

INTRODUCTION

CAM OPERATED ROTARY SWITCHES are defined as set of contacts arranged to make and break in a sequential fashion by which the connected outputs will either close or open the circuits.

The main areas of operation are in making, breaking and isolation of power circuits and switching of auxiliary circuits.

The Cam which does the function of closing & opening of the contacts have multiple positions (Rotary Movement) which allows multiple circuit functions controlled through a single operation.

These switches are suitable for AC as well as DC applications. By virtue of CAM design functions like Make Before Break type of contacts can be easily achieved. The number of positions and the switching angle are flexible and will offer the user a choice to decide based on the requirement.

Another advantage, which can be derived, is the flexibility in the Contact block selection, which gives the user the option to select the number of contacts as per his requirement. The choice also covers the rating of the applicable Operational Duty. This will ensure that the right switch is chosen for the application. CAM operated rotary switches also offers design flexibility to assemble complex switching programmes to customize any switching application.

The basic operating mechanism of these switches depends on the type of application. Quick-Make, Quick-Make-Quick-Break and Spring return operating mechanisms can be chosen.

Usage of high quality engineering materials for various components ensure that the switches have long life with higher degree of Electrical and Mechanical endurance. Double Butt contacts with silver bimetals on copper ensure better making and breaking over conventional knife-edge switches. Usage of high-grade engineering plastics like Nylon and Celcon for the components and glass filled polyamide construction provides greater mechanical strength to the switches.

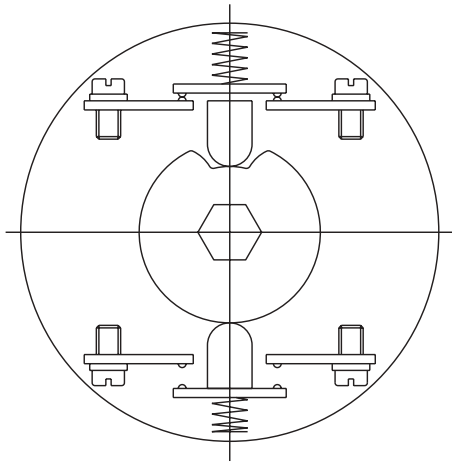
These Cam operated rotary switches have versatile mounting options to suit any kind of application. Special mounting options like single hole, door interlocking and padlocking are also available.

Greater importance is attached to the aesthetics of the switches. These switches come with attractive combination of knobs and front plates to render greater compatibility to the panel design. User defined marking on the script plate with different sizes of script plates eliminate the need to label the switch on the panel.

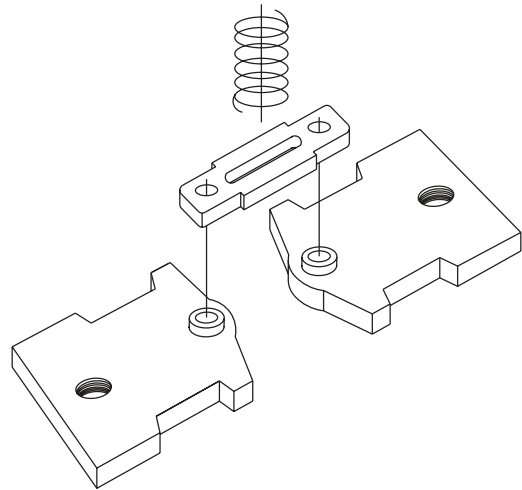
The enclosed sheets will give an indepth view into the various types of switches, Mountings, Switching Programmes, Optional Accessories and the Ordering procedure for **CAM OPERATED ROTARY SWITCH**.

CONTENTS

GENERAL CONSTRUCTION-S,TP & RT SERIES



CAM ASSEMBLY



CONTACT ASSEMBLY

Salzer switches S, TP & RT series are designed to accommodate two isolated Double break silver alloy contacts per stage at 180 degree disposition. AC Switches are characterised by "Quick make-slow break" action by the inbuilt feature in our latching device and cam construction, these switches can be applied for DC Switching also by Derating and by adding additional contacts in series according to the DC Switching voltage.

Contacts : Double break Type AgCdO

Insulation : Glass Filled polyamide with High Tracking Index

Operating Temp : -25°C to 55°C

Operating Frequency : Upto 10KHz

Humidity 95% Rh : 48 hours

S SERIES STANDARD



- * Available from 6 to 400 Ampere
- * Open Terminals for easy Accessibility

TP SERIES TOUCH PROOF



- * Available from 6 to 16 Ampere
- * Touch Proof (Finger Protected) Terminals (IP20)

RT SERIES REAR TERMINATION



- * Available from 16 to 63 Ampere
- * Rear Facing Terminals for convenient Access
- * Touch Proof (Finger Protected) Terminals (IP20)

AC Duty Rating

DC Duty Rating

Category	Typical AC Application	Category	Typical DC Application
AC-1	Non-Inductive or slightly Inductive Loads, Resistance furnaces.	DC-1	Non-Inductive or slightly Inductive Loads, Resistance furnaces.
AC-3	Squirrel-cage motors : starting switching Off motors during Running.	DC-22	Switching of resistive loads, Including moderate overloads
AC-15	Control of AC electromagnetic loads	DC-13	Control of DC electromagnets
AC-21A	Switching of resistive loads, Including moderate overloads (frequent switching)	DC-23	Switching of motor loads or other highly inductive loads
AC-23-A	Switching of motor loads or other highly inductive loads (frequent switching)	----	-----

TECHNICAL SPECIFICATION

AC RATING CODE	UNIT	S6 TP6	S10 TP10	S16 TP16	RT16	RT20	S25 RT25	S32 RT32	S40 RT40	S63 RT63	S80	S100	S125	S200	S400
Rated Operational Current (Ie) AC21A / AC1	A	6	10	16	16	20	25	32	40	63	80	100	125	200	320
Rated Operational Voltage (Ue)	V	440	440	690	690	690	690	690	690	690	690	690	690	690	690
Isolating Voltage upto (Uiso)	V	250	250	415	415	415	415	415	500	500	690	690	690	690	690
Impulse withstand Voltage (Uimp)	kV	4	4	6	6	6	6	6	6	6	6	6	6	6	6
Rated Uninterrupted Current (Ith)	A	8	12	20	20	25	32	40	50	80	100	125	150	225	425
Rated Operational Power															
AC23A 3 Phase	KW	1	1.8	3	3	3	5.5	7.5	11	15	22	30	31	37	-
380-440 V	KW	2.2	3	7.5	7.5	7.5	11	15	18.5	22	33	41	45	55	-
500-690 V	KW	-	-	7.5	7.5	7.5	11	15	18.5	22	30	37	41	45	-
AC3 3 Phase	KW	0.25	0.37	0.55	0.55	0.55	1.5	2.2	2.5	3	-	-	8.3	-	-
220-240 V	KW	0.8	1.5	2.2	2.2	2.2	4	5.5	7.5	15	18.5	22	17.2	22	-
380-440 V	KW	1.5	3	5.5	5.5	5.5	7.5	11	15	18.5	22	33	37	45	-
500-690 V	KW	-	-	5.5	5.5	5.5	7.5	11	15	18.5	22	33	37	45	-
Short Circuit Capacity															
Fuse Size (Type gG/gM)	A	6	10	16	16	20	25	32	40	63	80	100	125	200	400
Rated Fuse Short Circuit Current	KA	3	3	5	5	5	10	10	20	20	25	25	25	25	50
DC Rating															
DC1 (Power)	A	6	10	16	16	20	25	32	40	63	80	100	125	160	250
DC13 (Control)	A	4	6	16	16	20	25	32	40	63	80	100	125	160	250
Terminal Cross Section															
Single / Multiple	mm ²	0.7	0.7	1.5	1.5	1.5	1.5	2.5	2.5	4	6	10	10	10	20
min	mm ²	1.5	1.5	4	4	4	4	6	10	16	25	35	50	70	140
max	mm ²	0.7	0.7	1	1	1	1	1.5	2.5	2.5	6	10	10	10	20
Fine strand with sleeve	mm ²	1.5	1.5	2.5	2.5	2.5	2.5	4	6	10	16	25	35	50	100
Terminal screw	Metric	M3	M3	M3.5	M3.5	M3.5	M4	M4	M5	M5	2xM5	2xM5	2xM5	M10	M10
Terminal Tighting Torque	Nm	0.5	0.5	0.8	0.8	0.8	1.2	1.2	2	2	2.5	2.5	2.5	2.5	4

Switch Life (Under standard Operating conditions) Mechanical Life : 1 lac Operations @ 300 cycles / hour

Electrical Life : 10,000 Operations at 100 % Rated duty at 120 cycles / hour

CSA/UL RATINGS

AC Rating Code	Unit	S6	S10	S16 TP16 RT16	RT20	S25 TP25 RT25	S32 TP32 RT32	S40 RT40	S63 RT63	S80	S100	S125	S200
Ampere Rating	A	6	10	15	20	20	30	40	55	70	95	125	175
Operational Voltage	V	300	300	300	440	600	600	600	600	600	600	600	600
HP Rating 1 Phase 120V	HP	0.25	0.33	0.33	0.33	1	1	2	3	-	-	-	-
240V	HP	0.5	0.75	1	1	3	3	5	7.5	-	-	-	-
3 Phase 120V	HP	0.75	1	1	1	2	2	5	7.5	10	15	15	20
240V	HP	1	1	2	2	5	5	10	15	20	25	25	25
480V	HP	-	-	-	-	10	10	20	30	40	50	50	50
600V	HP	-	-	-	-	15	15	24	40	50	50	50	50

Note :- AC4 Rating = AC3 rating / 2

Star Delta Switch Rating = 1.6 X AC3 rating



European : IEC-60947-1 : 1988
IEC-60947-3 : 1990
IEC-60947-5 : 1992

North American : CSA 22.2 No.14-1991
UL 508 (1994)

Indian : IS 13947-1/3/5, 1993

ISOLATORS-ON/OFF SWITCHES

ISOLATORS:

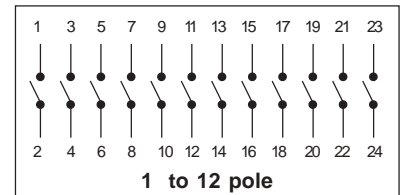
Isolators which are ON/ OFF switches are used for making/breaking electrical circuits for isolation purpose. In rotary switches isolators are offered in very compact versions from 1 pole to 12 pole for multiple circuit isolation. The duty category utilisation of the isolators are categorized as AC1/AC21 for higher duty like motor duty operation the rating AC3/AC23 should be considered

Isolators can be offered with stayput /spring return and preclose contacts for neutral & earth closing applications.

Application: Isolation of Main,Control & Instrumentation circuits also for motor ON / OFF & Machine tool main incomer isolation



CONNECTING DIAGRAM



STAYPUT

Script Plate Marking	60 Degree	90 Degree	90 Degree Complete Rotation	
Description	Programme Code	Programme Code	Programme Code	No of Stage
1 Pole	61001	61191	61195	1
2 Pole	61002	61192	61198	1
3 Pole	61003	61199	61197	2
4 Pole	61004	61194	61196	2
5 Pole	61005	-	-	3
6 Pole	61006	61906	-	3
7 Pole	61007	-	-	4
8 Pole	61008	-	-	4
9 Pole	61009	-	-	5
10 Pole	61010	-	-	5
11 Pole	61011	-	-	6
12 Pole	61012	-	-	6

Feasible Ampere. Rating : 6,10,16,25,32,40,63,80,100,125,200 & 400 Amps

ISOLATORS WITH PRECLOSE CONTACT

90 Degree	4 to 5 pole	
	2 4 6 8 10	2 4 6 8
	61194	
Description	Programme code	No of Stage
4 Pole - 1 Pole Preclose	61194	2
4 Pole - 3 Pole Preclose	61904	2
5 Pole - 3 Pole Preclose	61905	3
3 Pole with Neutral Terminal	61178	2
Feasible Ampere. Rating :		
6,10,16,25,32,40,63,80,100,125,200 & 400 Amps		

SPRING RETURN ISOLATORS 45 Degree

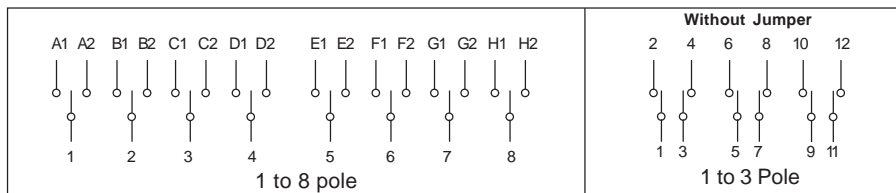
45 Degree Spring Return to OFF	1 to 4 pole	
	2 4 6 8	
	61194	
Description	Programme code	No of Stage
1 Pole Spring Return	61351	1
2 Pole Spring Return	61352	1
3 Pole Spring Return	61353	2
4 Pole Spring Return	61354	2
Feasible Ampere. Rating :		
6,10,16,25,32,40 & 63 Amps		

