TECHNICAL CATALOG

SACE Emax 2

Low voltage power circuit breakers
ANSI C37 / UL 1066 / CSA standards



SACE Emax 2 UL
Consultation guide



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New generation of functionalities ready for every type of system and simple to use.



Chapter 5
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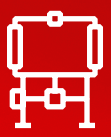
Chapter 6
Accessories
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SACE Emax 2 UL
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Main characteristics

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Overview of the SACE Emax 2 family

SACE Emax 2, a further leap forward

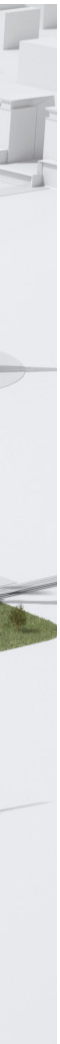
The world of the electrical power distribution changes fast and major new trends such as energy efficiency, connectivity and smart grids are now crowding onto the stage. These trends lead to new customer and application demands. In order to meet these demands, ABB has further improved SACE Emax 2. SACE Emax 2 air circuit breaker is now a multifunctional platform able to manage the next generation of electrical plants such as microgrids, evolving into a true Power Manager.
SACE Emax 2 is the first air circuit breaker that meets new grid requirements.

It enables a direct communication to the new energy management cloud-computing platform ABB Ability™ Energy and Asset Manager.
The smart and plug & play architecture makes SACE Emax 2 easy to use, cutting-edge connectivity capabilities creates a circuit breaker that is able to evolve during its lifecycle. Thanks to the ABB Ability Marketplace™ offering and the full portfolio of commissioning tools, it is possible to enhance the device, even when installed.
SACE Emax 2 sets a new circuit breaker benchmark for the needs of today and tomorrow.



Distinctive features

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



Performance

The SACE Emax 2 range is made up of 4 sizes: E1.2, E2.2, E4.2 and E6.2 up to 6000A, which enable switchgear of compact dimensions and high ratings to be built with busbars of reduced length and cross-section.

The protection trip units, auxiliary connections and main accessories are the same throughout the range to simplify design and installation.

Furthermore, the sizes from E2.2 to E6.2 have the same height and depth.

The rating levels are updated and standardized throughout the sizes to meet the demands and needs of today's installations, from 42kA to 150kA, and to standardize switchgear projects.

High short-time currents, together with the efficiency of the protection functions, to provide complete selectivity in all situations.

Accurate design and choice of materials enable optimization of the overall dimensions of the circuit breaker. In this way switchgear of compact dimensions can be built to help deliver outstanding savings at the same performance.

Furthermore it can be ordered with a triple marking label, IEC, UL and CCC.

SACE Emax 2 air circuit breakers are certified for Class 1 active energy measurement in compliance with the IEC61557-12 standard. This permits it to satisfy highly demanding requirements of energy efficiency and to perfectly fit into SCADA systems thanks to a current detection proximal to 0.

Achieving maximum efficiency of an electrical installation requires intelligent management of power supplies and energy use. For this reason, the new technologies used in 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.

Distinctive features

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 almost any condition is now possible thanks to Advanced Functionalities such as:

- Load shedding: fast load shedding to provide continuity for critical loads during black-outs. Typical scenario is when LV distribution is disconnected from the grid (MV).
- Power controller: patented algorithm to help reduce the peak of power consumed, allowing savings on electricity bills. Managing different power sources and connecting them to main grid is also crucial, so that service continuity is maximized.
- Embedded ATS functions: an automatic transfer switch system is used in applications where continuity is essential and where there are multi source supplies.
- Synchrocheck logics: Synchronization of voltage and frequency to allow plant reconnection to the Utility. SACE Emax 2 is able to act as a controller of Main grid condition, disconnecting a plant when necessary and adapting protection to on-grid or off-grid conditions.
- Adaptive protection: Network changes recognition and automatic set of thresholds to provide protection and coordination in on-grid and off-grid conditions.

Connectivity

SACE Emax 2 circuit breakers can be into all automation and energy management systems to help improve productivity, energy consumption and remote service.

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™. The cartridge-type modules can be easily installed directly on the terminal box, even at a later date.

Furthermore, the integrated IEC61850 communication module enables connection to automation systems widely used in medium voltage power distribution to create intelligent networks (Smart Grids).

