Westinghouse

Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc
20 Amperes Continuous

Application

The Type WL-2 Switch is designed for panel mounting and is applied where a number of circuits must be transferred simultaneously. For example, they can be used to provide simultaneous tripping of several breakers as may be required in differential protection or trip the main breaker of a system in conjunction with other associated auxiliary breakers.

The Type WL-2 Switches listed in this catalog are for ⅛ to ¼ inch panel mounting. Switches are available on special order, for mounting on panels up to 2 inches thick.

Magnetic Assemblies are available for voltages of 24-48V Dc, 125/250V Dc, 120/240V Ac rectified and 120/240 or 480 Ac 60 Hz.

The contacts of the Type WL-2 Switch are rated 600 volts, 20 amperes continuous. For interrupting ratings, see Figures 9 and 10, page 4.

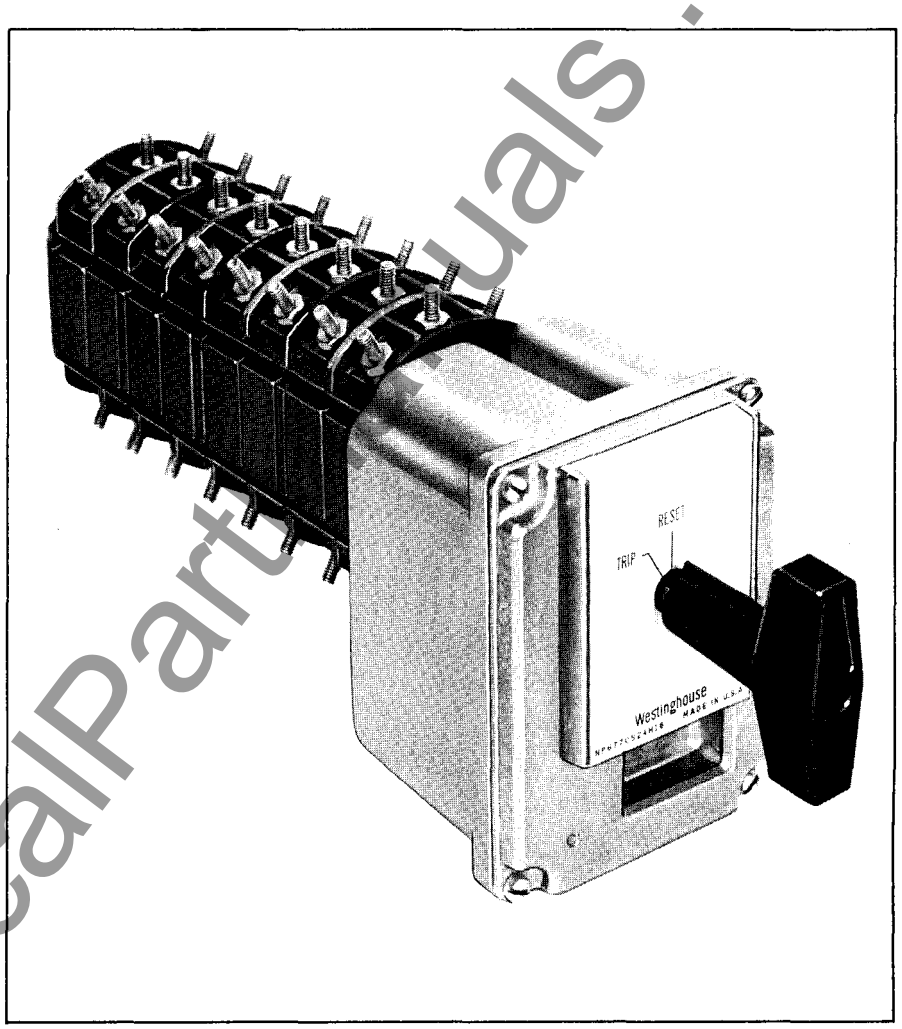
The tripping function of the Type WL-2 switch may produce a transient voltage in the control circuit which may exceed twice the control circuit voltage.

Any Type WL-2 switch having a control circuit which incorporates components which are sensitive to or may be damaged by overvoltages should be equipped with a diode or other protection device.
(Diode IN5406 is recommended)

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 thirty-eight (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.

The design has been limited to ten (10) stages of the six contact frame and six (6) stages of the twelve contact frame.

The trip coil of the type WL-2 switch has a low continuous rating, see Page 4, figure 3. This rating permits sufficient current flow for an application of monitoring without any overheating of the coil or having sufficient current to trip the unit.



Advantages

1. 25% less panel area.
2. Fewer moving and wearing parts.
3. Hermetically sealed, encapsulated coil.
4. Greater number of contacts on one shaft and per unit volume.
5. Simplified operating mechanism using permanent magnetic latch.
6. Light reset torque for manual reset operation.
7. One piece molded protective terminal cover easily added.
8. Reliable high speed operation.
9. Two coils (Dc & Ac/Dc) offer wide range of switch application and reduce inventory.
10. Long life expectancy – Tested to 10,000 operations.

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April 1, 1979
Supersedes DB 34-253 and supplements dated November 1971
E, D, C/1976/DB

Westinghouse

Features

The Type WL-2 Switch is supplied with a white nameplate (escutcheon) as standard. Nameplates in black, red, green and yellow are available upon request.

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 hexigon nuts) for each terminal of the unit for use in making field wiring connections.

The Type WL-2 Switch can be supplied with target indicator but is considered unnecessary because the size of the standard handle will provide positive visual indication of the switch position.

The coil and permanent magnet are encapsulated in a special formulated, electrical grade, epoxy composition thus forming an hermetically sealed unit. The encapsulated unit is not affected by repeated thermal cycling between −40 degrees centrigade 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. Polarity marking may be disregarded for Ac voltage applications.

Important Note: A Type WL-2 Switch of the non-handle trip design, although equipped with a handle, cannot be tripped by handle operation. To trip, a voltage corresponding to the coil rating shown on the switch nameplate must be applied to the trip coil.

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 reset and electrical trip, or (2) handle reset and both handle trip 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 cancelling the lines of force of the magnet which release the rotor to turn the "trip" position under spring stored energy.

Warning: To prevent coil damage the handle should not be manually held in the reset position when the trip circuit remains energized. When the trip circuit is energized and the switch is hand operated to the reset position, the operator will feel vibration through the switch handle and a buzzing sound will be audible.

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.

A standard device consists of a magnet assembly, compression spring assembly, and switch unit of up to ten stages of the six contact frame and six 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 being made at terminals B-5 and B-7. B-7 being the positive side. (See Wiring Diagram). In the case of the twelve contact stage, the factory will connect the coil leads to terminals A-6 and A-8, with A-8 being the positive (+) side. Customer connections being made at terminals B-6 and B-8, B-8 being the positive side. By this means, 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 design, there is a combination of both normally open and normally closed contacts on each unit. These may be varied to best suit the intended application. (Refer to contact tabulation section of this bulletin).

Figure Index

Table Index

Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc
20 Amperes Continuous

Exploded View of Typical Control Switch

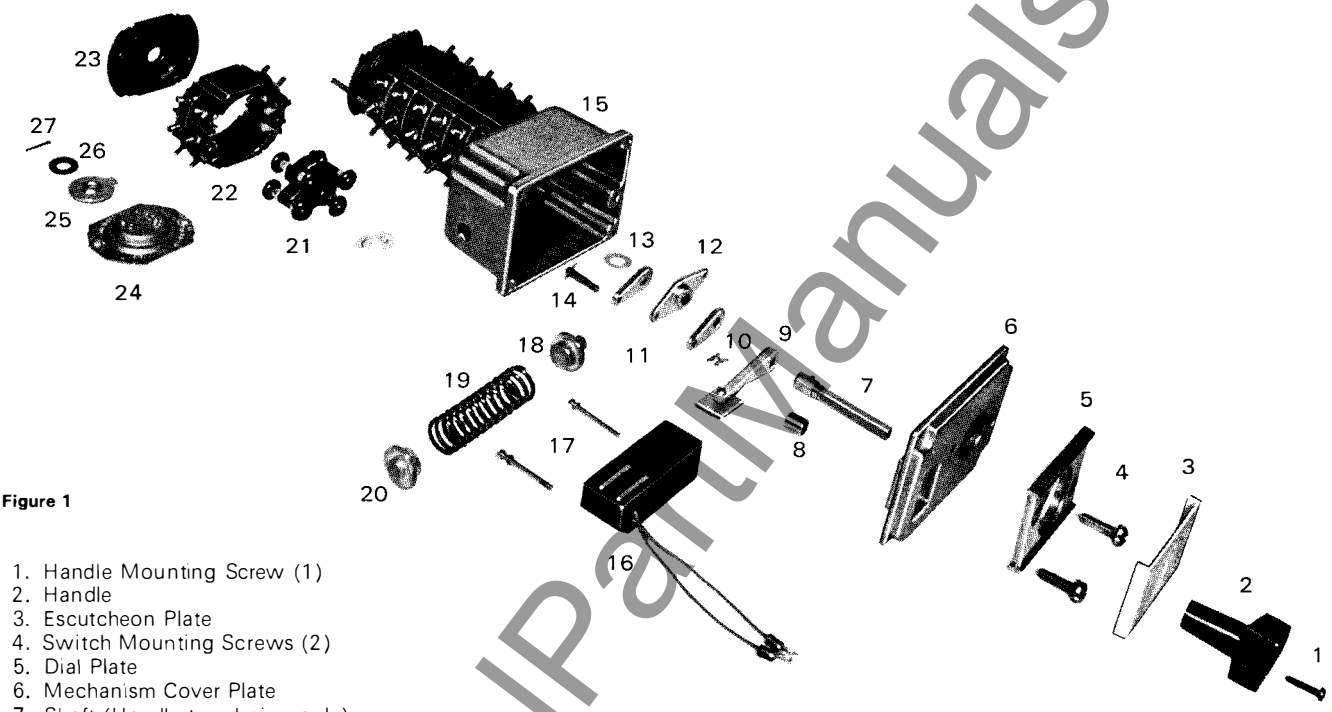

Figure 1

1. Handle Mounting Screw (1)
2. Handle
3. Escutcheon Plate
4. Switch Mounting Screws (2)
5. Dial Plate
6. Mechanism Cover Plate
7. Shaft (Handle trip design only)
8. Arm Spacer
9. Reset Arm Assembly
10. Keeper (2)
11. Tripping Arm (2)
12. Support with Bearing
13. Washer
14. Pin
15. Mechanism Housing
16. Coil-Magnet Assembly
17. Mounting Screws for Coil Assembly
18. Clevis
19. Spring-tripping
20. Anchor
21. Rotor
22. Stator Frame
23. Stage Spacer
24. End Cap
25. Stop
26. Washer
27. Cotter Pin

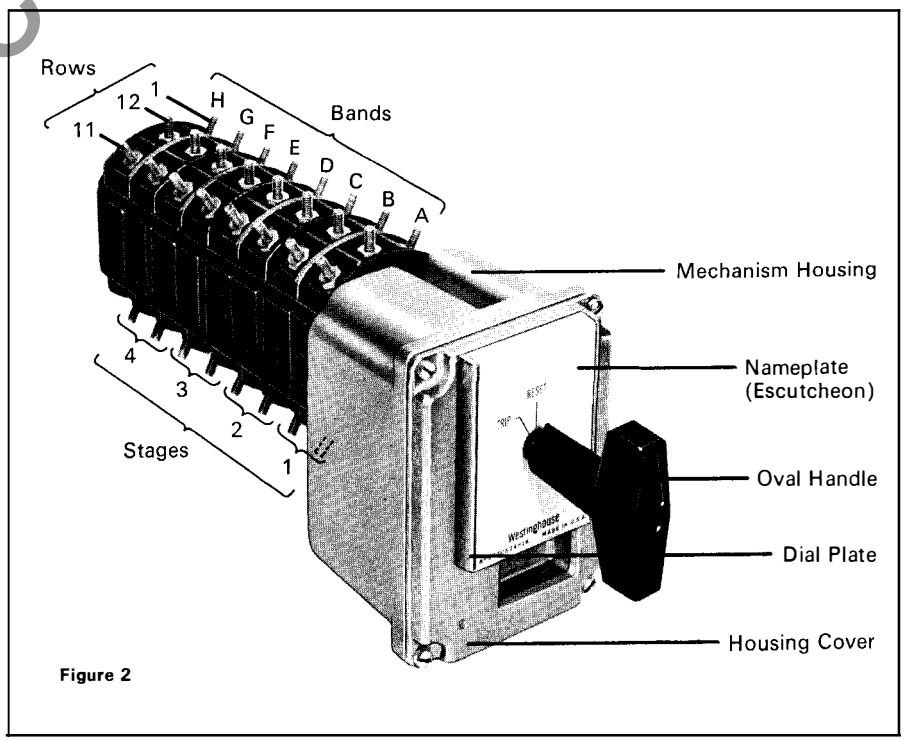

Figure 2

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Figure 3

Ratings

Average Coil Operating Current –

Ac	120	240	480	Dc	24	48	125	250
Amperes	1.4	3.0	6.0	Amperes	3.6	7.0	1.2	2.4
Inductance	.030H	.030H	.030H		.0029H	.0029H	.030H	.030H
Impedance	85Ω	80Ω	80Ω	Resistance	6.6Ω	6.6Ω	104Ω	104Ω

Continuous duty rating of trip coil is 45 Miliamperes maximum.

Figure 4

Operating Time

Operating time is the elapsed time from the initiation of voltage applied to the coil until the normally open contact of the switch "makes" or closes a circuit.

Average Operating Time in Cycles –

Ac Volts	120	240	480	Dc Volts	24	48	125	250
Avg. Time	1.58	1.54	1.50	Avg. Time	1.06	.96	1.05	1.01
Ac Volts Rectified	120	240						
Avg. Time	1.08	1.05						

Figure 5

The following interrupting ratings apply only to those contacts closed in the reset position (B contacts) and which are opened by electric tripping of the Type WL-2 Switch mechanism.

Interrupting Ratings – Single Contact –

Arcing ends one millisecond before contact makes

Voltage	Ac/Dc	Inductive Amperes Henries .0045	.012	.031	.063	.130	.243		Resistive Amperes
125	DC	4.65	3.67	2.85	2.1	1.53	0.9	.....	7.55
250	DC	1.6	1.6	1.0	1.0	0.98	0.78	....	1.6
500	DC	....	....	....	....	....	....	....	....
120	AC	....	....	....	....	....	....	7.53	7.95
240	AC	....	....	....	....	....	....	1.16	1.95
480	AC	....	....	....	....	....	....	.54	.9

Figure 6

Interrupting Rating – Two Contacts in Series –

Arcing ends one millisecond before contact makes

Voltage	Ac/Dc	Inductive Amperes Henries .0045	.012	.031	.063	.130	.243		Resistive Amperes
125	DC	27.0	14.75	7.7	4.85	2.92	1.9	....	7.8
250	DC	6.4	5.0	3.85	3.1	2.4	1.6	....	6.7
500	DC	1.5	1.7	1.5	1.35	1.15	0.98	....	1.7
120	AC	....	....	....	....	....	....	68.0	....
240	AC	....	....	....	....	....	....	9.1	9.0
480	AC	....	....	....	....	....	....	1.5	1.55

The values in the above tables are a maximum at which the arc, during interruption, will not carry to the adjacent "make" contact. Where a circuit to be interrupted has a rating exceeding those listed in above table, the adjacent "make" contact should not be used. Refer to Table 1, Page 9, column "Number of Paired Contacts" for details.

Figure 7

Trip Coil Minimum Pick-up Voltage –

Nominal Voltage Direct Current	Pick-up Volts	Nominal Voltage Alternating Current	Pick-up Volts
24	19	120	90
48	19	240	90
125	90	480	90
250	90		

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WL-2 Magnetic Switch Mean Operating Time

Figure 8

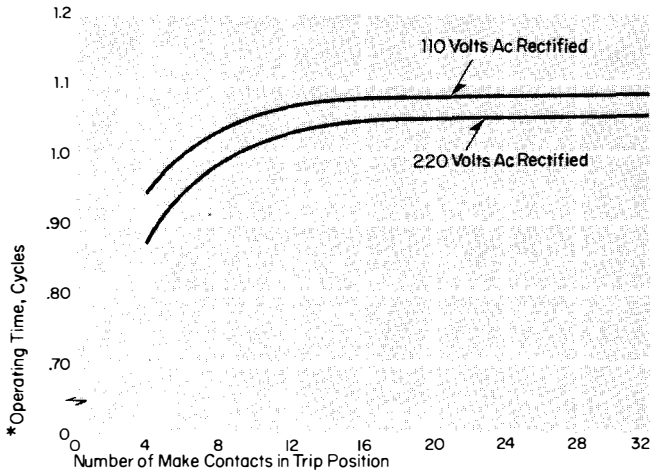
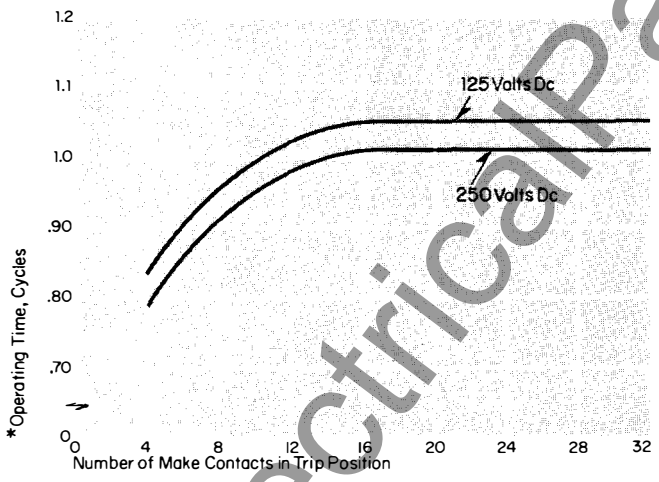


Figure 9



*Operating Time is The Elapsed Time From The Initiation of The Pulsed Voltage to The Switch Coil till The Normally Open Contacts of The Switch Make

Figure 10

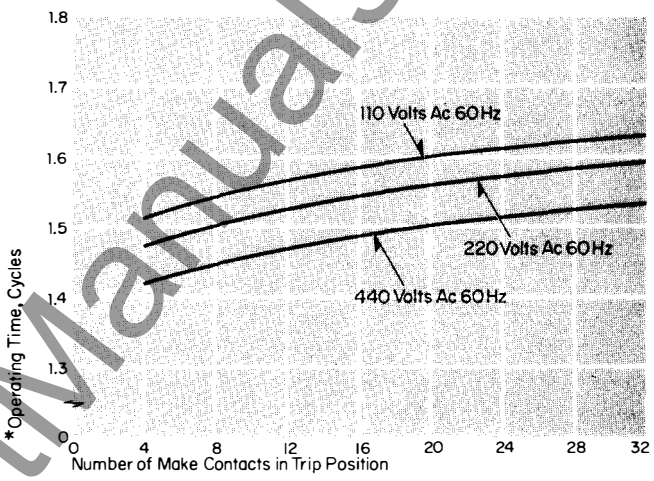
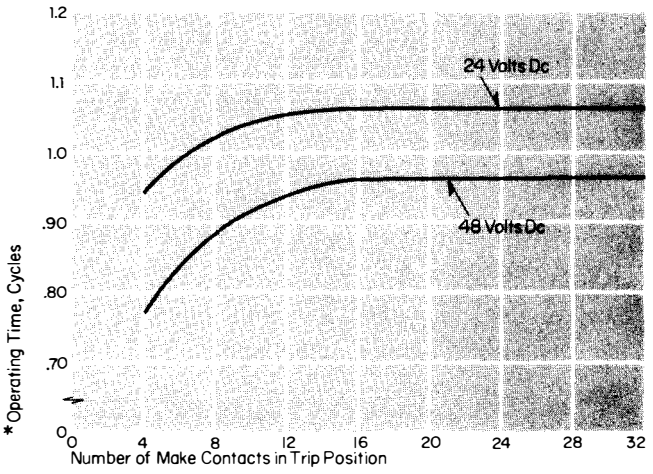


Figure 11



*Operating Time is The Elapsed Time From The Initiation of The Pulsed Voltage to The Switch Coil till The Normally Open Contacts of The Switch Make

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Contact Interpretation
The contacts of the Type WL-2 Switch are identified by the combination of Bands and Rows.

Rows: Viewing the switch from the handle end (front), it is noted the terminals are arranged in rows from front to back. The rows are set 30 degrees apart as is the face of a clock. On the six contact frame, the top three rows are identified as 11, 12 and 1 o'clock. The three rows at the bottom of the stage are 5, 6 and 7 o'clock. On the twelve contact frame, the rows are set as per each number on the face of a clock.

