

CANADIAN BROCHURE

SACE Emax 2 UL / CSA power circuit breakers



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• Efficient power management

- ABB Ability[™] enabled
- Small sizes and high performance
- Easy to use and safe

SACE Emax 2 From power circuit creaker to power manager

The world of electrical power distribution changes fast and major new trends such as renewables, energy storage and microgrids are now crowding onto the stage. These trends lead to new customer and application demands.

To meet these demands, ABB has now unveiled the innovative Emax 2 all-inone, the evolution of the Emax 2 into a multifunctional platform that is able to manage the next generation of electrical plants such as microgrids. Emax 2 all-in-one is the first circuit breaker that matches new grid requirements. It enables a direct communication to the new energy management cloud-computing platform ABB Ability[™] Electrical Distribution Control System. Smart and plug and play architecture makes Emax 2 all-in-one easy to use. Leveraging also unmatched electrical performances, Emax 2 sets a new circuit breaker benchmark for the needs of today and tomorrow.



Distinctive features

SACE Emax 2 evolution from circuit breaker to Power Manager continues, embedding more and more functionalities to become the all-in-one solution to manage "low-voltage distribution systems".

Efficiency

The new technologies used in the SACE Emax 2 circuit breakers allow the productivity and reliability of installations to be optimized, and at the same time, power consumption to be reduced while fully respecting the environment. New advanced functionalities, together with Protection trip units and Communication and system devices contribute to make SACE Emax 2 the circuit breaker that maximizes efficiency in all low-voltage electrical installation.

Control

SACE Emax 2 circuit breaker is the first single device ready to manage all the dynamics of a low-voltage electrical installation. Managing loads in any condition is now possible thanks to Advanced Functionalities such as: Adaptive load shedding, Predictive load shedding, Power controller, Embedded ATS, Synchro-reclosing, Interface protection system and Interface Device, Adaptive protection.

Connectivity

All circuit breakers can be equipped with communication units for use with Modbus, Profibus, and DeviceNet[™] protocols as well as the modern Modbus TCP, Profinet, EtherNet/IP[™] and Open ADR. SACE Emax 2 can also be integrated in an energy management system, ABB Ability[™] Electrical Distribution Control System.

Performance

The SACE Emax 2 range is made up of 4 sizes: E1.2, E2.2, E4.2 and E6.2 up to 6000A. The rating levels are updated and standardized throughout the sizes to meet the demands and needs of today's installations, from 42kA to 150kA.

Ease of use

The entire range is available in fixed and withdrawable versions, with double insulation between the front of the switchgear and the live parts to ensure operation in complete safety. The circuit breakers can be powered indifferently from above or below. The Ekip Touch protection trip units are equipped with a large colour touch-screen display which enables safe and intuitive operation. Furthermore the Ekip units can be programmed and consulted from a tablet, smart phone or portable PC via the Ekip Connect application and all the advanced functionalities can be easily programmed thanks to predefined logic templates.



SACE Emax 2 Power Circuit Breaker

The new SACE Emax 2 circuit-breakers have been designed to optimize the installation and commissioning of accessories.

The front of the circuit-breaker features two functional areas, which are protected by separate covers:

- Accessories area for the installation of accessories inside the circuit-breaker and Ekip trip unit. The areas dedicated to accessories can be accessed by removing the flange and the accessories covers. On removal, the operating mechanism area remains segregated and protected, providing safety for operators.
- **Safety area**, which delimits the housing of the stored energy operating mechanism of the circuit-breaker. To carry out maintenance on the operating mechanism, the covers of the accessories and safety area must be removed.

The auxiliary connection terminal box also features two areas:

- **Terminal area** for housing and inserting the terminals for wiring the auxiliary connections. The terminals can be wired first and then installed on the circuit-breaker terminal box, thereby facilitating cable connection for the operator.
- **Cartridge module area**, housing for the Ekip modules. These are installed directly on the upper part of the circuit-breaker or of the fixed part without having to remove the Ekip electronic trip unit, thereby minimizing the time required for the installation and commissioning of accessories.



SACE Emax 2 Ekip Trip Units

All SACE Emax 2 circuit breakers are equipped with protection trip units that are interchangeable from the front with just a few, simple operations by the customer.

SACE Ekip consists of:

- **Protection trip unit,** available with different interfaces and versions that range from basic to more complete; it contains a latest generation microprocessor that performs all the functions of protection and control.
- Ekip Measuring Module, connected internally to Emax 2, performs voltage, power and energy measurements with high accuracy without requiring any external connection or voltage transformer. The Ekip Measuring Pro version also performs all protection functions based on voltage and power without the need for external units, thereby simplifying design and construction of the system.
- Interchangeable rating plug enables all protection thresholds to be adjusted according to the rated current, increasing flexibility for the customer. It is useful in installations that are prepared for future development or in cases in which the power supplied may be limited temporarily.
- Main board is the mechanical housing of the trip unit, which includes a micro-controller for measuring currents and the self-protection functions. The separation of trip units ensures excellent reliability and immunity to conducted and radiated emissions. Integrated new generation Rogowski sensors, which are sensitive to the true r.m.s. value of the current, guarantee high accuracy of both measurements and protection.

