

SERIES 750

DPDT, 3PDT OCTAL STYLE POWER RELAY

BENEFITS:

FLAG INDICATOR: SHOWS RELAY STATUS IN MANUAL OR POWERED CONDITION.

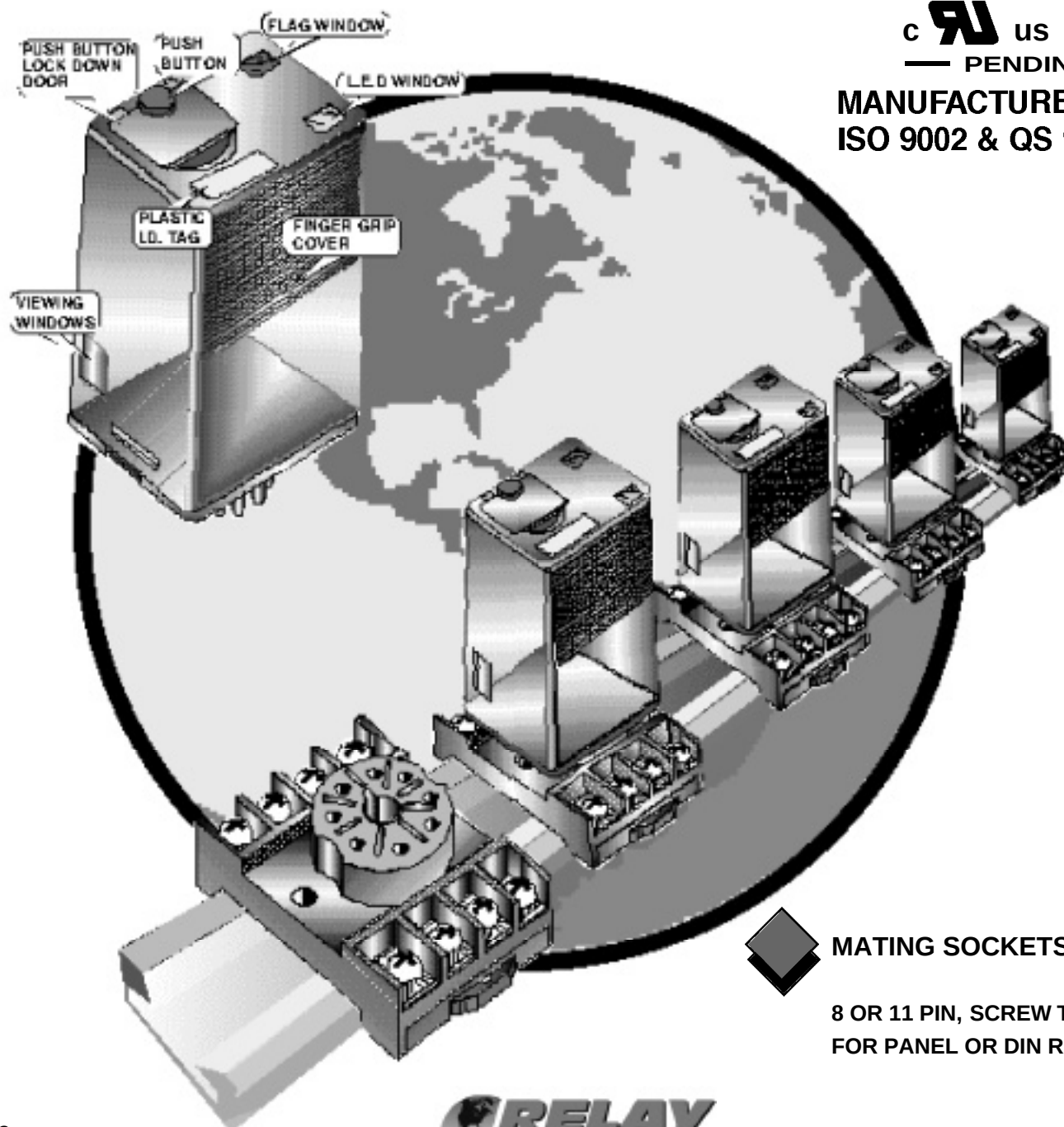
L.E.D. STATUS LAMP: SHOWS COIL "ON" OR "OFF" STATUS. IDEAL IN LOW LIGHT CONDITIONS.

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.



**MANUFACTURED UNDER
ISO 9002 & QS 9000**



MATING SOCKETS AVAILABLE

**8 OR 11 PIN, SCREW TERMINAL TYPE
FOR PANEL OR DIN RAIL MOUNTING.**

SERIES 750

DPDT, 3PDT OCTAL STYLE POWER RELAY

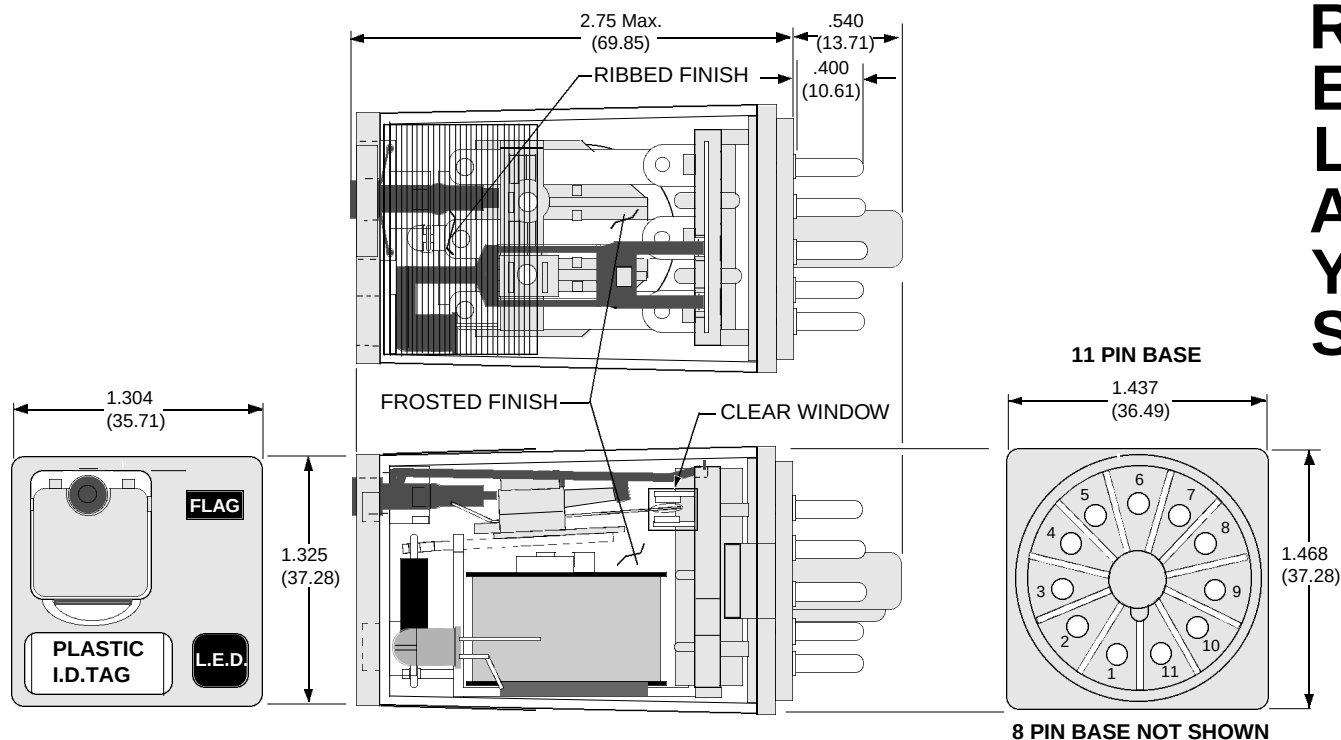
7

RELAYS

OUTLINE DIMENSIONS

SOLDER/PLUG-IN TERMINAL STYLE

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



GENERAL SPECIFICATIONS

Coil Pull-in: DC - 80%, AC - 85% of nominal voltage.
 Coil Dropout: 10% of nominal or more.
 Insulation System: Class "B" (130°C per UL std. 1446).
 Maximum Coil dissipation: DC coils - 3 Watts.

Contacts: Silver Cadmium Oxide, Gold flashed.

Contact Rating:

DPDT - 12Amp, 120/240 VAC,
 3PDT - 10Amp, 120/240VAC, 50/60Hz, 28 VDC.

Dielectric withstanding Voltage

Across Open Contacts: 500 V rms
 Between Current Carrying Parts: 1500 V rms

Temperature

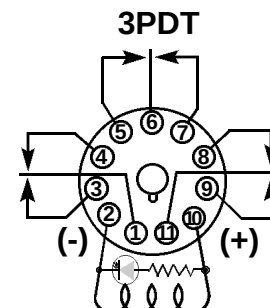
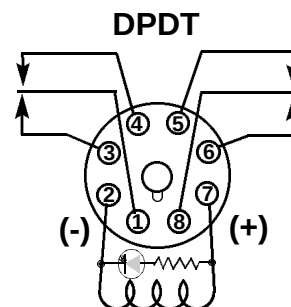
Operating: (AC) -45°C - +55°C, (DC) -45°C - +70°C

Terminals: 8 or 11 Pin Octal Style.

Enclosure: Polycarbonate dust cover.

WIRING DIAGRAM

VIEWED FROM PIN END



SERIES 750

DPDT, 3PDT OCTAL STYLE POWER RELAY

RELAY PART NUMBERS

PART NUMBERS FOR DPDT

PART NUMBERS	Coil measured @ 25°C	
	Nominal Input Voltage	Nominal Resistance (Ohms)
AC COIL - 8 PIN OCTAL STYLE		
750XBXCM4L-24A	24 VAC, 50/60 Hz	72 W
750XBXCM4L-120A	120 VAC, 50/60 Hz	1,700 W
750XBXCM4L-220/230A	220/230 VAC, 50 Hz	9,000 W
750XBXCM4L-240A	240 VAC, 50/60 HZ	9,100 W
DC COIL - 8 PIN OCTAL STYLE		
750XBXCM4L-110D	110 VDC	10,000 W
750XBXCM4L-24D	24 VDC	470 W
750XBXCM4L-12D	12 VDC	120 W

PART NUMBERS FOR 3PDT

PART NUMBERS	Coil measured @ 25°C	
	Nominal Input Voltage	Nominal Resistance (Ohms)
AC COIL - 11 PIN OCTAL STYLE		
750XCXCM4L-24A	24 VAC, 50/60 Hz	72 W
750XCXCM4L-120A	120 VAC, 50/60 Hz	1,700 W
750XCXCM4L-220/230A	220/230 VAC, 50 Hz	9,000 W
750XCXCM4L-240A	240 VAC, 50/60 HZ	9,100 W
DC COIL - 11 PIN OCTAL STYLE		
750XCXCM4L-110D	110 VDC	10,000 W
750XCXCM4L-24D	24 VDC	470 W
750XCXCM4L-12D	12 VDC	120 W

STANDARD PART NUMBERS SHOWN ABOVE.

ORDERING CODE 750

750 XBX CM4L- 120A

Series: _____
Enclosed Power relay with flag indicator & I.D. tag.

Contact Arrangement: _____
XBX - (DPDT) 8 pin Base
XCX - (3PDT) 11 pin Base

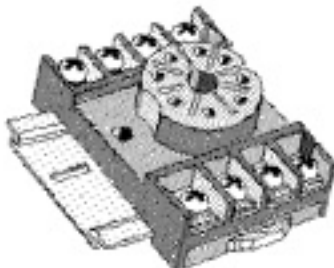
Standard Features: Push Button & Lock down door
L.E.D. Lamp Indicator _____

Coil Voltage: _____
6, 12, 24, 120, 220/230, 240 Add A for VAC Coils
6, 12, 24, 48, 110 Add D for VDC Coils

Other coil voltages available on special order.

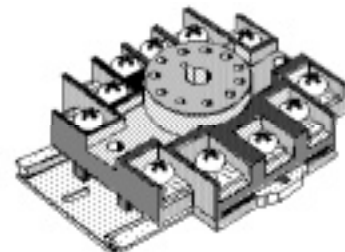
MATING SOCKETS

SOCKET PART NUMBERS LISTED BELOW.
RATED: 15 AMPS, 300 VAC



70-464-1 8 PIN OCTAL SOCKET

SCREW TERMINAL SOCKETS,
DIN RAIL/PANEL MOUNT



70-465-1 11 PIN SOCKET

7 RELAYS

COMPARISON OF FEATURES

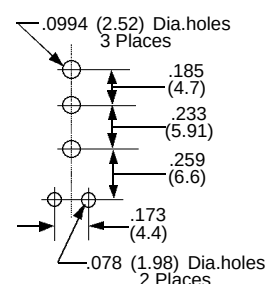
MAGNECRAFT IDEC

-

**TERMINALS: SOLDER PLUG-IN
OR PRINTED CIRCUIT.
CONTACT MATERIAL: ALL CONTACTS
SOLID SILVER CADMIUM OXIDE.
CONTACTS RATED 12 AMPS,
120/240 VAC 12 AMPS, 30 VDC
1/6HP, 120 VAC
1/3HP, 240 VAC**

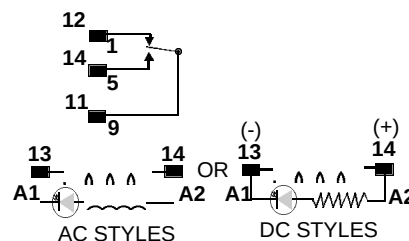
COIL POWER AT NOMINAL VOLTAGE:
AC: 0.9 VA, 60 HZ
DC: 0.7 WATTS

VIEWED FROM COM-
PONENT SIDE



WIRING DIAGRAM

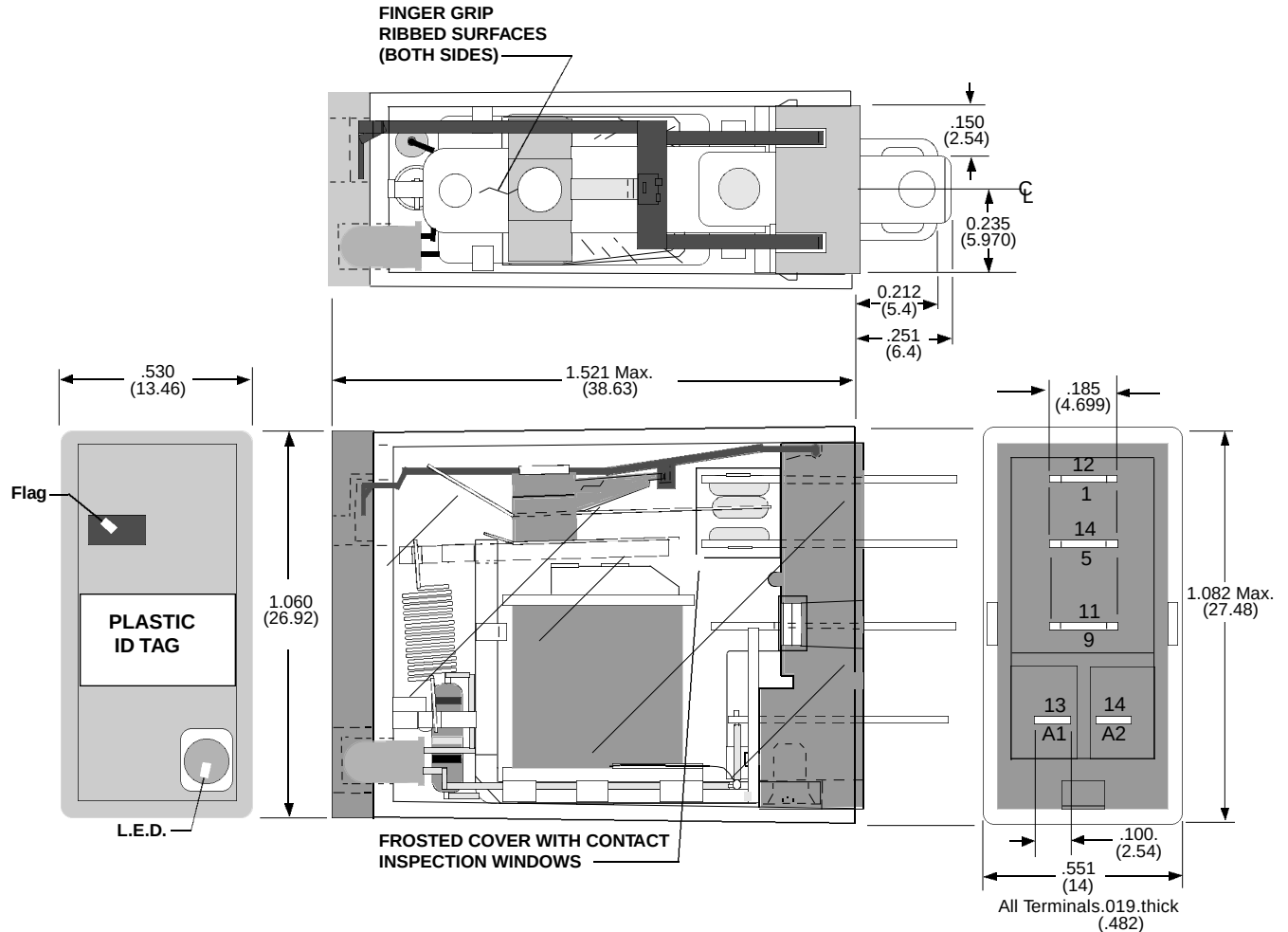
- Viewed from Pin End



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OUTLINE DIMENSIONS

SOLDER/PLUG-IN TERMINAL STYLE
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



STANDARD PART NUMBERS	Coil measured @ 25°C		CROSS REFERENCE IDEC
	Nominal Input Voltage	Nominal Resistance (Ohms)	
AC COIL - SOLDER/PLUG-IN TERMINALS			
781XAXL-24A	24 VAC	300	RH1B-L-AC24V
781XAXL-120A	120 VAC	7680	RH1B-L-AC120V
781XAXL-220/230A	220/230 VAC	31,200	RH1B-L-AC220/240V
781XAXL-240A	240 VAC	31,200	RH1B-L-AC220/240V
AC COIL - PRINTED CIRCUIT TERMINALS			
781XAXTL-24A	24 VAC	300	RH1V2-U-AC24V
781XAXTL-120A	120 VAC	7680	RH1V2-U-AC120V
781XAXTL-220/230A	220/230 VAC	31,200	RH1V2-U-AC220/240V
781XAXTL-240A	240 VAC	31,200	RH1V2-U-AC220/240V
DC COIL - SOLDER/PLUG-IN TERMINALS			
781XAXL-6D	6 VDC	47	RH1B-L-DC6V
781XAXL-12D	12 VDC	188	RH1B-L-DC12V
781XAXL-24D	24 VDC	750	RH1B-L-DC24V
781XAXL-48D	48 VDC	2660	RH1B-L-DC48V
781XAXL-110D	110 VDC	13800	RH1B-L-DC110V
DC COIL - PRINTED CIRCUIT TERMINAL			
781XAXTL-12D	12 VDC	188	RH1V2-U-DC12V
781XAXTL-24D	24 VDC	750	RH1V2-U-DC24V
781XAXTL-110D	110 VDC	13800	RH1V2-U-DC110V

Magnecraft & Struthers-Dunn

ORDERING CODE

781 XAX C L-120A

Series:

12A (SPDT) Slim line midget relay
with Flag Indicator & plastic I.D. tag.

Contact Arrangement:

XAX (SPDT)

Terminal style:

Solder/plug-in (Blade) terminals - **No Code**
Printed circuit terminals - **Code T**

Options:

Top Flange Adapter-Panel/DIN mount - **Code C**
Top or Bottom flange Adapter (Top mounted)- **Code C1**
Top or Bottom flange Adapter (Bottom mounted)- **Code C1A**
Standard Features: L.E.D. Lamp Indicator - **Code L**

Coil Voltage:

6, 12, 24, 120, 220/230 50 Hz, 240 Add "A" for VAC Coils
6, 12, 24, 48, 110 Add "D" for VDC Coils
AC COIL VOLTAGES ARE 50/60 Hz UNLESS OTHERWISE SPECIFIED

SERIES 781- SOCKET

BENEFITS:

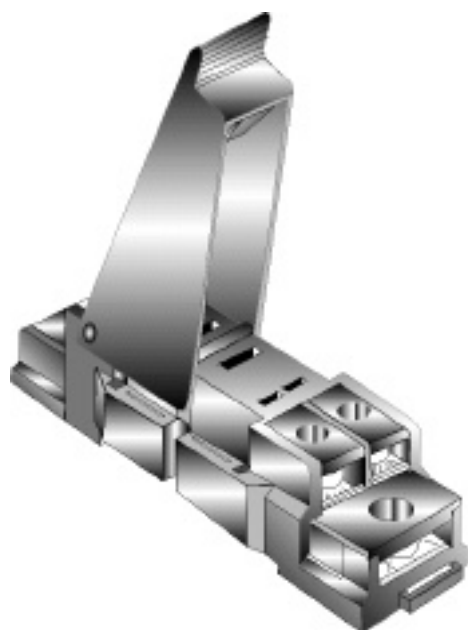
FINGER SAFE.
PANEL OR DIN RAIL MOUNT.
SCREW TERMINALS WITH CLAMPING PLATES.
RELAY HOLD DOWN AND EJECTION LEVER.

GENERAL SPECIFICATIONS

ELECTRICAL RATING: 12 AMPS, 250 VAC
WIRE SIZE: UP TO 2-#12 AWG

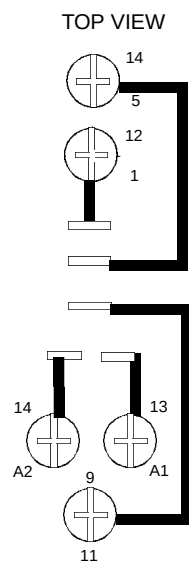
OTHER MATING SOCKETS AVAILABLE:

- 1 PANEL MOUNT TYPE.
- 2 P.C.TYPE.



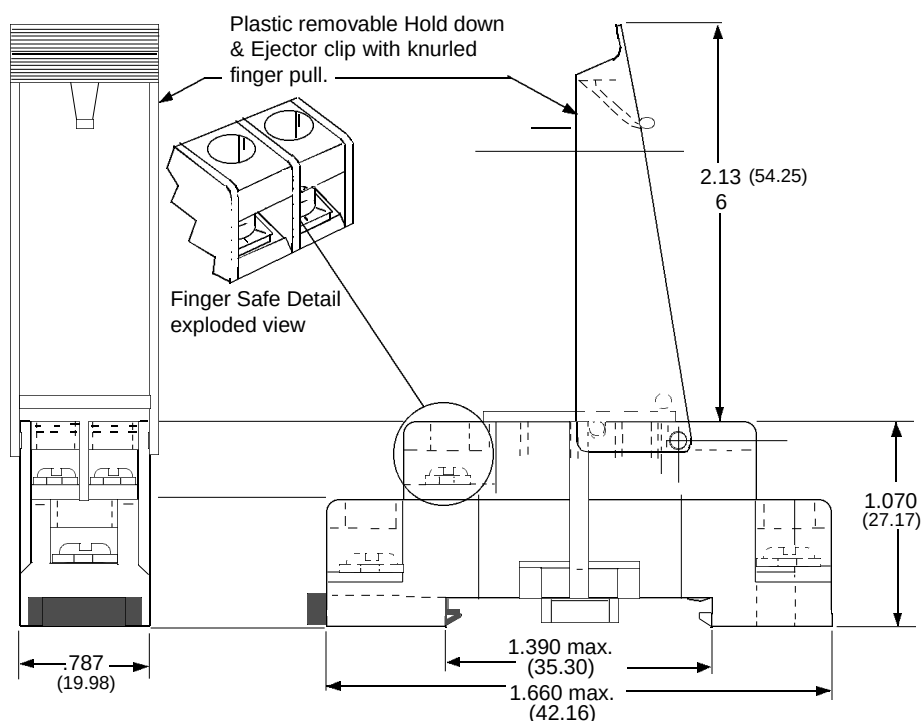
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R
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L
A
Y
S

WIRING DIAGRAM



OUTLINE DIMENSIONS

DIMENSIONS SHOWN ARE REFERENCE ONLY
Dimensions Shown in INCHES and (Millimeters)



REPLACES IDEC SH1B-05 SERIES SOCKET

PART NO.	REMARKS
70-781-1	Supplied with removable hold down ejector clip

SERIES 788

DPDT, 3PDT PLUG-IN POWER RELAY

BENEFITS:

FLAG INDICATOR: SHOWS RELAY STATUS IN MANUAL OR POWERED CONDITION.

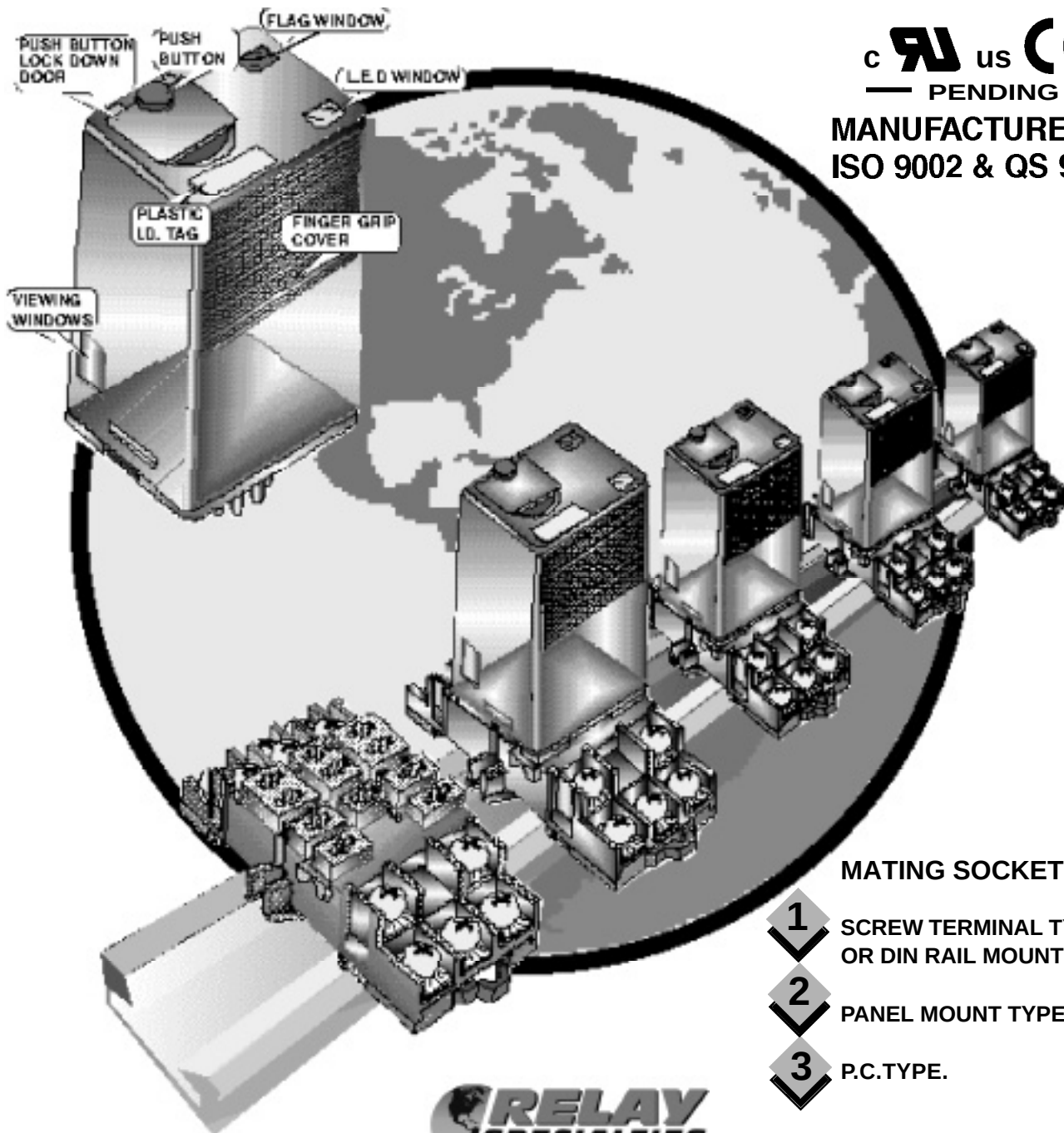
L.E.D. STATUS LAMP: SHOWS COIL "ON" OR "OFF" STATUS. IDEAL IN LOW LIGHT CONDITIONS.

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.



