR SCREW	- 40°C TO +100°C - 40°C TO +125°C 8.3 ms 8.3 ms 10 ¹⁰ Ω PRINTED CIRCUIT
AGENCY APPROVALS	  	  	  
PAGE NUMBER	PAGE 16	PAGE 17 - 18	PAGE 19 - 20

70S2 "H" & "L" STYLES



L W H
1.20 x 1.00 x 0.520

- DC INPUT
- AC OUTPUT
- UP TO 6 AMP LOADS
- OPTICALLY ISOLATED
- PRINTED CIRCUIT TERMINAL OR PANEL MOUNT

FORMERLY GRAYHILL

70S2 "K" STYLE



L W H
1.20 x 1.00 x 0.830

- DC INPUT
- AC OUTPUT
- UP TO 6 AMP LOADS
- OPTICALLY ISOLATED
- QUICK CONNECT TERMINAL OR PANEL MOUNT

FORMERLY GRAYHILL

226



L W H
1.50 X 0.670 X 0.600

- DC INPUT
- AC OUTPUT
- UP TO 7 AMP LOADS
- PHOTO ISOLATED
- RANDOM TURN-ON
- COMPATABLE WITH TTL GATES
- MOUNTS ON TO -3 TRANSISTOR HEAT SINKS

SPST-NO

140 OR 280 VAC
2.5 OR 6 AMPS

TRIAC (AC) OR TRANSISTOR (DC)
65 MILLIAMPS

2500 V rms

3 TO 30 VDC
1.0 TO 18 mA TYPICAL
1 VDC

- 40°C TO +100°C
- 40°C TO +125°C

8.3 mS
8.3 mS
10¹⁰ Ω
PRINTED CIRCUIT

 US
UL Recognized
File No. E52197


168986

SPST-NO

140 OR 280 VAC
4 AMPS

TRIAC (AC) OR TRANSISTOR (DC)
65 MILLIAMPS

3000 V rms

3 TO 30 VDC
1.0 TO 18 mA TYPICAL
1 VDC

- 40°C TO +100°C
- 40°C TO +125°C

8.3 mS
8.3 mS
10¹⁰ Ω
PRINTED CIRCUIT

 US
UL Recognized
File No. E52197


168986

SPST-NO

140 OR 280 VAC
7 AMPS

TRIAC
50 MILLIAMPS

2500 V rms

5 & 12 VDC
10 mA TYPICAL
1.4 VDC

- 30°C TO +80°C
- 40°C TO +100°C

10 mS
60 mS
10¹⁰ Ω
PRINTED CIRCUIT OR PUSH ON

 US
UL Recognized
File No. E52197



APPLICATION DATA

INTRODUCTION:

SOLID STATE RELAY (SSR) is a relay with isolated input and output, whose functions are achieved by means of electronic components without the use of moving parts as found in electromechanical relays.

PRINCIPLE OF OPERATION:

Solid State Relays are similar to electromechanical relays, in that both use a control circuit and a separate circuit for switching the load. When voltage is applied to the input of the SSR, the relay is energized by a light emitting diode. The light from the diode is beamed into a light sensitive semiconductor which, in the case of zero voltage crossover relays, conditions the control circuit to turn on the output solid state switch at the next zero voltage crossover. In the case of nonzero voltage crossover relays, the output solid state switch is turned on at the precise voltage occurring at the time. Removal of the input power disables the control circuit and the solid state switch is turned off when the load current passes through the zero point of its cycle.

APPLICATIONS:

Solid State Relays are specially suitable in many applications. Listed below are some typical applications.

INDUSTRIAL
AUTOMATION



ALARM
SYSTEMS



ELECTRONIC
APPLIANCES



INDUSTRIAL
APPLIANCES



MEDICAL
EQUIPMENT



PACKING
MACHINES



TOOLING
MACHINES



APPLICATION AND SELECTION CRITERIA FOR SOLID STATE RELAYS:

The Chart below indicates the areas in which SSR's (Solid State Relays) or EMR's (Electromechanical Relays) have better capabilities. (X) Indicates the Better choice.

	SSR	EMR
Long life	X	
Temperature cycling		X
Shock and vibration resistant	X	
Immunity to false operation due to transients		X
Generation of RFI, EMI	X	
Multipole		X
Multithrow (SPDT)		X
Size (includes Heat Sink) for equivalent load handling		X
Contact bounce	X	
Arcless switching	X	
Acoustic noise	X	
Zero voltage switching	X	
Ease of diagnosing malfunction		X
IC compatibility	X	
Immunity to humidity, salt spray & dirt	X	

LOAD CONSIDERATIONS

A major portion of application problems with SSR's result from operating conditions which specific loads impose upon an SSR. The following types of loads point out the potential problems that can occur with SSR's.

DC LOADS: All loads should be considered inductive and a diode should be placed across the load to absorb any inductive surge on turnoff.

RESISTIVE LOADS: Loads of constant value resistance are probably the simplest application of SSR's. Proper attention to the steady state current ratings and applied blocking voltage specifications normally will result in trouble-free operation.

LAMP LOADS: Incandescent lamp loads, though basically resistive, present some special problems. Because the resistance of a cold tungsten filament is about five to ten percent of the heated value, a large inrush current can occur. The period of the inrush current can range from one half cycle to several cycles, depending on the thermal time constant of the filament. It is essential to verify that this inrush current is within the surge specifications of the SSR. Also check that the lamp rating of the SSR is not exceeded. This is a UL rating based on the inrush of a typical lamp. Because of the unusually low filament resistance at the time of turn-on, a zero voltage turn-on characteristic is particularly desirable with tungsten lamps. It has been demonstrated that a zero voltage turn-on can extend the life of tungsten lamps by limiting inrush current.

CAPACITIVE LOADS: Caution must be used with low impedance capacitive loads to verify that the di/dt capabilities are not exceeded. The di/dt of a discharged capacitive load without external limiting impedance can approach infinity. Zero voltage turn-on is a particularly valuable means of limiting di/dt with capacitive loads.

MOTORS: Motors frequently have severe inrush currents during starting and can impose unusual voltages during turnoff. The inrush currents connected to mechanical loads having high starting torque or inertia should be carefully determined to verify that they are within the surge capabilities of the SSR. A current shunt and oscilloscope should be used to examine the duration of the inrush current. Motor starting may frequently reoccur at short intervals and the affect of repetitive inrush currents on the thermal operating point of an SSR must be considered. Check the motor operating current and locked rotor current versus the SSR motor rating. The possibility of abnormally stalled rotor conditions which draw much higher than normal currents should be considered. An extended stalled rotor condition may require an oversized SSR or fuse protection. The generated EMF of certain motors can require an SSR to have a blocking voltage greater than might be expected from steady state line voltage. The voltage applied to an SSR by a motor circuit during turnoff should be examined with an oscilloscope to verify that the applied voltages are safely below the specified SSR blocking voltages. Otherwise lock-on or erratic turnoff of the motor may occur. Some motor circuits may require higher than normal blocking voltage, transient limiting devices, or other techniques to control the voltage which must be blocked by an SSR during deceleration or direction reversal.

TRANSFORMERS:

In controlling transformers, the characteristics of the secondary load should be considered because it reflects the effective load on the SSR. Voltage transients from secondary load circuits, similarly, are frequently transformed and can be imposed on the SSR. Transformers present a special problem in that, depending on the state of the transformer flux at the time of turnoff, the transformer may saturate during the first half-cycle of subsequent applied voltage. This saturation can impose a very large current (Commonly ten to one hundred times rated primary current) on the SSR and exceed its half-cycle surge rating.

SSR's having random turn-on may have a better chance of survival than a zero voltage turn-on device for they commonly require the transformer to support only a

portion of the first half-cycle of the voltage. On the other hand, a random turn-on device will frequently close at the essentially zero voltage point (start of the half-cycle) and then the SSR must sustain the worst-case saturation current. A zero voltage turn-on device has the advantage that it turns on in a known, predictable mode and will normally immediately demonstrate (dependent on turnoff flux polarity) the worst-case condition. The use of an oscilloscope is recommended to verify that the half-cycle surge capability of the SSR is not exceeded. The severity of the transformer saturation problem varies greatly, dependent on the magnetic material of the transformer, saturated primary impedance, line impedance, etc.

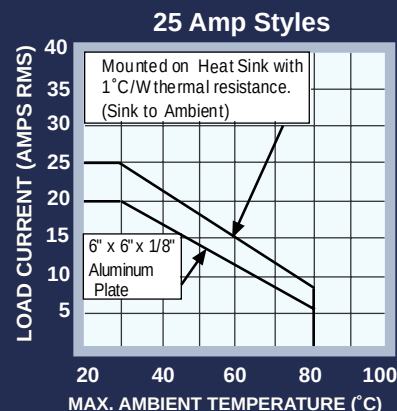
A safe rule of thumb in applying an SSR to a transformer primary is to select an SSR having a half-cycle current surge rating (RMS) greater than the maximum applied line voltage (RMS) divided by the transformer primary resistance. The primary resistance is usually easily measured and can be relied on as a minimum impedance limiting the first half-cycle of inrush current. The presence of some residual flux plus the saturated reactance of the primary will then further limit, in the worst case, the half-cycle surge safely within the surge rating of the SSR.

SELECTING THE PROPER SSR

NOMINAL LOAD CURRENT: Initially select a relay whose current rating exceeds the normal load current. Using the load current vs. temperature charts for that relay, check the actual current capacity at the ambient temperature to which the relay will be subjected.

As an example, the chart shows that a 25 ampere relay provided with a suitable heat sink can safely carry a maximum of 22 amperes continuously

at 40°C ambient. Since heat degrades the components ability to carry current, every effort should be made to keep the operating temperature of the SSR as low as possible.



APPLICATION DATA

PROTECTING THE OUTPUT SWITCH:

An SCR is a four layer semiconductor having 3 terminals: Cathode, anode and Gate. Normally it blocks current in both the forward and reverse directions. The SCR is triggered on in the forward direction by a small gate current. The SCR remains on until load current decreases to a value less than necessary to maintain the SCR in the on state. When switching AC, two SCRS are connected in inverse parallel.

A Triac also has 3 terminals, like the SCR, it normally blocks current in both directions; but may be triggered in either direction by a small gate current

Both SCR's and Triacs are members of the thyristor family. Therefore, we use this term to denote both devices.

There are 4 ways to put a thyristor into a conducting mode. Only one method is desirable and the other three are the source of most application problems.

The 4 methods of Thyristor turn-on are -

- Gate Turn-on:** By injecting a controlled current into the gate (the desired method).
- Forward Breakover Turn-on:** A voltage in excess of the Breakover (or Peak Blocking) voltage across thyristor.
- DV/DT turn-on:** A voltage which rises faster than the Thyristor can tolerate, and still remain in the off state.
- Thermal Turn-on:** Allowing the temperature of the thyristor to go beyond the value sufficient to cause excessive leakage current, causing turn-on and possible thermal runaway.

The last three methods can be protected against as follows. In those situations where high peak voltage transients occur, effective protection can be obtained by using metal oxide varistors (MOV). The MOV is a bidirectional voltage sensitive device that has low impedance when its design voltage threshold is exceeded.

HEAT SINKING:

It is important to select the right size heat sink for your applications. SSR's will typically generate 1.2 watts per amp of load current. The total wattage times the thermal resistance equal the temperature. For example a 25 amps SSR with a 20 amps load applied dissipates 24 watts when mounted on a aluminum plate 6" X 6" X 1/8" with thermal grease applied between the SSR base and aluminum plate. $20 \text{ amps} \times 1.2 \text{ watts / amp} = 24 \text{ watts}$. $24 \text{ watts} \times 1^\circ\text{C / watts} = 24^\circ\text{C rise}$.

FUSING:

The SSR has a $I^2 T$ rating which is a measure of the amount of energy it can safely handle without damage. The $I^2 T$ rating of the fuse is a measure of the amount of energy the fuse will pass to the SSR. To protect the SSR, an inline fuse rating should be less than that of the SSR. An SSR exposed to a surge greater than its non-repetitive rating will normally fail as a shorted unit.

EXPRESSIONS USED IN SPECIFICATIONS

$\frac{dv}{dt}$	Equals the maximum permissible rate of change of voltage in volts/microseconds
V =	Line Voltage
I =	Load Current
PF =	Load Power Factor
F =	Line Frequency
L =	Inductance in Henrys
C =	Capacitance in Microfarads
$R_1 \& R_2$	= Resistance in Ohms

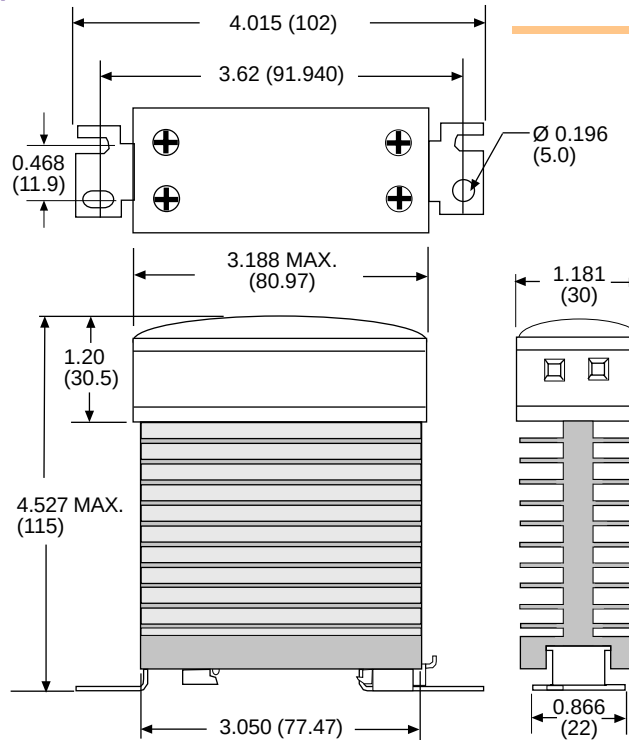
SOLID STATE RELAY SELECTION CHART

CONTROL VOLTAGE	LOAD VOLTAGE	MOUNTING	LOAD CURRENT AMPS													PAGE
			2	3	4	5	6	10	12	25	40	50	75	90	125	
3 - 30VDC	240 VAC or 60 VDC	PC BOARD	H PACK													21 - 22
			L PACK													21 - 22
			F PACK													19 - 20
		PC BOARD (SIP) SOCKET	V PACK													16
			K PACK													23 - 24
		PANEL	M PACK													19 - 20
			N PACK													17 - 18
			S PACK													17 - 18
		PANEL	W6 series (DDX)													12
			W6 series (DSX)													11
			W6 series (DTX)													13 - 14
90 - 280VAC	600 VAC	DIN/PANEL	SSR-DIN-DC													8
			SSR-DIN-AC													8
		PANEL	W6 series (ASX)													10
			W226													25
	5 or 12 VDC	PC/PUSH ON TERM.														

AC & DC CONTROLLED INPUT
INTEGRAL HEATSINK ONLY
30 MILLIMETERS WIDE
PANEL/DIN MOUNTABLE (35 mm RAIL)
FINGER SAFE COVER
L. E. D. STATUS LAMP.

SPST-N.O., 10 & 25 AMPS

OUTLINE DIMENSIONS
 DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

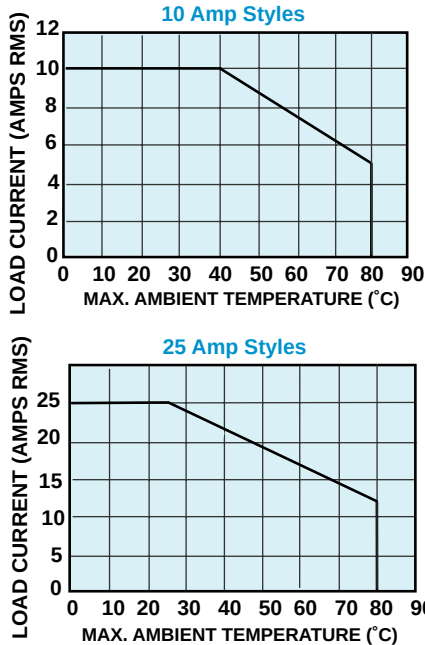


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RED L.E.D.
 STATUS LAMP



RECOMMEND SPACING
 BETWEEN MULTIPLE
 SSR'S 0.75 INCH



GENERAL SPECIFICATIONS

INPUT CHARACTERISTICS

Control Voltage Range:	DIN-AC: 90-280 VAC / DIN-DC: 3 - 32 VDC
Typical Input Current:	AC: 12 mA; DC: 16 mA
Must Release Voltage:	10 VAC / 1 VDC
Reverse Polarity Protection:	DC: Yes
Power Indicator:	Red L. E. D. Status lamp

OUTPUT CHARACTERISTICS

Style:	SSR: 210DIN-AC	225DIN-AC	610DIN-AC	625DIN-AC	210DIN-DC	225DIN-DC	610DIN-DC	625DIN-DC
Load Voltage Range:	24-280 VAC	24-280 VAC	48-660 VAC	48-660 VAC	24-280 VAC	24-280 VAC	48-660 VAC	48-660 VAC
Rated Load Current:	10 Amp	25 Amp	10 Amp	25 Amp	10 Amp	25 Amp	10 Amp	25 Amp
Maximum Off-State Voltage dv/dt:	200 uS	500 uS	200 uS	700 uS	200 uS	500 uS	200 uS	700 uS
Minimum Load Current:	50 mA	120 mA	80 mA	250 mA	50 mA	120 mA	80 mA	250 mA
Non -Repetitive Surge Current (1 Cycle):	83 A	800 A	83 A	1000 A	83 A	800 A	83 A	1000 A
Maximum Off State Leakage current (Rms):	10 mA	10 mA	10 mA	10 mA	10 mA	10 mA	10 mA	10 mA
Typical On-State Voltage Drop (Rms):	1.25 VAC	1.35 VAC	1.25 VAC	1.35VAC	1.25 VAC	1.25 VAC	1.25VAC	1.35 VAC
Maximum I ² T For Fusing (A ² Sec):	83	3700	83	1700	83	3700	83	1700

Operating Frequency Range:	25 Hz to 70 Hz
Maximum Turn - On Time:	AC: 40 mS / DC: 10 mS
Maximum Turn - Off Time:	AC: 80 mS / DC: 10 mS

MISCELLANEOUS CHARACTERISTICS

Dielectric Strength (Input-to Output Isolation):	4000 V rms
Insulation Resistance:	10 ¹⁰ Ω
Operating Temperature Range:	-30°C to +80°C
Storage Temperature Range:	-40°C to +100°C
Weight:	340 grams approx.

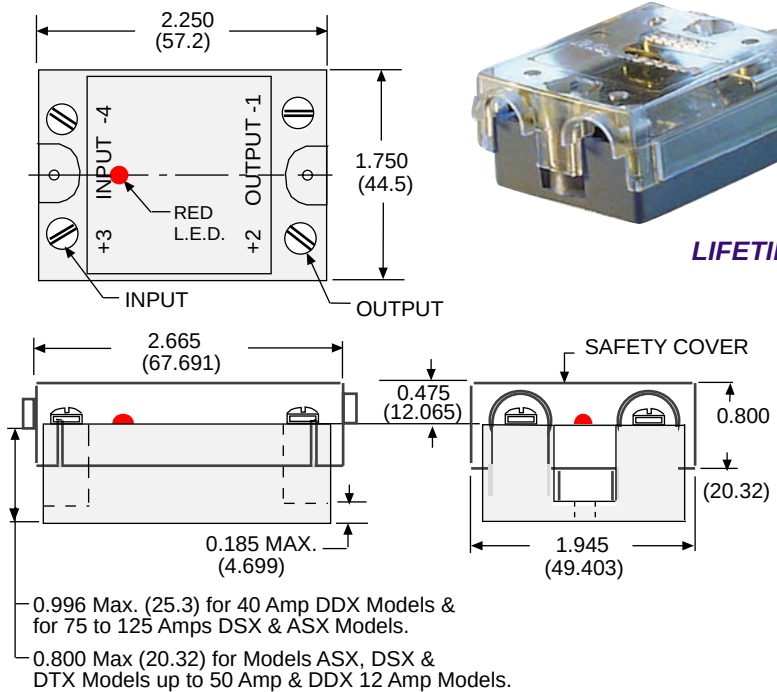
PART NUMBERS RATED LOAD CURRENT

SSR210DIN-AC	10 AMPS
SSR225DIN-AC	25 AMPS
SSR610DIN-AC	10 AMPS
SSR625DIN-AC	25 AMPS
SSR210DIN-DC	10 AMPS
SSR225DIN-DC	25 AMPS
SSR610DIN-DC	10 AMPS
SSR625DIN-DC	25 AMPS

SPST-N.O. 10 TO 125 AMPS

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



RED L.E.D. STATUS LAMP

UL **us** **CE**
 UL Recognized File No. E52197 On selected models

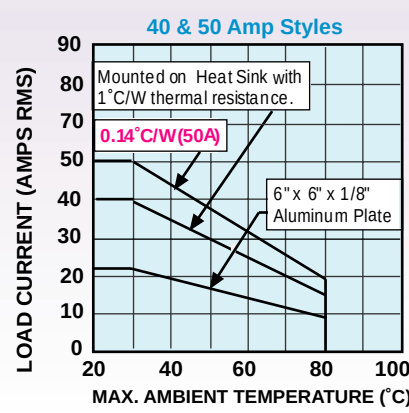
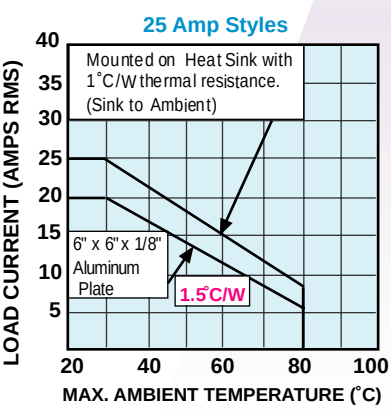
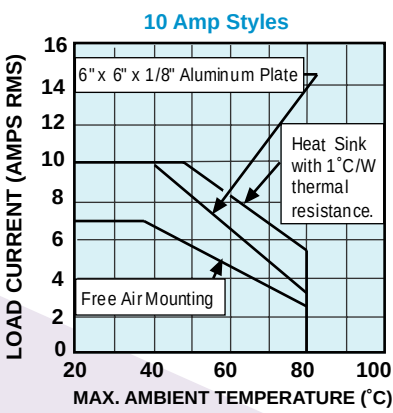
SAFETY COVER STANDARD ON ALL MODELS EXCEPT DUAL OUTPUT

LIFETIME WARRANTY

INPUT & OUTPUT SCREW SIZE

UP TO 40 AMP	
INPUT	OUTPUT
M 3.5	M 4
ABOVE 40 AMP	
M 3.5	M 6

THERMAL DERATING CURVE & LOAD CHARACTERISTICS



ORDERING CODE FOR RELAYS

W 6 2 10 ASX-

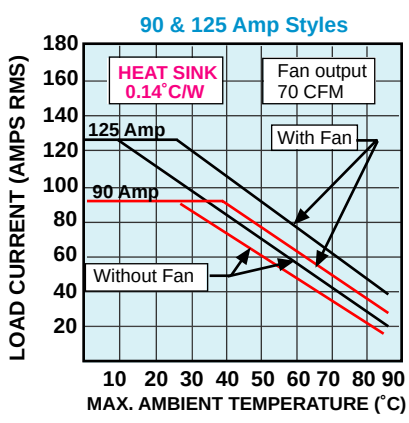
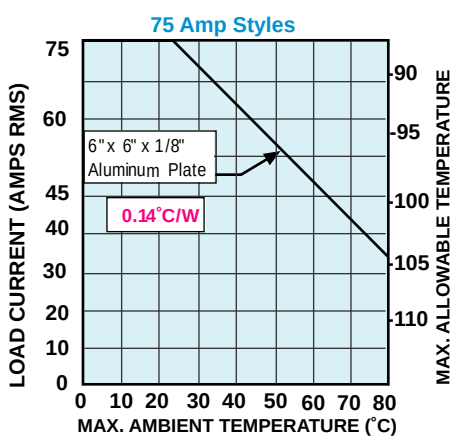
DENOTES STOCK: W

CLASS: 6

LOAD VOLTAGE RANGE: 2 10 ASX-
 24 - 280 VAC: CODE 2
 48 - 560 VAC: CODE 4
 48 - 600 VAC: CODE 6

RATED LOAD CURRENT: 10
 10 AMPS, 25 AMPS, 40 AMPS, 50 AMPS, 75 AMPS, 90 AMPS, 125 AMPS

INPUT/OUTPUT STYLE: ASX-
 AC INPUT / AC OUTPUT - ASX (SCR)
 DC INPUT / AC OUTPUT - DSX (SCR)
 DC INPUT / AC OUTPUT - DTX (TRIAC)
 DC INPUT / DC OUTPUT - DDX (MOSFET)



ALL CURRENT RATINGS ON THE FOLLOWING PAGES ARE BASED ON USE OF A SUITABLE THERMALLY CONDUCTIVE COMPOUND (E.G. SILICONE GREASE BETWEEN THE SSR MOUNTING BASE AND THE MOUNTING SURFACE OF A SUITABLE HEAT SINK).

AC CONTROLLED INPUT
AC SCR OUTPUT.
L. E. D. STATUS LAMP



ASX SERIES
SPST-N.O. 10 TO 125 AMPS

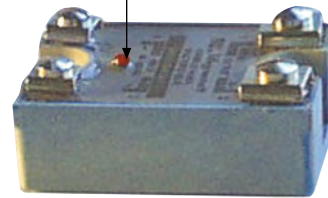
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UL Recognized
File No. E52197

CE On selected models

GENERAL SPECIFICATIONS

INPUT CHARACTERISTICS

Control Voltage Range: 90 - 280 VAC
Typical Input Current: 20 mA
Must Release Voltage: 10 VAC
Power Indicator: Red L. E. D. Status lamp



RED L.E.D.
STATUS LAMP

COMPLIES WITH REQUIREMENTS OF

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

* IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION

* CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

OUTPUT CHARACTERISTICS

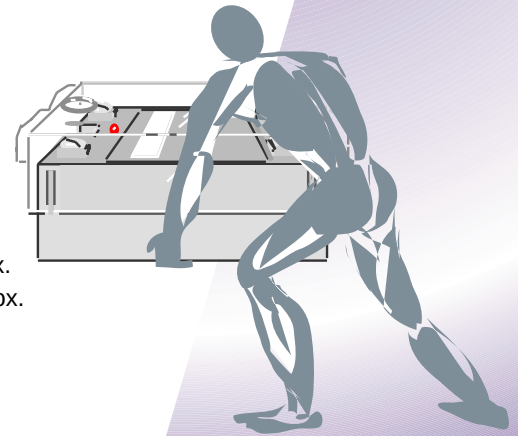
Style:
Load Voltage Range:
Rated Load Current:
Maximum Off-State Voltage dv/dt:
Minimum Load Current:
Non -Repetitive Surge Current (1 Cycle):
Maximum off State Leakage current (Rms):
Typical On-State Voltage Drop (Rms):
Maximum I²T for Fusing (A² Sec):
Suggested Heatsink °C/W:
Operating Frequency Range:
Maximum Turn - On Time:
Maximum Turn - Off Time:

W62					W64					W66	
40 - 280 VAC					48 - 560 VAC					48 - 660 VAC	
10 Amp	25 Amp	40 Amp	50 Amp	75 Amp	10 Amp	25 Amp	40 Amp	50 Amp	75 Amp	90 Amp	125 Amp
200 uS	500 uS	500 uS	500 uS	500 uS	200 uS	300 uS	500 uS	500 uS	500 uS	1000 uS	1000 uS
50 mA	120 mA	250 mA	250 mA	250 mA	50 mA	120 mA	250 mA	250 mA	250 mA	500 mA	500 mA
83 A	250 A	625 A	520 A	1150 A	83 A	250 A	625 A	520 A	1150 A	1350 A	1800 A
8 mA	8 mA	10 mA	10 mA	10 mA	10 mA	8 mA	10 mA	10 mA	10 mA	5 mA	5 mA
1.6 VAC	1.6 VAC	-	1.8 VAC	1.8 VAC	1.6 VAC	1.6 VAC	1.6 VAC	1.8VAC	1.8 VAC	1.8 VAC	1.8 VAC
72	312	1250	1250	5000	72	312	1250	1035	2600	3500	5800
3.2	0.5	0.2	0.14	0.14	3.2	0.5	0.2	0.14	0.14	0.14+fan	0.14+fan

25 Hz to 70 Hz
40 mS
80 mS

MISCELLANEOUS CHARACTERISTICS

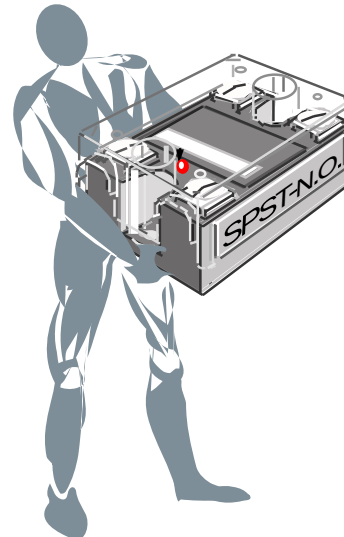
Dielectric Strength (Input-to Output Isolation): 4000 V rms
Insulation Resistance: 10¹⁰ Ω min.
Operating Temperature Range: -40°C to +80°C
Storage Temperature Range: -40°C to +100°C
Weight: 10 amps to 50 amps: 100 grams approx.
75 amps to 125 amps: 250 grams approx.



FEATURES

- * RED L. E. D. STATUS LAMP
- * CLEAR SAFETY COVER
- * UP TO 660 VAC OUTPUTS
- * HIGH TRANSIENT CAPABILITY—
SINGLE OUTPUT FEATURES BACK TO BACK SCR'S AND INTERNALLY MOUNTED RC (SNUBBER) NETWORK FOR HIGH DV/DT APPLICATIONS.
- * PHOTO-ISOLATED, ZERO VOLTAGE SWITCHING
- * OPTICALLY COUPLED FOR 4000 VAC ISOLATION BETWEEN INPUT AND OUTPUT AND RFI SUPPRESSION.
- * LIFETIME WARRANTY

SEE END OF SECTION 2 FOR CROSS REFERENCE.



**PART
NUMBERS**

**RATED LOAD
CURRENT**

W6210ASX-1	10 AMPS
*W6225ASX-1	25 AMPS
W6240ASX-1	40 AMPS
W6250ASX-1	50 AMPS
W6275ASX-1	75 AMPS
W6410ASX-1	10 AMPS
W6425ASX-1	25 AMPS
W6440ASX-1	40 AMPS
W6450ASX-1	50 AMPS
W6475ASX-1	75 AMPS
W6690ASX-1	90 AMPS
W66125ASX-1	125 AMPS

* **CE** Approved

DC CONTROLLED INPUT
AC SCR OUTPUT
L. E. D. STATUS LAMP.

DSX SERIES SPST-N.O. 10 TO 125 AMPS

UL us
UL Recognized
File No. E52197

CE On selected models

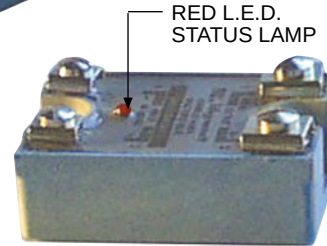
COMPLIES WITH REQUIREMENTS OF

- * IEC STANDARDS 947-4-1 AND 947-5-1 LOW VOLTAGE DIRECTIVE
- * IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION
- * CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

GENERAL SPECIFICATIONS

INPUT CHARACTERISTICS

Control Voltage Range:	3 - 32 VDC
Typical Input Current:	16 mA
Must Release Voltage:	1 VDC
Reverse Polarity Protection:	Yes
Power Indicator:	Red L. E. D. Status lamp

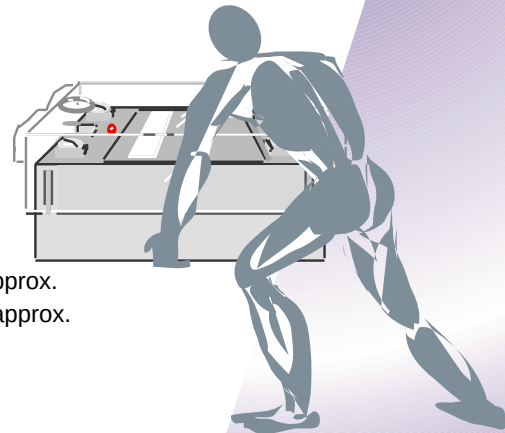


OUTPUT CHARACTERISTICS

Style:	W62					W64					W66	
Load Voltage Range:	40 - 280 VAC					48 - 560 VAC					48 - 660 VAC	
Rated Load Current:	10 Amp	25 Amp	40 Amp	50 Amp	75 Amp	10 Amp	25 Amp	40 Amp	50 Amp	75 Amp	90 Amp	125 Amp
Maximum Off-State Voltage dv/dt:	200 uS	500 uS	500 uS	500 uS	500 uS	200 uS	300 uS	500 uS	500 uS	500 uS	1000 uS	1000 uS
Minimum Load Current:	50 mA	120 mA	250 mA	250 mA	250 mA	50 mA	250 mA	250 mA	250 mA	250 mA	500 mA	500 mA
Non -Repetitive Surge Current (1 Cycle):	83 A	250 A	625 A	520 A	1150 A	83 A	250 A	625 A	520 A	1150 A	1350 A	1800 A
Maximum off State Leakage Current (Rms):	10 mA	10 mA	10 mA	8 mA	10 mA	10 mA	10 mA	10 mA	10 mA	10 mA	5 mA	5 mA
Typical On-State Voltage Drop (Rms):	1.6 VAC	1.6 VAC	1.6 VAC	1.8 VAC	1.8 VAC	1.6 VAC	1.6 VAC	1.6 VAC	1.8 VAC	1.8 VAC	1.8 VAC	1.8 VAC
Maximum I ² T for Fusing (A ² Sec):	83	250	625	1250	5000	72	312	1250	1035	2600	3500	5800
Suggested Heatsink °C/W:	3.2	0.5	0.2	0.014	0.14	3.2	0.5	0.2	0.14	0.14	0.14+fan	0.14+fan
Operating Frequency Range:	25 Hz to 70 Hz											
Maximum Turn - On Time:	40 mS											
Maximum Turn - Off Time:	80 mS											

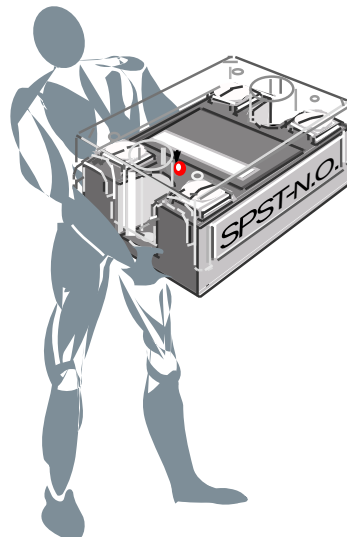
MISCELLANEOUS CHARACTERISTICS

Dielectric Strength (Input-to Output Isolation):	4000 V rms
Insulation Resistance:	10 ¹⁰ Ω min.
Operating Temperature Range:	-40°C to +80°C
Storage Temperature Range:	-40°C to +100°C
Weight:	10 amps to 50 amps: 100 grams approx. 75 amps to 125 amps: 250 grams approx.



FEATURES

- * RED L. E. D. STATUS LAMP
- * CLEAR SAFETY COVER
- * UP TO 660 VAC OUTPUTS
- * HIGH TRANSIENT CAPABILITY—
SINGLE OUTPUT FEATURES BACK TO BACK SCR'S AND INTERNALLY MOUNTED RC (SNUBBER) NETWORK FOR HIGH DV/DT APPLICATIONS.
- * PHOTO-ISOLATED, ZERO VOLTAGE SWITCHING
- * OPTICALLY COUPLED FOR 4000 VAC ISOLATION BETWEEN INPUT AND OUTPUT AND RFI SUPPRESSION.
- * LIFETIME WARRANTY



PART NUMBERS	RATED LOAD CURRENT
W6210DSX-1	10 AMPS
*W6225DSX-1	25 AMPS
W6240DSX-1	40 AMPS
W6250DSX-1	50 AMPS
W6275DSX-1	75 AMPS
W6410DSX-1	10 AMPS
W6425DSX-1	25 AMPS
W6440DSX-1	40 AMPS
W6450DSX-1	50 AMPS
W6475DSX-1	75 AMPS
W6690DSX-1	90 AMPS
W66125DSX-1	125 AMPS

* **CE** Approved

SEE END OF SECTION 2 FOR CROSS REFERENCE

DDX SERIES
FOR D.C. SWITCHING 12 TO 40 AMPS

DC CONTROLLED INPUT
DC MOSFET OUTPUT
L. E. D. STATUS LAMP.

UL **us**
UL Recognized
File No. E52197

GENERAL SPECIFICATIONS

INPUT CHARACTERISTICS

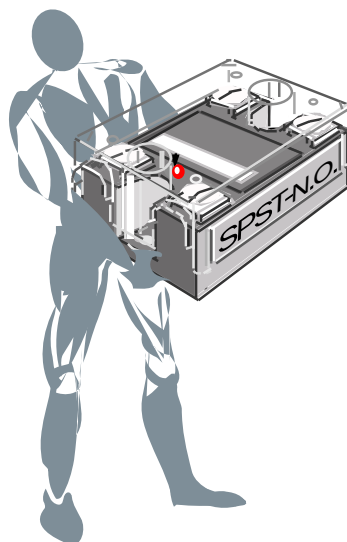
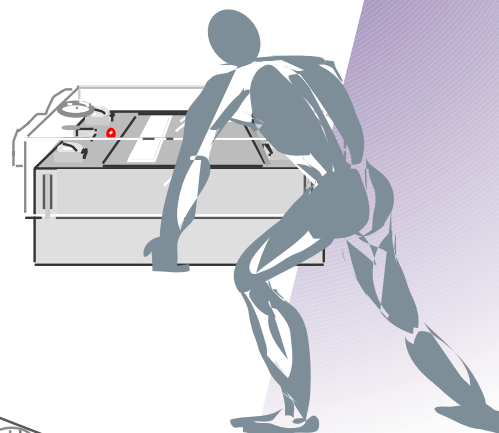
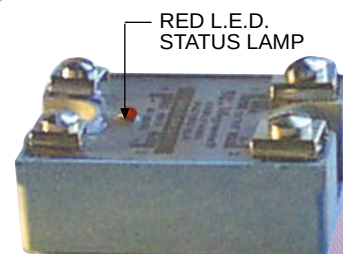
Control Voltage Range:	3 - 32 VDC
Typical Input Current:	10 mA
Must Release Voltage:	1 VDC
Power Indicator:	Red L. E. D. Status lamp

OUTPUT CHARACTERISTICS

	W62		
Load Voltage Range:	2 - 200 VDC		
Rated Load Current:	12 Amp	25 Amp	40 Amp
Minimum Load Current:	20 mA	20 mA	20 mA
Non -Repetitive Surge Current (1 Cycle):	27 A	50 A	90 A
Maximum Off State Leakage Current (Rms):	8 mA	8 mA	8 mA
Typical On-State Voltage Drop (Rms):	1.6 VAC	1.6 VAC	1.6 VAC
Suggested Heatsink °C/W:	1.0	0.5	0.14
Maximum Turn - On Time:	600 μ S		
Maximum Turn - Off Time:	2.6 mS		

MISCELLANEOUS CHARACTERISTICS

Dielectric Strength (Input-to Output Isolation):	2500 V rms
Insulation Resistance:	$10^{10} \Omega$ min.
Operating Temperature Range:	-40°C to +80°C
Storage Temperature Range:	-40°C to +100°C
Weight:	100 grams approx.



FEATURES

- * RED L. E. D. STATUS LAMP
- * CLEAR SAFETY COVER
- * UP TO 200 VDC OUTPUTS
- * 2500 VAC ISOLATION BETWEEN INPUT AND OUTPUT AND RFI SUPPRESSION.
- * LIFETIME WARRANTY

SEE END OF SECTION 2 FOR CROSS REFERENCE

**PART
NUMBERS**

**RATED LOAD
CURRENT**

W6212DDX-1	12 AMPS
W6225DDX-1	25 AMPS
W6240DDX-1	40 AMPS

DC CONTROLLED INPUT
AC TRIAC OUTPUT
L. E. D. STATUS LAMP.
NORMALLY OPEN OR
NORMALLY CLOSED CONTACTS.

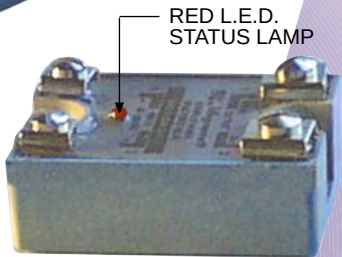
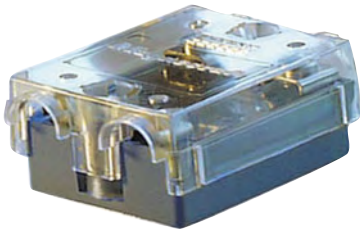
DTX SERIES
10 TO 40 AMPS



GENERAL SPECIFICATIONS

INPUT CHARACTERISTICS

Control Voltage Range:	3 - 32 VDC
Typical Input Current:	W62: 2 mA; W64: 16 mA
Must Release Voltage:	1 VDC
Reverse Polarity Protection:	Yes
Power Indicator:	Red L. E. D. Status lamp



OUTPUT CHARACTERISTICS

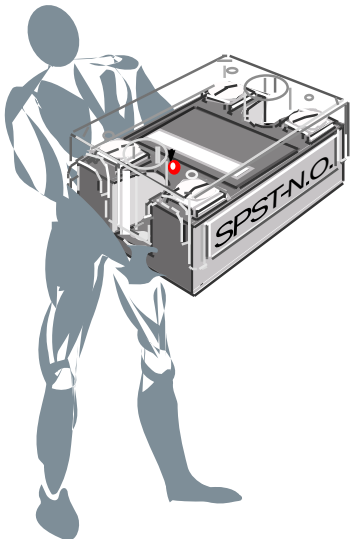
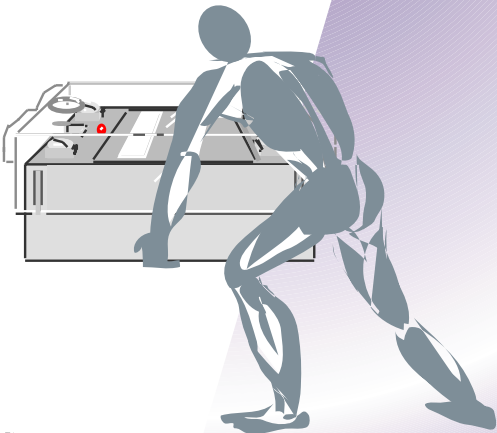
Style:	W62			W64		
Load Voltage Range:	24 - 280 VAC			48 - 480 VAC		
Rated Load Current:	10 Amp	25 Amp	40 Amp	10 Amp	25 Amp	40 Amp
Maximum Off-State Voltage dv/dt:	250 uS	250 uS	250 uS	200 uS	250 uS	250 uS
Minimum Load Current:	50 mA	120 mA	50 mA	50 mA	20 mA	250 mA
Non -Repetitive Surge Current (1 Cycle):	100 A	250 A	250 A	100 A	250 A	250 A
Maximum Off State Leakage current (Rms):	10 mA	10 mA	10 mA	10 mA	10 mA	10 mA
Typical On-State Voltage Drop (Rms):	1.6 VAC	1.6 VAC	1.6 VAC	1.6 VAC	1.6 VAC	1.6 VAC
Maximum I²T for Fusing (A² Sec):	52	300	438	35	200	250
Suggested Heatsink °C/W:	3.2	0.5	1.4	3.2	0.5	0.2
Operating Frequency Range:	25 Hz to 70 Hz					
Maximum Turn - On Time:	40 mS					
Maximum Turn - Off Time:	80 mS					

MISCELLANEOUS CHARACTERISTICS

Dielectric Strength (Input-to Output Isolation):	4000 V rms
Insulation Resistance:	10 ¹⁰ Ω Min.
Operating Temperature Range:	-40°C to +80°C
Storage Temperature Range:	-40°C to +100°C
Weight:	100 grams approx.

FEATURES

- * RED L. E. D. STATUS LAMP
- * CLEAR SAFETY COVER
- * UP TO 480 VAC OUTPUTS
- * HIGH TRANSIENT CAPABILITY—
SINGLE OUTPUT FEATURES TRIAC AND
INTERNALLY MOUNTED RC (SNUBBER)
NETWORK FOR HIGH DV/DT APPLICATIONS.
- * PHOTO-ISOLATED, ZERO VOLTAGE SWITCHING
- * OPTICALLY COUPLED FOR 4000 VAC ISOLATION
BETWEEN INPUT AND OUTPUT AND RFI
SUPPRESSION.
- * LIFETIME WARRANTY

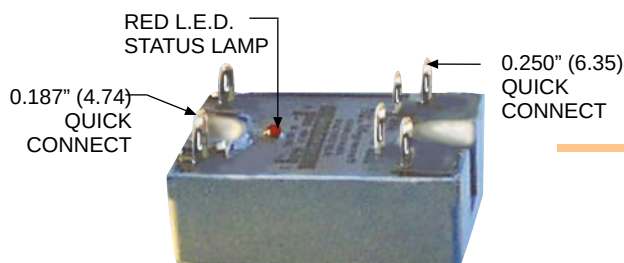


PART NUMBERS	RATED LOAD CURRENT
NORMALLY OPEN CONTACTS	
W6210DTX-1	10 AMPS
W6225DTX-1	25 AMPS
W6240DTX-1	40 AMPS
W6410DTX-1	10 AMPS
W6425DTX-1	25 AMPS
W6440DTX-1	40 AMPS
NORMALLY CLOSED CONTACTS	
W6210DTX-4	10 AMPS
W6225DTX-4	25 AMPS
W6240DTX-4	40 AMPS

SEE END OF SECTION 2 FOR CROSS REFERENCE

DTX SERIES
DPST-N.O. 10 AMPS

DC CONTROLLED INPUT
AC DOUBLE-POLE OUTPUT
L. E. D. STATUS LAMP.



UL
 UL Recognized
 File No. E52197

OUTLINE DIMENSIONS
 DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

GENERAL SPECIFICATIONS

INPUT CHARACTERISTICS

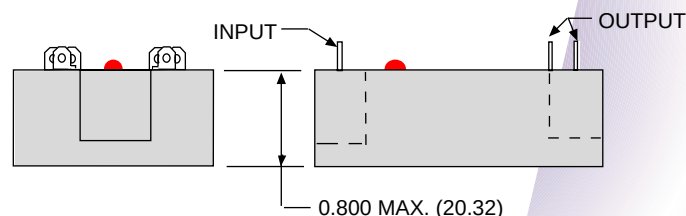
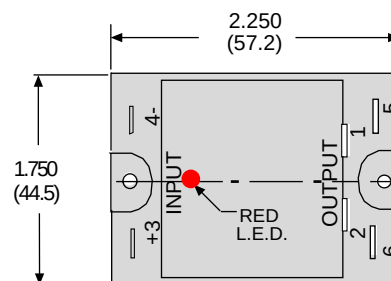
Control Voltage Range:	3.5 - 32 VDC
Typical Input current:	2 mA
Must Release Voltage:	1 VDC
Reverse Polarity Protection:	Yes
Power Indicator:	Red L. E. D. Status lamp

OUTPUT CHARACTERISTICS

Load Voltage Range:	24-280 VAC
Rated Load Current:	10 amp
Maximum off-State Voltage dv/dt:	250 V/uSEC
Minimum Load Current:	50 mA
Non -Repetitive Surge Current (1 Cycle):	100 amp
Maximum Off State Leakage current (Rms):	10 mA
Typical On-State Voltage Drop (Rms):	1.6 VAC
Suggested Heatsink °C/W:	1
Operating Frequency Range:	25 Hz to 70 Hz
Maximum Turn - On Time:	1/2 Hz
Maximum Turn - Off Time:	1/2 Hz

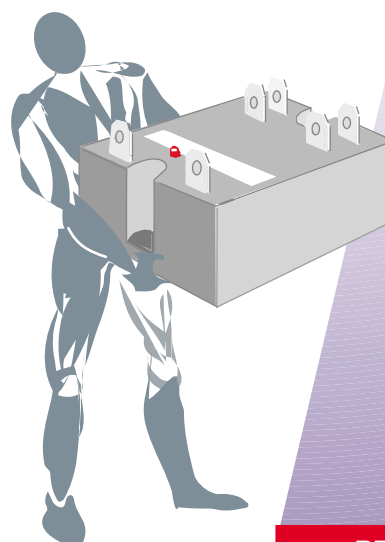
MISCELLANEOUS CHARACTERISTICS

Dielectric Strength (Input-to Output Isolation):	2500 V rms
Insulation Resistance:	$10^{10} \Omega$
Operating Temperature Range:	-40°C to +80°C
Storage Temperature Range:	-40°C to +100°C
Weight:	100 grams approx.



FEATURES

- * RED L. E. D. STATUS LAMP
- * CLEAR SAFETY COVER
- * UP TO 280 VAC OUTPUTS
- * HIGH TRANSIENT CAPABILITY—
SINGLE OUTPUT FEATURES TRIAC AND
INTERNALLY MOUNTED RC (SNUBBER)
NETWORK FOR HIGH DV/DT APPLICATIONS.
- * PHOTO-ISOLATED, ZERO VOLTAGE SWITCHING
- * OPTICALLY COUPLED FOR 2500 VAC ISOLATION
BETWEEN INPUT AND OUTPUT AND RFI
SUPPRESSION.
- * LIFETIME WARRANTY



**PART
NUMBERS**

**RATED LOAD
CURRENT**

W6210DTX-3

10 AMPS

BENEFITS

- * EXCELLENT TRANSIENT PROTECTION
- * HIGH SURGE CURRENT CAPABILITY
- * OPTICALLY ISOLATED
- * HIGH BLOCKING VOLTAGE
- * EXTREMELY LONG LIFE
- * MINIATURE BUT MIGHTY; UP TO 25 AMP SWITCHING

SPST-N.O. 2.5 TO 25 AMPS**FORMERLY
GRAYHILL**

UL US
UL Recognized
File No. E52197

SP 168986

TUV on
Selected models

DC INPUT-AC OUTPUT

MAX. LOAD CURRENT	CONTROL VOLTAGE RANGE	NOMINAL LOAD VOLTAGE	DESCRIPTION AND FEATURES	STYLE
2.5 A	3-30 or 6-30 VDC	24, 120 or 240 VAC	MINIATURE PRINTED CIRCUIT MOUNT RELAY, ONLY 0.500" HIGH	H
3 A	3-32 or 6-32 VDC	24, 120 or 240 VAC	SINGLE IN - LINE PACKAGE, USES ONLY 0.680 SQ. INCHES BOARD AREA	V
4 A	3-30 or 6-30 VDC	24, 120 or 240 VAC	COMPACT RELAY, PRINTED CIRCUIT MOUNT	F
6 A	3-30 or 6-30 VDC	120 or 240 VAC	LOW PROFILE RELAY, PANEL OR PRINTED CIRCUIT MOUNT	L
6 A	3-30 or 6-30 VDC	120 or 240 VAC	COMPACT RELAY, PANEL OR PRINTED CIRCUIT MOUNT	M
6 A	3-30 or 6-30 VDC	120 or 240 VAC	COMPACT RELAY, MEETS FIT/FUNCTION REPLACEMENTS FOR LARGER CLASS 6 STYLE RELAYS, QUICK CONNECT TERMINALS	N
6 A	3-30 or 6-30 VDC	120 or 240 VAC	COMPACT RELAY, MEETS FIT/FUNCTION REPLACEMENTS FOR LARGER CLASS 6 STYLE RELAYS, SCREW TERMINALS	S
10 A	3-30 or 6-30 VDC	120 or 240 VAC	COMPACT RELAY, PANEL OR PRINTED CIRCUIT MOUNT 10 AMP	M
12 A	3-30 or 6-30 VDC	120 or 240 VAC	COMPACT RELAY, MEETS FIT/FUNCTION REPLACEMENTS FOR LARGER CLASS 6 STYLE RELAYS, QUICK CONNECT TERMINALS	N
12 A	3-30 or 6-30 VDC	120 or 240 VAC	COMPACT RELAY, MEETS FIT/FUNCTION REPLACEMENTS FOR LARGER CLASS 6 STYLE RELAYS, SCREW TERMINALS	S
25 A	3-30 VDC	120 or 240 VAC	HIGH OUTPUT VERSION OF ABOVE STYLE "S"	S

DC INPUT-DC OUTPUT

MAX. LOAD CURRENT	CONTROL VOLTAGE RANGE	NOMINAL LOAD VOLTAGE	DESCRIPTION AND FEATURES	STYLE
3 A	3-15 or 9-30 VDC	3 to 60 VDC	SINGLE IN - LINE PACKAGE, USES ONLY 0.680 SQ. INCHES BOARD SPACE	V
3 A	3-15 or 9-30 VDC	3 to 60 VDC	COMPACT RELAY, PRINTED CIRCUIT. MOUNT	F
5 A	3-15 VDC	3 to 60 VDC	COMPACT RELAY, MEETS FIT/FUNCTION REPLACEMENTS FOR LARGER CLASS 6 STYLE RELAYS, QUICK CONNECT TERMINALS	N
5 A	3-15 VDC	3 to 60 VDC	COMPACT RELAY, MEETS FIT/FUNCTION REPLACEMENTS FOR LARGER CLASS 6 STYLE RELAYS, SCREW TERMINALS	S

ORDERING CODE FOR RELAYS

70S2- 04- D- 03 - V

CLASS: _____

CONTROL VOLTAGE: _____

01 = 3 - 15 VDC, DC/DC RELAYS
 02 = 9 - 30 VDC, DC/DC RELAYS
 03 = 3 - 30 VDC, 25 A COMPACT RELAY
 04 = 3 - 30 VDC (OR 32 VDC), DC/AC RELAYS
 05 = 6 - 30 VDC (OR 32 VDC), DC/AC RELAYS

CONTROL VOLTAGE: _____

A = 3-60 VDC B = 120 VAC
 C = 240 VAC D = 24 VAC

MAX CURRENT RATING _____

02 = 2.5 A 04 = 4 A 06 = 6 A 12 = 12 A
 03 = 3 A 05 = 5 A 10 = 10 A 25 = 25 A

PACKAGE STYLE _____

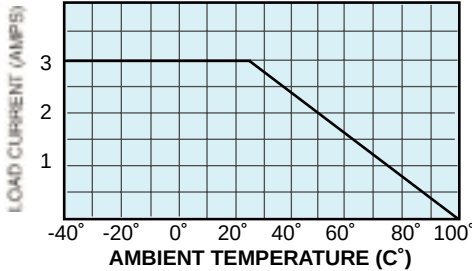
F, H, L, M, N, S OR V.



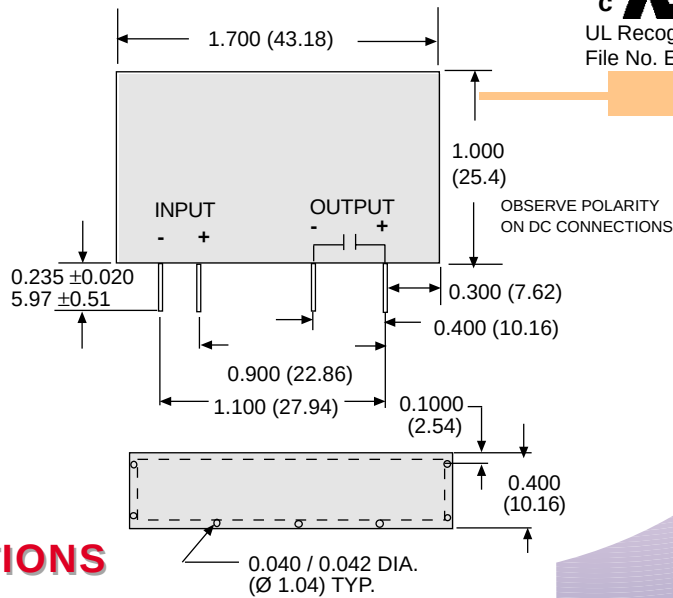
SPST-N.O. 3 AMPS

DC CONTROLLED INPUT
AC OR DC OUTPUT.

Figure 1: Maximum Continuous Current vs. Ambient Temperature



OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



UL **us**
UL Recognized
File No. E52197

168986

TUV on
Selected models

**STYLE V****GENERAL SPECIFICATIONS****INPUT CHARACTERISTICS**

Style:
Control Voltage Range:
Typical Input Current:
Must Release Voltage:
Max. Reverse Control Voltage:

OUTPUT CHARACTERISTICS

Load Voltage Range:
Rated Load Current :
Maximum off-State Voltage dv/dt:
Minimum Load Current:
Non-Repetitive Surge
Current (1 Cycle):
Maximum Off State Leakage
Current (Rms):
Typical On-State
Voltage Drop(Rms):
Minimum Peak Blocking Voltage:
Operating Frequency Range:
Maximum Turn - On Time:
Maximum Turn - Off Time:

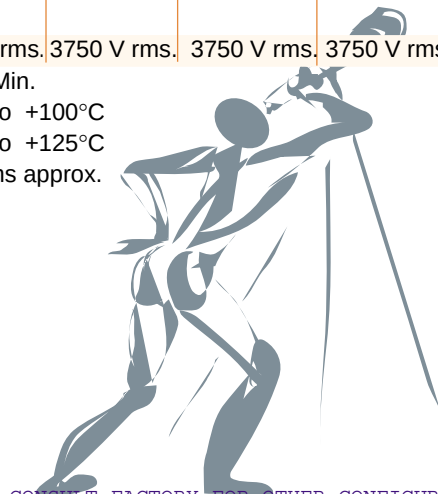
MISCELLANEOUS CHARACTERISTICS

Dielectric Strength
(Input- Output Insulation):
Insulation Resistance:
Operating Temperature Range:
Storage Temperature Range:
Weight:

	70S2-04-D	70S2-05-D	70S2-04-B	70S2-05-B	70S2-04-C	70S2-05-C	70S2-01-A	70S2-02-A
Control Voltage Range:	3 - 32 VDC	6 - 32 VDC	3 - 32 VDC	6 - 32 VDC	3 - 32 VDC	6 - 32 VDC	3 - 15 VDC	9 - 30 VDC
Typical Input Current:	1.0 -19 mA	1.0 -6.0 mA	1.0 -19 mA	1.0 -6.0 mA	1.0 -19 mA	1.0 -6.0 mA	5 - 40 mA	5 - 17 mA
Must Release Voltage:	1.0 VDC	1.0 VDC	1.0 VDC	1.0 VDC	1.0 VDC	1.0 VDC	1.0 VDC	1.0 VDC
Max. Reverse Control Voltage:	3 VDC	3 VDC	3 VDC	3 VDC	3 VDC	3 VDC	3 VDC	3 VDC
Load Voltage Range:	8 - 50 VAC	8 - 50 VAC	24 -140 VAC	24-140 VAC	24-280 VAC	24-280 VAC	3-60 VDC	3-60 VDC
Rated Load Current :	3 Amps	3 Amps	3 Amps	3 Amps	3 Amps	3 Amps	3 Amps	3 Amps
Maximum off-State Voltage dv/dt:	3000 V/u Sec Typ.							
Minimum Load Current:	75 mA	75 mA	75 mA	75 mA	75 mA	75 mA	100 mA	100 mA
Non-Repetitive Surge Current (1 Cycle):	60 Amps Peak @ 25°C						5 Amps/1 Sec.	
Maximum Off State Leakage Current (Rms):	3 mA	3 mA	6 mA	6 mA	6 mA	6 mA	10 uA	10 uA
Typical On-State Voltage Drop(Rms):	1.6	1.6	1.6	1.6	1.6	1.6	1.2 VDC	1.2 VDC
Minimum Peak Blocking Voltage:	200 V	200 V	400 V	400 V	600 V	600 V	105 VDC	105 VDC
Operating Frequency Range:	25 to 70 Hz	25 to 70 Hz	25 to 70 Hz	25 to 70 Hz	25 to 70 Hz	25 to 70 Hz	DC	DC
Maximum Turn - On Time:	8.3 mS	8.3 mS	8.3 mS	8.3 mS	8.3 mS	8.3 mS	75 uS	75 uS
Maximum Turn - Off Time:	8.3 mS	8.3 mS	8.3 mS	8.3 mS	8.3 mS	8.3 mS	500 uS	500 uS
Dielectric Strength (Input- Output Insulation):	3750 V rms.	3750 V rms.	3750 V rms.	3750 V rms.	3750 V rms.	3750 V rms.	2500 V rms.	2500 V rms.
Insulation Resistance:	10 ¹⁰ Ω Min.							
Operating Temperature Range:	-40°C to +100°C							
Storage Temperature Range:	-40°C to +125°C							
Weight:	25 grams approx.							

FEATURES

- * SINGLE IN LINE PACKAGE RELAY.
- * OPTICALLY ISOLATED.
- * PC MOUNT.
- * SWITCHES UP TO 3 AMP LOADS.
- * MINIMAL BOARD SPACE REQUIRED.
- * LIFETIME WARRANTY.

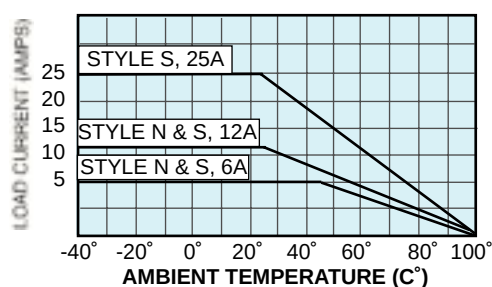


CONSULT FACTORY FOR OTHER CONFIGURATIONS

PART NUMBERS	LOAD VOLTAGE RANGE	RATED LOAD CURRENT
--------------	--------------------	--------------------

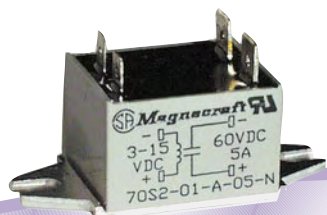
*70S2-04-D-03-V	8 - 50 VAC	3 AMPS
*70S2-05-D-03-V	8 - 50 VAC	3 AMPS
*70S2-04-B-03-V	24 -140 VAC	3 AMPS
*70S2-05-B-03-V	24 - 140 VAC	3 AMPS
*70S2-04-C-03-V	24 - 280 VAC	3 AMPS
*70S2-05-C-03-V	24 - 280 VAC	3 AMPS
70S2-01-A-03-V	3 - 60 VDC	3 AMPS
70S2-02-A-03-V	3 - 60 VDC	3 AMPS

* TUV

Figure 1: Maximum Continuous Current vs. Ambient Temperature**DC CONTROLLED INPUT
AC OR DC OUTPUT.**

UL **us**
UL Recognized
File No. E52197

SP 168986

**STYLE N****STYLE S****GENERAL SPECIFICATIONS****INPUT CHARACTERISTICS**

Style:	70S2-04-B	70S2-05-B	70S2-04-C	70S2-05-C	70S2-03-B	70S2-03-C	70S2-01-A	70S2-02-A
Control Voltage Range:	3 - 30 VDC	6 - 30 VDC	3 - 30 VDC	6 - 30 VDC	3 - 30 VDC	3 - 30 VDC	3 - 15 VDC	9 - 30 VDC
Typical Input Current:	7.0 -16 mA	6.0 -10 mA	7.0 -16 mA	6.0 -10 mA	7.0 -16 mA	7.0 -16 mA	5 - 40 mA	5 - 17 mA
Must Release Voltage:	1.0 VDC	1.0 VDC	1.0 VDC	1.0 VDC	1.0 VDC	1.0 VDC	1.0 VDC	1.0 VDC
Max.Reverse Control Voltage:	3 VDC	3 VDC	3 VDC	3 VDC	3 VDC	3 VDC	3 VDC	3 VDC

OUTPUT CHARACTERISTICS

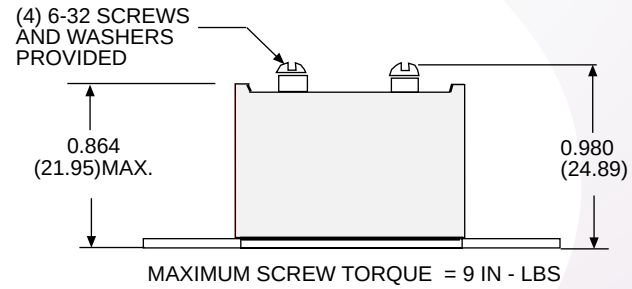
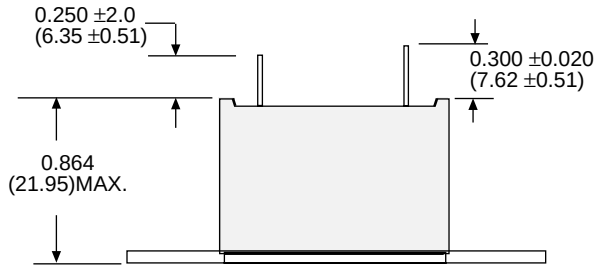
Load Voltage Range:	24-140 VAC	24-140 VAC	24-280 VAC	24-280 VAC	24-140 VAC	24-280 VAC	3-60 VDC	3-60 VDC
Rated Load Current :	6 Amp 12 Amp	6 Amp 12 Amp	6 Amp 12 Amp	6 Amp 12 Amp	25 Amps	25 Amps	5 Amps	5 Amps
Maximum off-State Voltage dv/dt:	3000 V/u Sec Typ.							
Minimum Load Current:	75 mA 100 mA	75 mA 100 mA	75 mA 100 mA	75 mA 100 mA	100 mA	100 mA	100 mA	100 mA
Non-Repetitive Surge Current (1 Cycle):	60Amp 150Amp	60Amp 150Amp	60Amp 150Amp	60Amp 150Amp	300 Amps	300 Amps	7 Amps/sec	7 Amps/sec
Maximum Off State Leakage Current (Rms):	6 mA	6 mA	6 mA	6 mA	6 mA	6 mA	10 uA	10 uA
Typical On-State Voltage Drop(Rms):	1.6 V	1.6 V	1.6 V	1.6 V	1.7 V	1.7 V	1.85 VDC	1.85 VDC
Minimum Peak Blocking Voltage:	400 V	400 V	600 V	600 V	400 V	600 V	105 VDC	105 VDC
Operating Frequency Range:	25 to 70 Hz	25 to 70 Hz	25 to 70 Hz	25 to 70 Hz	25 to 70 Hz	25 to 70 Hz	-	-
Maximum Turn - On Time:	8.3 mS	8.3 mS	8.3 mS	8.3 mS	8.3 mS	8.3 mS	75 uS	75 uS
Maximum Turn - Off Time:	8.3 mS	8.3 mS	8.3 mS	8.3 mS	8.3 mS	8.3 mS	750 uS	750 uS

MISCELLANEOUS CHARACTERISTICS

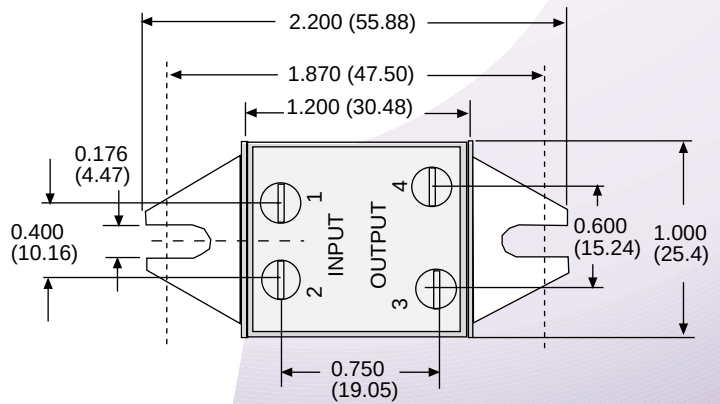
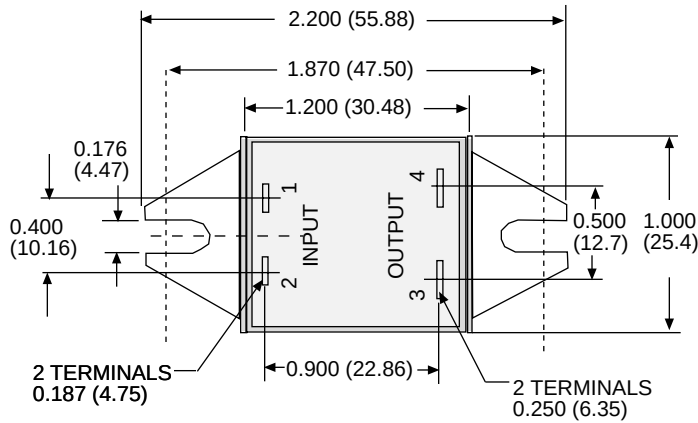
Dielectric Strength (Input- Output Insulation):	3000 V rms.	3000 V rms.	3000 V rms.	3000 V rms.	3000 V rms.	3000 V rms.	2500 V rms.	2500 V rms.
Insulation Resistance :	10 ¹⁰ Ω Min.							
Operating Temperature Range:	-40°C to +100°C							
Storage Temperature Range:	-40°C to +125°C							
Weight:	47 grams approx.							

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

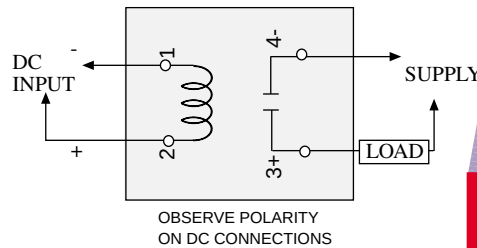
STYLE "S" IS NOT INTENDED FOR PC BOARD MOUNTING CONSULT FACTORY



MAXIMUM SCREW TORQUE = 9 IN - LBS



TERMINAL SIDE VIEW



STYLE N



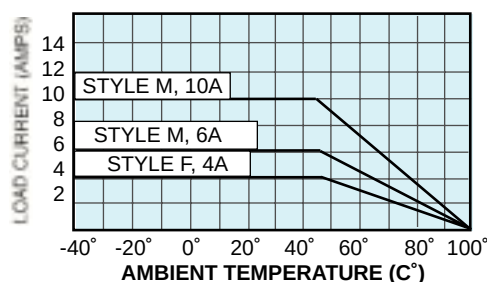
STYLE S

FEATURES

- * OPTICALLY ISOLATED.
- * PANEL MOUNT.
- * SWITCHES UP TO 25 AMP LOADS
- * MOUNTS ON CLASS 6 RELAY CENTERS, YET NEEDS 1/2 THE SPACE
- * SCREW TERMINALS OR PUSH - ON QC TERMINALS
- * LIFETIME WARRANTY



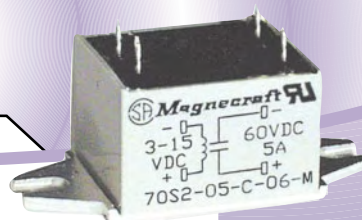
PART NUMBERS	LOAD VOLTAGE RANGE	RATED LOAD CURRENT
70S2-04-B-06-N	24 - 140 VAC	6 AMPS
70S2-05-B-06-N	24 - 140 VAC	6 AMPS
70S2-04-B-12-N	24 - 140 VAC	12 AMPS
70S2-05-B-12-N	24 - 140 VAC	12 AMPS
70S2-04-C-06-N	24 - 280 VAC	6 AMPS
70S2-05-C-06-N	24 - 280 VAC	6 AMPS
70S2-04-C-12-N	24 - 280 VAC	12 AMPS
70S2-05-C-12-N	24 - 280 VAC	12 AMPS
70S2-04-B-06-S	24 - 140 VAC	6 AMPS
70S2-05-B-06-S	24 - 140 VAC	6 AMPS
70S2-04-B-12-S	24 - 140 VAC	12 AMPS
70S2-05-B-12-S	24 - 140 VAC	12 AMPS
70S2-03-B-25-S	24 - 140 VAC	25 AMPS
70S2-04-C-06-S	24 - 280 VAC	6 AMPS
70S2-05-C-06-S	24 - 280 VAC	6 AMPS
70S2-04-C-12-S	24 - 280 VAC	12 AMPS
70S2-05-C-12-S	24 - 280 VAC	12 AMPS
70S2-03-C-25-S	24 - 280 VAC	25 AMPS
70S2-01-A-05-N	3 - 60 VDC	5 AMPS
70S2-01-A-05-S	3 - 60 VDC	5 AMPS
70S2-02-A-05-S	3 - 60 VDC	5 AMPS

SPST-N.O. 3, 4, 6 & 10 AMPS**Figure 1:** Maximum Continuous Current vs. Ambient Temperature

DC CONTROLLED INPUT
AC OR DC OUTPUT.

UL **us**
 UL Recognized
 File No. E52197

CSA 168986

**STYLE F****STYLE M****GENERAL SPECIFICATIONS****INPUT CHARACTERISTICS**

Style:	70S2-04-B	70S2-05-B	70S2-04-C	70S2-05-C	70S2-01-A	70S2-02-A
Control Voltage Range:	3 - 30 VDC	6 - 30 VDC	3 - 30 VDC	6 - 30 VDC	3 - 15 VDC	9 - 30 VDC
Typical Input Current:	7.0 -16 mA	6.0 -10 mA	7.0 -16 mA	6.0 -10 mA	5 - 40 mA	5 - 17 mA
Must Release Voltage:	1.0 VDC	1.0 VDC	1.0 VDC	1.0 VDC	1.0 VDC	1.0 VDC
Max. Reverse Control Voltage:	3 VDC	3 VDC	3 VDC	3 VDC	3 VDC	3 VDC

OUTPUT CHARACTERISTICS

Load Voltage Range:	24-140 VAC	24-140 VAC	24-280 VAC	24-280 VAC	3-60 VDC	3-60 VDC
Rated Load Current :	4 & 6 Amp 10 Amp	4 & 6 Amp 10 Amp	4 & 6 Amp 10 Amp	4 & 6 Amp 10 Amp	3 Amps	3 Amps
Maximum Off-State Voltage dv/dt:	3000 V/u Sec Typ.					
Minimum Load Current:	75 mA 100 mA	75 mA 100 mA	75 mA 100 mA	75 mA 100 mA	100 mA	100 mA
Non-Repetitive Surge Current (1 Cycle):	60 Amp 110 Amp	60 Amp 110 Amp	60 Amp 110 Amp	60 Amp 110 Amp	-	-
Maximum Off State Leakage Current (Rms):	6 mA	6 mA	6 mA	6 mA	10 uA	10 uA
Typical On-State Voltage Drop(Rms):	1.6 V	1.6 V	1.6 V	1.6 V	1.2 VDC	1.2 VDC
Minimum Peak Blocking Voltage:	400 V	400 V	600 V	600 V	105 VDC	105 VDC
Operating Frequency Range:	25 to 70 Hz	25 to 70 Hz	25 to 70 Hz	25 to 70 Hz	-	-
Maximum Turn - On Time:	8.3 mS	8.3 mS	8.3 mS	8.3 mS	75 uS	75 uS
Maximum Turn - Off Time:	8.3 mS	8.3 mS	8.3 mS	8.3 mS	500 uS	500 uS

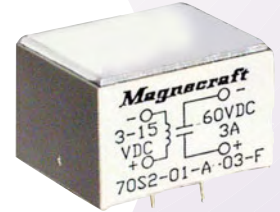
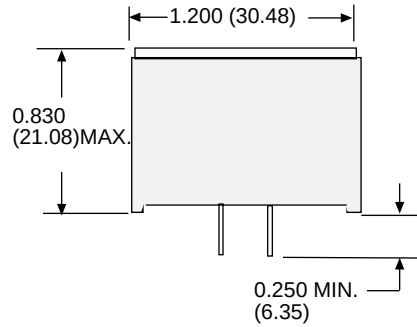
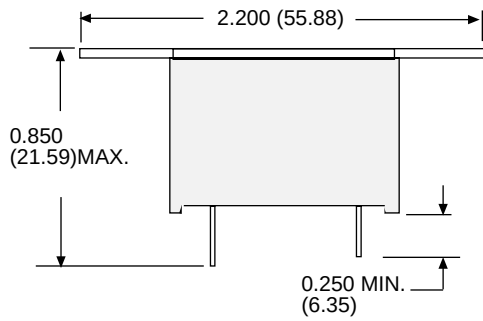
MISCELLANEOUS CHARACTERISTICS

Dielectric Strength (Input- Output Insulation):	3000 V rms.	3000 V rms	3000 V rms	3000 V rms	2500 V rms.	2500 V rms.
Insulation Resistance:	10 ¹⁰ Ω Min.					
Operating Temperature Range:	-40°C to +100°C					
Storage Temperature Range:	-40°C to +125°C					
Weight:	35 grams approx.					

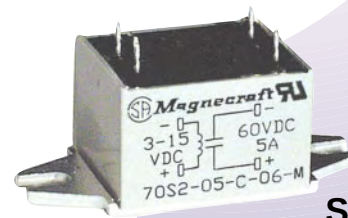
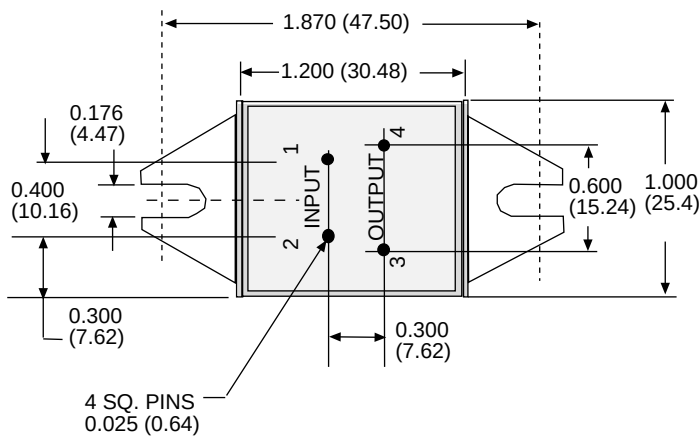
SPST-N.O. 3, 4, 6 & 10 AMPS

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

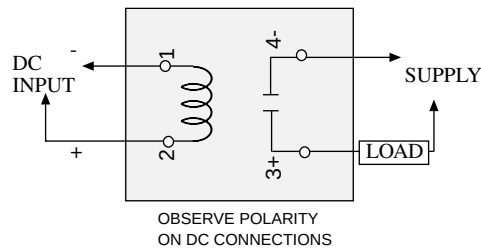


STYLE F



STYLE M

TERMINAL SIDE VIEW

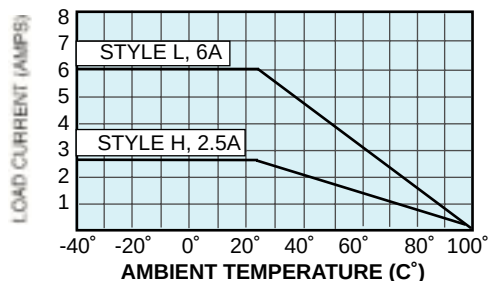


FEATURES

- * OPTICALLY ISOLATED.
- * PANEL OR PRINTED CIRCUIT MOUNT.
- * SWITCHES UP TO 3, 4, 6 OR 10 AMP LOADS.
- * LIFETIME WARRANTY.



PART NUMBERS	LOAD VOLTAGE RANGE	RATED LOAD CURRENT
70S2-04-B-04-F	24 - 140 VAC	4 AMPS
70S2-05-B-04-F	24 - 140 VAC	4 AMPS
70S2-04-C-04-F	24 - 280 VAC	4 AMPS
70S2-05-C-04-F	24 - 280 VAC	4 AMPS
70S2-04-B-06-M	24 - 140 VAC	6 AMPS
70S2-05-B-06-M	24 - 140 VAC	6 AMPS
70S2-04-B-10-M	24 - 140 VAC	10 AMPS
70S2-05-B-10-M	24 - 140 VAC	10 AMPS
70S2-04-C-06-M	24 - 280 VAC	6 AMPS
70S2-05-C-06-M	24 - 280 VAC	6 AMPS
70S2-04-C-10-M	24 - 280 VAC	10 AMPS
70S2-05-C-10-M	24 - 280 VAC	10 AMPS
70S2-01-A-03-F	3 - 60 VDC	3 AMPS
70S2-02-A-03-F	3 - 60 VDC	3 AMPS

SPST-N.O. 2.5 & 6 AMPS**Figure 1:** Maximum Continuous Current vs. Ambient Temperature**DC CONTROLLED INPUT
AC OUTPUT.**


UL Recognized
File No. E52197



168986

**STYLE H****STYLE L****GENERAL SPECIFICATIONS****INPUT CHARACTERISTICS**

Style:	70S2-04-D	70S2-05-D	70S2-04-B	70S2-05-B	70S2-04-C	70S2-05-C
Control Voltage Range:	3 - 30 VDC	6 - 30 VDC	3 - 30 VDC	6 - 30 VDC	3 - 30 VDC	6 - 30 VDC
Typical Input Current:	1.0 - 17 mA	1.0 - 6.0 mA	1.0 - 17 mA	1.0 - 6.0 mA	1.0 - 17 mA	1.0 - 6.0 mA
Must Release Voltage:	1.0 VDC	1.0 VDC	1.0 VDC	1.0 VDC	1.0 VDC	1.0 VDC
Max. Reverse Control Voltage:	3 VDC	3 VDC	3 VDC	3 VDC	3 VDC	3 VDC

OUTPUT CHARACTERISTICS

Load Voltage Range:	8 - 50 VAC	8 - 50 VAC	24 - 140 VAC	24 - 140 VAC	24 - 280 VAC	24 - 280 VAC
Rated Load Current :	2.5 Amps	2.5 Amps	2.5 & 6 Amps	2.5 & 6 Amps	2.5 & 6 Amps	2.5 & 6 Amps
Maximum Off-State Voltage dv/dt	3000 V/u Sec Typ.					
Minimum Load Current:	75 mA	75 mA	75 mA	75 mA	75 mA	75 mA
Non-Repetitive Surge Current (1 Cycle):	60 Amps Peak Max. @ 25°C					
Maximum Off State Leakage Current (Rms):	3 mA	3 mA	6 mA	6 mA	6 mA	6 mA
Typical On-State Voltage Drop(Rms):	1.6 V	1.6 V	1.6 V	1.6 V	1.6 V	1.6 V
Minimum Peak Blocking Voltage:	200 V	200 V	400 V	400 V	600 V	400 V
Operating Frequency Range:	25 to 70 Hz	25 to 70 Hz	25 to 70 Hz	25 to 70 Hz	25 to 70 Hz	25 to 70 Hz
Maximum Turn - On Time:	8.3 mS	8.3 mS	8.3 mS	8.3 mS	8.3 mS	8.3 mS
Maximum Turn - Off Time:	8.3 mS	8.3 mS	8.3 mS	8.3 mS	8.3 mS	8.3 mS

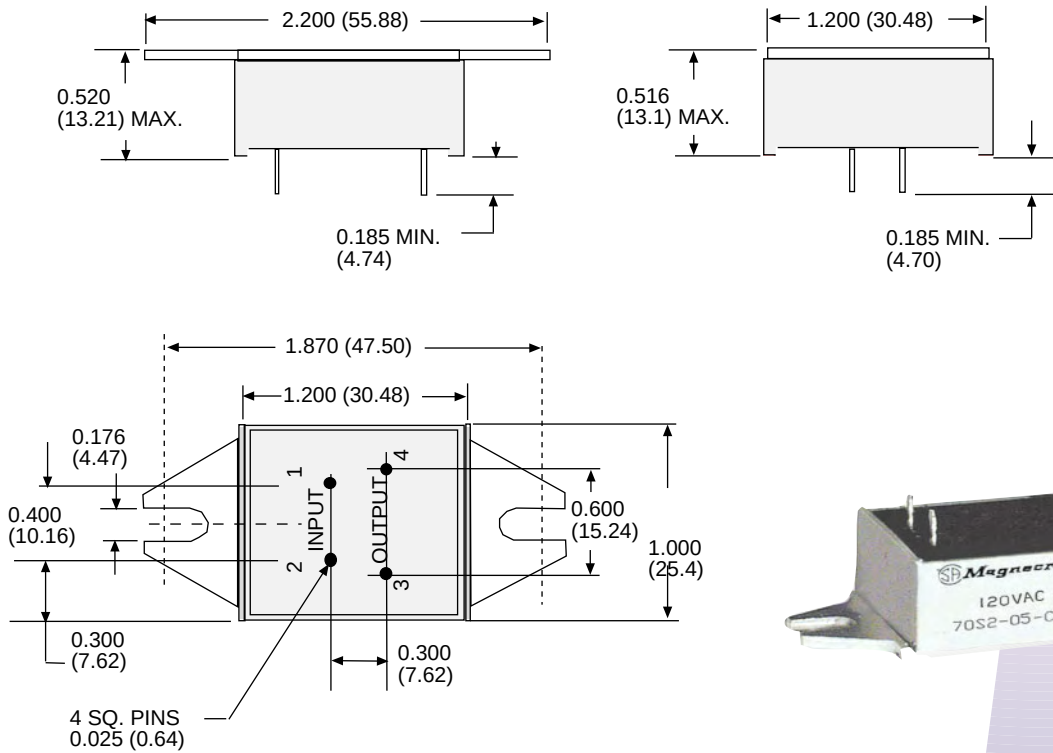
MISCELLANEOUS CHARACTERISTICS

Dielectric Strength (Input- Output Insulation):	2500 V rms. Min.
Insulation Resistance:	10 ¹⁰ Ω Min.
Operating Temperature Range:	-40°C to +100°C
Storage Temperature Range:	-40°C to +125°C
Weight:	22 g Style H, 25 g Style L approx.

SPST-N.O. 2.5 & 6 AMPS

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

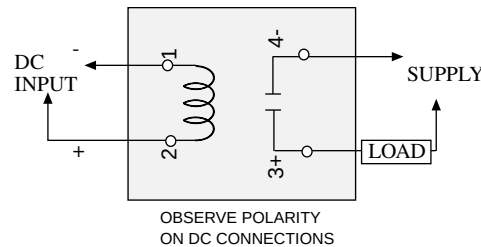


STYLE H



STYLE L

TERMINAL SIDE VIEW



FEATURES

- * OPTICALLY ISOLATED
- * PRINTED CIRCUIT MOUNT
- * SWITCHES UP TO 6 AMP LOADS
- * ONLY 0.5" ABOVE BOARD
- * MINIMAL BOARD SPACE REQUIRED
- * LIFETIME WARRANTY

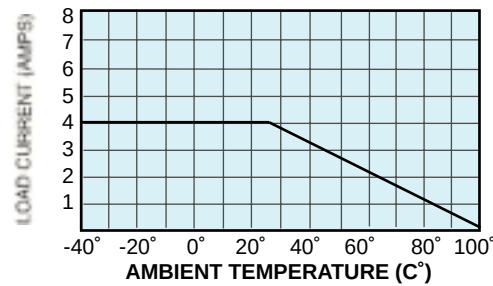


PART NUMBERS	LOAD VOLTAGE RANGE	RATED LOAD CURRENT
70S2-04-D-02-H	8 - 50 VAC	2.5 AMPS
70S2-05-D-02-H	8 - 50 VAC	2.5 AMPS
70S2-04-B-02-H	24 -140 VAC	2.5 AMPS
70S2-05-B-02-H	24 -140 VAC	2.5 AMPS
70S2-04-C-02-H	24 - 280 VAC	2.5 AMPS
70S2-05-C-02-H	24 - 280 VAC	2.5 AMPS
70S2-04-B-06-L	24 - 140 VAC	6 AMPS
70S2-05-B-06-L	24 - 140 VAC	6 AMPS
70S2-04-C-06-L	24 - 280 VAC	6 AMPS
70S2-05-C-06-L	24 - 280 VAC	6 AMPS

SPST-N.O. 4 AMPS

DC CONTROLLED INPUT
AC OR DC OUTPUT
SOCKET MOUNTABLE

Figure 1: Maximum Continuous Current vs. Ambient Temperature



UL **us**
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 File No. E52197

SR 168986



Mating Sockets
70-459-1: SCREW/DIN
 See Section 8 page 13



GENERAL SPECIFICATIONS

INPUT CHARACTERISTICS

Style:	70S2-04-B	70S2-04-C	70S2-04-D	70S2-04-B	70S2-05-C	70S2-05-D	70S2-01-A	70S2-02-A
Control Voltage Range:	3 - 30 VDC	3 - 30 VDC	3 - 30 VDC	6 - 30 VDC	6 - 30 VDC	6 - 30 VDC	3 - 15 VDC	9 - 30 VDC
Typical Input Current:	1 -17 mA	1 - 17 mA	1 -17 mA	1.0 - 6.0 mA	1.0 -17 mA	1 - 6.0 mA	5 - 40 mA	5 -17 mA
Must Release Voltage:	1.0 VDC	1.0 VDC	1.0 VDC	1.0 VDC	1.0 VDC	1.0 VDC	1.0 VDC	2 VDC
Max. Reverse Control Voltage:	5 VDC	5 VDC	5 VDC	5 VDC	5 VDC	5 VDC	5 VDC	5 VDC

OUTPUT CHARACTERISTICS

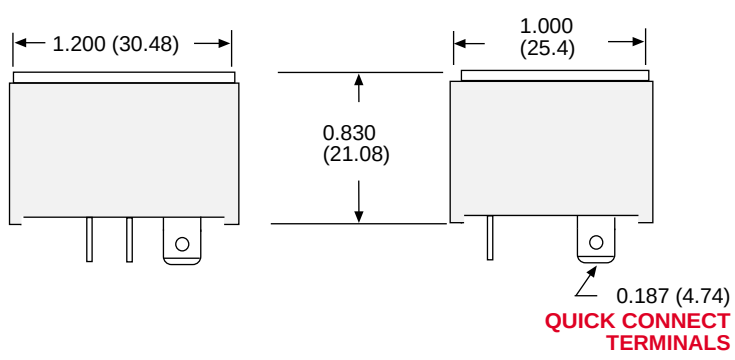
Load Voltage Range:	24-140 VAC	24-280 VAC	8 - 50 VAC	24-140 VAC	24-280 VAC	8 - 50 VAC	3 - 60 VDC	3 - 60 VDC
Rated Load Current :	4 Amps	4 Amps	4 Amps	4 Amps	4 Amps	4 Amps	3 Amps	3 Amps
Maximum Off-State Voltage dv/dt	3000 V/u Sec Typ.							
Minimum Load Current:	75 mA	75 mA	75 mA	75 mA	75 mA	75 mA	100 mA	100 mA
Non-Repetitive Surge Current (1 Cycle):	60 Amps Peak Max. @ 25°C						7 Amp-1sec	7 Amp-1sec
Maximum Off State Leakage Current (Rms):	6 mA	6 mA	3 mA	6 mA	6 mA	3 mA	10 uA	10 uA
Typical On-State Voltage Drop(Rms):	1.6 V	1.6 V	1.6 V	1.6 V	1.6 V	1.6 V	1.2 V	1.2 V
Minimum Peak Blocking Voltage:	400 V	600 V	200 V	400 V	600 V	200 V	105 V	105 V
Operating Frequency Range:	25 to 70 Hz	25 to 70 Hz	25 to 70 Hz	25 to 70 Hz	25 to 70 Hz	25 to 70 Hz		
Maximum Turn - On Time:	8.3 mS	8.3 mS	8.3 mS	8.3 mS	8.3 mS	8.3 mS	75 uS	75 uS
Maximum Turn - Off Time:	8.3 mS	8.3 mS	8.3 mS	8.3 mS	8.3 mS	8.3 mS	500 uS	500 uS

MISCELLANEOUS CHARACTERISTICS

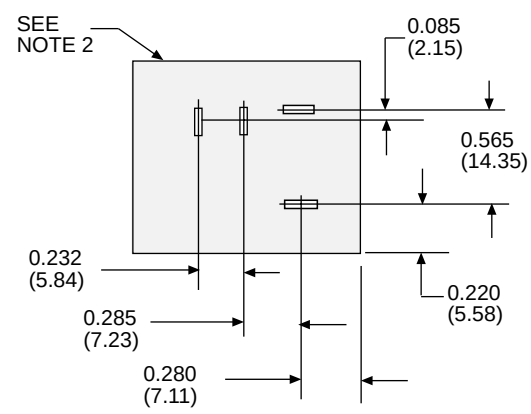
Dielectric Strength (Input- Output Insulation):	3000 V rms. Min.
Insulation Resistance:	10 ¹⁰ Ω Min.
Operating Temperature Range:	-40°C to +100°C
Storage Temperature Range:	-40°C to +125°C
Weight:	40 grams approx.