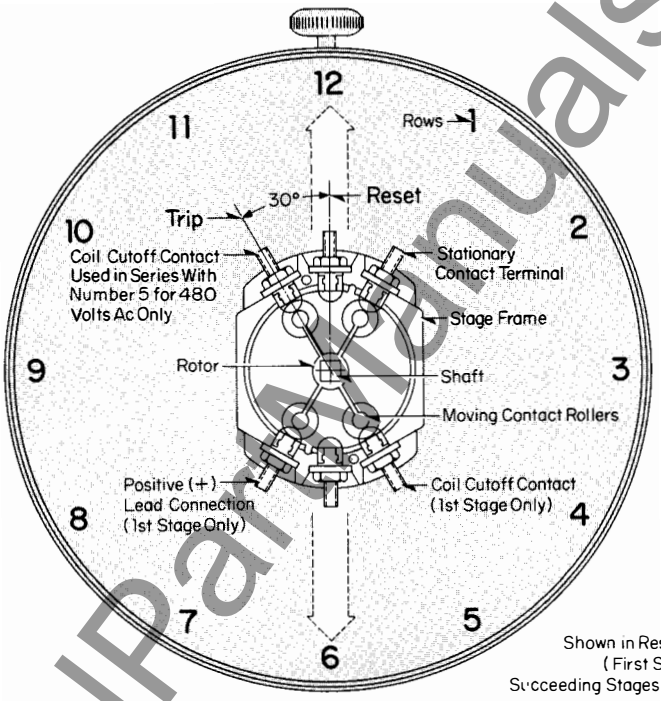

Figure 12

Shown in Reset Position
(First Stage Only -
Succeeding Stages may Differ)

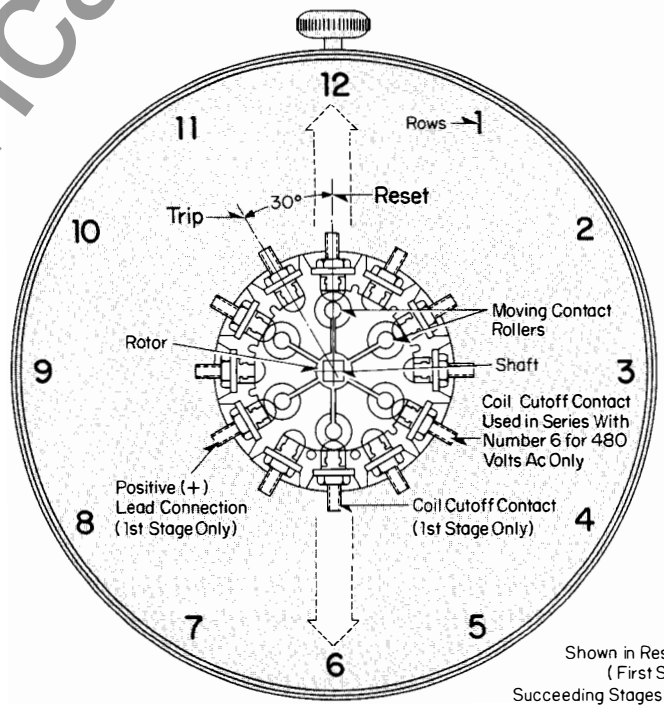

Figure 13

Shown in Reset Position
(First Stage Only -
Succeeding Stages may Differ)

Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc
20 Amperes Continuous

Type WL-2 Switch Materials

Handle	Moldarta, General Purpose
Nameplate	Cycolac
Dial Plate	Aluminum Die Cast
Housing	Aluminum Die Cast
Stage Frame	Glass Polyester
Rotor	Glass Polyester
Stationary Contact	Silicon Bronze, Silver Plated
Roller Contact	Silicon Bronze, Silver Plated
Springs	Stainless Steel
Locking Spacer (Window)	Lexan, Polycarbonate

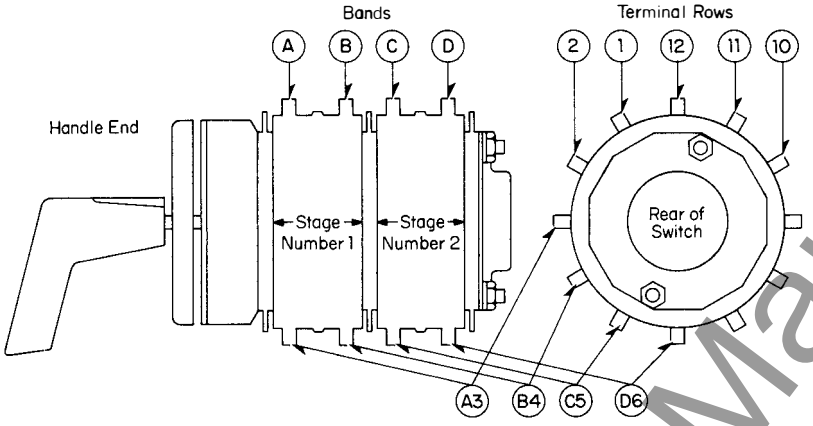

Figure 14 Methods of Identifying Contact Terminal Letter of Bands, Numbered Rows

Bands: As the switch is viewed from the side, bands of terminals are readily seen around the outer perimeter of the stage frame. Such bands are lettered. The band nearest the handle end is band "A", the second band is band "B", etc. Bands "A" and "B" constitute stage one, bands "C" and "D" constitute stage two, etc.

The row numbers and band letters are then combined to form full terminal identification as shown on figure 14 above and in the contact tabulations shown in this bulletin.

Contacts
The stationary contact (terminal) is a solid one piece forging. The moving (roller) contact is a solid bar.

To complete a circuit the roller contact internally bridges the stationary terminals in adjacent bands in the same row, for example, bands A & B in row twelve (A12-B-12) etc. (Also, see pages 10 through 15)

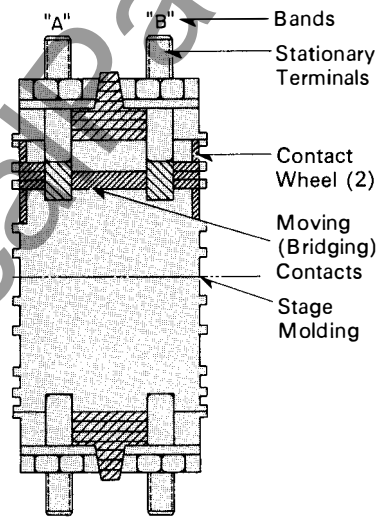

Figure 15

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Tests

Seismic

The type WL-2 switch was subjected to simulated seismic beat vibrations individually in each of three directions. Interpolation of the readings of the accelerometers located at various points on the equipment indicated that the type WL-2 switch was subjected to the following seismic forces:

front to back – 7.6g at 7 Hz
side to side – 1.0g at 4 Hz
vertical – 0.93g at 1.75 Hz

Contacts on the WL-2 switch were electrically monitored during the tests and no evidence of circuit disturbance was detected. The magnetic mechanism remained latched during the tests.

It is concluded, as a result of these tests, that the type WL-2 switch is satisfactory for seismic applications up to the values indicated above. However, these values are only the maximum seismic forces at which the WL-2 switch was tested. They do not represent a maximum level for the design of the switch.

Surge

When in the "trip" position the contacts in series with the trip coil are open, therefore, a voltage surge in this situation will have no affect on the switch.

When in the "reset" position where-in the coil cutoff contact is closed the coil will withstand an over voltage of 100 percent for ratings up to 440 volts Ac (RMS) since the coil is energized for less than one cycle.

At 440 volts Ac, RMS, the coil will withstand an over voltage of 50 percent.

Magnetic Field

The type WL-2 switch has been tested in a magnetic field produced by a single bus bar and in the inside of a bus loop:

1. Being bolted directly to a single bus bar carrying 15,000 amperes RMS.
2. Being bolted directly to the bus bar, inside the loop, carrying 8000 amperes RMS.

During these tests it was shown that the switch was unaffected by high magnetic fields even under these most arduous conditions. After a period of 30 seconds within the stated magnetic fields, the switch was satisfactorily operated through the trip coil pulsing cycle.

High Potential Test

The coil of the Type WL-2 switch need not be disconnected for test purposes. However. it is recommended that the switch be set in the "trip" position so that the coil cutoff contacts in series with the coil are open. If the switch were left in the "reset" position, a high potential of 1800 volts (assuming one side of the coil pulse voltage is grounded) would cause the switch to operate to the "trip" position. Should this occur several times within a short period the resultant heat build-up inside the coil would cause coil burn-out.

Radiation Effect

The ceramic and metallic magnet materials are known to resist radiation damage to high levels. The magnetic materials employed in the type WL-2 switch will exhibit no change in magnetic properties at radiation levels of 10^{17} epicadmium neutrons per cm^2. Above this level a gradual reduction of magnetic properties occurs and is approximately 40 percent at 10^{20} epicadmium neutrons per cm^2.

Rectifier

An optional feature of the type 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 Fig. 4 page 4).

When used. 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 volts Ac control are not available.

Where required for 480 volts Ac the rectifier must be supplied and mounted by the customer.

Symbols

② In circuits where interrupted current is within the ratings shown in Figure 5, Page 4, the number of trip and reset contacts shown in these columns are available and may be applied without exception.

③ Where the interrupted current of the reset (b) contact exceeds the ratings listed in Figure 5, Page 4, the adjacent "make" contact should not be used. This column sets out the number of these paired contacts per switch unit.

A pair of contacts are those having adjacent stationary terminals served by the same moving contact, i.e., one A (normally open) and one B (normally closed) contact with a common moving roller contact.

④ Refer to wiring diagrams on Page 9 this bulletin.

Int.=Intermediate position:

(1) That area between handle positions "reset" – "trip" (or vice versa) wherein all contacts are open re: break before make.

(2) In the case of overlapping contacts, that area between handle positions wherein the "make before break" contacts close adjacent terminals in the same bands. (Make before break contacts not illustrated in this bulletin).

Type WL-2 Instrument and Control Switch

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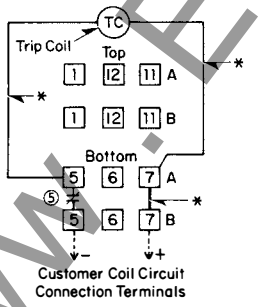
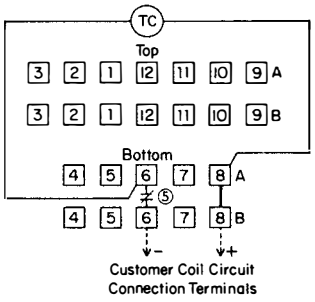
Switch Style Numbers

Fig.	No. of Stages	② Contacts Available Trip	Reset	③ No. of Paired Contacts	Switch Styles: Handle Trip 24-48V Dc	120-240V 60Hz With Rectifier	120-240V 60Hz 125-250V Dc	480V 600Y	Non-Handle Trip 24-48V Dc	120-240V 60Hz With Rectifier	120-240V 60Hz 125-250V Dc	480V 600Y
Six (6) Contact Frame WL-2 Switches												
1	1	2	2	1	796A201G01	796A201G03	796A201G05	796A201G07	796A201G02	796A201G04	796A201G06	796A201G08
2	2	4	6	3	796A205G01	796A205G03	796A205G05	796A205G07	796A205G02	796A205G04	796A205G06	796A205G08
3	2	6	4	3	796A204G01	796A204G03	796A204G05	796A204G07	796A204G02	796A204G04	796A204G06	796A204G08
4	3	6	10	5	796A210G01	796A210G03	796A210G05	796A210G07	796A210G02	796A210G04	796A210G06	796A210G08
5	3	8	8	5	796A208G01	796A208G03	796A208G05	796A208G07	796A208G02	796A208G04	796A208G06	796A208G08
6	3	10	6	5	796A209G01	796A209G03	796A209G05	796A209G07	796A209G02	796A209G04	796A209G06	796A209G08
7	4	8	14	7	796A212G01	796A212G03	796A212G05	796A212G07	796A212G02	796A212G04	796A212G06	796A212G08
8	4	10	12	7	796A202G01	796A202G03	796A202G05	796A202G07	796A202G02	796A202G04	796A202G06	796A202G08
9	4	12	10	7	796A213G01	796A213G03	796A213G05	796A213G07	796A213G02	796A213G04	796A213G06	796A213G08
10	4	14	8	7	796A211G01	796A211G03	796A211G05	796A211G07	796A211G02	796A211G04	796A211G06	796A211G08
11	5	10	18	9	796A215G01	796A215G03	796A215G05	796A215G07	796A215G02	796A215G04	796A215G06	796A215G08
12	5	12	16	9	796A225G01	796A225G03	796A225G05	796A225G07	796A225G02	796A225G04	796A225G06	796A225G08
13	5	14	14	9	796A200G01	796A200G03	796A200G05	796A200G07	796A200G02	796A200G04	796A200G06	796A200G08
14	5	16	12	9	796A224G01	796A224G03	796A224G05	796A224G07	796A224G02	796A224G04	796A224G06	796A224G08
15	5	18	10	9	796A214G01	796A214G03	796A214G05	796A214G07	796A214G02	796A214G04	796A214G06	796A214G08
16	6	12	22	11	796A217G01	796A217G03	796A217G05	796A217G07	796A217G02	796A217G04	796A217G06	796A217G08
17	6	14	20	11	796A228G01	796A228G03	796A228G05	796A228G07	796A228G02	796A228G04	796A228G06	796A228G08
18	6	16	18	11	796A227G01	796A227G03	796A227G05	796A227G07	796A227G02	796A227G04	796A227G06	796A227G08
19	6	18	16	11	796A218G01	796A218G03	796A218G05	796A218G07	796A218G02	796A218G04	796A218G06	796A218G08
20	6	20	14	11	796A226G01	796A226G03	796A226G05	796A226G07	796A226G02	796A226G04	796A226G06	796A226G08
21	6	22	12	11	796A216G01	796A216G03	796A216G05	796A216G07	796A216G02	796A216G04	796A216G06	796A216G08
22	7	14	26	13	796A220G01	796A220G03	796A220G05	796A220G07	796A220G02	796A220G04	796A220G06	796A220G08
23	7	16	24	13	796A243G01	796A243G03	796A243G05	796A243G07	796A243G02	796A243G04	796A243G06	796A243G08
24	7	18	22	13	796A242G01	796A242G03	796A242G05	796A242G07	796A242G02	796A242G04	796A242G06	796A242G08
25	7	20	20	13	796A241G01	796A241G03	796A241G05	796A241G07	796A241G02	796A241G04	796A241G06	796A241G08
26	7	22	18	13	796A230G01	796A230G03	796A230G05	796A230G07	796A230G02	796A230G04	796A230G06	796A230G08
27	7	24	16	13	796A229G01	796A229G03	796A229G05	796A229G07	796A229G02	796A229G04	796A229G06	796A229G08
28	7	26	14	13	796A219G01	796A219G03	796A219G05	796A219G07	796A219G02	796A219G04	796A219G06	796A219G08
29	8	16	30	15	796A222G01	796A222G03	796A222G05	796A222G07	796A222G02	796A222G04	796A222G06	796A222G08
30	8	18	28	15	796A248G01	796A248G03	796A248G05	796A248G07	796A248G02	796A248G04	796A248G06	796A248G08
31	8	20	26	15	796A247G01	796A247G03	796A247G05	796A247G07	796A247G02	796A247G04	796A247G06	796A247G08
32	8	22	24	15	796A246G01	796A246G03	796A246G05	796A246G07	796A246G02	796A246G04	796A246G06	796A246G08
33	8	24	22	15	796A223G01	796A223G03	796A223G05	796A223G07	796A223G02	796A223G04	796A223G06	796A223G08
34	8	26	20	15	796A245G01	796A245G03	796A245G05	796A245G07	796A245G02	796A245G04	796A245G06	796A245G08
35	8	28	18	15	796A244G01	796A244G03	796A244G05	796A244G07	796A244G02	796A244G04	796A244G06	796A224G08
36	8	30	16	15	796A221G01	796A221G03	796A221G05	796A221G07	796A221G02	796A221G04	796A221G06	796A221G08
④Wiring Diagram—Figures 16-18					16	16	16	18	16	16	16	18
Twelve (12) Contact Frame WL-2 Switches												
37	1	5	4	4	796A231G01	796A231G03	796A231G05	796A231G07	796A231G02	796A231G04	796A231G06	796A231G08
33	2	11	10	10	796A232G01	796A232G03	796A232G05	796A232G07	796A232G02	796A232G04	796A232G06	796A232G08
39	3	17	16	16	796A233G01	796A233G03	796A233G05	796A233G07	796A233G02	796A233G04	796A233G06	796A233G08
40	4	23	22	22	796A234G01	796A234G03	796A234G05	796A234G07	796A234G02	796A234G04	796A234G06	796A234G08
41	5	29	28	28	796A235G01	796A235G03	796A235G05	796A235G07	796A235G02	796A235G04	796A235G06	796A235G08
42	6	35	34	34	796A236G01	796A236G03	796A236G05	796A236G07	796A236G02	796A236G04	796A236G06	796A235G08
④Wiring Diagram—Figures 17-19					17	17	17	19	17	17	17	19

Wiring Diagrams – 24 Thru 250 Volts



Six Contact Frame



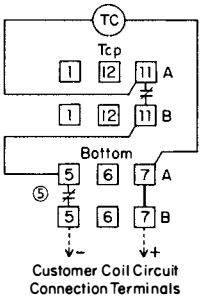
Twelve Contact Frame

*Factory Installed Connectors (Figures 16, 17, 18 and 19)

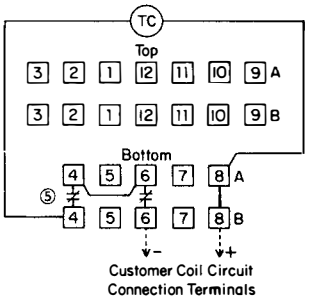
Figure 16

Figure 17

480 Volts – Two Coil Cutoff Contacts Wired in Circuit



Six Contact Frame

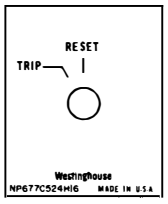


Twelve Contact Frame

Figure 18

Figure 19

Westinghouse



Nameplate

This nameplate marking is common to all Type WL-2 Switches listed in this descriptive bulletin.

Special nameplate markings are available upon request and may be obtained by specifying such special markings in order item reading.

Position Tabulations

Figure 1

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			

Figure 2

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11			X	
C12-D12	X			⊠
C1-D1			X	⊠
C5-D5			X	
C6-D6	X			⊠
C7-D7			X	⊠

Figure 3

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			

Figure 4

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11			X	
C12-D12	X			⊠
C1-D1			X	
C5-D5			X	
C6-D6	X			⊠
C7-D7			X	
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	⊠
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	⊠

Figure 5

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	⊠
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	⊠

Figure 6

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			

Figure 7

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11			X	
C12-D12	X			⊠
C1-D1			X	⊠
C5-D5			X	
C6-D6	X			⊠
C7-D7			X	⊠
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	⊠
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	⊠
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	⊠
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	⊠

Figure 8

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11			X	
C12-D12	X			⊠
C1-D1			X	⊠
C5-D5			X	
C6-D6	X			⊠
C7-D7			X	⊠
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	⊠
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	⊠

Figure 9

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	⊠
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	⊠
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			

Figure 10

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			

⊘ Contact A5-B5 is used as Trip Coil Cutoff Contact, to be used for no other purpose.
⊠ Use One or Other of Paired Contacts in Application. See page 8, symbol 3

Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc,
20 Amperes Continuous

Figure 11

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11			X	
C12-D12	X			⊠
C1-D1			X	
C5-D5			X	
C6-D6	X			⊠
C7-D7			X	
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	

Figure 12

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	

Figure 13

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	
G11-H11	X			⊠
G12-H12			X	
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	
G7-H7	X			
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	

Figure 14

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	
G7-H7	X			
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	

Figure 15

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	
I7-J7	X			

Figure 16

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11			X	
C12-D12	X			⊠
C1-D1			X	
C5-D5			X	
C6-D6	X			⊠
C7-D7			X	
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	

Figure 17

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	

Figure 18

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	
E7-F7	X			
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	

Figure 19

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	
G7-H7	X			
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	

Figure 20

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	
I7-J7	X			
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	

⊘ Contact A5-B5 is used as Trip Coil Cutoff Contact, to be used for no other purpose.
⊠ Use One or Other of Paired Contacts in Application. See page 8, symbol 3

Westinghouse

Position Tabulations *Continued*

Figure 21

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			
K11-L11	X			⊠
K12-L12			X	⊠
K1-L1	X			
K5-L5	X			⊠
K6-L6			X	⊠
K7-L7	X			

Figure 22

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11			X	⊠
C12-D12	X			⊠
C1-D1			X	
C5-D5			X	⊠
C6-D6	X			⊠
C7-D7			X	
E11-F11			X	⊠
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	⊠
E6-F6	X			⊠
E7-F7			X	
G11-H11			X	⊠
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	⊠
G6-H6	X			⊠
G7-H7			X	
I11-J11			X	⊠
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	⊠
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	⊠
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	⊠
K6-L6	X			⊠
K7-L7			X	
M11-N11			X	⊠
M12-N12	X			⊠
M1-N1			X	
M5-N5			X	⊠
M6-N6	X			⊠
M7-N7			X	

Figure 23

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11			X	⊠
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	⊠
E6-F6	X			⊠
E7-F7			X	
G11-H11			X	⊠
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	⊠
G6-H6	X			⊠
G7-H7			X	
I11-J11			X	⊠
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	⊠
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	⊠
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	⊠
K6-L6	X			⊠
K7-L7			X	
M11-N11			X	⊠
M12-N12	X			⊠
M1-N1			X	
M5-N5			X	⊠
M6-N6	X			⊠
M7-N7			X	

Figure 24

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11			X	⊠
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	⊠
G6-H6	X			⊠
G7-H7			X	
I11-J11			X	⊠
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	⊠
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	⊠
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	⊠
K6-L6	X			⊠
K7-L7			X	
M11-N11			X	⊠
M12-N12	X			⊠
M1-N1			X	
M5-N5			X	⊠
M6-N6	X			⊠
M7-N7			X	

Figure 25

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11			X	⊠
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	⊠
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	⊠
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	⊠
K6-L6	X			⊠
K7-L7			X	
M11-N11			X	⊠
M12-N12	X			⊠
M1-N1			X	
M5-N5			X	⊠
M6-N6	X			⊠
M7-N7			X	

