



Switchboard MaxSB Low Voltage Products and Systems



Switchboard MaxSB

New / Experienced

Building on years of experience in supplying low voltage distribution equipment all over the world ABB opens a new approach to what a switchboard can be and how it can better serve the user, the design engineer and the contractor.

Fresh / Familiar

ABB builds on the familiar look of a switchboard with group mounted molded case circuit breakers and fixed or draw out main breakers. Fresh ideas are incorporated with features such as a slotted vertical bus design, a full hinged door that incorporates the breaker cover plates, and a modular frame enclosure system.

Unique / Reliable

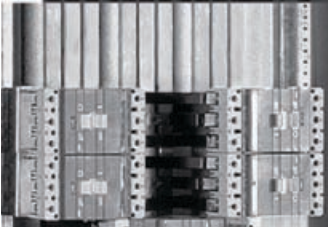
Unique design features such as the slotted bus, and hinged door make this switchboard new. Plated copper bus, bolted bus connections, a frame enclosure structure, and ABB's proven breaker technology make this ABB switchboard highly reliable. Quality is a standard feature in ABB switchboards. A list of expensive options is not needed to ensure the highest quality standards are met.

Features

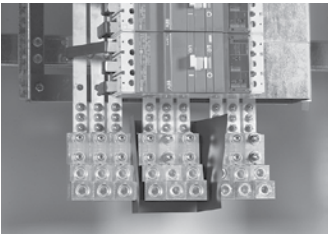
- Hinged door and large wire ways save time and money in field wiring.
- Unique bus layout delivers the freedom to locate feeder breakers independent of any hole pattern.
- Plated copper bus used in all three phases and neutral.
- Copper ground bus extends full width of switchboard.
- Horizontal bus up to 5000 Amps
- Vertical bus up to 3000 Amps
- Group mounted feeder breakers ranging from 15 amps to 1200 Amps
- Main breakers up to 5000 Amps
- Strong frame construction isolates bus and breaker assemblies from enclosure "skin". Durable dry paint finish. Four inch base and lifting eyes are standard.

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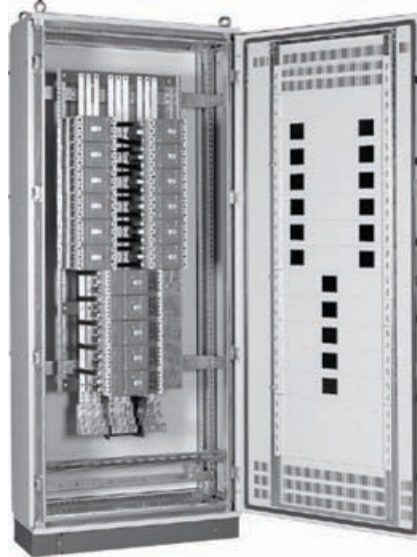
Switchboard MaxSB General information



Unique hole-less bus bar arrangement allows you to install feeder breakers in any location vertically. Less time less hassle.



Easy access to incoming terminals. Less time less hassle



5000 amp Mains and 3000 amp vertical bus designs enable this switchboard to distribute power in the largest low voltage applications. A multi-layered bus design and modular enclosure system provide the flexibility to provide an 800 amp free-standing switchboard that has an extremely small foot print.

Precise / Flexible

ABB's switchboard uses a frame-based enclosure system. Unlike self-supporting enclosures the frame supports the bus bar and breaker assemblies. Front panels, sidewalls, and rear panels are also supported by the frame structure. This design offers a number of advantages over self-supporting enclosure systems. Damaged walls and panels can be easily replaced without the need to disassemble interior bus or breaker assemblies. The modular nature of ABB's frame enclosure system makes it easy to expand the switchboard by adding sections as system requirements change. Simply remove a side wall and butt the new section against the old. Overlapping horizontal bus design makes for a simple and accurate splice connection.

Custom / Standard

Wouldn't it be nice to have the freedom to layout a switchboard in such a way that it compliments the application and site requirements? Would you benefit from the freedom to locate breakers as you choose? Wouldn't you like to add custom features like a dust-proof enclosure, or a full glass door for added security and an enhanced appearance in high visibility sites? ABB's standard switchboard design makes these and other custom like features affordable.