SPST-N.O. 4 AMPS

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



TERMINAL BOTTOM VIEW

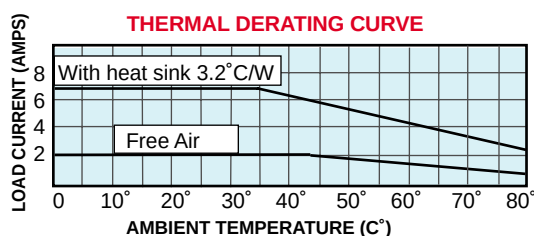


FEATURES

- * OPTICALLY ISOLATED
- * QUICK CONNECT/
SOLDER PLUG-IN MOUNT
- * MATES WITH 70-459-1 SOCKET
- * LIFETIME WARRANTY



PART NUMBERS	LOAD VOLTAGE RANGE	RATED LOAD CURRENT
70S2-04-B-04-K	24 - 140 VAC	4 AMPS
70S2-04-C-04-K	24 - 280 VAC	4 AMPS
70S2-04-D-04-K	8 - 50 VAC	4 AMPS
70S2-05-B-04-K	24 - 140 VAC	4 AMPS
70S2-05-C-04-K	24 - 280 VAC	4 AMPS
70S2-05-D-04-K	8 - 50 VAC	4 AMPS
70S2-01-A-03-K	3 - 60 VDC	3 AMPS
70S2-02-A-03-K	3 - 60 VDC	3 AMPS

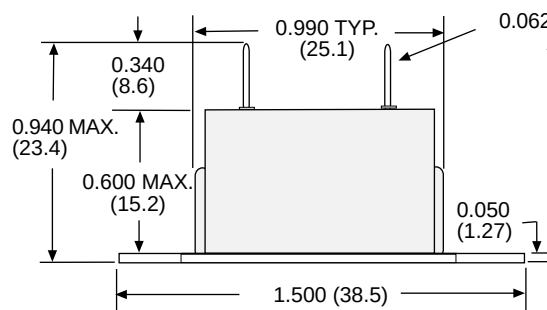
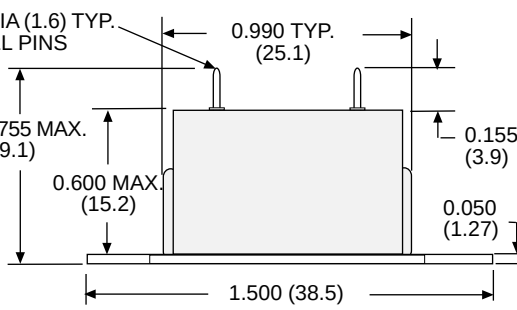
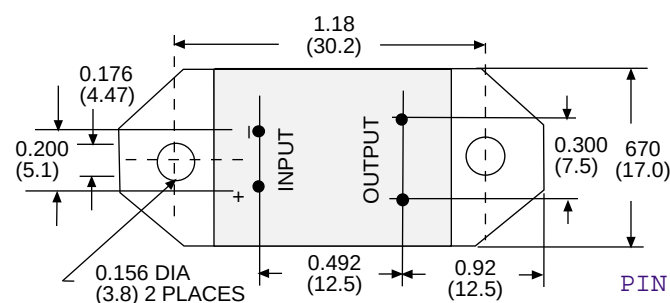
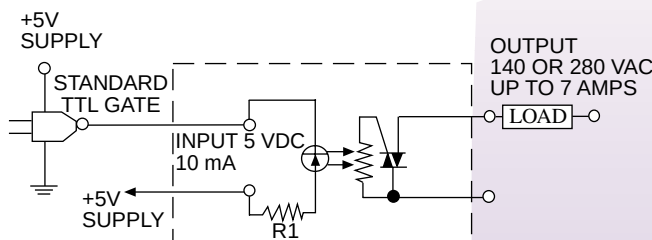
SPST-N.O. 7 AMPS

DC CONTROLLED INPUT
AC OUTPUT.



UL Recognized
File No. E52197

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

**FIG. "A"****FIG. "B"****PIN SIDE VIEW**

OUTPUT
140 OR 280 VAC
UP TO 7 AMPS

**GENERAL SPECIFICATIONS****INPUT CHARACTERISTICS**

Style:	W226RE-7-	W226RE-8-
Control Voltage Range:	5 VDC	12 VDC
Typical Input Current:	10 mA	10 mA
Must Release Voltage:	1 VDC	1 VDC

OUTPUT CHARACTERISTICS

Load Voltage Range:	140 VAC	280 VAC
Rated Load Current :	7 amps	7 amps
Minimum Load Current:	50 mA	50 mA
Non-Repetitive Surge Current (1 Cycle):	100 Amps	100 Amps
Maximum Off State Leakage Current (Rms):	0.1 mA @ 25°C	10 mA @ 65°C
Typical On-State Voltage Drop(Rms):	1.8 V	3.6 V
Minimum Peak Blocking Voltage:	260 V	380 V
Operating Frequency Range:	25 to 70 Hz	
Maximum Turn - On Time:	10 mS	
Maximum Turn - Off Time:	60 mS	

MISCELLANEOUS CHARACTERISTICS

Dielectric Strength (Input- Output Insulation):	2500 V rms. Min.
Insulation Resistance:	10 ¹⁰ Ω Min.
Operating Temperature Range:	-30°C to +80°C
Storage Temperature Range:	-40°C to +100°C
Weight:	13 grams approx.

PUSH-ON TERMINAL RECEPTACLES

	MOLEX	WINCHESTER
18-22 AWG	02-06-1103	156-10185
24-30 AWG	02-06-1132	156-10245

FEATURES

- * OPTICALLY ISOLATED.
- * PANEL MOUNT.
- * SWITCHES UP TO 7 AMP LOADS.
- * RANDOM VOLTAGE TURN ON.
- * PRINTED CIRCUIT OR PUSH - ON TERMINAL PIN VERSIONS.
- * LIFETIME WARRANTY.

PART NUMBERS	FIGURE	DC CONTROLLED INPUT	MAX. PULL - IN	MIN. DROP-OUT	MAX. OUTPUT CURRENT
PRINTED CIRCUIT TERMINALS					
W226RE-7-5A1	A	5 VDC	4.3 VDC	1.4 VDC	7 AMPS
W226RE-7-12A1	A	12 VDC	10.3 VDC	2.5 VDC	7 AMPS
W226RE-8-5A1	A	5 VDC	4.3 VDC	1.4 VDC	7 AMPS
W226RE-8-12A1	A	12 VDC	10.3 VDC	2.5 VDC	7 AMPS
PUSH ON TERMINALS					
W226R-7-5A1	B	5 VDC	4.3 VDC	1.4 VDC	7 AMPS
W226R-7-12A1	B	12 VDC	10.3 VDC	2.5 VDC	7 AMPS
W226R-8-5A1	B	5 VDC	4.3 VDC	1.4 VDC	7 AMPS
W226R-8-12A1	B	12 VDC	10.3 VDC	2.5 VDC	7 AMPS



SECTION 2 CROSS REFERENCE GUIDE

MAGNECRAFT & STRUTHERS-DUNN	CRYDOM	IDEC	POTTER & BRUMFIELD	GORDOS	OMRON	AROMAT	OPTO 22
W6210ASX-1	A2410		-	84134001	G3NA-210B		240A10
W6225ASX-1	A2425		SSR240A25	84134011	G3NA-225B		240A25
W6240ASX-1	A2440		-	-	G3NA-240B		
W6250ASX-1	A2450		SSR240A50	84134021	-		240A45
W6275ASX-1	A2475		-	84134031	-		
W6410ASX-1	-		-	-	G3NA-410B		
W6425ASX-1	HA4825		SSR480A25	-	G3NA-425B		
W6440ASX-1	-		-	-	G3NA-440B		
W6450ASX-1	HA4850		SSR480A50	-	-		
W6475ASX-1	HA4875		-	-	-		
W6690ASX-1	A2490/HA4890	RSSAN-90A	-	-	-		
W66125ASX-1	A24125/HA48125	-	SSR480A125	84134181	-		
W6210DSX-1	D2410		-	84134000	G3NA-210B	AQP10A2-Z4/30VDC	240D10
W6225DSX-1	D2425		SSR240D25	84134010	G3NA-225B	AQP20A2-Z4/30VDC	240D25
W6240DSX-1	-		-	-	G3NA-240B	AQP40A2-Z4/30VDC	
W6250DSX-1	D2450		SSR240D50	84134020	-		240D45
W6275DSX-1	D2475		-	84134030	-		
W6410DSX-1	-		-	-	G3NA-410B		480D10-12
W6425DSX-1	HD4825		SSR480D25	-	G3NA-425B		380D25/480D25-12
W6440DSX-1	-		-	-	G3NA-440B		
W6450DSX-1	HD4850		SSR480D50	-	-		380D45/480D45-12
W6475DSX-1	HD4875		-	-	-		
W6690DSX-1	D2490/HD4890	RSSDN-90A	-	-	-		
W66125DSX-1	D24125/HD48125	-	SSR480D125	84134080	-		
W6210DTX-1	TD2410		SSRT240D10	84134900			
W6225DTX-1			SSRT240D25	84134910			
W6212DDX-1	D1D12/D2D12				G3NA-D210B		
W6225DDX-1	D1D20				-		
W6240DDX-1	D1D40				-		
MAGNECRAFT & STRUTHERS-DUNN	CONTINENTAL	CRYDOM			GORDOS	CARLO GAVAZZI	
SSR210DIN-AC					84130150 / 84130100	RN1A23A10U	
SSR225DIN-AC					84130152 / 84130102	RN1A23A20U	
SSR610DIN-AC						RN1A60A10U	
SSR625DIN-AC	RSAA-660-25-1D0				84130158 / 84130118	RN1A60A20U	
SSR210DIN-DC			CKRD2410		84130101	RN1A23D10U	
SSR225DIN-DC			HPF2420 / CKRD2430		84130103	RN1A23D20U	
SSR610DIN-DC			CKRD4810			RN1A60D10U	
SSR625DIN-DC	RSDA-660-25-1D0		HPF480D20/CKRD4830/HPF480D30		84130116	RN1A60D20U	
MAGNECRAFT & STRUTHERS-DUNN	CONTINENTAL			CRYDOM	GORDOS	OPTO 22	
70S2-01-A-03-V	ODC-05/ODC-15					DC60MP	
70S2-02-A-03-V	ODC-24						
70S2-04-B-03-V	OAC-05/OAC-15/OAC-24			MP120D3	MOAC5L/MOAC24L/MOACU	MP120D2/MP120D4	
70S2-04-C-03-V	RP03-24/280-04A/OAC-05A/OAC-15A/OAC-24A			MP240D3	GA8-6B02/GA8-6D05	MP240D2/MP120D4	
70S2-04-C-12-N				EZ240D12		Z240D10	
70S2-05-C-12-N				EZE240D12			

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



SECTION 2 CROSS REFERENCE GUIDE

MAGNECRAFT & STRUTHERS-DUNN	CONTINENTAL	CRYDOM	OPTO 22
70S2-01-A-05-S		DC60S5/DC60S7	DC60S3/DC60S5
70S2-02-A-05-S		DC60S5/DC60S7	
70S2-03-B-25-S		D1225	
70S2-04-B-06-S			120D3
70S2-04-B-12-S		D1210	120D10
70S2-04-C-06-S		NTD2405	240D3
70S2-04-C-12-S	S505-OSJ610-000	D2410/NTD2410	240D10
70S2-03-C-25-S	S505-OSJ625-000	D2425/NTD2425	120D25/240D25

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

FOR SOLID STATE RELAYS APPLICATION ENGINEERING ASSISTANCE

Scott Heilman, PRODUCT MANAGER
FAX: (843) 395-8530
EMAIL: sheilman@magnecraft.com
FAX ON DEMAND: 1-800-891-2957
DOCUMENT: 500

U. S. A.

TELEPHONE: (843) 393-5778
FAX: (843) 395-4123
WEBSITE: www.magnecraft.com
EMAIL: info@magnecraft.com

EUROPE

TELEPHONE: 4989 / 75080310
FAX: 4989 / 7559344
WEBSITE: www.magnecraft.com
EMAIL: renatesteinback@magnecraft.de



Magnecraft & Struthers-Dunn
Your Contact for Relays

SECTION 3

POWER RELAYS & CONTACTORS
15 TO 300 AMPERES



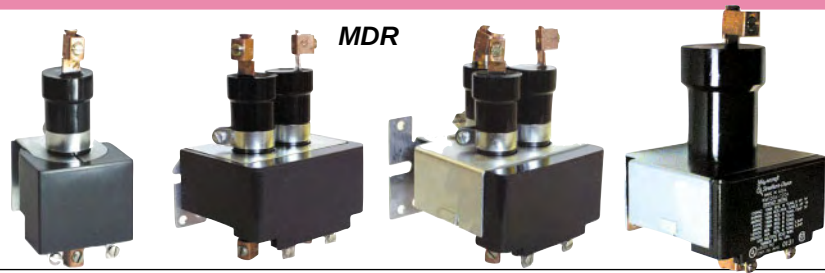
RELAY SERIES



199

ISO 9002

L W H
2.43-3.12 x 2.50 x 2.53



L W H
SEE PAGE XX

FEATURES

- PANEL MOUNT, OPEN STYLE CONSTRUCTION
- MULTI CONTACT CONFIGURATIONS UP TO 50 AMPS SWITCHING
- MAGNETIC BLOWOUT FOR DC SWITCHING
- CLASS "B" INSULATION SYSTEM
- SCREW OR BOX TERMINAL WIRE CONNECTIONS.
- AUXILIARY SWITCH.

- MERCURY DISPLACEMENT RELAY (MDR)
- UP TO 3 POLES, NO , NC OR COMBINATIONS OF NO & NC
- UP TO 100 AMPS SWITCHING
- LOW CONTACT RESISTANCE
- QUIET OPERATION RECYCLE PROGRAM

CONTACT DATA

CONTACT CONFIGURATION:

SEE CATALOG PAGE

1 TO 3PST-NO OR NC

CONTACT MATERIAL:

SILVER CADMIUM OXIDE,

MERCURY

CONTACT RESISTANCE:

50 MILLIOHMS (INITIAL)

2 - 3 MILLIOHMS (INITIAL)

MAX. CONTACT RATING:

SCREW TERMINAL:
30 AMPS UP TO 300 VAC, 28 VDC
BOX TERMINAL:
SPST-DM -UP TO 50 AMPS .
SCREW TERMINAL WITH MAGNETIC
BLOWOUT UP TO 20AMP @ 110 VDC

35 TO 100 AMPS @ 120-480VAC.
35-50 AMPS @ 600VAC
100 AMPS, 24-48 VDC
80 AMPS, 120VDC

COIL DATA

STANDARD VOLTAGE

AC:

24, 120 & 240 VAC

DC:

6, 12, 24 & 110 VDC

120 & 240 VAC

24 VDC

NOMINAL COIL POWER

VA: (VAC)

WATTS: (VDC)

INSULATION SYSTEM PER
UL STANDARD 1446

10 VA
2.0 WATTS

33 VA
9 WATTS

CLASS B

CLASS B

GENERAL DATA

AMBIENT TEMPERATURE
OPERATING:

- 30° C to + 50° C (AC.)
- 30° C to + 60° C (DC.)
- 50° C to + 100° C

- 35° C to + 60° C

STORAGE:

DIELECTRIC STRENGTH:
(COIL TO FRAME)

2200 V rms

2650 V rms

LIFE EXPECTANCY

ELECTRICAL:

MECHANICAL:

100,000 OPERATIONS
5 ,000,000 OPERATIONS

100,000 OPERATIONS
5,000,000 OPERATIONS

AGENCY APPROVALS

LISTED
367G

UL Listed
File No. E43641

LISTED
367G

UL Listed
File No. E52197

PAGE NUMBER

PAGE 3 - 12

PAGE 13 - 18



275



B101



101/102/103

L W H
3.62 x 2.985 x 2.75

- 2 COIL, COMPACT MOTOR REVERSING CONTACTOR
- 0.250 QUICK CCONNECT TERMINALS WITH UP TO 4 OPTIONAL AUXILIARY SWITCHES
- ENCAPSULATED COIL USED FOR AC OR DC MODELS
- MECHANICAL INTERLOCK, CENTER OFF WHEN BOTH COILS NOT ENERGIZED

L W H
2.84 x 2.80 x 2.90

- HEAVY DUTY DC SOLENOID STYLE CONTACTOR.
- DIN - RAIL OR PANEL MOUNT
- RATED UP TO 100 AMPS CONTINUOUS
- AWG 2 -12 PRESSURE WIRE CONNECTOR
- AC COILS AVAILABLE

L W H
SEE PAGE:XXXX

- HEAVY DUTY DC SOLENOID STYLE CONTACTOR
- CHOICE OF CONTACT CONFIGURATIONS
- RATED UP TO 300 AMPS CONTINUOUS
- AC COILS AVAILABLE

DUAL 3PST-NO (REVERSING)

SILVER CADMIUM OXIDE

100 MILLIOHMS (INITIAL)

1 HP @120 VAC (1-2-3 PHASE)
1.5 HP @ 240 VAC
3 HP @ 480 TO 600 VAC (2-3 PHASE)
15AMPS RESISTIVE
@ 120 VAC/30VDC

12 to 240 VAC
12 to 110 VDC

17 VA
5 WATTS

CLASS B

- 45° C to + 50° C (AC)
- 45° C to + 70° C (DC)

2500 V rms

100,000 OPERATIONS
5,000,000 OPERATIONS

SPST-NO OR NC

SILVER CADMIUM OXIDE

50 MILLIOHMS (INITIAL)

100 AMPS @ 120/240 VAC,30 VDC

12, 28, 48 VDC

11 WATTS

CLASS B

- 45° C to + 65° C (DC)

1500 V rms

100,000 OPERATIONS
500,000 OPERATIONS

SEE CATALOG PAGE

SILVER CADMIUM OXIDE

50 MILLIOHMS (INITIAL)

100 TO 300 AMPS
@ 120/240 VAC, 30 VDC

12, 28, 48 VDC

UP TO 14 WATTS

CLASS B

- 45° C to + 60° C (DC)

1500 V rms

100,000 OPERATIONS
500,000 OPERATIONS

**SPDT, DPDT, DPST-N.O.,
SPST-N.C.-D.B. & SPST-N.O.-D.M.,
10 TO 50 AMPS**



LISTED
367G



UL Listed
File No. E43641



COMPLIES WITH REQUIREMENTS OF

- * IEC STANDARDS 947-4-1 AND 947-5-1 LOW VOLTAGE DIRECTIVE
- * IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION
- * CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

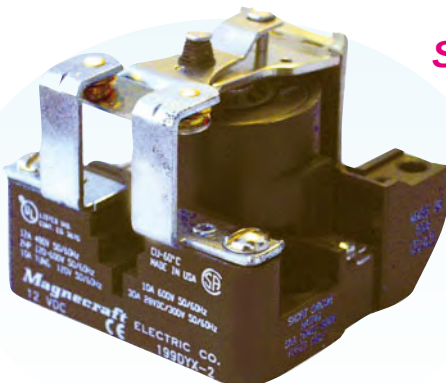
**MANUFACTURED UNDER
ISO 9002**

Optional metal enclosure
available, see page 12

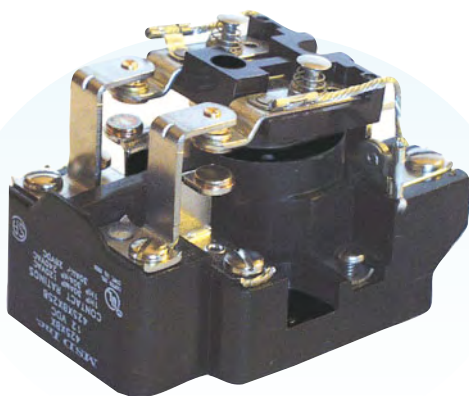
**CLASS "B" COIL
INSULATION SYSTEM**



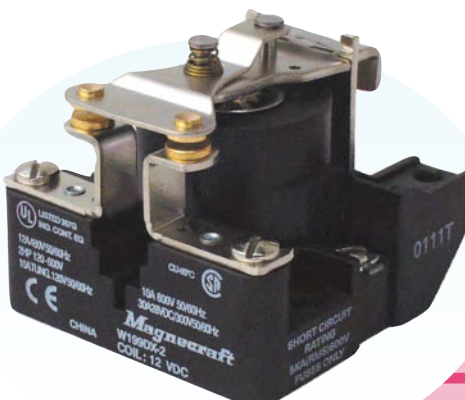
199 SPDT
30 AMP, 1-1/2 Hp



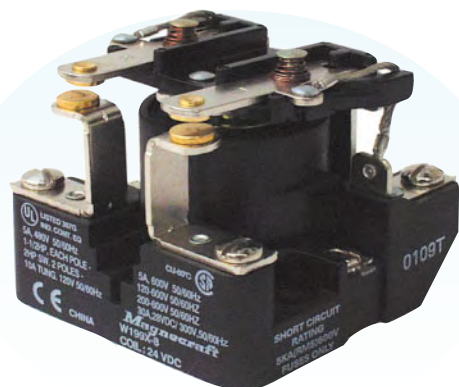
199 SPST-NC-DB
30 AMPS, 2 Hp



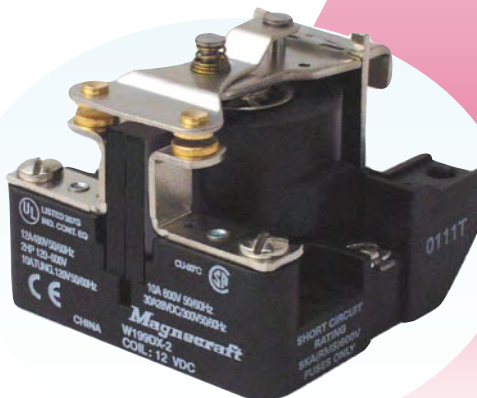
199 DPDT
30 AMP, 1-1/2 Hp PER POLE
2 Hp-2 POLE SWITCHING



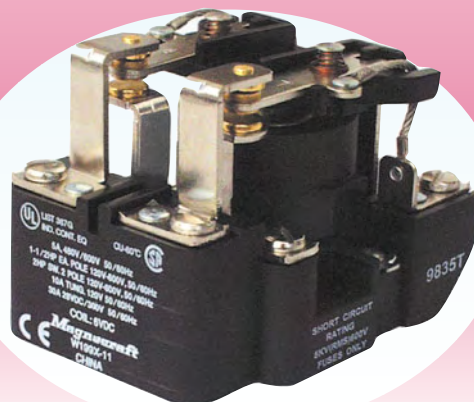
199 SPST-NO-DM
30 AMPS, 2 Hp



199 DPST-NO
30 AMPS, 1-1/2 Hp PER POLE
2 Hp - 2 POLE SWITCHING



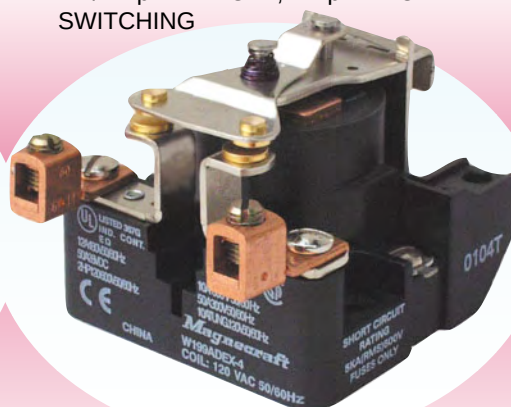
199DB SPST-NO-DM
WITH MAGNETIC BLOWOUT FOR DC ARC
QUENCHING 20 AMPS, 110 VDC



199H DPDT
40 AMPS GENERAL PURPOSE,
1-1/2 Hp PER POLE; 2 Hp - 2 POLE
SWITCHING



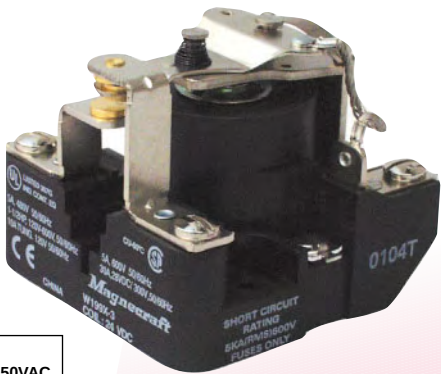
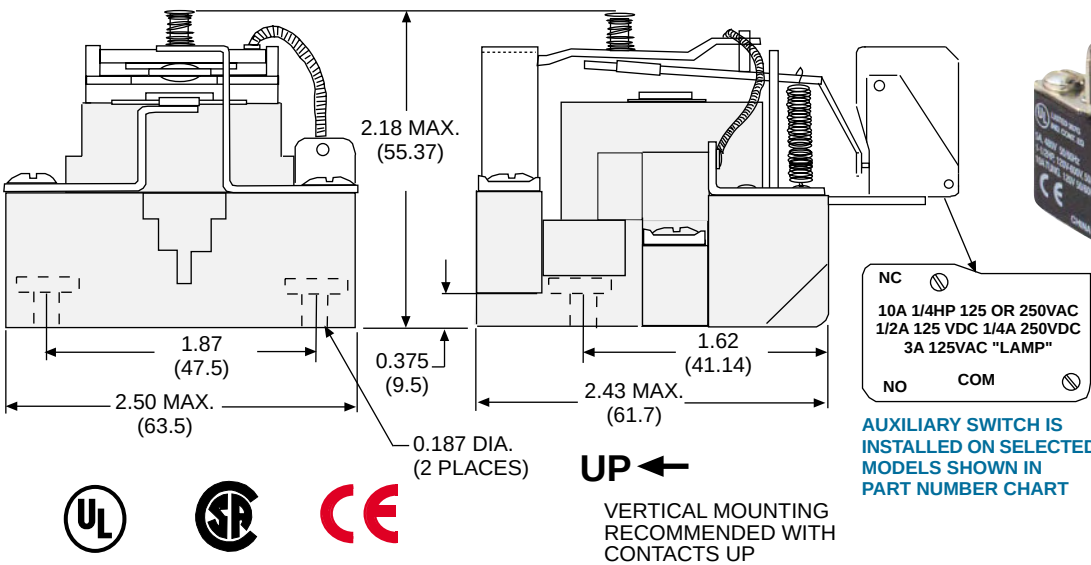
199B DPDT
WITH MAGNETIC BLOWOUT FOR DC ARC
QUENCHING 10 AMPS, 110 VDC



199DE SPST-NO-DM
WITH BOX TERMINALS.
50 AMPS, 2 Hp

SPDT, 30 AMPS

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



Optional metal enclosure available, see page 12

GENERAL SPECIFICATIONS

COIL

Pull-in Voltage: 85% of nominal voltage or less for AC coils
80% of nominal voltage or less for DC coils
Dropout Voltage: 10% of nominal voltage or more @ 25°C
Coil Resistance: ± 10% @ 25°C
Coil Power: 2.0 Watts DC., 10 VA (60Hz) AC @ 25°C
Max. Coil Dissipation: DC Coils-4 watts max.
Duty: Continuous

CONTACTS

Contact Material: Silver cadmium oxide, gold flashed
5/16" diameter standard
Contact Rating: 30 amps up to 300 VAC, 50/60Hz
5 amps @ 480/600 VAC, 50/60HZ 0.75 pf
Inductive load. 1-1/2 Hp motor load @ 120 thru
600 VAC, 50/60 Hz. 30 Amps @ 28 VDC
resistive load. 15 Amps tungsten @ 120 VAC
NEMA A 600 pilot duty 50/60Hz
Auxiliary Switch: 10 amps 1/4 Hp 125 or 250VAC
1/2 amp 125 VDC 1/4 amp 250 VDC
3 amps 125 VAC "Lamp"

TIMING

Operate Time: 40 milliseconds max. @ nominal voltage
Release Time: 30 milliseconds max. @ nominal voltage

DIELECTRIC STRENGTH

Between Open Contacts: 1500 V rms
Mutually Insulated
Conductive elements: 2200 V rms

TEMPERATURE

Operating Range: (AC) -30°C to +50°C,
(DC) -30°C +60°C
Non-Operating Storage
Range: -55°C to +100°C

LIFE EXPECTANCY

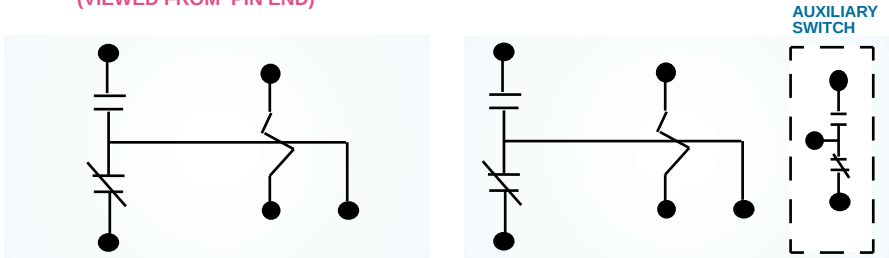
Electrical: 100,000 operations
Mechanical: @ rated resistive load
1,000,000 operations @ no load

MISCELLANEOUS

Coil Terminals: 6-32 combination head screws
Load Terminals: 8-32 combination head screws
Base Material: Molded phenolic,
UL recognized (QMFZ2)
Weight: 227 grams approx.

WIRING DIAGRAM

(VIEWED FROM PIN END)



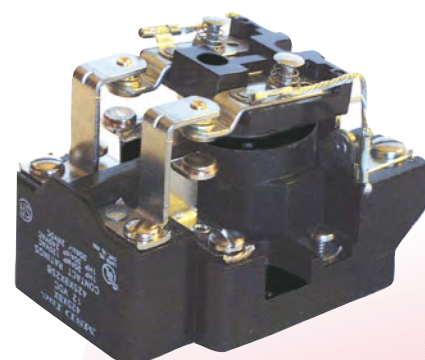
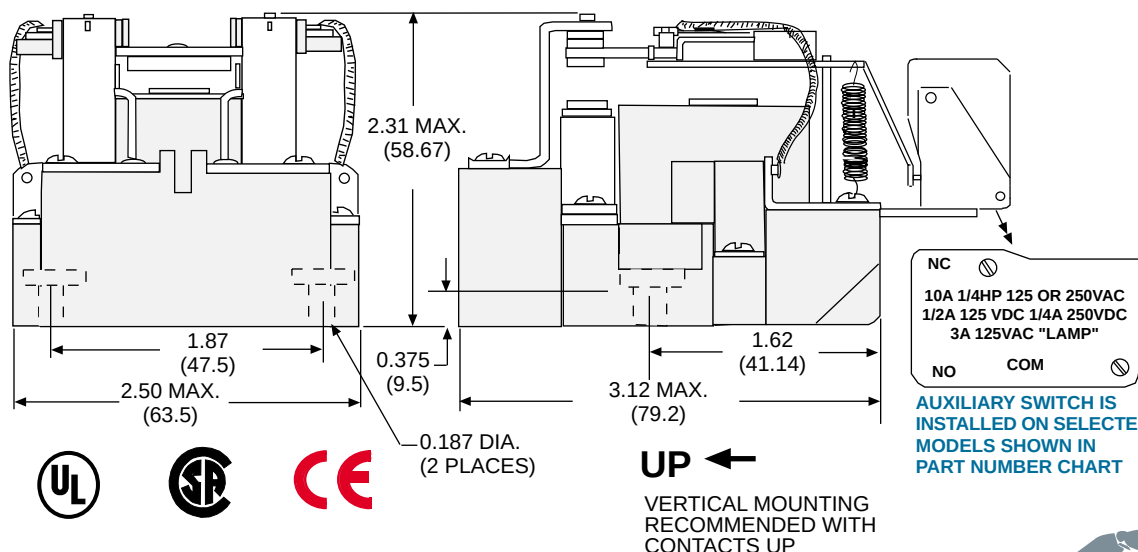
OTHER COIL VOLTAGES ARE AVAILABLE ON SPECIAL ORDER. CONTACT FACTORY FOR SPECIAL REQUIREMENTS.

STANDARD PART NUMBERS	COIL MEASURED @ 25°C	
	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED W199AX-4	120 VAC	290 Ω
AC OPERATED WITH SPDT AUXILIARY SWITCH W199AMX-4	120 VAC	290 Ω
DC OPERATED W199X-2	12 VDC	70 Ω
W199X-3	24 VDC	290 Ω
DC OPERATED WITH SPDT AUXILIARY SWITCH W199MX-2	12 VDC	70 Ω
W199MX-3	24 VDC	290 Ω

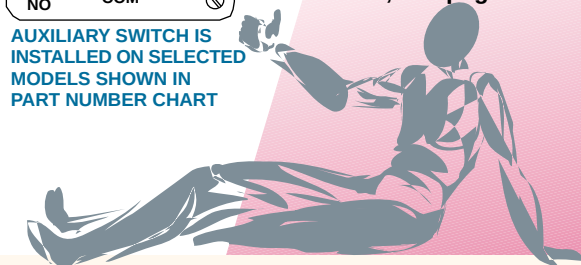
DPDT, 30 AMPS

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



Optional metal enclosure available, see page 12



GENERAL SPECIFICATIONS

COIL

Pull-in Voltage:	85% of nominal voltage or less for AC coils 80% of nominal voltage or less for DC coils
Dropout Voltage:	10% of nominal voltage or more @ 25°C
Coil Resistance:	± 10% @ 25°C
Coil Power:	2.0 watts DC., 10 VA (60Hz) AC @ 25°C
Max. Coil Dissipation:	DC coils-4 matts max.
Duty:	Continuous.

CONTACTS

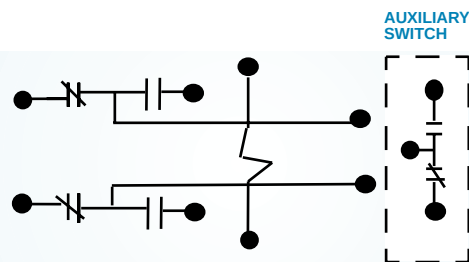
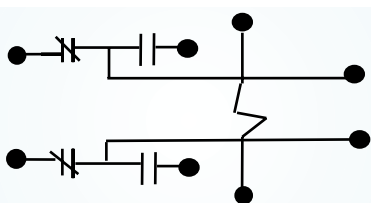
Contact Material:	Silver cadmium oxide, gold flashed 5/16" diameter standard.
Contact Rating:	30 amps up to 300 VAC, 50/60Hz 5 amps @ 480/600 VAC, 50/60Hz 0.75 pf inductive load. 1-1/2 Hp motor load each pole @ 120 thru 600 VAC, 50/60 Hz. 2 Hp motor load @ 200 to 600 VAC. when using two poles to switch both sides of load. 30 amps @ 28 VDC resistive load 15 amps tungsten @ 120 VAC NEMA A 600 pilot duty 50/60Hz
Auxiliary Switch:	10 amps 1/4 Hp 125 or 250VAC 1/2 amp 125 VDC 1/4 amp 250 VDC 3 amps 125 VAC "Lamp"

TIMING

Operate Time:	40 milliseconds max. @ nominal voltage
Release Time:	30 milliseconds max. @ nominal voltage

WIRING DIAGRAM

(VIEWED FROM PIN END)



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

DIELECTRIC STRENGTH

Between Open Contacts:	1500 V rms
Mutually Insulated	
Conductive elements:	2200 V rms

TEMPERATURE

Operating Range:	(AC) -30°C to +50°C, (DC) -30°C +60°C
Non-Operating Storage Range:	-55°C to +100°C

LIFE EXPECTANCY

Electrical:	100,000 operations @ rated resistive load
Mechanical:	1,000,000 operations @ no load

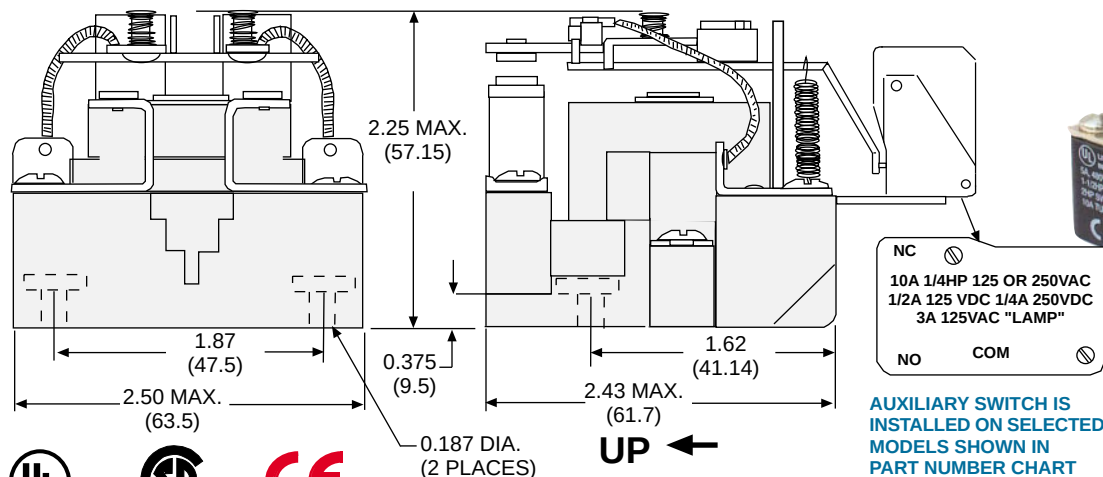
MISCELLANEOUS

Coil Terminals:	6-32 combination head screws
Load Terminals:	8-32 combination head screws
Base Material:	Molded phenolic, UL recognized (QMFZ2)
Weight:	311 grams approx.

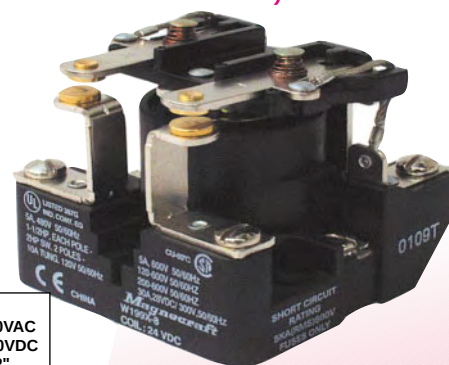
STANDARD PART NUMBERS	COIL MEASURED @ 25°C	
	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED		
W199AX-13	24 VAC	12 Ω
W199AX-14	120 VAC	290 Ω
W199AX-15	240 VAC	1200 Ω
AC OPERATED WITH SPDT AUXILIARY SWITCH		
W199AMX-63	24 VAC	12 Ω
W199AMX-64	120 VAC	290 Ω
W199AMX-65	240 VAC	1200 Ω
DC OPERATED		
W199X-11	6 VDC	18 Ω
W199X-12	12 VDC	70 Ω
W199X-13	24 VDC	290 Ω
W199X-14	110 VDC	6000 Ω
DC OPERATED WITH SPDT AUXILIARY SWITCH		
W199MX-49	6 VDC	18 Ω
W199MX-50	12 VDC	70 Ω
W199MX-51	24 VDC	290 Ω
W199MX-52	110 VDC	6000 Ω

DPST-N.O., 30 AMPS**OUTLINE DIMENSIONS**

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



VERTICAL MOUNTING
RECOMMENDED WITH
CONTACTS UP



Optional metal enclosure
available, see page 12

**GENERAL SPECIFICATIONS****COIL**

Pull-in Voltage:	85% of nominal voltage or less for AC coils, 80% of nominal voltage or less for DC coils
Dropout Voltage:	10% of nominal voltage or more @ 25°C
Coil Resistance:	± 10% @ 25°C
Coil Power:	2.0 Watts DC., 10 VA (60Hz) AC @ 25°C
Max. Coil Dissipation:	DC coils 4 watts max
Duty:	Continuous.

CONTACTS

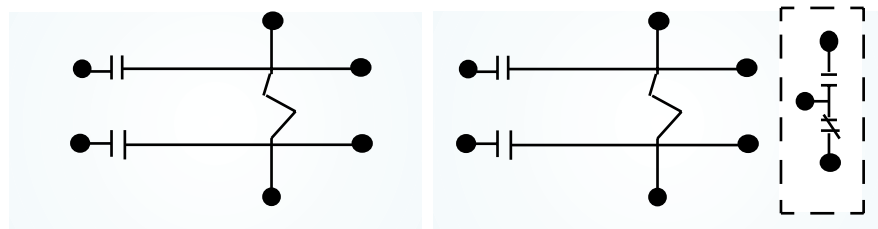
Contact Material:	Silver cadmium oxide, gold flashed. 5/16" diameter standard
Contact Rating:	30 amps up to 300 VAC, 50/60Hz, 5 amps @ 480/600VAC, 0.75 pf Inductive load. 1-1/2 Hp motor load (each pole) @120 thru 600 VAC, 50/60 Hz. 2 Hp motor load @ 200 thru 600 VAC, 50/60 Hz only when using two poles to switch both sides of load. 30 amps @ 28 VDC resistive load each poles. 15 amps tungsten @ 120 VAC. NEMA A600 pilot duty 50/60Hz.
Auxiliary Switch:	10 amps 1/4 Hp 125 or 250VAC 1/2 amp 125 VDC 1/4 amp 250 VDC 3 amps 125 VAC "Lamp"

TIMING

Operate Time:	40 milliseconds max. @ nominal voltage
Release Time:	30 milliseconds max. @ nominal voltage

WIRING DIAGRAM

(VIEWED FROM PIN END)

**DIELECTRIC STRENGTH**

Between Open Contacts:	1500 V rms
Mutually Insulated	
Conductive elements:	2200 V rms

TEMPERATURE

Operating Range:	(AC) -30°C to +50°C, (DC) -30°C to +60°C
Non-Operating Storage Range:	-55°C to +100°C

LIFE EXPECTANCY

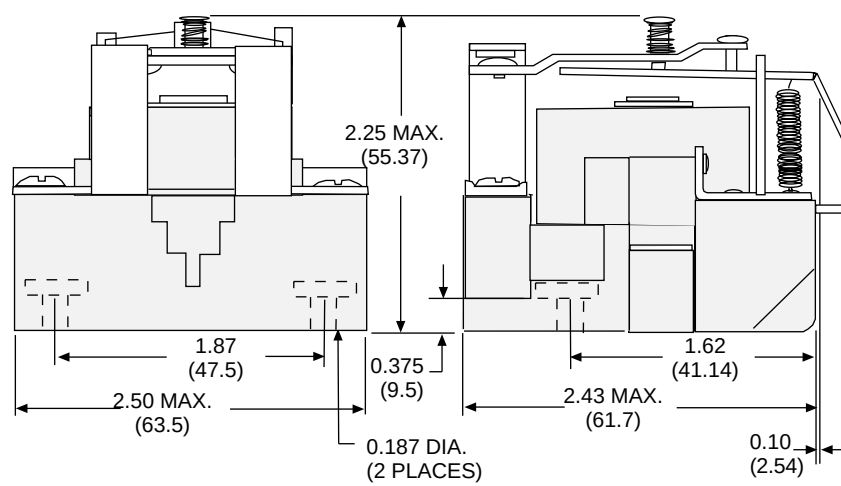
Electrical:	100,000 operations @ rated resistive load
Mechanical:	1,000,000 operations @ no load

MISCELLANEOUS

Coil Terminals:	6-32 combination head screws
Load Terminals:	8-32 combination head screws
Base Material:	Molded phenolic, UL recognized (QMFZ2)
Weight:	255 grams approx

STANDARD PART NUMBERS	COIL MEASURED @ 25°C	
	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED		
W199AX-8	24 VAC	12 Ω
W199AX-9	120 VAC	290 Ω
W199AX-10	240 VAC	1200 Ω
AC OPERATED WITH SPDT AUXILIARY SWITCH		
W199AMX-33	24 VAC	12 Ω
W199AMX-34	120 VAC	290 Ω
W199AMX-35	240 VAC	1200 Ω
DC OPERATED		
W199X-7	12 VDC	70 Ω
W199X-8	24 VDC	290 Ω
DC OPERATED WITH SPDT AUXILIARY SWITCH		
W199MX-26	12 VDC	70 Ω
W199MX-27	24 VDC	290 Ω

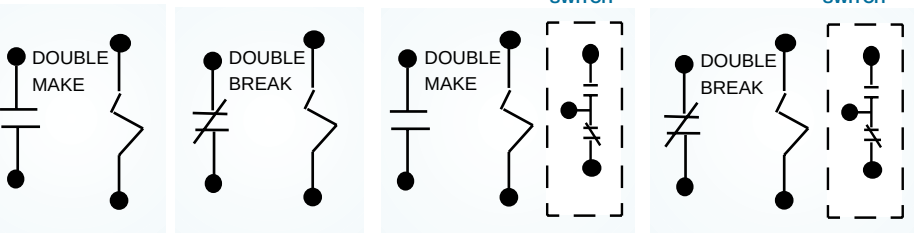
OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



GENERAL SPECIFICATIONS

- COIL**
 - Pull-in Voltage: 85% of nominal voltage or less for AC coils
80% of nominal voltage or less for DC coils
 - Dropout Voltage: 10% of nominal voltage or more @ 25°C
 - Coil Resistance: ± 10% @ 25°C
 - Coil Power: 2.0 watts DC., 10 VA (60Hz) AC @ 25°C
 - Max. Coil Dissipation: DC coils - 4 watts max
 - Duty: Continuous
- CONTACTS**
 - Contact Material: Silver cadmium oxide, gold flashed.
5/16" diameter standard.
 - Contact Rating
 - 30 amps up to 300 VAC, 50/60Hz
 - 5 amps @ 480/600 VAC, 50/60Hz
 - 12 amps @ 480 VAC, 10 amps @ 600 VAC, 50/60Hz 0.75 pf inductive load.
 - 2 Hp motor load @ 120 thru 600 VAC, 50/60 Hz. 30 amps @ 28 VDC resistive load.
 - 15 amps tungsten @ 120 VAC
 - NEMA A600 pilot duty 50/60Hz
 - 10 amps @ 120/240 VAC, 50/60 Hz
 - 1/4Hp. 120/240 VAC, 50/60 Hz
 - 1/2 amps @ 125 VDC, 1/4 amp @ 250 VDC
 - Auxiliary Switch:
 - 10 amps 1/4 Hp 125 or 250VAC
 - 1/2 amp 125 VDC 1/4 amp 250 VDC
 - 3 amps 125 VAC "Lamp"
- TIMING**
 - Operate Time: 40 milliseconds max. @ nominal voltage
 - Release Time: 30 milliseconds max. @ nominal voltage

WIRING DIAGRAM
(VIEWED FROM PIN END)

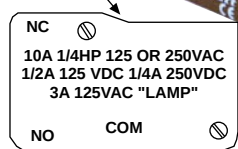


OTHER COIL VOLTAGES ARE AVAILABLE ON SPECIAL ORDER.
CONTACT FACTORY FOR SPECIAL REQUIREMENTS.

SPST
N.C.- D.B.

SPST-N.C.- D. B. OR
SPST-N.O.- D.M., 30 AMPS

Optional metal enclosure
available, see page 12



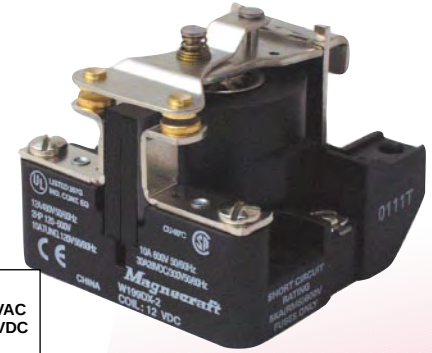
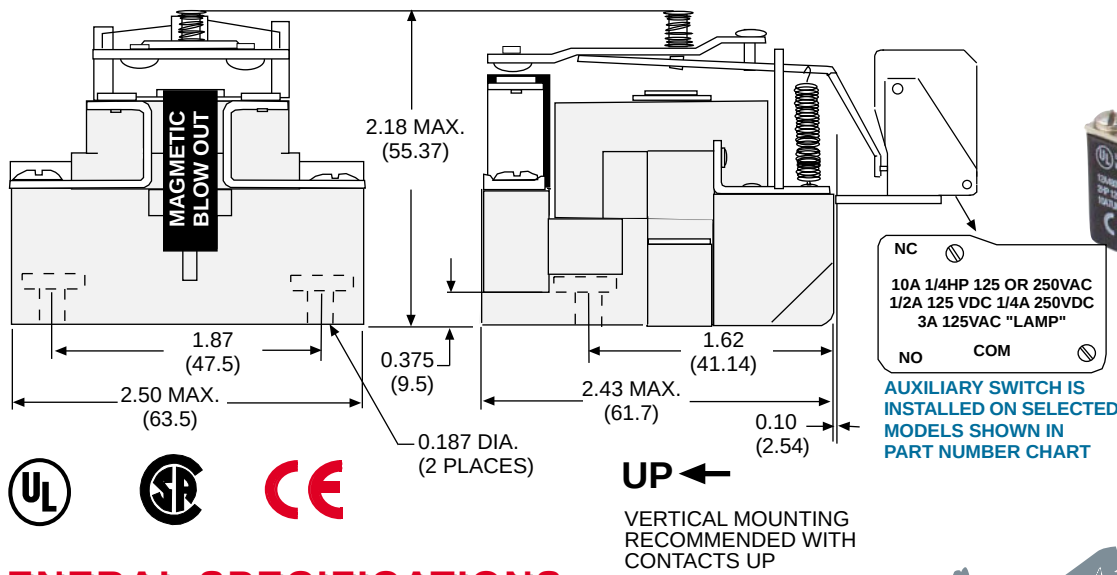
AUXILIARY SWITCH IS
INSTALLED ON SELECTED
MODELS SHOWN IN
PART NUMBER CHART

UP
VERTICAL MOUNTING
RECOMMENDED WITH
CONTACTS UP



- DIELECTRIC STRENGTH**
 - Between Open Contacts: 1500 V rms
 - Mutually Insulated
 - Conductive elements: 2200 V rms
- TEMPERATURE**
 - Operating Range: (AC) -30°C to +50°C,
(DC) -30°C +60°C
 - Non-Operating Storage Range: -55°C to +100°C
- LIFE EXPECTANCY**
 - Electrical: 100,000 operations
@ rated resistive load
 - Mechanical: 1,000,000 operations @ no load
- MISCELLANEOUS**
 - Coil Terminals: 6-32 combination head screws
 - Load Terminals: 8-32 Ccombination head screws
 - Base Material: Molded phenolic, UL recognized (QMFZ2)
 - Weight: 227 grams approx.

STANDARD PART NUMBERS	CONTACT CONFIGU- RATION	COIL MEASURED @ 25°C	
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED			
W199ADX-4	SPST-NO-DM	120 VAC	290 Ω
W199ADX-5	SPST-NO-DM	240 VAC	1200 Ω
AC OPERATED WITH SPDT AUXILIARY SWITCH			
W199ADMX-4	SPST-NO-DM	120 VAC	290 Ω
W199ADMX-5	SPST-NO-DM	240 VAC	1200 Ω
DC OPERATED			
W199DYG-2	SPST-NC-DB	12 VDC	70 Ω
W199DX-2	SPST-NO-DM	12 VDC	70 Ω
W199DX-3	SPST-NO-DM	24 VDC	290 Ω
DC OPERATED WITH SPDT AUXILIARY SWITCH			
W199DYM-2	SPST-NC-DB	12 VDC	70 Ω
W199DMX-2	SPST-NO-DM	12 VDC	70 Ω
W199DMX-3	SPST-NO-DM	24 VDC	290 Ω

**SPST-N. O., 30 AMPS
20 AMPS @ 110 VDC****OUTLINE DIMENSIONS**
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).Optional metal enclosure
available, see page 12**GENERAL SPECIFICATIONS****COIL**

Pull-in Voltage: 85% of nominal voltage or less for AC coils
80% of nominal voltage or less for DC coils

Dropout Voltage: 10% of nominal voltage or more @ 25°C

Coil Resistance: ± 10% @ 25°C

Coil Power: 10 VA (60Hz) AC @ 25°C

Max. Coil Dissipation: DC coils-4 watts max.

Duty: Continuous.

CONTACTS

Contact Material: Silver cadmium oxide, gold flashed.
5/16" diameter standard.

Contact Rating: 30 amps up to 300 VAC, 50/60Hz
12 amps @ 480 VAC, 10 Amps @ 600 VAC,
50/60Hz 0.75 pf Inductive load. 1-1/2 Hp motor
load @ 120 thru 600 VAC, 50/60 Hz. 30 amps
@ 28 VDC resistive load
15 amps tungsten @ 120 VAC
NEMA A600 pilot duty 50/60Hz

DC Rating: 20 Amps @ 110 VDC, resistive; 8 amps
@ 220 VDC resistive, 4 Amps @ 325VDC
resistive. 2 amps @ 500 VDC resistive.
For inductive loads, contacts must be
derated accordingly. Capacitive loads must
have current limiting to insure that inrush
current will not exceed 100 amps.

Auxiliary Switch: 10 amps 1/4 Hp 125 or 250VAC
1/2 amp 125 VDC 1/4 amp 250 VDC
3 amps 125 VAC "Lamp"

TIMING

Operate Time: 40 milliseconds max. @ nominal voltage

Release Time: 30 milliseconds max. @ nominal voltage

DIELECTRIC STRENGTH

Between Open Contacts: 1500 V rms

Mutually Insulated

Conductive elements: 2200 V rms

TEMPERATURE

Operating Range: (AC) -30°C to +50°C, (DC) -30°C to +60°C

Non-Operating Storage Range: -55°C to +100°C

LIFE EXPECTANCY

Electrical: 100,000 operations
@ rated resistive load

Mechanical: 1,000,000 operations @ no load

MISCELLANEOUS

Coil Terminals: 6-32 combination head screws

Load Terminals: 8-32 combination head screws

Base Material: Molded phenolic, UL recognized (QMFZ2)

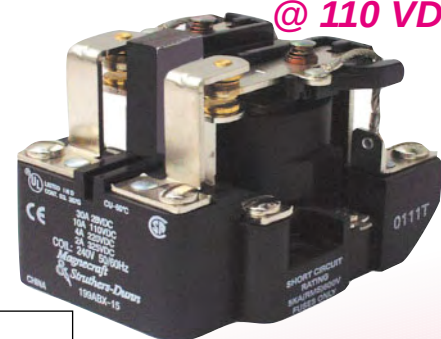
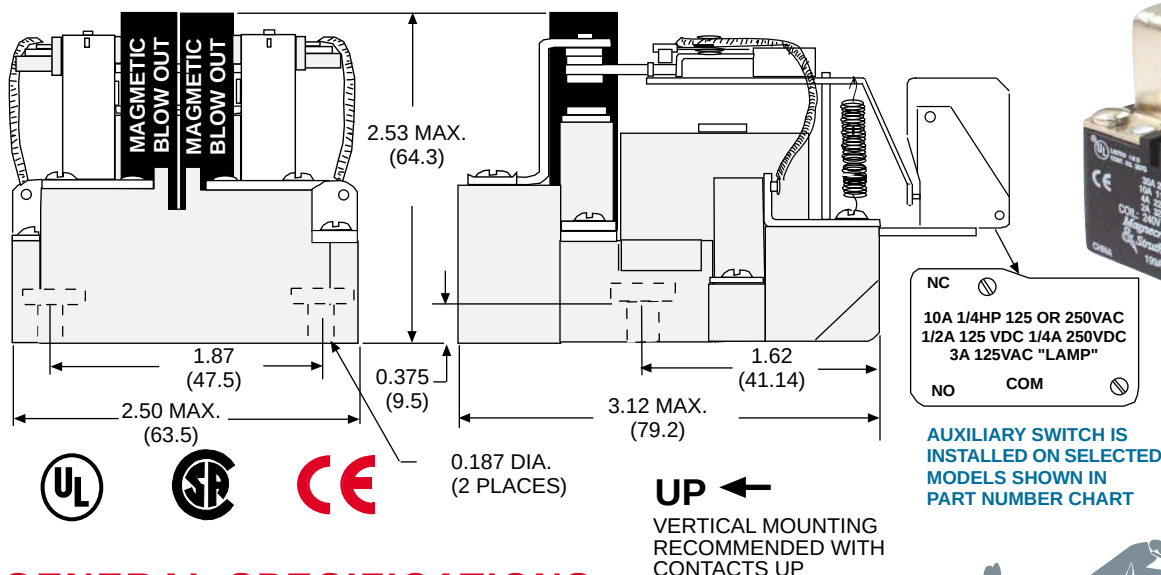
Weight: 227 grams approx.

WIRING DIAGRAM

(VIEWED FROM PIN END)



STANDARD PART NUMBERS	COIL MEASURED @ 25°C	
	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED		
W199ADB-X-4	120 VAC	290 Ω
AC OPERATED WITH SPDT AUXILIARY SWITCH		
W199ADB-MX-4	120 VAC	290 Ω
DC OPERATED		
W199DBX-3	24 VDC	290 Ω
W199DBX-6	48 VDC	1200 Ω
DC OPERATED WITH SPDT AUXILIARY SWITCH		
W199DBM-X-3	24 VDC	290 Ω
W199DBM-X-2	48 VDC	1200 Ω

**DPDT, 30 AMPS 10 AMPS
@ 110 VDC****OUTLINE DIMENSIONS**
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).Optional metal enclosure
available, see page 12**GENERAL SPECIFICATIONS****COIL**

Pull-in Voltage: 85% of nominal voltage or less for AC coils
80% of nominal voltage or less for DC coils

Dropout Voltage: 10% of nominal voltage or more @ 25°C

Coil Resistance: ± 10% @ 25°C

Coil Power: 2.0 watts DC., 10 VA (60Hz) AC @ 25°C

Max. Coil Dissipation: DC coils - 4 watts max.

Duty: Continuous.

CONTACTS

Contact Material: Silver cadmium oxide, gold flashed.
5/16" diameter standard.

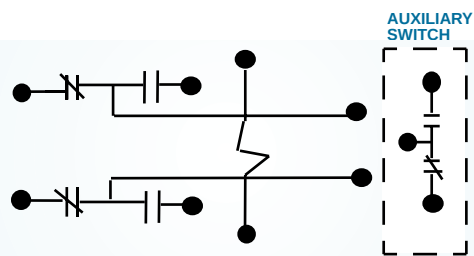
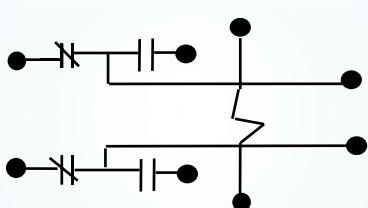
Contact Rating: 30 amps up to 300VAC, 50/60Hz
5 amps @ 480/600 VAC, 50/60Hz 0.75 pf
Inductive load. 1-1/2 Hp motor load (each pole)
@ 120 thru 600 VAC, 50/60 Hz. 2 Hp motor load
@ 120 thru 600 VAC, 50/60 Hz only when using
two poles to switch both sides of load. 30 amps
@ 28 VDC resistive load.
15 amps tungsten @ 120 VAC
NEMA A 600 pilot duty 50/60Hz

DC Rating: 10 amps @110VDC, resistive; 4 Amps @220VDC,
resistive, 2 amps @ 325VDC resistive. For inductive
loads, contacts must be derated accordingly.
Capacitive loads must have current limiting to
insure that inrush current will not exceed 50 amps

Auxiliary Switch: 10 amps 1/4 Hp 125 or 250VAC
1/2 amp 125 VDC 1/4 amp 250 VDC
3 amps 125 VAC "Lamp"

WIRING DIAGRAM

(VIEWED FROM PIN END)

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

Operate Time: 40 milliseconds max. @ nominal voltage

Release Time: 30 milliseconds max. @ nominal voltage.

ELECTRIC STRENGTH

Between Open Contacts: 1500 V rms

Mutually Insulated

Conductive elements: 2200 V rms

TEMPERATURE

Operating Range: (AC) -30°C to +50°C,
(DC) -30°C to +60°C

Non-Operating Storage
Range: -55°C to +100°C

LIFE EXPECTANCY

Electrical: 100,000 operations
@ rated resistive load

Mechanical: 1,000,000 operations @ no load

MISCELLANEOUS

Coil Terminals: 6-32 combination head screws

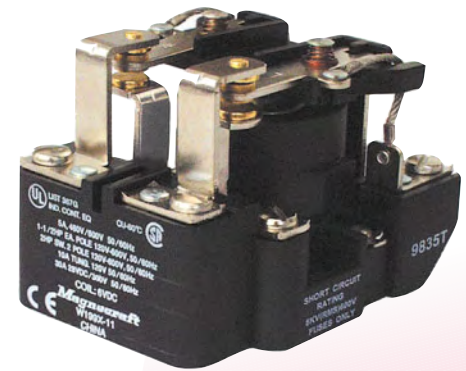
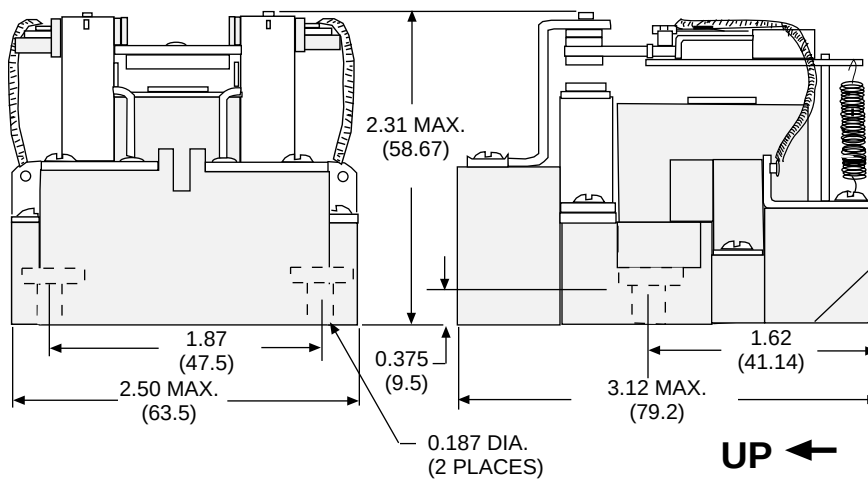
Load Terminals: 8-32 combination head screws

Base Material: Molded phenolic, UL recognized (QMF
312 grams approx.

STANDARD PART NUMBERS	COIL MEASURED @ 25°C	
	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED		
W199ABX-14	120 VAC	290 Ω
AC OPERATED WITH SPDT AUXILIARY		
W199ABMX-7	120 VAC	290 Ω
DC OPERATED		
W199BX-13	24 VDC	290 Ω
W199BX-14	110 VDC	6000 Ω
DC OPERATED WITH SPDT AUXILIARY		
W199BMX-13	24 VDC	290 Ω
W199BMX-14	110 VDC	6000 Ω

DPDT, 40 AMPS

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



Optional metal enclosure available, see page 12



UP ←

VERTICAL MOUNTING
RECOMMENDED WITH
CONTACTS UP

GENERAL SPECIFICATIONS

COIL

- Pull-in Voltage: 85% of nominal voltage or less for AC coils
80% of nominal voltage or less for DC coils
- Dropout Voltage: 10% of Nominal voltage or more @ 25°C
- Coil Resistance: ± 10% @ 25°C
- Coil Power: 2.0 watts DC., 10 VA (60Hz) AC @ 25°C
- Max. Coil Dissipation: DC coils-4 watts max
- Duty: Continuous

CONTACTS

- Contact Material: Silver cadmium oxide, gold flashed.
5/16" diameter standard
- Contact Rating: 40 amps up to 300 VAC, 50/60Hz
5 amps @ 480/600 VAC, 50/60Hz 0.75 pf inductive load. 1-1/2 Hp motor load esch pole @ 120 thru 600 VAC, 50/60 Hz.
2 Hp motor load @ 200 to 600 VAC when using two poles to switch both sides of load.
40 amps @ 28 VDC resistive load
15 amps tungsten @ 120 VAC
NEMA A600 pilot duty 50/60Hz
- Operate Time: 40 milliseconds max. @ nominal voltage
- Release Time: 30 milliseconds max. @ nominal voltage

TIMING

DIELECTRIC STRENGTH

- Between Open Contacts: 1500 V rms
- Mutually Insulated
- Conductive elements: 2200 V rms

TEMPERATURE

- Operating Range: (AC) -30°C to +50°C,
(DC) -30°C +60°C
- Non-Operating Storage Range: -55°C to +100°C

LIFE EXPECTANCY

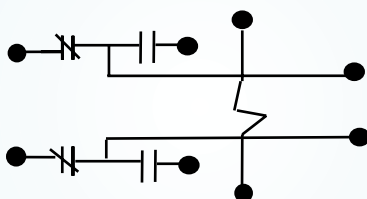
- Electrical: 100,000 operations @ rated resistive load
- Mechanical: 1,000,000 operations @ no load

MISCELLANEOUS

- Coil Terminals: 6-32 combination head screws
- Load Terminals: 8-32 combination head screws
- Base Material: Molded phenolic, UL recognized (QMFZ2)
- Weight: 311 grams approx.

WIRING DIAGRAM

(VIEWED FROM PIN END)

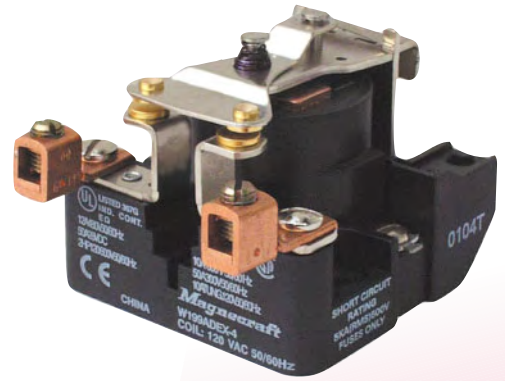
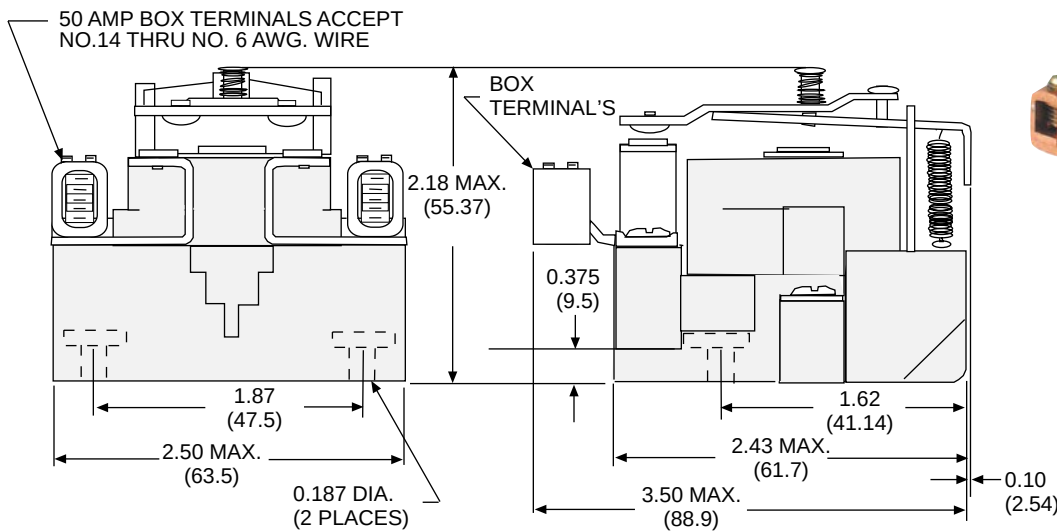


AUXILIARY CONTACTS AND OTHER COIL VOLTAGES ARE AVAILABLE ON SPECIAL ORDER.
CONTACT FACTORY FOR SPECIAL REQUIREMENTS.

STANDARD PART NUMBERS	COIL MEASURED @ 25°C	
	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED		
W199AHX-13	24 VAC	12 Ω
W199AHX-14	120 VAC	290 Ω
W199AHX-15	240 VAC, 60 Hz	1200 Ω
DC OPERATED		
W199HX-13	24 VDC	290 Ω
W199HX-14	110 VDC	6000 Ω

SPST-N.O.- D.M., 50 AMPS

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



Optional metal enclosure available, see page 12

UP ←

VERTICAL MOUNTING
RECOMMENDED WITH
CONTACTS UP



GENERAL SPECIFICATIONS

COIL

Pull-in Voltage:	85% of nominal voltage or less for AC coils 80% of nominal voltage or less for DC coils
Dropout Voltage:	10% of nominal voltage or more @ 25°C
Coil Resistance:	± 10% @ 25°C
Coil Power:	2.0 watts DC., 10 VA (60Hz) AC @ 25°C
Max. Coil Dissipation:	DC coils-4 watts max.
Duty:	Continuous.

CONTACTS

Contact Material:	Silver cadmium oxide, gold flashed. 5/16" diameter standard.
Contact Rating	50 amps up to 300VAC, 50/60Hz 50 amps @ 28 VDC resistive load, loads must have current limiting to insure that inrush current will not exceed 100 amps NEMA A600 pilot duty 50/60Hz

TIMING

Operate Time:	40 milliseconds max. @ nominal voltage
Release Time:	30 milliseconds max. @ nominal voltage.

DIELECTRIC STRENGTH

Between Open Contacts:	1500 V rms
Mutually Insulated	
Conductive elements:	2200 V rms

TEMPERATURE

Operating Range:	(AC) -30°C to +50°C, (DC) -30°C to +60°C
Non-Operating Storage Range:	-55°C to +100°C

LIFE EXPECTANCY

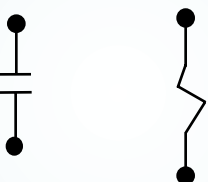
Electrical:	100,000 operations @ rated resistive load
Mechanical:	1,000,000 operations @ no load

MISCELLANEOUS

Coil Terminals:	6-32 Combination head screws
Load Terminals:	AMG 2-12 Pressure wire connector
Base Material:	Molded phenolic, UL recognized (QMFZ2)
Weight:	227 grams approx.

WIRING DIAGRAM

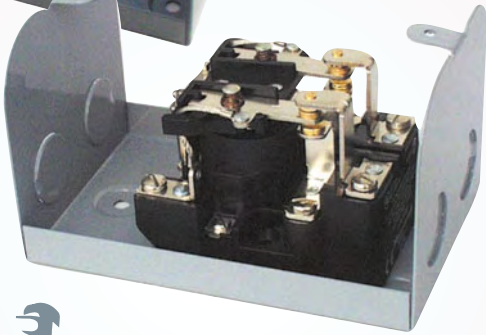
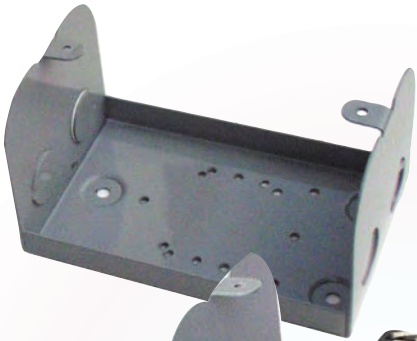
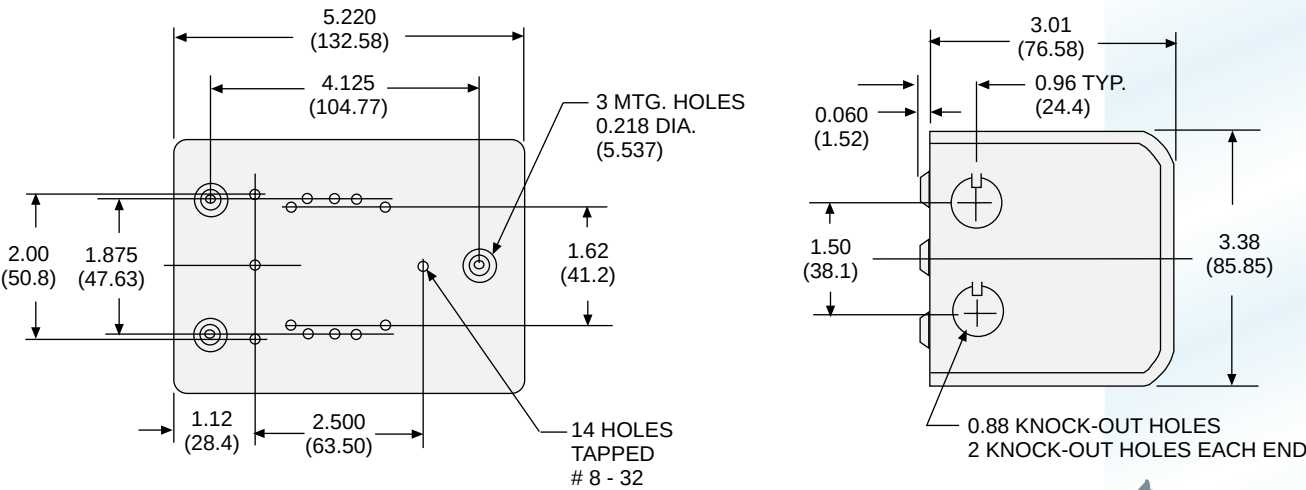
(VIEWED FROM PIN END)



STANDARD PART NUMBERS	COIL MEASURED @ 25°C	
	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED WITH SCREW TERMINALS		
W199ADEX-4	120 VAC	290 Ω
DC OPERATED WITH SCREW TERMINALS		
W199DEX-3	24 VDC	290 Ω

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

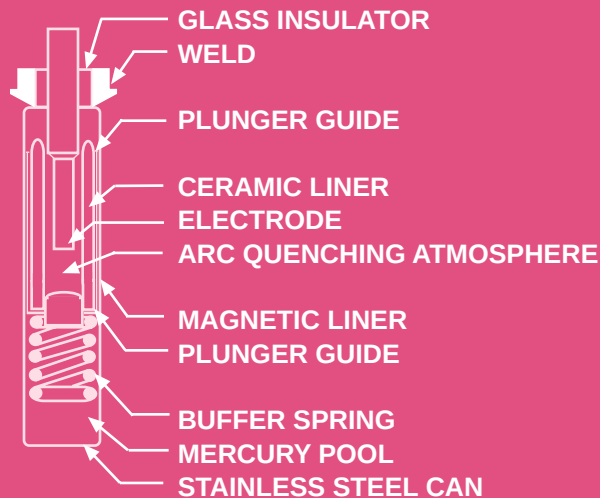


STANDARD PART NUMBER	DESCRIPTION
50-1289-1	UNIVERSAL MOUNT METAL ENCLOSURE

COVER & RELAY MOUNTING SCREWS INCLUDED

APPLICATION DATA

MERCURY DISPLACEMENT TUBE



PRINCIPLE OF OPERATION

The sectional view shows our normally open style Mercury Displacement tube with the plunger assembly floating on the mercury pool.

When the coil power is off, the mercury level is below the electrode tip. No electrical path exists between the electrode and mercury pool.

When coil power is applied, the plunger is drawn down into the mercury by the pull of the magnetic field. This action raises the mercury level, so it covers the end of the electrode closing the circuit.

When coil power is turned off, the buoyant force of the mercury causes the plunger assembly to rise, dropping the mercury level, and breaking the circuit.

APPLICATION DATA

Mercury Displacement relays are ideal for adverse environments-

- Where high inrushes are encountered
- Where hermetically sealed contact operation is required because of corrosive, dirty, or moist ambient conditions.
- Where use does not permit contact maintenance.
- Where reduced noise levels are required.
- Where minimum weight and size are desired.

DESIGN FEATURES

Mercury Displacement Relays provide a perpetually self-renewing contact to assure maximum contact life and minimum contact resistance. Conventional contactors are destroyed by pitting and welding under high load conditions. MDR's have a single moving part that floats free on a pool of mercury. There are no hinges, pivots, pins or mechanical linkage to wear out or break. The result is a life expectancy which exceeds other types of comparable size contactors handling the same loads and duty cycle.

Liquid Mercury Contact - provides a new contact surface with every actuation. Mercury is self-renewing and does not pit, weld, disintegrate or oxidize.

Hermetic sealing - provides internal and external protection from arcing.

Inert Gas atmosphere - contactor tube is evacuated, then pressurized with a combination of gases which extinguish arcing and contribute to long life.

The pressurized gases provide for a high dielectric withstanding voltage between contact surfaces.

Low Contact Resistance - Large electrode and mercury volume creates low contact resistance and provides high inrush current capability.

Quiet Operation - Switch clacking normally associated with conventional hard contactors is eliminated with mercury displacement tubes and the buffer spring assembly.

APPLICATION OF "M" SERIES VS "ML" SERIES

The series "ML" is physically the same as the "M" series except for the type of gases used in the contactor tubes. The "ML" series was developed for use with resistive and tungsten loads on AC power ONLY. The "ML" series will give much greater life than the "M" series for these types of loads and is intended for high activation use, such as molding machines or ovens. The "ML" series, however is not intended for use with motor loads on AC power, or for resistive, tungsten, or motor loads on DC power. The "M" series, which is our universal series is rated to be used on all types of loads resistive, tungsten, and motor for both AC and DC power.

RECOMMENDED FUSE PROTECTION

MDR's are capable of accepting high inrush currents however, short circuit currents can damage the contactor. Fast acting fuses should be used in-line with the contactor load to protect against short circuit fault current. UL class J and class RK-1 fuses are recommended.

**1, 2 & 3 POLES, 35, 60 AMPS
& 1 POLE 100 AMPS**

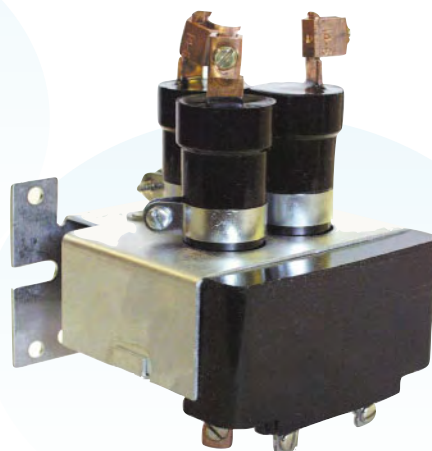


UL Listed
File No. E52197

MDR'S ARE IDEAL FOR SWITCHING
RESISTIVE, TUNGSTEN,
AND MOTOR LOADS FOR BOTH
AC AND DC APPLICATIONS.

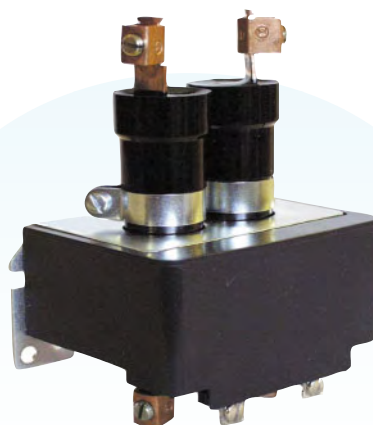


MDR 1 POLE
35 & 60 AMPS



MDR 3 POLE
35 & 60 AMPS

**HERMETICALLY SEALED
STAINLESS STEEL TUBES**
*Every contactor tube is hermetically
sealed for maximum life.
The MDR provides protection
to the user from arcing and other hazards
of switching heavy loads with exposed
contacts.*



MDR 2 POLE
35 & 60 AMPS



MDR 1 POLE
100 AMPS

**DISPOSAL OF TUBES THAT ARE
NO LONGER OPERABLE**

Magnecraft, at no charge, will accept and
properly dispose of mercury tubes which
are no longer operable.

All you need to do is prepay the freight.

Return the tube(s) to:

Magnecraft & Struthers-Dunn
Attn: Manufacturing Manager
MDR Recycling
700 Orange Street
Darlington, SC 29532-3793

GENERAL SPECIFICATIONS

COIL

Frequency of Operation: 60 per minute max
80% of nominal voltage, typ
Pull-in voltage: AC & DC coils
Dropout voltage: 78% of nominal voltage, typical AC coils
65% of nominal voltage, typical DC coils

CONTACTS

Material: Mercury.
Contact resistance: 0.002 ohm M60 & M100
0.003 ohm M30 & M30

TIMING

Operate: 50 milliseconds typical
Dropout: 80 milliseconds typical

DIELECTRIC STRENGTH

Across open Contact: 2650 V rms

TEMPERATURE

Operating: - 35°C to + 60°C Under continuous load

LIFE EXPECTANCY

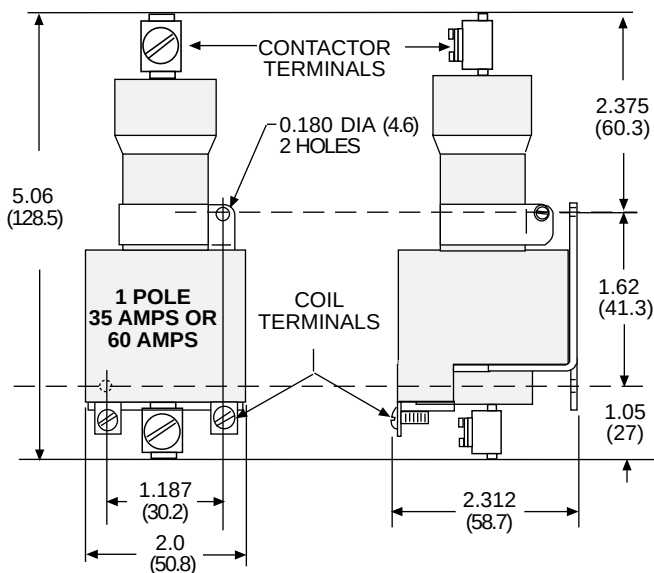
Electrical: 100,000 operations
@ rated resistive load.
Mechanical: 5,000,000 operations @ no load

MISCELLANEOUS

Insulation Material: Class B - 130°C
Load Terminals: M35 pressure connectors for
AWG 6-14 wire;
M60 pressure connectors for
AWG 2-12 wire;
M100 pPressure connectors for
AWG 1-8 wire
Mounting: Vertical ±10°C
Options: Combination of SPST-NO & SPST-NC
contact configurations. Available. Other
coil voltages available. Time delay
module offered consult factory for details

1, 2 & 3 POLES, 35 & 60 AMPS

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

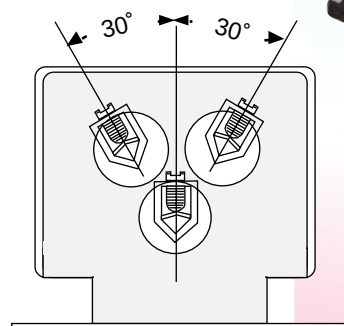
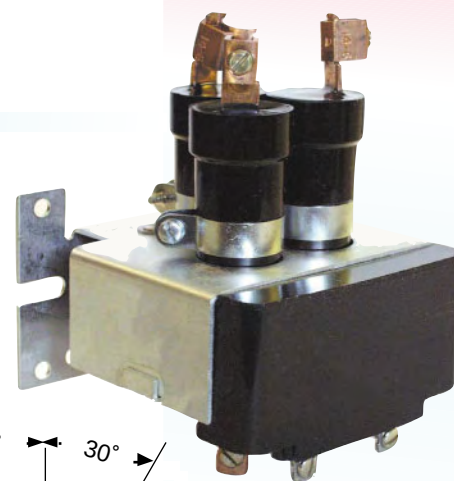
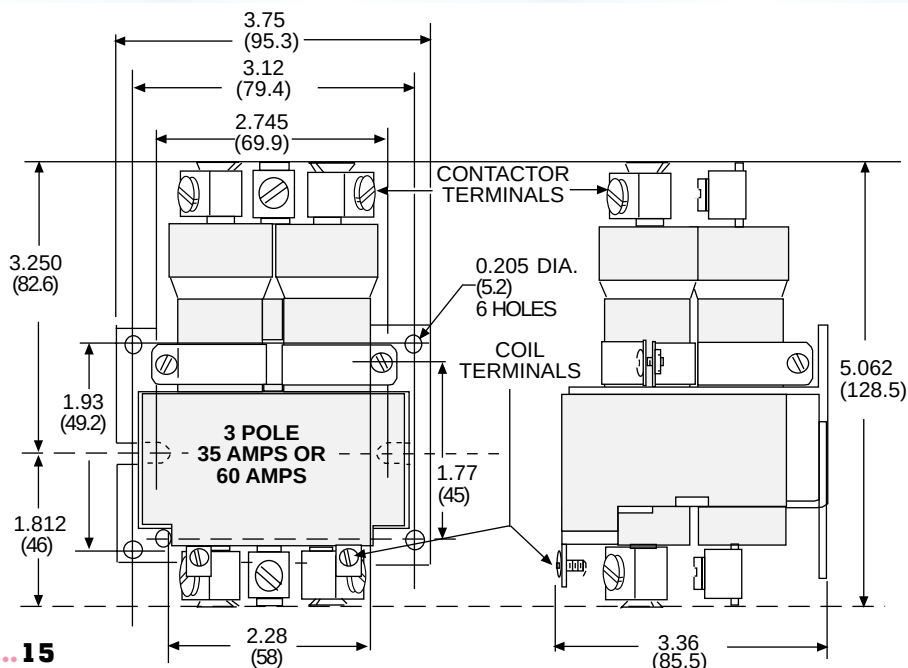
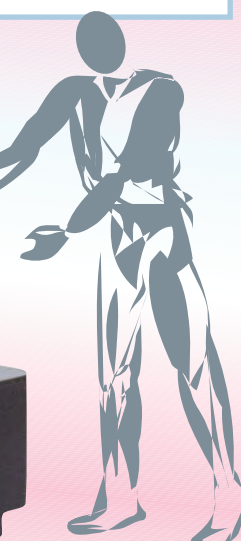
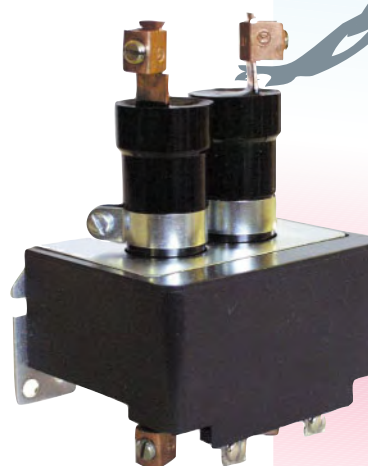
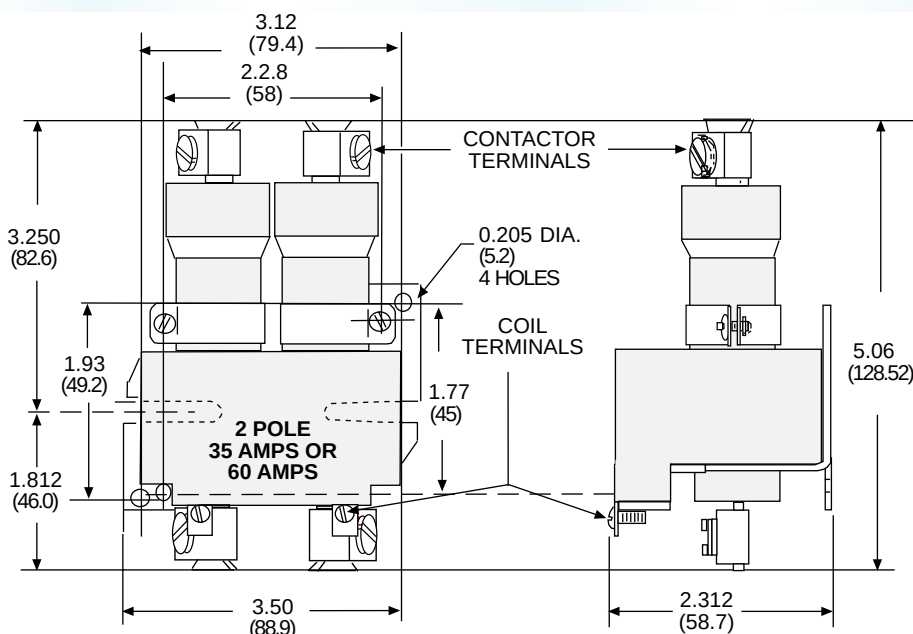


UL Listed
File No. E52197



NOTE:

THE OUTLINES FOR THE N.C. VERSIONS ARE NOT SHOWN. THE TUBE IS POSITIONED APPROXIMATELY 0.43 INCHES (11 MM) LOWER IN THE COIL. THE OVERALL HEIGHT IS THE SAME AS THE N.O. VERSION.



