

TECHNICAL DATA

The short circuit at the point of installation must be considered for all switches. The max fuselink for prospective short circuit is shown in the following table.

Cam Switch

Prospective Symm. Fault Current.	Switch rating A						
	40	63	125	200	400	630	800
	Maximum permissible Fuse Size						
10 kA	50	63	125	250	400	630	2x400
25 kA	50	63	125	160	315	500	2x400
40 kA	40	63	125	160	315	400	500
STR A rms. for 3s	530	1100	1500	2000	3800	5700	7500

Packet Switch

Switch rating	16	20	40	63	125	250	315	400	600
Prospective current 46 ka rms. max fuse	45	45	63	100	300	800	800	800	800
STR A rms. for 1 sec	400	400	1000	1200	3000	12500	12500	12500	20000

Flat Pack

Rating	Max Isqt x 1000	STR 1sec (rms.)kA	Short Circuit Making Cap	Rated operational Ie AC22(400v)	Rated operational Ie AC23
200	1000	10	22 Pk kA	200	200
250	1000	10	22 Pk kA	250	250
315	1000	10	22 Pk kA	315	250
400	1600	14	28 Pk kA	400	400
630	1600	14	28 Pk kA	630	630
800	4900	17	34 Pk kA	800	700
1000		35	73 Pk kA	1000	1000
1250		35	73 Pk kA	1250	1000
1600		35	73 Pk kA	1600	1000

CABLE TERMINATION SIZES. BYPASS & C/O SWITCHES.

Flat Pack Switches

Rating	Terminal Screw	Torque NM	Max. Conn.
200A	M8	13	185 sq mm cu 7x25
250A	M10	18	185 sq mm cu 7x25
315A	M10	18	185 sq mm cu 7x25
400A	M10	24	240 sq mm cu 6x40
630A	M10	24	240 sq mm cu 2x5x40
800A	M14	65	2x240 sq mm cu 2x10x50
1000A	M16	80	2x80x7 cu bar
1250A	M16	80	2x80x7 cu bar
1600A	2 x M14	55	2x80x7 cu bar

Packet Switches

Rating	Terminal Screw	Torque NM	Max. Conn.
20A	M4	1.5	2.5 sq mm
40A	M6	3	10 sq mm
63A	M6	3	25 sq mm
125A	M8	13	70 sq mm
250A	M12	45	240 sq mm
315A	M12	45	240 sq mm
400A	M12	45	240 sq mm
600 A	M10 x 2	18	Flat cu. 30mm wide

Cam Switches

Rating	Terminal Screw	Torque NM	Max. Conn.
20A	M3	0.2	1x4 sq mm or 2x2.5 sq mm
25A	M3	0.2	1x6 sq mm or 2x4 sq mm
63A	M5	1	1x16 sq mm or 2x10 sq mm
125A / 200A	M10	18	95 sq mm
315A	M10	18	95 sq mm
400A	M12	45	240 sq mm
630A	M16	80	Cu 10x70 400 sq mm



CHANGEOVER AND BY-PASS SWITCHES



CHANGE OVER + BY-PASS SWITCHES

PACKET SWITCH CHANGEOVER AND BY-PASS SWITCHES

Santon rotary packet switches have a fine tradition and have been manufactured for over 70 years. They are capable of onload switching and have manually dependent mechanisms fitted as standard up to and including 125A rating, however, manually independent mechanisms can be fitted if requested. Above 125A rating manually independent mechanisms are standard. Rotary switch contacts have silver surfaces and are of the wiping blade type resulting in low resistance and self cleaning. The moving contact consists of two parallel blades to give maximum pinch performance under short-circuit conditions.

Above 600A rating certain by-pass arrangements consist of two separate switches suitably interlocked with figure locks. Santon packet switches comply with EN60947.

CAM OPERATED CHANGEOVER AND BY-PASS SWITCHES

Santon rotary cam switches are manufactured by modern production processes and comply with the latest European standards. They have manually dependent spring operated mechanisms and the housing cells for the contacts are moulded in a thermosetting melamine with excellent resistance to arc and tracking. The insulation voltage for cam switches is 660v. All ratings are capable of on load switching but the 1200A has a load breaking facility only. The butt contacts are all double break 'anti-weld' silver alloy which provide an exceptionally long mechanical life. Above 200A the contacts are paralleled to provide the higher ratings.

