



Switchboard MaxSB Low Voltage Products and Systems



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.

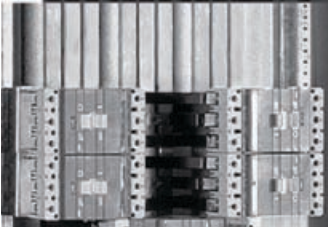
Features

- 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.

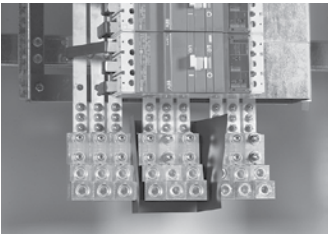
Switchboard MaxSB

17

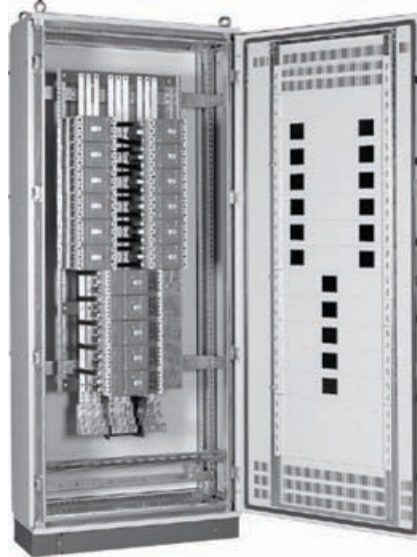
Switchboard MaxSB General information



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.

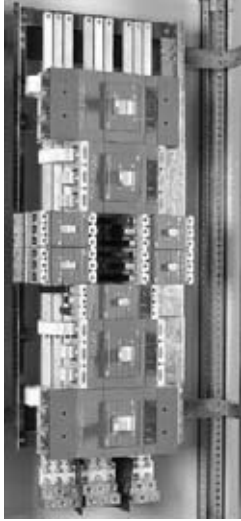
The maintenance department enjoys a hinged door that makes it easy for qualified personnel to access the cabinet to maintain and service ABB's switchboards. Connections are located so that you can actually get to them. A framed enclosure construction and bus design make this switchboard easy to expand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