⊘ Contact A5-B5 is used as Trip Coil Cutoff Contact, to be used for no other purpose.
⊠ Use One or Other of Paired Contacts in Application. See page 8, symbol 3

Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc,
20 Amperes Continuous

Figure 26

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	⊠
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	⊠
M11-N11			X	
M12-N12	X			⊠
M1-N1			X	⊠
M5-N5			X	
M6-N6	X			⊠
M7-N7			X	⊠

Figure 27

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			
K11-L11	X			⊠
K12-L12			X	⊠
K1-L1	X			
K5-L5	X			⊠
K6-L6			X	⊠
K7-L7	X			
M11-N11			X	
M12-N12	X			⊠
M1-N1			X	⊠
M5-N5			X	
M6-N6	X			⊠
M7-N7			X	⊠

Figure 28

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			
K11-L11	X			⊠
K12-L12			X	⊠
K1-L1	X			
K5-L5	X			⊠
K6-L6			X	⊠
K7-L7	X			
M11-N11	X			⊠
M12-N12			X	⊠
M1-N1	X			
M5-N5	X			⊠
M6-N6			X	⊠
M7-N7	X			

Figure 29

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11			X	
C12-D12	X			⊠
C1-D1			X	
C5-D5			X	⊠
C6-D6	X			⊠
C7-D7			X	
E11-F11			X	⊠
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	⊠
E6-F6	X			⊠
E7-F7			X	
G11-H11			X	⊠
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	⊠
G6-H6	X			⊠
G7-H7			X	
I11-J11			X	⊠
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	⊠
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	⊠
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	⊠
K6-L6	X			⊠
K7-L7			X	
M11-N11			X	⊠
M12-N12	X			⊠
M1-N1			X	
M5-N5			X	⊠
M6-N6	X			⊠
M7-N7			X	
O11-P11			X	⊠
O12-P12	X			⊠
O1-P1			X	
O5-P5			X	⊠
O6-P6	X			⊠
O7-P7			X	⊠

Figure 30

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	
M11-N11			X	
M12-N12	X			⊠
M1-N1			X	
M5-N5			X	
M6-N6	X			⊠
M7-N7			X	
O11-P11			X	
O12-P12	X			⊠
O1-P1			X	
O5-P5			X	
O6-P6	X			⊠
O7-P7			X	⊠

⊘ Contact A5-B5 is used as Trip Coil Cutoff Contact, to be used for no other purpose.
⊠ Use One or Other of Paired Contacts in Application. See page 8, symbol 3

Westinghouse

Position Tabulations *Continued*

Figure 31

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	⊠
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	⊠
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	⊠
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	⊠
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	⊠
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	⊠
M11-N11			X	
M12-N12	X			⊠
M1-N1			X	⊠
M5-N5			X	
M6-N6	X			⊠
M7-N7			X	⊠
011-P11			X	
012-P12	X			⊠
01-P1			X	⊠
05-P5			X	
06-P6	X			⊠
07-P7			X	⊠

Figure 32

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	⊠
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	⊠
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	⊠
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	⊠
M11-N11			X	
M12-N12	X			⊠
M1-N1			X	⊠
M5-N5			X	
M6-N6	X			⊠
M7-N7			X	⊠
011-P11			X	
012-P12	X			⊠
01-P1			X	⊠
05-P5			X	
06-P6	X			⊠
07-P7			X	⊠

Figure 33

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	⊠
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	⊠
M11-N11			X	
M12-N12	X			⊠
M1-N1			X	⊠
M5-N5			X	
M6-N6	X			⊠
M7-N7			X	⊠
011-P11			X	
012-P12	X			⊠
01-P1			X	⊠
05-P5			X	
06-P6	X			⊠
07-P7			X	⊠

Figure 34

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			
K11-L11	X			⊠
K12-L12			X	⊠
K1-L1	X			
K5-L5	X			⊠
K6-L6			X	⊠
K7-L7	X			
M11-N11			X	
M12-N12	X			⊠
M1-N1			X	⊠
M5-N5			X	
M6-N6	X			⊠
M7-N7			X	⊠
011-P11			X	
012-P12	X			⊠
01-P1			X	⊠
05-P5			X	
06-P6	X			⊠
07-P7			X	⊠

Figure 35

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			
K11-L11	X			⊠
K12-L12			X	⊠
K1-L1	X			
K5-L5	X			⊠
K6-L6			X	⊠
K7-L7	X			
M11-N11	X			⊠
M12-N12			X	⊠
M1-N1	X			
M5-N5	X			⊠
M6-N6			X	⊠
M7-N7	X			
011-P11			X	
012-P12	X			⊠
01-P1			X	⊠
05-P5			X	
06-P6	X			⊠
07-P7			X	⊠

⊘ Contact A5-B5 is used as Trip Coil Cutoff Contact, to be used for no other purpose.
⊠ Use One or Other of Paired Contacts in Application. See page 8, symbol 3

Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc,
20 Amperes Continuous

Figure 36

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			
K11-L11	X			⊠
K12-L12			X	⊠
K1-L1	X			
K5-L5	X			⊠
K6-L6			X	⊠
K7-L7	X			
M11-N11	X			⊠
M12-N12			X	⊠
M1-N1	X			
M5-N5	X			⊠
M6-N6			X	⊠
M7-N7	X			
O11-P11	X			⊠
O12-P12			X	⊠
O1-P1	X			
O5-P5	X			⊠
O6-P6			X	⊠
O7-P7	X			

Figure 37

CONTACT	POSITION T	INT	R	
A11-B11	X			⊠
A12-B12			X	⊠
A1-B1	X			⊠
A2-B2			X	⊠
A3-B3	X			⊠
A4-B4			X	⊠
A6-B6			X	⊘
A7-B7	X			
A9-B9	X			⊠
A10-B10			X	⊠

Figure 38

CONTACT	POSITION T	INT	R	
A11-B11	X			⊠
A12-B12			X	⊠
A1-B1	X			⊠
A2-B2			X	⊠
A3-B3	X			⊠
A4-B4			X	⊠
A6-B6			X	⊘
A7-B7	X			
A9-B9	X			⊠
A10-B10			X	⊠
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			⊠
C2-D2			X	⊠
C3-D3	X			⊠
C4-D4			X	⊠ *
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			⊠
C8-D8			X	⊠
C9-D9	X			⊠
C10-D10			X	⊠

* 2nd Stage Shown

Figure 39

CONTACT	POSITION T	INT	R	
A11-B11	X			⊠
A12-B12			X	⊠
A1-B1	X			⊠
A2-B2			X	⊠
A3-B3	X			⊠
A4-B4			X	⊠
A6-B6			X	⊘
A7-B7	X			
A9-B9	X			⊠
A10-B10			X	⊠
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			⊠
C2-D2			X	⊠
C3-D3	X			⊠
C4-D4			X	⊠ *
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			⊠
C8-D8			X	⊠
C9-D9	X			⊠
C10-D10			X	⊠

* 2nd Stage Shown
3rd Stage (E-F) is Same

Figure 40

CONTACT	POSITION T	INT	R	
A11-B11	X			⊠
A12-B12			X	⊠
A1-B1	X			⊠
A2-B2			X	⊠
A3-B3	X			⊠
A4-B4			X	⊠
A6-B6			X	⊘
A7-B7	X			
A9-B9	X			⊠
A10-B10			X	⊠
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			⊠
C2-D2			X	⊠
C3-D3	X			⊠
C4-D4			X	⊠ *
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			⊠
C8-D8			X	⊠
C9-D9	X			⊠
C10-D10			X	⊠

* 2nd Stage Shown
3rd, 4th Stages (E-F, G-H)
are Same

Figure 41

CONTACT	POSITION T	INT	R	
A11-B11	X			⊠
A12-B12			X	⊠
A1-B1	X			⊠
A2-B2			X	⊠
A3-B3	X			⊠
A4-B4			X	⊠
A6-B6			X	⊘
A7-B7	X			
A9-B9	X			⊠
A10-B10			X	⊠
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			⊠
C2-D2			X	⊠
C3-D3	X			⊠
C4-D4			X	⊠ *
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			⊠
C8-D8			X	⊠
C9-D9	X			⊠
C10-D10			X	⊠

* 2nd Stage Shown
3rd, 4th and 5th Stages
(E-F, G-H, I-J) are Same

Figure 42

CONTACT	POSITION T	INT	R	
A11-B11	X			⊠
A12-B12			X	⊠
A1-B1	X			⊠
A2-B2			X	⊠
A3-B3	X			⊠
A4-B4			X	⊠
A6-B6			X	⊘
A7-B7	X			
A9-B9	X			⊠
A10-B10			X	⊠
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			⊠
C2-D2			X	⊠
C3-D3	X			⊠
C4-D4			X	⊠ *
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			⊠
C8-D8			X	⊠
C9-D9	X			⊠
C10-D10			X	⊠

* 3rd, 4th, 5th and 6th Stages
(E-F, G-H, I-J, K-L) are Same

⊘ Contact A5-B5 is used as Trip Coil Cutoff Contact, to be used for no other purpose.
⊠ Use One or Other of Paired Contacts in Application. See page 8, symbol 3

Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc,
20 Amperes Continuous

Dimensions in Inches
Drilling Plan

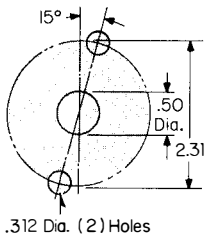
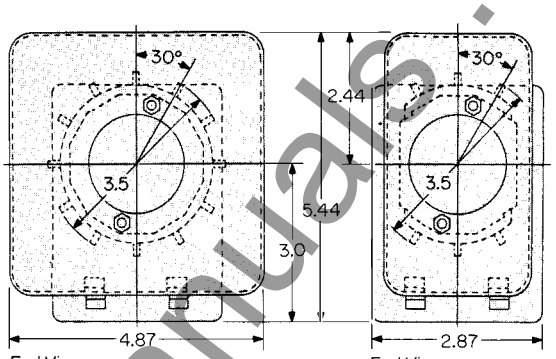


Figure 20

Line No.	No. of Stage	A	B	Approx. Pounds Weight
1	1	2.40	5.51	3.25
2	2	3.90	6.81	3.5
3	3	5.40	8.31	3.75
4	4	6.90	9.81	4.0
5	5	8.40	11.31	4.25
6	6	9.90	12.81	4.50
7	7	11.40	14.31	4.75
8	8	12.90	15.81	5.0



Type WL-2 Switch with Protective Cover

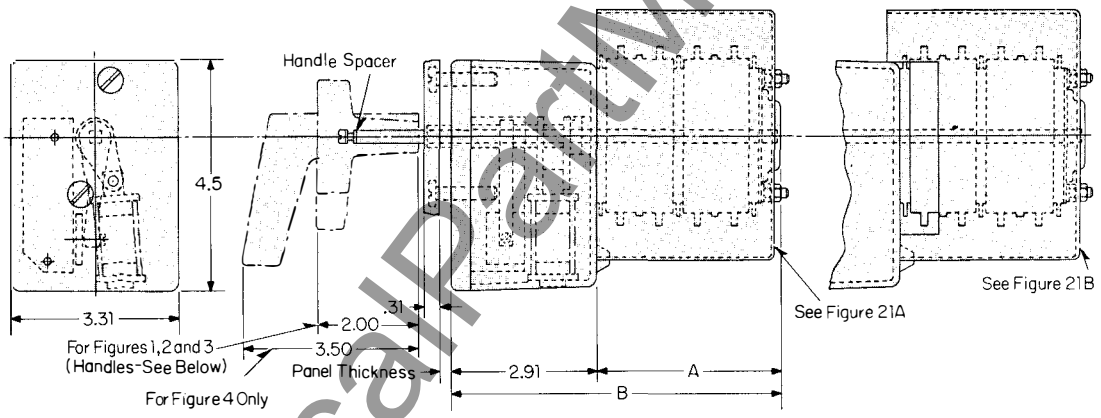


Figure 21

Type WL-2 Without Protective Cover

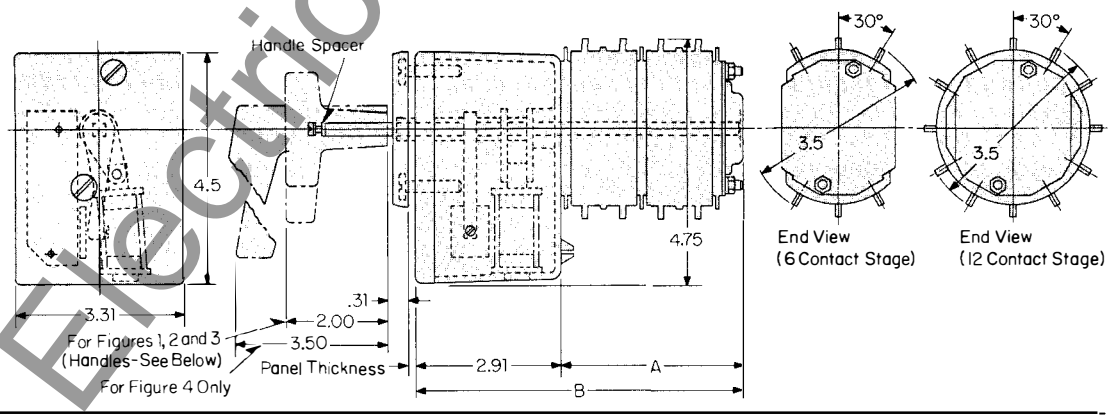
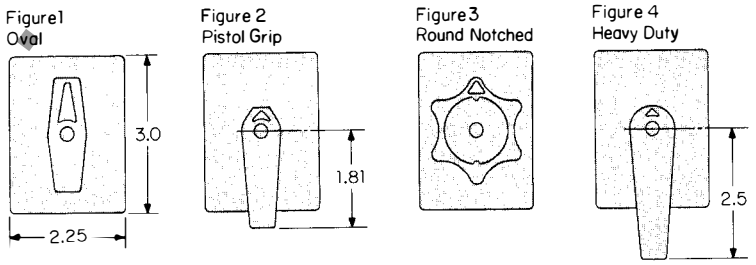


Figure 22

Handles



Westinghouse Electric Corporation
Switchgear Division, East Pittsburgh, Pa. 15112
Printed in USA

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Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc
20 Amperes Continuous

Application

The Type WL-2 Switch is designed for panel mounting and is applied where a number of circuits must be transferred simultaneously. For example, they can be used to provide simultaneous tripping of several breakers as may be required in differential protection or trip the main breaker of a system in conjunction with other associated auxiliary breakers.

The Type WL-2 Switches listed in this catalog are for ⅛ to ¼ inch panel mounting. Switches are available on special order, for mounting on panels up to 2 inches thick.

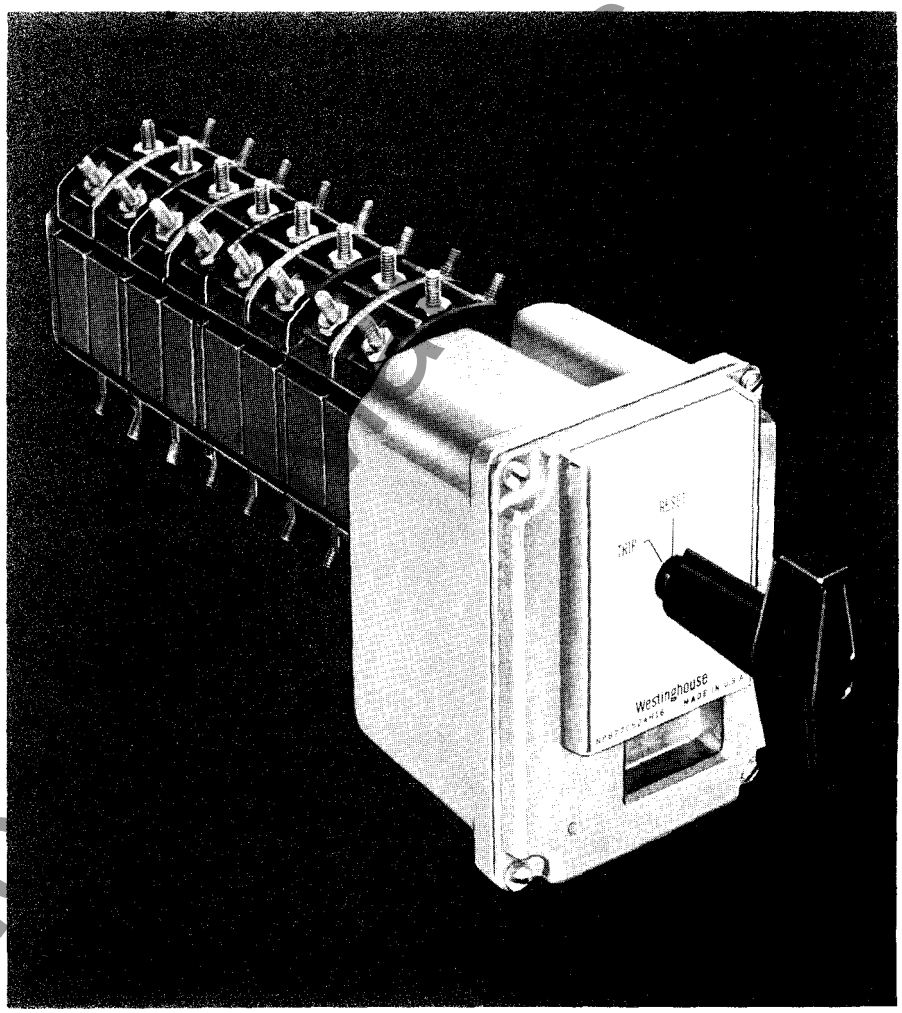
Magnetic Assemblies are available for voltages of 24-48V Dc, 125/250V Dc, 120/240V Ac rectified and 120/240 or 480 Ac 60 Hz.

The contacts of the Type WL-2 Switch are rated 600 volts, 20 amperes continuous. For interrupting ratings, see Figures 9 and 10, page 4.

The Type WL-2 Switch may be applied to static and non-static control systems without the use of separate arc quenching devices, such as diodes or resistors.

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 thirty-eight (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.

The design has been limited to ten (10) stages of the six contact frame and six (6) stages of the twelve contact frame.



Advantages

1. 25% less panel area.
2. Fewer moving and wearing parts.
3. Hermetically sealed, encapsulated coil.
4. Greater number of contacts on one shaft and per unit volume.
5. Simplified operating mechanism using permanent magnetic latch.
6. Light reset torque for manual reset operation.
7. One piece molded protective terminal cover easily added.
8. Reliable high speed operation.
9. Two coils (Dc & Ac/Dc) offer wide range of switch application and reduce inventory.
10. Long life expectancy – Tested to 10,000 operations.

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November, 1971
New Information
E. D. C/1976/PL

Westinghouse

Features
The Type WL-2 Switch is supplied with a white nameplate (escutcheon) as standard. Nameplates in black, red, green and yellow are available upon request.

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 hexigon nuts) for each terminal of the unit for use in making field wiring connections.

The Type WL-2 Switch can be supplied with target indicator but is considered unnecessary because the size of the standard handle will provide positive visual indication of the switch position.

The coil and permanent magnet are encapsulated in a special formulated, electrical grade, epoxy composition thus forming an hermetically sealed unit. The encapsulated unit is not affected by repeated thermal cycling between −40 degrees centrigade 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. Polarity marking may be disregarded for Ac voltage applications.

Important Note: A Type WL-2 Switch of the non-handle trip design, although equipped with a handle, cannot be tripped by handle operation. To trip, a voltage corresponding to the coil rating shown on the switch nameplate must be applied to the trip coil.

Operation
The Type WL-2 is a two position device having manual operation to the "reset" position and electric trip (spring operated)

Warning: To prevent coil damage the handle should not be manually held in the reset position when the trip circuit remains energized. When the trip circuit is energized and the switch is hand operated to the reset position, the operator will feel vibration through the switch handle and a buzzing sound will be audible.

to the "trip" position. The escutcheon is marked "trip" and "reset". This device can be supplied as either (1) handle reset and electrical trip, or (2) handle reset and both handle trip 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 cancelling the lines of force of the magnet which release the rotor to turn the "trip" position under spring stored energy.

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.

A standard device consists of a magnet assembly, compression spring assembly, and switch unit of up to ten stages of the six contact frame and six 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 being made at terminals B-5 and B-7. B-7 being the positive side. (See Wiring Diagram). In the case of the twelve contact stage, the factory will connect the coil leads to terminals A-6 and A-8, with A-8 being the positive (+) side. Customer connections being made at terminals B-6 and B-8, B-8 being the positive side. By this means, 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 design, there is a combination of both normally open and normally closed contacts on each unit. These may be varied to best suit the intended application. (Refer to contact tabulation section of this bulletin).

