

ATLV MaxSG

Low Voltage Metal Enclosed Switchgear



ABB



ABB, INC.

Product – General Description 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
- 5000A 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.



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

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.

Product – Features

**True Closed
Door Drawout
Capability**



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.

**Emax breaker
rejection feature.**



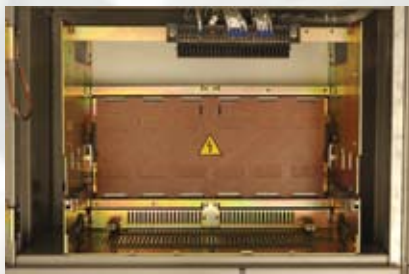
Draw out Padlock Provision

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.

**Safety shutters
standard in every
breaker cubicle.**



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.

MaxSG overhead lift device.



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.

Product - Bus Design

Bus Design

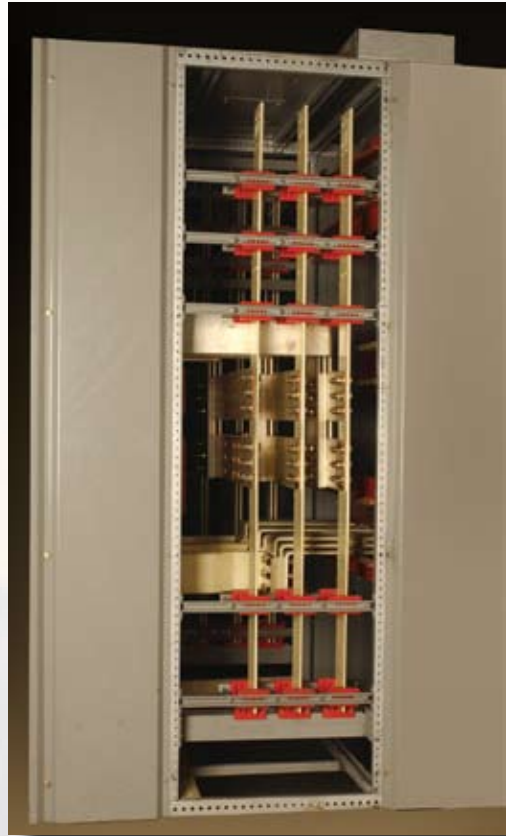
All horizontal and vertical bus are rated for ANSI and UL standard temperature rise requirements of a maximum 65°C rise over an ambient temperature of 40°C.

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.

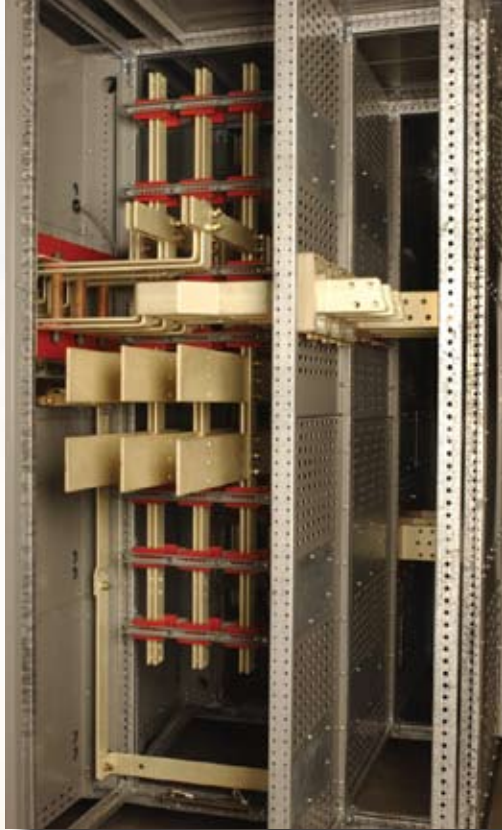
Bus Bracing

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



MaxSG main bus designed with the end user in mind.





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.

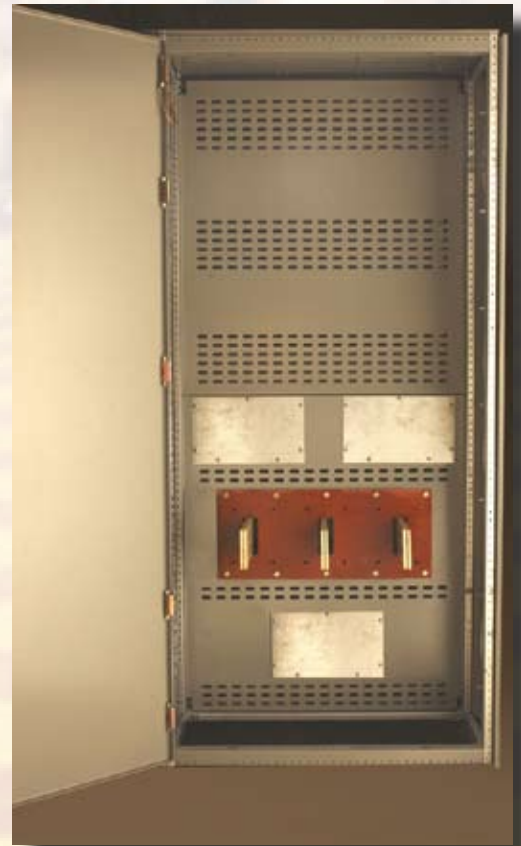
Silver Plated Bus (Standard)

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.

