

# 237 Series - Nuclear Grade Time Delay Relay Up To 2PDT or 4PST, 10 Amp

Versatile, Rugged, Proven - Nuclear grade off delay timer versions of the popular 219 series. Contacts can be configured up to 2PDT or 4PST. Blow out magnets can be added to increase DC switching capability. Time ranges are adjustable over a 1:100 range. Locking shaft potentiometer and integral hold down clip on plug is standard. A large option list makes this product easily customized for special applications.

## GENERAL SPECIFICATIONS (@ 25° C)

### Timing:

Functions Available	On-delay, Off-delay,
Time Range	Up to 7 hours
Timing Adjustment	Locking shaft potentiometer
Timing Repeatability (Constant voltage and temperature)	5%
Reset Time maximum	150mS
Input Pulse Length minimum	50mS

### Contacts:

Contact Configuration	Up to 2PDT or 4PST
Contact Material	Silver Alloy Gold Diffused
Contact Rating	
120 / 240VAC Resistive	10 Amp / 5 Amp
28VDC Resistive	10 Amp
Minimum Contact Load	50 mA
Contact Resistance, Initial	50 milliohms max @ 6VDC, 1A

### Coil:

Coils Available	AC and DC
Nominal Coil Power	5VA 2.5W
Input Voltage Tolerance -AC	85% to 110% of nominal
Input Voltage Tolerance -DC	80% to 110% of nominal
Transient Protection	Yes
Reverse Polarity Protection	Yes
Duty	Continuous

### Dielectric Strength:

Across Open Contacts	500Vrms
Between Mutually Insulated Points	1500Vrms
Insulation Resistance	1,000 Mohms min @ 500VDC

### Temperature:

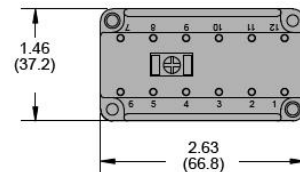
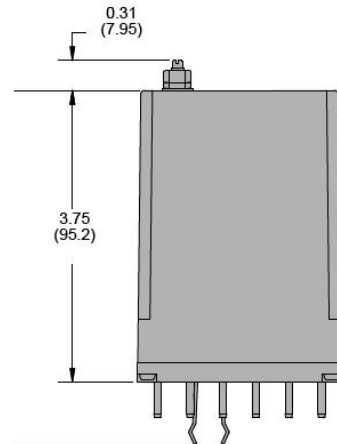
Operating	-20 to 70°C (-4 to 158°F)
Storage	-40 to 105°C (-40 to 221°F)

### Life Expectancy:

Electrical (full load operations)	100,000
Mechanical (no load operations)	10,000,000

### Miscellaneous:

Mounting Position	Any
Mating Socket	12 PIN = 27390 <b>Purchase Separately</b> 14 PIN = 33377
Enclosure	Hold down clip integral to relay plug Clear Polycarbonate
Weight	12pin = 249 gm 14pin = 295 gm



# 237 Series - Nuclear Grade Time Delay Relay Up To 2PDT or 4PST, 10 Amp

## 237 Off-Delay: Construction

- US Built with tricable materials.
- The 237 Off-delay consist of the nuclear grade 219 Series based construction with rugged, long lasting, specially selected materials, 94V-0 material flammability ratings and high wear plating's along with standard Gold Diffused contacts and molded sealed coil assembly.
- Contacts can be configured with Blow-out magnets added to increase DC switching capability.
- A large option list and wiring configurations, up to 2 pole double throw or 4 pole single throw when using 14-pin plugs, makes this product easily customized for special applications.
- Note: Special requirements outside of the standards will require a 3-digit code to replace all the codes and coil voltages normally used in a relay part number to secure consistent modifications are held to meet the special requirements.
- "NE" designation to the part number suffix is intended to mean the relay is used in a Nuclear Safety Environment.
- Do not hi-pot terminals 5, 6 or 7 or socket terminals with relay in place.

