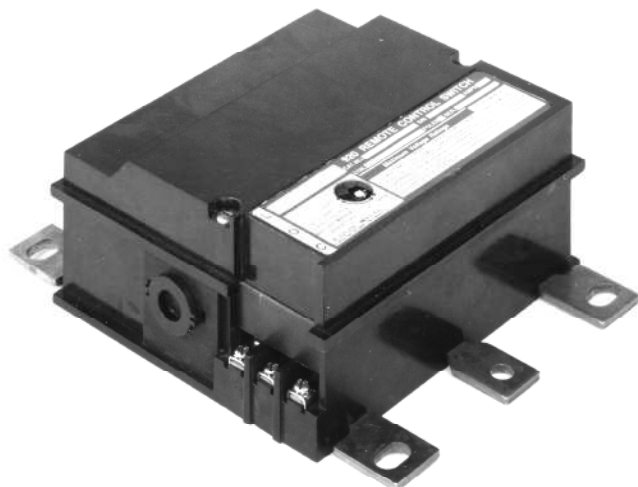


# Installation Manual

# ASCO® 920 Remote Control Switches 30 through 225 ampere sizes



This Installation Manual is for green nameplate ASCO 920s only. For black nameplate ASCO 920s refer to Owner's Manual 2D4920 R16.

ASCO 920 Remote Control (RC) Switches are pre-tested and ready to use. Installation requires mounting and connection of service cables (or bus) and control circuit wires. An experienced licensed electrician should install the RC Switch.

Each ASCO 920 RC Switch has a ratings / identification label defining load types and maximum voltage ratings. Use the switch only within the limits shown on this label.

## **⚠ DANGER**

**DANGER** is used in this manual to warn of high voltages capable of causing shock, burns, or death.

## **⚠ WARNING**

**WARNING** is used in this manual to warn of possible personal injury.

## **⚠ CAUTION**

**CAUTION** is used in this manual to warn of possible equipment damage.

## **⚠ WARNING**

**Do not exceed the values on the rating label. Exceeding the rating can cause personal injury or serious equipment damage.**

TABLE OF CONTENTS	
	page
Installation & Maintenance .....	1
Troubleshooting & Parts Kits .....	2
Optional Accessories .....	3
Wiring & Outline Diagrams ...	back of manual

### Catalog Number Identification with Elements Explained

Typical ASCO 920 catalog no. for 3 pole, 100 amp, 208 volt 60 Hz control, with subpanel and enclosed Remote Control Switch:

Product	Phase Poles	Amperes	Control Voltage	Subpanel	Accessories	Enclosure
920	2 - single phase 3 - three phase	30 60 75 100 150 200 225	3 110 - 120 V 6 208 - 240 V 7 265 - 277 V 9 440 - 480 V G 550 - 600 V X other voltages 50 - 60 Hz	0 - without 1 - with	X - if accessories ordered  blank - none	C -  blank - open type

## INSTALLATION

### ⚠ CAUTION

To prevent malfunction or shortened life, protect the switch from construction grit and metal chips.

**Mounting:** Two *Outline and Mounting Diagrams* are furnished; one for enclosed switches, the other for open-type switches. Select the appropriate diagram and mount the RC Switch (in any position). All mounting details and instructions are shown on the diagram.

### ⚠ WARNING

RC Switches on subpanels must be mounted with supplied insulator bushings and insulator pieces. Be sure the insulator pieces are behind the switch and use the insulator bushings under the hardware.

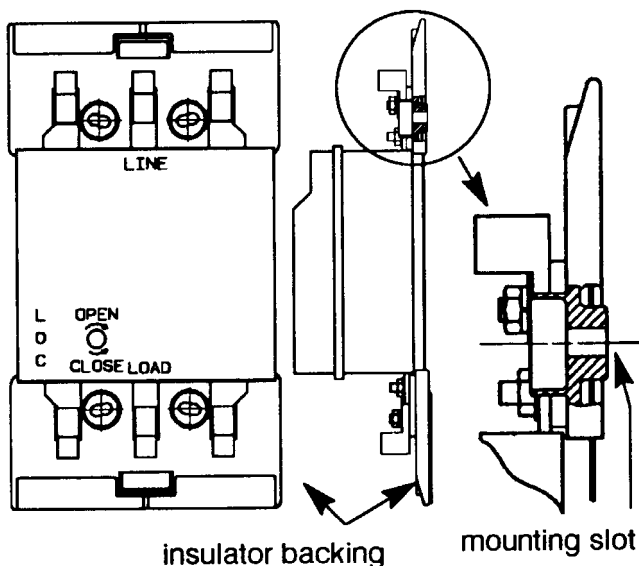


Figure 1. Required insulator bushings and backing insulators for RC Switches mounted on subpanels.