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— PENDING —

**MANUFACTURED UNDER
ISO 9002 & QS 9000**

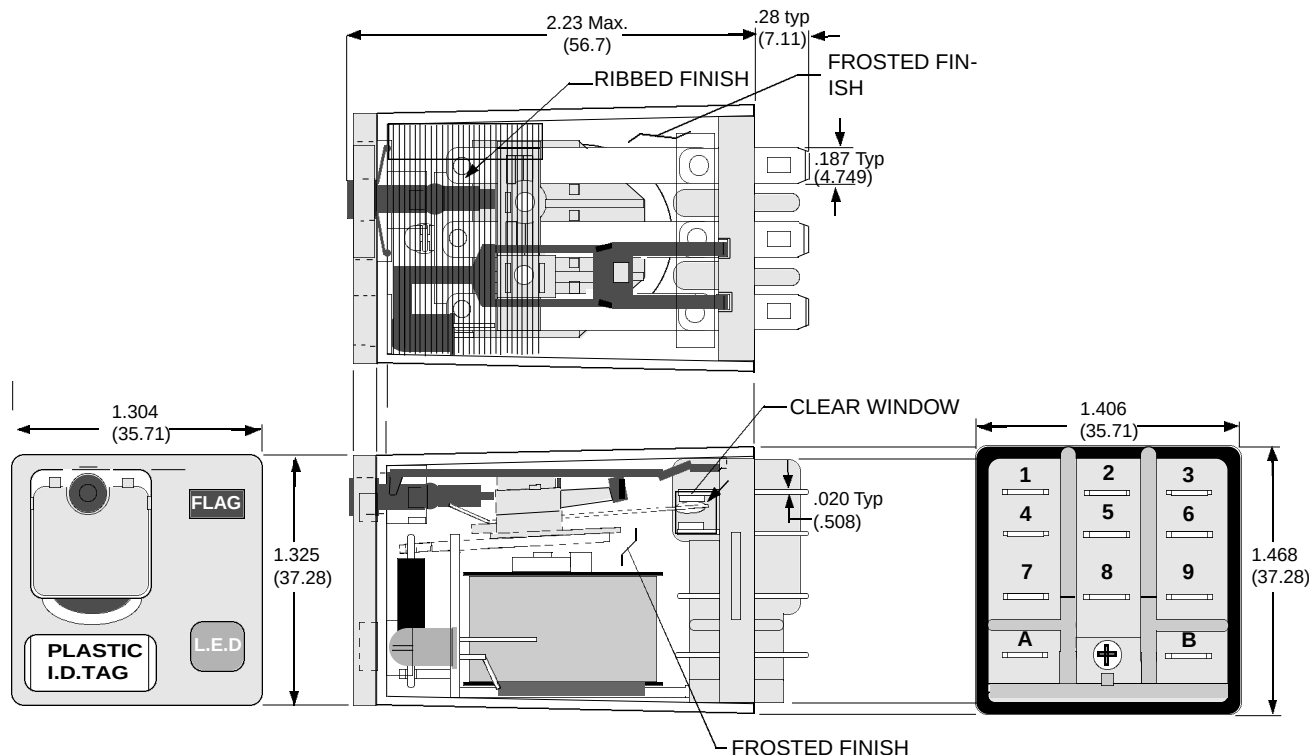
MATING SOCKETS AVAILABLE

- 1** SCREW TERMINAL TYPE FOR PANEL OR DIN RAIL MOUNTING.
- 2** PANEL MOUNT TYPE.
- 3** P.C. TYPE.

OUTLINE DIMENSIONS

SOLDER/PLUG-IN TERMINAL STYLE

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



GENERAL SPECIFICATIONS

Coil Pull-in: DC - 80%, AC - 85% of Nominal voltage.
 Coil Dropout: 10% of nominal or more.
 Insulation System: Class "B" (130°C per UL std. 1446).
 Maximum Coil dissipation: DC coils - 3 Watts.

Contacts: Silver Cadmium Oxide, Gold flashed.
 Contact Rating:
 DPDT - 12Amp, 120/240 VAC,
 3PDT - 11Amp, 120/240VAC, 50/60Hz, 28 VDC.

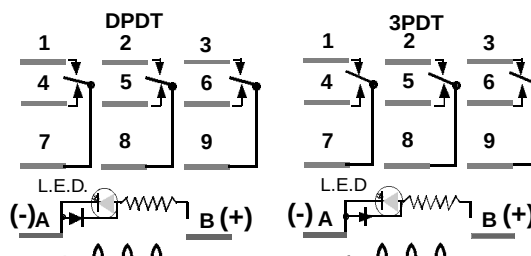
Dielectric withstanding Voltage
 Across Open Contacts: 500 V rms
 Between Current Carrying Parts: 2000 V rms

Temperature
 Operating: (AC) -30°C - +50°C, (DC) -30°C - +65°C

Terminals: Solder Plug-in or P.C. terminals.
 Enclosure: Polycarbonate dust cover.

WIRING DIAGRAM

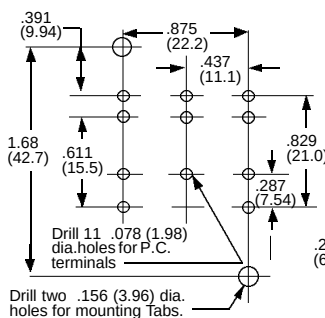
VIEWED FROM PIN END



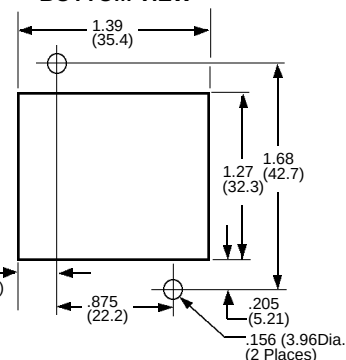
L.E.D. LAMPS OPTIONAL

RECOMMENDED SOCKET LAYOUTS

PRINTED CIRCUIT BOARD
 BOTTOM VIEW



CHASSIS CUTOUT
 BOTTOM VIEW



SERIES 788 DPDT, 3PDT PLUG-IN POWER RELAY

RELAY PART NUMBERS

PART NUMBERS FOR DPDT

PART NUMBERS	Coil measured @ 25°C	
	Nominal Input Voltage	Nominal Resistance (Ohms)
AC COIL - SOLDER/PLUG-IN TERMINALS		
788XBXCM4L-24A	24 VAC, 50/60 Hz	72 Ω
788XBXCM4L-120A	120 VAC, 50/60Hz	1,700 Ω
788XBXCM4L-220/230A	220/230 VAC, 50 Hz	9,100 Ω
788XBXCM4L-240A	240 VAC, 50/60HZ	9,100 Ω
AC COIL - PRINTED CIRCUIT TERMINALS		
788XBXTCM4L-24A	24 VAC, 50/60 Hz	72 Ω
788XBXTCM4L-120A	120 VAC, 50/60Hz	1,700 Ω
788XBXTCM4L-220/230A	220/230 VAC, 50 Hz	9,100 Ω
788XBXTCM4L-240A	240 VAC, 50/60HZ	9,100 Ω
DC COIL - SOLDER/PLUG-IN TERMINALS		
788XBXCM4L-110D	110 VDC	10,000 Ω
788XBXCM4L-24D	24 VDC	470 Ω
788XBXCM4L-12D	12 VDC	120 Ω
DC COIL - PRINTED CIRCUIT TERMINALS		
788XBXTCM4L-110D	110 VDC	10,000 Ω
788XBXTCM4L-24D	24 VDC	470 Ω
788XBXTCM4L-12D	12 VDC	120 Ω

PART NUMBERS FOR 3PDT

PART NUMBERS	Coil measured @ 25°C	
	Nominal Input Voltage	Nominal Resistance (Ohms)
AC COIL - SOLDER/PLUG-IN TERMINALS		
788XCXCM4L-24A	24 VAC, 50/60 Hz	72 Ω
788XCXCM4L-120A	120 VAC, 50/60Hz	1,700 Ω
788XCXCM4L-220/230A	220/230 VAC, 50 Hz	9,100 Ω
788XCXCM4L-240A	240 VAC, 50/60HZ	9,100 Ω
AC COIL - PRINTED CIRCUIT TERMINALS		
788XCXTCM4L-24A	24 VAC, 50/60 Hz	72 Ω
788XCXTCM4L-120A	120 VAC, 50/60Hz	1,700 Ω
788XCXTCM4L-220/230A	220/230 VAC, 50 Hz	9,100 Ω
788XCXTCM4L-240A	240 VAC, 50/60HZ	9,100 Ω
DC COIL - SOLDER/PLUG-IN TERMINALS		
788XCXCM4L-110D	110 VDC	10,000 Ω
788XCXCM4L-24D	24 VDC	470 Ω
788XCXCM4L-12D	12 VDC	120 Ω
DC COIL - PRINTED CIRCUIT TERMINALS		
788XCXTCM4L-110D	110 VDC	10,000 Ω
788XCXTCM4L-24D	24 VDC	470 Ω
788XCXTCM4L-12D	12 VDC	120 Ω

STANDARD PART NUMBERS SHOWN ABOVE.

ORDERING CODE

788 XBX CM4L -120A

Series _____
Enclosed Power relay with flag indicator, & I.D. tag

Contact Arrangement: _____
XBX (DPDT)
XCX (3PDT)

Terminal style: _____
Solder/plug-in (Blade) terminals - No Code
Printed Circuit terminals - Code - T

Standard Features: Push Button & Lock down door, L.E.D. Lamp Indicator _____

Coil Voltage: _____
6, 12, 24, 120, 220/230, 240 Add "A" for VAC Coils
6, 12, 24, 48, 110 Add "D" for VDC Coils

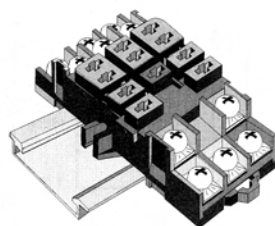
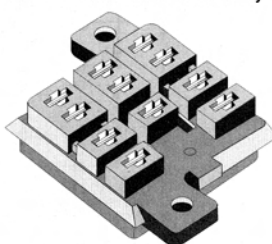
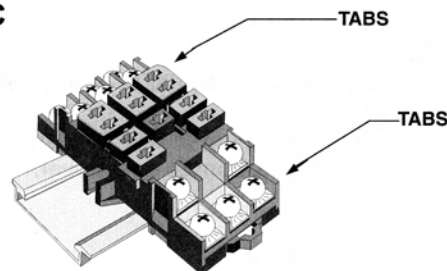
Struthers-Dunn

Other coil voltages available on special order.

MATING SOCKETS

SOCKET PART NUMBERS LISTED BELOW.

RATED: 15 AMPS, 300 VAC

70-463-1 11 PIN SCREW TERMINAL
DIN/PANEL MOUNT.70-124-1 .130" SOLDER TERMINALS.
70-124-2 .187" Q.C. TERMINALS.70-178-1 P.C. TERMINAL.
70-178-2 P.C. TERMINAL (NO TABS).

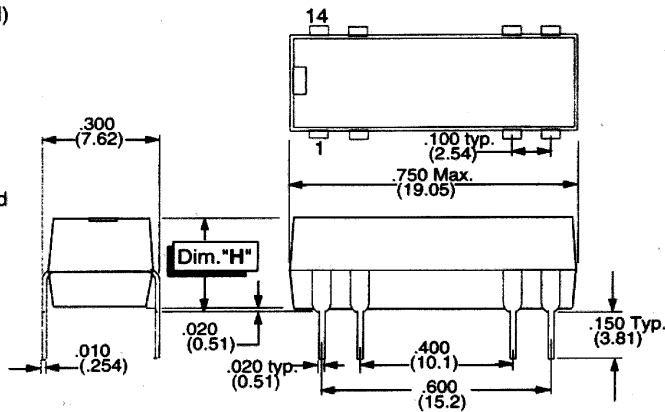
DUAL IN-LINE PACKAGE REED RELAY

DIP

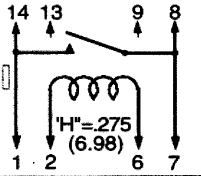
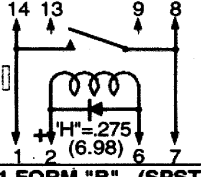
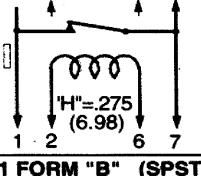
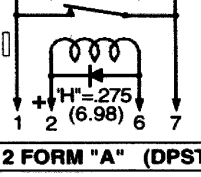
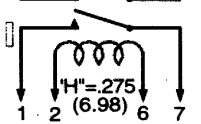
7
RELAYS

SPECIFICATIONS

Package Material: Epoxy, molded
 Contact Material: Rhodium or Mercury (as selected)
 Ambient Temperature: - 45°C to + 85°C
 Dielectric Strength: 150 V rms Across open contacts
 1500 V rms all other points
 Insulation Resistance: 1000 Megohms Min.
 Capacitance: 1.0 pF typical coil to contacts
 Shock Resistance: 50 G's
 Vibration Resistance: 20 G's to 200 Hz
 Operate Time: 1 Millisecond max.
 Release Time: 1 Millisecond max.
 Life: 10 Million operations at rated load
 100 Million operations Low Level



MIL SPECIFICATION
 MIL-R-83516/1 and /4 VERSIONS AVAILABLE

CIRCUIT DIAGRAM TOP VIEW	<i>Magnecraft</i> STRUTHERS-DUNN		COIL Measured @ 25°C					MAXIMUM CONTACT RATING	
			NOMINAL INPUT VOLTAGE	MAXIMUM PULL-IN	MAXIMUM DROPOUT	NOMINAL RESIS- TANCE (OHMS)	NOMINAL POWER (mW)	MAXIMUM SWITCHING LOAD	MAXIMUM CONTINUOUS CARRY CURRENT
	EQUIVALENT RELAY PART NUMBERS								
1 FORM "A" (SPST - N.O.)									
	W171DIP-2	MRR1ADS8-5D	5	3.8	0.5	500	50	10VA 0.5 AMP 100VDC	1.5 AMPS
	W171DIP-4	MRR1ADS8-12D	12	9.0	1.0	1200	120		
	W171DIP-5	MRR1ADS8-24D	24	18.0	2.0	2200	270		
1 FORM "A" (SPST - N.O.) WITH CLAMPING DIODE									
	W171DIP-7	MRR1ADS8V-5D	5	3.8	0.5	500	50	10VA 0.5 AMP 100VDC	1.5 AMPS
	W171DIP-9	MRR1ADS8V-12D	12	9.0	1.0	1200	120		
	W171DIP-10	MRR1ADS8V-24D	24	18.0	2.0	2200	270		
1 FORM "B" (SPST - N.C.)									
	W171DIP-12	MRR1BDS8-5D	5	3.8	0.5	500	50	10VA 0.5 AMP 100VDC	1.5 AMPS
	W171DIP-14	MRR1BDS8-12D	12	9.0	1.0	1200	120		
	W171DIP-15	MRR1BDS8-24D	24	18.0	2.0	2200	270		
1 FORM "B" (SPST - N.C.) WITH CLAMPING DIODE									
	W171DIP-17	MRR1BDS8V-5D	5	3.8	0.5	500	50	10VA 0.5 AMP 100VDC	1.5 AMPS
	W171DIP-19	MRR1BDS8V-12D	12	9.0	1.0	1200	120		
	W171DIP-20	MRR1BDS8V-24D	24	18.0	2.0	2200	270		
2 FORM "A" (DPST - N.O.)									
	W171DIP-21	MRR2ADLX8-5D	5	3.8	0.5	125	125	10VA 0.5AMP 100VDC	1.5 AMPS
	W171DIP-23	MRR2BDLX8-12D	12	9.0	1.0	500	300		
	W171DIP-24	MRR2BDLX8-24D	24	18.0	2.0	2000	270		

DUAL IN-LINE PACKAGE REED RELAY

DIP



MIL SPECIFICATION
MIL-R-83516/1 and /4 VERSIONS AVAILABLE
GPL LISTED

CIRCUIT DIAGRAM TOP VIEW	Magnecraft STRUTHERS-DUNN		COIL Measured @ 25°C					MAXIMUM CONTACT RATING	
			NOMINAL INPUT VOLTAGE	MAXIMUM PULL-IN	MAXIMUM DROPOUT	NOMINAL RESIS- TANCE (OHMS)	NOMINAL POWER mW	MAXIMUM SWITCHING LOAD	MAXIMUM CONTINUOUS CARRY CURRENT
	EQUIVALENT RELAY PART NUMBERS								
2 FORM "A" (DPST - N.O.) WITH CLAMPING DIODE									
	W171DIP-25	MRR2ADLXV-5D	5	3.8	0.5	200	125	10VA 0.5 AMP 100VDC	1.5AMPS
	W171DIP-27	MRR2ADLXV-12D	12	9.0	1.0	500	290		
	W171DIP-28	MRR2ADLXV-24D	24	18.0	2.0	2200	270		
1 FORM "C" (SPDT)									
	W172DIP-1	MRR1CDL8K2-5D	5	3.8	0.5	200	125	4VA .25 AMP 100VDC	0.5 AMPS
	* W172DIP-251		5	3.8	0.5	500	50		
	W172DIP-3	MRR1CDL8K2-12D	12	9.0	1.0	500	300		
	W172DIP-4	MRR1CDL8K2-24D	24	18.0	2.0	2200	270		
1 FORM "C" (SPDT) WITH CLAMPING DIODE									
	W172DIP-5	MRR1CDL8K2V-5D	5	3.8	0.5	200	125	4VA .25 AMP 100VDC	0.5 AMPS
	W172DIP-7	MRR1CDL8K2V-12D	12	9.0	1.0	500	300		
	W172DIP-8	MRR1CDL8K2V-24D	24	18.0	2.0	2200	270		
2 FORM "C" (DPDT)									
	W172DIP-17		5	3.8	0.5	46	540	4VA 0.1 AMP 100VDC	0.5AMPS
	W172DIP-19		12	9.0	1.0	266	540		
	W172DIP-20		24	18.0	2.0	1066	540		
2 FORM "C" (DPDT) WITH CLAMPING DIODE									
	W172DIP-21		5	3.8	0.5	46	540	4VA 0.1 AMP 100VDC	0.5AMPS
	W172DIP-23		12	9.0	1.0	266	540		
	W172DIP-24		24	18.0	2.0	1066	540		
1 FORM "C" (SPDT)									
	W172DIP-141	MRR1CDL8-5D	5	3.8	0.5	200	125	4VA .25 AMP 100VDC	0.5AMPS
	W172DIP-145	MRR1CDL8-12D	12	9.0	1.0	1000	144		
	W172DIP-146	MRR1CDL8-24D	24	18.0	2.0	3200	180		
1 FORM "C" (SPDT) WITH CLAMPING DIODE									
	W172DIP-147	MRR1CDL8V-5D	5	3.8	0.5	200	125	4VA .25 AMP 100VDC	0.5AMPS
	W172DIP-149	MRR1CDL8V-12D	12	9.0	1.0	1000	144		
	W172DIP-150	MRR1CDL8V-24D	24	18.0	2.0	3200	180		

* W172DIP-251 IS .340 HIGH

DUAL IN-LINE PACKAGE REED RELAY

DIP

7

MIL SPECIFICATION
MIL-R-83516/1 and /4 VERSIONS AVAILABLE
QPL LISTED



RELAYS

CIRCUIT DIAGRAM TOP VIEW	Magnecraft STRUTHERS-DUNN		COIL Measured @ 25°C					MAXIMUM CONTACT RATING		
			NOMINAL INPUT VOLTAGE	MAXIMUM PULL-IN	MAXIMUM DROPOUT	NOMINAL RESIS- TANCE (OHMS)	NOMINAL POWER (mW)	MAXIMUM SWITCHING LOAD	MAXIMUM CONTINUOUS CARRY CURRENT	
	EQUIVALENT RELAY PART NUMBERS									
1 FORM "C" (SPDT) WITH CLAMPING DIODE										
	W172DIP-31	MRR1CDL8K1-5D	5	3.8	0.5	200	125	4VA .25 AMP 100VDC	0.5AMPS	
	W172DIP-33	MRR1CDLK1-12D	12	9.0	1.0	500	290			
	W172DIP-34	MRR1CDLK1-24D	24	18.0	2.0	2200	270			
1 FORM "C" (SPDT) WITH CLAMPING DIODE										
	W172DIP-35	MRR1CDL8K1V-5D	5	3.8	0.5	200	125	4VA .25 AMP 100VDC	0.5 AMPS	
	W172DIP-37	MRR1CDL8K1V-12D	12	9.0	1.0	500	300			
	W172DIP-38	MRR1CDL8K1V-24D	24	18.0	2.0	2200	270			
1 FORM "A" (SPST-NO) MERCURY WETTED, POSITION SENSITIVE										
	W174DIP-1	MRR1ADS8Z-5D	5	3.8	0.5	50	650	50VA 2.0 AMP 500VDC	3.0 AMPS	
	W174DIP-3	MRR1ADS8Z-12D	12	9.0	1.0	250	480			
1 FORM "A" (SPST-NO) WITH CLAMPING DIODE MERCURY WETTED, POSITION SENSITIVE										
	W174DIP-5	MRR1ADS8ZV-5D	5	3.8	0.5	55	650	50VA 2.0 AMP 500VDC	3.0 AMPS	
	W174DIP-7	MRR1ADS8ZV-12D	12	9.0	1.0	300	480			
	W174DIP-8	MRR1ADS8ZV-24D	24	18.0	2.0	1100	525			
1 FORM "A" (SPST-NO) LATCHING DRY REED										
		MRRDL1AS8-5D	5	3.8	0.5	750	35	10VA 0.5AMP 100VDC	1.5 AMPS	
		MRRDL1AS8-12D	12	9.0	1.0	1000	145			
		MRRDL1AS8-24D	24	18.0	2.0	4600	125			

WHEN SPACING RELAYS, EXCEPT FOR THE LATCH VERSION, THE RELAYS REQUIRE 3/4 INCH SPACING FROM THE SIDE OF THE ADJACENT RELAYS. LATCH RELAYS REQUIRE 1 INCH SPACING BETWEEN ADJACENT RELAYS FROM END TO END AND CENTER LINE TO CENTER LINE.

SINGLE IN-LINE PACKAGE REED RELAY

SIP

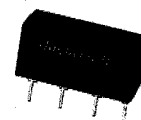
SPECIFICATIONS

Package Material:	Epoxy, molded
Contact Material:	Rhodium
Ambient Temperature:	- 40°C to + 85°C
Dielectric Strength:	150 V rms Across open contacts 1500 V rms all other points
Insulation Resistance:	1000 Megohms Min.
Capacitance:	1.0 pF typical coil to contacts
Shock Resistance:	50 G's
Vibration Resistance:	20 G's to 200 Hz
Operate Time:	1 Millisecond
Release Time:	1 Millisecond
Life:	5 Million operations at rated load 20 Million operations no load

CLASS 117 & MRRQ "SIP"

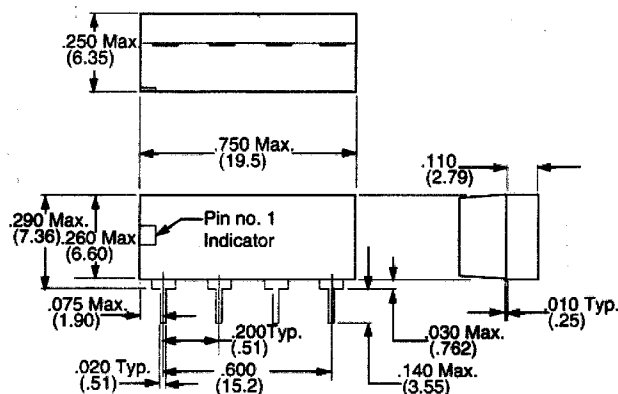
0.5 AMP SWITCHING

FORM "A" OR "B" CONTACTS



OUTLINE DIMENSIONS

Dimensions shown are in "INCHES" & (Millimeters)



OPTIONS

Suffix (Used in Struthers-Dunn Part Numbers only)

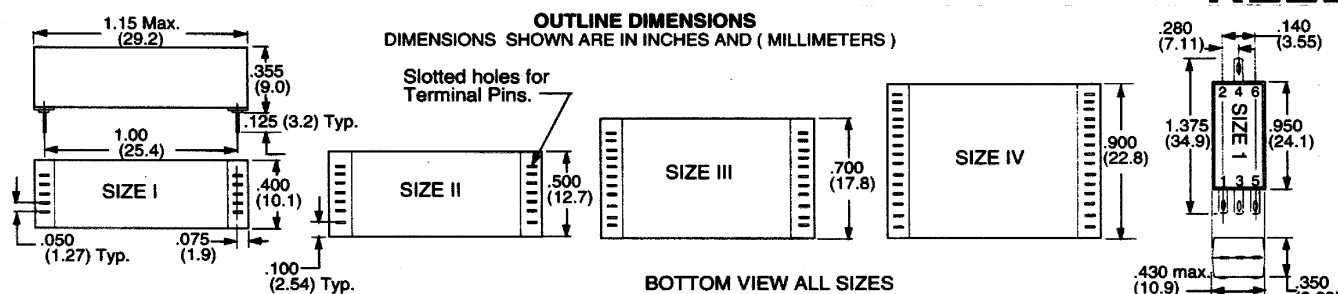
Electrostatic shield	E (requires Additional Terminal)
Low power Coil	R (5V & 12V dry reed only)
Mercury Reed Switch	Z (1 form "A" Only, position sensitive)

CIRCUIT DIAGRAM TOP VIEW	Magnecraft STRUTHERS-DUNN		COIL Measured @ 25°C					MAXIMUM CONTACT RATING			
	EQUIVALENT RELAY PART NUMBERS		NOMINAL INPUT VOLTAGE	MAXIMUM PULL-IN	MAXIMUM DROPOUT	NOMINAL RESIS- TANCE (OHMS)	NOMINAL POWER (mW)	MAXIMUM SWITCHING LOAD	MAXIMUM CONTINUOUS CARRY CURRENT		
1 FORM "A" (SPST - N.O.)											
	W117SIP-1	MRRQ1A-5D	5	4.0	0.5	500	50	10VA 0.5 AMP 200VDC	1.5 AMPS		
	W117SIP-3	MRRQ1A-12D	12	9.6	1.0	1870	77				
	W117SIP-5	MRRQ1A-24D	24	19.2	2.0	3200	180				
1 FORM "B" (SPST - N.C.)											
	W117SIP-22	MRRQ1B-5D	5	4.0	0.5	500	50				
	W117SIP-23	MRRQ1B-12D	12	9.6	1.0	1200	120				
	W117SIP-24	MRRQ1B-24D	24	19.2	2.0	2200	270				
1 FORM "A" (SPST - N.O.) WITH CLAMPING DIODE											
	W117SIP-6	MRRQ1AV-5D	5	4.0	0.5	500	50				
	W117SIP-8	MRRQ1AV-12D	12	9.6	1.0	1870	77				
	W117SIP-10	MRRQ1AV-24D	24	19.2	2.0	3200	180				
1 FORM "B" (SPST - N.C.) WITH CLAMPING DIODE											
	W117SIP-18	MRRQ1BV-5D	5	4.0	0.5	500	50				
	W117SIP-25	MRRQ1BV-12D	12	9.6	1.0	1200	120				
	W117SIP-26	MRRQ1BV-24D	24	19.2	2.0	2200	220				

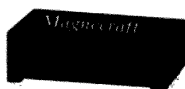
GENERAL SPECIFICATIONS MINIATURE REED RELAYS

MINIATURE REED

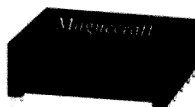
7 RELAYS



SIZE I



SIZE II



SIZE III



SIZE IV



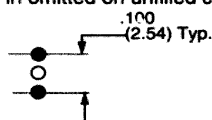
101MX

RELAY CLASS	101/193	104/193	131	134
CONTACT FORM:	1 Form "A" 1 Form "A" Latching (SPST-NO) 3 Form "A" Latching up to 6 Form "A"	1 & 2 Form "C" (SPDT,DPDT) for 104 Series 1 to 4 Form "C" SPDT,DPDT, 3PDT,4PDT for 193 Series	1 Form "A" (SPST) or 2 Form "A" Mercury DPST-N.O.	1 Form "C" Mercury (SPDT) 2 Form "C" Mercury (DPDT)
CONTACT RATING MAX. (Resistive Load): SWITCHING VOLTAGE MAX. SWITCHING CURRENT MAX. CARRY CURRENT MAX.	10 VA 200DC/130 AC 0.5 AMPS 2 AMPS	4VA 100 VDC 0.5 AMPS 1 AMPS	50VA 500 VDC 2 AMPS 3 AMPS	50VA 500 VDC 2 AMPS 3 AMPS
INITIAL CONTACT RESISTANCE (IN MILLIOHMS):	200 Milliohms Max.		100 Milliohms Max. Contact resistance Stability ± 10% over Life.	
INSULATION RESISTANCE (Ohms) TESTED AT 100 VDC:	10 ⁹ Min.		10 ¹⁰ Min.	10 ¹⁰ Min.
DIELECTRIC STRENGTH MIN. ACROSS OPEN CONTACTS: MIN. BETWEEN MUTUALLY INSULATED POINTS:	200 VDC 500 VDC		1000 VDC 1000 VDC	1000 VDC 1000 VDC
CAPACITANCE (non-shielded relay) ACROSS OPEN CONTACTS: OPEN CONTACTS TO COIL: CLOSED CONTACTS TO COIL:	3pf Typical Form "A" 2.0 pF Typ. Form "C" 3.0pF Typ.		.3pF 2.0 pF 3.0pF	.9pF 2.0 pF 2.5pF
TEMPERATURE: MAX. AMBIENT OPERATING (°C)	85 °C or (120 °C -70° x [Coil Power]) whichever is lower			
TEMPERATURE: MIN. AMBIENT OPERATING (°C)	- 45°C		- 37°C	
STORAGE TEMPERATURE:	- 60°C to + 105°C		- 40°C to + 105°C	
MOUNTING POSITION:	ANY		Vertical ± 15°	
LIFE AT RATED LOAD (Operations) With appropriate Contact protection (End of life 1 Ohm)	10 Million Operations 100 Million Operations at Low level		40 x 10 ⁸ 3 x 10 ⁸ at low level	50 x 10 ⁸ 5 x 10 ⁸ at low level
OPERATE TIME (Typical [in Micro-Sec.]).	800 μS, for N.O. 600 μS, for N.C.		1800 μS, for N.O.	2300 μS 2000 μS
TYPICAL RELEASE TIME (in Micro-Sec.) Diode Suppression: No Suppression:	600 μS, for N.O. 800 μS, for N.C.		1750 μS	2000 μS 2500 μS
PACKAGING:	Dust covered Epoxy Encapsulated is Standard.			