1, 2 & 3 POLES, 35 AMPS**UL CONTACT RATINGS TABLE FOR M35A-M35B**

VOLTAGE	HP		MOTOR AMPS		RESISTIVE AMPS	TUNGSTEN AMPS
	1Ø	3Ø	1Ø	3Ø		
120VAC	3*	5*	34	30	35*	35*
240VAC	5*	7.5*	28	19	35*	17
480VAC	5*	10*	14	14	35*	9
600VAC	5*	10*	11.2	11	35*	7
24VDC	1/2		27		35*	35*
48VDC	1/2		13.5		35*	35*
125VDC	1/2		5.2		16*	16*
250VDC	1/2		2.6		12*	12*

* UL and CSA Listed
SEE MDR GENERAL SPECIFICATIONS AND DIMENSIONS.

UL CONTACT RATINGS TABLE FOR ML35A-ML35B

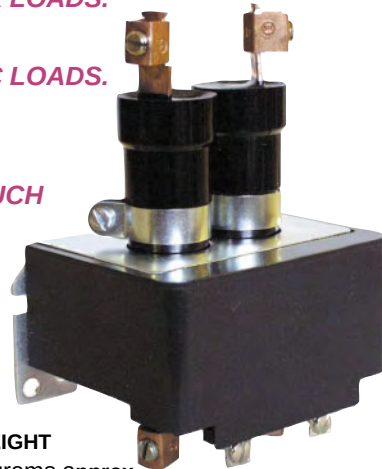
VOLTAGE	RESISTIVE AMPS	TUNGSTEN AMPS
120VAC	35*	35*
240 VAC	35*	17
480VAC	35*	9
600VAC	35*	7

* UL and CSA Listed

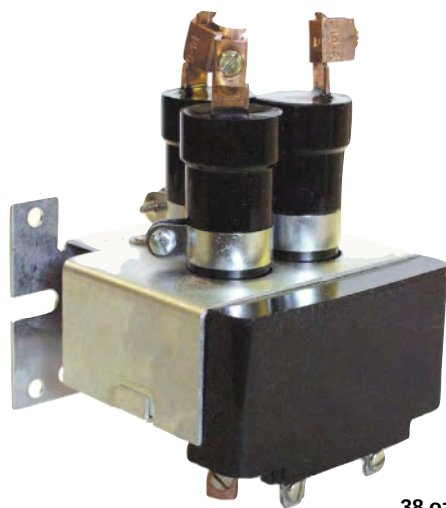
CLASS WM35
SWITCHES RESISTIVE,
TUNGSTEN, AND MOTOR LOADS.
HIGH INRUSH CAPACITY.
RECOMMENDED FOR DC LOADS.

CLASS WML35
RECOMMENDED FOR MUCH
LONGER LIFE WHEN
SWITCHING AC
RESISTIVE AND
TUNGSTEN LOADS.

WEIGHT
13 oz, 370 grams approx



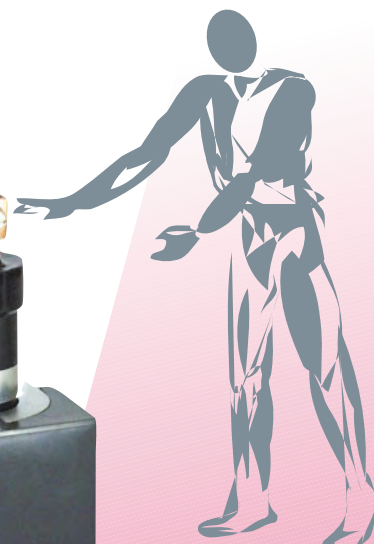
WEIGHT
26 oz, 738 grams approx



WEIGHT
38 oz, 1078 grams approx

↑
UP
RECOMMENDED
MOUNTING
POSITION ±10°

UL LISTED
367G
UL Listed
File No. E52197

**COIL MEASURED @ 25°C**

STANDARD PART NUMBERS	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL COIL CURRENT
1 POLE NORMALLY OPEN CONTACT			
WM35A-120A	120 VAC	700 Ω	0.058 AMP
WM35A-240A	240 VAC, 60Hz/ 220 VAC, 50Hz	2,800 Ω	0.029 AMP
WM35A-24D	24 VDC	186 Ω	0.120 AMP
2 POLE NORMALLY OPEN CONTACT			
WM35AA-120A	120 VAC	218 Ω	0.135 AMP
WM35AA-240A	240 VAC, 60Hz/ 220 VAC, 50Hz	1,200 Ω	0.063 AMP
WM35AA-24D	24 VDC	98 Ω	0.232 AMP
3 POLE NORMALLY OPEN CONTACT			
WM35AAA-120A	120 VAC	111 Ω	0.220 AMP
WM35AAA-240A	240 VAC, 60Hz/ 220 VAC, 50Hz	430 Ω	0.117 AMP
WM35AAA-24D	24 VDC	63 Ω	0.375 AMP
1 POLE NORMALLY CLOSED CONTACT			
WM35B-120A	120 VAC	460 Ω	0.115 AMP
ML SERIES 1 POLE NORMALLY OPEN CONTACT			
WML35A-120A	120 VAC	700 Ω	0.058 AMP
WML35A-240A	240 VAC, 60Hz/ 220 VAC, 50Hz	2,800 Ω	0.029 AMP
ML SERIES 2 POLE NORMALLY OPEN CONTACT			
WML35AA-120A	120 VAC	218 Ω	0.135 AMP
WML35AA-240A	240 VAC, 60Hz/ 220 VAC, 50Hz	1,200 Ω	0.063 AMP
ML SERIES 3 POLE NORMALLY OPEN CONTACT			
WML35AAA-120A	120 VAC	111 Ω	0.220 AMP
WML35AAA-240A	240 VAC, 60Hz/ 220 VAC, 50Hz	430 Ω	0.117 AMP

OTHER COIL VOLTAGES AVAILABLE, CONSULT FACTORY FOR DETAILS

1, 2 & 3 POLES, 60 AMPS**UL CONTACT RATINGS TABLE FOR M60A-M60B**

VOLTAGE	HP		MOTOR AMPS		RESISTIVE AMPS	TUNGSTEN	
	1Ø	3Ø	1Ø	3Ø		AMPS "A" (N.O.)	AMPS "B" (N.C.)
120VAC	3*	5*	34	30	60*	60*	45*
240VAC	5*	10*	28	28	60*	30	22.5
480VAC	7.5*	15*	21	21	60*	15	11.2
600VAC	7.5*	15*	16	17	50 **	12	9
24VDC	3/4		39		60*	50*	50*
48VDC	3/4		19.5		60*	50*	50*
125VDC	3/4		7.4		40*	40*	40*
250VDC	3/4		3.7		20*	20*	20*

* UL and CSA Listed ** 3 POLE 40 AMPS PER POLE
SEE MDR GENERAL SPECIFICATIONS AND DIMENSIONS.



UL Listed
File No. E52197

**UL CONTACT RATINGS TABLE FOR ML60A-60B**

VOLTAGE	RESISTIVE AMPS	TUNGSTEN	
		AMPS "A" (N.O.)	AMPS "B" (N.C.)
120VAC	60*	60*	45*
240VAC	60*	30	22.5
480VAC	60*	15	11.2
600VAC	50 **	12	9

* UL and CSA Listed ** 3 POLE 40 AMPS PER POLE

**CLASS WM60**

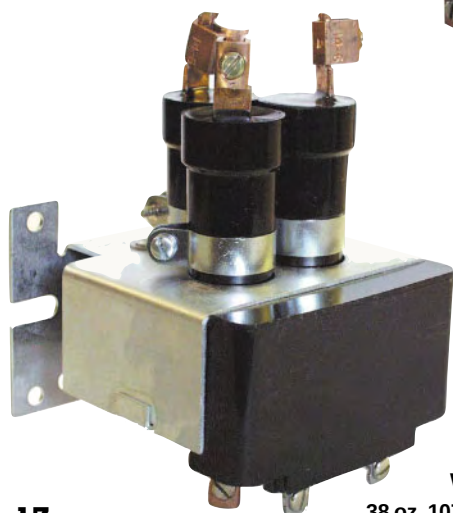
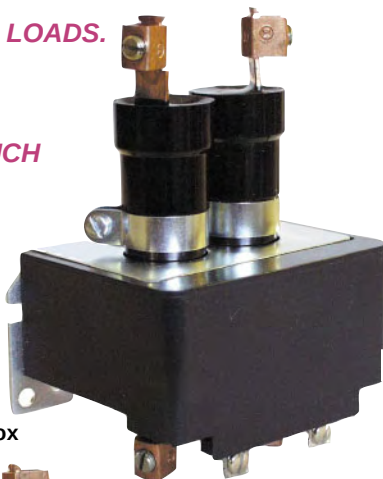
**SWITCHES RESISTIVE,
TUNGSTEN, AND MOTOR LOADS
HIGH INRUSH CAPACITY.
RECOMMENDED FOR DC LOADS.**

WEIGHT
13 oz, 370 grams approx

CLASS WML60

**RECOMMENDED FOR MUCH
LONGER LIFE WHEN
SWITCHING AC
RESISTIVE AND
TUNGSTEN LOADS.**

WEIGHT
26 oz, 738 grams approx



WEIGHT
38 oz, 1078 grams approx

UP
↑
RECOMMENDED
MOUNTING
POSITION ±10

COIL MEASURED @ 25°C

STANDARD PART NUMBERS	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL COIL CURRENT
1 POLE NORMALLY OPEN CONTACT			
WM60A-120A	120 VAC	700 Ω	0.058 AMP
WM60A-240A	240 VAC, 60Hz/ 220 VAC, 50Hz	2,800 Ω	0.029 AMP
WM60A-24D	24 VDC	186 Ω	0.120 AMP
2 POLE NORMALLY OPEN CONTACT			
WM60AA-120A	120 VAC	218 Ω	0.135 AMP
WM60AA-240A	240 VAC, 60Hz/ 220 VAC, 50Hz	1,200 Ω	0.063AMP
WM60AA-24D	24 VDC	98 Ω	0.232 AMP
3 POLE NORMALLY OPEN CONTACT			
WM60AAA-120A	120 VAC	111 Ω	0.220 AMP
WM60AAA-240A	240 VAC, 60Hz/ 220 VAC, 50Hz	430 Ω	0.117 AMP
WM60AAA-24D	24 VDC	63 Ω	0.375 AMP
1 POLE NORMALLY CLOSED CONTACT			
WM60B-120A	120 VAC	460 Ω	0.115 AMP
ML SERIES 1 POLE NORMALLY OPEN CONTACT			
WML60A-120A	120 VAC	700 Ω	0.058 AMP
WML60A-240A	240 VAC, 60Hz/ 220 VAC, 50Hz	2,800 Ω	0.029 AMP
ML SERIES 2 POLE NORMALLY OPEN CONTACT			
WML60AA-120A	120 VAC	218 Ω	0.135 AMP
WML60AA-240A	240 VAC, 60Hz/ 220 VAC, 50Hz	1,200 Ω	0.063AMP
ML SERIES 3 POLE NORMALLY OPEN CONTACT			
WML60AAA-120A	120 VAC	111 Ω	0.220 AMP
WML60AAA-240A	240 VAC, 60Hz/ 220 VAC, 50Hz	430 Ω	0.117 AMP

OTHER COIL VOLTAGES AVAILABLE, CONSULT FACTORY FOR DETAILS

UL CONTACT RATINGS TABLE

VOLTAGE	RESISTIVE AMPS	TUNGSTEN AMPS	HORSEPOWER SINGLE PHASE
120VAC	100	100*	3
240VAC	100	60	5
480VAC	100	30*	15
600VAC	80*	24*	10*
24VDC	100	100	1.5*
48VDC	100	100	1.5*
125VDC	80	80	1.5*
250VDC	40	40	1.5*

*NON UL RATING

CLASS WM100

**CAPABLE OF SWITCHING 100 AMP
LOADS UP TO 480 VAC / 48 VDC**

GENERAL SPECIFICATIONS

COIL

Frequency of Operation: 60 per minute max
 Pull-in voltage: 80% of nominal voltage, typ. AC & DC coils
 Dropout voltage: 78% of nominal voltage, typ. AC coils
 65% of nominal voltage, typ. DC coils

CONTACTS

Material: Mercury
 Contact resistance: 2 milliohm typical

TIMING

Operate: 50 milliseconds typical
 Dropout: 100 milliseconds typical

DIELECTRIC STRENGTH

Across open Contact: 2650 V rms

TEMPERATURE

Operating: - 35°C to + 60°C under continuous load

LIFE EXPECTANCY

Electrical: 100,000 operations
 @ rated resistive load
 Mechanical: 5,000,000 operations @ no load

MISCELLANEOUS

Insulation Material: Class B - 130°C.
 Connections: Pressure connectors for #1-8 AWG wire
 Options: Other coil voltages available
 consult factory for details
 Weight: 15.9 oz. 450 grams approx.

1 POLE 100 AMPS

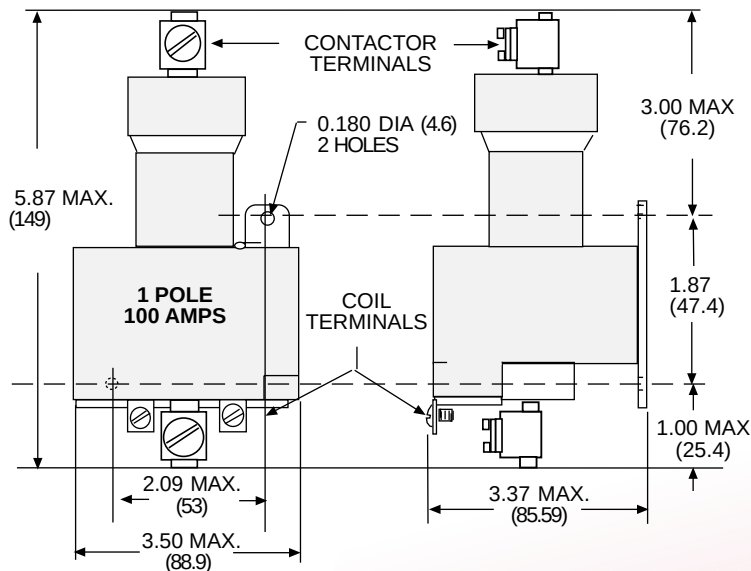


UL Listed
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OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

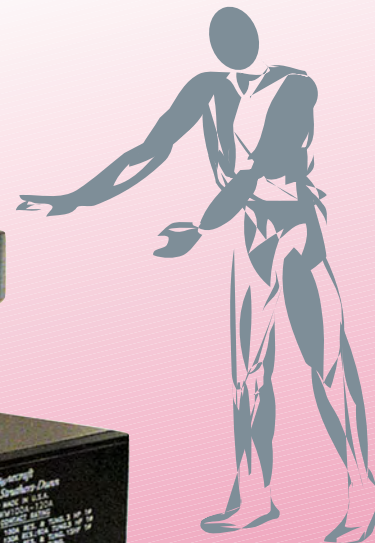
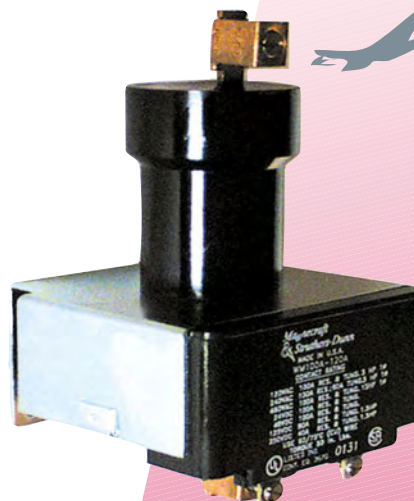


LOAD TERMINALS AWG #1 THRU #8 WIRE

UP



VERTICAL MOUNTING
 RECOMMENDED ±10°



COIL MEASURED @ 25°C

STANDARD PART NUMBERS	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL COIL CURRENT
AC OPERATED NORMALLY OPEN CONTACT			
WM100A-120A	120 VAC	73.5 Ω	0.225 AMP
WM100A-240A	240 VAC, 60Hz/ 220 VAC, 50Hz	300 Ω	0.138 AMP
WM100A-24D	24 VDC	53 Ω	0.380 AMP

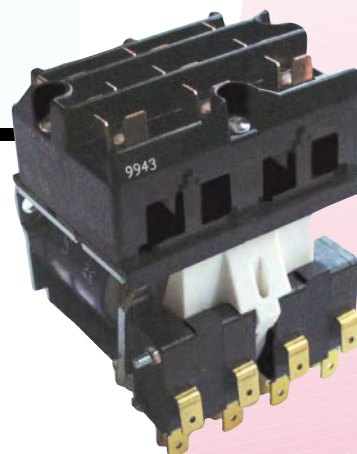
UL CONTACT RATINGS TABLE

LOAD VOLTAGE	PHASE	MOTOR LOAD	RESISTIVE LOAD
120 VAC	1-2-3	1 HP	15 AMPS
240 VAC	1	1.5 HP	10 AMPS
240 VAC	2-3	3 HP	10 AMPS
480/600 VAC	2-3	3 HP	5 AMPS
30 VDC	-	-	15 AMPS
125 VDC	-	-	5 AMPS

NOTE: AC CONTACTS RATED WITH ALL CONTACTS IN USE, NOT RATED PER POLE.

1 TO 3 HP, 15 AMPS

UL us
UL Recognized
File No. E13224B



THE SERIES A275 IS A COMPACT, 2-COIL, MECHANICALLY INTERLOCKED MOTOR REVERSING RELAY. APPLICATIONS INCLUDE:

INDUSTRIAL DOOR OPERATORS

ELECTRIC HOISTS

ELECTRONIC WHEEL BALANCING

THE A275 HAS 1/4" QUICK CONNECT TERMINALS ON THE COILS, CONTACTS AND AUXILIARY SWITCHES. THE MECHANICAL INTERLOCK WILL NOT JAM, EVEN IF BOTH COILS ARE SIMULTANEOUSLY ENERGIZED.

GENERAL SPECIFICATIONS**COIL**

Pull-in Voltage:	85% of nominal voltage or less for AC coils 80% of nominal voltage or less for DC coils,
Dropout Voltage:	10% of nominal voltage or more @ 25 °C
Max. allowed voltage:	110%
Coil Resistance:	± 10% @ 25°C
Duty:	Continuous

CONTACTS

Contact Material:	Silver cadmium oxide
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TIMING

Operate Time:	50 mS Max. @ nominal voltage
Release Time:	30 mS Max. @ nominal voltage

DIELECTRIC STRENGTH

All Mutually Insulated Points:	2500 V rms between all mutually Insulated current carrying parts and those parts to ground
Insulation Resistance:	500 VDC exceeds 1000 megohms

TEMPERATURE

Temperature Rating:	AC: -45°C to +50°C @ rated operation DC: -45°C to +70 °C @ rated operation
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LIFE EXPECTANCY

Mechanical:	5,000,000 operations @ no load 100,000 operations @ rated load
Electrical:	500,000 operations @ 1/2 rated load

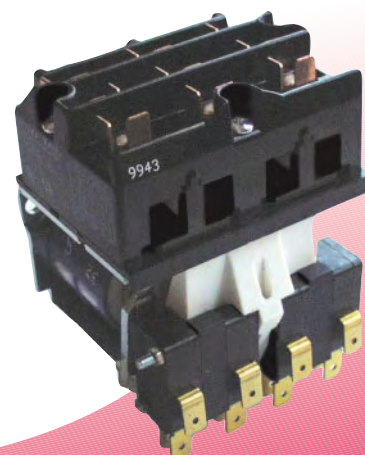
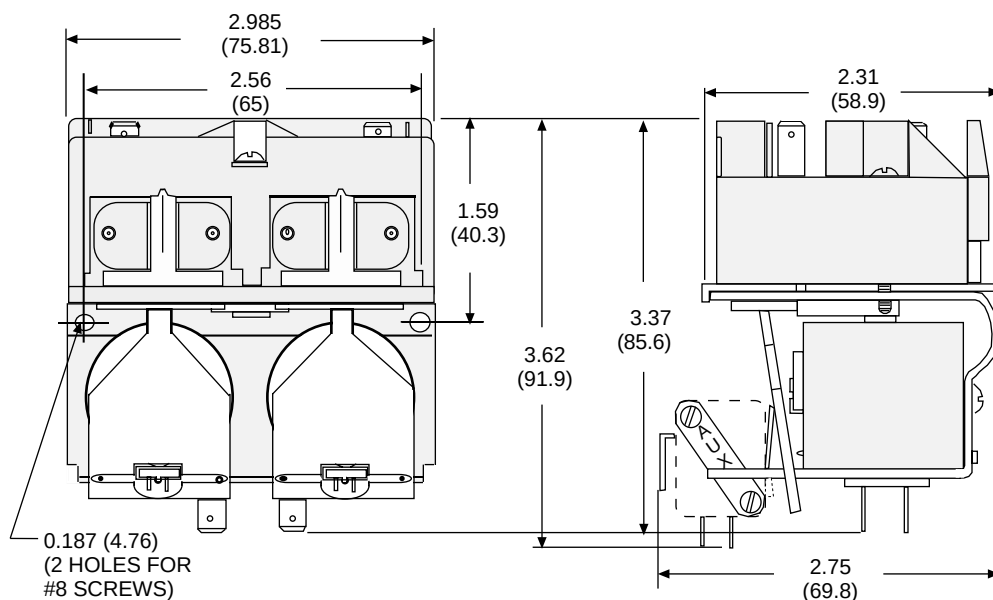
MISCELLANEOUS

Weight:	1 pound approx.
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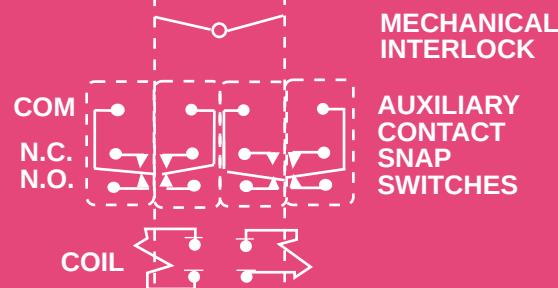
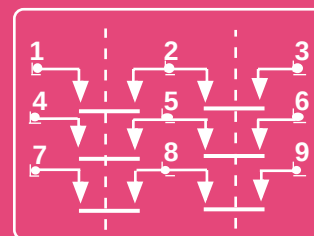


OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

**WIRING DIAGRAM**

(VIEWED FROM PIN END)

**ORDERING CODE FOR RELAYS****A275 KXX 90 -24****CLASS:**

A275, 0.250 TERMINALS, MOTOR REVERSING. CONTINUOUS, 1 & 2 HP, 3 POLE MODELS

CONTACT ARRANGEMENTS:

KXX (3PDM-NO., PER COIL)

OPTIONS:2 AUX. CONTACTS, EACH SPDT (1 PER COIL) 0.250 QUICK CCONNECT TERMINALS - **CODE 90**4 AUX. CONTACTS, EACH SPDT (2 PER COIL) 0.250 QUICK CCONNECT TERMINALS - **CODE 91**TUNGSTEN CONTACTS - **CODE 97**RECTIFIED COIL - **CODE V2****COIL VOLTAGE:****AC:** 12, 24, 120, 208 & 240 **ADD "A" FOR AC COILS****DC:** 12, 24, 48 & 120 **ADD "D" FOR DC COILS**

OTHER COIL VOLTAGES AVAILABLE, CONTACT FACTORY FOR SPACIAL REQUIREMENTS.

STANDARD PART NUMBERS**AC OPERATED**

A275KXX-24A

24 / 24 VAC

4.8 Ω

A275KXX-120A

120 / 120 VAC

125 Ω

A275KXX90-24A

24 / 24 VAC

4.8 Ω

A275KXX90-120A

120 / 120 VAC

125 Ω

A275KXX91-24A

24 / 24 VAC

4.8 Ω

A275KXX91-120A

120 / 120 VAC

125 Ω

DC OPERATED

A275KXX-24D

24 / 24 VDC

125 Ω

A275KXX90-24D

24 / 24 VDC

125 Ω

A275KXX91-24D

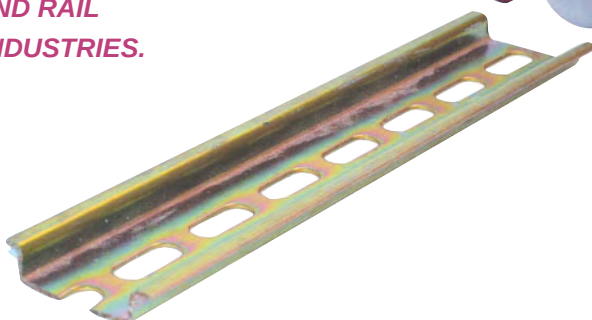
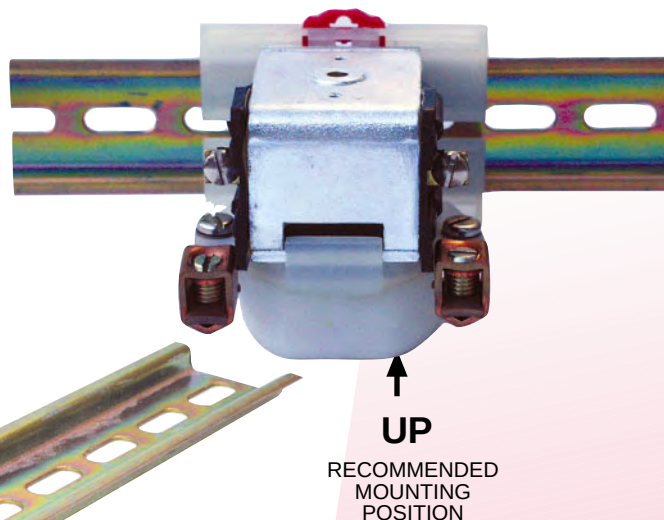
24 / 24 VDC

125 Ω

COIL MEASURED @ 25°C**NOMINAL INPUT VOLTAGE****NOMINAL RESISTANCE (OHMS)**

**SPST-N.O.-D.M. OR
SPST-N.C.-D.B.,
100 AMPS**

THE CLASS B101, IS A DC SOLENOID-ACTUATED, HEAVY DUTY CONTACTOR. EACH CONTACTOR HAS A SINGLE POLE, DOUBLE-MAKE OR DOUBLE-BREAK CONTACT, DIN-RAIL MOUNTING IS STANDARD. CONTACTS ARE ENCLOSED IN A MOLDED PLASTIC COVER. THE SERIES B101 IS RATED AT 100 AMPS CONTINUOUS DUTY. STOCK COILS ARE SPECIFIED FOR VDC. THE POWERFUL MAGNETIC STRUCTURE CREATES A HIGH CONTACT PRESSURE WHICH RESULTS IN VERY RELIABLE, LOW RESISTANCE CONTACTS. THE B101 IS SUITABLE FOR POWER APPLICATIONS IN TELECOMMUNICATIONS, ELEVATOR AND RAIL MASS TRANSIT, AS WELL AS OTHER INDUSTRIES.



GENERAL SPECIFICATIONS

COIL

Pull-in Voltage:	80% of nominal voltage or less for DC coils,
Dropout Voltage:	10% of nominal voltage or more @ 25°C
Max. allowed voltage:	± 110%
Coil Resistance:	± 10% @ 25°C
Duty:	Continuous.

CONTACTS

Contact Material:	Silver cadmium oxide.
Contact Rating:	100 amps @ 120/240 VAC
	100 amps @ 28 VDC

TIMING

Operate Time:	60 mS max. @ nominal voltage.
Release Time:	30 mS max. @ nominal voltage.

DIELECTRIC STRENGTH

All Mutually Insulated Points:	1500 V rms between all mutually Insulated current carrying parts and those parts to ground.
Insulation Resistance:	500 VDC exceeds 1000 megohms.

TEMPERATURE

Temperature Rating: -45°C to +65°C @ rated operation.

LIFE EXPECTANCY

Mechanical:	5,000,000 operations @ no load
Electrical:	100,000 operations @ rated load.

TERMINALS

Coil Terminals:	#6-32
Load Terminals:	AWG 2-12 pressure wire connector

MISCELLANEOUS

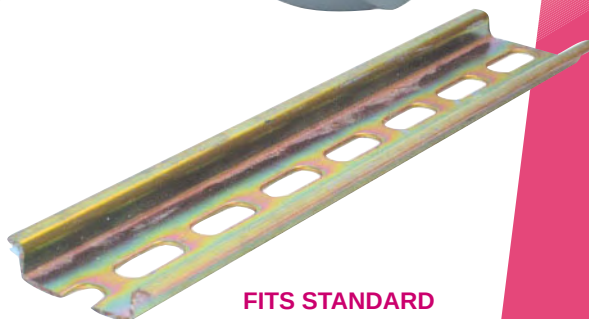
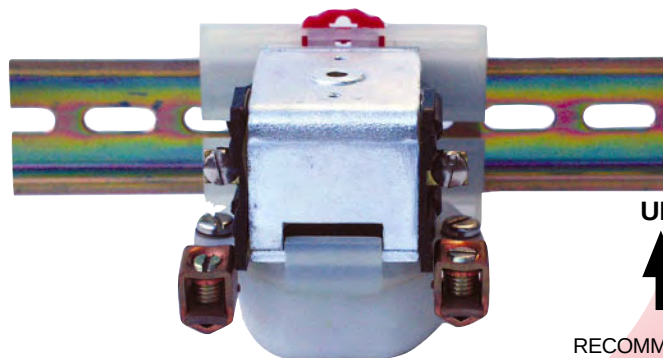
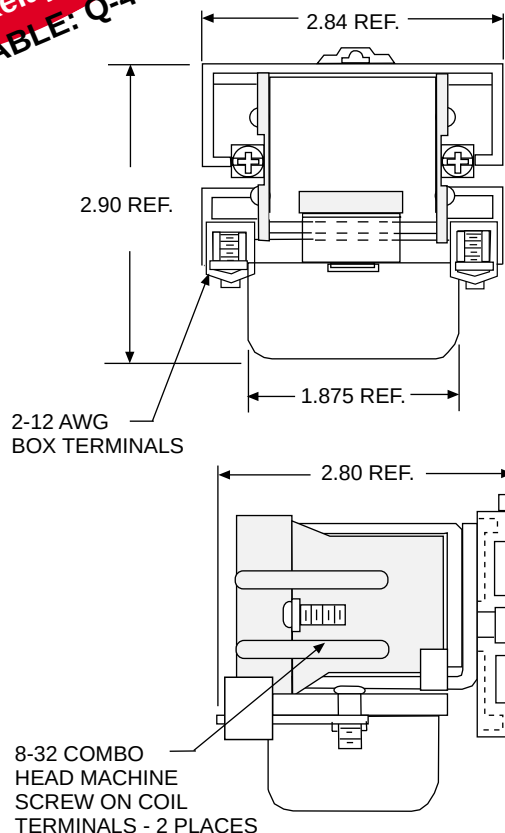
Mounting:	Panel or 35 mm DIN-rail
Weight:	370 grams approx.



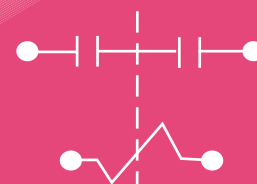
**SPST-N.O.-D.M. OR
SPST-N.C.-D.B.,
100 AMPS**

NEW
From The Market
Leader in Industrial
Relays
AVAILABLE: Q-4-02

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



WIRING DIAGRAM
(VIEWED FROM PIN END)



ORDERING CODE FOR RELAYS

CLASS: B101
100 AMP, 1 POLE

CONTACT ARRANGEMENTS: HXX
HXX 1 POLE N.O.-D.M.
XXH 1 POLE N.C.-D.B.

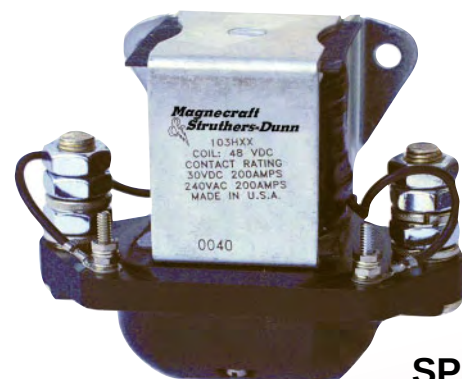
COIL VOLTAGE: -28D
12, 28 & 48 **ADD "D" FOR DC COILS**

OPTIONS (CONSULT FACTORY)
AC COIL INPUT VOLTAGES
NON STANDARD DC COIL VOLTAGES

STANDARD PART NUMBERS	CONTACT CONFIGU- RATION	COIL MEASURED @ 25°C	
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
B101HXX-12D	N.O.-D.M.	12 VDC	16.5 Ω
B101HXX-28D	N.O.-D.M.	28 VDC	92 Ω
B101HXX-48D	N.O.-D.M.	48 VDC	235 Ω
B101XXH-12D	N.C.-D.B.	12 VDC	16.5 Ω
B101XXH-28D	N.C.-D.B.	28 VDC	92 Ω
B101XXH-48D	N.C.-D.B.	48 VDC	235 Ω

THE CLASS 101, 102 AND 103 ARE DC SOLENOID-ACTUATED, HEAVY DUTY CONTACTORS. SINGLE POLE CONTACTS ARE ENCLOSED WITH A MOLDED PLASTIC COVER. THE CLASS 101 IS RATED AT 100 AMPS* CONTINUOUS DUTY, THE CLASS 102 IS RATED AT 200 AMPS* CONTINUOUS, AND THE CLASS 103 IS RATED AT 300 AMPS* CONTINUOUS. COILS ARE SPECIFIED FOR DC, AS STANDARD. THE POWERFUL MAGNETIC STRUCTURE CREATES VERY HIGH CONTACT PRESSURE WHICH RESULTS IN VERY RELIABLE AND LOW RESISTANCE CONTACTS, MAKING THEM SUITABLE FOR POWER APPLICATIONS IN TELECOMMUNICATIONS, ELEVATOR AND RAIL MASS TRANSIT, AS WELL AS OTHER INDUSTRIES.

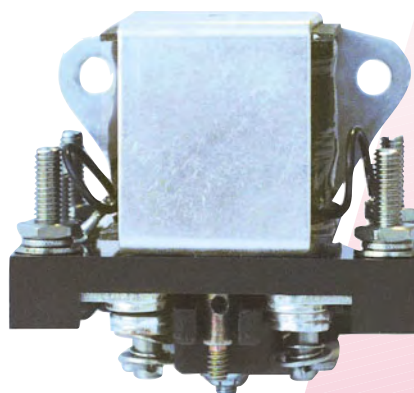
* UL PENDING. EXISTING RATING IS 50, 100 AND 200 AMPS, RESPECTIVELY



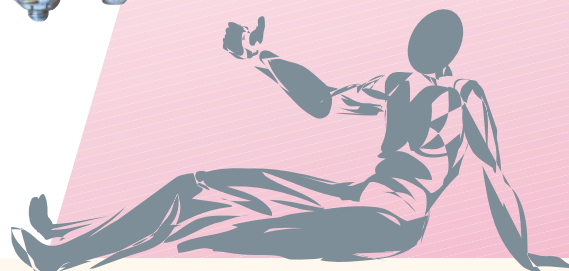
SPST



RECOMMENDED
MOUNTING
POSITION



DPST



GENERAL SPECIFICATIONS

COIL

Pull-in Voltage:	80% of nominal voltage or less for DC coils,
Dropout Voltage:	10% of nominal voltage or more @ 25°C
Max. allowed voltage:	110%
Coil Resistance:	±10% @ 25°C
Duty:	Continuous.

CONTACTS

Contact Material:	Silver cadmium oxide.
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TIMING

Operate Time:	60 mS max. @ nominal voltage
Release Time:	30 mS max. @ nominal voltage

DIELECTRIC STRENGTH

All Mutually Insulated	
Points:	1500 V rms between all mutually Insulated current carrying parts and those parts to ground.
Insulation Resistance:	500 VDC exceeds 1000 megohms.

TEMPERATURE

Temperature Rating:	-45°C to +65°C @ rated operation.
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LIFE EXPECTANCY

Mechanical:	5,000,000 operations @no load
Electrical:	100,000 operations @ rated load.

TERMINALS

Coil Terminals:	101: #6-32 102: #8-32 103: #8-32
Load Terminals:	101: #10-32 102: #1/4-20 103: #3/8-18

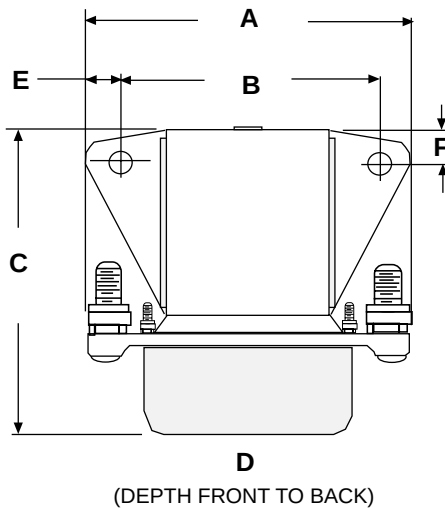
MISCELLANEOUS

Mounting:	Clearance holes, ea. 0.265 in dia
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100 TO 300 AMPS

OUTLINE DIMENSIONS

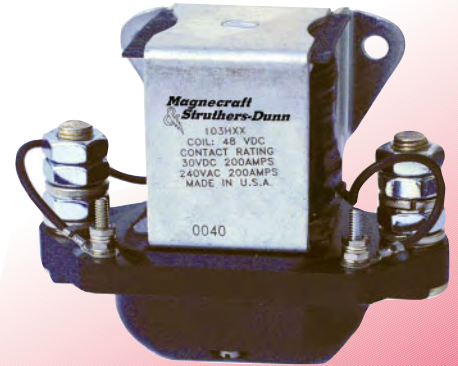
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



DIMENSIONS

DIM.	102, 1 POLE	103, 1 POLE	101, 2 POLE	102, 2 POLE	103, 2 POLE
A	3.38 (85.7)	4.25 (107.9)	2.56 (65.0)	3.25 (82.6)	4.50 (114.3)
B	2.25 (57.1)	2.40 (60.9)	1.87 (47.4)	2.25 (57.1)	2.40 (60.9)
C	3.22 (81.8)	3.53 (89.7)	2.50 (63.5)	3.13 (79.4)	3.63 (92.1)
D	2.09 (53.0)	2.65 (67.3)	2.13 (54.0)	2.75 (69.9)	3.50 (88.9)
E	0.56 (14.2)	0.92 (23.3)	0.40 (10.1)	0.56 (14.2)	0.92 (23.3)
F	0.50 (12.7)	0.56 (14.2)	0.43 (10.9)	0.50 (12.7)	0.56 (14.2)

UP

RECOMMENDED
MOUNTING
POSITION

NOMINAL VOLTAGE	RESISTANCE (OHMS) -10%				
	102, 1 POLE	103, 1 POLE	101, 2 POLE	102, 2 POLE	103, 2 POLE
12 VDC	17	15.3	9	10.7	15.3
28 VDC	75	59	98	75	59
48 VDC	290	245	150	290	245
110-125 VDC	1560	1420	1475	1560	1420

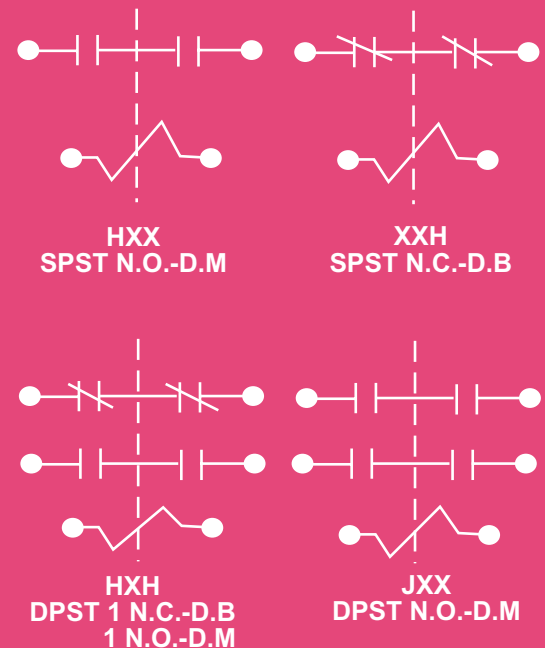
RESISTANCE LOAD (AMPS)

NOMINAL VOLTAGE	AC CONTACT RATINGS*		
	SERIES 101	SERIES 102	SERIES 103
120 VAC 60Hz	100	200	300
240 VAC 60Hz	100	200	300
DC CONTACT RATINGS			
30 VDC	100	200	300

*UL PENDING

WIRING DIAGRAM

(VIEWED FROM PIN END)



ORDERING CODE FOR RELAYS

CLASS: 102 HXX -28D

101 SCREW TERM., 100 AMP
102 SCREW TERM., 200 AMP
103 SCREW TERM., 300 AMP

CONTACT ARRANGEMENTS:

HXX 1 POLE N.O.-D.M.*
HXH 2 POLE -1 N.C.-D.B. AND 1 N.O.-D.M.
JXX 2 POLE N.O.-D.M.
XXH 1 POLE N.C.-D.M.*

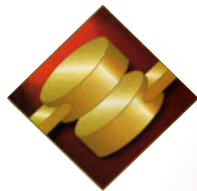
COIL VOLTAGE:

12, 28, 48, 110-125 ADD "D" FOR DC COILS

OPTIONS (CONSULT FACTORY)

AC COIL INPUT VOLTAGES
NON STANDARD DC COIL VOLTAGES

* 102 AND 103 ONLY, FOR 101 SEE B101 PAGE ?



SECTION 3 CROSS REFERENCE GUIDE

MAGNECRAFT	STRUTHERS-DUNN	POTTER & BRUMFIELD	OMRON	DELTRON	TYCO
W199AX-4	A425XAX-120A	PRD5AG0-120 / PRD5AY0-120	MGN1C-AC120	20239-83	9-1393127-9 / 1393128-5
W199AMX-4		PRDA5AGA-120 / PRDA5AYA-120			
W199X-2	A425XAX-12D	PRD5DG0-12 / PRD5DY0-12	MGN1C-DC12	20243-81	1-1393128-2 / 1-1393128-6
W199X-3	A425XAX-24D	PRD5DG0-24 / PRD5DY0-24	MGN1C-DC24	20243-82	1-1393128-3 / 1-1393128-7
W199MX-2		PRDA5DGA-12 / PRDA5DYA-12			
W199MX-3		PRDA5DGA-24 / PRDA5DYA-24			
W199AX-13	A425XBX-24A	PRD11AG0-24 / PRD11AY0-24	MGN2C-AC24	20241-82	1-1393127-1 / 2-1393127-9
W199AX-14	A425XBX-120A	PRD11AG0-120 / PRD11AY0-120	MGN2C-AC120	20241-83	1-1393127-9 / 2-1393127-6
W199AX-15	A425XBX-240A	PRD11AG0-240 / PRD11AY0-240	MGN2C-AC240	20241-84	1-1393127-2 / 3-1393127-0
W199AMX-63	A425XBX90-24A	PRDA11AGA-24 / PRDA11AYA-24		20246-82	
W199AMX-64	A425XBX90-120A	PRDA11AGA-120 / PRDA11AYA-120		20246-83	
W199AMX-65	A425XBX90-240A	PRDA11AGA-240 / PRDA11AYA-240		20246-84	
W199X-11	A425XBX-6D	PRD11DG0-6 / PRD11DY0-6	MGN2C-DC6		
W199X-12	A425XBX-12D	PRD11DG0-12 / PRD11DY0-12	MGN2C-DC12	20245-81	3-1393127-5 / 6-1393127-1
W199X-13	A425XBX-24D	PRD11DG0-24 / PRD11DY0-24	MGN2C-DC24	20245-82	3-1393127-8 / 6-1393127-2
W199X-14	A425XBX-110D	PRD11DG0-110 / PRD11DY0-110	MGN2C-DC110	20245-84	3-1393127-4 / 6-1393127-0
W199MX-49		PRDA11DGA-6 / PRDA11DYA-6			
W199MX-50	A425XBX90-12D	PRDA11DGA-12 / PRDA11DYA-12		20247-81	
W199MX-51	A425XBX90-24D	PRDA11DGA-24 / PRDA11DYA-24		20247-82	
W199MX-52	A425XBX90-110D	PRDA11DGA-110 / PRDA11DYA-110		20247-84	
W199AX-8	A425BXX-24A	PRD7AG0-24 / PRD7AY0-24	MGN2A-AC24	20240-82	9-1393129-6 / 1393130-9
W199AX-9	A425BXX-120A	PRD7AG0-120 / PRD7AY0-120	MGN2A-AC120	20240-83	9-1393129-5 / 1393130-7
W199AX-10	A425BXX-240A	PRD7AG0-240 / PRD7AY0-240	MGN2A-AC240	20240-84	9-1393129-7 / 1-1393130-0
W199AMX-33		PRDA7AGA-24 / PRDA7AYA-24		20248-82	
W199AMX-34		PRDA7AGA-120 / PRDA7AYA-120		20248-83	
W199AMX-35	A425BXX90-240A	PRDA7AGA-240 / PRDA7AYA-240		20248-84	
W199X-7	A425BXX-12D	PRD7DG0-12 / PRD7DY0-12	MGN2A-DC12	20244-81	1-1393130-5 / 2-1393130-8
W199X-8	A425BXX-24D	PRD7DG0-24 / PRD7DY0-24	MGN2A-DC24	20244-82	1-1393130-6 / 2-1393130-9
W199MX-26	A425BXX90-12D	PRDA7DGA-12 / PRDA7DYA-12		20249-81	
W199MX-27		PRDA7DGA-24 / PRDA7DYA-24		20249-82	
W199ADX-4	A425HXX-120A	PRD3AG0-120 / PRD3AY0-120	MGN1X-AC120	20238-83	6-1393127-9 / 7-1393127-9
W199ADX-5	A425HXX-240A	PRD3AG0-240 / PRD3AY0-240	MGN1X-AC240	20238-84	7-1393127-1 / 8-1393127-1
W199DYX-2	A425XXH-12D	PRD4DG0-12 / PRD4DY0-12		20336-81	
W199ADMX-4	A425HXX90-120A	PRDA3AGA-120 / PRDA3AYA-120			
W199ADMX-5	A425HXX90-240A	PRDA3AGA-240 / PRDA3AYA-240			
W199DYM-2					
W199DX-2	A425HXX-12D	PRD3DG0-12 / PRD3DY0-12	MGN1X-DC12	20242-81	8-1393127-3 / 9-1393127-5
W199DX-3	A425HXX-24D	PRD3DG0-24 / PRD3DY0-24	MGN1X-DC24	20242-82	8-1393127-4 / 9-1393127-6
W199DMX-2	A425HXX90-12D	PRDA3DGA-12 / PRDA3DYA-12			
W199DMX-3	A425HXX90-24D	PRDA3DGA-24 / PRDA3DYA-24			
W199ADB-4	A425HXX69-120A	PRD3AJ0-120 / PRD3AH0-120			7-1393127-4 / 7-1393127-3
W199ADB-4		PRDA3AJA-120 / PRDA3AHA-120			
W199DBX-3	A425HXX69-24D	PRD3DJ0-24 / PRD3DH0-24			
W199DBX-6	A425HXX69-48D	PRD3DJ0-48 / PRD3DH0-48			
W199DBMX-3		PRDA3DJA-24 / PRDA3DHA-24			
W199DBMX-2		PRDA3DJA-48 / PRDA3DHA-48			

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



SECTION 3 CROSS REFERENCE GUIDE

MAGNECRAFT	STRUTHERS-DUNN	POTTER & BRUMFIELD	OMRON	DELTRON	TYCO
W199ABX-14	A425XBX69-120A	PRD11AJ0-120 / PRD11AH0-120	MGN2CM-AC120	20919-83	2-1393127-0 / 1-1393127-6
W199ABMX-7	A425XBX6990-120A	PRDA11AJA-120 / PRDA11AHA-120			
W199BX-13	A425XBX69-24D	PRD11DJ0-24 / PRD11DH0-24			
W199BX-14	A425XBX69-110D	PRD11DJ0-110 / PRD11DH0-110	MGN2CM-DC110	20918-84	4-1393127-6
W199BMX-13	A425XBX6990-24D	PRDA11DJA-24 / PRD11DHA-24			
W199BMX-14	A425XBX6990-110D	PRDA11DJA-110 / PRDA11DHA-110			
W199ADEX-4		PRD3AP4-120			7-1393127-6
W199DEX-3		PRD3DP4-24			9-1393127-1
50-1289-1		35D013			

MAGNECRAFT & STRUTHERS-DUNN	DURAKOOL	MDI
WM35A-120A	BFL-7032	35NO-120A
WM35A-240A	BFL-7034	35NO-220A
WM35A-24D	BFL-7048	35NO-24D
WM35AA-120A	BFL2-7027	235NO-120A
WM35AA-240A	BFL2-7029	235NO-240A
WM35AA-24D	BFL2-7032	235NO-24D
WM35AAA-120A	BFL3-7024	335NO-120A
WM35AAA-240A	BFL3-7026	335NO-240A
WM35AAA-24D	BFL3-7038	335NO-24D
WM35B-120A		35NC-120A
WM60A-120A	BFC-717	60NO-120A
WM60A-240A	BFC-719	60NO-220A
WM60A-24D	BFC-722	60NO-24D
WM60AA-120A	BFC2-727	260NO-120A
WM60AA-240A	BFC2-729	260NO-240A
WM60AA-24D	BFC2-733	260NO-24D
WM60AAA-120A	BFC3-708	360NO-120A
WM60AAA-240A	BFC3-710	360NO-240A
WM60AAA-24D	BFC3-721	360NO-24D
WM100A-120A	CFC-718	100NO-120A
WM100A-240A	CFC-720	100NO-220A
WM100A-24D	CFC-723	100NO-24D

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

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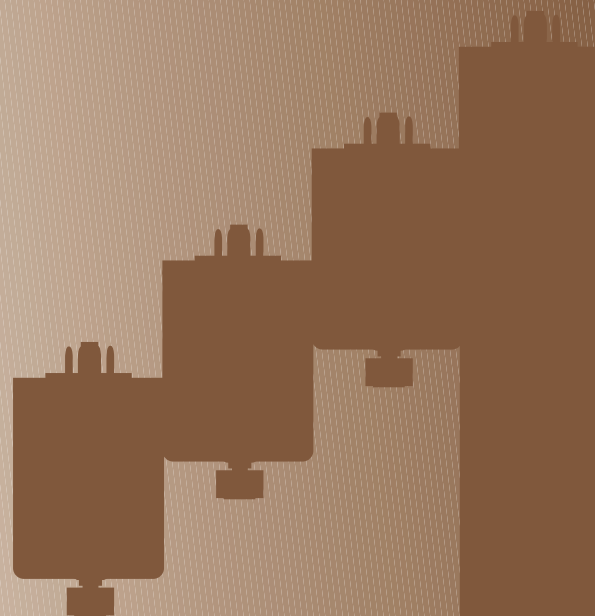
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Magnecraft & Struthers-Dunn
Your Contact for Relays

SECTION 4

TIME DELAY RELAYS
5 TO 13 AMPERES



RELAY SERIES

211



L W H
1.75 x 2.37 x 3.5

TDRPRO



L.E.D. STATUS LAMP

L W H
1.87 x 1.87 x 2.86

67



L W H
1.37 x 0.734 x 1.18

FEATURES

- 8 OR 11 PIN OCTAL PLUG-IN
- ON DELAY, OFF DELAY, INTERVAL AND ONE SHOT MODES AVAILABLE
- REPEATABILITY $\pm 0.1\%$
- FIELD ADJUSTABLE BY KNOB, OR FIXED TIME AVAILABLE WITHOUT KNOB
- OTHER TIMING RANGES & INPUT VOLTAGES AVAILABLE

- 8 OR 11 PIN OCTAL PLUG-IN
- ON DELAY, REPEAT, INTERVAL, OFF DELAY & ONE SHOT
- UNIVERSAL POWER SUPPLY
- REPEATABILITY $\pm 0.1\%$
- FIELD ADJUSTABLE BY THUMB WHEELS
- PANEL MOUNTABLE

- MINIATURE PLUG-IN
- ON DELAY
- REPEATABILITY $\pm 2\%$
- RECESSED SCREW ADJUSTMENT
- 4 POLE STYLES AVAILABLE
- PRINTED CIRCUIT TERMINALS AVAILABLE
- OTHER TIMING RANGES & INPUT VOLTAGES AVAILABLE

CONTACT DATA

CONTACT CONFIGURATION:

DPDT

SPDT, DPDT

DPDT

CONTACT MATERIAL:

SILVER CADMIUM OXIDE,

SILVER CADMIUM OXIDE
GOLD FLASHED

SILVER GOLD OVERLAY,

CONTACT RESISTANCE:

50 MILLIOHMS MAX. INITIAL

50 MILLIOHMS MAX. INITIAL

50 MILLIOHMS MAX. INITIAL

MAX. CONTACT RATING:

10 AMPS @ 120 / 240 VAC, 30 VDC
1/3 HP @ 240 VAC
1/2 HP @ 120 VAC
NEMA B300 PILOT DUTY

12 AMPS @ 120 / 240 VAC, 30 VDC
RESISTIVE.
1/3 HP @ 120 VAC 1/2 HP @ 240 VAC

5 AMPS @ 120 VAC, 28 VDC

COIL DATA

STANDARD VOLTAGE

AC:

120 VAC

DC:

24 VDC

24 TO 240 VAC

24 TO 240 VDC

120 VAC

12 & 24 VDC

INPUT VOLTAGE RANGE:

85 % TO +110 % (AC)
80 % TO +110 % (DC)
OF NOMINAL

85 % TO +110 % (AC),
80 % TO +110 % (DC)
OF NOMINAL

REVERSE POLARITY
PROTECTION:

YES - DC

NON POLARITY SENSITIVE

YES - DC

GENERAL DATA

AMBIENT TEMPERATURE

OPERATING:

- 30°C TO +55°C

- 10°C TO +55°C

- 30°C TO +55°C

STORAGE:

- 55°C TO +85°C

- 40°C TO +85°C

- 50°C TO +85°C

STANDARD TIMING RANGE:

0.1 SECOND TO 120 MINUTES

0.1 SECOND TO 9,990 HOURS

0.1 SECOND TO 450 SECONDS

DIELECTRIC STRENGTH:

1500 V RMS

1500 V rms

1250 V rms

LIFE EXPECTANCY (MIN.)

ELECTRICAL:

200,000 OPERATIONS

200,000 OPERATIONS

50,000 OPERATIONS

MECHANICAL:

10,000,000 OPERATIONS

10,000,000 OPERATIONS

10,000,000 OPERATIONS

AGENCY APPROVALS



LISTED
367G
UL Listed
File No.



US
UL Recognized
File No. E43641



US
UL Recognized
File No. E43641



UL Recognized
File No. E43641



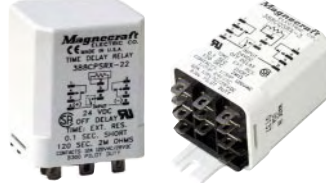
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PAGE 11

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388 EXTERNAL
ADJUSTMENT

388 KNOB
ADJUSTMENT

388 TRUE
OFF DELAY

L W H
1.75 x 2.37 x 3.5

- 8 PIN OCTAL PLUG-IN
- REPEAT CYCLE TIMER
- ON AND OFF TIMES INDEPENDENTLY ADJUSTABLE
- REPEATABILITY $\pm 0.1\%$
- FIELD ADJUSTABLE TIMING USING KNOBS
- OTHER TIMING RANGES & INPUT VOLTAGES AVAILABLE

L W H
1.40 x 1.53 x 1.90

- SQUARE BASE PLUG-IN OR FLANGE MOUNT
- ON DELAY, OFF DELAY
- REPEATABILITY $\pm 3\%$
- FIELD ADJUSTABLE TIMING USING EXTERNAL RESISTOR

L W H
1.53 x 1.40 x 3.52

- SQUARE BASE PLUG-IN
- ON DELAY, OFF DELAY
- REPEATABILITY $\pm 0.1\%$
- FIELD ADJUSTABLE TIMING USING KNOB

L W H
1.53 x 1.40 x 3.52

- SQUARE BASE PLUG-IN
- TRUE OFF DELAY
- REPEATABILITY $\pm 3\%$
- FIELD ADJUSTABLE TIMING USING KNOB
- POWER TO INPUT NOT REQUIRED DURING TIMING CYCLE

DPDT

SILVER CADMIUM OXIDE,
50 MILLIOHMS MAX. INITIAL

10 AMPS @ 120 / 240VAC, 30 VDC
1/3 HP @ 120 VAC,
1/2 HP @ 240 VAC,
NEMA B300 PILOT DUTY

120 VAC

85 % TO +110% (AC),
80 % TO +110% (DC)
OF NOMINAL

YES - DC

- 30°C TO +55°C
- 55°C TO +85°C

0.1 SECOND TO 30 MINUTES

1500 V rms

200,000 OPERATIONS
10,000,000 OPERATIONS


PAGE 12

DPDT

SILVER CADMIUM OXIDE,
50 MILLIOHMS MAX. INITIAL

12 AMPS @ 120 VAC, 28 VDC
1/3 HP @ 120 VAC,
1/2 HP @ 240 VAC,
NEMA B300 PILOT DUTY

120 VAC
24 VDC

85 % TO +110 % (AC)
80 % TO +110 % (DC)
OF NOMINAL

YES - DC

- 30°C TO +55°C
- 55°C TO +85°C

0.1 SECOND TO 120 SECONDS

1500 V rms

100,000 OPERATIONS
5,000,000 OPERATIONS


PAGE 13 - 14

DPDT

SILVER CADMIUM OXIDE,
50 MILLIOHMS MAX. INITIAL

12 AMPS @ 120 VAC, 28 VDC
1/3 HP @ 120 VAC,
1/2 HP @ 240 VAC,
NEMA B300 PILOT DUTY

120 VAC
24 VDC

85 % TO +110 % (AC)
80 % TO +110 % (DC)
OF NOMINAL

YES - DC

- 30°C TO +55°C
- 55°C TO +85°C

0.1 SECOND TO 180 SECONDS

2000 V rms

100,000 OPERATIONS
5,000,000 OPERATIONS


PAGE 15 - 16

DPDT

SILVER CADMIUM OXIDE,
50 MILLIOHMS MAX. INITIAL

12 AMPS @ 120 VAC, 28 VDC
1/3 HP @ 120 VAC,
1/2 HP @ 240 VAC,
NEMA B300 PILOT DUTY

120 VAC
24 VDC

85 % TO +110 % (AC)
80 % TO +110 % (DC)
OF NOMINAL

YES - DC

- 30°C TO +55°C
- 55°C TO +85°C

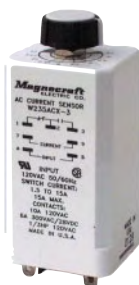
0.1 SECOND TO 200 SECONDS

2000 V rms

100,000 OPERATIONS
5,000,000 OPERATIONS


PAGE 17

RELAY SERIES

235
CURRENT
SENSOR

286 & 287



326 & 327



FEATURES

CONTACT DATA

CONTACT CONFIGURATION:

CONTACT MATERIAL:

CONTACT RESISTANCE:

MAX. CONTACT RATING:

COIL DATA

STANDARD VOLTAGE

AC:

DC:

INPUT VOLTAGE RANGE:

REVERSE POLARITY
PROTECTION:

GENERAL DATA

AMBIENT TEMPERATURE

OPERATING:

STORAGE:

STANDARD TIMING RANGE:

DIELECTRIC STRENGTH:

LIFE EXPECTANCY

ELECTRICAL:

MECHANICAL:

AGENCY APPROVALS

PAGE NUMBER

4...3

L W H
2.37 x 1.75 x 3.52

- SQUARE BASE PLUG-IN
- 1.5 TO 15 AMP SENSING RANGE
- $\pm 2\%$ REPEATABILITY
- SPDT CONTACT CONFIGURATION
- FIELD ADJUSTABLE WITH KNOB

SPDT

SILVER CADMIUM OXIDE,

50 MILLIOHMS MAX. INITIAL

10 AMPS @ 120 VAC
6 AMPS 28 VDC

120 VAC

85 % TO 110 % OF NOMINAL

NOT APPLICABLE

- 30°C TO +55°C
- 40°C TO +85°C

1.5 TO 15 AMPS

2500 V rms

200,000 OPERATIONS
5,000,000 OPERATIONSUL Recognized
File No. E62636L W H
1.50 x 1.37 x 3.52

- SQUARE BASE PLUG-IN
- 286-ON DELAY, 287-OFF DELAY
- REPEATABILITY $\pm 3\%$
- TIMING FIELD ADJUSTABLE BY KNOB OR EXTERNAL RESISTOR
- FIXED VERSIONS AVAILABLE
- 10 AMPS SWITCHING
- UP TO 3 POLES

SPDT, DPDT, 3PDT

SILVER CADMIUM OXIDE,

50 MILLIOHMS MAX. INITIAL

10 AMPS @ 120/240 VAC, 28 VDC
1/3 HP @ 120 VAC,
1/2 HP @ 240 VAC,24 TO 240 VAC
12 TO 125 VDC85 % TO +110 % (AC),
80 % TO +110 % (DC)
OF NOMINAL

YES - DC

- 10°C TO +70°C
- 55°C TO +85°C

0.1 SECOND TO 300 SECONDS

1500 V rms

100,000 OPERATIONS
10,000,000 OPERATIONSUL Recognized
File No. E13224L W H
1.37 X 1.37 X 3.62

- 8 or 11 PIN OCTAL PLUG-IN
- 326 ON DELAY, 327 OFF DELAY
- $\pm 3\%$ REPEATABILITY
- TIMING FIELD ADJUSTABLE BY KNOB OR EXTERNAL RESISTOR
- FIXED VERSIONS AVAILABLE
- 10 AMP SWITCHING
- UP TO 3 POLES

SPDT, DPDT, 3PDT

SILVER CADMIUM OXIDE,

50 MILLIOHMS MAX. INITIAL

10 AMPS @ 120/240 VAC, 30 VDC
1/3 HP @ 120 VAC,
1/2 HP @ 240 VAC,24 TO 240 VAC
12 TO 125 VDC85 % TO +110 % (AC)
80 % TO +110 % (DC)
OF NOMINAL

YES - DC

- 10°C TO +70°C
- 55°C TO +85°C

0.1 SECOND TO 300 SECONDS

1500 V rms

100,000 OPERATIONS
10,000,000 OPERATIONSUL Recognized
File No. E13224

246 & 247



L W H
2.62 X 1.46 X 4.06

- 12 OR 14 PIN PLUG-IN.
WITH INTEGRAL LOCKING CLIP
- RUGGED INDUSTRIAL DESIGN
- STYLE 246 - ON DELAY,
STYLE 247 - OFF DELAY
- ±3% REPEATABILITY
- 2 - 4 POLE CONTACT
CONFIGURATIONS
- LARGE CHOICE OF OPTIONS

SEE CATALOG PAGE

SILVER CADMIUM OXIDE,
GOLD DIFFUSED
50 MILLIOHMS MAX. INITIAL

10 AMPS @ 120/240 VAC, 28 VDC

24 TO 240 VAC
12 TO 250 VDC

85 % TO +110 % (AC),
80 % TO +110 % (DC)
OF NOMINAL

YES - DC

- 10°C to +55°C
- 55°C to +70°C

0.1 SECOND TO 300 SECONDS

1500 V rms

100,000 OPERATIONS
10,000,000 OPERATIONS



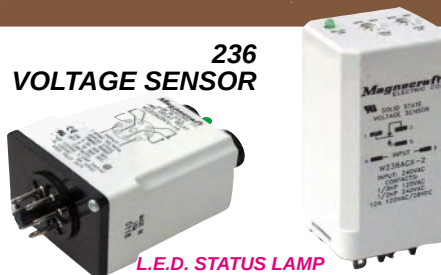
UL Recognized
File No. E13224



LISTED
367G
UL Listed With
Magnecraft Socket



246 SERIES

236
VOLTAGE SENSOR

L.E.D. STATUS LAMP

L W H
SEE PAGE 26

- SQUARE BASE OR OCTAL PLUG-IN
- INDEPENDENTLY ADJUSTABLE PICK AND
DROP OUT VOLTAGES
- TIME DELAYED ACTION AVAILABLE
- ±1% REPEATABILITY
- LED POWER INDICATOR
- FIELD ADJUSTABLE RECESSED POTS
OR KNOBS

SPDT, DPDT

SILVER CADMIUM OXIDE,
50 MILLIOHMS MAX. INITIAL

SPST:13 AMPS @ 120/240 VAC, 28 VDC
1/3 HP@ 120 VAC, 1/2 HP @ 240 / 480 VAC
3 AMPS @ 480 VAC.NEMA B300 PILOT DUTY
DPDT:10 AMPS @ 120 / 240 VAC, 28 VDC
1/3 HP@ 120 VAC, 1/2 HP @ 240 VAC
NEMA B300 PILOT DUTY

24 TO 480 VAC
24 VDC

-

YES - DC

- 30°C to +55°C
- 40°C to +85°C

SEE CATALOG PAGE

2500 V rms

100,000 OPERATIONS
10,000,000 OPERATIONS (DPDT)



UL Recognized
File No. E62636


Magnecraft & Struthers-Dunn
Your Contact for Relays

U. S. A.

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FAX: 4989 / 7559344

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APPLICATION DATA

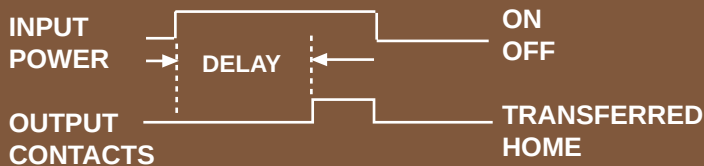
WHAT IS A TIME DELAY RELAY:

A Time Delay relay is a combination of an electromechanical output relay and a control circuit. The control circuit is comprised of solid state components and timing circuits that control operation of the relay and timing range. Typical time delay functions include On-Delay, Off-Delay, Repeat cycle, One Shot, Interval, On-Delay & Off Delay (Combination) and True Off Delay. Each function is explained below. Time delay relays have a broad choice of timing ranges from less than one second to hours. There is a choice of timing adjustments from calibrated external knob, recessed pots or internally fixed timing. The output contacts on the electromechanical output relay are direct wired to the output terminals. The contact load ratings are specified for each specific type of time delay relay.

TIMING FUNCTIONS:

ON-DELAY- (SLOW OPERATE RELAY)

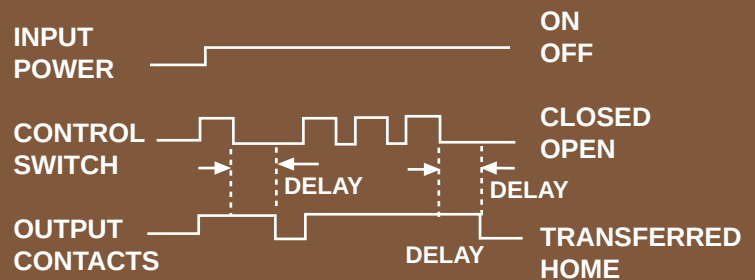
Upon application of power to the input, the time delay period begins. At the end of the time delay period, output contacts transfer. Input power must be removed to return output contacts to home position and reset the control circuit. If input power is interrupted before a timing period ends, timing stops. When input power is restored, timing starts from the beginning.



Some typical Applications: Cascade starting, Air Conditioning & heating controls, Burglar Alarms, Power Outage delay, instrument Control.

OFF-DELAY (SLOW RELEASE RELAY)

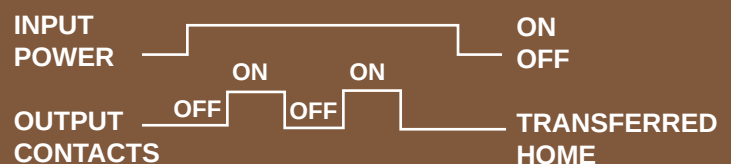
Continuous power must be applied to input during all timing sequences. Upon closure of external control switch, output contacts transfer. Upon opening control switch, the timing period begins. When timing period ends, output contacts return home. To repeat this timing cycle, the control switch must be re-closed and then opened. If input power is interrupted during timing cycle, the output contacts return to home position and the control switch must be closed and reopened to start the timing from the beginning. If the control switch closes during a timing period, timing stops and output contacts remain transferred. When control switch is opened, timing will start again from the beginning. The timing period can be extended, repeatedly using the control switch in this way until the last initiated timing period is permitted to end and output contacts return home.



Some typical Applications: Air Conditioning, automatic Door Controls, Lighting Controls, burglar alarms, Vending Machines, circuits, conveyor systems, instrument control, watchdog circuits.

REPEAT CYCLE (FLASHER)

Upon application of power to the input, the Off time delay Period begins. The contacts transfer at the end of the Off time Delay Period and the ON time delay period begins. At the end of the ON time delay period output contacts return home and OFF time delay period begins again. This sequence will continue as long as input power is supplied to the Input Pins.

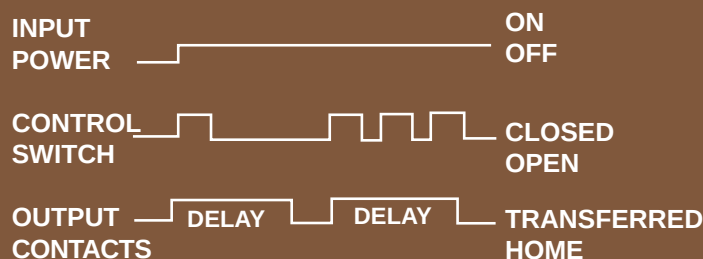


Some typical Applications: Signs, Product testing, signal devices, machine control, Signal warning devices, conveyor control.



ONE SHOT (RETRIGGERABLE)

Continuous power must be applied to the input during all timing sequences. Upon closure of external control switch, output contacts transfer and timing period begins. When timing period ends, output contacts return home. Once the timing period begins, the control switch may remain closed or opened without affecting timing. To repeat this cycle, the control switch must be open, or opened at the end of the timing period, and then closed to start timing period over again.



Some typical Applications: Vending machines, dispensing controls, machine control, welding control,

INTERVAL

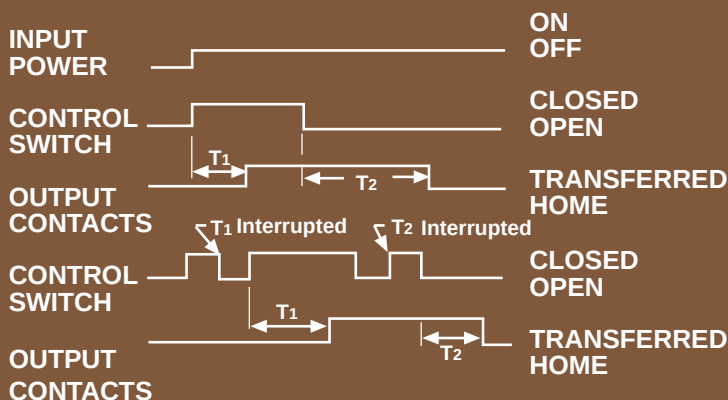
Upon application of power to the input, the output contacts transfer and the delay period begins. At the end of the time delay period, the output contacts return home. Input power must be interrupted to recycle timer.



Some typical Applications: Machine control, End of process alarm, Welding control, Photographic timing.

ON-DELAY & OFF-DELAY- (COMBINATION)

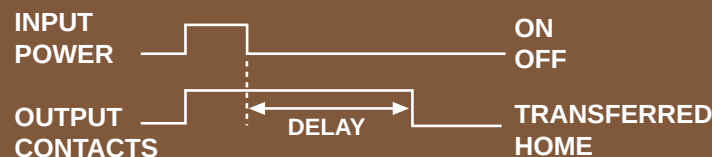
Continuous power must be applied to the input during all timing sequences. Upon closure of the external control switch, first time delay period T_1 begins. When T_1 period ends, output contacts transfer. Then, when control switch is opened, second delay period T_2 begins. When T_2 ends, output contacts return home. To repeat this timing cycle, repeat this sequence from the beginning. If the prevailing open or closed status of the control switch is changed during either T_1 or T_2 Timing periods, timing stops. Position of output contacts remain as they were. Returning control switch to its pre-changed position restarts interrupted timing period from the beginning and normal timing resumes.



Some typical Applications: Cascade starting & stopping of heavy loads, laboratory equipment, machine control

TRUE OFF DELAY- (SLOW RELEASE)

Upon application of power to the input, output contacts transfer. The delay period begins when power is removed from the input. If power is supplied to input during the timing period, time is reset and time delay period starts over again when power is removed from the input.



Some typical Applications: Loss of power alarm control, Burglar alarms.



U. S. A.

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FAX: 4989/ 7559344
WEBSITE: www.magnecraft.com
EMAIL: renatesteinback@magnecraft.de

DPDT, 10 AMPS

**THE CLASS 211 TIME DELAY RELAY
MAKES USE OF HYBRID CIRCUITRY,
COMBINING INTEGRATED CIRCUITS
FOR A MULTITUDE OF TIMING FUNCTIONS,
AND THE RELIABILITY OF RELAY TECHNOLOGY.**

UL **us**
UL Recognized
File No. E43641



UL LISTED
367G



COMPLIES WITH REQUIREMENTS OF

- * IEC STANDARDS 947-4-1 AND 947-5-1 LOW VOLTAGE DIRECTIVE
- * IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION
- * CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

WHEN USED
WITH SOCKETS
70-464-1 (8 PIN)
70-465-1 (11 PIN)

GENERAL SPECIFICATIONS

TIMING

Operating Modes Available:	On delay, off delay, Interval, one shot
Timing Adjustments Available:	0.1 to 120 minutes
Repeatability (Repeat Accuracy when Stabilized):	$\pm 0.1\%$ max. or ± 33 mS AC min. or ± 10 mS DC. min. @ constant voltage & temperature
Timing Change Over Temperature and Voltage Range:	$\pm 10\%$
Timing Tolerance High End:	- 0 to + 40%
Timing Tolerance Low End :	+ 0 to - 40%
Reset Time:	100 milliseconds max.

CONTACTS

Contact Rating:	10 amps @ 120VAC / 30VDC resistive load, 1/2 Hp @ 240 VAC, 1/3 Hp @ 120 VAC, NEMA B300 pilot duty
Contact Life:	200,000 operations @ 120VAC, 10 amps resistive load 1,000,000 operations @ 120 VAC, 5 amps resistive load 2,000,000 operations @ 120VAC, 2 amps resistive load
Mechanical Life:	10,000,000 operations

INPUT

Operating Voltage Range:	AC: 85 % to 110 %, DC: 80 % to 110 % of nominal
Temperature range (Operate):	- 30 °C to + 55°C
Temperature range (Storage):	- 55°C to + 85°C
Steady State Input Current:	80 mA @ 24 VAC, 20 mA @ 120 VAC, 15 mA @ 230 VAC, 80 mA @ 12 VDC, 50 mA @ 28 VDC, 30 mA @ 48 VDC

PROTECTION

Reverse Polarity:	Yes - DC
Transient:	UL 508 surge test: 5000V for 50 uS
Noise Immunity:	NEMA ICS2-230 2500 VAC

DIELECTRIC STRENGTH

Coil to Contacts:	1500 V rms
Across Open Contacts:	1000 V rms

MECHANICAL

Operating Position:	Any
Enclosure:	Polycarbonate dust cover
Mounting:	Standard 8 or 11 pin octal
Weight:	115 grams approx

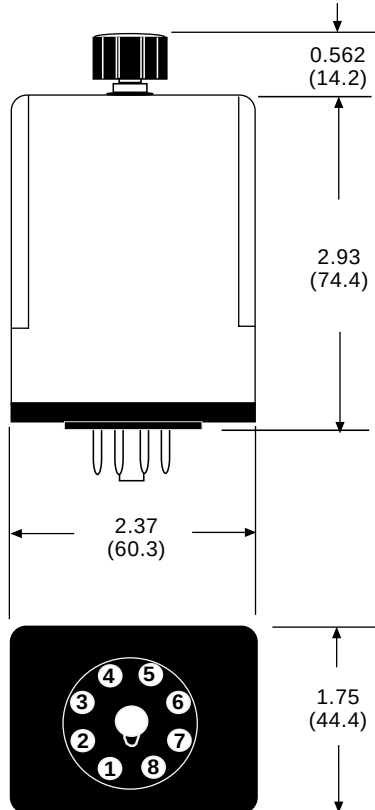


Mating Sockets
70-750D8-1, 70-750D11-1,
70-464-1, 70-465-1: SCREW/DIN
70-169-1, 70-170-1: SCREW/PANEL
See section 8, page 7 - 12

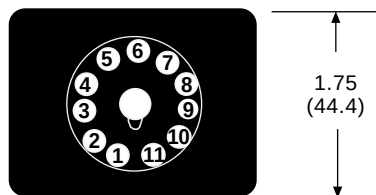
DPDT, 10 AMPS

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



8 PIN OCTAL



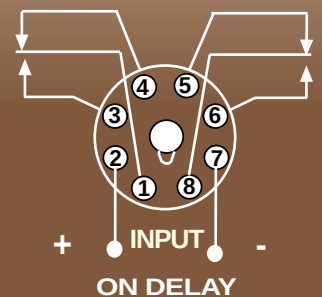
11 PIN OCTAL

ON-DELAY

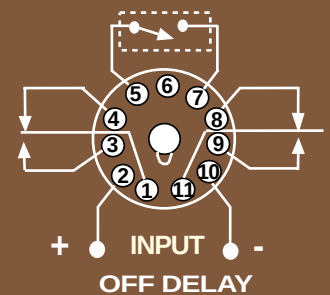
OFF-DELAY



WIRING DIAGRAMS



EXTERNAL CONTROL SWITCH



EXTERNAL SWITCH SHALL NOT BE CONNECTED TO ANY EXTERNAL LOAD OR VOLTAGE. DAMAGE TO INTERNAL COMPONENTS CAN OCCUR.

STANDARD PART NUMBERS	NOMINAL INPUT VOLTAGE	TIMING RANGE
ON DELAY		
W211ACPSOX-18	120 VAC	0.1 TO 1.0 SECONDS
W211ACPSOX-5	120 VAC	0.1 TO 10 SECONDS
W211ACPSOX-7	120 VAC	1.0 TO 180 SECONDS
W211ACPSOX-8	120 VAC	2.0 TO 300 SECONDS
W211ACPSOX-60	120 VAC	1.0 TO 15 MINUTES
W211ACPSOX-61	120 VAC	2.0 TO 30 MINUTES
W211ACPSOX-62	120 VAC	4.0 TO 60 MINUTES
W211ACPSOX-63	120 VAC	8.0 TO 120 MINUTES
W211CPSOX-1	24 VDC	0.1 TO 10 SECONDS
W211CPSOX-3	24 VDC	1.0 TO 180 SECONDS
OFF DELAY		
W211ACPSRX-5	120 VAC	0.1 TO 10 SECONDS
W211ACPSRX-7	120 VAC	1.0 TO 180 SECONDS
W211ACPSRX-8	120 VAC	2.0 TO 300 SECONDS
W211ACPSRX-60	120 VAC	1.0 TO 15 MINUTES
W211CPSRX-1	24 VDC	0.1 TO 10 SECONDS
W211CPSRX-3	24 VDC	1.0 TO 180 SECONDS

SPDT & DPDT, 12 AMPS**FEATURES**

5 TIMING FUNCTIONS, TIMING RANGES FROM 0.1 SECONDS TO 9,990 HOURS, UNIVERSAL VOLTAGE INPUT AND 12 AMP OUTPUT FOR HIGHER POWER APPLICATIONS

UNIVERSAL POWER SUPPLY ALLOWS FOR INPUT VOLTAGES FROM 24 TO 240 VDC OR VAC 50/60HZ.

CLASS "F" INSULATION SYSTEM

THUMB WHEEL ADJUSTMENTS FOR FUNCTION AND TIMING

RED L.E.D. LAMP INDICATOR

0.1 % ACCURACY USING A CRYSTAL CLOCK

MOUNTING CLIP ALLOWS FOR VARIED PANEL THICKNESSES,

BENEFITS

FIVE FUNCTIONS - ONE PACKAGE

ONE PART FOR MOST VOLTAGES

12 AMPS CONTACT RATING

POSITIVE POSITION THUMB WHEEL ADJUSTMENT

STATUS L.E.D.

ACCURATE TIME, ALL THE TIME

PANEL CLIP INCLUDED



UL Recognized
File No. E43641



PENDING

COMPLIES WITH REQUIREMENTS OF

- * IEC STANDARDS 947-4-1 AND 947-5-1 LOW VOLTAGE DIRECTIVE
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- * CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

**MANUFACTURED UNDER
ISO 9002 & QS 9000**

GENERAL SPECIFICATIONS**TIMING**

Operating Modes Available: On delay, repeat, one shot, off delay & interval
Timing Adjustments: 0.1 second to 9,990 hours
Repeatability: 0.1%, (Internal crystal)
(Constant Voltage and Temperature)

CONTACTS

Contact Material: Silver cadmium oxide, gold flashed
Contact Rating: 12 amps @ 120 / 240 VAC, 30 VDC resistive
1/3 Hp @ 120 VAC 1/2 Hp @ 240 VAC

INPUT

Voltage Range: 24 to 240 VDC / VAC $\pm 15\%$, 50/60 Hz.
Temperature Range (Operate): -10°C to $+55^{\circ}\text{C}$
Temperature Range (Storage): -40°C to $+85^{\circ}\text{C}$
Transient Protection: Yes
Reverse Polarity Protection: Non polarity sensitive

DIELECTRIC STRENGTH

Between Output Poles: 1,500 V rms
Between Input and Output: 1,500 V rms

LIFE EXPECTANCY

Electrical: 100,000 operations
Mechanical: 10,000,000 operations

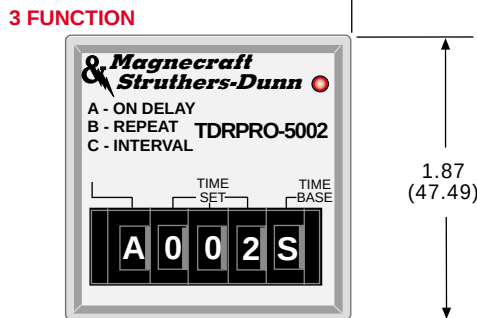
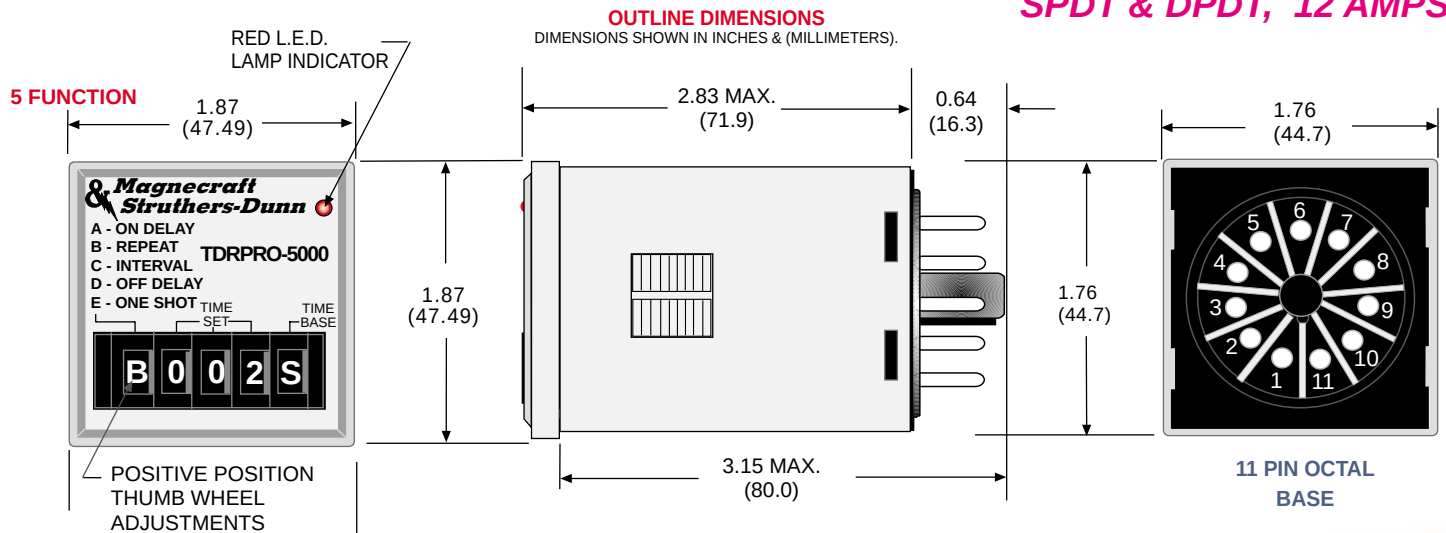
MISCELLANEOUS

Operating Position: Any
Enclosure: Gray polycarbonate
Mounting: 11 pin octal plug-in, 8 pin octal
1.8 x 1.8 (45 x 45) panel cutout
Weight: 122 grams approx.

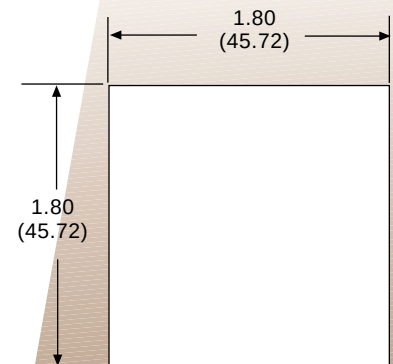
**Mating Sockets**

**70-750D8-1, 70-750D11-1,
70-464-1, 70-465-1: SCREW/DIN
70-169-1, 70-170-1: SCREW/PANEL
See section 8, page 7 - 12**

SPDT & DPDT, 12 AMPS

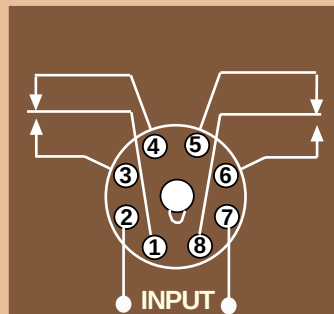


PANEL CUTOUT
FOR PANEL MOUNTING



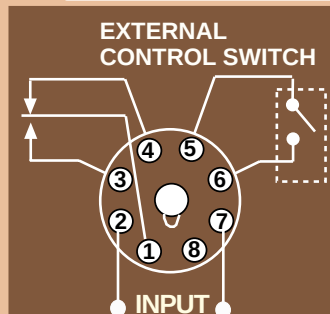
WIRING DIAGRAMS

VIEWED FROM PIN END



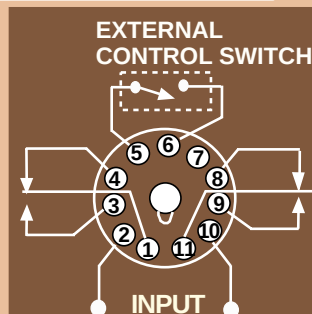
TDRPRO-5002

EXTERNAL CONTROL SWITCH



TDRPRO-5001

EXTERNAL CONTROL SWITCH



TDRPRO-5000

EXTERNAL SWITCH SHALL NOT BE CONNECTED TO ANY EXTERNAL LOAD OR VOLTAGE. DAMAGE TO INTERNAL COMPONENTS CAN OCCUR.

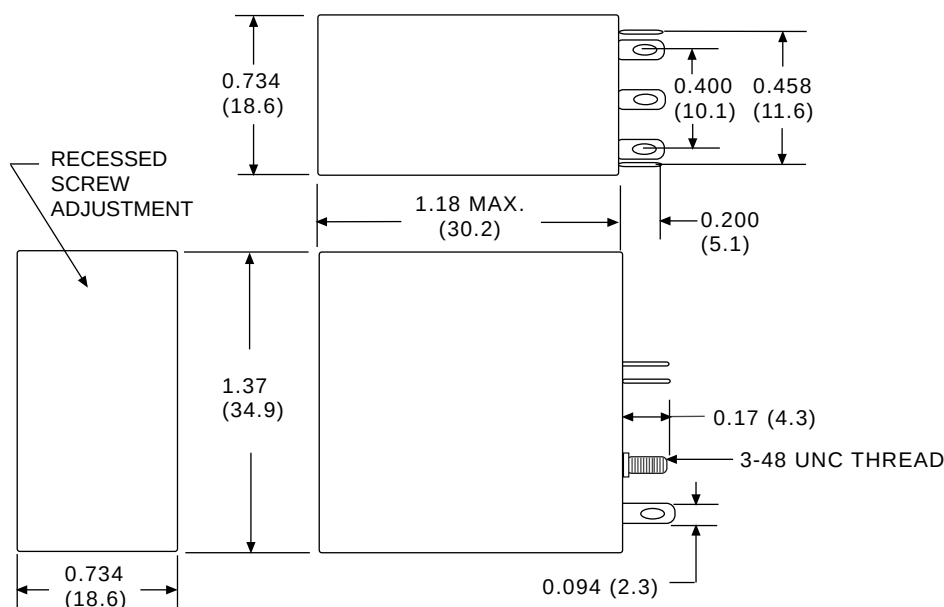
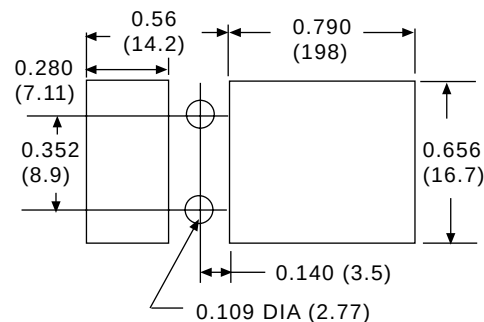


STANDARD PART NUMBERS	NOMINAL INPUT VOLTAGE	TIMING RANGE
5 FUNCTION - 11 PIN		
TDRPRO-5000	24-240 VAC 24-240 VDC	0.1 SECOND TO 9,990 HOURS
5 FUNCTION - 8 PIN		
TDRPRO-5001	24-240 VAC 24-240 VDC	0.1 SECOND TO 9,990 HOURS
3 FUNCTION - 8 PIN		
TDRPRO-5002	24-240 VAC 24-240 VDC	0.1 SECOND TO 9,990 HOURS

DPDT, 5 AMPS

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

UL Recognized
File No. E43641CHASSIS CUTOUT
FOR PANEL MOUNTING

GENERAL SPECIFICATIONS

TIMING

Operating Modes Available:	On delay,
Timing Adjustments Available:	0.1 to 450 seconds
Repeatability	
(Repeat Accuracy when Stabilized):	± 2% max. @ nominal voltage @ 25°C
Reset time:	100 milliseconds max.

