



ReliaGear™ SB switchboard

The road to reliability

Agenda



Product overview



Circuit breakers



Configurations



The background is a solid red color. On the left side, there are white geometric shapes: a large 'L' shape and a smaller rectangle. A diagonal line of white halftone dots runs from the bottom left towards the top right. Above the text, there is a short white horizontal line.

— Product overview

Distribution equipment stratification

Switchboards



Product	Lighting panelboard	Power panelboard	Switchboard	Low voltage switchgear
Trademark Name(s)	ReliaGear™	ReliaGear™ neXT	ReliaGear™ SB	ReliaGear® LV SG
UL certification	UL 67	UL 67	UL 891	UL 1558
Typical application	Light commercial	Heavy commercial	Heavy commercial/light industrial	Heavy industrial
Maximum amperage	800	1200	6000	5000

ABB’s ReliaGear family of low voltage electrical distribution products

ReliaGear SB switchboard

Specifications

- 3P3W and 3P4W – 600/347 Vac, 480/277 Vac, 208/120 Vac
- Fully rated 100 KAIC at 480/277 Vac, 65 KAIC at 600/347 Vac
- Main circuit breakers: up to 6000 A
- Main lugs: up to 6000 A
- Plug-in branch circuit breakers: 15–1200 A
- Enclosures: NEMA Type 1 and 3R



ReliaGear SB advantages



Safe Enhanced protection

- Finger-safe bus stack that meets IP20 standards
- Insert and remove components while reducing the risk of contact with live parts due to accidental contact
- Integrated Bluetooth® technology allows for viewing circuit breaker parameters from outside an arc-flash zone



Smart Easy to install

- Circuit breakers install anywhere on the bus stack
- Same Ekip trip unit family for both power and molded case circuit breakers increase familiarity and setup speed
- Hinged gutter doors for quick, convenient cable access



Reliable Outstanding reliability

- Spring-loaded circuit breaker plug-in connectors
- Magnetic forces generated by a short circuit make an even tighter connection
- No more bolted joints that can become loose or require torque checks



— Circuit breakers

Devices

Main circuit breakers and switches

- SACE® Emax 2 (power circuit breaker): 6000 A max
- PowerBreak II (insulated case circuit breaker): 4000 A max
- HPC II (high pressure contact fused switch): 4000 A max
- BPS (bolted pressure switch): 4000 A max
- SACE® Tmax® XT (molded case circuit breaker): XT5 (600 A max) & XT7 (1200 A max), individually or group mounted



Devices

Feeder circuit breakers

- Individually mounted:
 - SACE® Emax 2: 6000 A max
 - PowerBreak II: 4000 A max
 - SACE® Tmax® XT7: 1200 A max
 - SACE® Tmax® XT5: 600 A max
- Group mounted:
 - SACE® Tmax® XT: 15 - 1200 A (XT1, XT4, XT5, XT6, XT7)
 - Record Plus FB: 15 – 100 A (1P and 2P)



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Individually mounted circuit breakers

SACE® Emax 2 characteristics



- UL1066 certified, 3 or 4 poles
- Ekip Touch/Hi-Touch field upgradeable trip units
- Seven communication protocols available
- 1% energy accuracy with Ekip Hi-Touch trip unit
- Large color touch-screen display
- Direct communications with energy management cloud-computing platform, ABB Ability™