CLASS 101 DRY MINIATURE REED RELAY

MINIATURE REED

Spacing between filled in circles in schematics are on a .100 Grid Pattern. Pin omitted on unfilled circles.



PIN SPACING OF .100" IS STANDARD. PIN SPACING OF .150 IS AVAILABLE ON SPECIAL ORDER. ALSO AVAILABLE ARE MODELS WITH ELECTROSTATIC SHIELDS. CONSULT DISTRIBUTOR FOR PART NUMBERS. NONSTANDARD SCHEMATICS AND PIN-OUTS CAN ALSO BE PRODUCED FOR SPECIFIC CUSTOMER REQUIREMENTS.

CASE SIZE	CIRCUIT DIAGRAM TOP VIEW	<i>Magnecraft</i>	COIL MEASURED AT 25°C					MAX. CONTACT RATING			
		PART NUMBER	NOMINAL INPUT VOLTAGE	MAXIMUM PULL-IN	MAXIMUM DROPOUT	NOMINAL RESISTANCE (OHMS)	NOMINAL POWER (mW)	MAX. RESISTIVE LOAD	SWITCHING CURRENT & VOLTAGE	CARRY CURRENT	
SPST-NO (1 FORM "A")											
I		W101MPCX-2 W101MPCX-3 W101MX-2 * W101MX-3 *	12 24 12 24	9.0 18.0 9.0 18.0	1.0 2.0 1.0 2.0	1400 3300 1400 3300	102 175 102 175	10 VA	0.5 AMP 200 VDC	2 AMPS	
3PST-NO (3 FORM "A")											
III		W101MPCX-5 W101MPCX-6 W101MPCX-7	5 12 24	4.0 9.0 18.0	0.5 1.0 2.0	90 430 1500	280 340 380	10 VA	0.5 AMP 200 VDC	2 AMPS	
SPST-NO (1 FORM "A") MAGNETIC LATCH											
III		W101LMPCX-16 W101LMPCX-17	5/5 12/12	3.8 9.0	0.5 1.0	425/425 2500/2500	60 60	10 VA	0.5 AMP 200 VDC	2 AMPS	
CLASS 131 MERCURY											
SPST-NO (1 FORM "A") MERCURY											
III		W131MPCX-3 W131MPCX-4	12 24	9.0 18.0	1.0 2.0	330 1400	435 410	50 VA	2.0 AMP 500 VDC	3 AMPS	
DPST-NO (2 FORM "A") MERCURY											
III		W131MPCX-7 W131MPCX-8	12 24	9.0 18.0	1.0 2.0	230 1200	626 480	50 VA	2.0 AMP 500 VDC	3 AMPS	

For Class 134 allow a minimum of 30 seconds after mounting for excess Mercury to clear from the contacts before using.

* AXIAL LEAD RELAY

CLASS 104 DRY MINIATURE REED RELAY

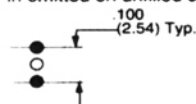
MINIATURE
REED

7

PIN SPACING OF .100" IS STANDARD. PIN SPACING OF .150 IS AVAILABLE ON SPECIAL ORDER. ALSO AVAILABLE ARE MODELS WITH ELECTROSTATIC SHIELDS.

NONSTANDARD SCHEMATICS AND PIN-OUTS CAN ALSO BE PRODUCED FOR SPECIFIC CUSTOMER REQUIREMENTS.

Spacing between filled in circles in schematics are on a .100 Grid Pattern. Pin omitted on unfilled circles.



RELAYS

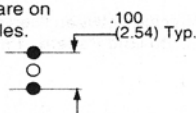
CASE SIZE	CIRCUIT DIAGRAM TOP VIEW	Magnecraft	COIL MEASURED AT 25°C					MAX. CONTACT RATING		
		PART NUMBER	NOMINAL INPUT VOLTAGE	MAXIMUM PULL-IN	MAXIMUM DROPOUT	NOMINAL RESISTANCE (OHMS)	NOMINAL POWER (mW)	MAX. RESISTIVE LOAD	SWITCHING CURRENT & VOLTAGE	CARRY CURRENT
SPST (1 FORM "C")										
I		W104MPCX-3	24	18.0	2.0	2600	220	4 VA	0.25 AMP 100VDC	0.5 AMPS
III		W104MPCX-6	12	9.0	1.0	230	626	4 VA	0.25 AMP 100VDC	0.5 AMPS
DPDT (2 FORM "C")										
III		W104MPCX-149 W104MPCX-150 W104MPCX-151	5 12 24	4.0 9.0 18.0	0.5 1.0 2.0	45 230 1200	556 626 480	4 VA	0.25 AMP 100VDC	0.5 AMPS
CLASS 134 MERCURY										
DPDT(2 FORM "C") MERCURY										
II		W134MPCX-7 W134MPCX-8	5 12	4.0 9.6	0.5 1.0	45 230	560 620	50 VA	1.0 AMP 500 VDC	2.0 AMPS
DPDT (2 FORM "C") MERCURY WITH SUPPRESSION DIODE										
II		W134MPCX-10 W134MPCX-11	5 12	4.0 9.6	1.0 1.0	45 230	560 620	50 VA	1.0 AMP 500 VDC	2.0 AMPS
SPDT (1 FORM "C") MERCURY										
I		W134MPCX-1 W134MPCX-2 W134MPCX-3	5 12 24	4.0 9.0 18.0	0.5 1.0 2.0	60 330 1400	417 435 410	50 VA	1.0 AMP 500 VDC	2.0 AMPS

For Class 134 allow a minimum of 30 seconds after mounting for excess Mercury to clear from the contacts before using.

CLASS 193 DRY MINIATURE REED RELAY

MINIATURE
REED

Spacing between filled in circles in schematics are on a .100 Grid Pattern. Pin omitted on unfilled circles.

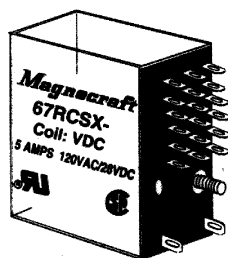


PIN SPACING OF .100" IS STANDARD. PIN SPACING OF .150 IS AVAILABLE ON SPECIAL ORDER. ALSO AVAILABLE ARE MODELS WITH ELECTROSTATIC SHIELDS. CONSULT DISTRIBUTOR FOR PART NUMBERS. NONSTANDARD SCHEMATICS AND PIN-OUTS CAN ALSO BE PRODUCED FOR SPECIFIC CUSTOMER REQUIREMENTS.

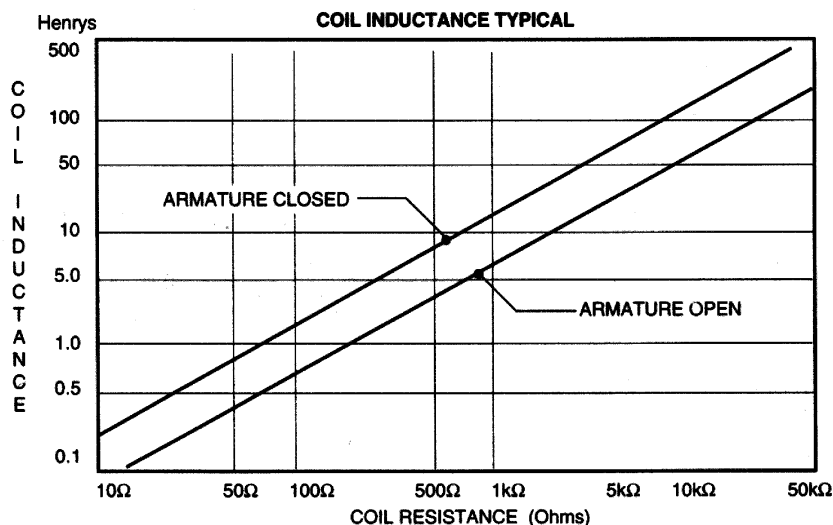
CASE SIZE	CIRCUIT DIAGRAM (Top View)	<i>Magnecraft</i> PART NUMBER	COIL MEASURED AT 25°C					MAX. CONTACT RATING		
			NOMINAL INPUT VOLTAGE	MAXIMUM PULL-IN	MAXIMUM Dropout	NOMINAL RESISTANCE (OHMS)	NOMINAL POWER (mW)	MAX. RESISTIVE LOAD	SWITCHING CURRENT & VOLTAGE	CARRY CURRENT
SPST-N.O. (1 FORM "A")										
I		W193RE1A3-5S W193RE1A3-12G W193RE1A3-24G	5 12 24	4.0 9.0 18.0	0.5 1.0 2.0	500 420 2300	50 350 250	10 VA	0.5 AMP 200 VDC	2 AMPS
SPDT (1 FORM "C")										
I		W193RE1C3-5S W193RE1C3-12G W193RE1C3-24G	5 12 24	4.0 9.0 18.0	0.5 1.0 2.0	350 420 2300	70 350 250	4 VA	0.5 AMP 100 VDC	1 AMP
DPST-N.O. (2 FORM "A")										
II		W193RE2A3-6G W193RE2A3-12G W193RE2A3-24G	5 12 24	4.0 9.0 18.0	0.5 1.0 2.0	70 280 1500	360 500 390	10 VA	0.5 AMP 200 VDC	2 AMP
DPDT (2 FORM "C")										
II		W193RE2C3-6G W193RE2C3-12G W193RE2C3-24G	5 12 24	4.0 9.0 18.0	0.5 1.0 2.0	70 280 1500	360 500 390	4 VA	0.5 AMP 100 VDC	1 AMP
3PST-N.O. (3 FORM "A")										
III		W193RE3A3-6G W193RE3A3-12G W193RE3A3-24G	5 12 24	4.0 9.0 18.0	0.5 1.0 2.0	50 210 1150	500 690 500	10 VA	0.5 AMP 200 VDC	2 AMP
3PDT (3 FORM "C")										
III		W193RE3C3-6G W193RE3C3-12G W193RE3C3-24G	5 12 24	4.0 9.0 18.0	0.5 1.0 2.0	50 210 1150	500 690 500	4 VA	0.5 AMP 100 VDC	1 AMP
4PST-N.O. (4 FORM "A")										
IV		W193RE4A3-6G W193RE4A3-12G W193RE4A3-24G	5 12 24	4.0 9.0 18.0	0.5 1.0 2.0	50 210 1150	500 690 500	10 VA	0.5 AMP 200 VDC	2 AMP
4PDT (4 FORM "C")										
IV		W193RE4C3-6G W193RE4C3-12G W193RE4C3-24G	5 12 24	4.0 9.0 18.0	0.5 1.0 2.0	35 140 770	720 1030 750	4 VA	0.5 AMP 100 VDC	1 AMP

CLASS
67

MINIATURE ENCLOSED INDUSTRIAL RELAY



Standard Class 67 miniature industrial relays are designed for applications requiring 1 to 8 form "C" 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 67TRCSX- models have Bifurcated Contacts and are designed for low level switching applications.



CLASS 67 TYPICAL TIMING VALUES

POLES	SPDT DPDT	4PDT	6PDT	8PDT
OPERATE TIME	.012	.014	.016	.018
RELEASE TIME	.008	.008	.008	.008

Measured at Nominal Voltage @ 25°C

TYPICAL CONTACT LIFE EXPECTANCY FOR SWITCHING RESISTIVE LOADS @ 25°C

Load Current	Load Voltage	Number of Operations		
		Adjustment		
		Super sensitive	Ultra sensitive	Standard adjustment
5.0A	28 VDC	NA	NA	5 X 10 ⁴
5.0A	120VAC	NA	NA	5 X 10 ⁴
2.0A	28VDC/120VAC	6 X 10 ⁵	-	1.5 X 10 ⁶
1.0A	28VDC/120VAC	1.2 X 10 ⁷	5 X 10 ⁵	1.2 X 10 ⁷
0.5A	28VDC/120VAC	-	5 X 10 ⁶	-
0.1A	28VDC/120VAC	5 X 10 ⁷	-	5 X 10 ⁷
0.1A	6 VDC	-	5 X 10 ⁷	-
50mA	6 VDC	5 X 10 ⁷	-	5 X 10 ⁷
30mA	6 VDC	-	-	-
1mA	6 VDC	-	5 X 10 ⁷	-
10A	10mVDC	5 X 10 ⁷	-	5 X 10 ⁷

SPECIFICATIONS CLASS 67**COIL**

Pickup voltage: 80% of nominal voltage or less.
 Dropout voltage: 10% of nominal or more.
 Coil resistance: $\pm 10\%$ measured @ 25°C
 Maximum coil dissipation: 2.2 watts
 Coil Temperature rise: 30°C per watt
 Maximum coil temperature: 105°C

CONTACTS

Contact material: Silver, Gold overlay
 Contact resistance: 50 milliohms max. initial

CAPACITANCE

Between contacts: 2 pf, typ.
 Contact to coil: 2 pf, typ.
 Coil to frame: 30 pf, typ.

DIELECTRIC STRENGTH

Contact to coil: 1500 V rms
 Across open contacts: 500 V rms
 Coil to frame: 1000 V rms
 Contacts to frame: 1500 V rms
 Insulation resistance: 1000 megohms @ 25°C & 50% R.H.

TEMPERATURE

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

MISCELLANEOUS

Solder-bath temperature: +525°F (260°C) 10 seconds max.
 Enclosure Material: Polycarbonate see thru plastic cover.
 Weight: 0.8 to 1.4 oz. (22 to 40 grams)

OPTIONS:

Other options such as other coil voltages, sensitivities, contact arrangements and epoxy sealing are available on special order.

MINIATURE ENCLOSED INDUSTRIAL RELAY

**CLASS
67**

DC OPERATED - SOLDER TERMINAL or PLUG-IN STYLE					
STANDARD CONTACTS		COIL Measured @ 25°C			
Magnecraft PART NUMBER	CONTACT RATING	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL POWER (WATTS)	CONTACT CONFIGU- RATION
W67RCSX-101	5 AMPS	5	52	1W	SPDT
W67RCSX-103	5 AMPS	24	700	1W	SPDT
W67RCSX-1	5 AMPS	5	52	1/2W	DPDT
W67RCSX-2	5 AMPS	12	185	3/4W	DPDT
W67RCSX-3	5 AMPS	24	700	1W	DPDT
W67RCSX-4	5 AMPS	48	2500	1W	DPDT
W67RCSX-5	5 AMPS	115	15,000	1W	DPDT
W67RCSX-6	5 AMPS	5	52	1/2W	4PDT
W67RCSX-7	5 AMPS	12	185	3/4W	4PDT
W67RCSX-8	5 AMPS	24	700	1W	4PDT
W67RCSX-9	5 AMPS	48	2500	1W	4PDT
W67RCSX-10	5 AMPS	115	15,000	1W	4PDT
W67RCSX-12	5 AMPS	12	90	1.5W	6PDT
W67RCSX-13	5 AMPS	24	430	1.5W	6PDT
W67RCSX-17	5 AMPS	12	72	2W	8PDT
W67RCSX-18	5 AMPS	24	350	2W	8PDT

DC OPERATED - BIFURCATED CONTACTS - FOR LOW LEVEL SWITCHING APPLICATIONS

W67TRCSX-2	3 AMPS	12	185	3/4W	DPDT
W67TRCSX-3	3 AMPS	24	700	1W	DPDT
W67TRCSX-7	3 AMPS	12	185	3/4W	4PDT
W67TRCSX-8	3 AMPS	24	700	1W	4PDT
W67TRCSX-12	3 AMPS	12	90	1.5W	6PDT
W67TRCSX-13	3 AMPS	24	430	1.5W	6PDT
W67TRCSX-17	3 AMPS	12	72	2W	8PDT
W67TRCSX-18	3 AMPS	24	350	2W	8PDT

DC OPERATED - PRINTED CIRCUIT STYLE

STANDARD CONTACTS		COIL Measured @ 25°C			
Magnecraft PART NUMBER	CONTACT RATING	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL POWER (WATTS)	CONTACT CONFIGU- RATION
W67RPCX-2	5 AMPS	12 VDC	185	1W	DPDT
W67RPCX-3	5 AMPS	24 VDC	700	1W	DPDT
W67RPCX-7	5 AMPS	12 VDC	185	1W	4PDT
W67RPCX-8	5 AMPS	24 VDC	700	1W	4PDT
W67RPCX-12	5 AMPS	12 VDC	90	1.5W	6PDT
W67RPCX-13	5 AMPS	24 VDC	430	1.5W	6PDT

CLASS 67 - AC OPERATED RELAYS - SOLDER TERMINAL or PLUG-IN STYLE 50/60 Hz

STANDARD CONTACTS		COIL Measured @ 25°C			
Magnecraft PART NUMBER	CONTACT RATING	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL POWER (WATTS)	CONTACT CONFIGU- RATION
W67ARCSX-5	5 AMPS	120 VAC	-	1.5VA	DPDT
W67ARCSX-10	5 AMPS	120 VAC	-	2.5VA	4PDT
W67ARCSX-15	5 AMPS	120 VAC	-	2.5VA	6PDT

CLASS 67 - DC OPERATED - ULTRA SENSITIVE - SOLDER TERMINAL or PLUG-IN STYLE

STANDARD CONTACTS		COIL Measured @ 25°C				CONTACT CONFIGURATION
Magnecraft PART NUMBER	CONTACT RATING	NOMINAL INPUT MILLIAMPS DC	NOMINAL RESISTANCE (OHMS)	PULL-IN MILLIAMPS DC	PULL-IN WATTS	
W67SCSX-1	3 AMPS	9.4 mADC	1000	9.2 mADC	85mW	DPDT
W67SCSX-2	3 AMPS	6.4 mADC	2500	6.3 mADC	100mW	DPDT
W67SCSX-3	3 AMPS	4.5 mADC	5000	4.4 mADC	100mW	DPDT
W67SCSX-6	3 AMPS	13.7 mADC	1000	13.5 mADC	200mW	4PDT
W67SCSX-7	3 AMPS	9.1 mADC	2500	8.9 mADC	200mW	4PDT
W67SCSX-8	3 AMPS	6.5 mADC	5000	6.3 mADC	200mW	4PDT

MINIATURE ENCLOSED INDUSTRIAL RELAY

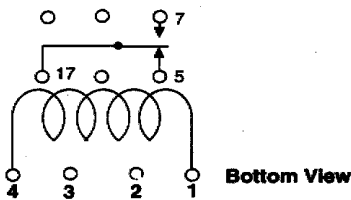
CLASS
67

7
RELAYS

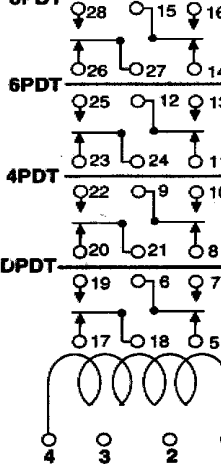
CONTACT MATERIAL: SILVER GOLD OVERLAY
RATED 3 or 5 AMPS @ 32VDC/120VAC

The Class 67 Relays have combination
solder/plug-in terminals with a 3-48UNC
stud or printed circuit terminals.

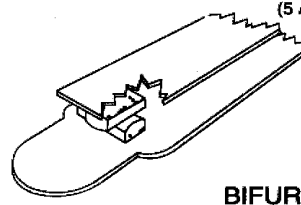
WIRING DIAGRAM
SPDT



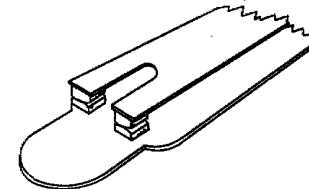
WIRING DIAGRAM
8PDT



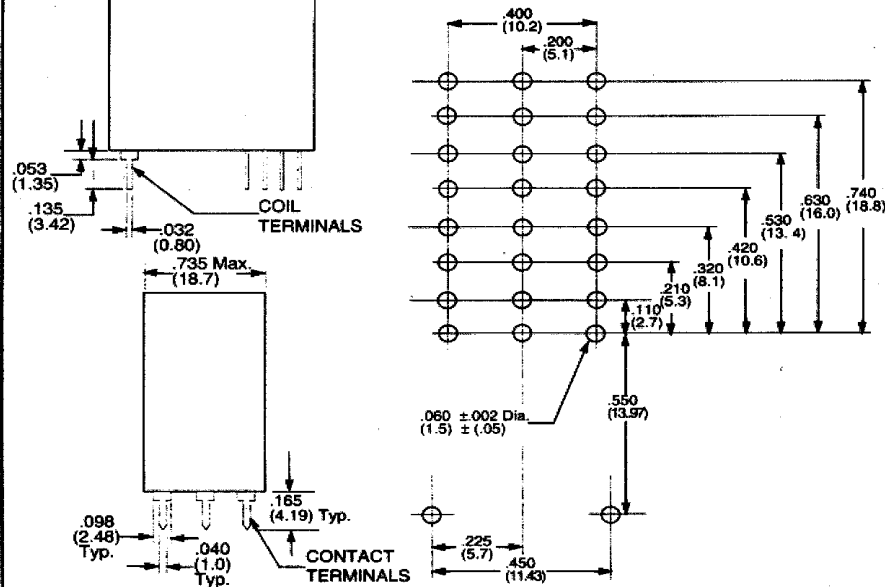
STANDARD CONTACTS
(5 AMP CROSS BAR)



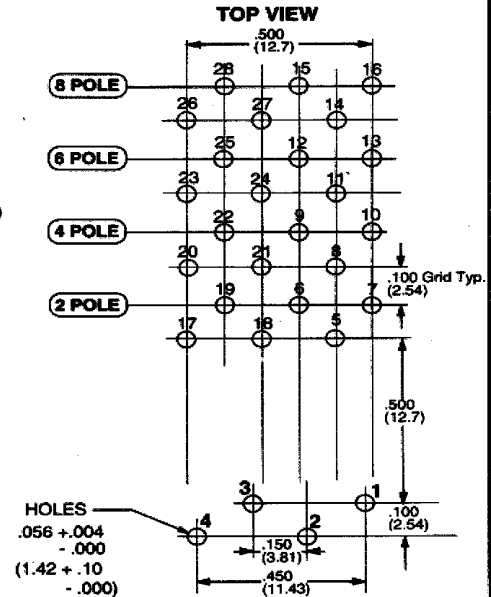
BIFURCATED CONTACTS
(LOW LEVEL APPLICATIONS)



SUGGESTED PRINTED CIRCUIT BOARD LAYOUT
FOR RELAYS WITH PRINTED CIRCUIT TERMINALS



SUGGESTED PRINTED CIRCUIT BOARD LAYOUT
FOR SOCKETS WITH PRINTED CIRCUIT TERMINALS

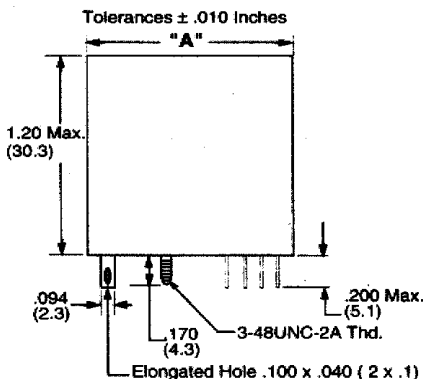


All Contact Terminals are .010 Thick.
All coil terminals are .018 Thick.

Dimensions shown are in inches and (Millimeters).

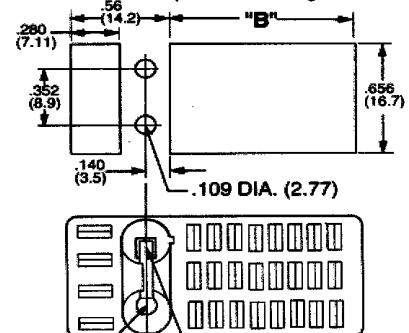
DIMENSIONS

CONTACT CONFIGURATION	"A" DIM.	"B" DIM.
SPDT	.978 (24.8)	.344 (8.7)
DPDT	1.156 (29.4)	.562 (14.3)
4PDT	1.374 (34.9)	.780 (19.8)
6PDT	1.592 (40.4)	1.000 (25.4)



All Contact Terminals are .010 Thick
all coil terminals are .018 Thick.

CHASSIS CUTOUT
for panel mounting.



USE # 5 SCREW
FOR MOUNTING
SOCKET

GROUND STRIP FOR
3-48 UN-2A STUD

EPOXY SEALED PC BOARD MOUNTABLE ON 0.100 GRID

The Class 60 Miniature high reliability industrial grade relay has excellent RF switching characteristics.

CLASS 60

BIFURCATED CROSS BAR CONTACTS
LOW LEVEL TO 2 AMPS
SPDT, DPDT CONTACTS

OUTLINE DIMENSIONS

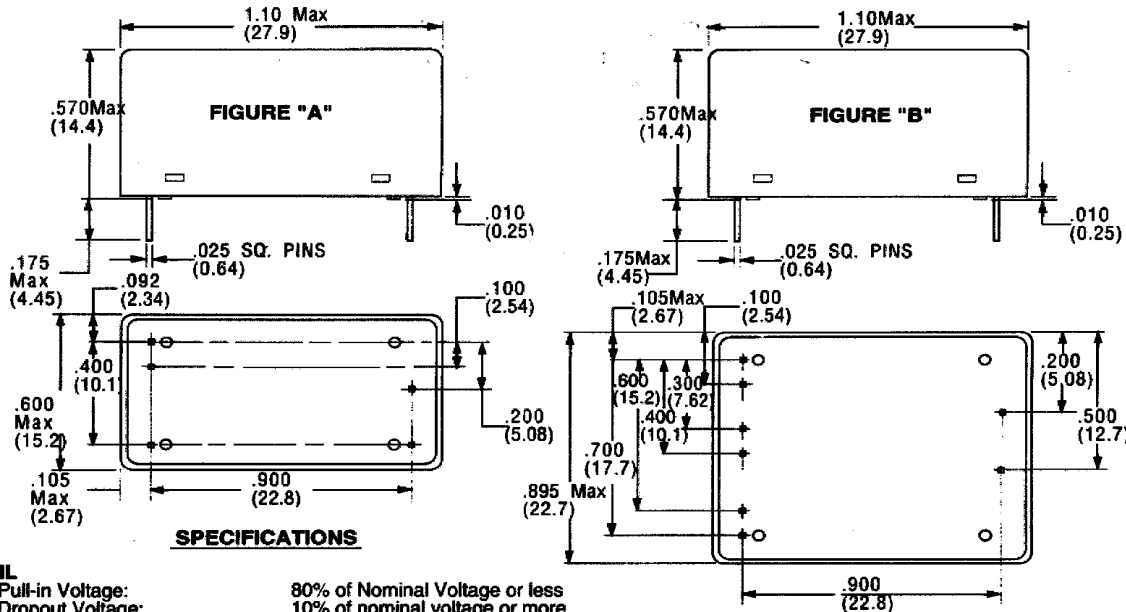
DIMENSIONS SHOWN IN "INCHES" AND (MILLIMETERS)

CLASS
60

W60HE1S



W60HE2S



SPECIFICATIONS

COIL

Pull-in Voltage: 80% of Nominal Voltage or less
Dropout Voltage: 10% of nominal voltage or more
Max. allowed voltage: 120% of nominal voltage, duty cycle 100%
Nominal power: 327mW max. min. sensitivity: 200 mW
Max. coil dissipation: 0.75 Watt
Coil Resistance: $\pm 10\%$ Measured @ 25°C

CONTACTS

Contact Material: Gold Clad Silver Palladium.
Contact Resistance: Initial 50 Milliohms @ 6VDC, 10mA
100 Milliohms max., After life: 200 mΩ
Contact Rating: 50uA- 50mV, 2A-24VDC, 1A-100VAC,
Max. voltage: 150VDC, max. power switched
60 Watts or 120 VA

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 600VAC 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 2000Hz, (No contact opening > 10μS)

SHOCK RESISTANCE

Functional: 50g's 6mS Max.
Mechanical: Contact Chatter Destructive 50g's.