## Timing Network Details:

- Locking shaft potentiometer and integral hold down clip in base are standard. The special adjustable timing potentiometer has a lockable shaft to avoid easy tampering or accidental changes to timing settings.
- Timing Module timing circuit is made using a RC (Resistor-Capacitor) Timing circuit to achieve  $\pm 5\%$  over voltage range and constant temperature at 77F and 10% repeatability over voltage and temperature range.
- The 237 Solid State timing construction provides a reliable operation over its long life. Solid state components have been selected to withstand line transients that occur in control circuit switching. However, excessive line transients to terminals 6 & 7 may cause erratic timing or damage the solid state timing module.
- Time ranges are adjustable over a 1:100 range.
- 237 Relay plug Pins 8 & 9 need to be jumpered for standard timing function. They also can be wired to allow remote adjustment using an external potentiometer or fixed resistor in most contact configurations and must be obtained separately.
- 237 Off-Delay requires continuous power applied to pins 6 & 7.
- 237 - An external control switch must be wired to pins 5 & 6 to initiate the timing function.

**237**

**Timing Resistance Chart**

Add resistors to increase timing as shown below:

---

**Original Range: 0.2 to 20 Sec**  
 100K  $\Omega$  ea. = 6 Sec  
 500K  $\Omega$  Max

---

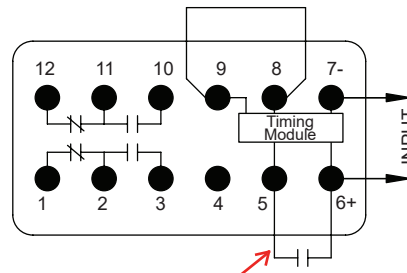
**Original Range: 2.0 to 200 Sec**  
 200K  $\Omega$  ea. = 55 Sec  
 1 MEG  $\Omega$  Max

**Use Resistors rated ¼ Watt or more.**

## 237 Wire Diagram

237XBXP (DPDT) OFF DELAY

† Jumper or external resistor



External trigger switch on pins 5&6 to begin Timing.

† If the jumper wire shown in each diagram is replaced by a resistor, delay time will be added to that which is produced by an internal fixed resistor on fixed time models (Code F) or any setting on screwdriver adjustable models.

# Series 237 – Off Delay – Legacy Part Numbering System

## Manufactured in the US – Nuclear Grade

### (219 Base Relay with Lockable Timer Module)

237

XBX

P

69

L

M

V

33

- 000 -

120VAC

#### Series Part Number:

#### Contact Type :

Standard – 10 Amp Gold Diffused Silver Alloy (50mA min)  
Bifurcated – 5 Amp Gold Diffused Silver Alloy (Code 33)

#### Contact Combination: Standard in Bold (others possible)

XAX (SPDT) (1 Form C) *12-pin Plug*  
**XBX (DPDT) (2 Form C)** *12-pin Plug*  
 XCX (3PDT) (3 Form C) *Special with 14-pin Plug*  
**ABX (SPST- NO & DPDT) (1 Form & 2 Form C)** *12-pin Plug*  
 BXX (DPST- NO) (2 Form A) *12-pin Plug*  
 BXB (DPST- NO & DPST- NC) (2 Form A & 2 Form B) *12-pin Plug*  
 CXX (3PST- NO) (3 Form A) *12-pin Plug*  
 HXX (SPST- NO-DM) (Form X) *12-pin Plug*  
 XXH (SPST- NC-DB) (1 Form Y) *12-pin Plug*  
 JXX (DPST- NO-DM) ( 2 Form X) *Special with 14-pin Plug*  
 XXJ (DPST- NC-DB) ( 2 Form Y) *Special with 14-pin Plug*  
 XHX (SPDT- DM-DB) (1 Form Z) *12-pin Plug*  
 XAB (SPDT & DPST- NC) (1 Form C & 2 Form B) *12-pin Plug*

*Other special options available – make before break, special adjustments, special wiring, octal plug*

#### Enclosure:

Lexan Finger Protective Cover – P  
*Other special options available – Opaque covers*

#### Other Option Codes:

Blowout Magnet – 69 **When used - 69 places before “P” in part # sequence**  
 Lamp Indicator – L  
 Manual Actuator – M  
 Gasket Sealed Cover - N  
 Coil Suppression Diode – V **(VDC version only)**  
 Bifurcated Contacts – 33 **(Low Current up to 5 Amp@120VAC)** *(Special options - mixed bifurcated and standard contacts available)*

*Other special options available: Arc Suppressor (back EMF) Network across AC coils*