CAM OPERATED ROTARY SWITCHES

CHANGEOVER PROGRAMMES WITH OFF



CONNECTING DIAGRAM



STAYPUT

60 Degree			90 Degree	
Description	Programme code	No of Stage	Description	Programme code
1 pole	61025	1	1 pole	61151
2 pole	61026	2	2 pole	61152
3 pole	61027	3	3 pole	61153
4 pole	61028	4	4 pole	61154
5 pole	61029	5	-	-
6 pole	61030	6	-	-
7 pole	61031	7	-	-
8 pole	61032	8	-	-
Feasible Ampere Rating: 6,10,16,25,32,40,63,80,100,125,200 & 400 Amps				

SPRING RETURN

45 Degree Spring Return to 0			Spring Return from 1 to 0	
Description	Programme code	No of Stage	Description	Programme code
1 pole	61361	1	1 pole	61364
2 pole	61362	2	2 pole	61365
3 pole	61363	3	3 pole	61369
Feasible Ampere Rating: 6,10,16,25,32,40 & 63 Amps				

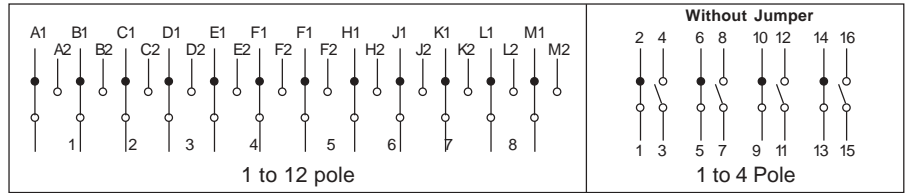
WITHOUT JUMPER

60 Degree Stayput without Jumper			45 Degree Spring return without Jumper	
Description	Programme code	No of Stage	Description	Programme code
1 pole without jumper	62625	1	1 pole without jumper	61761
2 pole without jumper	61626	2	2 pole without jumper	61762
3 pole without jumper	61627	3	-	-
Feasible Ampere Rating: 6,10,16,25,32,40,63,80,100,125,200 & 400 Amps			Feasible Ampere Rating: 6,10,16,25,32,40 & 63 Amps	

CHANGEOVER PROGRAMMES WITHOUT OFF



CONNECTING DIAGRAM



STAYPUT

90 Degree Complete Rotation			60 Degree		
Description	Programme code	No of Stage	Description	Programme code	No of Stage
1 pole	61037	1	5 pole	61041	5
2 pole	61038	2	6 pole	61042	6
3 pole	61039	3	7 pole	61043	7
4 pole	61040	4	8 pole	61044	8
--	--	--	9 pole	61045	9
--	--	--	10 pole	61046	10
--	--	--	11 pole	61047	11
--	--	--	12 pole	61048	12
Feasible Ampere Rating Applicable : 6,10,16,25,32,40,63,80,100,125,200 & 400 Amps					

SPRING RETURN

45 Degree Spring Return		
Description	Programme code	No of Stage
1 pole	61371	1
2 pole	61372	2
3 pole	61373	3
Feasible Ampere Rating: 6,10,16,25,32,40 & 63 Amps		

WITHOUT JUMPER

90 Degree Stayput without Jumper			45 Degree Spring return without Jumper	
Description	Programme code	No of Stage	Description	Programme code
1 pole without jumper	61637	1	1 pole without jumper	61771
2 pole without jumper	61638	2	-	-
3 pole without jumper	61639	3	-	-
4 pole without jumper	61640	4	-	-
Feasible Ampere Rating :			Feasible Ampere Rating :	
6,10,16,25,32,40,63,80,100,125,200 & 400 Amps			6,10,16,25,40 & 63 Amps	

CAM OPERATED ROTARY SWITCHES










MULTISTEP SWITCHES WITH OFF

MULTISTEP (POLE-WAY) SWITCHES WITH OFF

These switches are also called as Pole-Way switches, they are available with OFF & without OFF. Multistep does the function of connecting different circuits to a common supply or vice-versa. 1 pole, 2 pole & 3 pole is popular for 1 Ph, 2 Ph & 3 Ph supply.

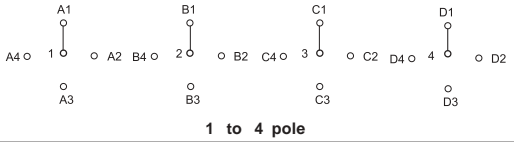
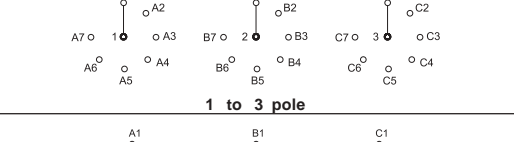

Application:- Typical usage Tap changing switch for Transformer / Stabilizer and other special application circuits.




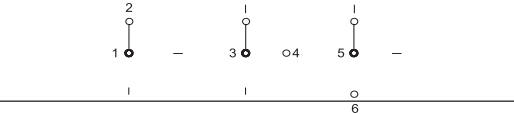

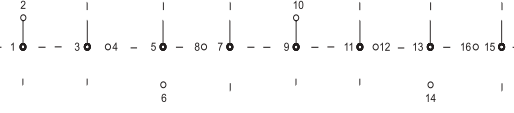
PROG NO.	DESCRIPTION	SCRIPT PLATE MARKING	CONNECTING DIAGRAM / TERMINAL MARKING	NO OF STAGES
61059	1 Pole-2 Way	 2 WAY - 60°	$\begin{array}{cccc} \circ & \circ & \circ & \circ \\ \text{oA1} & \text{oB1} & \text{oC1} & \text{oD1} \\ & & & \\ 1 \circ & 2 \circ & 3 \circ & 4 \circ \\ \text{oA2} & \text{oB2} & \text{oC2} & \text{oD2} \end{array}$ <p style="text-align: center;">1 to 4 pole</p>	1
61079	2 Pole-2 Way			2
61099	3 Pole-2 Way			3
61130	4 Pole-2 Way			4
61060	1 Pole-3 Way	 3 WAY - 90°	$\begin{array}{cccc} \circ & \circ & \circ & \circ \\ \text{A3o} & \text{A1} & \text{B3o} & \text{B1} & \text{C3o} & \text{C1} & \text{D3o} & \text{D1} \\ & & & & & & & \\ 1 \circ & 2 \circ & 3 \circ & 4 \circ & 5 \circ & 6 \circ & 7 \circ & 8 \circ \\ \text{oA2} & \text{oB2} & \text{oC2} & \text{oD2} & & & & \end{array}$ <p style="text-align: center;">1 to 4 pole</p>	2
61080	2 Pole-3 Way			3
61100	3 Pole-3 Way			5
61131	4 Pole-3 Way			6
61061	1 Pole-4 Way	 4 WAY - 60°	$\begin{array}{cccc} \circ & \circ & \circ & \circ \\ \text{oA1} & \text{oB1} & \text{oC1} & \text{oD1} \\ & & & \\ 1 \circ & 2 \circ & 3 \circ & 4 \circ \\ \text{oA2} & \text{oB2} & \text{oC2} & \text{oD2} \\ \text{A4o} & \text{B4o} & \text{C4o} & \text{D4o} \\ \text{A3o} & \text{B3o} & \text{C3o} & \text{D3o} \end{array}$ <p style="text-align: center;">1 to 4 pole</p>	2
61081	2 Pole-4 Way			4
61101	3 Pole-4 Way			6
61132	4 Pole-4 Way			8
61062	1 Pole-5 Way	 5 WAY - 60°	$\begin{array}{ccc} \text{A5o} & \text{oA1} & \text{B5o} & \text{oB1} & \text{C5o} & \text{oC1} \\ & & & & & \\ 1 \circ & 2 \circ & 3 \circ & 4 \circ & 5 \circ & 6 \circ \\ \text{oA2} & \text{oB2} & \text{oC2} & \text{oD2} & & \\ \text{A4o} & \text{B4o} & \text{C4o} & \text{D4o} & & \\ \text{A3o} & \text{B3o} & \text{C3o} & \text{D3o} & & \end{array}$ <p style="text-align: center;">1 to 3 pole</p>	3
61082	2 Pole-5 Way			5
61102	3 Pole-5 Way			8
61063	1 Pole-6 Way	 6 WAY - 45°	$\begin{array}{ccc} \text{A6o} & \text{oA1} & \text{B6o} & \text{oB1} & \text{C6o} & \text{oC1} \\ & & & & & \\ 1 \circ & 2 \circ & 3 \circ & 4 \circ & 5 \circ & 6 \circ \\ \text{oA2} & \text{oB2} & \text{oC2} & \text{oD2} & \text{oC3} & \\ \text{A5o} & \text{B5o} & \text{C5o} & \text{D5o} & \text{C4o} & \\ \text{A4o} & \text{B4o} & \text{C4o} & \text{D4o} & & \end{array}$ <p style="text-align: center;">1 to 3 pole</p>	3
61083	2 Pole-6 Way			6
61103	3 Pole-6 Way			9
61064	1 Pole-7 Way	 7 WAY - 45°	$\begin{array}{ccc} \text{A7o} & \text{oA1} & \text{B7o} & \text{oB1} \\ & & & \\ 1 \circ & 2 \circ & 3 \circ & 4 \circ \\ \text{oA2} & \text{oB2} & \text{oC2} & \text{oD2} \\ \text{A6o} & \text{B6o} & \text{C6o} & \text{D6o} \\ \text{A5o} & \text{B5o} & \text{C5o} & \text{D5o} \\ \text{A4o} & \text{B4o} & \text{C4o} & \text{D4o} \end{array}$ <p style="text-align: center;">1 to 2 pole</p>	4
61084	2 Pole-7 Way			7
61065	1 Pole-8 Way	 8 WAY - 30°	$\begin{array}{ccc} & \text{oA1} & \\ & & \\ & 1 \circ & \text{oA2} \\ & & \\ \text{A8o} & \text{oA3} & \\ \text{A7o} & \text{oA4} & \\ \text{A6o} & \text{oA5} & \end{array}$	4
61066	1 Pole-9 Way	 9 WAY - 30°	$\begin{array}{ccc} & \text{oA1} & \\ & & \\ & 1 \circ & \text{oA2} \\ & & \\ \text{A9o} & \text{oA3} & \\ \text{A8o} & \text{oA4} & \\ \text{A7o} & \text{oA5} & \end{array}$	5
61067	1 Pole-10 Way	 10 WAY - 30°	$\begin{array}{ccc} & \text{oA1} & \\ & & \\ & 1 \circ & \text{oA2} \\ & & \\ \text{A10o} & \text{oA3} & \\ \text{A9o} & \text{oA4} & \\ \text{A8o} & \text{oA5} & \end{array}$	5
61068	1 Pole-11 Way	 11 WAY - 30°	$\begin{array}{ccc} & \text{oA1} & \\ & & \\ & 1 \circ & \text{oA2} \\ & & \\ \text{A11o} & \text{oA3} & \\ \text{A10o} & \text{oA4} & \\ \text{A9o} & \text{oA5} & \end{array}$	6

Feasible ampere ratings : 6, 10, 16, 25, 32, 40, 63, 80, 100, 125 & 200 Amps

MULTISTEP (POLE-WAY) SWITCHES WITHOUT OFF

PROG NO.	DESCRIPTION	SCRIPT PLATE MARKING	CONNECTING DIAGRAM / TERMINAL MARKING	NO OF STAGES
61049	1 Pole-3 Way	 3 WAY - 60°	 1 to 6 pole	2
61069	2 Pole-3 Way			3
61089	3 Pole-3 Way			5
61120	4 Pole-3 Way			6
61124	5 Pole-3 Way			8
61126	6 Pole-3 Way			9
61050	1 Pole-4 Way	 4 WAY - 90°	 1 to 4 pole	2
61070	2 Pole-4 Way			4
61090	3 Pole-4 Way			6
61121	4 Pole-4 Way			8
61051	1 Pole-5 Way	 5 WAY - 60°	 1 to 4 pole	3
61071	2 Pole-5 Way			5
61091	3 Pole-5 Way			8
61122	4 Pole-5 Way			10
61052	1 Pole-6 Way	 6 WAY - 60°	 1 to 3 pole	3
61072	2 Pole-6 Way			6
61092	3 Pole-6 Way			9
61053	1 Pole-7 Way	 7 WAY - 45°	 1 to 3 pole	4
61073	2 Pole-7 Way			7
61093	3 Pole-7 Way			11
61054	1 Pole-8 Way	 8 WAY - 45°	 1 to 3 pole	4
61074	2 Pole-8 Way			8
61094	3 Pole-8 Way			12
61055	1 Pole-9 Way	 9 WAY - 30°		5
61056	1 Pole-10 Way	 10 WAY - 30°		5
61057	1 Pole-11 Way	 11 WAY - 30°		6
61058	1 Pole-12 Way	 12 WAY - 30°		6

MULTISTEP SWITCHES WITHOUT JUMPER

61649	1 Pole-3 Way Without Off Without Jumper	 4 WAY - 90°	 1 to 2 pole	2
61650	1 Pole-4 Way Without Off Without Jumper	 4 WAY - 90°	 1 to 2 pole	2
61670	2 Pole-4 Way Without Off Without Jumper		4	

Feasible Ampere Ratings: 6,10,16,25,32,40,63,80,100,125 & 200 Amps

CAM OPERATED ROTARY SWITCHES

INSTRUMENTATION SWITCHES

INSTRUMENTATION SELECTOR SWITCHES:

With the help of these switches we can * **Measure Currents** in different circuits with Current Transformer, a single Ammeter & a switch * **Measure Voltages** between phases and phase & Neutral with one voltmeter & a switch * **Measure Voltages & Currents** of a circuit with one Voltmeter, one Ammeter and a single switch.



