311 Series - Industrial Sequencing Relay
DPDT, 5 Amps

File No. E52197

RoHS COMPLIANT

The 311 Series relays are sequencing (stepper) relays built on the industrial 219 style frame. Hold down clip is integral to the relay base. Double pole contacts transfer on energizing of coil or de-energizing. Dual cam movement allows contacts to operate together or separately. Works equally well with application of continous voltage to coil or energy saving impulse. No continuous voltage required for memory. Numerous custom switching arrangements are possible over 8 steps per revolution of the cams.

GENERAL SPECIFICATIONS (@ 25° C)

MANUFACTURED IN THE USA

Contacts:

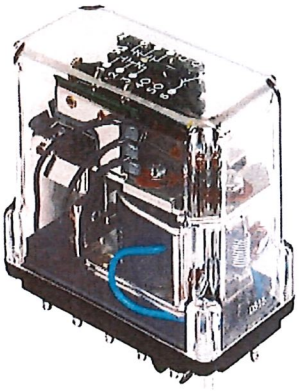
Contact Configuration	DPDT
Contact Material	Silver Alloy
Contact Rating	
120 / 240VAC Resistive	5 Amp
28VDC Resistive	5 Amp
Contact Resistance, Initial	100 milliohms max @ 6VDC

Coil:

Coils Available	AC or DC up to 300V
Nominal Coil Power	4.9VA 1.8W
Input Voltage Tolerance - AC	85% to 110% of nominal
Input Voltage Tolerance - DC	80% to 110% of nominal
Drop out voltage	10% of nominal
Duty	Continuous

Timing:

Operate Time (max)	35mS
Release Time (max)	35mS



Dielectric Strength:

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

Temperature:

Operating	-20 to 60°C (-4 to 140°F)
Storage	-40 to 105°C (-40 to 221°F)

Life Expectancy:

Electrical (full load operations)	100,000
Mechanical (no load operations)	5,000,000

Miscellaneous:

Mounting Position	Any
Mating Socket	27390 or 27390D (Din Rail Mount) Purchase Separately
Enclosure	Clear Polycarbonate
Weight	7.5oz (190 grams)

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WHAT IS A SEQUENCE RELAY:

A Sequence relay is sometimes called an alternator, stepper, flip-flop, or impulse relay. The relay has the ability to open and close it's contacts in a preset sequence. All sequence relays use a ratchet or catch mechanism to cause their contacts to change state by repeated impulses to a single coil. Usually, but not always, one pulse will close a set of contacts, the next will open them, and so on back and forth. This alternating of open and closed states has many possible uses.

A Sequence relay requires a pulsed voltage to the coil of approximately 50 milliseconds for each sequence to take place. When the coil is pulsed, the relay armature moves a lever that in turn rotates the ratchet and cams to the first position in the sequence. This position will remain as long as another pulse is not introduced to the coil.

The relay is normally comprised of at least two sets of contacts to allow the contacts to alternate in combinations of open and closed states, with each pulse of voltage to the coil.

One example of possible two pole combinations, would be where one pole remains open and the other pole is closed with the first pulse applied to the coil. The second pulse could then reverse the above sequence. The third pulse could have both poles closed and the fourth pulse could open both poles. The above example could also have other sequences, depending upon the amount of teeth in the ratchet and the amount of lobes on the cams.

Figure 1 shows an example of how cam placement on the contact blades can change the position of the contacts as cams are rotated by the ratchet gear.

SEQUENCE APPLICATIONS:

Some typical applications for sequence relays is turning one device on and off from a single momentary contact.

A typical example is remotely starting and stopping a conveyer from a single momentary push button. Several momentary push buttons might be wired in parallel to control the conveyer from a number of locations.

Another common use for sequence relays is cascade starting of multiple HVAC or other high start-up load systems, to limit the high starting current.

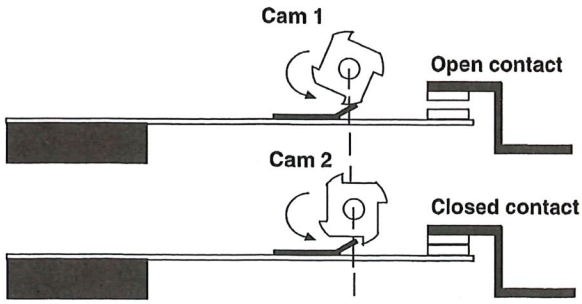

FIGURE 1

NOTE: Alternates are available - Standard is transfer when impulse voltage applied. Option is when Impulse voltage is removed then the switch changes state on release. (Code "R")

Both switches can be actuated together to switch off and on together or alternately. Other options are removing a section of one or both cams to cause a skip in the operation of a switch even if the relay receives a pulse. Can be customised up to as many as 8 steps per revolution of the cams.

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Ordering Code 311 XBX P R L -120VAC

Series
311

Contact Arrangement
XBX (DPDT) - (2 form C)

Standard Features
Plug-in with polycarbonate cover - CODE P

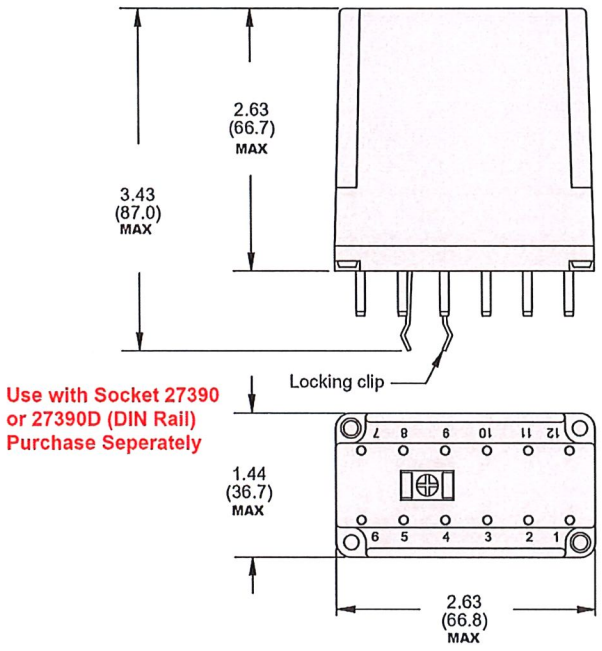
Contact Transfer
When coil is energized - NO CODE
When coil is de-energized - CODE R

Optional Features
Indicator lamp - CODE L
Coil suppression - CODE V

Coil Voltage
AC: 6, 12, 24, 120, 240 (Add VAC)
DC: 6, 12, 24, 115-125 (Add VDC)

4 Pole version is available - Contact Struthers-Dunn Customer Service for more information

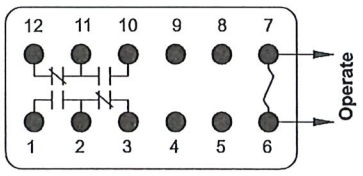
Outline Dimensions
Dimensions Shown in inches & (millimeters)



Coil Specifications

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	160
120	540	48	540
240	1815	110-125	3700

311 Wire Diagram
(Top View)



311XBXP

311XBXPR*
*Transfer on release