

# GENERAL PURPOSE RELAY

## TYPE 157



### FEATURES:

- The Type 157 relay is a rugged power driver offering superior 3/16" through air and 3/8" over-surface spacing.
- An interlocked frame and contact block prevent contact misalignment during plug-in.
- Open or dust covered available with indicator lamps and push-to-operate buttons.
- A magnetic latching version provides a unique switchable core which cannot be falsely latched.
- All Midtex catalog Type 157 relays have UL & CSA Recognition as motor controllers through 600 VAC
- They provide through air spacing of 3/16" minimum and over-surface spacing of 3/8" minimum and are recognized for 1/2 hp motor controller applications at 240/480/600 VAC (1/3 hp at 120 VAC).
- Chassis mounted open relays must employ 1/32" additional insulation between mounting surface and relay to insure 1/2" over-surface and through air to the mounting surface.
- Sockets for the 157 relays are constructed to meet UL requirements for these ratings.
- UL File E38802 CSA LR54109

## TYPE 15



CONTACTS			
Material		UL & CSA Recognition Rating	
-100	1/8" Fine Silver (gold flash) 5 amp	5 amp, 28 VDC/ 2 amp 1/8 hp 1/4 hp 2 amp 7.2 amp in rush, 24 VAC (SP devices)	120/240 VAC, 80% pf 480/600 VAC, 80% pf 120 VAC 240 VAC
-200	3/16" Silver Cadmium Oxide 10 amp	10 amp, 28 VDC/ 1/3 hp 1/2 hp 36 LRA, 8.5 FLA, 18VDC 3 amp 10 amp	120/240 VAC, 80% pf 120 VAC 277/240/480/600 VAC 480/600 VAC, 80% pf 277VAC resistive
-300	3/16" Silver Cadmium Oxide 15 amp (UL on 1 & 2PDT only)	15 amp 10 amp 3 amp 1/3 hp 1/2 hp 600w Tungsten	277/240/120 VAC 28 VDC 480/600 VAC 120 VAC 240/480/600 VAC 120/240 VAC
-700	1/8" Fine Silver Gold Diffused	5 amp, 28 VDC/ 2 amp 1/8 hp 1/4 hp 2 amp 7.2 amp in rush, 24 VAC (SP devices)	120/240 VAC, 80% pf 480/600 VAC, 80% pf 120 VAC 240 VAC
-3MO	Mag Blowout (See Note)	1 Form X 2 Form A 2 Form C	12A @ 150 VDC 7A @ 150 VDC 5A @ 150 VDC

Note: For Mag Blowout positive contacts are 7 and 9. Negative contacts are 1, 3, 4 and 6.

### ELECTRICAL/MECHANICAL CHARACTERISTICS

All ratings at 25°C ambient

#### Design and Construction

Recognized by UL for motor controllers up to 600 VAC in accordance with UL Standard 508, Industrial Control Equipment. Optional features include manual push-to-test button and indicator lamp.

**Insulation Material**-High quality phenolic

**Weight** (approximate)-2.3 ounces (64 grams)—open relay  
3.0 ounces (84 grams)—enclosed relay

#### Marking

Midtex name, part number, nominal voltage, and terminal identification are standard. Customer marking optional.

**Initial Contact Resistance**-50 milliohms max.

COILS						
<b>Voltage Ratings</b>	6 to 240 VAC 50/60 Hz 5 to 110 VDC					
<b>Pick-up Voltage</b>	AC-85% of nominal DC-75% of nominal					
<b>Duty Cycle</b>	Rated for continuous duty operation at 25% overvoltage					
<b>Shock</b>	15 g's, 11±1mS (non-operating test, no mechanical damage)					
<b>Vibration</b>	0.1" DA or 10g's, 10 to 55 Hz (operating test, no contact chatter)					
Power Ratings*						
	<b>1 &amp; 2 Pole AC</b>	<b>3 Pole AC</b>	<b>DC</b>			
Nominal	1.7 VA	2.0 VA	1.2 W			
Max. Continuous	2.7 VA	3.1 VA	1.9 W			
Temperature Rise*						
	<b>1 &amp; 2 Pole AC</b>		<b>3 Pole AC</b>	<b>DC</b>		
	<b>Open</b>	<b>Enc.</b>	<b>Open</b>	<b>Enc.</b>		
Nominal Voltage	35°C	45°C	45°C	60°C	35°C	40°C
25% overvoltage	55°C	65°C	75°C	85°C	50°C	55°C

\*60 Hz operation  
Increase values 20% for 50 Hz operation.

