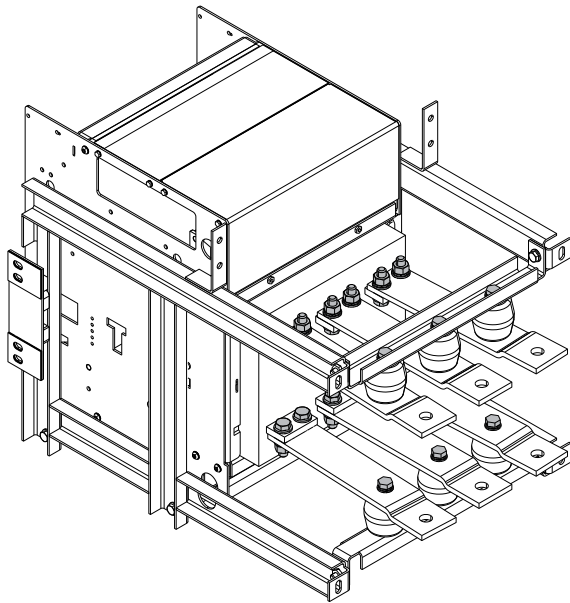


Retrofit kits

Hard Bus Retrofill Otomax to Emax 2



With only few modification actions and sustainable costs, Retrofitting kits are the perfect solution to improve a low voltage switchgear. ABB SACE has developed new hard bus retrofitting kits to replace and upgrade SACE Otomax Air withdrawable circuit breaker with the ABB latest family of circuit breakers, SACE Emax 2.

ABB ensures operating continuity between SACE Otomax Air circuit breakers and the newest series of circuit breakers SACE Emax 2. Replacement kits are designed to preserve existing switchgear and to reduce to a minimum the downtime due to the installation. Special copper adapting kits can be mounted on SACE Emax 2 standard fixed part in order to replicate the copper bars connections of Otomax's breakers to the switchgear. The result is a completely upgraded system with all the advantages of new technology offered by SACE Emax 2 circuit breakers.

This Retrofitting kit consists of:

1. Dedicated plates for an easy installation of the circuit-breaker
2. Special SACE Emax 2 adapter busbars according to the size to be mounted on the fixed part
3. Kit for door's adaption
4. Dedicated Emax 2 fixed part

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
- Reduce 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.

From Circuit-Breaker to Power Manager

SACE Emax 2 improves the efficiency of electrical plants, creating the new standard of:

- **Control:** Ekip PowerController to improve energy efficiency and saving
- **Connectivity:** integration into systems with integrated communication modules with different protocols: Modbus RS-485, Modbus TCP, Profibus, DeviceNet, EtherNet/IP, IEC61850, Bluetooth
- **Ease of use:** creation of efficiency and simplicity. Power measurement with Emax 2 advanced trip units
- **Easy to Maintain:** Diagnosis and installation with Ekip Connect Software. Programmed signal to remind when maintenance activities are required. ABB Ability EDCS is also available with Emax 2 for Predictive Maintenance & Audits.



Panorama

ABB offers a different solutions to upgrade obsolete Otomax withdrawable circuit breakers both with Emax2 and New Emax:

- **Hard bus retrofit (RF)** with Emax 2 is the traditional retrofit kit for which the complete Otomax 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 Hard Bus Retrofit is available also with New Emax)
- **Cradle in Cradle (CiC)** with New Emax is an advanced retrofit solution type that allow to replace only the Otomax moving part. In this case A special version of New Emax fixed part is supplied by ABB to be racked in the installed fixed part. When shut down time is an issue, the CiC solutions is preferable.

ABB Retrofitting kit solutions have been **factory tested** for mechanical and electrical operations, short circuit breaking capacity, short circuit withstand current and dielectric properties **according to IEC standards**.