CONTACTS

Contact Rating:	5 Amps @ 120VAC / 28 VDC resistive
Contact Life:	50,000 operations @ 120 VAC, 5 amps resistive 1,500,000 operations @ 120 VAC, 2 amps resistive load 12,000,000 operations @ 120 VAC, 1 amp resistive load 10,000,000 operations
Mechanical Life:	

INPUT

Operating Voltage Range:	AC: 85 % to 110 %, DC: 80 % to 110 % of nominal
Temperature Range (Operate):	-30°C to + 55°C
Temperature Range (Storage):	-50°C to +85°C
Steady State Input Current:	40 mA @ 24 VDC, 80 mA @ 12 VDC

PROTECTION

Reverse Polarity:	Yes - DC
Transient:	Twice nominal voltage for 1 millisecond

DIELECTRIC STRENGTH

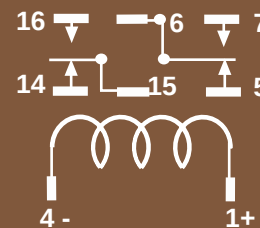
Coil to Contacts:	500 V rms
Across Open Contacts:	1250 V rms

MECHANICAL

Operating Position:	Any
Enclosure:	Polycarbonate dust cover
Mounting:	Socket plug-in/solder also available with printed circuit terminals
Weight:	35.2 grams approx



WIRING DIAGRAM



Chassis Mount Socket:

70-307-1

PCB Socket:

70-308-1

See section 8, page 25. 26

STANDARD
PART
NUMBERSNOMINAL
INPUT
VOLTAGETIMING
RANGE

ON DELAY

W67CPSOX-1

12 VDC

0.1 TO 30 SECONDS

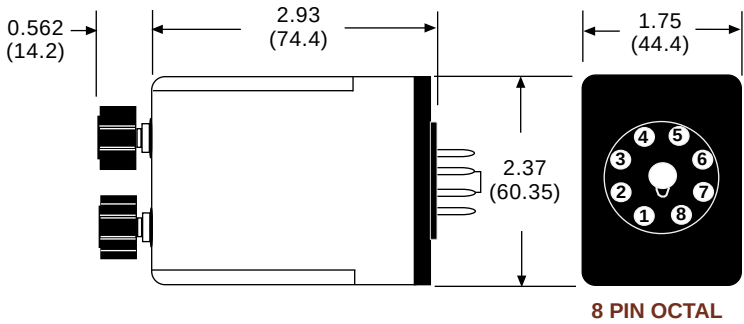
W67CPSOX-2

24 VDC

0.1 TO 30 SECONDS

DPDT, 5 AMPS

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).




UL Recognized
File No. E43641



COMPLIES WITH REQUIREMENTS OF

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INDEPENDENT TIME
SETTINGS FOR BOTH
“ON” AND “OFF”
TIMING RANGES

GENERAL SPECIFICATIONS

TIMING

- Operating Modes Available:
Timing Adjustments Available:
Repeatability
(Repeat Accuracy when Stabilized):

Timing change over temperature
and voltage range:
Timing Tolerance high end of range:
Timing Tolerance low end of range:
Reset time:
- Repeat cycle timing
0.1 to 30 minutes

±0.1% Max. or ± 33 mS AC min. or ± 10 mS DC. min.
@ constant voltage & temperature

± 10%
- 0 to + 40%
+ 0 to - 40%
100 milliseconds max.

CONTACTS

- Contact Rating:

Contact Life:

Mechanical Life:
- 10 Amps @ 120 / 240 VAC, 30 VDC resistive load,
1/2 Hp @ 240 VAC, 1/3 Hp @120 VAC,
NEMA B300 pilot duty

200,000 operations @ 120VAC, 10Amp resistive load
1,000,000 operations @ 120 VAC, 5 Amp resistive load
2,000,000 operations @ 120VAC, 2 Amps resistive load
10,000,000 operations

INPUT

- Operating Voltage Range:
Temperature Range (Operate):
Temperature Range (Storage):
Steady State Input Current:
- AC: 85% to 110%, DC: 80% to 110% of nominal
-30°C to +55°C
-55°C to +85°C
25 mA @ 120 VAC, 25 mA @ 240 VAC,
80 mA @ 12 VDC, 40 mA @ 24 VDC, 24 mA @ 48 VDC.

PROTECTION

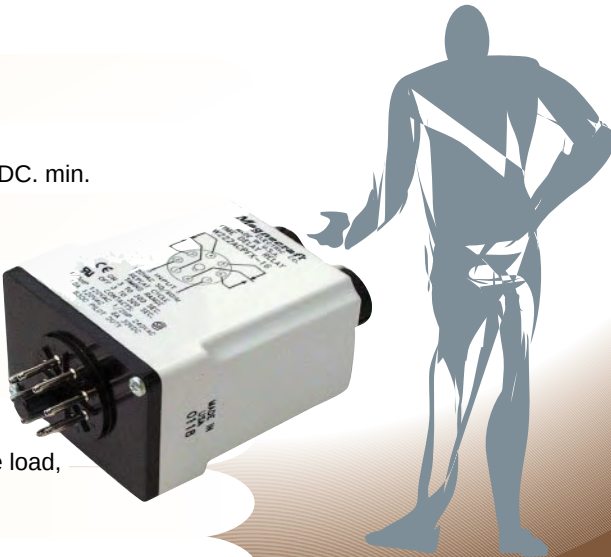
- Reverse Polarity:
Transient:
Noise Immunity:
- Yes - DC
UL 508 saurge test: 5000V for 50 uS
NEMA ICS2-230 2500 VAC

DIELECTRIC STRENGTH

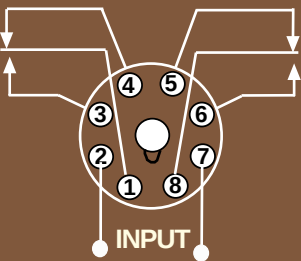
- Coil to Contacts:
Across Open Contacts:
- 1500 V rms
1000 V rms

MECHANICAL

- Operating Position:
Enclosure:
Mounting:
Weight:
- Any
Polycarbonate dust cover
8 pin octal
132 grams approx.



WIRING DIAGRAM



Mating Sockets
70-750D8-1, 70-750D11-1,
70-464-1, 70-465-1: SCREW/DIN
70-169-1, 70-170-1: SCREW/PANEL
See section 8, page 7 - 12

STANDARD PART NUMBERS	NOMINAL INPUT VOLTAGE	TIMING RANGE
REPEAT CYCLE		
W222ACPFX-11	120 VAC	0.1 TO 10 SECONDS
W222ACPFX-16	120 VAC	3 TO 300 SECONDS
W222ACPFX-27	120 VAC	2 TO 30 MINUTES

DPDT, 12 AMPSUL Recognized
File No. E52197

COMPLIES WITH REQUIREMENTS OF

- * IEC STANDARDS 947-4-1 AND 947-5-1 LOW VOLTAGE DIRECTIVE
- * IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION
- * CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

"ON" OR "OFF" DELAY FUNCTIONS
EXTERNAL RESISTANCE ADJUSTABLE
± 3 % REPEATABILITY DPDT, 12 AMP

GENERAL SPECIFICATIONS

TIMING

Operating Modes Available:	On delay, off delay
Timing Adjustments Available:	0.1 to 120 seconds
Repeatability:	±3% @ nominal voltage @ 25°C
Percent Timing Change Over Temperature and Voltage Range:	±10%
Timing Tolerance High End :	-0 to +40%
Timing Tolerance Low End:	+0 to -40%

CONTACTS

Contact Rating:	12 amps @ 120 VAC/28 VDC resistive 1/3 HP, 120 VAC, 1/2 HP, 240 VAC B300 pilot duty.
Contact Life:	100,000 operations @ 120 VAC 12 amps resistive load. 1,000,000 operations @ 28 VDC 5 amps resistive load.
Mechanical Life:	5,000,000 operations

INPUT

Operating Voltage Range:	AC: 85% to 110%, DC: 80% to 110% of nominal
Temperature Range (Operate):	- 30°C to + 55°C
Temperature Range (Storage):	- 55°C to + 85°C
Steady State Input Current:	20 mA @ 120 VAC, 60 mA @ 24 VDC

PROTECTION

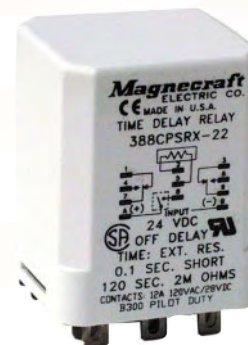
Reverse Polarity:	Yes - DC
Transient:	Twice nominal voltage for 1 millisecond

DIELECTRIC STRENGTH

Coil to Contacts:	1500 V rms
Across Open Contacts:	1000 V rms

MECHANICAL

Operating Position:	Any
Enclosure:	Polycarbonate dust cover
Terminals:	0.187 x 0.020" quick connect terminals
Weight:	96 grams approx.

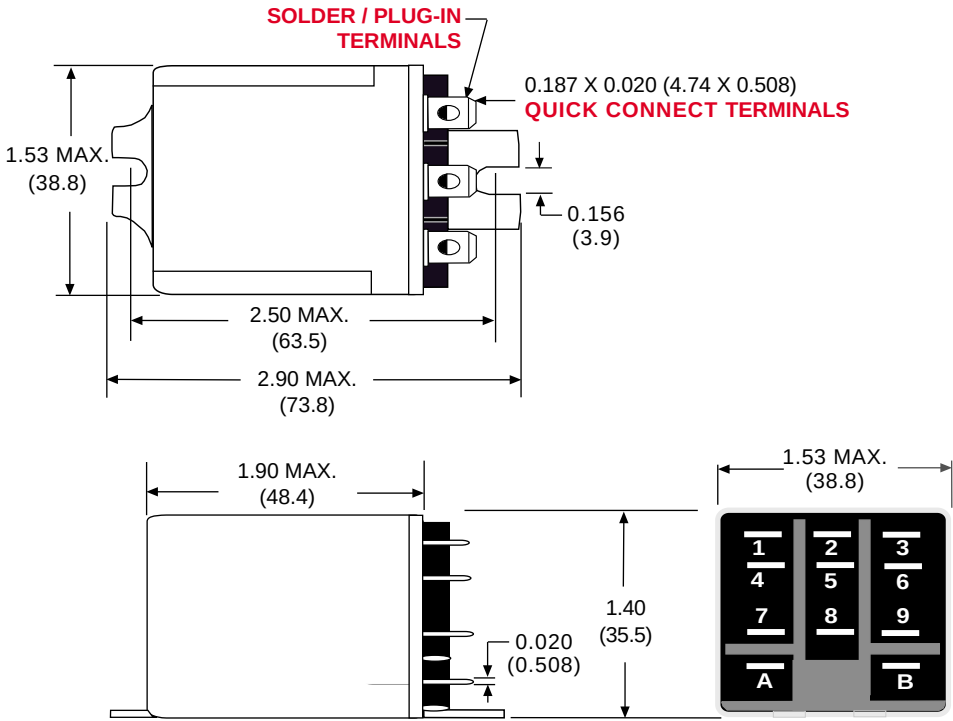


Mating Sockets

70-463-1: SCREW/DIN
70-124-1: SOLDER
70-178-1, 70-178-2: PRINTED CIRCUIT
70-124-2: QUICK CONNECT
 See section 8, page 16, 17

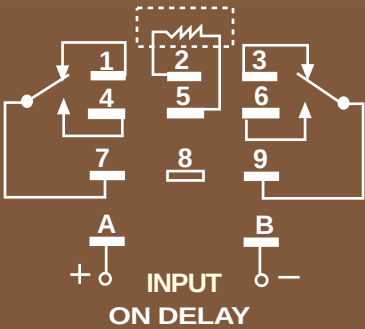
DPDT, 12 AMPS

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

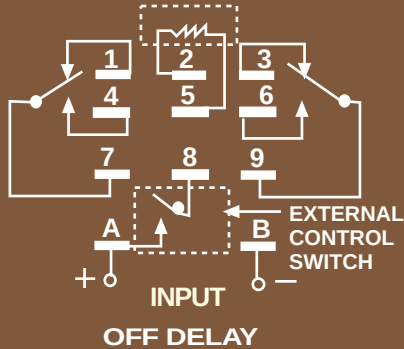


WIRING DIAGRAMS

EXTERNAL RESISTOR



EXTERNAL RESISTOR



EXTERNAL SWITCH SHALL NOT BE CONNECTED TO ANY EXTERNAL LOAD OR VOLTAGE. DAMAGE TO INTERNAL COMPONENTS CAN OCCUR.

THE PLUG-IN STYLE TIMER HAS THE SAME CASE DIMENSIONS AS THE FLANGE MOUNT STYLE EXCEPT IT HAS NO FLANGE AND IT IS ALSO SOCKET MOUNTABLE.

STANDARD PART NUMBERS	NOMINAL INPUT VOLTAGE	TIMING RANGE	EXTERNAL RESISTOR
ON DELAY PLUG-IN STYLE			
W388ACPSOX-1	120 VAC	0.1 TO 10 SECONDS	20,000 Ω
W388ACPSOX-2	120 VAC	1.0 TO 120 SECONDS	PER SECOND
W388CPSOX-1	24 VDC	0.1 TO 10 SECONDS	16,000 Ω
W388CPSOX-2	24 VDC	1.0 TO 120 SECONDS	PER SECOND
ON DELAY SURFACE MOUNT FLANGE STYLE			
W388ACQSOX-1	120 VAC	0.1 TO 10 SECONDS	20,000 Ω
W388ACQSOX-2	120 VAC	1.0 TO 120 SECONDS	PER SECOND
W388CQSOX-2	24 VDC	1.0 TO 120 SECONDS	
OFF DELAY PLUG-IN STYLE			
W388CPSRX-22	24 VDC	1.0 TO 120 SECONDS	16,000 Ω PER SECOND



DPDT, 12 AMPS**THE CLASS 388 IS KNOB ADJUSTABLE****"ON" OR "OFF" DELAY FUNCTIONS.****DPDT, 12 AMP CONTACTS, $\pm 0.1\%$ REPEATABILITY,**UL Recognized
File No. E43641

COMPLIES WITH REQUIREMENTS OF

- * IEC STANDARDS 947-4-1 AND 947-5-1 LOW VOLTAGE DIRECTIVE
- * IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION
- * CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

GENERAL SPECIFICATIONS

TIMING

Operating Modes Available:	On delay, off delay
Timing Adjustments Available:	0.1 to 30 minutes
Repeatability:	$\pm 0.1\%$ ± 33 mS AC min. or ± 10 mS DC @ constant voltage & temperature
Timing Change Over Temperature and Voltage Range:	$\pm 10\%$
Timing Tolerance High End:	-0 to +40%
Timing Tolerance Low End:	+0 to -40%
Reset Time:	100 mS max.

CONTACTS

Contact Rating:	12 amps @ 120 VAC / 28 VDC resistive 1/3 Hp, 120 VAC, 1/2 Hp, 240 VAC NEMA B300 pilot duty
Contact Life:	100,000 operations @ 120 VAC, 12 amps resistive load 1,000,000 operations @ 120 VAC, 5 amps resistive load 2,000,000 operations @ 120 VAC, 2 amps resistive load
Mechanical Life:	5,000,000 operations

INPUT

Operating Voltage Range:	AC: 85% to 110%, DC: 80% to 110% of nominal
Temperature Range (Operate):	-30°C to +55°C
Temperature Range (Storage):	-55°C to +85°C
Steady State Input Current:	15 mA @ 230 VAC, 20 mA @ 120 VAC, 80 mA @ 24 VAC, 20 mA @ 48 VDC, 60 mA @ 24 VDC, 120 mA @ 12 VDC

PROTECTION

Reverse Polarity:	Yes - DC
Transient:	UL 508 Surge test: 5000V for 50 μ S
Noise Immunity:	NEMA ICS2-230: 2500 VAC

DIELECTRIC STRENGTH

Coil to Contacts:	2000 V rms
Across Open Contacts:	1000 V rms

MECHANICAL

Mounting Position:	Any
Enclosure:	Polycarbonate dust cover
Terminals:	0.187 x 0.020" quick connect terminals
Weight:	96 grams approx.



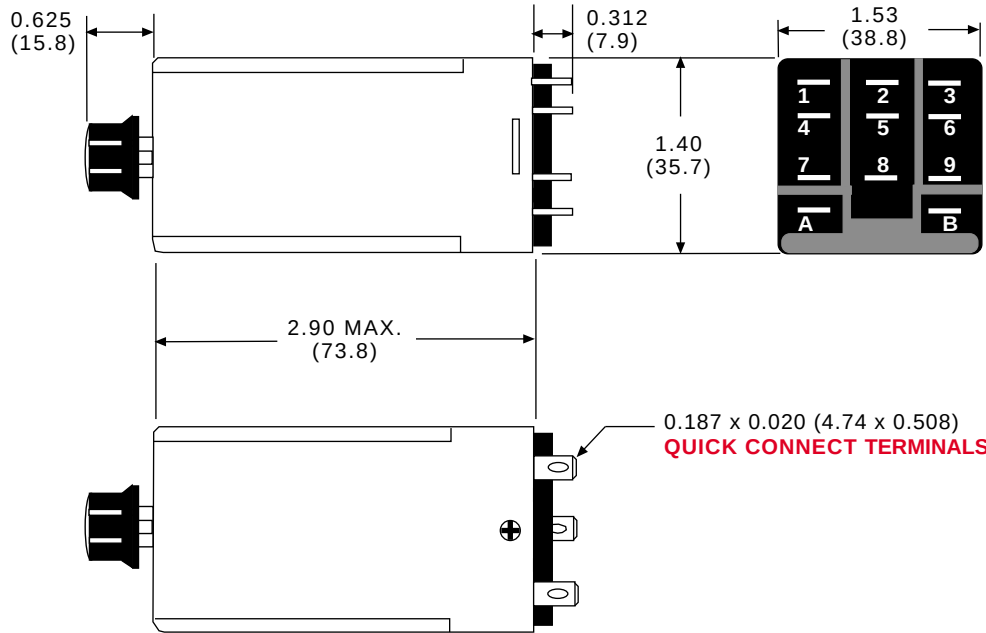
Mating Sockets

70-463-1: SCREW/DIN
70-124-1: SOLDER
70-178-1, 70-178-2: PRINTED CIRCUIT
70-124-2: QUICK CONNECT
 See section 8, page 16, 17

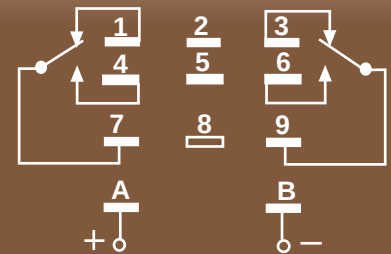
DPDT, 12 AMPS

OUTLINE DIMENSIONS

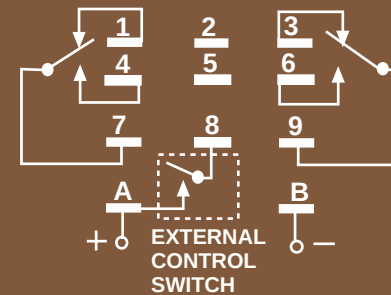
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



WIRING DIAGRAMS



INPUT
ON DELAY



INPUT
OFF DELAY

EXTERNAL SWITCH SHALL NOT BE CONNECTED TO ANY EXTERNAL LOAD OR VOLTAGE. DAMAGE TO INTERNAL COMPONENTS CAN OCCUR.

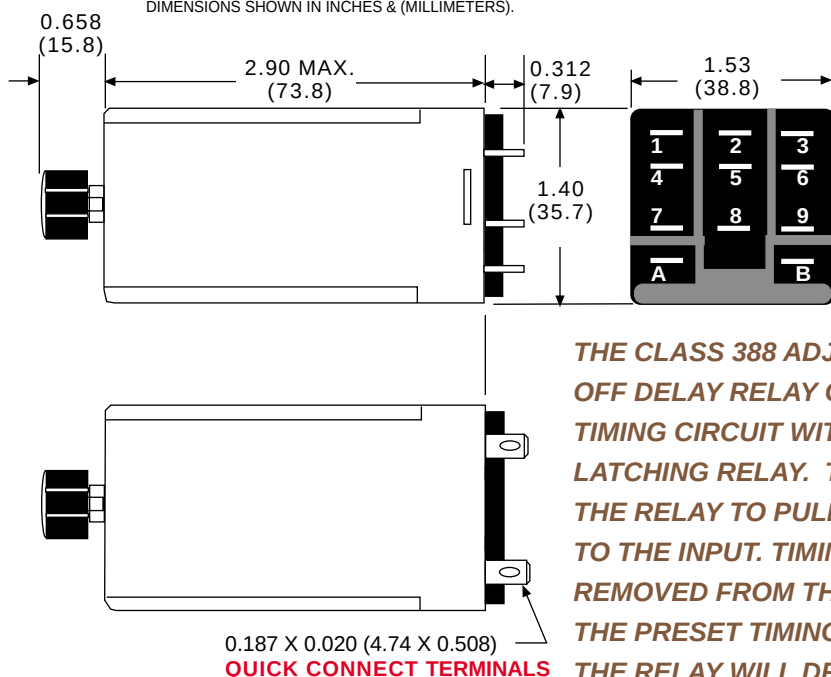


CALL FACTORY FOR OTHER VOLTAGES, TIME AND FUNCTIONS

STANDARD PART NUMBERS	NOMINAL INPUT VOLTAGE	TIMING RANGE
ON DELAY		
W388ACPSOX-42	120 VAC	0.1 TO 10 SECONDS
W388ACPSOX-44	120 VAC	1.0 TO 180 SECONDS
OFF DELAY		
W388CPSRX-2	24 VDC	0.1 TO 10 SECONDS
W388CPSRX-4	24 VDC	1.0 TO 180 SECONDS

DPDT, 12 AMPS**OUTLINE DIMENSIONS**

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



THE CLASS 388 ADJUSTABLE TRUE OFF DELAY RELAY COMBINES A SOLID STATE TIMING CIRCUIT WITH A STATE OF THE ART MAGNETIC LATCHING RELAY. THIS COMBINATION ALLOWS THE RELAY TO PULL-IN WHEN POWER IS APPLIED TO THE INPUT. TIMING STARTS WHEN POWER IS REMOVED FROM THE INPUT AND AT THE END OF THE PRESET TIMING PERIOD THE RELAY WILL DROPOUT.

UL
UL Recognized
File No. E43641



COMPLIES WITH REQUIREMENTS OF

- * IEC STANDARDS 947-4-1 AND 947-5-1 LOW VOLTAGE DIRECTIVE
- * IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION
- * CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

GENERAL SPECIFICATIONS**TIMING**

Operating Modes Available: True off delay
 Timing Adjustments Available: 0.1 to 5 Minutes
 Repeatability
 (Repeat Accuracy when Stabilized): $\pm 3\%$ @ nominal voltage & 25°C
 Reset Time: 100 mS max.

CONTACTS

Contact Rating: 12 amps @ 120 VAC/28 VDC resistive
 1/3 Hp, 120 VAC, 1/2 Hp, 240 VAC
 NEMA B300 pilot duty
 Contact Life: 100,000 operations @ 120 VAC 12 amps resistive load
 1,000,000 operations @ 120 VAC 5 amps resistive load
 2,000,000 operations @ 120 VAC 2 amps resistive load
 Mechanical Life: 5,000,000 operations

INPUT

Temperature Range Operate: -10°C to +55°C
 Temperature Range Storage: -40°C to +85°C
 Input Current: 10 mA @ 120VAC, 15 mA @ 24VDC

PROTECTION

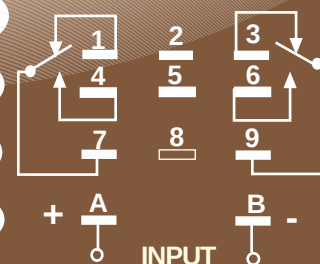
Reverse Polarity: Yes - DC
 Transient: 2000 VAC for 50 microseconds

DIELECTRIC STRENGTH

Coil to Contacts: 2000 V rms
 Across Open Contacts: 1000 V rms

MECHANICAL

Enclosure: Polycarbonate dust cover
 Mounting: Square base plug-in
 Terminals: 0.187" X 0.020" quick connect terminals
 Weight: 96 grams approx.

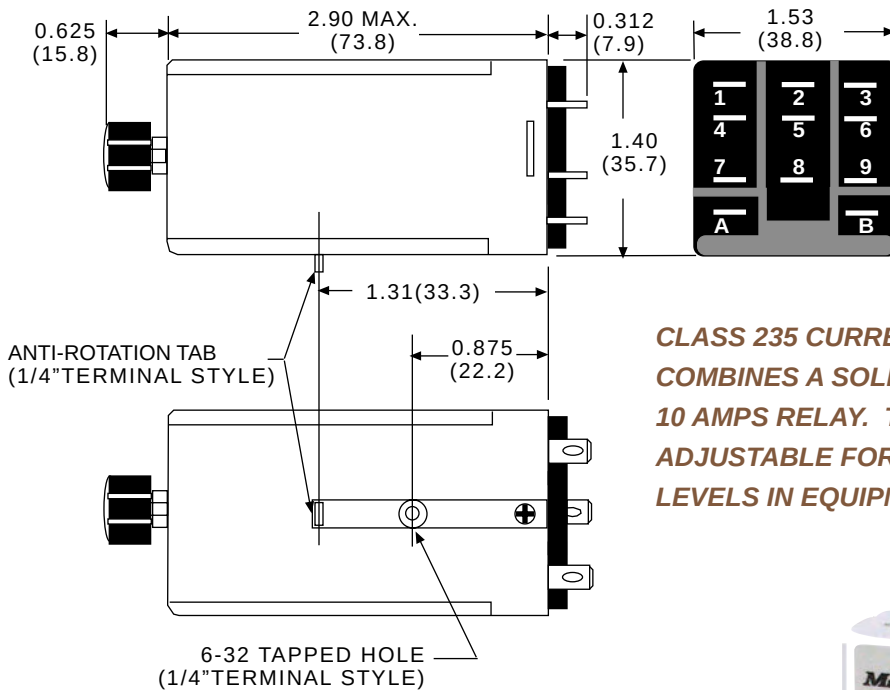
**WIRING DIAGRAM****Mating Sockets**

70-463-1: SCREW/DIN
 70-124-1: SOLDER
 70-178-1, 70-178-2: PRINTED CIRCUIT
 70-124-2: QUICK CONNECT
 See section 8, page 16, 17

STANDARD PART NUMBERS	NOMINAL INPUT VOLTAGE	TIMING RANGE
AC OPERATED		
W388ACPSRX-29	120 VAC	0.1 TO 10 SECONDS
W388ACPSRX-30	120 VAC	0.6 TO 60 SECONDS
DC OPERATED		
W388CPSRX-35	24 VDC	0.1 TO 10 SECONDS
W388CPSRX-36	24 VDC	0.6 TO 60 SECONDS

SPDT, 1.5 TO 15 AMPS

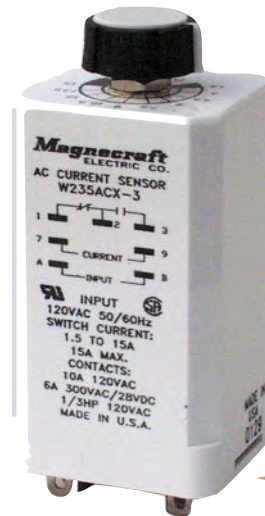
OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



UL Recognized
File No. E62636



CLASS 235 CURRENT SENSING RELAY
COMBINES A SOLID STATE SENSOR WITH A SPDT,
10 AMPS RELAY. THE SENSOR IS FIELD
ADJUSTABLE FOR DETECTING AC CURRENT
LEVELS IN EQUIPMENT.



GENERAL SPECIFICATIONS

CURRENT SENSING:

Sense Current Range: 1.5 to 15 amps
Repeatability: $\pm 2\%$ @ constant voltage & temperature
 $\pm 10\%$ over voltage & temperature range

CONTACTS

Contact Rating: 10 amps @ 120 VAC, 6 amps @ 28 VDC
Transient: 2000 V rms for 5 microseconds
Contact Life: 200,000 operations @ rated load
Mechanical Life: 5,000,000 operations @ no load

INPUT

Input Current: 15 mA (1.7 VA)
Current Sensor Resistance: 5 milliohms
Temperature Range Operate: -10°C to $+55^{\circ}\text{C}$
Temperature Range Storage: -40°C to $+85^{\circ}\text{C}$

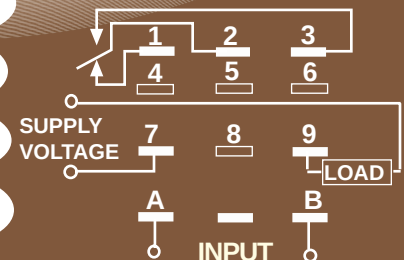
DIELECTRIC STRENGTH

Coil to Contacts: 2500 V rms
Across Open Contacts: 500 V rms

MECHANICAL

Enclosure: Polycarbonate dust cover
Terminals: 0.187 or 0.250 quick connect terminals
Mounting: Square base plug-in
Mounting Bracket: Optional
Weight: 113 grams approx.

WIRING DIAGRAM



CONTINUOUS VOLTAGE MUST BE SUPPLIED TO INPUT.

Mating Sockets

70-463-1: SCREW/DIN
70-124-1: SOLDER
70-178-1, 70-178-2: PRINTED CIRCUIT
70-124-2: QUICK CONNECT
See section 8, page 16, 17

STANDARD PART NUMBERS	NOMINAL INPUT VOLTAGE	CURRENT RANGE	TERMINAL SIZE
W235ACX-2	120 VAC	1.5 TO 15 AMPS	0.250"
W235ACX-3	120 VAC	1.5 TO 15 AMPS	0.187"



UL Recognized
File No. E13224

THE CLASS 286 ON DELAY & 287 OFF DELAY TIME DELAY RELAYS HAVE TIMING RANGES FROM 0.1 TO 300 SECONDS. THE 286 TIMER HAS UP TO THREE POLES AND THE 287 TIMER HAS UP TO TWO POLES. THE 286 & 287 TIME DELAY RELAYS ARE RATED AT 10 AMPS, 120/240 VAC, 28 VDC.

GENERAL SPECIFICATIONS

TIMING

Operating Modes Available:	On delay, off delay, Interval
Timing Adjustments Available:	0.1 to 300 minutes
Repeatability (Repeat Accuracy when Stabilized):	± 3% @ 20°C to 25°C (AC +16 mS)
Reset time:	150 mS max.

CONTACTS

Contact Material:	Silver cadmium oxide.
Contact Rating:	10 amps @ 120 / 240 VAC 10 amps @ 28 VDC 1/3 Hp @ 120 VAC 1/2 Hp @ 240 VAC
Contact Life:	100,000 operations @ rated load
Mechanical Life:	10,000,000 operations @ no load

INPUT

Operating Voltage Range:	AC: 85% , DC: 80% of nominal
Temperature Range (Operate):	10°C to +70 °C
Max. Allowed Voltage:	110% of nominal voltage

PROTECTION

Reverse Polarity:	Yes - DC
Transient:	2000 V for 5 mS

DIELECTRIC STRENGTH

Coil to Contacts:	1500 V rms
Across Open Contacts:	500 V rms

MECHANICAL

Operating Position:	Any
Enclosure:	Clear polycarbonate
Weight:	142 grams approx.



Mating Sockets

70-463-1: SCREW/DIN
70-124-1: SOLDER
70-178-1, 70-178-2: PRINTED CIRCUIT
70-124-2: QUICK CONNECT
See section 8, page 16, 17

ORDERING CODE FOR RELAYS

1, 2 & 3 POLE, 10 AMPS

286 XAX C 001 F 120A

CLASS:

286: ON DELAY
287: OFF DELAY

CONTACT ARRANGEMENTS:

XAX: SPDT
XBX: DPDT
XCX: 3PDT (286 ONLY)

MOUNTING OPTIONS:

C: PLUG-IN
C1 NOTE 1: 1BRACKET
CS1 NOTE 1: TOP STUD
C2: SIDE TAPPED HOLE
CS2: SIDE STUD

TIMING RANGES:

0.1 - 1.0 SEC: CODE 001
0.2 - 2.0 SEC: CODE 002
1.0 - 10 SEC: CODE 010
3.0 - 30 SEC: CODE 030
6.0 - 60 SEC: CODE 060
18 - 180 SEC: CODE 180
30 - 300 SEC: CODE 300

ADJUSTMENT OPTIONS

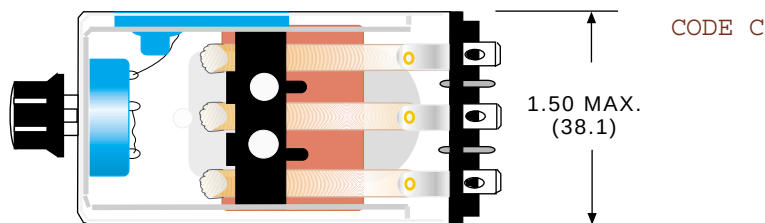
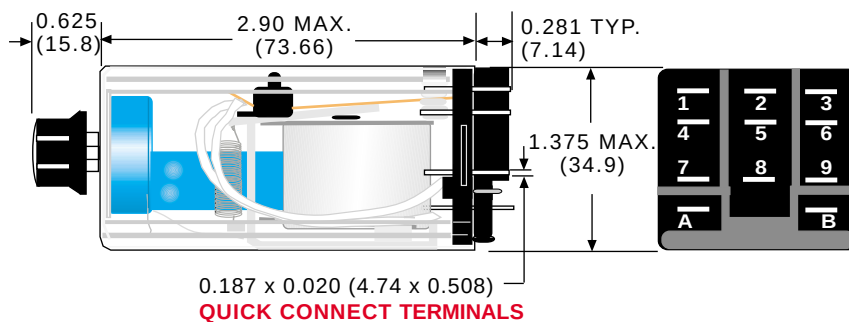
ADJUSTMENT KNOB: NO CODE
FIXED DELAY: SPECIFY FIXED TIME & CODE F *
REMOTE ADJUSTMENT: CODE R **

OPERATING VOLTAGE:

24, 48, 120, 240 ADD "A" FOR AC COILS
12, 24, 48, 115-125 ADD "D" FOR DC COILS

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

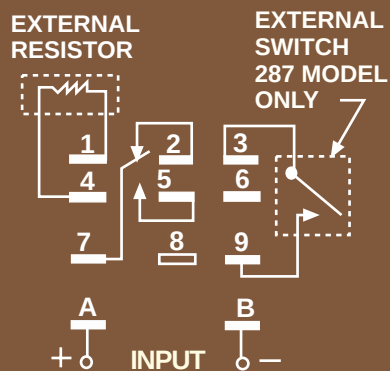


(F * Models) - timing code does not apply. Specify single delay time requirement
(R ** Models) - Available only for SPDT and DPDT models. External potentiometer required.
Example of typical fixed time delay relay part number - 286XBXCS1-3.5F-120A
(ON DELAY, DPDT, TOP STUD, 3.5 SEC FIXED, 120 VAC COIL INPUT)

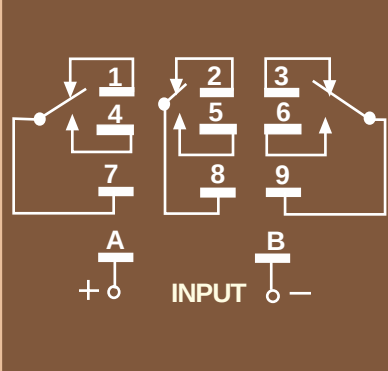
NOTE 1:

BRACKET & TOP STUD NOT AVAILABLE WITH
ADJUSTABLE TIMING.

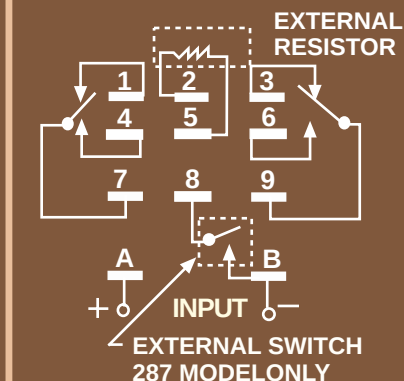
WIRING DIAGRAM



286XAX (SPDT)
287XAX (SPDT)



286XCX (3PDT)



286XBX (DPDT)
287XBX (DPDT)



ORDERING CODE FOR RELAYS**SPDT, DPDT & 3PDT 10 AMPS**UL Recognized
File No. E13224

326 **XAX** **48P 001** **F** **120A**

CLASS:
326: ON DELAY
327: OFF DELAY

CONTACT ARRANGEMENTS:
XAX: SPDT
XBX: DPDT
XCX: 3PDT

CONSTRUCTION STYLE:
OCTAL STYLE PLUG-IN: **CODE 48P**
NON STANDARD WIRING: **CODE 48P-K**

TIMING RANGES:
0.1 - 1.0 SEC: **CODE 001**
0.2 - 2.0 SEC: **CODE 002**
1.0 - 10 SEC: **CODE 010**
3.0 - 30 SEC: **CODE 030**
6.0 - 60 SEC: **CODE 060**
18 - 180 SEC: **CODE 180**
30 - 300 SEC: **CODE 300**

ADJUSTMENT:
ADJUSTMENT KNOB): **NO CODE**
FIXED DELAY: **SPECIFY FIXED TIME & CODE F ***
REMOTE ADJUSTMENT: **CODE R ****

OPERATING VOLTAGE:
24, 48, 120, 240 **ADD "A" FOR AC COILS**
12, 24, 48, 115-125 **ADD "D" FOR DC COILS**

F * Models) - timing code does not apply. Specify single delay time requirement
(R ** Models)- Available only for SPDT and DPDT models.
 External fixed or Adjustable resistor required.
Example of typical fixed time delay relay part number - **326XBX48P3.5F-120A**
 (ON DELAY, DPDT, OCTAL PLUG, 3.5 SEC FIXED, 120 VAC POWER INPUT)

GENERAL SPECIFICATIONS**TIMING**

Repeatability: DC: $\pm 3\%$ @ 20°C, AC: $\pm 3\%$ +16 mS @ 20°C
 Accuracy: Adjustable $\pm 10\%$ within temperature & voltage range
 Switching Time of Output Relay: 20 mS
 Min. Waiting Time Before Starting Next Cycle (Reset Time): 100 mS (for timing cycle up to 60 sec)
 150 mS (for timing cycle 60 to 300 sec)

CONTACTS

Contact Material: Silver cadmium oxide
 Rating: 10 amps @ 120 / 240 VAC, 10 amps @ 30 VDC,
 1/3 Hp @ 120 VAC, 1/2 Hp @ 240 VAC
 Electrical Life: 100,000 operations @ rated load
 Mechanical Life: 10,000,000 operations @ no load

INPUT

Nominal Voltage: AC: 24 to 240, DC: 12 to 125
 Minimum Oper. Voltage: AC - 85% of nominal; DC - 80% of nominal
 Max. Allowed Voltage: 110% of nominal voltage
 Ambient Temperature Rating: -10°C to +70 °C

DIELECTRIC STRENGTH

Across Open Contacts: 500 V rms
 Coil to Contacts: 1500 V rms
 Transient Protection: 2000 VAC for 5 mS

MECHANICAL

Enclosure: Clear polycarbonate
 Weight: 142 grams approx.

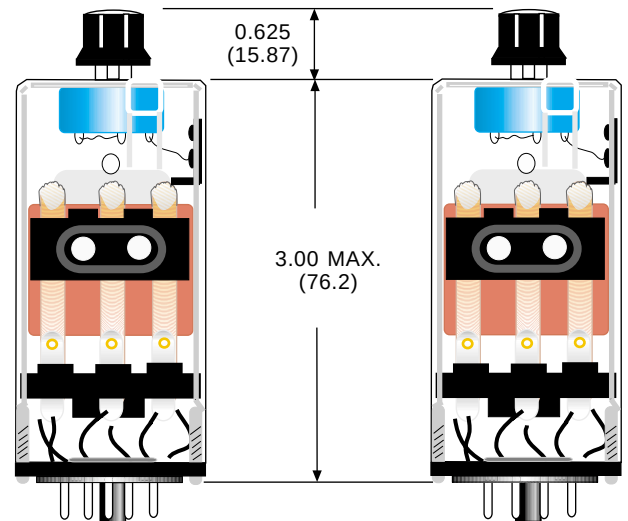
**Mating Sockets**

70-750D8-1, 70-750D11-1,
 70-464-1, 70-465-1: SCREW/DIN
 70-169-1, 70-170-1: SCREW/PANEL
 See section 8, page 7 - 12

1, 2 & 3 POLE, 10 AMPS

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



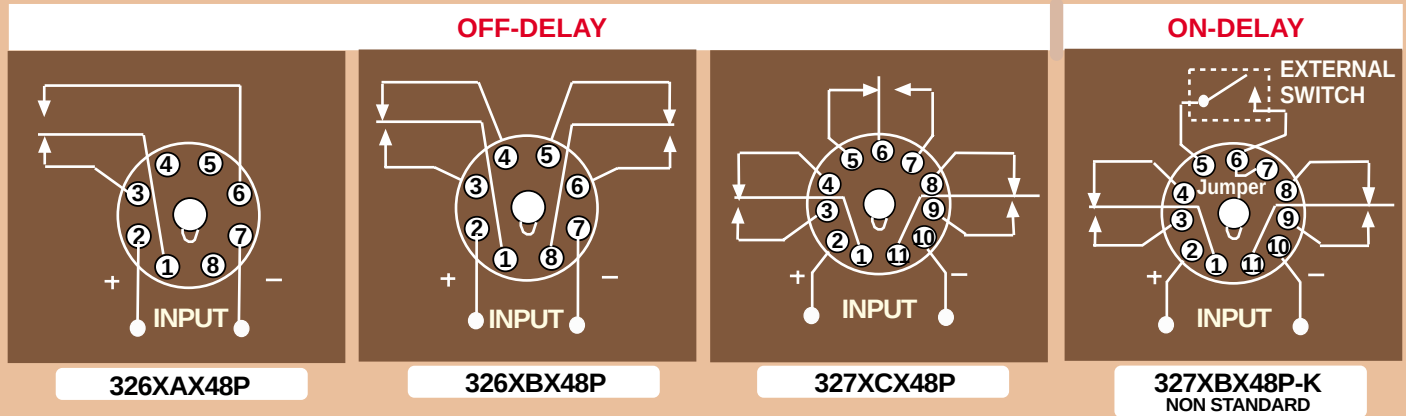
11 PIN OCTAL OFF-DELAY

8 PIN OCTAL ON-DELAY

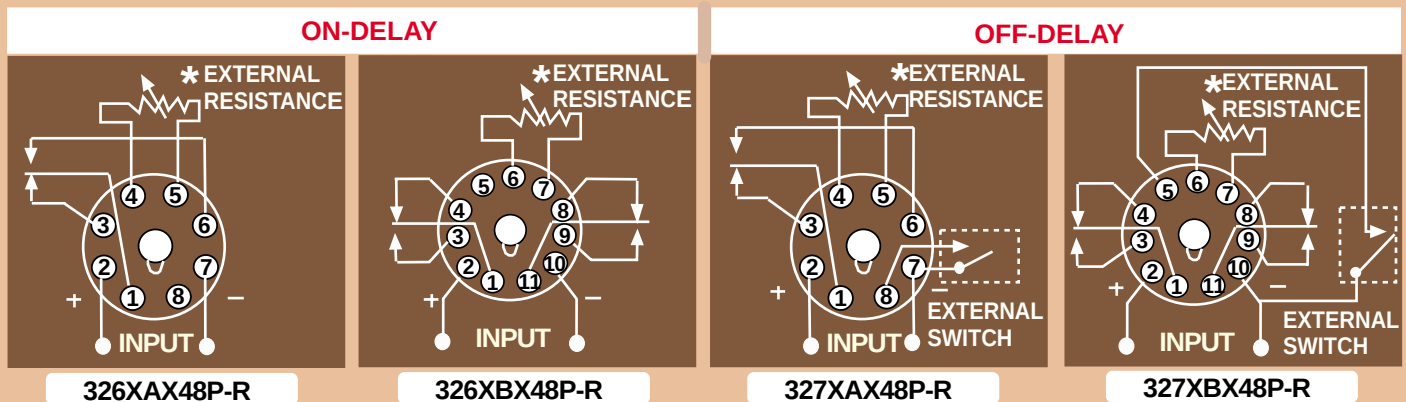
WIRING DIAGRAMS

- * External Resistor for remote timing adjustment on models 326 or 327 with Code R.
- ** Observe Polarity on DC input models

MODELS WITH INTERNAL TIMING RESISTOR



MODELS WITH EXTERNAL (REMOTE) TIMING RESISTOR



UL CONTACT LOAD RATINGS TABLE

POLES	CURRENT OR HORSE POWER	LOAD VOLTAGE	LOAD VOLTAGE FREQUENCY	TYPE OF LOAD
ALL STYLES	10 AMP	120 VAC	50/60 Hz	RESISTIVE
	5 AMP	240 VAC	50/60 Hz	RESISTIVE
	10 AMP	28 VDC	DC	RESISTIVE
	0.5 AMP	125 VDC	DC	RESISTIVE
	3 AMP	120 VAC	50/60 Hz	INDUCTIVE
	1 AMP	240 VAC	50/60 Hz	INDUCTIVE
	3 AMP	28 VDC	DC	INDUCTIVE
	0.1 AMP	125 VDC	DC	INDUCTIVE
SUFFIX "69" WITH BLOWOUT MAGNET FOR DC SWITCHING (NOT UL OR CSA)				
SPST-NO	1.5 AMP	125 VDC	DC	RESISTIVE
SPST-NO-DM	4 AMP	125 VDC	DC	RESISTIVE
SPST-NO	0.5 AMP	250 VDC	DC	RESISTIVE
SPST-NO-DM	1.5 AMP	250 VDC	DC	RESISTIVE
SPST-NO	0.5 AMP	125 VDC	DC	INDUCTIVE
SPST-NO-DM	1.5 AMP	125 VDC	DC	INDUCTIVE
SPST-NO	150 mA	250 VDC	DC	INDUCTIVE
SPST-NO-DM	0.5 AMP	250 VDC	DC	INDUCTIVE

DPDT, 3PDT, 4PDT, DPDT WITH 1 N.C & 1 N.O., DPDT WITH 2 N.O., 10 AMPS**INSTANTANEOUS CONTACTS AVAILABLE**UL Recognized
File No. E13224Class 246 CSA
Certified**LISTED**
367GUL Listed when
used with type
27390 socket**CONTACTS CAN SWITCH 30 AMP
LOADS AND CARRY 10 AMPS
CONTINUOUSLY AT VOLTAGES
SHOWN IN UL CONTACT LOAD
RATINGS TABLE.**

THE CLASS 246 & 247 TIME DELAY RELAYS ARE ON-DELAY OR OFF DELAY, WITH TIMING RANGES FROM 0.1 TO 300 SECONDS. BOTH TIMERS INCORPORATE THE PROVEN INDUSTRIAL WORKHORSE CLASS 219 FRAME ALONG WITH A SOLID STATE TIMING MODULE. PRODUCTS ARE AVAILABLE WITH A VARIETY OF POLE AND CONTACT CONFIGURATIONS. A LARGE CHOICE OF OPTIONS IS AVAILABLE AND SWITCH UP TO 30 AMP LOADS.

GENERAL SPECIFICATIONS

TIMING

Operating Modes Available:

Repeatability:

Accuracy:

Recycle Time:

False Contacting:

On delay, off delay

± 3% @ 25°C (AC +16 mS)

Adjustable ± 10% within temperature & voltage range

150 mS 60 to 300 Sec

No false contacting if power is interrupted
during timing cycle

CONTACTS

Contact Material:

Electrical Life:

Mechanical Life:

Silver cadmium oxide - gold diffused

100,000 operations @ rated load

10,000,000 operations @ no load

INPUT

Coil Voltage

Minimum Operate Voltage:

Ambient Temperature Rating:

Max. Allowed Voltage:

AC - 85% of nominal

DC - 80% of nominal

AC: -10°C to +45°C @ rated operation,
DC: -10°C to +70°C @ rated operation

110% of nominal voltage

PROTECTION

Reverse Polarity:

Yes - DC

DIELECTRIC STRENGTH

Across Open Contacts:

Coil to Contacts:

Transient Protection:

500 V rms

1500 V rms

2000V for 5 mS

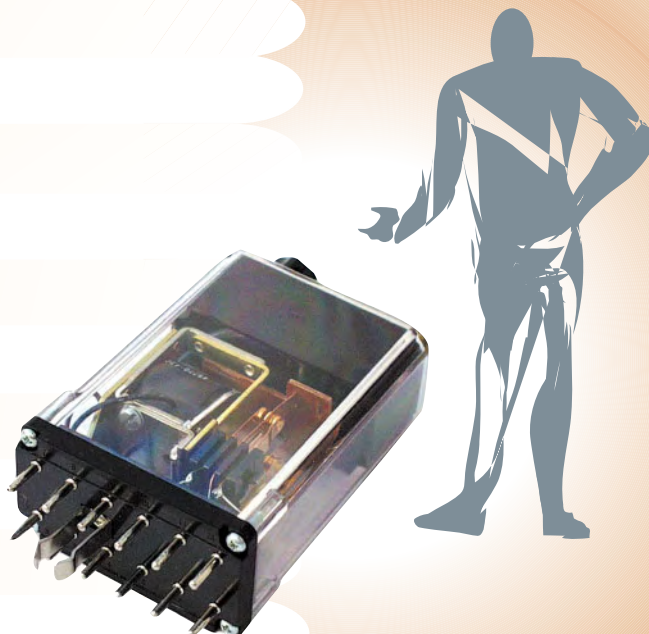
MECHANICAL

Enclosure:

Weight:

Clear polycarbonate

227 grams approx.

**12 Pin Versions Mating Socket:**
27390**14 Pin Versions Mating Socket:**
33377**See section 8, page 27**

ORDERING CODE FOR RELAYS

247 **XBX** **P** **L** **-010 -120A**

CLASS:
 246: ON DELAY,
 247: OFF DELAY,

CONTACT ARRANGEMENTS:
 XBX: (2 FORM "C")
 XCX: (3 FORM "C")
 ABA: (1 FORM A & 2 FORM C & 1 FORM B).
 BBX: (2 FORM A & 2 FORM C) 246 ONLY.

STANDARD FEATURES:
 PLUG-IN WITH POLYCARBONATE COVER: **CODE P**

OPTIONS:
 INDICATOR LAMP: **CODE L**
 MANUAL ACTUATOR: **CODE M**
 BIFURCATED CONTACTS (5 AMPS MAX): **CODE 33**
 PERMANENT MAGNET, BLOWOUT: **CODE 69**
 ADJUSTMENT KNOB): **NO CODE**
 REMOTE ADJ. (EXT POT REQUIRED) : **CODE R**
 LOCKING SHAFT POT: **CODE 8**
 INSTANTANEOUS CONTACTS: **CALL**

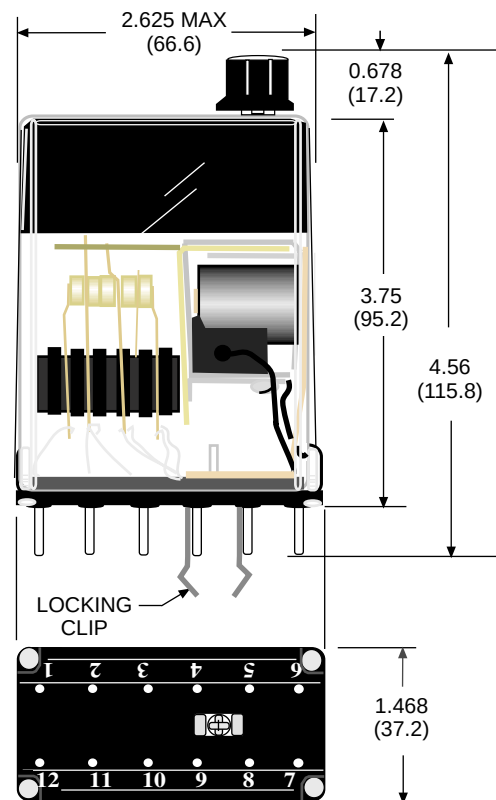
TIMING RANGES:
 0.1 - 1.0 SEC: **CODE 001**
 0.2 - 2.0 SEC: **CODE 002**
 1.0 - 10 SEC: **CODE 010**
 3.0 - 30 SEC: **CODE 030**
 6.0 - 60 SEC: **CODE 060**
 18 - 180 SEC: **CODE 180**
 30 - 300 SEC: **CODE 300**
 OVER 300 SEC: **CALL**
 FIXED: **CODE F (EX. 3F)**

OPERATING VOLTAGE:
 24, 48, 120, 240 ADD "A" FOR AC COILS
 12, 24, 48, 110-125, 250 ADD "D" FOR DC COILS

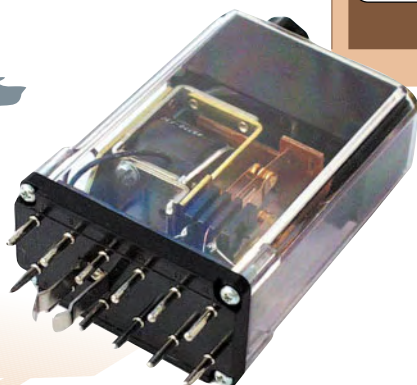
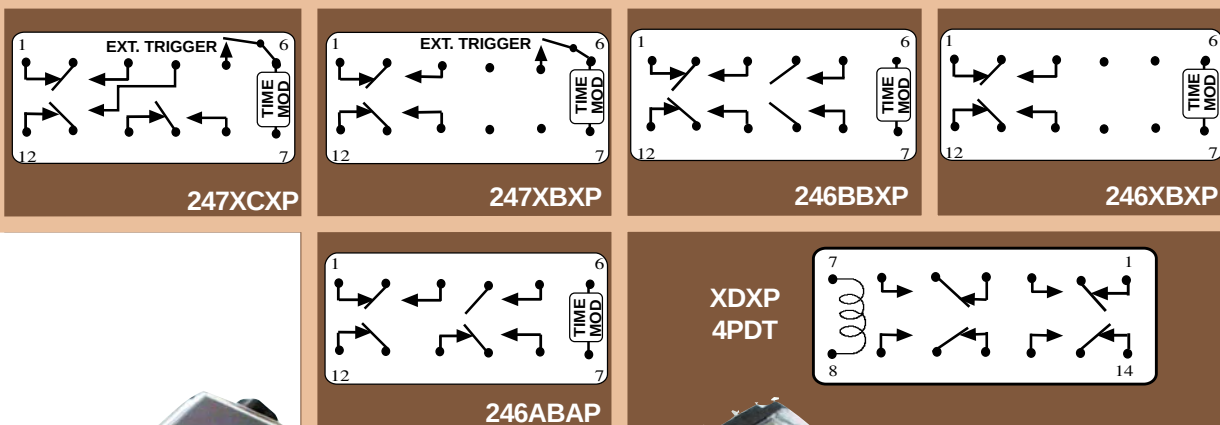
DPDT, 3PDT, 4PDT
DPDT WITH 1 N.C & 1 N.O.,
DPDT WITH 2 N.O., 10 AMPS

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



WIRING DIAGRAMS



CALL FACTORY FOR
 OTHER AGASTAT
 ALTERNATIVES

**SPDT, 13 AMPS
& DPDT, 10 AMPS**

CLASS 236 VOLTAGE SENSING RELAYS COMBINE A SOLID STATE SENSOR WITH A SPDT, 13 AMP OR DPDT 10 AMP RELAY. PULL-IN & DROPOUT VOLTAGES ARE INDEPENDENTLY ADJUSTABLE. THE 236 CAN BE USED EITHER AS A OVER OR UNDER VOLTAGE DETECTING RELAY. STATUS L.E.D. INCLUDED.

APPLICATIONS: BROWNOUT PROTECTION, WARNING OF UNDER VOLTAGE CONDITIONS AND OVER VOLTAGE PROTECTION. PREVENTS EQUIPMENT BURNOUT.



UL Recognized
File No. E62636



**OPTIONAL TIME DELAY
AVAILABLE IN OCTAL
PIN VERSION**

GENERAL SPECIFICATIONS

VOLTAGE SENSING:

Nominal Input: 24, 120, 240, 480 VAC 50/60Hz, 24 VDC.
other AC & DC voltages available

Adjustment Range: Pull-in 75% to 115% of nominal voltage,
Dropout 75% to 95% of pickup setting

Repeatability: $\pm 1\%$ @ constant voltage & temperature

CONTACTS

Contact Material: Silver cadmium oxide

Contact Rating: **SPDT:** 13 amps @ 240 VAC, 28 VDC Res.
1/3 Hp @ 120 VAC, 1/2 Hp @ 240 / 480 AC,
3 amps @ 480 VAC, NEMA B300 pilot duty
DPDT: 10 amps @ 240 VAC / 28 VDC Res.
1/3Hp @ 120 VAC, 1/2 Hp 240 VAC.
NEMA B300 pilot duty

Electrical Life: 100,000 operations @ rated load

Mechanical Life: **SPDT:** 5,000,000 operations
DPDT: 10,000,000 operations

INPUT

Input Current: 15 mA (1.7 VA) @ 120 VAC
12 mA 240 VAC max. (2.9VA)
7 mA max. 480 AC (3.41 VA)

Temperature Range Operate: - 30°C to + 55°C

Temperature Range Storage: - 40°C to + 85°C

DIELECTRIC STRENGTH

Coil to Contacts: 2500 V rms

Across Open Contacts: 1000 V rms

Transient: UL 508 surge 5000 V for 50 microseconds

Noise Immunity: NEMA ICS2-230, 2500 VAC.

MECHANICAL

Enclosure: Polycarbonate dust cover

Terminals: 0.187 quick connect terminals, or 8 pin octal base

Power "ON" Indicator: L.E.D. (green)

Weight: 124.4 grams, 155.5 grams (8 pin octal)



Mating Sockets

**70-750D8-1, 70-750D11-1,
70-464-1, 70-465-1: SCREW/DIN
70-169-1, 70-170-1: SCREW/PANEL**

See section 8, page 7 - 12

70-463-1: SCREW/DIN

70-124-1: SOLDER

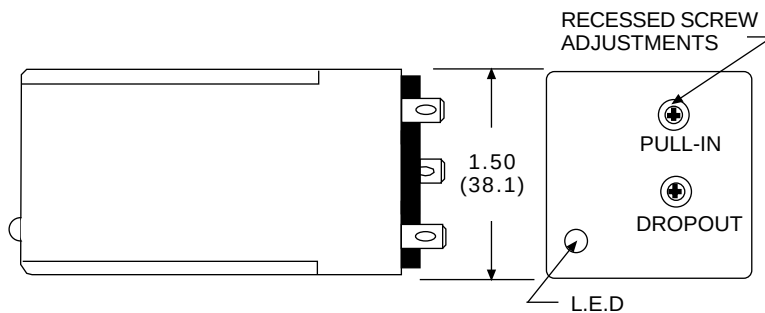
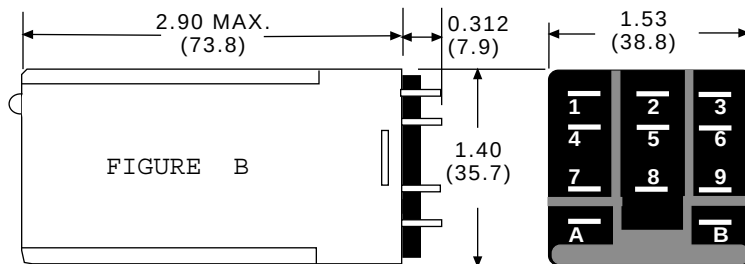
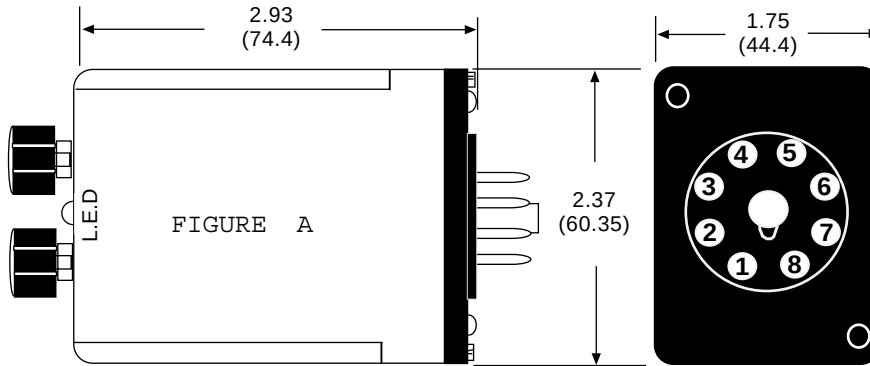
70-178-1, 70-178-2: PRINTED CIRCUIT

70-124-2: QUICK CONNECT

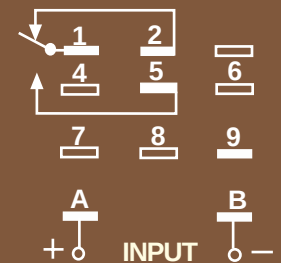
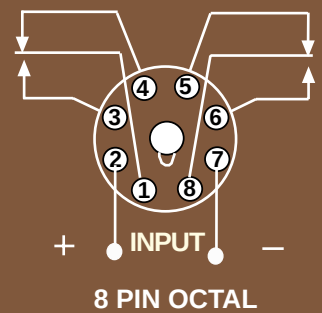
See section 8, page 16, 17

**SPDT, 13 AMPS &
DPDT, 10 AMPS**

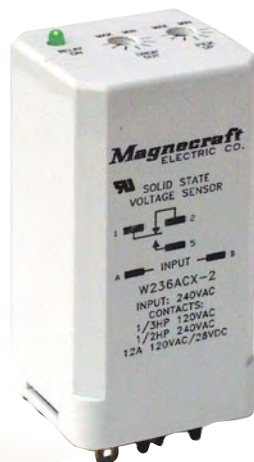
OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



WIRING DIAGRAM



SQUARE BASE
CONTINUOUS VOLTAGE MUST BE
SUPPLIED TO INPUT.



STANDARD PART NUMBERS	FIG.	NOMINAL INPUT VOLTAGE	VOLTAGE PULL-IN RANGE	VOLTAGE DROP-OUT RANGE
W236ACPX-1	A	120 VAC	92 TO 140 VAC	75% TO 95% OF PICKUP VOLTAGE SETTING
W236ACPX-4	A	24 VAC	20 TO 30 VAC	
W236CPX-2	A	24 VDC	20 TO 30 VDC	
W236ACX-1	B	120 VAC	90 TO 138 VAC	
W236ACX-2	B	208 / 220 / 120 VAC	180 TO 276 VAC	
W236ACX-3	B	480 VAC	360 TO 552 VAC	



SECTION 4 CROSS REFERENCE GUIDE

MAGNECRAFT & STRUTHERS-DUNN	POTTER & BRUMFIELD	CUTLER HAMMER	NTE	SIEMENS	SQUARE D
W211ACPSOX-18	CDB-38-70001				
W211ACPSOX-5	CDB-38-70003/CGB-38-70010S/ CHB-38-70001/CKB-38-70010/ CB-1003B-70	MTON1P120A		OND-0110-120A	9050JCK11V20
W211ACPSOX-7	CKB-38-70180/CHB-38-70003/ CB-1005B-70/CDB-38-70005	MTON2P120A		OND-1180-120A	9050JCK15V20
W211ACPSOX-8	CGB-38-70005M		R28-11A10-120M		
W211ACPSOX-60	CGB-38-70010M				9050JCK16V20
W211ACPSOX-61					9050JCK17V20
W211ACPSOX-62	CGB-38-70050M				9050JCK18V20
W211ACPSOX-63	CB-1007B70				9050JCK19V20
W211CPSOX-1	CHD-38-30001/CB-1028D-30/CDD-38-30003			OND-0110-24D	
W211ACPSRX-5	CHB-38-70011/CB-1021B-78	MTOF1P120A		OFD-0110-120A	9050JCK21V20
W211ACPSRX-7	CHB-38-70013	MTOF2P120A		OFD-1180-120A	9050JCK25V20
W211CPSRX-1	CHD-38-30011				
W211CPSRX-3	CHD-38-30013/CDD-38-30008				
MAGNECRAFT & STRUTHERS-DUNN	POTTER & BRUMFIELD	SQUARE D			
TDRPRO-5000	CNM5, CNS-35-96, CNS-35-76	JCK60, JCK70			
TDRPRO-5002	CN1, CNS-35-92, CNS-35-72				
MAGNECRAFT & STRUTHERS-DUNN	POTTER & BRUMFIELD				
W67CPSOX-1	R123012X2E1				
W67CPSOX-2	R123024X2E1				
MAGNECRAFT & STRUTHERS-DUNN	SQUARE D				
W222ACPF-11	9050JCK51V20				
W222ACPF-27	9050JCK57V20				
MAGNECRAFT & STRUTHERS-DUNN	POTTER & BRUMFIELD	CUTLER HAMMER	MIDTEX		
W388ACPSOX-1	CLF-41-70010				
W388ACPSOX-2			614-12T400		
W388CPSOX-1	CLH-41-30010				
W388CPSOX-2			614-12C400		
W388CPSRX-22			612-12C400		
W388ACPSOX-42		MTON1B120A	612-43T100		
W388ACPSOX-44		MTON2B120A	614-43T400		
W388CPSRX-2			612-43C100		
W388CPSRX-4			612-43C400		

THE CROSS REFERENCE IS INTENDED TO MATCH FOOT PRINT, INTERNAL WIRING, AND CONTACT LOAD RATINGS.

CONSTRUCTION FEATURES AND GENERAL SPECIFICATIONS SHOULD BE COMPARED IF EXACT REPLACEMENT IS REQUIRED.



FOR TIME DELAY APPLICATION ENGINEERING ASSISTANCE

Scott Heilman, PRODUCT MANAGER
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EMAIL: sheilman@magnecraft.com
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DOCUMENT: 500

U. S. A.

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EMAIL: info@magnecraft.com

EUROPE

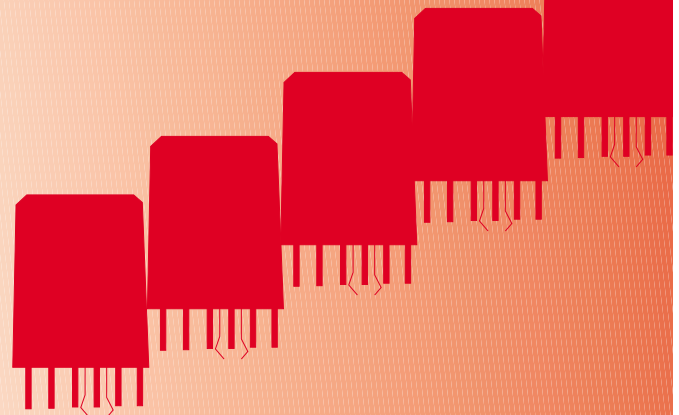
TELEPHONE: 4989 / 75080310
FAX: 4989 / 7559344
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EMAIL: renatesteinback@magnecraft.de



Magnecraft & Struthers-Dunn
Your Contact for Relays

SECTION 5

**LATCHING, SEQUENCE
AND STEPPER RELAYS
5 TO 30 AMPERES**



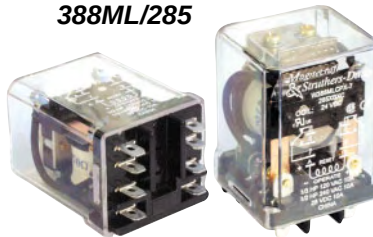
MAGNETIC LATCHING RELAYS

RELAY SERIES

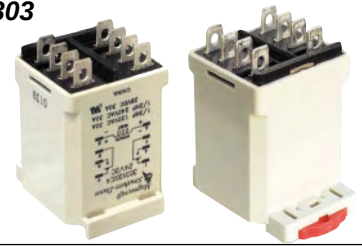
250ML



388ML/285



303



L W H
2.89 x 1.37 x 1.37

L W H
1.90 X 1.53 X 1.40

L W H
2.90 X 1.53 X 1.40

FEATURES

- OCTAL 11 PIN PLUG-IN
- DUAL COIL LATCHING SELF-MAINTAINING SET AND RESET COILS
- MAINTAINS LAST POSITION WITHOUT POWER
- AC OR DC COILS

- PERMANENT MAGNETIC LATCHING RELAY
- SINGLE OR DUAL COIL
- 3 WAY TERMINALS: SOLDER, 0.187" QUICK CONNECT OR PLUG IN
- HIGH SENSITIVITY COILS AVAILABLE
- AC OR DC INPUT

- ENCLOSED 30 AMPS PERMANENT-MAGNET LATCH RELAY
- PRINTED CIRCUIT, SOLDER OR QUICK CONNECT TERMINALS
- OPTIONAL BLOWOUT MAGNET FOR DC SWITCHING AVAILABLE

CONTACT DATA

CONTACT CONFIGURATION:

DPDT

DPDT

DPDT SPDT-DM-DB

CONTACT MATERIAL:

SILVER CADMIUM OXIDE
GOLD FLASHED
100 MILLIOHMS (INITIAL)

SILVER CADMIUM OXIDE
GOLD FLASHED
50 MILLIOHMS (INITIAL)

SILVER CADMIUM OXIDE
GOLD FLASHED
50 MILLIOHMS (INITIAL)

MAX. CONTACT RATING:

10 AMPS @ 120 VAC, 28 VDC

10 AMPS @ 120/240 VAC
10 AMPS @ 28 VDC

30 AMPS, 120/240/277 VAC
30 AMPS, 28 VDC. (RESISTIVE LOAD),
1 HP 120 VAC, 50/60 HZ
2HP 208 / 240 / 480 / 600 VAC.
50/60 HZ (MOTOR LOAD)

COIL DATA

STANDARD VOLTAGE

AC:

DC:

24, 120, 240
12, 24, 110

120
12, 24

6 TO 240
6 TO 110 -125

NOMINAL COIL POWER
VA: (VAC)
WATTS: (VDC)
INSULATION SYSTEM PER
UL STANDARD 1446

2.0 VA
1.64 WATTS

2.1 VA
1.9 WATTS

3.4 VA
3.0 WATTS

CLASS B

CLASS B

CLASS B

GENERAL DATA

AMBIENT TEMPERATURE
OPERATING:

- 30°C TO +70°C

- 45°C TO +70°C

- 30°C TO +60°C

STORAGE:

- 30°C TO +105°C

- 45°C TO +105°C

- 40°C TO +105°C

DIELECTRIC STRENGTH:
(COIL TO FRAME)

1500 V rms

1500 V rms

4000 V rms

LIFE EXPECTANCY
ELECTRICAL:
MECHANICAL:

100,000 OPERATIONS
10,000,000 OPERATIONS

100,000 OPERATIONS
10,000,000 OPERATIONS

100,000 OPERATIONS
10,000,000 OPERATIONS

AGENCY APPROVALS

UL US
UL Recognized
File No. E43641

UL US
UL Recognized
File No. E43641



UL US
UL Recognized
File No. E13224

PAGE NUMBER

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PAGE 9 - 11

B255



L W H
2.63 X 1.47 X 4.56

- 2 COIL MECHANICAL LATCHING
- SINGLE LEVEL SOCKET WIRING
- CONTINUOUS DUTY COILS
- BOTH COILS MAY BE ENERGIZED SIMULTANEOUSLY WITHOUT DAMAGE

SPST, 3PDT OR UP TO 4PST-N.O. OR 4PST-N.C.

SILVER CADMIUM OXIDE
OR GOLD DIFFUSED
50 MILLIOHMS (INITIAL)

MAKE 30 AMPS @ 120 VAC,
CARRY 10 A, BREAK 10 A
MAKE 30 AMPS @ 240 VAC,
CARRY 10 A, BREAK 5 A
MAKE 30 AMPS @ 125 VDC,
CARRY 10 A, BREAK 0.5 A

6 TO 240
6 TO 125 (250V WITH SERIES RESISTOR)

5 VA
2 WATTS

CLASS B

- 10°C TO +60°C

- 40°C TO +105°C

1500 V rms

100,000 OPERATIONS
10,000,000 OPERATIONS



385



L W H
3.04 X 1.67 X 2.392

- DUAL COIL MECHANICAL LATCH UP TO 6PDT, 3 POLES PER COIL
- AC & DC COILS
- 3/16" QUICK CONNECT OR SOLDER
- DIN OR PANEL MOUNTABLE

DPDT, 4PDT & 6PDT

SILVER CADMIUM OXIDE
GOLD FLASHED
50 MILLIOHMS (INITIAL)

15 AMPS, @ 120, 240 277 VAC.
3 AMPS @ 600 VAC. (RESISTIVE LOAD),
10 AMPS @ 28 VDC. (RESISTIVE LOAD),
1/3 HP @ 120 VAC, 50/60 HZ
1/2 HP @ 208, 240, 480, 600 VAC.
50/60 HZ (MOTOR LOAD)

6 TO 240
6 TO 110 -125

2.6 VA
2.6 WATTS

CLASS A

- 40°C TO +70°C

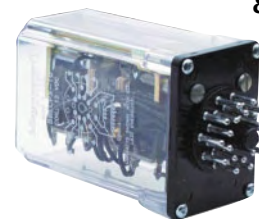
- 40°C TO +105°C

1500 V rms

100,000 OPERATIONS
10,000,000 OPERATIONS



88LCP



L W H
2.37 x 1.75 x 3.56

- DUAL COIL, MECHANICAL LATCHING
- UP TO 5PDT 20 PIN OCTAL PLUG-IN
- DC COILS AVAILABLE

UP TO 5PDT

SILVER CADMIUM OXIDE
100 MILLIOHMS (INITIAL)

10 AMPS @ 120 VAC
10 AMPS @ 240 VAC
10 AMPS @ 28 VDC

120
12

6 VA
2.5 WATTS

-

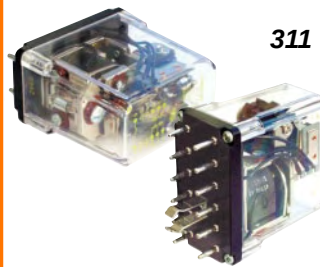
- 10°C TO +50°C

- 30°C TO +105°C

1500 V rms

100,000 OPERATIONS
5,000,000 OPERATIONS

RELAY SERIES



311

L W H
2.65 X 1.47 X 4.56


711

L W H
2.90 x 1.54 x 1.40

FEATURES

- SEQUENCE (STEPPING) RELAY
- SINGLE COIL CONTINUOUS DUTY
- CONTACT TRANSFER ON ENERGIZING OR DE-ENERGIZING STROKE OF RELAY
- SINGLE LEVEL SOCKET WIRING
- ELECTRONICALLY STEERED IMPULSE RELAY
- 3/16" QUICK CONNECT, PLUG-IN OR SOLDER TERMINALS
- HOLDS LAST SET POSITION WITH NO POWER REQUIRED

CONTACT DATA

CONTACT CONFIGURATION:

DPDT

DPDT

CONTACT MATERIAL:

SILVER CADMIUM OXIDE

SILVER CADMIUM OXIDE
GOLD FLASHED
100 MILLIOHMS (INITIAL)

CONTACT RESISTANCE:

50 MILLIOHMS (INITIAL)

MAX. CONTACT RATING:

5 AMPS @ 120 VAC
5 AMPS @ 28 VDC
0.1 AMP @ 125 VDC

12 AMPS @ 120 / 240 VAC, 28 VDC

COIL DATA

STANDARD VOLTAGE

AC:

DC:

6 TO 240
6 TO 110 -125

12 , 24, 48, 110

NOMINAL COIL POWER
VA: (VAC)
WATTS: (VDC)
INSULATION SYSTEM PER
UL STANDARD 1446

5 VA
1.8 WATTS

1.64 VA
1.8 WATTS

CLASS B

CLASS B

GENERAL DATA

AMBIENT TEMPERATURE
OPERATING:

- 10°C TO + 60°C

- 45°C TO + 70°C

STORAGE:

- 40°C TO + 105°C

- 45°C TO + 105°C

DIELECTRIC STRENGTH:
(COIL TO FRAME)

1500 V rms

1500 V rms

LIFE EXPECTANCY
ELECTRICAL:
MECHANICAL:

100,000 OPERATIONS
5,000,000 OPERATIONS

100,000 OPERATIONS
10,000,000 OPERATIONS

AGENCY APPROVALS



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Magnecraft & Struthers-Dunn

Your Contact for Relays

U. S. A.

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WEBSITE: www.magnecraft.com

EMAIL: reneatesteinback@magnecraft.de

Latching relays are often confused with sequence, or stepper, and impulse relays. These are in fact three distinctly different types of devices, although in many cases one might be used to mimic the function of another.

LATCHING RELAYS

Latching relays require one pulse of coil power to move their contacts in one direction, and another, separate one to move them back. Repeated pulses from the same input have no effect. Latching relays are useful in applications where power must be conserved since they require none to maintain their last position, or where it is desirable to have a relay that stays where it was during an interruption of power. They are most often divided into two sub-categories, magnetic latch and mechanical latch.

Magnetic latch relays employ either a permanent or "remanent" magnet to hold their last set Position. The permanent magnet type has the advantage, in that it will not lose its memory no matter how long it is left in one position, while the remanent type if left latched will eventually lose its magnetic charge and drop out. It will also operate backwards if the reset side is subjected to excessive voltage, while the permanent magnet types will tolerate extreme overvoltage to either input without malfunction or damage. The rest of this discussion will address only permanent magnet types.

Permanent magnet latch relays can have either single or dual coils. They will operate in one direction when power is applied with one polarity, and will reset when polarity is reversed on the single coil types, or when properly polarized voltage is applied to the reset coil of a dual version. Most dual coil types can also be used as single coil versions if necessary or desirable. Nearly all AC controlled magnetic latch relays have single coils that employ steering diodes to differentiate between operate and reset commands.

Mechanical latching relays use a catch device to hold their contacts in their last set Position until commanded to change state, usually by means of energizing a second coil. These types are often constructed in such a manner that when the operate coil is energized the contacts will go to the operated position regardless of whether the reset coil is energized or not. They will stay in that position only if the reset coil is not energized when power is removed from the operate side. This "operate coil dominant" operation can be especially useful in certain applications where it is desirable to have the relay function as a non-latching type unless an event has occurred, at which time the reset coil is de-energized. Packaging machinery that places several units into a single container would be a good example.

SEQUENCE RELAYS

Sequence or stepper relays change the state of their contacts upon successive pulses of power to a single coil. Most employ some form of ratchet and cam assembly that requires several pulses to make one revolution of the cams. Many, but not all, have their cams arranged so that each contact transfers with each pulse. That is, if a contact is open it will close, if closed it will open. By utilizing two sets of double-throw contacts, these devices can perform a number of useful functions. They are most commonly used to equalize wear on two devices that are used to perform a single function. As each command for a device to operate is received, the one that did not operate last is energized. One of the most common uses of this function is sewage lift stations where two pumps sit side by side with only one operating at a time in normal service.

Sequence relays can also be used to perform other repetitive functions by altering the arrangement or number of lobes on their cams. For example, a sequence could be set up controlling two loads with successive pulses where one would come on, then the other, then both, then both would go off. Literally any such sequence is possible that has a number of steps that will divide evenly into the number of pulses required to rotate the cam one full turn.

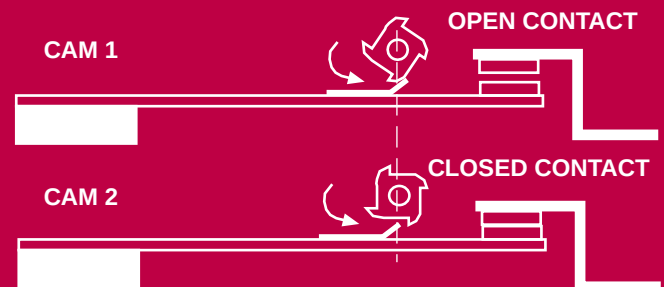


FIGURE 1

IMPULSE RELAYS

Impulse relays are a form of sequence relay that will only perform the first function described earlier, each contact transfers on each pulse. In many cases the terms sequence and impulse can be used interchangeably, but not all.

Many impulse relays are made up of a magnetic latch relay and a solid state steering circuit that, upon application of power, determines which position the relay is in and energizes the opposite coil. The contacts transfer and hold that position when power is removed. When reenergized the contacts transfer again and hold that position, and so on.

Impulse relays can be used as wear equalizers. They are also well suited for applications such as turning a single device on or off from one or more locations with a single momentary switch or push button at each station. For example, a conveyor could be started and/or stopped from multiple locations by means of a single button at each position.

DPDT, 10 AMPS**FEATURES****11 PIN OCTAL BASE:**

EASILY INSTALLED IN EXISTING OR READILY AVAILABLE SOCKETS

10 AMP CONTACT RATING:

ACCOMMODATES MOST CONTROL CIRCUIT LOADS

PERMANENT MAGNET LATCHING MECHANISM:

STAYS IN LAST SET POSITION INDEFINITELY WITH NO EXTERNAL POWER REQUIRED

BENEFITS

 UL Recognized
 File No. E43641

**MAGNETIC LATCHING RELAY WITH
11 PIN OCTAL BASE. OPERATES BY
PULSED INPUT AND MAINTAINS
LAST POSITION.**

GENERAL SPECIFICATIONS**COIL**

Pull-in Voltage:	80% of nominal voltage or less for AC coils 70% of nominal voltage or less for DC coils
Max. Voltage:	5 X nominal voltage with no false transfer of contacts during operate or reset pulse
Resistance:	±10 % measured @ 25°C
Coil Power:	1.64 watts DC, 2.0 VA(60 Hz) AC @ 25°C
Insulation System:	Class "B" (130°C per UL standard. 1446)
Pulse Duration Min.:	50 milliseconds
Duty:	Single coils are continuous duty, Dual coils are intermittent duty

CONTACTS

Contact Material:	0.187 silver cadmium oxide, gold flashed
Contact Resistance:	50 milliohms maximum initial at rated current
Contact Rating:	10 Amps @ 120/240 VAC, 28 VDC 1/3 Hp @ 120 VAC, 1/2 Hp @ 240 VAC

TIMING

Operate Time:	(AC) 30 mS max. (DC) 20 mS max. @ nominal voltage
Reset Time:	(AC) 30 mS max. (DC) 20 mS max. @ nominal voltage

DIELECTRIC STRENGTH

1500 V rms	
Contacts to Coil:	1500 V rms
Coil to Frame:	500 V rms
Across Open Contacts:	1500 V rms
Pole to Pole:	1500 V rms
Contacts to Frame:	1000 megohms min. @ 500 VDC
Insulation Resistance:	

TEMPERATURE

Operating:	- 30°C to +70°C @ rated operation
Storage:	- 30°C to +105°C

SHOCK RESISTANCE

Latched:	10 g's
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VIBRATION RESISTANCE

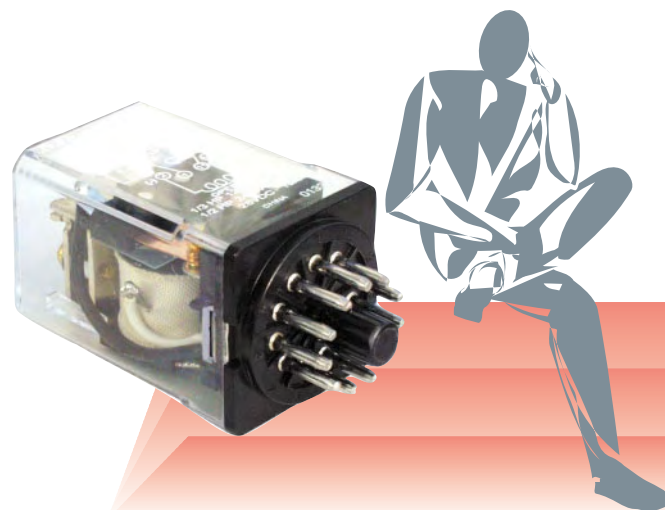
Latched:	5 g's, 10 Hz to 55 Hz
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LIFE EXPECTANCY

Electrical:	100,000 operations @ rated resistive load
Mechanical:	10,000,000 operations @ no load

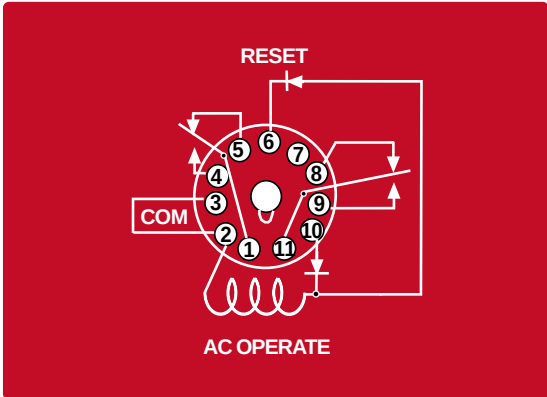
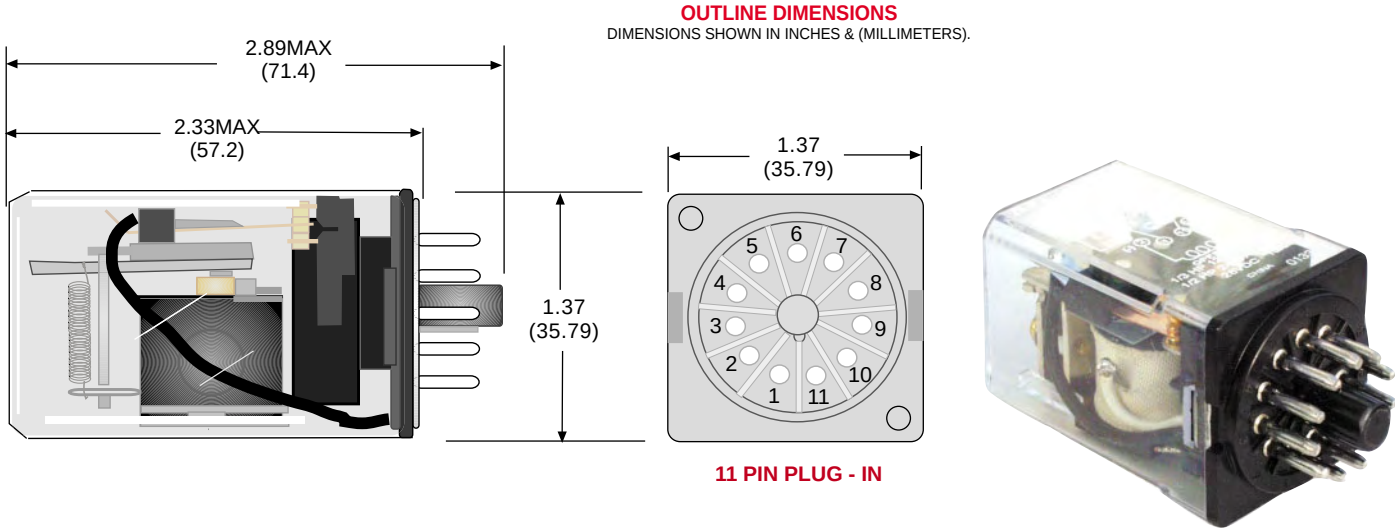
MISCELLANEOUS

Operating Position:	Any
Insulation Material:	Molded plastic
Enclosure:	Clear polycarbonate
Weight:	170 grams approx.

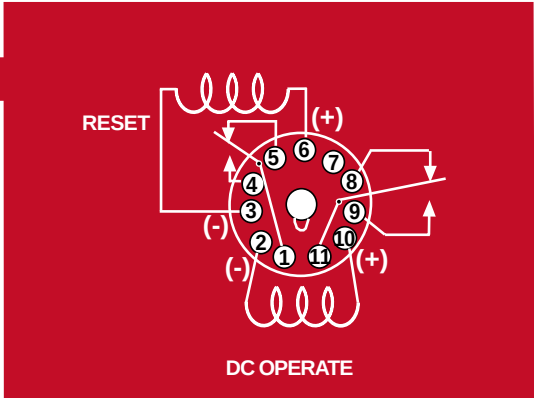
**Mating Sockets**

**70-750D8-1, 70-750D11-1,
70-464-1, 70-465-1: SCREW/DIN
70-169-1, 70-170-1: SCREW/PANEL
See section 8, page 7 - 12**

DPDT, 10 AMPS



WIRING DIAGRAMS
(VIEWED FROM PIN END)



STANDARD PART NUMBERS	COIL MEASURED @ 25°C		
	NOMINAL INPUT VOLTAGE	OPERATE VOLTAGE MIN.	NOMINAL RESISTANCE (OHMS)
AC OPERATED SINGLE COIL			
W250AML2CPX-8	24 VAC	19.2 VAC	740 Ω
W250AML2CPX-9	120 VAC	96 VAC	10,000 Ω
W250AML2CPX-10	240 VAC	192 VAC	36,00 Ω
DC OPERATED DUAL COIL			
W250ML2CPX-6	12 VDC	8.4 VDC	88/88 Ω
W250ML2CPX-7	24 VDC	16.7 VDC	350/350 Ω
W250ML2CPX-8	110 VDC	77 VDC	9000/9000 Ω

RETROFITS IDEC RR2KP-U
SEE END OF SECTION 5 FOR CROSS REFERENCE

DPDT, 10 AMPS

FEATURES

BENEFITS

11 PIN BLADE TERMINAL SQUARE BASE:

ACCEPTS STANDARD 0.187" QUICK CONNECT TERMINALS AS WELL AS EXISTING READILY AVAILABLE SOCKETS

CONSERVATIVE 10 AMP CONTACT RATING:

WILL TOLERATE SIGNIFICANT ACCIDENTAL OVERLOADS WITHOUT PREMATURE FAILURE

3 AMP 600 VAC CONTACT RATING:

ACCOMMODATES NEARLY ALL CONTROL CIRCUIT VOLTAGES



UL Recognized
File No. E43641

Recognized Component mark for
Canada and the United States.