The maximum number of contact cells driven from a pair of mechanisms is 12. Switches requiring above 12 cells are ganged together in groups of 2, 3 or 4 stacks, driven from a single handle

through a precision engineered steel gear drive mechanism. Santon cam switches comply with EN60947.

FLAT PACK CHANGEOVER AND BY-PASS SWITCHES

Santon flat pack switches are a combination of interlocked switches which have manually independent mechanisms and 3 positions - BY PASS-OFF-NORMAL. The contacts are double break wiping action clip and blade type. Terminations are the in line arrangement for ease of connection.

The changeover and by pass links are included with the switch thus reducing the number of cables or switch connections. Santon flat pack switches comply with EN60947.

Santon produce 3 ranges of manual changeover switches. These switches can be provided with or without off position and are available enclosed or as open types for mounting in customers equipment, control panels etc.



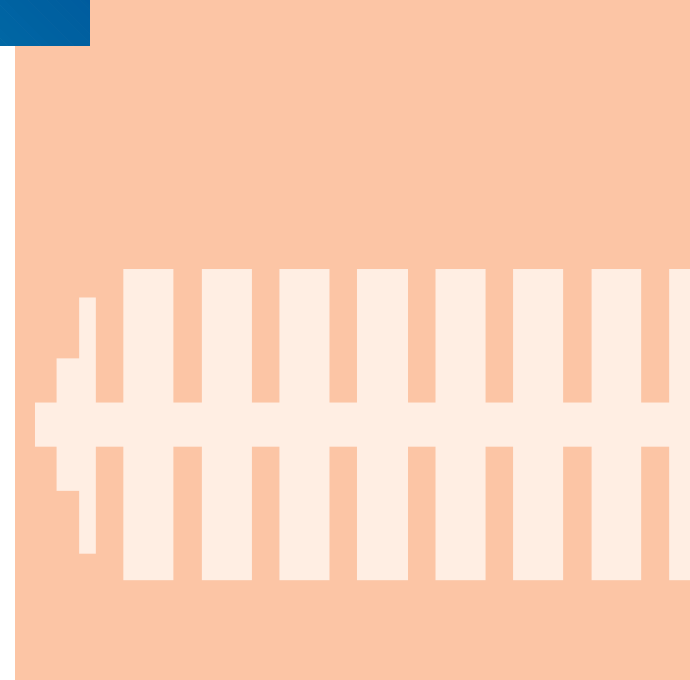
40A Packet Switch



630A Flat Pack



16A Packet Switch



TYPES

Packet switch Designated - RX } Prefix O if Off position
 Cam switch Designated - CX } is required.
 Flat pack type Designated - OFX }

e.g. With off, RX becomes ORX. Flatpack is only available with off.

As standard the packet switch and cam switch types are available in 2 and 4 pole arrangements. Flat pack switches are 4 pole form as standard. Other combinations of poles and ratings can be produced on application.

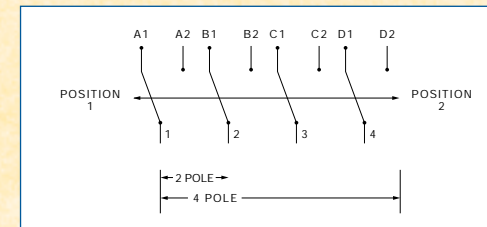
Changeover switches are suitable for 440vAC, DC voltages are available on application.

Order reference Rating AMPS AC22 415V	Rotary cam Switch 2 Pole	Rotary cam Switch 4 Pole	Rotary Packet Switch 2 Pole	Rotary Packet Switch 4 Pole	Flat Pack Switch
16			RX2.16	RX4.16	
20	CX2.20	CX4.20			
25	CX2.25	CX4.25	RX2.25	RX4.25	
40			RX2.40	RX4.40	
63	CX2.63	CX4.63	RX2.63	RX4.63	
125	CX2.125	CX4.125	RX2.125	RX4.125	
200	CX2.200	CX4.200			OFX4.200
250					OFX4.250
315			RX2.315	RX4.315	OFX4.315
400	CX2.400	CX4.400		RX4.400	OFX4.400
630		CX4.630		RX4.600	OFX4.630
800					OFX4.800
1000					OFX4.1000
1250					OFX4.1250
1600					OFX4.1600

