

SERVICE NOTE

Advanced retrofitting kit solution

Hard Bus Retrofill GEC Alsthom MPACT MK1 Withdrawable to Emax 2 IEC



With few modifications to your existing switchgear, retrofitting kits are a cost-effective solution to upgrade your electrical system. The Hard Bus Retrofill retrofitting kits allows a very fast and reliable upgrade of GEC Alsthom MPACT MK1 circuit breakers and switch-disconnectors with Emax 2.

Air circuit breakers put into service many years ago might not provide the reliability and safety assurances required today. Making certain that people, equipment, and processes are properly protected is a growing concern. When maintenance is no longer enough owing to lack of materials or when components are out of production, retrofit kits are the best solution. ABB Low Voltage Service offers a unique way to upgrade installed hardware and software to the next generation, by changing the worn or outdated parts while maintaining the original plant and equipment configuration. The kits are tested in the ABB SACE Division Lab, accredited by ACCREDIA and acknowledged by important international certification bodies such as ACAE/LOVAG, ANCE, ASTA, ETL SEMKO, UL, CSA and Naval Registers.

Safety and Service continuity

- Safety improvement
- Service continuity guaranteed
- Ease of installation
- Reduction of the cost of maintenance
- Long availability of the product and its spare parts
- Factory tested solution
- Wide range of mechanical and electrical accessories with Emax 2.

Value Propositions



Safety & Protection

Highest quality level confirmed by certified products. ABB brand is associated with buying quality products.



Easy to install

Fast and easy installation without dismantle the existing fixed part. Reduction of the downtime due to the installation in less than 1 hour.



Control & Connectivity

Ekip Power Controller to improve energy efficiency and saving. Integration into systems with integrated communication modules of different protocols: Modbus RS-485, Modbus TCP, Profibus, DeviceNet, EtherNet/IP, IEC61850, Bluetooth.



Easy to maintain

Diagnosis and installation with Ekip Connect Software. Automatic notifications to remind maintenance activities. ABB Ability Energy and Asset Manager is also available with Emax 2 for Predictive Maintenance.



Sustainability

Retrofit kits enable a circular economy by extending the lifespan of your electrical system and minimizing CO₂ emissions and raw materials usage.

How to retrofit a GEC Alsthom MPACT MK1 IEC?

ABB offers a complete range of solutions to upgrade GEC Alsthom MPACT MK1 circuit breakers with Emax 2:

- **Hard Bus Retrofill (HBRF):** it is the traditional retrofit kit for which the complete MK1 circuit breaker needs to be dismantled. The kit consists in a new Emax 2 breaker equipped with special terminals to fit the existing busbars. This solution is available for Withdrawable versions only.

All retrofit solutions have been tested for mechanical and electrical operations, short circuit breaking capacity, short circuit withstand current and dielectric properties according to IEC standards.

Correspondence table

The tables below show the correspondences between GEC Alsthom MPACT MK1 Withdrawable and Emax 2 both for automatic circuit breakers and switch disconnectors.

Automatic Circuit Breakers: GEC Alsthom MPACT MK1 to Emax 2

MK1 Range	MK1 Type	Iu [A]	Poles	Emax 2	Iu [A]	Icu/Ics 415V [kA]	Icu/Ics 660V [kA]	Icw (1s) [kA]
Standard	08	800	3p/4p	E2.2	800	-	50	50 (660V)
	12	1250	3p/4p	E2.2	1250	-	50	50 (660V)
	16	1600	3p/4p	E2.2	1600	-	50	50 (660V)
	20	2000	3p/4p	E2.2	2000	-	50	50 (660V)
	25	2500	3p/4p	E2.2	2500	-	50	50 (660V)
	31	3150	3p/4p	E4.2	3200	-	50	50 (660V)
	35	3500	3p/4p	E4.2	3600	-	50	50 (660V)
	40	4000	3p/4p	E4.2	4000 ⁽¹⁾	-	50	50 (660V)
High break "S"	08	800	3p/4p	E2.2	800	80	-	80 (415V)
	12	1250	3p/4p	E2.2	1250	80	-	80 (415V)
	16	1600	3p/4p	E2.2	1600	80	-	80 (415V)
	20	2000	3p/4p	E2.2	2000	80	-	80 (415V)
	25	2500	3p/4p	E2.2	2500	80	-	80 (415V)
	31	3150	3p/4p	E4.2	3200	80	-	80 (415V)
	35	3500	3p/4p	E4.2	3600	80	-	80 (415V)
	40	4000	3p/4p	E4.2	4000 ⁽¹⁾	80	-	80 (415V)

Note:

(1) derating to 3800A

For 4 poles circuit breakers it's mandatory to specify the position of the neutral phase by choosing between standard sequence (N, L1, L2, L3) or neutral on right side sequence (L1, L2, L3, N).

