



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)

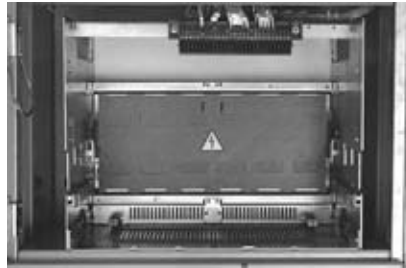
Interlocks prevent racking of the breaker while the main contacts are closed.

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

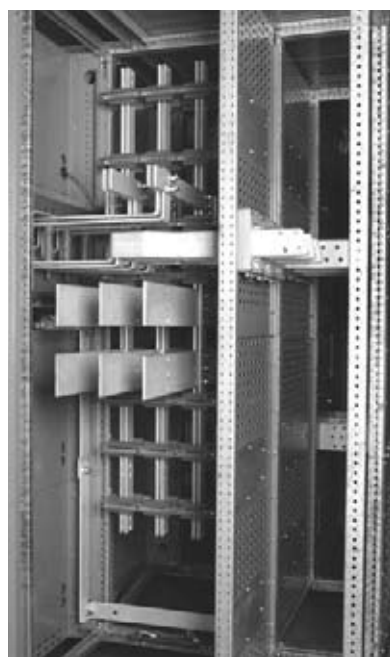
A ground bus is supplied over the entire length of the switchgear and is conveniently located for customer connections.



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

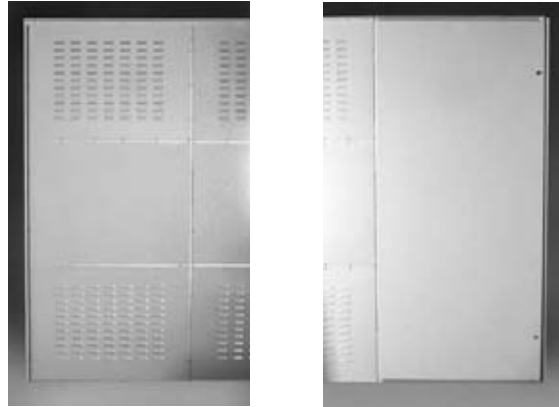


Basic Structure

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

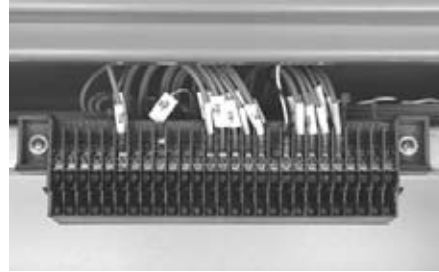
Intercubicle wiring is done on terminal strips located in a wire way on top of the equipment. This allows for quick and easy access when installing or expanding the MaxSG switchgear.

Wire Designation

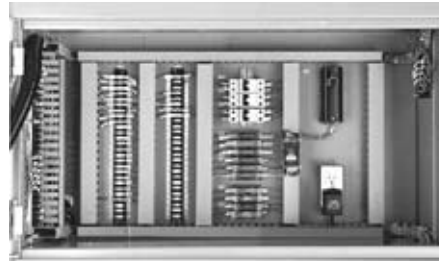
Heat shrink permanent marking origin destination wire tags are offered as a standard on all MaxSG switchgear.

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



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 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											

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