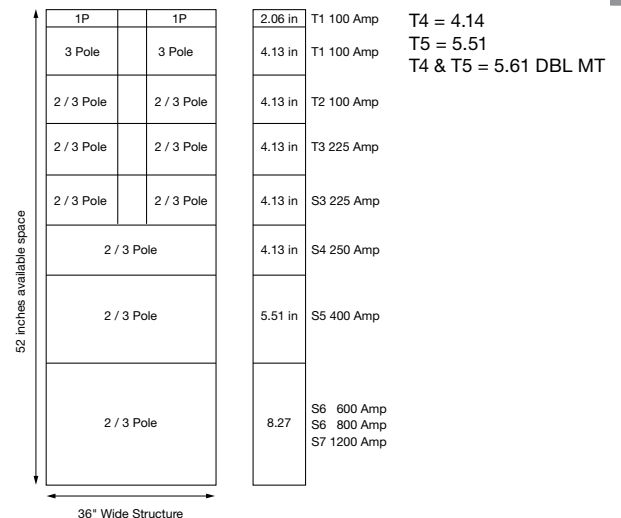
Power
Distribution
Systems



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										

17



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

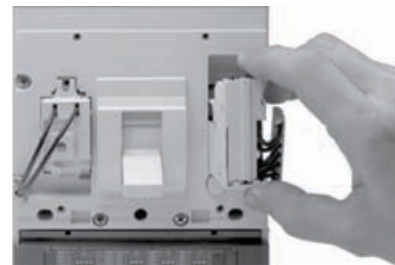


S3



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

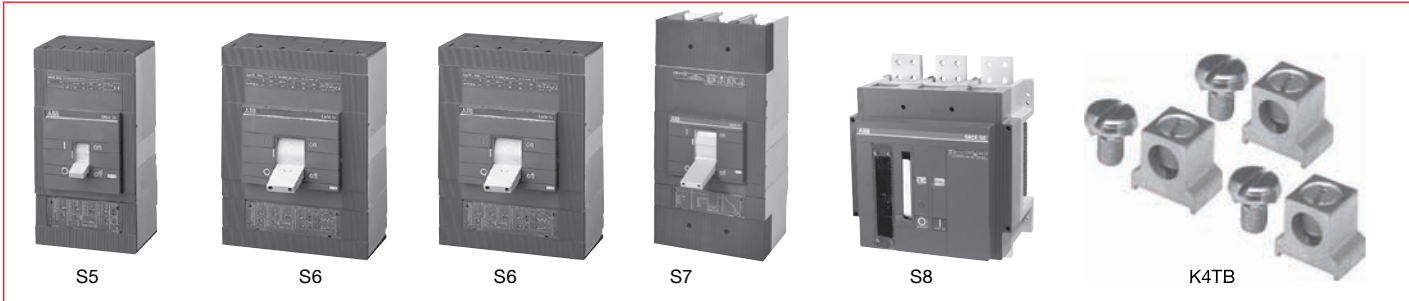
		S3B	S3			S4			
Maximum frame continuous rated current	40° C	A	225	150	225	250			
Rated operational voltage	50/60Hz	V	240	600	480	600			
Test voltage	1 min. 50/60 Hz	V	3000	3000	3000	3000			
Rated impulse withstand voltage		kV	6	6	6	8			
Poles		No.	2/3	2/3/4	2/3/4	2/3/4			
Performance level			B	N	H	L	N	H	L
UL/CSA short-circuit interrupting capacity	240VAC 480VAC	kA RMS	150	65	100	150	65	100	150
UL 489, File #E93565	600VAC		–	25	50	85 ^②	25	50	65
CSA, File #LR90467	500VDC	①	50	14	14	25	–	–	–
	600VDC	①	–	35	50	65	25	35	50
	202/230VAC		150	20	35	50	–	–	–
IEC-947 rated ultimate short-circuit breaking capacity	380/400/415VAC	kA RMS	–	65	100	170	65	100	170
	440VAC		–	35	65	85	35	65	85
	500VAC		–	30	50	65	30	50	65
	660/690VAC		–	25	40	50	25	40	50
			–	14	18	20	14	18	20
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	6.70 x 4.13 x 4.07	10.0 x 4.13 x 4.07	10.0 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	6.70 x 5.51 x 4.07	10.0 x 5.51 x 4.07	10.0 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	25,000	25,000	25,000
frequency	ops./hour		240	120	120	120	120	120	120
Weights (fixed 3P)	lbs.		6.75	6.75	6.75	6.75	8.8	8.8	8.8

① For use with thermal - magnetic trip only:
500 VDC, 2 poles in series
600 VDC, 3 poles in series
② 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

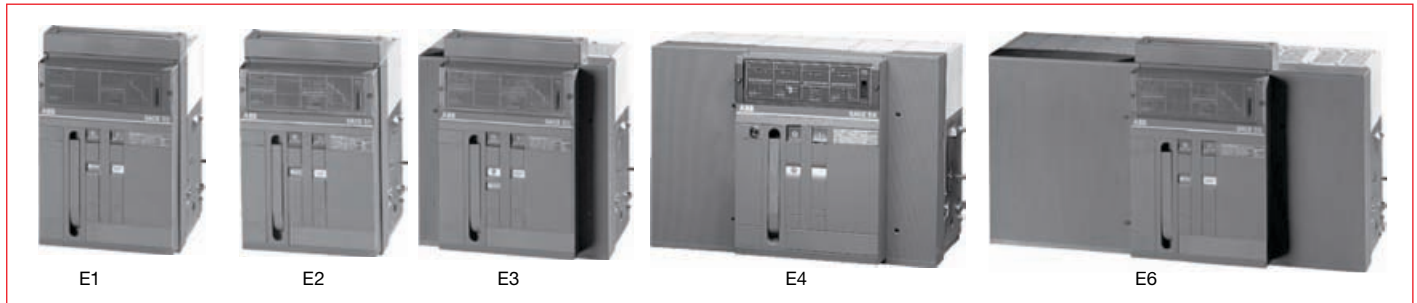
For breakers	Amps	Wire range	Catalog number
S3	60	14AWG - 2AWG	K3TA
S3 - S4	100	14AWG - 1/0	K4TB
S3 - S4	150	14AWG - 4/0	K4TC
S3 - S4 - S5	225	4AWG - 300kcmil	K4TD
S4	250	6AWG - 350kcmil	K4TE
S5	300	250kcmil - 500kcmil	K5TF
S5	400	(2) 3/0 - 250kcmil	K5TG
S6	600	(2) 250kcmil - 250Kcmil	K5TH
S6	800	(3) 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	
		B-A	B-A	N-A	N-A	S-A	H-A	V-A	S-A	H-A	V-A	H-A	V-A	
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.