**Service Connections:** For panelboard mounting, the extended bus plates provide both the mechanical support and the electrical connection. Switches on subpanels are furnished with solderless lugs for copper or aluminum wire. *Outline and Mounting Diagram* lists wire sizes accepted.

Remove surface oxides from wires by cleaning with a wire brush. When aluminum conductor is used, apply joint compound to conductor. Tighten conductor and carefully wipe away excess compound. Maintain proper electrical clearance between live metal parts and grounded metal.

**Control Line Connections:** Control circuit connections designated L, O, C are supplied with clamp type terminals. These terminals accept wire sizes #14–10 AWG Cu. Simply insert appropriate control wires and tighten terminal clamp screws. See the *Wiring Diagram*.

### ⚠ CAUTION

Tighten all electrical connections; refer to the torque specified on the label on the RC Switch.

Table A lists the maximum distances and minimum wire sizes that can be run between a control station and one ASCO 920 switch.

**Table A – Line Run**

Min. Wire Size AWG	Maximum Distance (feet) <sup>1</sup> for these AC Control Voltages			
	120 V	208 V	240 V	277 V
14	750	1650	2760	3950
12	1200	2600	4300	6350
10	2000	4200	6900	10000

<sup>1</sup> For ambient temperatures to 40°C.

### ⚠ CAUTION

Do not exceed these distances for proper switch operation.

Line run can be extended by use of Auxiliary Control Relays. See page 3.

Table B provides the ASCO 920 coil inrush current and minimum control circuit fuse sizes.

**Table B – Inrush Current / Minimum Fuse**

Amps	Inrush Current / Fuse (amps) <sup>2</sup> for these AC Control Voltages				
	120 V	208 V	240 V	277 V	480 V
Inrush	11.3	5.15	6.4	7	7
Fuse	3	1.5	1.5	1.5	3

<sup>2</sup> Fuse value listed will also protect ASCO 920 against abnormal operating conditions.

## MAINTENANCE

Annual preventive maintenance will insure high reliability and long life for the ASCO 920 RC Switch.

**Keep the Switch clean.** De-energize all sources, then brush and vacuum away any excessive dust accumulation.

**Maintain Switch Lubrication.** Under normal service, relubrication is not required. Renew factory lubrication if switch is subjected to severe dust or abnormal operating conditions, and if the coil is replaced. Only use Lubrication Kit 625549; do not use oil or any other type of lubricant.

**Inspect Main Current-Carrying Contacts.**

De-energize all sources, then remove cover to check contact condition. Discoloration or slight pitting does not affect contact efficiency. Replace the contacts when they become pitted, excessively worn, or appear to be overheated.

### ⚠ CAUTION

The arc chutes are held in place by the cover. If the arc chutes are removed, be sure they are put back in place with “top” visible. Make sure the cover is fully seated before tightening the cover screws. (Do not over-tighten).

## MANUAL OPERATION

A means for manual operation is provided for maintenance purposes only. The switch must be completely de-energized. Open the supply source circuit breaker to the ASCO 920. Label, tape, and disconnect the control circuit wires from terminals L, O, and C.

### **WARNING**

**Do manually operate the RC Switch until all power sources (service & control) and all loads are deenergized (open circuit breakers).**

A slotted socket in the cover directly connects to the solenoid operator mechanism. Use a medium blade screwdriver to turn the socket 1/4 turn clockwise to close or counterclockwise to open. See Figure 2 below.