All circuit breaker settings and functions are also accessible via Bluetooth, using EPiC mobile app. This remote connection allows a safer interaction with the device mitigating the risk of arc flash accidents.

Furthermore with an easy connection thanks to Ekip Com Hub module, SACE Emax 2 can be integrated in ABB Ability™ Energy and Asset Manager, exploiting all the capabilities of a cloud computing platform such as predictive maintenance, analysis and report download.



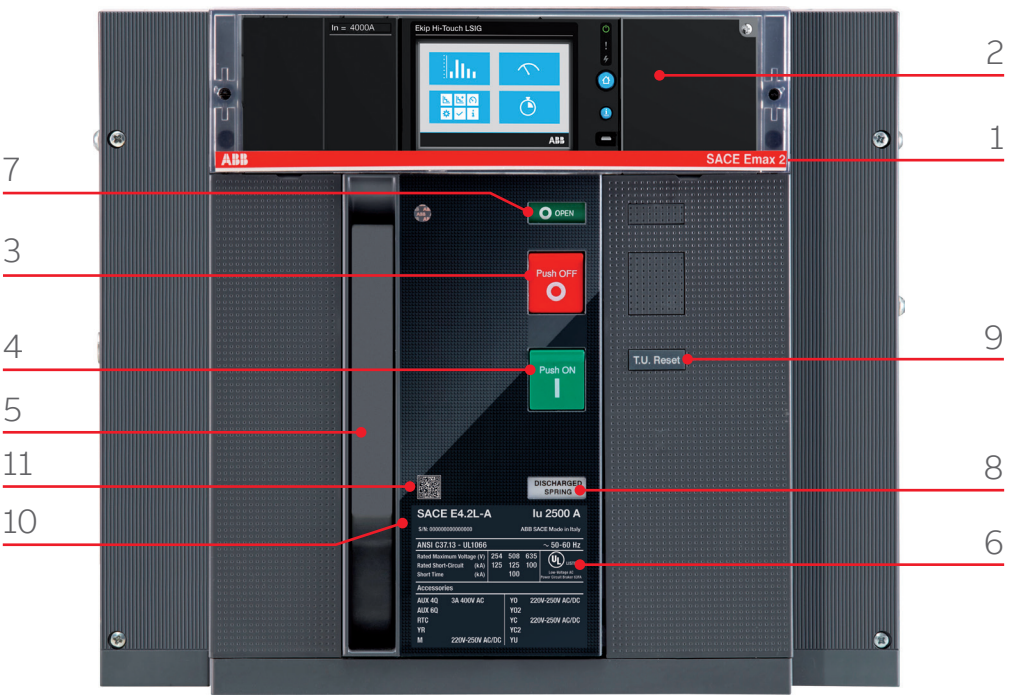

In = 2500A
Ekip Hi-Touch LSIG
ABB
SACE Emax 2
OPEN
Push OFF
Push ON
T.U. Reset
SACE E2.2V-A
Iu 2000 A
ANSI C37.13 - UL1066
Accessories

Distinctive features

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 help ensure safe operation. The circuit breakers can be powered from the top or bottom terminal connections. All essential information is available in the central area of the front shield and helps enable immediate identification of the status of the circuit breaker: open, closed, ready to close, charged and discharged springs.
Maintenance is intended to be simple and safe. Thanks to the new front cover design, the main accessories can be installed without completely removing the front cover.
The withdrawable circuit breaker is inserted and removed via dedicated guide rails that simplify movement. The correct movement from racked-in, test isolated, to racked-out position is provided by a lock in each position.
As a further expectation of safety, the shutters of the fixed part can be locked from the front when the circuit breaker is removed.
The shutters of the upper terminals are independent of those of the lower terminals to facilitate checking and maintenance operations.
The Ekip Touch protection trip units are equipped with a large color touch-screen display which helps enable safe and intuitive operation. Furthermore, the Ekip trip units can be accessed by means of smartphone, tablet or portable PC, thanks to enhanced connectivity capabilities and a full portfolio of commissioning tools. The improved electronics allows updating of the circuit breaker while in service during operation.
SACE Emax 2 is now able to evolve during the lifecycle thanks to dedicated software packages available on the ABB Ability Marketplace™. Upgrade and customize the circuit breaker has never been so easy. Thanks to the customization simplicity, communication modules installation ease and clear user interface, SACE Emax 2 is making the complex system ready for a new digital experience.



