



DESCRIPTIVE BULLETIN

Power Break II and AV3 switchboard



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Power Break II and AV3 switchboard

ABB's industrial-duty switchboard product lines Power Break II and AV-3 Access feature individually-mounted breaker compartments for ABB's product family of breakers

Power Break II (PB) switchboards can house insulated case circuit breakers as mains, ties, and feeders; and low voltage power circuit breakers as mains and ties. AV-3 Access (AV3) provides individual compartments for molded case breakers serving as mains, ties, or feeders.

Both switchboards lines offer an outstanding cost effective, alternative to the more robust switchgear constructions.

ABB switchboards feature:

- Rugged construction - specially designed bus structure enabling them to withstand the damaging effects of a short circuit for at least 30 cycles - a feature normally found only in switchgear
- Fast cycle times – ABB has a competitive switchboard manufacturing cycle times in the industry
- Broad functionality - similar overall functionality to comparable ANSI-rated switchgear
- Cost effective design - ABB switchboards save you money as functional alternative to switchgear

Both switchboard product lines feature protective devices that can be provided with communications capability for connection to ABB Ability. Both switchboard lines also feature simple designs that allow for rapid field modification and maintenance - a must for use in applications where system downtime is absolutely unacceptable.

Product scope

- Up to 6000A main bus
- 150kAIC @ 480V, 100kAIC @ 600V
- EntelliGuard G mains and ties only up to 6000A
- Power Break II (ICCB) breakers up to 4000A
- Designed, built, and tested in accordance with NEMA PB-2, and listed under UL-891
- AV3 utilizes individual mounted Spectra (MCCB) breakers

Optional features

- Rear extensions to 60, 64 and 74 inch deep frame
- Infrared scanning window in rear doors
- Lockable T-handles on circuit breaker cubicle door
- Lockable T-handles on rear doors
- Overhead breaker lifting hoist
- Section barriers and shutters

Benefits

- Individual breaker compartments, including 100% rated molded case breakers
- Rear cable compartment
- Trip unit display through the breaker escutcheon with metering and trip information
- Industry-exclusive 30-cycle short circuit withstand bus rating up to 85kA
- Standard tin-plated copper main bus
- Standard full-height 2000 amp silver-plated copper vertical bus in AV3
- Compact, modular design allowing 5-high breaker stacks in most cases
- Optional epoxy-coated, insulated/isolated bus with rear and side barriers
- EntelliGuard TU trip unit
- ABB design approach also facilitates field reconfiguration
- Flexibility, reliability, simplicity and safety
- Coordinated to ABB sub-assemblies
- Cycle time to support your needs

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PBII switchboard with
4 PB2 insulated case