SACE® Emax 2 power circuit breaker

Family

E6.2



E4.2



E2.2



E1.2



Same height and depth from E6.2 to E2.2

SACE® Emax 2 power circuit breaker

E6.2

4000-6000 A, 3 and 4 poles¹, stationary and withdrawable¹



Note 1 – 6000 A available with 3 pole, withdrawable construction only

SACE® Emax 2 power circuit breaker

E4.2

2500 – 3000 A, 3 and 4 poles, stationary and withdrawable



SACE® Emax 2 power circuit breaker

E2.2

1600 – 2000 A, 3 and 4 poles, stationary and withdrawable



SACE® Emax 2 power circuit breaker

E1.2

800-1200 A, 3 and 4 poles, stationary and withdrawable



SACE® Emax 2 power circuit breaker

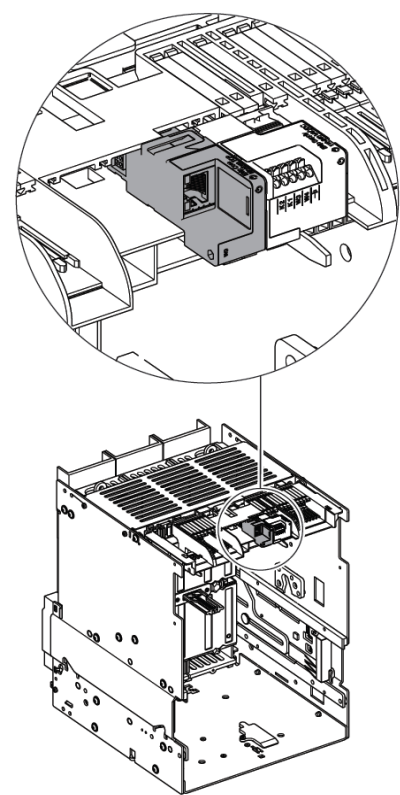
Electrical accessories animation



SACE® Emax 2 power circuit breaker

Connectivity: communications

Installation



Functionality






- Supervision and control

Communication protocols available

- Ekip Com Modbus RS-485
- Ekip Com Modbus TCP/IP
- Ekip Com Profibus
- Ekip Com Profinet
- Ekip Com EtherNet/IP
- Ekip Com DeviceNet
- IEC 61850
- Redundant communications

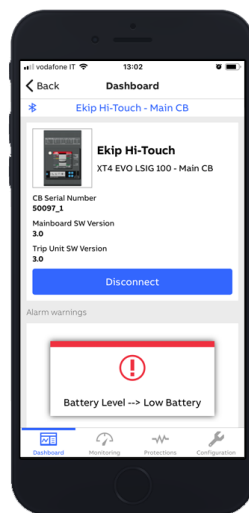
Additional communications

- Ekip Com Hub (ABB Ability EDCS)
- Ekip Link (local bus communication)

Photo	Required products
	Ekip Touch or greater
	Ekip Com module
	Ekip Supply
	Ekip T&P Programming Unit
	Ekip Connect software

SACE® Emax 2 power circuit breaker

Connectivity: Bluetooth Low Energy (BLE)



Functionality

- ABB EPiC app used to commission circuit breakers
 - Available for iOS and Android
- Simple dashboard for status updates
- Monitoring and events
- Adjustments of protection settings
- Upgrade trip unit functionality via ABB MarketPlace
- Import/Export settings
- Password protection provides access for authorized personnel only
- Provided as standard for Ekip Touch or greater with the option to remove via configurator

Remaining individually mounted devices

PowerBreak II



High pressure contact switch



Bolted pressure switch



SACE® Tmax® XT5 and XT7



Remaining individually mounted devices

PowerBreak II

400-4000 A, 3 poles, stationary and withdrawable¹



Note 1 – 4000 A stationary mounting is 80% rated

Remaining individually mounted devices

High pressure contact switch

400-4000 A, 3 poles, stationary and withdrawable



Remaining individually mounted devices

Bolted pressure switch

1000-4000 A, 3 poles, stationary and withdrawable



Remaining individually mounted devices

SACE® Tmax® XT5 and XT7

400-1200 A, 3 poles, stationary



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Group mounted circuit breakers

Group mounted circuit breakers

Molded case circuit breakers

Record Plus FB



SACE® Tmax® XT1



SACE® Tmax® XT4



SACE® Tmax® XT5



SACE® Tmax® XT6



SACE® Tmax® XT7



Group mounted circuit breakers

SACE® Tmax® XT7

800-1200 A¹, 3 poles, Ekip Dip and Touch/Hi-Touch trip units



Note 1 – 1000 A and 1200 A requires conductors that are sized based on 75°C with an insulation rating of 90°C

Group mounted circuit breakers

SACE® Tmax® XT6

800 A, 3 poles, thermal-magnetic adjustable (TMA) and Ekip Dip trip units



Group mounted circuit breakers

SACE® Tmax® XT5

400-600 A, 3 poles, thermal-magnetic adjustable (TMA), Ekip Dip and Touch/Hi-Touch trip units