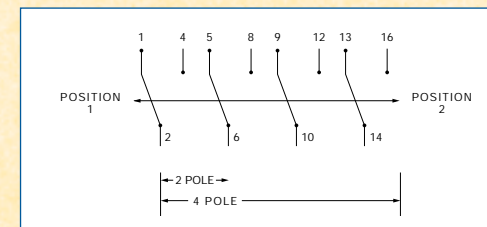
If a surface mounted (enclosed) changeover switch is required, Prefix E is to be added. E.g. EORX4.125 is an enclosed with off packet switch type changeover 4 pole 125 amp.

TERMINAL MARKINGS

Packet Switch



Cam Switch



NOTE: Some CAM switches may have terminal markings as packet switch above

OVERALL DIMENSIONS OF SWITCHES EXCLUDING HANDLE.

Cam Switches

Switch Reference	H x W x D (Volume only)
CX4.20	48 x 48 x 82
CX4.25	61 x 61 x 88
CX4.63	84 x 84 x 111
CX4.125	126 x 126 x 166
CX4.200	145 x 126 x 166
CX4.400	170 x 126 x 314
CX4.630	190 x 126 x 432

Packet Switches

Switch Reference	H x W x D (Volume only)
RX4.16	74x 70 x 89
RX4.25	74 x 70 x 89
RX4.40	105 x 114 x 150
RX4.63	105 x 116 x 120
RX4.125	105 x 116 x 180
RX4.315	216 x 216 x 290
RX4.400	216 x 216 x 290
RX4.600	216 x 216 x 463

Flat Pack Switches

Switch Reference	H x W x D (Volume only)
OFX4.200	190 x 298 x 298
OFX4.250	190 x 298 x 298
OFX4.315	190 x 298 x 298
OFX4.400	280 x 373 x 340
OFX4.630	280 x 373 x 360
OFX4.800	310 x 422 x 380
OFX4.1000	381 x 532 x 415
OFX4.1250	381 x 532 x 415
OFX4.1600	441 x 532 x 415

DIMENSIONS APPROX. FOR CHANGEOVER SWITCHES (ENCLOSED). SPEC. IP54.

Cam Switches

Switch Reference	Enclosure	H x W x D
E(O)CX2.20	Thermoplastic	90 x 90 x 90
E(O)CX4.20	"	90 x 90 x 90
E(O)CX2.25	"	176 x 125 x 190
E(O)CX4.25	"	176 x 125 x 190
E(O)CX2.63	"	176 x 125 x 190
E(O)CX4.63	"	176 x 125 x 199
E(O)CX2.125	Sheet Steel	400 x 300 x 300
E(O)CX4.125	"	400 x 300 x 300
E(O)CX2.200	"	400 x 300 x 300
E(O)CX4.200	"	400 x 300 x 300
E(O)CX2.400	"	600 x 400 x 400
E(O)CX4.400	"	600 x 400 x 400
E(O)CX4.630	"	600 x 600 x 600

Packet Switches

Switch Reference	Enclosure	H x W x D
E(O)RX2.16	Sheet Steel	100 x 100 x 83
E(O)RX4.16	"	100 x 100 x 83
E(O)RX2.25	"	100 x 100 x 83
E(O)RX4.25	"	150 x 150 x 150
E(O)RX2.40	"	150 x 150 x 150
E(O)RX4.40	"	150 x 150 x 150
E(O)RX2.63	"	214 x 214 x 157
E(O)RX4.63	"	214 x 214 x 157
E(O)RX2.125	"	400 x 300 x 300
E(O)RX4.125	"	400 x 300 x 300
E(O)RX2.315	"	600 x 400 x 400
E(O)RX4.315	"	600 x 400 x 400
E(O)RX4.400	"	600 x 400 x 400
E(O)RX4.600	"	600 x 600 x 600

Flat Pack Switches

Switch Reference	Enclosure	H x W x D
EOFX4.200	Sheet Steel	600 x 400 x 300
EOFX4.250	"	600 x 400 x 300
EOFX4.315	"	600 x 400 x 300
EOFX4.400	"	700 x 500 x 400
EOFX4.630	"	700 x 500 x 400
EOFX4.800	"	1000 x 750 x 500
EOFX4.1000	"	1000 x 750 x 500
EOFX4.1250	"	1200 x 800 x 500
EOFX4.1600	"	1400 x 800 x 500

BY-PASS SWITCHES

By-pass switches enable the load to be fed directly from the supply whilst the normal source of supply is isolated.

