

SERVICE NOTE

Your SACE MEGAMAX needs to be replaced?

Choose ABB Retrofit solutions



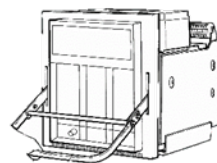
Traditional and Advanced retrofit kit solutions to upgrades Megamax to a next generation of low-voltage circuit breaker.

SACE Megamax is one of the most famous Air Circuit Breaker produced by ABB starting from '90s and sold everywhere in the world. Available in 6 frames with different performance levels:

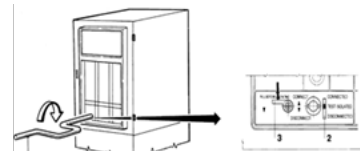
	F1						F2			F3	F4	F5	F6		
	B	N	S	H	V	L	H	V	L	S	S	S	H	S	H
1250	●	●	●	●	●	●									
1600	●	●	●	●	●	●									
2000							●	●	●		●				
2500							●	●	●	●	●				
3000										●	●				
3200												●	●	●	
3600												●			
4000													●	●	
5000														●	●
6300															● ●

Megamax in withdrawable version used to have 2 different racking in/out mechanism concepts:

- **Open door (OD):** it requires to open the panel door to rack in and out the moving part



- **Closed door (CD):** no need to open the door to rack in and out the moving part



Starting from January 2017, Megamax is in the Obsolete phase (see LCM) and not produced anymore.

Product	Trip unit	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Megamax F1-F6	PR1-AR1		Classic				Limited					Obsolete
Megamax F1-F6	PR1/C-PR1/D-PR1/A		Classic		Limited				Obsolete			

Classic: volume production is reduced. Circuit-breaker replacement, accessories and spare parts are available
 Limited: production is stopped but accessory and spare parts are available
 Obsolete: availability of Spares and accessories is not granted. Retrofit solutions can be available.

Even if a circuit breaker is obsolete, it's not necessary to replace the complete system where it is included if retrofit solution is available.

ABB created different retrofit solutions to support customer in case of Megamax replacement:

- **Hard bus retrofit** with Emax 2: the most traditional retrofit kit for which the complete Megamax circuit breaker needs to be dismantled. The kit consists in a new Emax 2 or New Emax circuit breaker equipped with special terminals to fit the existing busbars. The kits are available both for Fixed and Withdrawable circuit breaker versions.

Here below the already available Retrofit kit solutions for Megamax circuit breaker in withdrawable version:

	F1						F2			F3	F4	F5	
	B	N	S	H	V	L	H	L	S	S	S	S	H
1250	DR/RF	DR/RF	DR/RF	DR/RF	RF*	RF*				RF			
1600	DR/RF	DR/RF	DR/RF	DR/RF	RF*	RF*				RF			
2000	DR/RF	DR/RF	DR/RF	DR/RF			DR/RF	RF*	DR/RF	RF			
2500							DR/RF	RF*	DR/RF	RF			
3200											RF		
4000												RF	RF

RF* = only with New Emax Current-limiting version (L)

Independently from the type, the use of retrofit kits is advantageous for:

Low cost

- the investment is much less that it would be if new switchgear were to be installed. In addition, the retrofitting solution maintains the original configuration of the switchgear equipment and installation
- planned scheduling and implementation with minimum downtime.

Easy, safe replacement

- no structural changes
- adaptation to auxiliary circuits
- anyone can install the replacement kits as they are supplied complete with assembly instructions and electric interconnection diagrams.

Safety improvements

- retrofit kits restore the life cycle status of the switchgear
- use of new technology focused on safety and reliability.

Performance

- full inter-connectivity with existing distribution systems
- improved control over installations with new electronic protections:
 - energy consumption,
 - power control,
 - selectivity
 - ATS integrated in the circuit breaker trip unit
 - connectivity to ABB Ability EDCS Cloud based supervision and monitoring system

- **Direct replacement** with New Emax and Emax 2: the most advanced retrofit solution type: only Megamax moving part is removed. A special version of Emax 2 or New Emax moving part is supplied by ABB to be racked in/out from standard Megamax fixed part.

Maintenance and repairs

- ease of maintenance and improved functionality of the system
- cost reduction as spare parts for the new circuit breaker continue to be available for much longer.