Group mounted circuit breakers

SACE® Tmax® XT4

250 A, 3 poles, thermal-magnetic adjustable (TMA), Ekip Dip and Touch/Hi-Touch trip units



Group mounted circuit breakers

SACE® Tmax® XT1

125 A, 3 poles, thermal-magnetic fixed (TMF) trip units



Group mounted circuit breakers

Record Plus FB

100 A, 1 and 2 poles, thermal-magnetic fixed (TMF) trip units



SACE® Tmax® XT trip units

Thermal magnetic

TMF: Thermal Magnetic Fixed: No adjustments possible

TMA: Thermal Magnetic Adjustable: Adjustable Thermal (L) and Magnetic (I)

LT adjustable on TMA from 0.7-1.0



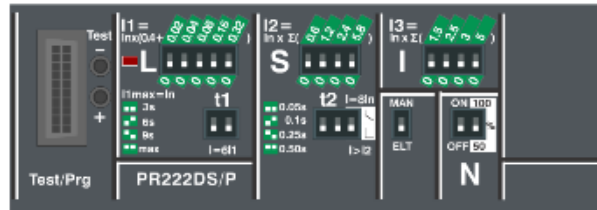
Ekip Dip

LSI: Adjustable L, S, and I

LIG: Adjustable L, I, and G

LSIG: Adjustable L, S, I, and G

LT adjustable from 0.4-1.0 in .02 increments



Ekip Touch/Hi-Touch

LSI: Adjustable L, S and I

LSIG: Adjustable L, S, I, and G

LT adjustable from 0.4-1.0 in .001 increments



Ekip trip units are electronic

Which trip unit should I choose?

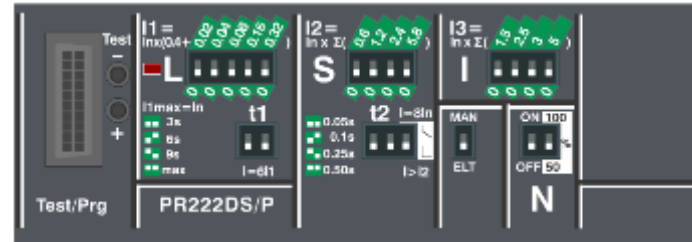
Molded case circuit breakers

Thermal magnetic (TMF/TMA)



- Basic protection against overloads and short-circuits are needed
- When you just need “a circuit breaker”

Ekip Dip



- First level electronic trip unit for greater protection selection
- Ground fault protection is required

Ekip Touch/Hi-Touch



- Advanced electronic trip unit with high accuracy measurements and digital display
- Communications, including Bluetooth®
- Metering (1% power and energy accuracy)
- Field upgradeable
- Monitoring via the Cloud

Ekip Touch/Hi-Touch

Measurement functions and precision

Ekip Touch trip units are available three different versions

Ekip Touch allows for current metering while the Ekip Touch Measuring adds voltage and power metering. Ekip Hi-Touch continues but also adds 1% power accuracy.

Measurements		Touch	Touch Measuring	Hi-Touch
Currents (RMS)	[A] L1, L2, L3, Ne	1%	1%	0.50%
Ground fault current (RMS)	[A] Ig	2%	2%	0.50%
Phase-to-phase voltage (RMS)	[V] U12, U23, U31	-	0.50%	0.50%
Phase-to-neutral voltage (RMS)	[V] U1, U2, U3	-	0.50%	0.50%
Frequency	[Hz] f	0.20%	0.20%	0.20%
Active power	[kW] P1, P2, P3, Ptot	-	2%	1%
Reactive power	[kVAR] Q1, Q2, Q3, Qtot	-	2%	2%
Apparent power	[KVA] S1, S2, S3, Stot	-	2%	1%
Power factor	PF1, PF2, PF3, PF total	-	2%	1%
Active energy	[kW] Ep total, Ep positive, Ep negative	-	2%	1%
Reactive energy	[kVAR] Eq total, Ep positive, Ep negative	-	2%	2%
Apparent energy	[KVA] Es total	-	2%	1%

Group mounted accessories

Plug-in protection modules

Surge protection devices (SPD)

- Plug-in module
- Voltages (AC): 120 Wye, 277 Wye, 347 Wye, 480 Delta
- Impulse currents (kA): 65, 80, 125, 150, 200, 300
- Takes up 10X height
- Can be used in all widths, dependent upon the configuration



Reduced Energy Let Through (RELT)