Key
1 Trademark and size of circuit- breaker
2 SACE Ekip protection trip unit
3 Pushbutton for manual opening
4 Pushbutton for manual closing
5 Lever to manually charge closing springs
6 Electrical rating plate
7 Mechanical device to signal circuit breaker open “O” and closed “I”
8 Signal for springs charged or discharged
9 Mechanical signalling of overcurrent release tripped
10 Size and serial number
11 QR code



SACE Emax 2 is now equipped with a laser etched QR code located on the front of the circuit breaker allowing easy access to product data via smartphone.
By scanning the QR code directly from your smartphone the user will have access to:

1. Product datasheet including full list of factory installed accessories and relevant documentation
2. ABB Contact information.
3. Link to download ABB EPiC mobile app for monitoring and commissioning.

In addition, ABB’s EPiC mobile app has been enhanced with the ability to scan the QR code in order to provide a consistent user experience across the platform.



Product conformity

The SACE Emax 2 circuit breakers and their accessories conform with ANSI C37.13, C37.16, C37.17 and C37.50 standards and are UL 1066 certified. The UL 1066 certification allows Emax 2 to be used in UL 1558 switchgear, UL 891 switchboards and CSA C22.2 no. 31 switchgear assemblies.

Approvals and certifications

The SACE Emax 2 family also includes a range that conforms to the international IEC 60947, EN 60947 (harmonized in 30 CENELEC countries),
CEI EN 60947 and IEC 61000 Standards and complies with the following EC directives:

- "Low Voltage Directives" (LVD) no. 2014/35/EU
- "Electromagnetic Compatibility Directive" (EMC) no. 2014/30/EU.

The IEC range is also certified by the Russian certification body GOST (Russia Certificate of Conformity) and has achieved China CCC Certification (China Compulsory Certification).
The low-voltage electrical distribution plants inside the modern ship require continuous improvements in order to ensure always more safety and availability and ABB enriches its products with a new certification:

- **UL1066 SA** (ACB): ABB guarantees for the ACB the same working temperature of MCCBs in an ambient with inclination (30°) and vibrations certify in the UL1066 standard.

Certification of conformity with the above-mentioned product Standards is carried out in compliance with the European EN 45011 Standard by the Italian certification body ACAE (Association for the Certification of Electrical Equipment),which is recognized by the European organization LOVAG (Low Voltage Agreement Group), and by the Swedish Intertek SEMKO certification organization Intertek Semko which is recognized by the international organization IECEE.

Product Material Compliance

The Emax 2 family complies with the following international regulations:

- RoHS II, Directive 2011/65/EU and Amendment 2015/863 - Restriction of Hazardous Substances;
- REACH, 2006/1907/EC, Registration, Evaluation, Authorization and Restriction of Chemicals;
- WEEE 2012/19/EU -Waste Electrical & Electronic Equipment;
- Conflict Minerals - Dodd-Frank Consumer Protection Act. Section 1502.

The main versions of the devices are approved by the following shipping registers

Registro Italiano Navale (RINA): Italian

Bureau Veritas (BV): French

Nippon Kaiji Kyokai (NKK): Japan

Lloyd's Register of Shipping (LR): English

Det Norske Veritas (DNV): Norway

UK Conformity Assessed: UK

American Bureau Shipping (ABS): American

Russian Maritime Regiser of Shipping (RMRS): Russian

Circuit breaker Listed naval

Germanischer Lloyd (GL): Deutsch

For the types of certified circuit breakers, certified ratings and corresponding validity, please contact ABB.



Quality and Sustainability: company efficiency and integrated management systems. Quality, Sustainability and Customer Satisfaction have always been ABB SACE's major commitment.

The involvement of all company departments and organization of processes have led ABB to develop, implement and certify management systems in compliance with international standards:

- ISO 9001 for quality management
- IRIS for the quality of supplies in the railway sector (International Railway Industry Standards)
- ISO 14001 for environmental management
- OHSAS 18001 for the management of the health and safety of employees in the workplace
- SA 8000 for the management of social responsibility.



The ABB SACE testing laboratory, accredited by ACCREDIA in compliance with the ISO/IEC 17025 Standard, provides both ABB and external customers with a qualified service of performing certification tests on devices and electric equipment of low and medium voltage in accordance with the relevant product Standards.