Industrial / Commercial

The Operations Manager wants reliability, the specifying engineer wants a product he can believe in, the service department demands maintainability, the CFO wants value and the contractor wants a supplier and product that is easy to work with and on time delivery. One company can match all of these requirements; ABB.

The Operations Manager and specifying engineer appreciate features such as plated copper bus and bolted bus connections. A frame-based enclosure system delivers strength, expandability and simplifies repairs. The complete system is designed and tested to meet or exceed UL requirements.

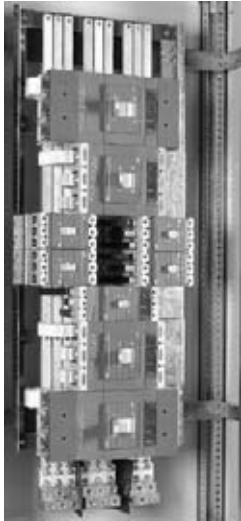
The maintenance department enjoys a hinged door that makes it easy for qualified personnel to access the cabinet to maintain and service ABB's switchboards. Connections are located so that you can actually get to them. A framed enclosure construction and bus design make this switchboard easy to expand as requirements change.

Contractors save on installation time with easy to access terminals, increased cable area and a design that makes it easy to add breakers and accessories in the field.

Switchboard MaxSB

Low Voltage Products and Systems

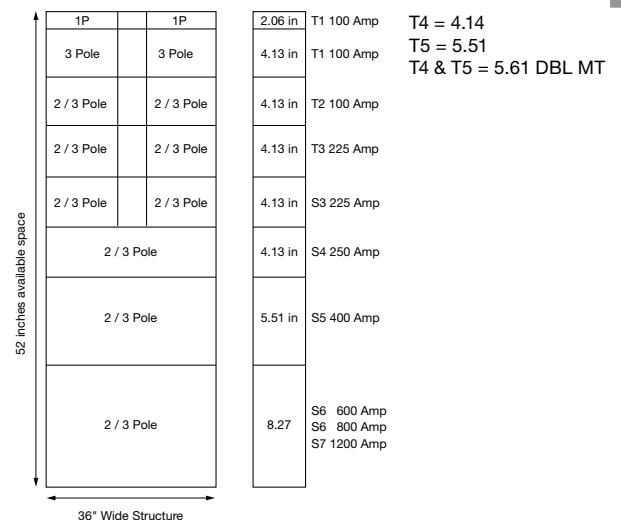
Power
Distribution
Systems



Feeder Breakers

Frame	Poles	Space Inches	KAIC			Trip Frame Rating Amps									
			277	240	480	15	20	25	30	35	40	50	60		
T1B	1	1.0	18 ^②												
T1N	3	3.0		50	22 ^③										
T2S	2/3	3.54		65	35										
T2H	2/3	3.54		100	65										
T3N	2/3	4.13		50	25										
T3S	2/3	4.13		65	35										
S3N	2/3	4.13		65	25										
S3H	2/3	4.13		100	50										
S3L	2/3	4.13		150	85 ^①										
						70	80	90	100						
T1B	1	1.0	18												
T1N	3	3.0		50	22										
T2S	2/3	3.54		65	35										
T2H	2/3	3.54		100	65										
T3N	2/3	4.13		50	25										
T3S	2/3	4.13		65	35										
S3N	2/3	4.13		65	25										
S3H	2/3	4.13		100	50										
S3L	2/3	4.13		150	85										
						125	150	175	200	225					
						250 Electronic - adjustable 40 - 250									
S4N	2/3	4.13		65	25										
S4H	2/3	4.13		150	65										
S4L	2/3	4.13		200	100										
						400 Electronic - adjustable 160 - 400									
S5N	2/3	5.51		65	35										
S5H	2/3	5.51		150	65										
S5L	2/3	5.51		200	100										
						600 Electronic - adjustable 240 - 600									
S6N	2/3	8.27		65	50										
S6H	2/3	8.27		150	65										
S6L	2/3	8.27		200	100										
						800 Electronic - adjustable 320 - 800									
S6N	2/3	8.27		65	50										
S6H	2/3	8.27		150	65										
S6L	2/3	8.27		200	100										
						1200 Electronic - adjustable 480 - 1200									
S7H	2/3	8.27		100	65										

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① S3L	15-30A	65kA@480V
② T1B	15A	10kA@277V
③ T1N	15A	35kA@240V 14kA@480V

Maximum switchboard rating = 100kA

Molded case circuit breakers

Tmax

T1 100 A, T2 100A, T3 225 A



T1 100A



T2 100A



T3 225A



Tmax T2 can be fitted with the latest generation in electronic trip units. This is the first time that a circuit-breaker of this size can benefit from electronic protection, and the setting flexibility it provides.