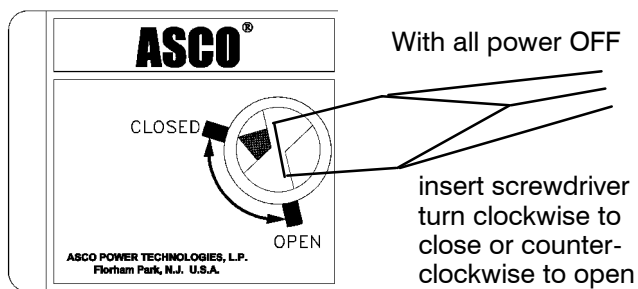


Figure 2. Socket in nameplate for manual operation **ALL POWER MUST BE OFF BEFORE TURNING !**

## TROUBLESHOOTING

*Note any Optional Accessories that may have been furnished with the ASCO 920 and review their operation.*

### **DANGER**

**Deenergize all power sources to the Remote Control Switch before working on it.**

#### **RC Switch opens and closes repeatedly.**

1. **Check Wiring.** Make sure control stations are not calling on the ASCO 920 to open and to close at the same time. See Wiring Diagram.
2. **Check Control Station.** Make sure control stations do not have overlapping contacts.

#### **RC Switch tries to open or close, but cannot.**

1. **Check Voltage.** Make sure control line voltage is at least 90% of nameplate coil voltage.
2. **Check Line Run & Wire Size.** Make sure control line size and distance is within the requirements of Table A, page 1.
3. **Check VA Burden of Transformer.** If a transformer is used in the control line, make sure it can handle the VA burden required. See Table B, page 1.

## REPLACEMENT PARTS KITS

For convenience, replacement contacts and coils are sold in kit form. Select kits by noting switch ampere size, number of poles, and coil control voltage as specified on the nameplate. The kits can be ordered from any ASI, 1-800-800-ASCO. (2726).

For other parts, and service procedures, refer to Service Bulletin 381339-015. This publication is supplied with the kits. When converting to a control voltage different from originally furnished, request a new nameplate.

Coil Kits for these AC Control Voltages			
110-120 V	208-240 V	265-277 V	440-480 V
605326-001	605326-008	605326-002	605326-003

ASCO 920 amp. size	Contact Kits		Coil Control Contact Kit	Lubrication Kit <sup>3</sup>
	2 Pole	3 Pole		
30-100	331709	331703	331713	625549
150-225	331710	331704		

<sup>3</sup> Lubrication points: core and link inside the core tube, operator spring, and rotating weight pin.

## OPTIONAL ACCESSORIES

### Pilot Lights, Optional Accessory 9

These pilot lights, if furnished, are connected and installed in the enclosure door, or are supplied loose for open type switches. Each neon light requires a 1/2" diameter round hole and can be installed in panels up to 0.1" thick. See the Wiring Diagram. Acc. 9s can be added later in Kit form. Kit voltage must be the same as RC Switch control voltage (coil).

Acc. 9A light comes on when main contacts are closed.

Acc. 9B light comes on when main contacts are open. A resistor is used for 208–277 VRC control. It is supplied on a terminal block with connections labeled 1, 2.

Acc.	Description	Kit
9A	110–120 V	333270–006
	208–277 V	333270–007
9B	110–120 V	333271–006
	208–277 V	333271–007

### Auxiliary Contacts, Optional Accessory 14

Acc. 14 auxiliary contacts are installed on the right side of the ASCO 920. Terminals accept wire size #14 AWG Cu.

Acc.	Description	Kit
14A 14B	two auxiliary contacts (14A & 14B) with bracket, cam, and screws	607039

### Auxiliary Relays, Optional Acc. 47, 48, 49

Optional auxiliary relays (Acc. 47, 48, 49) are useful:

- When the control station is located at a distance greater than allowable ASCO 920 line run (Table A, page 1).
- When controlling device doesn't have adequate current-carrying capability to control RC (Table B, page 1).
- When the controlling device is a single-pole single-throw contact, which requires a 2-wire control line.
- When Form 3 (start-stop) control is required.

The relays have a low VA burden: Acc. 47 has 3.0 VA for ac, 2.5 watts for dc; Acc. 48 & 49 have 2.0 VA for ac, 1.2 watts for dc. Acc. 47 & 48 terminals accept wire sizes #22–12 AWG Cu; Acc. 49 accepts #18–12 AWG Cu.

The relays are mounted and wired to the RC on enclosed switches, or supplied loose with open type switches.