Thanks to the implementation of systems and their integration (Integrated Management System), ABB SACE, with a view to continuous improvement, has implemented processes with a focus on:

- quality, preventing defects and faults along the entire supply chain
- environment, reviewing production processes in terms of ecology and waste reduction, rationalizing the consumption of raw materials and energy, preventing pollution, containing noise emissions and reducing the quantity of rejects in the production processes
- health and safety of employees, offering a healthy and safe workplace in all of the various stages of work with a "zero accident objective"
- social responsibility, providing the respect of human rights and the absence of any discrimination throughout the supply chain, and offering a favourable and transparent working atmosphere.

A further commitment aimed at safeguarding the environment has been achieved by assessing products' life cycles (LCA, Life Cycle Assessment). This includes the assessment and improvement of the environmental performance of products from the engineering stage throughout their entire life cycle. The materials, processes and packaging used are chosen with a view to optimising the actual environmental impact of each product, including its energy efficiency and recyclability.

ABB EcoSolutions™

Leading the way to the circular economy

To help preserve the Earth's resources for future generations, ABB takes a company-wide approach to circularity. We aim to innovate towards new circular business models by cutting waste, increasing recyclability and reusability, and making our products more durable. We work closely with customers and suppliers to embed circularity across the value chain.

ABB's EcoSolutions™ label provides full transparency on a product's circularity value and environmental impact. ABB products with the EcoSolutions label carry an independently verified environmental product declaration (EPD) (ISO 14025) – and comply with a set of key performance indicators defined in ABB's circularity framework.

ABB EcoSolutions: transparency for customers

The ABB EcoSolutions™ label is an assurance that the product is:

- designed to last and manufactured with the maximum amount of sustainably sourced raw materials;
- made with processes that are designed to avoid waste and maximize the use of sustainable packaging materials;
- designed to increase resource and process efficiency while in use, be upgradable and optimize the lifetime of equipment and facilities;
- supported by take-back services leading to refurbishment, re-use or recycling of products and components, and is accompanied by instructions for responsible end-of-life treatment.

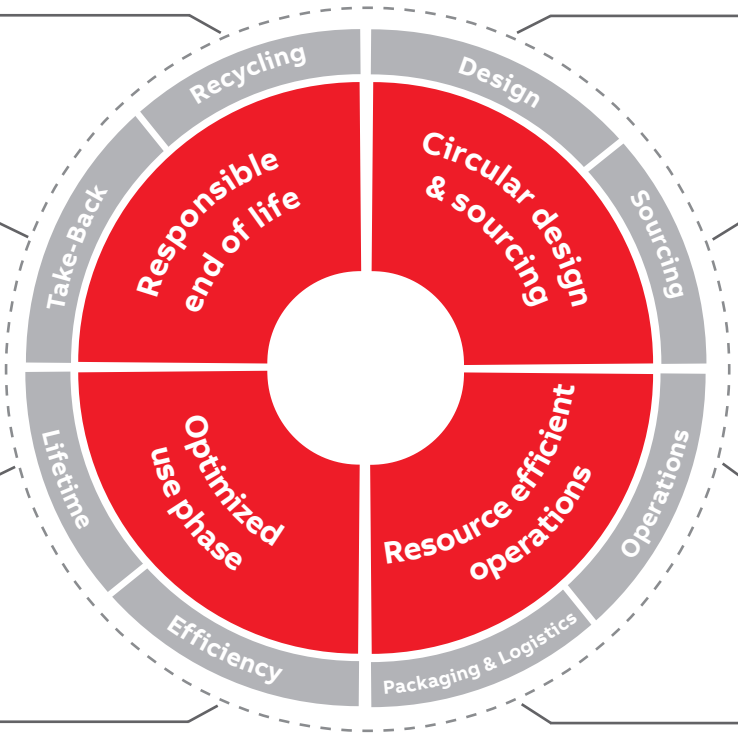
EcoSolutions products are evaluated against a clear set of 8 key performance indicators (KPIs) based on these four stages of the product life cycle.