UL 489 CSA 22.2

Circuit breakers		Tmax T1 1p	Tmax T1	Tmax T2	Tmax T3
Maximum frame continuous current 40°C Iu	[A]	100	100	100	225
Number of poles	[Nr]	1	3/4	2/3/4	2/3/4
Rated operational voltage (AC) 50-80Hz Ue	[V]	277	480	480	480
Short circuit interrupting capacity, Icu		B	N	S H	N S
AC 240V	[kA]		50	65 100	50 65
277V	[kA]	18 ^①			
480V	[kA]		22 ^②	35 65	25 35
DC 250V 2 poles in series	[kA]		25		25 35
500V 3 poles in series	[kA]		25		25 35
Relays	TM PR22 1DS MA	-	-	-	-
Versions	MCCB MCS MCP	-	-	-	-

IEC 60047-2

Circuit breakers		Tmax T1 1p	Tmax T1	Tmax T2	Tmax T3
Rated uninterrupted current Iu	[A]	160	160	160	250
Number of poles	[Nr]	1	3/4	3/4	3/4
Rated service voltage, Ue	[V]	240	690	690	690
DC	[V]	125	500	500	500
Rated ultimate short circuit breaking capacity, Icu		B	B C N	N S H L	N S
AC 220/230V	[kA]	25	25 40 50	65 85 100 120	50 85
380/415	[kA]		16 25 36	36 50 70 85	36 50
440V	[kA]		10 15 22	30 45 55 75	25 40
500V	[kA]		8 10 15	25 30 36 50	20 30
690V	[kA]		3 4 6	6 7 8 10	5 8
DC 250V 2 poles in series	[kA]		16 25 36	35 50 70 85	36 50
250V 2 poles in series	[kA]		20 30 40	40 55 85 100	40 55
500V 2 poles in series	[kA]		16 25 36	36 50 70 85	36 50
Trip units	Fixed thermal magnetic Fixed thermal magnetic PR221/DS Fixed magnetic Adjustable magnetic	-	-	-	-
Dimensions	H [in/mm] W 1p or 3p [in/mm] W 4p [in/mm]	5.12/130 1/25.4	5.12/130 3/76 4/102	5.12/130 3.54/90 4.72/122	5.9/150 4.13/105 5.5/140
Mechanical life	D [in/mm] [No operations] [No hourly operations]	2.76/70 25000 240	2.76/70 25000 240	2.76/70 25000 240	2.76/70 25000 120
Electrical life	[No operations] [No hourly operations]	8000 120	8000 120	8000 120	8000 120

① 15A : 10kA@277Vac

② 15A : 35kA@240Vac; 14kA@480Vac

Molded case circuit breakers

Isomax S3B, S3, S4



S3B

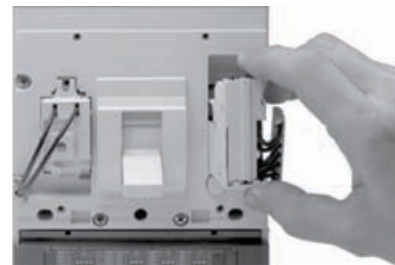


S3



S4

Isolation of control accessories and power poles allows for the safe addition / replacement of shunt trips, auxiliaries, bell alarm and under voltage relays.