COMPLIES WITH REQUIREMENTS OF

- * IEC STANDARDS 947-4-1 AND 947-5-1 LOW VOLTAGE DIRECTIVE
- * IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION
- * CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

GENERAL SPECIFICATIONS

COIL

Pull-in Voltage:	85% of nominal voltage or less for AC coils 75% of nominal voltage or less for DC coils
Max. Voltage:	5 x nominal voltage with no false transfer of contacts during operate or reset pulse
Resistance:	±10% measured @ 25°C
Coil Power:	1.9 watts DC, 2.1 VA(60 Hz) AC @ 25°C
Insulation System:	Class "B" (130°C per UL standard. 1446)
Pulse Duration Min.:	30 milliseconds
Duty:	Single coils are continuous duty, Dual coils are intermittent duty

CONTACTS

Contact Material:	Silver cadmium oxide, gold flashed
Contact Resistance:	50 milliohms maximum initial at rated current
Contact Rating:	10 amps @ 120 / 240 VAC, 28 VDC, 1/3 Hp @ 120 VAC, 1/2 Hp @ 240 VAC., 5 amps @ 480 VAC, 3 amps 600 VAC

TIMING

Operate time:	(AC) 30 mS max., (DC) 20 mS max. @ nominal voltage
Reset time:	(AC) 30 mS max., (DC) 20 mS max. @ nominal voltage

DIELECTRIC STRENGTH

Contacts to Coil:	1500 V rms
Coil to Frame:	1500 V rms
Across Open Contacts:	500 V rms
Pole to Pole:	1500 V rms
Contacts to Frame:	1500 V rms
Insulation Resistance:	1000 megohms min. @ 500 VDC

TEMPERATURE

Operating:	-45°C to +70°C @ rated operation
Storage:	-45°C to +105°C

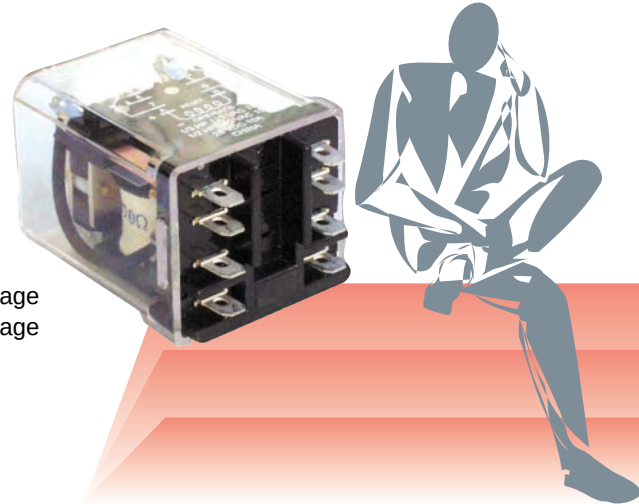
LIFE EXPECTANCY

Electrical:	100,000 operations @ rated resistive load
Mechanical:	10,000,000 operations @ no load

MISCELLANEOUS

Operating Position:	Any
Insulation Material:	Molded plastic
Enclosure:	Clear polycarbonate
Weight:	87 grams approx.

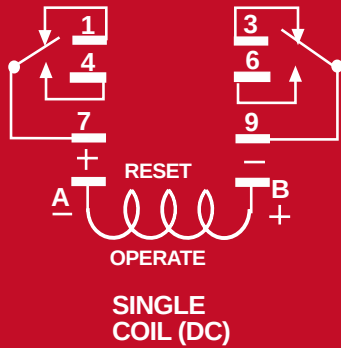
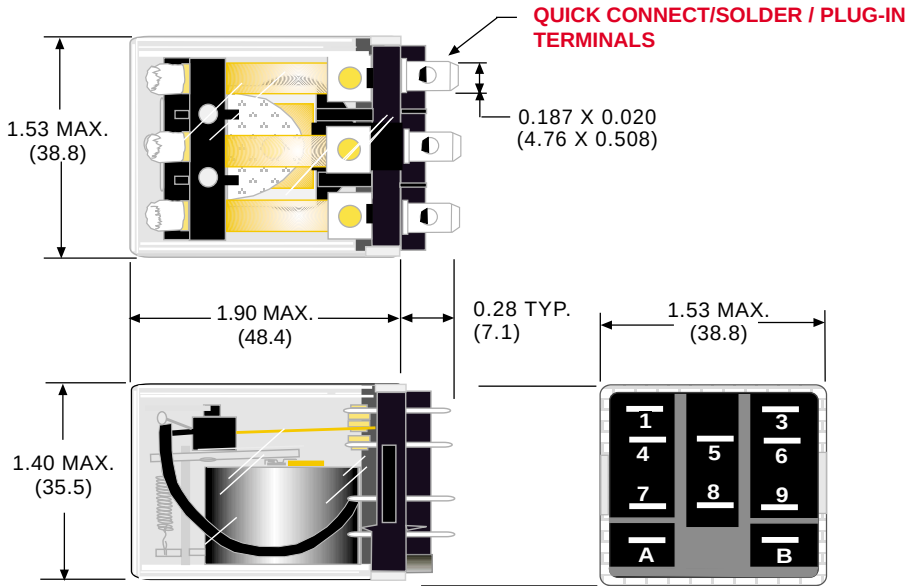
**MAGNETIC LATCHING RELAY
WITH SQUARE BASE.
OPERATES BY PULSED INPUT
AND MAINTAINS LAST POSITION.**



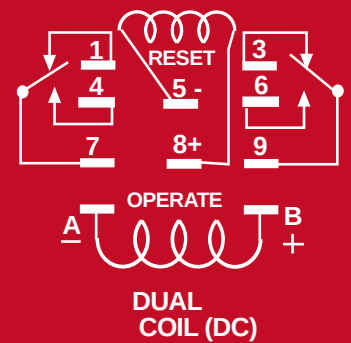
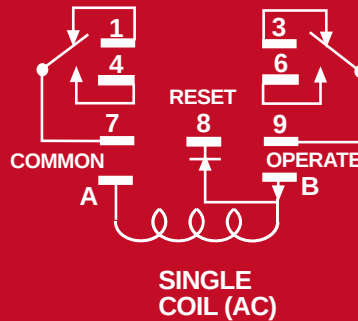
Mating Sockets

70-463-1: SCREW/DIN
70-124-1: SOLDER
70-178-1, 70-178-2: PRINTED CIRCUIT
70-124-2: QUICK CONNECT
See section 8, page 16, 17

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



WIRING DIAGRAMS
(VIEWED FROM PIN END)



STANDARD PART NUMBERS	STRUTHERS-DUNN EQUIVALENT PART NUMBERS	COIL MEASURED @ 25°C	
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED, SINGLE COIL			
W388AMLCPX-9	285XBXC-120A	120 VAC	10,000 Ω
DC OPERATED, SINGLE COIL			
W388MLCPX-6	285XBXC-12D	12 VDC	120 Ω
W388MLCPX-7	285XBXC-24D	24 VDC	470 Ω
DC OPERATED, DUAL COIL			
W388ML2CPX-6	285XBXCD-12D	12 VDC	88/88 Ω
W388ML2CPX-7	285XBXCD-24D	24 VDC	350/350 Ω

3PDT AVAILABLE

FEATURES**0.250" QUICK CONNECT/
SOLDER TERMINALS:****2 MM CONTACT GAPS:****COMPACT DESIGN:****WIDE SELECTION
OF COVER STYLES
AND OPTIONS:**

SIMPLE INSTALLATION, WILL ACCEPT FULLY INSULATED (BOOED) TERMINALS

MEETS NEARLY ALL INTERNATIONAL REQUIREMENTS FOR SPACING

HANDLES "CONTACTOR LOADS" IN A CONTROL RELAY PACKAGE.

CAN BE "CUSTOMIZED" AS NEEDED WITHOUT EXCESSIVE COST OR MINIMUMS

BENEFITS**DPDT, DPST-NO, SPDT-DB-DM,
30 AMPS**UL Recognized
File No. E13224**GENERAL SPECIFICATIONS****COIL**

Pull-in Voltage:	85% of nominal voltage or less for AC coils 75% of nominal voltage or less for DC coils
Max. Voltage:	110% of nominal voltage
Resistance:	±10 % measured @ 25°C
Coil Power:	3 watts DC, 3.4 VA (60Hz) AC 25°C
Insulation System:	Class "B" (130°C per UL standard 1446)
Pulse Duration Min.:	30 milliseconds
Duty:	Continuous

CONTACTS

Contact Material:	Silver cadmium oxide, gold flashed.
Contact Resistance:	50 milliohms maximum initial at rated current
Contact Rating:	30 amps, 120 / 240 / 277 VAC, 15 amps, 600 VAC (resistive load) 30 amps, 28 VDC. (resistive load), 1 Hp 120 VAC, 50/60 Hz 2Hp 208 / 240 / 480 / 600 VAC. 50/60Hz (motor load) option code 69 allows a 150 VDC 5 amp rating (DPDT) and a 10 amp rating (SPDT - DM - DB)

TIMING

Operate Time:	25 mS maximum @ nominal voltage
Reset Time:	25 mS maximum @ nominal voltage

DIELECTRIC STRENGTH

Contacts to Coil:	4000 V rms
Coil to Frame:	4000 V rms
Across Open Contacts:	1000 V rms
Pole to Pole:	2200 V rms
Contacts to Frame:	4000 V rms
Insulation Resistance:	1000 megohms min. @ 500 VDC

TEMPERATURE

Operating:	-30°C to +60°C @ rated operation
Storage:	-40°C to +105°C

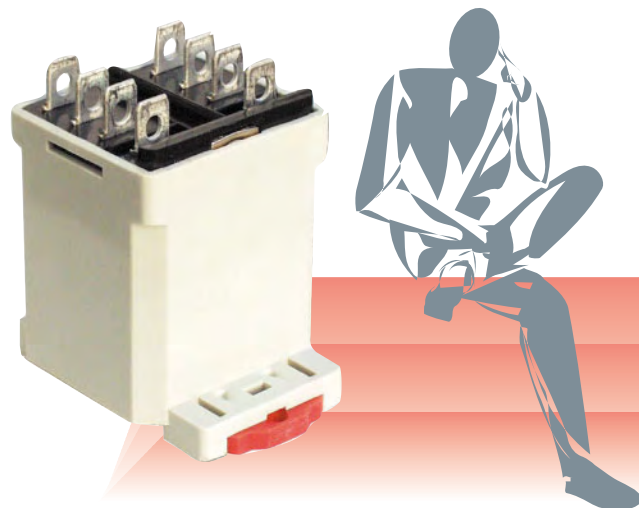
LIFE EXPECTANCY

Electrical:	100,000 operations @ rated resistive load
Mechanical:	10,000,000 operations @ no load

MISCELLANEOUS

Operating Position:	Any
Insulation Material:	Molded plastic
Enclosure:	Polycarbonate
Weight:	85 grams approx.

THE CLASS 303 RELAY HAS BEEN DESIGNED FOR INSTALLATION OF FULLY INSULATED 0.250" QUICK CONNECT TERMINALS. CONTACT GAPS ARE 2 MILLIMETERS WIDE TO MEET MOST STANDARDS FOR CREEPAGE AND CLEARANCE. THE OPTIONAL MAGNETIC BLOWOUT ALLOWS FOR HIGH VOLTAGE DC SWITCHING APPLICATIONS. ITS LATCH MECHANISM KEEPS IT IN ITS LAST SET POSITION UNTIL COMMANDED TO CHANGE BY MEANS OF A SEPARATE SIGNAL.

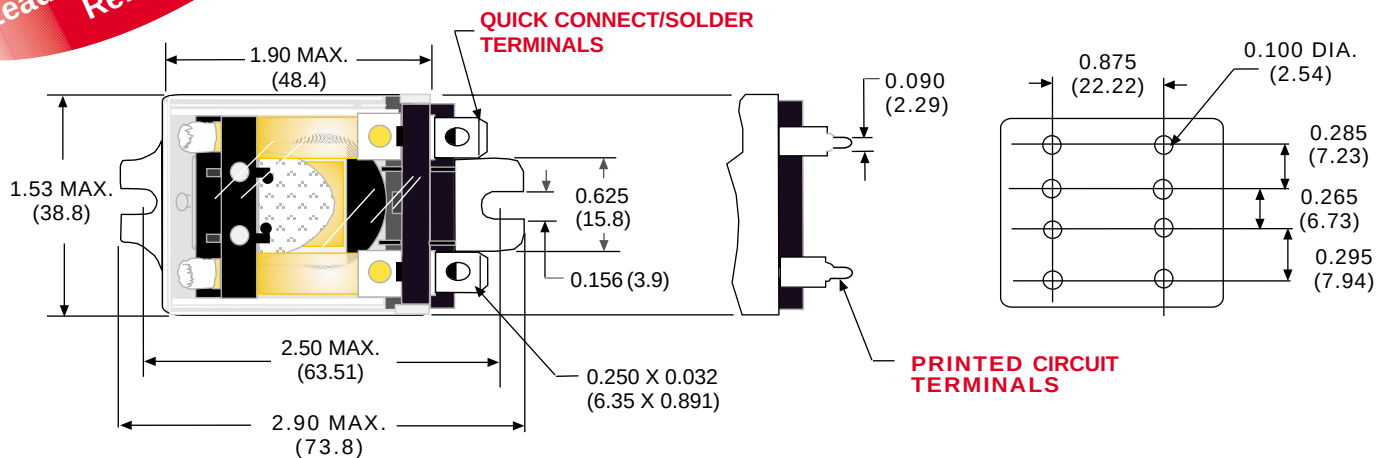


**MAGNETIC LATCHING RELAY
WITH SQUARE BASE.
OPERATES BY PULSED INPUT
AND MAINTAINS LAST POSITION.**

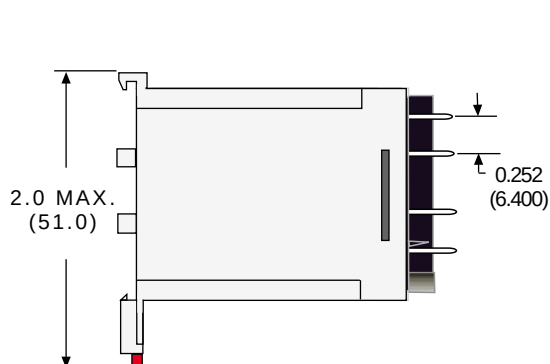
DPDT, 30 AMPS

NEW
From The Market
Leader in Industrial
Relays

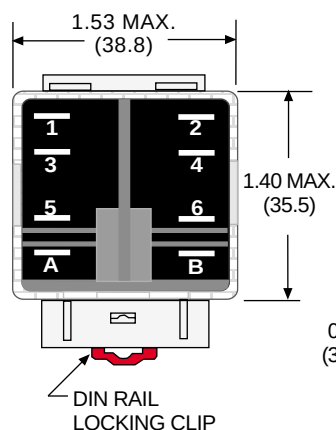
OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



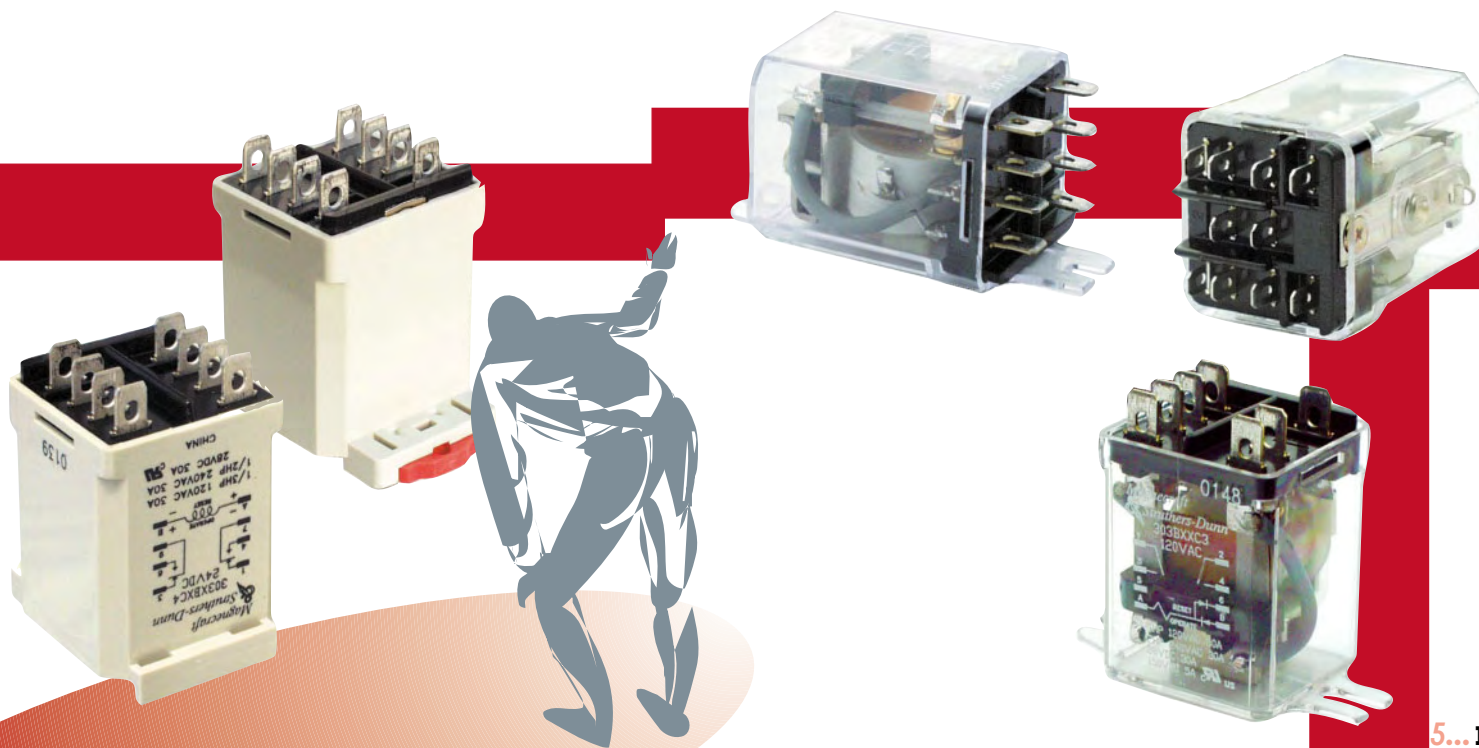
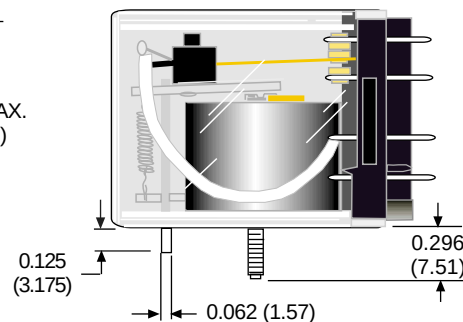
ENCLOSED FLANGE MOUNT



ENCLOSED DIN MOUNT

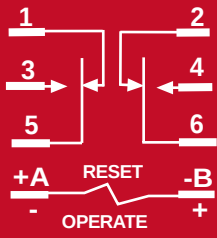
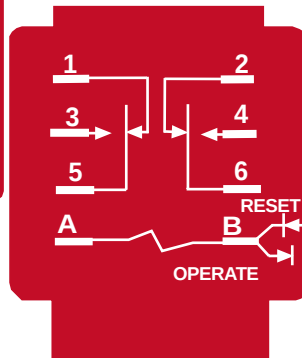
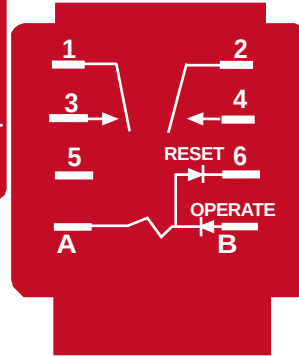
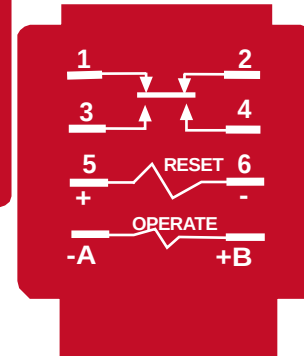
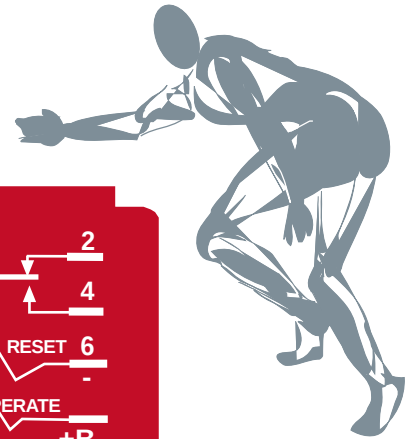


ENCLOSED STYLE CHOICE OF 6 -32 STUD OR TAPPED CORE WITH ANTI ROTATION TAB.



DPDT, 30 AMPS**WIRING DIAGRAMS**

(VIEWED FROM PIN END)

**XBx DPDT
(SINGLE COIL)****XBx DPDT
(AC SINGLE COIL)****Bxx DPST - N.O.
(AC SINGLE COIL)****XHx SPDT - N.C. - N.O.
(DB - DM), (DUAL COIL)****ORDERING CODE FOR RELAYS****F 303 XBx C1 L -240****COILS:**130°C: **NO CODE**, 150°C: **CODE F****CLASS:**303 - 30 AMPS RATING WITH
0.25 QUICK CONNECT/SOLDER
TERMINALS**CONTACT ARRANGEMENTS:**XBx: DPDT, Bxx: DPST-N.O.
XHx: SPDT - DM -DB, XXB: DPST-N.C.**CONSTRUCTION STYLE:***ENCLOSED, PLAIN COVER: **CODE C**
ENCLOSED, SIDE FLANGE MOUNT: **CODE C1**
ENCLOSED, 6-32 TAPPED CORE
& ANTI-ROTATION TAB: **CODE C2**
ENCLOSED, 6-32 STUD
& ANTI-ROTATION TAB: **CODE C2**
ENCLOSED, TOP FLANGE MOUNT: **CODE C3**
ENCLOSED, DIN MOUNT: **CODE C4****TERMINALS STYLE:**SOLDER/QUICK CONNECT TERMINALS: **NO CODE**
*PRINTED CIRCUITS TERMINALS: **CODE T****OPTIONS:**L.E.D. STATUS LAMP: **CODE L** (NOT AVAILABLE W/CODE 4)
MAGNET BLOWOUT: **CODE 69**
DUAL COIL: **CODE D**COIL VOLTAGE:**6, 12, 24, 120, 240 **ADD "A" FOR AC COILS**
6, 12, 24, 48, 110-125 **ADD "D" FOR DC COILS*** NOTE: CODE "C" RECOMMENDED TO BE USED WITH PRINTED
CIRCUIT TERMINALS

** NOTE: DUAL COIL NOT AVAILABLE ON XBx CONTACT ARRANGEMENT



		COIL MEASURED @ 25°C	
STANDARD PART NUMBERS	CONTACT CONFIGURATION	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED, SINGLE COIL			
303BXXC3-120A	DPST-N.O	120 VAC	6300 Ω
303XBXC1-120A	DPDT	120 VAC	6300 Ω
DC OPERATED, SINGLE COIL			
303XBXC1-24D	DPDT	24 VDC	300 Ω
303XBXC4-24D	DPDT	24 VDC	300 Ω
303XBx69C-24D	DPDT	24 VDC	300 Ω
DC OPERATED, DUAL COIL			
303XHXC1D-12D	SPDT-N.C.-N.O. (DB-DM)	12 VDC	70/70 Ω

FEATURES**INDUSTRIAL PLUG-IN CONSTRUCTION:**

ULTIMATE RUGGEDNESS & RELIABILITY.

2 COILS WITH OPERATE COIL DOMINANT:

VERSATILE OPERATION

MULTIPLE CONTACT ARRANGEMENTS AND AVAILABLE OPTIONS

CAN BE PURCHASED EXACTLY AS NEEDED

GOLD DIFFUSED CONTACTS STANDARD

WILL NOT TARNISH, LOW CONTACT RESISTANCE FOR THE LIFE OF THE RELAY

BENEFITS**UP TO 3PDT, 10 AMPS**UL Recognized
File No. E13224UL Listed industrial control equipment
225G when used with 27390 socket**GENERAL SPECIFICATIONS****COIL**

Pull-in Voltage:	85% of nominal voltage or less for AC coils 80% of nominal voltage or less for DC coils
Max. Voltage:	110% of nominal voltage
Resistance:	±10 % measured @ 25°C
Coil Power:	2 watts DC, 5 VA (60Hz) AC 25°C
Insulation System:	Class "B" (130°C per UL standard 1446)
Pulse Duration Min.:	30 milliseconds
Duty:	Continuous

CONTACTS

Contact Material:	Silver cadmium oxide, gold diffused
Contact Resistance:	50 milliohms maximum initial at rated current
Contact Rating:	See UL contact rating table

TIMING

Operate time:	25 mS max. @ nominal voltage
Reset time:	20 mS max. @ nominal voltage

DIELECTRIC STRENGTH

Contacts to Coil:	1500 V rms
Coil to Frame:	1500 V rms
Across Open Contacts:	500 V rms
Pole to Pole:	1500 V rms
Contacts to Frame:	1500 V rms
Insulation Resistance:	1000 megohms min. @ 500 VDC

TEMPERATURE

Operating:	-10°C to +60°C @ rated operation
Storage:	-40°C to +105°C

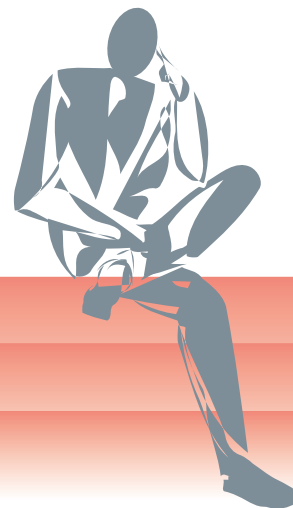
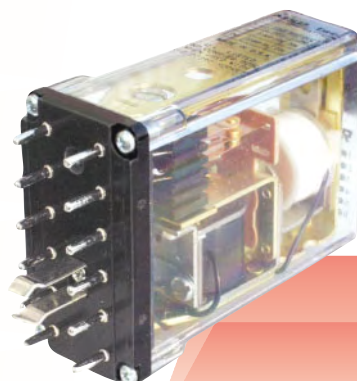
LIFE EXPECTANCY

Electrical:	100,000 operations @ rated resistive load
Mechanical:	10,000,000 operations @ no load

MISCELLANEOUS

Operating Position:	Any
Insulation Material:	Molded plastic
Enclosure:	Clear polycarbonate
Weight:	215 grams approx.

THE CLASS B255 IS A TWO COIL LATCHING VERSION OF THE GENERAL PURPOSE TYPE 219 RELAY. WHEN THE OPERATE COIL IS MOMENTARILY ENERGIZED, THE RELAY MECHANICALLY LATCHES IN THE ENERGIZED POSITION AND REMAINS IN THE ENERGIZED POSITION WITH THE POWER REMOVED FROM THE COIL. THE SECOND COIL WHEN MOMENTARILY ENERGIZED, PROVIDES ELECTRICAL RESET OF THE CONTACTS. ALL CONTACTS OPERATE FROM A COMMON ARMATURE TO PREVENT CONTACT OVERLAPPING. COILS ARE RATED FOR CONTINUOUS DUTY. NUCLEAR QUALIFIED VERSIONS ARE AVAILABLE. CONTACT THE FACTORY FOR DETAILS.

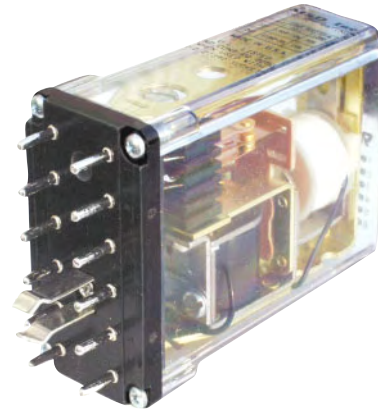
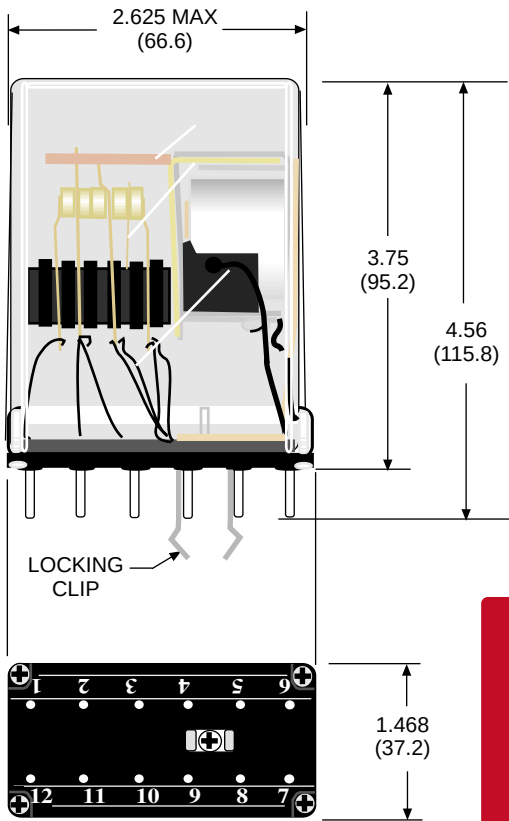


**Mating Socket
27390
See section 8, page 27**

UP TO 3PDT, 10 AMPS

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

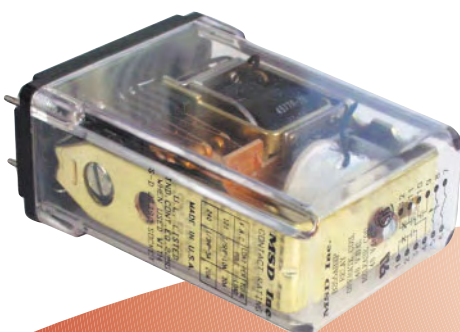


UL CONTACT RATINGS TABLE

VOLTS	MAKE	CARRY	BREAK	
			RESISTIVE	INDUCTIVE
24 VDC	30 A	10 A	10 A	10 A
120 VAC	30 A	10 A	10 A	3 A
240 VAC	30 A	10 A	5 A	1 A
28 VDC	30 A	10 A	10 A	3 A
125 VDC	30 A	10 A	0.5 A	0.1 A
**FOR VERSIONS WITH SUFFIX "69" PERMANENT MAGNET BLOWOUTS				
125 VDC SM*	30 A	10 A	1.5 A	0.5 A
125 VDC DM	30 A	10 A	4 A	1.5 A
250 VDC SM	30 A	10 A	0.5 A	150 A
250 VDC DM	30 A	10 A	1.5 A	0.5 A

* SM = SINGLE MAKE
DM = DOUBLE MAKE

** relays with code 69 feature (check with factory for UL & CSA listing)



COIL SPECIFICATIONS @ 25°C

*AC COIL DATA (50/60 Hz)

NOMINAL VOLTAGE	RESET COIL (3 VA)		OPERATE COIL (5 VA)	
	RESISTANCE OHMS $\pm 10\%$	COIL POWER (mA)	RESISTANCE OHMS $\pm 10\%$	COIL POWER (mA)
6	3.0	840	1.10	800
12	14.5	256	4.20	410
24	52.0	150	15.5	200
120	1450	26.5	540	45.0
240	5000	4.8	1815	13.2

Current inrush on all AC coils is less than twice the listed milliamperes ratings as shown in the AC coil data table.

*Currents shown in table measured at 60 Hz.

COIL SPECIFICATIONS @ 25°C

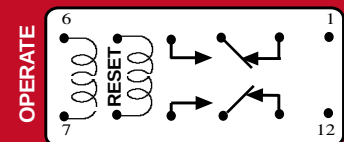
DC COIL DATA

NOMINAL VOLTAGE	RESET COIL (1.4 W)		OPERATE COIL (1.8 W)	
	RESISTANCE OHMS $\pm 10\%$	COIL POWER (mA)	RESISTANCE OHMS $\pm 10\%$	COIL POWER (mA)
6	21.0	286	15.5	385
12	85.0	141	63.5	189
24	300	80	250	96.0
115/125	8000	14.4	6200	20.0

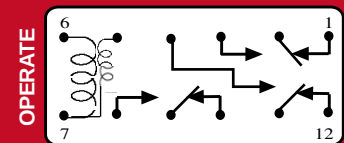
DC relays, 1.8 Watts (2.5 W @ 125VDC)

WIRING DIAGRAMS

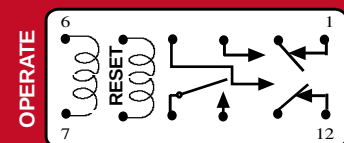
(VIEWED FROM OUTER END)



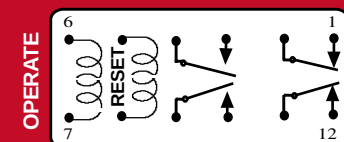
B255BXP
(DPDT)



B255XCXP
(3PDT)



B255ABXP
(DPDT + 1 N.O.)



B255BXP
(2 N.O. + 2 N.C.)

ORDERING CODE FOR RELAYS

B255 XCX P LM -120

CLASS: B255 2 COIL LATCH PLUG-IN

CONTACT ARRANGEMENTS:

XBX DPDT
XCX 3PDT
ABX SPST-NO & 2 FORM C
BXX DPST-NO & 2 FORM B

STANDARD FEATURES:

POLYCARBONATE COVER: CODE "P"

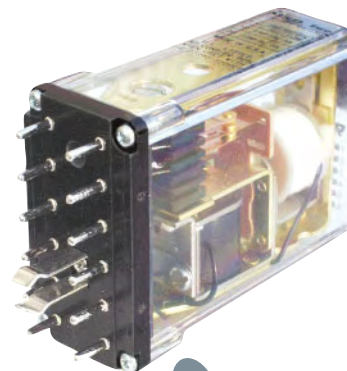
OPTIONAL FEATURES:

INDICATOR LAMP ACROSS BOTH COILS: CODE "L"
MANUAL ACTUATOR: CODE "M"
LIGHT & ACTUATOR: CODE "LM"
PERM. MAGNET BLOWOUT: CODE "69"
BIFURCATED CONTACTS: CODE "33"
DC COIL SUPPRESSION: CODE "V"
AC COIL SUPPRESSION: CODE "V1"

COIL VOLTAGE:

6, 12, 24, 120, 240 ADD "A" FOR AC COILS
6, 12, 24, 115-125 ADD "D" FOR DC COILS

NOTE: FOR TIME DELAY ON ENERGIZING RESET COIL, SPECIFY 256 SERIES IN LIEU OF B255 DC RELAYS, 1.8 WATTS (2.5 W @ 125 VDC)



STANDARD PART NUMBERS

CONTACT CONFIGURATION

COIL MEASURED @ 25°C

NOMINAL INPUT VOLTAGE

NOMINAL RESISTANCE (OHMS)

AC OPERATED

B255BXP-120A

2 N.O. + 2 N.C.

120 VAC

540/1450 Ω

B255BXP-120A

DPDT

120 VAC

540/1450 Ω

B255XCXP-120A

3PDT

120 VAC

540/1450 Ω

DC OPERATED, DUAL COIL

B255BXP-24D

DPDT

24 VDC

250/300 Ω

FEATURES**UP TO 6PDT
15 AMP CONTACT:****3 AMP 600 VAC RATING:****DIN RAIL/PANEL
MOUNTABLE:****RECTIFIED COILS
ON AC TYPES:**MAXIMUM FLEXIBILITY OF USES EASILY HANDLES
MODERATELY HEAVY LOADS

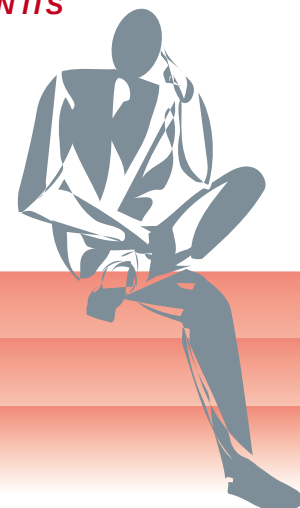
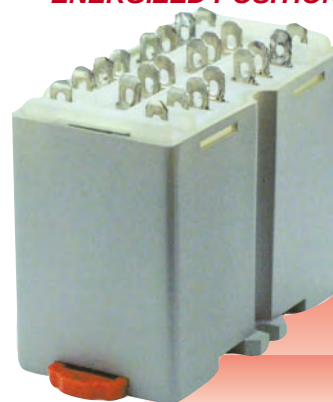
SUITABLE FOR NEARLY ALL CONTROL VOLTAGES

RAPID INSTALLATION - CAN REPLACE EXISTING OPEN
TYPES SUCH AS POTTER & BRUMFIELD KUB WITHOUT
PANEL MODIFICATION

RUNS COOLER & QUIETER, USES LESS ENERGY.

BENEFITS**DPDT, 4PDT & 6PDT 15 AMPS****UL** US DIN MOUNTING
UL PENDING

THE CLASS 385 RELAY IS A MECHANICALLY LATCHED, ELECTRICALLY RESET RELAY, IT CAN BE FURNISHED WITH TWO, FOUR OR SIX SETS OF DOUBLE THROW CONTACTS, AND ALL POPULAR COIL VOLTAGES. AC COIL TYPES INCORPORATE BUILT IN RECTIFIERS FOR MAXIMUM COIL EFFICIENCY AND MINIMAL HEATING FOR CONTINUOUS DUTY CAPABILITY. ALL TERMINALS ARE STANDARD 0.187 INCH QUICK CONNECT AND ARE ALSO PIERCED FOR DIRECT SOLDER CONNECTION IF DESIRED. THE MOLDED PLASTIC DUST COVER SNAPS ONTO A STANDARD DIN RAIL, AS WELL AS INCORPORATING MOUNTING SLOTS THAT EXACTLY MATCH POTTER & BRUMFIELD'S KUB. UNLIKE MOST MECHANICAL LATCH RELAYS, THE 385 DOES NOT HAVE A DOMINANT COIL. IF BOTH COILS ARE ENERGIZED AT THE SAME TIME, ALL OF THE NORMALLY OPEN CONTACTS CLOSE, AND ALL NORMALLY CLOSED CONTACTS OPEN. WHICH EVER COIL IS DE-ENERGIZED FIRST, RELEASES AND LOCKS THE OTHER SIDE IN ITS ENERGIZED POSITION.

**GENERAL SPECIFICATIONS****COIL**

Pull-in Voltage:	75% of nominal voltage or less
Max. Voltage:	110% of nominal voltage
Resistance:	±10% measured @ 25°C
Coil Power:	2.6 watts DC, 2.0 VA (60Hz) AC 25°C
Pulse Duration Min.:	30 milliseconds
Duty:	Intermittent duty

CONTACTS

Contact Material:	Silver cadmium oxide, gold flashed
Contact Resistance:	75 milliohms maximum initial at rated current
Contact Rating:	15 amps, @ 120/ 240 / 277 VAC. 3 amps, @ 600 VAC. (resistive load), 10 amps @ 28 VDC. (resistive load), 1/3 Hp @ 120 VAC, 50/60 Hz 1/2Hp @ 208 / 240 / 480 / 600 VAC. 50/60 Hz (motor load)

TIMING

Operate Time:	25 mS min @ nominal voltage
Reset Time:	20 mS min @ nominal voltage

DIELECTRIC STRENGTH

Contacts to Coil:	2000 V rms
Coil to Frame:	2000 V rms
Across Open Contacts:	500 V rms
Pole to Pole:	1500 V rms
Contacts to Frame:	2000 V rms
Insulation Resistance:	1000 megohms min. @ 500 VDC

TEMPERATURE

Operating:	-40°C to +70°C @ rated operation
Storage:	-40°C to +105°C

LIFE EXPECTANCY

Electrical:	100,000 operations @ rated resistive load
Mechanical:	10,000,000 operations @ no load

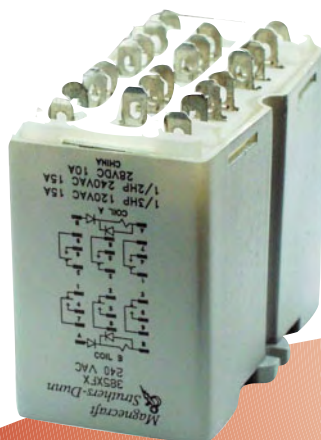
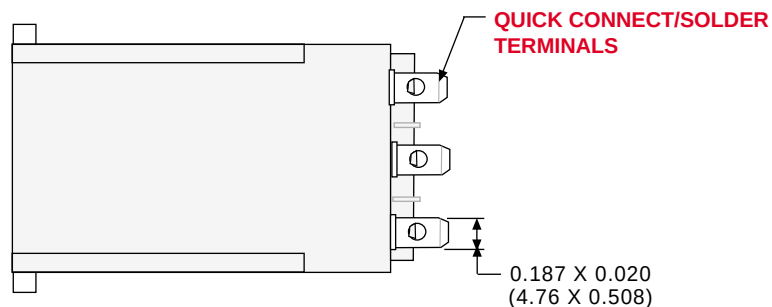
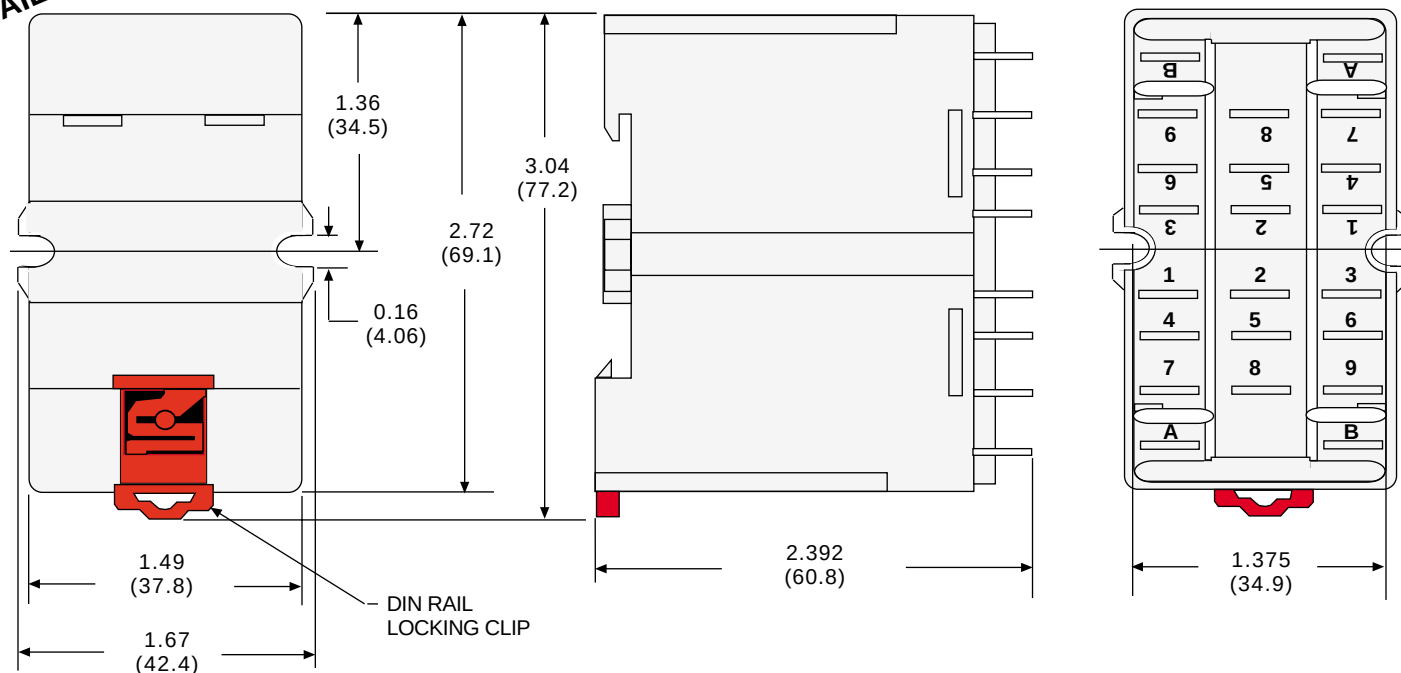
MISCELLANEOUS

Operating Position:	Any
Insulation Material:	Molded plastic
Enclosure:	Polycarbonate
Weight:	85 grams approx.

DPDT, 4PDT & 6PDT 15 AMPS

NEW
From The Market
Leader in Industrial
Relays
AVAILABLE: Q-2-02

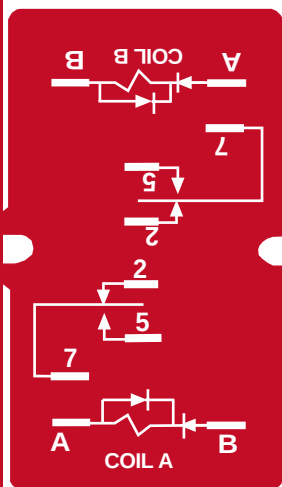
OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



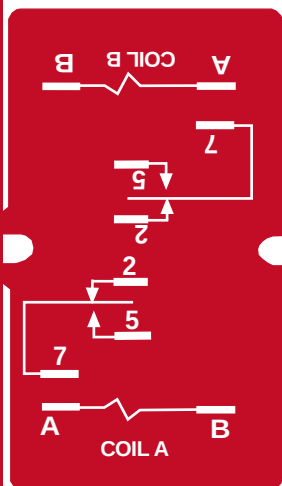
DPDT, 4PDT & 6PDT 15 AMPS

WIRING DIAGRAMS

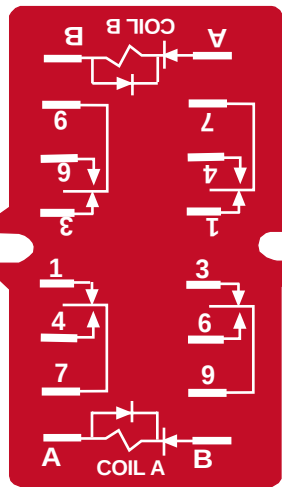
(VIEWED FROM PIN END)



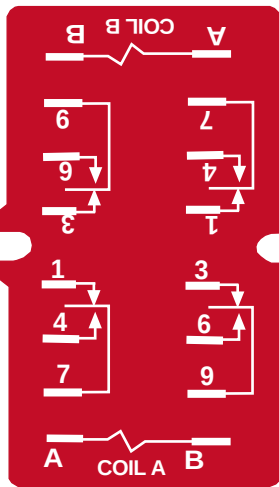
**385XBX DPDT
(AC COIL)**



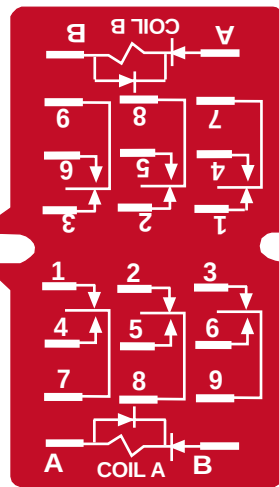
**385XBX DPDT
(DC COIL)**



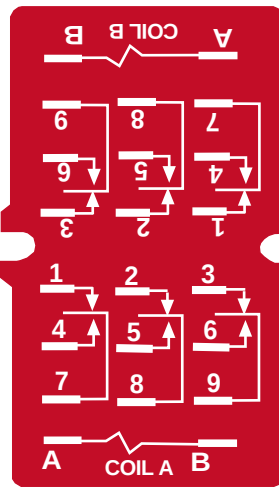
**XDX 4PDT
(AC COIL)**



**XDX 4PDT
(DC COIL)**



**XFX 6PDT
(AC COIL)**



**XFX 6PDT
(DC COIL)**



ORDERING CODE FOR RELAYS

COILS: **F** **385** **XBX** **-240**
 130°C: NO CODE, 150°C: CODE F

CLASS:
 385 - 15 AMPS RATING WITH
 0.187" QUICK CONNECT/SOLDER
 TERMINALS

CONTACT ARRANGEMENTS:
 XBX: DPDT,
 XDX: 4PDT
 XFX: 6PDT

COIL VOLTAGE:
 6, 12, 24, 120, 240 ADD "A" FOR AC COILS
 6, 12, 24, 48, 110-125 ADD "D" FOR DC COILS

STANDARD PART NUMBERS	CONTACT CONFIGU- RATION	COIL MEASURED @ 25°C	
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED, DUAL COIL			
385XDX-120A	4PDT	120 VAC	4800/4800 Ω
DC OPERATED			
385XDX-12D	4PDT	12 VDC	85/85 Ω
385XDX-24D	4PDT	24 VDC	340/340 Ω

RETROFITS POTTER & BRUMFIELD KUB
 SEE END OF SECTION 5 FOR CROSS REFERENCE

5PDT, 10 AMPS

FEATURES

20 PIN PLUG-IN , 5PDT:

LARGEST NUMBER OF CONTACTS AVAILABLE IN A SOCKET MOUNTED LATCHING RELAY

2 COIL CONSTRUCTION
NEITHER COIL DOMINANT:

MULTIPLE CAPABILITIES

BENEFITS

GENERAL SPECIFICATIONS

COIL

Pull-in Voltage: 85% of nominal voltage or less for AC coils
80% of nominal voltage or less for DC coils

Max. Voltage: 110% of nominal voltage

Resistance: ±7.5% measured @ 25°C

Coil Power: 2.5 watts DC, 6 VA (60Hz) AC 25°C

Pulse Duration Min.: 50 milliseconds

Max. pulse time 2 minutes for AC coils,
5 minutes for DC coils

Duty: Intermittent duty

CONTACTS

Contact Material: Silver cadmium oxide, gold flashed

Contact Resistance: 10 amps, 120 / 240 VAC, 28 VDC

Contact Rating: 50 milliohms maximum initial at rated current

TIMING

Operate time: 25 mS or less @ nominal voltage

Reset time: 25 mS or less @ nominal voltage

DIELECTRIC STRENGTH

Contacts to Coil: 1500 V rms

Coil to Frame: 1500 V rms

Across Open Contacts: 500 V rms

Pole to Pole: 1500 V rms

Contacts to Frame: 1500 V rms

Insulation Resistance: 1000 megohms min. @ 500 VDC

TEMPERATURE

Operating: -10°C to +50°C (AC), -10°C to +60°C (DC) @ rated operation

Storage: -30°C to 105°C

SHOCK RESISTANCE

Operating: 5 g's

Reset: 20 g's

VIBRATION RESISTANCE

Operating: 5 g's, 10 Hz to 55 Hz

Reset: 5 g's, 10 Hz to 55 Hz

LIFE EXPECTANCY

Electrical: 100,000 operations @ rated resistive load

Mechanical: 10,000,000 operations @ no load

MISCELLANEOUS

Operating Position: Any

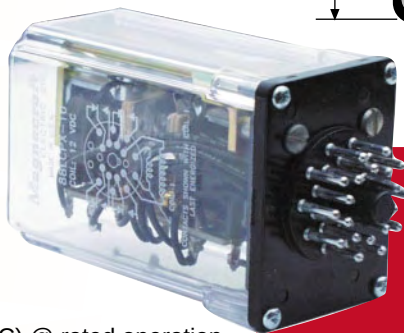
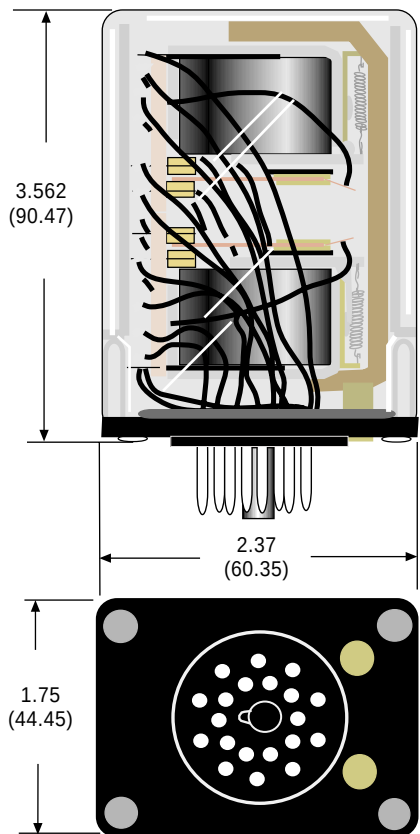
Insulation Material: Molded plastic

Enclosure: Clear, polycarbonate

Weight: 226.8 grams approx.

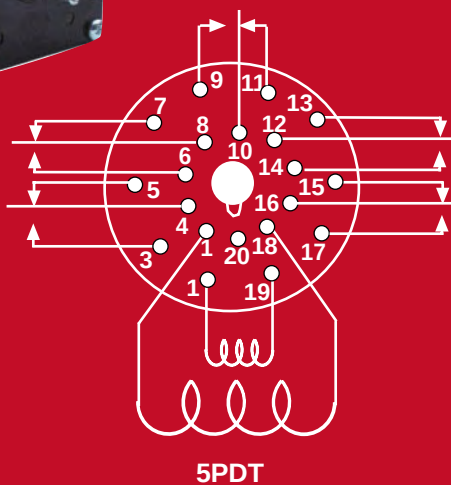
OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



WIRING DIAGRAMS

(VIEWED FROM PIN END)



5PDT

STANDARD
PART
NUMBERS

AC OPERATED

88ALCPX-23

CONTACT
CONFIGU-
RATION

5PDT

COIL MEASURED @ 25°C

NOMINAL
INPUT
VOLTAGE

120 VAC

NOMINAL
RESISTANCE
(OHMS)

650 Ω

DPDT, 5 AMPS**FEATURES****INDUSTRIAL PLUG-IN CONSTRUCTION:****TRANSFER ON RELEASE VERSION AVAILABLE :****NON-STANDARD SEQUENCES AVAILABLE**

RUGGED & RELIABLE

EXTRA LONG LIFE WHEN LOAD IS ENERGIZED ONLY WHEN THE 311'S COIL IS ON.

CAN BE CUSTOMIZED WITH ANY SEQUENCE DIVISIBLE INTO EIGHT

BENEFITS

 UL Recognized
 File No. E7104
GENERAL SPECIFICATIONS**COIL**

Pull-in Voltage:	85% of nominal voltage or less for AC coils 80% of nominal voltage or less for DC coils
Max. Voltage:	110% of nominal voltage
Resistance:	±10 % measured @ 25°C
Coil Power:	1.8 watts DC, 5 VA (60Hz) AC 25°C
Insulation System:	Class "B" (130°C per UL standard 1446)
Pulse Duration Min.:	30 milliseconds
Duty:	Continuous

CONTACTS

Contact Material:	Silver cadmium oxide
Contact Resistance:	50 milliohms maximum initial at rated current
Contact Rating:	5 amps, 120 VAC, 30 VDC., 0.1 amp, 115 VDC
Max. Inrush:	12 amps, 120 VAC, 30 VDC., 0.25 amp, 115 VDC

TIMING

Operate time:	35 mS max. @ nominal voltage
Reset time:	35 mS max. @ nominal voltage

DIELECTRIC STRENGTH

Contacts to Coil:	1500 V rms
Coil to Frame:	1500 V rms
Across Open Contacts:	500 V rms
Pole to Pole:	1500 V rms
Contacts to Frame:	1500 V rms
Insulation Resistance:	1000 megohms min. @ 500 VDC

TEMPERATURE

Operating:	-10°C to +60°C @ rated operation
Storage:	-40°C to +105°C

LIFE EXPECTANCY

Electrical:	100,000 operations @ rated resistive load
Mechanical:	5,000,000 operations @ no load

MISCELLANEOUS

Operating Position:	Any
Insulation Material:	Molded plastic
Enclosure:	Clear polycarbonate
Weight:	190 grams approx.

THE CLASS A311 RELAY IS A SEQUENCING VERSION OF THE CLASS 219 GENERAL PURPOSE RELAY. CONTACTS TRANSFER ON EACH IMPULSE TO THE COIL. MODELS ARE AVAILABLE WITH CONTACTS TRANSFERRING WHEN COIL IS ENERGIZED OR WHEN DE-ENERGIZED.

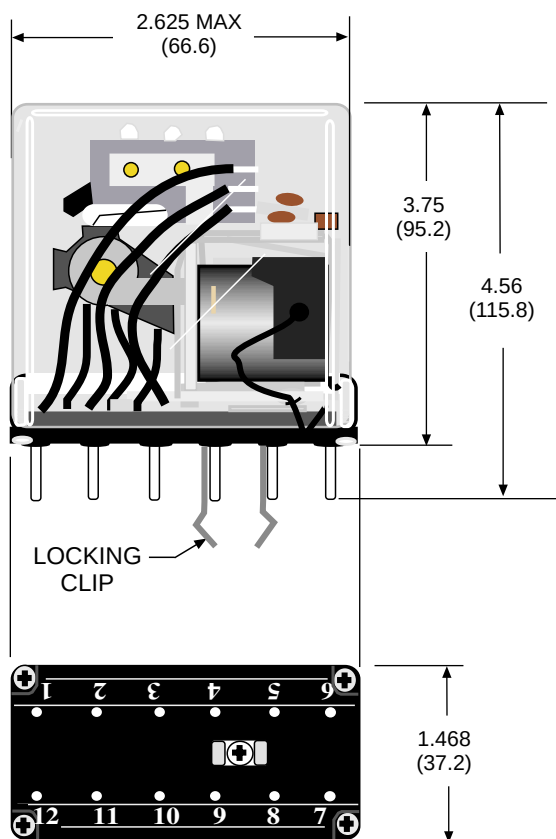
A DOUBLE CAM MOVEMENT, ONE CAM PER SNAP SWITCH, ALLOWS ONE OR BOTH CONTACTS TO BE ENERGIZED OR DE-ENERGIZED WITH THE CAM ROTATING ONE HALF STEP WHEN THE COIL IS ENERGIZED AND THE OTHER HALF STEP WHEN THE COIL IS DE-ENERGIZED ASSURES RELIABLE SEQUENCING OF THE TWO SPDT SNAP SWITCHES.



Mating Socket
27390
 See section 8, page 27

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



ORDERING CODE FOR RELAYS

CLASS: A311
A311 INDUSTRIAL PLUG-IN ,
SEQUENCE RELAY,
5 AMP, DPDT

CONTACT ARRANGEMENTS: XBX
XBX: DPDT

STANDARD FEATURES: P
PLUG-IN WITH POLYCARBONATE
COVER: CODE P

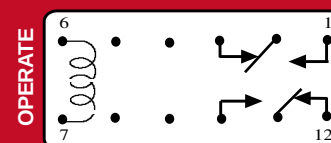
CONTACT TRANSFER: R
WHEN COIL IS ENERGIZED: NO CODE
WHEN COIL IS DE-ENERGIZED: CODE R

OPTIONS: L
INDICATOR LAMP: CODE L
COIL SUPPRESSION: CODE V

COIL VOLTAGE: 120A
6, 12, 24, 120, 240 ADD "A" FOR AC COILS
6, 12, 24, 48, 110-125 ADD "D" FOR DC COILS

WIRING DIAGRAMS

(VIEWED FROM PIN END)



**A311XBXP
A311XBXPR*
(DPDT)
TRANSFER ON RELEASE**

STANDARD PART NUMBERS	COIL MEASURED @ 25°C	
	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED		
A311XBXP-120A	120 VAC	540 Ω
A311XBXP-240A	240 VAC	1815 Ω
A311XBXPR-120A	120 VAC	540 Ω
DC OPERATED		
A311XBXP-24D	24 VDC	250 Ω
A311XBXPR-24D	24 VDC	250 Ω

DPDT, 12 AMPS**FEATURES****INTERNAL PERMANENT MAGNET LATCH RELAY**

HOLDS LAST POSITION INDEFINITELY WITH NO EXTERNAL POWER REQUIRED

SOLID STATE STEERING CIRCUIT

WILL NOT FORGET ITS LAST POSITION

COMPACT WITH 0.187" PLUG-IN, QUICK CONNECT, OR SOLDER TERMINALS

INTERCHANGEABLE WITH POTTER & BRUMFIELD KUR & MIDTEX 619

SNAP-ON FLANGE OR DIN MOUNT ADAPTERS AVAILABLE

PERMITS CUSTOM INSTALLATION

LED INDICATORS (OPTIONAL)

SHOWS IF INPUT IS ENERGIZED AND IN WHICH DIRECTION

BENEFITS

TYPE 711XBXC MAY BE USED TO SWITCH (ALTERNATE) BETWEEN TWO LOADS, OR TO TURN A SINGLE LOAD OR GROUP OF LOADS ON AND OFF WITH SUCCESSIVE PULSES FROM A SINGLE CONTROL SOURCE. WHEN USED AS AN ALTERNATING RELAY, IT WOULD MOST OFTEN BE EMPLOYED TO EQUALIZE WEAR ON TWO SIMILAR DEVICES SUCH AS HVAC EQUIPMENT OR PUMPS WHERE ONLY ONE IS TYPICALLY NEEDED TO OPERATE AT A TIME. EACH TIME THE CONTROLLING DEVICE CALLS FOR A SYSTEM TO OPERATE, THE ONE THAT DID NOT OPERATE THE PREVIOUS TIME COMES ON. WHEN USED FOR ON-OFF OPERATION, THE DEVICE BEING CONTROLLED WOULD TURN ON WHEN A SWITCH IS CLOSED AND STAY ON WHEN THE SWITCH IS OPENED. IT WOULD TURN OFF WHEN THE SWITCH RECLOSING AND WOULD STAY OFF UNTIL THE SWITCH IS OPENED AND CLOSED AGAIN. THE CONTROLLING SWITCH COULD BE A LIMIT SWITCH, A PUSH BUTTON, OR ANY SUITABLE DEVICE OR COMBINATION OF DEVICES THAT CAN PRODUCE A PULSE TO TURN ON, PULSE AGAIN TO TURN OFF SIGNAL. THE PULSE DURATION CAN BE ANY LENGTH SO LONG AS IT IS AT LEAST 50 MILLISECONDS. CAUTION: INPUT SENSING AND TRANSFER CIRCUIT WILL BE DAMAGED IF DIELECTRIC (HI POT) OR INSULATION RESISTANCE TEST PROBES CONTACT TERMINALS "A" AND "B" SIMULTANEOUSLY.

GENERAL SPECIFICATIONS**COIL**

Pull-in Voltage:	85% of nominal voltage or less for DC coils
Max. Voltage:	110% of nominal voltage
Resistance:	±10% measured @ 25°C
Coil Power:	1.8 watts DC, 1.64 VA (60Hz) AC 25°C
Insulation System:	Class "B" (130°C per UL standard 1446)
Pulse Duration Min.:	50 milliseconds
Duty:	Intermittent duty

CONTACTS

Contact Material:	Silver cadmium oxide, gold flashed
Contact Resistance:	50 milliohms maximum initial at rated current
Contact Rating:	12 amps @ 120/240 VAC 50/60 HZ, 28 VDC

TIMING

Operate Time:	35 mS max. @ nominal voltage
Reset Time:	35 mS max. @ nominal voltage

DIELECTRIC STRENGTH

Contacts to Coil:	1500 V rms
Coil to Frame:	1500 V rms
Across Open Contacts:	500 V rms
Pole to Pole:	1500 V rms
Contacts to Frame:	1500 V rms
Insulation Resistance:	1000 megohms min. @ 500 VDC

TEMPERATURE

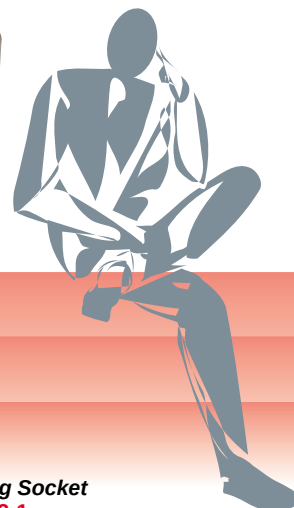
Operating:	-45°C to +70°C @ rated operation
Storage:	-45°C to +105°C

LIFE EXPECTANCY

Electrical:	100,000 operations @ rated resistive load
Mechanical:	10,000,000 operations @ no load

MISCELLANEOUS

Operating Position:	Any
Insulation Material:	Molded plastic
Enclosure:	Grey polycarbonate
Weight:	110 grams approx.

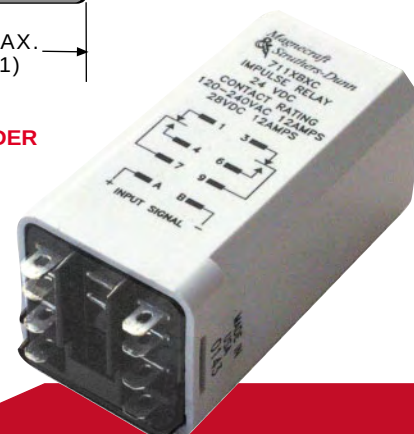
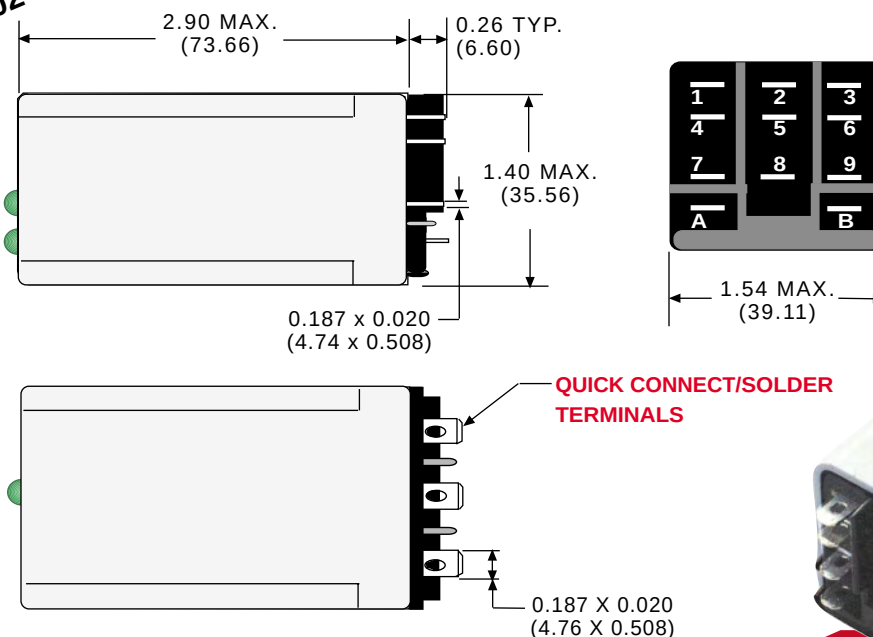


**Mating Socket
70-473-1
See section 8, page 16**

DPDT, 12 AMPS

NEW
From The Market
Leader in Industrial
Relays
AVAILABLE: Q-3-02

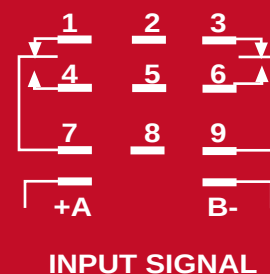
OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



TYPE 711 IS AN ELECTRONICALLY STEERED MAGNETIC LATCH IMPULSE SEQUENCING RELAY THAT ALTERNATES ITS CONTACT STATE ON SUCCESSIVE PULSES FROM THE SAME INPUT. BUILT ON THE SAME BASE AS OUR 788 SERIES, IT WILL ACCEPT ALL OF OUR STANDARD 0.187" BLADE TYPE SQUARE BASE SOCKETS. CONTACTS ARE DOUBLE POLE DOUBLE THROW RATED 12 AMPS.

OUR 711 DIFFERS FROM THE COMPETITION IN THAT WE USE A PERMANENT MAGNET LATCHING MECHANISM THAT WILL NOT CHANGE POSITION UNTIL COMMANDED, NO MATTER HOW LONG IT REMAINS IDLE.

WIRING DIAGRAMS (VIEWED FROM PIN END)



STANDARD PART NUMBERS	COIL MEASURED @ 25°C	
	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)*
AC OPERATED		
711XBXC-120A	120 VAC	1.64 VA
DC OPERATED		
711XBXC-12D	12 VDC	70 Ω
711XBXC-24D	24 VDC	220 Ω
711XBXC-110D	110 VDC	5700 Ω

* 711'S COIL RESISTANCE CANNOT BE ACCURATELY MEASURED . IT CAN BE CALCULATED USING CURRENT AND VOLTAGE METHOD (R = E / I)



SECTION 5 CROSS REFERENCE GUIDE

MAGNECRAFT & STRUTHERS-DUNN	IDEC	
W250AML2CPX-8	RR2KP-U-AC24	
W250AML2CPX-9	RR2KP-U-AC120	
W250AML2CPX-	RR2KP-U-AC240	
10W250ML2CPX-6	RR2KP-U-DC12	
W250ML2CPX-7	RR2KP-U-DC24	
W250ML2CPX-8	RR2KP-U-DC110	
MAGNECRAFT & STRUTHERS-DUNN	POTTER & BRUMFIELD	
W388AMLCPX-9	KUL11A15S-120	
W388MLCPX-6	KUL11D15S-12	
W388MLCPX-7	KUL11D15S-24	
W388ML2CPX-6	KUL11D15D-12	
W388ML2CPX-7	KUL11D15D-24	
MAGNECRAFT & STRUTHERS-DUNN	POTTER & BRUMFIELD	
385XDX-120A	KB-17AG-120 OR KUB-17A15-120	
385XDX-12D	KB-17DG-12 OR KUB-17D15-12	
385XDX-24D	KB-17DG-24 OR KUB-17D15-24	
MAGNECRAFT & STRUTHERS-DUNN	POTTER & BRUMFIELD	
88ALCPX-23	KBP-20AG-120	
MAGNECRAFT & STRUTHERS-DUNN	POTTER & BRUMFIELD	MIDTEX
711XBXC-12D	KUR-11D15-12	619-11B200
711XBXC-24D	KUR-11D15-24	619-11C200
711XBXC-48D	KUR-11D15-48	619-11D200
711XBXC-110D	KUR-11D15-110	619-11F200

THE CROSS REFERENCE IS INTENDED TO MATCH FOOT PRINT, INTERNAL WIRING, AND CONTACT LOAD RATINGS.

CONSTRUCTION FEATURES AND GENERAL SPECIFICATIONS SHOULD BE COMPARED IF EXACT REPLACEMENT IS REQUIRED.

FOR LATCHING APPLICATION ENGINEERING ASSISTANCE

Tom Mahaffey, PRODUCT MANAGER

FAX: (843) 395-8530

EMAIL: tmahaffey@magnecraft.com

FAX ON DEMAND: 1-800-891-2957

DOCUMENT: 500

U. S. A.

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FAX: (843) 393-4123

WEBSITE: www.magnecraft.com

EMAIL: info@magnecraft.com

EUROPE

TELEPHONE: 4989 / 75080310

FAX: 4989 / 7559344

WEBSITE: www.magnecraft.com

EMAIL: renatesteinback@magnecraft.de





Magnecraft & Struthers-Dunn
Your Contact for Relays

SECTION 6

**REED RELAYS FOR PRINTED
CIRCUIT BOARD APPLICATIONS
4 VA TO 100 VA
COAXIAL RELAYS
FOR R. F. SWITCHING**



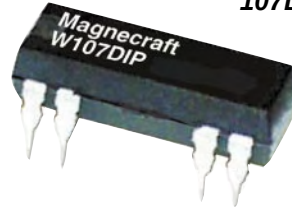
RELAY SERIES

117SIP



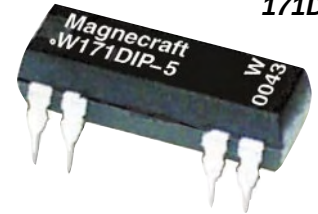
L W H
0.290 x 0.280 x 0.750

107DIP



L W H
0.275 X 0.300 X 0.750

171DIP



L W H
0.275 X 0.300 X 0.750

FEATURES

- SPST - NO OR NC - EPOXY MOLDED CONSTRUCTION.
- STANDARD 0.1 GRID SPACING.
- AVAILABLE WITH OR WITHOUT SUPPRESSION DIODE ACROSS COIL.

- SPST - NO OR NC - EPOXY MOLDED CONSTRUCTION.
- STANDARD 0.1 GRID SPACING.
- 4 HOOK-UP PINS TO COIL & 4 HOOK-UP PINS TO CONTACTS
- AVAILABLE WITH OPTIONAL ELECTROSTATIC SHIELD

- SPST - NO OR NC - EPOXY MOLDED CONSTRUCTION.
- STANDARD 0.1 GRID SPACING.
- AVAILABLE WITH OR WITHOUT SUPPRESSION DIODE ACROSS COIL.
- AVAILABLE WITH OPTIONAL ELECTROSTATIC SHIELD

CONTACT DATA

CONTACT CONFIGURATION:

SPST-N. O., SPST-N. C.

SPST-N. O., SPST-N. C.

SPST-N. O., SPST-N. C.

CONTACT MATERIAL:

RHODIUM

RHODIUM

RHODIUM

CONTACT RESISTANCE:

100 MILLIOHMS (INITIAL)

100 MILLIOHMS (INITIAL)

100 MILLIOHMS (INITIAL)

MAX. SWITCHING LOAD:

0.5 AMP, 200 VDC @ 10 VA

0.5 AMP, 100 VDC @ 10 VA

0.5 AMP, 100 VDC @ 10 VA

CONTINUOUS
CARRY CURRENT:

1.2 AMP

1.5 AMP

1.5 AMP

COIL DATA

STANDARD VOLTAGE
DC:

5, 12, 24,

5, 12, 24,

5, 12, 24,

NOMINAL COIL POWER
WATTS:

50 - 290 mW MAX.

35 - 290 mW MAX.

35 - 290 mW MAX.

GENERAL DATA

AMBIENT TEMPERATURE
OPERATING:

- 45°C TO + 85°C

- 40°C TO + 85°C

- 40°C TO + 85°C

STORAGE:

- 40°C TO + 105°C

- 40°C TO + 105°C

- 40°C TO + 105°C

DIELECTRIC STRENGTH:
(COIL TO FRAME)

500 V rms

1000 V rms

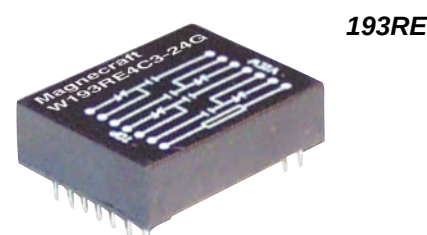
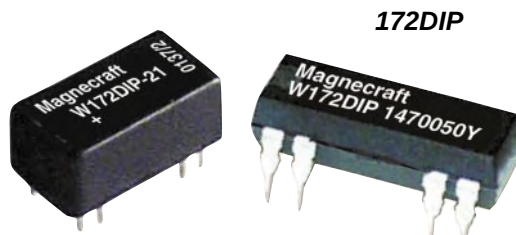
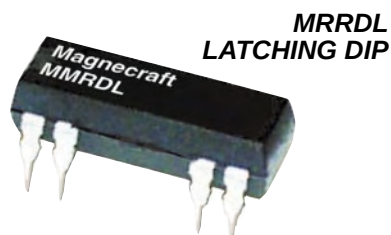
1000 V rms

LIFE EXPECTANCY
ELECTRICAL:
MECHANICAL:

50,000,000 OPERATIONS
100,000,000 OPERATIONS

50,000,000 OPERATIONS
100,000,000 OPERATIONS

50,000,000 OPERATIONS
100,000,000 OPERATIONS



L W H
0.275 X 0.300 X 0.750

L W H
0.275 X 0.300 X 0.750/0.338 X 0.393 X 0.750

L W H
0.355 X 0.4 TO 0.9 X 1.15

- SPST - NO - EPOXY MOLDED CONSTRUCTION
- STANDARD 0.1 GRID SPACING
- DUAL OPERATE & RESET COIL
- MAINTAINS LAST SET CONTACT POSITION WITHOUT THE NEED FOR COIL POWER

- SPDT - EPOXY MOLDED CONSTRUCTION. DPDT - ENCAPSULATED CONSTRUCTION.
- STANDARD 0.1 GRID SPACING.
- AVAILABLE WITH SUPPRESSION DIODE ACROSS COIL.
- AVAILABLE WITH OPTIONAL ELECTROSTATIC SHIELD

- SPDT -NO, SPDT, DPST - NO & DPDT - DUST COVER STANDARD. ENCAPSULATED CONSTRUCTION OPTIONAL
- STANDARD 0.1 GRID OR OPTIONAL 0.15 GRID SPACING.
- UP TO 4PDT OR 6PST CONTACT ARRANGEMENTS.

SPST-N. O.

SPDT, DPDT

1 TO 4PDT, 1 TO 6PST

RHODIUM

RHODIUM

RHODIUM

100 MILLIOHMS (INITIAL)

100 MILLIOHMS (INITIAL)

200 MILLIOHMS (INITIAL)

0.5 AMP, 100 VDC @ 10 VA

SPDT: 0.25 AMP, 100 VDC @ 4 VA
DPDT: 0.5 AMP, 100 VDC @ 10 VA

MAX. SWITCHING
0.5 AMP OR 200 VDC
@ 10 VA

1.5 AMP

SPDT - 0.5 AMP, DPDT - 1.0 AMP

1.5 AMP

5, 12, 24,

5, 12, 24,

12, 24,

35 - 290 mW MAX.

35 - 290 mW MAX.

1030 mW MAX.

- 40°C TO + 85°C

- 40°C TO + 85°C

- 40°C TO + 85°C

- 40°C TO + 105°C

- 40°C TO + 105°C

- 40°C TO + 105°C

1000 V rms

1000 V rms

500 V rms

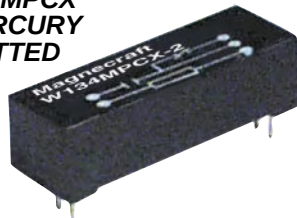
50,000,000 OPERATIONS
100,000,000 OPERATIONS

50,000,000 OPERATIONS
100,000,000 OPERATIONS

50,000 OPERATIONS
10,000,000 OPERATIONS

RELAY SERIES

134 MPCX
MERCURY
WETTED



102VX & 102HVX



120 COAXIAL



FEATURES

L W H
2.90 X 1.53 X 1.40

- SPDT & DPDT - DUST COVER STANDARD. ENCAPSULATED CONSTRUCTION OPTIONAL
- STANDARD 0.1 GRID OR OPTIONAL 0.15 SPACING AVAILABLE.
- POSITION SENSITIVE. VERTICAL MOUNTED.

L W H
0.65 X 0.76 X 2.67

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

L W H
1.73 X 0.703 X 1.62

- SPDT - METAL CASE
150 WATT SWITCHING UP TO 470 MHz.
- RG58C/U CABLE,
12" LONG STANDARD.
50 OHM IMPEDANCE
R.F. SWITCHING CONTACTS

CONTACT DATA

CONTACT CONFIGURATION:

SPDT, DPDT

SPST- N. O.

SPDT

CONTACT MATERIAL:

RHODIUM / MERCURY

TUNGSTEN

SILVER ALLOY GOLD FLASHED

CONTACT RESISTANCE:

100 MILLIOHMS (INITIAL)

200 MILLIOHMS (INITIAL)

50 MILLIOHMS (INITIAL)

MAX. SWITCHING LOAD:

MAX. SWITCHING
1.0 AMP OR 500 VDC @ 50 VA

VX-10 MA @ 5000VDC
HVX-5 MA @ 10,000 VDC

150 WATTS, 85 Vrms

CONTINUOUS
CARRY CURRENT:

30 & 15 MILLIAMPS

150 WATTS

COIL DATA

STANDARD VOLTAGE
DC:

5, 12, 24,

12, 24,

12

NOMINAL COIL POWER
WATTS:

620 mW MAX.

1.5 WATTS MAX.

1.44 WATTS MAX.

GENERAL DATA

AMBIENT TEMPERATURE
OPERATING:

- 37°C TO + 85°C

- 40°C TO + 85°C

- 55°C TO + 65°C

STORAGE:

- 40°C TO + 105°C

- 40°C TO +105°C

- 40°C TO +105°C

DIELECTRIC STRENGTH:
(COIL TO FRAME)

1000 V rms

12000 V rms

1500 V rms

LIFE EXPECTANCY
ELECTRICAL:
MECHANICAL:

40,000 OPERATIONS
10,000,000 OPERATIONS

1,000,000 OPERATIONS
10,000,000 OPERATIONS

5,000,000 OPERATIONS
100,000 OPERATIONS

HOW REED RELAYS WORK

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

DRY REED RELAYS

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

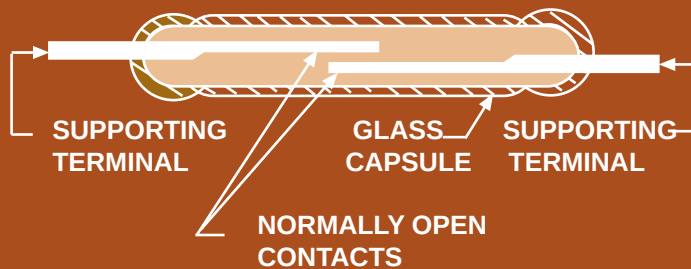


Figure 1. Construction of Switch Capsule of Typical Dry Reed switch (SPST-NO)

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

MERCURY-WETTED CONTACT RELAYS.

Mercury wetted contacts consist of a glass-encapsulated reed with its base immersed in a pool of mercury and the other end capable of moving between one or two stationary contacts. The mercury flows up the reed by capillary action and wets the contact surfaces of the moving end of the reed as well as the contact surfaces of the stationary contacts. A mercury to mercury contact is maintained in the closed position. The capsule is surrounded by an electromagnetic coil and operates in the same manner as a dry reed.

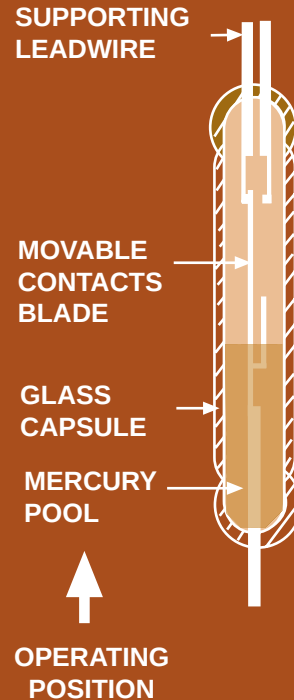


Figure 2. Miniature Mercury wetted contacts switch (SPST)

Mercury wetted contacts are fast in operation and have relatively good load carrying capacity and long life. The mercury films are reestablished at each contact closure and contact erosion is eliminated. The mercury films are stretchable, there is no contact bounce and because it is a mercury contact, the contact resistance is very low and ideal for low level switching applications. The disadvantages of this type of reed relay are the freezing point of mercury (-38°C), poor resistance to shock and vibration and the need to mount the relay in a near vertical position. These relays are used for a variety of switching applications such as found in computers, business machines, machine tool control systems, and laboratory instruments.

CONTACT COMBINATIONS.

The switches used in dry reed relays provide SPST-NO, SPST-NC, SPDT contact combinations.

The SPST-NO corresponds with the basic switch capsule design (Fig.1).

The SPST-NC results from a combination of the SPST-NO switch and a permanent magnet strong enough to pull the contacts closed but able to open when coil voltage is applied to the relay coil.

In typical true SPDT designs, the armature is mechanically tensioned against the normally closed contact, and is moved to the normally open contact upon application of a magnetic field. The SPDT contact combination can also be achieved by joining a SPST-NO switch with an appropriately adjusted SPST-NC switch, and jumping one side of both switches together to form the movable contact system.

Latching contacts, defined as contacts which remain in the position to which they were driven, and stay in that position when coil power is removed from the relay coil.

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

APPLICATION DATA

MAGNETIC FIELDS

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

ELECTRICAL CHARACTERISTICS

SENSITIVITY:

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

OPERATE TIME:

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

RELEASE TIME:

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

CONTACT BOUNCE

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

CONTACT RESISTANCE

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

INSULATION RESISTANCE

A dry reed switch made in a properly controlled internal atmosphere will have an insulation resistance of 10^{12} to 10^{14} ohms or greater. When it is assembled into a relay, parallel insulation paths reduce this to typical values of 10^9 ohms. Depending on the particular manner of relay construction, exposure to high humidity or contaminating environments can appreciably lower final insulation resistance.

CAPACITANCE

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

DIELECTRIC WITHSTAND VOLTAGE

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



THERMAL EMF

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

NOISE

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

ENVIRONMENTAL CHARACTERISTICS

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

VIBRATION

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

SHOCK

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

TEMPERATURE

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

CONTACT PROTECTION

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



Figure 3

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



Figure 4

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

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SPST-N.O. OR N.C., 0.5 AMP**GENERAL SPECIFICATIONS****COIL**

Pull-in Voltage:	85% of nominal voltage or less
Drop Out Voltage:	10% of nominal voltage or more
Max. Voltage:	110% of nominal voltage
Resistance:	±10% measured @ 25°C
Coil Power:	See chart
Duty:	Continuous

CONTACTS

Contact Material:	Rhodium
Contact Resistance:	200 milliohms max
Contact Rating:	0.5 amp 200 VDC (10VA) 1.2 amps max. Continuous carry current

TIMING

Operate time:	1 mS or less @ nominal voltage
Release time:	1 mS or less @ nominal voltage

DIELECTRIC STRENGTH

Across Open Contacts:	150 V rms
Between Mutually	
Insulation Points:	500 V rms
Insulation Resistance:	1000 megohms min. @ 500 VDC
Capacitance:	1.0 pf typical coil to contact

TEMPERATURE

Operating:	-40°C to +85°C @ rated operation
Storage:	-40°C to +105°C

SHOCK RESISTANCE

Operating:	50 g's
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VIBRATION RESISTANCE

Operating:	20 g's, 40 Hz to 200 Hz
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LIFE EXPECTANCY

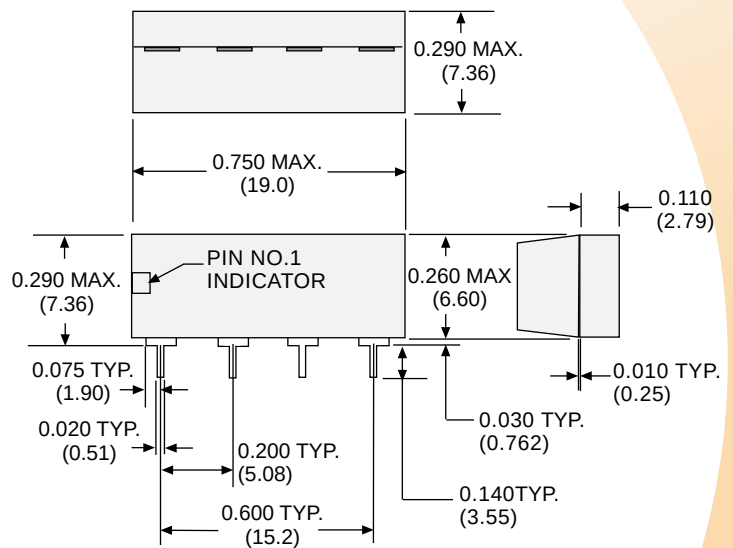
Electrical:	50,000,000 operations @ 5-10 V @ 10 mA
Mechanical:	100,000,000 operations @ no load

MISCELLANEOUS

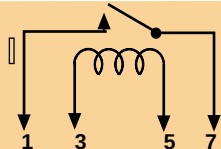
Operating Position:	Any
Enclosure:	Epoxy molded
Weight:	1 gram approx.

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

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



**WIRING
DIAGRAMS**
(TOP VIEWED)

SPST - N. O.

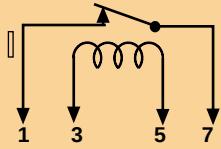
**STANDARD
PART
NUMBERS**

W117SIP-1
W117SIP-3
W117SIP-5

COIL MEASURED @ 25°C

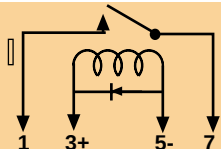
**NOMINAL
INPUT
VOLTAGE** **NOMINAL
RESISTANCE
(OHMS)** **NOMINAL
POWER
(mW)**

5 500 Ω 50
12 1000 Ω 144
24 2000 Ω 288

SPST - N. C.

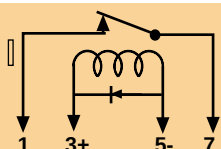
W117SIP-22
W117SIP-23
W117SIP-24

5 500 Ω 50
12 1200 Ω 120
24 2200 Ω 270

SPST - N. O. WITH CLAMPING DIODE

W117SIP-6
W117SIP-8
W117SIP-10

5 500 Ω 50
12 1000 Ω 144
24 2000 Ω 288

SPST - N. C. WITH CLAMPING DIODE

W117SIP-18
W117SIP-25
W117SIP-26

5 500 Ω 50
12 1200 Ω 120
24 2200 Ω 220

SPST-N.O., 0.5 AMP**GENERAL SPECIFICATIONS****COIL**

Pull-in Voltage:	85% of nominal voltage or less
Drop Out Voltage:	10% of nominal voltage or more
Max. Voltage:	110% of nominal voltage
Resistance:	±10% measured @ 25°C
Coil Power:	See chart
Duty:	Continuous

CONTACTS

Contact Material:	Rhodium
Contact Resistance:	200 milliohms max.
Contact Rating:	0.5 amp 100 VDC (10VA) 1.5 amps max. Continuous carry current.

TIMING

Operate time:	1 mS or less @ nominal voltage.
Reset time:	1 mS or less @ nominal voltage.

