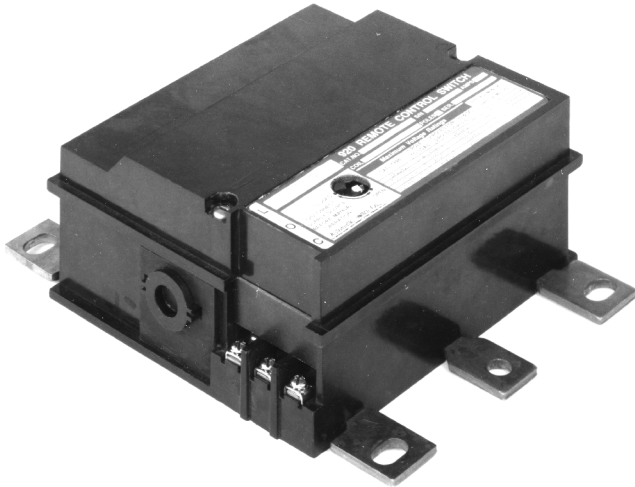


Installation Manual

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.

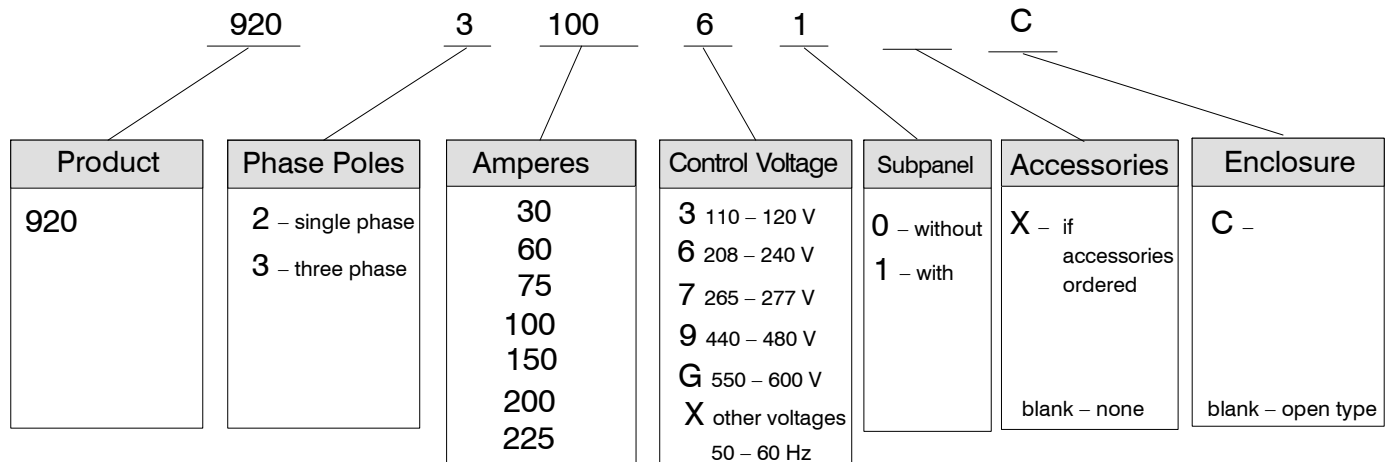
⚠ WARNING

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:



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.

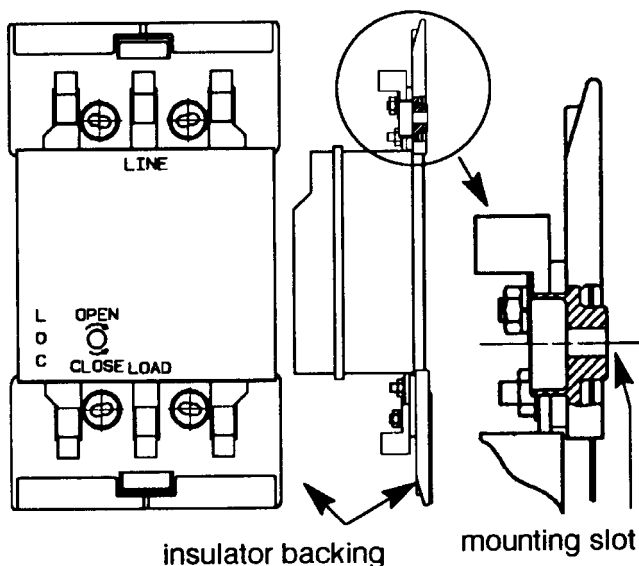


Figure 1. Required insulator bushings and backing insulators for RC Switches mounted on subpanels.