Figure Index

Table Index

Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc
20 Amperes Continuous

Exploded View of Typical Control Switch

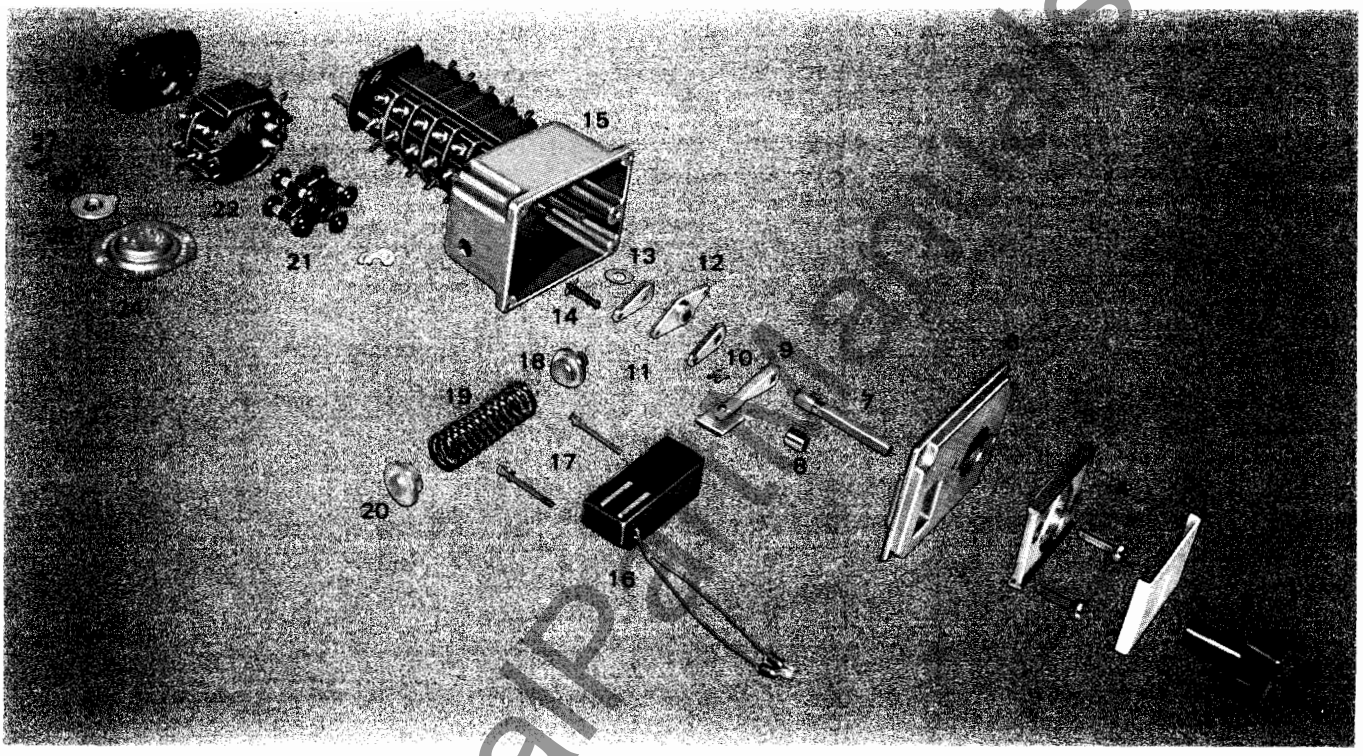

Figure 1

1. Handle Mounting Screw (1)
2. Handle
3. Escutcheon Plate
4. Switch Mounting Screws (2)
5. Dial Plate
6. Mechanism Cover Plate
7. Shaft (Handle trip design only)
8. Arm Spacer
9. Reset Arm Assembly
10. Keeper (2)
11. Tripping Arm (2)
12. Support with Bearing
13. Washer
14. Pin
15. Mechanism Housing
16. Coil-Magnet Assembly
17. Mounting Screws for Coil Assembly
18. Clevis
19. Spring-tripping
20. Anchor
21. Rotor
22. Stator Frame
23. Stage Spacer
24. End Cap
25. Stop
26. Washer
27. Cotter Pin

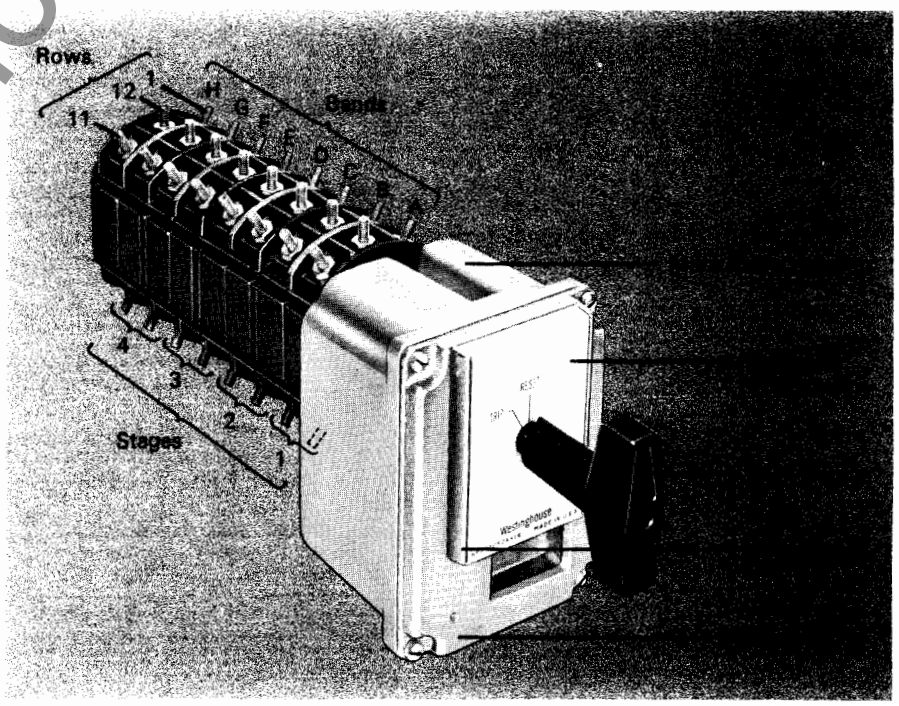

Figure 2

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Ratings

Average Coil Operating Current – Figure 3

Ac	120	240	480	Dc	24	48	125	250
Amperes	1.4	3.0	6.0	Amperes	3.6	7.0	1.2	2.4
Inductance	.030H	.030H	.030H		.0029H	.0029H	.030H	.030H

Operating Time

Operating time is the elapsed time from the initiation of voltage applied to the coil until the normally open contact of the switch "makes" or closes a circuit.

Average Operating Time in Cycles – Figure 4

Ac Volts	120	240	480	Dc Volts	24	48	125	250
Avg. Time	1.58	1.54	1.50	Avg. Time	1.6	.96	1.05	1.01
Ac Volts Rectified	120	240						
Avg. Time	1.08	1.05						

The following interrupting ratings apply only to those contacts closed in the reset position (B contacts) and which are opened by electric tripping of the Type WL-2 Switch mechanism.

Interrupting Ratings – Single Contact – Figure 5

Arcing ends one millisecond before contact makes

Voltage	Ac/Dc	Inductive Amperes Henries .0045	.012	.031	.063	.130	.243		Resistive Amperes
125	DC	4.65	3.67	2.85	2.1	1.53	0.9	.....	7.55
250	DC	1.6	1.6	1.0	1.0	0.98	0.78	....	1.6
500	DC	....	....	....	....	....	....	....	....
120	AC	....	....	....	....	....	....	7.53	7.95
240	AC	....	....	....	....	....	....	1.16	1.95
480	AC	....	....	....	....	....	....	.54	.9

Interrupting Rating – Two Contacts in Series – Figure 6

Arcing ends one millisecond before contact makes

Voltage	Ac/Dc	Inductive Amperes Henries .0045	.012	.031	.063	.130	.243		Resistive Amperes
125	DC	27.0	14.75	7.7	4.85	2.92	1.9	....	7.8
250	DC	6.4	5.0	3.85	3.1	2.4	1.6	....	6.7
500	DC	1.5	1.7	1.5	1.35	1.15	0.98	....	1.7
120	AC	....	....	....	....	....	....	68.0	....
240	AC	....	....	....	....	....	....	9.1	9.0
480	AC	....	....	....	....	....	....	1.5	1.55

The values in the above tables are a maximum at which the arc, during interruption, will not carry to the adjacent "make" contact. Where a circuit to be interrupted has a rating exceeding those listed in above table, the adjacent "make" contact should not be used. Refer to Table 1, Page 9, column "Number of Paired Contacts" for details.

Trip Coil Minimum Pick-up Voltage – Figure 7

Nominal Voltage Direct Current	Pick-up Volts	Nominal Voltage Alternating Current	Pick-up Volts
24	19	120	90
48	19	240	90
125	90	480	90
250	90		

Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc
20 Amperes Continuous

WL-2 Magnetic Switch Mean Operating Time

Figure 8

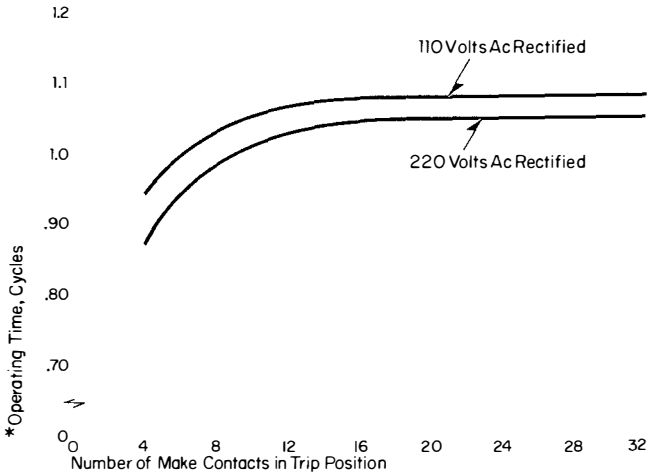
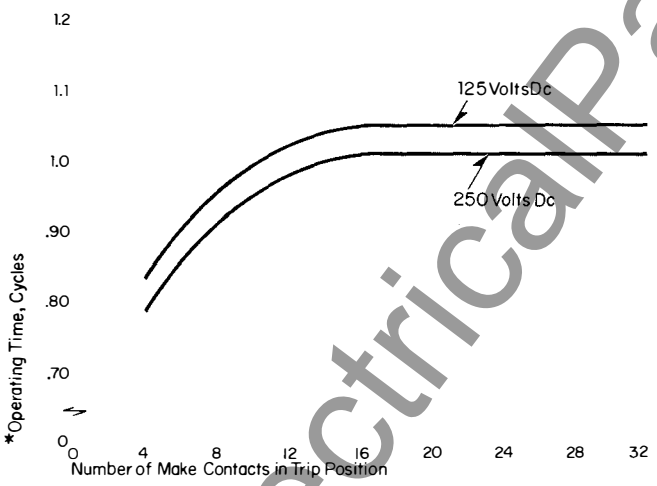


Figure 9



*Operating Time is The Elapsed Time From The Initiation of The Pulsed Voltage to The Switch Coil till The Normally Open Contacts of The Switch Make

Figure 10

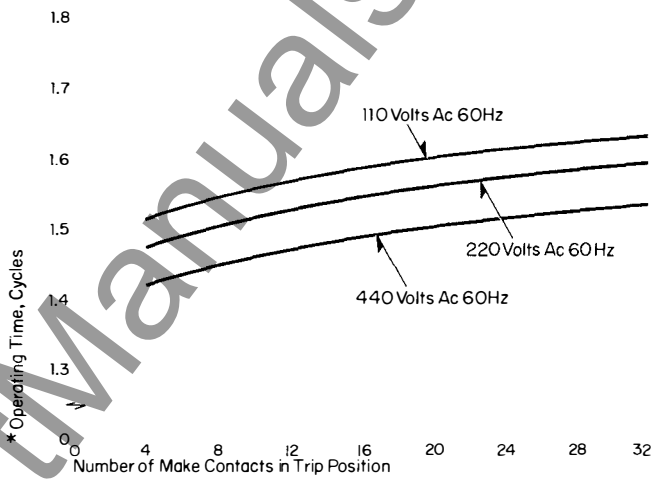
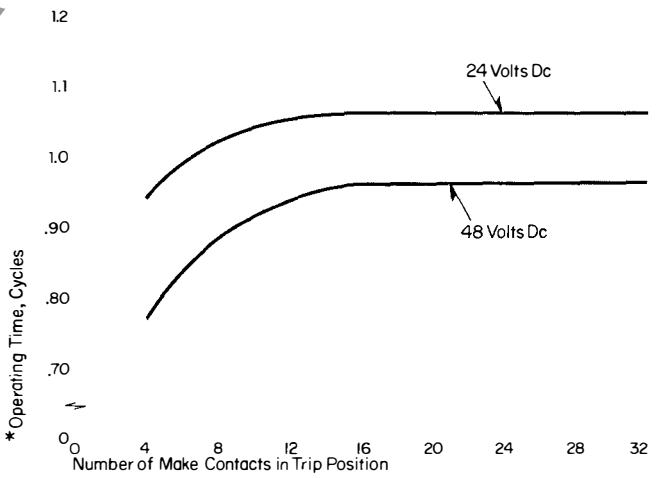


Figure 11



*Operating Time is The Elapsed Time From The Initiation of The Pulsed Voltage to The Switch Coil till The Normally Open Contacts of The Switch Make

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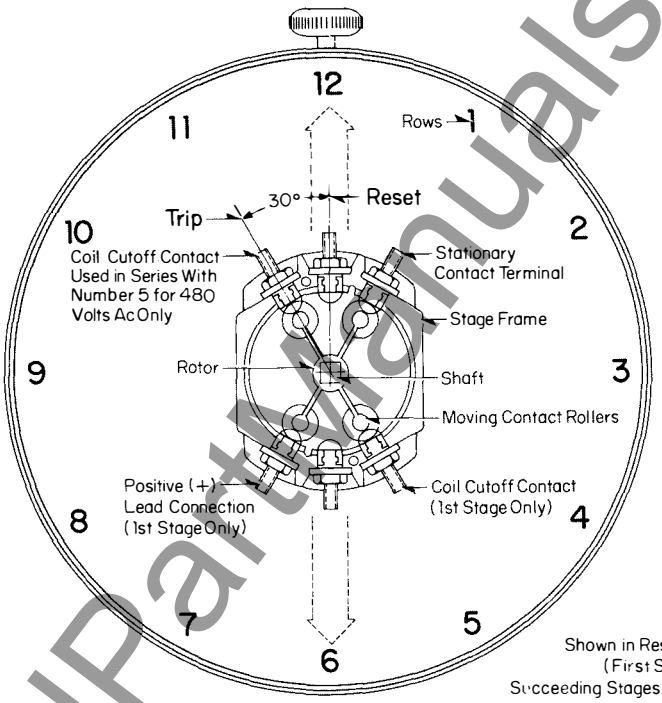
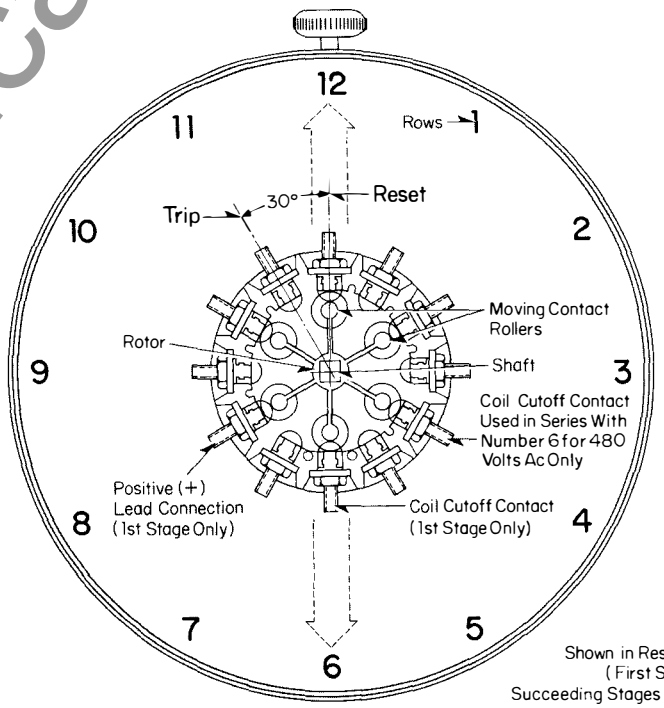
Contact Interpretation
The contacts of the Type WL-2 Switch are identified by the combination of Bands and Rows.

Rows: Viewing the switch from the handle end (front), it is noted the terminals are arranged in rows from front to back. The rows are set 30 degrees apart as is the face of a clock. On the six contact frame, the top three rows are identified as 11, 12 and 1 o'clock. The three rows at the bottom of the stage are 5, 6 and 7 o'clock. On the twelve contact frame, the rows are set as per each number on the face of a clock.



Shown in Reset Position
(First Stage Only-
Succeeding Stages may Differ)

Figure 12



Shown in Reset Position
(First Stage Only-
Succeeding Stages may Differ)

Figure 13

Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc
20 Amperes Continuous

Type WL-2 Switch Materials

Handle	Moldarta, General Purpose
Nameplate	Cycolac
Dial Plate	Aluminum Die Cast
Housing	Aluminum Die Cast
Stage Frame	Glass Polyester
Rotor	Glass Polyester
Stationary Contact	Silicon Bronze, Silver Plated
Roller Contact	Silicon Bronze, Silver Plated
Springs	Stainless Steel
Locking Spacer (Window)	Lexan, Polycarbonate

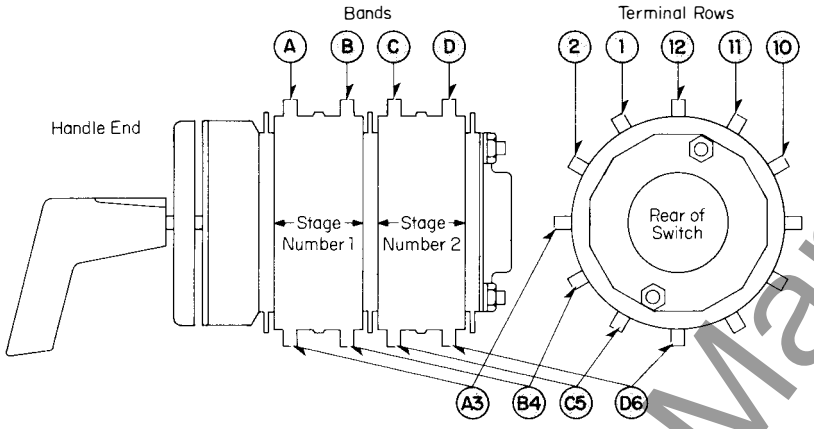


Figure 14. Methods of Identifying Contact Terminal Letter of Bands, Numbered Rows

Bands: As the switch is viewed from the side, bands of terminals are readily seen around the outer perimeter of the stage frame. Such bands are lettered. The band nearest the handle end is band "A", the second band is band "B", etc. Bands "A" and "B" constitute stage one, bands "C" and "D" constitute stage two, etc.

The row numbers and band letters are then combined to form full terminal identification as shown on figure 14 above and in the contact tabulations shown in this bulletin.

Contacts
The stationary contact (terminal) is a solid one piece forging. The moving (roller) contact is a solid bar.

To complete a circuit the roller contact internally bridges the stationary terminals in adjacent bands in the same row, for example, bands A & B in row twelve (A12-B-12) etc. (Also, see pages 10 through 15)

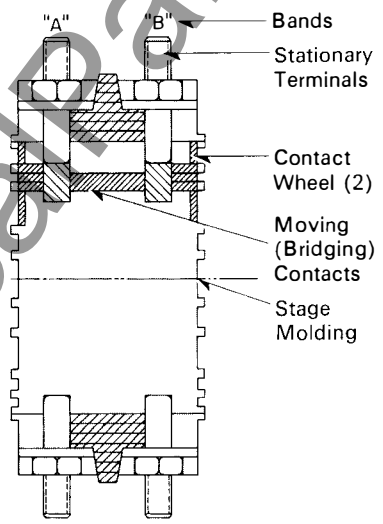


Figure 15

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Tests

Seismic

The type WL-2 switch was subjected to simulated seismic beat vibrations individually in each of three directions. Interpolation of the readings of the accelerometers located at various points on the equipment indicated that the type WL-2 switch was subjected to the following seismic forces:

front to back	– 7.6g at 7 Hz
side to side	– 1.0g at 4 Hz
vertical	– 0.93g at 1.75 Hz

Contacts on the WL-2 switch were electrically monitored during the tests and no evidence of circuit disturbance was detected. The magnetic mechanism remained latched during the tests.

It is concluded, as a result of these tests, that the type WL-2 switch is satisfactory for seismic applications up to the values indicated above. However, these values are only the maximum seismic forces at which the WL-2 switch was tested. They do not represent a maximum level for the design of the switch.

Surge

When in the "trip" position the contacts in series with the trip coil are open, therefore, a voltage surge in this situation will have no affect on the switch.

When in the "reset" position where-in the coil cutoff contact is closed the coil will withstand an over voltage of 100 percent for ratings up to 440 volts Ac (RMS) since the coil is energized for less than one cycle.

At 440 volts Ac, RMS, the coil will withstand an over voltage of 50 percent.

Magnetic Field

The type WL-2 switch has been tested in a magnetic field produced by a single bus bar and in the inside of a bus loop:

1. Being bolted directly to a single bus bar carrying 15,000 amperes RMS.
2. Being bolted directly to the bus bar, inside the loop, carrying 8000 amperes RMS.

During these tests it was shown that the switch was unaffected by high magnetic fields even under these most arduous conditions. After a period of 30 seconds within the stated magnetic fields, the switch was satisfactorily operated through the trip coil pulsing cycle.

High Potential Test

The coil of the Type WL-2 switch need not be disconnected for test purposes. However, it is recommended that the switch be set in the "trip" position so that the coil cutoff contacts in series with the coil are open. If the switch were left in the "reset" position, a high potential of 1800 volts (assuming one side of the coil pulse voltage is grounded) would cause the switch to operate to the "trip" position. Should this occur several times within a short period the resultant heat build-up inside the coil would cause coil burn-out.

Radiation Effect

The ceramic and metallic magnet materials are known to resist radiation damage to high levels. The magnetic materials employed in the type WL-2 switch will exhibit no change in magnetic properties at radiation levels of 10^{17} epicadmium neutrons per cm^2. Above this level a gradual reduction of magnetic properties occurs and is approximately 40 percent at 10^{20} epicadmium neutrons per cm^2.