Santon offer 3 basic types of by-pass switches as standard. All standard by-pass switches are 4 pole and are suitable for 415/440v 3ph + N supply.



1000A Flatpack By-pass Switch

TYPE 1. NORMAL BY-PASS.

NORMAL POSITION.

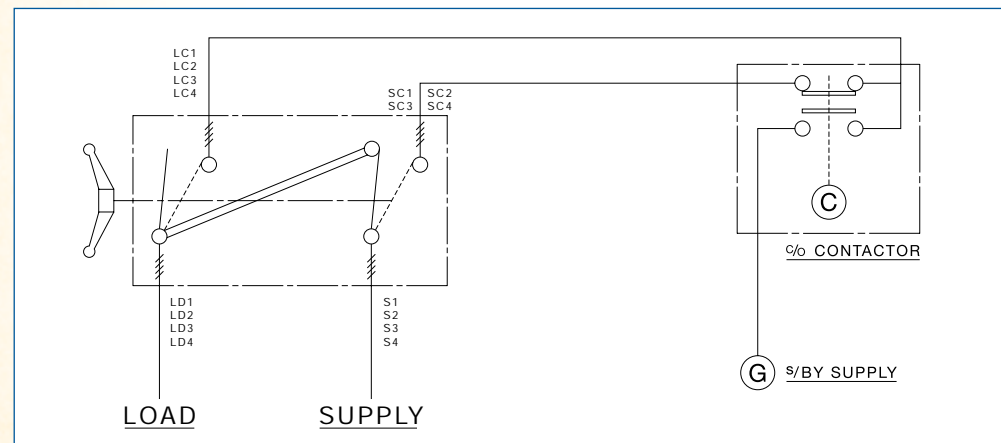
Mains supply is fed to the input of the changeover contactor. The common of the changeover contactor feeds the load.

Note: the stand-by or generator must be connected directly to the changeover contactor.

BY-PASS POSITION.

The load is fed directly from the main supply, the changeover contactor is isolated from the main supply and the load.

Note: The stand-by supply or generator remains connected to the changeover contactor.



NORMAL		BYPASS
S1 - SC1, LD1 - LC1	S2 - SC2, LD2 - LC2	S1 - LD1, S2 - LD2
S3 - SC3, LD3 - LC3	S4 - SC4, LD4 - LC4	S3 - LD3, S4 - LD4

Diagram – Type 1 By-pass Switch (single pole shown in By-pass position).

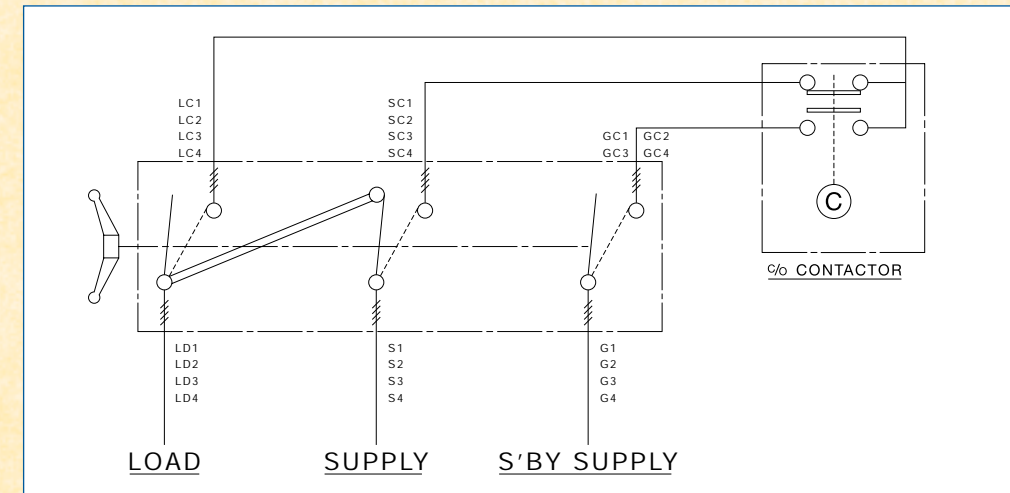


Diagram Type 2 By-pass Switch (single pole shown in By-pass position).