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) ¹ 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

¹ 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) ² 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

² 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.

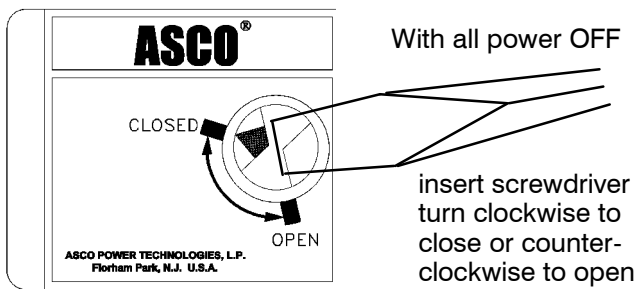


Figure 2. Socket in nameplate for manual operation **ALL POWER MUST BE OFF BEFORE TURNING !**

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 ³
	2 Pole	3 Pole		
30-100	331709	331703	331713	625549
150-225	331710	331704		

³ 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 V RC 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*.

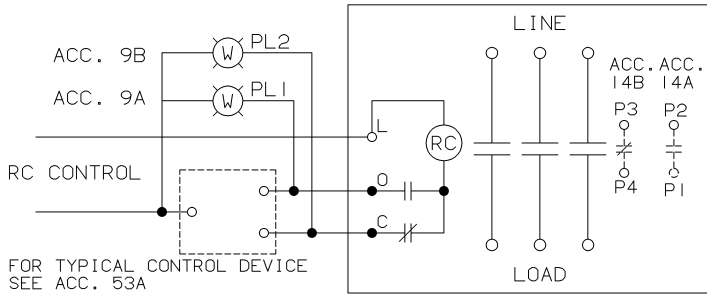
Acc.	Description	Kit
53A	momentary toggle switch with center-off position for 3-wire control	333275
53B	3-position selector switch (HOA) used with Acc. 47 for 2-wire control	333276
53C	maintained toggle switch used with Acc. 47 for 2-wire control	333277
53D	2 momentary toggle switches (1 normally closed,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



ACC. 14 AUXILIARY CONTACTS

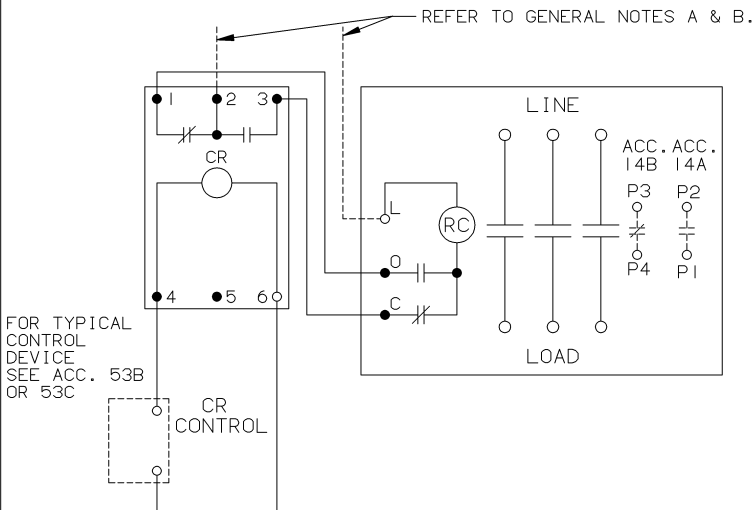
- ONE (1) ACC. 14A & ONE (1) ACC. 14B SUPPLIED.
- ACC. 14A-AUXILIARY CONTACT, P1/P2, CLOSED WHEN MAIN CONTACTS ARE CLOSED.
- RATED 10A AT 480V 60HZ, GENERAL USE.
- ACC. 14B-AUXILIARY CONTACT, P3/P4, CLOSED WHEN MAIN CONTACTS ARE OPEN.
- RATED 10A AT 480V 60HZ, GENERAL USE.