### Two-Wire Control, Optional Accessory 47

Acc. 47 is an auxiliary relay panel for 2-wire control of the ASCO 920. The relay panel must be energized to close the ASCO 920 contacts, and de-energized to open the ASCO 920 contacts. Therefore, use a single-pole, maintained-type control station (Acc. 53B or 53C). Order **Catalog 321A40** and specify relay coil voltage.

### Three-Wire Control, Optional Accessory 48

Acc. 48 is an auxiliary relay panel for 3-wire control of the ASCO 920. It has two relays. One relay must be energized to open the ASCO 920 contacts; the other relay must be energized to close the ASCO 920 contacts. Therefore, use a single-pole, double-throw, momentary-

type control station (Acc. 53A). Order **Catalog 321A36** and specify relay coil voltage. See the Wiring Diagram.

### Form 3 Control, Optional Accessory 49

Acc. 49 is an auxiliary relay for Form 3 control of the ASCO 920. This relay must be energized to close the ASCO 920 contacts; the relay must be de-energized to open the ASCO 920 contacts. Therefore, use one normally open and one normally closed separate control stations (Acc. 53D). Order a mounting socket kit and plug-in relay listed below (specify relay control voltage).

Acc.	Description				Kit
49	mounting socket kit				295855
Acc.	AC Control	Relay	Acc.	DC Control	Relay
49A	24 V	115206	49F	12 V	115274
49B	120 V	115201	49G	24 V	115277
49C	208 V	115210	49H	32 V	115279
49D	240 V	115202	49I	48 V	115283
49E	277 V	115213	49J	110 V	115271

### Control Line Fuses, Optional Accessory 52

These control line fuses are mounted for enclosed switches, or are supplied loose for open type switches. Fuse block has #10–32 terminal screws. The cartridge fuses are suitable for ac only as listed on *Wiring Diagram*.

Acc.	Description	Kit
52A	one 15 amp, 300 Vac type SC fuse for 300 Vac max. grounded	333272
52B	two 15 amp 300 Vac type SC fuses for 300 Vac max. ungrounded	333273
52C	two 15 amp 600 Vac type KTK fuses for 301–600 Vac max. ungrounded	333274

### Door-Mounted Controls, Optional Acc. 53

These manual controls are connected and mounted on the enclosure door, or are supplied loose for open type switches. See the *Composite Wiring Diagram*.

Acc.	Description	Kit
53A	momentary toggle switch with center-off position for 3-wire control	333275
53B	3-position selector switch (HOA) used with Acc. 47 for 2-wire control	333276
53C	maintained toggle switch used with Acc. 47 for 2-wire control	333277
53D	2 momentary toggle switches (1 normally closed, 1 norm. open) used with Acc. 49 for form 3 control	333278

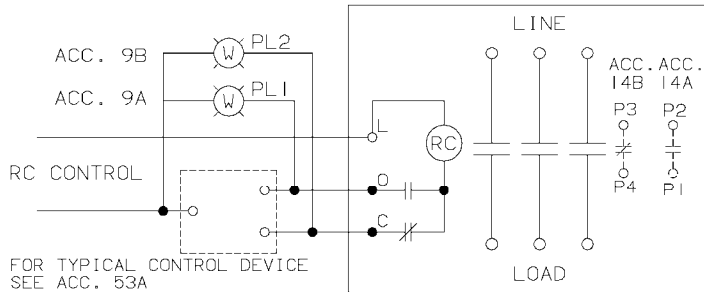


# OPTIONAL ACCESSORIES

## ACC. 9 PILOT LIGHTS

NOTE: INSTALLED AND CONNECTED FOR ENCLOSED TYPES. SHIPPED LOOSE FOR OPEN TYPES.

- ACC. 9A-PILOT LIGHT INDICATES MAIN CONTACTS ARE CLOSED.
- ACC. 9B-PILOT LIGHT INDICATES MAIN CONTACTS ARE OPEN.



