

# 3:1 Dual Voltage Switch

Central Moloney, Inc.  
Components Operation

An ISO 9002 Certified Company

## Product Data Sheet

File No.	PDS1001	Revised	March 1, 1995
Availability	Immediate	Country	USA

## 3:1 Dual Voltage Switch

Central Moloney Components Operation is pleased to present a versatile, heavy duty 3:1 Dual Voltage Switch. Extensive R & D efforts went into reducing the size of this switch requiring less tank height and oil.

### Material

This switch features a body and rotor molded from a 30% fiberglass filled thermoplastic polyester resin. The same as used for years for DV switches, tap changers and many other transformer products.

### Features

1. Small physical size 4.38" diameter by 3.39" projection into tank (single deck). The three deck (three phase) version projects into the tank 8.39". The small size of this switch will, in many cases, allow a reduction in tank diameter, tank height and volume of oil. All of these reductions mean less shipping weight.
2. Self cleaning, wiping type contacts.

3. Double "O" ring shaft seal.

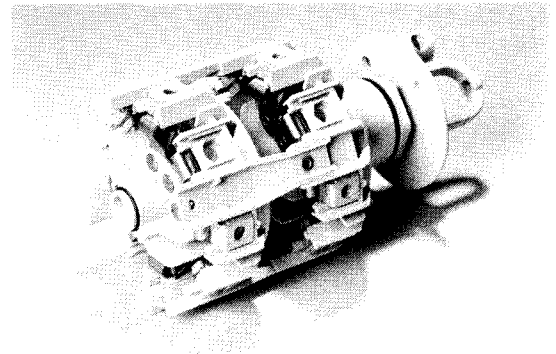
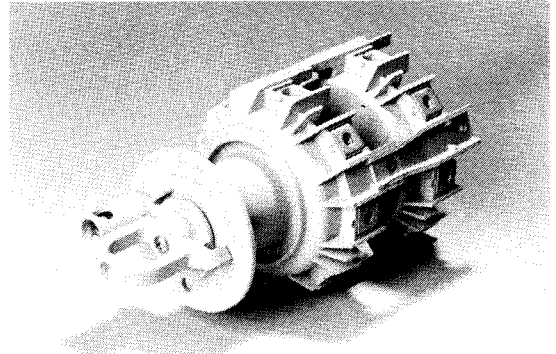
4. Cupped flange gasket seal.

5. Molded position indicator plate. The series and parallel voltage is molded on the face of the plate in bold characters.

6. The bodies and rotors are designed to be ganged for other ratios and three phase applications.

7. The switch bodies, rotors, handle, position indicator plate and mounting nut are molded from engineering thermoplastic.

8. The stationary contacts are made of copper and are equipped with a .25"-20-2B steel nut. The nut is held



captive by the contact. All that is required to make a connection to the switch is a .25"-20 screw and washer. The stationary contacts are easily removable or replaceable.

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## Electrical Rating (under oil)

150 Amperes Continuous Series Position

300 Amperes Continuous Parallel Position

Impulse Level 150 KV Full Wave (except 115 KV between adjacent contacts)