Recycling
End-of-life instructions that help maximize recyclability

Take-Back
Take back services that support refurbishment, re-use or recycling

Lifetime
Longer product or process lifetimes through durable design, maintenance, or upgrades

Efficiency
Improved resource efficiency for customer operations



Design concept
Designed for sustainability, durability, and recyclability

Sourcing
Raw materials sourced with maximum sustainable content

Operations
Waste minimized in operations and in projects

Packaging & Logistics
Sustainable or recycled materials optimize packaging and logistics

* Contact ABB for information about products provided with ABB EcoSolutions™ in each production plant.



ABB Eco Solutions™

Look for the ABB EcoSolutions™ logo and QR code on packaging to access transparent sustainability information about the product. To receive information for a specific product, please contact ABB.

ABB Low Voltage Product Service

ABB's technical assistance service offers solutions aimed at supporting the customer in all stages of the lifespan of the circuit breaker in service and covering the entire chain of value; ABB is present from the moment of selection to the end of the life of the product, thereby providing the investments of its customers.

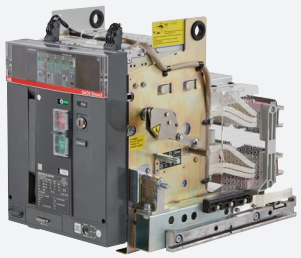
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Retrofit kit selector

ABB supplies annual updates regarding the evolution of the circuit breaker ranges (Life Cycle Management) and for each product it provides details of associated services and the level of support available, so that customers can chose the products and spare parts best suited to their needs.
ABB's organisation offers services that include installation and commissioning, technical training on the use and maintenance of products, the supply of original spare parts, corrective and preventive maintenance, equipment diagnostics, modernization of systems with upgrades and retrofitting kits, consultancy services and personalized maintenance and service contracts.
All this is supported by one of the most extensive global sales and service networks.

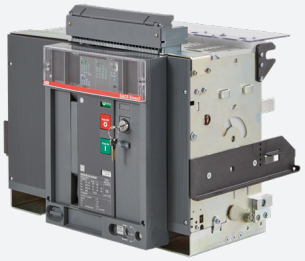
Retrofitting kit
Through continuous research targeted to customer needs, ABB SACE Modernization Services has developed innovative retrofit kits in order to simplify and speed up the installation of a new circuit breaker, updating customer's low voltage systems with the latest technology available and very limited downtimes. Whenever a device is no longer available on the market and maintenance is no longer efficient, ABB SACE Modernization Services' retrofit kits are the solution to substitute an obsolete circuit breaker. Retrofits are specifically designed to preserve the existing frameworks and minimize installation time.
ABB has developed different kit versions to cover all possible customer scenarios:

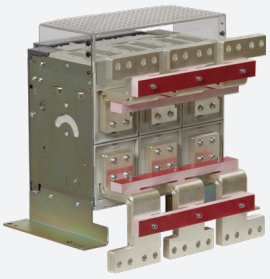
- Direct Replacement (DR)
- Cradle in Cradle (CiC)
- Hard Bus Retrofill (HBRF)

ABB SACE Modernization retrofits are available for ABB, GE and also competitors circuit breakers.









The ranges

2/2 **SACE Emax 2 power circuit breakers UL 1066**

2/4 **SACE Emax 2 switch disconnectors UL 1066**

2/6 **SACE Emax 2 power circuit breakers multi-standard version IEC 60947, UL1066 and CCC**

2/8 **SACE Emax 2 air switch disconnectors at 1500 V DC**

SACE Emax 2 power circuit breakers UL 1066

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) - Drawout (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 capacity for 4 pole CBs		[%Iu]	100	100	100
Interrupting rating at rated maximum voltage	254 V	[kA]	42	50	65
	508 V	[kA]	42	50	65
	635 V	[kA]	42	42	42
Rated short time current		[kA]	42	50	50
Trip times [3]	Maximum breaking time for I>Icw	[ms]	40	40	40
	Maximum breaking time for I>Icw	[ms]	25	25	25
Overall dimensions	H - Fixed	[in/mm]	11.65 / 296		
	D - Fixed	[in/mm]	7.20 / 183		
	W - Fixed 3p	[in/mm]	8.27 / 210		
	W - Fixed 4p/4p full size	[in/mm]	11.02 / 280		
	H - Draw out	[in/mm]	14.33 / 363.5		
	D - Draw out	[in/mm]	11.06 / 281		
	W - Draw out 3p	[in/mm]	10.94 / 278		
	W - Draw out 4p/4p full size	[in/mm]	13.70 / 348		
Weights	Fixed 3p / 4p / 4p full size	[lbs/Kg]	30.9/35.3 lbs - 14/16 kg		
	Draw out 3p / 4p / 4p full size	[lbs/Kg]	90.4/102.5 lbs - 41/46.5 kg		