FOR TYPICAL CONTROL DEVICE SEE ACC. 53A

## ACC. 14 AUXILIARY CONTACTS

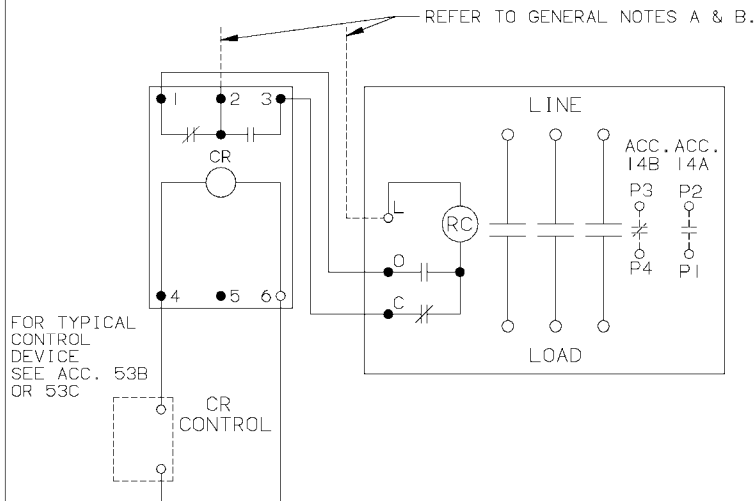
- ONE (1) ACC. 14A & ONE (1) ACC. 14B SUPPLIED.
- ACC. 14A-AUXILIARY CONTACT, P1/P2, CLOSED WHEN MAIN CONTACTS ARE CLOSED.
- RATED 10A AT 480V 60HZ, GENERAL USE.
- ACC. 14B AUXILIARY CONTACT, P3/P4, CLOSED WHEN MAIN CONTACTS ARE OPEN.
- RATED 10A AT 480V 60HZ, GENERAL USE.

## ACC. 22 NEUTRAL PLATE

- SOLID NEUTRAL, FULL RATED TERMINALS AL-CU. MOUNTED ON ENCLOSED TYPES. SHIPPED LOOSE FOR OPEN TYPES.

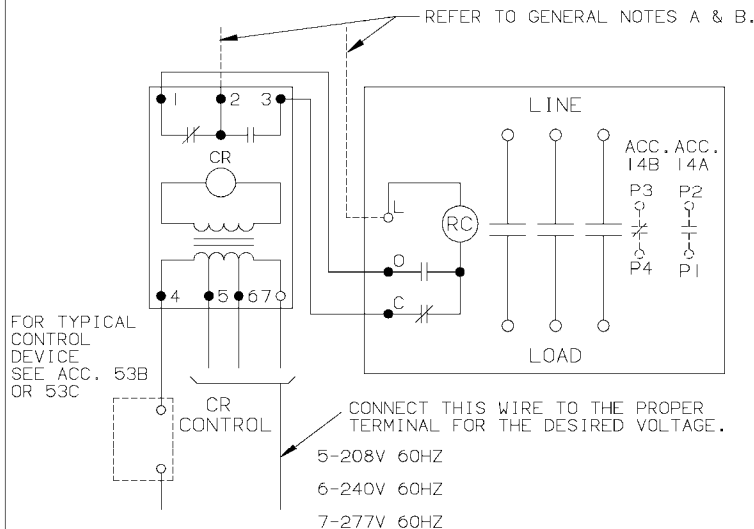
## ACC. 47 AUXILIARY RELAY FOR 2 WIRE CONTROL

- ACC. 47A-120V 60HZ OR 120VDC
- ACC. 47C- 24V 60HZ OR 24VDC



FOR TYPICAL CONTROL DEVICE SEE ACC. 53B OR 53C

- ACC. 47B-208V, 240V, OR 277V 60HZ



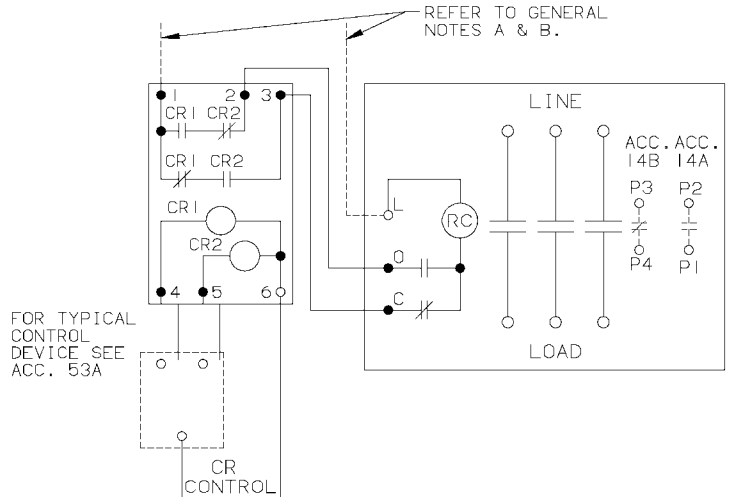
FOR TYPICAL CONTROL DEVICE SEE ACC. 53B OR 53C