DIELECTRIC STRENGTH

Across Open Contacts:	200 V rms
Between Mutually	
Insulation Points:	1000 V rms
Insulation Resistance:	1000 megohms min. @ 500 VDC
Capacitance:	2.0 pf typical contact to open contact

TEMPERATURE

Operating:	-40°C to +85°C @ rated operation
Storage:	-40°C to +105°C

SHOCK RESISTANCE

Operating:	50 g's
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VIBRATION RESISTANCE

Operating	20 g's, 40 Hz to 200 Hz
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LIFE EXPECTANCY

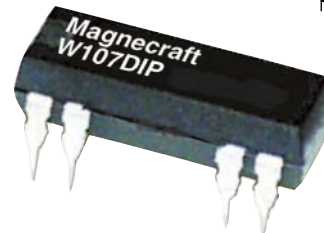
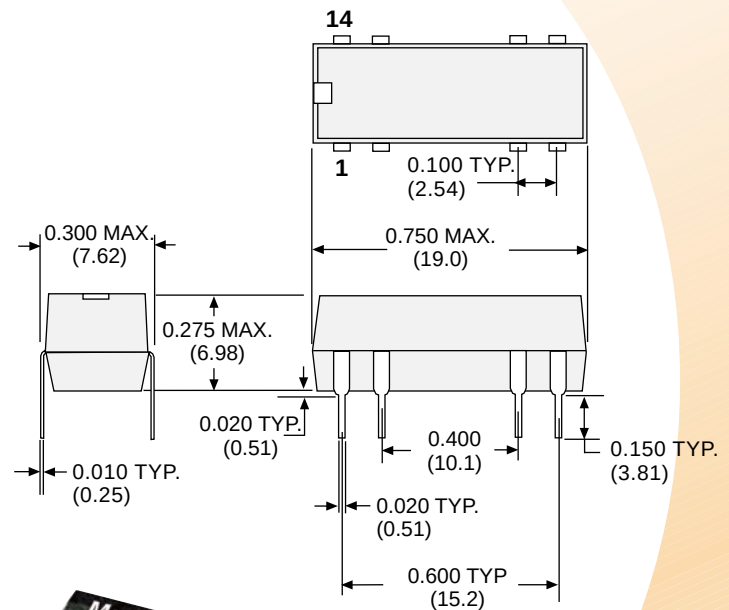
Electrical:	50,000,000 operations @ 5-10 V @ 10 mA
Mechanical:	100,000,000 operations @ no load

MISCELLANEOUS

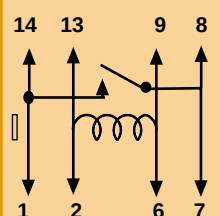
Operating Position:	Any
Enclosure:	Epoxy molded
Weight:	1 gram approx.

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

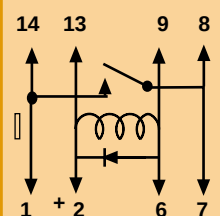
OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



**WIRING
DIAGRAMS**
(TOP VIEWED)

SPST - N. O.

STANDARD PART NUMBERS	COIL MEASURED @ 25°C		
	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL POWER (mW)
W107DIP-1	5	500 Ω	50
W107DIP-3	12	1000 Ω	144
W107DIP-4	24	2000 Ω	288
SPST - N. O. WITH CLAMPING DIODE			
W107DIP-5	5	500 Ω	50
W107DIP-7	12	1000 Ω	144
W107DIP-8	24	2000 Ω	288

SPST - N. O. WITH CLAMPING DIODE

SEE END OF SECTION 6 FOR CROSS REFERENCE

**SPST-N.O. OR N.C., DPST-N.O.
0.5 AMP****GENERAL SPECIFICATIONS****COIL**

Pull-in Voltage:	85% of nominal voltage or less
Drop Out Voltage:	10% of nominal voltage or more
Max. Voltage:	110% of nominal voltage
Resistance:	±10% measured @ 25°C
Coil Power:	See chart
Duty:	Continuous

CONTACTS

Contact Material:	Rhodium
Contact Resistance:	200 milliohms max.
Contact Rating:	0.5 amp 100 VDC (10VA) 1.5 amps max continuous carry current

TIMING

Operate time:	1 mS or less @ nominal voltage
Release time:	1 mS or less @ nominal Voltage

DIELECTRIC STRENGTH

Across Open Contacts:	150 V rms
Between Mutually	
Insulation Points:	500 V rms
Insulation Resistance:	1000 megohms min. @ 100 VDC
Capacitance:	1.0 pf typical contact to contact

TEMPERATURE

Operating:	-40°C to +85°C @ rated operation
Storage:	-40°C to +105°C

SHOCK RESISTANCE

Operating:	50 g's
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VIBRATION RESISTANCE

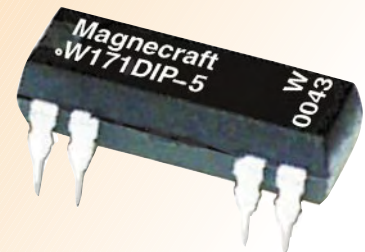
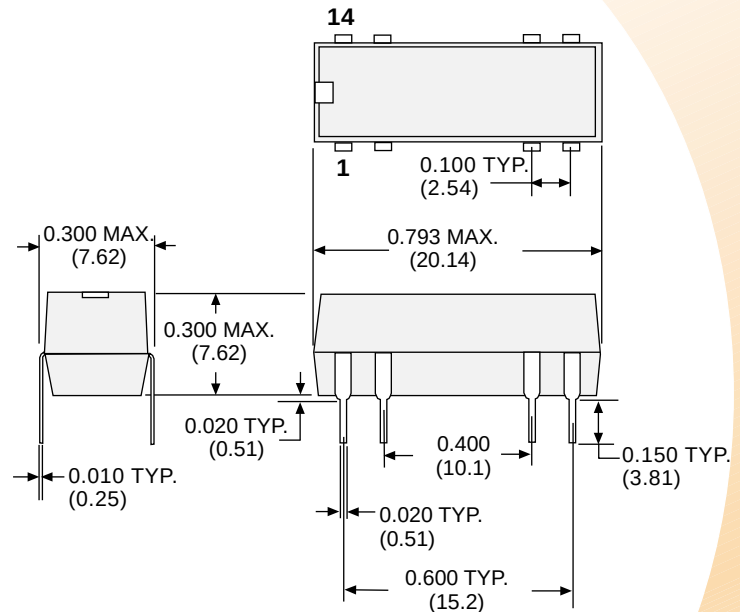
Operating:	20 g's, 40 Hz to 200 Hz
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LIFE EXPECTANCY

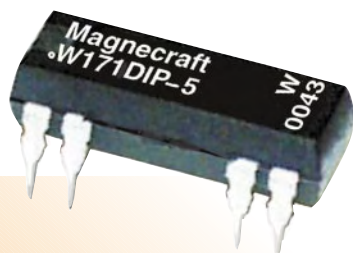
Electrical:	50,000,000 operations @ rated load
Mechanical:	100,000,000 operations low level

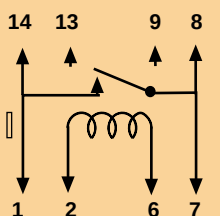
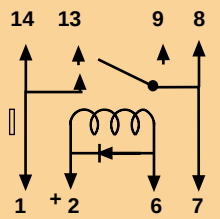
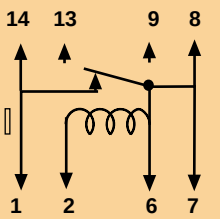
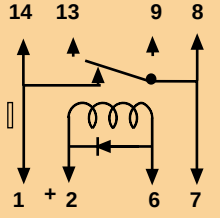
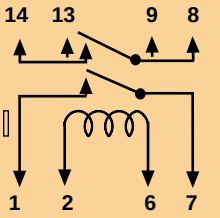
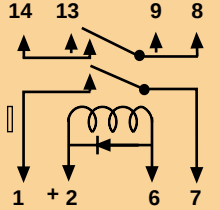
MISCELLANEOUS

Operating Position:	Any
Enclosure:	Epoxy molded
Weight:	1 gram approx.

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

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

**SPST-N.O. OR N.C., DPST-N.O.
0.5 AMP**

WIRING DIAGRAMS (TOP VIEWED)	STANDARD PART NUMBERS	COIL MEASURED @ 25°C		
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL POWER (mW)
SPST - N. O.				
	W171DIP-2	5	500 Ω	50
	W171DIP-4	12	1200 Ω	120
	W171DIP-5	24	2200 Ω	270
SPST - N. O. WITH CLAMPING DIODE				
	W171DIP-7	5	500 Ω	50
	W171DIP-9	12	1000 Ω	144
	W171DIP-10	24	2200 Ω	270
SPST - N. C.				
	W171DIP-12	5	200 Ω	50
	W171DIP-14	12	1200 Ω	120
	W171DIP-15	24	2200 Ω	270
SPST - N. C. WITH CLAMPING DIODE				
	W171DIP-17	5	500 Ω	50
	W171DIP-19	12	1200 Ω	120
	W171DIP-20	24	2200 Ω	270
DPST - N. O.				
	W171DIP-21	5	500 Ω	50
	W171DIP-23	12	1000 Ω	144
	W171DIP-24	24	2200 Ω	270
DPST - N. O. WITH CLAMPING DIODE				
	W171DIP-25	5	500 Ω	50
	W171DIP-27	12	1000 Ω	144
	W171DIP-28	24	2200 Ω	270

SEE END OF SECTION 6 FOR CROSS REFERENCE

SPST - N.O., 0.5 AMP

GENERAL SPECIFICATIONS

COIL

Pull-in Voltage:	85% of nominal voltage or less
Drop Out Voltage:	10% of nominal voltage or more
Max. Voltage:	110% of nominal voltage
Resistance:	±10% measured @ 25°C
Coil Power:	See chart
Duty:	Continuous

CONTACTS

Contact Material:	Rhodium
Contact Resistance:	200 milliohms max
Contact Rating:	0.5 amp 100 VDC (10VA) 1.5 amps max continuous carry current

TIMING

Operate time:	1 mS or less @ nominal voltage
Release time:	1 mS or less @ nominal Voltage

DIELECTRIC STRENGTH

Across Open Contacts:	150 V rms
Between Mutually	
Insulation Points:	500 V rms
Insulation Resistance:	1000 megohms min. @ 100 VDC
Capacitance:	1.0 pf typical contact to contact

TEMPERATURE

Operating:	-40°C to +85°C @ rated operation
Storage:	-40°C to +105°C

SHOCK RESISTANCE

Operating:	50 g's
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VIBRATION RESISTANCE

Operating:	20 g's, 40 Hz to 200 Hz
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LIFE EXPECTANCY

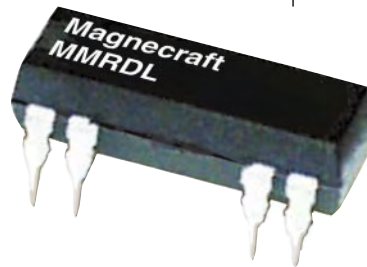
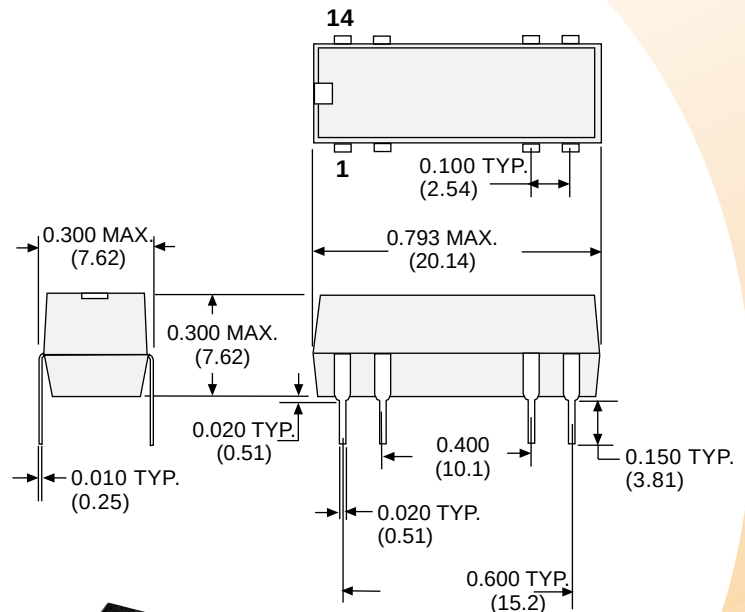
Electrical:	50,000,000 operations @ rated load
Mechanical:	100,000,000 operations low level

MISCELLANEOUS

Operating Position:	Any
Enclosure:	Epoxy molded
Weight:	1 gram approx.

OUTLINE DIMENSIONS

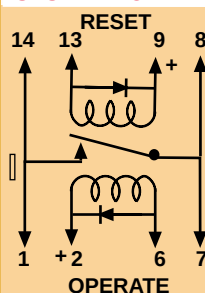
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



WIRING DIAGRAMS

(TOP VIEWED)

SPST - N. O.



STANDARD PART NUMBERS

MRRDL1AS8-5D
MRRDL1AS8-12D
MRRDL1AS8-24D

COIL MEASURED @ 25°C

NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL POWER (mW)
5	750 / 750 Ω	35
12	1000 / 1000 Ω	145
24	4600 / 4600 Ω	125

WHEN SPACING LATCHING DIP RELAYS, THE RELAYS REQUIRE 1 INCH SPACING BETWEEN ADJACENT RELAYS FROM END TO END.

SPDT, 0.25 AMP**GENERAL SPECIFICATIONS****COIL**

Pull-in Voltage:	85% of nominal voltage or less
Drop Out Voltage:	10% of nominal voltage or more
Max. Voltage:	110% of nominal voltage
Resistance:	±10% measured @ 25°C
Coil Power:	See chart
Duty:	Continuous

CONTACTS

Contact Material:	Rhodium
Contact Resistance:	200 milliohms max
Contact Rating:	0.25 amp 100 VDC (4 VA) 0.5 amps max continuous carry current

TIMING

Operate time:	1 mS or less @ nominal voltage
Release time:	1 mS or less @ nominal Voltage

DIELECTRIC STRENGTH

Across Open Contacts:	1000 V rms
Between Mutually	
Insulation Points:	500 V rms
Insulation Resistance:	1000 megohms min. @ 100 VDC
Capacitance:	1.0 pf typical coil to contact

TEMPERATURE

Operating:	-40°C to +85°C @ rated operation
Storage:	-40°C to +105°C

SHOCK RESISTANCE

Operating:	50 g's
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VIBRATION RESISTANCE

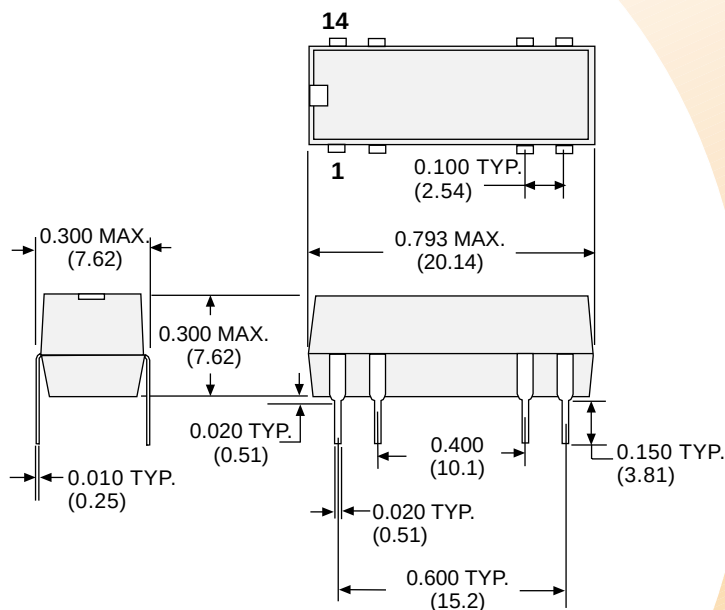
Operating:	20 g's, 40 Hz to 200 Hz
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LIFE EXPECTANCY

Electrical:	50,000,000 operations @ 50V/50mA
Mechanical:	80,000,000 operations low level 10V/10mA

MISCELLANEOUS

Operating Position:	Any
Enclosure:	Epoxy molded
Weight:	1 gram approx.

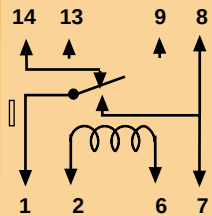
OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

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



WIRING DIAGRAMS (TOP VIEWED)

SPDT



STANDARD PART NUMBERS

COIL MEASURED @ 25°C

NOMINAL INPUT VOLTAGE

NOMINAL RESISTANCE (OHMS)

NOMINAL POWER (mW)

W172DIP-1

5

200 Ω

125

W172DIP-3

12

500 Ω

300

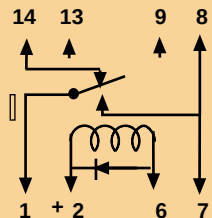
W172DIP-4

24

2200 Ω

270

SPDT WITH CLAMPING DIODE



W172DIP-5

5

200 Ω

125

W172DIP-7

12

500 Ω

300

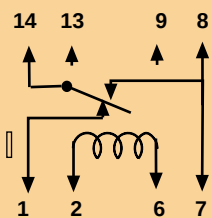
W172DIP-8

24

2200 Ω

270

SPDT



W172DIP-31

5

200 Ω

125

W172DIP-33

12

500 Ω

290

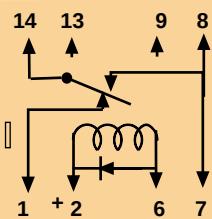
W172DIP-34

24

2200 Ω

270

SPDT WITH CLAMPING DIODE



W172DIP-35

5

200 Ω

125

W172DIP-37

12

500 Ω

290

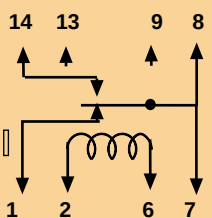
W172DIP-38

24

2200 Ω

270

SPDT



W172DIP-141

5

200 Ω

125

W172DIP-145

12

1000 Ω

144

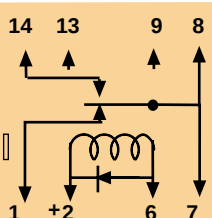
W172DIP-146

24

3200 Ω

180

SPDT WITH CLAMPING DIODE



W172DIP-147

5

200 Ω

125

W172DIP-149

12

1000 Ω

144

W172DIP-150

24

3200 Ω

180

SEE END OF SECTION 6 FOR CROSS REFERENCE

DPDT, 1.0 AMP

GENERAL SPECIFICATIONS

COIL

Pull-in Voltage:	85% of nominal voltage or less
Drop Out Voltage:	10% of nominal voltage or more
Max. Voltage:	110% of nominal voltage
Resistance:	±10 % measured @ 25°C
Coil Power:	See chart
Duty:	Continuous

CONTACTS

Contact Material:	Rhodium
Contact Resistance:	200 milliohms max.
Contact Rating:	0.25 amp 100 VDC (4 VA) 0.5 amps max continuous carry current.

TIMING

Operate time:	1 mS or less @ nominal voltage.
Release time:	1 mS or less @ nominal Voltage.

DIELECTRIC STRENGTH

Across Open Contacts:	1000 V rms
Between Mutually	
Insulation Points:	500 V rms
Insulation Resistance:	1000 megohms min. @ 100 VDC
Capacitance:	1.0 pf typical coil to contact

TEMPERATURE

Operating:	-40°C to +85°C @ rated operation
Storage:	-40°C to +105°C

SHOCK RESISTANCE

Operating:	50 g's
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VIBRATION RESISTANCE

Operating:	20 g's, 40 Hz to 200 Hz
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LIFE EXPECTANCY

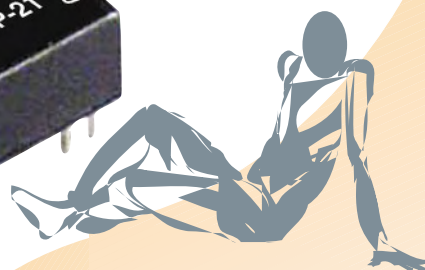
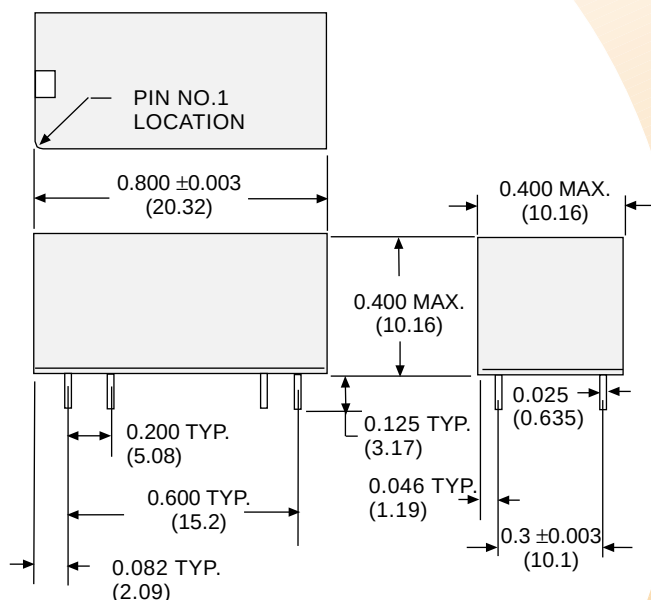
Electrical:	50,000,000 operations @ rated load
Mechanical:	100,000,000 operations low level

MISCELLANEOUS

Operating Position:	Any
Enclosure:	Epoxy molded
Weight:	1 gram approx.

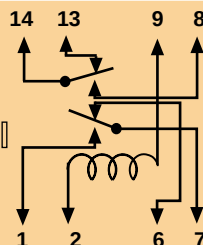
OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

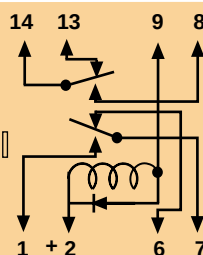


WIRING DIAGRAMS (TOP VIEWED)

DPDT



DPDT WITH CLAMPING DIODE



STANDARD PART NUMBERS

COIL MEASURED @ 25°C

NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL POWER (mW)
-----------------------	---------------------------	--------------------

W172DIP-17

5

46 Ω

540

W172DIP-19

12

266 Ω

540

W172DIP-20

24

1066 Ω

540

W172DIP-21

5

46 Ω

540

W172DIP-23

12

266 Ω

540

W172DIP-24

24

1066 Ω

540

WHEN SPACING DUAL IN - LINE REED RELAYS, THE RELAYS REQUIRE 1/2 INCH SPACING FROM THE SIDE OF THE ADJACENT RELAYS.

PIN SPACING OF 0.100" IS STANDARD. PIN SPACING OF 0.150 IS AVAILABLE ON SPECIAL ORDER. ALSO AVAILABLE ARE MODELS WITH ELECTROSTATIC SHIELDS. CONSULT FACTORY FOR PART NUMBERS. NONSTANDARD SCHEMATICS AND PIN-OUTS CAN ALSO BE PRODUCED FOR SPECIFIC CUSTOMER REQUIREMENTS.

SPDT - NO, SPDT, DPST-NO, DPDT, 0.5 AMP

GENERAL SPECIFICATIONS

COIL

Pull-in Voltage:	85% of nominal voltage or less
Drop Out Voltage:	10% of nominal voltage or more
Max. Voltage:	110% of nominal voltage
Resistance:	±10 % measured @ 25°C
Coil Power:	See chart
Duty:	Continuous

CONTACTS

Contact Material:	Rhodium
Contact Resistance:	200 milliohms max.
Contact Rating:	10 VA -SPST - NO. & SPDT 4 VA -DPST - NO. & DPDT 0.5 amps max continuous carry current.

TIMING

Operate time:	1 mS or less @ nominal voltage.
Release time:	1 mS or less @ nominal Voltage.

DIELECTRIC STRENGTH

Across Open Contacts:	1000 VDC
Between Mutually	
Insulation Points:	1000 VDC
Insulation Resistance:	1000 megohms min. @ 100 VDC
Capacitance:	3 pf typical coil to contact

TEMPERATURE

Operating:	-40°C to +85°C @ rated operation
Storage:	-40°C to +105°C

SHOCK RESISTANCE

Operating:	50 g's
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VIBRATION RESISTANCE

Operating:	20 g's, 40 Hz to 200 Hz
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LIFE EXPECTANCY

Electrical:	10,000,000 operations @ rated load
Mechanical:	100,000,000 operations @ no load

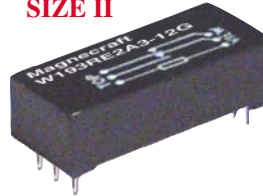
MISCELLANEOUS

Operating Position:	Any
Enclosure:	Epoxy encapsulated
Weight:	1 gram approx.

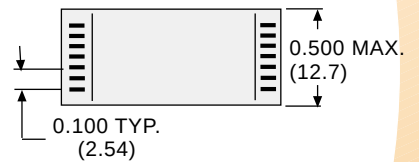
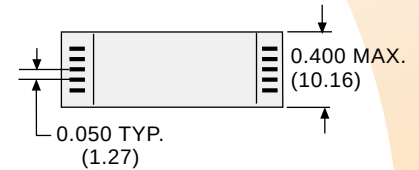
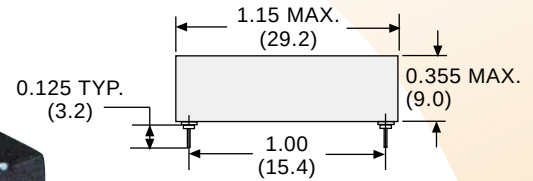
SIZE I



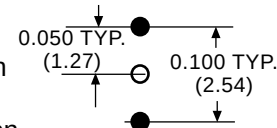
SIZE II



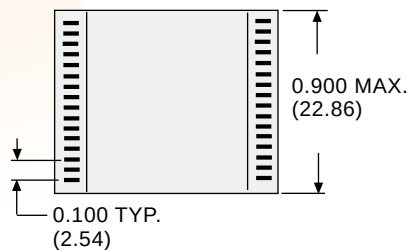
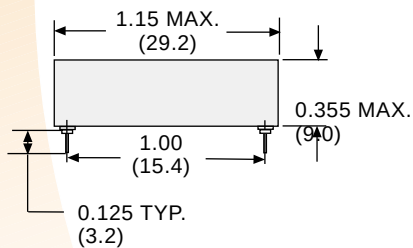
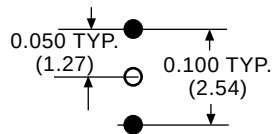
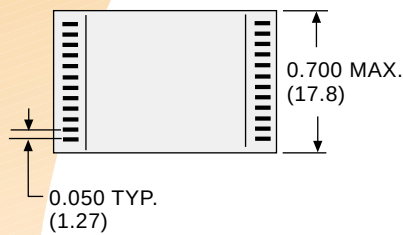
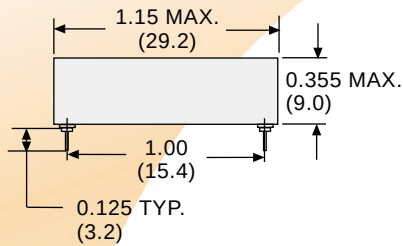
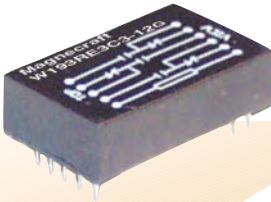
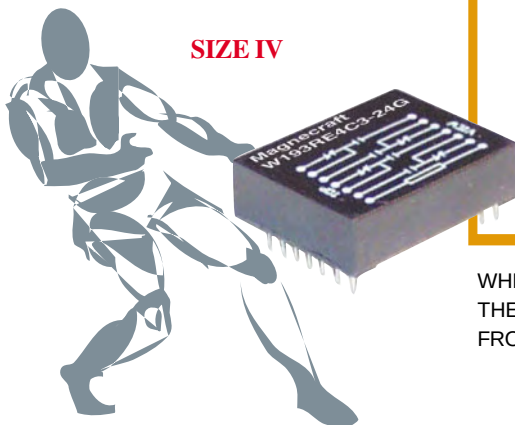
OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



Spacing between filled in circles in schematics are on 0.100 grid patterns. Pin omitted on unfilled circles.



CASE SIZE	WIRING DIAGRAMS (TOP VIEWED)	STANDARD PART NUMBERS	COIL MEASURED @ 25°C		
			NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL POWER (mW)
SPST - N. O.					
I		W193RE1A3-12G	12	420 Ω	350
		W193RE1A3-24G	24	2300 Ω	250
SPDT					
I		W193RE1C3-12G	12	420 Ω	350
		W193RE1C3-24G	24	2300 Ω	250
DPST - N. O.					
II		W193RE2A3-12G	12	280 Ω	500
		W193RE2A3-24G	24	1500 Ω	390
DPDT					
II		W193RE2C3-12G	12	280 Ω	500
		W193RE2C3-24G	24	1500 Ω	390

**3PST-N.O. 4PST- N.O.,
3PDT & 4PDT., 0.5 AMP****SIZE III****SIZE IV**

CASE SIZE	WIRING DIAGRAMS (TOP VIEWED)	STANDARD PART NUMBERS	COIL MEASURED @ 25°C		
			NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL POWER (mW)
III	3PST - N. O.				
		W193RE3A3-12G W193RE3A3-24G	12 24	210 Ω 1150 Ω	690 500
III	3PDT				
		W193RE3C3-12G W193RE3C3-24G	12 24	210 Ω 1150 Ω	690 500
III	4PST - N. O.				
		W193RE4A3-12G W193RE4A3-24G	12 24	210 Ω 1150 Ω	690 500
IV	4PDT				
		W193RE4C3-12G W193RE4C3-24G	12 24	140 Ω 770 Ω	1030 750

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

PIN SPACING OF 0.100" IS STANDARD. PIN SPACING OF 0.150" IS AVAILABLE ON SPECIAL ORDER. ALSO AVAILABLE ARE MODELS WITH ELECTROSTATIC SHIELDS. CONSULT FACTORY FOR PART NUMBERS. NONSTANDARD SCHEMATICS AND PIN-OUTS CAN ALSO BE PRODUCED FOR SPECIFIC CUSTOMER REQUIREMENTS.

GENERAL SPECIFICATIONS

COIL

Pull-in Voltage:	85% of nominal voltage or less
Drop Out Voltage:	10% of nominal voltage or more
Max. Voltage:	110% of nominal voltage
Resistance:	±10 % measured @ 25°C
Coil Power:	See chart
Duty:	Continuous

CONTACTS

Contact Material:	Rhodium/Mercury
Contact Resistance:	100 milliohms max.
Contact Rating:	2 amp 500 VDC (50VA) 3 amps max continuous carry current.

TIMING

Operate time:	2.0 mS or less @ nominal voltage.
Reset time:	2.5 mS or less @ nominal Voltage.

DIELECTRIC STRENGTH

Across Open Contacts:	1000 VDC
Between Mutually	
Insulation Points:	1000 VDC
Insulation Resistance:	1000 megohms min. @ 100 VDC
Capacitance:	2.0 pf typical coil to contact

TEMPERATURE

Operating:	-37°C to +85°C @ rated operation
Storage:	-40°C to +105°C

SHOCK RESISTANCE

Operating:	50 g's
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VIBRATION RESISTANCE

Operating:	20 g's, 40 Hz to 200 Hz
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LIFE EXPECTANCY

Electrical:	50,000,000 operations @ rated load
Mechanical:	10,000,000 operations @ no load

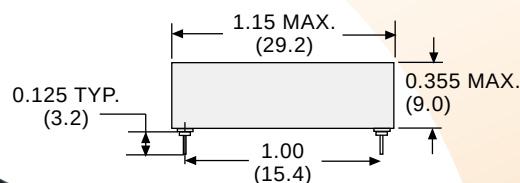
MISCELLANEOUS

Operating Position:	Vertical ±15%
Enclosure:	Epoxy encapsulated
Weight:	1 gram approx.

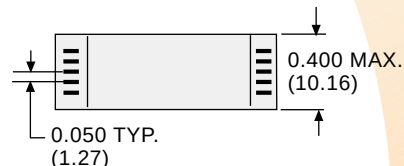
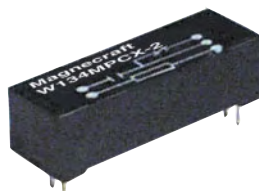
WHEN SPACING MINIATURE REED RELAYS, THE RELAYS REQUIRE 1/2 INCH SPACING FROM THE SIDE OF THE ADJACENT RELAYS.

SPDT & DPDT, 2 AMP

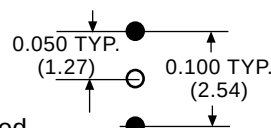
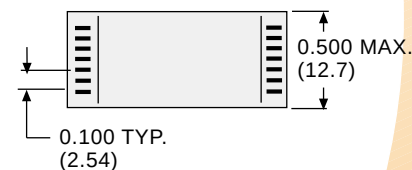
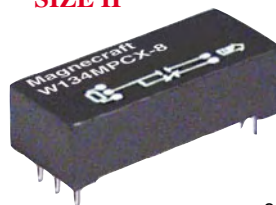
OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



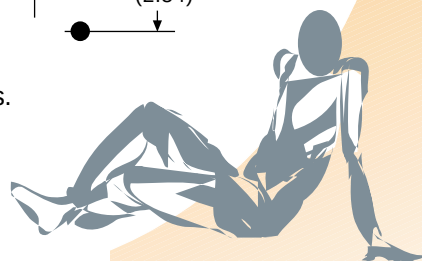
SIZE I



SIZE II



Spacing between filled in circles in schematics are on 0.100 grid patterns. Pin omitted on unfilled circles.



CASE SIZE	WIRING DIAGRAMS (TOP VIEWED)	STANDARD PART NUMBERS	COIL MEASURED @ 25°C		
			NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL POWER (mW)
I	SPDT MERCURY 	W134MPCX-2	12	330 Ω	435
		W134MPCX-3	24	1400 Ω	410
II	DPDT MERCURY 	W134MPCX-8	12	230 Ω	620
		W134MPCX-11	12	230 Ω	620
II	DPDT MERCURY WITH CLAMPING DIODE 	W134MPCX-11	12	230 Ω	620

**SPST - N.O.,
5 TO 10 MILLIAMPS****EPOXY ENCAPSULATED HIGH VOLTAGE REED.****SPST-NO TUNGSTEN CONTACTS****SWITCHES LOADS UP TO 10 MA @ 5000 VOLTS DC****CLASS 102HV SAME AS ABOVE EXCEPT:****SWITCHES 10,000 VOLTS WITH LOADS UP TO 5 mA DC**

GENERAL SPECIFICATIONS

COIL

Pull-in Voltage:	75% of nominal voltage or less
Drop Out Voltage:	10% of nominal voltage or more
Max. Voltage:	110% of nominal voltage
Resistance:	±10 % measured @ 25°C
Coil Power:	See chart
Duty:	Continuous

CONTACTS

Contact Material:	Tungsten
Contact Resistance:	200 milliohms max
Contact Rating:	10 ma 5000 VDC 5 ma @ 10,000 VDC

TIMING

Operate time:	1 mS or less @ nominal voltage
Release time:	1 mS or less @ nominal Voltage

DIELECTRIC STRENGTH

Across Open Contacts:	12,000 VDC
Between Mutually	
Insulation Points:	12,000 VDC
Insulation Resistance:	1000 megohms min. @ 500 VDC
Capacitance:	5 pf typical coil to contact

TEMPERATURE

Operating:	-40°C to +85°C @ rated operation
Storage:	-40°C to +105°C

SHOCK RESISTANCE

Operating:	30 g's, 11 mS, 1/2 sine wave
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VIBRATION RESISTANCE

Operating:	10 g's, 10 Hz to 1000 Hz
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LIFE EXPECTANCY

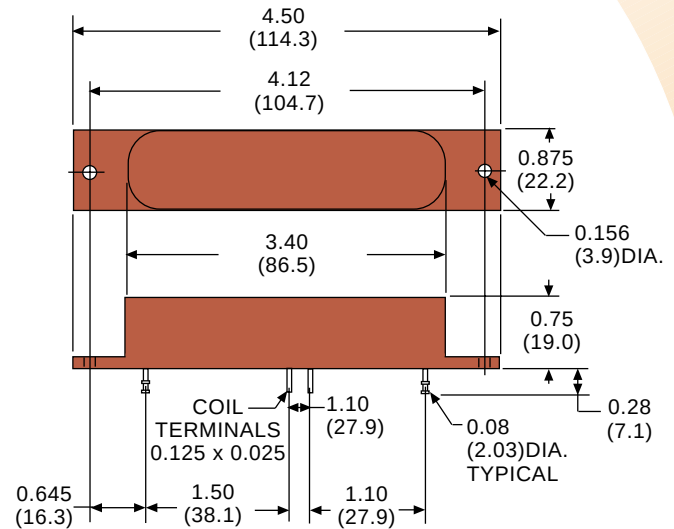
Electrical:	1,000,000 operations @ rated load
Mechanical:	10,000,000 operations @ no load

MISCELLANEOUS

Operating Position:	Any
Enclosure:	Epoxy encapsulated
Weight:	49 grams approx.

OUTLINE DIMENSIONS

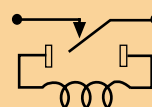
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



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



WIRING DIAGRAMS (TOP VIEWED)



COIL MEASURED @ 25°C

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

SPDT, 150 WATTS**PANEL MOUNT WITH RG58C/U****CABLE (50 OHM)****SWITCHING 150 WATTS UP TO 470 MHz****OUTLINE DIMENSIONS**

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

GENERAL SPECIFICATIONS**COIL**

Pull-in Voltage:	75% of nominal voltage or less
Drop Out Voltage:	10% of nominal voltage or more
Max. Voltage:	110% of nominal voltage
Resistance:	±10 % measured @ 25°C
Coil Power:	See chart
Duty:	Continuous

CONTACTS

Contact Material:	Silver alloy
Contact Resistance:	50 milliohms max. & rated load
Contact Rating:	150 watts 85 V rms

TIMING

Operate time:	15 mS or less @ nominal voltage.
Reset time:	7 mS or less @ nominal voltage.

DIELECTRIC STRENGTH

Across Open Contacts:	500 V rms
Between Mutually	
Insulation Points:	1000 V rms
Insulation Resistance:	1000 megohms min. @ 500 VDC
Capacitance:	30 pf maximum contact to open contact

TEMPERATURE

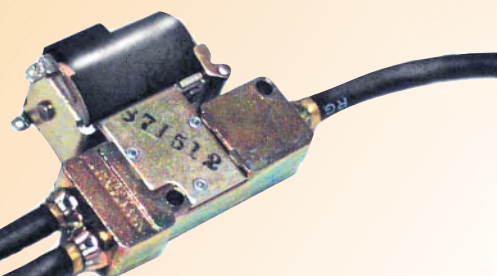
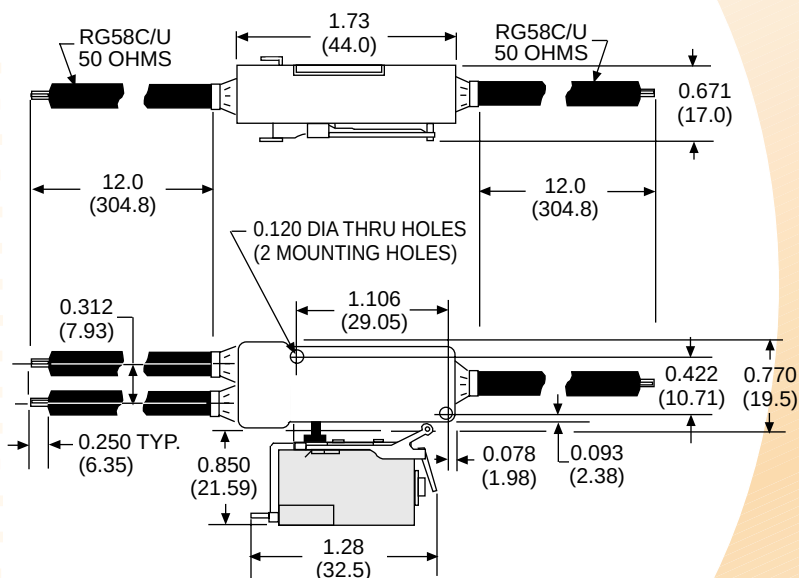
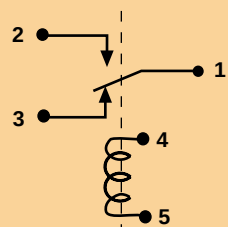
Operating:	-55°C to +65°C @ rated operation
Storage:	-55°C to +105°C

LIFE EXPECTANCY

Electrical:	5,000,000 operations @ rated load
Mechanical:	100,000 operations @ no load

MISCELLANEOUS

Operating Position:	Any
Enclosure:	Metal
Weight:	85 grams approx.

**WIRING DIAGRAMS**
(SIDE VIEW COIL DOWN)**SPDT****STANDARD PART NUMBERS****W120X-14****COIL MEASURED @ 25°C****NOMINAL INPUT VOLTAGE****12 VDC****NOMINAL RESISTANCE (OHMS)****500 Ω****NOMINAL POWER (mW)****288**



SECTION 6 CROSS REFERENCE GUIDE

MAGNECRAFT & STRUTHERS-DUNN	POTTER & BRUMFIELD	CLARE	COTO	COTO SPARTIN	GORDOS	HAMLIN	MEDER
W117SIP-1	JWS-117-1	DSS41A05	90010500		741A-9	3621A0500	SIL05-1A75-71L
W117SIP-3	JWS-117-3	DSS41A12	90011201		741A-3	3621A1200	SIL12-1A75-71L
W117SIP-5	JWS-117-5	DSS41A24			741A-7	3621A2400	SIL24-1A75-71L
W117SIP-22	JWS-117-12	DSS41B05			741B-3		
W117SIP-23	JWS-117-14	DSS41B12			741B-5		
W117SIP-24	JWS-117-15	DSS41B24			741B-8		
W117SIP-6	JWS-117-6	DSS41A05B			741B-10	3621A0510	SIL05-1A75-71D
W117SIP-8	JWS-117-8	DSS41A12B			741A-4	3621A1210	SIL12-1A75-71D
W117SIP-10	JWS-117-110	DSS41A24B			741A-8	3621A2410	SIL24-1A75-71D
W117SIP-18	JWS-117-17	DSS41B05B			741B-4		
W117SIP-25	JWS-117-19	DSS41B12B			741B-6		
W117SIP-26	JWS-117-30	DSS41B24B			741B-8		
MAGNECRAFT & STRUTHERS-DUNN	POTTER & BRUMFIELD	CLARE	COTO	COTO SPARTIN	GORDOS	HAMLIN	MEDER
W107DIP-1	JWD-107-1	PRMA10037			831A-3		DIP05-1A75-11L
W107DIP-3	JWD-107-3	PRMA10038			831A-5		DIP12-1A75-11L
W107DIP-4		PRMA10039			831A-7		DIP24-1A75-11L
W107DIP-5	JWD-107-5	PRMA10037B			831A-4		DIP05-1A75-11D
W107DIP-7	JWD-107-7	PRMA10038B			831A-6		DIP12-1A75-11D
W107DIP-8		PRMA10039B			831A-8		DIP24-1A75-11D
MAGNECRAFT & STRUTHERS-DUNN	POTTER & BRUMFIELD	CLARE	COTO	COTO SPARTIN	GORDOS	HAMLIN	MEDER
W171DIP-2		PRMA1A05	80010500	8L01-05-001	831A-3	721A0500	DIP05-1A75-11L
W171DIP-4		PRMA1A12	80011200	8L01-12-001	831A-5	721A1200	DIP12-1A75-11L
W171DIP-5	JWD-171-5	PRMA1A24		8L01-24-001	831A-7	721A2400	DIP24-1A75-11L
W171DIP-7		PRMA1A05B	80010510	8L01-05-011	831A-4	721A0510	DIP05-1A75-11D
W171DIP-9		PRMA1A12B	80011210	8L01-12-011	831A-6	721A1210	DIP12-1A75-11D
W171DIP-10	JWD-171-10	PRMA1A24B		8L01-24-011	831A-8	721A2410	DIP24-1A75-11D
W171DIP-12	JWD-171-12	PRMA1B05	80210500	8L21-05-001	831B-3	721B0500	DIP05-1B75-11L
W171DIP-14	JWD-171-14	PRMA1B12	80211200	8L21-12-001	831B-5	721B1200	DIP12-1B75-11L
W171DIP-15	JWD-171-15	PRMA1B24		8L21-24-001	831B-7	721B2400	DIP24-1B75-11L
W171DIP-17	JWD-171-17	PRMA1B05B	80210510	8L21-05-011	831B-4	721B0510	DIP05-1B75-11D
W171DIP-19	JWD-171-19	PRMA1B12B	80211210	8L21-12-011	831B-6	721B1210	DIP12-1B75-11D
W171DIP-20	JWD-171-20	PRMA1B24B		8L21-24-011	831B-8	721B2410	DIP24-1B75-11D
W171DIP-21	JWD-171-21	PRMA2A05	80020500	8L02-05-001	832A-3	722A0500	DIP05-2A75-21L
W171DIP-23	JWD-171-23	PRMA2A12	80021200	8L02-12-001	832B-5	722A1200	DIP12-2A75-21L
W171DIP-24	JWD-171-24	PRMA2A24		8L02-24-001	832B-7	722A2400	DIP24-2A75-21L
W171DIP-25	JWD-171-25	PRMA2A05B	80020510	8L02-05-011	832B-4	722A0510	DIP05-2A75-21D
W171DIP-27	JWD-171-27	PRMA2A12B	80021210	8L02-12-011	832B-6	722A1210	DIP12-2A75-21D
W171DIP-28	JWD-171-28	PRMA2A24B		8L02-24-011	831B-8	722A2410	DIP24-2A75-21D
MAGNECRAFT & STRUTHERS-DUNN	POTTER & BRUMFIELD				GORDOS		
W172DIP-1	JWD-172-1				836C-1	721R0500	
W172DIP-3	JWD-172-3				836C-3	721R1200	
W172DIP-4	JWD-172-4				836C-5	721R2400	
W172DIP-5	JWD-172-5				836C-2	721R0510	
W172DIP-7	JWD-172-7				836C-4	721R1210	
W172DIP-8	JWD-172-8				836C-6	721R2410	



SECTION 6 CROSS REFERENCE GUIDE

MAGNECRAFT & STRUTHERS-DUNN	POTTER & BRUMFIELD	GORDOS	HAMLIN	MEDER	CLARE	COTO
W172DIP-17		835C-1				
W172DIP-19		835C-3				
W172DIP-20		835C-5				
W172DIP-21		835C-2				
W172DIP-23		835C-4				
W172DIP-24		835C-6				
W172DIP-141	JWD-172-155	831C-1	721C0500	DIP05-1C75-51L	PRMA1C05	80410500
W172DIP-145	JWD-172-157	831C-3	721C1200	DIP12-1C75-51L	PRMA1C12	80411200
W172DIP-146	JWD-172-158	831C-5	721C2400	DIP24-1C75-51L	PRMA1C24	
W172DIP-147	JWD-172-159	831C-2	721C0510	DIP05-1C75-51D	PRMA1C05B	80410510
W172DIP-149	JWD-172-161	831C-4	721C1210	DIP12-1C75-51D	PRMA1C12B	80411210
W172DIP-150	JWD-172-162	831C-6	721C2410	DIP24-1C75-51D	PRMA1C24B	
W172DIP-31		831C-1	721E0500			80510500
W172DIP-33		831C-3	721E1200			80511200
W172DIP-34		831C-5	721E2400			
W172DIP-35			721E0510			80510510
W172DIP-37			721E1210			80511210
W172DIP-38			721E2410			

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

FOR REED RELAY APPLICATION ENGINEERING ASSISTANCE

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Magnecraft & Struthers-Dunn
Your Contact for Relays

SECTION 7

**PRINTED CIRCUIT BOARD RELAYS
1 TO 30 AMPERES**



PRINTED CIRCUIT BOARD RELAYS

RELAY SERIES

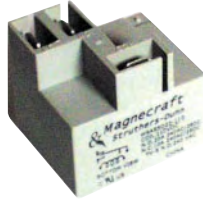


1330/1335

ISO 9002
QS 9000



90



9A

FEATURES

L W H
0.905 x 0.728 x 1.275

- MINIATURE SIZE
- ENCLOSED SEE THRU COVER WITH PRINTED CIRCUIT TERMINALS
- AC OR DC OPERATION
- 5 AMP RESISTIVE OR 3 AMP INDUCTIVE SWITCHING

L W H
1.30 x 1.08 x 0.805

- EPOXY SEALED IMMERSION CLEANABLE
- STANDARD 0.1 GRID PATTERN
- CLASS "B" OR "F" INSULATION SYSTEM
- MEETS UL 508 & UL 873 SPACING

L W H
1.27 x 1.08 x 1.10

- EPOXY SEALED IMMERSION CLEANABLE WITH TAPE SEAL
- CLASS "F" INSULATION SYSTEM
- SPADE TERMINALS ACCEPT INSULATED 1/4" QUICK CONNECT TERMINALS & 3/16" COIL QUICK CONNECT TERMINALS
- SEE SECTION 1 FOR FLANGE MOUNT STYLE WITH 1/4" & 3/16" QUICK CONNECT TERMINALS

CONTACT DATA

CONTACT CONFIGURATION:

DPDT

SPST-NO. & SPDT

SPST-NO. & SPDT

CONTACT MATERIAL:

SILVER CADMIUM OXIDE

SILVER CADMIUM OXIDE

SILVER CADMIUM OXIDE

MAX. CONTACT RATING:

3 AMP, 120 VAC.,
5 AMP, 120 VAC., 30 VDC

SPST-NO:
30AMP, 240 VAC, 20AMP, 30 VDC
SPDT:
20 AMP, 250 VAC (NO),
15 AMP, 240 VAC (NC),
10AMP, 30 VDC

SPST-NO:
30AMP, 240 VAC, 20AMP, 28 VDC
SPDT:
30 AMP, 240 VAC, 20AMP, 28 VDC (NO),
15AMP, 240 VAC, 10AMP, 28 VDC (NC),

COIL DATA

STANDARD VOLTAGE

AC:

DC:

24 & 120 VAC
12 & 24 VDC

5, 12, 24 & 110 VDC

5, 12, 24, 48 & 110 VDC

NOMINAL COIL POWER
VA: (VAC)
WATTS: (VDC)
INSULATION SYSTEM PER

1.2 VA
1.2 WATTS

-
2.8 WATTS MAX.

0.95 VA
2.8 WATTS MAX

GENERAL DATA

AMBIENT TEMPERATURE
OPERATING:

- 45°C TO +70°C

- 55°C TO +105°C

- 55°C TO +85°C

STORAGE:

- 55°C TO +130°C

- 55°C TO +130°C

DIELECTRIC STRENGTH:
(COIL TO FRAME)

1500 V rms

1500 V rms

2500 V rms

LIFE EXPECTANCY
ELECTRICAL:
MECHANICAL:

100,000 OPERATIONS
AC: 50 ,000,000 &
DC:100,000,000 OPERATIONS

100,000 OPERATIONS
10,000,000 OPERATIONS

100,000 OPERATIONS
10,000,000 OPERATIONS

AGENCY APPROVALS



UL Recognized
File No. E52197



UL Recognized
File No. E13224



LR 700908



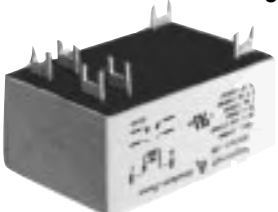
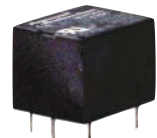
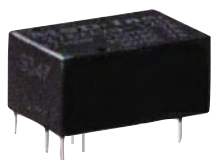
UL Recognized
File No. E43641

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 92	 7	 60	 A178
L W H 2.06 x 1.36 x 1.356	L W H 0.410 x 0.410 x 0.553	L W H 1.10 x 0.600/0.895 x 0.745	L W H 0.750 x 0.611 x 0.630
● EPOXY SEALED IMMERSION CLEANABLE WITH TAPE SEAL ● CLASS "F" INSULATION SYSTEM ● SEE SECTION 1 FOR FLANGE MOUNT STYLE WITH 1/4" & 3/16" QUICK CONNECT TERMINALS	● MICRO MINIATURE SIZE ● CONFORMS TO FCC PART 68.302, 1500V SURGERESISTANCE, FCC 68.3041000V DIELECTRIC STRENGTH ● EXCELLENT R.F. SWITCHING CHARACTERISTICS ● HIGH SHOCK & VIBRATION RESISTANCE ● PRINTED CIRCUIT BOARD MOUNTING ON 0.1 GRID PATTERN ● 94V-0 PLASTIC, EPOXY SEALED	● MINIATURE SIZE ● CONFORMS TO FCC PART 68.302, 1500V SURGE RESISTANCE, FCC 68.3041000V DIELECTRIC STRENGTH ● EXCELLENT R.F. SWITCHING CHARACTERISTICS ● HIGH SHOCK & VIBRATION RESISTANCE ● PRINTED CIRCUIT BOARD MOUNTING ON 0.1 GRID PATTERN	● MINIATURE EPOXY SEALED ● PRINTED CIRCUIT BOARD MOUNTING ● SWITCHES UP TO 15 AMP LOADS ● CLASS "B" OR "F" INSULATION SYSTEM ● IMMERSION CLEANABLE ● DISPLACES APPROXIMATELY 0.29 CUBIC INCH
DPST-NO. & DPDT	SPDT & DPDT	SPDT & DPDT	SPST
SILVER CADMIUM OXIDE	GOLD CLAD SILVER	GOLD CLAD SILVER	SILVER ALLOY
DPDT-NO: 30A, 277 VAC. 20A, 28 VDC DPST-NO: 30A, 277 VAC. 20A, 28 VDC DPDT-NC: 3A, 277 VAC, 28 VDC	DPDT: 2 AMP, 24 VDC, 0.6AMP, 100 VAC SPDT: 2 AMP, 120 VAC, 50 uA, 50 mV MIN 2 AMP, 24 VDC	DPDT: 2 AMP, 24 VDC, 1 AMP, 100 VAC SPDT: 2 AMP, 120 VAC 50 uA, 50 mV MIN	12 AMP, 120 VAC, 30 VDC 10 AMP, 150 VAC
24, 120 & 240 VAC 12, 24, 48 & 110 VDC	5, 12, & 24 VDC	5, 12, & 24 VDC	3, 5, 12, 24 & 48 VDC
4 VA 1.7 WATTS	- 327 MILLIWATTS MAX	- 327 MILLIWATTS MAX	- 0.36 WATTS
DC: - 40°C TO +85°C AC: - 40°C TO +65°C - 55°C to +155°C	- 35°C TO +70°C	- 35°C TO +70°C	- 40°C TO +70°C - 40°C TO +80°C
4000 V rms	500 V rms	500 V rms	1500 V rms
5,000,000 OPERATIONS 100,000 OPERATIONS	100,000,000 OPERATIONS 100,000 OPERATIONS	100,000,000 OPERATIONS 100,000 OPERATIONS	100,000 OPERATIONS 10,000,000 OPERATIONS
 UL Recognized File No. E43641	 UL Recognized File No. E52197	 UL Recognized File No. E52197	 UL Recognized File No. E195668
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PRINTED CIRCUIT BOARD RELAYS

RELAY SERIES



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ISO 9002
QS 9000



976

ISO 9002
QS 9000



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FEATURES

- DUST COVERED
- DISPLACES APPROXIMATELY 1.1 CUBIC INCH
- VARIETY OF MOUNTING CONFIGURATIONS
- TV-5 RATINGS AVAILABLE

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

- SUBMINIATURE EPOXY SEALED IMMERSION CLEANABLE
- STANDARD 0.1 GRID PATTERN
- SINGLE SIDE STABLE DESIGN
- 5KV SURGE RESISTANCE COIL TO FRAME
- MEETS 4mm INTERNATIONAL SPACING COIL TO CONTACT

CONTACT DATA

CONTACT CONFIGURATION:

SPDT

SPDT & DPDT

SPST-NO. & SPDT

CONTACT MATERIAL:

SILVER CADMIUM OXIDE
SILVER, GOLD PLATED

SILVER CADMIUM OXIDE

SILVER ALLOY

MAX. CONTACT RATING:

3 AMP, 120 VAC, 28 VDC
(15 AMP, 150 VAC, 28 VDC)
5 AMP, 120 VAC, 28 VDC
10 AMP, 120/240 VAC, 28 VDC
(15 AMP, 150 VAC, 28 VDC)

SPDT:
20 AMP, 125 VAC, 30 VDC
10AMP, 48 VDC,
16 AMP, 250VAC, 30 VDC
DPDT:
5 AMP, 250 VAC, 30 VDC

SPST-NO:
10AMP, 250 VAC/30 VDC
SPDT:
7 AMP, 250 VAC/30 VDC

COIL DATA

STANDARD VOLTAGE

AC:
DC:

3, 5, 6, 12, 24 VDC

24, 120 & 240 VAC
5, 6, 12 & 24 VDC

5, 6, 12, & 24 VDC

NOMINAL COIL POWER
VA: (VAC)
WATTS: (VDC)
INSULATION SYSTEM PER
UL STANDARD 1446

400 MILLIWATTS

1.2 VA
0.54 WATTS

200 MILLIWATTS

GENERAL DATA

AMBIENT TEMPERATURE
OPERATING:

- 55°C TO +85°C

- 20°C TO +55°C

- 40°C TO +70°C

STORAGE:

- 55°C TO +130°C

- 40°C TO +80°C

DIELECTRIC STRENGTH:
(COIL TO FRAME)

1500 V rms

5000 V rms

2000 V rms

LIFE EXPECTANCY
ELECTRICAL:
MECHANICAL:

100,000 OPERATIONS
50,000,000 OPERATIONS

100,000 OPERATIONS
10,000,000 OPERATIONS

100,000 OPERATIONS
2,000,000 OPERATIONS

AGENCY APPROVALS



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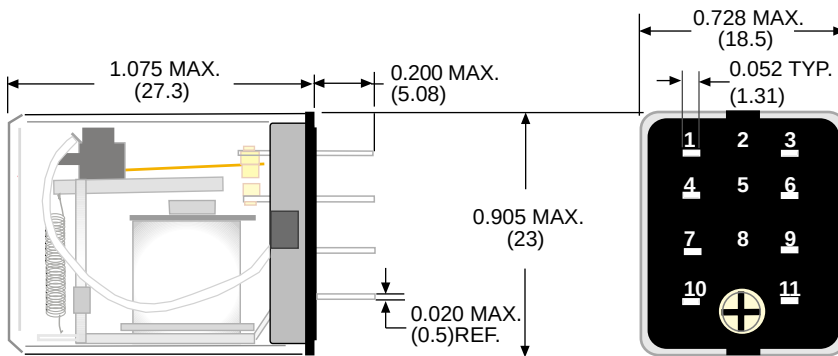
DPDT 5 AMPS

UL **us**
 UL Recognized
 File No. E52197

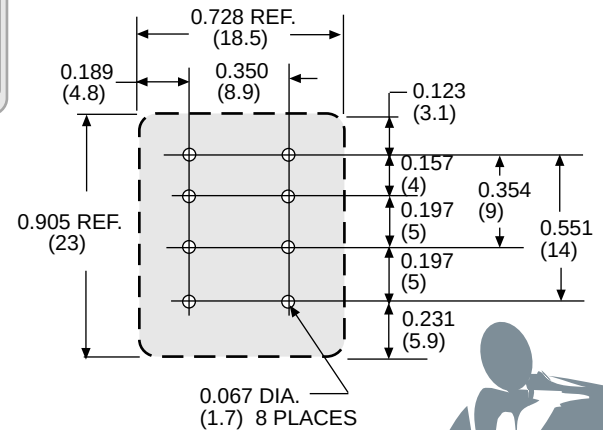
MANUFACTURED UNDER
ISO 9002 & QS 9000

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



PRINTED CIRCUIT MOUNTING HOLE LAYOUT (BOTTOM VIEW)



GENERAL SPECIFICATIONS

COIL

Pull-in Voltage:	75% of nominal voltage or less for AC or DC coils
Dropout Voltage:	10% min. or more for DC
Max. Voltage:	110%
Resistance:	±10% measured @ 25°C
Duty:	Continuous

CONTACTS

Contact Material:	Silver cadmium oxide, 0.093 Dia. (2.36)
Contact Resistance:	100 milliohms max
Contact Rating:	UL RATED - 5 Amps @ 120 VAC resistive NOT UL RATED - 30 VDC resistive, 3 Amp inductive, 1/8 Hp @ 120 VAC

TIMING

Operate Time:	20 mS max AC, 15 mS max. DC @ nominal voltage
Release Time:	20 mS max. AC, 15 mS max. DC @ nominal voltage

DIELECTRIC STRENGTH

Coil to Frame:	1500 V rms
Across Open Contacts:	500 V rms
Contact to Frame:	1500 V rms
Insulation Resistance:	1500 megohms min

TEMPERATURE

Ambient Temperature:	-45°C to +70°C @ rated operation
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LIFE EXPECTANCY

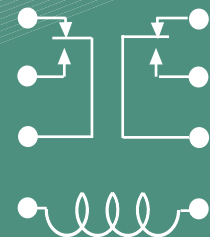
Electrical:	100,000 operations @ rated resistive load
Mechanical:	AC operated device in excess of 50,000,000 operations DC operated devices, in excess of 100,000,000 operations

MISCELLANEOUS

Operating Position:	Any
Insulating Material:	Molded parts are diallyl phthalate for higher arc resistance
Enclosure:	Clear heat resistant polycarbonate dust cover
Weight:	24 grams approx.



CIRCUIT DIAGRAM (VIEWED FROM PIN END)



STANDARD PART NUMBERS	CONTACT CONFIGU- RATION	COIL MEASURED @ 25°C	
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED COILS			
W1330P-2C-24A	DPDT	24 VAC	245 Ω
W1330P-2C-120A	DPDT	120 VAC	5400 Ω
DC OPERATED COILS			
W1335P-2C-12D	DPDT	12 VDC	125 Ω
W1335P-2C-24D	DPDT	24 VDC	500 Ω

UL CONTACT LOAD RATINGS TABLE

LOAD	LOAD VOLTAGE	SPDT-N.O. LOAD	SPDT			
			N.O.	OPERATIONS	N.C.	OPERATIONS
RESISTIVE	240 VAC	30 AMP	20 AMP	100,000	2-10 AMP	100,000
RESISTIVE	277 VAC	20 AMP	20 AMP	100,000	15AMP @ 250VAC	100,000
RESISTIVE	5-30 VDC	20 AMP	20 AMP	100,000	10 AMP	100,000
INDUCTIVE RESISTIVE	277 VAC	12 AMP	12 AMP	6,000	6 AMP	6,000
MOTOR	125 VAC	1 HP	1 HP	30,000	1/4 HP	-
	125 VAC	3/4 HP	3/4 HP	100,000	-	-
	240/250VAC	2 HP	2 HP	1,000	1/2 HP	-
	125/240 VDC	470 VA	470 VA	100,000	275 VA	30,000
FLA/LRA†	125 VAC	30/96	30/96	30,000	10/33	30,000
	240 VAC	30/80	30/80	30,000	10/33	30,000
	277 VAC	20/60	20/60	100,000	-	-
	125 VAC	27/82	27/82	100,000	-	-
TUNGSTEN	250 VAC	TV - 3	TV - 3	25,000	TV - 3	-
BALLAST	277 VAC	6 AMP	6 AMP	6,000	3 AMP	6,000

† FLA = Full load Amps, LRA = Locked rotor Amps.

CLASS "B" OR "F" INSULATION EPOXY SEALED. BREAKAWAY NIB OVER VENT HOLE (REMOVED AFTER CLEANING).

CLASS 90 PRINTED CIRCUIT BOARD RELAYS PROVIDE AN INEXPENSIVE MEANS OF SWITCHING LOADS UP TO 30 AMPS. DESIGNED PRIMARILY FOR THE APPLIANCE INDUSTRY AND HVAC MARKETS, THEY ARE ALSO WELL SUITED FOR LOAD MANAGEMENT, AUTOMOTIVE AND OTHER APPLICATIONS.

SPST-N.O. & SPDT 30 AMPS

UL us
UL Recognized
File No. E13224



LR 700908



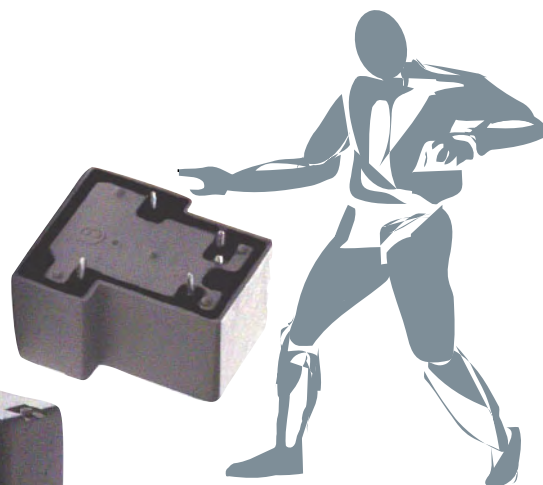
COMPLIES WITH REQUIREMENTS OF

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

* IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION

* CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

MANUFACTURED UNDER ISO 9002 & QS 9000



GENERAL SPECIFICATIONS

COIL

Pull-in Voltage: 75% of nominal voltage or less
Dropout Voltage: 10% of nominal voltage or more
Resistance: $\pm 10\%$ measured @ 25°C
Coil Power: 2.8 watts max
Insulation System: Class "B" (130°C) or class "F" (155°C)
Duty: Continuous

CONTACTS

Contact Material: Silver cadmium oxide
Contact Resistance: 50 milliohms max. initial value

TIMING

Operate Time: 15 mS max. @ nominal voltage
Release Time: 10mS max. @ nominal voltage

DIELECTRIC STRENGTH

Contacts to Coil: 1500 V rms
Across Open Contacts: 1000 V rms
Insulation Resistance: 500 megohms under normal conditions 100 megohms high temp, high humidity

TEMPERATURE

Operating: -55°C to +105°C
Storage: -55°C to +130°C
Relative Humidity: Up to 93% @ 40°C
Atmospheric Pressure: 650 to 800 mmHg

VIBRATION RESISTANCE

Functional: 10 to 55 Hz @ double amplitude of 1 mm

SHOCK RESISTANCE

Functional: 10 g's for 11 mS, no contact opening > 100uS
Mechanical: 100 g's

LIFE EXPECTANCY

Electrical: 100,000 operations @ rated resistive load
Mechanical: 10,000,000 operations @ no load

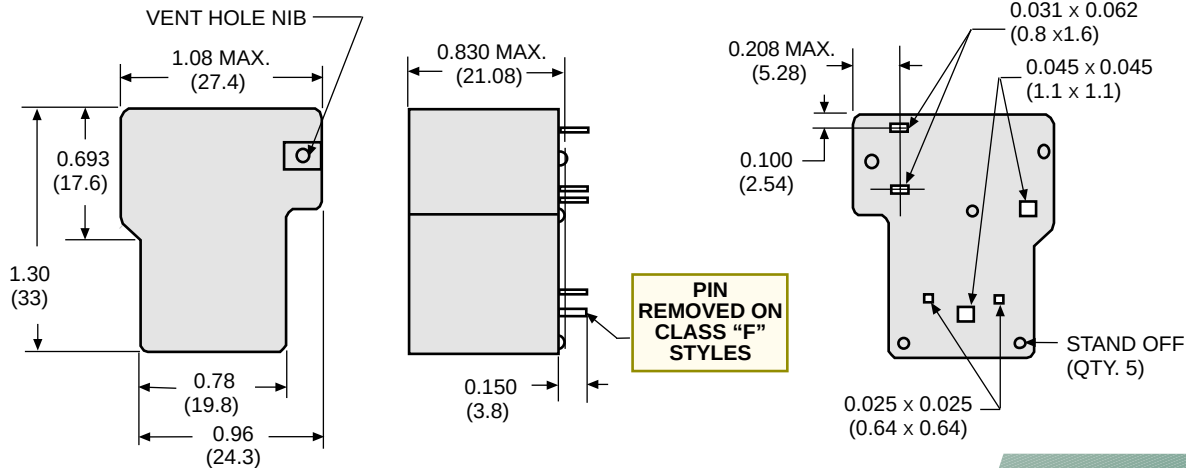
MISCELLANEOUS

Operating position: Any
Enclosure: 94V-0 flammability rating, epoxy sealed immersion cleanable
Weight: 27 grams approx

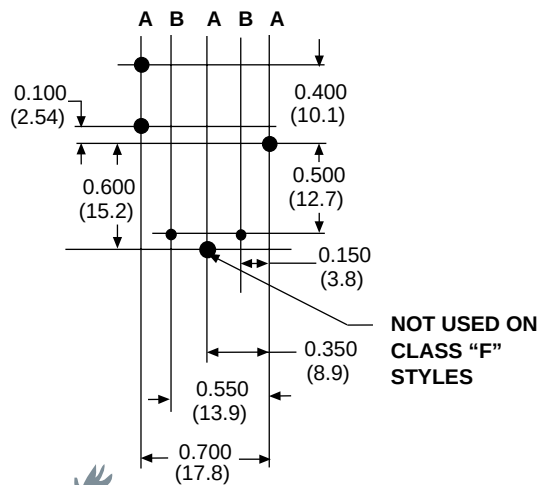
SPST-N.O. & SPDT 30 AMPS

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



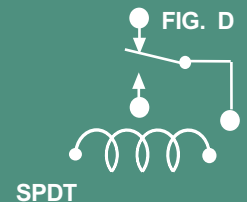
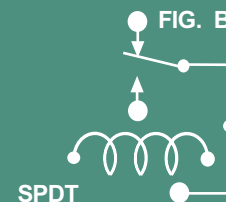
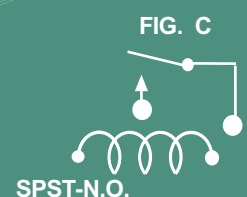
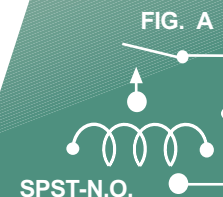
PRINTED CIRCUIT MOUNTING HOLE LAYOUT (BOTTOM VIEW)



DRILL "A" HOLES 0.086

DRILL "B" HOLES 0.046

WIRING DIAGRAM (VIEWED FROM PIN END)



STANDARD PART NUMBERS

CONTACT CONFIGURATION

COIL MEASURED @ 25°C

NOMINAL INPUT VOLTAGE

NOMINAL RESISTANCE (OHMS)

CLASS "B" INSULATION, FIG. "A", 30 AMP

W90S1D12-5	SPST-NO	5 VDC	27 Ω
W90S1D12-12	SPST-NO	12 VDC	155 Ω
W90S1D12-24	SPST-NO	24 VDC	660 Ω
W90S1D12-110	SPST-NO	110 VDC	13,450 Ω

CLASS "B" INSULATION, FIG. "B", 20 AMP

W90S5D12-5	SPDT	5 VDC	27 Ω
W90S5D12-12	SPDT	12 VDC	155 Ω
W90S5D12-24	SPDT	24 VDC	660 Ω
W90S5D12-110	SPDT	110 VDC	13,450 Ω

CLASS "F" INSULATION, FIG. "C", 30 AMP

W90S1D42-5	SPST-NO	5 VDC	27 Ω
W90S1D42-12	SPST-NO	12 VDC	155 Ω
W90S1D42-24	SPST-NO	24 VDC	660 Ω
W90S1D42-110	SPST-NO	110 VDC	13,450 Ω

CLASS "F" INSULATION, FIG. "D", 20 AMP

W90S5D42-5	SPDT	5 VDC	27 Ω
W90S5D42-12	SPDT	12 VDC	155 Ω
W90S5D42-24	SPDT	24 VDC	660 Ω
W90S5D42-110	SPDT	110 VDC	13,450 Ω

UL CONTACT LOAD RATINGS TABLE

LOAD	LOAD VOLTAGE	SPST	SPDT		OPERATIONS
		N.O. LOAD	N.O. LOAD	N.C. LOAD	
GENERAL PURPOSE	240 VAC	30AMP	30AMP	15AMP	100,000
RESISTIVE	28 VDC	30AMP	30AMP	10AMP	100,000
MOTOR	125 VAC	1 HP	1 HP	1/4 HP	1,000
	240 VAC	2 HP	2 HP	1/2 HP	6,000
FLA/LRA ‡	120 VAC	22/98AMP	22/98AMP	-	100,000
	240 VAC	30/80AMP	30/80AMP	12/30AMP	30,000
TUNGSTEN	240 VAC	TV - 5	TV - 5	-	25,000
BALLAST	277 VAC	10AMP	10AMP	3AMP	6,000
PILOT DUTY	240 VAC	470 VAC	470 VAC	275 VAC	6,000

‡ FLA = Full load amps, LRA = Locked rotor amps.

SPST-N.O. & SPDT 30 AMPS

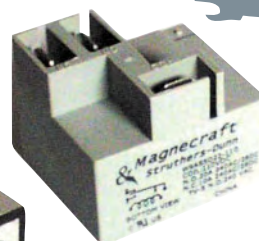
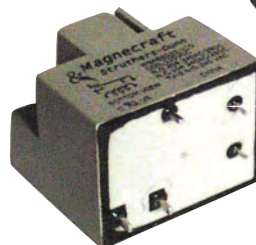


UL Recognized
File No. E43641

CLASS "F" INSULATION.

EPOXY SEALED WITH REMOVABLE
TAPE SEAL OVER VENT HOLE
(REMOVED AFTER CLEANING)

MEETS UL 508, UL 873 AND
UL 1950 - 1/8" THRU AIR - 1/4"
OVER SURFACE (SEE NOTES)



GENERAL SPECIFICATIONS

COIL

Pull-in Voltage: 80% of nominal voltage or less for AC coils
75% of nominal voltage or less for DC coils

Dropout Voltage: 10% of nominal voltage or more

Max. Coil Voltage: 120% max.

Power Consumption: AC coil: 0.95 VA, DC coil: 2.8 watts max.

Insulation System: Class "F"(155°C)

Resistance: ±10% measured @ 25°C

Duty: Continuous

CONTACT

Contact Material: Silver cadmium oxide

Switching Voltage: 277 VAC, 28 VDC max.

Contact Resistance: 75 milliohms @ 1 Amp rated current

Minimum Load: 1 A, 5 VDC, 12 VAC

TIMING

Operate Time: DC:15 mS typ. Including bounce

Release Time: DC:15mS typ. Including bounce

DIELECTRIC STRENGTH

Contacts to Coil: 2500 V rms

Between Open Contacts: 1500 V rms

Insulation Resistance: 1000 mΩ min. @ 500 VDC, 25°C 50% Rh

TEMPERATURE

Operating: -55°C to +85°C

Storage: -55°C to +130°C

VIBRATION RESISTANCE

Functional: 10 to 55Hz 1.65 mm max.
No contact opening > 100 uS

SHOCK RESISTANCE

Functional: 10 g's for 11 mS,
no contact opening > 100 μS

Mechanical: 100 g's

LIFE EXPECTANCY

Electrical: 100,000 operations
@ rated resistive load

Mechanical: 10,000,000 operations @ no load

MISCELLANEOUS

Operating Position: Any

Enclosure: Epoxy sealed immersion cleanable
suitable for automatic circuit board
processing. Max. Exposure soldering
temperature is 4 sec. @ 500°F.
94V-O flammability rating
1/4" quick connect & safety wells accept
insulated female quick connect terminals
33 grams approx

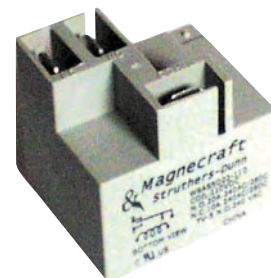
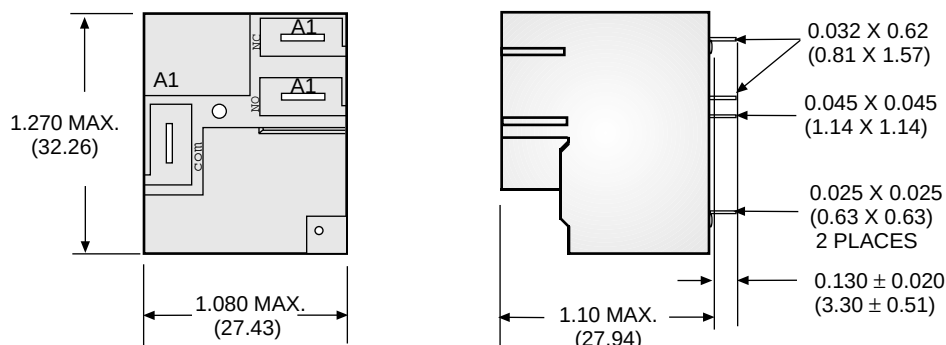
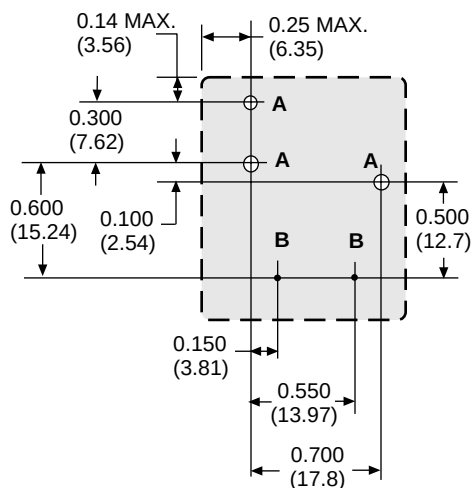
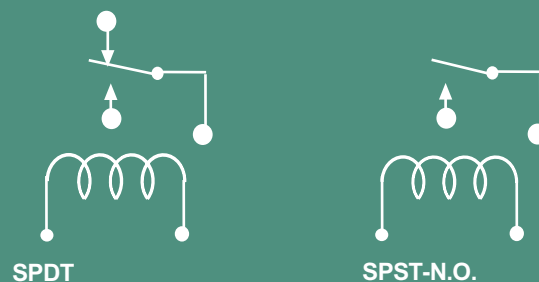
Enclosure: 33 grams approx

Terminals: 33 grams approx

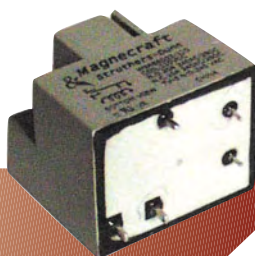
Weight: 33 grams approx

SPST-N.O. & SPDT 30 AMPS**OUTLINE DIMENSIONS**

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

**PRINTED CIRCUIT MOUNTING HOLE LAYOUT (BOTTOM VIEW)****HOLE "A" = 0.081 ± 0.005 DIA.****(2.06 X 0.13)****HOLE "B" = 0.043 ± 0.08 DIA.****(1.09 X 0.08)****WIRING DIAGRAM (VIEWED FROM PIN END)**

STANDARD PART NUMBERS	CONTACT CONFIGU- RATION	COIL MEASURED @ 25°C	
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
PRINTED CIRCUIT MOUNT, 30 AMP			
W9AS1D22-5	SPST-NO	5 VDC	25 Ω
W9AS1D22-12	SPST-NO	12 VDC	144 Ω
W9AS1D22-24	SPST-NO	24 VDC	576 Ω
W9AS1D22-110	SPST-NO	110 VDC	12100 Ω
PRINTED CIRCUIT MOUNT, 20 AMP			
W9AS5D22-5	SPDT	5 VDC	25 Ω
W9AS5D22-12	SPDT	12 VDC	144 Ω
W9AS5D22-24	SPDT	24 VDC	576 Ω
W9AS5D22-110	SPDT	110 VDC	12100 Ω
PRINTED CIRCUIT MOUNT, 30 AMP			
W9AS1A22-24	SPST-NO	24 VAC	
W9AS1A22-120	SPST-NO	120 VAC	
W9AS1A22-240	SPST-NO	240 VAC	
PRINTED CIRCUIT MOUNT, 20 AMP			
W9AS5A22-24	SPDT	24 VAC	
W9AS5A22-120	SPDT	120 VAC	
W9AS5A22-240	SPDT	240 VAC	



DPST-N.O. & DPDT 30 AMPS

UL CONTACT LOAD RATINGS TABLE

RATING	LOAD VOLTAGE	DPST-N.O. & DPDT	DPDT	OPERATIONS
		N.O. LOAD	N.C. LOAD	
RESISTIVE LOAD	120/277 VAC	30 AMP	3 A MP	6,000
	28 VDC	20 AMP	3 A MP	100,000
MOTOR	120 VAC	1 HP	-	1000
	240 VAC	3 HP	-	1000
TUNGSTEN	120 VAC	TV-10	-	25,000
LRA/FLA*	240 VAC	96/22	-	30,000
		110/25.3	-	
PILOT DUTY	240 VAC	3 AMP	-	6,000

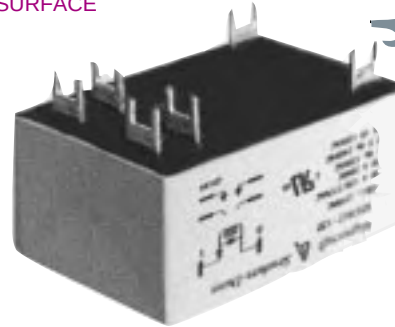
Note: Vent tape must be removed to achieve listed ratings

* FLA = Full load Amps, LRA = Locked rotor Amps.

cULus
UL Recognized
File No. E43641

CLASS "F" INSULATION. EPOXY SEALED WITH REMOVABLE TAPE SEAL OVER VENT HOLE (REMOVED AFTER CLEANING).

MEETS UL 873 AND
UL 508 SPACING - (8MM)
THRU AIR, (9.5 MM)
OVER SURFACE



GENERAL SPECIFICATIONS

COIL

Pull-in Voltage:	AC: 80% of nominal voltage or less DC: 75% of nominal voltage or less
Dropout Voltage:	10% of nominal voltage or more
Max. Operating Frequency:	14 operations per minute
Coil Power:	AC coil: 4.0VA, DC coil: 1.7W
Insulation System:	Class "F" (155°C)
Coil Resistance:	±10% measured @ 25°C
Duty:	Continuous

CONTACT

Contact Material:	Silver cadmium oxide
Contact Load Ratings:	See: "UL CONTACT LOAD RATINGS TABLE"
Contact Resistance:	100,000,000 @ initial rated current (switched)
Minimum Load:	N.O. 500 mA @ 12 VAC/VDC N.C. 100 mA @ 6 VAC/VDC

TIMING

Operate Time:	DC: 15 mS typ. 25ms W / Bounce
Release Time:	DC: 10mS typ. 25 ms W / Bounce

DIELECTRIC STRENGTH

Between Open Contacts:	1500 V rms
Contacts to Coil:	4000V rms
Insulation Resistance:	10 ³ meg Ω min. @ 500 VDC, 50% Rh

TEMPERATURE

Operating:	AC coil rectified: -40°C to +85°C, DC: -40°C to +85°C
Storage:	-55°C to +155°C

VIBRATION RESISTANCE

Functional:	0.065 (1.65 mm) double amplitude -10 thru 55 Hz
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SHOCK RESISTANCE

Functional:	10 g's for 11 mS, 1/2 sign wave pulse with no contact opening > 100μs
Mechanical:	100 g for 11 ms 1/2 sine wave pulse

LIFE EXPECTANCY

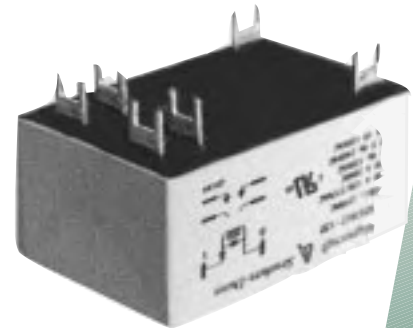
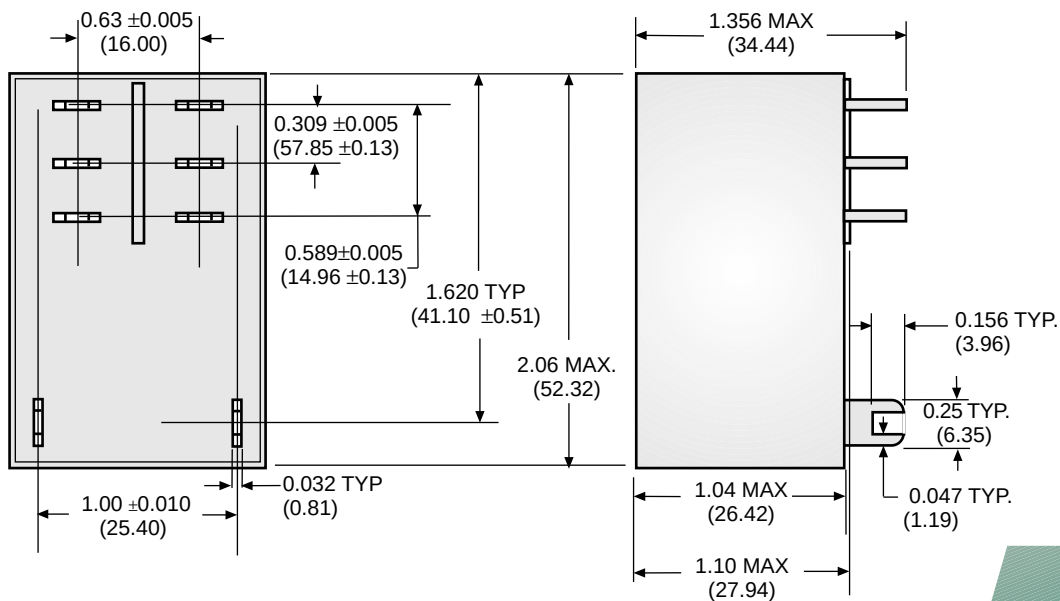
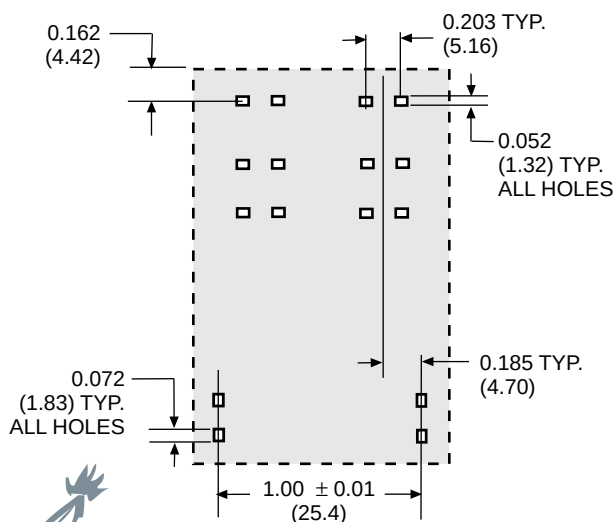
Electrical:	100,000 operations @ rated resistive load
Mechanical:	5,000,000 operations @ no load

MISCELLANEOUS

Operating Position:	Any
Enclosure:	Epoxy sealed immersion cleanable tape sealed plastic cover
Flammability:	94V-O Flammability rating
Weight:	86 g approx

DPST-N.O. & DPDT 30 AMPS**OUTLINE DIMENSIONS**

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

**PRINTED CIRCUIT MOUNTING HOLE LAYOUT (BOTTOM VIEW)**

NOTE:
VENT TAPE MUST BE REMOVED
TO ACHIEVE LISTED RATINGS

WIRING DIAGRAM (VIEWED FROM PIN END)

STANDARD PART NUMBERS	CONTACT CONFIGU- RATION	COIL MEASURED @ 25°C	
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
AC OPERATED COIL PRINTED CIRCUIT MOUNT, 30 AMP			
W92S7A12-24	DPST-NO	24 VAC	-
W92S7A12-120	DPST-NO	120 VAC	-
W92S7A12-240	DPST-NO	240 VAC	-
W92S11A12-24	DPDT	24 VAC	-
W92S11A12-120	DPDT	120 VAC	-
W92S11A12-240	DPDT	240 VAC	-
DC OPERATED COIL PRINTED CIRCUIT MOUNT, 30 AMP			
W92S7D12-12	DPST-NO	12 VDC	86 Ω
W92S7D12-24	DPST-NO	24 VDC	350 Ω
W92S7D12-48	DPST-NO	48 VDC	1,390 Ω
W92S7D12-110	DPST-NO	110 VDC	7,255 Ω
W92S11D12-12	DPDT	12 VDC	86 Ω
W92S11D12-24	DPDT	12 VDC	350 Ω
W92S11D12-48	DPDT	48 VDC	1,390 Ω
W92S11D12-110	DPDT	110 VDC	7,255 Ω

R.F. PERFORMANCE TABLE

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

SPDT & DPDT 2AMP

cRL us
UL Recognized
File No. E52197

*** AVAILABLE WITH SPDT OR DPDT BIFURCATED GOLD CLAD SILVER-PALLADIUM CROSS BAR CONTACTS- RATED FOR LOW LEVEL TO 2.0 AMP SWITCHING.**

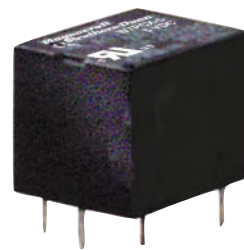
*** REQUIRES ONLY .155 SQUARE INCH OF CIRCUIT BOARD SPACE.**

*** TOTAL VOLUME OF LESS THAN A CUBIC CENTIMETER.**

*** CONFORMS TO FCC PART 68.302. 1500 V PEAK SURGE RESISTANCE.**

*** CONFORMS TO FCC PART 68.304. 1000 V DIELECTRIC WITHSTANDING VOLTAGE.**

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



GENERAL SPECIFICATIONS

COIL

Pull-in Voltage:	80% of nominal voltage or less
Dropout Voltage:	10 % of nominal voltage or more
Max. Voltage:	120% of nominal voltage, duty cycle: 100%.
Resistance:	±10%
Coil Power:	327 milliwatts max., min sensitivity: 200 milliwatts.
Max. Coil Dissipation	0.75 watts.

CONTACTS

Contact Material:	Gold clad silver palladium.
Contact Rating:	SPDT: 50 uA @ 50mV, 2A , 24 VDC, 2A, 120 VAC, DPDT: 50 uA @ 50mV, 2A, 24 VDC, 0.6A, 100 VAC, initial 50 mΩ
Contact Resistance:	100 milliohms max @ 6 VDC 10 milliamps.

TIMING

Operate Time:	4.0 mS max. @ nominal voltage typ.
Release Time:	5.0 mS max. @ nominal voltage typ.