Circuit breaker type

			S3B	S3			S4						
Maximum frame continuous rated current	40° C	A	225	150			225						
Rated operational voltage	50/60Hz	V	240	600			480						
Test voltage	1 min. 50/60 Hz	V	3000	3000			3000						
Rated impulse withstand voltage		kV	6	6			6						
Poles		No.	2/3	2/3/4			2/3/4						
Performance level			B	N	H	L	N	H	L	N	H	L	
UL/CSA short-circuit Interrupting capacity UL 489, File #E93565 CSA, File #LR90467	240VAC	kA RMS	150	65	100	150	65	100	150	65	100	150	
	480VAC		–	25	50	85 [ⓐ]	25	50	65	65	150	200	
	600VAC		–	14	14	25	–	–	–	18	32	35	
	500VDC		–	50	35	50	65	25	35	50	–	–	–
	600VDC	–	–	20	35	50	–	–	–	–	–	–	
IEC-947 rated ultimate Short-circuit Breaking capacity	202/230VAC	kA RMS	150	65	100	170	65	100	170	65	100	200	
	380/400/415VAC		–	35	65	85	35	65	85	35	65	100	
	440VAC		–	30	50	65	30	50	65	30	50	80	
	500VAC		–	25	40	50	25	40	50	25	40	65	
	660/690VAC	–	–	14	18	20	14	18	20	18	22	30	
Overcurrent trip unit/relay													
Thermal-magnetic			•	•			•			–			
Microprocessor-based			–	–			–			•			
Dialogue unit			–	–			–			•			
Interchangeability			–	–			–			•			
Version – Terminals													
Fixed – front or rear			•	•			•			•			
Plug-in – front or rear			•	•			•			•			
Withdrawable – front or rear			•	•			•			•			
Dimensions (fixed circuit-breaker)													
2P & 3P (H x W x D)		in	6.70 x 4.13 x 4.07	6.70 x 4.13 x 4.07			6.70 x 4.13 x 4.07			10.0 x 4.13 x 4.07			
4P (H x W x D)		in	6.70 x 5.51 x 4.07	6.70 x 5.51 x 4.07			6.70 x 5.51 x 4.07			10.0 x 5.51 x 4.07			
Mechanical duration operations			No.	25,000	25,000			25,000			25,000		
frequency			ops./hour	240	120			120			120		
Weights (fixed 3P)			lbs.	6.75	6.75			6.75			8.8		

ⓐ For use with thermal - magnetic trip only:
500 VDC, 2 poles in series
600 VDC, 3 poles in series
ⓑ 15-30A units are 65kA at 480VAC

Molded case circuit breakers

Isomax

S3B, S3, S4



Circuit breaker type

			S5	S6			S7	S8
Maximum frame continuous rated current	40° C	A	400	600	800	1200	1600/2000/2500	
Rated operational voltage	50/60Hz	V	600	600	600	600	600	
Test voltage	1 min. 50/60 Hz	V	3000	3000	3000	3000	3000	
Rated impulse withstand voltage		kV	8	8	8	8	8	
Poles		No.	2/3/4	2/3/4	2/3/4	2/3/4	3	
Performance level			N H L	N H L	N H L	H	V	
UL/CSA short-circuit interrupting capacity	240VAC 480VAC	kA RMS	65 150 200 35 65 100	65 150 200 50 65 100	65 150 200 50 65 100	100 65	120 100	
UL 489, File #E93565	600VAC	①	22 22 35	25 35 42	25 35 42	50	85	
CSA, File #LR90467	500VDC	①	35 50 65	35 50 65	35 50 65	-	-	
	600VDC	①	20 35 50	20 35 50	20 35 50	-	-	
IEC-947 rated ultimate short-circuit breaking capacity	202/230VAC 380/400/415VAC	kA RMS	65 100 200 35 65 100	65 100 200 35 65 100	65 100 200 35 65 100	100 65	120 120	
	440VAC		30 50 80	30 50 680	30 50 80	55	100	
	500VAC		25 40 65	25 40 65	25 40 65	45	70	
	660/690VAC		20 25 30	20 25 35	20 25 35	25	50	
Overcurrent trip unit/relay								
Thermal-magnetic			•	•	•	-	-	
Microprocessor-based			•	•	•	•	•	
Dialogue unit			•	•	•	•	•	
Interchangeability			•	•	•	•	•	
Version — Terminals								
Fixed — front or rear			•	•	•	•	•	
Plug-in — front or rear			•	•	•	-	-	
Withdrawable — front or rear			•	•	•	•	-	
Dimensions (fixed circuit-breaker)								
2P & 3P (H x W x D)		in	10.0 x 5.51 x 4.07	10.55 x 8.27 x 4.07	14.25 x 8.27 x 4.07	15.98 x 8.27 x 5.45	15.75 x 15.98 x 9.25	
4P (H x W x D)		in	10.0 x 7.24 x 4.07	10.55 x 11.0 x 4.07	14.25 x 11.0 x 4.07	15.98 x 11.0 x 5.45		
Mechanical duration operations frequency		No. ops./hour	20,000 120	20,000 120	20,000 120	10,000 120	10,000 20	
Weights (fixed 3P)		lbs.	11.0	21.0	22.0	37.5	135	