COIL CHARACTERISTICS			
Nominal Voltage		Resistance (Ohms±10%)	
	5	20	
V	6	32	
D	12	120	
C	24	470	
	48	1800	
	110	10000	
		<b>1 &amp; 2PDT</b>	<b>3PDT</b>
V	6	6.0	4.2
V	12	21	18
A	24	75	72
C	120	2250	1700
	240	9100	7200

# TYPE 157

## PART NUMBERING SYSTEM

Relay Type	Enclosure and Terminals	Contact Arr.	Coil	Contacts	Standard or Special
157	1-Open, Solder/Plug-in/.187 Quick Connect 2-Plain Cover, Solder/Plug-in/.187 Quick Connect 3-Flanged Cover, Solder/.187 Quick Connect 4-Plain Cover with End Mounting Bracket, Solder/Plug-in/.187 Quick Connect 9-Plain Cover, P.C. Terminal 0-Special (Including top flange)	1-SPDT 2-2PDT 3-3PDT 4-1 Form A 5-1 Form B 6-2 Form A 7-2 Form B 8-1 Form X 9-1 Form Y  0-Special	E-5 VDC A-6 VDC B-12 VDC C-24 VDC D-48 VDC F-110 VDC N-6 VAC P-12 VAC Q-24 VAC T-120 VAC U-240 VAC S-Special	1-1/8" Fine Silver Gold Flash 2-3/16" Silver Cadmium Oxide (10 Amp) 3-3/16" Silver Cadmium Oxide (15 Amp) 7-1/8" Fine Silver Gold Diffused  0-Special	00-Standard C0-Push Button Actuator D0-Diode across Coil F0-Class "F" Coil L0-Lamp Across Coil LC-Lamp & Push Button M0-Mag Blowout 09-PC Terminal without Cover. Use 9 in first digit. A1-Z9-Special *Top Flange avail.-Consult Factory

Example: 157-23C200 is a Type 157 relay, plain cover, solder/plug-in/.187 quick connect terminals 3 pole double throw contacts, 24VDC coil, 3/16" diameter Silver Cadmium Oxide contacts, of completely standard construction.

Stock items: 157-22B200, 157-22C200, 157-22C2L0, 157-22F200, 157-22Q200, 157-22Q2LC, 157-22T200, 157-22T2L0, 157-22U200, 157-23B200, 157-23C200, 157-23C2L0, 157-23Q200, 157-23Q2L0, 157-23T200, 157-23T2L0, 157-23T2LC, 157-32B200, 157-32C200, 157-32Q200, 157-32T200, 157-33B200, 157-33C200, 157-33Q200, 157-33T200.

## TEMPERATURE RANGE

Operating**	Minimum	Maximum		Storage
		Open	Enclosed	
1 & 2 pole AC	-45°C	+70°C	+60°C	-65°C to +100°C
3 pole AC	-45°C	+60°C	+45°C	
1, 2, 3, pole DC	-45°C	+80°C	+70°C	

\*\*50/60 Hz operation, based on 105°C limit.

## ELECTRICAL CHARACTERISTICS

### Dielectric Breakdown

Greater than 1200 VAC, RMS 60 Hz across open contacts  
 Greater than 2500 VAC, RMS 60 Hz all other mutually insulated elements

### Insulation Resistance

1000 megohms minimum at 500 VDC

### Timing

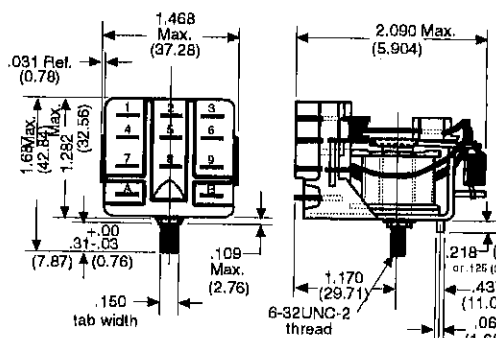
Operate time—15 mS nominal, 20 mS maximum  
 Release time—6 mS nominal, 10 mS maximum  
 (Nominal voltage, no coils suppression, DC relays only)

### Life Expectancy

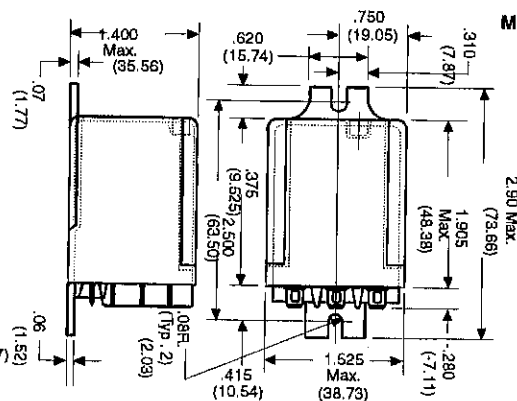
Mechanical—10 million operations  
 Electrical—100,000 operations at rated load