Rectifier

An optional feature of the type 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 Fig. 4 page 4).

When used, 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 volts Ac control are not available.

Where required for 480 volts Ac the rectifier must be supplied and mounted by the customer.

Symbols

② In circuits where interrupted current is within the ratings shown in Figure 5, Page 4, the number of trip and reset contacts shown in these columns are available and may be applied without exception.

③ Where the interrupted current of the reset (b) contact exceeds the ratings listed in Figure 5, Page 4, the adjacent "make" contact should not be used. This column sets out the number of these paired contacts per switch unit.

A pair of contacts are those having adjacent stationary terminals served by the same moving contact, i.e., one A (normally open) and one B (normally closed) contact with a common moving roller contact.

④ Refer to wiring diagrams on Page 9 this bulletin.

⑤ Denotes coil cutoff contact – to be used for no other purpose.

⑥ Indicates paired contacts. To be used per instructions in Figures 5 & 6, Page 4 this bulletin.

Int. = Intermediate position:

(1) That area between handle positions "reset" – "trip" (or vice versa) wherein all contacts are open re: break before make.

(2) In the case of overlapping contacts, that area between handle positions wherein the "make before break" contacts close adjacent terminals in the same bands. (Make before break contacts not illustrated in this bulletin).

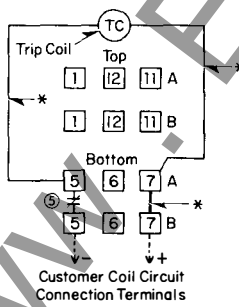
Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc
20 Amperes Continuous

Switch Style Numbers

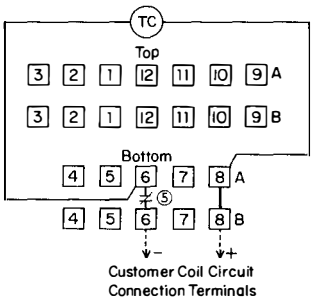
Fig.	No. of Stages	② Contacts Available Trip	Reset	③ No. of Paired Contacts	Switch Styles Handle Trip 24-48V Dc	120-240V 600 Y With Rectifier	120-240V 600 Y 125-250V Dc	480V 600Y	Non-Handle Trip 24-48V Dc	120-240V 600Y With Rectifier	120-240V 600Y 125-250V Dc	480V 600Y
Six (6) Contact Frame WL-2 Switches												
1	1	2	2	1	796A201G01	796A201G03	796A201G05	796A201G07	796A201G02	796A201G04	796A201G06	796A201G08
2	2	4	6	3	796A205G01	796A205G03	796A205G05	796A205G07	796A205G02	796A205G04	796A205G06	796A205G08
3	2	6	4	3	796A204G01	796A204G03	796A204G05	796A204G07	796A264G02	796A204G04	796A204G06	796A204G08
4	3	6	10	5	796A210G01	796A210G03	796A210G05	796A210G07	796A210G02	796A210G04	796A210G06	796A210G08
5	3	8	8	5	796A208G01	796A208G03	796A208G05	796A208G07	796A208G02	796A208G04	796A208G06	796A208G08
6	3	10	6	5	796A209G01	796A209G03	796A209G05	796A209G07	796A209G02	796A209G04	796A209G06	796A209G08
7	4	8	14	7	796A212G01	796A212G03	796A212G05	796A212G07	796A212G02	796A212G04	796A212G06	796A212G08
8	4	10	12	7	796A202G01	796A202G03	796A202G05	796A202G07	796A202G02	796A202G04	796A202G06	796A202G08
9	4	12	10	7	796A213G01	796A213G03	796A213G05	796A213G07	796A213G02	796A213G04	796A213G06	796A213G08
10	4	14	8	7	796A211G01	796A211G03	796A211G05	796A211G07	796A211G02	796A211G04	796A211G06	796A211G08
11	5	10	18	9	796A215G01	796A215G03	796A215G05	796A215G07	796A215G02	796A215G04	796A215G06	796A215G08
12	5	12	16	9	796A225G01	796A225G03	796A225G05	796A225G07	796A225G02	796A225G04	796A225G06	796A225G08
13	5	14	14	9	796A200G01	796A200G03	796A200G05	796A200G07	796A200G02	796A200G04	796A200G06	796A200G08
14	5	16	12	9	796A224G01	796A224G03	796A224G05	796A224G07	796A224G02	796A224G04	796A224G06	796A224G08
15	5	18	10	9	796A214G01	796A214G03	796A214G05	796A214G07	796A214G02	796A214G04	796A214G06	796A214G08
16	6	12	22	11	796A217G01	796A217G03	796A217G05	796A217G07	796A217G02	796A217G04	796A217G06	796A217G08
17	6	14	20	11	796A228G01	796A228G03	796A228G05	796A228G07	796A228G02	796A228G04	796A228G06	796A228G08
18	6	16	18	11	796A227G01	796A227G03	796A227G05	796A227G07	796A227G02	796A227G04	796A227G06	796A227G08
19	6	18	16	11	796A218G01	796A218G03	796A218G05	796A218G07	796A218G02	796A218G04	796A218G06	796A218G08
20	6	20	14	11	796A226G01	796A226G03	796A226G05	796A226G07	796A226G02	796A226G04	796A226G06	796A226G08
21	6	22	12	11	796A216G01	796A216G03	796A216G05	796A216G07	796A216G02	796A216G04	796A216G06	796A216G08
22	7	14	26	13	796A220G01	796A220G03	796A220G05	796A220G07	796A220G02	796A220G04	796A220G06	796A220G08
23	7	16	24	13	796A243G01	796A243G03	796A243G05	796A243G07	796A243G02	796A243G04	796A243G06	796A243G08
24	7	18	22	13	796A242G01	796A242G03	796A242G05	796A242G07	796A242G02	796A242G04	796A242G06	796A242G08
25	7	20	20	13	796A241G01	796A241G03	796A241G05	796A241G07	796A241G02	796A241G04	796A241G06	796A241G08
26	7	22	18	13	796A230G01	796A230G03	796A230G05	796A230G07	796A230G02	796A230G04	796A230G06	796A230G08
27	7	24	16	13	796A229G01	796A229G03	796A229G05	796A229G07	796A229G02	796A229G04	796A229G06	796A229G08
26	7	26	14	13	796A219G01	796A219G03	796A219G05	796A219G07	796A219G02	796A219G04	796A219G06	796A219G08
29	8	16	30	15	796A222G01	796A222G03	796A222G05	796A222G07	796A222G02	796A222G04	796A222G06	796A222G08
30	8	18	28	15	796A248G01	796A248G03	796A248G05	796A248G07	796A248G02	796A248G04	796A248G06	796A248G08
31	8	20	26	15	796A247G01	796A247G03	796A247G05	796A247G07	796A247G02	796A247G04	796A247G06	796A247G08
32	8	22	24	15	796A246G01	796A246G03	796A246G05	796A246G07	796A246G02	796A246G04	796A246G06	796A246G08
33	8	24	22	15	796A223G01	796A223G03	796A223G05	796A223G07	796A223G02	796A223G04	796A223G06	796A223G08
34	8	26	20	15	796A245G01	796A245G03	796A245G05	796A245G07	796A245G02	796A245G04	796A245G06	796A245G08
35	8	28	18	15	796A244G01	796A244G03	796A244G05	796A244G07	796A244G02	796A244G04	796A244G06	796A224G08
36	8	30	16	15	796A221G01	796A221G03	796A221G05	796A221G07	796A221G02	796A221G04	796A221G06	796A221G08
④Wiring Diagram – Figure					16	16	16	18	16	16	16	18
Twelve (12) Contact Frame WL-2 Switches												
37	1	5	4	4	796A231G01	796A231G03	796A231G05	796A231G07	796A231G02	796A231G04	796A231G06	796A231G08
33	2	11	10	10	796A232G01	796A232G03	796A232G05	796A232G07	796A232G02	796A232G04	796A232G06	796A232G08
39	3	17	16	16	796A233G01	796A233G03	796A233G05	796A233G07	796A233G02	796A233G04	796A233G06	796A233G08
40	4	23	22	22	796A234G01	796A234G03	796A234G05	796A234G07	796A234G02	796A234G04	796A234G06	796A234G08
41	5	29	28	28	796A235G01	796A235G03	796A235G05	796A235G07	796A235G02	796A235G04	796A235G06	796A235G08
42	6	35	34	34	796A236G01	796A236G03	796A236G05	796A236G07	796A236G02	796A236G04	796A236G06	796A235G08
④Wiring Diagram – Figure					17	17	17	19	17	17	17	19

Wiring Diagrams – 24 Thru 250 Volts



Six Contact Frame

Figure 16

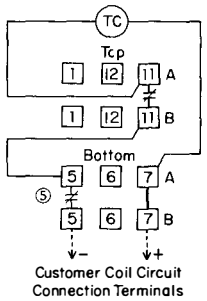


Twelve Contact Frame

*Factory Installed Connectors (Figures 16, 17, 18 and 19)

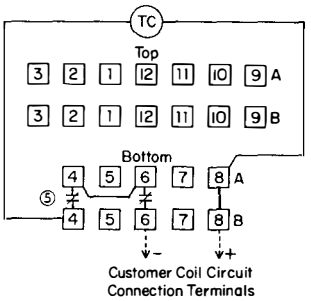
Figure 17

480 Volts – Two Coil Cutoff Contacts Wired in Circuit



Six Contact Frame

Figure 18



Twelve Contact Frame

Figure 19

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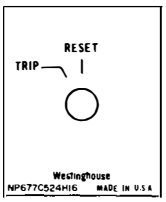

Nameplate

This nameplate marking is common to all Type WL-2 Switches listed in this descriptive bulletin.

Special nameplate markings are available upon request and may be obtained by specifying such special markings in order item reading.

Position Tabulations

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11			X	
C12-D12	X			⊠
C1-D1			X	
C5-D5			X	
C6-D6	X			⊠
C7-D7			X	⊠

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			⊠

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11			X	
C12-D12	X			⊠
C1-D1			X	
C5-D5			X	
C6-D6	X			⊠
C7-D7			X	⊠
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	⊠

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11			X	
C12-D12	X			⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			⊠
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	⊠

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			⊠
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	
E5-F5	X			⊠
E6-F6			X	
E7-F7	X			⊠

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			⊠
C11-C11			X	
C12-D12	X			⊠
C1-D1			X	
C5-D5			X	
C6-D6	X			⊠
C7-D7			X	⊠
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	⊠

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			⊠
C11-F11	X			⊠
C12-F12	X			⊠
E1-F1			X	
E5-F5	X			⊠
E6-F6			X	
E7-F7	X			⊠
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	⊠

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			⊠
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	⊠
G11-H11	X			⊠
G12-H12			X	
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	
G7-H7	X			⊠

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			⊠
E11-F11	X			⊠
E12-F12			X	
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	
E7-F7	X			⊠
G11-H11	X			⊠
G12-H12			X	
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	
G7-H7	X			⊠

⊘ Contact A5-B5 is used as Trip Coil Cutoff Contact. See page 8, symbol ⑤.

⊠ Use One or Other of Paired Contacts in Application. See page 8, symbol ⑥. For Exception, See D.B.

Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc,
20 Amperes Continuous

CONTACT	POSITION			
	T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11			X	
C12-D12	X			⊠
C1-D1			X	⊠
C5-D5			X	
C6-D6	X			⊠
C7-D7			X	⊠
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	⊠
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	⊠
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	⊠
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	⊠
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	⊠
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	⊠

CONTACT	POSITION			
	T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	⊠
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	⊠
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	⊠
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	⊠
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	⊠
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	⊠

CONTACT	POSITION			
	T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	⊠
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	⊠
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	⊠
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	⊠

CONTACT	POSITION			
	T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	⊠
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	⊠

CONTACT	POSITION			
	T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			

CONTACT	POSITION			
	T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11			X	
C12-D12	X			⊠
C1-D1			X	⊠
C5-D5			X	
C6-D6	X			⊠
C7-D7			X	⊠
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	⊠
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	⊠
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	⊠
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	⊠
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	⊠
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	⊠
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	⊠
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	⊠

CONTACT	POSITION			
	T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	⊠
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	⊠
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	⊠
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	⊠
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	⊠
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	⊠
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	⊠
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	⊠

CONTACT	POSITION			
	T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	⊠
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	⊠
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	⊠
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	⊠
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	⊠
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	⊠

CONTACT	POSITION			
	T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	⊠
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	⊠
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	⊠
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	⊠

CONTACT	POSITION			
	T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	⊠
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	⊠

⊘ Contact A5-B5 is used as Trip Coil Cutoff Contact. See page 8, symbol ⑤.

⊠ Use One or Other of Paired Contacts in Application. See page 8, symbol ⑥. For Exception, See D.B.

Westinghouse

Position Tabulations *Continued*

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			
K11-L11	X			⊠
K12-L12			X	⊠
K1-L1	X			
K5-L5	X			⊠
K6-L6			X	⊠
K7-L7	X			

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11			X	⊠
C12-D12	X			⊠
C1-D1			X	
C5-D5			X	⊠
C6-D6	X			⊠
C7-D7			X	
E11-F11			X	⊠
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	⊠
E6-F6	X			⊠
E7-F7			X	
G11-H11			X	⊠
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	⊠
G6-H6	X			⊠
G7-H7			X	
I11-J11			X	⊠
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	⊠
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	⊠
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	⊠
K6-L6	X			⊠
K7-L7			X	
M11-N11			X	⊠
M12-N12	X			⊠
M1-N1			X	
M5-N5			X	⊠
M6-N6	X			⊠
M7-N7			X	

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11			X	⊠
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	⊠
E6-F6	X			⊠
E7-F7			X	
G11-H11			X	⊠
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	⊠
G6-H6	X			⊠
G7-H7			X	
I11-J11			X	⊠
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	⊠
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	⊠
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	⊠
K6-L6	X			⊠
K7-L7			X	
M11-N11			X	⊠
M12-N12	X			⊠
M1-N1			X	
M5-N5			X	⊠
M6-N6	X			⊠
M7-N7			X	

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11			X	⊠
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	⊠
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	⊠
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	⊠
K6-L6	X			⊠
K7-L7			X	
M11-N11			X	⊠
M12-N12	X			⊠
M1-N1			X	
M5-N5			X	⊠
M6-N6	X			⊠
M7-N7			X	

⊘ Contact A5-B5 is used as Trip Coil Cutoff Contact. See page 8, symbol ⑤.
⊠ Use One or Other of Paired Contacts in Application. See page 8, symbol ⑥. For Exception, See D.B.

Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc,
20 Amperes Continuous

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			
K11-L11			X	⊠
K12-L12	X			⊠
K1-L1			X	⊠
K5-L5			X	⊠
K6-L6	X			⊠
K7-L7			X	⊠
M11-N11			X	⊠
M12-N12	X			⊠
M1-N1			X	⊠
M5-N5			X	⊠
M6-N6	X			⊠
M7-N7			X	⊠

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			
K11-L11	X			⊠
K12-L12			X	⊠
K1-L1	X			
K5-L5	X			⊠
K6-L6			X	⊠
K7-L7	X			
M11-N11			X	⊠
M12-N12	X			⊠
M1-N1			X	⊠
M5-N5			X	⊠
M6-N6	X			⊠
M7-N7			X	⊠

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			
K11-L11	X			⊠
K12-L12			X	⊠
K1-L1	X			
K5-L5	X			⊠
K6-L6			X	⊠
K7-L7	X			
M11-N11	X			⊠
M12-N12			X	⊠
M1-N1	X			
M5-N5	X			⊠
M6-N6			X	⊠
M7-N7	X			

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11			X	⊠
C12-D12	X			⊠
C1-D1			X	⊠
C5-D5			X	⊠
C6-D6	X			⊠
C7-D7			X	⊠
E11-F11			X	⊠
E12-F12	X			⊠
E1-F1			X	⊠
E5-F5			X	⊠
E6-F6	X			⊠
E7-F7			X	⊠
G11-H11			X	⊠
G12-H12	X			⊠
G1-H1			X	⊠
G5-H5			X	⊠
G6-H6	X			⊠
G7-H7			X	⊠
I11-J11			X	⊠
I12-J12	X			⊠
I1-J1			X	⊠
I5-J5			X	⊠
I6-J6	X			⊠
I7-J7			X	⊠
K11-L11			X	⊠
K12-L12	X			⊠
K1-L1			X	⊠
K5-L5			X	⊠
K6-L6	X			⊠
K7-L7			X	⊠
M11-N11			X	⊠
M12-N12	X			⊠
M1-N1			X	⊠
M5-N5			X	⊠
M6-N6	X			⊠
M7-N7			X	⊠
011-P11			X	
012-P12	X			⊠
01-P1			X	⊠
05-P5			X	
06-P6	X			⊠
07-P7			X	⊠

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	⊠
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	⊠
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	⊠
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	⊠
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	⊠
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	⊠
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	⊠
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	⊠
M11-N11			X	
M12-N12	X			⊠
M1-N1			X	⊠
M5-N5			X	
M6-N6	X			⊠
M7-N7			X	⊠
011-P11			X	
012-P12	X			⊠
01-P1			X	⊠
05-P5			X	
06-P6	X			⊠
07-P7			X	⊠

⊘ Contact A5-B5 is used as Trip Coil Cutoff Contact. See page B, symbol ⑤.
⊠ Use One or Other of Paired Contacts in Application. See page B, symbol ⑥. For Exception, See D.B.

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Position Tabulations *Continued*

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11			X	⊠
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	⊠
G6-H6	X			⊠
G7-H7			X	
I11-J11			X	⊠
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	⊠
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	⊠
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	⊠
K6-L6	X			⊠
K7-L7			X	
M11-N11			X	⊠
M12-N12	X			⊠
M1-N1			X	
M5-N5			X	⊠
M6-N6	X			⊠
M7-N7			X	
011-P11			X	⊠
012-P12	X			⊠
01-P1			X	
05-P5			X	⊠
06-P6	X			⊠
07-P7			X	

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	⊠
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	⊠
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	⊠
K6-L6	X			⊠
K7-L7			X	
M11-N11			X	⊠
M12-N12	X			⊠
M1-N1			X	
M5-N5			X	⊠
M6-N6	X			⊠
M7-N7			X	
011-P11			X	⊠
012-P12	X			⊠
01-P1			X	
05-P5			X	⊠
06-P6	X			⊠
07-P7			X	

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			
K11-L11	X			⊠
K12-L12			X	⊠
K1-L1	X			
K5-L5	X			⊠
K6-L6			X	⊠
K7-L7	X			
M11-N11			X	⊠
M12-N12	X			⊠
M1-N1			X	
M5-N5			X	⊠
M6-N6	X			⊠
M7-N7			X	
011-P11			X	⊠
012-P12	X			⊠
01-P1			X	
05-P5			X	⊠
06-P6	X			⊠
07-P7			X	

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			
K11-L11	X			⊠
K12-L12			X	⊠
K1-L1	X			
K5-L5	X			⊠
K6-L6			X	⊠
K7-L7	X			
M11-N11			X	⊠
M12-N12	X			⊠
M1-N1			X	
M5-N5			X	⊠
M6-N6	X			⊠
M7-N7			X	
011-P11			X	⊠
012-P12	X			⊠
01-P1			X	
05-P5			X	⊠
06-P6	X			⊠
07-P7			X	

⊘ Contact A5-B5 is used as Trip Coil Cutoff Contact. See page 8, symbol ⑤.
⊠ Use One or Other of Paired Contacts in Application, See page 8, symbol ⑥. For Exception, See D.B.

Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc,
20 Amperes Continuous

CONTACT	POSITION		
	T	INT	R
A11-B11			X
A12-B12	X		
A1-B1			X
A5-B5			X
A6-B6	X		
C11-D11	X		
C12-D12			X
C1-D1	X		
C5-D5	X		
C6-D6			X
C7-D7	X		
E11-F11	X		
E12-F12			X
E1-F1	X		
E5-F5	X		
E6-F6			X
E7-F7	X		
G11-H11	X		
G12-H12			X
G1-H1	X		
G5-H5	X		
G6-H6			X
G7-H7	X		
I11-J11	X		
I12-J12			X
I1-J1	X		
I5-J5	X		
I6-J6			X
I7-J7	X		
K11-L11	X		
K12-L12			X
K1-L1	X		
K5-L5	X		
K6-L6			X
K7-L7	X		
M11-N11	X		
M12-N12			X
M1-N1	X		
M5-N5	X		
M6-N6			X
M7-N7	X		
O11-P11	X		
O12-P12			X
O1-P1	X		
O5-P5	X		
O6-P6			X
O7-P7	X		

CONTACT	POSITION		
	T	INT	R
A11-B11	X		
A12-B12			X
A1-B1	X		
A2-B2			X
A3-B3	X		
A4-B4			X
A6-B6			X
A7-B7	X		
A9-B9	X		
A10-B10			X

CONTACT	POSITION		
	T	INT	R
A11-B11	X		
A12-B12			X
A1-B1	X		
A2-B2			X
A3-B3	X		
A4-B4			X
A6-B6			X
A7-B7	X		
A9-B9	X		
A10-B10			X
C11-D11	X		
C12-D12			X
C1-D1	X		
C2-D2			X
C3-D3	X		
C4-D4			X
C5-D5	X		
C6-D6			X
C7-D7	X		
C8-D8			X
C9-D9	X		
C10-D10			X

* 2nd Stage Shown

CONTACT	POSITION		
	T	INT	R
A11-B11	X		
A12-B12			X
A1-B1	X		
A2-B2			X
A3-B3	X		
A4-B4			X
A6-B6			X
A7-B7	X		
A9-B9	X		
A10-B10			X
C11-D11	X		
C12-D12			X
C1-D1	X		
C2-D2			X
C3-D3	X		
C4-D4			X
C5-D5	X		
C6-D6			X
C7-D7	X		
C8-D8			X
C9-D9	X		
C10-D10			X

* 2nd Stage Shown
3rd Stage (E-F) is Same

CONTACT	POSITION		
	T	INT	R
A11-B11	X		
A12-B12			X
A1-B1	X		
A2-B2			X
A3-B3	X		
A4-B4			X
A6-B6			X
A7-B7	X		
A9-B9	X		
A10-B10			X
C11-D11	X		
C12-D12			X
C1-D1	X		
C2-D2			X
C3-D3	X		
C4-D4			X
C5-D5	X		
C6-D6			X
C7-D7	X		
C8-D8			X
C9-D9	X		
C10-D10			X

* 2nd Stage Shown
3rd, 4th Stages (E-F, G-H)
are Same

CONTACT	POSITION		
	T	INT	R
A11-B11	X		
A12-B12			X
A1-B1	X		
A2-B2			X
A3-B3	X		
A4-B4			X
A6-B6			X
A7-B7	X		
A9-B9	X		
A10-B10			X
C11-D11	X		
C12-D12			X
C1-D1	X		
C2-D2			X
C3-D3	X		
C4-D4			X
C5-D5	X		
C6-D6			X
C7-D7	X		
C8-D8			X
C9-D9	X		
C10-D10			X

* 2nd Stage Shown
3rd, 4th and 5th Stages
(E-F, G-H, I-J) are Same

CONTACT	POSITION		
	T	INT	R
A11-B11	X		
A12-B12			X
A1-B1	X		
A2-B2			X
A3-B3	X		
A4-B4			X
A6-B6			X
A7-B7	X		
A9-B9	X		
A10-B10			X
C11-D11	X		
C12-D12			X
C1-D1	X		
C2-D2			X
C3-D3	X		
C4-D4			X
C5-D5	X		
C6-D6			X
C7-D7	X		
C8-D8			X
C9-D9	X		
C10-D10			X

* 3rd, 4th, 5th and 6th Stages
(E-F, G-H, I-J, K-L) are Same

Ø Contact A5-B5 is used as Trip Coil Cutoff Contact. See page 8, symbol ⑤.
⊠ Use One or Other of Paired Contacts in Application. See page 8, symbol ⑥. For Exception, See D.B.

Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc,
20 Amperes Continuous

Dimensions in Inches

Drilling Plan

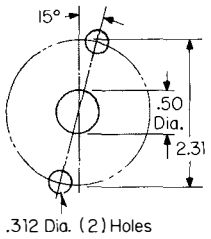
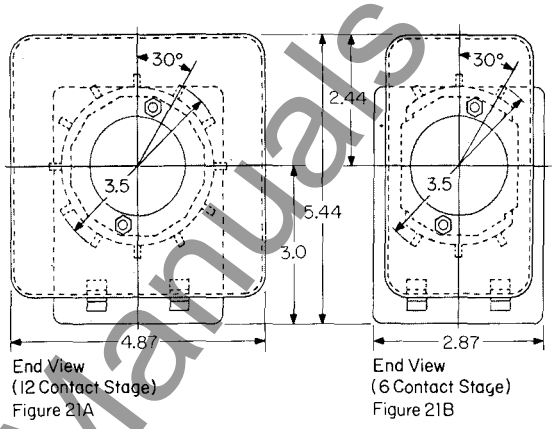


Figure 20

Type WL-2 Switch with Protective Cover



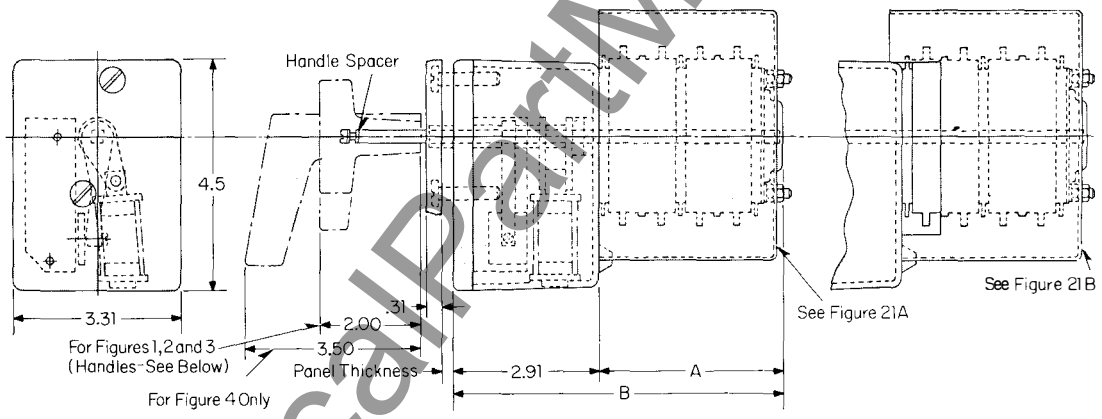


Figure 21

Type WL-2 Without Protective Cover

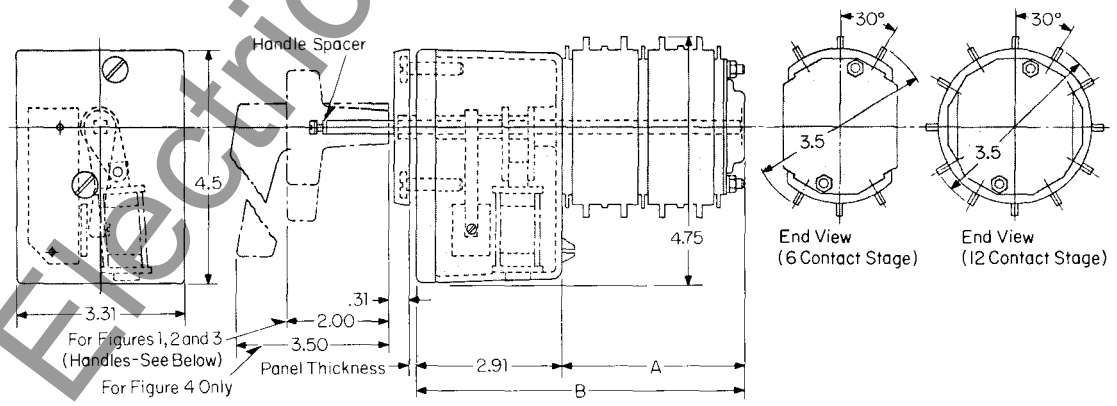


Figure 22

Handles

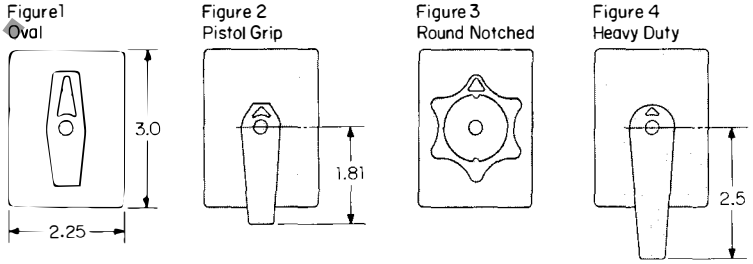


Figure 23

Westinghouse Electric Corporation
Switchgear Division, East Pittsburgh, Pa. 15112
Printed in USA

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Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc
20 Amperes Continuous

Application

The Type WL-2 Switch is designed for panel mounting and is applied where a number of circuits must be transferred simultaneously. For example, they can be used to provide simultaneous tripping of several breakers as may be required in differential protection or trip the main breaker of a system in conjunction with other associated auxiliary breakers.

The Type WL-2 Switches listed in this catalog are for ⅛ to ¼ inch panel mounting. Switches are available on special order, for mounting on panels up to 2 inches thick.

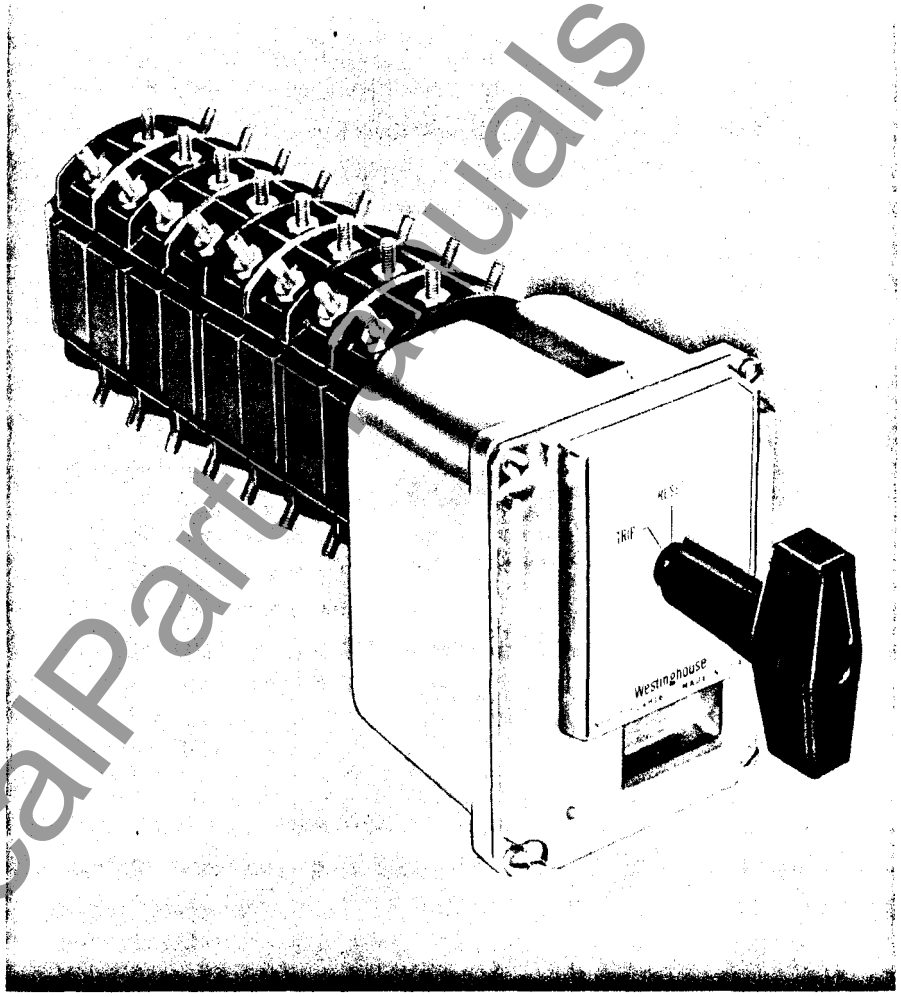
Magnetic Assemblies are available for voltages of 24-48V Dc, 125/250V Dc, 120/240V Ac rectified and 120/240 or 480 Ac 60 Hz.

The contacts of the Type WL-2 Switch are rated 600 volts, 20 amperes continuous. For interrupting ratings, see Figures 9 and 10, page 4.

The Type WL-2 Switch may be applied to static and non-static control systems without the use of separate arc quenching devices, such as diodes or resistors.

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 thirty-eight (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.

The design has been limited to ten (10) stages of the six contact frame and six (6) stages of the twelve contact frame.



Advantages

1. 25% less panel area.
2. Fewer moving and wearing parts.
3. Hermetically sealed, encapsulated coil.
4. Greater number of contacts on one shaft and per unit volume.
5. Simplified operating mechanism using permanent magnetic latch.
6. Light reset torque for manual reset operation.
7. One piece molded protective terminal cover easily added.
8. Reliable high speed operation.
9. Two coils (Dc & Ac/Dc) offer wide range of switch application and reduce inventory.
10. Long life expectancy – Tested to 10,000 operations.

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November, 1971
New Information
E. D. C/1976/PL

Westinghouse

Features
The Type WL-2 Switch is supplied with a white nameplate (escutcheon) as standard. Nameplates in black, red, green and yellow are available upon request.

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 hexigon nuts) for each terminal of the unit for use in making field wiring connections.

The Type WL-2 Switch can be supplied with target indicator but is considered unnecessary because the size of the standard handle will provide positive visual indication of the switch position.

The coil and permanent magnet are encapsulated in a special formulated, electrical grade, epoxy composition thus forming an hermetically sealed unit. The encapsulated unit is not affected by repeated thermal cycling between −40 degrees centrigade 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. Polarity marking may be disregarded for Ac voltage applications.

Important Note: A Type WL-2 Switch of the non-handle trip design, although equipped with a handle, cannot be tripped by handle operation. To trip, a voltage corresponding to the coil rating shown on the switch nameplate must be applied to the trip coil.

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 reset and electrical trip, or (2) handle reset and both handle trip 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 cancelling the lines of force of the magnet which release the rotor to turn the "trip" position under spring stored energy.

Warning: To prevent coil damage the handle should not be manually held in the reset position when the trip circuit remains energized. When the trip circuit is energized and the switch is hand operated to the reset position, the operator will feel vibration through the switch handle and a buzzing sound will be audible.

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.

A standard device consists of a magnet assembly, compression spring assembly, and switch unit of up to ten stages of the six contact frame and six 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 being made at terminals B-5 and B-7. B-7 being the positive side. (See Wiring Diagram). In the case of the twelve contact stage, the factory will connect the coil leads to terminals A-6 and A-8, with A-8 being the positive (+) side. Customer connections being made at terminals B-6 and B-8, B-8 being the positive side. By this means, 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 design, there is a combination of both normally open and normally closed contacts on each unit. These may be varied to best suit the intended application. (Refer to contact tabulation section of this bulletin).

Figure Index

Table Index

Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc
20 Amperes Continuous

Exploded View of Typical Control Switch

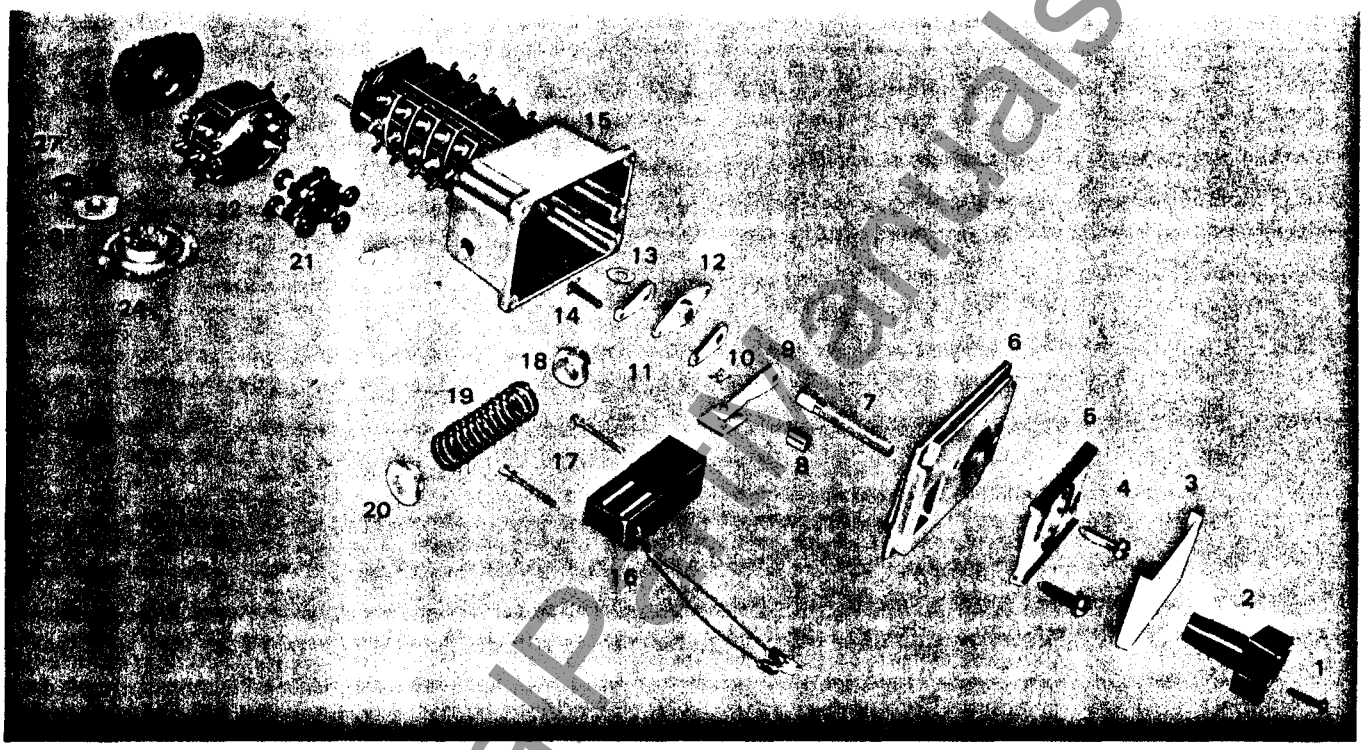

Figure 1

1. Handle Mounting Screw (1)
2. Handle
3. Escutcheon Plate
4. Switch Mounting Screws (2)
5. Dial Plate
6. Mechanism Cover Plate
7. Shaft (Handle trip design only)
8. Arm Spacer
9. Reset Arm Assembly
10. Keeper (2)
11. Tripping Arm (2)
12. Support with Bearing
13. Washer
14. Pin
15. Mechanism Housing
16. Coil-Magnet Assembly
17. Mounting Screws for Coil Assembly
18. Clevis
19. Spring-tripping
20. Anchor
21. Rotor
22. Stator Frame
23. Stage Spacer
24. End Cap
25. Stop
26. Washer
27. Cotter Pin

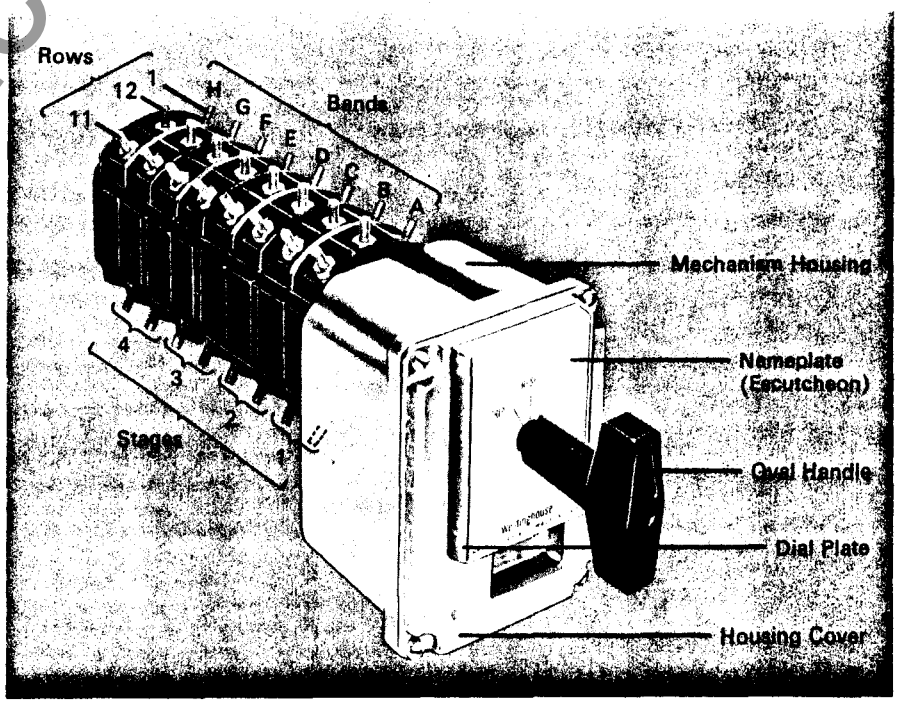

Figure 2

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Ratings

Average Coil Operating Current – Figure 3

Ac	120	240	480	Dc	24	48	125	250
Amperes	1.4	3.0	6.0	Amperes	3.6	7.0	1.2	2.4
Inductance	.030H	.030H	.030H		.0029H	.0029H	.030H	.030H

Operating Time

Operating time is the elapsed time from the initiation of voltage applied to the coil until the normally open contact of the switch "makes" or closes a circuit.

Average Operating Time in Cycles – Figure 4

Ac Volts	120	240	480	Dc Volts	24	48	125	250
Avg. Time	1.58	1.54	1.50	Avg. Time	1.6	.96	1.05	1.01
Ac Volts Rectified	120	240						
Avg. Time	1.08	1.05						

The following interrupting ratings apply only to those contacts closed in the reset position (B contacts) and which are opened by electric tripping of the Type WL-2 Switch mechanism.

Interrupting Ratings – Single Contact – Figure 5

Arcing ends one millisecond before contact makes

Voltage	Ac/Dc	Inductive Amperes Henries .0045	.012	.031	.063	.130	.243		Resistive Amperes
125	DC	4.65	3.67	2.85	2.1	1.53	0.9	.....	7.55
250	DC	1.6	1.6	1.0	1.0	0.98	0.78	....	1.6
500	DC	....	....	....	....	....	....	....	....
120	AC	....	....	....	....	....	....	7.53	7.95
240	AC	....	....	....	....	....	....	1.16	1.95
480	AC	....	....	....	....	....	....	.54	.9

Interrupting Rating – Two Contacts in Series – Figure 6

Arcing ends one millisecond before contact makes

Voltage	Ac/Dc	Inductive Amperes Henries .0045	.012	.031	.063	.130	.243		Resistive Amperes
125	DC	27.0	14.75	7.7	4.85	2.92	1.9	....	7.8
250	DC	6.4	6.0	3.85	3.1	2.4	1.6	....	6.7
500	DC	1.6	1.7	1.6	1.35	1.15	0.98	....	1.7
120	AC	....	....	....	....	....	....	68.0	....
240	AC	....	....	....	....	....	....	9.1	9.0
480	AC	....	....	....	....	....	....	1.5	1.56

The values in the above tables are a maximum at which the arc, during interruption, will not carry to the adjacent "make" contact. Where a circuit to be interrupted has a rating exceeding those listed in above table, the adjacent "make" contact should not be used. Refer to Table 1, Page 9, column "Number of Paired Contacts" for details.