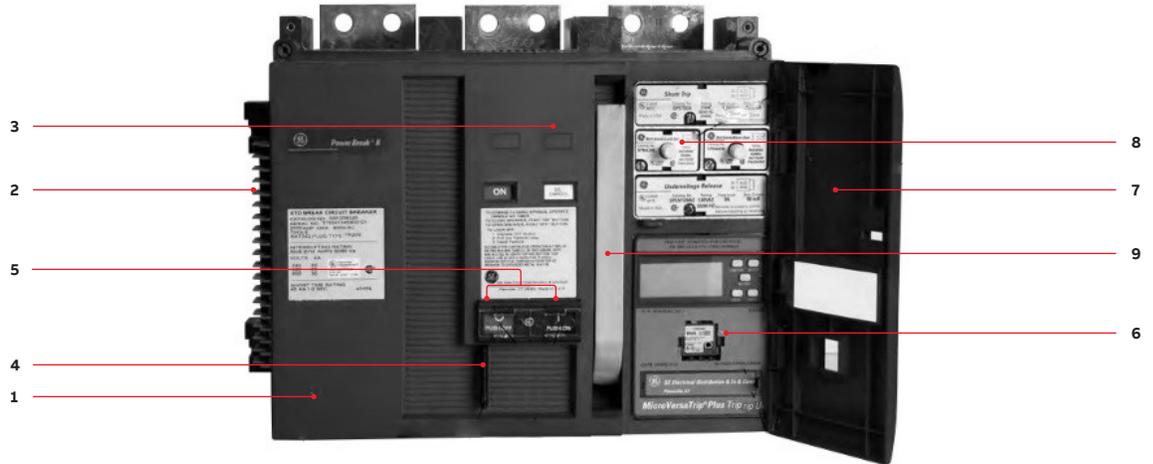


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| <ol style="list-style-type: none"> 1. Meets UL 891 and NEMA PB-2 standards for switchboard construction 2. Industry-exclusive 30 cycle short circuit withstand bus rating eliminates need for instantaneous tripping 3. Standard tin-plated copper bus 4. Drawout or stationary breakers 5. Indoor and outdoor (walk-in and non-walk-in) enclosure available 6. Individual breakers isolated (top, bottom and rear) from adjacent breaker compartments and main bus/rear cable compartment 7. Drawout breaker can be tilted providing easy inspection and maintenance of primary contact finger assembly | <ol style="list-style-type: none"> 8. Fully equipped solid state MicroVersaTrip Plus™ or PM™ trip 9. New, compact, 100%-rated Power Break II insulated case circuit breaker combines ease of use and state-of-the-art performance in 800A, 1600A, 2000A, 2500A, 3000A, and 4000A frame sizes 10. Smaller Power Break II breaker design, allowing up to 5 breakers to be mounted in the same switchboard stack (some restrictions apply) 11. Convenient access to breaker controls and trip unit 12. Standard hinged doors with quarter-turn latches |
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PB II insulated case circuit breakers

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02
Insulated case
circuit breakers



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02

1. Compact, lightweight design
2. 36-point pre-wired, dedicated secondary terminal block standard (see item 16)
3. Optional mechanical counter
4. Padlock device standard
5. Easy-to-reach ON/OFF buttons
6. EntelliGuard® TU trip units - field upgradable, UL Listed, CSA certified, IEC 947-2 certified
7. Sealable door provides added security
8. Drop-in shunt trip, undervoltage release and bell alarm (with and without manual lockout) modules
9. Flush-mounted pump handle

Power Break II insulated case circuit breakers are highly compact, heavy-duty breakers that combine ease of use, aesthetics and state-of-art performances in 200 through 4000-Amp frame sizes, rated for up to 200,000 Amps RMS symmetrical for 240Vac, in drawout and stationary versions.

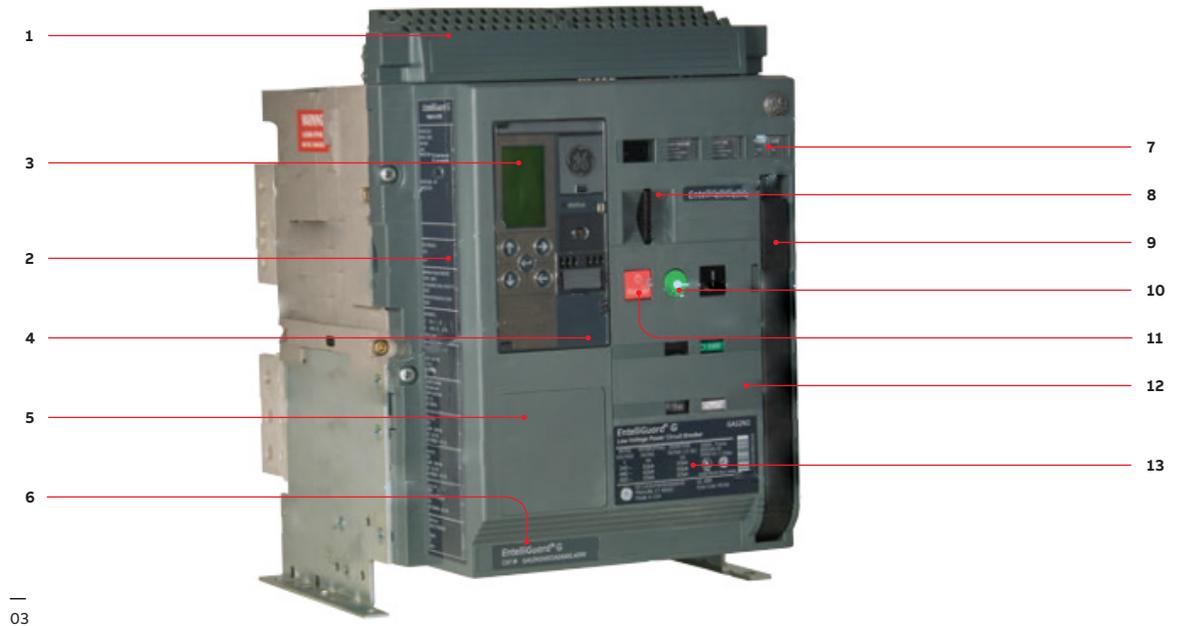
Available with EntelliGuard TU trip unit with the built-in flexibility required to match your system's needs, whether for optimum safety, optimum system reliability, or both at the same time. Whether you're using all circuit breakers or a mixed system of breakers and fusible devices, the EntelliGuard TU will accommodate your needs with minimal compromise and maximum functionality.