NORMAL	BYPASS
S1 - SC1, G1 - GC1, LD1 - LC1	S1 - LD1, S2 - LD2
S2 - SC2, G2 - GC2, LD2 - LC2	S3 - LD3, S4 - LD4
S3 - SC3, G3 - GC3, LD3 - LC3	
S4 - SC4, G4 - GC4, LD4 - LC4	

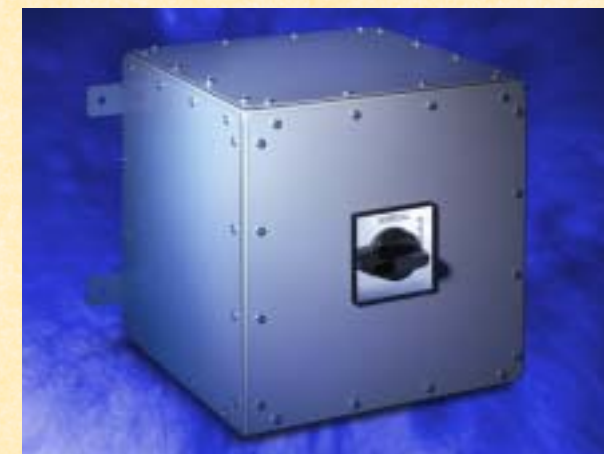
TYPE 2. NORMAL - BY-PASS.

NORMAL POSITION.

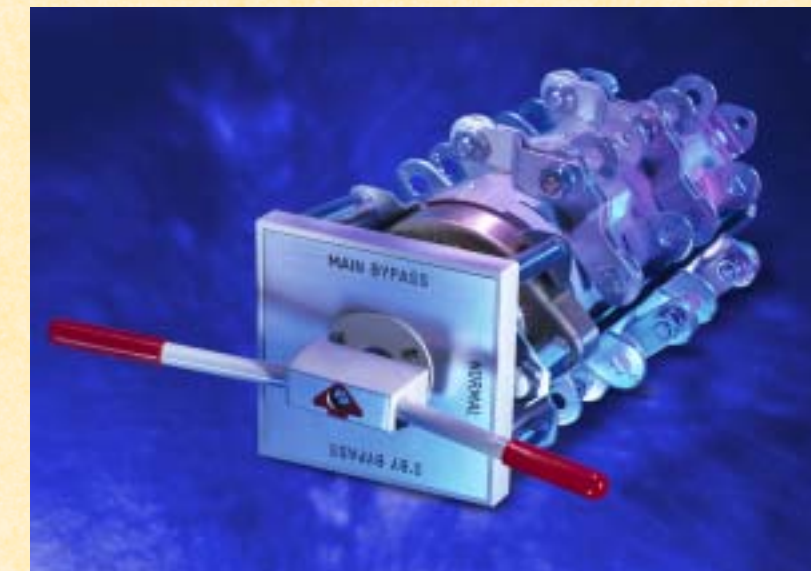
Main supply is fed to the input of the changeover contactor. The common of the changeover contactor feeds the load. Stand-by or generator supply is fed to the input of the changeover contactor.

BY-PASS POSITION.

The load is fed directly from the main supply. The changeover contactor is isolated from the main and stand-by supplies as well as the load.



400A Cam Switch By-pass



400A Packet Switch By-pass

BY-PASS SWITCHES

TYPE 3. STANDBY BY-PASS - NORMAL - MAINS BY-PASS.

NORMAL POSITION.

Main supply is fed to the input of the changeover contactor. The common of the changeover contactor feeds the load. Stand-by or generator supply is fed to the input of the changeover contactor.

MAINS BY-PASS POSITION.

The load is fed directly from the main supply. The changeover contactor is isolated from the main and stand-by supplies as well as the load.

STAND-BY BY-PASS POSITION.

The load is fed directly from the stand-by supply. The changeover contactor isolated from the main and stand-by supplies as well as the load.