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



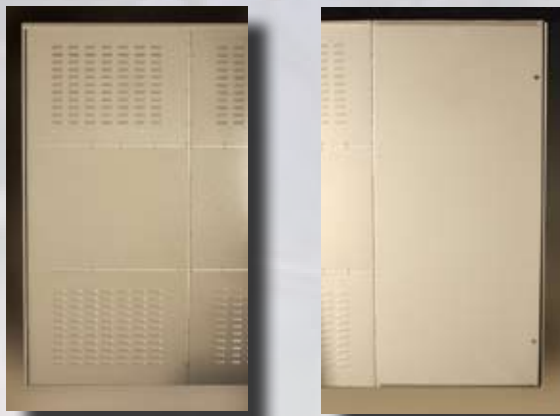
Product – Structural Design

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.



Product – 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



Product – Dimensional Data

MaxSG 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"	23.6"	65"	75"
	525mm	600mm	1650mm	1900mm
2500A-3600A	20.7"	31.5"	65"	75"
	525mm	800mm	1650mm	1900mm
4000A-5000A	20.7"	39.4"	65"	75"
	525mm	1000mm	1650mm	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
23.6"	971lbs
31.5"	1155lbs
39.4"	1381lbs

* 257lbs to be added for end panels

Table: Emax Breaker Weights

BREAKER TYPE	WEIGHT
E2	159lbs
E3	220lbs
E4	324lbs
E6	463lbs

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.

Air Circuit Breakers

Circuit-breaker type		E2		E3			
Performance level		B-A	N-A	N-A	S-A	H-A	V-A
Rated continuous current	A	1600	1200	2000	1200	1200	1200
File # E194191	A	—	1600	2500	1600	1600	1600
	A	—	—	—	2000	2000	2000
	A	—	—	—	2500	2500	2500
Rated short circuit current	240VAC	kA	42	65	65	85	100
	480VAC	kA	42	50	50	65	100
	600VAC	kA	42	50	50	65	85
Rated short time current	kA	42	50	50	65	65	65
Trip units							
PR111/P-A		■	■	■	■	■	■
PR112/P-A		■	■	■	■	■	■
PR113/P-A		■	■	■	■	■	■
Operation times							
Make time (max)	ms	80	80	80	80	80	80
Break time (<ST current)(max)	ms	70	70	70	70	70	70
Break time (>ST current)(max)	ms	30	30	30	30	30	30
Overall dimensions, 3 pole							
Drawout:	W (3 poles) mm/in	296/11.65		404/15.91			
	H =461mm / 18.15in						
	D =396.5mm / 15.61in						
	W (3 poles) mm/in	324/12.76		432/17.01			
Weights (CB with releases, RH terminals and CTs, accessories excluded)							
Drawout 3 poles	Kg/lbs	72/159		100/220			
Specifications common to the entire range							
Rated max voltage	635VAC						
Rated voltage	600VAC						
Test voltage (1 min 50/60Hz)	2.2kV						
Frequency	50/60Hz						
Numbers of poles	3						
Versions	Drawout						

ABB's Emax air circuit breaker is available with three trip unit 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.



E4			E6	
S-A	H-A	V-A	H-A	V-A
3200	3200	3200	4000	4000
3600	3600	3600	5000	5000
—	—	—	—	—
—	—	—	—	—
85	100	100	125	125
65	85	100	85	125
65	85	85	85	85
65	85	85	100	100
			PR111/P-A	
			PR112/P-A	
			■ Operation times	
Make time (max)			ms	
80Break time (I<ST current)(max)			ms	70
(I>ST current)(max)			ms	30
			566/22.28	
594/23.39			810/31.89	Weights (CB with FixDrawout 3 poles
			Overall dimensions, 4 pole	
			Fixed:H=418mm / 16.46in	
			D=302mm / 11.89in mm/in	
			210/463	

E2



E3



E4



E6



* For additional information on Emax circuit breakers and related products see catalogs listed below:

* Emax Catalog:
1SDC200003D0201



* MaxSB Catalog:
AC1800



Due to the continuous development of Standards as well as of materials, the characteristics and dimensions indicated in this catalog should be regarded as binding only on confirmation from ABB.



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