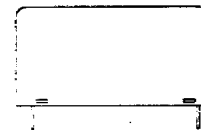
LIFE

Electrical (Rated Load): 100,000 Operations Rated Load.
Mechanical (No Load): 100 Million Operations

MISCELLANEOUS

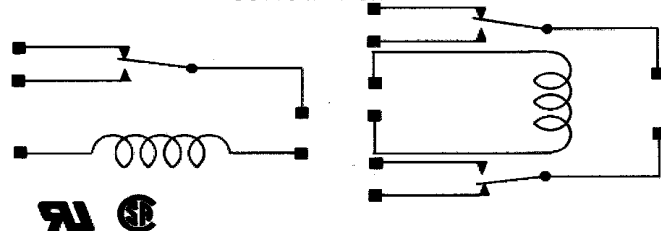
Terminal Finish: Terminals are solder Coated & epoxy free to provide excellent solderability.
Max. exposure to soldering temperature is 5 seconds @ 250°C.
Enclosure: PBC Plastic, Epoxy sealed for Automatic Circuit Board Processing.
Weight: SPDT-5.5 g's, DPDT- 9 g's approx.

ACTUAL SIZE



CIRCUIT DIAGRAMS

BOTTOM VIEW

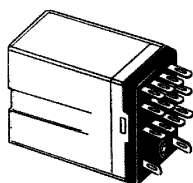


Magnecraft PART NUMBERS	Contact Config- uration	COIL Measured @ 25°C		
		Nominal Input Voltage	Resis- tance (Ohms)	Pull-in Power (mW)
FIGURE "A"				
W60HE1S-5DC	SPDT	5VDC	75	200
W60HE1S-12DC	SPDT	12VDC	440	200
W60HE1S-24DC	SPDT	24VDC	1550	200
W60HE1S-48DC	SPDT	48VDC	5250	200
FIGURE "B"				
W60HE2S-5DC	DPDT	5VDC	75	200
W60HE2S-12DC	DPDT	12VDC	440	200
W60HE2S-24DC	DPDT	24VDC	1550	200
W60HE2S-48DC	DPDT	48VDC	5250	200

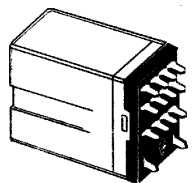
ICE CUBE STYLE SOLDER/PLUG-IN OR PC BOARD RELAY

CLASS
78 & 281

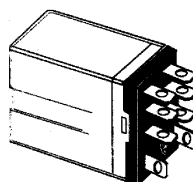
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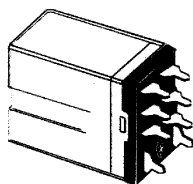
W78ACSX/CSX
4PDT, 3 AMP
Solder/Plug-in



W78APCX/PCX
4PDT, 3 AMP
Printed Circuit



W78ARCSX/RCSX
DPDT, 10 AMP
Solder/plug-in



W78ARPCX/RPCX
DPDT, 10 AMP
Printed Circuit



COIL

Pull-in Voltage: 80% of Nominal Voltage or less
Dropout: DC - 10% min., AC - 30% min.
Max. Voltage: 110%
Coil Resistance: +15%, -20% (AC), ±15% (DC)

CONTACTS

Contact Configuration: DPDT, 4PDT.
Contact Material: 3 AMP Silver gold flashed, 5 & 10 AMP Silver Cadmium Oxide.
Contact Resistance: 50 Milliohms Max.

Contact Rating:

DPDT - 10 Amp @ 240VAC/30VDC. 1/3 HP. 120VAC. 1/2HP 240VAC. 4PDT-5Amp @ 120/240VAC 30VDC. 1/10HP @ 120 VAC. 4PDT-3Amp @ 120 VAC/30VDC. 1/10HP 120VAC.

TIMING

Operate Time: 25mS Max. @ Nominal Voltage.
Release Time: 25 mS Max. @ Nominal Voltage.

DIELECTRIC STRENGTH

Coil to Frame: 1500 V rms
Across Open Contacts: 1000 V rms
Contact to Frame: 1500 V rms
Insulation Resistance: 100 Megohms Min. @ 500 VDC.

TEMPERATURE

Ambient Temperature: -40°C to + 70°C @ Rated Operation

VIBRATION RESISTANCE

Mechanical Durability: 10 to 55 Hz: 1mm (Double Amplitude).
Malfunction Durability, 10 to 55 Hz: 1mm (Double Amplitude).

SHOCK RESISTANCE

Mechanical Durability: Mechanical Durability, 1000 m/s² (approx. 100 G).
Malfunction Durability: Malfunction Durability, 200 m/s² (approx. 20 G).

LIFE EXPECTANCY

Mechanical (No Load): 50,000,000 Operations (AC) 100,000,000 Operations (DC).
Electrical (rated Load): 200,000 Operations Min. (Resistive).

MISCELLANEOUS

Enclosure: Clear Polycarbonate Dust Cover, Molded.
Standard Feature: Opposite Polarity Barrier, 4 Pole style relays Only.
Weight: DPDT 1.41 oz. (Approx. 40 g) . 4PDT 2.47 oz. (Approx. 70 g).

Magnecraft STRUTHERS-DUNN 4PDT, 3 AMP RATING		Magnecraft STRUTHERS-DUNN DPDT, 10 AMP RATING		Coil measured @ 23°C		
DUAL MARKED RELAY PART NUMBERS		DUAL MARKED RELAY PART NUMBERS		Nominal Input Voltage	Nominal Resistance (Ohms)	Nominal Power (Approx.)
AC OPERATED COIL - SOLDER/PLUG-IN STYLE.						
W78ACSX-2	C281XDX100J-12A	W78ARCSX-7	C281XBX411-6A	6 VAC	12.2	1.2VA
W78ACSX-3	C281XDX100J-24A	W78ARCSX-9	C281XBX411-24A	12 VAC	46	1.2VA
W78ACSX-5	C281XDX100J-120A	W78ARCSX-11	C281XBX411-120A	24VAC	180	1.2VA
W78ACSX-6	C281XDX100J-240A	W78ARCSX-12	C281XBX411-220A	120 VAC	4430	1.2VA
				240 VAC	18,790	1.2VA
AC OPERATED COIL - SOLDER/PLUG-IN STYLE WITH INDICATOR LAMP.						
W78ANCSX-24	C281XDX100LJ-24A	W78ARNCSX-6	C281XBX411L-24A	24 VAC	180	1.2VA
W78ANCSX-25	C281XDX100LJ-120A	W78ARNCSX-5	C281XBX411L-120A	120VAC	4430	1.2VA
W78ANCSX-26	C281XDX100LJ-240A	W78ARNCSX-7	C281XBX411L-240A	240 VAC	18,790	1.2VA
DC OPERATED COIL - SOLDER/PLUG-IN STYLE						
W78CSX-1	C281XDX100J-6D	W78RCSX-6	C281XBX411-6D	6 VDC	40	0.9W
W78CSX-2	C281XDX100J-12D	W78RCSX-7	C281XBX411-12D	12 VDC	160	0.9W
W78CSX-3	C281XDX100J-24D	W78RCSX-8	C281XBX411-24D	24VDC	650	0.9W
		W78RCSX-9	C281XBX411-48D	48 VDC	2,600	0.9W
W78CSX-6	C281XDX100J-110D	W78RCSX-10	C281XBX411-110D	110 VDC	11,000	0.9W
DC OPERATED COIL - SOLDER/PLUG-IN STYLE WITH INDICATOR LAMP						
W78NCSX-23	C281XDX100LJ-24D	W78RNCSX-6	C281XBX411L-24D	24 VDC	650	0.9W
AC OPERATED - PRINTED CIRCUIT STYLE						
W78APCX-3	C281XDX103J-24A			24 VAC	180	1.2VA
W78APCX-5	C281XDX103J-120A	W78ARPCX-5	C281XBX413-120A	120 VAC	4430	1.2VA
		W78ARPCX-6	C281XBX413-240A	240 VAC	18,790	1.2VA
DC OPERATED - PRINTED CIRCUIT STYLE						
		W78RPCX-1	C281XBX413-6D	6 VDC	40	0.9W
W78PCX-2	C281XDX103J-12D	W78RPCX-2	C281XBX413-12D	12 VDC	160	0.9W
W78PCX-3	C281XDX103J-24D	W78RPCX-3	C281XBX413-24D	24 VDC	650	0.9W
W78PCX-6	C281XDX103J-110D			110 VDC	11,000	0.9W
4PDT, 5 AMP RATING						
AC OPERATED COIL - SOLDER/PLUG-IN STYLE.						
W78KACSX-15	C281XDX210J-24A			24VAC	180	1.2VA
W78KACSX-17	C281XDX210J-120A			120 VAC	4430	1.2VA
W78KACSX-18	C281XDX210J-240A			240 VAC	18,790	1.2VA
DC OPERATED COIL - SOLDER/PLUG-IN STYLE.						
W78KCSX-12	C281XDX210J-12D			12 VDC	160	0.9 W
W78KCSX-13	C281XDX210J-24D			24 VDC	650	0.9W

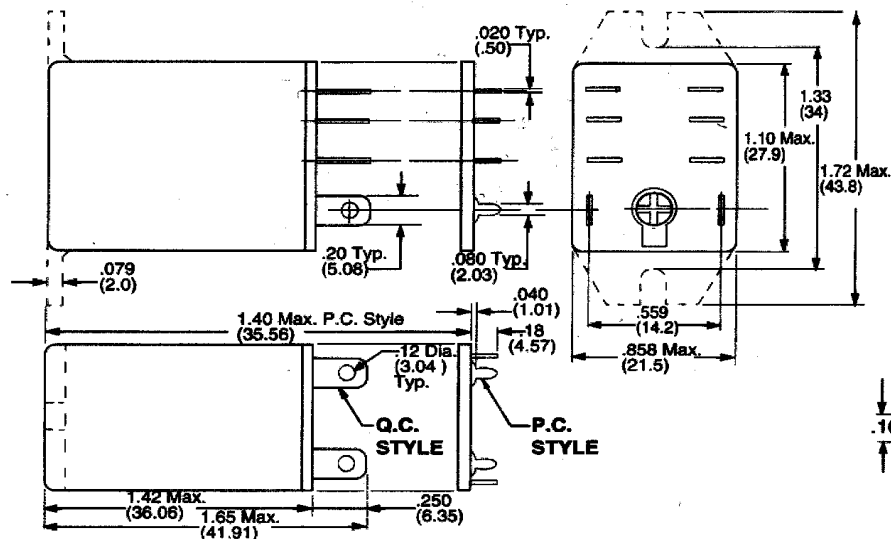
ICE CUBE STYLE SOLDER/PLUG-IN OR PC BOARD RELAY

CLASS
78 & 281

OUTLINE DIMENSIONS

Dimensions shown in INCHES and (MILLIMETERS)

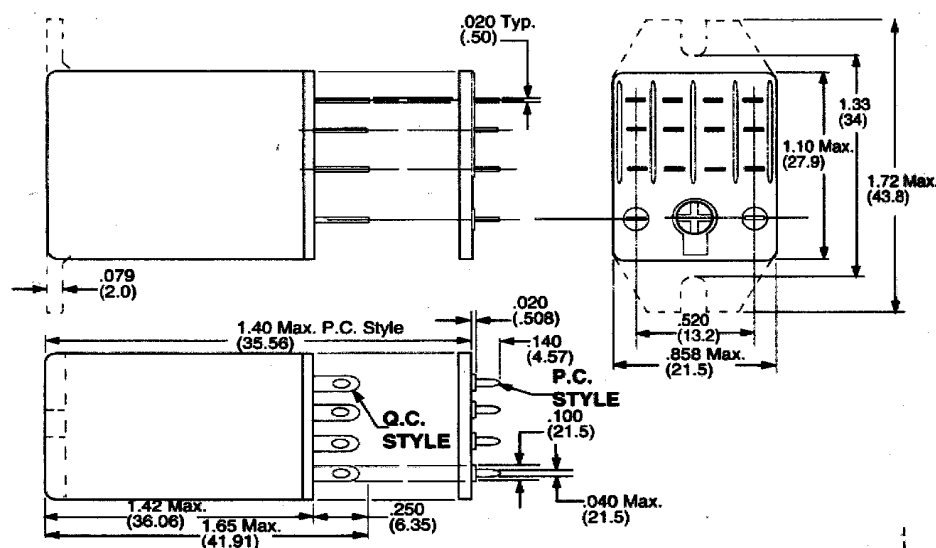
Optional FLANGED COVER available on special order as Non-Stock.



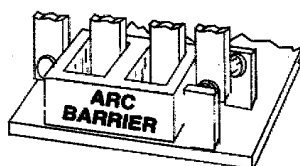
OUTLINE DIMENSIONS

Dimensions shown in INCHES and (MILLIMETERS)

Optional FLANGED COVER available on special order as Non-Stock.

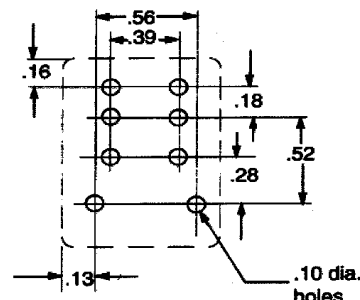
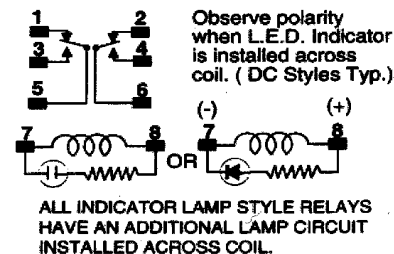


ALL 4 POLE RELAYS HAVE OPPOSITE POLARITY ARC BARRIERS AS A STANDARD FEATURE. ARC BARRIERS PROVIDE GREATER VOLTAGE PROTECTION BETWEEN ADJACENT POLES



- DOUBLE POLE DOUBLE THROW
- 10 AMP LOAD @ 240VAC/30VDC RESISTIVE
- 1/3 HP 120VAC, 1/2 HP 240VAC
- CONTACT MATERIAL: SILVER CADMIUM OXIDE

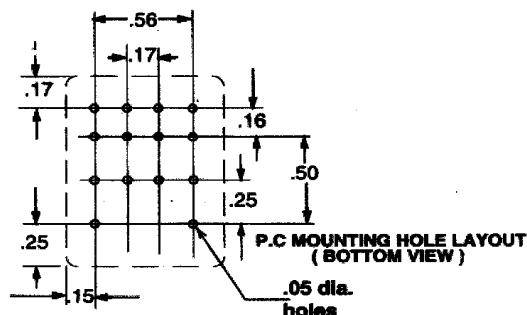
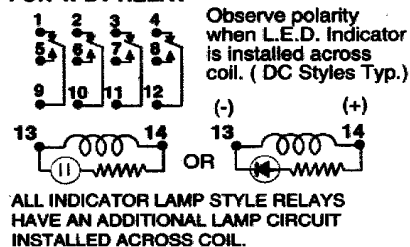
WIRING DIAGRAM FOR DPDT RELAY



P.C. MOUNTING HOLE LAYOUT (BOTTOM VIEW)

- FOUR POLE DOUBLE THROW
- 3 & 5 AMP LOAD @ 120/240VAC /30VDC RESISTIVE
- 1/10 HP 120VAC
- CONTACT MATERIAL: SILVER CADMIUM OXIDE

WIRING DIAGRAM FOR 4PDT RELAY



P.C. MOUNTING HOLE LAYOUT (BOTTOM VIEW)

GENERAL SPECIFICATIONS

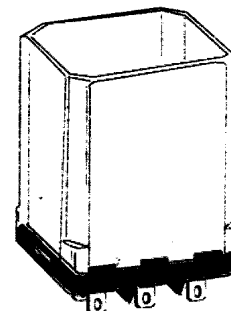
CLASS
388 & 283

7

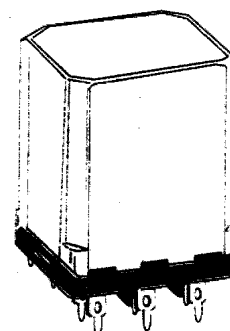
RELAYS

FEATURES

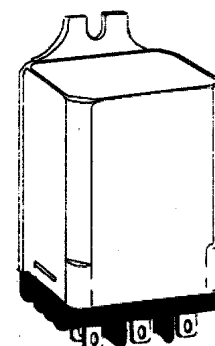
The Class 388 & 283 general purpose relays are available in a wide choice of AC or DC voltages and options. Plug-in style relays have 3-way pierced terminals. While spaced for standard plug-in Socket mounting. The flat terminals (0.187 x 0.020) also accept quick connect receptacles or direct soldering. Screw terminal sockets are available for chassis, direct panel mounting or DIN rail mounting.



PLUG-IN



P.C. MOUNT



FLANGE MOUNT

CONTACT RATINGS TABLE			
POLES	120 VAC	240 VAC	28 VDC
1 POLE	13 AMP 1/3 HP	13 AMP 1/2 HP	13 AMP
2 POLE	12 AMP 1/3 HP	8 AMP 1/2 HP	12 AMP
3 POLE	11 AMP 1/3 HP	11 AMP 1/2 HP	11 AMP

CSA rated 240VAC, 10 Amps (1 and 2 pole), 6 Amp for (3 pole) resistive load. DPDT only, also rated 3 Amps at 301 thru 600VAC, resistive load and 1/2 HP at 301 thru 600 VAC motor load.

TYPICAL OPERATING CHARACTERISTICS (For DC voltage types only).			
POLES	SPDT	DPDT	3PDT
MIN. OPERATE mW (SENSITIVITY)	125	250	375
OPERATE TIME (Milliseconds maximum.)	18.0	20.0	24.0
RELEASE TIME (Milliseconds Maximum.)	30.0	28.0	26.0

VDE Versions available with contact ratings of 10 Amps at 250 VAC (resistive load), 4 Amps at 250 VAC (inductive load - .4 pF).

Measured at Nominal Voltage @ 25°C

SPECIFICATIONS CLASS 388 & 283 RELAYS

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 coils
Maximum coil dissipation:	Capability of DC coils 3.0 Watts max.
Duty:	Continuous

CONTACTS

Contact material:	3/16" silver cadmium oxide, gold flashed.
Contact resistance:	50 Milliohms maximum initial resistance at rated current

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

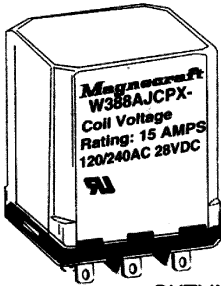
Operating:	-30°C to +50°C (AC), -30°C to +65°C (DC)
Storage	-30°C to 100°C

MISCELLANEOUS

Insulation material:	Molded plastic
Enclosure:	Clear Polycarbonate dust cover
Terminals:	3/16" solder/plug-in, Printed Circuit terminals other terminals available: .205 x .032, .250 x .032 on special order.
Weight:	3.1 oz.. (88 g approx. with cover).

ENCLOSED 15A PLUG-IN & MAGNETIC BLOWOUT RELAY

CLASS
388



CLASS 388JCP ENCLOSED PLUG-IN STYLE RELAYS RATED AT 15 AMP

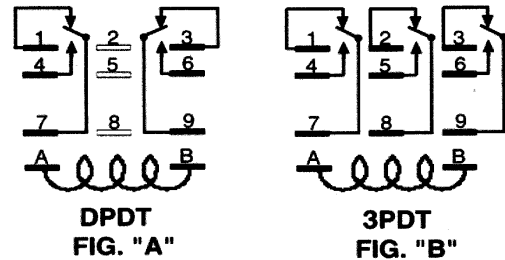


Magnecraft PART NO.	WIRING DIAG. FIG.	CONTACT CONFIGURATION & RATING	NOMINAL INPUT VOLTAGE	NOMINAL RESIS- TANCE (OHMS)	NOMINAL POWER
AC OPERATED 388JCP, 15 AMP ENCLOSED PLUG-IN RELAY					
W388AJCPX-8	'A'	DPDT, 15AMP	24 VAC	-	2.0VA
W388AJCPX-14	'B'	3PDT, 15AMP	120 VAC	-	2.0 VA

VDE versions available.

WIRING DIAGRAM

Viewed from terminal end



DPDT
FIG. "A"

3PDT
FIG. "B"

LOAD RATINGS 388JCP

RATING	VOLTS AC	VOLTS DC	LOAD	AGENCY APPROVAL
1/3HP	120		MOTOR	UL/CSA
1/2HP	240		MOTOR	UL/CSA
15AMPS	120	15VDC	RESISTIVE	UL/CSA
15AMPS	240		RESISTIVE	UL/CSA
13AMPS		28VDC	RESISTIVE	UL/CSA
10AMPS	240		RESISTIVE	UL/CSA

LOAD RATINGS 388DB

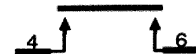
10 AMPS	150VDC	RESISTIVE
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388DB MAGNETIC BLOWOUT RELAY NOT UL OR CSA APPROVED

The Class 388JCP and 388DB style relays have the same load specifications as the 388/285 enclosed plug-in style relays plus the additional load ratings charted on this page.

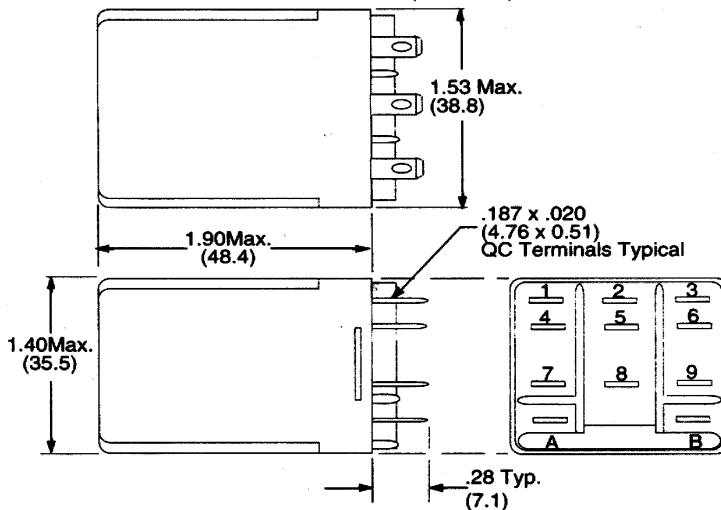
WIRING DIAGRAM

Viewed from terminal end



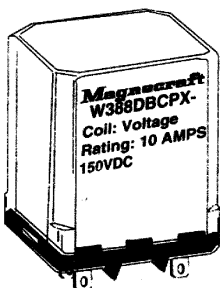
SPST-NO-(DM)
(1 FORM "X"
FIG. "C"

OUTLINE DIMENSIONS
Dimensions shown are in "INCH" and (Millimeter)



Dimensional Drawing applies to all relay part numbers shown on this page.

CLASS 388DB ENCLOSED PLUG-IN STYLE WITH MAGNETIC BLOWOUT FOR DC SWITCHING. RATED 10 AMPS AT 150 VDC



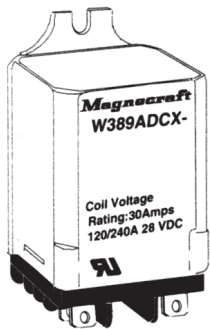
Magnecraft PART NO.	WIRING DIAG. FIG.	CONTACT CONFIGU- RATION	NOMINAL INPUT VOLTAGE	NOMINAL RESIS- TANCE (OHMS)	NOMINAL POWER
AC OPERATED WITH BLOWOUT MAGNET					
W388ADBCPX-2	'C'	SPST-NO (DM)	120 VAC	-	2.0VA
DC OPERATED WITH BLOWOUT MAGNET					
W388DBCPX-2	'C'	SPST-NO (DM)	12 VDC	120	1.2W
W388DBCPX-3	'C'	SPST-NO (DM)	24 VDC	472	1.2W
W388DBCPX-5	'C'	SPST-NO (DM)	110 VDC	10,000	1.2W

ENCLOSED FLANGE STYLE 30 AMP POWER RELAY

CLASS
389

7

RELAYS

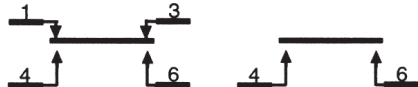


CLASS 389D

1/4" Q.C. MALE TAB TERMINALS
FOR USE WITH FEMALE QUICK
CONNECT TERMINALS OR
SUITABLE FOR SOLDERING.

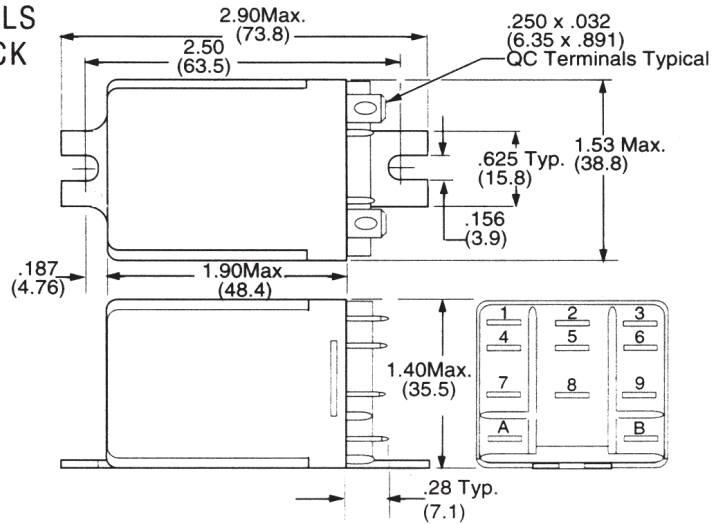


WIRING DIAGRAM Viewed from terminal end



SPDT-NC-NO-
(DB-DM)
(1 FORM "Z")

SPST-NO-(DM)
(1 FORM "X")



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	6	0.06	3600	360

CLASS 389 & 298 LOAD RATINGS

ENCLOSED STYLE 1, 2 and 3 POLE				
NO. OF POLES	CURRENT OR HORSE- POWER	LOAD VOLTAGE	LOAD VOLTAGE FRE- QUENCY	TYPE OF LOAD
1 P O L E	13A	28	D C	RESISTIVE
	20A	15	D C	RESISTIVE
	25A	300	50/60 Hz	RESISTIVE
	5A	600	50/60 Hz	RESISTIVE
	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
2 P O L E	13A	28	D C	RESISTIVE
	20A	15	D C	RESISTIVE
	25A	300	50/60 Hz	RESISTIVE
	5A	600	50/60 Hz	RESISTIVE
	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
3 P O L E	13A	28	D C	RESISTIVE
	20A	15	D C	RESISTIVE
	20A	150	50/60 Hz	RESISTIVE
	15A	250	50/60 Hz	RESISTIVE
	★ 10A	300	50/60 Hz	RESISTIVE
	1/2HP	120	50/60 Hz	MOTOR
	1/2HP	208/240	50/60 Hz	MOTOR
	470VA	120/240	50/60 Hz	PILOT DUTY
	445VA	208	50/60 Hz	PILOT DUTY
	B300			PILOT DUTY

CLASS 389D LOAD RATINGS

ENCLOSED STYLE				
NO. OF POLES	CURRENT OR HORSE- POWER	LOAD VOLTAGE	LOAD VOLTAGE FREQUENCY	TYPE OF LOAD
1 P O L E	30A	28	D C	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
	B600			PILOT DUTY

CLASS 389 & 298 BALLAST LOAD RATINGS

NO. OF POLES	ENCLOSED STYLE
1 POLE	20 AMPS, 277VAC, 50/60Hz
2 POLE	20 AMPS, 277VAC, 50/60Hz
3 POLE	20 AMPS, 150VAC, 50/60Hz 6-2/3 AMPS, 277VAC, 50/60Hz
DOUBLE BREAK DOUBLE MAKE (1 FORM "X" & "Z")	
1 POLE	25 AMPS, 277VAC, 50/60Hz

Not CSA rated with (★) are UL Appliance rated.
All other ratings no so marked are industrial rated.
★ CSA rating only not UL.

