

150 A Two- and Three-Phase Series Multiple (Dual Voltage) Switches

GENERAL

The Cooper Power Systems 150 A externally operated Two- or Three-Phase series multiple (dual voltage) switch is used to change connection of de-energized transformer windings between series and parallel to provide different common transformer voltage ratios. They also make it possible to stock one transformer with voltage conversion capability. Using stacked multi-layer switches and auxiliary back switches, voltages such as 2400 V x 7620 V or 7200 V x 19920 V can be provided. Tri-voltage switches are also available.

Externally operable switches eliminate many of the hazards associated with manual internal tap changing of distribution transformers because line crews need not be exposed to high-voltage conductors and hot transformer fluids. They also eliminate the need to dismount pole-type transformers for voltage adjustment and prevent exposure of the transformer tank interiors to contamination. The switches are designed for use in distribution transformers filled with transformer oil, Envirotemp FR3 Fluid or an approved equivalent.

Series multiple (dual voltage) switches are available with lever, "T", or hotstick-operable handles. The lever handle has an indexing screw to ensure complete, positive switch contact. The spring-loaded padlockable handle is hotstick-operable. It allows greater leverage and provides positive indication of switch position.

The switch shaft is made of a high strength glass-reinforced nylon, and is sealed against leakage by two high temperature resistant Viton® O-rings. The switch body and rotor are made of glass-reinforced polyester. The spring tempered, high conductivity copper pinch-type rotor contacts, provide dependable self-cleaning action.



Figure 1.
150 A Externally Operated Series Multiple (Dual Voltage) Switches.

Series multiple (dual voltage) switches are available with either bolt tab or crimp terminals. Switches with crimp terminals have additional inboard tapped holes for making separate ring tongue connections without changing switch contacts. All terminals have hex recesses to hold $\frac{7}{16}$ inch hex bolt heads of standard $\frac{1}{4}$ inch hardware for fast, easy connections.

INSTALLATION

No special tools are required. The switch body is installed through a keyed 1.33 inch (34 mm) hole in the tank wall and sealed by an inside gasket. An outer sealing nut is tightened to a torque of 80 to 120 in-lbs. Refer to Installation Instruction Sheet S800-72-1 (5000050386) for details.

TABLE 1
Voltage Ratings and Characteristics

Description	kV
Standard Voltage Class	35 Max.
AC 60 Hz 1 Minute Withstand	50
BIL and Full Wave Crest (in both series and parallel positions)	150

Voltage ratings and characteristics are in accordance with IEEE Std C57.12™ standard.

TABLE 2
Current Ratings and Characteristics

Description	Amperes
Continuous	150 A rms series position 300 A rms parallel position