DIELECTRIC STRENGTH

All Mutually Insulated Points:	500 VAC for 1 minute, 1 milliamp max. leakage, or 600 VAC for 1 second, 1 milliamp leakage.
Surge Test:	Meets FCC 68.302 (1500V surge) and 68.304 (1000V dielectric).
Insulation Resistance:	500 VDC exceeds 1000 megohms.

TEMPERATURE

Operating:	-35°C to +70°C
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VIBRATION RESISTANCE

Functional:	15 g's, 10 to 2000 Hz, no contact opening > 10 uS max. contact chatter destructive: 50 g's.
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SHOCK RESISTANCE

Functional	50g's 6mS half sine
Mechanical:	Destructive: 150 g's.

LIFE EXPECTANCY

Electrical:	100,000 operations- 2 Amp 24 VDC, 1.0 Amps 120VAC @ rated resistive load.
Mechanical:	100,000,000 operations @ no load

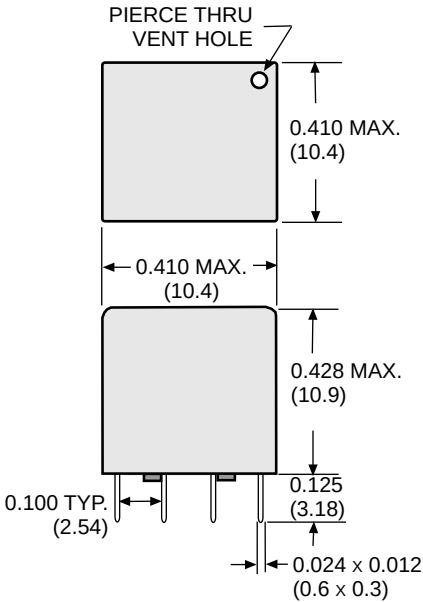
MISCELLANEOUS

Terminal Finish:	Terminals are solder coated and epoxy free to provide excellent solderability. Max. Exposure to soldering temperature is 5 seconds @ 250°C. after cleaning process, pierce a small hole in cover for venting.
Operating Position:	Any
Enclosure:	UL, 94V-O plastic, epoxy sealed.
Weight:	2.7 g Approx.

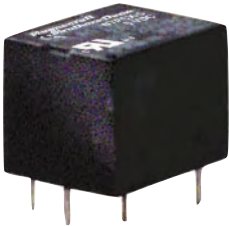
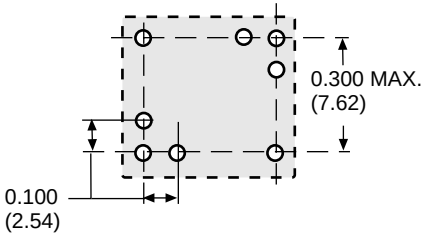
SPDT & DPDT 2 AMP

OUTLINE DIMENSIONS

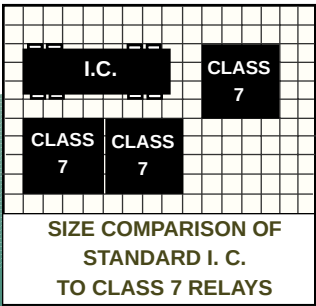
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



PRINTED CIRCUIT MOUNTING HOLE LAYOUT (BOTTOM VIEW)

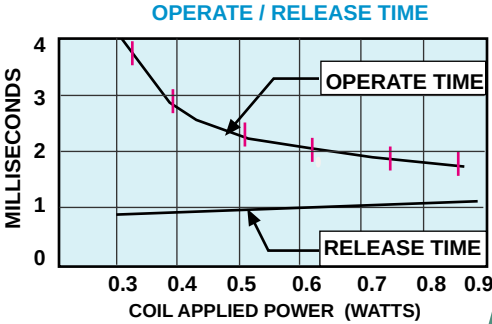
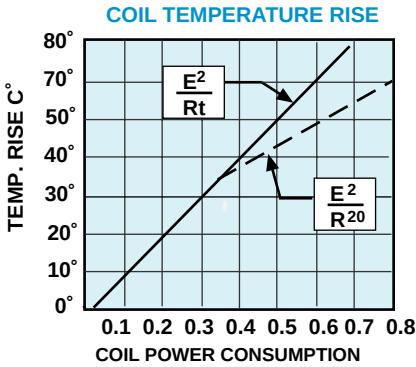


TOP VIEW SHOWN AT ACTUAL SIZE ON 0.1 GRID



SIZE COMPARISON OF STANDARD I. C. TO CLASS 7 RELAYS

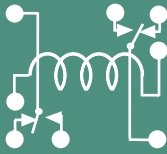
THE CLASS 7 RELAYS CAN BE DENSELY PACKED TOGETHER WITHOUT MAGNETIC INTERACTION FROM ADJACENT RELAYS.



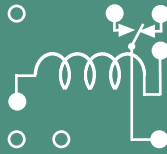
$$\frac{E^2}{R_t} = \frac{\text{COIL VOLTAGE}}{\text{COIL RESISTANCE VALUE AFTER TEMP. WAS RAISED}}$$

$$\frac{E^2}{R^{20}} = \frac{\text{COIL VOLTAGE}}{\text{AT 20°C COIL RESISTANCE VALUE}}$$

WIRING DIAGRAM (VIEWED FROM PIN END)



DPDT



SPDT

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

R.F. PERFORMANCE TABLE

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

SPDT & DPDT 2 AMP



- * AVAILABLE WITH SPDT OR DPDT BIFURCATED GOLD CLAD SILVER-PALLADIUM CROSS BAR CONTACTS- RATED FOR LOW LEVEL TO 2.0 AMP SWITCHING.
- * REQUIRES ONLY 0.155 SQUARE INCH OF CIRCUIT BOARD SPACE.
- * TOTAL VOLUME OF LESS THAN A CUBIC CENTIMETER.
- * CONFORMS TO FCC PART 68.302. 1500 V PEAK SURGE RESISTANCE.
- * CONFORMS TO FCC PART 68.304. 1000 V DIELECTRIC WITHSTANDING VOLTAGE.



GENERAL SPECIFICATIONS

COIL

Pull-in Voltage: 80% of nominal voltage or less

Dropout Voltage: 10% of nominal voltage or more

Max. Voltage: 120% of nominal voltage, duty cycle 100%

Resistance: ±10% measured @ 25°C 327mW max.

Coil Power: Min. sensitivity: 200 mW

Max. Coil Dissipation: 0.75 watt

CONTACTS

Contact Material: Gold clad silver palladium.

Contact Rating: Low level: 50uA- 50mV, SPDT: 2 A-24 VDC, 2A-120 VAC, DPDT: 2 A-24 VDC, 0.6A-100 VAC,

Contact Resistance: Initial 50 milliohms @ 6 VDC, 10mA, 100 milliohms max.

TIMING

Operate Time: 4.0 mS max. @ nominal voltage.

Release Time: 10.0 mS max. @ nominal voltage.

Contact Bounce: 2.5 mS operate, 5.0 mS release

DIELECTRIC STRENGTH

All Mutually Insulated Points: 500 VAC for 1 minute, 1 milliamp max. leakage, or 600 VAC for 1 second, 1 milliamp leakage.

Surge Test: Meets FCC 68.302 (1500V surge) and 68.304 (1000V dielectric).

Insulation Resistance: 500 VDC exceeds 1000 megohms.

TEMPERATURE

Operating: -35°C to +70°C

VIBRATION RESISTANCE

Functional: 15g's, 10 to 2000 Hz, no contact opening greater than 10µS

SHOCK RESISTANCE

Functional: 50g's, 6mS max.

Mechanical: Contact chatter destructive 50g's.

LIFE EXPECTANCY

Electrical: 100,000 operations @ rated resistive load.

Mechanical: 100,000,000 operations @ no load

MISCELLANEOUS

Terminal Finish: Terminals are solder coated to provide excellent solderability. max. exposure to soldering temperature is 5 seconds @ 250°C.

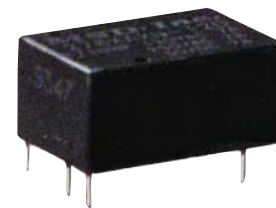
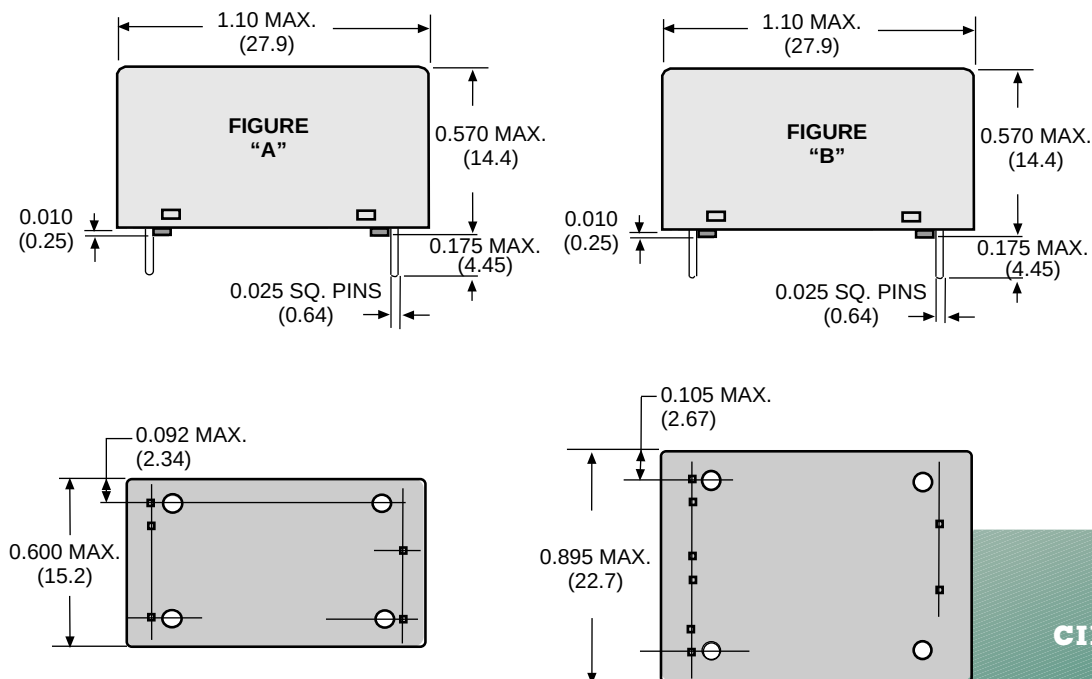
Operating Position: Any

Enclosure: Plastic.

Weight: SPDT-5.5 g, DPDT- 9 g Approx.

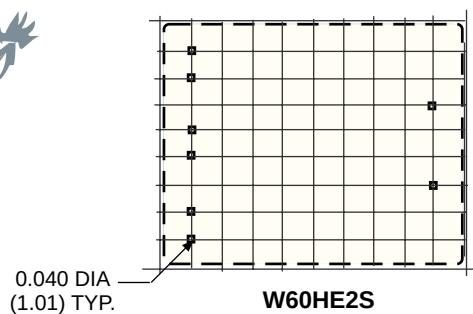
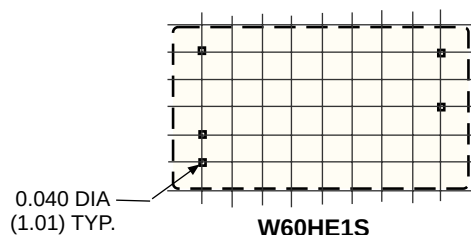
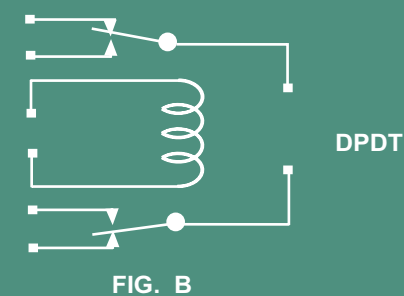
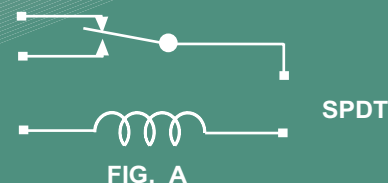
OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



PRINTED CIRCUIT MOUNTING HOLE LAYOUT

(TOP VIEW SHOWN AT ACTUAL SIZE ON 0.1 GRID)

CIRCUIT DIAGRAMS
(BOTTOM VIEW)STANDARD
PART
NUMBERSCONTACT
CONFIGU-
RATION

COIL MEASURED @ 25°C

NOMINAL
INPUT
VOLTAGENOMINAL
RESISTANCE
(OHMS)

FIG. A

W60HE1S-5DC

SPDT

5 VDC

75

W60HE1S-12DC

SPDT

12 VDC

440

W60HE1S-24DC

SPDT

24 VDC

1550

W60HE1S-48DC

SPDT

48 VDC

5250

FIG. B

W60HE2S-5DC

DPDT

5 VDC

75

W60HE2S-12DC

DPDT

12 VDC

440

W60HE2S-24DC

DPDT

24 VDC

1550

W60HE2S-48DC

DPDT

48 VDC

5250 Ω

UL CONTACT LOAD RATINGS TABLE

LOAD	LOAD VOLTAGE	SPDT	SPST-		OPERATIONS
		N.O. & N.C. LOAD	N.O. LOAD	N.C. LOAD	
GENERAL	277 VAC	10AMP	-	-	100,000
RESISTIVE	120 VAC	-	-	12 AMP	100,000
RESISTIVE	120 VAC	-	12 AMP	-	20,000
GENERAL	125 VAC	-	15 AMP	-	6,000
RESISTIVE	30 VDC	12 AMP	-	-	100,000
MOTOR	120 VAC	-	1/4 HP	-	34,000
	120 VAC	-	-	1/4 HP	21,000
BALLAST	120 VAC	-	15 AMP	-	7,000
	480 VAC	3.75 AMP	-	-	100,000
TUNGSTEN	120 VAC	-	TV - 5	-	6,000

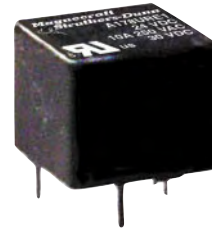
**SPST- N.O. 15 AMPS
& SPDT 10 AMPS**

UL us
UL Recognized
File No. E195668

CLASS "B" & "F" COIL INSULATION SYSTEM.
WITHSTANDS THE VAPOR AND SPRAY
CLEANING OF MOST FLUXING SYSTEMS.
TERMINALS ARE SOLDER COATED TO
PROVIDE EXCELLENT SOLDERABILITY.

PART NUMBERS SHOWN AVAILABLE FROM
YOUR LOCAL MAGNECRAFT & STRUTHERS-DUNN
DISTRIBUTION. UL CLASS "F" COIL INSULATION
SYSTEM AVAILABLE ON SPECIAL ORDER.

CONTACT FACTORY.

**GENERAL SPECIFICATIONS****COIL**

Pull-in Voltage: 75% of nominal voltage or less
Dropout Voltage: 10% min. of nominal voltage or more
Max. Voltage: 110%
Resistance: $\pm 10\%$ measured @ 20°C
Coil Power: 0.36 watts, 48 VDC : 0.51watts
Insulation System: Class "B"
(130°C per UL standart 1446)
Duty: Continuous

CONTACTS

Contact Material: Silver alloy
Contact Rating: See "UL CONTACT LOAD RATING TABLE"
Contact Resistance: 100 milliohms @ 24 VDC & 1 Amp max
Max. Switching Power: 2400 VA / 240 W
Min. Load: 6 VDC / 0.1 A

TIMING

Operate Time: 10 mS max. @ nominal voltage
Release Time: 5 mS max. @ nominal voltage

DIELECTRIC STRENGTH

Contacts to Coil: 1500 V rms
Across Open Contacts: 750 V rms
Insulation Resistance: 100 Megohms @ 500 VDC

TEMPERATURE

Operating: -40°C to +70°C
Storage: -40°C to +80°C

VIBRATION RESISTANCE

Functional: 10 to 55Hz dual amplitude 1.5 mm

SHOCK RESISTANCE

Functional: 10 g' s
Mechanical: 100 g' s

LIFE EXPECTANCY

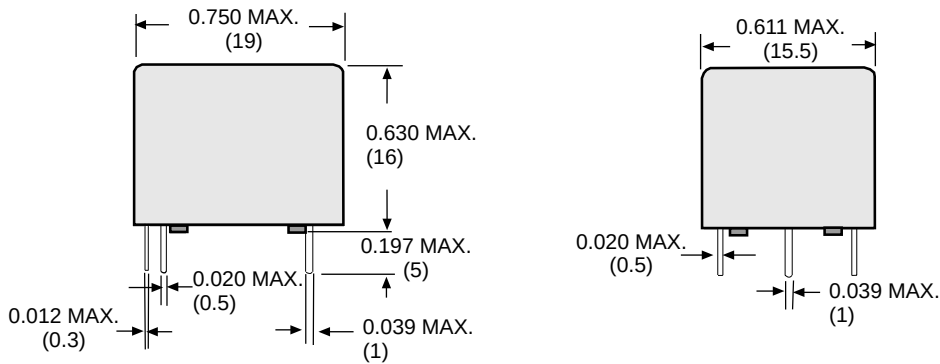
Electrical: 100,000 operations
@ rated resistive load.
Mechanical: 10,000,000 operations @ no load

MISCELLANEOUS

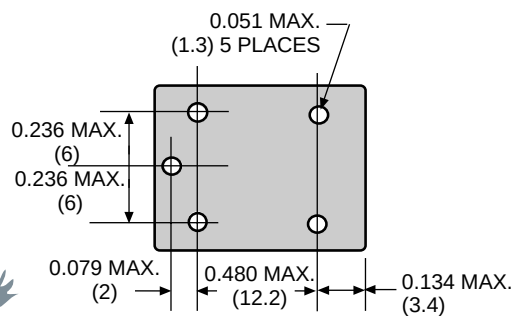
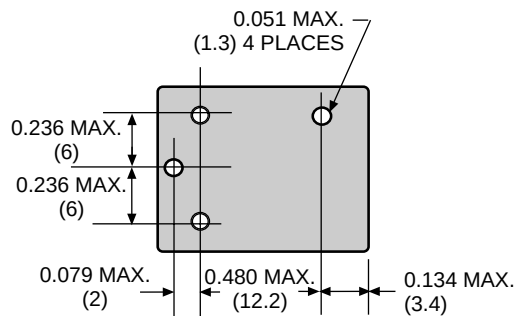
Operating Position: Any
Enclosure: Plastic, epoxy sealed, suitable for
automatic circuit board processing.
After cleaning process, pierce a small
hole in cover for venting
Weight: 10 g Approx.

**SPST- N.O. 15 AMPS
& SPDT 10 AMPS**

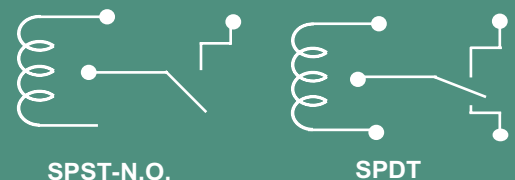
OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



**PRINTED CIRCUIT
MOUNTING HOLE LAYOUT**
(BOTTOM VIEW)



WIRING DIAGRAMS
(VIEWED FROM PIN END)



STANDARD PART NUMBERS	CONTACT CONFIGU- RATION	COIL MEASURED @ 25°C	
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
15 AMPS			
A178URE1A-3DC	SPST-NO	3 VDC	25 Ω
A178URE1A-5DC	SPST-NO	5 VDC	70 Ω
A178URE1A-12DC	SPST-NO	12 VDC	400 Ω
A178URE1A-24DC	SPST-NO	24 VDC	1600 Ω
A178URE1A-48DC	SPST-NO	48 VDC	4500 Ω
10 AMPS			
A178URE1-3DC	SPDT	3 VDC	25 Ω
A178URE1-5DC	SPDT	5 VDC	70 Ω
A178URE1-12DC	SPDT	12 VDC	400 Ω
A178URE1-24DC	SPDT	24 VDC	1600 Ω
A178URE1-48DC	SPDT	48 VDC	4500 Ω

UL CONTACT LOAD RATINGS TABLE

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

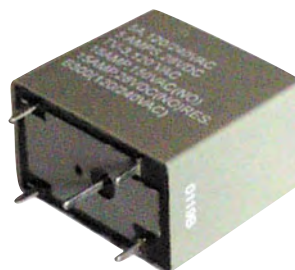
NOTES: SCO = SILVER CADMIUM OXIDE; SIL = SILVER.

SPDT, 3, 5 & 10 AMPS

UL **us**
UL Recognized
File No. E52197

MANUFACTURED UNDER
ISO 9002 & QS 9000

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

**GENERAL SPECIFICATIONS****COIL**

Pull-in Voltage: VG, VW adj. (DC) = 75%,
VF, VG adj. (AC) = 80% of nominal
coil voltage or less.

Dropout Voltage: 10% of actual pull-in or more

Max. Voltage: 120% max.

Resistance: $\pm 10\%$

Duty: Continuous

CONTACTS

Contact Material: Silver cad oxide (5, 10 Amp), silver,
gold plated (3 Amp).

Contact Resistance: 100 milliohms max. initial value
@ 6 VDC, 1 Amp

TIMING

Operate Time: 10 mS typ. (25 mS max.)

Release Time: 7 mS typ. (10 mS max.)

DIELECTRIC STRENGTH

Contacts to Coil: 1,500 V rms

Across Open Contacts: 500 V rms

Coil to Frame: 1,500 V rms

Insulation Resistance: 1000 m Ω min. @ 500 VDC

TEMPERATURE

Operating: -55°C to +85°C

Storage: -55°C to +130°C

VIBRATION RESISTANCE

Functional: 10 to 55 Hz @ 1.65mm displacement

SHOCK RESISTANCE

Functional: 10 g's

Mechanical: 100 g's

LIFE EXPECTANCY

Electrical: 100,000 operations
@ rated resistive load

Mechanical: 50,000,000 operations @ no load

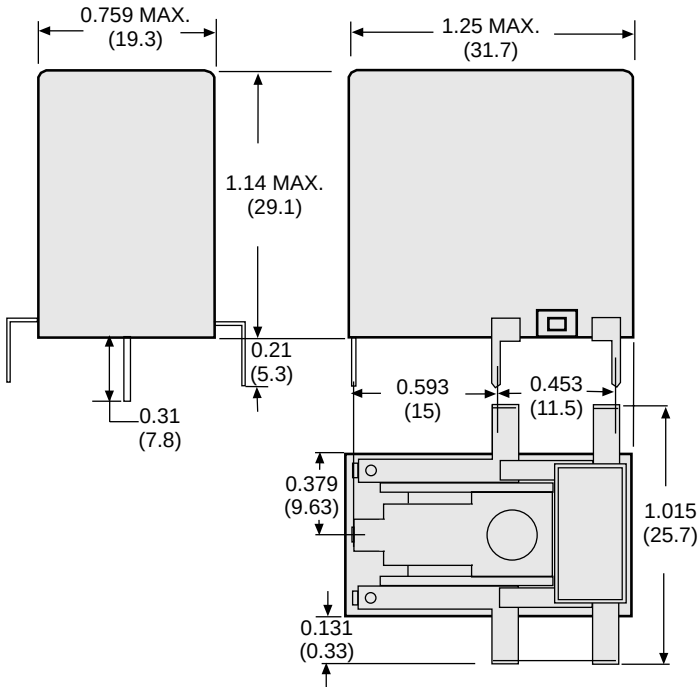
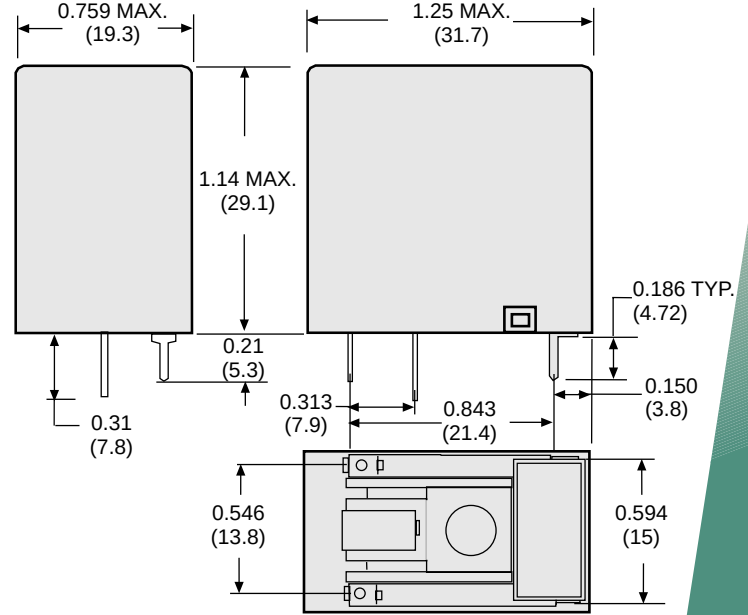
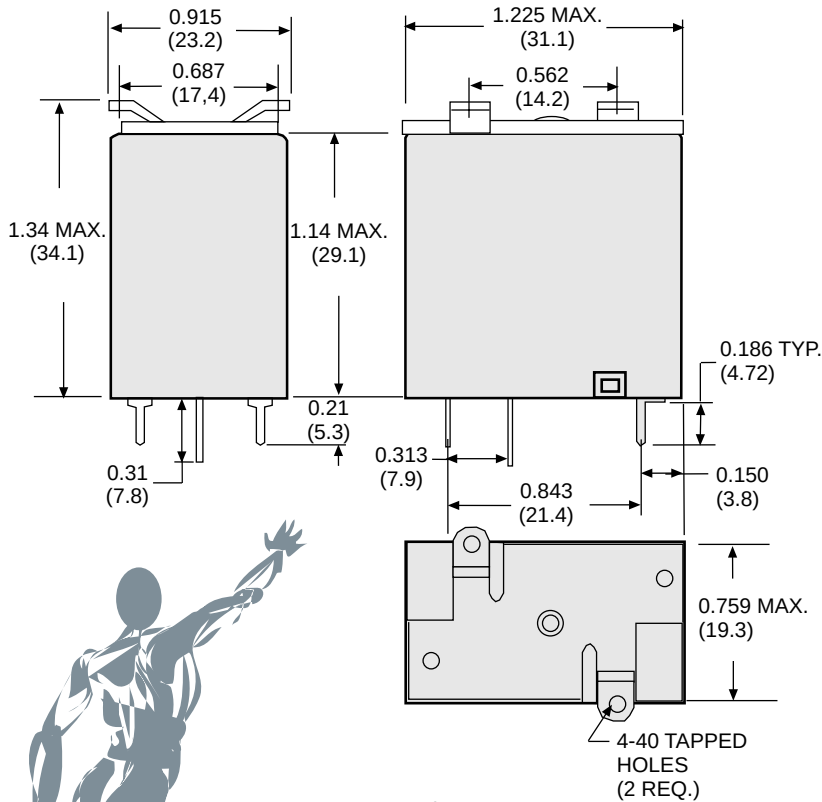
MISCELLANEOUS

Soldering Temperature: 270°C (518°F) Max. for 5 seconds max

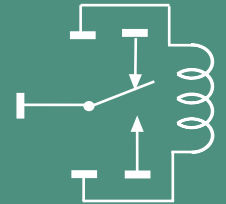
Operating Position: Any

Enclosure: Dust cover

Weight: 42 g Approx

SPDT, 3, 5 & 10 AMPS**OUTLINE DIMENSIONS**
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).**STYLE RE1C2****STYLE RE1C1****STYLE R1C4****WIRING DIAGRAMS**

(VIEWED FROM PIN END)

**STYLE RE1C1
R1C4****STYLE RE1C2**

SPDT

**STANDARD
PART
NUMBERS****CONTACT
CONFIGU-
RATION****COIL MEASURED @ 25°C****NOMINAL
INPUT
VOLTAGE****NOMINAL
RESISTANCE
(OHMS)****3 AMP STYLE RE1C1**

W49RE1C1VG-3DC-SIL	SPDT	3 VDC	90 Ω
W49RE1C1VG-5DC-SIL	SPDT	5 VDC	235 Ω
W49RE1C1VG-12DC-SIL	SPDT	12 VDC	1350 Ω
W49RE1C2VF-6DC-SIL	SPDT	6 VDC	410 Ω
W49RE1C2VF-12DC-SIL	SPDT	12 VDC	1640 Ω
W49RE1C2VF-24DC-SIL	SPDT	24 VDC	6560 Ω

5 AMP STYLE RE1C1 AND RE1C2

W49RE1C1VG-5DC-SCO	SPDT	5 VDC	235 Ω
W49RE1C1VG-12DC-SCO	SPDT	12 VDC	1350 Ω
W49RE1C1VG-24DC-SCO	SPDT	24 VDC	5400 Ω
W49RE1C2VF-6DC-SCO	SPDT	6 VDC	410 Ω
W49RE1C2VF-12DC-SCO	SPDT	12 VDC	1640 Ω
W49RE1C2VF-24DC-SCO	SPDT	24 VDC	6560 Ω

10 AMP STYLE RE1C1

W49RE1C1VW-5DC-SCO	SPDT	5 VDC	100 Ω
W49RE1C1VW-12DC-SCO	SPDT	12 VDC	600 Ω
W49RE1C1VW-24DC-SCO	SPDT	24 VDC	2400 Ω

SOLDER TERMINALS, BRACKET MOUNTING 10 AMP STYLE RE1C4

W49R1C4VG-5DC-SCO	SPDT	5 VDC	235 Ω
W49R1C4VG-12DC-SCO	SPDT	12 VDC	1350 Ω

10 AMP STYLE RE1C4

W49R1C4VW-5DC-SCO	SPDT	5 VDC	100 Ω
W49R1C4VW-24DC-SCO	SPDT	24 VDC	2400 Ω

UL CONTACT LOAD RATINGS TABLE

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

* COSØ = 0.4 (TUV)

† L/R = 7mS (TUV)

SPDT & DPDT 5, 12 & 20 AMPS

 UL Recognized
 File No. E191122


TUV

**MANUFACTURED UNDER
 ISO 9002 & QS 9000**

- * **UL CLASS "F" COIL INSULATION SYSTEM AVAILABLE.**
- * **AC COIL VOLTAGES.**
- * **UL RATED TV-3, TV-5 OR TV-8, N. O. ONLY.**
- * **CONTACTS RATED UP TO 20 AMP.**
- * **8 MILLIMETERS MINIMUM. CLEARANCE. COIL TO CONTACTS.**
- * **DIELECTRIC STRENGTH: 5,000 V rms.**

GENERAL SPECIFICATIONS**COIL**

Pull-in Voltage:	85% of nominal voltage or less for AC 75% of nominal voltage or less for DC
Dropout Voltage:	30% min. of nominal voltage or more for AC 10% min. of nominal voltage or more for DC
Max. Voltage:	110%
Resistance:	±10% measured @ 25°C
Coil Power:	AC 1.2 VA, DC 0.54 watts @ nominal voltage
Insulation System:	Class "B" (130°C per UL standart 1446) Class "F" available
Max. Coil Dissipation:	1.5 VA (60Hz) @ 25°C
Duty:	Continuous

CONTACTS

Contact Material:	Silver cadmium oxide
Contact Rating:	See: "UL CONTACT LOAD RATINGS TABLE"
Contact Resistance:	100 milliohms min

TIMING

Operate Time:	15 mS max. @ nominal voltage
Release Time:	10 mS max. @ nominal voltage

DIELECTRIC STRENGTH

Contacts to Coil:	5000 V rms; (8 mm creepage & clearance)
Across Open Contacts:	1000 V rms
Pole to Pole:	2500 V rms
Insulation Resistance:	100 megohms 500 VDC

TEMPERATURE

Operating:	-20°C to +55°C
Storage:	-40°C to +80°C

VIBRATION RESISTANCE

Functional:	10 to 55 Hz dual amplitude 1.5 mm
-------------	-----------------------------------

SHOCK RESISTANCE

Functional:	10 g's (11mS)
Mechanical:	100 g's (6mS)

LIFE EXPECTANCY

Electrical:	100,000 operations @ rated resistive load
Mechanical:	10,000,000 operations @ no load

MISCELLANEOUS

Operating Position:	Any
Enclosure:	Plastic, epoxy sealed, suitable for automatic circuit board processing. After cleaning process, pierce a small hole in cover for venting
Weight:	17 grams approx.



SPDT & DPDT 5, 12 & 20 AMPS

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

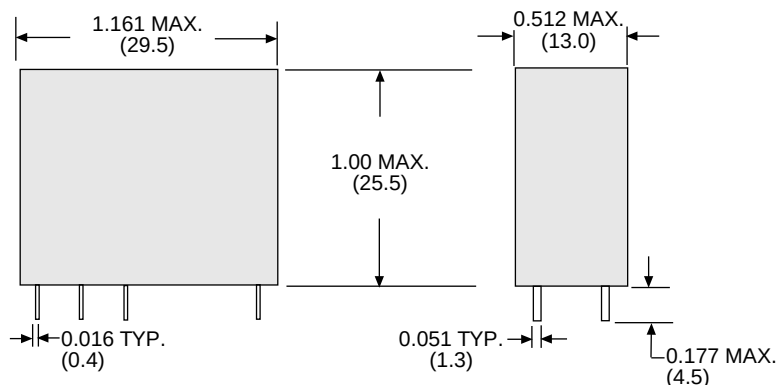
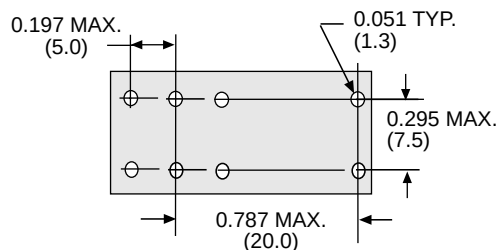
PRINTED CIRCUIT
MOUNTING HOLE LAYOUT
(BOTTOM VIEW)

FIG. "A"

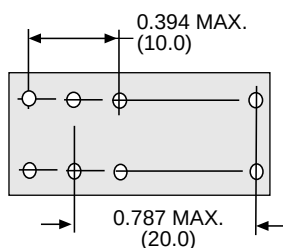


FIG. "B"

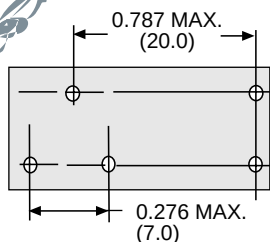


FIG. "C"

WIRING DIAGRAMS
(VIEWED FROM PIN END)

FIG. A



FIG. B



FIG. C

STANDARD PART NUMBERS	CONTACT CONFIGU- RATION	COIL MEASURED @ 25°C	
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS & VA)
DC OPERATED COIL, FIG. A			
976XBXH-5D / 76EURPCPX-61	DPDT	5 VDC	47 Ω
976XBXH-6D / 76EURPCPX-62	DPDT	6 VDC	68 Ω
976XBXH-12D / 76EURPCPX-63	DPDT	12 VDC	270 Ω
976XBXH-24D / 76EURPCPX-64	DPDT	24 VDC	1100 Ω
DC OPERATED COIL, FIG. B			
976XAX97H-5D / 76EURPCPX-146	SPDT	5 VDC	47 Ω
976XAX97H-6D / 76EURPCPX-147	SPDT	6 VDC	68 Ω
976XAX97H-12D / 76EURPCPX-148	SPDT	12 VDC	270 Ω
976XAX97H-24D / 76EURPCPX-149	SPDT	24 VDC	1100 Ω
DC OPERATED COIL, FIG. C			
976XAXH-5D / 76EURPCPX-14	SPDT	5 VDC	68 Ω
976XAXH-6D / 76EURPCPX-15	SPDT	6 VDC	270 Ω
976XAXH-12D / 76EURPCPX-16	SPDT	12 VDC	1100 Ω
976XAXH-24D / 76EURPCPX-17	SPDT	24 VDC	4400 Ω
AC OPERATED COIL, FIG. A			
976XBXH-24A	DPDT	24 VAC	250 Ω
976XBXH-120A	DPDT	120 VAC	5,600 Ω
976XBXH-240A	DPDT	240 VAC	22000 Ω
AC OPERATED COIL, FIG. B			
976XAX97H-24A	SPDT	24 VAC	250 Ω
976XAX97H-120A	SPDT	120 VAC	5,600 Ω
976XAX97H-240A	SPDT	240 VAC	22000 Ω
AC OPERATED COIL, FIG. C			
976XAXH-24A	SPDT	24 VAC	250 Ω
976XAXH-120A	SPDT	120 VAC	5,600 Ω
976XAXH-240A	SPDT	240 VAC	22000 Ω

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

UL CONTACT LOAD RATINGS TABLE

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

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

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

GENERAL SPECIFICATIONS**COIL**

Pull-in Voltage:	70% of nominal voltage or less
Dropout Voltage:	10% of nominal voltage or more
Max. Voltage:	110%
Resistance:	±10%
Coil Power:	200 mW approx

CONTACTS

Contact Material:	Silver alloy
Contact Resistance:	100 milliohms initial @ 6 VDC, 1 Amp

TIMING

Operate Time:	10 mS max. @ nominal voltage
Release Time:	10 ms max. @ nominal voltage

DIELECTRIC STRENGTH

Contacts to Coil:	2000 V rms
Across Open Contacts:	1000 V rms
Surge Voltage Resistance:	5000 V rms between coil and contacts
Insulation Resistance:	500 VDC exceeds 1000 megohms min

TEMPERATURE

Operating:	-40°C to +70°C
Storage:	-40°C to +100°C

VIBRATION RESISTANCE

Functional:	10 to 55Hz, dual amplitude 1.5 mm
-------------	-----------------------------------

SHOCK RESISTANCE

Functional:	100g's 6 mS no damage
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LIFE EXPECTANCY

Electrical:	100,000 operations @ rated resistive load
Mechanical:	10,000,000 operations @ no load

MISCELLANEOUS

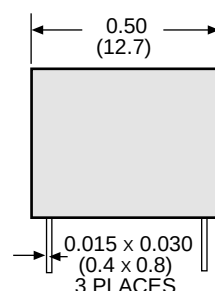
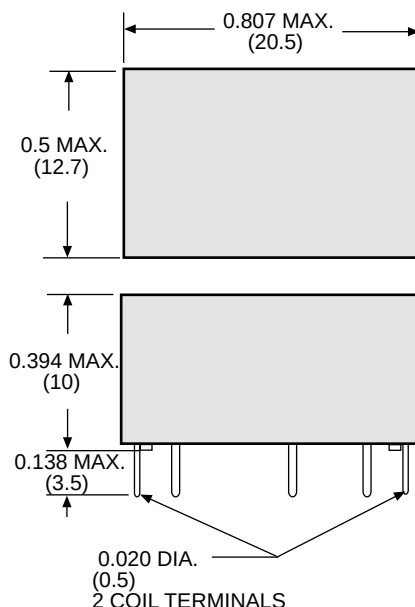
Operating Position:	Any
Enclosure:	Plastic cover, epoxy sealed
Weight:	5.5 grams approx.

SPST-N.O. & SPDT 10 AMPS

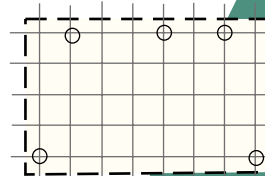
MANUFACTURED UNDER
ISO 9002

UL **us**
UL Recognized
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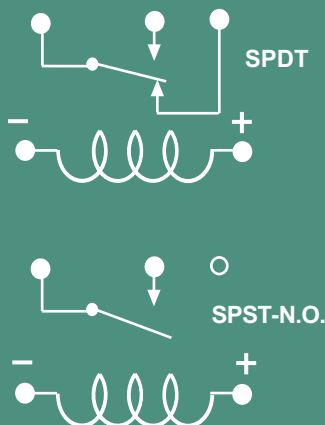
OUTLINE DIMENSIONS
 DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



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



WIRING DIAGRAM
 (VIEWED FROM PIN END)

**COIL MEASURED @ 25°C**

STANDARD PART NUMBERS	CONTACT CONFIGU- RATION	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
276AXXH-5D	SPST-NO	5 VDC	125 Ω
276AXXH-6D	SPST-NO	6 VDC	180 Ω
276AXXH-12D	SPST-NO	12 VDC	720 Ω
276AXXH-24D	SPST-NO	24 VDC	2880 Ω
276XAXH-5D	SPDT	5 VDC	125 Ω
276XAXH-6D	SPDT	6 VDC	180 Ω
276XAXH-12D	SPDT	12 VDC	720 Ω
276XAXH-24D	SPDT	24 VDC	2880 Ω



SECTION 7 CROSS REFERENCE GUIDE

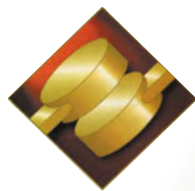
MAGNECRAFT & STRUTHERS-DUNN	AROMAT	AMERICAN ZETTLER	OMRON	POTTER & BRUMFIELD
W90S1D12-5		AZ2150(or 2151)-1A-5DE	G8P-1A4-DC5	T90S1D12-5 (CLASS F)
W90S1D12-12		AZ2150(or 2151)-1A-12DE	G8P-1A4-DC12	T90S1D12-12 (CLASS F)
W90S1D12-24		AZ2150(or 2151)-1A-24DE	G8P-1A4-DC24	T90S1D12-24 (CLASS F)
W90S1D12-110		AZ2150(or 2151)-1A-110DE	G8P-1A4-DC110	T90S1D12-110 (CLASS F)
W90S5D12-5		AZ2150(or 2151)-1C-5DE	G8P-1C4-DC5	T90S5D12-5 (CLASS F)
W90S5D12-12		AZ2150(or 2151)-1C-12DE	G8P-1C4-DC12	T90S5D12-12 (CLASS F)
W90S5D12-24		AZ2150(or 2151)-1C-24DE	G8P-1C4-DC24	T90S5D12-24 (CLASS F)
W90S5D12-110		AZ2150(or 2151)-1C-110DE	G8P-1C4-DC110	T90S5D12-110 (CLASS F)
W90S1D42-5	JTN1aE-PA-F-DC5V	AZ2150(or 2151)-1A-5DEF	G8P-1A4-CF-DC5	T90S1D42-5
W90S1D42-12	JTN1aE-PA-F-DC12V	AZ2150(or 2151)-1A-12DEF	G8P-1A4-CF-DC12	T90S1D42-12;T9AS1D12-12
W90S1D42-24	JTN1aE-PA-F-DC24V	AZ2150(or 2151)-1A-24DEF	G8P-1A4-CF-DC24	T90S1D42-24 T9AS1D12-24
W90S1D42-110		AZ2150(or 2151)-1A-110DEF	G8P-1A4-CF-DC110	T90S1D42-110
W90S5D42-5	JTN1E-PA-F-DC5V	AZ2150(or 2151)-1C-5DEF	G8P-1C4-CF-DC5	T90S5D42-5
W90S5D42-12	JTN1E-PA-F-DC12V	AZ2150(or 2151)-1C-12DEF	G8P-1C4-CF-DC12	T90S5D42-12
W90S5D42-24	JTN1E-PA-F-DC24V	AZ2150(or 2151)-1C-24DEF	G8P-1C4-CF-DC24	T90S5D42-24
W90S5D42-110		AZ2150(or 2151)-1C-110DEF	G8P-1C4-CF-DC110	T90S5D42-110
MAGNECRAFT & STRUTHERS-DUNN	AROMAT	AMERICAN ZETTLER		POTTER & BRUMFIELD
W9AS1D22-5	JTN1aE-TMP-F-DC5V	AZ2100-1A-5DEF		T9AS1D22-5
W9AS1D22-12	JTN1aE-TMP-F-DC12V	AZ2100-1A-12DEF		T9AS1D22-12
W9AS1D22-24	JTN1aE-TMP-F-DC24V	AZ2100-1A-24DEF		T9AS1D22-24
W9AS1D22-48	JTN1aE-TMP-F-DC48V	AZ2100-1A-48DEF		T9AS1D22-48
W9AS1D22-110	JTN1aE-TMP-F-DC110V	AZ2100-1A-110DEF		T9AS1D22-110
W9AS5D22-5	JTN1E-TMP-F-DC5V	AZ2100-1C-5DEF		T9AS5D22-5
W9AS5D22-12	JTN1E-TMP-F-DC12V	AZ2100-1C-12DEF		T9AS5D22-12
W9AS5D22-24	JTN1E-TMP-F-DC24V	AZ2100-1C-24DEF		T9AS5D22-24
W9AS5D22-48	JTN1E-TMP-F-DC48V	AZ2100-1C-48DEF		T9AS5D22-48
W9AS5D22-110	JTN1E-TMP-F-DC110V	AZ2100-1C-110DE		T9AS5D22-110
MAGNECRAFT & STRUTHERS-DUNN		AMERICAN ZETTLER	OMRON	POTTER & BRUMFIELD
W92S7A12-24		AZ2850-2A-24A	G7L-2A-P-CB-AC24	T92S7A12-24
W92S7A12-120		AZ2850-2A-120A	G7L-2A-P-CB-AC120	T92S7A12-120
W92S7A12-240		AZ2850-2A-240A	G7L-2A-P-CB-AC240	T92S7A12-240
W92S11A12-24		AZ2850-2C-24A		T92S11A12-24
W92S11A12-120		AZ2850-2C-120A		T92S11A12-120
W92S11A12-240		AZ2850-2C-240A		T92S11A12-240
W92S7D12-12		AZ2800-2A-12D	G7L-2A-P-CB-DC12	T92S7D12-12
W92S7D12-24		AZ2800-2A-24D	G7L-2A-P-CB-DC24	T92S7D12-24
W92S7D12-48		AZ2800-2A-48D	G7L-2A-P-CB-DC48	T92S7D12-120
W92S7D12-110		AZ2800-2A-110D	G7L-2A-P-CB-DC110	T92S7D12-240
W92S11D12-12		AZ2800-2C-12D		T92S11D12-12
W92S11D12-24		AZ2800-2C-24D		T92S11D12-24
W92S11D12-48		AZ2800-2C-48D		T92S11D12-120
W92S11D12-110		AZ2800-2C-110D		T92S11D12-240
MAGNECRAFT & STRUTHERS-DUNN	MIDTEX			
W7PCX-1	MMS105			
W7PCX-3	MMS102			



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MAGNECRAFT & STRUTHERS-DUNN	MIDTEX			
W7PCX-4	MMS124			
W7PCX-5	MMS205			
W7PCX-7	MMS212			
W7PCX-8	MMS224			
MAGNECRAFT & STRUTHERS-DUNN				POTTER & BRUMFIELD
W60HE1S-5DC				R50E2Y1-5V
W60HE1S-12DC				R50E2Y1-12V
W60HE1S-24DC				R50E2Y1-24V
W60HE1S-48DC				R50E2Y1-48V
W60HE2S-5DC				R50E2Y2-5V
W60HE2S-12DC				R50E2Y2-12V
W60HE2S-24DC				R50E2Y2-24V
W60HE2S-48DC				R50E2Y2-48V
MAGNECRAFT & STRUTHERS-DUNN	AROMAT	AMERICAN ZETTLER	OMRON	POTTER & BRUMFIELD
A178URE1A-3DC	NOT AVAILABLE	NOT AVAILABLE	G5LE-1A4(as is or ACD, or-ASI)-DC3	T7NS1D1-3
A178URE1A-5DC	JS1a-5V	NOT AVAILABLE	G5LE-1A4(as is or ACD, or-ASI)-DC5	T7NS1D1-5
A178URE1A-12DC	JS1a-12V	NOT AVAILABLE	G5LE-1A4(as is or ACD, or-ASI)-DC12	T7NS1D1-12
A178URE1A-24DC	JS1a-24V	NOT AVAILABLE	G5LE-1A4(as is or ACD, or-ASI)-DC24	T7NS1D1-24
A178URE1A-48DC	JS1a-48V	NOT AVAILABLE	G5LE-1A4(as is or ACD, or-ASI)-DC48	T7NS1D1-48
A178URE1-3DC	NOT AVAILABLE	NOT AVAILABLE	G5LE-14(as is or ACD, or-ASI)-DC3	T7NS5D1-3
A178URE1-5DC	JS1-5V	AZ941-1CT-5DEB	G5LE-14(as is or ACD, or-ASI)-DC5	T7NS5D1-5
A178URE1-12DC	JS1-12V	AZ941-1CT-12DEB	G5LE-14(as is or ACD, or-ASI)-DC12	T7NS5D1-12
A178URE1-24DC	JS1-24V	AZ941-1CT-24DEB	G5LE-14(as is or ACD, or-ASI)-DC24	T7NS5D1-24
A178URE1-48DC	JS1-48V	AZ941-1CT-48DEB	G5LE-14(as is or ACD, or-ASI)-DC48	T7NS5D1-48
MAGNECRAFT & STRUTHERS-DUNN				CORNELL DUBILIER
W49RE1C1VG-3DC-SIL				653-3K
W49RE1C1VG-5DC-SIL				653-6K
W49RE1C1VG-12DC-SIL				653-12K
W49RE1C1VG-5DC-SCO				603-6B
W49RE1C1VG-12DC-SCO				603-12B
W49RE1C1VG-24DC-SCO				603-24B
W49RE1C1VW-5DC-SCO				613-6B
W49RE1C1VW-12DC-SCO				613-12B
W49RE1C1VW-24DC-SCO				613-24B
MAGNECRAFT & STRUTHERS-DUNN	AROMAT	AMERICAN ZETTLER	OMRON	POTTER & BRUMFIELD
976XBXH-5D / 76EURPCPX-61	JW2SN-DC5V	AZ733-2C-5DE	G2R-24-DC5	RTE24005F
976XBXH-6D / 76EURPCPX-62	JW2SN-DC6V	AZ733-2C-6DE	G2R-24-DC6	RTE24006F
976XBXH-12D / 76EURPCPX-63	JW2SN-DC12V	AZ733-2C-12DE	G2R-24-DC12	RTE24012F
976XBXH-24D / 76EURPCPX-64	JW2SN-DC24V	AZ733-2C-24DE	G2R-24-DC24	RTE24024F
976XAX97H-5D / 76EURPCPX-146	NOT AVAILABLE	AZ755-1C-5DE	G2R-1-E-DC5	RTD14005F
976XAX97H-6D / 76EURPCPX-147	NOT AVAILABLE	AZ755-1C-6DE	G2R-1-E-DC6	RTD14006F
976XAX97H-12D / 76EURPCPX-148	NOT AVAILABLE	AZ755-1C-12DE	G2R-1-E-DC12	RTD14012F
976XAX97H-24D / 76EURPCPX-149	NOT AVAILABLE	AZ755-1C-24DE	G2R-1-E-DC24	RTD14024F
976XAX97H-48D / 76EURPCPX-150	NOT AVAILABLE	AZ755-1C-48DE	G2R-1-E-DC48	RTD14048F

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



SECTION 7 CROSS REFERENCE GUIDE

MAGNECRAFT & STRUTHERS-DUNN	AROMAT	AMERICAN ZETTLER	OMRON	POTTER & BRUMFIELD
976AXH-5D / 76EURPCPX-14	JW1FSN-DC5V	NOT AVAILABLE	G2R-14-DC5	RTB14005F
976AXH-6D / 76EURPCPX-15	JW1FSN-DC6V	NOT AVAILABLE	G2R-14-DC6	RTB14006F
976AXH-12D / 76EURPCPX-16	JW1FSN-DC12V	NOT AVAILABLE	G2R-14-DC12	RTB14012F
976AXH-24D / 76EURPCPX-17	JW1FSN-DC24V	NOT AVAILABLE	G2R-14-DC24	RTB14024F
976AXH-48D / 76EURPCPX-18	JW1FSN-DC48V	NOT AVAILABLE	G2R-14-DC48	RTB14048F
110VDC COIL AVAILABLE ON CLASS 976				
976XBH-24A			G2R-24-AC24	RTE24524
976XBH-120A			G2R-24-AC120	RTE24615
976XBH-240A			G2R-24-AC240	RTE24730
976AX97H-24A			G2R-1-E-AC24	RTD34524
976AX97H-120A			G2R-1-E-AC120	RTD34615
976AX97H-240A			G2R-1-E-AC240	RTD34730
976AXH-24A			G2R-14-AC24	RTB14524
976AXH-120A			G2R-14-AC120	RTB14615
976AXH-240A			G2R-14-AC240	RTB14730
MAGNECRAFT & STRUTHERS-DUNN	GUARDIAN			
W1330P-2C-24A	1330P-2C-24A			
W1330P-2C-120A	1330P-2C-120A			
W1335P-2C-12D	1335P-2C-12D			
W1335P-2C-24D	1335P-2C-24D			

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

FOR PRINTED CIRCUIT BOARD RELAYS APPLICATION ENGINEERING ASSISTANCE

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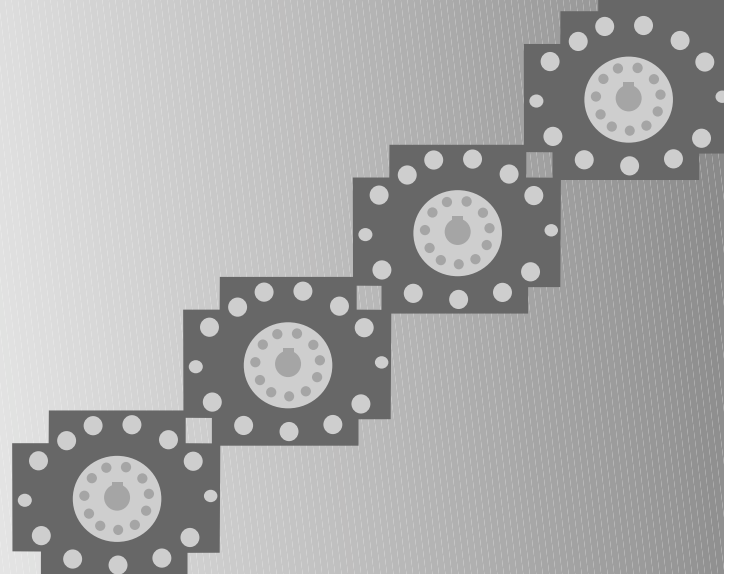
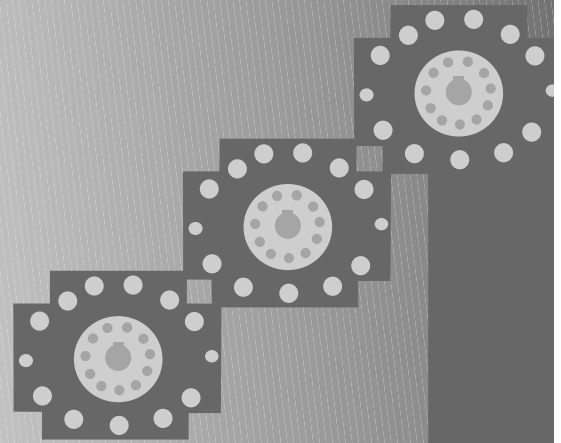
EMAIL: renatesteinback@magnecraft.de



Magnecraft & Struthers-Dunn
Your Contact for Relays

SECTION 8

SOCKETS & ACCESSORIES
5 TO 16 AMPERES



70-169-1



- OCTAL STYLE 8 PIN BASE
- LOW PROFILE

8

SCREW TERMINAL WITH
CLAMPING PLATES

PANEL MOUNT

CLASS	SECTION	PG
88HP	I	XX
211	4	XX
222	4	XX
236	4	XX
250	1	XX
250ML	5	XX
326/327	4	XX
314	1	XX
750	1	XX
750H	1	XX
TDRPRO	4	XX

—
—

15 AMP, 300 VOLTS



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- OCTAL STYLE 11 PIN BASE
- LOW PROFILE

11

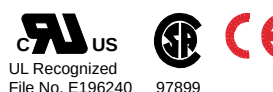
SCREW TERMINAL WITH
CLAMPING PLATES

PANEL MOUNT

CLASS	SECTION	PG
88HP	I	XX
211	4	XX
250	1	XX
250ML	5	XX
326/327	4	XX
314	1	XX
750	1	XX
750H	1	XX
TDRPRO	4	XX

—
—

15 AMP, 300 VOLTS



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- BLADE STYLE MINIATURE 8 PIN BASE
- FITS STANDARD 35 MILLIMETER DIN RAILS
- UL LISTED WHEN USED WITH SELECTED RELAYS FOUND IN SECTION 1

8

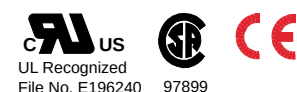
SCREW TERMINAL WITH
CLAMPING PLATES

DIN RAIL OR
PANEL MOUNT

CLASS	SECTION	PG
78	I	XX
782	I	XX
70S2 K PACK	4	XX

16 -1197
16 -1341
NO

10 AMP, 300 VOLTS



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- BLADE STYLE MINIATURE 14 PIN BASE
- FITS STANDARD 35 MILLIMETER DIN RAILS
- UL LISTED WHEN USED WITH SELECTED RELAYS FOUND IN SECTION 1

14

SCREW TERMINAL WITH
CLAMPING PLATES

DIN RAIL OR
PANEL MOUNT

CLASS	SECTION	PG
78	I	XX
782	I	XX
782H	I	XX

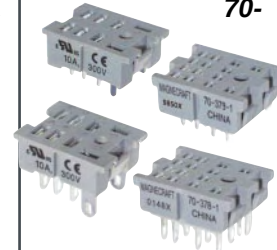
16 -1197
16 -1341
NO

10 AMP, 300 VOLTS



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- BLADE STYLE SOLDER OR PRINTED CIRCUIT TERMINAL 8 OR 14 PIN BASE

8 OR 14

SOLDER OR
PRINTED CIRCUIT
TERMINAL

CHASSIS OR
PRINTED CIRCUIT

CLASS	SECTION	PG
78	I	XX
782	I	XX
782H	I	XX

16 -1197
16 -1124
16 -1341
NO

10 AMP, 300 VOLTS (DPDT)
5 AMP, 300 VOLTS (4PDT)



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SOCKET SELECTION GUIDE

RELAY SERIES

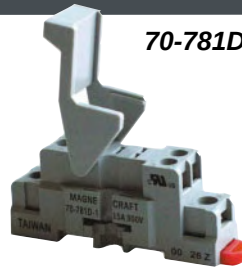
70-463-1



70-



70-781D-1



70-781F-1 & 70-781T-1



FEATURES

- BLADE STYLE 11 PIN SQUARE BASE
- FITS STANDARD 35 MILLIMETER DIN RAILS
- UL LISTED WHEN USED WITH SELECTED RELAYS FOUND IN SECTION 1

- BLADE STYLE SQUARE 11 PIN BASE
- QUICK CONNECT OR PRINTED CIRCUIT TERMINAL

- BLADE STYLE SLIM 5 PIN BASE
- FINGER SAFE
- FITS STANDARD 35 MILLIMETER DIN RELAYS
- PLASTIC HOLD DOWN CLIP & I.D. TAG

- BLADE STYLE SOLDER OR PRINTED CIRCUIT TERMINAL 5 PIN BASE

NUMBER OF PINS

11

11

5

5

TERMINAL STYLE

SCREW TERMINAL WITH CLAMPING PLATES

SOLDER QUICK CONNECT OR PRINTED CIRCUIT

SCREW TERMINAL WITH CLAMPING PLATES

SOLDER OR PRINTED CIRCUIT

MOUNTING STYLE

DIN RAIL OR PANEL MOUNT

CHASSIS OR PRINTED CIRCUIT

DIN RAIL OR PANEL MOUNT

CHASSIS OR PRINTED CIRCUIT

MATING RELAYS

CLASS	SECTION	PG	CLASS	SECTION	PG	CLASS	SECTION	PG	CLASS	SECTION	PG
235	4	XX	235	4	XX	78XAX	I	XX	78XAX	I	XX
236	4	XX	236	4	XX	781	1	XX	781	1	XX
286/287	4	XX	286/287	4	XX						
388/A283	1	XX	388/A283	1	XX						
388B	1	XX	388B	1	XX						
388J	1	XX	388J	1	XX						
388TDR	4	XX	388TDR	4	XX						
388ML	5	XX	388ML	5	XX						
388V	1	XX	388V	1	XX						
711	5	XX	711	5	XX						
788	1	XX	788	1	XX						

HOLD DOWN CLIP INCLUDED

16 -1278, 16 -1325
16 -1340, 16 -1239
NO

16 -1278, 16 -1325, 16 -1340,
16 -1239, 16 -722-2
NO

16 -1327
YES

16 -1326
NO

UL RATING

15 AMP, 300 VOLTS

15 AMP, 300 VOLTS

15 AMP, 300 VOLTS

15 AMP, 300 VOLTS

AGENCY APPROVALS



PAGE NUMBER

PAGE 16

PAGE 17

PAGE 18

PAGE 19

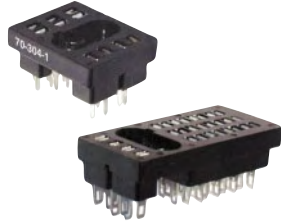
SOCKET SELECTION GUIDE

 70-782D-1			 70-783D-1			PHOTO NOT AVAILABLE SIMILAR TO 70-783D- EXCEPT 14 PIN BASE 70-784D-1			 70-78C-1			 70-78D-1		
● BLADE STYLE MINIATURE 8 PIN BASE ● FINGER SAFE ● MODULE COMPATIBLE ● 2 WAY PANEL MOUNT SYSTEM ● FITS STANDARD 35 MILLIMETER DIN RAILS ● PLASTIC HOLD DOWN CLIP & I.D. TAG			● BLADE STYLE 11 PIN BASE ● FINGER SAFE ● MODULE COMPATIBLE ● 2 WAY PANEL MOUNT SYSTEM ● FITS STANDARD 35 MILLIMETER DIN RAILS ● PLASTIC HOLD DOWN CLIP & I.D. TAG			● BLADE STYLE 14 PIN BASE ● FINGER SAFE ● MODULE COMPATIBLE ● 2 WAY PANEL MOUNT SYSTEM ● FITS STANDARD 35 MILLIMETER DIN RAILS ● PLASTIC HOLD DOWN CLIP & I.D. TAG			● BLADE STYLE 11 PIN BASE ● FITS STANDARD 35 MILLIMETER DIN RAILS			● BLADE STYLE 14 PIN BASE ● FITS STANDARD 35 MILLIMETER DIN RAILS		
8			11			14			11			14		
SCREW TERMINAL WITH CLAMPING PLATES			SCREW TERMINAL WITH CLAMPING PLATES			SCREW TERMINAL WITH CLAMPING PLATES			SCREW TERMINAL WITH CLAMPING PLATES			SCREW TERMINAL WITH CLAMPING PLATES		
DIN RAIL OR 2 WAY PANEL MOUNT			DIN RAIL OR 2 WAY PANEL MOUNT			DIN RAIL OR 2 WAY PANEL MOUNT			DIN RAIL OR PANEL MOUNT			DIN RAIL OR PANEL MOUNT		
CLASS	SECTION	PG	CLASS	SECTION	PG	CLASS	SECTION	PG	CLASS	SECTION	PG	CLASS	SECTION	PG
78	1	XX	78XCX	1	XX	78DX	1	XX	78XCX	1	XX	78DX	1	XX
782	1	XX	783	1	XX	784	1	XX	*783			*784		
70S2	4	XX												
K PACK														
16 -1549 YES			16 -1350 YES			16 -1351 YES			16 -1331 * NOT AVAILABLE NO			16 -1331 * NOT AVAILABLE NO		
16 AMP, 300 VOLTS			16 AMP, 300 VOLTS			16 AMP, 300 VOLTS			10 AMP, 300 VOLTS			10 AMP, 300 VOLTS		
AVAILABLE: Q-4-02			AVAILABLE: Q-4-02			AVAILABLE: Q-1-03			    			    		
PAGE 20			PAGE 21			PAGE 22			PAGE 23			PAGE 24		

8...4

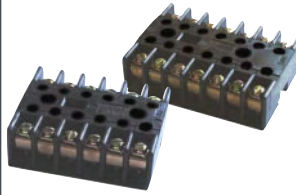
SOCKET SELECTION GUIDE & ACCESSORIES

RELAY SERIES

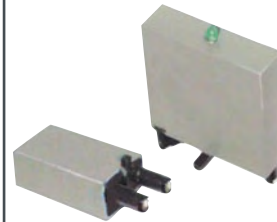


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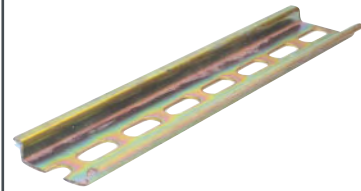
27390 & 33377



70-AS & BS



16-700DIN



FEATURES

- BLADE STYLE SOLDER OR PRINTED CIRCUIT TERMINAL 8 TO 26 PIN BASE

- HEAVY DUTY 12 OR 14 PIN BASE
- INTEGRAL LOCKING RECEPTACLE
- UL LISTED WHEN USED WITH SELECTED RELAYS
- FOUND IN SECTION 1

- MOV MODULES PROTECT BY SHUNTING DAMAGING ELECTRICAL SPIKES AWAY FROM COIL
- DIODE MODULES PROTECT FROM INDUCTIVE VOLTAGES.
- LED MODULES VERIFY POWER AT COIL TERMINALS

- DIN MOUNTING TRACK-EXTRUDED ALUMINUM
- FITS STANDARD 35 MILLIMETER WIDTHS

NUMBER OF PINS

8 - 26

12 OR 14

2

—

TERMINAL STYLE

SOLDER OR PRINTED CIRCUIT

SCREW TERMINAL WITH CLAMPING PLATES

BLADE STYLE

—

MOUNTING STYLE

CHASSIS OR PRINTED CIRCUIT

PANEL MOUNT

PLUG -IN

SLOTS FOR SCREW MOUNT

MATING RELAYS

CLASS SECTION PG

CLASS SECTION PG

—

—

67 1 XX

219 1 XX

246/247 4 XX

B255 5 XX

A311 5 XX

HOLD DOWN CLIP: INCLUDED:

16 -875 -1, 16 -875 - 2
16 -875 -3, 16 -875 - 8
YES

—

—

SELF CONTAINED
YES

—

—

UL RATING:

10 AMP, 300 VOLTS

10 AMP, 600 VOLTS

—

—

AGENCY APPROVALS:



PAGE NUMBER:

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16-700



- DIN RAIL PLASTIC END CLIP
- LOCKING SCREW KEEPS DEVICES FROM MOVING ON DIN RAIL

—

—

DIN RAIL

—

—

—

Magnecraft & Struthers-Dunn
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U. S. A.
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WEBSITE: www.magnecraft.com
EMAIL: info@magnecraft.com
EUROPE
TELEPHONE: 4989 / 75080310

FAX: 4989 / 7559344

WEBSITE: www.magnecraft.com
EMAIL: renatesteinback@magnecraft.de

FEATURES

COMPLETE ISOLATION OF ALL INTERNAL METAL TRACKS AND CONTACTS:

IDEAL FOR APPLICATIONS THAT REQUIRE UP TO 600 VOLTS.

SCREWS & CLAMPING PLATES DESIGNED WITH MAXIMUM SET BACK:

ELIMINATES ARCING BETWEEN TERMINALS AND THE NEED FOR WIRE TERMINALS.

EXTENDED PANEL MOUNTING SCREW SLOTS:

ALLOWS FOR HOLE CENTERS FROM 1.29" UP 1.4". IDEAL REPLACEMENT IN MANY EXISTING SOCKET MOUNTING APPLICATIONS.

HEAVY DUTY 1 PIECE TRACK AND CONTACT SYSTEM:

ALLOWS FOR GREATER HEAT DISSIPATION AND LOWER CONTACT RESISTANCE AT THE RELAY TERMINALS.

STANDARD DIN RAIL MOUNTING:

FITS ALL STANDARD 35 MILLIMETER DIN TRACKS

BENEFITS

**10 AMPS, 600 VOLTS
15 AMPS, 300 VOLTS**

UL **us**
UL Recognized
File No. E70500

SR 97899



LISTED 367G
IND. CONT. EQ.

C **US**
WHEN USED
WITH RELAYS
250, 314, 211
OR 750



COMPLIES WITH REQUIREMENTS OF

- * IEC STANDARDS 947-4-1 AND 947-5-1 LOW VOLTAGE DIRECTIVE
- * IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION
- * CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

DESIGNED FOR PANEL OR DIN MOUNT.

GENERAL SPECIFICATIONS

Electrical Rating:

10 amps, 600 volts, 15 amps, 300 volts

Dielectric Strength:

2500 V rms between all electrical elements of opposite polarity.
2500 V rms between all elements to metal mounting plate

CONSTRUCTION

Contacts and Internal Metal Tracks:

Plated copper alloy

Screws and Clamping Plates:

Steel, yellow zinc plated

Screw Style and Size:

Combination head, M3 x .5 x 6.35

Screw and Clamping Plate Torque:

9 Inch - Lbs

Internal Metal Tracks,

Contacts and Screw Terminals:

One piece construction

MISCELLANEOUS

Hook-up Wire Range:

AWG #12 to #22 solid or stranded

Molded Material:

UL recognized break resistant electrical grade thermoplastic

Socket Mounting Torque:

8 to 10 Inch - Lbs

Body Color:

Gray

DIN Locking Clip Color:

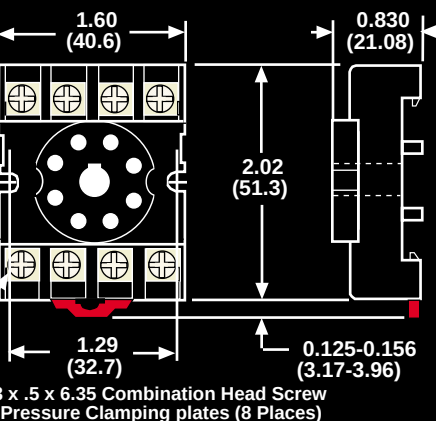
Red

Weight:

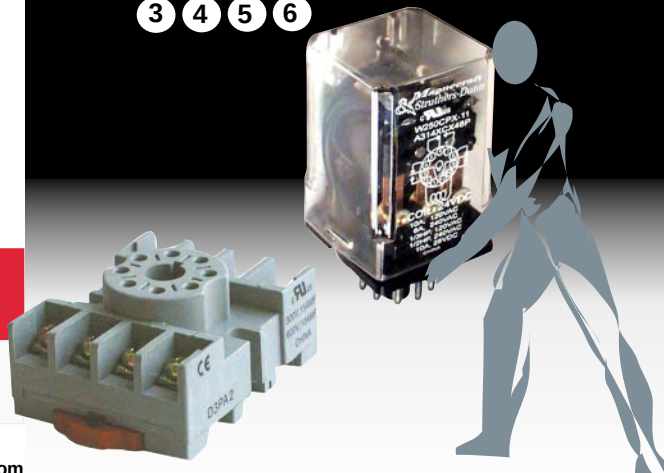
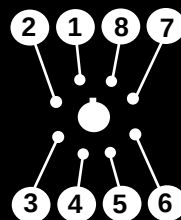
40 grams, approx.

70-464- ACCEPTS ALL STANDARD 8 PIN OCTAL PLUG RELAYS

STANDARD PART NUMBERS	DESCRIPTION
70 - 464 - 1	8 PIN OCTAL SOCKET, DIN / PANEL MOUNT, WITH SCREW TERMINALS & CLAMPING PLATES.



WIRING DIAGRAM TOP VIEW



FEATURES

COMPLETE ISOLATION OF ALL INTERNAL METAL TRACKS AND CONTACTS:

HEAVY DUTY 1 PIECE TRACK AND CONTACT SYSTEM:

STANDARD DIN RAIL MOUNTING:

BENEFITS

IDEAL FOR APPLICATIONS THAT REQUIRE UP TO 600 VOLTS.

ALLOWS FOR GREATER HEAT DISSIPATION AND LOWER CONTACT RESISTANCE AT THE RELAY TERMINALS.

FITS ALL STANDARD 35 MILLIMETER DIN TRACKS.

5 AMPS, 600 VOLTS

15 AMPS, 300 VOLTS

UL us

UL Recognized

File No. E70500

97899

CE

LISTED 367G

IND. CONT. EQ.

COMPLIES WITH REQUIREMENTS OF

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

* IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION

* CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

WHEN USED WITH RELAYS

250, 314, 211

OR 750

DESIGNED FOR PANEL OR DIN MOUNT.

GENERAL SPECIFICATIONS

Electrical Rating:	5 amps, 600 volts, 15 amps 300 volts
Dielectric Strength:	2000 V rms between all electrical elements of opposite polarity. 2000 V rms between all elements to metal mounting plate
CONSTRUCTION	
Contacts and internal metal tracks:	Plated copper alloy
Screws and clamping plates:	Steel, yellow zinc plated
Screw style and size:	Combination head, M3 x .5 x 6.35
Screw and clamping plate torque:	9 Inch - Lbs
Internal metal tracks, contacts and screw terminals:	One piece construction
MISCELLANEOUS	
Hook-up Wire Range:	AWG #12 to #22 solid or stranded
Molded Material:	UL recognized break resistant electrical grade thermoplastic
Socket Mounting Torque:	8 to 10 Inch - Lbs
Body Color:	Gray
DIN Locking Clip Color:	Red
Weight:	57 grams, approx.

70-465- ACCEPTS ALL STANDARD 11 PIN OCTAL PLUG RELAYS

STANDARD PART NUMBERS	DESCRIPTION
70 - 465 - 1	11 PIN OCTAL SOCKET, DIN / PANEL MOUNT, WITH SCREW TERMINALS & CLAMPING PLATES.

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

TOLERANCES : ± 0.010 (± 0.25)

UNLESS OTHERWISE SHOWN

M3 x .5 x 6.35 Combination Head Screw & Pressure Clamping plates (11 Places)

70 - 465 - 1

WIRING DIAGRAM

TOP VIEW

PHONE: (843) 393-5778 FAX: (843) 393-4123 EMAIL: info@magnecraft.com

8...8

FEATURES**BENEFITS****ISOLATED INPUTS AND OUTPUT TERMINALS:**

SEPARATES CONTROL CIRCUITS FROM LOAD CIRCUITS, PREVENTS MIS -WIRING AND POTENTIAL SHORTING BETWEEN CIRCUITS.

INTERNAL COIL BUSS JUMPER SYSTEM:

ALLOWS INPUTS TO COIL TO BE INTERNALLY CONNECTED TO ADJACENT SOCKETS OF THE SAME STYLE WITHOUT THE NEED FOR EXTERNAL WIRING BETWEEN SOCKETS.

MODULE COMPATIBLE:

ALLOWS FOR OPTIONAL PROTECTION OR L.E.D. MODULES TO BE USED WITH SOCKETS .

FINGER SAFE:

PREVENTS SHOCK TO OPERATORS BY KEEPING FINGERS AWAY FROM LIVE CIRCUITS.

36 MILLIMETERS WIDE:

IDEAL FOR SPACE SAVING, ALLOWS MORE SOCKETS TO BE INSTALLED ON DIN RAIL OR PANEL THAN OTHER CONVENTIONAL SOCKETS.

DESIGNED FOR PANEL OR DIN MOUNT.

GENERAL SPECIFICATIONS

Electrical Rating:	10 amps, 600 volts, 16 amps, 300 volts
Dielectric Strength:	2500 V rms between all electrical elements of opposite polarity. 2500 V rms between all elements to metal mounting plate

CONSTRUCTION

Contacts and internal metal tracks:	Plated copper alloy
Screws and Clamping Plates:	Steel, yellow zinc plated
Screw Style and Size:	Combination head, M3 x 0.5 x 6.35
Screw and Clamping Plate Torque:	8 Inch - Lbs
Internal Metal Tracks,	
Contacts and Screw Terminals:	One piece construction

MISCELLANEOUS

Hook-up Wire Range:	AWG #12 to #22 solid or stranded.
Molded Material:	UL recognized break resistant electrical grade thermoplastic
Socket Mounting Torque:	7 to 8 Inch - Lbs
Body Color:	Gray
DIN Locking Clip Color:	Red
Weight:	60 grams approx.

70-750D8- ACCEPTS ALL STANDARD 8 PIN OCTAL PLUG RELAYS

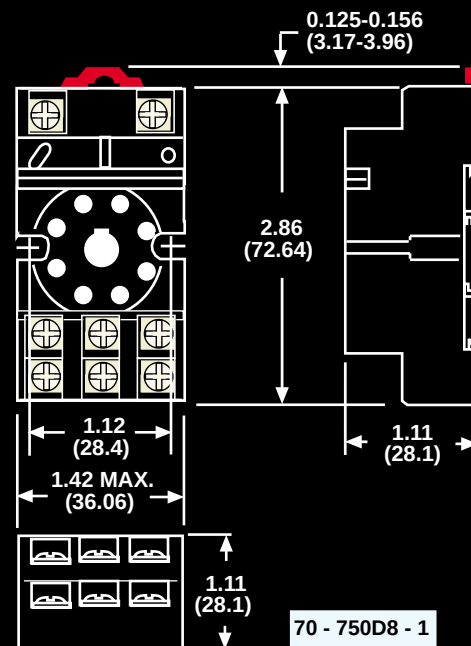
STANDARD PART NUMBERS	DESCRIPTION
70 - 750D8 - 1	8 PIN OCTAL FINGER SAFE SOCKET, DIN / PANEL MOUNT, WITH SCREW TERMINALS & CLAMPING PLATES.

NEW
From The Market
Leader in Industrial
Relays
AVAILABLE: Q-4-02

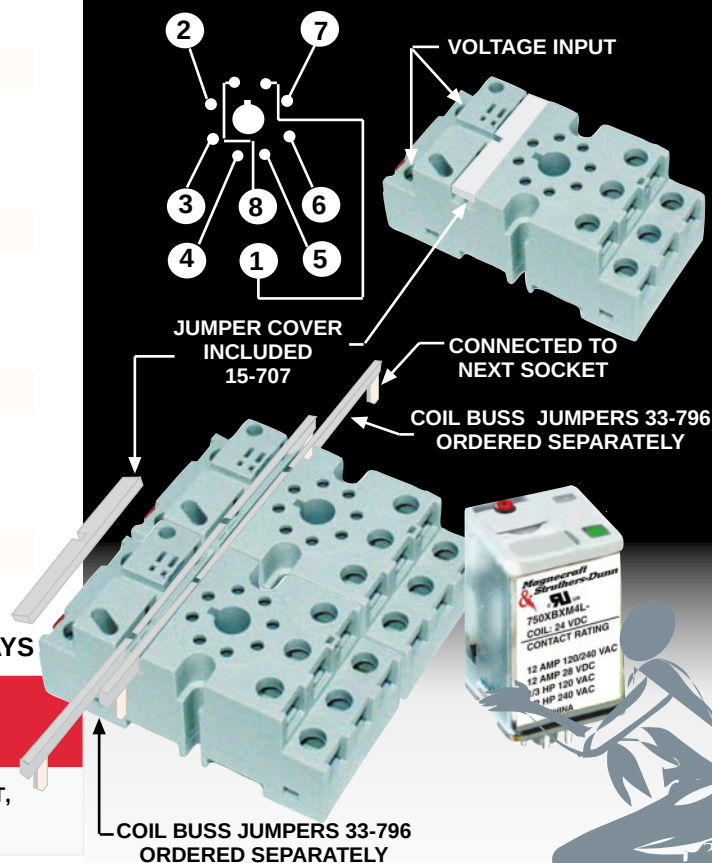
10 AMPS, 600 VOLTS
16 AMPS, 300 VOLTS

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).
TOLERANCES : ± 0.010 (± 0.25)
UNLESS OTHERWISE SHOWN



16-1332 HOLD DOWN CLIP ORDERED SEPARATELY

WIRING DIAGRAM**TOP VIEW**

FEATURES**ISOLATED INPUTS AND OUTPUT TERMINALS:**

SEPARATES CONTROL CIRCUITS FROM LOAD CIRCUITS, PREVENTS MIS-WIRING AND POTENTIAL SHORTING BETWEEN CIRCUITS.

INTERNAL COIL BUSS JUMPER SYSTEM:

ALLOWS INPUTS TO COIL TO BE INTERNALLY CONNECTED TO ADJACENT SOCKETS OF THE SAME STYLE WITHOUT THE NEED FOR EXTERNAL WIRING BETWEEN SOCKETS.

MODULE COMPATIBLE:

ALLOWS FOR OPTIONAL PROTECTION OR L.E.D. MODULES TO BE USED WITH SOCKETS.

FINGER SAFE:

PREVENTS SHOCK TO OPERATORS BY KEEPING FINGERS AWAY FROM LIVE CIRCUITS.

36 MILLIMETERS WIDE:

IDEAL FOR SPACE SAVING, ALLOWS MORE SOCKETS TO BE INSTALLED ON DIN RAIL OR PANEL THAN OTHER CONVENTIONAL SOCKETS.

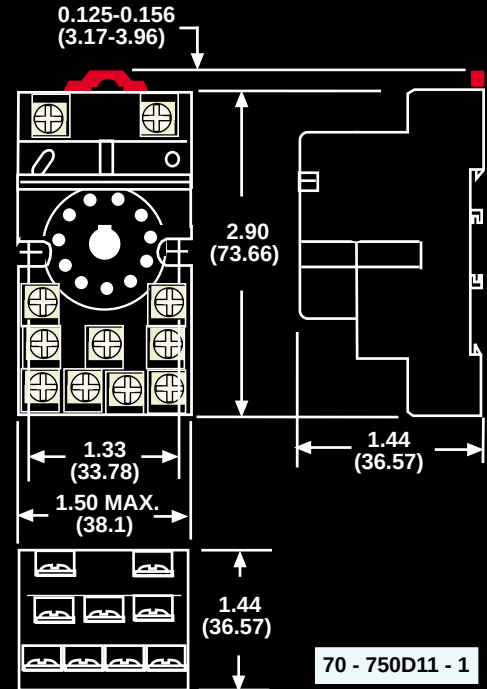
BENEFITS

NEW
From The Market
Leader in Industrial
Relays
AVAILABLE Q-1-03

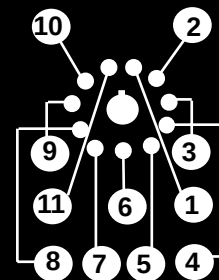
10 AMPS, 600 VOLTS
16 AMPS, 300 VOLTS

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).
TOLERANCES : ± 0.010 (± 0.25)
UNLESS OTHERWISE SHOWN



16-1332 HOLD DOWN CLIP ORDERED SEPARATELY

WIRING DIAGRAM
TOP VIEW

JUMPER COVER
INCLUDED 15-708

COIL BUSS JUMPERS
33-796 ORDERED
SEPARATELY

CONNECTED TO
NEXT SOCKET

COIL BUSS JUMPERS 33-796
ORDERED SEPARATELY

GENERAL SPECIFICATIONS

Electrical Rating:	5 amps, 600 volts, 16 amps, 300 volts
Dielectric Strength:	2500 V rms between all electrical elements of opposite polarity. 2500 V rms between all elements to metal mounting plate

CONSTRUCTION

Contacts and Internal Metal Tracks:	Plated copper alloy
Screws and Clamping Plates:	Steel, yellow zinc plated
Screw Style and Size:	Combination head, M3 x .5 x 6.35
Screw and Clamping Plate Torque:	8 Inch - Lbs
Internal Metal Tracks,	
Contacts and Screw Terminal:	One piece construction

MISCELLANEOUS

Hook-up Wire Range:	AWG #12 to #22 solid or stranded.
Molded Material:	UL recognized break resistant electrical grade thermoplastic
Socket Mounting Torque:	7 to 8 Inch - Lbs
Body Color:	Gray
DIN Locking Clip Color:	Red
Weight:	78 grams, approx.

70-750D11- ACCEPTS ALL STANDARD 11 PIN OCTAL PLUG RELAYS

STANDARD PART NUMBERS	DESCRIPTION
70 - 750D11 - 1	11 PIN OCTAL FINGER SAFE SOCKET, DIN / PANEL MOUNT, WITH SCREW TERMINALS & CLAMPING PLATES.

FEATURES**LOW PROFILE:**

IDEAL IN PANEL MOUNTING APPLICATION WHERE HEIGHT IS AT A PREMIUM.

HEAVY DUTY 1 PIECE TRACK AND CONTACT SYSTEM:

ALLOWS FOR GREATER HEAT DISSIPATION AND LOWER CONTACT RESISTANCE AT THE RELAY TERMINALS.

IMPROVED CONTACT DESIGN:

ALLOWS FOR MORE AREA OF CONTACT ON RELAY TERMINALS, RESULTING IN LOWER CONTACT RESISTANCE AT RELAY TERMINALS.

BENEFITS**15 AMPS, 300 VOLTS**

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UL Recognized
File No. E70500

CE 97899

CE

COMPLIES WITH REQUIREMENTS OF

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

* IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION

* CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

DESIGNED FOR PANEL OR DIN MOUNT.**GENERAL SPECIFICATIONS**

Electrical Rating:
Dielectric Strength:

15 amps, 300 volts
2000 V rms between all electrical elements of opposite polarity.
2000 V rms between all elements to metal mounting plate

CONSTRUCTION

Contacts and Internal Metal Tracks:
Screws and Clamping Plates:
Screw Style and Size:
Screw and Clamping Plate Torque:
Internal Metal Tracks,
Contacts and Screw Terminal:

Brass,nickel plated
Steel, yellow zinc plated
Combination head, M3 x 0.5 x 6.35
9 Inch - Lbs
One piece construction

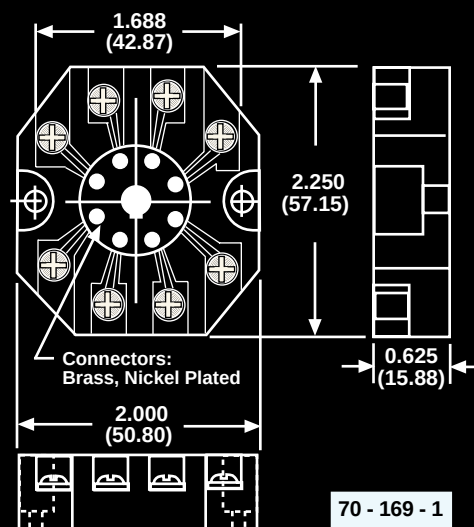
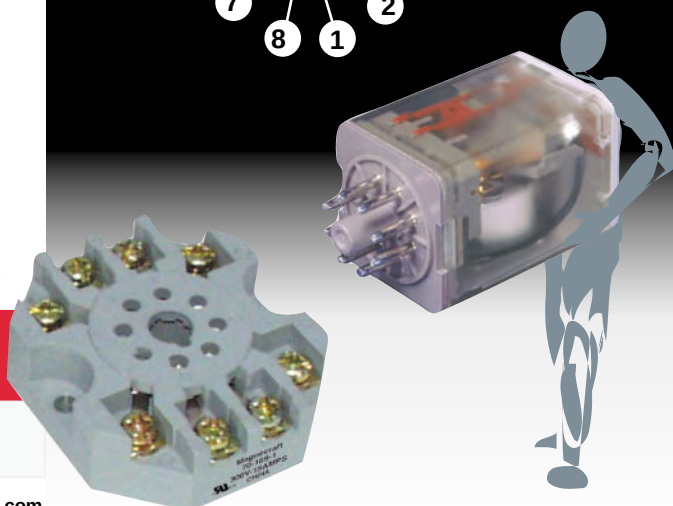
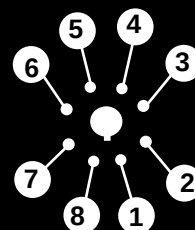
MISCELLANEOUS

Hook-up Wire Range:
Molded Material:

AWG #12 to #22 solid or stranded.
UL recognized break resistant electrical grade thermoplastic
8 to 10 Inch - Lbs
Gray
Panel
40 grams approx.

Socket Mounting Torque:
Body Color:
Mounting:
Weight:

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).
TOLERANCES : ± 0.010 (± 0.25)
UNLESS OTHERWISE SHOWN

**WIRING DIAGRAM**
TOP VIEW**70-169- ACCEPTS ALL STANDARD 8 PIN OCTAL PLUG RELAYS**

STANDARD PART NUMBERS	DESCRIPTION
70 - 169 - 1	8 PIN OCTAL SOCKET, PANEL MOUNT, WITH SCREW TERMINALS & CLAMPING PLATES.

FEATURES

LOW PROFILE:

IDEAL IN PANEL MOUNTING APPLICATION WHERE HEIGHT IS AT A PREMIUM.

HEAVY DUTY 1 PIECE TRACK AND CONTACT SYSTEM:

ALLOWS FOR GREATER HEAT DISSIPATION AND LOWER CONTACT RESISTANCE AT THE RELAY TERMINALS.

IMPROVED CONTACT DESIGN:

ALLOWS FOR MORE AREA OF CONTACT ON RELAY TERMINALS, RESULTING IN LOWER CONTACT RESISTANCE AT RELAY TERMINALS.

BENEFITS

15 AMPS, 300VOLTS

UL **us**
UL Recognized
File No. E70500

97899

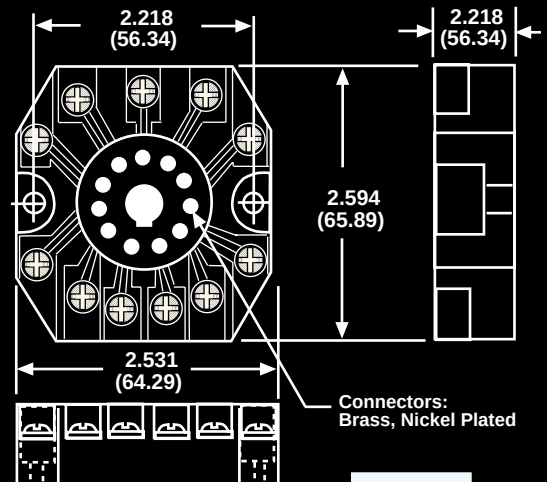


COMPLIES WITH REQUIREMENTS OF

- * IEC STANDARDS 947-4-1 AND 947-5-1 LOW VOLTAGE DIRECTIVE
- * IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION
- * CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).
TOLERANCES : ± 0.010 (± 0.25)
UNLESS OTHERWISE SHOWN



70 - 170 - 1

DESIGNED FOR PANEL OR DIN MOUNT.