#### Timing Codes:

1.0-10 Seconds - **010**  
 0.2-12 Seconds - **012**  
 0.2-20 Seconds - **020**  
 6 -60 Seconds - **060**  
 2-200 Seconds - **200**  
 1-30 Minutes - **30M**

*Other Timing Ranges may be possible*

#### Coil Voltage – Class F, 155°C

VAC – 24, 120 (100-135), 240  
 VDC – 12, 24, 48, 115/125, 250

*Other special options available: special coil resistances & voltages*

**NOTE: 237 Series Relay does not currently have UL or CSA listings**

# 237 Time Delay Relays

- Rugged, industrial time delay versions of the popular 219 series. The 237 Off-delay consists of the nuclear grade 219 rugged long lasting specially selected materials, 94V-0 material flammability ratings and heavy duty plating's along with standard Gold Diffused contacts with a molded sealed coil assembly.
- The special adjustable timing potentiometer has a lockable shaft to avoid easy tampering or accidental changes to timing settings.
- Contacts can be configured up to 3 pole double throw or 4 pole single throw.
- Blow-out magnets can be added to increase DC switching capability.
- Time ranges are adjustable over a 1:100 range. Locking shaft potentiometer and integral hold down clip are standard.
- A large option list and wiring configurations makes this product easily customized for special applications.
- Relay and timing module is enclosed in 94V-0 flame resistant polycarbonate cover.

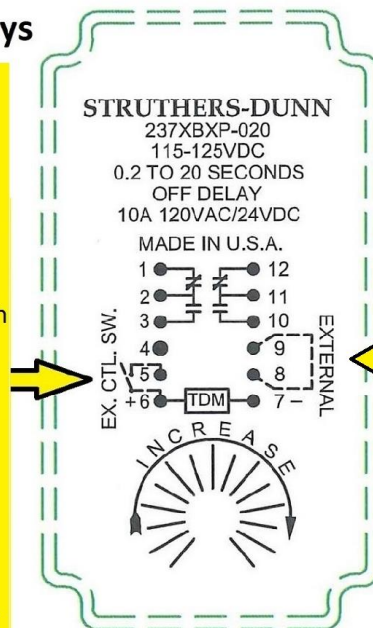
## 237 Series (Legacy) Off-Delay Timer

### Operational Guide for 12 pin Relays

1. Continuous Power must be applied to Pins 6 (positive) and 7 (negative).
2. Pins 5 & 6 are for External Control Switch to trigger the relay to operate and start the Off Delay timing circuit.

#### NOTES for OFF Delay function:

- Interruption of power or If the Control Switch is opened before the timer has finished, it will reset the relay to its normal state. If power is reapplied, the timer will start all over again from the beginning.
- After the relay has timed out and the contacts return to its normal state, the control switch will need to be opened and then closed to start the timer function again.



On some configurations (XBX), to just use the internal time as stated on the relay, example 020 (0.2-20 Seconds) pins 8 & 9 need to be jumped on socket terminals 8 & 9.

\* If additional time is desired, do not jumper pins #8&9 but instead add resistors or a pot between Socket Terminals #8&9 to increase the time.

**0.2 to 20 Sec.** 100K Ohms per 6 Sec, (500K Ohm max.)

**2.0 to 200 Sec.** - 200K Ohms per 55 Sec. (1Meg Ohm Max.)

# 237 Series - Nuclear Grade Time Delay Relay Up To 2PDT or 4PST, 10 Amp

## Contact Load Ratings

Contact Configuration	Current / HP	Load Voltage	Load Frequency	Type of Load
All Styles EXCEPT Code 33	10 Amp	120 VAC	50/60Hz	Resistive
	5 Amp	240 VAC	50/60Hz	Resistive
	10 Amp	28 VDC	DC	Resistive
	0.5 Amp	125 VDC	DC	Resistive
	1/6HP	120 VAC	50/60Hz	Motor
	1/3HP	240 VAC	50/60Hz	Motor
Code 33	5 Amp	120 VAC	50/60Hz	General Purpose
	2.5 Amp	240 VAC	50/60Hz	General Purpose

### Additional Ratings for code "69" relays incorporating a blowout magnet.

Contact Configuration	Current / HP	Load Voltage	Load Frequency	Type of Load
All Styles EXCEPT Code 33	3 Amp	125 VDC	DC	Resistive
	1Amp	250 VDC	DC	Resistive

See the next page for additional Contact Ratings

Use Code "33" for bifurcated contacts when switching low level current below 50mA.