ENCLOSED FLANGE MOUNT POWER RELAY

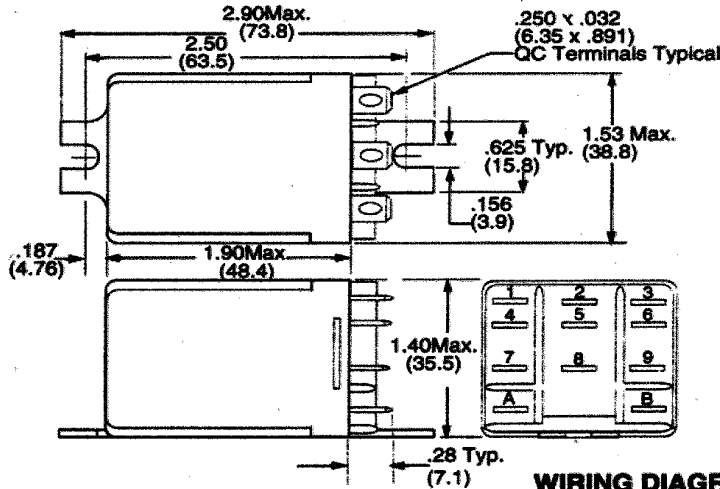
CLASS
389 & 298

CLASS 389 & 298 RELAY

1/4" MALE TAB TERMINALS FOR
USE WITH FEMALE QUICK CONNECT
TERMINALS OR SUITABLE FOR SOLDERING

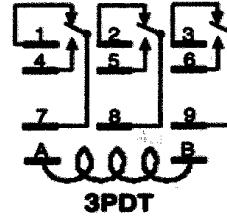
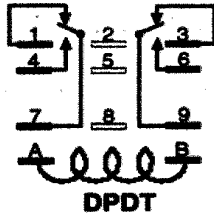
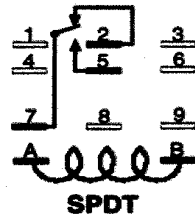
OUTLINE DIMENSIONS

Dimensions shown are in INCH and (Millimeter)



WIRING DIAGRAM

Viewed from terminal end



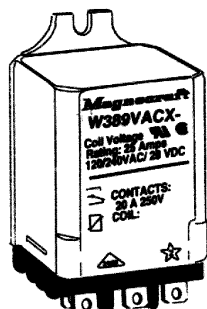
Magnecraft STRUTHERS-DUNN DUAL MARKED PART NUMBERS		CONTACT CONFIGU- RATION	CONTACT RATING	COIL Measured @ 25°C		
FLANGE STYLE				NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL POWER
AC OPERATED						
W389ACX-4	298XAXC1-120A	SPDT	25 AMP	120 VAC	-	2.75VA
W389ACX-8	298XBXC1-24A	DPDT	25 AMP	24VAC	-	2.75VA
W389ACX-9	298XBXC1-120A	DPDT	25 AMP	120 VAC	-	2.75VA
W389ACX-10	298XBXC1-240A	DPDT	25 AMP	240 VAC, 60 Hz 220 VAC, 50 Hz	-	2.75VA
W389ACX-14	298XCXC1-120A	3PDT	20 AMP	120 VAC	-	2.75VA
W389ACX-15	298XCXC1-240A	3PDT	20 AMP	240 VAC, 60 Hz 220 VAC, 50 Hz	-	2.75VA
W389ADCX-4		SPST-NO-(DM)	30 AMP	120 VAC	-	2.75VA
W389ADCX-5		SPST-NO-(DM)	30 AMP	240VAC, 60Hz 220 VAC, 50Hz	-	2.75VA
W389ADZCX-3		SPDT-NO-NC (DM-DB)	30 AMP	24 VAC	-	3.75VA
W389ADZCX-4		SPDT-NO-NC (DM-DB)	30 AMP	120VAC	-	3.75VA
DC OPERATED						
W389CX-2	298XAXC1-12D	SPDT	25 AMP	12 VDC	100	1.44W
W389CX-3	298XAXC1-24D	SPDT	25 AMP	24 VDC	400	1.44W
W389CX-7	298XBXC1-12D	DPDT	25 AMP	12VDC	100	1.44W
W389CX-8	298XBXC1-24D	DPDT	25 AMP	24VDC	400	1.44W
W389CX-12	298XCXC1-12D	3PDT	20 AMP	12 VDC	100	1.44W
W389CX-13	298XCXC1-24D	3PDT	20 AMP	24 VDC	400	1.44W
W389DCX-2		SPST-NO-(DM)	30 AMP	12 VDC	100	1.44W
W389DCX-3		SPST-NO-(DM)	30 AMP	24 VDC	400	1.44W
W389DCZX-2		SPDT-NO-NC (DM-DB)	30 AMP	12 VDC	100	1.44W
W389DCZX-3		SPDT-NO-NC (DM-DB)	30 AMP	24VDC	400	1.44W

ENCLOSED FLANGE MOUNT VDE APPROVED RELAY

CLASS
389V

7

CLASS 389V
UL, CSA & VDE TRIPLE
AGENCY APPROVAL
VDE RATED AT
20 AMPS @ 250 VAC
8mm CREEPAGE, COIL TO
CONTACTS



GENERAL SPECIFICATIONS

COIL
Pull-in Voltage: AC: 85%, DC: 80% of nominal voltage
Dropout Voltage: 10% of nominal voltage or more @ 25°C
Coil dissipation max. DC coils: 2.5 Watts max. continuous
Max. allowed voltage: 110% of nominal voltage @ 25°C
Coil Resistance: ±10% Measured @ 25°C

CONTACTS
Contact Material: Silver Cadmium Oxide, Gold Flashed 1/4" dia.
Contact ratings: 20 Amps @ 250 Vac 1.0 pF
6 Amps @ 250 Vac 0.4 pF Inductive
see page 26 & 27 for General UL & CSA ratings for 1, 2 and 3 pole enclosed style relays.

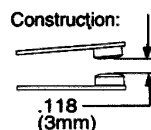
TIMING
Operate Time: 20 mS Max. @ Nominal Voltage.
Release Time: 20 mS Max. @ Nominal Voltage.

DIELECTRIC STRENGTH
All Mutually Insulated Points: 1000 V rms across open contacts 1 & 2 pole
500 V rms 3 pole
4000 V rms between all other mutually conductive elements.

TEMPERATURE
Operating: AC: -30°C to +50°C DC: -45°C to +60 °C
Storage: +30°C to +100°C

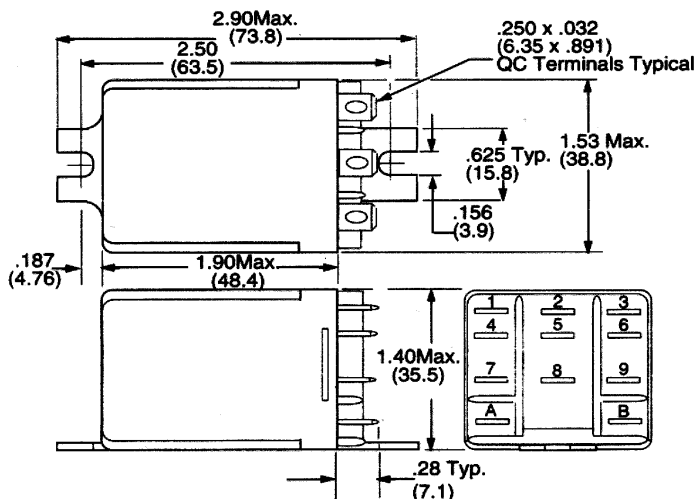
MISCELLANEOUS
Enclosure: Clear polycarbonate
Weight: 3.3 oz (94 grams approx.)

Construction:
DPST-NO contacts with 3mm contact gaps, designed to meet VDE requirements, are available in a special version. VDE usually requires their final approval in the end use application with this version.



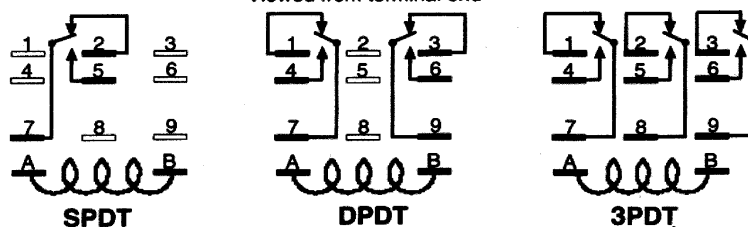
OUTLINE DIMENSIONS

Dimensions shown are in INCH and (Millimeter)



WIRING DIAGRAM

Viewed from terminal end



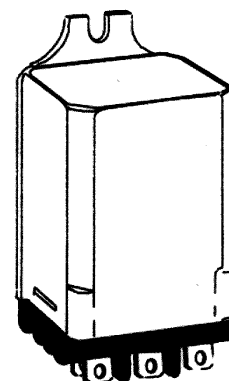
Magnecraft PART NUMBER	CONTACT CONFIGURATION	COIL Measured at 25°C		
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL POWER
AC OPERATED				
W389VACX-5	SPDT	120VAC	-	2.0VA
W389VACX-6	SPDT	220VAC	-	2.0VA
W389VACX-11	DPDT	120VAC	-	2.0VA
W389VACX-12	DPDT	220VAC	-	2.0VA
W389VACX-17	3PDT	120VAC	-	2.0VA
W389VACX-18	3PDT	220VAC	-	2.0VA
DC OPERATED				
W389VCX-3	SPDT	24VDC	400	1.44W
W389VCX-8	DPDT	24VDC	400	1.44W
W389VCX-13	3PDT	24VDC	400	1.44W

GENERAL SPECIFICATIONS

CLASS
389 & 298

FEATURES

The Class 389 & 298 relays are high quality general purpose relays, designed to switch larger loads without increasing overall size. One, two and three pole relays are available with a choice of various contact combinations. Double make and double break styles are available only with a one pole style but is capable of switching larger loads and are especially well suited for switching motor loads. These relays are available in the 30 Amp contact range. The Class 389/298 uses 1/4" spade lug terminals for use with faston connectors or for direct soldering. VDE versions are available with contact ratings of 20 Amps at 250VAC (resistive load) 6 Amps at 250VAC (inductive load - .4 pF).



FLANGE MOUNT

SPECIFICATIONS CLASS 389 & 298 RELAYS

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:	± 10 % Measured at 25°C
Nominal power:	1.44 Watts for DC coils, 2VA to 3.5VA for AC coils
Maximum coil dissipation:	Capability of DC coils 2.5 Watts max.
Duty:	Continuous
Insulation:	Class "B" coil system. (130°C).
VDE, coil:	Designed to meet 8 mm creepage and withstand 4000 V rms (except 3 pole) between coil & contacts.

CONTACTS

Contact material:	1/4" silver cadmium oxide, gold flashed.
Contact Gap:	.015 min. is standard.
Contact resistance:	50 Milliohms maximum initial resistance at rated current

TIMING

Operate time, (excluding bounce):	20 milliseconds max.at nominal voltage.
Release time, (excluding bounce):	20 milliseconds max.at nominal voltage.

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:	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

Electrical:	100,000 at rated load.
Mechanical:	5 Million Operations no load

MISCELLANEOUS

Enclosure:	Clear Polycarbonate dust cover
Insulation material:	Molded plastic
Terminals:	1/4" x .032 Q.C. Terminals suitable for solder or faston connectors, also available with Printed Circuit terminals. (.090 x .032)
Weight:	3.3 oz.. (94 g approx. with cover).

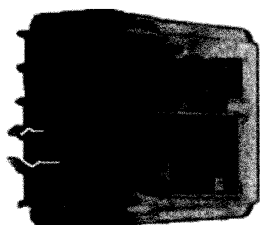
300 VOLT GENERAL PURPOSE PLUG-IN RELAY

SERIES
219

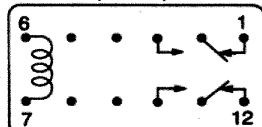
7

RELAYS

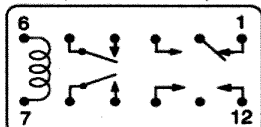
THE SERIES 219 GENERAL PURPOSE INDUSTRIAL PLUG-IN RELAYS FEATURE 12 PIN AND 14 PIN BASES. THE COIL IS ENCAPSULATED FOR PROTECTION. NUCLEAR QUALIFIED VERSIONS ARE AVAILABLE.



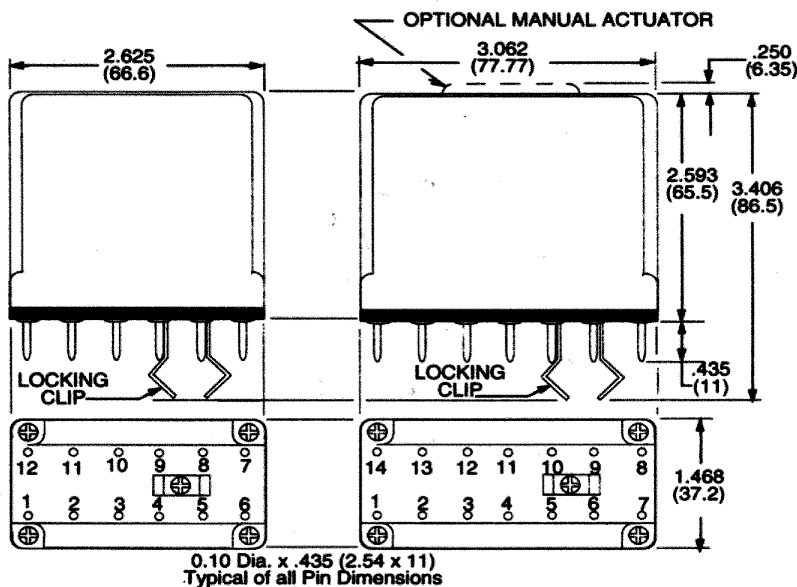
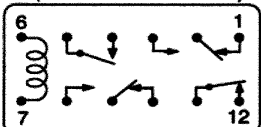
219XBBXP
(DPDT)



219BBXP
(DPDT + 2 N.O.)



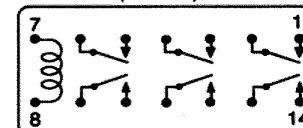
219ABAP
(DPDT + 1 NO & 1 NC)



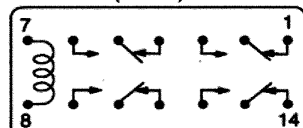
MODELS AVAILABLE

12 PIN	CONTACTS	14 PIN	CONTACTS
219BBXP	DPDT + 2 NO	219XDXP	4PDT
219XBBXP	DPDT	219FXXP	6P-NO
219ABAP	DPDT + 1 NO & 1 NC	219DXBP	4P-NO + 2P-NC

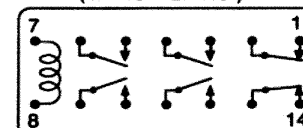
219FXXP
(6P-NO)



219XDXP
(4PDT)



219DXBP
(4P-NO + 2P-NC)



COIL		GENERAL SPECIFICATIONS	
Pull-in, min. AC		85% of Nominal Voltage	
Pull-in min. DC		80 % of Nominal Voltage	
Overvoltage, max.		110% of nominal, voltage	
CONTACTS		Contact Material:	
		Silver Cadmium Oxide, Gold diffused (Standard)	
TIMING		Operate Time:	
		Release Time:	
		25 mS Max. @ Nominal Voltage.	
		20 mS Max. @ Nominal Voltage.	
DIELECTRIC STRENGTH		All Mutually insulated Points:	
		Insulation:	
		1500 V rms	
		1/4" over surface, 1/8" thru Air	
TEMPERATURE		Rated Operation:	
		-10°C to +60°C	
LIFE EXPECTANCY		Mechanical:	
		Electrical:	
		10 Million Operations no load	
		100,000 Operations @ Rated Load.	
MISCELLANEOUS		Enclosure:	
		Clear polycarbonate.	

COIL SPECIFICATIONS @ 25°C

AC RELAYS 50/60 HZ (COIL DATA @ 60HZ Voltage)					DC RELAYS, 1.8 WATTS (2.5 W @ 125VDC)			
Nominal Voltage	Resistance Ohms ± 10%	Milliamperes Open	Milliamperes Closed	Impedance Ohms	Nominal Voltage	Resistance Ohms ± 10%	Milliamperes Cold	Milliamperes 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

* Note: Stock 24 Vdc and 115 Vac relays have nameplates stamped 24-28 and 115-125 Vdc respectively. These relays operate at 80% of the lower voltages and operate within allowable temperature rises at higher voltages. 250 Vdc - Use 125 Vdc relay and series resistor (6000 Ω, 5 W) not supplied.

CONTACT RATINGS

VOLTS	MAKE	CARRY	BREAK	
			RESISTIVE	INDUCTIVE
24 VDC	30A	10A	10A	10A
120 VAC	30A	10A	10A	3A
240 VAC	30A	10A	5A	1A
28 VDC	30A	10A	10A	3A
125 VDC	30A	10A	0.5A	0.1A
125 VDC * SM	30A	10A	1.5A	0.5A
125 VDC * SM	30A	10A	4A	1.5A
125 VDC * SM	30A	10A	0.5A	150 mA
125 VDC * SM	30A	10A	1.5A	0.5A

Relays with Code 69 feature

OPTIONS

ORDERING CODE

Typical Type No. **219 XBX P L-24D**

Series

219 Industrial plug-in style

Contact Arrangements

XBX (2 Form "C")

ABa (DPDT + 1 Pole-NO & 1 Pole NC)

BBX (2 Pole-NO & DPDT)

XDX (4 PDT)

FXX (6 Pole-NO)

DXB (4 Pole-NO & 2 Pole-NC)

Standard Features

Polycarbonate Cover- CODE "P"

Optional Features

Indicator Lamp - CODE "L"

Manual Actuator- CODE "M"

130°C Coil - CODE "U"

Bifurcated Contacts - CODE "33"

Perm. Magnet Blowout- CODE "69"

Coil Voltage

AC: 6, 12, 24, 120, 240 (Add "A")

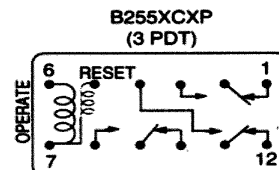
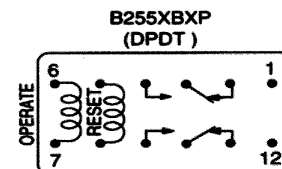
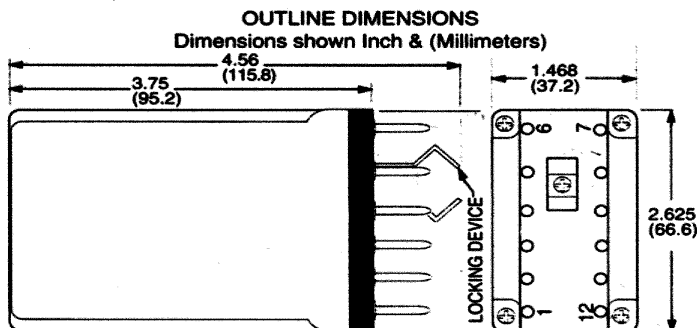
DC: 6, 12, (24-28), 32, 115/125 (Add "D")

Coil Voltages & Frequencies must be specified.

300 VOLT LATCHING PLUG-IN RELAYS

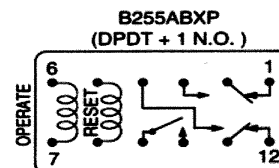
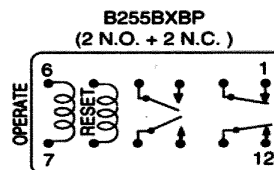
SERIES B255

THE SERIES 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 REMAIN IN THE ENERGIZED POSITION EVEN IF POWER IS INTERRUPTED. THE SECOND COIL PROVIDES ELECTRICAL RESET. ALL CONTACTS OPERATE FROM A COMMON ARMATURE TO PREVENT CONTACT OVERLAPPING. COILS ARE RATED FOR CONTINUOUS DUTY.



MODELS AVAILABLE B255

TYPE	CONTACTS
B255ABXP	DPDT + 1 NO
B255XBXP	DPDT
B255XCXP	3PDT
B255BXBP	2 NO + 2 NC



COIL GENERAL SPECIFICATIONS	
Pull-in, min. AC	85% of Nominal Voltage
Pull-in min. DC	80 % of Nominal Voltage
Overvoltage, max.	110% of nominal, voltage
CONTACTS	
Contact Material:	Silver Cadmium Oxide, & Gold diffused (Standard)
TIMING	
Operate Time: (operate coil)	25 mS Max. @ Nominal Voltage.
Release Time: (Reset coil energized)	20 mS Max. @ Nominal Voltage.
DIELECTRIC STRENGTH	
All Mutually Insulated Points:	1500 V rms
Insulation:	1/4" over surface, 1/8" thru Air
TEMPERATURE	
Rated Operation:	-10°C to +60°C
LIFE EXPECTANCY	
Mechanical:	10 Million Operations no load
Electrical:	100,000 Operations @ Rated Load.
MISCELLANEOUS	
Enclosure:	Clear polycarbonate.

COIL SPECIFICATIONS @ 25°C

AC RELAYS 50/60 HZ (COIL DATA @ 60HZ Voltage)

Nominal Voltage	RESET COIL (3VA)		OPERATE COIL (5VA)	
	Resistance Ohms ±10%	Coil Power (mA)	Resistance Ohms ±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

All AC coils are 50/60Hz current inrush on all AC coils is less than twice the listed milliamperes rating. 60Hz currents shown

DC RELAYS

Nominal Voltage	RESET COIL (1.4W)		OPERATE COIL (1.8W)	
	Resistance Ohms ±10%	Coil Power (mA)	Resistance Ohms ±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

CONTACT RATINGS

VOLTS	MAKE	CARRY	BREAK	
			RESISTIVE	INDUCTIVE †
24 VDC	30A	10A	10A	10A
120 VAC	30A	10A	10A	3A
240 VAC	30A	10A	5A	1A
28 VDC	30A	10A	10A	3A
125 VDC	30A	10A	0.5A	0.1A
125 VDC * SM	30A	10A	1.5A	0.5A
125 VDC * SM	30A	10A	4A	1.5A
125 VDC * SM	30A	10A	0.5A	150 mA
125 VDC * SM	30A	10A	1.5A	0.5A

*Relays with Code 69 feature (Check with factory for UL & CSA Listing).
† Inductive load is defined as other relay coils.

OPTIONS

130°C Coil
Coil Suppression
Light & Actuator
Fine Silver-Gold Diffused Bifurcated Contacts

SUFFIX

U
V
LM
33

ORDERING CODE

Typical Type No. **B255 XCX P LM -**

Series — B255 2 Coil Latch plug-in

Contact Arrangements —
XBXP DPDT, (2 Form "C")
XCX 3PDT, (3 FORM C)
ABX 1 Form A & 2 Form C
BXP 2 Form A & 2 Form B

Standard Features — Polycarbonate Cover- CODE "P"

Optional Features —
Indicator Lamp across both coils - CODE "L"
Manual Actuator- CODE "M"
Perm. Magnet Blowout- CODE "69"

Coil Voltage —
Coil Voltages & Frequencies must be specified.

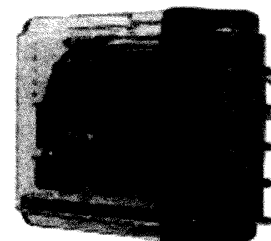
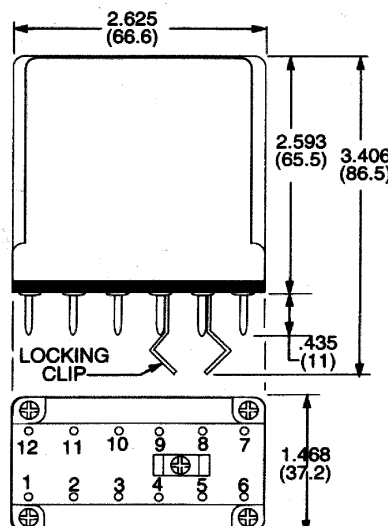
Note: For time delay on energizing reset coil, specify 256 series in lieu of B255

DC RELAYS. 1.8 WATTS (2.5 W @ 125VDC)

INDUSTRIAL PLUG-IN SEQUENCE (STEPPER), 5 AMP

**SERIES
A311**
7
**R
E
L
A
Y
S**

The A311 Series Relay is a sequencing version of the 219 series general purpose relay. Contacts transfer on each impulse to the coil. Models are available with contacts transferring either with coil is energized or when deenergized. A double cam movement with the cam rotating a half-step when the coil is energized and the other half step when the coil is deenergized assures reliable sequencing. Contacts are DPDT, 2 snap switches.

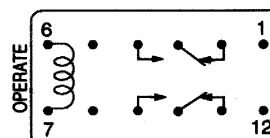


PART NUMBERS SHOWN ALSO AVAILABLE THRU STOCKING DISTRIBUTION.

GENERAL SPECIFICATIONS	
COIL	
Pull-in, min. AC	85% of Nominal Voltage
Pull-in min. DC	80 % of Nominal Voltage
Overvoltage, max.	110% of nominal, voltage
CONTACTS	
Contact Material:	Silver Cadmium Oxide
TIMING	
Operate Time: (operate coil)	35 mS Max. @ Nominal Voltage.
Release Time: (Reset coil energized)	35 mS Max. @ Nominal Voltage.
DIELECTRIC STRENGTH	
Across open Contacts:	500 V rms
Between mutually insulated current carrying parts & those parts to ground:	1500 V rms
Insulation Resistance :	1000 MΩ min. @ 500 VDC
TEMPERATURE	
Rated Operation:	-10°C to +60°C
LIFE EXPECTANCY	
Mechanical:	5 Million Operations no load
Electrical:	100,000 Operations @ Rated Load.
MISCELLANEOUS	
Enclosure:	Clear polycarbonate.

WIRING DIAGRAM

Viewed from Pin Side



A311XBXP
A311XBXP *
(DPDT)

*Transfer on Release

CONTACT RATINGS

LOAD	120VAC	30VDC	115VDC
Resistive	5A	5A	0.1A
Max. Inrush	12A	12A	0.25A

COIL SPECIFICATIONS @ 25°C

AC COIL, 50/60Hz		DC COIL	
Nominal Voltage	Resistance Ohms ± 10%	Nominal Voltage	Resistance Ohms ± 10%
6	1.1	6	15.5
12	4.2	12	63.5
24	15.5	24	250
120	540	48	970
240	1815	110-125	6200

NOTE: Relays with other coil characteristics may be supplied to meet specific application requirements. 250VDC operation may be obtained by wiring a 6,200 Ω, 5 Watt resistor in series with the 110-125VDC coil. The resistor must be mounted external to the A311.

ORDERING CODE

Typical Type No.

A311 XBXP R L -120A

Series

A311 Industrial plug-in,
Sequence Relay, 5 Amp, DPDT

Contact Arrangements

XBXP (2 Form C)

Standard Features

Plug-in with Polycarbonate Cover - CODE P

Contact Transfer

When coil is energized - NO CODE
when coil is deenergized CODE R

Options

Indicator Lamp - CODE L

Coil Suppression - CODE V

Coil Voltage

AC: 6, 12, 24, 120, 240 (Add "A")

DC: 6, 12, 24, 48, 110-125 (Add "D")

FLASH TRANSFER RELAY SWITCHES TUNGSTEN LOADS

CLASS
21



CLASS 21

ENCLOSED PLUG-IN STYLE POWER RELAY

DPDT CONTACT CONFIGURATION

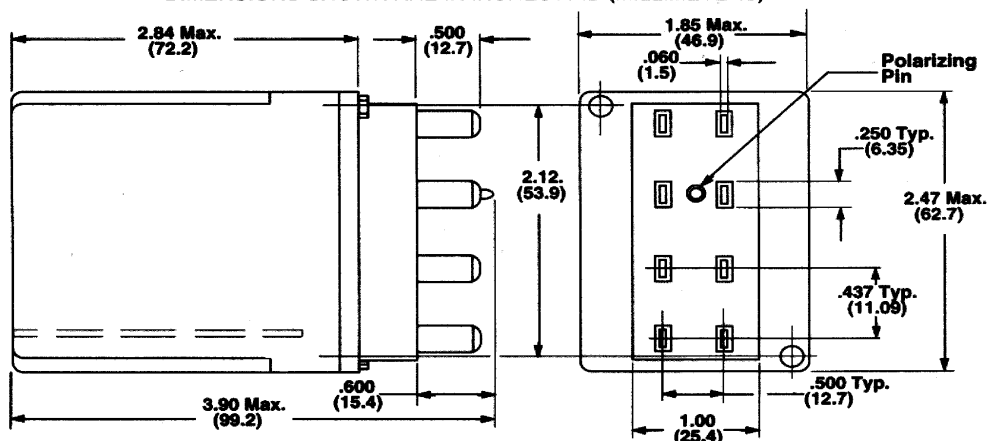
SWITCHES TUNGSTEN LAMP LOADS TO 2400 WATTS



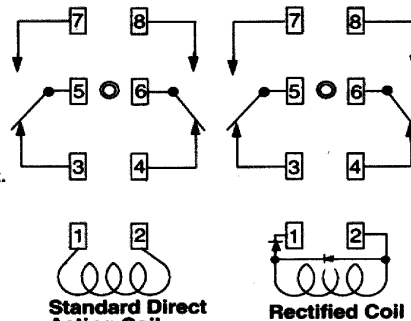
MEETS NEMA STD. TS 2- 1992
APPROVED BY D.O.T FOR:
California Minnesota Georgia
New York Illinois Texas
Oregon Colorado

OUTLINE DIMENSIONS

DIMENSIONS SHOWN ARE IN INCHES AND (MILLIMETERS)



WIRING DIAGRAM VIEWED FROM PIN END



Magnecraft Part Number	Contact Configuration	Coil Measured at 25°C		Type	UL	CSA
		Nominal Voltage	Nominal Power			
W21ACPX-2	DPDT	120VAC	8.0 VA	Standard Direct Acting	YES	YES
W21ACPXD-5	DPDT	120VAC	4.0 VA	* Rectified	PENDING	PENDING

- * Rectified type coil provides:
1. Chatter Free operation in Brownout conditions down to 85VAC
and will not overheat up to 130VAC.
2. Less Power consumption and less Heating.