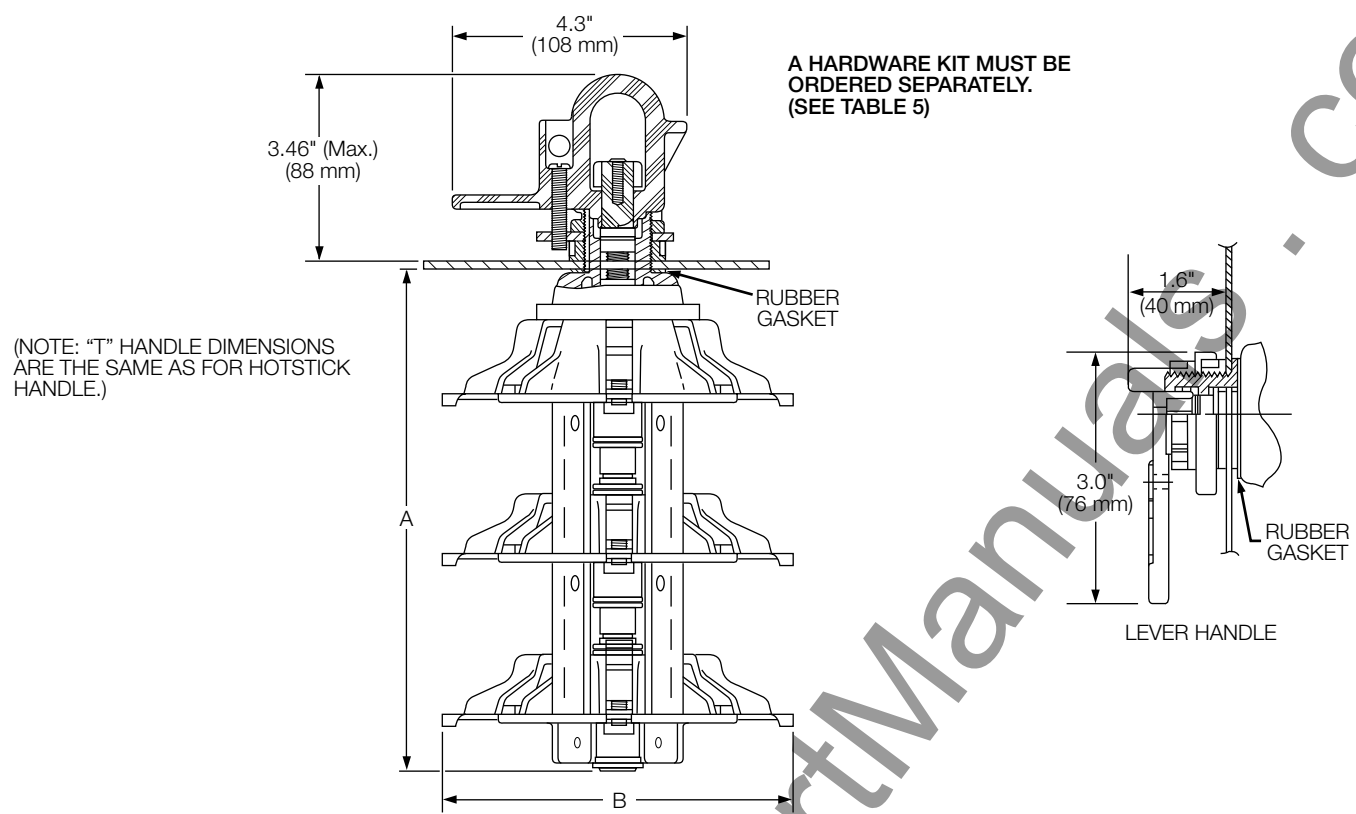


Figure 2. Series Multiple Switch. (Shown with Padlocked Hotstick Handle.)

Note: Dimensions given are for reference only.

TABLE 3 Multiple Switch Configurations

Switch Type	Dimensions-in./(mm)				
	A	B (w/Terminals)			
		Bolt Tab	Bolt Tab w/Stud	#14-16 #10-12 #8	#6
2-Phase Standard (2 Decks)	6.28	5.52	5.52	6.63	6.88
	(160)	(140)	(140)	(168)	(175)
3-Phase Standard (3 Decks)	9.12	5.52	5.52	6.63	6.88
	(232)	(140)	(140)	(168)	(175)
3-Phase With Back Decks (6 Decks)	16.1	5.52	5.52	6.63	6.88
	(409)	(140)	(140)	(168)	(175)
3-Phase Cover Mount (5 Decks) ^①	14.9	5.52	5.52	6.63	6.88
	(378)	(140)	(140)	(168)	(175)

① The upper two decks have no contacts – for spacing only.

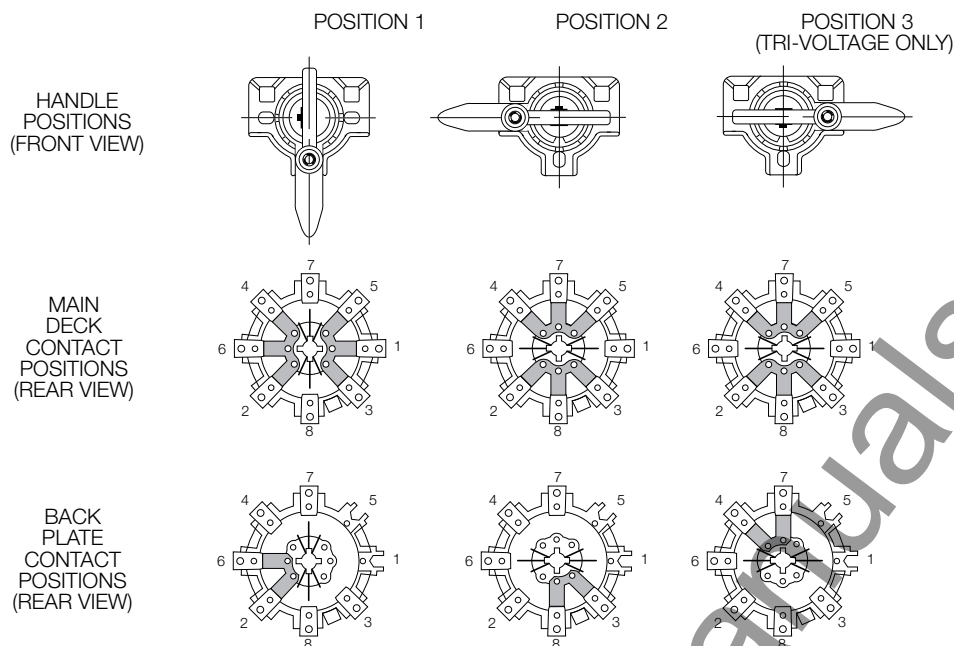


Figure 3.
Switch Contact Positions. (Typical switch shown. For specifics refer to Table 5.)