Features and benefits**Power Break II insulated case circuit breakers**

- Modular, drop-in accessories common to all frame sizes
- Flush-mounted pump handle
- Manually and electrically operated versions in same compact envelope
- Double insulated ON/OFF buttons
- 72-point pre-wired, dedicated secondary terminals
- Modular, field-installable motor operator
- EntelliGuard TU trip unit featuring reduced energy let-through (RELT) setting
- Modular auxiliary switches with up to 12 NO/NC set of contacts
- Charge-after-close mechanism
- Manual discharge of springs without closing
- Suitable for reverse feed

EntelliGuard G air circuit breakers

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03
EntelliGuard G air
circuit breakers



- 03
1. 78 secondary disconnects - combination terminals
 2. Detailed, factory-assembled side label
 3. EntelliGuard TU trip unit
 4. Rating plug
 5. Optional factory-installed interlocks (mechanical or kirk key)
 6. Complete, factory-assembled catalog number

7. Accessory windows
8. Padlock provision
9. Retractable handle for manual spring charging
10. Command close coil
11. Operating buttons: ON/OFF
12. Breaker status contacts: OPEN/CLOSED
Closing spring status: CHARGED/DISCHARGED
13. Tamper-proof breaker label

ABB low-voltage air circuit breakers designs rated from 400A to 6000A, with fault interruption ratings up to 200kAIC. Integral to the EntelliGuard G breakers with state-of-the-art EntelliGuard TU trip units, which provide superior system protection, system reliability, monitoring and communications. The breaker-trip unit system delivers superior circuit protection without compromising either selectivity or arc flash protection.

Features and benefits

EntelliGuard G air circuit breaker

- ANSI/UL1066, UL489, carries a UL, cUL and CE label
- Multiple short time bands under 100ms optimally fit above the Instantaneous clearing times
- Alternate instantaneous setting (RELT) mitigates arc flash hazard
- Adjustable ST and GF zone selective Interlocking optimizes restrained and unrestrained bands
- Zone selective instantaneous protection, multiple zone protection, 3 cycle clearing and selectivity are provided simultaneously
- Instantaneous trip adjusts up to 30X trip plug rating
- In addition to arc flash protection and selectivity features, the EntelliGuard TU
- Motor operators
- Closing devices
- Shunt trip for ground fault
- Uvr with fixed time delay
- Second shunt trip or UV release
- Auxiliary switches and contacts
- Bell alarm / trip annunciation
- Breaker mounted key interlock
- Mechanical interlocks – fixed breakers
- Mechanical interlocks – drawout breakers
- Network interlock
- Mechanical operation counter
- Pushbutton padlock device
- Ready-to-close switch
- Secondary disconnect block
- Spring charged contact