VOLTMETER SELECTOR SWITCHES

PROG NO.	DESCRIPTION	SCRIPT PLATE MARKING	CONNECTING DIAGRAM/ TERMINAL MARKING	NO OF STAGES
61312	3 ph Line to Line			2
61313	3 ph Line to Line & Line to Neutral			3
61314	3 ph Line to Line Line to Neutral & without Off			3
61317	3 ph Line to Line & L1 to N			3
61318	3 ph Line to Line 2 Sources			4
61311	3 ph Line to Neutral			2
61319	3 ph Line to Line Without Off			2

Feasible Ampere Rating : 6,10 & 16 Amps

VOLTMETER & AMMETER SELECTOR SWITCHES

PROG NO.	DESCRIPTION	SCRIPT PLATE MARKING	CONNECTING DIAGRAM / TERMINAL MARKING	NO OF STAGES
61336	3 Voltages Line - Line & 3 Currents			5
61337	4 Voltages & 3 Currents			6
61338	3 Voltages Line to Neutral & 3 Currents			5

Feasible Ampere Ratings : 6,10 & 16 Amps

INSTRUMENTATION SWITCHES

AMMETER SELECTOR SWITCHES

PROG NO.	DESCRIPTION	SCRIPT PLATE MARKING	CONNECTING DIAGRAM / TERMINAL MARKING	NO OF STAGES
61325	1 Pole-3 Transformer With OFF			3
61321	1 Pole-1 Transformer			1
61331	1 Pole-2 Transformer			2
61384	1 Pole-3 Transformer Without OFF			3
61326	1 Pole-4 Transformer With OFF			4
61327	2 Pole-2 Transformer With OFF			3
61328	3 Pole-3 Transformer With OFF			5
61329	3 Pole-3 Transformer Without OFF			5
61330	4 Pole-4 Transformer Without OFF			6
71000	Direct Ammeter Selector Without Current Transformer			5

POWER FACTOR METER SWITCHES

73078	One Current Transformer One Voltage Transformer			2
	Two Current Transformer			2

WATTMETER SWITCH

73071	Two Wattmeter Method			5
Feasible Ampere Rating: 10 & 16				


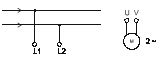

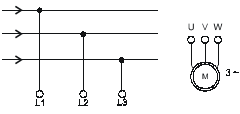
CAM OPERATED ROTARY SWITCHES

MOTOR CONTROL SWITCHES


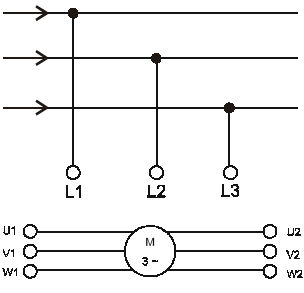


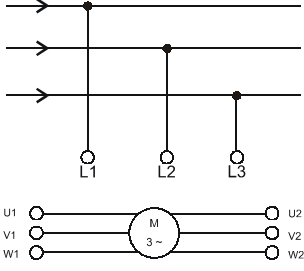

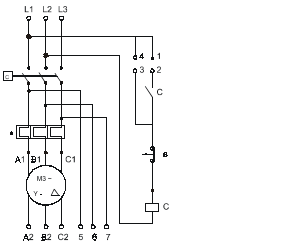

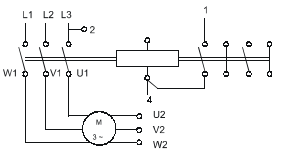
MOTOR CONTROL SWITCHES:

These switches directly operate the motor with AC3 or AC4 Duty Rating. They are mainly used for motor Forward - Reversing , Star -Delta, Two speed Forward -Reversing and other special switches designed to operate with a Contactor with built-in tripping feature in the event of Power failure and Overload.

MOTOR REVERSING SWITCHES

PROG NO.	DESCRIPTION	SCRIPT PLATE MARKING	CONNECTING DIAGRAM/ TERMINAL MARKING	NO OF STAGES
61210	2 POLE			2
61211	3 POLE			3
61253	3 POLE SPRING RETURN	 Spring Return to "0"		3

MOTOR SWITCHES / STAR DELTA SWITCHES

PROG NO.	DESCRIPTION	SCRIPT PLATE MARKING	CONNECTING DIAGRAM/ TERMINAL MARKING	NO OF STAGES
61200	OFF-STAR-DELTA			4
61201	Spring Return From STAR to OFF			4
61203	Standard			5
61239	Star Delta with Sequence Locking & LMD Contacts			3
61240	For use with Contactors			4

Feasible Ampere Rating : 6,10,16,25,32,40 & 63 Amps

MOTOR CONTROL SWITCHES

MOTOR SWITCHES / MULTI SPEED SWITCHES

PROG NO.	DESCRIPTION	SCRIPT PLATE MARKING	CONNECTING DIAGRAM/ TERMINAL MARKING	NO OF STAGES
61212	2 Speed Single Winding			4
61213	2 Speed Single Winding			4
61215	2 Speed Single Winding For use with Contactors			5
61217	2 Speed Single Winding Reversing			6
61219	2 Speed 2 Seperate Windings			3
61226	3 Speed 2 Windings (O-A-B-A)			6
61243	3 Speed 2 Windings (O-A-B-B)			6
Feasible Ampere Rating : 6,10,16,25,32,40 & 63 Amps				

MOTOR SWITCHES - START & RUN SWITCHES

PROG NO.	DESCRIPTION	SCRIPT PLATE MARKING	CONNECTING DIAGRAM/ TERMINAL MARKING	NO OF STAGES
61208	Split-phase Start	Spring return from start to "0"		2
61209	Split-phase Start Reversing	Spring return from start		3
61270	Split-phase Start Reversing Switching			3
Feasible Ampere Rating : 6,10 & 16 Amps				


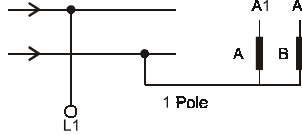
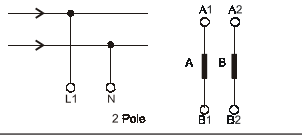
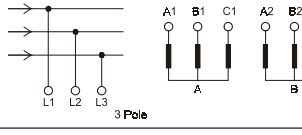

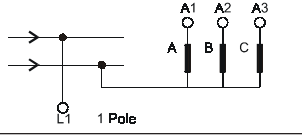
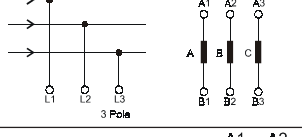
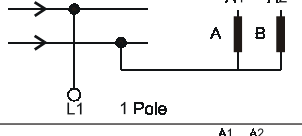

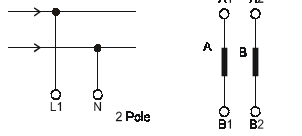

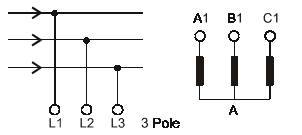
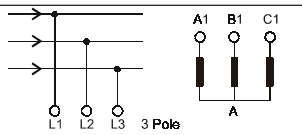
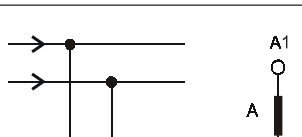
CAM OPERATED ROTARY SWITCHES

GANG SWITCHES

GANG SWITCHES:

These switches are called Gang switches, as they increase the capacity of circuits by ganging. They are used for Serialing or Paralleling to derive different circuit capacity. The power of Battery supply can be increased by serialing. The power of resistor can be increased by Paralleling.

Applications: In Railway coaches for controlling the Battery supply, In Dept of Telecommunication panels and special application circuits.


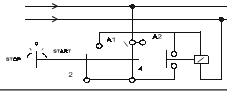

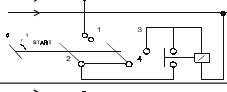

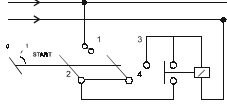

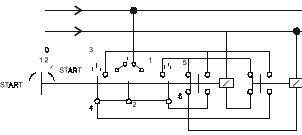

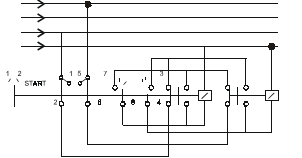

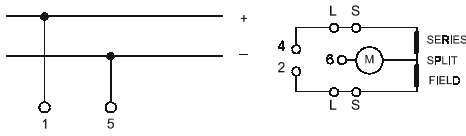
PROG NO.	DESCRIPTION	SCRIPT PLATE MARKING	CONNECTING DIAGRAM/ TERMINAL MARKING	NO OF STAGES
61109	2 Gang with OFF 1 Pole	2 GANG  60°		1
61117	2 Gang with OFF 2 Pole			2
61111	2 Gang with OFF 3 Pole			3
61110	3 Gang with OFF 1 Pole	3 GANG  90°		2
61118	3 Gang with OFF 2 Pole			3
61112	3 Gang with OFF 3 Pole			5
61113	2 Gang, Series With OFF 1 Pole		2 GANG SERIES  90°	
61115	2 Gang, Series With OFF 2 Pole	2 GANG SERIES PARALLEL  90°		2
61114	2 Gang, Series With OFF 3 Pole			3
61116	2 Gang Series-Parallel With OFF 2 Pole			2

Feasible Ampere Rating : 6,10,16,25,32,40 & 63

CONTROL SWITCHES:

Control switches are used to energise contactors for controlling motor operations. Most of the switches are of Spring return type to enable latching of the circuit with Contactor's NO contact to facilitate tripping by Contactor's Tripping device.

Applications: Control switches are a unique alternative for many of the "Push Button" stations, where it is preferred to control a system with one switch instead of many Push Buttons. Many positions of the switch are possible to derive combinations.

PROG NO.	DESCRIPTION	SCRIPT PLATE MARKING	CONNECTING DIAGRAM/ TERMINAL MARKING	NO OF STAGES
61300	1 Pole STOP-START With Spring Return	 spring return		1
61388	2 Pole STOP-START With Spring Return	 spring return		2
61301	1 Pole STOP-START With Spring Return From START to RUN	 spring return from start to "1"		1
61701	Without Jumper			
61307	STOP-START SWITCH With Spring Return to run for 2 units	 spring return from start		2
61707	Without Jumper			
61366	Contactor Control With Spring Return to OFF	 spring return to "0"		2
61271	Motor Voltage Control Switch	 spring return to "0"		2

Feasible Ampere Rating : 6,10,16,25,32,40 & 63

MOUNTING FEASIBILITY TABLE

Mounting Code	Description	Feasibility - *					
		S6/10	S16	S25/32	S40/63	S80/100/125	S200/400
B00	Front Mounting S25/S32 Switches with 48x48 plate			*	*	*	*
B02	Rear/Back Mounting with Standard Front Plate	*	*	*	*	*	*
B03	Front Mounting, Standard Mounting Plate	*	*	*	*	*	*
B12	Rear/Back Mounting with next size plate		*	*	*	*	*
B13	Front Mounting with next size plate	*	*	*	*	*	*
B14	Single Hole Mounting 48x48 plate for S6 to S32	*	*	*	*	*	*
B19	Single Hole Mounting 32x32 plate for S6 & S10	*	*	*	*	*	*
B21	Din Rail Mounting on 35 mm Rail	*	*	*	*	*	*
B30	Front Mounting with Rectangular padlock		*	*	*	*	*
B32	Rear/Back Mounting, Door Interlock + Rectangular Padlock (B42+B30)		*	*	*	*	*
B33	Front Mounting with Round padlock		*	*	*	*	*
B34	Rear Mounting, Door Interlock + Round Padlock (B33+B42)		*	*	*	*	*
B41	Rear Mounting with Door Clutch Mechanism (Door Opens in both pos)		*	*	*	*	*
B42	Rear Mounting with Door Interlock		*	*	*	*	*
B51	Single Hole Mounting, Key operated without Front Plate		*	*	*	*	*
B53	Single Hole Mounting, Key operated with Front Plate	*	*	*	*	*	*
B63	Front Mounting, Knob/handle Operatable, Lockable with Key		*	*	*	*	*
B90	Front Mounting with Centre Key Lock		*	*	*	*	*
F32	Door Clutch + Rectangular Padlock Mounting Plate at Front		*	*	*	*	*
F41	Door Clutch without Padlock, Mounting Plate at Front		*	*	*	*	*
F47	Door Clutch, Front Plate of Next size, Mounting Plate at Front		*	*	*	*	*
M17	SS Enclosure		Upto 4	Upto 4	Upto 3		
A17	Aluminium Enclosure		Upto 4	Upto 3	Upto 2		
B17	PVC/ABS Enclosure		Upto 4	Upto 4	Upto 4		
B31	PVC/ABS Enclosure with Round Padlock			Upto 3	Upto 2	Upto 2	

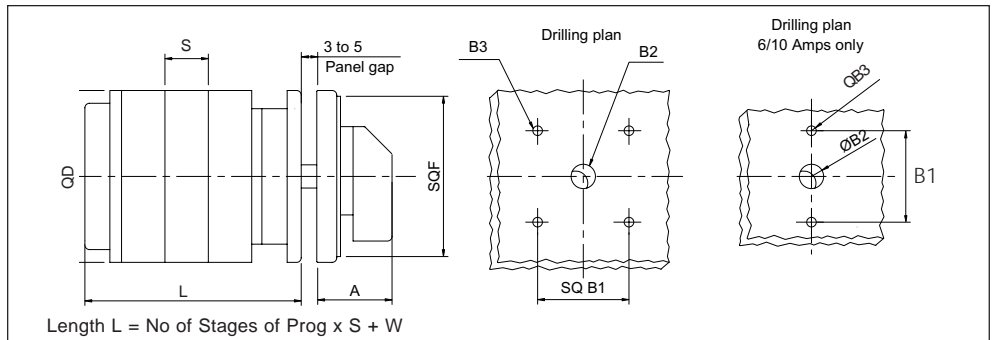
CAM OPERATED ROTARY SWITCHES

FRONT MOUNTINGS

Features : * Standard 4 hole Front panel Mounting * Knob / Handle operatable * Suitable for all switching angles & Spring return switches * Front Assembly in 4 different colors Yellow/Red, Grey/Black, Black/Black, Aluminum Finish.