ORDERING INFORMATION

To order a Cooper Power Systems 150 A externally operated series multiple switch, specify one switch and one hardware kit from the charts on pages 3-4.

TABLE 4
Abbreviations and Definitions

"DV"	Dual Voltage, 6 or 8 Terminals, 2-3 Finger Contacts.	"1BP"	One Backplate at end of switch, 4 Terminals, 2 Finger Contacts.
"TV"	Tri-Voltage, 6 or 8 Terminals, 2-3 Finger Contacts.	"TD"	Terminal Deck, 2 Terminals (B.T.), w/o Rotor Assembly or Finger Contacts.
"BP"	Backplate (Backswitch), 4 Terminals, 2 Finger Contacts.	"CM/DV"	Cover Mounted Switch.
"DBP"	Double Backplate, 8 Terminals, 2-2 Finger Contacts.	"SP"	Special Switch with non-standard quantities and placements of terminals and contacts.
"2BP"	Two Backplates, 4 Terminals each, 2 Finger Contacts each.		

TABLE 5
Capwrench, Lever, Padlockable Hotstick Handle or "T" Handle Operated Series Multiple Switches[®]

Catalog Number		Switch Type [®]	Description		Contacts	No. of Terminals on Front Phase Deck	"N" Drawing No.
Switch Number	Hardware Kit ^{①②}	DV CM/DV TV	Phase	Bolt Tab Back Deck [®]	Bolt Tab w/Stud ^③		
			Two Three	BP, DBP, 1BP, SP	#14-16 #10-12 #8, #6		
2237266C01M 2237266C02M 2237266C03M 2237266C04M 2237266C05M	Hotstick Handle 2237947A07 or "T" Handle 2237947A74	DV DV DV DV DV	2Ø 2Ø 2Ø 2Ø 2Ø	— — — — —	Bolt Tab #14 - 16 #10 - 12 #8 #6	6 6 6 6 6	599
2237266C51M 2237266C52M 2237266C53M 2237266C54M 2237266C55M	Hotstick Handle 2237947A07 or "T" Handle 2237947A74	DV DV DV DV DV	2Ø 2Ø 2Ø 2Ø 2Ø	— — — — —	Bolt Tab #14 - 16 #10 - 12 #8 #6	8 8 8 8 8	599
2237914C01M 2237914C02M 2237914C03M 2237914C04M 2237914C05M 2237914C16M	Lever Handle 2237947A08 ^④	DV DV DV DV DV DV	3Ø 3Ø 3Ø 3Ø 3Ø 3Ø	BP BP BP BP BP BP	Bolt Tab #14 - 16 #10 - 12 #8 #6 Bolt Tab w/Stud ↗	6 6 6 6 6 6	879
2237560C01M 2237560C06M 2237560C51M 2237560C56M	Lever Handle 2237947A08 ^④	DV DV DV DV	3Ø 3Ø 3Ø 3Ø	SP SP SP SP	Bolt Tab Bolt Tab w/Stud ↗ Bolt Tab Bolt Tab w/Stud ↗	6 6 8 8	788

Note: For associated number notes please see bottom of page 4.

TABLE 5 (Continued)

Capwrench, Lever, Padlockable Hotstick Handle or "T" Handle Operated Series Multiple Switches^⑤