- Plug-in module to mitigate arc flash hazard
- Touch trip unit required
- Voltages (AC): 240, 480, 600
- Compulsory by NEC for 1200 A breaker (XT7)
- Takes up 3X height
- Can be used in all widths, dependent upon the configuration



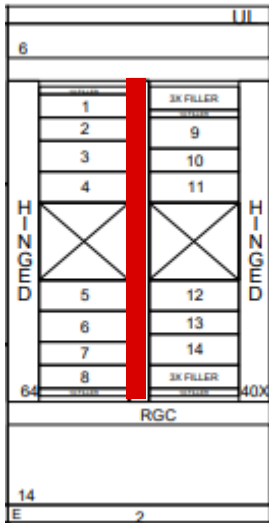


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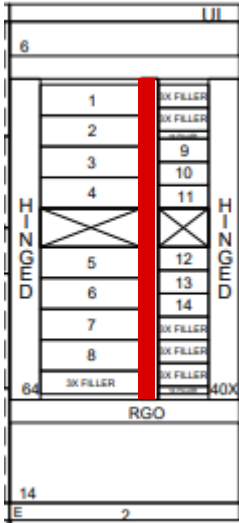
Configurations

Group mounted configurations

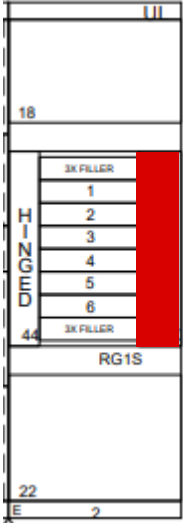
Center



Offset



One-sided

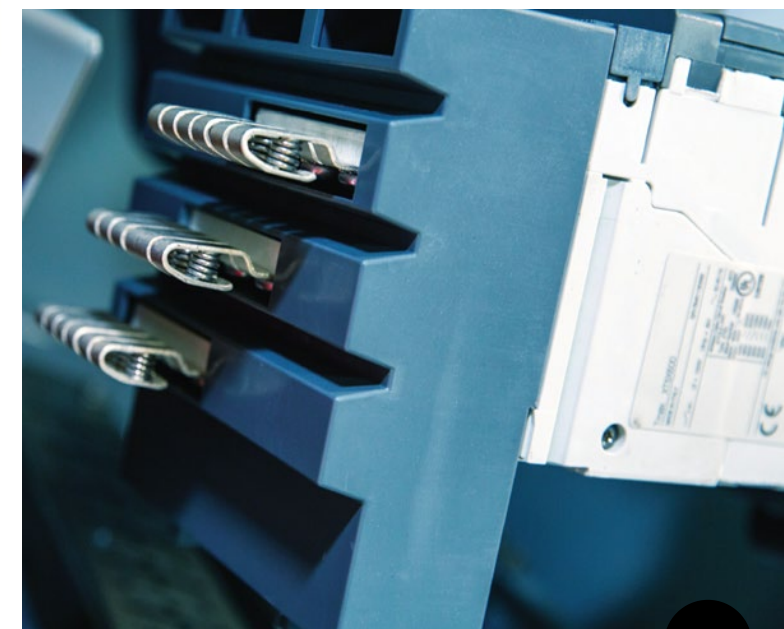
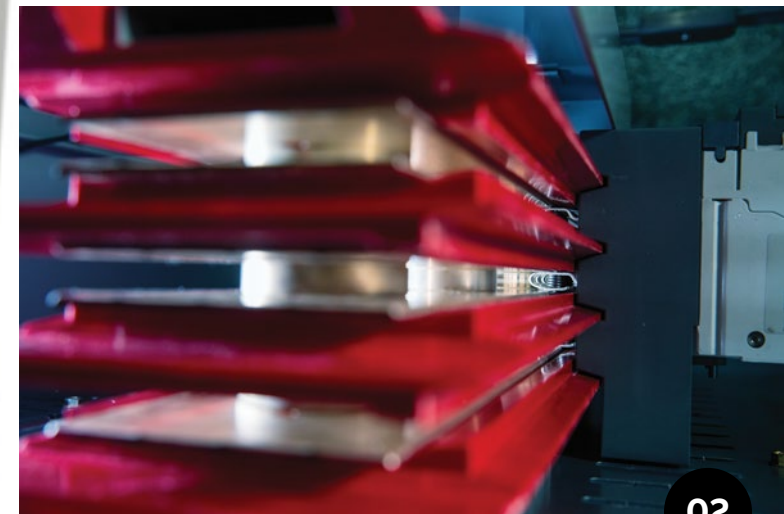