Fields of applications		Measurement and Protection of Current	Measurement of Voltage, Power, Energy	Measurement and Protection of Voltage, Power, Energy	Network Analyzer	
Ekip Dip		with Ekip Multimeter	-	-	-	
Ekip Touch	 Distribution	•	with Ekip Measuring	with Ekip Measuring Pro	-	
Ekip Hi-Touch		•	•	•	•	
Ekip G Touch	C	•	•	•	-	
Ekip G Hi-Touch	— Generators	•	•	•	•	



SACE Emax 2 Product overview

Common data							
Rated maximum voltage	[V]	635					
Rated voltage	[V]	600					
Test voltage (1min. 50/60 Hz)	[kV]	2.2					
Frequency	[Hz]	50 - 60					
Number of poles		3-4					
Version		Fixed (F) - Draw	vout (W)				
SACE Emax 2 for UL1066				E1.2			
Performance levels				B-A	N-A	S-A	
Current			[A]	800	800	250	
			[A]	1200	1200	400	
			[A]			800	
			[A]			1200	
			[A]				
			[A]				
Neutral pole current-carrying cap	acity for 4-pole CBs		[%lu]	[%lu] 100 100		100	
Interrupting rating at rated	254 V		[kA]	42	50	65	
maximum voltage	508 V		[kA]	42	50	65	
	635 V		[kA]	42	42	42	
Rated short time current			[kA]	[kA] 42 50		50	
Trip times	Break time with fault c short time current	urrent < rated	[ms]	40	40	40	
	Break time with fault c short time current	urrent > rated	[ms]	25	25	25	
Overall dimensions	H - Fixed		[in/mm]	11.65 / 296			
	D - Fixed		[in/mm]	[in/mm] 7.20/183			
	W - Fixed 3p		[in/mm]	8.27 / 210			
	W - Fixed 4p/4p FS		[in/mm]	11.02 / 280			
	H - Drawout		[in/mm]	14.33 / 363.5			
	D - Drawout		[in/mm]	11.06 / 281			
	W - Drawout 3p		[in/mm]	10.94 / 278			
	W - Drawout 4p/4p FS		[in/mm]	13.70/348			
Weights (CB with trip unit and current sensor)	Fixed 3p		[lbs/kg]	30.9 / 14			
	Fixed 4p/4p FS		[lbs/kg]	35.3 / 16			
	Drawout 3p (incl. fixed	l part)	[lbs/kg]	90.4 / 41			
	Drawout 4p/4p FS (ind	cl. fixed part)	[lbs/kg]	102.5 / 46.5			

1) Fixed version only; 2) poles and draw out only - Overall dimension as 4 poles full size

SACE Emax 2 for UL1066			E1.2			
Mechanical life with regular ordina	[A]	< 800	800	1200		
maintenance prescribed by the manufacturer		[No. cycles x 1000]	20	20	20	
	Frequency	[Cycles/Hour] 60		60	60	
Mechanical with regular ordinary	508 V	[No. cycles x 1000]	8	8	7	·
maintenance prescribed by the	635 V	[No. cycles x 1000]	8	8	6,5	·
	Frequency	[Cycles/Hour]	30	30	30	







E2.2			E4.2			E6.2				
B-A	N-A	S-A	H-A	V-A	S-A	H-A	V-A	H-A	V-A	
1600	1600	800	800	250	2500	2500	800	4000	4000	
	2000	1200	1200	400	3200	3200	1600	5000	5000	
		1600	1600	800	3600 ¹⁾	3600 ¹⁾	2000	6000 ²⁾	6000 ²⁾	
		2000	2000	1200			2500			
				1600			3200			
				2000			3600 ¹⁾			
100	100	100	100	100	100	100	100	50-100	50-100	
42	50	65	85	100	65	85	100	85	100	
42	50	65	85	100	65	85	100	85	100	
42	50	65	85	85	65	85	100	100	100	
42	50	65	85	85	65	85	100	85	100	
40	40	40	40	40	40	40	40	40	330	
25	25	25	25	25	25	25	25	25	286	
14.61 / 371					14.61 / 37	71		14.61 / 371		
10.63 / 270)				10.63 / 27	70		10.63 / 270		
10.87 / 276	5				15.12 / 38	34		30.00 / 762		
14.41 / 366	5				20.08 / 5	10		34.96 / 888 - 39.92 / 1014		
16.73 / 425	5				16.73 / 42	25		16.73 / 425		
15.47 / 393					15.47 / 39	93		15.47 / 393		
12.48 / 317	,				16.73 / 42	25		31.61 / 803		
16.02 / 407	7				21.69 / 55	51		36.57 / 929 - 42.09 / 1069		
115 / 52				161 / 73 (201 / 91 (210 / 95 (up to 2500A) 3200A) 3600A))	314 / 142 (3p)			
148 / 67				203 / 92 (256 / 116	up to 2500A (3200A))	360 / 163 (4p) 406 / 184 (4p FS)			
128 / 58 (up to 1600A)					261 / 118	(up to 2500/	4)	486 / 220 (3p up to 5000A)		
150 / 60 /	000A)	<u> </u>			300/130	(up to 2500)	^)	818 / 3/1 (3p 6000A)		
239 / 108 (u	2000A))			325/14/ 377/171	(up to 2500/ (3200A)		554 / 251 (4p up to 5000A) 620 / 281 (4p FS up to 5000A)		
 	/					,		,,,,,,,		

E2.2							E6.2		
< 1600	1600	2000	< 2500	2500	3200	3600	4000	5000	6000
25	25	25	20	20	20	20	12	12	12
60	60	60	60	60	60	60	60	60	60
15	12	10	10	8	7	7	4	3	2
15	10	8	10	8	7	7	4	2	2
30	30	30	20	20	20	20	10	10	10



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