CONNECT THIS WIRE TO THE PROPER TERMINAL FOR THE DESIRED VOLTAGE.

- 5-208V 60HZ
- 6-240V 60HZ
- 7-277V 60HZ

## ACC. 48 AUXILIARY RELAY FOR 3 WIRE CONTROL

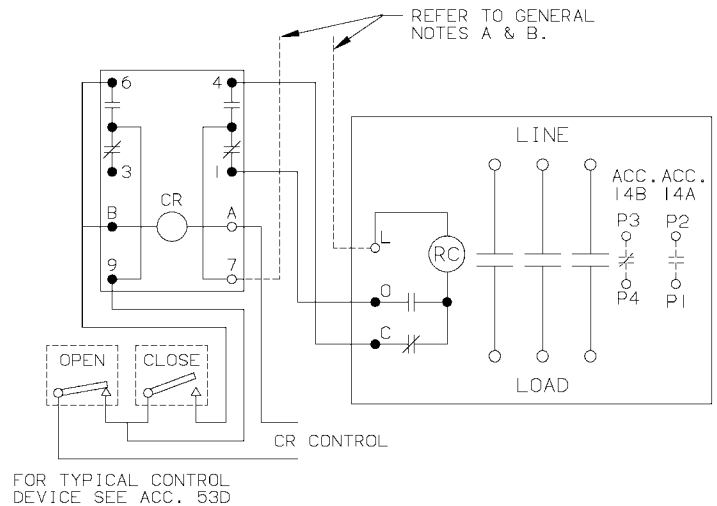
- ACC. 48A- 24V 60HZ
- ACC. 48B-120V 60HZ
- ACC. 48C-208V 60HZ
- ACC. 48D-240V 60HZ
- ACC. 48E-277V 60HZ
- ACC. 48F- 12V DC
- ACC. 48G- 24V DC
- ACC. 48H- 32V DC
- ACC. 48I- 48V DC
- ACC. 48J-110V DC



FOR TYPICAL CONTROL DEVICE SEE ACC. 53A

## ACC. 49 AUXILIARY RELAY FOR FORM 3 CONTROL

- ACC. 49A- 24V 60HZ
- ACC. 49B-120V 60HZ
- ACC. 49C-208V 60HZ
- ACC. 49D-240V 60HZ
- ACC. 49E-277V 60HZ
- ACC. 49F- 12V DC
- ACC. 49G- 24V DC
- ACC. 49H- 32V DC
- ACC. 49I- 48V DC
- ACC. 49J-110V DC

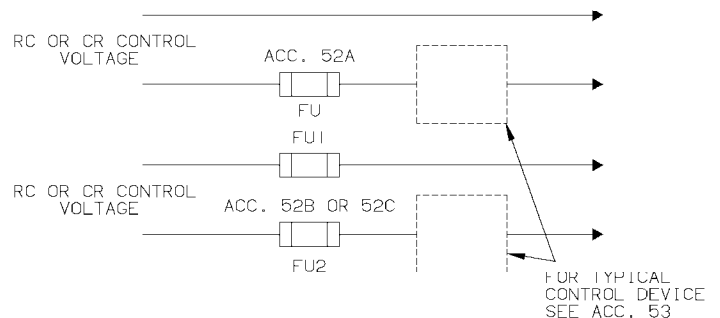


FOR TYPICAL CONTROL DEVICE SEE ACC. 53D

## ACC. 52 CONTROL LINE FUSE(S)

NOTES: INSTALLED AND CONNECTED ON ENCLOSED TYPES. SHIPPED LOOSE FOR OPEN TYPES.

