

What's Shakin'?

Seismic requirements and ABB compliance



- ABB has established consolidated IBC-2012, 2015 or 2018 seismic capable product lines
- Products were shake table tested in accordance with ICC ES AC156
- Products are rated to perform successfully during and after seismic activity
- Developed for areas with stringent seismic requirements
- Needed in essential facilities (data centers, hospitals, etc.)

Equipment ratings

The product lines listed below are certified per ASCE 7-05, ASCE 7-10, IEEE 693-2005 or 2018 and IBC-2012, 2015 or 2018 for the following maximum seismic parameters. Samples of the most seismically significant constructions were tested to qualify each product line. For OSHPD requests, contact a local ABB sales representative.

Product line	Std/Opt	IBC-2018 (unless otherwise noted)				Certification report
		$I_p = 1.5, z/h = 1$		$I_p = 1.5, z/h = 0$		
		S_s	S_{ds}	S_s	S_{ds}	
Panelboards						
A-Series and ReliaGear lighting panels ¹						
AQ, AL, RQ and RL	Std	2.84 g	2.00 g	3.60 g	2.50 g	10095950
AE, AS, RE and RS	Std	2.84 g	2.00 g	3.60 g	2.50 g	
AD and RD	Std	2.84 g	2.00 g	3.60 g	2.50 g	
Spectra series power panelboards	Std	3.75 g	2.50 g	5.19 g	3.46 g	10095805
ReliaGear neXT	Std		2.0 g		2.50 g	1900462
Switchboards						
Spectra and Jiffy series switchboards ¹	Opt	2.34 g	1.56 g	3.80 g	2.53 g	10095999
Integrated switchboards						
Without transformer ¹	Opt	2.34 g	1.56 g	4.35 g	2.90 g	10095999
With transformer	Opt	1.43 g	0.95 g	2.85 g	1.90 g	
PowerBreak II switchboard	Opt	2.51 g	1.67 g	4.01 g	2.67 g	10096054
ReliaGear SB	Opt		2.00 g		2.50 g	15605 Rev. 1
Switchgear						
Advance MV SG	Opt	3.0 g	2.0 g			1089150a-R6
Advance 27 MV SG	Opt	3.0 g	2.0 g			1089150a-R6
SafeGear MV SG	Opt	3.75 g	2.5 g			1089150b-R6

Product line	Std/Opt	IBC-2018 (unless otherwise noted)				Certification report
		$I_p = 1.5, z/h = 1$		$I_p = 1.5, z/h = 0$		
		S_s	S_{ds}	S_s	S_{ds}	
SafeGear HD MV SG	Opt	3.75 g	2.5 g			1089192-R5
ReliaGear ND MV SG ²	Opt		See footnote			1089169-R4
ReliaGear LV SG	Opt	2.00 g	1.33 g	3.12 g	2.13 g	0001292633
MNS-SG AR	Opt		1.48 g		2.37 g	1089151
Motor control centers						
Evolution LV motor control center ¹	Std	2.69 g	1.79 g	3.98 g	2.65 g	10095801
ReliaGear LV MCC motor control center ⁴	Opt	2.10 g	1.4 g	3.36 g	2.24 g	1089-316
Limitamp MV motor control center	Opt	2.76 g	1.84 g	3.38 g	2.25 g	10095800
SafeGear MV MCC motor control center ³			See footnote			
MNS-MCC LV motor control center	Std		1.48 g		2.37 g	1089151
BreakMaster load interrupter switch	Opt	3.62 g	2.41 g	5.79 g	3.86 g	10095791
Enclosed drives	Std	3.02 g	2.01 g	5.40 g	3.60 g	
Enclosed controls	Std	3.50 g	2.33 g	5.60 g	3.73 g	10095809
Safety switches ¹	Std	1.82 g	1.21 g	2.91 g	1.94 g	
ReliaGear LV busway (certified to IBC-2015)	Std	1.67 g	1.11 g	1.67 g	1.11 g	10095806

1 Minimum S_{ds} values have been provided. See certification letter for criteria for higher S_{ds} values

2 ReliaGear ND has been certified to $I_p = 1.0, z/h = 1$

3 SafeGear MCC has been certified to $I_p = 1.0, z/h = 1$

4 Excludes ATS, draw-out 2500 A PBII, Size 5 FVR/PW/2S1W/2SW/Y-delta, 1.5 kVA & 3 kVA CPTs, and distribution transformers

IBC-2012, 2015 or 2018 test criteria

- I_p : Equipment importance factor in accordance with Section 11.5.1 of ASCE 7 (from 1.0 to 1.5). All ABB equipment with IBC certification is qualified to an I_p level of 1.5, indicating the equipment will be fully functional during and after a seismic event.
- z/h : The ratio of equipment mounting height (z) to roof height (h) (From 0 to 1). Ground and roof mounted equipment, for example, would have z/h levels of 0 and 1, respectively.
- S_s : Mapped maximum considered earthquake response at short periods [%g]. Values are assigned based upon geographic location, probability, and severity of seismic activity; provided on maps in IBC-2012. (From 0% to 300%).
- S_{ds} : Five-percent damped design spectral response acceleration at short periods. Adjusted value based upon S_s and installation site characteristics. (From 0.0 to 2.0) $S_{ds} = 2/3 * Fa * S_s$ (where $0.8 < Fa < 1$).

IBC seismic testing qualified each product line to specific S_{ds} levels for ground- and roof-level installation. Equipment S_{ds} levels must equal or exceed the S_{ds} levels of the installation location.

Certification

Seismic certification and analytical work was performed by FORELL/ELSESSER ENGINEERS, INC. Registered Professional Engineer, Structural, California license #S4454 and “W. E. Gundy and Associates, Inc., Registered Professional Engineers,” William E. Gundy, Registered Professional Engineer, California license #CE-26539. As shown, a typical report includes verification of test results, as well as qualification to relative IBC and IEEE 693 standards.