Switch disconnectors: GEC Alsthom MPACT MK1 to Emax 2

MK1 Range	MK1 Type	Iu [A]	Poles	Emax 2	Iu [A]	Icw (1s) [kA]
Standard	08	800	3p/4p	E2.2/MS	800	50 (660V)
	12	1250	3p/4p	E2.2/MS	1250	50 (660V)
	16	1600	3p/4p	E2.2/MS	1600	50 (660V)
	20	2000	3p/4p	E2.2/MS	2000	50 (660V)
	25	2500	3p/4p	E2.2/MS	2500	50 (660V)
	31	3150	3p/4p	E4.2/MS	3200	50 (660V)
	35	3500	3p/4p	E4.2/MS	3600	50 (660V)
	40	4000	3p/4p	E4.2/MS	4000 ⁽¹⁾	50 (660V)
High break "S"	08	800	3p/4p	E2.2/MS	800	80 (415V)
	12	1250	3p/4p	E2.2/MS	1250	80 (415V)
	16	1600	3p/4p	E2.2/MS	1600	80 (415V)
	20	2000	3p/4p	E2.2/MS	2000	80 (415V)
	25	2500	3p/4p	E2.2/MS	2500	80 (415V)
	31	3150	3p/4p	E4.2/MS	3200	80 (415V)
	35	3500	3p/4p	E4.2/MS	3600	80 (415V)
	40	4000	3p/4p	E4.2/MS	4000 ⁽¹⁾	80 (415V)

Note:

(1) derating to 3800A

For 4 poles circuit breakers it's mandatory to specify the position of the neutral phase by choosing between standard sequence (N, L1, L2, L3) or neutral on right side sequence (L1, L2, L3, N).

Trip Unit comparison

With Emax 2 retrofit kits it is possible to choose amid three different Trip Units in order to replace the GEC Alsthom MPACT MK1 ones: Ekip Dip, Ekip Touch and Ekip Hi-Touch.

The table below shows the functions available for the various MK1 trip units compared to the Emax 2 trip units:



	GEC Alsthom MK1 Trip Units					Emax 2 Trip Units Ekip		
	CTZ 66	CTZ 76	CTZ 61	CTZ 71 CTZM 71	LMZ 2	Dip	Touch	Hi-Touch
Protection functions								
L - Overload protection	●	●	●	●	●	●	●	●
S - Selective short-circuit	-	-	●	●	●	●	●	●
I - Instantaneous short-circuit	●	●	●	●	●	●	●	●
G - Earth fault	-	●	-	●	●	●	●	●

● = supplied as standard

Accessories compatibility

The majority of GEC Alsthom MPACT MK1 mechanical and electrical accessories can be replaced with Emax 2's ones:

MK1 Withdrawable	HBRF MK1 Withdrawable to Emax 2
Shunt release	Emax 2 standard YO (AUX 4Q to be wired in series with YO to replace the contact in series with the shunt release of MK1)
Electrical closing release coil	Emax 2 standard YC
Undervoltage release	Emax 2 standard YU
Undervoltage time delay feature	Emax 2 standard UVD (external wiring required)
MWS - Motor Wound Stored Charge Spring Closing	Emax 2 standard M
Auxiliary switches	Emax 2 standard AUX 4Q + AUX 6Q
Electrical fault trip indication	Emax 2 standard S51 contact
Carriage position indicator switches	Emax 2 standard AUP
Mechanical key interlock facility	Emax 2 standard key lock in open position KLC
Padlock facilities	Emax 2 standard protection device for opening and closing pushbuttons PBC (D=4 mm or D=7 mm or D=8 mm)
Mechanical interlock	Emax 2 mechanical interlock (all the interlocked breakers need to be replaced)