SACE Emax 2 for UL1066			**E1.2**		
Anticipated mechanical life with regular ordinary maintenance prescribed by the manufacturer		[A]	< 800	800	1200
		[No. cycles x 1000]	20	20	20
	Frequency	[Cycles/Hour]	60	60	60
Anticipated electrical life with regular ordinary maintenance prescribed by the manufacturer	508 V	[No. cycles x 1000]	8	8	7
	635 V	[No. cycles x 1000]	8	8	6.5
	Frequency	[Cycles/Hour]	30	30	30

1) Fixed version only
2) 3 poles and draw out only - Overall dimension as 4 poles full size
3) Total clearing time is the sum of breaking time and trip time







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	85	100
42	50	65	85	85	65	85	100	85	100
40	40	40	40	40	40	40	40	40	40
25	25	25	25	25	25	25	25	25	25
14.61/371					14.61/371			14.61/371	
10.63/270					10.63/270			10.63/270	
10.87/276					15.12/384			30.00/762	
14.41/366					20.08/510			34.96/888 - 39.92/1014	
16.73/425					16.73/425			16.73/425	
15.47/393					15.47/393			15.47/393	
12.48/317					16.73/425			31.61/803	
407/16.02					21.69/551			36.57/929 - 42.09/1069	
115/148 lbs - 52/67 Kg					Up to 2500A: 161/203 lbs - 73/92 kg 3200A: 201/256 lbs - 91/116 kg 3600A: 210 lbs - 95 kg			314/360/406 lbs 142/163/184 kg	
up to 1600A: 128/150 lbs - 58/68 Kg 2000A: 135/239lbs - 61/108kg					Up to 2500A: 261/325 lbs - 118/147 kg 3200A: 300/377 lbs - 136/171 kg			Up to 5000A: 486/554/620 lbs - 220/251/281 kg 6000A: 818 lbs - 371 Kg	

E2.2			E4.2				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

SACE Emax 2 switch disconnectors UL 1066

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) - Drawout (W)



SACE Emax 2 for UL1066			**E1.2**	
Performance levels			**B-A**	**N-A**
Current		[A]	800	800
		[A]	1200	1200
		[A]		
		[A]		
		[A]		
		[A]		
Neutral pole current-carrying capacity for 4 pole CBs		[%Iu]	100	100
Rated short time current		[kA]	42	50 (1)
Overall dimensions	H - Fixed	[in/mm]	11.65 / 296	
	D - Fixed	[in/mm]	7.20 / 183	
	W - Fixed 3p	[in/mm]	8.27 / 210	
	W - Fixed 4p/4p full size	[in/mm]	11.02 / 280	
	H - Draw out	[in/mm]	14.33 / 363.5	
	D - Draw out	[in/mm]	11.06 / 281	
	W - Draw out 3p	[in/mm]	10.94 / 278	
	W - Draw out 4p/4p full size	[in/mm]	13.70 / 348	

1) Rated short-time current is equal to 42kA at 635V

SACE Emax 2 for UL1066			**E1.2**	
Anticipated mechanical life with regular ordinary maintenance prescribed by the manufacturer		[A]	800	1200
		[No. cycles x 1000]	20	20
	Frequency	[Cycles/Hour]	60	60
Anticipated electrical life with regular ordinary maintenance prescribed by the manufacturer	508 V	[No. cycles x 1000]	8	7
	635 V	[No. cycles x 1000]	8	6.5
	Frequency	[Cycles/Hour]	30	30







E2.2			E4.2			E6.2
N-A	**S-A**	**V-A**	**S-A**	**H-A**	**V-A**	**L-A**
1600	800	800	2500	2500	800	4000
2000	1600	1600	3200	3200	1600	5000
	2000	2000	3600	3600	2000	6000
					2500	
					3200	
					3600	
100	100	100	100	100	100	50-100
50	65	85	65	85	100	100
14.61/371			14.61/371			14.61/371
10.63/270			10.63/270			10.63/270
10.87/276			15.12/384			30.00/762
14.41/366			20.08/510			34.96/888 - 39.92/1014
16.73/425			16.73/425			16.73/425
15.47/393			15.47/393			15.47/393
12.48/317			16.73/425			31.61/803
407/16.02			21.69/551			36.57/929 - 42.09/1069