EntelliGuard TU

- Instantaneous - zone selective interlocking (I-ZSI) builds on the short time and ground fault interlocking by now providing the ability to overlap the Instantaneous setting on the main and feeder breakers. Now I-ZSI can be used for selectivity
- Instantaneous - waveform recognition instantaneous trip is based on the amount of energy and duration versus a threshold current setting (MVT). Improves coordination with current limiting devices by discerning whether a downstream breaker/fuse is clearing the fault. Provides ability to set the Instantaneous pickup below the peak let thru of a downstream current limiting device while maintaining selectivity
- RELT- reduced energy let through with positive feedback two independent instantaneous settings selectable via an external switch or modbus communications with positive indication via an output contact. Commonly referred to in the industry as an "arc flash switch" or "maintenance switch"
- Additional features and benefits:
 - Large backlit LCD screen with detailed descriptions***
 - LED health status indicator***
 - Status and event log with date/time stamp (10 events)***
 - Free set-up software
 - Full metering and relaying***
 - Thermal memory
 - Universal rating plugs
 - Programmable input and output relays***
 - Meets and surpasses all applicable UL, ANSI, NEMA and IEC standards
 - WaveForm capture (4 cycles prior, 4 cycles after, 40 samples/cycle)
 - Open communication protocols: Modbus 485 RTU and Profibus (EntelliGuard G breaker Only)***
 - Plug and play replacement without breaker rewiring for RMS-9, MVT, MVT+, EPIC, MVT M/PM trip units legacy

***Some options require additional 24 VDC.

Standards and interrupting ratings

Standards

Equipment	
Power Break II/AV3	UL 891
Switchboard	NEMA PB-2
Insulated case circuit breaker	
Power Break II/AV3	UL 489 CSA C22.2 No. 5.1 NEMA AB-1

Low voltage circuit breaker	
EntelliGuard G	ANSI/UL1066 UL489
Molded case circuit breaker	
Spectra	UL 489 NEMA AB-1

Short circuit withstand ratings

Low voltage circuit breakers – main device

Interrupting rating tier ANSI/UL1066 devices, LVPCB								Envelope 1		Envelope 2		Envelope 3		
Code	254V	580V	635V	1/2S Withstand	HSIOC	Override No.1	Override WI	Code	400 - 1200	400 - 2000	3200	400 - 3200	3200	4000 - 5000
S	65.000	65.000	50.000	50.000	50.000	49.000	53.500	S	.					
N	65.000	65.000	65.000	65.000	None	None	None	N		.	.			
H	85.000	85.000	65.000	65.000	65.000	63.700	69.500	H		.				
P ²	100.000	100.000	65.000	65.000	65.000	63.700	69.500	P		.				
E	85.000	85.000	85.000	85.000	None	None	None	E			.			
M	100.000	100.000	100.000	85.000	85.000	83.800	90.950	M			.			.
B	100.000	100.000	100.000	100.000	None	None	None	B					.	.
L	150.000	150.000	100.000	100.000	100.000	98.000	107.000	L					.	.

Insulated case circuit breakers - main and feeder devices

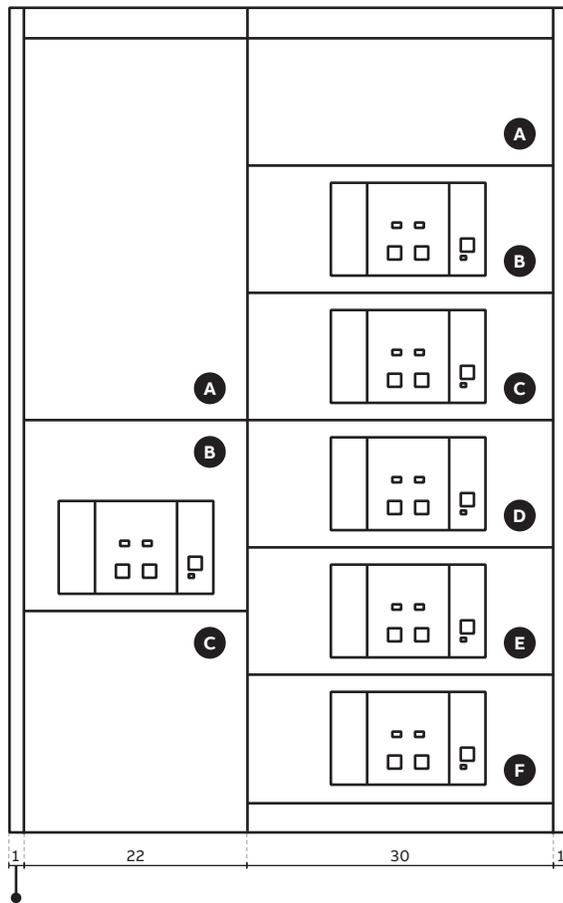
Frame size	Power Break II					
	800A	1600A	2000A	2500A	3000A	4000A
Standard	240Vac	65	85	85	100	100
	480Vac	65	65	65	100	100
	600Vac	50	50	50	85	85
	250Vac				42	42
High-break	240Vac	100	125	125	200	200
	480Vac	100	100	100	150	150
	600Vac	65	65	65	100	100
Special high-break	750Vac				35	35
Short-time (0.5 sec)		25	30	30	42	42