## DIMENSIONS

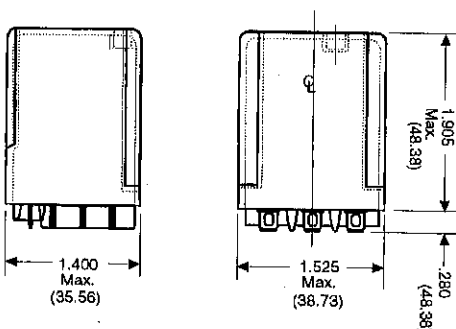
Open  
Model 157-1



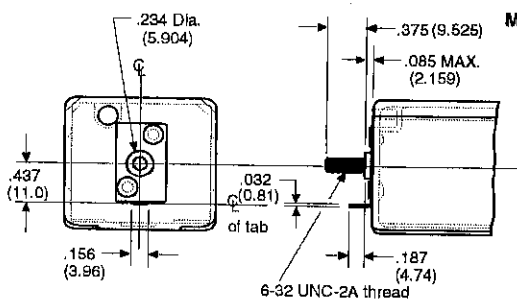
Model 157-3



Dust Cover  
Model 157-2



Model 157-4

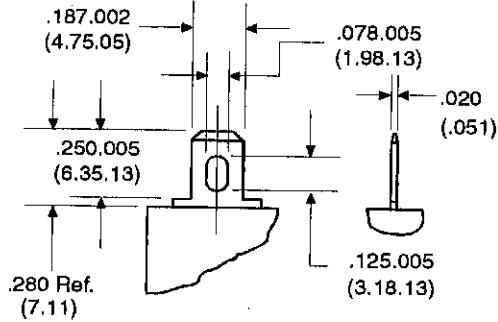


Inches  
(Millimeters)

# TYPE 157

## TERMINALS

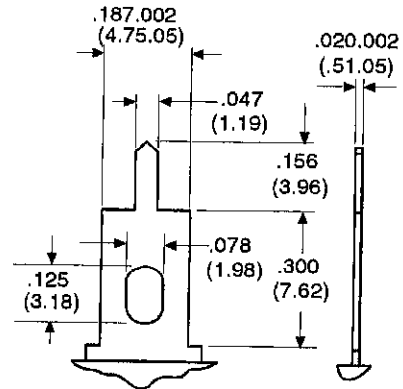
Solder/Plug In .187 Quick Connect



Inches  
(Millimeters)

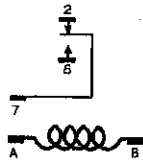
Mates with .187" UL standard quick connect terminal also suitable for solder connection. Model 157-1,-2,-3,-4

Printed Circuit Terminal

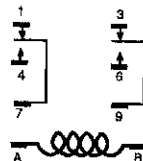


Printed Circuit Terminal For direct relay to PCB mounting. Model 157-9

## WIRING

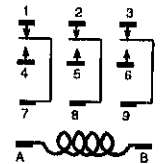


1 Form C (SPDT)



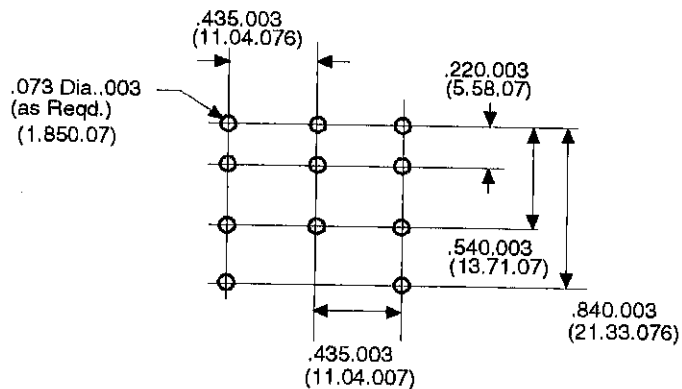
2 Form C (DPDT)

Reference Only



3 Form C (3PDT)

## PCB LAYOUT



Bottom View  
Reference Only

See RELAY SOCKETS on page 51.  
See HOLD DOWN SPRINGS on page 53.

# TYPE 157

## MAGNETIC LATCHING RELAY

When there is a need to conserve power, retain logic function during power outages, or improve reliability by several orders-of-magnitude over outdated mechanical latching relays, the Type 157 magnetic latching relay is made to order for these applications.