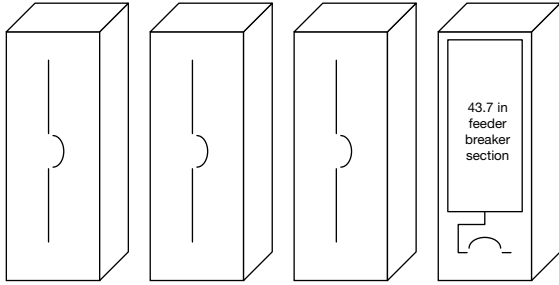
Air circuit breakers

Emax

E1, E2, E3, E4, E6

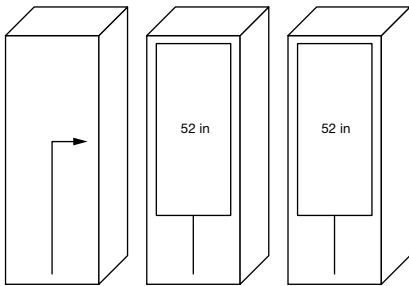
Typical layouts

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.



MaxSG Switchgear Low voltage metal enclosed



Standard Line-Up of MaxSG Metal Enclosed Low Voltage switchgear with instrumentation and Emax Power Circuit Breakers.

MaxSG Switchgear

ABB MaxSG switchgear is a further continuation in the development of innovative products from ABB, a world-wide leader in development and production of low voltage switchgear. MaxSG is industrial duty equipment built to ANSI standards. MaxSG is designed to use 100% rated Emax circuit breakers and follows the vision of ABB products in providing customers with advanced solutions to meet the needs associated with the mechanical, electrical and thermal stress of today's manufacturing environment.

The MaxSG Metal-Enclosed Low Voltage Switchgear offers many advantages that include:

Modular frame arrangements

Optional barriers for increased personnel protection

Efficient and flexible designs

Standard connections to a full range of ABB products

MaxSG is available with the following nominal ratings:

- 600Vac max
- 5000Aac max
- 50/60 Hz
- 2200Vac RMS Dielectric
- 125kA Symmetrical Short Circuit Withstand Rating
- Seismic Qualification Zones 1 -4

MaxSG can accommodate four Emax Power Circuit Breaker frame types:

- E2 1200-1600A: B-A N-A
- E3 1200-2500A: N-A, S-A, H-A, V-A
- E4 3200-3600A: S-A, H-A, V-A
- E6 4000-5000A : H-A, V-A

ABB MaxSG switchgear and the use of these breakers will allow a full range of selectivity, coordination, and short circuit withstand capability.

MaxSG vertical sections are offered in 23.6" (600mm), 31.5" (800mm), and 39.4" (1000mm) widths and will allow four 2000A circuit breakers to be placed in one vertical section maximizing power supply capability and minimizing floor space. In addition MaxSG offers depths of 65"(1650mm) and 75" (1900mm) to provide maximum available cable area.

ABB MaxSG switchgear and Emax circuit breakers have been designed and conformance tested to meet and exceed the industry requirements of ANSI C37.13, C37.16, C37.17 and UL 1066 for the breaker elements and ANSI C37.20.1, C37.51 and UL1558 for the switchgear assembly.

MaxSG and ABB will fill the customer's needs from general application through a full range of special applications including electrical protection, transfer/coordination, and extreme environmental applications.

ATLV MaxSG

MaxSG Switchgear Features

Closed-Door Draw out Capability (standard)

MaxSG offers the ability to rack the breaker from the "CONNECT" position through the "TEST" position and to the "DISCONNECT" position while the breaker compartment door remains stationary and closed providing maximum convenience and personnel safety.



True Closed Door Draw out Capability

Draw out Padlock Provision

Allows the Emax breaker to be padlocked in the "CONNECT", "TEST" or "DISCONNECT" position providing an added degree of safety.