Standard cable lug kits

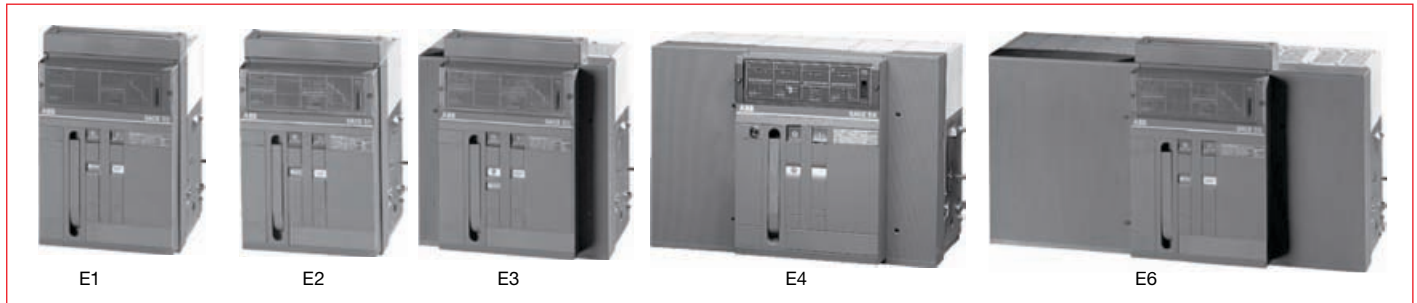
For breakers	Amps	Wire range	Catalog number
S3	60	14AWG - 2AWG	K3TA
S3 - S4	100	14AWG - 1/0	K4TB
S3 - S4	150	14AWG - 4/0	K4TC
S3 - S4 - S5	225	4AWG - 300kcmil	K4TD
S4	250	6AWG - 350kcmil	K4TE
S5	300	250kcmil - 500kcmil	K5TF
S5	400	(2) 3/0 - 250kcmil	K5TG
S6	600	(2) 250kcmil - 250Kcmil	K5TH
S6	800	(3) 2/0 - 400kcmil	K6TJ
S7	1200	(4) 4/0 - 400kcmil	K7TK
S8	1600	(4) 1/0 - 750kcmil	K8TL
S8	2500	(6) 1/0 - 750kcmil	K8TM

Standard cable lugs, for use on load side of circuit breaker. Suitable for use with Cu or Al. Special versions available with taps and screw for control wire connection. Note: S6 and S7 lugs are Al9Cu (90°); all others AL7Cu (75°C). Must use wire based on 75°C ampacity.