B03 *IP 55 Protection from front



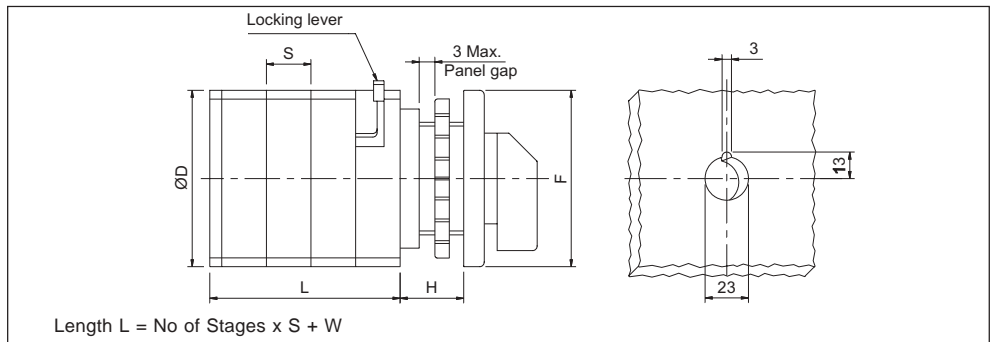
***Quote B13 for next Bigger size Front plate**

TYPE	B1	B2	B3	A	D	F	S	W	MAX
S6/S10/TP6/TP10	20	9	4.5	24	33	32	9.5	18.5	12
S16/TP16/RT16	36	12	4.5	29	46	48	12	26	21
S25/S32/RT25/RT32	48	12	5.5	36	52	64	15	27	15
S40/S63/RT40/RT63	68	15	5.5	46	76	88	21	33	10
S80/S100/S125	68	15	5.5	46	92	88	26	40	10
S200	68	15	5.5	46	88	88	32	40	10
S400	68	15	5.5	46	88	88	64	40	4

Features : - * Single hole mounting with std dia 22.5 mm * Eliminates the need for screws / Hardware for panel fixing * Easy Termination * Suitable upto 32 Ampere



B14/B19 *IP 65 Protection from front



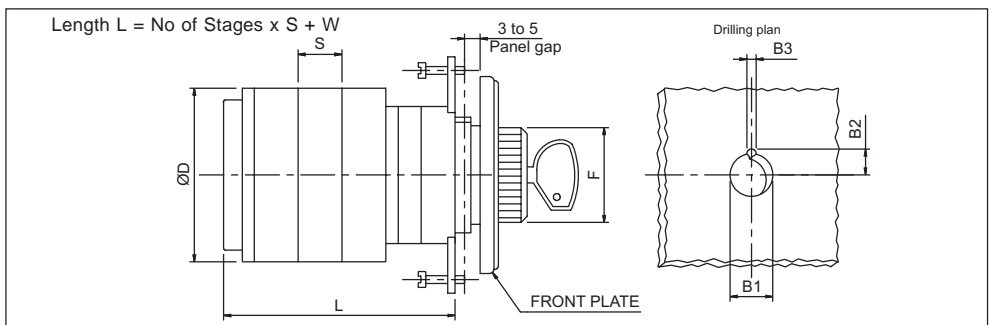
***Quote B14 for next Bigger size Front plate**

TYPE	CODE	D	F	S	H	W	MA-X
S6/S10/TP6/TP10	B19	33	32	9.5	10	28.5	12
	B14	33	48	9.5	13	28.5	12
S16/TP16/RT16	B19	46	48	12	13	36	21
S25/S32/RT25/RT32	B19	52	48	15	13	37	15

Features : - * Key Operated safety switch, prevents operational access to unauthorised personnel., * Available with or without Front plate * Suitable up to 32 Ampere.



B53/B51 * IP 40 Protection from front



***Quote B51 for Mounting without Front plate**

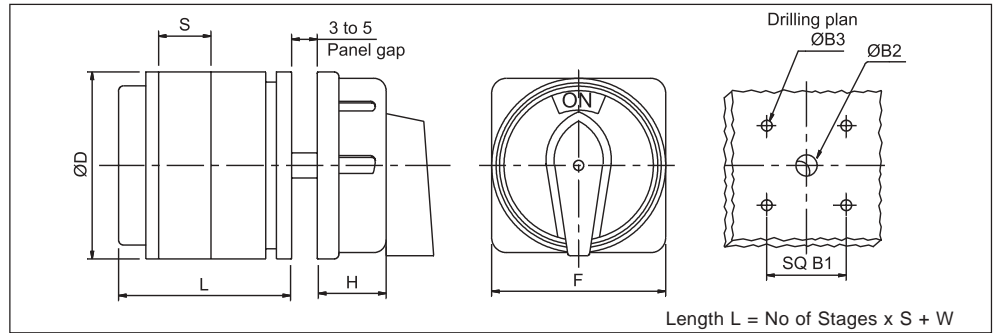
TYPE	B1	B2	B3	D	F	S	W	MAX
S16/TP16/RT16	23	13.5	2.5	46	28	12	37	5
S25/S32/RT25/RT32	23	13.5	2.5	52	28	15	38	5

LOCKABLE SWITCHES

Features : - * Four Hole Round padlockable mounting * Secure with max. 3 padlocks in OFF position. prevents operational access to unauthorised personnel.* Suitable for switches only with 90° Switching angle



B 33 * IP 55 Protection from front

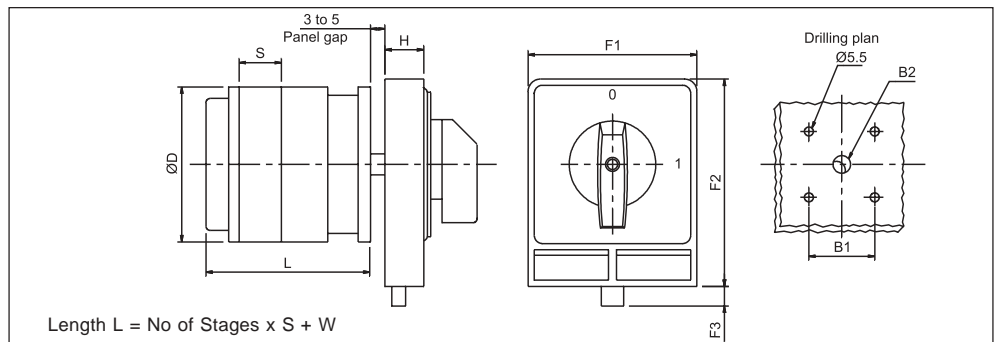


TYPE	B1	B2	B3	D	F	H	S	W	MAX
S16/TP16/RT16	36	12	4.5	46	65	26	12	26	12
S25/S32/RT25/RT32	36	12	4.5	52	65	26	15	27	8
S40/S63/RT40/RT63	68	15	5.5	76	95	31	21	33	6
S80/S100/S125	68	15	5.5	92	95	31	26	40	6
S200	68	15	5.5	88	95	31	32	40	6
S400	68	15	5.5	88	95	31	64	40	3

Features : - * Four Hole Rectangular Padlockable mounting * Secure with max four padlocks in OFF position.* Prevents Operational Access to Unauthorised Personnel * Suitable for switches with 90° Switching angle .



B 30 * IP 55 Protection from front

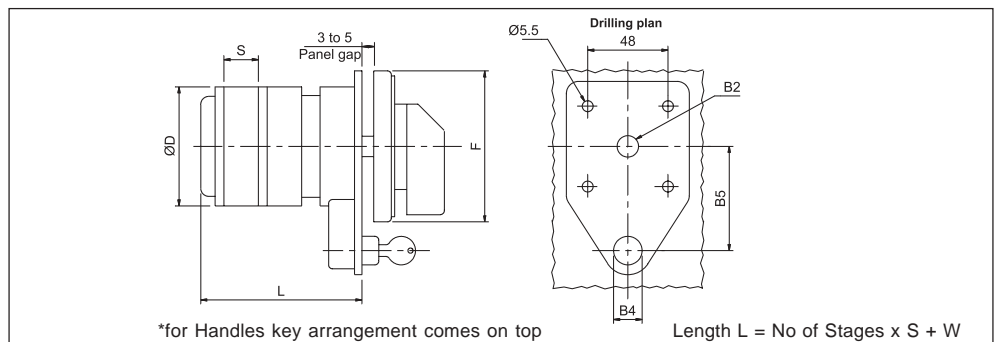


TYPE	B1	B2	D	F1	F2	F3	H	S	W	MAX
S16/TP16/RT16	48	12	46	75	102	13.5	23	12	26	12
S25/S32/RT25/RT32	48	12	52	75	102	13.5	23	15	27	8
S40/S63/RT40/RT63	68	15	76	98	126	16	25	21	33	6
S80/S100/S125	68	15	92	98	126	16	255	26	40	6
S200	68	15	88	98	126	16	25	32	40	6
S400	68	15	88	98	126	16	25	64	40	2

Features : - * Knob / handle operatable Switch * With Key lockable Assembly prevents switching by unauthorised personnel. *Key lock / Key removable only in OFF position * Lock Assembly can also be provided on top



B 63 * IP 40 Protection from front



TYPE	B2	B4	B5	D	F	S	W	MAX
S16/TP16/RT16	15	23	43.5	46	64	12	45	12
S25/S32/RT25/RT32	15	23	43.5	52	64	15	45	12
S40/S63/RT40/RT63	15	23	43.5	76	64	21	47	6

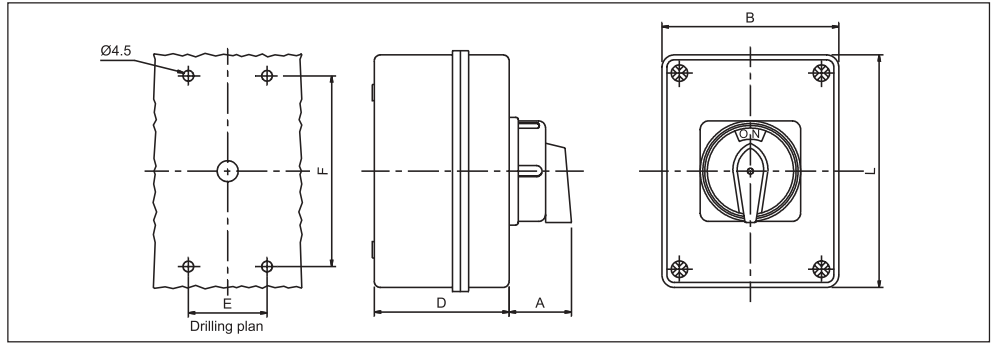
CAM OPERATED ROTARY SWITCHES

ENCLOSURE MOUNTINGS

Features : - * Switches Mounted in ABS Plastic Enclosure * Provides protection from dust & hazardous material * with Round Padlockable Device * Secure with max 3 Padlocks in OFF position * Prevents operational access to Unauthorised Personnel * Suitable for 90° switches.