Breaker Rejection Feature (standard)

Prevents breakers with lower short circuit/continuous current ratings from being inserted into the breaker compartment.



Emax breaker rejection feature.

Safety Shutters (standard)

Safety shutters to prevent accidental contact with live bus are a standard on all breakers. In addition a padlock feature is available to lock the shutters in the closed position for an added degree of safety.

Breaker Insertion / Withdrawal Interlock (standard)

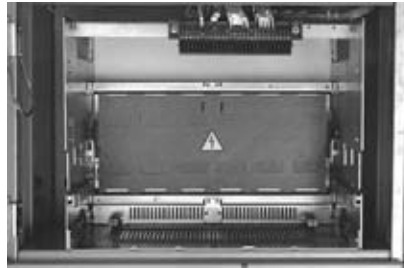
Interlocks prevent racking of the breaker while the main contacts are closed.

Kirk Key Interlocks

Allows the breaker to be locked open when in the connected position. Typical mechanical breaker interlocking can be achieved with this feature. Single and double barrel locks are available in the breaker compartment.

Overhead Lift Device

A rail mounted hoist is installed on top of the equipment for lifting the breakers into and out of the breaker cubicles.



Safety shutters standard in every Breaker cubicle.



MaxSG overhead lift device.

MaxSG Switchgear Bus design

Bus Design

All horizontal and vertical bus are rated for ANSI and UL standard temperature rise requirements of maximum 65°C rise over an ambient temperature of 40°C.

Bus Insulation Systems

Bare bus is provided as standard in all MaxSG switchgear. The configuration provides horizontal isolation barriers at all tiebreakers for added protection in the event of a fault. An insulated bus system that completely insulates the bus with thermo-contractile flame resistant tubing is also available. At connection joints an adhesive coated low voltage tape or optional flexible boots are supplied for customer inspection and maintenance.

Bus Bracing

Steel supported polyester type fingerplates provide bus bracing. Bus bracing is available from 50kA to 125kA symmetrical ratings.

Rear Barriers

Steel main bus barriers are available to completely isolate the rear cable compartment area from the main bus for added personnel safety. Steel inter-compartment barriers are also available to isolate each vertical section.

Silver Plated Bus (Standard)

All bus is copper with a silver plated surface. Tin plated bus is offered as an option.

Ground Bus

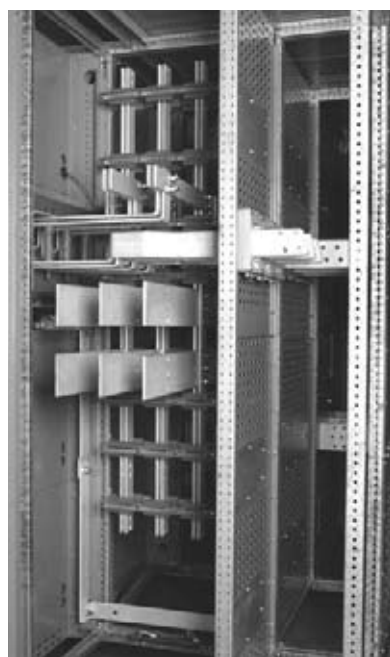
A ground bus is supplied over the entire length of the switchgear and is conveniently located for customer connections.



MaxSG main bus designed with the end user in mind.



Optional rear main bus barriers, providing a completely isolated cable compartment.



MaxSG Switchgear Structural design

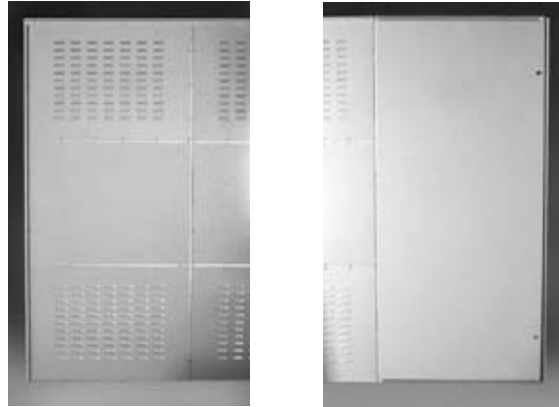


Basic Structure

The basic structure of the switchgear is a rigid platform constructed of 12gA steel. Lifting is available through floor jacks.