Quality

Result of experience and expertise acquired by the same designers who develop the circuit-breakers, these retrofit kits are only guaranteed by ABB after they have been tested under both standard and critical conditions (short-circuit currents). ABB retrofit kits undergo the same tests as the whole range of ABB circuit-breakers and are certified in the ABB SpA Laboratory - ABB SACE Division. Each retrofit kit is subjected by ABB SACE to the tests listed below, in accordance with IEC 60947-2 or IEC 60947-1:

- racking-in/out operations
- verification of signalling devices
- verification of the safety device that prevents racking in and racking-out in the closed position
- verification in the disconnected position, to ensure that the specified clearances between isolating contacts cannot be inadvertently reduced
- verification of degree of protection
- dielectric properties (Impulse + Industrial frequency)
- verification of minimum clearances in air
- verification of minimum creepage distances
- temperature-rise test
- ultimate short circuit breaking capacity (240 / 415 / 690 V)
- rated short time withstand current
- maintenance manual (safety aspects).

Hard Bus Retrofill solutions



Traditional hard bus retrofit kit solutions to upgrades Megamax can cover most of installations.

What

The kit consists in:

Dedicated copper bars to connect the Emax 2 (fixed part or fixed version of circuit breaker) to the existing Megamax busbars (Fig 1), adapting plates to fixed Emax 2 without drilling the switchboard (Fig 2) and adapter plate for panel door (Fig 3).

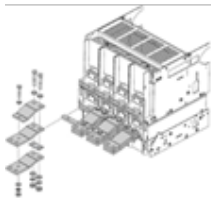


Fig 1

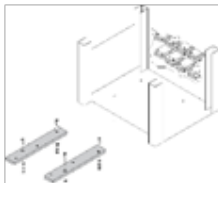


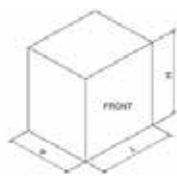
Fig 2



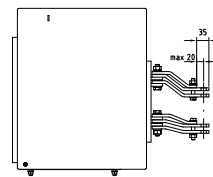
Fig 3

How

Completely dismantle the Megamax circuit breaker. Install the new kit. It could takes a few hours and it mandatory requires to shut down the swtichgear.



Before ordering it's necessary to verify the minimum cubicle clearance dimensions required by the new circuit breaker:



Verify the busbars do not exceed the max dimension indicated below (20mm):

When

In case of:

- Megamax fixed version
- Megamax withdrawable version but fixed part not in good conditions anymore
- Switch the system off for installtion is not a problem
- Direct replacement is not available
- Emax 2 Mechanical interlock or 15 extra AUX or door lock needed

Why

- Indipended solution from Open or Closed door version.
- New features on the New product: communication modules, new accessories (locks, AUX, ...), advanced maintenance programs, ...
- Longer availability of the product (circuit breaker, accessories and spare parts)
- 100% compatibility with Emax 2 accessories
- Technical support

Megamax → Emax 2	Withdrawable version with Horizontal rear terminals	Withdrawable version with Front terminals
F1B 1250 → E2.2B 1600	●	●
F1B 1600 → E2.2B 1600	●	●
F1B 2000 → E2.2B 2000	●	●
F1N 1250 → E2.2N 1250	●	●
F1N 1600 → E2.2N 1600	●	●
F1N 2000 → E2.2N 2000	●	●
F1S 1250 → E2.2S 1250	●	●
F1S 1600 → E2.2S 1600	●	●
F1S 2000 → E2.2S 2000	●	●
F1H 1250 → E2.2H 1250	●	●
F1H 1600 → E2.2H 1600	●	●
F2S 2000 → E2.2S 2500	●	●
F2S 2500 → E2.2S 2500	●	●
F2H 2000 → E2.2H 2500	●	●
F2H 2500 → E2.2H 2500	●	●
F3S 1250 → E2.2H 2500	●	-
F3S 1600 → E2.2H 2500	●	-
F3S 2000 → E2.2H 2500	●	-
F3S 2500 → E4.2H 2500	●	-
F4S 3200 → E4.2H 4000	●	-
F5S 4000 → E4.2H 4000	●	-
F5H 4000 → E4.2V 4000	●	-

