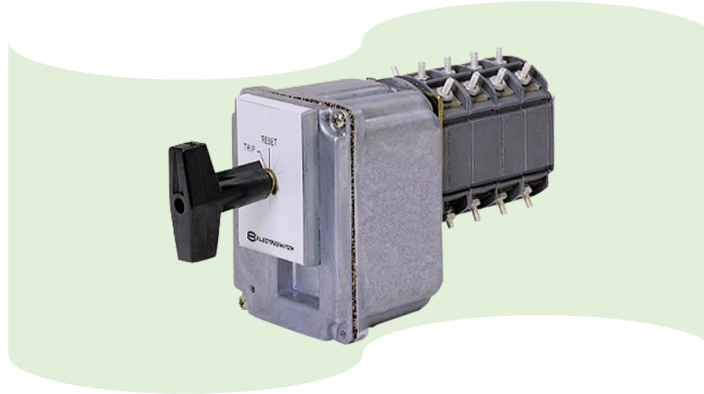


TYPE WL-2 LOCK-OUT RELAYS



Abstract

The Type WL-2 Lockout Relay is a control relay primarily used in applications requiring the simultaneous operation of a large number of contacts. The Type WL-2 is available in two versions, a "handle trip" unit, which can be tripped manually or electrically and a "non-handle" trip unit which will trip only in response to the application of the appropriate control voltage. Both versions are manually reset.

Operation

The Type WL-2 is a two position device having manual operation to the "reset" position and electric trip (spring operated) to the "trip" position. The escutcheon is marked "trip" and "reset". This device can be supplied as either (1) handle trip and electrical trip, or (2) handle reset and both handle and electric trip. The rotor is held in the reset (normal) position by means of a permanent magnet. Tripping is accomplished by energizing the release coil, which induces a magnetic field in opposition to the holding magnet (electromagnetic induction) thus canceling the lines of force of the magnet which releases the rotor to turn to the "trip" position under spring stored energy.

Trip Coil

Magnetic Assemblies are available for a wide range of operating voltages. Refer to chart on Page 52.

The permanent magnet has a minimum holding force of at least double the tripping spring pressure. Therefore, the reserve force of the magnet is sufficient to hold the rotor in reset position under conditions of shock and vibration normally found in commercial application.

The trip coil is factory wired to a coil cutoff contact. In all cases, this coil cutoff contact is closed when the rotor is in the reset position. In the tripping sequence, the coil cutoff contact is opened as the rotor moves from the "reset" to the "trip" position.

The trip coil of the type WL-2 switch has a low continuous rating of 45mA maximum. This rating permits sufficient current flow for monitoring without overheating the coil or tripping the unit.

The coil and permanent magnet are encapsulated in an electrical grade epoxy composition forming an hermetically sealed unit. The encapsulated unit is not affected by repeated thermal cycling between -40 degrees Centigrade and 125 degrees Centigrade.

The hydrolytic stability of this encapsulant is excellent, having experienced no adverse effects after prolonged exposure to high temperature, high humidity conditions.

The coil cannot be replaced separately. Due to the nature of construction, the coil-magnet assembly must be replaced as a unit. Each coil-magnet assembly is factory tested for polarity and only the positive lead is marked showing polarity.

Due to the necessity of maintaining a safe ratio between the permanent magnet holding force and the tripping spring pressure, the WL-2 switch is designed for a maximum of 38 "make" contacts, i.e., contacts closed in the trip position. Since the unit is hand reset, a greater number of contacts can be closed in the "reset" position.

Contacts

The design has been limited to 8 stages of the six contact frame and 6 stages of the twelve contact frame.

On each switch, certain contacts are used for trip coil circuitry. Thus, on control voltages of 24 volts through 250 volts, one contact is used for trip coil cutoff. For 440 volt control, two contacts are wired in series for trip coil cutoff.

On the first stage of each switch, a second contact is used to connect the positive lead from the trip coil. The terminals of this contact are connected by means of an external connector which bears a positive (+) sign. (Disregard for ac control voltage.) In the case of the six contact stage, the factory will connect the coil leads to terminals A-5 and A-7, with A-7 being the positive (+) side. Customer connections are made at terminals B-5 and B-7, B-7 being the positive side. (See wiring diagram.) In the case of the twelve contact stages, the factory will connect the coil leads to terminals A-6 and A-8 with A-8 being the positive (+) side. Customer connections are made at terminals B-6 and B-8, B-8 being the positive side. Factory wiring need not be disturbed to accomplish field connections.