Hinges

Doors are attached with semi-concealed hinges allowing rugged support for equipment mounting and providing protection against non-authorized removal of doors with the use of tamper resistant hardware.



Standard bolted rear cover and optional hinged rear door.

Rear Covers/ Doors

Rear bolted covers with tap type screws provide easy removal and installation in the field. Optional full height hinged doors are also available on request.

Rear Cable Space

Conduit entries meet and exceed all applicable NEC requirements. Extended rear compartment space is available as an option to allow extra space if desired.

Paint and Finish

MaxSG uses an electro-static powder coat finish that meets and exceeds IEEE C37.20.1 coating qualification requirements. ANSI 61 light gray is offered as a standard.



Rear cable area.

MaxSG Switchgear Wiring / Instrumentation

Secondary Terminations

Customer secondary terminations are located above the circuit breaker providing ample room for customer connection routing and termination. Spare terminal points can be located in the front of the gear in an instrument compartment.

Instrument compartments

When additional devices are required separate instrument compartments are supplied. Voltage transformers, when specified, are also mounted in the instrument compartments with their primary and secondary fuse protection.

Intercubicle Wiring

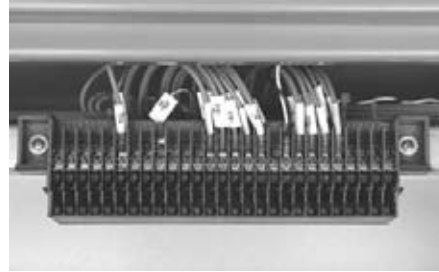
Intercubicle wiring is done on terminal strips located in a wire way on top of the equipment. This allows for quick and easy access when installing or expanding the MaxSG switchgear.

Wire Designation

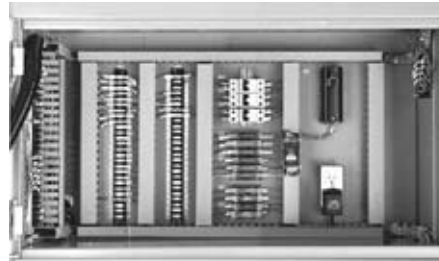
Heat shrink permanent marking origin destination wire tags are offered as a standard on all MaxSG switchgear.

Control Wiring

#14 gA SIS wiring is standard. Wiring is offered with the standard insulated locking fork and optional ring type terminals.



Customer secondary terminal locations.



Instrument compartment



MaxSG Switchgear

Dimensional data

Section sizing

The basic MaxSG switchgear is 87" (2200mm) in height, 90.2" (2290mm) to the top of the wiring and 98.9" (2511mm) over the top of the overhead lifting device, and 65" (1650mm) deep. The width of the vertical section is determined by the breaker type and frame size.

Table: Section Sizing

Breaker Frame Size	Breaker Cubicle Height	Min. Section Width	Minimum Equipment Depth	Optional Equipment Depth
1200-2000A	20.7" 525mm	23.6" 600mm	65" 1650mm	75" 1900mm
2500A-3600A	20.7" 525mm	31.5" 800mm	65" 1650mm	75" 1900mm
4000A-5000A	20.7" 525mm	39.4" 1000mm	65" 1650mm	75" 1900mm

MaxSG weights

The process for determining the cumulative weight for MaxSG switchgear is to add the weights for each vertical section of equipment and add the total weight of the breakers to be installed.