GENERAL SPECIFICATIONS

Electrical Rating:	15 amps, 300 volts
Dielectric Strength:	2000 V rms between all electrical elements of opposite polarity. 2000 V rms between all elements to metal mounting plate

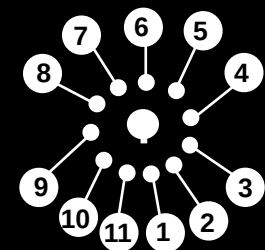
CONSTRUCTION

Contacts and Internal Metal Tracks:	Brass,nickel plated
Screws and Clamping Plates:	Steel, yellow zinc plated
Screw Style and Size:	Combination head, M3 x 0.5 x 6.35
Screw and Clamping Plate Torque:	9 Inch - Lbs
Internal Metal Tracks,	
Contacts and Screw Terminal:	One piece construction

MISCELLANEOUS

Hook-up Wire Range:	AWG #12 to #22 solid or stranded
Molded Material:	UL recognized break resistant electrical grade thermoplastic
Socket Mounting Torque:	8 to 10 Inch - Lbs
Body Color:	Gray
Mounting:	Panel
Weight:	70 grams approx

WIRING DIAGRAM TOP VIEW



70-170- ACCEPTS ALL STANDARD 11 PIN OCTAL PLUG RELAYS

STANDARD PART NUMBERS	DESCRIPTION
70 - 170 - 1	11 PIN OCTAL SOCKET, PANEL MOUNT, WITH SCREW TERMINALS & CLAMPING PLATES.

FEATURES

BENEFITS

HEAVY DUTY 1 PIECE
TRACK AND CONTACT
SYSTEM:

ALLOWS FOR GREATER HEAT DISSIPATION AND LOWER CONTACT RESISTANCE AT THE RELAY TERMINALS.

IMPROVED CONTACT
DESIGN:

ALLOWS FOR MORE AREA OF CONTACT ON RELAY TERMINALS, RESULTING IN LOWER CONTACT RESISTANCE AT RELAY TERMINALS.

STANDARD DIN RAIL
MOUNTING:

FITS ALL STANDARD 35 MILLIMETER DIN TRACKS.

DESIGNED FOR PANEL OR DIN MOUNT.

GENERAL SPECIFICATIONS

Electrical Rating:	10 amps, 300 volts
Dielectric Strength:	2000 V rms between all electrical elements of opposite polarity. 2000 V rms between all elements to metal mounting plate

CONSTRUCTION

Contacts and Internal Metal Tracks:	Plated copper alloy
Screws and Clamping Plates:	Steel, yellow zinc plated
Screw Style and Size:	Combination head, M3 x .5 x 6.35
Screw and Clamping Plate Torque:	8 Inch - Lbs
Internal Metal Tracks,	
Contacts and Screw Terminals:	One piece construction

MISCELLANEOUS

Hook-up Wire Range:	AWG #12 to #22 solid or stranded
Molded Material:	UL recognized break resistant electrical grade thermoplastic
Socket Mounting Torque:	7 to 8 Inch - Lbs
Body Color:	Gray
DIN Locking Clip Color:	Red
Weight:	49.8 grams approx.

STANDARD
PART
NUMBERS

70 - 459 - 1

DESCRIPTION

8 PIN SOCKET, DIN / PANEL MOUNT,
WITH SCREW TERMINALS & CLAMPING PLATES.

10 AMPS, 300 VOLTS

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UL Recognized
File No. E70500

97899

CE

UL LISTED 367G
IND. CONT. EQ.
C US
WHEN USED
WITH RELAYS
78 OR 782

COMPLIES WITH REQUIREMENTS OF

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

* IEC = INTERNATIONAL
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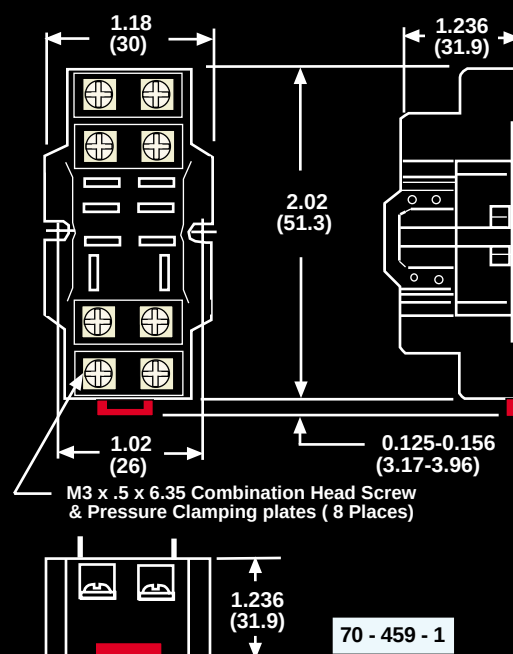
* CE TESTING AND EVALUATION
PERFORMED BY THE UNDERWRITERS
LABORATORIES AS A THIRD PARTY
PARTICIPANT

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

TOLERANCES : ± 0.010 (± 0.25)

UNLESS OTHERWISE SHOWN



16-1197 HOLD DOWN CLIP ORDERED SEPARATELY

WIRING DIAGRAM

TOP VIEW



FEATURES**HEAVY DUTY 1 PIECE TRACK AND CONTACT SYSTEM:**

ALLOWS FOR GREATER HEAT DISSIPATION AND LOWER CONTACT RESISTANCE AT THE RELAY TERMINALS.

IMPROVED CONTACT DESIGN:

ALLOWS FOR MORE AREA OF CONTACT ON RELAY TERMINALS, RESULTING IN LOWER CONTACT RESISTANCE AT RELAY TERMINALS.

STANDARD DIN RAIL MOUNTING:

FITS ALL STANDARD 35 MILLIMETER DIN TRACKS.

BENEFITS

DESIGNED FOR PANEL OR DIN MOUNT.
MEETS CLASS 1 DIVISION 2 APPROVAL WHEN USED WITH 782H RELAY AND 16-1341 HOLD DOWN SPRING.

GENERAL SPECIFICATIONS

Electrical Rating:	10 amps, 300 volts
Dielectric Strength:	1600 V rms between all electrical elements of opposite polarity. 1600 V rms between all elements to metal mounting plate

CONSTRUCTION

Contacts and Internal Metal Tracks:	Plated copper alloy
Screws and Clamping Plates:	Steel, yellow zinc plated
Screw Style and Size:	Combination head, M3 x .5 x 6.35
Screw and Clamping Plate Torque:	7 Inch - Lbs
Internal Metal Tracks,	
Contacts and Screw Terminals:	One piece construction

MISCELLANEOUS

Hook-up Wire Range:	AWG #14 to #22 solid or stranded
Molded Material:	UL recognized break resistant electrical grade thermoplastic
Socket Mounting Torque:	7 to 8 Inch - Lbs
Body Color:	Gray
DIN Locking clip color:	Red
Weight:	42 grams approx.

STANDARD PART NUMBERS**DESCRIPTION****70 - 461 - 1**

14 PIN SOCKET, DIN / PANEL MOUNT, WITH SCREW TERMINALS & CLAMPING PLATES.

10 AMPS, 300 VOLTS

UL **us**
 UL Recognized
 File No. E70500

97899

UL **us**
 LISTED 367G
 IND. CONT. EQ.

us
 WHEN USED
 WITH RELAYS
 78 OR 782

CE
 COMPLIES WITH REQUIREMENTS OF

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

* IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION

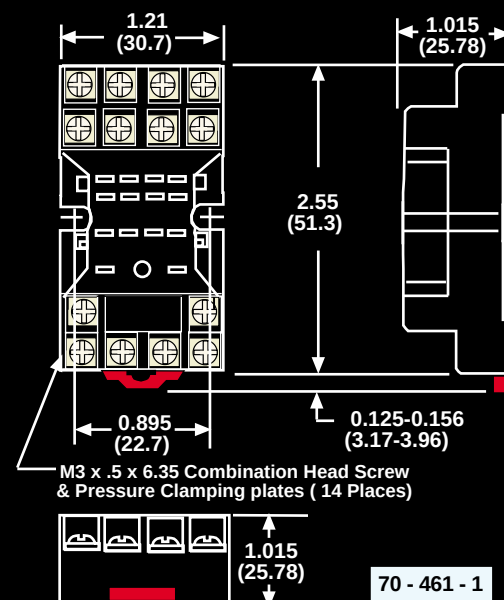
* CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

OUTLINE DIMENSIONS

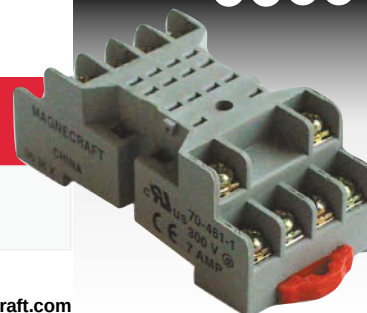
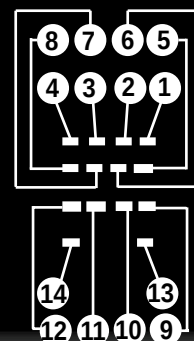
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

TOLERANCES : ± 0.010 (± 0.25)

UNLESS OTHERWISE SHOWN

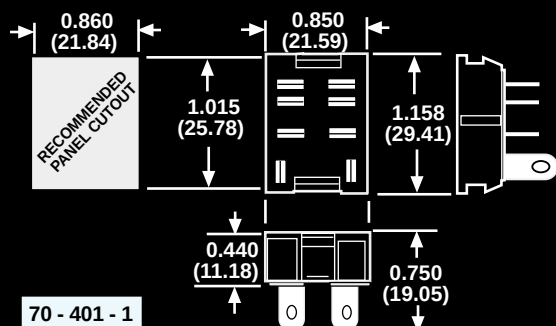


16-1197 HOLD DOWN CLIP ORDERED SEPARATELY
 16-1341 UNIVERSAL HOLD DOWN CLIP FITS RELAY HEIGHTS FROM 1.27 " TO 1.53". ORDERED SEPARATELY

WIRING DIAGRAM**TOP VIEW**

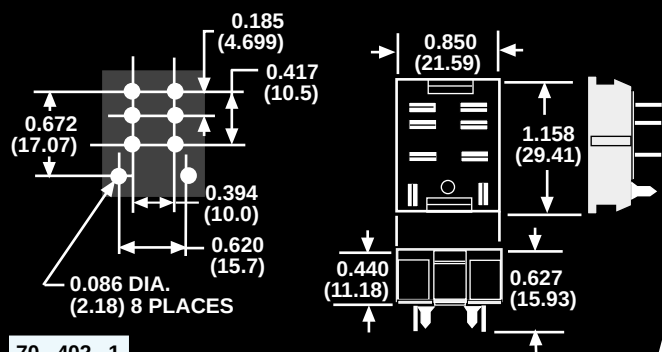
OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).
TOLERANCES : ± 0.010 (± 0.25)
UNLESS OTHERWISE SHOWN

**70 - 401 - 1**

16 -1197 EAST-WEST HOLD DOWN CLIP ORDERED SEPARATELY.
16 -1324 NORTH- SOUTH HOLD DOWN CLIP ORDERED SEPARATELY.

**RECOMMENDED
PRINTED CIRCUIT LAYOUT**
VIEWED FROM COMPONENT SIDE

**70 - 402 - 1**

16 -1197 EAST-WEST HOLD DOWN CLIP ORDERED SEPARATELY.
16 -1324 NORTH- SOUTH HOLD DOWN CLIP ORDERED SEPARATELY.

GENERAL SPECIFICATIONS

Electrical Rating: 10 amps, 300 volts for 1 & 2 pole,
5 amps, 300 volts for 4 pole
Dielectric Strength: 1500 V rms between all electrical elements
of opposite polarity. 1500 V rms between all
elements to metal mounting plate

CONSTRUCTION

Contacts: Plated copper alloy

MISCELLANEOUS

Hook-up Wire: Up to A.W.G. #17 solid or stranded
Molded Material: UL recognized break resistant
electrical grade thermoplastic
Body Color: Gray
Weight: 6.2 grams for 70-378- solder terminals
5.9 grams for 70-379- printed circuit terminals
6.5 grams for 70-401- solder terminals
5.8 grams for 70-402- printed circuit terminals

STANDARD PART NUMBERS	DESCRIPTION
70 - 401 - 1	8 PIN SOLDER TERMINALS
70 - 402 - 1	8 PIN PRINTED CIRCUIT TERMINALS
70 - 378 - 1	14 PIN SOLDER TERMINALS
70 - 379 - 1	14 PIN PRINTED CIRCUIT TERMINALS

DESIGNED FOR PANEL
OR PRINTED CIRCUIT

10 AMPS, 300 VOLTS
5 AMPS, 300 VOLTS

UL **us**
UL Recognized
File No. E70500

97899

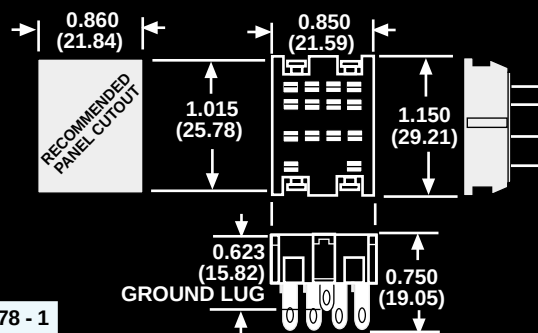


COMPLIES WITH REQUIREMENTS OF

- * IEC STANDARDS 947-4-1 AND 947-5-1 LOW VOLTAGE DIRECTIVE
- * IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION
- * CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

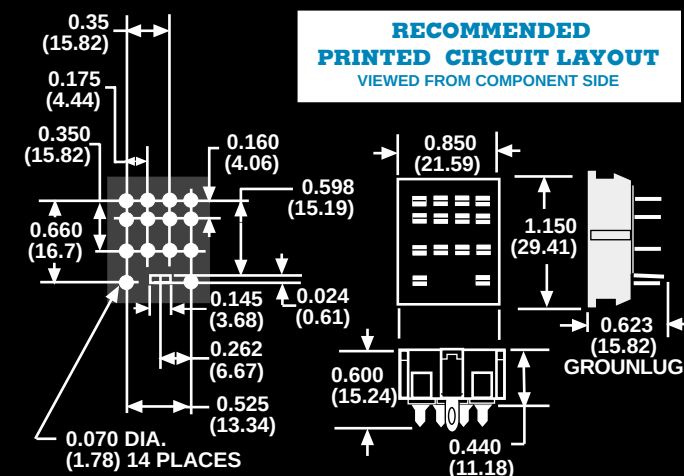
OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).
TOLERANCES : ± 0.010 (± 0.25)
UNLESS OTHERWISE SHOWN

**70 - 378 - 1**

16 -1197 EAST-WEST HOLD DOWN CLIP ORDERED SEPARATELY.
16 -1324 NORTH- SOUTH HOLD DOWN CLIP ORDERED SEPARATELY.

**RECOMMENDED
PRINTED CIRCUIT LAYOUT**
VIEWED FROM COMPONENT SIDE

**70 - 379 - 1**

16 -1197 EAST-WEST HOLD DOWN CLIP ORDERED SEPARATELY.
16 -1324 NORTH- SOUTH HOLD DOWN CLIP ORDERED SEPARATELY.

FEATURES

HEAVY DUTY 1 PIECE TRACK AND CONTACT SYSTEM:

ALLOWS FOR GREATER HEAT DISSIPATION AND LOWER CONTACT RESISTANCE AT THE RELAY TERMINALS.

STANDARD DIN RAIL MOUNTING:

FITS ALL STANDARD 35 MILLIMETER DIN TRACKS.

BENEFITS

DESIGNED FOR PANEL OR DIN MOUNT.

GENERAL SPECIFICATIONS

Electrical Rating:	15 amps, 300 volts
Dielectric Strength:	2000 V rms between all electrical elements of opposite polarity 2000 V rms between all elements to metal mounting plate

CONSTRUCTION

Contacts and Internal Metal Tracks:	Plated copper alloy
Screws and Clamping Plates:	Steel, yellow zinc plated
Screw Style and Size:	Combination head, M3 x 0.5 x 6.35
Screw and Clamping Plate Torque:	9 Inch - Lbs
Internal Metal Tracks, Contacts and Screw Terminal:	One piece construction

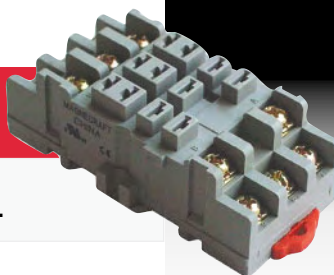
MISCELLANEOUS

Hook-up Wire Range:	AWG #12 to #22 solid or stranded.
Molded Material:	UL recognized break resistant electrical grade thermoplastic
Socket Mounting Torque:	8 to 10 Inch - Lbs.
Body Color:	Gray
DIN Locking Clip Color:	Red
Weight:	50.6 grams approx.

STANDARD PART NUMBERS

DESCRIPTION

70 - 463 - 1	11 PIN SOCKET, DIN/PANEL MOUNT, WITH SCREW TERMINALS & CLAMPING PLATES.
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15 AMPS 300 VOLTS

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UL Recognized
File No. E70500

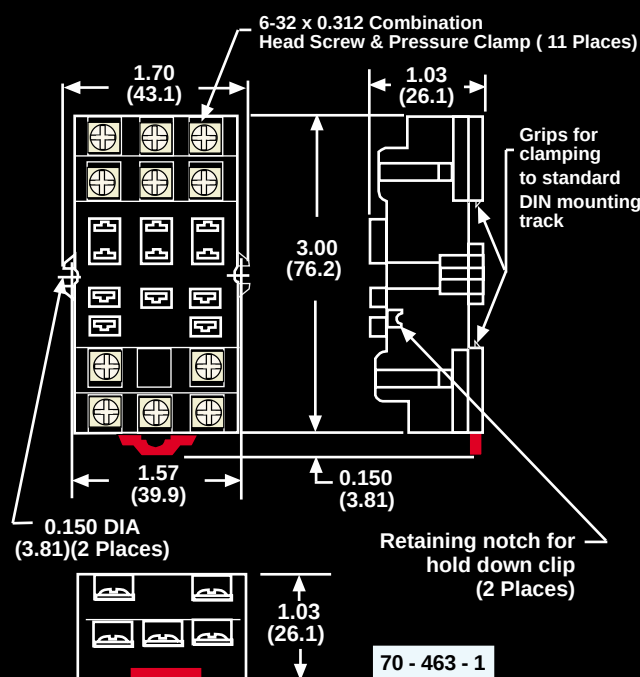
97899

UL LISTED 367G
IND. CONT. EQ.
C US
WHEN USED
WITH RELAYS
388 OR 788

CE
COMPLIES WITH REQUIREMENTS OF
* IEC STANDARDS 947-4-1 AND 947-5-1 LOW VOLTAGE DIRECTIVE
* IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION
* CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

OUTLINE DIMENSIONS

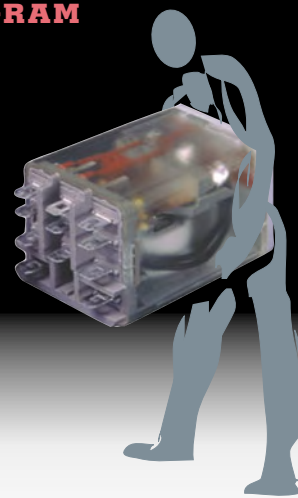
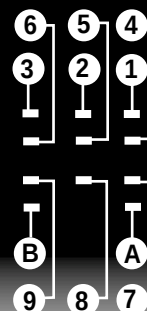
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).
TOLERANCES : ± 0.010 (± 0.25)
UNLESS OTHERWISE SHOWN



- 16-1278 HOLD DOWN CLIP FITS 388 / A283 RELAYS
- 16-1325 HOLD DOWN CLIP FITS 788 RELAYS
- 16-1340 UNIVERSAL HOLD DOWN CLIP FITS RELAY HEIGHTS FROM 1.90 " TO 2.15"
- 16-1239 HOLD DOWN CLIP FITS 388 TDR LONG BODY RELAYS
HOLD DOWN CLIPS ORDERED SEPARATELY

WIRING DIAGRAM

TOP VIEW



OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

TOLERANCES : ± 0.010 (± 0.25)

UNLESS OTHERWISE SHOWN

RECOMMENDED
CHASSIS CUTOUT

BOTTOM VIEW

15 AMPS, 300 VOLTS

cULus

UL Recognized
File No. E70500

97899



COMPLIES WITH REQUIREMENTS OF

* IEC STANDARDS 947-4-1 AND
947-5-1 LOW VOLTAGE DIRECTIVE* IEC = INTERNATIONAL
ELECTROTECHNICAL COMMISSION* CE TESTING AND EVALUATION
PERFORMED BY THE UNDERWRITERS
LABORATORIES AS A THIRD PARTY
PARTICIPANT

- 16-1278 HOLD DOWN CLIP FITS 388 / A283 RELAYS
 16-1325 HOLD DOWN CLIP FITS 788 RELAYS
 16-1340 UNIVERSAL HOLD DOWN CLIP FITS RELAY
 HEIGHTS FROM 1.90 "TO 2.15"
 16-1239 HOLD DOWN CLIP FITS 388
 TDR LONG BODY RELAYS
 16-722-2 HOLD DOWN CLIP SAME AS 16-1278 EXCEPT
 MOUNTS TO SOCKET TABS WITH SCREWS .
HOLD DOWN CLIPS ORDERED SEPARATELY

70 - 124 - 1
 0.130 Solder
 terminals with
 mounting tabs

70 - 124 - 2
 0.187 (3/16")
 quick connect
 terminals with
 mounting tabs

70 - 178 - 1
 Printed circuit
 terminals with
 mounting tabs

DESIGNED FOR PANEL
 OR PRINTED CIRCUIT

GENERAL SPECIFICATIONS

Electrical Rating:	15 amps, 300 volts
Dielectric Strength:	2500 V rms between all electrical elements of opposite polarity. 2500 V rms between all elements to metal mounting plate

CONSTRUCTION

Contacts:	Brass tin plated
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MISCELLANEOUS

Hook-up Wire:	Up to A.W.G. #16 solid or stranded.
Molded Material:	UL recognized break resistant electrical grade thermoplastic.
Body Color:	Gray
Weight:	12.1 grams for 70-124-1 & 70-124-2 9.4 grams for 70-178-1 & 70-178-2

STANDARD PART NUMBERS	DESCRIPTION
70 - 124 - 1	11 PIN 0.130 SOLDER TERMINALS WITH MOUNTING TABS
70 - 124 - 2	11 PIN 3/16" (0.187) QUICK CONNECT TERMINALS WITH MOUNTING TABS
70 - 178 - 1	11 PIN PRINTED CIRCUIT TERMINALS WITH MOUNTING TABS
70 - 178 - 2	11 PIN PRINTED CIRCUIT TERMINALS WITHOUT MOUNTING TABS

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

TOLERANCES : ± 0.010 (± 0.25)

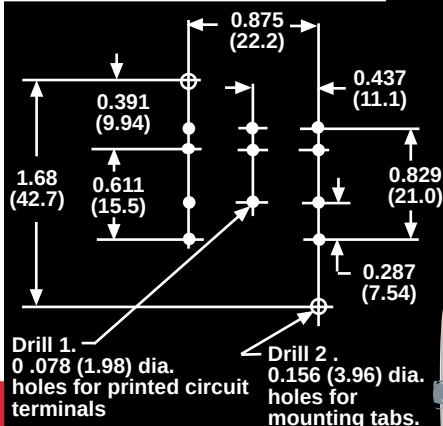
UNLESS OTHERWISE SHOWN

70 - 178 - 2

Printed circuit
 terminals without
 mounting tabs

RECOMMENDED
PRINTED CIRCUIT LAYOUT

VIEWED FROM COMPONENT SIDE



15 AMPS, 300 VOLTS

UL **us**
UL Recognized
File No. E70500

97899

CE

COMPLIES WITH REQUIREMENTS OF

- * IEC STANDARDS 947-4-1 AND 947-5-1 LOW VOLTAGE DIRECTIVE
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- * CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

NEW
From The Market
Leader in Industrial
Relays

FEATURES**HEAVY DUTY 1 PIECE TRACK AND CONTACT SYSTEM:**

ALLOWS FOR GREATER HEAT DISSIPATION AND LOWER CONTACT RESISTANCE AT THE RELAY TERMINALS.

IMPROVED CONTACT DESIGN:

ALLOWS FOR MORE AREA OF CONTACT ON RELAY TERMINALS, RESULTING IN LOWER CONTACT RESISTANCE AT RELAY TERMINALS.

FINGER SAFE:

PREVENTS SHOCK TO OPERATORS BY KEEPING FINGERS AWAY FROM LIVE CIRCUITS.

PLASTIC HOLD DOWN CLIP AND I.D TAG SYSTEM:

ALLOWS FOR QUICK LOCKING OF RELAY IN TO SOCKETS AND REMAINS WITH SOCKET IF RELAY IS REMOVED. I.D. TAG IS IDEAL FOR CIRCUIT OR RELAY IDENTIFICATION.

STANDARD DIN RAIL MOUNTING:

FITS ALL STANDARD 35 MILLIMETER DIN TRACKS.

BENEFITS

DESIGNED FOR PANEL OR DIN MOUNT.

HOLD DOWN CLIP IS INCLUDED

GENERAL SPECIFICATIONS

Electrical Rating:	15 amps, 300 VAC
Dielectric Strength:	2500 V rms between all electrical elements of opposite polarity. 2500 V rms between all elements to metal mounting plate

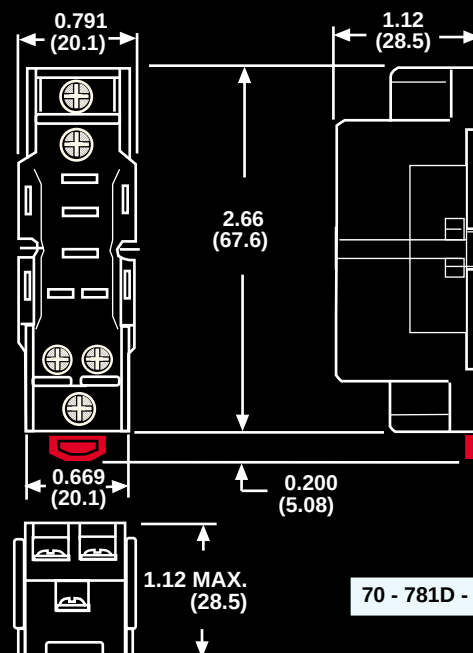
CONSTRUCTION

Contacts and Internal Metal Tracks:	Plated copper alloy
Screws and Clamping Plates:	Steel, yellow zinc plated
Screw Style and Size:	Combination head, M3 x .5 x 6.35
Screw and Clamping Plate Torque:	8 Inch - Lbs
Internal Metal Tracks,	
Contacts and Screw Terminal:	One piece construction

MISCELLANEOUS

Hook-up Wire Range:	AWG #12 to #22 solid or stranded
Molded Material:	UL recognized break resistant electrical grade thermoplastic
Socket Mounting Torque:	7 to 8 Inch - Lbs
Body Color:	Gray
DIN Locking Clip Color:	Red
Weight:	32 grams, approx.

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).
TOLERANCES : ± 0.010 (± 0.25)
UNLESS OTHERWISE SHOWN

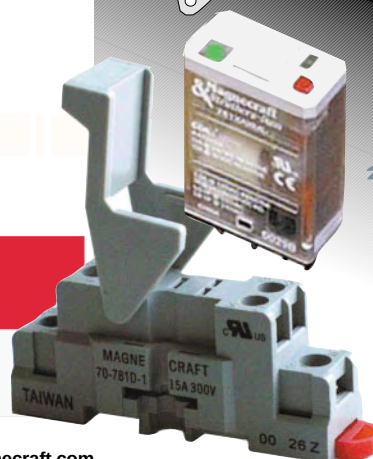
**70 - 781D - 1****WIRING DIAGRAM**

TOP VIEW



HOLD DOWN CLIP

16-1327 HOLD DOWN CLIP INCLUDED

**STANDARD PART NUMBERS****DESCRIPTION****70 - 781D -1**

5 PIN SOCKET, FINGER SAFE, DIN / PANELMOUNT WITH SCREW TERMINALS & CLAMPING PLATES.

15 AMPS, 300 VOLTS

cULus
UL Recognized
File No. E70500

SR 97899

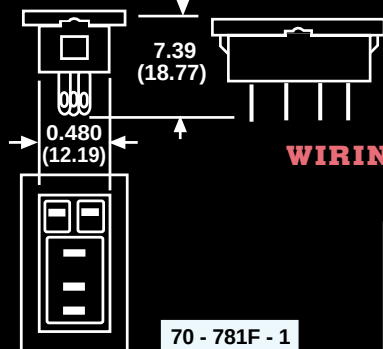
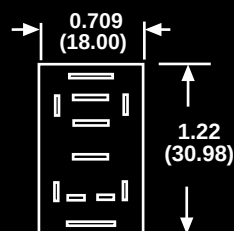


COMPLIES WITH REQUIREMENTS OF

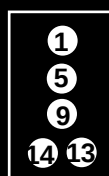
- * IEC STANDARDS 947-4-1 AND 947-5-1 LOW VOLTAGE DIRECTIVE
- * IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION
- * CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT



OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).
TOLERANCES : ± 0.010 (± 0.25)
UNLESS OTHERWISE SHOWN



WIRING DIAGRAM
TOP VIEW



70 - 781F - 1

16-1326 HOLD DOWN CLIP ORDERED SEPARATELY

NEW
From The Market
Leader in Industrial
Relays

DESIGNED FOR PANEL OR PRINTED CIRCUIT.

GENERAL SPECIFICATIONS

Electrical Rating: 15 amps, 300 VAC
Dielectric Strength: 2500 V rms between all electrical elements of opposite polarity 2500 V rms between all elements to metal mounting plate

CONSTRUCTION

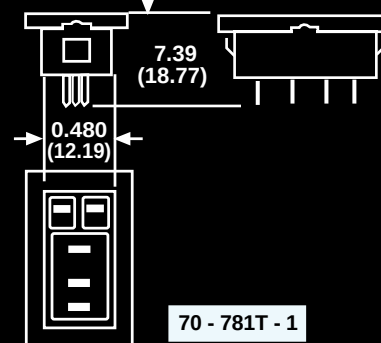
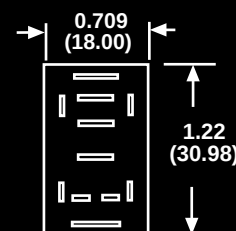
Contacts: Plated copper alloy

MISCELLANEOUS

Hook-up Wire Range: AWG #14 to #22 solid or stranded
Molded Material: UL recognized break resistant electrical grade thermoplastic
Body Color: Gray
Weight: 6 grams, approx.

STANDARD PART NUMBERS	DESCRIPTION
70 - 781F -1	5 PIN, SOLDER TERMINALS, FOR PANEL MOUNT
70 - 781T -1	5 PIN, PRINTED CIRCUIT TERMINALS

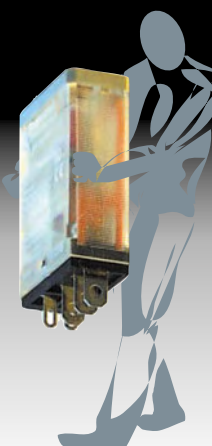
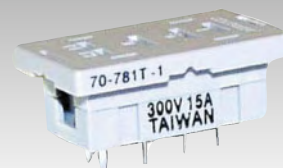
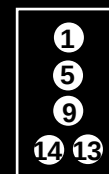
OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).
TOLERANCES : ± 0.010 (± 0.25)
UNLESS OTHERWISE SHOWN



70 - 781T - 1

16-1326 HOLD DOWN CLIP ORDERED SEPARATELY

WIRING DIAGRAM
TOP VIEW



FEATURES**HEAVY DUTY 1 PIECE TRACK AND CONTACT SYSTEM:**

ALLOWS FOR GREATER HEAT DISSIPATION AND LOWER CONTACT RESISTANCE AT THE RELAY TERMINALS.

IMPROVED CONTACT DESIGN:

ALLOWS FOR MORE AREA OF CONTACT ON RELAY TERMINALS, RESULTING IN LOWER CONTACT RESISTANCE AT RELAY TERMINALS.

FINGER SAFE:

PREVENTS SHOCK TO OPERATORS BY KEEPING FINGERS AWAY FROM LIVE CIRCUITS.

MODULE COMPATIBLE:

ALLOWS FOR OPTIONAL PROTECTION OR L.E.D. MODULES TO BE USED WITH SOCKET.

TWO WAY PANEL MOUNTING:

RETROFITS BOTH IDEC AND OMRON MOUNTING . IDEAL REPLACEMENT FOR EXISTING SOCKETS.

PLASTIC HOLD DOWN CLIP AND I.D TAG SYSTEM:

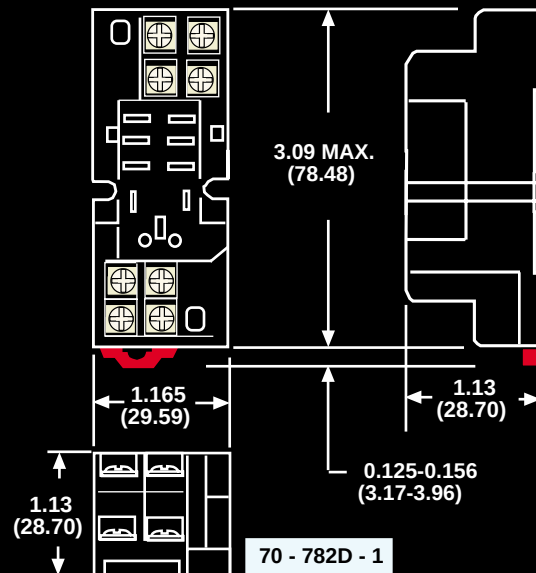
ALLOWS FOR QUICK LOCKING OF RELAY INTO SOCKETS AND REMAINS WITH SOCKET IF RELAY IS REMOVED. I.D. TAG IS IDEAL FOR CIRCUIT OR RELAY IDENTIFICATION.

BENEFITS**16 AMPS, 300 VOLTS**

NEW
From The Market
Leader in Industrial
Relays
AVAILABLE: Q-4-02

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).
TOLERANCES : ± 0.010 (± 0.25)
UNLESS OTHERWISE SHOWN

**DESIGNED FOR PANEL OR DIN MOUNT.****HOLD DOWN CLIP IS INCLUDED****GENERAL SPECIFICATIONS**

Electrical Rating:

16 amps, 300 volts

Dielectric Strength:

2000 V rms between all electrical elements of opposite polarity
2000 V rms between all elements to metal mounting plate

CONSTRUCTION

Contacts and Internal Metal Tracks:

Plated copper alloy

Screws and Clamping Plates:

Steel, yellow zinc plated

Screw Style and Size:

Combination head, M3 x 0.5 x 6.35

Screw and Clamping Plate Torque:

8 Inch - Lbs

Internal Metal Tracks,

One piece construction

Contacts and Screw Terminal:

MISCELLANEOUS

Hook-up Wire Range:

AWG #12 to #22 solid or stranded

Molded Material:

UL recognized break resistant electrical grade thermoplastic

Socket Mounting Torque:

7 to 8 Inch - Lbs

Body Color:

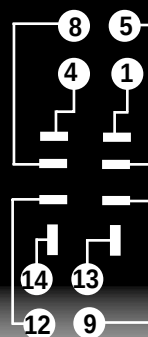
Gray

DIN Locking clip color:

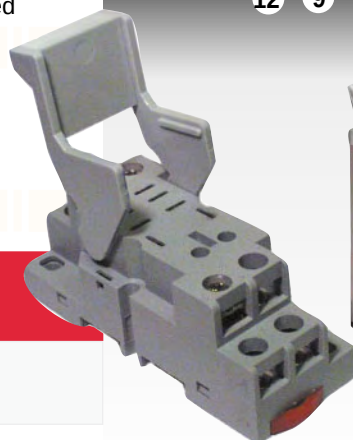
Red

Weight:

55 grams approx.

WIRING DIAGRAM**TOP VIEW**

16-1349 HOLD DOWN CLIP INCLUDED

**STANDARD PART NUMBERS****DESCRIPTION**

70 - 782D - 1

8 PIN SOCKET, DIN / PANEL MOUNT,
WITH SCREW TERMINALS & CLAMPING PLATES.

FEATURES**BENEFITS****HEAVY DUTY 1 PIECE TRACK AND CONTACT SYSTEM:**

ALLOWS FOR GREATER HEAT DISSIPATION AND LOWER CONTACT RESISTANCE AT THE RELAY TERMINALS.

IMPROVED CONTACT DESIGN:

ALLOWS FOR MORE AREA OF CONTACT ON RELAY TERMINALS, RESULTING IN LOWER CONTACT RESISTANCE AT RELAY TERMINALS.

FINGER SAFE:

PREVENTS SHOCK TO OPERATORS BY KEEPING FINGERS AWAY FROM LIVE CIRCUITS.

MODULE COMPATIBLE:

ALLOWS FOR OPTIONAL PROTECTION OR L.E.D. MODULES TO BE USED WITH SOCKETS .

TWO WAY PANEL MOUNTING:

RETROFITS BOTH IDEC AND OMRON MOUNTING. IDEAL REPLACEMENT FOR EXISTING SOCKET.

PLASTIC HOLD DOWN CLIP AND I.D TAG SYSTEM:

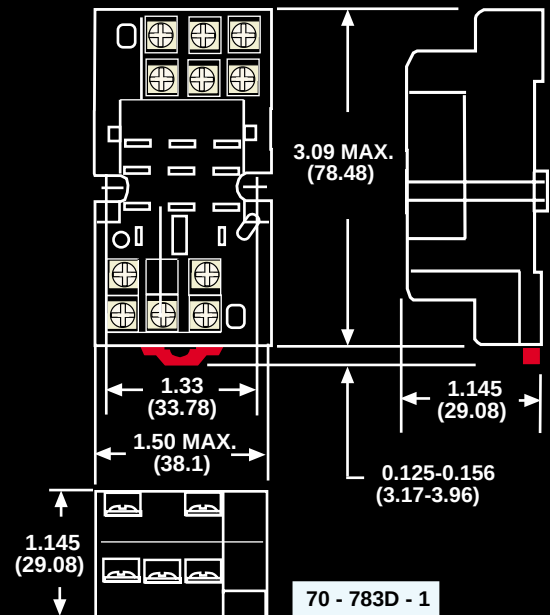
ALLOWS FOR QUICK LOCKING OF RELAY INTO SOCKETS AND REMAINS WITH SOCKET IF RELAY IS REMOVED I.D. TAG IS IDEAL FOR CIRCUIT OR RELAY IDENTIFICATION.

16 AMPS, 300 VOLTS

NEW
From The Market
Leader in Industrial
Relays
AVAILABLE: Q-4-02

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).
TOLERANCES : ± 0.010 (± 0.25)
UNLESS OTHERWISE SHOWN



DESIGNED FOR PANEL OR DIN MOUNT.
HOLD DOWN CLIP IS INCLUDED

GENERAL SPECIFICATIONS

Electrical Rating:	16 amps, 300 volts
Dielectric Strength:	2000 V rms between all electrical elements of opposite polarity 2000 V rms between all elements to metal mounting plate

CONSTRUCTION

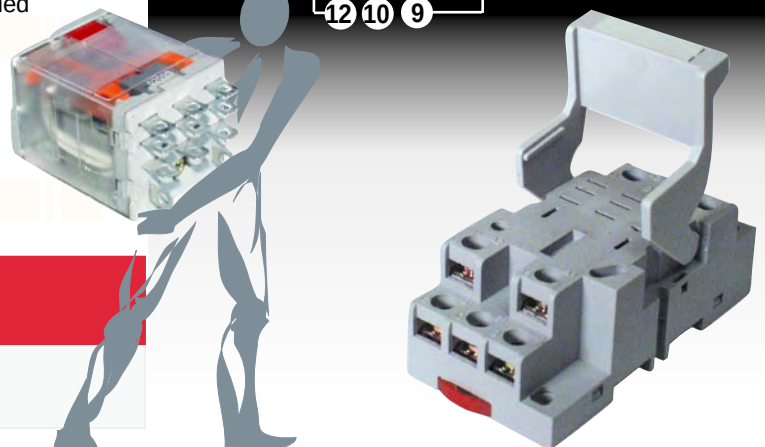
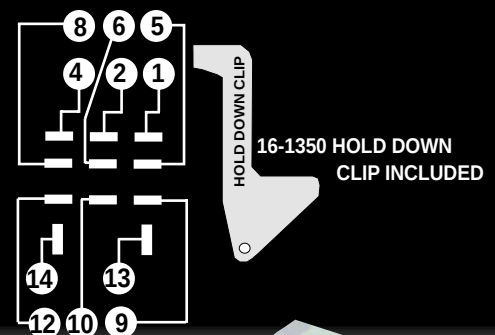
Contacts and internal metal tracks:	Plated copper alloy
Screws and clamping plates:	Steel, yellow zinc plated
Screw style and size:	Combination head, M3 x .5 x 6.35
Screw and clamping plate torque:	8 Inch Lbs
Internal metal tracks, contacts and screw terminal:	One piece construction

MISCELLANEOUS

Hook-up Wire Range:	AWG #12 to #22 solid or stranded
Molded Material:	UL recognized break resistant electrical grade thermoplastic
Socket Mounting Torque:	7 to 8 Inch Lbs
Body Color:	Gray
DIN Locking clip color:	Red
Weight:	62 grams, approx.

WIRING DIAGRAM

TOP VIEW

**STANDARD PART NUMBERS****DESCRIPTION**

70 - 783D - 1	11 PIN, SOCKET, DIN / PANEL MOUNT, WITH SCREW TERMINALS & CLAMPING PLATES.
---------------	--

FEATURES**HEAVY DUTY 1 PIECE TRACK AND CONTACT SYSTEM:**

ALLOWS FOR GREATER HEAT DISSIPATION AND LOWER CONTACT RESISTANCE AT THE RELAY TERMINALS.

IMPROVED CONTACT DESIGN:

ALLOWS FOR MORE AREA OF CONTACT ON RELAY TERMINALS, RESULTING IN LOWER CONTACT RESISTANCE AT RELAY TERMINALS.

FINGER SAFE:

PREVENTS SHOCK TO OPERATORS BY KEEPING FINGERS AWAY FROM LIVE CIRCUITS.

MODULE COMPATIBLE:

ALLOWS FOR OPTIONAL PROTECTION OR L.E.D. MODULES TO BE USED WITH SOCKETS .

TWO WAY PANEL MOUNTING:

RETROFITS BOTH IDEC AND OMRON MOUNTING. IDEAL REPLACEMENT FOR EXISTING SOCKET.

PLASTIC HOLD DOWN CLIP AND I.D TAG SYSTEM:

ALLOWS FOR QUICK LOCKING OF RELAY INTO SOCKETS AND REMAINS WITH SOCKET IF RELAY IS REMOVED I.D. TAG IS IDEAL FOR CIRCUIT OR RELAY IDENTIFICATION.

BENEFITS

**DESIGNED FOR PANEL OR DIN MOUNT.
HOLD DOWN CLIP IS INCLUDED**

GENERAL SPECIFICATIONS

Electrical Rating:	16 amps, 300 volts
Dielectric Strength:	2000 V rms between all electrical elements of opposite polarity 2000 V rms between all elements to metal mounting plate

CONSTRUCTION

Contacts and Internal Metal Tracks:	Plated copper alloy
Screws and Clamping Plates:	Steel, yellow zinc plated
Screw Style and Size:	Combination head, M3 x .5 x 6.35
Screw and Clamping Plate Torque:	7 Inch - Lbs
Internal Metal Tracks, Contacts and Screw Terminal:	One piece construction

MISCELLANEOUS

Hook-up Wire Range:	AWG #12 to #22 solid or stranded
Molded Material:	UL recognized break resistant electrical grade thermoplastic
Socket Mounting Torque:	7 to 8 Inch - Lbs
Body Color:	Gray
DIN Locking Clip Color:	Red
Weight:	77 grams approx.

STANDARD PART NUMBERS**DESCRIPTION**

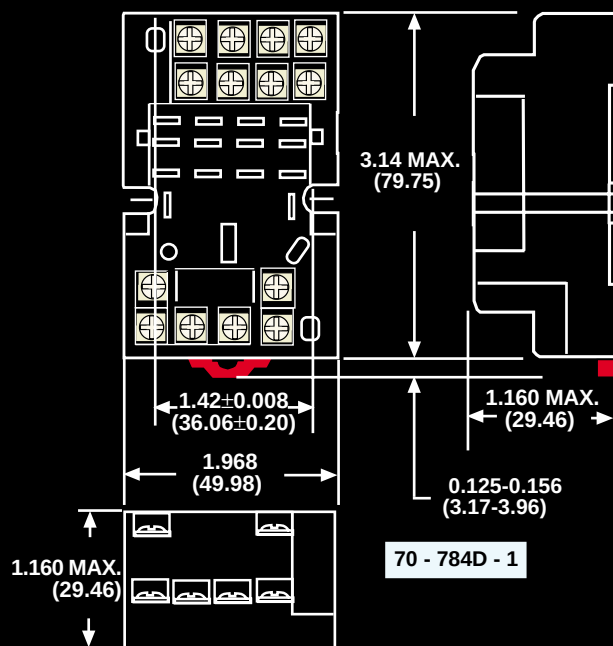
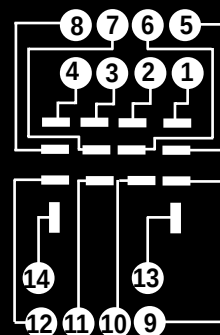
70 - 784D - 1	14 PIN, SOCKET, DIN / PANEL MOUNT, WITH SCREW TERMINALS & CLAMPING PLATES.
---------------	--

16 AMPS, 300 VOLTS

NEW
From The Market
Leader in Industrial
Relays
AVAILABLE Q-1-03

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).
TOLERANCES : ± 0.010 (± 0.25)
UNLESS OTHERWISE SHOWN

**WIRING DIAGRAM TOP VIEW**

16-1351 HOLD DOWN CLIP INCLUDED

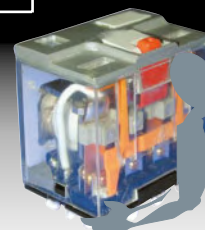


PHOTO NOT AVAILABLE
SIMILAR TO 70-783D-
EXCEPT 14 PIN BASE

FEATURES**BENEFITS****HEAVY DUTY 1 PIECE
TRACK AND CONTACT
SYSTEM:**

ALLOWS FOR GREATER HEAT DISSIPATION AND LOWER
CONTACT RESISTANCE AT THE RELAY TERMINALS.

**IMPROVED CONTACT
DESIGN:**

ALLOWS FOR MORE AREA OF CONTACT ON RELAY
TERMINALS, RESULTING IN LOWER CONTACT
RESISTANCE AT RELAY TERMINALS.

**STANDARD DIN RAIL
MOUNTING:**

FITS ALL STANDARD 35 MILLIMETER DIN TRACKS.

10 AMPS, 300 VOLTS

UL **us**
UL Recognized
File No. E70500

40787



COMPLIES WITH REQUIREMENTS OF

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

* IEC = INTERNATIONAL
ELECTROTECHNICAL COMMISSION

* CE TESTING AND EVALUATION
PERFORMED BY THE UNDERWRITERS
LABORATORIES AS A THIRD PARTY
PARTICIPANT

NEW
From The Market
Leader in Industrial
Relays

DESIGNED FOR PANEL OR DIN MOUNT.

GENERAL SPECIFICATIONS

Electrical Rating: 10 amps, 300 volts
Dielectric Strength: 2000 V rms between all electrical
elements of opposite polarity
2000 V rms between all elements to
metal mounting plate

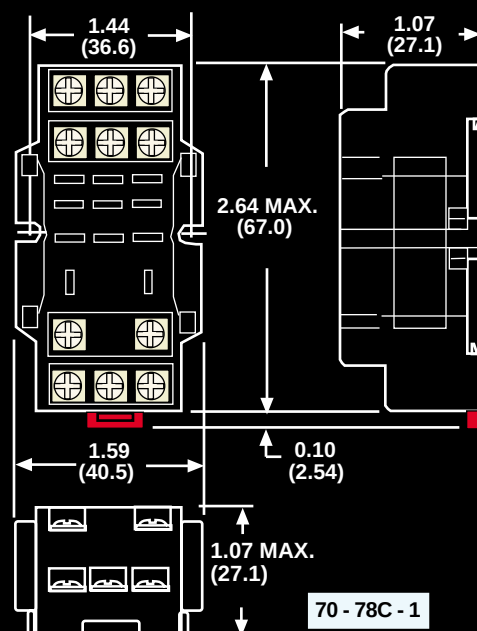
CONSTRUCTION

Contacts and internal metal tracks: Plated copper alloy
Screws and clamping plates: Steel, yellow zinc plated
Screw style and size: Combination head, M3 x .5 x 6.35
Screw and clamping plate torque: 8 Inch Lbs
Internal metal tracks,
contacts and screw terminal: One piece construction

MISCELLANEOUS

Hook-up Wire Range: AWG #12 to #22 solid or stranded
Molded Material: UL recognized break resistant
electrical grade thermoplastic
Socket Mounting Torque: 7 to 8 Inch Lbs
Body Color: Gray
DIN Locking clip color: Red
Weight: 75 grams approx.

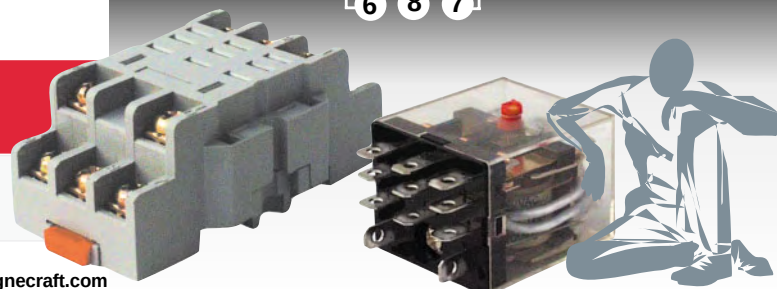
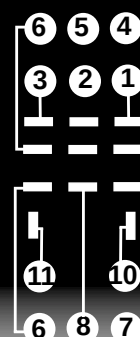
OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).
TOLERANCES : ± 0.010 (± 0.25)
UNLESS OTHERWISE SHOWN



16-1331 HOLD DOWN FLAT CLIPS FOR 78XCX RELAYS
ORDERED SEPARATELY

WIRING DIAGRAM

TOP VIEW

**STANDARD
PART
NUMBERS****DESCRIPTION**

70 - 78C - 1

11 PIN SOCKET DIN / PANEL MOUNT,
WITH SCREW TERMINALS & CLAMPING PLATES.

FEATURES**HEAVY DUTY 1 PIECE
TRACK AND CONTACT
SYSTEM:**

ALLOWS FOR GREATER HEAT DISSIPATION AND LOWER CONTACT RESISTANCE AT THE RELAY TERMINALS.

**IMPROVED CONTACT
DESIGN:**

ALLOWS FOR MORE AREA OF CONTACT ON RELAY TERMINALS, RESULTING IN LOWER CONTACT RESISTANCE AT RELAY TERMINALS.

**STANDARD DIN RAIL
MOUNTING:**

FITS ALL STANDARD 35 MILLIMETER DIN TRACKS.

BENEFITS**10 AMPS, 300 VOLTS**

UL **us**
UL Recognized
File No. E70500

SR 40787

CE

COMPLIES WITH REQUIREMENTS OF

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

* IEC = INTERNATIONAL
ELECTROTECHNICAL COMMISSION

* CE TESTING AND EVALUATION
PERFORMED BY THE UNDERWRITERS
LABORATORIES AS A THIRD PARTY
PARTICIPANT

NEW
From The Market
Leader in Industrial
Relays

DESIGNED FOR PANEL OR DIN MOUNT.

GENERAL SPECIFICATIONS

Electrical Rating:	10 amps, 300 volts
Dielectric Strength:	2000 V rms between all electrical elements of opposite polarity. 2000 V rms between all elements to metal mounting plate

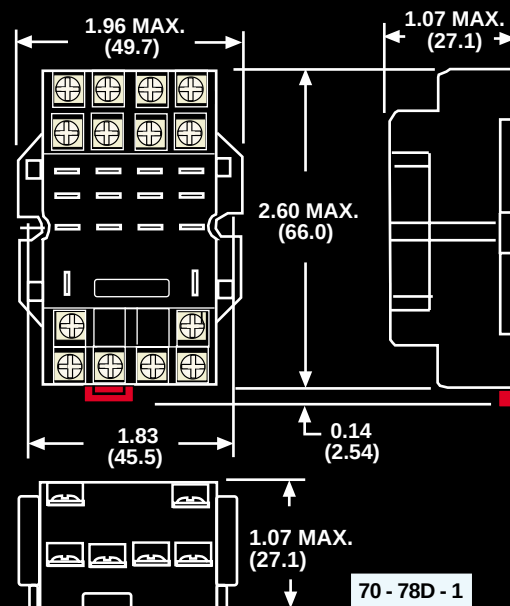
CONSTRUCTION

Contacts and Internal Metal Tracks:	Plated copper alloy
Screws and Clamping Plates:	Steel, yellow zinc plated
Screw Style and Size:	Combination head, M3 x .5 x 6.35
Screw and Clamping Plate Torque:	7 Inch - Lbs
Internal Metal Tracks, Contacts and Screw Terminal:	One piece construction

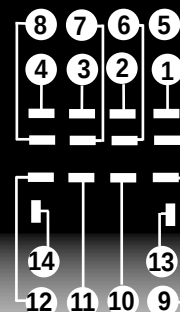
MISCELLANEOUS

Hook-up Wire Range:	AWG #12 to #22 solid or stranded
Molded Material:	UL recognized break resistant electrical grade thermoplastic
Socket Mounting Torque:	7 to 8 Inch - Lbs
Body Color:	Gray
DIN Locking clip color:	Red
Weight:	85 grams, approx.

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).
TOLERANCES : ± 0.010 (± 0.25)
UNLESS OTHERWISE SHOWN



16-1331 HOLD DOWN FLAT CLIPS FOR 78XDX RELAYS
ORDERED SEPARATELY

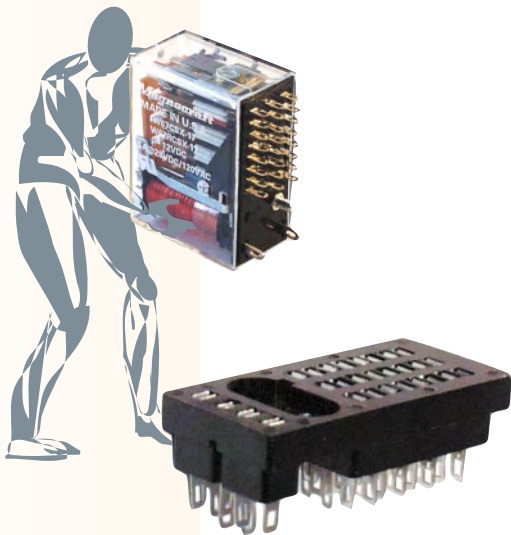
**WIRING DIAGRAM
TOP VIEW****STANDARD
PART
NUMBERS****DESCRIPTION**

70 - 78D - 1

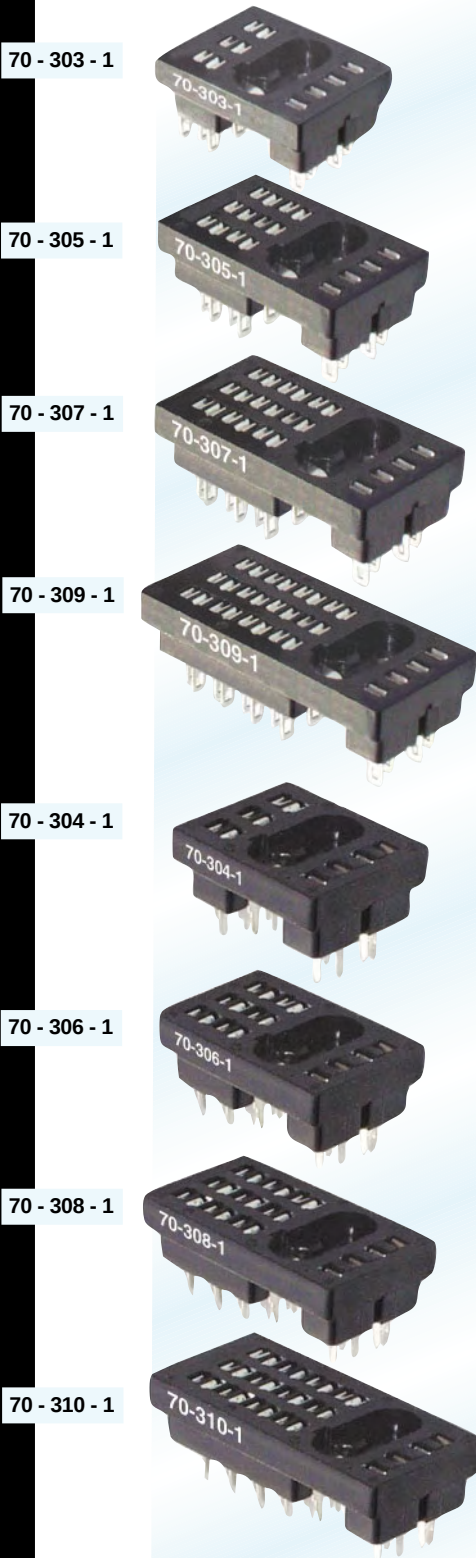
14 PIN SOCKET, DIN / PANEL MOUNT,
WITH SCREW TERMINALS & CLAMPING PLATES.

GENERAL SPECIFICATIONS

Electrical Rating:	10 amps, 300 volts
Dielectric Strength:	1000 V rms between all electrical elements of opposite polarity 1000 V rms between all elements to metal mounting plate
CONSTRUCTION	
Contacts:	Brass, tin plated
MISCELLANEOUS	
Hook-up Wire Range:	AWG #18 to #22 solid or stranded
Molded Material:	UL recognized break resistant electrical grade thermoplastic
Mounting:	Panel
Body Color:	Black
Weight:	4.3 grams for 70-303-1 & 70-304-1 5.5 grams for 70-305-1 & 70-306-1 6.9 grams for 70-307-1 & 70-308-1 8.5 grams for 70-309-1 & 70-310-1



10 AMPS 300 VOLTS

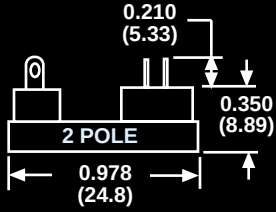


STANDARD PART NUMBERS	DESCRIPTION
70 - 303 - 1	SOLDER TERMINALS
70 - 305 - 1	SOLDER TERMINALS
70 - 307 - 1	SOLDER TERMINALS
70 - 309 - 1	SOLDER TERMINALS
70 - 304 - 1	PRINTED CIRCUIT TERMINALS
70 - 306 - 1	PRINTED CIRCUIT TERMINALS
70 - 308 - 1	PRINTED CIRCUIT TERMINALS
70 - 310 - 1	PRINTED CIRCUIT TERMINALS

NOTE:
 WHEN INSTALLING SOCKET(S) INTO A PRINTED CIRCUIT BOARD, USE PLUG-IN STYLE RELAYS FOR MAXIMUM TERMINAL CONTACT WITH MATING SOCKET. PLUG-IN STYLE RELAYS HAVE A GROUNDING STUD AND ARE RECOMMENDED FOR USE WITH ALL SOCKET STYLES.

10 AMPS 300 VOLTS

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).
TOLERANCES : ± 0.010 (± 0.25) UNLESS OTHERWISE SHOWN

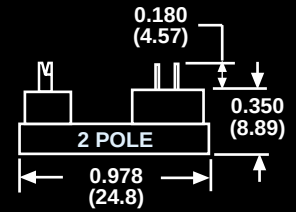


16-875-1 HOLD DOWN CLIP INCLUDED

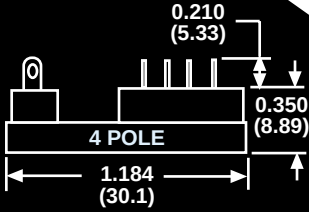
70 - 303 - 1



70 - 304 - 1

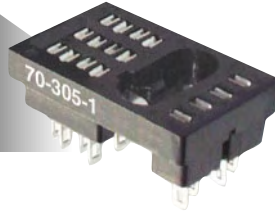


16-875-1 HOLD DOWN CLIP INCLUDED

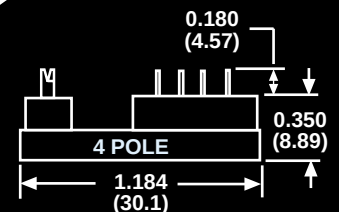


16-875-2 HOLD DOWN CLIP INCLUDED

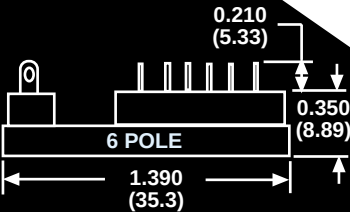
70 - 305 - 1



70 - 306 - 1

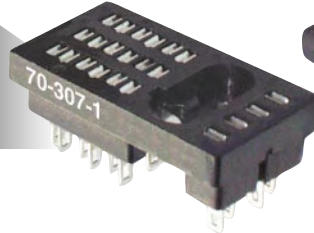


16-875-2 HOLD DOWN CLIP INCLUDED

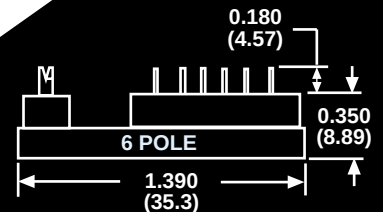


16-875-3 HOLD DOWN CLIP INCLUDED

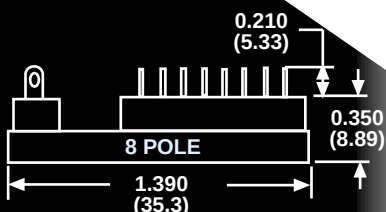
70 - 307 - 1



70 - 308 - 1

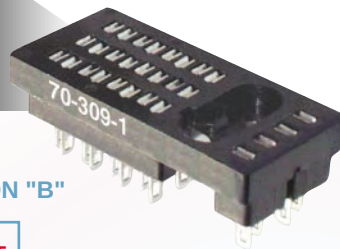


16-875-3 HOLD DOWN CLIP INCLUDED

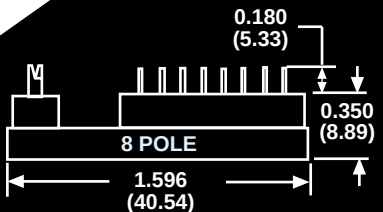
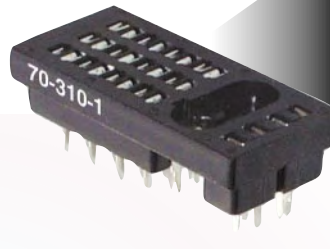


16-1120-8 HOLD DOWN CLIP INCLUDED

70 - 309 - 1



70 - 310 - 1

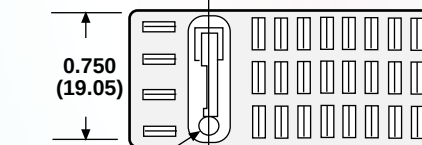
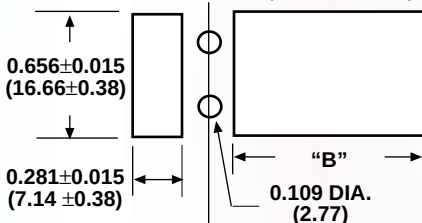


16-1120-8 HOLD DOWN CLIP INCLUDED

CHASSIS CUTOUT DIMENSION "B"

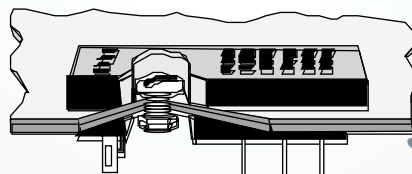
SPDT DPDT	4PDT	6PDT	8PDT
0.343 (8.71)	0.562 (14.27)	0.781 (19.84)	1.00 (25.4)

CHASSIS CUTOUT for panel mounting



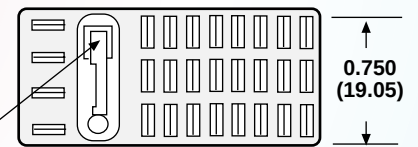
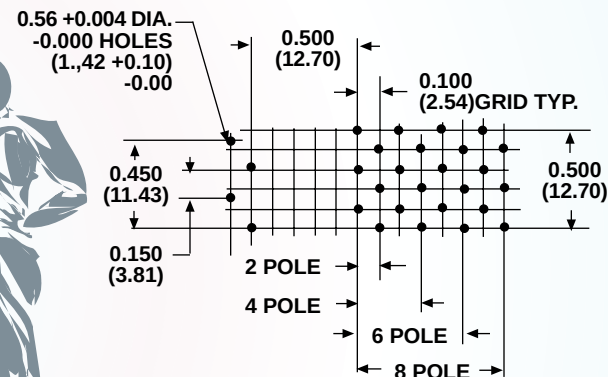
USE 3 - 48 SCREW & NUT
FOR MOUNTING SOCKET

CHASSIS CUTOUT



SUGGESTED PRINTED CIRCUIT BOARD LAYOUT

TOP VIEW



GROUND STRIP FOR 3 - 48 UN-2A
STUD ON PLUG-IN STYLE RELAYS

FEATURES**INTEGRAL LOCKING
RECEPTACLE**

MATES WITH RELAY LOCKING CLIP. ELIMINATES THE NEED FOR EXTERNAL RELAY HOLD DOWN CLIPS.

**HEAVY DUTY 1 PIECE
TRACK AND CONTACT
SYSTEM:**

IDEAL FOR APPLICATIONS THAT REQUIRE UP TO 600 VOLTS.

**IMPROVED CONTACT
DESIGN:**

ALLOWS FOR MORE AREA OF CONTACT ON RELAY TERMINALS, RESULTING IN LOWER CONTACT RESISTANCE AT RELAY TERMINALS.

BENEFITS**10 AMPS, 600 VOLTS**

UL Recognized
File No. E70500, E13224



COMPLIES WITH REQUIREMENTS OF

LISTED WHEN USED
WITH SERIES 219
RELAYS

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

* IEC = INTERNATIONAL
ELECTROTECHNICAL COMMISSION

* CE TESTING AND EVALUATION
PERFORMED BY THE UNDERWRITERS
LABORATORIES AS A THIRD PARTY
PARTICIPANT

DESIGNED FOR PANEL MOUNT.

GENERAL SPECIFICATIONS

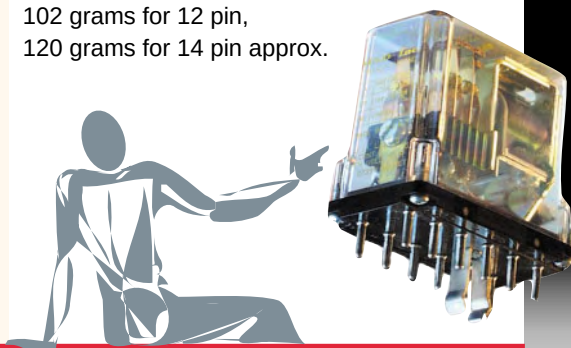
Electrical Rating:	10 amps, 600 volts
Dielectric Strength:	2000 V rms between all electrical elements of opposite polarity 2000 V rms between all elements to metal mounting plate

CONSTRUCTION

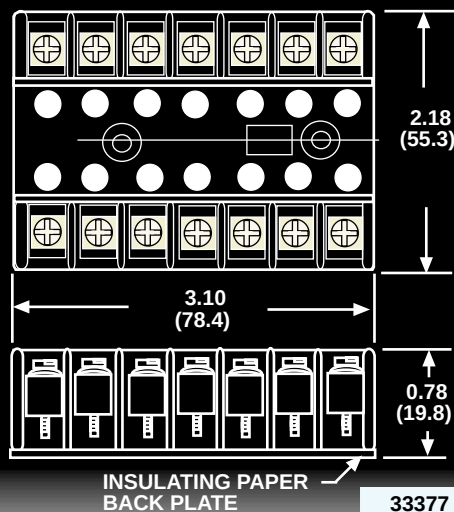
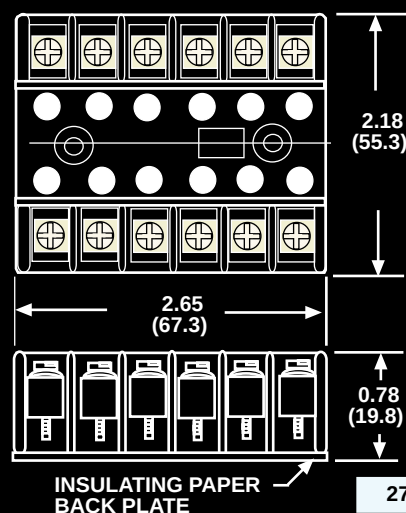
Contacts and Internal Metal Tracks:	Plated copper alloy
Screws and Clamping Plates:	Steel, yellow zinc plated
Screw Style and Size:	Combination head, M3 x .5 x 6.35
Screw and Clamping Plate Torque:	9 Inch Lbs
Internal Metal Tracks,	
Contacts and Screw Terminal:	One piece construction

MISCELLANEOUS

Hook-up Wire Range:	AWG #12 to #22 solid or stranded
Molded Material:	UL recognized break resistant electrical grade thermoplastic
Socket Mounting Torque:	8 to 10 Inch Lbs
Body Color:	Gray
Weight:	102 grams for 12 pin, 120 grams for 14 pin approx.



OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).
TOLERANCES : ± 0.010 (± 0.25)
UNLESS OTHERWISE SHOWN

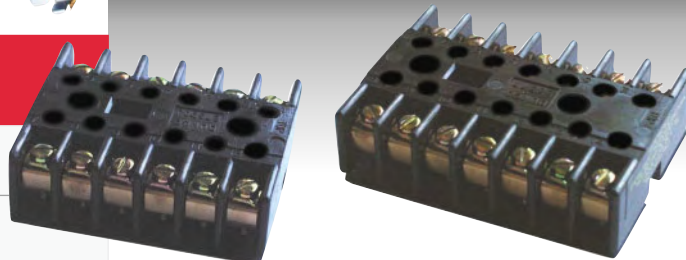
**STANDARD
PART
NUMBERS****DESCRIPTION**

27390

12 PIN SOCKET PANEL MOUNT,
WITH SCREW TERMINALS & CLAMPING PLATES.

33377

14 PIN SOCKET PANEL MOUNT,
WITH SCREW TERMINALS & CLAMPING PLATES.



When Sockets are mounted end to end, the distance between adjacent mounting holes should be 1" minimum.

FEATURES

METAL OXIDE VARISTOR CIRCUIT:

METAL OXIDE VARISTORS PROTECTS BY SHUNTING POTENTIALLY DAMAGING ELECTRICAL SPIKES AWAY FROM THE RELAY COIL . IDEAL FOR AC AND DC APPLICATIONS.

DIODE CIRCUIT

PROTECTS EXTERNAL DRIVE CIRCUITRY FROM INDUCTIVE VOLTAGES GENERATED WHEN REMOVING COIL VOLTAGE. IDEAL FOR DC APPLICATIONS. POLARITY SENSITIVE.

LED CIRCUIT

LED STATUS LAMP VERIFIES POWER IS BEING SUPPLIED TO THE COIL. IDEAL FOR BOTH AC AND DC APPLICATIONS. POLARITY SENSITIVE FOR DC APPLICATION.

BENEFITS

PLUGGING MODULE INTO THE SOCKET, CONNECTS THE CIRCUIT IN PARALLEL WITH THE RELAY COIL. NO ADDITIONAL WIRING REQUIRED.

MODULES FIT WITHIN MAXIMUM DIMENSIONS OF RELAY AND SOCKET.

ORDERING CODE FOR MODULES

70 - A SM M - 24

SOCKET FAMILY: _____

PACKAGE SIZE "A" OR "B": _____

SOCKET MODULE: _____

FUNCTION: _____

M = M.O.V (METAL OXIDE VARISTOR)
D = DIODE
L = L.E.D. STATUS LAMP

INPUT VOLTAGE: _____

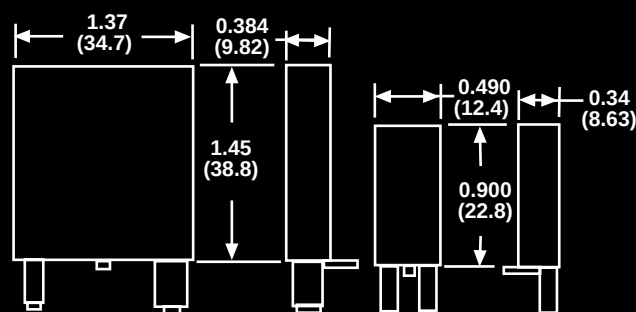
24, 120, 240, 250

STANDARD PART NUMBERS	FUNCTION	NOMINAL INPUT VOLTAGE	PACKAGE STYLE	MATING SOCKETS
70-ASMM-24	MOV suppressor	24 VAC / VDC	A	70-783D-1 70-784D-1 70-750D8-1 70-750D11-1
70-ASMM-120	MOV suppressor	120 VAC / VDC	A	
70-ASMM-240	MOV suppressor	240 VAC / VDC	A	
70-ASMD-250	Protection diode	6 - 250 VDC	A	
70-ASML-24	LED, green	24 VAC / VDC	A	
70-ASML-120	LED, green	120 VAC / VDC	A	
70-ASML-240	LED, green	240 VAC / VDC	A	70-782D-1
70-BSMM-24	MOV suppressor	24 VAC / VDC	B	
70-BSMM-120	MOV suppressor	120 VAC / VDC	B	
70-BSMM-240	MOV suppressor	240 VAC / VDC	B	
70-BSMD-250	Protection diode	6 - 250 VDC	B	
70-BSML-24	LED, green	24 VAC / VDC	B	
70-BSML-120	LED, green	120 VAC / VDC	B	
70-BSML-240	LED, green	240 VAC / VDC	B	

NEW
From The Market
Leader in Industrial
Relays
AVAILABLE: Q-4-02



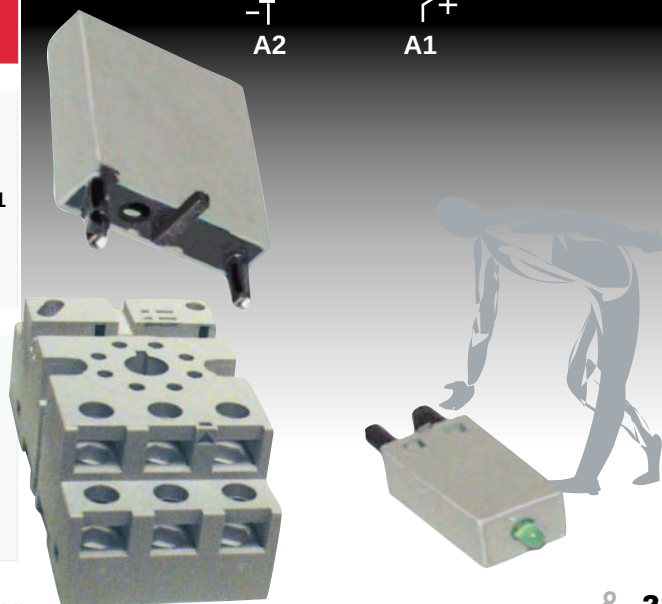
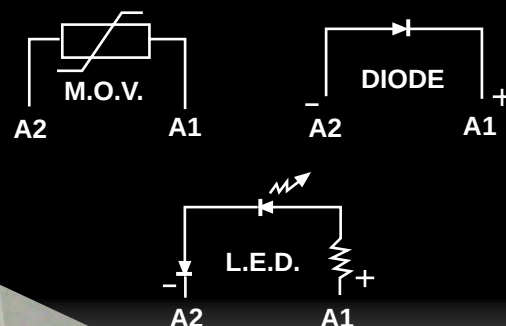
OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).
TOLERANCES : ± 0.010 (± 0.25)
UNLESS OTHERWISE SHOWN



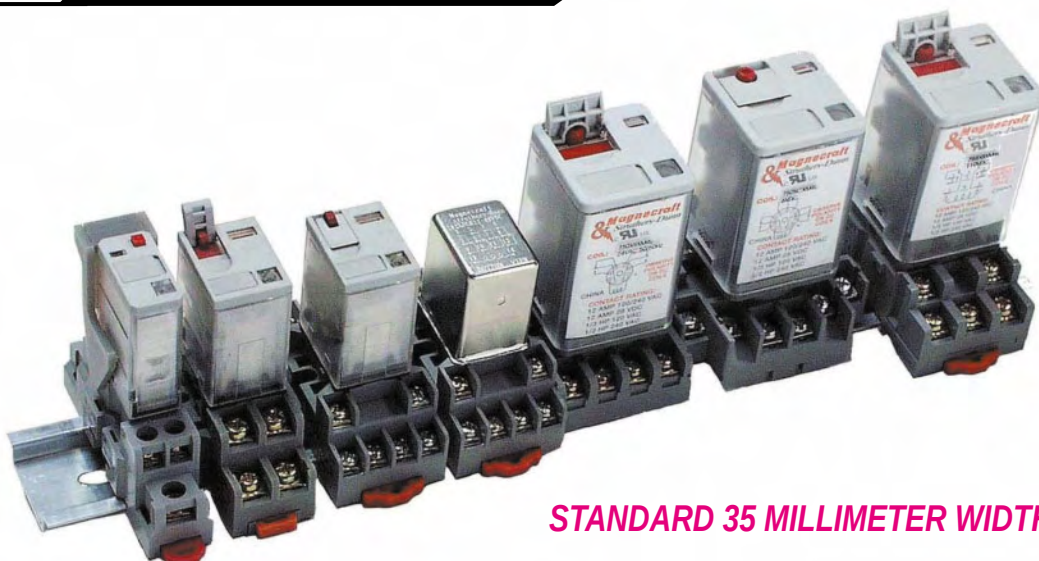
PACKAGE "A"

PACKAGE "B"

WIRING DIAGRAM TOP VIEW

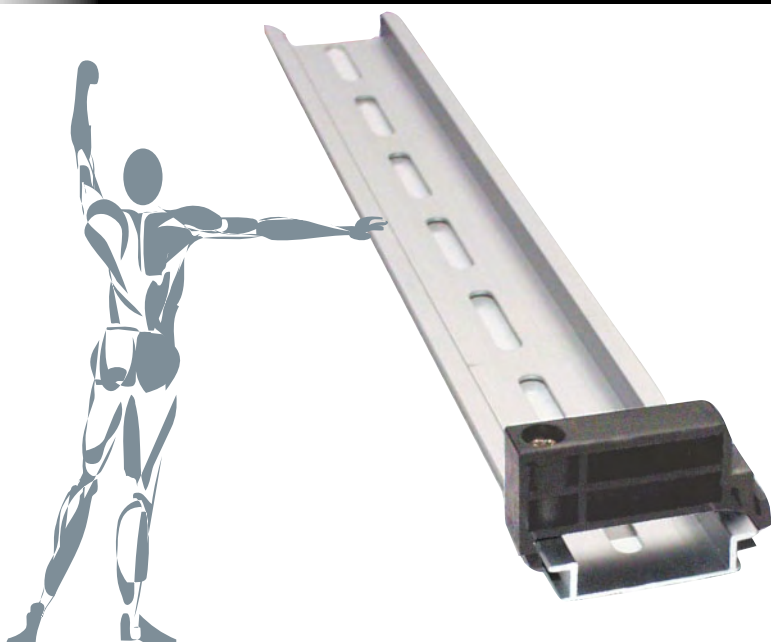
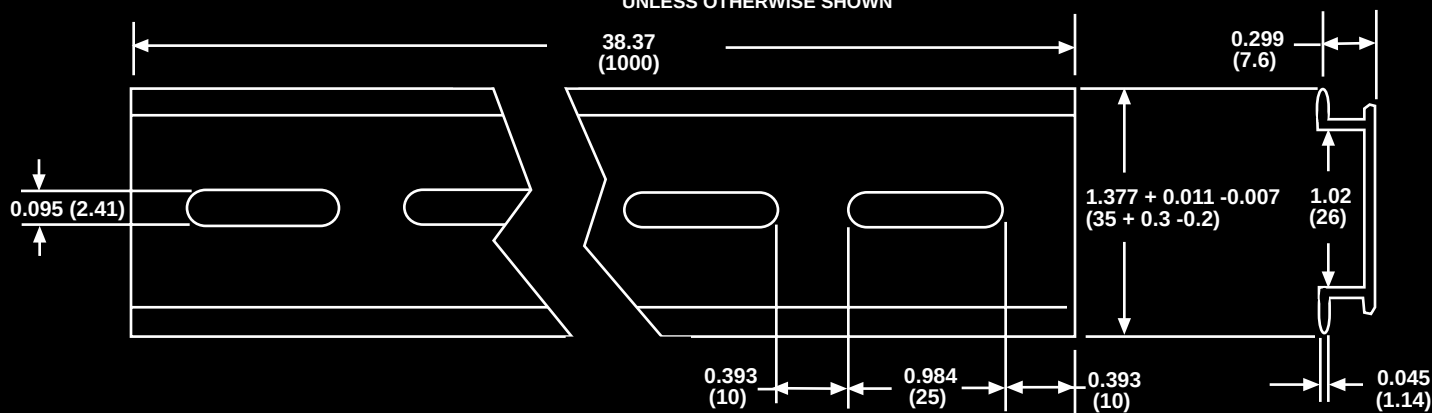


NEW
From The Market
Leader in Industrial
Relays



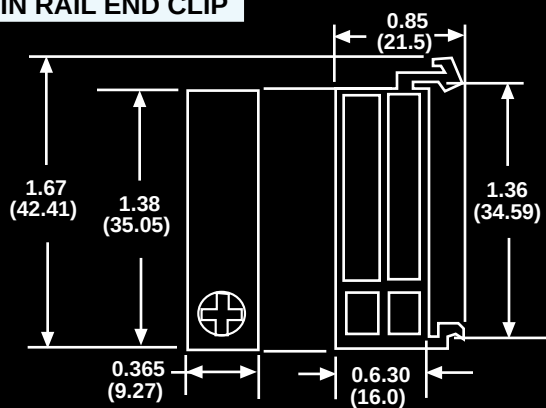
STANDARD 35 MILLIMETER WIDTH

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).
TOLERANCES : ± 0.010 (± 0.25)
UNLESS OTHERWISE SHOWN



OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).
TOLERANCES : ± 0.010 (± 0.25)
UNLESS OTHERWISE SHOWN

DIN RAIL END CLIP



**STANDARD
PART
NUMBERS**

DESCRIPTION

16-700DIN	DIN RAIL EXTRUDED ALUMINUM, 39.37" (1000 mm)
16-DCLIP-1	END CLIP, PLASTIC, WITH LOCKING SCREW



SECTION 8 CROSS REFERENCE GUIDE

MAGNECRAFT & STRUTHERS-DUNN	TYCO / POTTER & BRUMFIELD	IDEC	CUSTOM CONNECTOR	OMRON	A-B	FINDER	TYCO / SCHRACK
70-464-1	27E891 / 27E122	SR2P-06	OT08-PC	PF083A-E	700-HN125	90.16	
70-465-1	27E123 panel mt only	SR3P-06	OT11-PC	PF113A-E	700-HN126		
70-750D8-1					700-HN202	90.72, 90.72.0	
70-750D11-1					700-HN203	90.73, 90.73.0	
70-169-1			RB08-PC				
70-170-1			RB11-PC				
70-459-1	27E895	SH2B-05	GT08-PC	PTF08A-E	700-HN116		
70-461-1	27E894	SY4S-05	MT14-PC	PYF14A-E	700-HN128	94.44	
70-401-1	27E488	SH2B-51	GR108-SLD	PT08	700-HN117		
70-402-1	27E489	SH2B-62	GR108-PCB	PT08-0	700-HN118	96.12, 96.12.0	
70-378-1	27E006	SY4S-51	MR14-SLD	PY14	700-HN104	94.24	RA 78 703
70-379-1	27E031	SY4S-61	MR14-PCB	PY14-02	700-HN105	94.14	RA 78 702
70-781D-1		SH1B-05					
70-781F-1		SH1B-51					
70-781T-1		SH1B-62					
70-782D-1				PTF08A-E		96.72, 96.72.0	
70-463-1		SR3B-05	ST11-PC		700-HN127	92.43.1	
70-124-1		SR3B-51	CM11-SLD		700-HN107	92.33	RM 78 701
70-124-2			CM11-QDC				
70-178-1			CM11-PCB				RM 78 702
70-178-2			CM11-PCB-1S			92.13	
70-783D-1		SH3B-05C		PTF11A-E			
70-784D-1		SH4B-05C		PTF14A-E	700-HN139	96.74, 96.74.0	
70-78C-1		SH3B-05					
70-78D-1		SH4B-05					
27390			SD12-PC				
33377			SD14-PC				
70-303-1	27E125						ZA 78 710
70-304-1	27E128						ZA 78 712
70-305-1	27E126						ZA 78 720
70-306-1	27E129						ZA 78 722
70-307-1	27E127						ZA 78 730
70-308-1	27E130						ZA 78 732
70-309-1	27E211						
70-310-1	27E254						
16-700DIN		BND-1000		PFP-100N			
16-DCLIP-1		BNL-5		PFP-M			

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CROSS REFERENCE REFLECTS COMPATIBILITY WITH RELAY (FOOT PRINTS) AND MOUNTING. THE SHAPE, SIZE AND METHOD OF RELAY HOLD DOWN MAY VARY. THE WIRING HOOK UP POINTS, LOAD CURRENT, MAXIMUM VOLTAGE AND COLOR OF SOCKET CAN ALSO VARY. CONSULT FACTORY FOR EXACT REPLACEMENT.

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DOCUMENT: 500





CLASS TO CLASS CROSS REFERENCE

MAGNECRAFT & STRUTHERS-DUNN	TYCO / POTTER & BRUMFIELD	OMRON	FINDER	CRYDOM	DELTROL	IDEC	TYCO / SCHRACK	OTHER
W21								MIDTEX-136
W60	R50							
W67	R10	MH, MHE					ZKU, ZLU	
W78	KHAU, K10	LY, MY			310/320	RY, RH	TM, RA, RAP	
78XCX		LY3				RH3B,		
78XDX		LY4	56.34			RH4B		
W90	T90	G8P					ZD	
W9A	T9A	G7G						
W92	T92	G7L						
W107,171,172DIP	JWD					RN		
W117SIP	JWS					RP		
A178	T70	G5L, G5LE				RCN	ZF	
W199	PRD	MGN			900			
TDRPRO	CM, CNM							
W211	CKB, CGB, CHD, CDB, CB, CHB							
W222	CR							
W250/A314	KRPA, KRP	MK			105	RR2P, 3P	CA, CAD, CAP	
300					270/275			
385	KB, KUB							
W388	KU, KUP	MJN			268	RR1B-RR3B	RM70	
W388DB	KUEP				166E			
388J	RM		62.32, 62.33				RM23, RM33	
388V	KUGP		62.22, 62.32-33				RM53, RM63	
W389	KUMP, KUHP	MJN			260		RMC	
W389D	KUMP	MJN			275F		RMD	
389F			62.82, 62.83				RM73, RM83	
W6	SSRT, SSR	G3NA		HD, HA, D2 D1, A24		RSS		
SSRDIN				CKR, HPF				GORDOS-841 CONTINENTAL -RS
750	KRPA	MK	60				MT	ALLEN BRADLEY- HA
750H	KR-E							
781/78XAX						RH1, RH1V		
782		LY212N	56.32.55.34				ZT. PT	
782H	KHS	MY4H						
788	KUP							ALLEN BRADLEY- HB
976 Replaces W76	RKS, RKA	G2R					RP	

NOTE: This Class to Class Cross reference Guide in some cases may not be an exact cross to another competitors relay class. The intent of this guide is to match the footprint and to get as close to the operating characteristics as possible. Consult with one of our Application Engineers for exact crossover.



Magnecraft & Struthers-Dunn
Your Contact for Relays

MEET THE FAMILY



700 SERIES

MAGNECRAFT & STRUTHERS-DUNN'S FAMILY OF RELAYS DESIGNED FOR INDUSTRIAL CONTROL APPLICATIONS.

The new Magnecraft & Struthers-Dunn 700 series combines advanced features that make them easy and reliable to install, test and use.

- Coil status lamp
- Push button
- Push button lock down door
- Flag indicator, ID tag
- Finger grip cover & snap-on adapters for DIN rail or chassis mount
- Matching high-tech gray bodies with frosted cover.

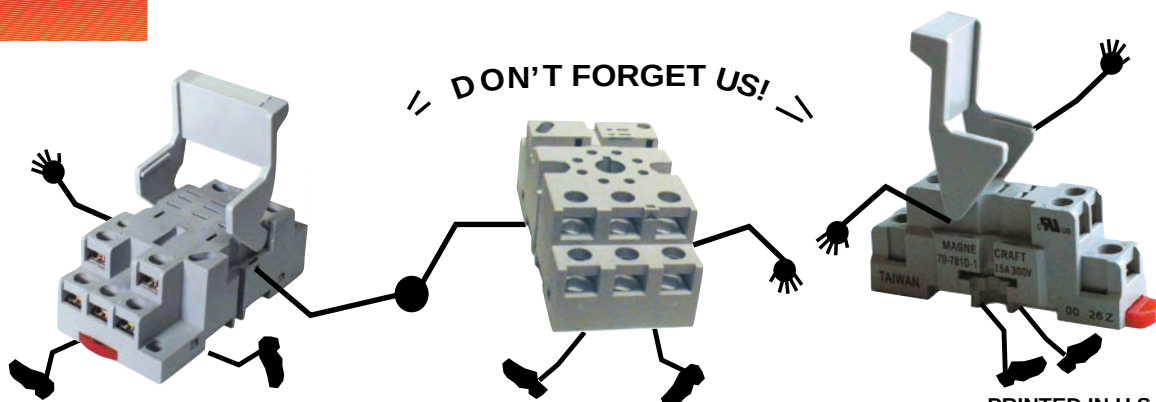
All models come with a wide choice of coil voltages, contact configurations and terminal styles.

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SEE SECTION 8 FOR OUR FAMILY OF HIGH-TECH SOCKETS & ACCESSORIES

PRINTED IN U.S.A.
Part no. - L103000