ACC. 22 NEUTRAL PLATE

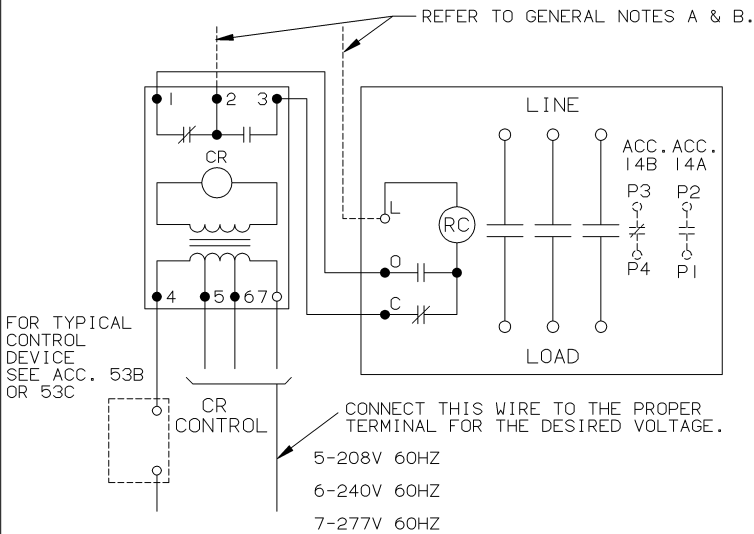
- SOLID NEUTRAL, FULL RATED TERMINALS AL-CU. MOUNTED ON ENCLOSED TYPES. SHIPPED LOOSE FOR OPEN TYPES.

ACC. 47 AUXILIARY RELAY FOR 2 WIRE CONTROL

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



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



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

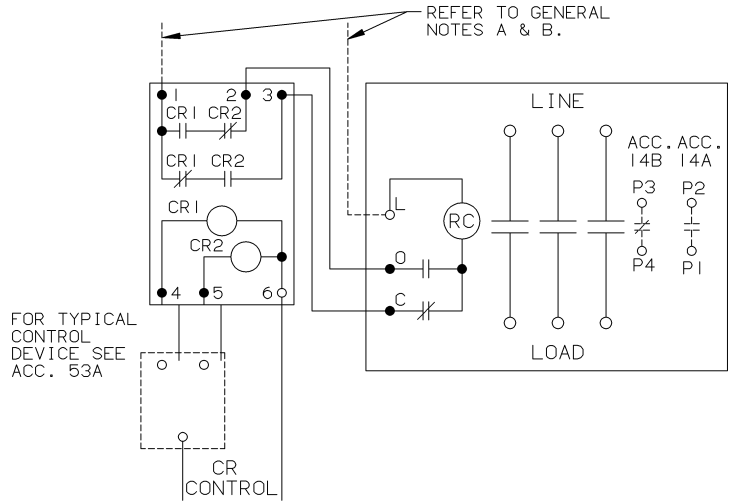
5-208V 60HZ

6-240V 60HZ

7-277V 60HZ

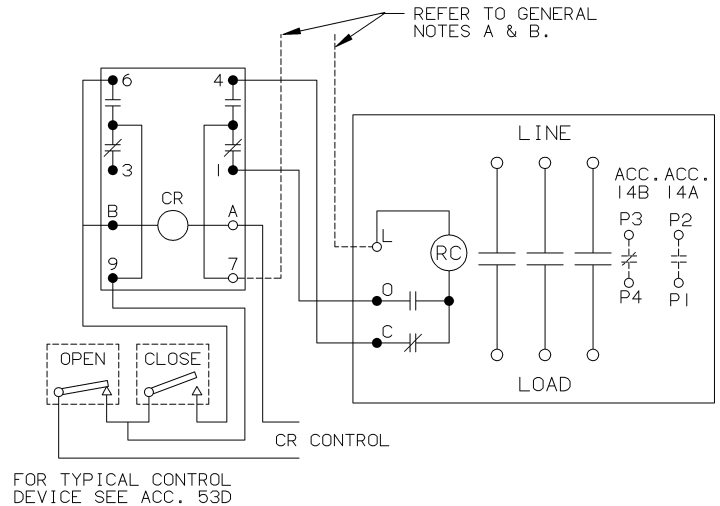
ACC. 48 AUXILIARY RELAY FOR 3 WIRE CONTROL

- 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



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

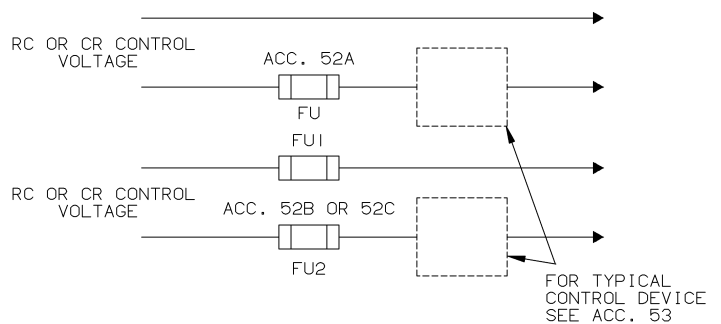


FOR TYPICAL CONTROL DEVICE SEE ACC. 53D

ACC. 52 CONTROL LINE FUSE(S)

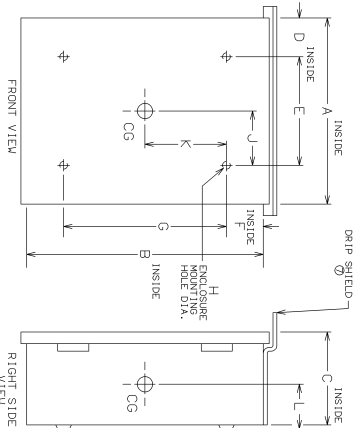
NOTES: INSTALLED AND CONNECTED ON ENCLOSED TYPES. SHIPPED LOOSE FOR OPEN TYPES.