TYPE	L (III)		L (IV)		H		P	
	Emax2	Megamax	Emax2	Megamax	Emax2	Megamax	Emax2	Megamax
E2.2-F1	400	384	490	479	515	485	355	514
E2.2-F2	400	466	490	561	515	485	355	514
E2.2-F3	400	466	490	581	545	625	355	576
E4.2-F4	500	586	600	701	545	625	355	576
E4.2-F5	500	811	600	926	545	625	355	576

Direct Replacement solutions



Direct replacement retrofit kit is the perfect solution as it is a fast, easy and a plug&play solution. There is no need to dismantle any part but Megamax moving part. Only panel door must be adapted to new.

Shut down time is a big issue for your business? Do not worry, ABB has the right solutions for you: with Direct replacement the installation time is reduced to the minimum: no need to rewire, no need to disassemble anything but just rack-out Megamax moving part and rack-in the Direct replacement retrofit with new generation of ABB Air circuit breaker.

What

The Direct Replacement retrofit kit consists in a dedicated moving part (Fig 1) of New Emax (to retrofit Megamax open door version) or Emax 2 (to retrofit Megamax closed door version) that fits Megamax fixed part. Only a panel door adaptation is required.

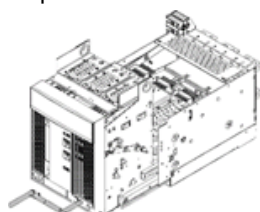


Fig 1

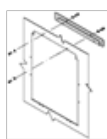


Fig 2

Moreover the kit always includes the Auxiliary contacts of connected/insulated position.

How

Only Megamax moving part needs to be removed. The panel door must be adapted with part of the supplied kit or replaced. The installation of the new kit takes a few minutes.

When

In case of:

- Reduced time for installation
- Megamax withdrawable version with Megamax fixed part still in good conditions (see document 1SDH001279R0002)
- No need of mechanical interlock.

Why

- Easy and fast solution
- Independed solution from terminals type
- New features on the New product: communication modules, new accessories (locks, AUX, ...), advanced maintenance programs, ...
- Longer availability of the product (circuit breaker, accessories and spare parts)
- Compatibility with most New product's accessories
- Technical support. Megamax Open Door can be easily converted into Closed Door just using Emax 2 direct replacement kit.

Closed door version between Megamax F1 and F2 up to 2500A:		Open door version between Megamax F1 and F2 up to 2000A:	
Megamax	→ Emax 2	Megamax	→ New Emax
F1B 1250 (CD)	→ E2.2B 1600	F1B 1250 (OD)	→ E2B 1250
F1B 1600 (CD)	→ E2.2B 1600	F1B 1600 (OD)	→ E2B 1600
F1B 2000 (CD)	→ E2.2B 2000	F1B 2000 (OD)	→ E2B 2000
F1N 1250 (CD)	→ E2.2N 1250	F1N 1250 (OD)	→ E2N 1250
F1N 1600 (CD)	→ E2.2N 1600	F1N 1600 (OD)	→ E2N 1600
F1N 2000 (CD)	→ E2.2N 2000	F1N 2000 (OD)	→ E2N 2000
F1S 1250 (CD)	→ E2.2S 1250	F1S 1250 (OD)	→ E2S 1250
F1S 1600 (CD)	→ E2.2S 1600	F1S 1600 (OD)	→ E2S 1600
F1S 2000 (CD)	→ E2.2S 2000	F1S 2000 (OD)	→ E2S 2000
F2S 2000 (CD)	→ E2.2S 2500**		
F2S 2500 (CD)	→ E2.2S 2500**		
F1H 1250 (CD)	→ E2.2H 1250	F1H 1250 (OD)	→ E2H 1250
F1H 1600 (CD)	→ E2.2H 1600	F1H 1600 (OD)	→ E2H 1600
F2H 2000 (CD)	→ E2.2H 2500*	F1L 1250 (OD)	→ E2L 1250
F2H 2500 (CD)	→ E2.2H 2500*	F1L 1600 (OD)	→ E2L 1600
		F2H 2000 (OD)	→ E2H 2000

* = derating to 2400A; ** = add RP=2000A

Megamax Open Door can be easily converted into Closed Door just using Emax 2 direct replacement kit.