Trip Coil Minimum Pick-up Voltage – Figure 7

Nominal Voltage Direct Current	Pick-up Volts	Nominal Voltage Alternating Current	Pick-up Volts
24	19	120	90
48	19	240	90
125	90	480	90
250	90		

Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc
20 Amperes Continuous

WL-2 Magnetic Switch Mean Operating Time

Figure 8

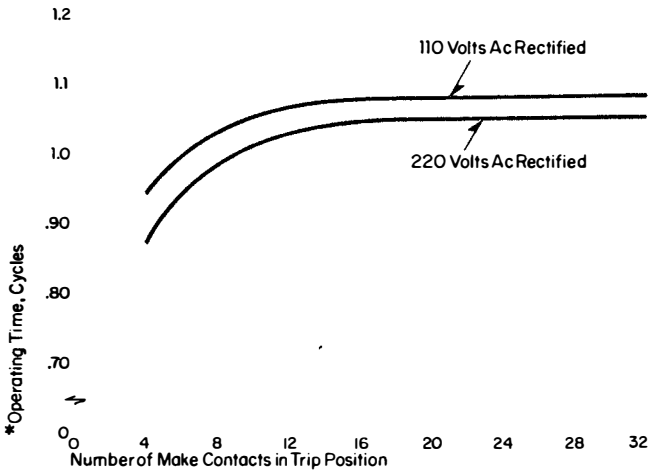
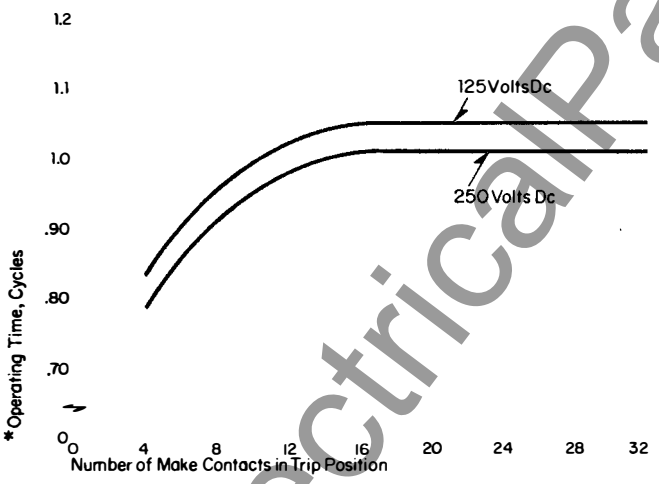


Figure 9



*Operating Time is The Elapsed Time From The Initiation of The Pulsed Voltage to The Switch Coil till The Normally Open Contacts of The Switch Make

Figure 10

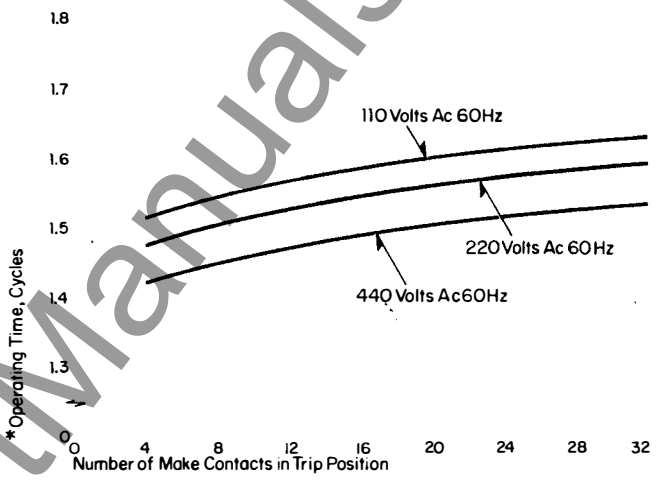
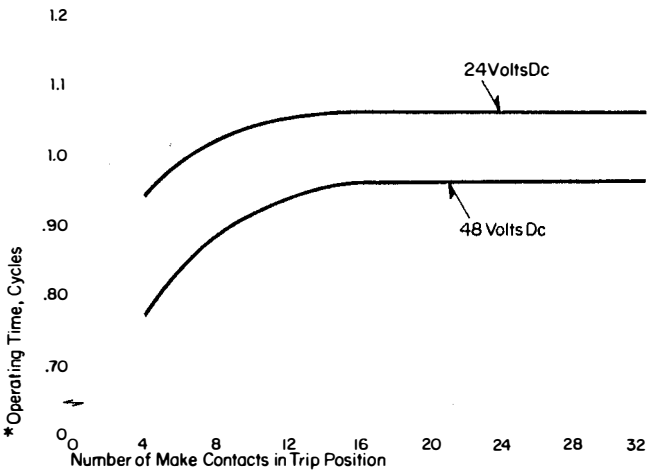


Figure 11



*Operating Time is The Elapsed Time From The Initiation of The Pulsed Voltage to The Switch Coil till The Normally Open Contacts of The Switch Make

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Contact Interpretation
The contacts of the Type WL-2 Switch are identified by the combination of Bands and Rows.

Rows: Viewing the switch from the handle end (front), it is noted the terminals are arranged in rows from front to back. The rows are set 30 degrees apart as is the face of a clock. On the six contact frame, the top three rows are identified as 11, 12 and 1 o'clock. The three rows at the bottom of the stage are 5, 6 and 7 o'clock. On the twelve contact frame, the rows are set as per each number on the face of a clock.

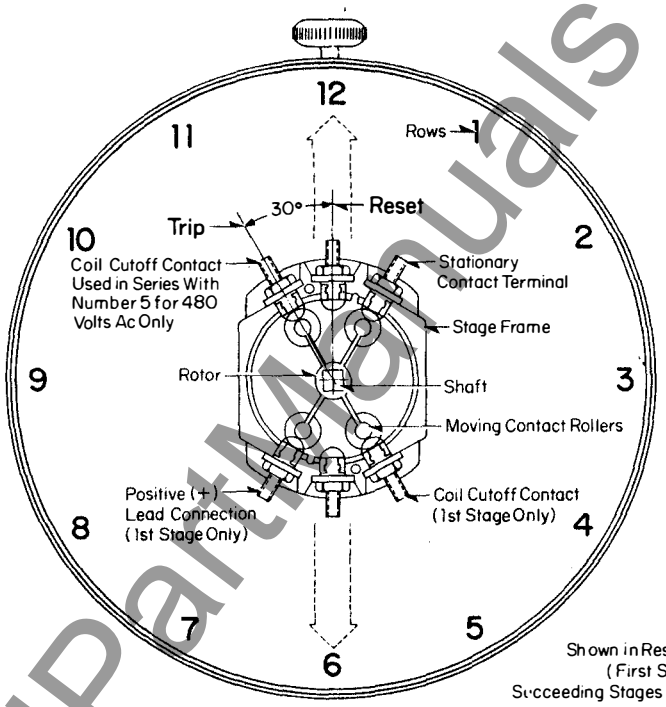

Figure 12

Shown in Reset Position
(First Stage Only-
Succeeding Stages may Differ)

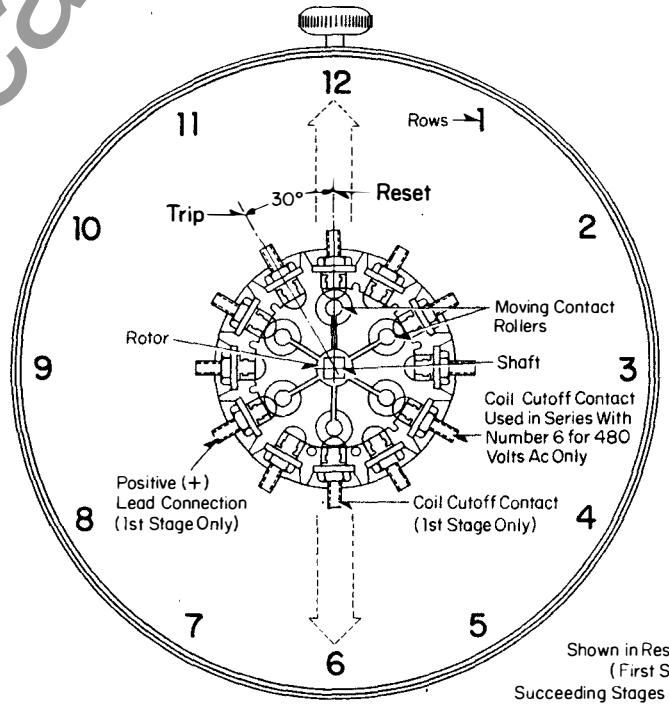

Figure 13

Shown in Reset Position
(First Stage Only-
Succeeding Stages may Differ)

Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc
20 Amperes Continuous

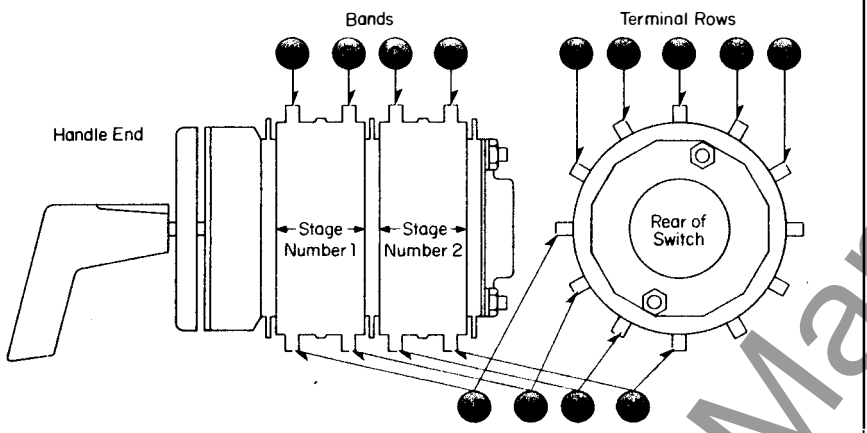

Figure 14. Methods of Identifying Contact Terminal Letter of Bands, Numbered Rows

Type WL-2 Switch Materials

Handle	Moldarta, General Purpose
Nameplate	Cycolac
Dial Plate	Aluminum Die Cast
Housing	Aluminum Die Cast
Stage Frame	Glass Polyester
Rotor	Glass Polyester
Stationary Contact	Silicon Bronze, Silver Plated
Roller Contact	Silicon Bronze, Silver Plated
Springs	Stainless Steel
Locking Spacer (Window)	Lexan, Polycarbonate

Bands: As the switch is viewed from the side, bands of terminals are readily seen around the outer perimeter of the stage frame. Such bands are lettered. The band nearest the handle end is band "A", the second band is band "B", etc. Bands "A" and "B" constitute stage one, bands "C" and "D" constitute stage two, etc.

The row numbers and band letters are then combined to form full terminal identification as shown on figure 14 above and in the contact tabulations shown in this bulletin.

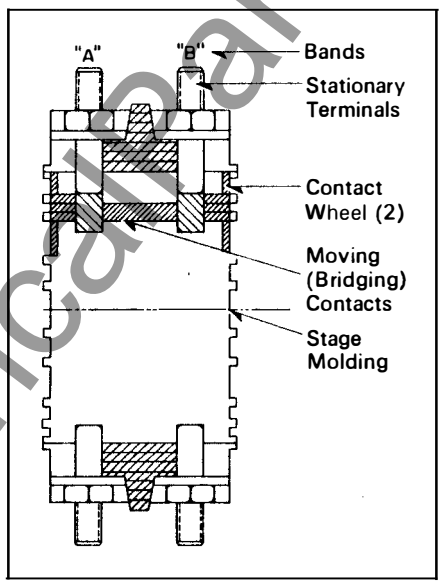

Figure 15

Contacts

The stationary contact (terminal) is a solid one piece forging. The moving (roller) contact is a solid bar.

To complete a circuit the roller contact internally bridges the stationary terminals in adjacent bands in the same row, for example, bands A & B in row twelve (A12-B-12) etc. (Also, see pages 10 through 15)

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Tests

Seismic

The type WL-2 switch was subjected to simulated seismic beat vibrations individually in each of three directions. Interpolation of the readings of the accelerometers located at various points on the equipment indicated that the type WL-2 switch was subjected to the following seismic forces:

front to back – 7.6g at 7 Hz
side to side – 1.0g at 4 Hz
vertical – 0.93g at 1.75 Hz

Contacts on the WL-2 switch were electrically monitored during the tests and no evidence of circuit disturbance was detected. The magnetic mechanism remained latched during the tests.

It is concluded, as a result of these tests, that the type WL-2 switch is satisfactory for seismic applications up to the values indicated above. However, these values are only the maximum seismic forces at which the WL-2 switch was tested. They do not represent a maximum level for the design of the switch.

Surge

When in the "trip" position the contacts in series with the trip coil are open, therefore, a voltage surge in this situation will have no affect on the switch.

When in the "reset" position where-in the coil cutoff contact is closed the coil will withstand an over voltage of 100 percent for ratings up to 440 volts Ac (RMS) since the coil is energized for less than one cycle.

At 440 volts Ac, RMS, the coil will withstand an over voltage of 50 percent.

Magnetic Field

The type WL-2 switch has been tested in a magnetic field produced by a single bus bar and in the inside of a bus loop:

1. Being bolted directly to a single bus bar carrying 15,000 amperes RMS.
2. Being bolted directly to the bus bar, inside the loop, carrying 8000 amperes RMS.

During these tests it was shown that the switch was unaffected by high magnetic fields even under these most arduous conditions. After a period of 30 seconds within the stated magnetic fields, the switch was satisfactorily operated through the trip coil pulsing cycle.

High Potential Test

The coil of the Type WL-2 switch need not be disconnected for test purposes. However, it is recommended that the switch be set in the "trip" position so that the coil cutoff contacts in series with the coil are open. If the switch were left in the "reset" position, a high potential of 1800 volts (assuming one side of the coil pulse voltage is grounded) would cause the switch to operate to the "trip" position. Should this occur several times within a short period the resultant heat build-up inside the coil would cause coil burn-out.

Radiation Effect

The ceramic and metallic magnet materials are known to resist radiation damage to high levels. The magnetic materials employed in the type WL-2 switch will exhibit no change in magnetic properties at radiation levels of 10^{17} epicadmium neutrons per cm^2. Above this level a gradual reduction of magnetic properties occurs and is approximately 40 percent at 10^{20} epicadmium neutrons per cm^2.

Rectifier

An optional feature of the type 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 Fig. 4 page 4).

When used, 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 volts Ac control are not available.

Where required for 480 volts Ac the rectifier must be supplied and mounted by the customer.

Symbols

② In circuits where interrupted current is within the ratings shown in Figure 5, Page 4, the number of trip and reset contacts shown in these columns are available and may be applied without exception.

③ Where the interrupted current of the reset (b) contact exceeds the ratings listed in Figure 5, Page 4, the adjacent "make" contact should not be used. This column sets out the number of these paired contacts per switch unit.

A pair of contacts are those having adjacent stationary terminals served by the same moving contact, i.e., one A (normally open) and one B (normally closed) contact with a common moving roller contact.

④ Refer to wiring diagrams on Page 9 this bulletin.

⑤ Denotes coil cutoff contact – to be used for no other purpose.

⑥ Indicates paired contacts. To be used per instructions in Figures 5 & 6, Page 4 this bulletin.

Int. = Intermediate position:

(1) That area between handle positions "reset" – "trip" (or vice versa) wherein all contacts are open re: break before make.

(2) In the case of overlapping contacts, that area between handle positions wherein the "make before break" contacts close adjacent terminals in the same bands. (Make before break contacts not illustrated in this bulletin).

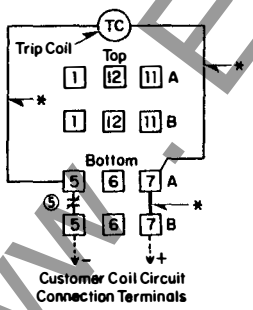
Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc
20 Amperes Continuous

Switch Style Numbers

Fig.	No. of Stages	② Contacts Available Trip	Reset	③ No. of Paired Contacts	Switch Styles Handle Trip 24-48V Dc	120-240V 600 Y With Rectifier	120-240V 600 Y 125-250V Dc	480V 600Y	Non-Handle Trip 24-48V Dc	120-240V 600Y With Rectifier	120-240V 600Y 125-250V Dc	480V 600Y
Six (6) Contact Frame WL-2 Switches												
1	1	2	2	1	796A201G01	796A2 1 03	796A201G05	796A201G07	796A201G02	796A201G04	796A201G06	796A201G08
2	2	4	6	3	796A205G01	796A205G03	796A205G05	796A205G07	796A205G02	796A205G04	796A205G06	796A205G08
3	2	6	4	3	796A204G01	796A204G03	796A204G05	796A204G07	796A204G02	796A204G04	796A204G06	796A204G08
4	3	6	10	5	796A210G01	796A210G03	796A210G05	796A210G07	796A210G02	796A210G04	796A210G06	796A210G08
5	3	8	8	5	796A208G01	796A208G03	796A208G05	796A208G07	796A208G02	796A208G04	796A208G06	796A208G08
6	3	10	6	5	796A209G01	796A209G03	796A209G05	796A209G07	796A209G02	796A209G04	796A209G06	796A209G08
7	4	8	14	7	796A212G01	796A212G03	796A212G05	796A212G07	796A212G02	796A212G04	796A212G06	796A212G08
8	4	10	12	7	796A202G01	796A202G03	796A202G05	796A202G07	796A202G02	796A202G04	796A202G06	796A202G08
9	4	12	10	7	796A213G01	796A213G03	796A213G05	796A213G07	796A213G02	796A213G04	796A213G06	796A213G08
10	4	14	8	7	796A211G01	796A211G03	796A211G05	796A211G07	796A211G02	796A211G04	796A211G06	796A211G08
11	5	10	18	9	796A215G01	796A215G03	796A215G05	796A215G07	796A215G02	796A215G04	796A215G06	796A215G08
12	5	12	16	9	796A225G01	796A225G03	796A225G05	796A225G07	796A225G02	796A225G04	796A225G06	796A225G08
13	5	14	14	9	796A200G01	796A200G03	796A200G05	796A200G07	796A200G02	796A200G04	796A200G06	796A200G08
14	5	16	12	9	796A224G01	796A224G03	796A224G05	796A224G07	796A224G02	796A224G04	796A224G06	796A224G08
15	5	18	10	9	796A214G01	796A214G03	796A214G05	796A214G07	796A214G02	796A214G04	796A214G06	796A214G08
16	6	12	22	11	796A217G01	796A217G03	796A217G05	796A217G07	796A217G02	796A217G04	796A217G06	796A217G08
17	6	14	20	11	796A228G01	796A228G03	796A228G05	796A228G07	796A228G02	796A228G04	796A228G06	796A228G08
18	6	16	18	11	796A227G01	796A227G03	796A227G05	796A227G07	796A227G02	796A227G04	796A227G06	796A227G08
19	6	18	16	11	796A218G01	796A218G03	796A218G05	796A218G07	796A218G02	796A218G04	796A218G06	796A218G08
20	6	20	14	11	796A226G01	796A226G03	796A226G05	796A226G07	796A226G02	796A226G04	796A226G06	796A226G08
21	6	22	12	11	796A216G01	796A216G03	796A216G05	796A216G07	796A216G02	796A216G04	796A216G06	796A216G08
22	7	14	26	13	796A220G01	796A220G03	796A220G05	796A220G07	796A220G02	796A220G04	796A220G06	796A220G08
23	7	16	24	13	796A243G01	796A243G03	796A243G05	796A243G07	796A243G02	796A243G04	796A243G06	796A243G08
24	7	18	22	13	796A242G01	796A242G03	796A242G05	796A242G07	796A242G02	796A242G04	796A242G06	796A242G08
25	7	20	20	13	796A241G01	796A241G03	796A241G05	796A241G07	796A241G02	796A241G04	796A241G06	796A241G08
26	7	22	18	13	796A230G01	796A230G03	796A230G05	796A230G07	796A230G02	796A230G04	796A230G06	796A230G08
27	7	24	16	13	796A229G01	796A229G03	796A229G05	796A229G07	796A229G02	796A229G04	796A229G06	796A229G08
26	7	26	14	13	796A219G01	796A219G03	796A219G05	796A219G07	796A219G02	796A219G04	796A219G06	796A219G08
29	8	16	30	15	796A222G01	796A222G03	796A222G05	796A222G07	796A222G02	796A222G04	796A222G06	796A222G08
30	8	18	28	15	796A248G01	796A248G03	796A248G05	796A248G07	796A248G02	796A248G04	796A248G06	796A248G08
31	8	20	26	15	796A247G01	796A247G03	796A247G05	796A247G07	796A247G02	796A247G04	796A247G06	796A247G08
32	8	22	24	15	796A246G01	796A246G03	796A246G05	796A246G07	796A246G02	796A246G04	796A246G06	796A246G08
33	8	24	22	15	796A223G01	796A223G03	796A223G05	796A223G07	796A223G02	796A223G04	796A223G06	796A223G08
34	8	26	20	15	796A245G01	796A245G03	796A245G05	796A245G07	796A245G02	796A245G04	796A245G06	796A245G08
35	8	28	18	15	796A244G01	796A244G03	796A244G05	796A244G07	796A244G02	796A244G04	796A244G06	796A224G08
36	8	30	16	15	796A221G01	796A221G03	796A221G05	796A221G07	796A221G02	796A221G04	796A221G06	796A221G08
④Wiring Diagram – Figure					16	16	16	18	16	16	16	18
Twelve (12) Contact Frame WL-2 Switches												
37	1	5	4	4	796A231G01	796A231G03	796A231G05	796A231G07	796A231G02	796A231G04	796A231G06	796A231G08
33	2	11	10	10	796A232G01	796A232G03	796A232G05	796A232G07	796A232G02	796A232G04	796A232G06	796A232G08
39	3	17	16	16	796A233G01	796A233G03	796A233G05	796A233G07	796A233G02	796A233G04	796A233G06	796A233G08
40	4	23	22	22	796A234G01	796A234G03	796A234G05	796A234G07	796A234G02	796A234G04	796A234G06	796A234G08
41	5	29	28	28	796A235G01	796A235G03	796A235G05	796A235G07	796A235G02	796A235G04	796A235G06	796A235G08
42	6	35	34	34	796A236G01	796A236G03	796A236G05	796A236G07	796A236G02	796A236G04	796A236G06	796A235G08
④Wiring Diagram – Figure					17	17	17	19	17	17	17	19

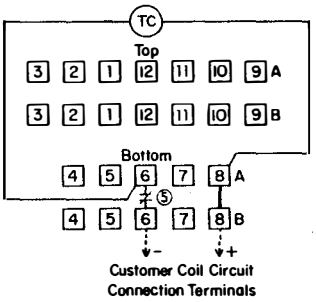
Wiring Diagrams – 24 Thru 250 Volts



Six Contact Frame

*Factory Installed Connectors (Figures 16, 17, 18 and 19)

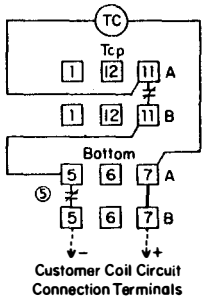
Figure 16



Twelve Contact Frame

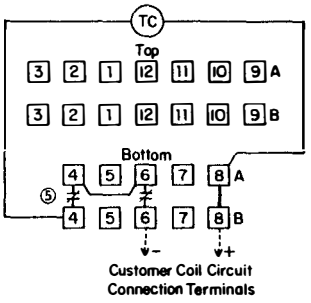
Figure 17

480 Volts – Two Coil Cutoff Contacts Wired in Circuit



Six Contact Frame

Figure 18



Twelve Contact Frame

Figure 19

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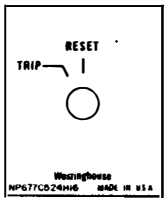

Nameplate

This nameplate marking is common to all Type WL-2 Switches listed in this descriptive bulletin.