- 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

NEMA TYPE 1 & 2 ENCLOSURES



NEMA TYPE 1 SURFACE MOUNTED, NEMA TYPE 1 FLUSH MOUNTED, NEMA TYPE 1 WITH GASKET, & NEMA TYPE 2 ENCLOSURES WITH 2 & 3 WIRE FUSED OR UNFUSED CONTROL OR FORM 3 CONTROL, OR WITH NEUTRAL PLATE ONLY.

AMP SIZE	DIMENSIONAL DATA												NET WEIGHT POUNDS (KG)	
	A	B	C	D	E	F	G	H	J	K	L	NEMA TYPE 1	NEMA TYPE 2	
30 TO 100	13.00	18.25	4.50	1.00	11.00	1.00	16.25	0.31	5.10	7.83	2.20	23.00	24.50	
	330.2	463.6	114.3	25.4	279.4	25.4	412.8	0.79	129.5	198.8	56.2	(10.4)	(11.1)	
150 TO 225	13.00	24.00	4.50	1.00	11.00	1.00	22.00	0.31	5.10	10.80	2.00	28.50	30.00	
	330.2	609.6	114.3	25.4	279.4	25.4	558.8	0.79	129.5	274.3	50.8	(12.9)	(13.6)	

SOUNDPROOF ENCLOSURES

NEMA TYPE 1 SURFACE MOUNTED, NEMA TYPE 1 FLUSH MOUNTED, & NEMA TYPE 1 WITH GASKET ENCLOSURES WITH 2 & 3 WIRE FUSED OR UNFUSED CONTROL OR FORM 3 CONTROL, WITH OR WITHOUT NEUTRAL PLATE.

AMP SIZE	DIMENSIONAL DATA												NET WEIGHT POUNDS (KG)	
	A	B	C	D	E	F	G	H	J	K	L	NEMA TYPE 1	NEMA TYPE 2	
30 TO 100	20.00	28.00	16.62	2.25	18.10	2.06	17.27	0.21	7.10	8.94	3.00	50.00	52.00	
	508.0	700.0	423.9	57.1	457.5	52.1	438.2	5.3	180.6	227.0	76.2	(22.7)	(23.6)	
150 TO 225	20.00	34.00	16.62	2.25	18.10	1.64	21.87	0.21	7.10	12.00	3.20	50.00	52.00	
	508.0	860.8	423.9	57.1	457.5	41.9	555.5	5.3	180.6	304.8	81.3	(22.7)	(23.6)	

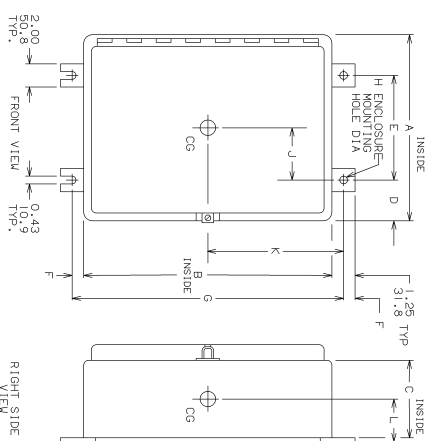
NOTES

- ENCLOSURES CONSTRUCTED IN ACCORDANCE WITH UL STANDARD 508 (ANSI C33.76-1971).
- MATERIAL-16 GAUGE (1.0598, 1.5 MM) SHEET STEEL
- STANDARD FINISH-LIGHT GRAY ANSI #61.
- SINGLE DOOR, HINGED ON RIGHT SIDE WITH PULL RING, FRICTION CATCH ON 30-100 AMP (13 X 18, 25 X 330, 2 X 463, 6 MM) SIZE AND KEY LOCKING PANEL BOARD CATCH ON 30-100 AMP (20,00 X 20,00, 508,0 X 508,0 MM) AND ALL 150-225 AMP SIZES.
- FULL WIRING CUTTERS AND 0.5 DIA., Ø12.7 MM PILEOT KNOCKOUT PROVIDED TOP AND BOTTOM.
- FLUSH MOUNTED ENCLOSURES HAVE REMOVABLE FLUSH DOOR TRIM, TRIM OVERLAYS 1,000, 25.4 MM ON ALL SIDES.
- NEMA TYPE 2 ENCLOSURES ARE PROVIDED WITH GASKETING AND TOP MOUNTED DRIP SHIELDS. PILEOT KNOCKOUTS PROVIDED IN BOTTOM ONLY.
- INSTALLATION MANUAL 381333-005, IS FURNISHED WITH EACH REMOTE CONTROL SWITCH. REFER TO THIS PUBLICATION PRIOR TO INSTALLATION AND OPERATION OF SWITCH.