Catalog Number		Switch Type ^⑥	Description		Contacts	No. of Terminals on Front Phase Deck	"N" Drawing No.
Switch Number	Hardware Kit ^{①②}	DV CM/DV TV	Phase	Back Deck ^③	Bolt Tab Bolt Tab w/Stud ^④		
			Two Three	BP, DBP, 1BP, SP	#14-16 #10-12 #8, #6		
2237510C01M	Hotstick Handle 2237947A06 or "T" Handle 2237947A73	TV	2Ø	SP	Bolt Tab	8	755
2237265C01M 2237265C02M 2237265C03M 2237265C04M 2237265C05M 2237265C16M	Hotstick Handle 2237947A04 or "T" Handle 2237947A70	DV DV DV DV DV DV	3Ø 3Ø 3Ø 3Ø 3Ø 3Ø	— — — — — —	Bolt Tab #14 - 16 #10 - 12 #8 #6 Bolt Tab w/Stud ^④	6 6 6 6 6 6	601
2237265C51M 2237265C52M 2237265C53M 2237265C54M 2237265C55M 2237265C56M	Hotstick Handle 2237947A04 or "T" Handle 2237947A70	DV DV DV DV DV DV	3Ø 3Ø 3Ø 3Ø 3Ø 3Ø	— — — — — —	Bolt Tab #14 - 16 #10 - 12 #8 #6 Bolt Tab w/Stud ^④	8 8 8 8 8 8	601
2237403B01M 2237403B02M 2237403B03M 2237403B04M 2237403B05M 2237403B16M	Hotstick Handle 2237947A05 or "T" Handle 2237947A72	DV DV DV DV DV DV	3Ø 3Ø 3Ø 3Ø 3Ø 3Ø	BP BP BP BP BP BP	Bolt Tab #14 - 16 #10 - 12 #8 #6 Bolt Tab w/Stud ^④	6 6 6 6 6 6	602
2237403B51M 2237403B52M 2237403B53M 2237403B54M 2237403B55M 2237403B66M	Hotstick Handle 2237947A05 or "T" Handle 2237947A72	DV DV DV DV DV DV	3Ø 3Ø 3Ø 3Ø 3Ø 3Ø	BP BP BP BP BP BP	Bolt Tab #14 - 16 #10 - 12 #8 #6 Bolt Tab w/Stud ^④	8 8 8 8 8 8	602
2237403B06M 2237403B07M 2237403B08M 2237403B09M 2237403B10M 2237403B11M	Hotstick Handle 2237947A05 or "T" Handle 2237947A72	DV DV DV DV DV DV	3Ø 3Ø 3Ø 3Ø 3Ø 3Ø	DBP DBP DBP DBP DBP DBP	Bolt Tab #14 - 16 #10 - 12 #8 #6 Bolt Tab w/Stud ^④	6 6 6 6 6 6	602
2237403B56M 2237403B57M 2237403B58M 2237403B59M 2237403B60M 2237403B61M	Hotstick Handle 2237947A05 or "T" Handle 2237947A72	DV DV DV DV DV DV	3Ø 3Ø 3Ø 3Ø 3Ø 3Ø	DBP DBP DBP DBP DBP DBP	Bolt Tab #14 - 16 #10 - 12 #8 #6 Bolt Tab w/Stud ^④	8 8 8 8 8 8	602
2237908C01M	Hotstick Handle 2237947A05 or "T" Handle 2237947A72	DV	3Ø	SP	Bolt Tab	8	877
2237586C01M	Hotstick Handle 2237947A05 or "T" Handle 2237947A72	DV	3Ø	SP	Bolt Tab	6	800
2237467C01M 2237467C02M 2237467C03M 2237467C51M	Hotstick Handle 2237947A04 or "T" Handle 2237947A70	CM/DV CM/DV CM/DV CM/DV	3Ø 3Ø 3Ø 3Ø	— — — —	Bolt Tab #14 - 16 #10 - 12 Bolt Tab	6 6 6 8	759
2237404B01M 2237404B02M 2237404B03M 2237404B04M 2237404B05M	Hotstick Handle 2237947A03 or "T" Handle 2237947A71	TV TV TV TV TV	3Ø 3Ø 3Ø 3Ø 3Ø	BP BP BP BP BP	Bolt Tab #14 - 16 #10 - 12 #8 #6	6 6 6 6 6	604
2237404B51M 2237404B52M 2237404B53M 2237404B54M 2237404B55M	Hotstick Handle 2237947A03 or "T" Handle 2237947A71	TV TV TV TV TV	3Ø 3Ø 3Ø 3Ø 3Ø	BP BP BP BP BP	Bolt Tab #14 - 16 #10 - 12 #8 #6	8 8 8 8 8	604

^① Hardware Kits are not included with the switch, Hardware Kits must be ordered separately.^② Actuating devices are included in the Hardware Kits.^③ Bolt Tab w/Stud (1/4-20 threaded stud).^④ Add "P" to end of the part number to make lever handle padlockable.^⑤ For configuration not found, consult with your factory representative.^⑥ For abbreviations and definitions see Table 4.

© 2008 Cooper US, Inc.

Envirotemp and FR3 are valuable trademarks of Cooper US, Inc., in the U.S. and other countries. You are not permitted to use the Cooper Trademarks without the prior written consent of Cooper US, Inc.

Viton® is a registered trademark of E.I. DuPont Demours & Company

IEEE Std C57.12 standard is a trademark of the Institute of Electrical and Electronics Engineers, Inc., (IEEE). This publication/product is not endorsed or approved by the IEEE.


COOPER Power Systems
2300 Badger Drive
Waukesha, WI 53188 USA
www.cooperpower.com