## Coil Specifications

AC Coils, 50/60HZ				DC Coils				
Nominal voltage	Resistance ohms ±10%	Milliamperes		Impedance ohms	Nominal voltage	Resistance ohms ±10%	Milliamperes	
		Cold	Hot				Cold	Hot
6	1.1	1500	840	7.2	6	15.5	385	304
12	4.2	750	410	27	12	63.5	189	147
24	15.5	375	200	120	24 /28*	250	96	77
120	540	75	40	2,700	32	375	86	62
240	2100	32	17	13,400	37.5	375	100	80
					48	975	49	39
					115/125*	6200	20	16
					250	27777	9	7

Note: Stock 24VDC and 115VDC relays have nameplates stamped 24/28VDC and 115/125VDC respectively. These relays operate at 80% of the lower voltages and operate within allowable temperature rises at higher voltages.



# 237 Series - Nuclear Grade Time Delay Relay Up To 2PDT or 4PST, 10 Amp

## Additional Contact Ratings

### Highest Load for Standard Contacts

\*Current - A, Resistive unless otherwise noted

Voltage	Current, A	Switching Type
28 VDC, "69"	10A	Make & Break
48 VDC, "69"	10A	Make & Carry
	5A	Make & Break
125 VDC, "69"	10A	Make & Carry
	4A	Carry & Break
	3A	Make & Break
	0.5A, Inductive	Make & Break
125 VDC, "69" DOUBLE MAKE	4A	Make & Break
250 VDC, "69"	1.1A, Inductive	Make & Break
	4A	Make & Carry
	2A	Carry & Break
	1A	Make & Break
250 VDC, "69" DOUBLE MAKE	0.15A, Inductive	Make & Break
	1.5A	Make & Break
250 VDC, "69" DOUBLE MAKE	0.55A, Inductive	Make & Break
120 VAC	10A, 3A Inductive, 1/6 HP	Make & Break
240 VAC	10A, 1/3 HP	Make & Break
277 VAC	10A	Make & Carry
	7A	Carry & Break
	4.5A	Make & Break

### Highest Load for Bifurcated Contacts

\*Current - A, Resistive unless otherwise noted

Voltage	Current, A	Switching Type
28 VDC	5A	Make & Carry
	3A	Carry & Break
	2.5	Make & Break
48 VDC	3A	Make & Carry
	2A	Carry & Break
	1.5A	Make & Break
125VDC	1A	Make & Carry
	0.5	Carry & Break
	0.25	Make & Break
250 VDC	0.5A	Make & Carry
	0.25A	Carry & Break
	0.1A	Make & Break
120 VAC	5A	Make & Carry
	3A	Carry & Break
	5	Make & Break
240 VAC	2.5A	Make & Carry
	1.5A	Carry & Break
	2.5 A	Make & Break
277 VAC	2.5A	Make & Carry
	1.5A	Carry & Break
	1.0A	Make & Break
480 VAC	0.5A	Make & Carry
	0.2A	Make & Break

### Lowest Load for Standard Contacts

\*Current - A, Resistive unless otherwise noted

Voltage	Current, A	Switching Type
5 VDC	1A	Make & Break
12 VDC	0.75A	Make & Break
28 VDC	0.050A	Make & Break
48 VDC	0.050A	Make & Break
125VDC	0.050 A	Make & Break
250 VDC	0.050A	Make & Break
120 VAC	0.050A	Make & Break
240 VAC	0.050A	Make & Break
480 VAC	0.050A	Make & Break

### Lowest Load for Bifurcated Contacts

\*Current - A, Resistive unless otherwise noted

Voltage	Current, A	Switching Type
5 VDC	0.1A	Make & Break
12 VDC	0.075A	Make & Break
28 VDC	0.01A	Make & Break
48 VDC	0.005A	Make & Break
125VDC	0.005A	Make & Break
250 VDC	0.001A	Make & Break
120 VAC	0.01A	Make & Break
240 VAC	0.005A	Make & Break
480 VAC	0.001A	Make & Break

Use Code "69" for blowout magnet when switching voltages above 40VDC.

Use Code "33" for bifurcated contacts when switching low level current below 50mA.