SIZES OF UL LISTED SOLDERLESS SCREW TYPE TERMINALS FOR EXTERNAL LINE AND LOAD.

SWITCH RATING (AMPS)	RANGE OF AL-CU WIRE SIZES (LINE & LOAD)	RANGE OF CU WIRE SIZES (CONTROL CONNECTIONS L, O, & C)
30-100	ONE #14 TO #10 AVG	ONE #14 TO #10 AVG
150-225	ONE #6 AVG TO 350 MCM	ONE #14 TO #10 AVG

NEMA TYPE 3R, 4, & 12 ENCLOSURES



NEMA TYPE 3R, 4, & 12 ENCLOSURES WITH 2 AND 3 WIRE FUSED OR UNFUSED CONTROL, OR FORM 3 CONTROL, WITH OR WITHOUT NEUTRAL PLATE.

AMP SIZE	DIMENSIONAL DATA												NET WEIGHT POUNDS (KG)	
	A	B	C	D	E	F	G	H	J	K	L	NEMA TYPES 3R, 4, & 12	NEMA TYPE 12	
30 TO 100	20.00	20.00	6.00	1.00	14.00	0.62	21.25	0.43	7.00	10.73	3.00	50.00	52.00	
	508.0	508.0	152.4	25.4	355.6	15.7	532.8	10.9	177.8	272.3	76.2	(22.7)	(23.6)	
150 TO 225	20.00	24.00	5.00	1.00	14.00	0.62	25.25	0.43	7.00	12.73	3.00	61.25	62.75	
	508.0	609.6	127.0	25.4	355.6	15.7	641.4	10.9	177.8	323.3	76.2	(27.8)	(28.3)	

NOTES

- ENCLOSURES CONSTRUCTED IN ACCORDANCE WITH UL STANDARD 508 (ANSI C33.76-1971).
- MATERIAL-14 GAUGE (1.0747, 1.9 MM) SHEET STEEL WITH CONTINUOUSLY WELDED SEAMS
- STANDARD FINISH-LIGHT GRAY ANSI #61.
- SINGLE DOOR, HINGED ON LEFT SIDE WITH PARLOCK HASP, PLATED DOOR CLAMPS ON THREE (3) SIDES FOR NEMA TYPE 3R AND 4, AND ONE (1) SIDE FOR NEMA TYPE 12.
- FULL WIRING CUTTERS PROVIDED ON TOP AND BOTTOM.
- INSTALLATION MANUAL 381333-005, IS FURNISHED WITH EACH REMOTE CONTROL SWITCH. REFER TO THIS PUBLICATION PRIOR TO INSTALLATION AND OPERATION OF SWITCH.

FOR OPEN TYPE DIMENSIONS REFER TO COMPOSITE DRAWING J3531-951.

COMPUTER GENERATED DRAWING

ASCO®
ASCO Power Technologies, LP
FLOHAM PARK, NEW JERSEY 07932 U.S.A.

BY DATE	PROPERTY OF ASCO POWER TECHNOLOGIES.
JTT 4/283	USE PERMITTED FOR OUR WORK ONLY.
CR 4/283	ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.
CHKD BY	DATE
ENGR APPL	FIG 4/283

INCHES
MM



CATALOG NO. _____
TO **ASCO**® S. O. _____
DATE _____ BY _____

COMPOSITE OUTLINE AND MOUNTING DIMENSIONS FOR ENCLOSED TYPE

2 OR 3 POLE

ASCO® 220 REMOTE CONTROL SWITCHES

207167	SEE EGN. H	01/09/06	BMK
112512	SEE EGN. G	04/16/90	RJ
81344	SEE ER	10/17/84	FR
81352	SEE ER	2/24/84	FRS
79822	REWORKAN D	12/28/83	FRS
EX NO	LITER CHG	DATE	APPL
DS 331850			
CHK	H		