Air circuit breakers

Emax

E1, E2, E3, E4, E6



Circuit breaker type

		E1		E2		E3				E4			E6	
Performance level		B-A	B-A	N-A	N-A	S-A	H-A	V-A	S-A	H-A	V-A	H-A	V-A	
Rated continuous current File #E194191	A	800	1600	1200	2000	1200	1200	1200	3200	3200	3200	4000	4000	
	A	1200	-	1600	2500	1600	1600	1600	3600	3600	3600	5000	5000	
	A	-	-	-	-	2000	2000	2000	-	-	-	-	-	
	A	-	-	-	-	2500	2500	2500	-	-	-	-	-	
Rated short circuit current	240VAC	kA	42	42	65	65	85	85	100	85	100	100	125	125
	480VAC	kA	42	42	50	50	65	85	100	65	85	100	85	125
	600VAC	kA	35	42	50	50	65	65	85	65	85	85	85	85
Rated short time current	kA	35	42	50	50	65	65	65	65	85	85	100	100	
Trip units														
PR111/P-A		•	•	•	•	•	•	•	•	•	•	•	•	
PR112/P-A		•	•	•	•	•	•	•	•	•	•	•	•	
PR113/P-A		•	•	•	•	•	•	•	•	•	•	•	•	
Operation times														
Make time (max)	ms	80	80	80	80	80	80	80	80	80	80	80	80	
Break time (<ST current)(max)	ms	70	70	70	70	70	70	70	70	70	70	70	70	
Break time (>ST current)(max)	ms	30	30	30	30	30	30	30	30	30	30	30	30	
Overall dimensions, 3 pole														
Fixed: H=418mm / 16.46in D=302mm / 11.89in W (3 poles)	mm/in	296/11.65	296/11.65			404/15.91				566/22.28		782/30.79		
Drawout: H=461mm / 18.15in D=396.5mm / 15.61 in W (3 poles)	mm/in	324/12.76	324/12.76			432/17.01				594/23.39		810/31.89		
Weights (CB with releases, RH terminals and CTs, accessories excluded)														
Fixed 3 poles	Kg/lbs	452/93	46/101			68/150				95/209		140/309		
Drawout 3 poles	Kg/lbs	65/143	72/159			100/220				147/324		210/463		
Overall dimensions, 4 pole														
Fixed: H=418mm / 16.46in D=302mm / 11.89in W (4 poles)	mm/in	386/15.20	386/15.20			530/20.87				656/25.83		908/35.75		
Drawout: H=461mm / 18.15in D=396.5mm / 15.61in W (4 poles)	mm/in	414/16.30	414/16.30			558/21.97				684/26.93		936/36.85		
Weights (CB with releases, RH terminals and CTs, accessories excluded)														
Fixed 4 poles	Kg/lbs	50/110	55/121			80/176				115/253		170/374		
Drawout 4 poles	Kg/lbs	80/176	89/196			125/275				190/418		260/573		

Specifications common to the entire range

Rated max voltage 635 VAC
 Rated voltage 600VAC
 Test voltage (1 min 50/60Hz) 2.2k
 Frequency 50/60Hz
 Number of poles 3/4
 Versions Fixed/Drawout

Lugs: Main Breakers and Main Lugs Only

Frames	Lug size	Wire size	Catalog number
E1	(4)	#2-600kcmil	KE1CLK 4600
E2	(4)	#2-600kcmil	KE2CLK 4600
E3	(6)	#2-600kcmil	KE3CLK 6600
E4	(10)	#2-600kcmil	KE4CLK 10600
E5	(12)	#2-600kcmil	KE6CLK 12600



ABB's Emax air circuit breaker is available with three trip units models. From the PR111 that offers only the basic protection functions to the PR113 that offers protection, multi-meter capability, and communication capability there is a trip unit for every application.

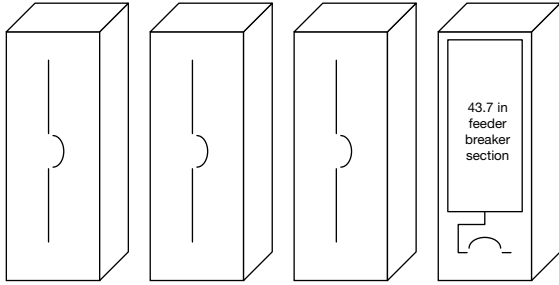
Air circuit breakers

Emax

E1, E2, E3, E4, E6

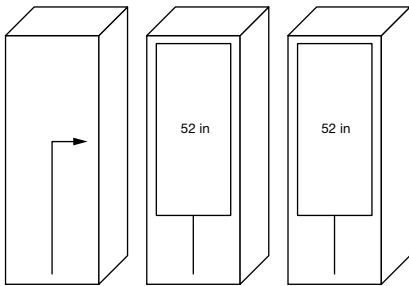
Typical layouts

Mains



4000 - 5000 Amps	3000 Amps	2000 - 2500 Amps	800 - 1200 Amps*
W/D/H: 45" / 33" / 88"	37.3" / 33" / 88"	29.5" / 33" / 88"	37.3" / 14.25" / 88"

Mains Lugs Only and Feeder Breaker Sections



2500 - 5000 Amps	800 - 1600 Amps	2000 - 2500 Amps
W/D/H: 29.5" / 25" / 88"	37.3" / 14.25" / 88"	37.3" / 25" / 88"

* 25" deep enclosure required as a minimum for multiple sections with horizontal bus.