OPTIONS ON STANDARD BY-PASS SWITCH

1. An Off position can be provided on packet switch and cam switch type 1 and 2 by-pass switches if required. An Off position can be provided on the type 3 packet switch only.
2. Auxiliary contacts can be provided to suit individual requirements.
3. 1,2 or 3 pole alternatives are available.
4. Door sequenced/interlock handles can be provided for switches mounted behind hinged doors.
5. Castell /Fortress interlocking is available to suit specific requirements.
6. Enclosed by-pass switches are available upon request.

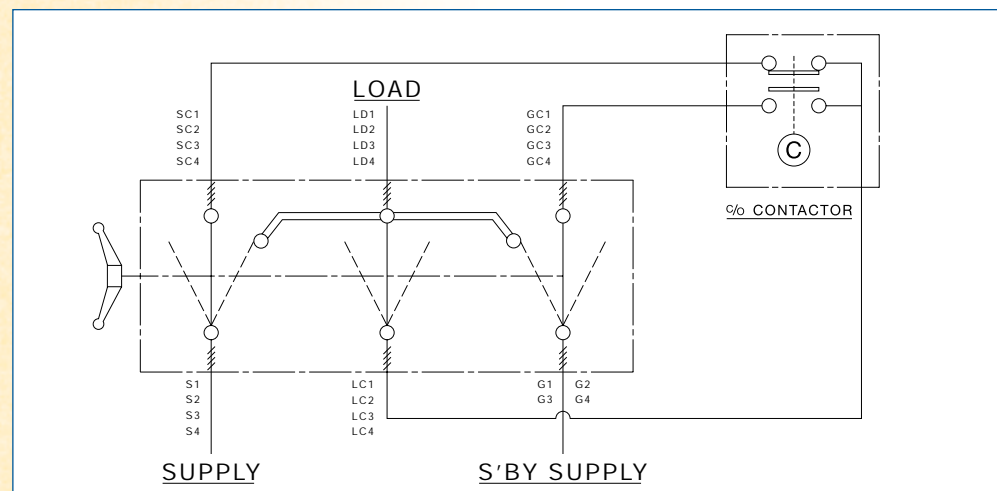


Diagram Type 3 By-pass Switch
(single pole shown in By-pass position).

MAIN BYPASS	NORMAL	S'BY BYPASS
S1 - LD1	S1 - SC1, LD1 - LC1, G1 - GC1	G1 - LD1
S2 - LD2	S2 - SC2, LD2 - LC2, G2 - GC2	G2 - LD2
S3 - LD3	S3 - SC3, LD3 - LC3, G3 - GC3	G3 - LD3
S4 - LD4	S4 - SC4, LD4 - LC4, G4 - GC4	G4 - LD4

BYPASS SWITCHES STANDARD ORDER REFERENCES.

(4 POLE – PREFIX 'O' FOR 'OFF' POSITION).

TYPE 1

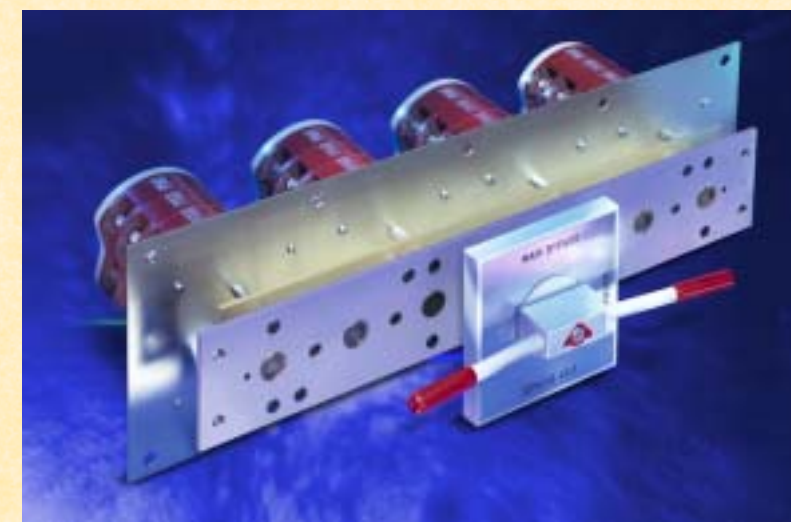
Rating AC22	Cam	Packet	Flatpack
40A	CB1.4.40	RB1.4.40	
63A	CB1.4.63	RB1.4.63	
125A	CB1.4.125	RB1.4.125	
200A	CB1.4.200		OFB1.4.200
250A		RB1.4.250	OFB1.4.250
315A			OFB1.4.315
400A	CB1.4.400	RB1.4.400	OFB1.4.400
630A	CB1.4.630.2	RB1.4.600	OFB1.4.630
800A	CB1.4.800.4		OFB1.4.800
1000A			OFB1.4.1000
1250A			OFB1.4.1250
1600A			OFB1.4.1600