60 HZ Withstand 50 KV 1 minute

Momentary Current: 25 Times Rated For 2 Seconds - 3750 Amps

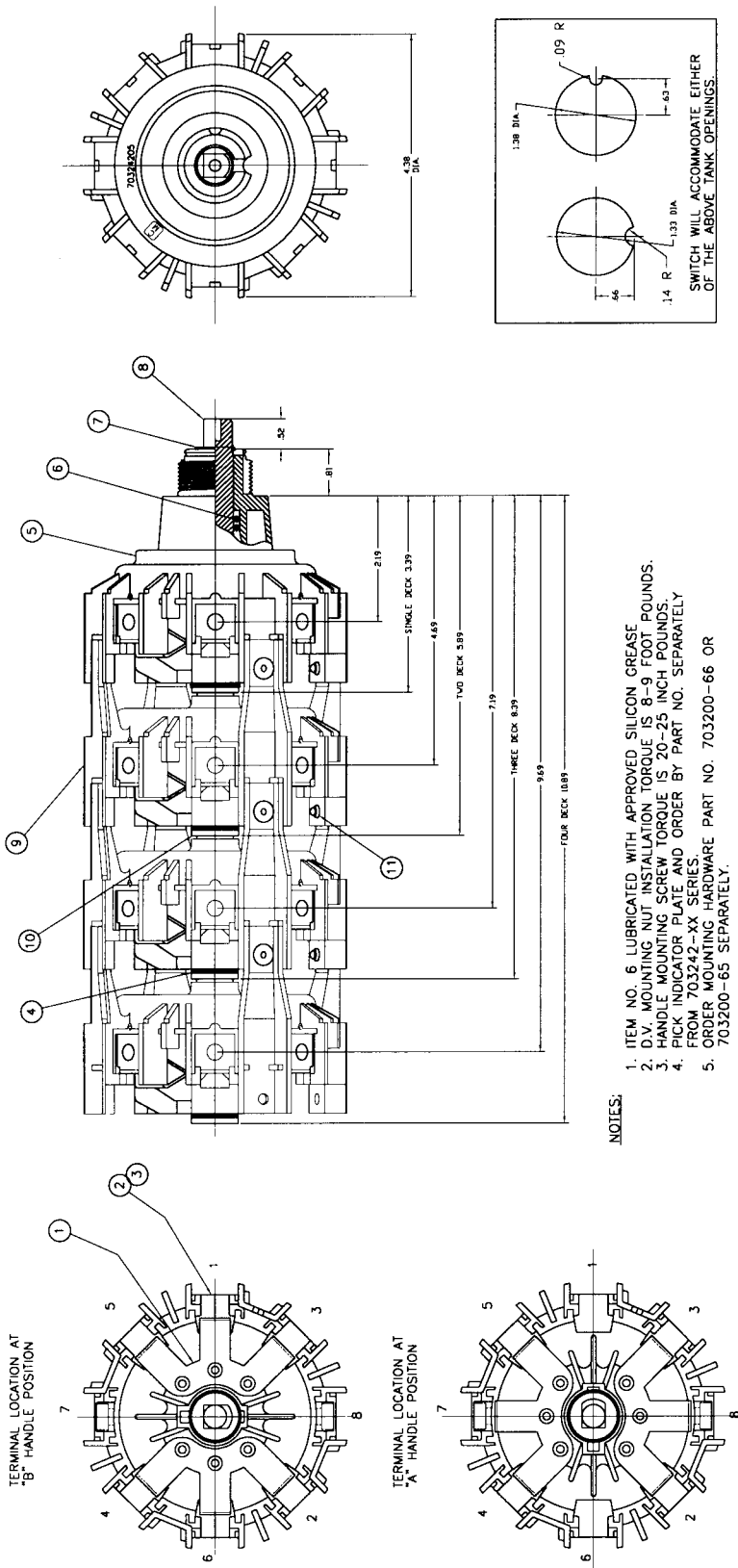
50 Times Rated For 0.5 Seconds - 7500 Amps

## Typical Application

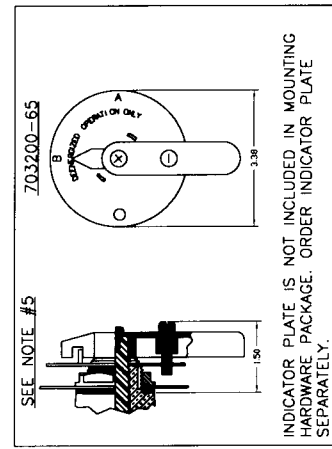
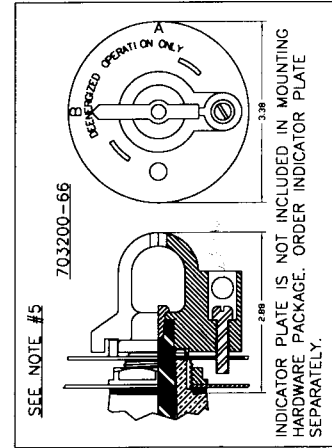
RATIO	VOLTAGE	SINGLE PHASE P/N	THREE PHASE P/N
2:1	2400 x 4800 7200 x 14400	703242-50 (Single Deck)	703244-50 (Three Deck)
2:1	4800 x 7200 7200 x 12470 7620 x 13200	703242-50 (Single Deck)	703244-50 (Three Deck)
3:1	2400 x 7200 4800 x 14400	703242-50 (Single Deck)	703244-50 (Three Deck)
3:1	2400 x 6930 4160 x 12000 4800 x 13800	703243-75 (Single Deck With Back Switch)	703246-50 (Three Deck With 3 Back Switches)
3:1	2160 x 7200 2400 x 7620 4160 x 13800	703243-75 (Single Deck With Back Switch)	703246-50 (Three Deck With 3 Back Switches)
8:1	2400 x 19200	703245-50 (4 Deck)	

Fuse switching schemes vary greatly depending on winding arrangements and fuse applications. Except for 2 to 1 ratios, an additional set of back switch contacts is generally required for each phase. Specify part # 703243-60 (single phase) or Part # 703246-60 (three phase) for double back switches.