Special nameplate markings are available upon request and may be obtained by specifying such special markings in order item reading.

Position Tabulations

Figure 1

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			

Figure 2

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11			X	
C12-D12	X			⊠
C1-D1			X	
C5-D5			X	
C6-D6	X			⊠
C7-D7			X	

Figure 3

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			
C6-D6			X	⊠
C7-D7	X			

Figure 4

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11			X	
C12-D12	X			⊠
C1-D1			X	
C5-D5			X	
C6-D6	X			⊠
C7-D7			X	
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	

Figure 5

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	

Figure 6

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	
E7-F7	X			

Figure 7

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11			X	
C12-D12	X			⊠
C1-D1			X	
C5-D5			X	
C6-D6	X			⊠
C7-D7			X	
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	

Figure 8

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11			X	
C12-D12	X			⊠
C1-D1			X	
C5-D5			X	
C6-D6	X			⊠
C7-D7			X	
E11-F11	X			⊠
E12-F12			X	
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	
E7-F7	X			
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	

Figure 9

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	
G11-H11	X			⊠
G12-H12			X	
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	
G7-H7	X			

Figure 10

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	
G7-H7	X			

⊘ Contact A5-B5 is used as Trip Coil Cutoff Contact. See page 8, symbol ⑤.
⊠ Use One or Other of Paired Contacts in Application. See page 8, symbol ⑥. For Exception, See D.B.

Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc,
20 Amperes Continuous

Figure 11

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11			X	
C12-D12	X			⊠
C1-D1			X	
C5-D5			X	
C6-D6	X			⊠
C7-D7			X	
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	

Figure 12

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	

Figure 13

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	
G11-H11	X			⊠
G12-H12			X	
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	
G7-H7	X			
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	

Figure 14

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	
G7-H7	X			
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	

Figure 15

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	
I7-J7	X			

Figure 16

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11			X	
C12-D12	X			⊠
C1-D1			X	
C5-D5			X	
C6-D6	X			⊠
C7-D7			X	
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	

Figure 17

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	

Figure 18

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	
E7-F7	X			
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	

Figure 19

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	
G7-H7	X			
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	

Figure 20

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	
I7-J7	X			
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	

⊘ Contact A5-B5 is used as Trip Coil Cutoff Contact. See page 8, symbol ⑤.
⊠ Use One or Other of Paired Contacts in Application. See page 8, symbol ⑥. For Exception, See D.B.

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Position Tabulations *Continued*

Figure 21

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	
I7-J7	X			
K11-L11	X			⊠
K12-L12			X	
K1-L1	X			
K5-L5	X			⊠
K6-L6			X	
K7-L7	X			

Figure 22

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11			X	
C12-D12	X			⊠
C1-D1			X	
C5-D5			X	
C6-D6	X			⊠
C7-D7			X	
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	
M11-N11			X	
M12-N12	X			⊠
M1-N1			X	
M5-N5			X	
M6-N6	X			⊠
M7-N7			X	

Figure 23

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	
M11-N11			X	
M12-N12	X			⊠
M1-N1			X	
M5-N5			X	
M6-N6	X			⊠
M7-N7			X	

Figure 24

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	
E7-F7	X			
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	
M11-N11			X	
M12-N12	X			⊠
M1-N1			X	
M5-N5			X	
M6-N6	X			⊠
M7-N7			X	

Figure 25

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	
G7-H7	X			
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	
M11-N11			X	
M12-N12	X			⊠
M1-N1			X	
M5-N5			X	
M6-N6	X			⊠
M7-N7			X	

⊘ Contact A5-B5 is used as Trip Coil Cutoff Contact. See page 8, symbol ⑤.
⊠ Use One or Other of Paired Contacts in Application. See page 8, symbol ⑥. For Exception, See D.B.

Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc,
20 Amperes Continuous

Figure 26

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	Ø
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	⊠
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	⊠
M11-N11			X	
M12-N12	X			⊠
M1-N1			X	⊠
M5-N5			X	
M6-N6	X			⊠
M7-N7			X	⊠

Figure 27

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	Ø
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			
K11-L11	X			⊠
K12-L12			X	⊠
K1-L1	X			
K5-L5	X			⊠
K6-L6			X	⊠
K7-L7	X			
M11-N11			X	⊠
M12-N12	X			⊠
M1-N1			X	⊠
M5-N5			X	
M6-N6	X			⊠
M7-N7			X	⊠

Figure 28

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	Ø
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			
K11-L11	X			⊠
K12-L12			X	⊠
K1-L1	X			
K5-L5	X			⊠
K6-L6			X	⊠
K7-L7	X			
M11-N11	X			⊠
M12-N12			X	⊠
M1-N1	X			
M5-N5	X			⊠
M6-N6			X	⊠
M7-N7	X			

Figure 29

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	Ø
A6-B6	X			
C11-D11			X	
C12-D12	X			⊠
C1-D1			X	⊠
C5-D5			X	
C6-D6	X			⊠
C7-D7			X	⊠
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	⊠
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	⊠
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	⊠
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	⊠
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	⊠
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	⊠
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	⊠
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	⊠
M11-N11			X	
M12-N12	X			⊠
M1-N1			X	⊠
M5-N5			X	
M6-N6	X			⊠
M7-N7			X	⊠
O11-P11			X	
O12-P12	X			⊠
O1-P1			X	⊠
O5-P5			X	
O6-P6	X			⊠
O7-P7			X	⊠

Figure 30

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	Ø
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11			X	
E12-F12	X			⊠
E1-F1			X	⊠
E5-F5			X	
E6-F6	X			⊠
E7-F7			X	⊠
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	⊠
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	⊠
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	⊠
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	⊠
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	⊠
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	⊠
M11-N11			X	
M12-N12	X			⊠
M1-N1			X	⊠
M5-N5			X	
M6-N6	X			⊠
M7-N7			X	⊠
O11-P11			X	
O12-P12	X			⊠
O1-P1			X	⊠
O5-P5			X	
O6-P6	X			⊠
O7-P7			X	⊠

Ø Contact A5-B5 is used as Trip Coil Cutoff Contact. See page 8, symbol ⑤.
⊠ Use One or Other of Paired Contacts in Application. See page 8, symbol ⑥. For Exception, See D.B.

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Position Tabulations *Continued*

Figure 31

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11			X	
G12-H12	X			⊠
G1-H1			X	
G5-H5			X	
G6-H6	X			⊠
G7-H7			X	⊠
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	⊠
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	⊠
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	⊠
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	⊠
M11-N11			X	
M12-N12	X			⊠
M1-N1			X	⊠
M5-N5			X	
M6-N6	X			⊠
M7-N7			X	⊠
O11-P11			X	
O12-P12	X			⊠
O1-P1			X	⊠
O5-P5			X	
O6-P6	X			⊠
O7-P7			X	⊠

Figure 32

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11			X	
I12-J12	X			⊠
I1-J1			X	⊠
I5-J5			X	
I6-J6	X			⊠
I7-J7			X	⊠
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	⊠
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	⊠
M11-N11			X	
M12-N12	X			⊠
M1-N1			X	⊠
M5-N5			X	
M6-N6	X			⊠
M7-N7			X	⊠
O11-P11			X	
O12-P12	X			⊠
O1-P1			X	⊠
O5-P5			X	
O6-P6	X			⊠
O7-P7			X	⊠

Figure 33

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			
K11-L11			X	
K12-L12	X			⊠
K1-L1			X	⊠
K5-L5			X	
K6-L6	X			⊠
K7-L7			X	⊠
M11-N11			X	
M12-N12	X			⊠
M1-N1			X	⊠
M5-N5			X	
M6-N6	X			⊠
M7-N7			X	⊠
O11-P11			X	
O12-P12	X			⊠
O1-P1			X	⊠
O5-P5			X	
O6-P6	X			⊠
O7-P7			X	⊠

Figure 34

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			
K11-L11	X			⊠
K12-L12			X	⊠
K1-L1	X			
K5-L5	X			⊠
K6-L6			X	⊠
K7-L7	X			
M11-N11			X	
M12-N12	X			⊠
M1-N1			X	⊠
M5-N5			X	
M6-N6	X			⊠
M7-N7			X	⊠
O11-P11			X	
O12-P12	X			⊠
O1-P1			X	⊠
O5-P5			X	
O6-P6	X			⊠
O7-P7			X	⊠

Figure 35

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			
K11-L11	X			⊠
K12-L12			X	⊠
K1-L1	X			
K5-L5	X			⊠
K6-L6			X	⊠
K7-L7	X			
M11-N11	X			⊠
M12-N12			X	⊠
M1-N1	X			
M5-N5	X			⊠
M6-N6			X	⊠
M7-N7	X			
O11-P11			X	
O12-P12	X			⊠
O1-P1			X	⊠
O5-P5			X	
O6-P6	X			⊠
O7-P7			X	⊠

⊘ Contact A5-B5 is used as Trip Coil Cutoff Contact. See page 8, symbol ⑤.
⊠ Use One or Other of Paired Contacts in Application. See page 8, symbol ⑥. For Exception, See D.B.

Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc,
20 Amperes Continuous

Figure 36

CONTACT	POSITION T	INT	R	
A11-B11			X	
A12-B12	X			⊠
A1-B1			X	⊠
A5-B5			X	⊘
A6-B6	X			
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			
E11-F11	X			⊠
E12-F12			X	⊠
E1-F1	X			
E5-F5	X			⊠
E6-F6			X	⊠
E7-F7	X			
G11-H11	X			⊠
G12-H12			X	⊠
G1-H1	X			
G5-H5	X			⊠
G6-H6			X	⊠
G7-H7	X			
I11-J11	X			⊠
I12-J12			X	⊠
I1-J1	X			
I5-J5	X			⊠
I6-J6			X	⊠
I7-J7	X			
K11-L11	X			⊠
K12-L12			X	⊠
K1-L1	X			
K5-L5	X			⊠
K6-L6			X	⊠
K7-L7	X			
M11-N11	X			⊠
M12-N12			X	⊠
M1-N1	X			
M5-N5	X			⊠
M6-N6			X	⊠
M7-N7	X			
O11-P11	X			⊠
O12-P12			X	⊠
O1-P1	X			
O5-P5	X			⊠
O6-P6			X	⊠
O7-P7	X			

Figure 37

CONTACT	POSITION T	INT	R	
A11-B11	X			⊠
A12-B12			X	⊠
A1-B1	X			⊠
A2-B2			X	⊠
A3-B3	X			⊠
A4-B4			X	
A6-B6			X	⊘
A7-B7	X			
A9-B9	X			⊠
A10-B10			X	⊠

Figure 38

CONTACT	POSITION T	INT	R	
A11-B11	X			⊠
A12-B12			X	⊠
A1-B1	X			⊠
A2-B2			X	⊠
A3-B3	X			⊠
A4-B4			X	
A6-B6			X	⊘
A7-B7	X			
A9-B9	X			⊠
A10-B10			X	⊠
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			⊠
C2-D2			X	⊠
C3-D3	X			⊠
C4-D4			X	⊠ *
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			⊠
C8-D8			X	⊠
C9-D9	X			⊠
C10-D10			X	⊠

* 2nd Stage Shown

Figure 39

CONTACT	POSITION T	INT	R	
A11-B11	X			⊠
A12-B12			X	⊠
A1-B1	X			⊠
A2-B2			X	⊠
A3-B3	X			⊠
A4-B4			X	
A6-B6			X	⊘
A7-B7	X			
A9-B9	X			⊠
A10-B10			X	⊠
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			⊠
C2-D2			X	⊠
C3-D3	X			⊠
C4-D4			X	⊠ *
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			⊠
C8-D8			X	⊠
C9-D9	X			⊠
C10-D10			X	⊠

* 2nd Stage Shown
3rd Stage (E-F) is Same

Figure 40

CONTACT	POSITION T	INT	R	
A11-B11	X			⊠
A12-B12			X	⊠
A1-B1	X			⊠
A2-B2			X	⊠
A3-B3	X			⊠
A4-B4			X	
A6-B6			X	⊘
A7-B7	X			
A9-B9	X			⊠
A10-B10			X	⊠
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			⊠
C2-D2			X	⊠
C3-D3	X			⊠
C4-D4			X	⊠ *
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			⊠
C8-D8			X	⊠
C9-D9	X			⊠
C10-D10			X	⊠

* 2nd Stage Shown
3rd, 4th Stages (E-F, G-H)
are Same

Figure 41

CONTACT	POSITION T	INT	R	
A11-B11	X			⊠
A12-B12			X	⊠
A1-B1	X			⊠
A2-B2			X	⊠
A3-B3	X			⊠
A4-B4			X	
A6-B6			X	⊘
A7-B7	X			
A9-B9	X			⊠
A10-B10			X	⊠
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			⊠
C2-D2			X	⊠
C3-D3	X			⊠
C4-D4			X	⊠ *
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			⊠
C8-D8			X	⊠
C9-D9	X			⊠
C10-D10			X	⊠

* 2nd Stage Shown
3rd, 4th and 5th Stages
(E-F, G-H, I-J) are Same

Figure 42

CONTACT	POSITION T	INT	R	
A11-B11	X			⊠
A12-B12			X	⊠
A1-B1	X			⊠
A2-B2			X	⊠
A3-B3	X			⊠
A4-B4			X	
A6-B6			X	⊘
A7-B7	X			
A9-B9	X			⊠
A10-B10			X	⊠
C11-D11	X			⊠
C12-D12			X	⊠
C1-D1	X			⊠
C2-D2			X	⊠
C3-D3	X			⊠
C4-D4			X	⊠ *
C5-D5	X			⊠
C6-D6			X	⊠
C7-D7	X			⊠
C8-D8			X	⊠
C9-D9	X			⊠
C10-D10			X	⊠

* 3rd, 4th, 5th and 6th Stages
(E-F, G-H, I-J, K-L) are Same

⊘ Contact A5-B5 is used as Trip Coil Cutoff Contact. See page 8, symbol ⑤.
⊠ Use One or Other of Paired Contacts in Application. See page 8, symbol ⑥. For Exception, See D.B.

Type WL-2 Instrument and Control Switch

600 Volts Ac or Dc.
20 Amperes Continuous

Dimensions in Inches

Drilling Plan

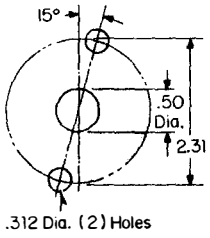
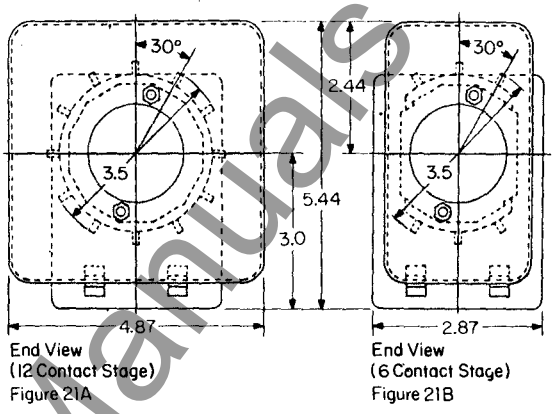


Figure 20

Type WL-2 Switch with Protective Cover



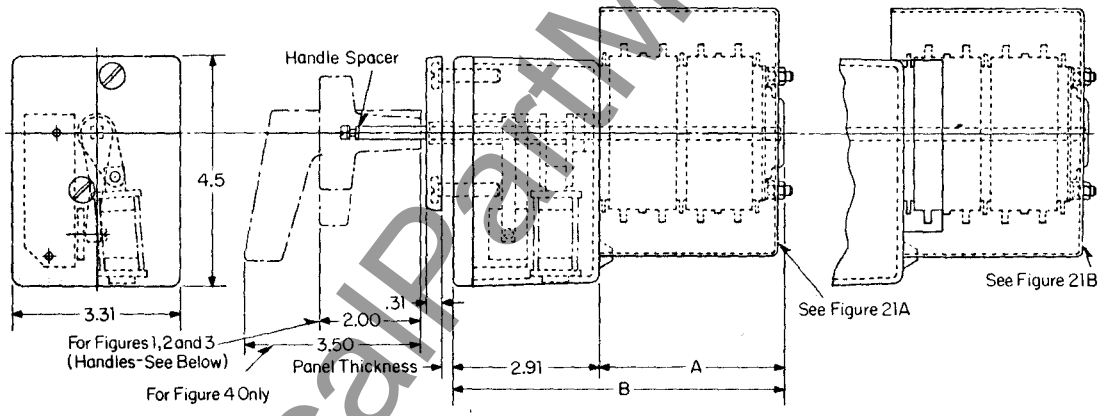


Figure 21

Type WL-2 Without Protective Cover

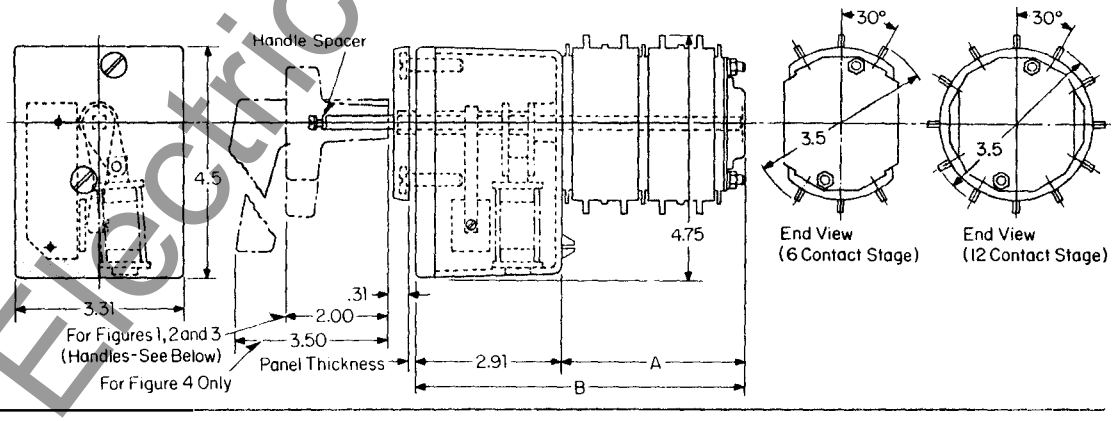


Figure 22

Handles

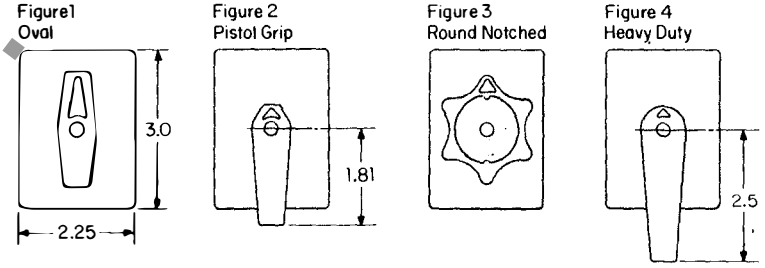


Figure 23

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