TYPE 2

Rating	Cam	Packet
40A	CB2.4.40	RB2.4.40
63A	CB2.4.63	RB2.4.63
125A	CB2.4.125	RB2.4.125
200A	CB2.4.200	
250A		RB2.4.250
400A	CB2.4.400.2	RB2.4.400
630A	CB2.4.630.4	
800A	CB2.4.800.4	

TYPE 3

Rating	Cam	Packet
40A	CB3.4.40	RB3.4.40
63A	CB3.4.63	RB3.4.63
125A	CB3.4.125	RB3.4.125
200A	CB3.4.200	
250A		RB3.4.250
400A	CB3.4.400.4	RB3.4.400
630A	CB3.4.630.4	
800A	CB3.4.800.4	



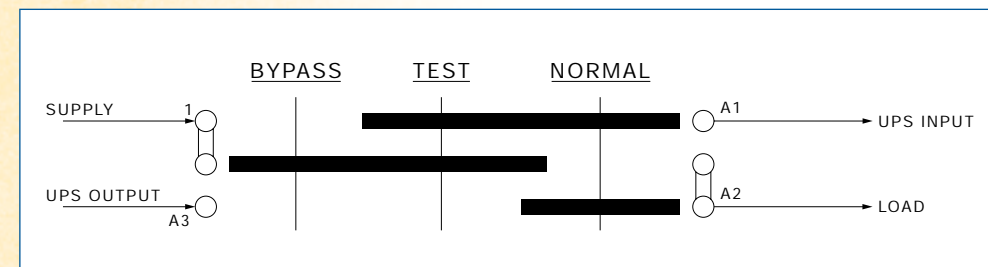
125A Type 3 Cam
Switch By-pass, 4 gang

'UPS' BY-PASS SWITCHES

GENERAL

By-pass switches enable the load to be fed directly from the mains supply in the by-pass position, whilst the UPS is disconnected. A test position is provided such that the UPS unit is energised when by-passed so tests can be made.

UPS switches may be single pole or TP & N. Contacts used on UPS by-pass switches are make before break, so as not to cause an interruption to the supply during switching.



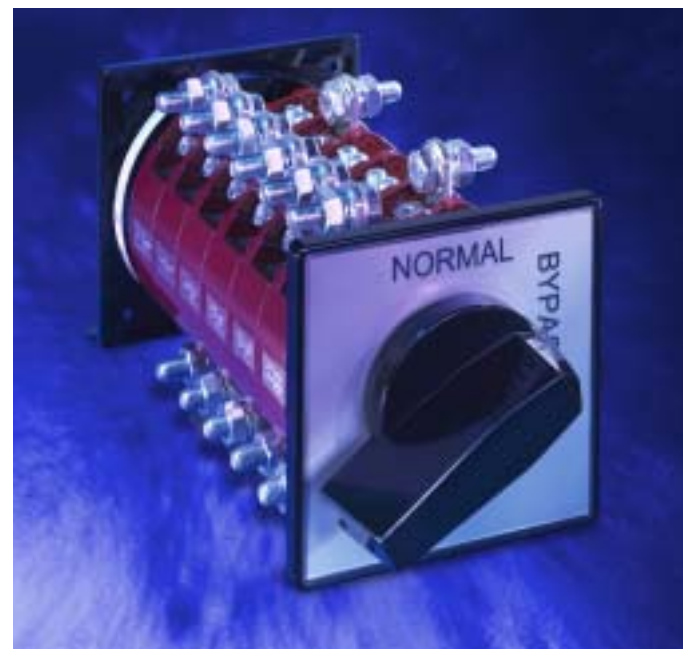
Standard Diagram for UPS By-pass Switch with Test Position.