- CONTROL LINE FUSE(S) SUITABLE FOR AC ONLY.
- ACC. 52A-ONE 15A,300V,TYPE SC FUSE FOR 300V MAXIMUM-GROUNDED.
- ACC. 52B-TWO 15A,300V,TYPE SC FUSES FOR 300V MAXIMUM-UNGROUND.
- ACC. 52C-TWO 15A,600V TYPE KTK FUSES FOR 301-600V MAXIMUM-UNGROUND.



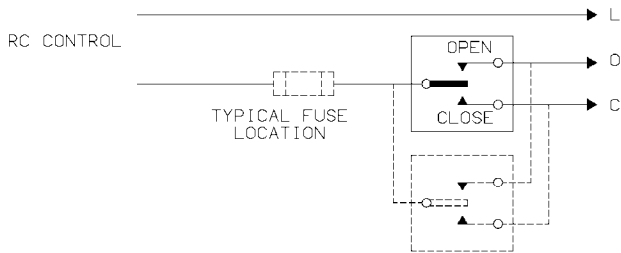
FOR TYPICAL CONTROL DEVICE SEE ACC. 53

# STANDARD REMOTE CONTROL SWITCH

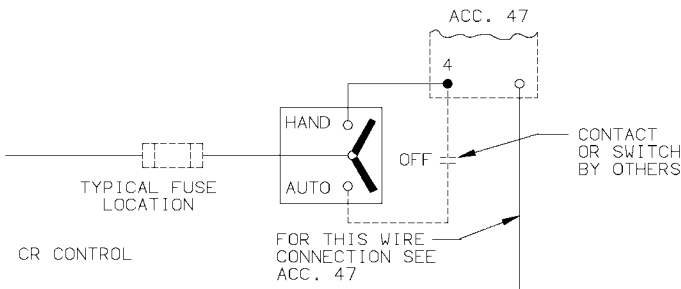
## ACC. 53 DOOR MOUNTED CONTROL

NOTES: INSTALLED AND CONNECTED ON ENCLOSED TYPES. SHIPPED LOOSE FOR OPEN TYPES.

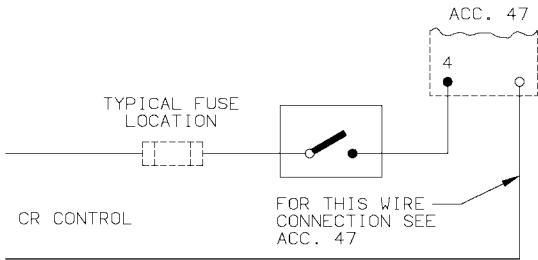
- ACC. 53A-MOMENTARY TOGGLE SWITCH WITH CENTER OFF POSITION FOR 3 WIRE CONTROL. TWO CONTROL STATIONS SHOWN IN PARALLEL.



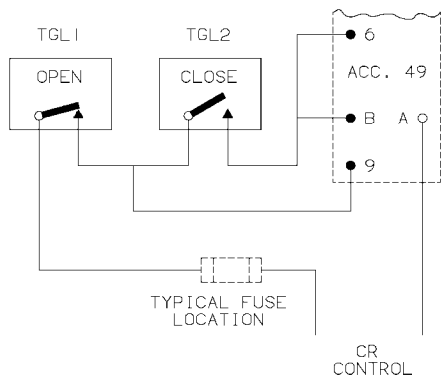
- ACC. 53B-H.O.A. SWITCH - CAN ONLY BE USED WITH ACC. 47; RELAY FOR 2 WIRE CONTROL.



- ACC. 53C-ONE POLE, SINGLE THROW, MAINTAINED TYPE TOGGLE SWITCH FOR USE WITH ACC. 47; RELAY FOR 2 WIRE CONTROL.

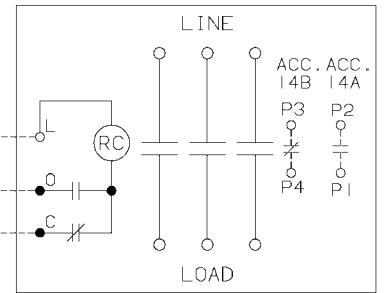


- ACC. 53D-TWO MOMENTARY ACTION TOGGLE SWITCHES, USED WITH ACC. 49; RELAY FOR FORM 3 CONTROL.