B 31

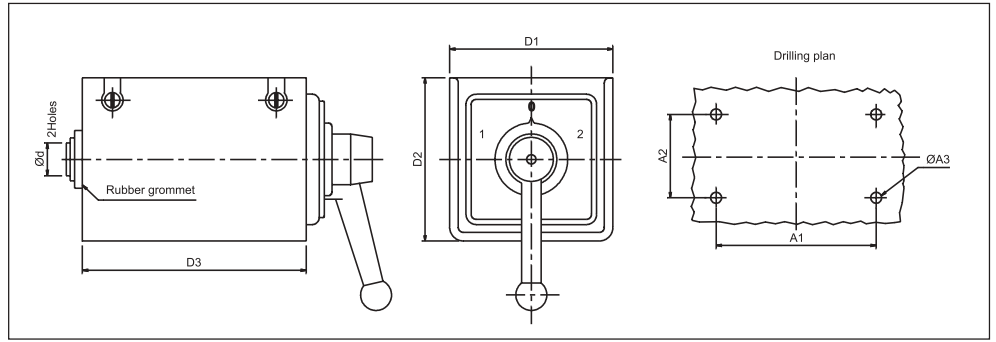


TYPE	A	L	B	D	E	F	STAGES
S16/TP16/RT16	42	110	80	66	60	90	3
S25/S32/RT25/RT32	42	125	100	70	80	115	2
S40/S63/RT40/RT63	48	175	125	90	105	155	2

Features : - * Switches Mounted in sheet metal enclosures *Provides protection from dust & hazardous environment. *Knob / Handle operatable * Suitable for switches upto 32 Ampere



M 17

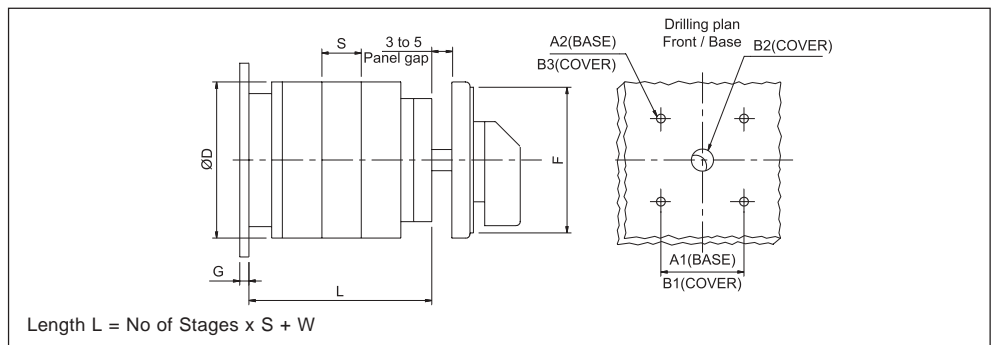


TYPE	A1	A2	A3	D1	D2	D3	MAX
S6/S10/TP6/TP10	70	60	4	85	89	98	4
S16/TP16/RT16	70	60	4	85	89	98	4
S25/S32/RT25/RT32	70	60	4	85	89	98	3
16 Ampere For/ Reverse	81	65	5	75	75	110	-

Features : - * Four hole base mounted on Rear side of the Panel * Knob/ Handle operatable



B 02 * IP 55 Protection from front



***Quote B12 for next Bigger size Front plate**

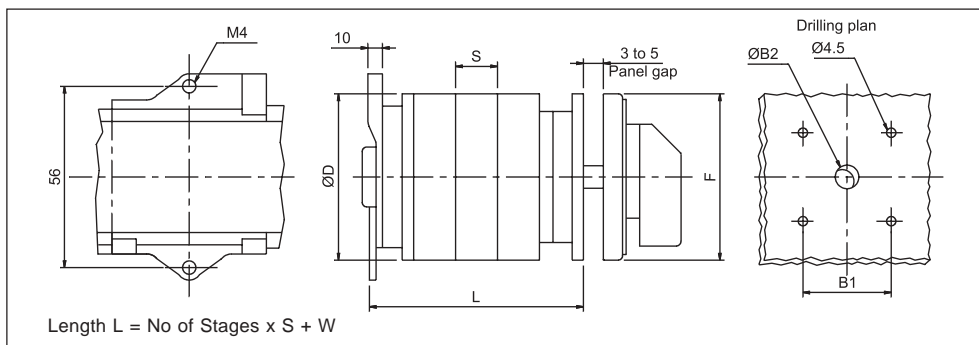
TYPE	A1	A2	B1	B2	B3	D	F	G	S	W	MAX
S6/S10/TP6/TP10	36	M5	36	9	4.5	48	32	4.5	9.5	22	10
S16/TP16/RT16	48	M5	36	12	4.5	60	48	3.5	12	30	12
S25/S32/RT25/RT32	48	M5	48	12	4.5	60	64	3.5	15	31	8
S40/S63/RT40/RT63	68	M6	68	15	5.5	84	88	5	21	41	6
S80/S100/S125	81	M6	68	15	5.5	101	88	5	26	48	6
S200	81	M6	68	15	5.5	101	88	5	32	48	6
S400	81	M6	68	15	5.5	101	88	8	64	48	3

REAR MOUNTINGS

Features : * Snap mounting base on Din EN50022 (Omega) rail 35mm & 1.2 mm thick * or Two Hole rear mounting. * Provides Easy Termination



B 21 * IP 40 Protection from front

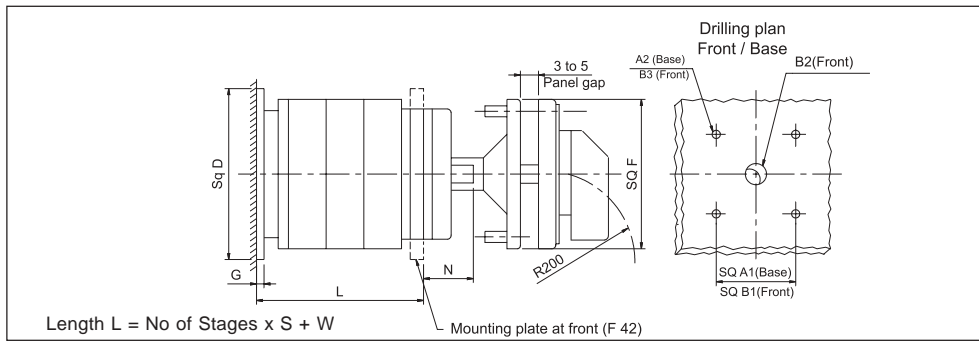


TYPE	B1	B2	B3	D	F	S	W	MAX
S6/S10/TP6/TP10	20	9	4.5	33	32	9.5	28.5	10
S16/TP16/RT16	36	12	4.5	46	48	12	37	12
S25/S32/RT25/RT32	48	12	5.5	52	64	15	38	8

Features : - * Mounted on Rear side of the panel and operated from the front door * Door interlockable mechanism & panel door openable only in OFF position. * Provides a safety feature. * Knob / Handle operatable



B42/B41 * IP 55 Protection from front

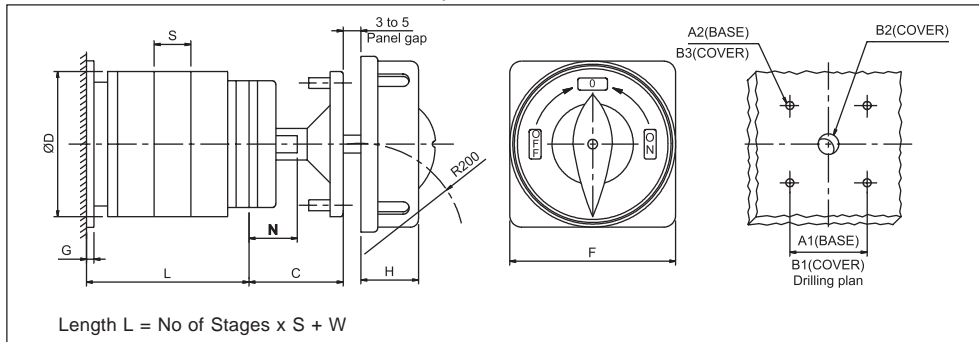


TYPE	A1	A2	B1	B2	B3	D	F	G	C	N	S	W	MAX
S16/TP16/RT16	48	M5	48	15	4.5	60	64	3.5	45	22	12	54	8
S25/S32/RT25/RT32	48	M5	48	15	4.5	60	64	3.5	41	22	15	55	8
S40/S63/RT40/RT63	81	M6	68	18	5.5	101	88	5	46	26	21	66	6
S80/S100/S125	81	M6	68	18	5.5	101	88	5	46	26	26	72	6
S200	81	M6	68	18	5.5	101	88	5	46	26	32	72	6
S400	81	M6	68	18	5.5	101	88	5	46	34	64	72	3

Features : - * Mounted on rear side of the panel and operated from the front door * Door interlockable mechanism & door openable only in OFF position. with round padlockable device. * Secure with max 3 Padlocks in OFF position



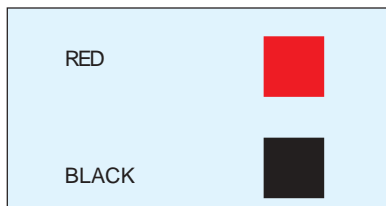
B 34 * IP 55 Protection front



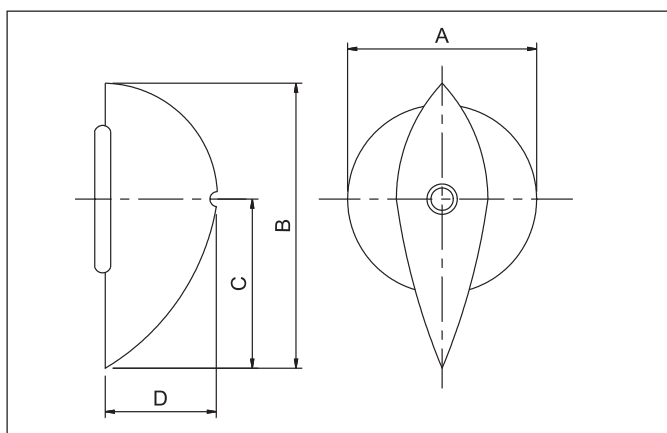
TYPE	A1	A2	B1	B2	B3	D	F	G	C	N	S	W	MAX
S16/TP16/RT16	48	M5	36	15	4.5	60	65	3.5	45	24.5	12	54	6
S25/S32/RT25/RT32	48	M5	36	15	4.5	60	65	3.5	41	24.5	15	55	6
S40/S63/RT40/RT63	68	M6	68	18	5.5	84	95	5	46	33.5	21	66	6
S80/S100/S125	81	M6	68	18	5.5	101	95	5	46	33.5	26	72	6
S200	81	M6	68	18	5.5	101	95	5	46	33.5	32	72	6
S400	81	M6	68	18	5.5	101	95	5	46	33.5	64	72	3

KNOBS / HANDLE

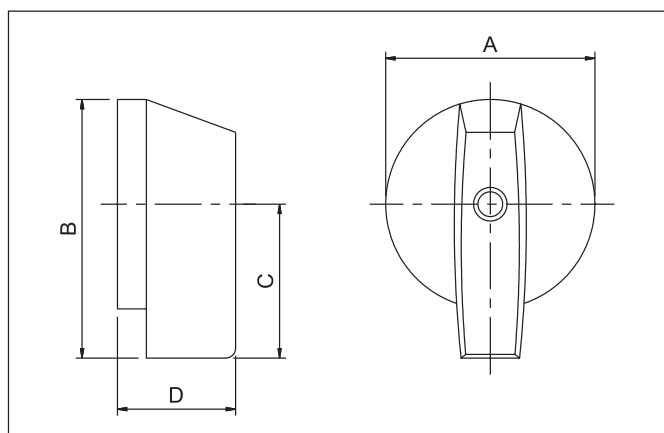
KNOBS/HANDLE COLOURS



TD - TEAR DROP



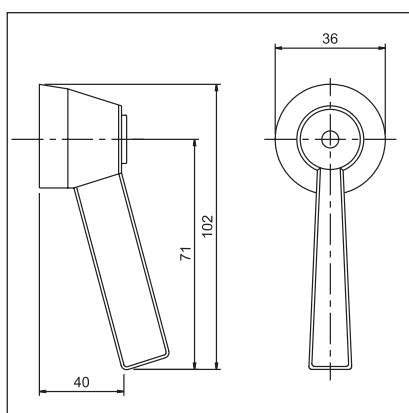
FL - FLAG KNOB



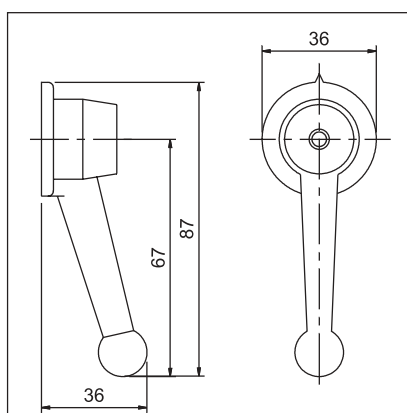
CODE - TD	A	B	C	D
S6/S10/TP6/TP10	27	41	25	21
S16/TP16/RT16	27	41	25	21
S25/S32/RT25/RT32	36	52	31	25
S40 & ABOVE	50	70	42	33

CODE - FL	A	B	C	D
S6/S10/TP6/TP10	16.5	22	13.75	18
S16/TP16/RT16	27	39	24	24
S25/S32/RT25/RT32	36	50	27	25
S40 & ABOVE	50	68	42.5	32