Molded case circuit breakers – feed devices for AV3

Frame size	Spectra													
	150A				250A				600A				1200A	
	SEDA	SEHA	SELA	SEPA	SFHA	SFLA	SFPA	SGDA	SGHA	SGLA	SGPA	SKHA	SKLA	SKPA
240Vac	18	65	100	200	65	100	200	65	65	100	200	65	100	200
480Vac	14	25	65	100	25	65	100	-	35	65	100	50	65	100
600Vac	10	18	25	25	18	25	25	-	25	65	65	25	42	65

Power Break II switchboard sizing

Typical layout of Power Break II switchboard



Left side main section

- A** Aux compartment 42 inches
- B** Main breaker section 2000A 21 inches
- C** Aux compartment 21 inches

Right side feeder section

- A** Aux compartment 14 inches
- B** F 800A or 1600A breaker compartment 14 inches

Estimate weights and dimensions:
 Shipping dimensions: 54 inches
 Weight: 4420 pounds

Available compartment height is 84 inches.

Device			Main and tie devices			Feeder devices ²		
			Manual and electrical operations			Manual and electrical operations		
Type	Rating	Structure	Unit height	Width	Section Depth	Unit height	Width	Section Depth
Insulated case circuit breakers								
Power Break II	800	Stationary						
		Drawout						
	1600	Stationary	14"	22" Std	50", 60"	14"	22"	45"
		Drawout		30" Opt			30"	
	2000	Stationary						
		Drawout	21"			21"		
	2500	Stationary	35"		50", 60"	35"		
		Drawout		22"			22"	45"
	3000	Stationary					30"	
		Drawout		30"				
4000 ¹	Stationary	42"	22" Std	60"				
	Drawout		30" Opt					
Low voltage power circuit breaker								
EntelliGuard G ¹	800	Drawout						
	1600	Drawout		22" Std				
				30" Opt				
	2000	Drawout	21"		60"			
	3200	Drawout		30" Std				
				38" Opt				
	4000	Drawout						
5000	Drawout ³	35"	38"	67"				
6000	Drawout							

1. Selections adjacent to a 4000 A device or EntelliGuard breaker must be a minimum of 30" wide. Add 2" for non walk-in outdoor construction.

2. Feeder devices can be located in the same section with mains rated 3000 A and lower.

3. Horizontal main bus available up to 6000 A.

Device			Main and tie devices			Feeder devices ¹				
			Manual and electrical Operations			Manual and electrical operations				
Type	Rating	Structure	Unit height	Width	Section Depth	Unit height	Width	Section Depth		
Molded case circuit breaker										
Spectra	150	80%	14" ²	15"	45" 50" 60"	14"	15"	45" 50" 60"		
		100%								
	250	80%								
		100%								
	600	80%							21"	21"
		100%								
	1200	80%							35"	21", 28"
		100%								

1. Feeder devices can be located in the same section with mains rated 3000A and lower.
 2. Requires 7" blank at top to meet 6'7" rule.

Applications:

- Critical power facilities
- Medium to large commercial and industrial applications

Segments/Industries:

- Data center
- Food and beverage
- Industrial processes
- Waste water
- High/Medium commercial

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