FOR OPEN TYPE DIMENSIONS REFER TO COMPOSITE OUTLINE DRAWING GS 331-849.

FOR ENCLOSED TYPE DIMENSIONS REFER TO COMPOSITE ENCLOSURE DRAWING GS 331-850.



RC CONTROL

FOR TYPICAL CONTROL DEVICE SEE ACC. 53A AND ASCO CONTROL CATALOG 1000, ORDERING SECTION 7.

FOR AUXILIARY CONTACTS SEE OPTIONAL ACC. 14 NOTE.

### GENERAL NOTES

- ACCESSORY INTERWIRING IS SUPPLIED ON ENCLOSED TYPE SWITCHES ONLY.
- WHEN RC COIL AND LINE VOLTAGE ARE THE SAME THE RC CONTROL VOLTAGE CAN BE DERIVED FROM THE LINE POLES OF THE RC SWITCH.
- OMIT CENTER POLE FOR TWO POLE SWITCHES.
- INDICATES CUSTOMER CONNECTION POINTS.  
● INDICATES FACTORY CONNECTION POINTS.
- CONNECTION POINTS THAT HAVE BOTH CUSTOMER AND FACTORY CONNECTIONS ARE SHOWN AS CUSTOMER CONNECTIONS.
- MAIN CONTACTS ARE SHOWN IN OPEN POSITION WITH CONTROL LINE DE-ENERGIZED SEE RATINGS BELOW.
- FOR RC INRUSH AND LINE RUN VALUES REFER TO CATALOG.
- LINE AND LOAD TERMINALS ARE REVERSIBLE.
- INSTALLATION MANUAL 381333-005, IS FURNISHED WITH EACH REMOTE CONTROL SWITCH. REFER TO THIS PUBLICATION PRIOR TO INSTALLATION AND OPERATION OF THE SWITCH.

### MAIN CONTACT MAXIMUM VOLTAGE RATINGS OPEN OR CLOSED

LOAD TYPE	POLES TO LOAD	
	1	2 FOR 1Ø & DC, 3 FOR 3Ø
BALLAST	277VAC	480VAC
TUNGSTEN	250VAC	250VAC
GENERAL	347VAC	600VAC
*DC-RESISTANCE ONLY	125VAC	250VAC

\* 75 AMPS OR SWITCH RATING, WHICHEVER IS LESS

### LEGEND

DEVICE DESIGNATOR	DEVICE
RC	REMOTE CONTROL SWITCH
PL	PILOT/INDICATING LIGHT
CR	CONTROL RELAY

### COMPUTER GENERATED DRAWING

BASIC CATALOG NUMBERS	VOLT CODE	SUB PNL CODE	OPT ACC CODE	ENCLOSURE CODE	CONTROL VOLTAGE CODE	DESCRIPTION
ASCO POLES AMPS					OPERATING FREQUENCIES 50-60 HZ	
920	30				3	110-120V
	60				6	208-240V
	75	0 (WITH-OUT)	X	C	7	265-277V
	100				9	440-480V
	150	1 (WITH)			G	550-600V
	200				X	OTHER VOLTAGES
	225					
ENCLOSURE TYPE					CATALOG NUMBER _____	
OPEN TYPE					CERTIFIED	
					TO <b>ASCO</b> S.O. _____	
					DATE _____ BY _____	
COMPOSITE WIRING DIAGRAM					207167	SEE ECN
<b>ASCO 920 REMOTE CONTROL SWITCH</b>					119013	SEE ECN
					102418	REVISED
					84344	REVISED
					83652	SEE ER
					E.R. NO.	ITEM CHGD.
					CHG.	DATE
					APVD.	
BY	DATE	ASCO POWER TECHNOLOGIES, L.P.		DS 331851		
DRAWN	TEK	4/83	FLORHAM PARK, NEW JERSEY 07932 U.S.A.			
CHECKED	CR	4/83	AL <input checked="" type="checkbox"/> AP <input checked="" type="checkbox"/>			
DFTG	APL	FM	4/83	PROPERTY OF ASCO POWER TECHNOLOGIES, USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.		
ENG	APL	PDG	4/83	CHG LTR		