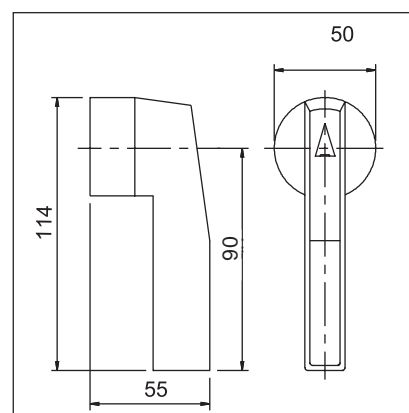
PG - PISTOL GRIP HANDLE



BG - BALL GRIP HANDLE



LV - LEVER HANDLE



CODE - PG
Applicable for
S16 / TP16 / RT16
S25 / S32 / RT25 / RT32
S40 / S63

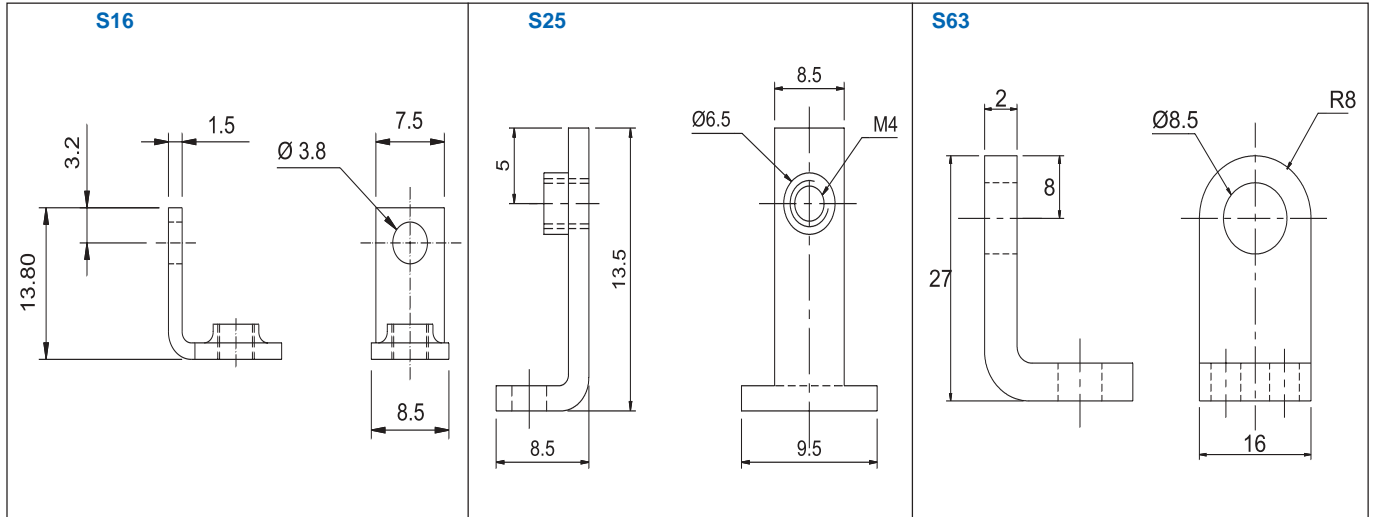
CODE - BG
Applicable for
S16 / TP16 / RT16
S25 / S32 / RT25 / RT32
S40 / S63

CODE - LV
Applicable for
S80 / S100 / S125
S200 / S400

KNOBS / HANDLE

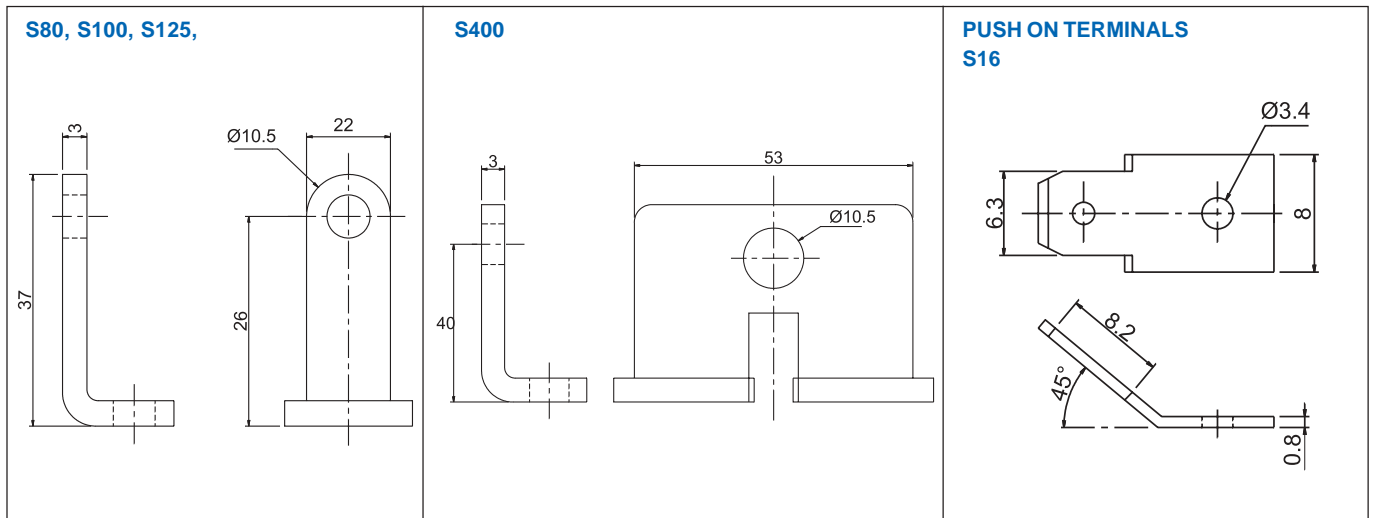
ACCESSORIES

EXTENDED TERMINALS



Always mounted on switch supplied as optional for S40 and S63

ALWAYS MOUNTED ON SWITCH

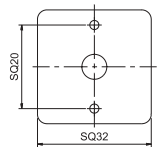
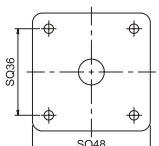
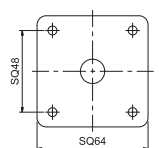
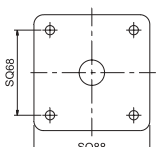
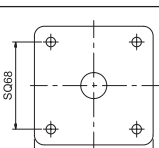
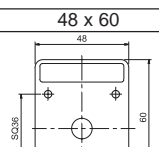
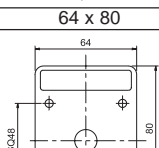


Always mounted on switch

Mating terminal socket Code No : 1653

CAM OPERATED ROTARY SWITCHES

FRONT PLATES

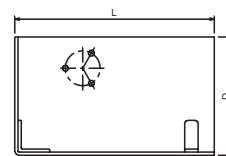
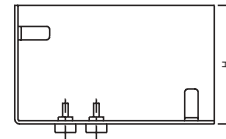
STANDARD STYLE	FRAME SIZE	BIGGER STYLE
S6/S10 TP6/TP10		--
S16 TP16 RT16		S6/S10 TP6/TP10
S25/S32 RT25/RT32		S16 TP16 RT16
S40 & Above		S25/S32 RT25/RT32
--		S40 & Above
SPECIAL FRONT PLATES		
S16 TP16 RT16		--
S25/S32 RT25/RT32		S16 TP16 RT16

* Other special size mounting plates at Front or Rear can be supplied against requirement.

ACCESSORIES

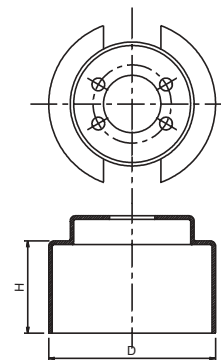
SHROUDING COVERS

Rectangular



TYPE	L	D	H	NO. OF STAGES
S63	175	115	100	3
	210	200	90	3
S200	175	110	115	3
	210	200	100	3

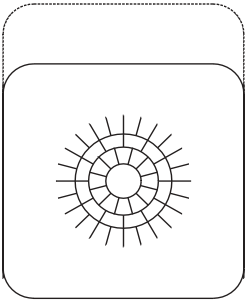




S-Series



TYPE	ØD	H	
		2 STAGE	3 STAGE
S25/S32	65 ^{+0.2}	48	63
S63	89 ^{+0.2}	118	182

CODE - YR	CODE - GB	CODE - BB	CODE - AB
			
Yellow Front Plate Red Knob	Grey Front Plate Black Knob	Black Front Plate Black Knob	Aluminium Foil with Black Knob

CUSTOMISED PROGRAMME FORMATION

Front Plate	Programme Number																		
	1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	
Switching Angle °	----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- -----																		
Switching Positions ↓	----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- -----																		
	1																		
	2																		
	3																		
	4																		
	5																		
	6																		
	7																		
	8																		
	9																		
	10																		
	11																		
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	13																		
	14																		
	15																		
	16																		
	17																		
	18																		
	19																		
	20																		
	21																		
	22																		
	23																		
	24																		
 Locked Position  Contact Closed  Contact Closed without Interruption  Spring Return 																			
1 Switch Type						2 Mounting Form						3 Stop	With	Without					
4 Front Plate	Type	Colour	7 Optional Extras																
5 Marking																			
6 Handle	Type	Colour	Customer										Date						
CUSTOMER CODE No.																			

CAM OPERATED ROTARY SWITCHES

CUSTOMISED PROGRAMME FORMATION

The switch design and construction gives flexibility for making customised programmes within a very short period. Basically an engineer trying to specify the customised programme should concentrate on the following points.

- (a) Number of Operating positions of switch handle
- (b) Total number of Contacts required
- (c) Contact closing sequence of all the contacts required in various positions of handle. Please Note :-
- (d) Each position should be identified and Script plate marking required in those positions should be mentioned .
- (e) The latching angle (angle between positons) Standard latching / switching angles are 60°, 90°, 45° & 30° .Spring return are also possible for 45° & 90° switching angle.

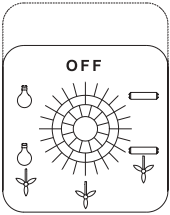
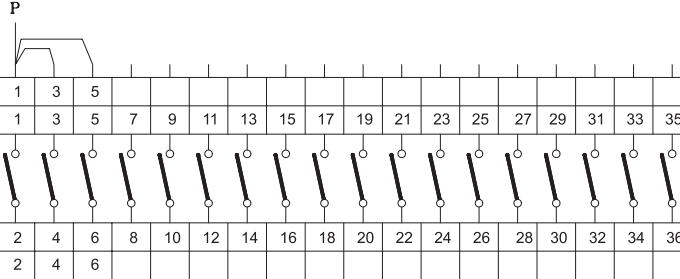

(f) Total number of contacts can be decided based on the actual need. You may arrange the contacts to your convenience and number them as 1/2, 3/4, 5/6...etc.. While making the switch, we may rearrange the contacts to use solid jumpers so as to avoid loose wire jumpers

(g) Fill up the Programme sheet by marking 'X' at places where contacts have to Close (NC).

Also Ensure to specify the Ampere Rating, Mounting Style, Switching angle, Script Plate markings ,Terminal marking, Lockable Position (If any)

For example refer the sample Customised programme sheet of a Bedroom switch having 3 contacts controlling a Tube,Fan & Night lamp

Note:-The above Construction carries a five digit number starting with (7xxxx) allotted by us .This Number alone is sufficient for future correspondance & further Ordering

Front Plate		Programme Number		7 3 0 3 7																																															
		<p>P</p> 																																																	
		Switching Angle 60°																																																	
		Switch Positions																																																	
		OFF		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36												
TUBE		5																																																	
TUBE & FAN		9																																																	
FAN		13																																																	
FAN & LAMP		17																																																	
NIGHT LAMP		21																																																	
		22																																																	
		23																																																	
		24																																																	
																																																			
1	Switch Type	S 16					2	Mounting Form	Bo3			3	Stop	With	Without																																				
4	Front Plate	Type	SO		Colour	Yellow		7	Optional Extras																																										
5	Marking																																																		
6	Handle	Type	Tear Drop		Colour	Red		Customer					Date																																						
CUSTOMER CODE No.																																																			

CUSTOMISED PROGRAMME FORMATION

Programme Code | Type | Ampere | Mounting | Knob | Color



Example:-

6 1 1 9 7 S E B O 3 T D Y R

Programme Selector Table

Programmes	Prog Code
Isolators	Pg 3
Changeovers with OFF	Pg 4
Changeovers without OFF	Pg 5
Multistep with OFF	Pg 6
Multistep without OFF	Pg 7
Instrumentation Switches	Pg 8 & 9
Motor Control	Pg 10 & 11
Gang Switches	Pg 12
Control Switches	Pg 13

Type Selection

Type	Code	Possible Amps
S-Series	S	6 to 400 Amps
Touch Proof	T	6 to 16 Amps
Rear Access Termination	R	16 to 63 Amps
DC Switches	D	16 to 500 Amps
Phase Selector only for 1 pole 3 way with OFF	P	25 to 63 Amps

Mounting Selection

For Mounting Styles
Refer Table on Page 13




Ampere Selection

Ampere	Code
6	A
10	B
16	C
20	D
25	E
32	F
40	G
50	H
63	I
80	J
100	K
125	L
160	M
200	N
250	O
300	P
400	Q
500	R
600	S
800	T

Knob / Handle Selection

CODE - TD	CODE - FH	CODE - PG	CODE - BG	CODE - LV
				
TEAR DROP	FLAG KNOB	PISTOL GRIP	BALL GRIP	LEVER HANDLE

Color Combination Selection Table

CODE - YR	CODE - GB	CODE - BB	CODE - AB
			
Yellow front plate Red knob	Grey front plate Black knob	Black front plate Black knob	Aluminum Foil with Black knob

BREAKER CONTROL SWITCHES

FEATURES

- Specially designed spring return mechanism for reliable operation.
- Robust handle design for better grip and operating leverage.
- Facility to add on multiple contacts in LMD operations.
- Possibility of adding upto 9 main contacts for trip / close operations.