SPECIFICATIONS CLASS 21 RELAY

COIL

Pull-in Voltage: AC: 85% of Nominal (70% Rectified style)
DC: 75% of Nominal
Dropout Voltage: 10% of Nominal Voltage
Duty Cycle: 1 to 2 Sec on time, 4 sec off time.

CONTACTS

Contact Material: Silver alloy 3/8" dia.
Contact Configuration: Double Pole Double Throw
Contact Rating: 20Amps for Class 21ACPX & 21ACPXD
When used with mating socket, 70-446
30Amps, 28VDC (Resistive).
1HP, 120VAC (Motor)
2HP, 240VAC (Motor)
20Amps, 120VAC (Tungsten Lamp)
10Amps, 240VAC (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

LIFE EXPECTANCY

Electrical: 250,000 Operations min. at 1 KW
tungsten 120VAC, 200,000 Operations
min. at 2.4 KW tungsten, 120VAC
5 Million Operations (No Load) Min.
Mechanical:

MISCELLANEOUS

Enclosure: Clear Polycarbonate
Weight: 7.2 oz.. 204.7 Grams

OPEN STYLE 30 AMP POWER RELAY

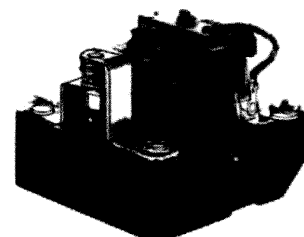
CLASS
199

7
RELAYS

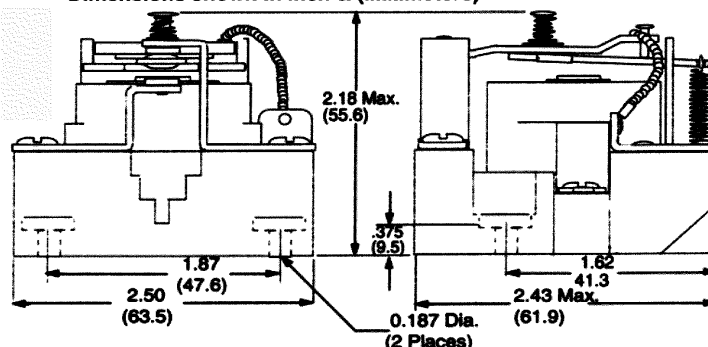
SPECIFICATIONS CLASS 199

- COIL**
Pull-in Voltage: 80% DC Coils, 85% AC coils of nominal voltage or Less.
Dropout Voltage: 10% of Nominal Voltage or More.
Coil Resistance: $\pm 10\%$
Max. Coil Dissipation: 4 Watts DC Continuous Duty.
- CONTACTS**
Contact Combinations: SPDT (1 Form C) - DFDT 2 Form C)
Contact Rating each Pole: 30 Amps up to 300VAC, 50/60Hz
5 Amps @ 480/600 Vac, 0.75pF 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 pole to switch both sides of Load.
30 Amps @ 28 Vdc Resistive Each Pole.
- Contact Material: Silver Cadmium Oxide, Gold Flashed.
5/16" Diameter Standard.
- TIMING**
Operate time: 40 Milliseconds Max. @ Nominal V
Release Time: 30 Milliseconds Max. @ Nominal V
- DIELECTRIC STRENGTH**
Between Open Contacts: 1500 V rms
Mutually Insulated Conductive elements: 2200 V rms
- TEMPERATURE**
Operating: -30°C to +50°C (for AC) to 60°C (DC)
Storage: -30°C to +100°C
- LIFE**
Electrical (Rated Load): 100,000 Operations
Mechanical (No Load): 5,000,000 Operations
- MISCELLANEOUS**
Coil Terminals: 6-32 Binder Head Screws
Contact Terminals: 8-32 Binder Head Screws
Base Material: Molded Phenolic, UL Recognized (QMF22)
Weight: 8 oz. - 227 Grams approx. (SPDT)
11 oz. - 311 Grams approx. (DPDT)

- CLASS 199 SPDT**
- 30 AMP @ 1-1/2 Hp
 - MOLDED PLASTIC INSULATION
 - SCREW TERMINALS
 - CLASS "B" COIL INSULATION SYSTEM



SPDT (1 FORM C)
OUTLINE DIMENSIONS
Dimensions shown in Inch & (Millimeters)



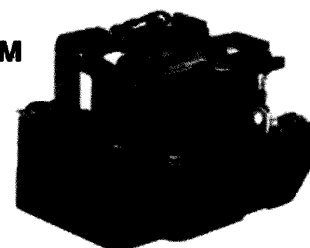
Magnecraft PART NUMBER		COIL Measured @ 25°C		
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL POWER
SPDT	DPDT			
AC OPERATED				
W199AX-4	W199AX-13	24 VAC	-	10 VA
	W199AX-14	120 VAC	-	10 VA
	W199AX-15	240 VAC, 60 Hz 220 VAC, 50 Hz	-	10 VA
DC OPERATED				
W199X-2 W199X-3	W199X-11	6 VDC	18	2.0 W
	W199X-12	12 VDC	70	2.0 W
	W199X-13	24 VDC	290	2.0 W
	W199X-14	110 VDC	6000	2.0 W
RECTIFIED, AC OPERATED				
	W199AXD-38 †	208, 240, 277 VAC	-	See Note ††

† Built in Coil Diodes provide a wide range of Nominal Coil input voltages. This relay is suitable to Operate within a range of 208 Vac thru 277 Vac.

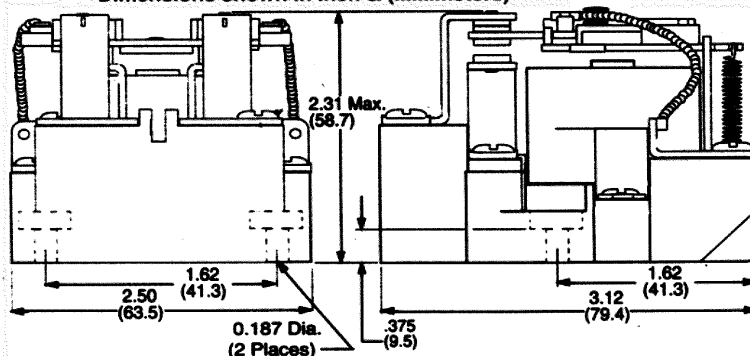
†† 208 Vac = 2.3 VA, 240 Vac = 3.0 VA, 277 Vac = 4.0 VA.

OTHER COIL VOLTAGES ARE AVAILABLE ON SPECIAL ORDER.

- CLASS 199 DPDT**
- 30 AMP @ 1-1/2 Hp
 - MOLDED PLASTIC INSULATION
 - SCREW TERMINALS
 - CLASS "B" COIL INSULATION SYSTEM

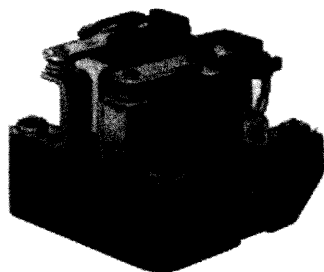


DPDT (2 FORM C)
OUTLINE DIMENSIONS
Dimensions shown in Inch & (Millimeters)



OPEN STYLE POWER RELAY

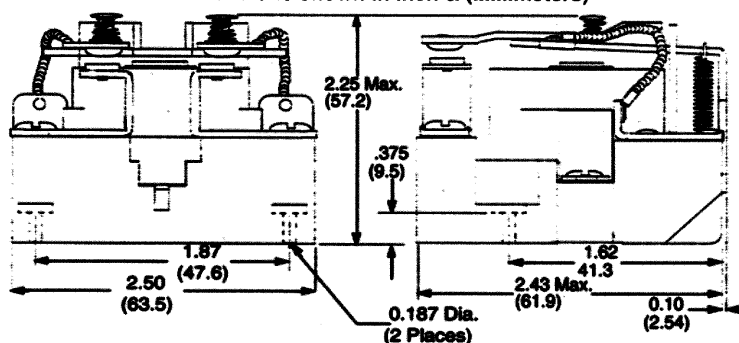
CLASS
199



- CLASS 199 DPST-NO
- 1-1/2 HP PER POLE
- 2 Hp - 2 POLE SWITCHING
- MOLDED PLASTIC INSULATION
- SCREW TERMINALS
- CLASS "B" COIL INSULATION SYSTEM

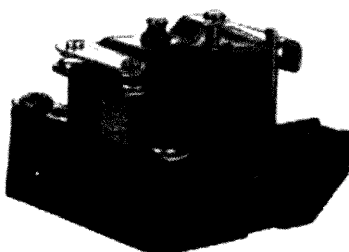
DPST-NO OUTLINE DIMENSIONS

Dimensions shown in Inch & (Millimeters)



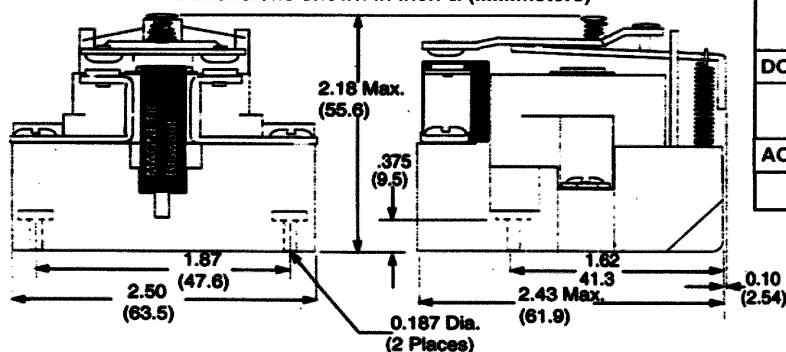
CLASS 199DB

- SPST-NO-DM WITH MAGNETIC BLOWOUT FOR DC ARC QUENCHING
- 20 AMP @ 110 VDC
- MOLDED PLASTIC INSULATION
- SCREW TERMINALS
- CLASS "B" COIL INSULATION SYSTEM



SPST-NO-DM OUTLINE DIMENSIONS

Dimensions shown in Inch & (Millimeters)



SPECIFICATIONS CLASS 199

COIL

Pull-in Voltage: 80% DC Coils, 85% AC coils of nominal voltage or Less.
Dropout Voltage: 10% of Nominal Voltage or More.
Coil Resistance: $\pm 10\%$ Measured @ 25°C
Max. Coil Dissipation: 4 Watts DC Continuous Duty.

CONTACTS

Contact Combinations: DPST-NO (2 Form A) - SPST-NO (Double Make (1 Form X))

Contact Rating each Pole: 30 Amps up to 300 VAC, 50/60Hz
5 Amps @ 480/600Vac, 0.75pF 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 pole to switch both sides of Load 30 Amps @ 28 Vdc Resistive Each Pole.

Ratings, SPST-NO-DM with Blowout Magnet:

20 Amps @ 110 Vdc, Resistive; 8 Amps at 220 Vdc, Resistive, 4 Amps @ 500Vdc Resistive. Inductive Loads must be current limited as not to exceed 100 Amp inrush Currents.

Contact Material:

Silver Cadmium Oxide, Gold Flashed. 5/16" Diameter Standard.

TIMING

Operate time: 40 Milliseconds Max. @ Nominal V
Release Time: 30 Milliseconds Max. @ Nominal V

DIELECTRIC STRENGTH

Between Open Contacts: 1500 V rms
Mutually Insulated Conductive elements: 2200 V rms

TEMPERATURE

Operating: -30°C to +50°C (for AC) to +60°C (DC)
Storage: -30°C to +100°C

LIFE

Electrical (Rated Load): 100,000 Operations
Mechanical (No Load): 5,000,000 Operations

MISCELLANEOUS

Coil Terminals: 6-32 Binder Head Screws
Contact Terminals: 8-32 Binder Head Screws
Base Material: Molded Phenolic, UL Recognized (OMFZ2)
Weight: 9 oz. - 255 Grams approx. (DPST-NO)
8 oz. - 227 Grams approx. (SPST-NO-DM)



Magnecraft PART NUMBER	COIL Measured @ 25°C		
	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL POWER
AC OPERATED (DPST-NO)			
W199AX-8	24 VAC	-	10 VA
W199AX-9	120 VAC	-	10 VA
W199AX-10	240 VAC, 60 Hz 220 VAC, 50 Hz	-	10 VA
DC OPERATED (DPST-NO)			
W199X-11	12 VDC	70	2.0 W
W199X-12	24 VDC	290	2.0 W
AC OPERATED (SPST-NO-DM WITH MAGNETIC BLOWOUT)			
W199ADB-4	120 VAC	-	10 VA

OTHER COIL VOLTAGES ARE AVAILABLE ON SPECIAL ORDER.

DOUBLE MAKE OR BREAK POWER RELAYS

CLASS
199

7

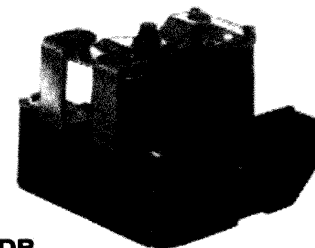
RELAYS

SPECIFICATIONS CLASS 199

- COIL**
Pull-in Voltage: 80% DC Coils, 85% AC coils of nominal voltage or Less.
Dropout Voltage: 10% of Nominal Voltage or More.
Coil Resistance: $\pm 10\%$
Max. Coil Dissipation: 4 Watts DC Continuous Duty.
- CONTACTS**
Contact Combinations: SPST-NC (Double Break (1 Form y))
SPST-NO (Double Make (1 Form x))
Contact Rating each Pole: 30 Amps up to 300 VAC, 50/60Hz
12 Amps @ 480, 10 Amps @ 600Vac, 50/60 Hz, 0.75pF Inductive Load, 2 Hp Motor Load @ 120 thru 600 Vac, 50/60 Hz. 30 Amps @ 28 Vdc Resistive load.
Ratings, SPST-NO-DM with Box Terminals: 50 Amps up to 300 VAC, 50/60Hz
50 Amps @ 28 Vdc Resistive load. Loads must be current limited as not to exceed 100 Amp inrush Currents.
Contact Material: Silver Cadmium Oxide, Gold Flashed. 5/16" Diameter Standard.
- TIMING**
Operate time: 40 Milliseconds Max. @ Nominal V
Release Time: 30 Milliseconds Max. @ Nominal V
- DIELECTRIC STRENGTH**
Between Open Contacts: 1500 V rms
Mutually Insulated Conductive elements: 2200 V rms
- TEMPERATURE**
Operating: -30°C to +50°C (AC) to +60°C (DC)
Storage: -30°C to +100°C
- LIFE**
Electrical (Rated Load): 100,000 Operations
Mechanical (No Load): 5,000,000 Operations
- MISCELLANEOUS**
Coil Terminals: 6-32 Binder Head Screws
Contacts Terminals: 8-32 Binder Head Screws
Base Material: Molded Phenolic, UL Recognized (QMFZ2)
Weight: 8 oz. - 227 Grams approx.

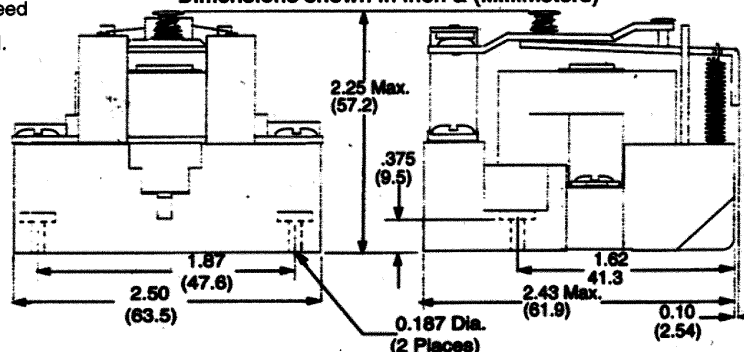
CLASS 199 SPST-NC-DB

- RATED 30 AMPS @ 2 HP
- SCREW TERMINALS
- CLASS "B" COIL INSULATION SYSTEM



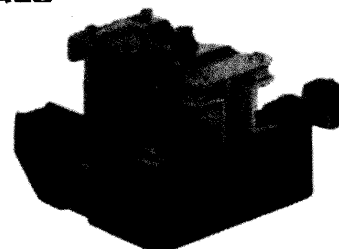
SPST-NC-DB OUTLINE DIMENSIONS

Dimensions shown in Inch & (Millimeters)



CLASS 199 SPST-NO-DM

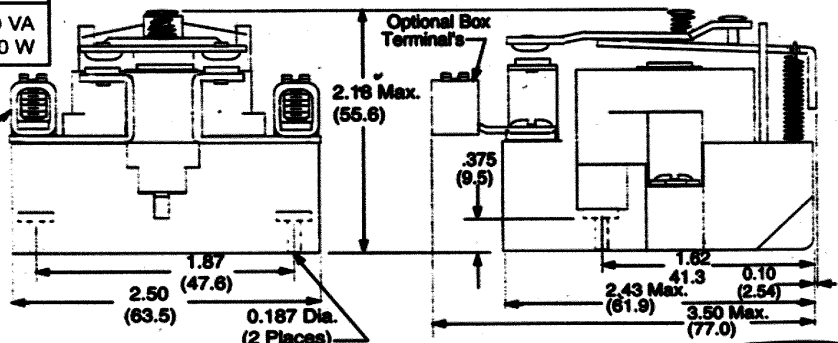
- RATED 30 AMPS @ 2HP WITH SCREW TERMINALS
- 50 AMPS @ 2HP WITH BOX TERMINALS.
- CLASS "B" COIL INSULATION SYSTEM



SHOWN WITH OPTIONAL BOX TERMINALS

SPST-NO-DM OUTLINE DIMENSIONS

Dimensions shown in Inch & (Millimeters)



50 AMP BOX TERMINALS ACCEPT NO.14 THRU NO. 6 AWG. WIRE

Magnecraft PART NUMBER	COIL Measured @ 25°C		
	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL POWER
DC OPERATED (SPST-NC-DB WITH 30 AMP SCREW TERMINALS)			
W199DYX-2	12 VDC	70	2.0 W
AC OPERATED (SPST-NO-DM WITH 30 AMP SCREW TERMINALS)			
W199ADX-4	120 VAC	-	10 VA
W199ADX-5	240 VAC, 60 Hz 220 VAC, 50 Hz	-	10 VA
DC OPERATED (DPST-NO-DM WITH 30 AMP SCREW TERMINALS)			
W199DX-2	12 VDC	70	2.0 W
W199DX-3	24 VDC	290	2.0 W
AC & DC OPERATED (SPST-NO-DM WITH 50 AMP BOX TERMINALS)			
W199ADEX-4	120 VAC	-	10 VA
W199DEX-3	24 VDC	290	2.0 W

OTHER COIL VOLTAGES ARE AVAILABLE ON SPECIAL ORDER.

DC SWITCHING POWER RELAY

CLASS
199

CLASS 199B

- DPDT WITH MAGNETIC BLOWOUT FOR DC ARC QUENCHING
- 10 AMP @ 110 VDC
- MOLDED PLASTIC INSULATION
- SCREW TERMINALS
- CLASS "B" COIL INSULATION SYSTEM

SPECIFICATIONS CLASS 199

COIL

Pull-in Voltage: 80% DC Coils, 85% AC coils of nominal voltage or Less.
Dropout Voltage: 10% of Nominal Voltage or More.
Coil Resistance: $\pm 10\%$
Max. Coil Dissipation: 4 Watts DC Continuous Duty.

CONTACTS

Contact Combinations: DPDT (2 Form C)
Contact Rating each Pole: 30 Amps up to 300 VAC, 50/60Hz
5 Amps @ 480/600Vac, 0.75pF 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 pole to switch both sides of Load 30 Amps @ 28 Vdc Resistive Each Pole.

DC Ratings: 10 Amps @ 110 Vdc, Resistive; 4 Amps at 220 Vdc, Resistive, 2 Amps @ 325Vdc Resistive. Inductive Loads must be current limited as not to exceed 50 Amp inrush currents.

Contact Material: Silver Cadmium Oxide, Gold Flashed. 5/16" Diameter Standard.

TIMING

Operate time: 40 Milliseconds Max. @ Nominal V
Release Time: 30 Milliseconds Max. @ Nominal V

DIELECTRIC STRENGTH

Between Open Contacts: 1500 V rms
Mutually Insulated
Conductive elements: 2200 V rms

TEMPERATURE

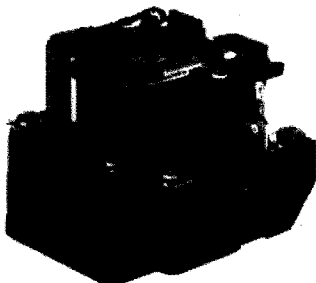
Operating: -30°C to +50°C (for AC) to +60°C (DC)
Storage: -30°C to +100°C

LIFE

Electrical (Rated Load) 100,000 Operations
Mechanical (No Load) 5,000,000 Operations

MISCELLANEOUS

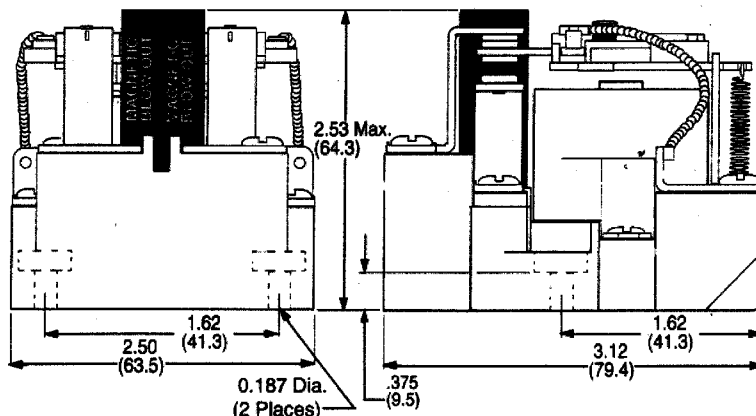
Coil Terminals: 6-32 Binder Head Screws
Contact Terminals: 8-32 Binder Head Screws
Insulation Material: Moving Contacts Barrier - Molded thermoset Plastic.
Weight: 11 oz. - 312 Grams approx.. (DPDT)



Magnecraft PART NUMBER	COIL Measured @ 25°C		
	NOMINAL INPUT VOLTAGE	NOMINAL RESIS- TANCE (OHMS)	NOMINAL POWER
AC OPERATED (DPDT WITH BLOW OUT MAGNET)			
W199ABX-14	120 VAC	-	10 VA
DC OPERATED (DPDT WITH BLOW OUT MAGNET)			
W199BX-14	110 VDC	6000	2.0 W

OTHER COIL VOLTAGES ARE AVAILABLE ON SPECIAL ORDER.

DPDT (2 FORM C WITH BLOWOUT MAGNET)
OUTLINE DIMENSIONS
Dimensions shown in Inch & (Millimeters)



SERIES
425

7

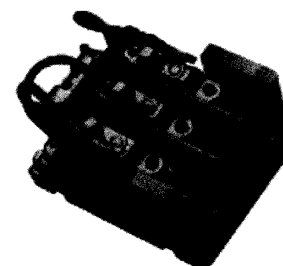
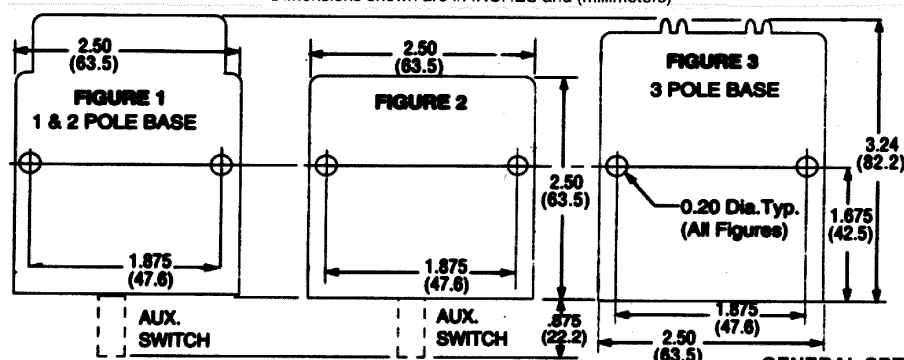
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OPEN STYLE - 1 TO 3 POLE, 30 AMP POWER RELAY

The series 425 Power relay is capable of handling up to 30 Amps and 1 Hp Loads. The Series 425 has sufficient spacing to allow for 600 Vac contact ratings. The Design features a enclosed coil, Screw Terminals and Silver Cadmium Oxide contacts as standard. The Series 425 has a wide choice of options to choose from.

OUTLINE DIMENSIONS

Dimensions shown are in INCHES and (millimeters)



GENERAL SPECIFICATIONS

CONTACTS

Contact Material: Silver Cadmium Oxide.

TIMING

Operate Time: 30 ms Max. @ Nominal Voltage.
Release Time: 15 ms Max. @ Nominal Voltage.

INSULATION CHARACTERISTICS

Dielectric Strength: 2500 V rms between Mutually insulated current carrying parts and those parts to ground.
Insulation Resistance: 500 VDC Exceeds 1000 Megohms.

ENVIRONMENTAL CAPABILITIES

Ambient Temperature Rating: AC: -55°C to +45°C @ Rated Operation.
DC: -55°C to +80 °C

LIFE EXPECTANCY

Mechanical: 10 Million Operations no load
Electrical: 100,000 Operations @ Rated Load.

MISCELLANEOUS

Enclosure: Open Style
Weight: Small Base 9oz. large base 11 oz.approx.

CONTACT RATINGS 1 & 2 POLE

TYPE	LOAD	30VDC	120/240VAC	125VDC	600 VAC
Hot Armature (300V)	General Duty Motor (45% PF)	30A	30A 1 Hp	★	-
Insulated Armature (600V)	General Duty Motor (45% PF)	30A	30A 1 Hp	★	10A
★ Contact ratings for models with pm Blowout magnets (69)					
Contacts				125/DC	
NO				20A	
NC				20A	

3 POLE RELAY

Load	30/DC 120-240/AC 208-240/AC 277/AC 600/AC
General Duty	
Motor (45% PF)	

COIL SPECIFICATIONS 1 & 2 POLE RELAYS @ 25°C

Nominal Voltage	Resistance Ohms ± 10%		Current (MA)		Power Consumption	
	AC	DC	AC	DC	AC	DC
6	0.86	18	1600	333	9.8VA	2.0W
12	3.2	71	820	169	9.8VA	2.0W
24	12	288	410	84	9.8VA	2.0W
120 *	290	6050	85	18-21	9.8VA	2.0W
240 †	1200	-	43	-	9.8VA	-
480 **	4500	-	22	-	9.8VA	-

* AC Coil is 120V, 50/60Hz, DC Coil is 110-125VDC

** UL and CSA Listing only for insulated armature

† For 220 VDC use 6000 Ω, 5 Watt resistor in series with 110 VDC relay.