Table: MaxSG Switchgear Section Weights

Section Width	Weight (lbs.)
23.6"	971
31.5"	1155
39.4"	1381

* 257lbs to be added for end panels

Table: Emax Breaker Weights

Breaker type	Weight (lbs.)
E2	159
E3	220
E4	324
E6	463

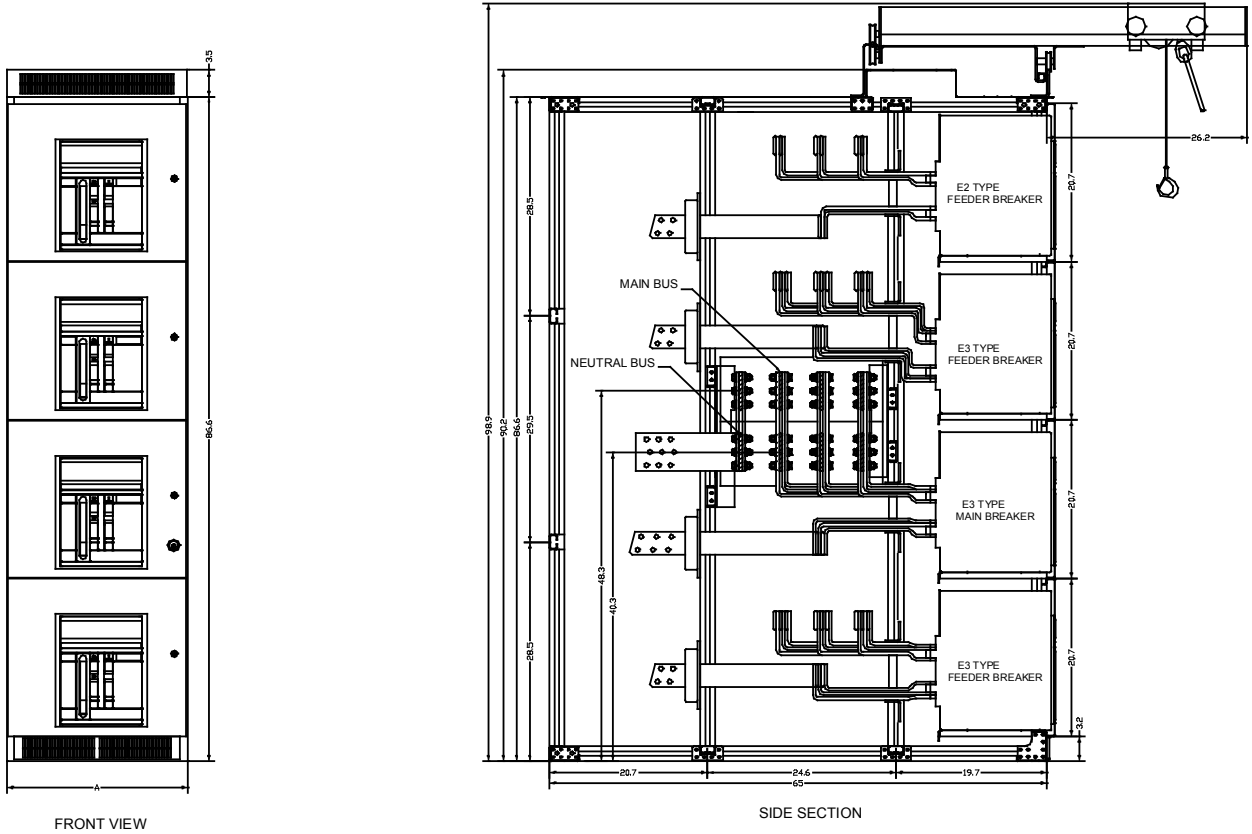
MaxSG rules for layouts and sizing

- Main and tie breakers must be placed in the "C" compartment.
- One breaker can be placed below a main breaker.
- One breaker can be placed below a tie breaker.
- Instrument compartments are 20.7" (525mm) or 41.4" (1050mm) in height.
- Miniature control switches, miniature volt/ammeters, and indicating lights can be mounted on breaker compartment doors.
- Liquid cooled transformers require a 15" transition section.
- A maximum of four breakers can be placed in a vertical section.
- The factory should be consulted to determine if cabling arrangements will allow UL service entrance.
- The factory should be consulted for special applications such as fire pump breakers.