OPERATIONS

Main contact operations

Breaker control switches have 3 operating positions viz., Trip, Neutral & Close either in stayput or in spring return mechanism. In spring return mechanism handle returns to neutral position after trip / close operation. Main contacts operates in trip or in close positions according to the operation of the switch.

LMD operations

LMD contacts can either be fitted in trip or in close position. When the switch makes closing operation the LMD contacts fitted in the closing position will close and stays in that position even after the switch handle goes back to neutral position. Similarly the LMD contacts fitted in the trip position remains in that position when the switch handle makes trip operation and goes back to neutral position. These LMD contacts generally used for annunciation purpose thus helps the user to indicate tripping of breaker due to fault conditions and help in diagnosing the feeder fault problems.

SIL Operations

This device fitted along with this breaker control switch will act as a blocking device for consecutive closing of the switch, will prevent closing coil of the breaker getting charged repeatedly and hence eliminates burning of this closing coil.

TECHNICAL SPECIFICATION

GENERAL :-

ENDURANCE

Mechanical * - 1 Lac Operations at 300 cycles /hour

Electrical * - 10,000 Operations at 120 cycles/ hour

Operational Temperature :-25° C to 55° C

Frequency up to 5 KHz



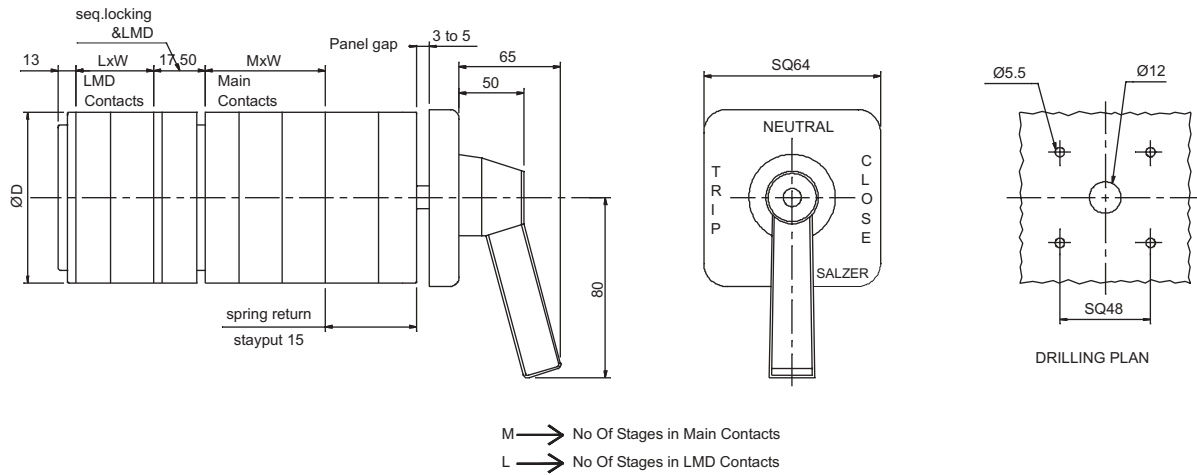
DESCRIPTION		UNIT	SG25	SG32
Rated Operational voltage	Ue	V ac	690	690
		V dc	250	250
Resistance to surge voltage	Uimp	kV	6	6
Rated uninterrupted current	Ith	A	32	40
Rated Operational Current Pilot Duty AC15	Ie			
	20-240V AC	A	8	14
	380-440V AC	A	5	6
Short circuit protection HRC fuse size		A	25	32
Rated short circuit		kA	10	10
Terminal cross section				
Rigid wire	min	mm ²	1.5	2.5
	max		4	6
Flexible wire	min	mm ²	1	1.5
	max		2.5	4
Terminal Screw			M4	M4
Terminal Tightening Torque			1.2Nm	1.2Nm
CSA / UL RATINGS				
Voltage Rating		V	600	600
Ampere Rating		A	20	30
VA Rating			AC-720 VA DC-275 VA	

Voltage	No of Contacts in series	SG 25				SG 32			
		Resistive Amps	Inductive L / R Amps			Resistive Amps	Inductive L / R Amps		
			10 m sec	20 m sec	40 m sec		10 m sec	20 m sec	40 m sec
50 V	1	20	20	15	6	25	25	18	8
	2	-	-	20	14	-	-	25	18
	3	-	-	-	20	-	-	-	25
125 V	1	3	2.5	1.5	1.0	5	3	2	1.2
	2	20	15	10	5	25	18	12	6
	3	-	20	20	10	-	25	25	12
250 V	1	1.0	0.5	0.3	0.2	1.2	0.6	0.4	0.3
	2	5	2	1.0	0.5	6	2.5	1.2	0.6
	3	20	10	4	1	25	12	5	1.2

BREAKER CONTROL SWITCHES

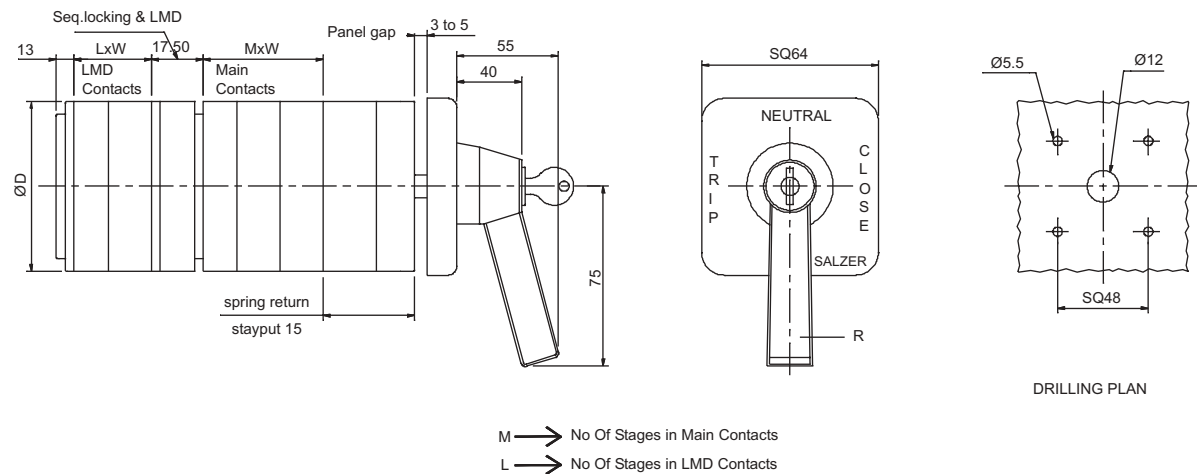
MOUNTING STYLES

B03



TYPE	D	W
SG25	58	14
SG32	62	16

B90



TYPE	D	W
SG25	58	14
SG32	62	16

BREAKER CONTROL SWITCHES

BREAKER CONTROL ORDERING CODE

1		2		3		4		5		6		7		8		9		10		P	G		B	B
---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	----	--	---	---	--	---	---

Example:-

1 Q S L 1 1 E B 9 0 P G B B

25 Ampere Spring return TNC with 1 set of Main Contact 1NO+1NC, 1 LMD contact in Trip position & 1 LMD contact in Close position with Sequential locking and Barrell Lock Mounting

Digit 1

No of Main Contacts in Trip / Close Position	
Description	Code
1 NO+1 NC	1
2 NO+2 NC	2
3 NO+3 NC	3
4 NO+4 NC	4
5 NO+5 NC	5
6 NO+6 NC	6
7 NO+7 NC	7
8 NO+8 NC	8
9 NO+9 NC	9

Digit 2

Sequence Locking	Code
If required	O
Not required	O

Digit 3

Latching Mechanism	Code
Spring Return	S
Stayput	C

Digit 4

LMD Contacts	Code
If required	L
Not required	D

Digit 5

No of LMD Contacts in Trip Position	
Description	Code
1 Contact	1
2 Contact	2
3 Contact	3
4 Contact	4
5 Contact	5
6 Contact	6
If not required	0

Digit 6

No of LMD Contacts in Close Position	
Description	Code
1 Contact	1
2 Contact	2
3 Contact	3
4 Contact	4
5 Contact	5
6 Contact	6
If not required	0

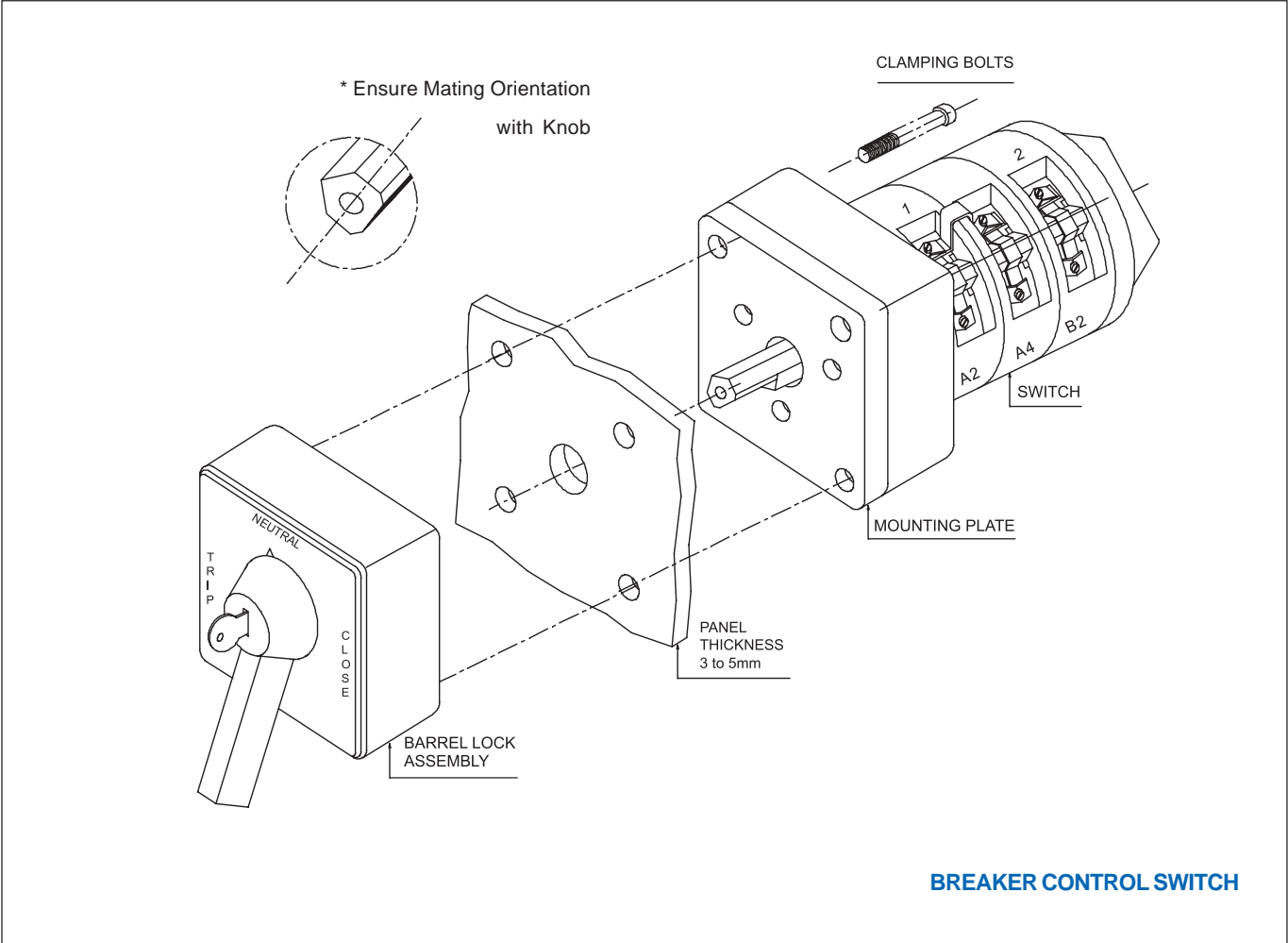
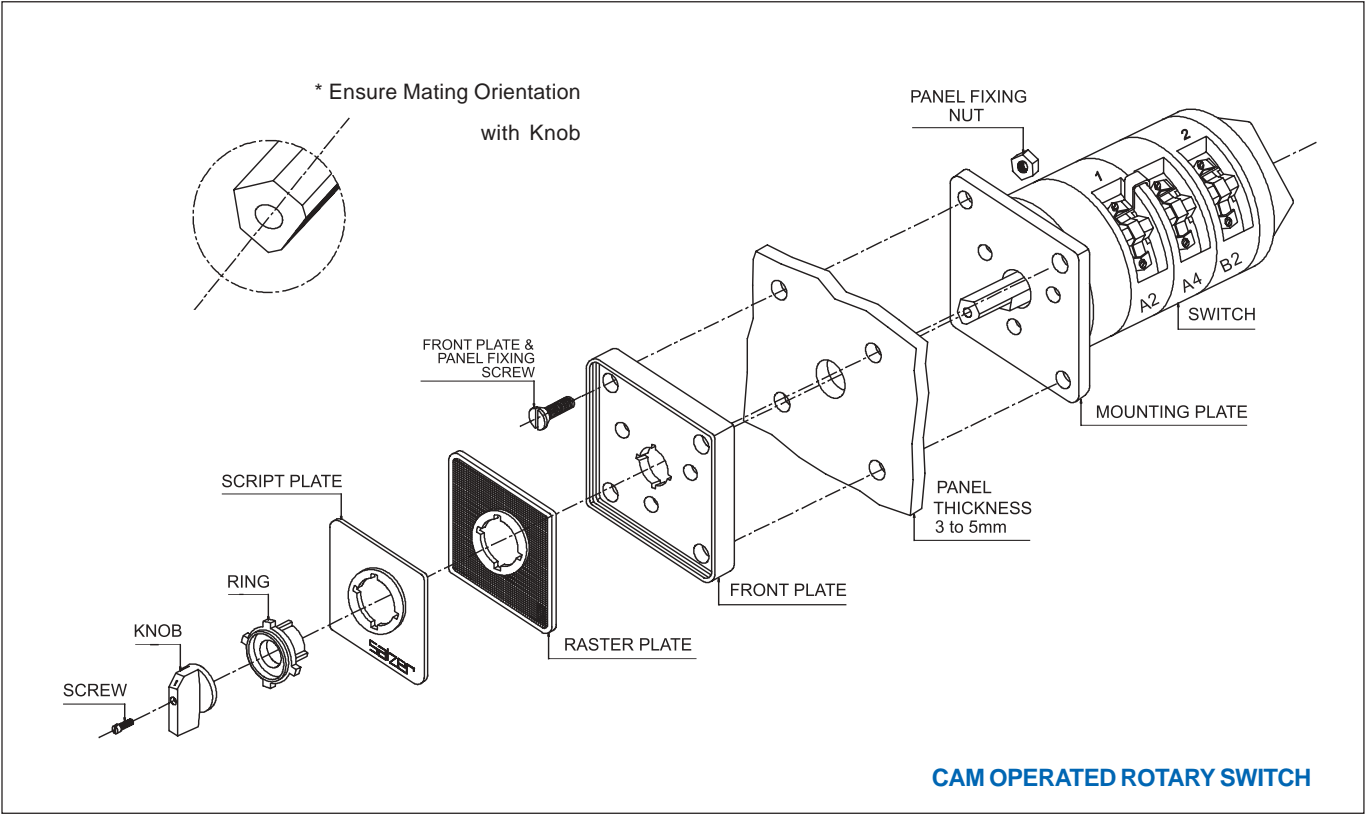
Digit 7