COIL SPECIFICATIONS 3 POLE RELAYS @ 25°C

Nominal Voltage	Resistance Ohms ± 10%		Current (MA)		Power Consumption	
	AC	DC	AC	DC	AC	DC
12	1.8	35.5	1600	333	11VA	4.0W
24	6.7	142	820	169	11VA	4.0W
48	27	568	410	84	11VA	4.0W
120 *	170	2980	85	18-21	11VA	4.0W
240 **	680	-	43	-	11VA	-
480	2720	-	22	-	11VA	-

* AC Coil is 120V, 50/60Hz, DC Coil is 110-125VDC

** For 220 VDC use 3600 Ω, 10 Watt resistor in series with 110 VDC relay.

1, 2, and 3 Pole Relays

Min. Operate: AC: 85% of nominal Voltage or less @ 25°C
DC: 75% of nominal Voltage or less @ 25°C
Max. Over Voltage: 110% of nominal

ORDERING CODE

Typical Type No. **425 XBX 6990 -120A**

Series

425 Screw Terminal, 30A, 1-3 Pole

Contact Arrangements

Hot Armature Types 300V

AXX SPST-NO FIG.2

XXA SPST-NC FIG.2

XAX SPDT FIG.2

HXX SPST-NO-DM FIG.1

XHX SPDT-NC-DB FIG.1

Insulated Armature Types (600V)

XXH2 SPST-NC-DB FIG.1

XHX2 SPDT-DB FIG.1

HXX2 SPST-NO-DM FIG.2

BXX DPST-NO FIG.2

XXB DPST-NC FIG.1

XBX DPDT FIG.1

CXX 3PST-NO FIG.3

XCX 3PDT FIG.3

Options

Tungsten Contacts (High Inrush) - CODE W

0.25 inch quick connect terminals- CODE 18

Perm. Magnet Blowout

(1 & 2 pole relays only) - CODE 69

1 Aux. Contact (SPDT Snap Switch, 10A) - CODE 90

2 Aux. Contact (SPDT Snap Switches, 10A) - CODE 91

Coil Voltage

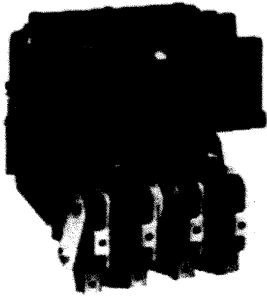
AC: 6, 12, 24, 48, 120, 240, 480 (Add "A")

DC: 6, 12, 24, 48, 110-125 (Add "D")

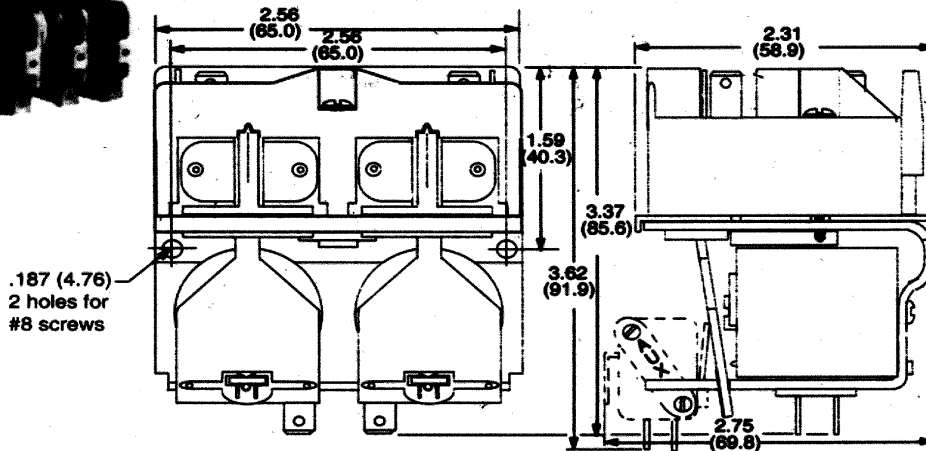
MOTOR REVERSING CONTACTOR, 1 & 2 HP, 6 POLE

**SERIES
A275**


The Series A275 relay is a 2 coil, compact motor reversing contactor which finds extensive applications in the industrial door operator industry, the hoist industry and electronic wheel balancers, to name a few. The A275 has Q.C. coil terminals extending out the back (opposite the contact terminals), mechanically interlocked armatures is a standard feature.

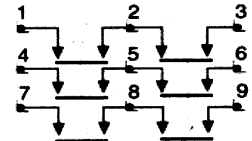


OUTLINE DIMENSIONS
Dimensions shown in Inch and (Millimeters)



WIRING DIAGRAM

TOP VIEW
Main contact terminals are numbered on contactor



Auxiliary contact
Snap Switches

AC COIL SPECIFICATIONS @ 25°C

Nominal Voltage	Resistance Ohms ± 10%	Power Consumption
12V/50-60hz	1.24	17VA
24V/50-60hz	4.63	16.7VA
110V/50-120V/60hz	125	16.8VA
220V/50-240V/60hz	500	16.8VA

DC COIL SPECIFICATIONS @ 25°C

Nominal Voltage	Resistance Ohms ± 10%	Power Consumption
12	31.0	4.5W
24	125	4.6W
32	210	4.9W
48	500	4.6W
120	3240	4.4W

Polypropylene encapsulated coils

CONTACT RATINGS

AC CONTACTS: (Apply only with contacts in use, not on a "per pole" basis).

VOLTAGE (60HZ)	PHASE	MOTOR LOADS (HP)	RESISTIVE LOAD (AMPS)
120	1 - 2 - 3	1	15
240	1	1.5	10
240	2 - 3	3	10
480/600	2 - 3	3*	5

DC CONTACTS

VOLTAGE (DC)	RESISTIVE LOAD (AMPS)
30	15
125	5

600 volt spacing to ground.

300 volt spacing for auxiliary contacts.

* 480/600 volt models with electric interlocks are rated for 2 hp.

GENERAL SPECIFICATIONS

COIL

Pull-in Voltage: AC: 85%, DC: 80% of nominal voltage measured at 25°C
Dropout Voltage: 10% of nominal voltage or more @ 25°C
Max. allowed voltage: 110% of nominal voltage
Coil Resistance: ±10% Measured @ 25°C

CONTACTS

Contact Material: Silver Cadmium Oxide.

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.

LIFE EXPECTANCY

Mechanical: 5 Million Operations no load
Electrical: 100,000 Operations @ Rated Load.
500,000 Operations @ 1/2 rated load.

MISCELLANEOUS

Weight: 1 pound. approx..

OPTIONS (CONSULT FACTORY)

ORDERING CODE

Typical Type No. **A275 KXX 90 -24A**

Series

A275, 1/4" Terminals, motor reversing.
Continuous, 1 & 2hp, 3 pole models

Contact Arrangements

KXX (3PDM-NO., per coil)

Options

2 Aux. contacts, each 1 form "C"
(1 per coil) 1/4" Q.C. terminals - **CODE 90**

4 Aux. contacts, each 1 form "C"
(2 per coil) 1/4" Q.C. terminals - **CODE 91**

Coil Voltage

AC: 12, 24, 110, 120, 220, 240 (Add "A")

DC: 12, 24, 32, 48, 120 (Add "D")

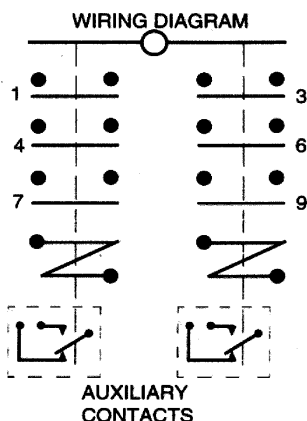
2 COIL MOTOR REVERSING CONTACTOR 1.5 - 7.5HP, 6 POLE

SERIES
A575

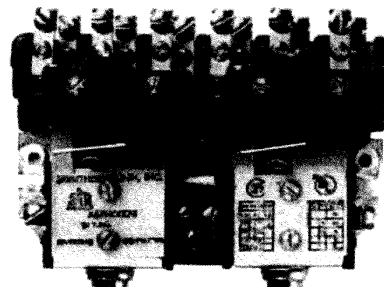
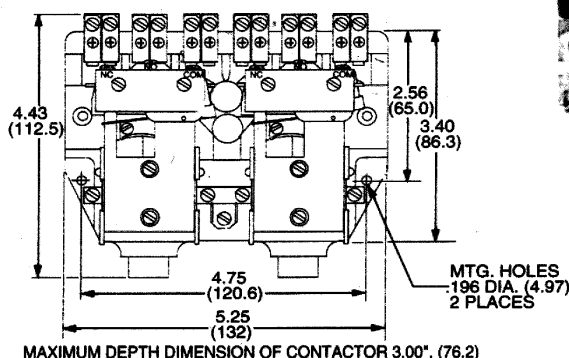
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The Series A575 relay is rated to 7.5 HP. Two sets of 3 pole, double-make, N.O. contacts are mechanically interlocked to prevent simultaneous closure. Front mounted auxiliary contacts are available for electrical lockup and lockout. All versions have silver cadmium oxide contacts. The A575 motor reversing contactor is widely used for control of overhead doors, elevators, hoists, machine tools, and other similar devices that requires frequent jogging.



OUTLINE DIMENSIONS
Dimensions shown in Inch and (Millimeters)



CONTACT RATINGS

LOAD	VOLTAGE (60HZ)	PHASE	MOTOR LOADS (HP)	RESISTIVE LOAD (AMPS)
3PST-DM-NO (per pole)	120	1	1-1/2	30
	208/240	1	3	30
	208/240	2-3	5	30
	480/600	2-3	7-1/2	15

DC CONTACTS

LOAD	VOLTAGE (DC)	RESISTIVE LOAD (AMPS)
3PST-DM-NO (per pole)	115	15
	230	2

AUXILIARY CONTACTS

LOAD	VOLTAGE (AC)	RESISTIVE LOAD (AMPS)
1 FORM "A"	120	5
"B" OR "C"	240	5

GENERAL SPECIFICATIONS

COIL	
Pull-in Voltage:	AC: 85%, DC: 80% of nominal voltage measured at 25°C
Dropout Voltage:	10% of nominal voltage or more @ 25°C
Max: allowed voltage:	110% of nominal voltage
Coil Resistance:	±10% Measured @ 25°C
CONTACTS	
Contact Material:	Silver Cadmium Oxide.
TIMING	
Operate Time:	60 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:	-40°C to +50°C @ rated operation.
LIFE EXPECTANCY	
Mechanical:	5 Million Operations no load
Electrical:	100,000 Operations @ Rated Load.
	250,000 Operations @ 1/2 rated load.
MISCELLANEOUS	
Weight:	1 pound, approx..

AC COIL SPECIFICATIONS @ 25°C (22VA)

Nominal Voltage	Resistance Ohms ± 10%	Nominal Current
12	1.00	1.833 AMP
24	5.30	0.917 AMP
*120	92.0	0.183 AMP
240	420	0.920 AMP
440	2100	0.050 AMP
550	3100	0.040 AMP

* AC coil is 120, 50-60HZ

DC COIL SPECIFICATIONS @ 25°C (10 WATT)

Nominal Voltage	Resistance Ohms ± 10%	Nominal Current
12	16.5	0.727
24	58.2	0.412
**120	1,450	0.083
240	4,200	0.055

** DC coil is 110-125 VDC

OPTIONS

ORDERING CODE

Typical Type No. **A575 KXX 90 -24A**

Series

A575, Screw Terminals, 2 coil motor rev. contactor, 1.5 - 7.5 HP

Contact Arrangements

KXX (3PDM-NO., per coil)

Options

1 Form "A" & 1 Form "B" Aux. contacts per coil, Rated 5 Amps - **CODE 74**1 form "C" Aux. contact per coil Rated 5 Amps. - **CODE 90**

Coil Voltage

AC: 12, 24, 120, 240, 440, 550 (Add "A")

DC: 12, 24, 115-125, 240 (Add "D")

NOTE: CONTACTORS MUST BE MOUNTED IN THE VERTICAL POSITION WITH THE LOAD CONTACTS UP.
Mechanical Interlock omitted

30 AMP MERCURY DISPLACEMENT RELAY

**CLASS
MDR**
CLASS M30

RATED 30 AMPS
SWITCHES RESISTIVE
TUNGSTEN, AND MOTOR LOADS
1 POLE N.O. CONTACT
SCREW TERMINALS


SPECIFICATIONS MERCURY DISPLACEMENT RELAYS
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: .004 Ohm terminal to terminal

TIMING

Operate (at nominal voltage) 50 Milliseconds typical
Dropout (at nominal voltage) 80 Milliseconds typical

DIELECTRIC STRENGTH

All mutually insulated points to ground: 2650 V rms (1 Second)

TEMPERATURE

Operating: - 35°C to + 60°C Under continuous load.

LIFE

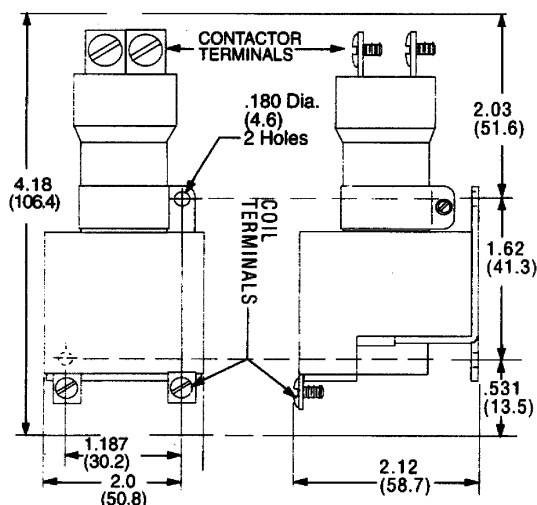
Mechanical: (No load) 5,000,000 Operations
Electrical (Rated load) 100,000 Operations

MISCELLANEOUS

Insulation Material: Class B - 130°C
Mounting: Vertical ±10°
Options: Form "A" and "B" contact configurations. Other coil voltages available other then listed in MDR section
Weight: 13 ozs. 370 grams.

FOR EXTENDED LOAD LIFE WHEN SWITCHING RESISTIVE AND TUNGSTEN LOADS ORDER THE ML30-STYLE. OTHER COIL VOLTAGE AND CONTACT COMBINATIONS AVAILABLE.

Construction in accordance with VDE 0660 and 0110 (Insulation group 380)


CONTACTOR RATINGS FOR M30A - M30B

VOLTAGE	PHASE	HP		MOTOR AMPS		RESISTIVE AMPS	TUNGSTEN AMPS
		1Ø	3Ø	1Ø	3Ø		
120VAC	1Ø 3Ø	2*	3*	24	19.2	30*	30*
240VAC	1Ø 3Ø	5*	7.5*	28	19	30*	15
480VAC	1Ø 3Ø	5*	10*	14	14	30*	7.5
600VAC	1Ø 3Ø	5*	10*	11.2	11	25 **	6
24VDC	DC	1/2		27		30*	30*
48VDC	DC	1/2		13.5		30*	30*
125VDC	DC	1/2		5.2		16*	16*
250VDC	DC	1/2		2.6		12*	12*

* UL and CSA Listed ** CSA only

Magnecraft PART NUMBER	COIL Measured @ 25°C			
	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL CURRENT	NOMINAL POWER
WM30A-120A	120 VAC	700	.058	7VA

35 AND 60 AMP MERCURY DISPLACEMENT RELAYS

CLASS
MDR

CLASS WM35 and WM60
SWITCHES RESISTIVE,
TUNGSTEN, AND MOTOR LOADS
STAINLESS STEEL TUBE S
HIGH INRUSH CAPACITY

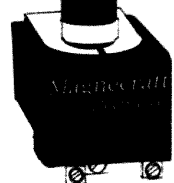


RELAYS

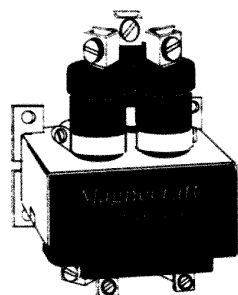
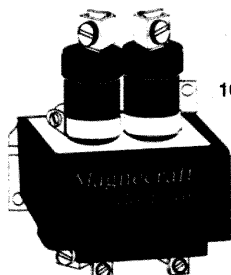
Magnecraft PART NUMBER	COIL Measured @ 25°C			
	NOMINAL INPUT VOLTAGE	NOMINAL RESIS- TANCE (OHMS)	NOMINAL CURRENT (AMPS)	NOMINAL POWER
1 POLE NORMALLY OPEN CONTACT				
WM60A-120A	120 VAC	700	.058	7VA
WM60A-240A	240VAC, 60HZ 220VAC, 50HZ	2,800	.029	7VA
WM60A-24D	24VDC	186	.120	3.5W
2 POLE NORMALLY OPEN CONTACTS				
WM60AA-120A	120 VAC	218	.135	16.5VA
WM60AA-240A	240VAC, 60HZ 220VAC, 50HZ	1,200	.063	16.5VA
WM60AA-24D	24VDC	98	.232	6W
3 POLE NORMALLY OPEN CONTACTS				
WM60AAA-120A	120 VAC	111	.220	28VA
WM60AAA-240A	240VAC, 60HZ 220VAC, 50HZ	430	.117	28VA
WM60AAA-24D	24VDC	64	.375	9W
1 POLE NORMALLY CLOSED CONTACT				
WM60B-120A	120VAC	460	.115	13VA

Magnecraft PART NUMBER	COIL Measured @ 25°C			
	NOMINAL INPUT VOLTAGE	NOMINAL RESIS- TANCE (OHMS)	NOMINAL CURRENT (AMPS)	NOMINAL POWER
1 POLE NORMALLY OPEN CONTACT				
WM35A-120A	120 VAC	700	.058	7VA
WM35A-240A	240VAC, 60HZ 220VAC, 50HZ	2,800	.029	7VA
WM35A-24D	24VDC	186	.120	3.5W
2 POLE NORMALLY OPEN CONTACTS				
WM35AA-120A	120 VAC	218	.135	16.5VA
WM35AA-240A	240VAC, 60HZ 220VAC, 50HZ	1,200	.063	16.5VA
WM35AA-24D	24VDC	98	.232	6W
3 POLE NORMALLY OPEN CONTACTS				
WM35AAA-120A	120 VAC	111	.220	28VA
WM35AAA-240A	240VAC, 60HZ 220VAC, 50HZ	430	.117	28VA
WM35AAA-24D	24VDC	64	.375	9W
1 POLE NORMALLY CLOSED CONTACT				
WM35B-120A	120VAC	460	.115	13VA

1 POLE
Weight
13 Ozs., (370 Grams)



2 POLE
Weight
10 Ozs., (738 Grams)



3 POLE
Weight
2Lbs. 6ozs., Ozs., (1078Grams)

CONTACTOR RATINGS FOR M35A - M35B

VOLTAGE	PHASE	HP		MOTOR AMPS		RESISTIVE AMPS	TUNGSTEN AMPS
		1Ø	3Ø	1Ø	3Ø		
120VAC	1Ø 3Ø	3*	5*	34	30	35*	35*
240VAC	1Ø 3Ø	5*	7.5*	28	19	35*	17
480VAC	1Ø 3Ø	5*	10*	14	14	35*	9
600VAC	1Ø 3Ø	5*	10*	11.2	11	25**	7
24VDC	DC	1/2		27		35*	35*
48VDC	DC	1/2		13.5		35*	35*
125VDC	DC	1/2		5.2		16*	16*
250VDC	DC	1/2		2.6		12*	12*

* UL and CSA Listed ** CSA only

CONTACTOR RATINGS FOR M60A - M60B

VOLTAGE	PHASE	HP		MOTOR AMPS		RESISTIVE AMPS	TUNGSTEN	
		1Ø	3Ø	1Ø	3Ø		AMPS "A" (N.O.)	AMPS "B" (N.C.)
120VAC	1Ø 3Ø	3*	5*	34	30	60*	60*	45*
240VAC	1Ø 3Ø	5*	10*	28	28	60*	30	22.5
480VAC	1Ø 3Ø	7.5*	15*	21	21	60*	15	11.2
600VAC	1Ø 3Ø	7.5*	15*	16	17	50**	12	9
24VDC	DC	3/4		39		60*	50*	50*
48VDC	DC	3/4		19.5		60*	50*	50*
125VDC	DC	3/4		7.4		40*	40*	40*
250VDC	DC	3/4		3.7		20*	20*	20*

* UL and CSA Listed ** CSA only

35 AND 60 AMP MERCURY DISPLACEMENT RELAYS

CLASS
MDR

CLASS WML35 and WML60

RECOMMENDED FOR MUCH LONGER LIFE
WHEN SWITCHING RESISTIVE AND TUNGSTEN LOADS
AVAILABLE IN AC RELAYS ONLY
NOT RECOMMENDED FOR SWITCHING DC LOADS



Magnecraft PART NUMBER	COIL Measured @ 25°C				Magnecraft PART NUMBER	COIL Measured @ 25°C			
	NOMINAL INPUT VOLTAGE	NOMINAL RESIS- TANCE (OHMS)	NOMINAL CURRENT (AMPS)	NOMINAL POWER		NOMINAL INPUT VOLTAGE	NOMINAL RESIS- TANCE (OHMS)	NOMINAL CURRENT (AMPS)	NOMINAL POWER
1 POLE NORMALLY OPEN CONTACT					1 POLE NORMALLY OPEN CONTACT				
WML60A-120A WML60A-240A	120 VAC 240VAC, 60HZ 220VAC, 50HZ	700 2,800	.058 .029	7VA 7VA	WML35A-120A WML35A-240A	120 VAC 240VAC, 60HZ 220VAC, 50HZ	700 2,800	.058 .029	7VA 7VA
2 POLE NORMALLY OPEN CONTACTS					2 POLE NORMALLY OPEN CONTACTS				
WML60AA-120A WML60AA-240A	120 VAC 240VAC, 60HZ 220VAC, 50HZ	218 1,200	.135 .063	16.5VA 16.5VA	WML35AA-120A WML35AA-240A	120 VAC 240VAC, 60HZ 220VAC, 50HZ	218 1,200	.135 .063	16.5VA 16.5VA
3 POLE NORMALLY OPEN CONTACTS					3 POLE NORMALLY OPEN CONTACTS				
WML60AAA-120A WML60AAA-240A	120 VAC 240VAC, 60HZ 220VAC, 50HZ	111 430	.220 .117	28VA 28VA	WML35AAA-120A WML35AAA-240A	120 VAC 240VAC, 60HZ 220VAC, 50HZ	111 430	.220 .117	28VA 28VA

CONTACTOR RATINGS FOR ML60A - ML60B

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 ** CSA only

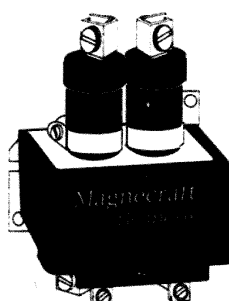
CONTACTOR RATINGS FOR ML35A - ML35B

VOLTAGE	RESISTIVE AMPS	TUNGSTEN AMPS
120VAC	35*	35*
240 VAC	35*	17
480VAC	35*	9
600VAC	25 **	7

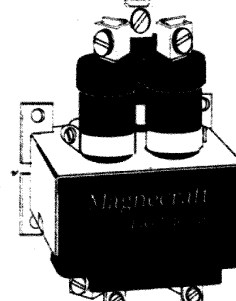
* UL and CSA Listed ** CSA only



1 POLE
Weight
13 Ozs., (370 Grams)



2 POLE
Weight
10 Ozs., (738 Grams)



3 POLE
Weight
2Lbs. 6ozs., (1078Grams)

100 AMP MERCURY DISPLACEMENT RELAYS

MAGNECRAFT HAS DEVELOPED AN MDR WITH MUCH LARGER SWITCHING CAPABILITIES. THE M100 RELAY CAN SWITCH LOADS UP TO 100 AMPERES AT 480VAC FOR RESISTIVE LOADS

CLASS WM100

CAPABLE OF SWITCHING 100 AMP RESISTIVE, TUNGSTEN AND MOTOR LOADS.
DC SWITCHING 28VDC, 100 AMPS

CLASS
MDR

7

RELAYS



SPECIFICATIONS MERCURY DISPLACEMENT RELAYS

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:	.,001 ohm Typical

TIMING

Operate (at nominal voltage)	50 Milliseconds typical
Dropout (at nominal voltage)	100 Milliseconds typical

DIELECTRIC STRENGTH

Across open Contact:	2650 V rms
Coil to Contact:	2650 V rms
Contact to Frame:	2650 V rms
Coil to Frame:	2650 V rms

TEMPERATURE

Operating:	- 35°C to + 60°C Under continuous load.
------------	---

LIFE

Mechanical: (No load)	5,000,000 Operations
Electrical (Rated load)	100,000 Operations

MISCELLANEOUS

Insulation Material:	Class B - 130°C
Terminals:	# 1 thru 8 AWG wire
Mounting:	Vertical ±10°
Options:	Coil Voltages from 12VAC to 480VAC; 5VDC thru 250VDC.

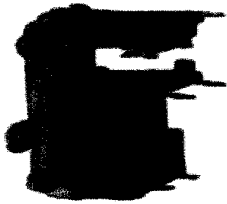
CONTACTOR RATINGS FOR M100

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*
120VDC	80	80	1.5*
250VDC	40	40	1.5*

* NON UL RATING

Magnecraft PART NUMBER	COIL Measured @ 25°C			
	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL CURRENT (AMPS)	NOMINAL POWER
1 POLE NORMALLY OPEN CONTACT				
WM100A-120A	120 VAC	73.5	.275	33VA
WM100A-240A	240VAC, 60HZ 220VAC, 50HZ	300	.138	33VA
WM100A-24D	24VDC	53	.380	10W

HIGH VOLTAGE SWITCHING RELAYS

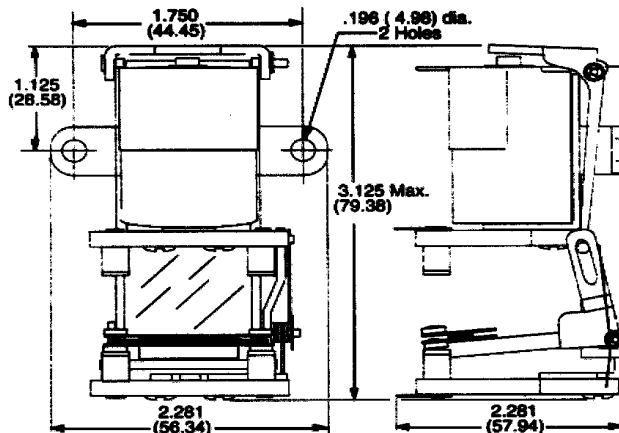
CLASS
158. 102V

CLASS 158

SPDT-DB-DM CONTACT CONFIGURATION
SWITCHES LOADS UP TO 1KVA

OUTLINE DIMENSIONS

DIMENSIONS SHOWN ARE IN INCHES AND (MILLIMETERS)



SPECIFICATIONS

COIL

Coil Dissipation DC 5 Watts.

CONTACTS

Contact Material: Silver alloy, Gold Flashed, 1/4" dia.
Contact Configuration: SPDT-DB-DM
Switching Voltage max.: 5000 VDCContact Rating: 200 mA @ 5000 VDC
1 Amp @ 1000 VDC

DIELECTRIC STRENGTH

Across open contacts 7500 V rms
Contact to Coil: 8500 V rms
Contact to Frame: 3000 V rms
Insulation Resistance 500 VDC, Exceeds 100 MΩ

TEMPERATURE

Operating: -40°C to +85°C

LIFE EXPECTANCY

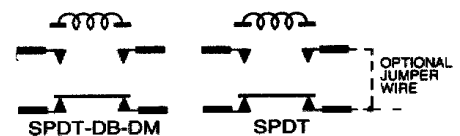
Electrical: 100,000 (Rated Load)
Mechanical: 5 Million Operations (No Load) Min.

MISCELLANEOUS

Mounting: Bracket with 2 Clearance holes
0.196 dia.
Weight: 212.6 grams

WIRING DIAGRAM

VIEWED FROM PIN END



Magnecraft Part Number	Contact Configuration	Coil Measured at 25°C		
		Nominal Input Voltage	Nominal Resistance (Ohms)	Nominal Power (Watts)
W158HVX-1	SPDT-DB-DM	24VDC	120	5

NOTE: Other voltages and contact combinations available.