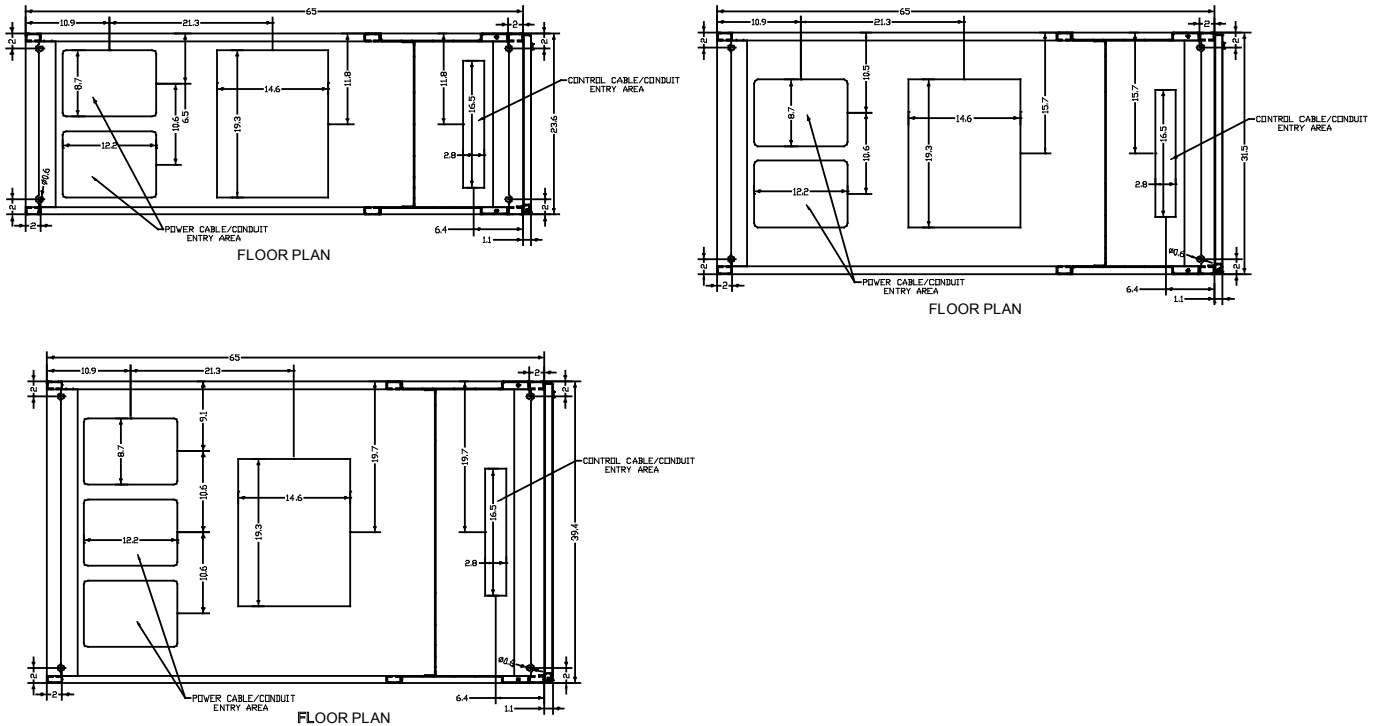
MaxSG Switchgear

Approximate dimensions

MaxSG elevation and section view



MaxSG base plan drawings



MaxSG Switchgear Air circuit breakers



E2



E3



E4



E6

Circuit breaker type

		E2		E3				E4			E6	
		B-A	N-A	N-A	S-A	H-A	V-A	S-A	H-A	V-A	H-A	V-A
Performance level												
Rated continuous current File #E194191	A	1600	1200	2000	1200	1200	1200	3200	3200	3200	4000	4000
	A	-	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 65	65 85	85 100	85 100	85 100	85 100	100 100	100 100	125 125	125 125
	480VAC	kA	42 50	50 65	65 85	85 100	65 85	85 100	65 85	85 100	85 125	85 125
	600VAC	kA	42 50	50 65	65 85	85 100	65 85	85 100	65 85	85 100	85 85	85 85
Rated short time current		kA	42 50	50 65	65 65	65 65	85 85	85 85	85 85	100 100	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
Break time (<ST current) (max)	ms	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
Overall dimensions, 3 pole												
W (3 poles)	mm/in	296/11.65		404/15.91				566/22.28			782/30.79	
Drawout: H=461mm / 18.15in												
D=396.5mm / 15.61in												
W (3 poles)	mm/in	324/12.76		432/17.01				594/23.39			810/31.89	
Weights (CB with releases, RH terminals and CTs, accessories excluded)												
Drawout 3 poles	Kg/lbs	72/159		100/220				147/324			210/463	
Specifications common to the entire range												
Rated max voltage	635 VAC											
Rated voltage	600VAC											
Test voltage (1 min 50/60Hz)	2.2kV											
Frequency	50/60Hz											
Number of poles	3											
Versions	Drawout											

17

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.

* For additional information on Emax circuit breakers and related products see catalogs listed below:
 * Emax Catalog: 1SDC200003D0201 * MaxSB Catalog: AC1800