All of the superior electrical characteristics available in the standard Type 157 relay, including 1/4" through air and 3/8" over surface spacing, are offered in the magnetic latching version. Magnetic latching is achieved by a specially designed magnetic core that makes it possible to maintain a substantial magnetic force of attraction after termination of the electrical pulse that energizes the core. There are no mechanical latches associated with the design, nor permanent magnets that can result in inadvertent operation. To restore the relay to its unoperated position, a short pulse of opposite polarity and lower magnitude than the operate pulse is applied to the coil or a second concentric wound coil.

### CONTACTS

All ratings at 25°C ambient

Contact ratings are identical to the standard Type 157 relay

#### General

Open and dust covered 1, 2 & 3PDT industrial relay UL & CSA recognized

UL File E38802

CSA File LR54109

#### Timing

Latch time: 13 mS nominal with a one second pulse of nominal voltage

Unlatch time: 13 mS nominal with a one second pulse of nominal unlatch voltage after latching with a one second pulse of nominal latch voltage.

A latch pulse of 50 mS minimum at nominal voltage is recommended to insure positive latching.

#### Design and Construction

Insulation material, weight, marking, shock, vibration, dielectric breakdown, insulation resistance and temperature range are identical to the Type 157 relay

### COIL CHARACTERISTICS

Nominal Coil Voltage	Latch Coil Resistance Ohms ± 10%	Unlatch Coil Resistance Ohms ± 10%
5 VDC	14	45
6 VDC	20	64
12 VDC	80	275
24 VDC	330	1070
48 VDC	1290	2850
110 VDC	5125	10750
6 VAC	5.5	105
12 VAC	22	445
24 VAC	88	1740
120 VAC	2090	17430

Operate voltage (latch/unlatch)\*

DC—75% of nominal

AC—85% of nominal

\*120% of nominal or greater (one second duration single pulse) unlatch voltage above which relay latches again maximum continuous voltage: 120% of nominal (one coil only)

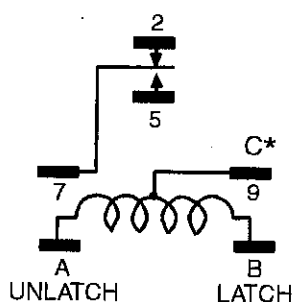
### PART NUMBERING SYSTEM (For Magnetic Latch)

Relay Type	Enclosure and Terminals	Contact Arr.	Coil Voltage	Contacts	Standard or Special
157	5—Open, Solder/Plug-in/.187 Quick Connect 6—Plain Cover, Solder/Plug-in/.187 Quick Connect (Except Coil Tap on 3PDT) 7—Flanged Cover, Solder/.187 Quick Connect (Except Coil Tap on 3PDT) 8—Plain Cover, End Mounting Bracket, Solder/Plug-in/.187 Quick Connect (Except Coil Tap on 3 PDT) 9—PC Terminals. See Fifth Position For Open and Enclosed Designations.	1—SPDT 2—2PDT 3—3PDT 4—1 Form A 5—1 Form B 6—2 Form A 7—2 Form B 8—1 Form X 9—1 Form Y  0—Special	LATCH/UNLATCH E—5 VDC A—6 VDC B—12 VDC C—24 VDC D—48 VDC F—110 VDC N—6 VAC P—12 VAC Q—24 VAC T—120 VAC U—240 VAC S—Special	1—1/8" Fine Silver Gold Flash 2—3/16" Silver Cadmium Oxide (10 Amp) 3—3/16" Silver Cadmium Oxide (15 Amp) 7—1/8" Fine Silver Gold Diffused  0—Special	00—Standard *08—PC Terminal Relay *01—PC Terminal with Enclosure  A1-Z9—Special

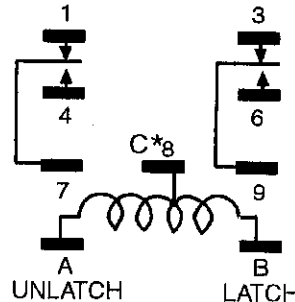
\*Applicable when enclosure digit is 9. (157-9\_ \_ \_ \_)

Stock item: 157-62B200, 157-62C200, 157-62T200, 157-62Q200

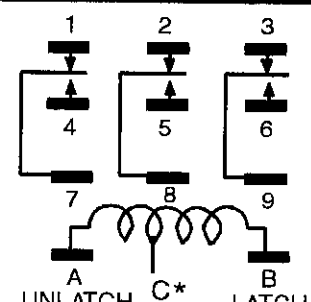
### WIRING



1 Form C (SPDT)



2 Form C (DPDT)



3 Form C (3PDT)

\*C denotes common connection. On 3 pole relays the common connection is a wire lead coming off of the coil. It is not terminated to the relay header. Consult factory for single coil or isolated double coil models.

See RELAY SOCKETS on page 51.  
See HOLD DOWN SPRINGS on page 53.