Ampere Rating	Code
25 Ampere	E
32 Ampere	F

Digit 8, 9, 10

Mounting	Code
Standard Front Mounting	B03
Barrei Lock with Centre Key	B90

INSTALLATION PROCEDURE



DC SWITCHES

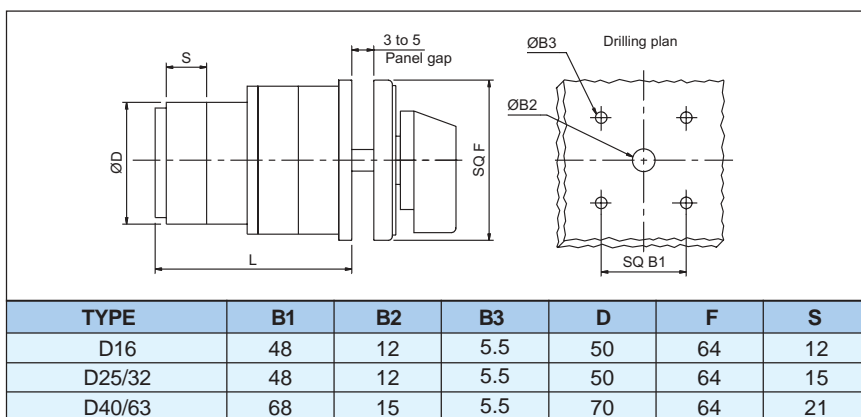
Features

- Snap Action – rugged mechanism
- “Quick-make, Quick-Break” operation
- Double break contacts are of Agcdo housed in glass filled polymied contact stage to ensure optimum electrical condition & weldfree operations.
- Cam operated switching for higher electrical endurance & smooth operations.

- Option of 60 & 90 degree switching programmes.

Applications;

- DC power circuits
 - UPS & Inverter power switching
 - All switching programmes- Isolators, Changeovers & Multistep switches.
- Custom built switching application with 90 degree switching angle.



Stages		1	2	3	4	5	6	7	8	9	10	11	12
Length in mm	D16	62	74	86	98	110	122	134	146	158	170	182	194
	D25/32	65	80	95	110	125	140	155	170	185	200	215	230
	D40/63	69	90	111	132	153	174	195	216	237	258	279	300

TECHNICAL SPECIFICATION

DC RATINGS	DESCRIPTION						UNIT	RATED OPERATIONAL CURRENT Ie				
								SWITCH TYPE				
								D16	D25	D32	D40	D63
Rated Uninterrupted Current [Ith]							A	20	32	40	50	80
DC 22A L/R 2m sec												
Rated Operational Voltage	110V	250V		460V			A	16	25	32	40	63
No of series contacts	1	2		4								
DC 23A L/R 7.5m sec												
Rated Operational Voltage	24V	48V	70V	110V	180V	250V	A	10	16	25	32	40
No of series contacts	1	2	3	4	5	6						
AC RATINGS	AC3 Rating 3 Phase 380-440V						Hp	7	10	14	20	25
	AC21 Rating						A	16	25	32	40	63
GENERAL	Fuse Protection						A	16	25	32	40	63
	Short Circuit through fault current						kA	5	10	10	20	20
	Terminal Cross Section				[Rigid] min	mm ²	1.5	1.5	1.5	1.5	1.5	
					[Flex] max	mm ²	4	4	6	10	16	
	Tightening Torque						Nm	0.8	1.2	1.2	2	2
Maximum Contact Stages							16	10	10	6	6	

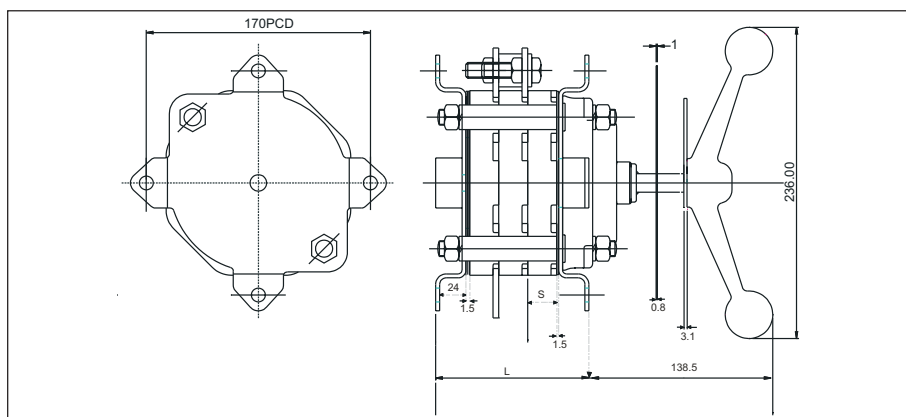
DC SWITCHES

Features

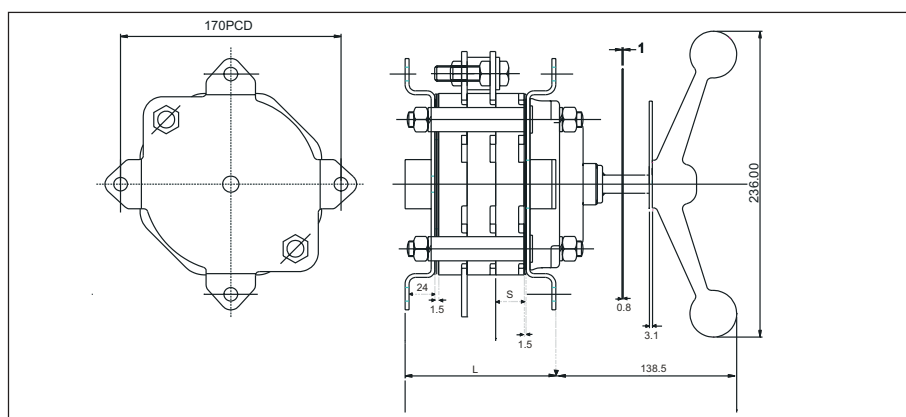
- Housing made up of SMC material for rigidity and higher mechanical strength.
- 'Wiping contacts' operations helps in dust free & self cleaning concepts.
- Extended terminals for Bus bar/ Aluminium cable connections.
- Capston Handle operation for better leverage
- CPRI Tested.

Applications

- D40R – Railway coaches lighting & fan circuits switching.
- All DC power circuits – Railways, Telecommunications & Power plants.



DESCRIPTION	UNIT	D100	D200	D300	D400	D500
DUTY RATING - DC 22A L/R 2M sec						
Operational Voltage	VDC	250	250	250	250	250
Voltage for AC Rating	VAC	460	460	460	460	460
Operational Current	A	100	200	300	400	500
Thermal Current ? I th ?	A	125	250	375	500	625
Switching Angle	Deg	90	90	90	90	90
Maximum Contact Stages		9	9	9	9	9

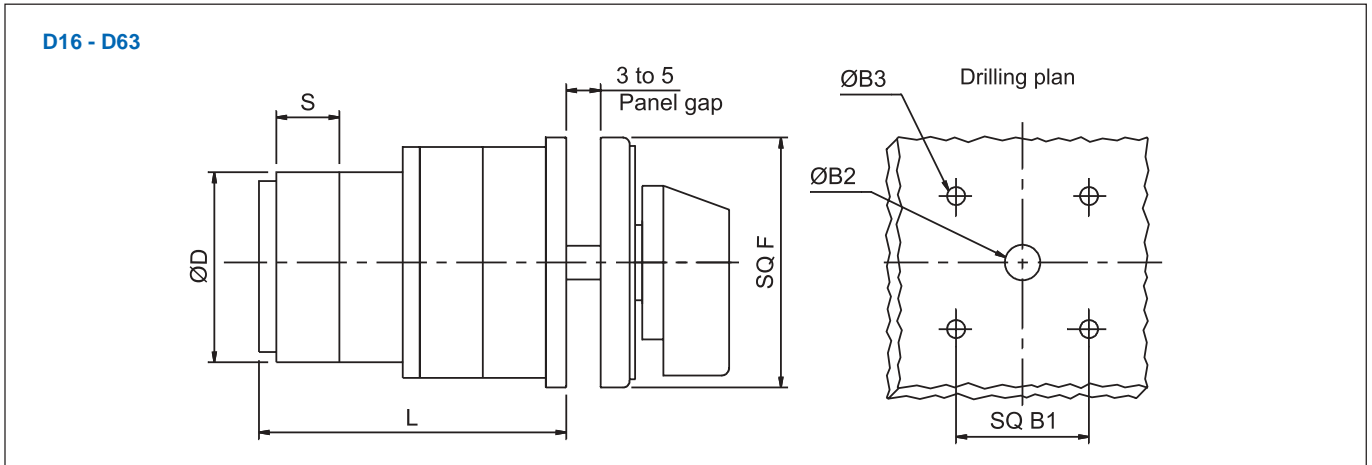


Construction & Features

D16 - D63

D series switches are designed for DC Switching applications, these switches are constructed using Snap action Mechanism which provides Quick make Quick break of the contacts which is essential for DC switching. The Contacts are of AgCdO Double break Butt type, housed in a Glass filled Polyamide Contact stage and are operated through cams for higher Electrical endurance & smooth operation.

Suitable for 90 & 60 Degree Switching programmes & applicable for both AC & DC Switching. Suitable Switching Programmes * Isolators * Changeovers * Multistep Switches & * Gang Switches etc (Refer Page 3 to 7 & 12)



TYPE	B1	B2	B3	D	F	S
D16	48	12	5.5	50	64	12
D25 / D32	48	12	5.5	50	64	15
D40 / D63	68	15	5.5	70	64	21

Stages		1	2	3	4	5	6	7	8	9	10	11	12
Length in mm	D16	62	74	86	98	110	122	134	146	158	170	182	194
	D25/32	65	80	95	110	125	140	155	170	185	200	215	230
	D40/63	69	90	111	132	153	174	195	216	237	258	279	300