CLASS 102V

EPOXY ENCAPSULATED

SPST-NO TUNGSTEN CONTACTS

SWITCHES LOADS UP TO 10 mA @ 5000V

CLASS 102HV

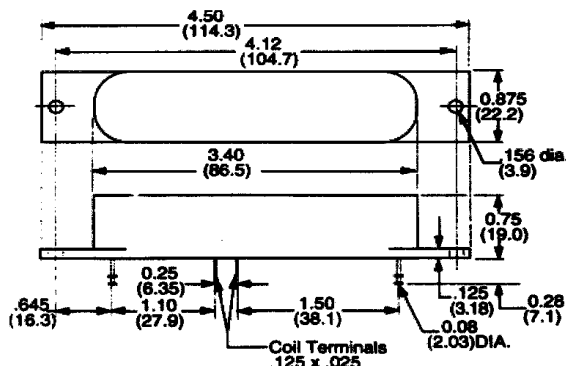
Same as above except:

Switches 10,000V with Loads up to 5 mA

Do not hook wire heavier
than #22 AWG, since excess
stress on terminals could
cause damage to internal
components

OUTLINE DIMENSIONS

DIMENSIONS SHOWN ARE IN INCHES AND (MILLIMETERS)



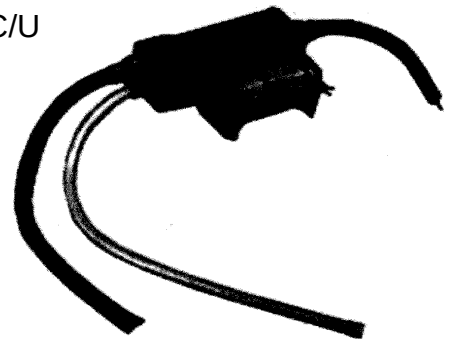
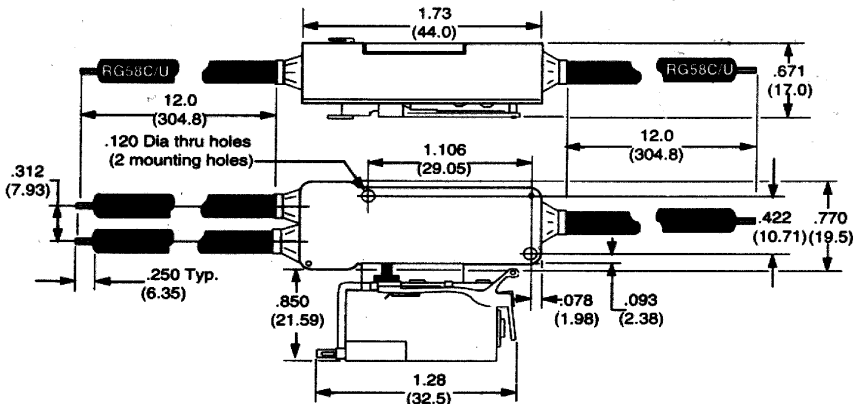
<i>Magnecraft</i> Part Number	Contact Configuration	Coil Measured at 25°C		
		Nominal Input Voltage	Nominal Resistance (Ohms)	Nominal Power
5,000 VOLTS NORMALLY OPEN				
W102VX-49	SPST-NO	6 VDC	70	500 mW
W102VX-50	SPST-NO	12 VDC	250	580 mW
W102VX-51	SPST-NO	24 VDC	1000	580 mW
10,000 VOLTS NORMALLY OPEN				
W102HVX-3	SPST-NO	24 VDC	400	1.5 Watts

NOTE: Other voltages and contact combinations available.
Pull-in is measured at 75% of nominal voltage or less, at 25°C
Weight: 49.2 grams, 1.74 oz.

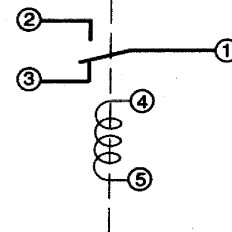
150 WATT, COAXIAL R.F. SWITCHING RELAY

CLASS
120 **7**

120 COAXIAL RELAY
PANEL MOUNT WITH RG58C/U
CABLE (50 OHM)
SWITCHING UP TO 470 MHz



WIRING DIAGRAM
Side View Coil Down



R
E
L
A
Y
S

GENERAL SPECIFICATIONS

CONTACTS

R.F. Load rating:
Contact Configuration:
Contact Resistance (Initial):
VSWR (Voltage Standing Wave Ratio)
Cross Talk:

150 Watts max. up to 470 MHz
SPDT (1 Form "C")
50 Milliohms max.
1.25 to 1 max., up to 460 MHz
40 DB min., up to 470 MHz.

TIMING

Operate Time:
Release Time:

15 mS Max. @ Nominal Voltage.
7 mS Max. @ Nominal Voltage.

DIELECTRIC STRENGTH

All Mutually Insulated current
carrying parts to ground:
Insulation Resistance:

1000 V rms @ Sea level
1000 Megohms min. 500 V

TEMPERATURE

Rated Operation:

-55°C to +65°C

LIFE EXPECTANCY

Mechanical:
Electrical:

100,000 Operations @ Rated Load.
5 Million Operations no load

MISCELLANEOUS

Mounting:
Connectors:
Cable Type:

Cable Impedance:
Weight:

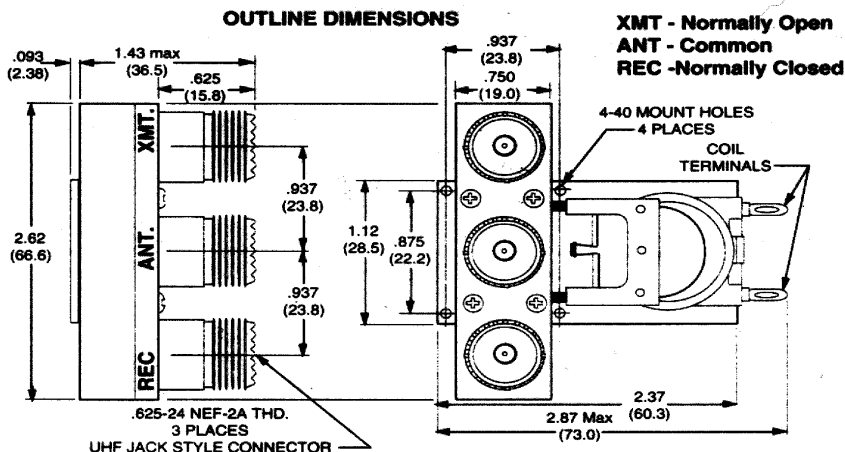
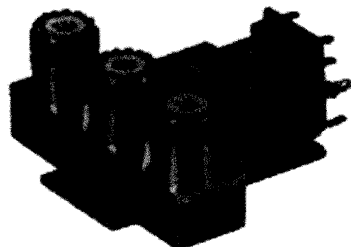
Panel mount with 2 mount holes.
None
RG58C/U, 12" long, with stripped wire
length of .250"
50 Ohms
3 ozs. 85.0 grams approx.

<i>Magnecraft</i> PART NUMBER	CONTACT CONFIGURATION	COIL Measured @ 25°C	
		NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
DC OPERATED			
W120X-14	SPDT	12 VDC	100

500 WATT, COAXIAL R.F. SWITCHING RELAY

CLASS
128

128 COAXIAL RELAY
PANEL MOUNT WITH UHF CONNECTORS
AUXILIARY CONTACTS
AC OR DC INPUT AVAILABLE.

**GENERAL SPECIFICATIONS****R.F. CONTACTS**

R.F. Load rating:
 Contact Configuration:
 Contact Resistance (Initial):
 VSWR (Voltage Standing Wave Ratio)
 Cross Talk:

500 Watts max. up to 1000 MHz
 SPDT (1 Form "C")
 50 Milliohms
 1.25 to 1 max., up to 470 MHz
 40 DB min., up to 470 MHz.

TIMING

Operate Time:
 Release Time:

20 mS Max. @ Nominal Voltage.
 20 mS Max. @ Nominal Voltage.

DIELECTRIC STRENGTH

All Mutually Insulated current
 carrying parts to ground:
 Insulation Resistance:

1000 V rms @ Sea level
 1000 Megohms min. 500 V

TEMPERATURE

Rated Operation:

-55°C to +65°C

VIBRATION:

Rated Operation:

10 to 55 Hz @ 10 G's acceleration

SHOCK

Rated Operation:

30 G's @ 11ms

LIFE EXPECTANCY

Mechanical:
 Electrical:

100,000 Operations @ Rated Load.
 5 Million Operations no load

MISCELLANEOUS

Connectors:

UHF Standard, 50 Ω Impedance

AUXILIARY CONTACTS

Auxiliary Contact Load Rating:
 Contact Configuration:
 Contact Material:
 Weight:

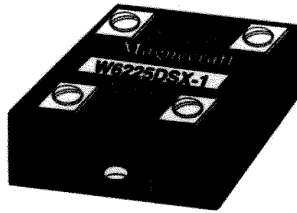
10 Amps at 120 VAC, 28 VDC Resistive.
 DPDT, (2 Form "C")
 Silver Alloy, Gold Flashed
 9 oz. - 255.1 grams.

Magnecraft PART NUMBER	R.F. CONTACT CONFIGURATION	AUXILIARY CONTACT CONFIGURATION	COIL Measured @ 25°C	
			NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
DC OPERATED - WITHOUT AUXILIARY CONTACTS				
W128X-9	SPDT	NONE	12 VDC	100
AC OPERATED - WITH AUXILIARY CONTACTS				
W128AX-11	SPDT	DPDT	120 VAC	-
DC OPERATED - WITH AUXILIARY CONTACTS				
W128X-14	SPDT	DPDT	12 VDC	100
W128X15	SPDT	DPDT	24 VDC	400

DC CONTROLLED SOLID STATE RELAY

CLASS
6

7



CLASS 6
 DC CONTROLLED INPUT
 AC SCR OUTPUT
 SOLID STATE RELAYS
 HIGH RELIABILITY TYPE
 3-32 VDC INPUT
 50/60 Hz AC OUTPUT



RATING APPROVALS FOR 240 VAC MODELS ONLY.
 480 VAC APPROVALS PENDING.

High Transient Capability—Single output features back to back SCR's an internal mounted RC (snubber) network for high dv/dt applications.

Photo-Isolated, Zero Switching—Optically coupled for 4000 VAC isolation between input and output and RFI suppression.

OUTPUT TERMINALS = 1 & 2
 INPUT TERMINALS = 3 (+), 4 (-)

RELAYS

Magnecraft PART NUMBERS	W6102	W6110	W6125	W6140	W6202	W6210	W6225	W6240
	DSX-1	DSX-1	DSX-1	DSX-1	DSX-1	DSX-1	DSX-1	DSX-1
INPUT CHARACTERISTICS								
Input Voltage Range (over operating temperature range)	3 to 32 Volts DC							
Maximum Pickup Voltage (over operating temperature range)	3 Volts DC							
Minimum Dropout Voltage (over operating temperature range)	1 Volts DC							
Input Impedance	1500 ohms minimum							
Reverse Polarity Protected	Yes							
Input Filtered for transients less than one millisecond.	Yes							
Response Time	1/2 Cycle Max.							
OUTPUT CHARACTERISTICS								
Nominal Off State Voltage V_D (RMS)	400				600			
Maximum Off State Voltage $V_{D\text{ MAX}}$ (RMS)	140				280			
Minimum Off State Voltage $V_{D\text{ MIN}}$ (RMS)	20				40			
Non-Repetitive Peak Voltage V_{DSM} (Blocking Voltage)	300				500			
Maximum Rate of Rise of Off State Voltage dv/dt	200	500 Volts per microsec.				500 Volts per microsec.		
Rated Load Current I_T (RMS)*	2.5	10.0	25.0	40	2.5	10.0	25.0	40
U/L Incandescent Lamp Ampere Rating	2.0	8.0	16.0	30	2.0	8.0	16.0	30
U/L Motor Load Ampere Rating	1.0	4.5	8	14	1.0	4.5	8	14
Minimum Load Current $I_{T\text{ MIN}}$ (RMS) to maintain "On"	50 mA.							
Non-Repetitive Surge Current $I_{T\text{ SM}}$ (one Cycle Surge)	22.5	120	250	625	22.5	120	250	625
Maximum RMS Overload current for 1 second	5	24	40	80	5	24	40	80
Maximum Off State Leakage current I_D (RMS)	8 mA				10 mA			
Maximum RMS On-State Voltage V_T (RMS) Maximum Voltage drop across relay output @ rated current	3.5	1.6	1.6	1.6	3.5	1.6	1.6	1.6
MISCELLANEOUS CHARACTERISTICS								
Max I^2T For Fusing (8-3ms) A^2 sec	2.1	60	260	1620	2.1	60	260	1620
Thermal Resistance Junction To Case (T_J , Max.= 115°C) °c/w	8.5	1.78	1.02	0.63	8.5	1.78	1.02	0.63
Suggested Heat Sink	16-790 or 16-793							
Dielectric Strength V_{ISO} (Input-Output Isolation)	4,000 VAC							
Insulation Resistance R_{ISO} @ 500VDC	$10^{10}\ \Omega$							
Operating temperature Range	-30°C to +80°C							
Storage temperature Range	-40°C to +120°C							
Weight	4 oz. (113.4 g)							

*All current ratings are based on use of suitable thermally conductive compound (e.g. silicone grease between the SSR mounting base and mounting surface of suitable heat sink).

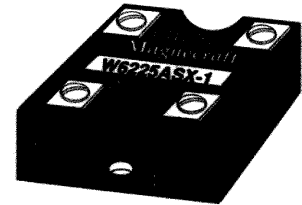
AC CONTROLLED SOLID STATE RELAY

CLASS
6

MEETS UL 1950 (IEC 950) STANDARD FOR
USAGE IN SEL V (SAFE EXTRA LOW VOLTAGE)
CIRCUITS.

CLASS 6

AC CONTROLLED INPUT
AC SCR OUTPUT
SOLID STATE RELAYS
HIGH RELIABILITY TYPE
90 to 280 VAC INPUT OR
80 TO 140 VDC INPUT
VAC OUTPUT 50/60 Hz



OUTPUT TERMINALS = 1 & 2
INPUT TERMINALS = 3 & 4

High Transient Capability—Single output features back to back SCR's an internal mounted RC (snubber) network for high dv/dt applications.
Photo-Isolated, Zero Switching—Optically coupled for 4000 VAC isolation between input and output and RFI suppression.

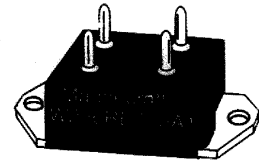
Magnecraft PART NUMBERS		W6110	W6125	W6140	W6202	W6210	W6225	W6240		
		ASX-1	ASX-1	ASX-1	ASX-1	ASX-1	ASX-1	ASX-1		
INPUT CHARACTERISTICS										
Input Voltage Range (over operating temperature range)	90 to 280 VAC (Also can be used with 80 to 140 Volts DC)									
Maximum Pickup Voltage (over operating temperature range)	90 VAC (80 VDC)									
Minimum Dropout Voltage (over operating temperature range)	10VAC (10 VDC)									
Input Impedance	60K ohms minimum									
Reverse Polarity Protected	Not Applicable									
Input Filtered for transients less than one millisecond.	Yes									
Response Time	10 mS Turn on 40 mS Turn Off									
OUTPUT CHARACTERISTICS										
Nominal Off State Voltage V_D (RMS)	120				240					
Maximum Off State Voltage $V_{D MAX}$ (RMS)	140				280					
Minimum Off State Voltage $V_{D MIN}$ (RMS)	20				40					
Non-Repetitive Peak Voltage V_{DSM} (Blocking Voltage)	300				500					
Maximum Rate of Rise of Off State Voltage dv/dt	500 Volts per microsecond				200V	500 Volts per microsecond				
Rated Load Current I_T (RMS)*	10	25.0	40	2.5	10	25.0	40			
U/L Incandescent Lamp Ampere Rating	8.0	16.0	30	2.0	8.0	16.0	30			
U/L Motor Load Ampere Rating	4.5	8.0	14	1.0	4.5	8.0	14			
Minimum Load Current $I_{T MIN}$ (RMS) to maintain "On"	50 ma.									
Non-Repetitive Surge Current $I_{T SM}$ (one Cycle Surge)	120	250	625	22.5	120	250	625			
Maximum RMS Overload current for 1 second	24	24	80	5	24	24	80			
Maximum Off State Leakage current I_D (RMS)	8 ma				10 ma					
Maximum RMS On-State Voltage V_T (RMS) Maximum Voltage drop across relay output @ rated current	1.6	1.6	1.6	3.5	1.6	1.6	1.6			
MISCELLANEOUS CHARACTERISTICS										
Max I ² T For Fusing (8-3ms) A ² sec	60	260	1620	2.1	60	260	1620			
Thermal Resistance Junction To Case (T _J , Max.= 115°C) °c/w	1.48	1.02	0.63	8.5	1.48	1.02	0.63			
Suggested Heat Sink	16-790 or 16-793									
Dielectric Strength V_{ISO} (Input-Output Isolation)	4,000 VAC									
Insulation Resistance R_{ISO} @ 500VDC	10 ¹⁰ Ω									
Operating temperature Range	-30°C to +80°C									
Storage temperature Range	-30°C to +100°C									
Weight	4 oz. (113.4 g)									

*All current ratings are based on use of suitable thermally conductive compound (e.g. silicone grease between the SSR mounting base and mounting surface of suitable heat sink).

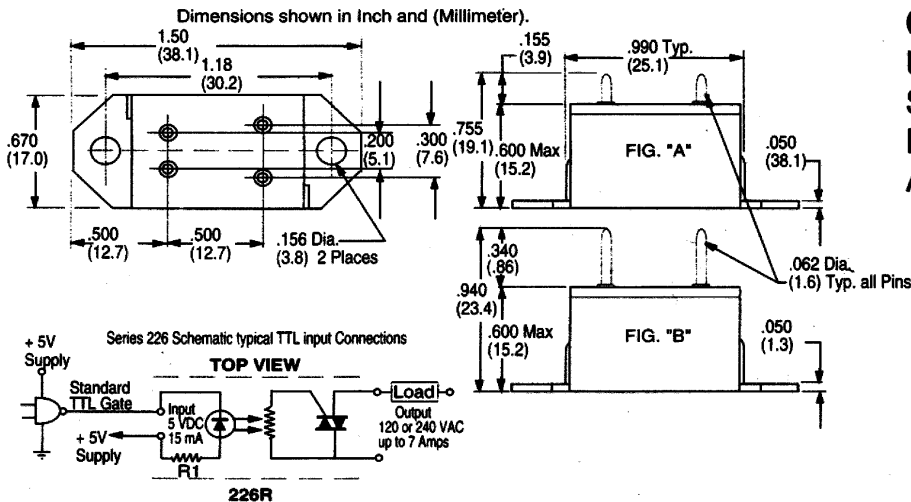
MINIATURE SOLID STATE RELAY

CLASS
226

CLASS 226
UP TO 7 AMPS
SPST—NO
DC INPUTS
AC OUTPUTS



7
RELAYS



COMPATIBLE WITH TTL GATES.
PRINTED CIRCUIT AND PUSH-ON
TERMINAL PIN VERSIONS.

PUSH-ON TERMINAL RECEPTALS

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

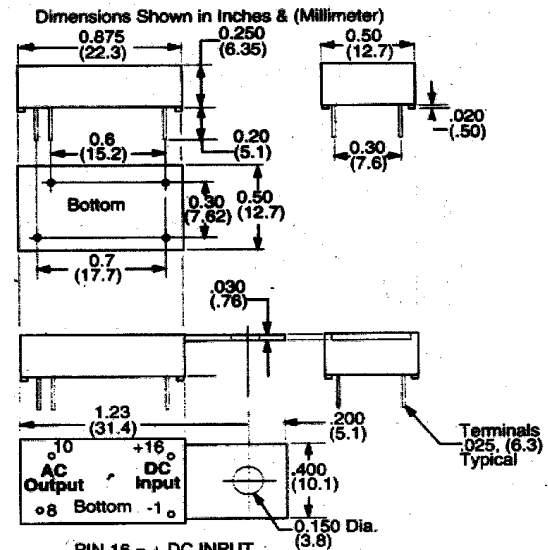


Magnecraft PART NUMBER	PUSH ON TERMINALS	FIG "A"	W226R-7-5A1	W226R-7-12A1	W226R-8-5A1	W226R-8-12A1
	PRINTED CIRCUIT TERMINALS	FIG "B"	W226RE-7-5A1	W226RE-7-12A1	W226RE-8-5A1	W226RE-8-12A1
INPUT CHARACTERISTICS						
Input Voltage Range			5VDC	12VDC	5VDC	12VDC
Maximum Pickup Voltage (over operating temperature range)			4.3VDC	10.3VDC	4.3VDC	10.3VDC
Minimum Dropout Voltage (over operating temperature range)			1.5VDC			
Input Current			Input current (at nominal voltage) 13mA typical / 15mA max..			
Reverse Polarity Protected			No			
Input Filtered for transients less than one millisecond.			No			
Response Time			Turn on, 16m Sec. Max.,		Turn off, 60m Sec. Max.	
OUTPUT CHARACTERISTICS						
Nominal Off State Voltage V_D (RMS)			120		240	
Maximum Off State Voltage $V_{D\text{ MAX}}$ (RMS)			260		380	
Minimum Off State Voltage $V_{D\text{ MIN}}$ (RMS)			20		40	
Non-Repetitive Peak Voltage V_{DSM} (Blocking Voltage)			400		700	
Maximum Rate of Rise of Off State Voltage dv/dt			100V/uSec blocking		4V/uSec commutating	
Rated Load Current I_T (RMS)* All current ratings are based on use of suitable thermally conductive compound (e.g. silicone grease between the SSR mounting base and mounting surface of suitable heat sink).			7 Amp			
Minimum Load Current $I_{T\text{ MIN}}$ (RMS) to maintain "On"			20mA			
Non-Repetitive Surge Current $I_{T\text{ SM}}$ (one Cycle Surge)			50 Amp			
Maximum RMS Overload current for 1 second			18 Amp			
Maximum Off State Leakage current I_D (RMS)			0.1mA @ 25°C		1.0 mA @ 25°C max.	
Maximum RMS On-State Voltage V_T (RMS) Maximum Voltage drop across relay output @ rated current			1.8V		3.6V	
MISCELLANEOUS CHARACTERISTICS						
Max. I^2T for fusing (8.3 m Sec)			24			
Thermal Resistance Junction to Case			3°C/w			
Suggested Heat Sink			TO—3 mounting			
Dielectric Strength V_{ISO} (Input-Output Isolation)			2500 VAC			
Insulation Resistance R_{ISO} @ 500VDC			10 ¹⁰ Ω			
Operating temperature Range			-40° to + 65°C			
Storage temperature Range			-40° to + 85°C			
Weight			0.37 oz. (10.6g)			

MINIATURE P.C. SOLID STATE RELAY

CLASS
230CLASS 230 E
1.5 AMP RATEDCLASS 230T
3.0 AMP RATED

CLASS 230
1.5 & 3 AMPS
SPST—NO
DC INPUTS
AC OUTPUTS
ZERO CROSS OVER
SWITCHING.

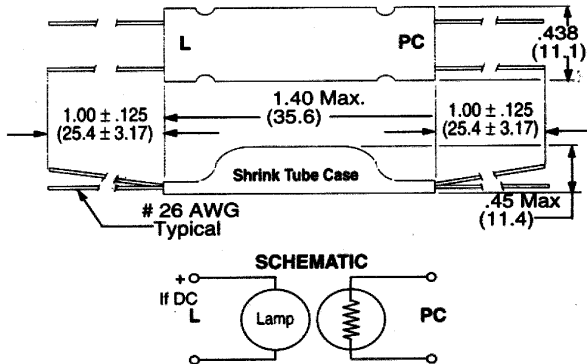


PIN 16 = + DC INPUT
PIN 1 = DC INPUT
PIN 8 = AC LOAD OUTPUT
PIN 10 = AC LOAD OUTPUT

Magnecraft PART NUMBERS	PRINTED CIRCUIT	W230E-1-5	W230E-2-5	W230E-1-12	W230E-2-12
	PRINTED CIRCUIT WITH HEAT SINK	W230T-3-5	W230T-4-5	W230T-3-12	W230T-4-12
INPUT CHARACTERISTICS					
Input Voltage Range		5VDC	5VDC	12V	12VDC
Maximum Pickup Voltage (over operating temperature range)		4VDC	4VDC	9.3VDC	9.3VDC
Minimum Dropout Voltage (over operating temperature range)		2.0 VDC			
Input Current	Input current (at nominal voltage) 13mA typical / 16mA max.				
Reverse Polarity Protected	No				
Input Filtered for transients less than one millisecond.	No				
Response Time	1/2 cycle				
OUTPUT CHARACTERISTICS					
Nominal Off State Voltage V_D (RMS)		120	240	120	240
Maximum Off State Voltage $V_{D\text{ MAX}}$ (RMS)		140	280	140	280
Minimum Off State Voltage $V_{D\text{ MIN}}$ (RMS)		20	40	20	40
Non-Repetitive Peak Voltage V_{DSM} (Blocking Voltage)		400	500	400	500
Maximum Rate of Rise of Off State Voltage dv/dt	200V/uSec.				
Rated Load Current I_T (RMS)*	1.5 Amps (230E)		3.0 Amps (230T)		
All current ratings are based on use of suitable thermally conductive compound (e.g. silicone grease between the SSR mounting base and mounting surface of suitable heat sink).					
Minimum Load Current $I_{T\text{ MIN}}$ (RMS) to maintain "On"	20mA				
Non-Repetitive Surge Current $I_{T\text{ SM}}$ (one Cycle Surge)	20 Amp				
Maximum RMS Overload current for 1 second	5 Amp				
Maximum Off State Leakage current I_D (RMS)	1mA Max.				
Voltage drop across relay output @ rated Current	1.7V				
MISCELLANEOUS CHARACTERISTICS					
Max. I^2T for fusing (8.3 m Sec)	4.5				
Thermal Resistance Junction to Case	230T= 8° C/w				
Dielectric Strength V_{ISO} (Input-Output Isolation)	2500VAC				
Insulation Resistance R_{ISO} @ 500VDC	$10^{10} \Omega$				
Operating temperature Range	-30° to + 80°C				
Storage temperature Range	-40° to + 100°C				
Weight	12 oz. (3.4g)-230E .20 Oz. (5.64g)-230T				

301T OPTO-ISOLATOR

OPTICAL COUPLING PROVIDES HIGH INPUT TO OUTPUT ISOLATION. CAN BE USED AS AN ON/OFF SWITCH OR AS AN LOW VOLTAGE CONTROLLED RESISTOR. IDEAL FOR TRIGGERING SCR'S AND TRIACS.



301T OPTO-ISOLATOR
0.2 WATT OUTPUT
VAC OR VDC OUTPUTS
SHRINK TUBE COVER

SPECIFICATIONS 301T

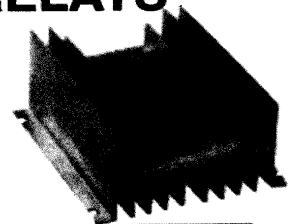
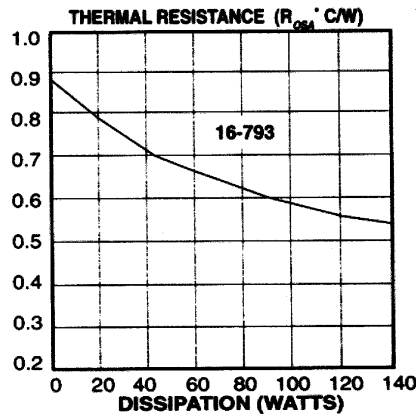
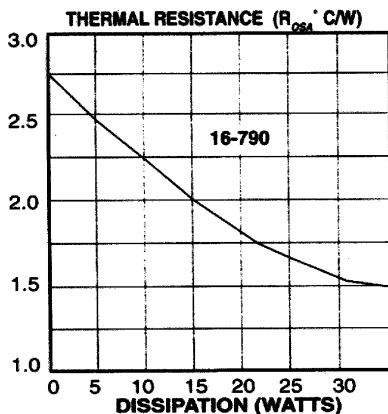
CONTACTS		
Output Voltage Max.:	± 250 VDC or VAC Peak	
INSULATION RESISTANCE		
Dielectric Strength	1000 V rms Between all insulated Points	
Across Open Contacts:	100 Ohms	
ENVIRONMENTAL CAPABILITIES		
Ambient Temperature	-40°C to + 60°C	
Operating:		
Miscellaneous		
Weight:	301T: 0.04 oz (1.1 g)	

NOT RECOMMENDED FOR WAVE OR DIP SOLDERING. ALSO MAY BE AFFECTED BY CLEANING SOLVENTS

Magnecraft PART NUMBER	INPUT			OUTPUT		RESPONSE TIME	
	LAMP TYPE	VOLTAGE	CURRENT (mA)	ON RESISTANCE (Ohms max.)	POWER DISSIPATION Per pole (mW)	TURN-ON TO 10KΩ (mS max.)	TURN-OFF TO 100KΩ (mS max.)
W301T1-2A1	LED	1.7 VDC	40	2000Ω	200	10	50
W301T1-2B1	LED	2.0 VDC	25	1000Ω	200	5	100
W301T1-12B1	INCAND.	12 VDC/AC	24	400Ω	200	150	300
W301T1-120A1	NEON	120 VDC/AC†	1.3	1200Ω	200	35	100

† Add 47KΩ Ohm external series resistor to limit current.

HEAT SINKS FOR CLASS 6 SOLID STATE RELAYS



Magnecraft PART NUMBER	(2) LOAD CURRENT	THERMAL RESISTANCE
16-790	5 to 20 Amps	3° C/W
16-793	Above 20 Amps	1° C/W

- (1) Heat Sinks are Aluminum alloy
(2) Current ratings are based on the use of a suitable thermally conductive compound (e.g. Silicon grease) between the SSR base and mounting surface of Heat Sink.