CONTACTS	
NORMAL POSITION	1 - A1, A3 - A2 (SINGLE POLE)
TEST	1 - A1 - A2
BYPASS	1 - A2

200A Type 1 Cam Switch By-pass

	Singel Phase & Neutral	Three Phase & Neutral
32A	H3P-RA8	H3P-TEO
40A	H4P-RA8	H4P-TEO
63A	H6P-RA8	H6P-TEO
80A	N80P-RA8	N80P-TEO
125A	H12C-RA8	H12C-TEO
200A	O/A	NC2C-PX2
315A	O/A	G3C-PX2

Details on application, refer to sales office.



OVERALL DIMENSIONS OF BYPASS SWITCH EXCLUDING HANDLE.

Note: If required fitted into a sheet steel enclosure prefix the reference with 'E' i.e.ECB1.4.40

Cam Switches

Order Reference	H x W x D (Open)	H x W x D (Enclosed)
CB1.4.40	65 x 65 x 115	300 x 200 x 200
CB1.4.63	65 x 65 x 146	300 x 200 x 200
CB1.4.125	126 x 126 x 226	400 x 300 x 300
CB1.4.200	145 x 126 x 226	400 x 300 x 300
CB1.4.400	170 x 126 x 432	600 x 400 x 400
CB1.4.630.2	260 x 340 x 430	750 x 600 x 600
CB1.4.800.4	260 x 675 x 340	1000 x 800 x 600
CB2.4.40	65 x 65 x 145	300 x 200 x 200
CB2.4.63	65 x 65 x 183	400 x 300 x 300
CB2.4.125	126 x 126 x 314	600 x 600 x 400
CB2.4.200	145 x 126 x 314	460 x 460 x 460
CB2.4.400.2	210 x 340 x 400	600 x 600 x 600
CB2.4.630.4	260 x 648 x 340	1000 x 800 x 600
CB2.4.800.4	260 x 648 x 400	1000 x 800 x 600
CB3.4.40	65 x 65 x 170	300 x 200 x 200
CB3.4.63	65 x 65 x 220	390 x 390 x 268
CB3.4.125	126 x 126 x 373	460 x 460 x 460
CB3.4.250	145 x 126 x 373	460 x 460 x 460
CB3.4.400.4	210 x 648 x 340	1000 x 800 x 600
CB3.4.630.4	260 x 648 x 430	1000 x 800 x 600
CB3.4.800.4	260 x 648 x 520	1000 x 800 x 600

Packet Switches

Order Reference	H x W x D (Open)	H x W x D (Enclosed)
RB1.4.40	120 x 120 x 160	300 x 300 x 200
RB1.4.63	125 x 125 x 160	300 x 300 x 200
RB1.4.125	125 x 125 x 240	400 x 300 x 300
RB1.4.250	230 x 230 x 330	460 x 460 x 460
RB1.4.400	230 x 230 x 330	600 x 600 x 600
RB1.4.600	250 x 250 x 600	1000 x 800 x 600
RB2.4.40	120 x 120 x 190	214 x 214 x 268
RB2.4.63	125 x 125 x 190	400 x 300 x 300
RB2.4.125	125 x 125 x 315	600 x 600 x 400
RB2.4.250	230 x 230 x 505	600 x 600 x 600
RB2.4.400	230 x 230 x 505	600 x 600 x 600
RB3.4.40	120 x 120 x 230	214 x 214 x 268
RB3.4.63	125 x 125 x 230	400 x 300 x 300
RB3.4.125	155 x 125 x 405	460 x 460 x 460
RB3.4.250	230 x 230 x 505	600 x 600 x 600
RB3.4.400	230 x 230 x 505	600 x 600 x 600

Flat Pack Switches

Order Reference	H x W x D (Open)	H x W x D (Enclosed)
OFB1.4.200	190 x 298 x 400	800 x 500 x 450
OFB1.4.250	190 x 298 x 400	800 x 500 x 450
OFB1.4.315	190 x 298 x 400	800 x 500 x 450
OFB1.4.400	280 x 373 x 460	1000 x 600 x 550
OFB1.4.630	280 x 373 x 460	1000 x 600 x 550
OFB1.4.800	300 x 422 x 487	1000 x 600 x 550
OFB1.4.1000	391 x 532 x 580	1400 x 1000 x 600
OFB1.4.1250	391 x 532 x 580	1400 x 1000 x 600
OFB1.4.1600	451 x 532 x 580	1400 x 1000 x 600