SACE Tmax XT circuit breaker plugging into vertical bus stack



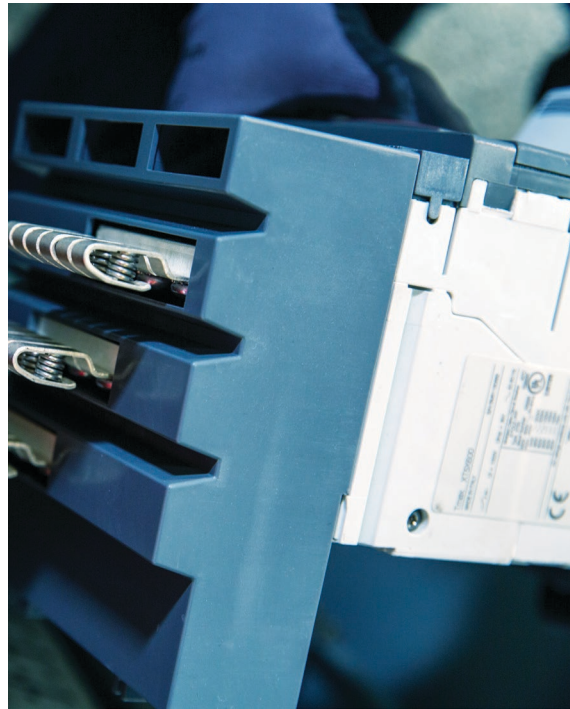
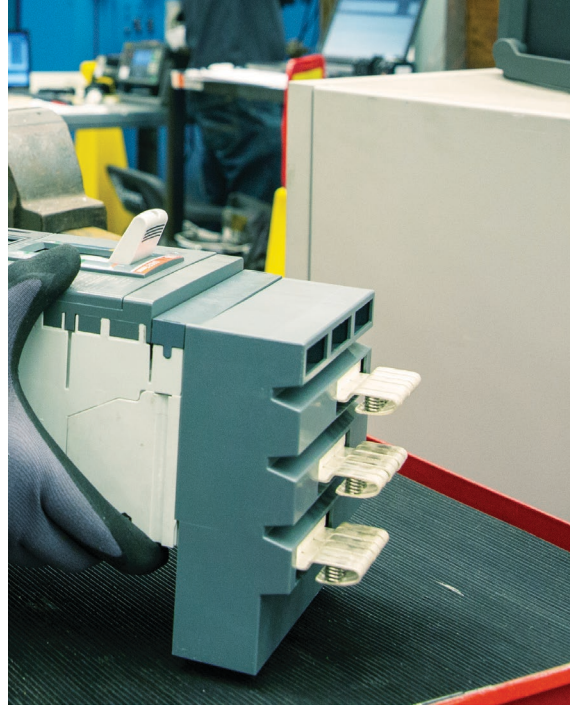
Click on bus stack to see animation

- 01.** ReliaGear SB interior
- 02.** ReliaGear SB vertical bus stack
- 03.** Circuit breaker line side connector



Superior plug-in circuit breaker connections

- Increased plating thickness withstands repeated insertion and removal
- Uses the magnetic force generated by a short circuit to make the connection even tighter and more reliable
- No more bolted joints that can become loose or require torque checks
- Levering features further reduce installation and removal force



Sizing

Circuit breaker spacing requirements

Group mounted circuit breakers are sized by X space requirements where X = 1.385" in height

Circuit breaker name	Number of poles	Maximum circuit breaker amperage	X spacing requirements
Record Plus FB	1	100	1X
Record Plus FB	2	100	2X
SACE® Tmax® XT1	3	125	3X standard, also offered in a 2 pack at 5X or 5 pack at 11X
SACE® Tmax® XT4	3	250	3X, 4X for Touch, Hi-Touch
SACE® Tmax® XT5	3	600	4X standard, 5X if it contains a bell alarm, auxiliary contact, shunt trip, undervoltage release; Touch, or Hi-Touch trip units
SACE® Tmax® XT6	3	800	6X
SACE® Tmax® XT7	3	1200	6X

ABB

SACE® Tmax® XT circuit breaker plugging into vertical bus stack