The Type WL-2 switch is not available with all contacts normally closed or all normally open. Due to the nature of the design, there is a combination of both normally open and normally closed contacts on each unit. They may be varied to best suit the intended application. (Refer to contact tabulation section - Pages 53-55)

Rectifier

An optional feature of the WL-2 switch is a rectifier. The rectifier can only be used on 110 volts and 220 volts ac. It is used to decrease the operating time of the switch where only alternating current is available for control. (See operating times in coil operating characteristics below.)

The rectifier is factory mounted and wired within the control mechanism housing. The addition of a rectifier does not in any way alter the wiring connection as shown in the wiring diagrams.

Rectifiers for 480 vac control are not available.

Where required for 480ac, the rectifier must be supplied and mounted by the customer.

Handles

All styles listed in this bulletin include an oval handle considered standard for this application. Other handle shapes available upon request are round, pistol grip, and large pistol grip. With each switch there is sufficient hardware (#8-32 hexagon nuts) for each terminal of the unit for use in making field wiring connections.

Nameplates

The Type WL-2 switch is supplied with a white nameplate (es-cutcheon) as standard. The Type WL-2 switch can be supplied with target indicator but that is considered unnecessary because the size of the standard handle will provide positive visual indications of the switch position. The standard nameplate is shown on Page 56.

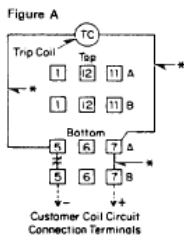
COIL OPERATING CHARACTERISTICS

NOMINAL OPERATING VOLTAGE	AVERAGE COIL CURRENT	INDUCTANCE (H)	RESISTANCE (Ω)	IMPEDANCE (Ω)	MINIMUM PICK UP	OPERATING TIME AVERAGE	
						CYCLES	mSEC
24vdc	3.6A	.0029	6.6		19vdc	1.06	17.7
48vdc	7.3A	.0029	6.6		19vdc	.96	16.0
125vdc	1.2A	.030	104		90vdc	1.05	17.5
250vdc	2.4A	.030	104		90vdc	1.01	16.8
120vac	1.4A	.030		85	90vac	1.58	26.3
120vac rectified	1.4A	.030		85	90vac	1.08	18.0
240vac	3.0A	.030		80	90vac	1.54	25.7
240vac rectified	3.0A	.030		80	90vac	1.05	17.5
480vac	6.0A	.030		80	90vac	1.50	25.0

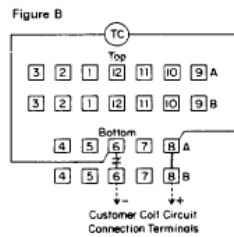
CONTACT RATINGS

VOLTAGE	SINGLE CONTACT								TWO CONTACTS IN SERIES							
	INDUCTIVE AMPERES							RESISTIVE AMPS	INDUCTIVE AMPERES							RESISTIVE AMPS
	4.5mH	12mH	31mH	63mH	130mH	243mH			4.5mH	12mH	31mH	63mH	130mH	243mH		
125vdc	4.65	3.67	2.85	2.1	1.53	0.9		7.55	27.0	14.75	7.7	4.85	2.92	1.9		7.8
250vdc	1.6	1.6	1.0	1.0	0.98	0.78		1.6	6.4	5.0	3.85	3.1	2.4	1.6		6.7
500vdc									1.5	1.7	1.5	1.35	1.15	0.98		1.7
120vac							7.53	7.95							68.0	
240vac							1.16	1.95							9.1	9.0
480vac							.54	.9							1.5	1.55

Wiring Diagrams – 24 Thru 250 Volts

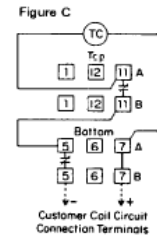


Six Contact Frame
* Factory Installed Connectors

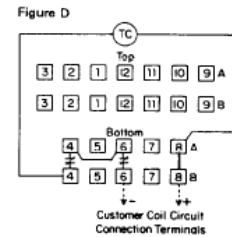


Twelve Contact Frame

480 Volts – Two Coil Cutoff Contacts Wired in Circuit



Six Contact Frame



Twelve Contact Frame