Correspondence table

This Hard Bus Retrofill retrofitting solution is available for withdrawable Otomax P1 – P2 – P3 with an uninterrupted rated current Iu from 800 to 4500A. The table below is useful to choose the right Hard Bus Retrofill version because shows the correspondence between Otomax and Emax 2

SACE Otomax	Iu [A]	Poles	Emax 2	Emax 2 Performance Level	Iu [A]	Iu (Rating Plug) [A]	Icu 380V	Icu 500V	Icu 660V	Icw (1s) 500V
P1A	800	3p	E2.2	B	1600	800	32	30	-	30
	1250	3p	E2.2	B	1600	1250	32	30	-	30
	1600	3p	E2.2	B	1600	-	35	32	-	32
	2000	3p	E4.2	N	3200	2000	35	32	-	32
P1B	1000	3p	E2.2	B	1600	1000	32	30	-	30
	1600	3p	E2.2	B	1600	-	32	30	-	30
	2000	3p	E2.2	B	2000	-	35	32	-	32
	2500	3p	E4.2	N	3200	2500	35	32	-	32
P2A	800	3p	E2.2	N	800	-	52	50	-	50
	1250	3p	E2.2	N	1250	-	52	50	-	50
	1600	3p	E2.2	N	1600	-	55	52	-	52
	2000	3p	E4.2	N	3200	2000	55	52	-	52
	3000	3p	E4.2	N	3200	3000	57	55	-	55
	4000	3p	E6.2	H	4000	-	57	55	-	55
P2B	1000	3p	E2.2	N	1000	-	52	50	-	50
	1600	3p	E2.2	N	1600	-	52	50	-	50
	2000	3p	E2.2	N	2000	-	55	52	-	52
	2500	3p	E4.2	N	3200	2500	55	52	-	52
	3000	3p	E4.2	N	3200	3000	57	55	-	55
	4000	3p	E6.2	H	4000	-	57	55	-	55
P2C	1000	3p	E2.2	N	1000	-	52	50	50	50
	1250	3p	E2.2	N	1250	-	52	50	50	50
	1600	3p	E2.2	N	1600	-	52	50	55	50
	2000	3p	E2.2	N	2000	-	55	52	52	52
	2500	3p	E4.2	N	3200	2500	55	52	52	52
	3200	3p	E4.2	N	3200	-	57	55	-	55
	4000	3p	E6.2	H	4000	-	57	55	-	55
	4500	3p	E6.2	H	4000	-	57	55	-	55
P3A	1600	3p	E2.2	H	1600	-	75	75	-	75
	2000	3p	E4.2	H	3200	2000	75	75	-	75
	3000	3p	E4.2	V	3200	3000	100	100	-	100
	4000	3p	E6.2	H	4000	-	100	100	-	100
P3B	2000	3p	E2.2	H	2000	-	75	75	-	75
	2500	3p	E4.2	H	3200	2500	75	75	-	75
	3000	3p	E4.2	V	3200	3000	100	100	-	100
	4000	3p	E6.2	H	4000	-	100	100	-	100
P3C	2000	3p	E2.2	H	2000	-	75	75	-	75
	2500	3p	E4.2	H	3200	2500	75	75	-	75
	3200	3p	E4.2	V	3200	-	100	100	-	100
	4000	3p	E6.2	H	4000	-	100	100	-	100
	4500	3p	E6.2	H	4000	-	100	100	-	100

Accessories and Trip Unit

This new retrofitting solution guarantee the use of all the mechanical and electrical accessories of the Emax 2.

There are two different series of releases that may be installed on Otomax circuit breakers:

- “K” series electromagnetic overcurrent releases
- “S” series solid state overcurrent releases

Both “K” and “S” releases are able to attain the protections L, I and S.

With the retrofit kits with Emax 2 it is possible to choose amid three different Trip Units to replace the Otomax’s ones: Ekip Dip, Ekip Touch, Ekip Hi-Touch. Emax 2 **Trip Units** are available in the versions LI, LSI, and LSIg.



K series electromagnetic overcurrent release - LI, LSI



S series electromagnetic overcurrent release - LI, LSI



Ekip DIP - LI, LSI, LSIg



Ekip Touch - LI, LSI, LSIg



Ekip Hi-Touch - LI, LSI, LSIg