# 3:1 Dual Voltage Switch - Mechanical Characteristics



- NOTES:
- ITEM NO. 6 LUBRICATED WITH APPROVED SILICON GREASE
  - D.V. MOUNTING NUT INSTALLATION TORQUE IS 8-9 FOOT POUNDS.
  - HANDLE MOUNTING SCREW TORQUE IS 20-25 INCH POUNDS.
  - PICK INDICATOR PLATE AND ORDER BY PART NO. SEPARATELY FROM 703242-XX SERIES.
  - ORDER MOUNTING HARDWARE PART NO. 703200-66 OR 703200-65 SEPARATELY.



ASSY. NO.	1	2	3	4	5	6	7	8	9	10	11	SINGLE DECK	TWO DECKS	THREE DECKS	FOUR DECKS
-4250	1	6	6	1	1	2	1	1	1	1	1				
-4350	2	12	12	2	1	2	2	1	1	1	1				
-4450	3	18	18	3	1	2	3	1	2	2	2				
-4550	4	24	24	4	1	2	4	1	3	3	3				
	ROTOR ASSEMBLY WITH W. CONTACTS 703242-87	STATIONARY CONTACT 703242-00	250°-20 STEEL NUT 200000-01	O-RING ROTOR ASSY. RETAINER 200035-42	SWITCH BODY W/GLAND 703242-05	O' RING VITON 200035-36	O' RING SHAFT RETAINER 200035-26	DRIVE SHAFT 703242-07	SWITCH BODY W/O GLAND 703242-08	DRIVEN SHAFT 703242-08	RIVET (ALUMINUM) 700003-66				

# 3:1 Dual Voltage Switch - Certified Test Results

Listed below are the results of tests performed to date on the 70324X-XX Series Dual Voltage Switch. Assemblies #703242-50 (Single Deck), #703243-50 (Two Deck), and #703243-75 (Single Deck With Back Switch) were tested. Dielectric Tests were performed with the switches mounted in an oil-filled tank. Each test was performed on ten switches, with the lowest failure voltage recorded.

## Impulse Withstand,

1.2 x 50 Full Wave	Pass, KV	Fail, KV
Between adjacent contacts	115	125
Across rotor, parallel connection	185	199
All contacts to ground	238	-
Phase to phase	207	214

## 60 HZ Applied Voltage

Withstand, One Minute	Pass, KV	Fail, KV
Between adjacent contacts	40	41
Across rotor	50	60.5
All contacts to ground	50	65
Phase to phase	50	63

## Thermal Cycle Test

Ten switches were thermal cycled ten times, two hours at 140°C followed by two hours at -40°C for each cycle. Five were mounted in plates for the test. All were inspected and leak tested, with no damage or leaks found.

## Fault Current Withstand

A switch was mounted in an oil-filled tank, switched to the series position, and fault current was circulated through the contacts. A current of 3833 Amperes RMS (25.5 times rated current) was applied, five times at 15 cycles duration and once at two seconds duration. On two tests the peak asymmetrical current, first half cycle, was 9080 amperes. The contacts were not damaged by this test.

## Mechanical Tests:

### Gasket Compression

Ten switches were mounted on test plates and the mounting nuts tightened to attain 35 percent gasket compression. In each case the measured torque was 60 inch pounds (5 foot pounds).

### Mounting Nut Torque Withstand

Ten switches were mounted on test plates and tightened to failure. Threads stripped at 25 to 35 foot pounds torque.

### Torque To Break Shaft Or Operating Handle

Six operating handles were mounted on switch shafts, the opposite end of the shafts held firmly, and torque was applied to the handles. Shafts broke at 17.5 to 23 foot pounds.

### Torque To Break Indicator Plate

Ten switch assemblies without contact were mounted in test plates and the operating handles turned against the indicator plate stops to failure. The nib keying the plate to the switch gland sheared off at 8 to 12 foot pounds.

### Tensile Force To Break Handle

Three switches were mounted in a test fixture and tensile force applied to the operating handle to failure. The handles broke at 293 to 345 pounds pull.

### Cantilever Force To Break Shaft

Three switch assemblies were mounted in a test fixture and cantilever force was applied to the remote end of the hookstick eye of the operating handle. The shafts broke at 264 to 274 pounds force.

### Torque Withstand Of Ganging Bars

Three 2-deck switches were mounted in test plates and torsional force was applied to the back deck to cause failure of the ganging bars. The bars cracked at 110 to 120 foot pounds. Two switches were baked 10 hours at 145°C to simulate a transformer dryout cycle and tested as above. Failure occurred at 90 to 95 foot pounds.

### Resistance To Torsional Deflection

Two 6-deck switches without contacts were mounted on test plates and torque was applied to the back deck body to produce 5 degrees misalignment between front and back decks. Clockwise and counterclockwise torsion was applied to each switch. Five degrees misalignment occurred at 17 to 23 foot pounds applied torque.

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