E2.2			E4.2				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

SACE Emax 2 power circuit breakers multi-standard version IEC 60947, UL1066 and CCC

Common data		
Rated service voltage Ue	[V]	690
Rated insulation voltage Ui	[V]	1000
Rated impulse withstand voltage Uimp	[kV]	12
Frequency	[Hz]	50 - 60
Number of poles		3- 4
Version		Fixed (F) - Drawout (W)
Isolation behaviour		IEC 60947-2



Standard			**E2.2**				
Performance levels			**B-A**	**N-A**	**S-A**	**H-A**	**V-A**
Rated uninterrupted current Iu @ 40°C		[A]	1600	1600	800	800	400
		[A]		2000	1200	1200	800
		[A]			1600	1600	1200
		[A]			2000	2000	1600
		[A]					2000
UL1066							
Interrupting rating at rated maximum voltage	254 V	[kA]	42	50	65	85	100
	508 V	[kA]	42	50	65	85	100
	635 V	[kA]	42	50	65	85	85
Rated short time current		[kA]	42	50	65	85	85
IEC 60947							
Rated ultimate short-circuit breaking capacity Icu	400-415 V	[kA]	42	50	66	85	100
	440 V	[kA]	42	50	66	85	100
	500-525 V	[kA]	42	50	66	85	85
	690 V	[kA]	42	50	66	85	85
Rated service short-circuit breaking capacity Ics	400-415 V	[kA]	42	50	66	85	100
	440 V	[kA]	42	50	66	85	100
	500-525 V	[kA]	42	50	66	85	85
	690 V	[kA]	42	50	66	85	85
Overall dimensions	H - Fixed	[in/mm]	14.61/371				
	D - Fixed	[in/mm]	10.63/270				
	W - Fixed 3p	[in/mm]	10.87/276				
	W - Fixed 4p/4p full size	[in/mm]	14.41/366				
	H - Draw out	[in/mm]	16.73/425				
	D - Draw out	[in/mm]	15.47/393				
	W - Draw out 3p	[in/mm]	12.48/317				
	W - Draw out 4p/4p full size	[in/mm]	407/16.02				
Weights	Fixed 3p / 4p / 4p full size	[lbs/Kg]	115/148 lbs - 52/67 Kg				
	Draw out 3p / 4p / 4p full size	[lbs/Kg]	up to 1600A: 128/150 lbs - 58/68 Kg 2000A: 135/239lbs - 61/108kg				

SACE Emax 2 for IEC 60947, UL1066 and CCC			**E2.2**		
Anticipated mechanical life with regular ordinary maintenance prescribed by the manufacturer		[Iu]	< 1600	1600	2000
		[No. cycles x 1000]	25	25	25
	Frequency	[Oper./Hour]	60	60	60
Anticipated electrical life with regular ordinary maintenance prescribed by the manufacturer	440 V	[No. cycles x 1000]	15	12	10
	690 V	[No. cycles x 1000]	15	10	8
	Frequency	[Oper./Hour]	30	30	30





E4.2			E6.2
S-A	**H-A**	**V-A**	**V-A**
2500	2500	800	4000
3200	3200	1600	5000
		2000	
		2500	
		3200	
65	85	100	100
65	85	100	100
65	85	100	100
65	85	100	100
66	85	100	100
66	85	100	100
66	85	100	100
66	85	100	100
66	85	100	100
66	85	100	100
66	85	100	100
66	85	100	100
14.61/371			14.61/371
10.63/270			10.63/270
15.12/384			30.00/762
20.08/510			34.96/888 - 39.92/1014
16.73/425			16.73/425
15.47/393			15.47/393
16.73/425			31.61/803
21.69/551			36.57/929 - 42.09/1069
Up to 2500A: 161/203 lbs - 73/92 kg - 3200A: 201/256 lbs - 91/116 kg			314/360/406 lbs - 142/163/184 kg
Up to 2500A: 261/325 lbs - 118/147 kg 3200A: 300/377 lbs - 136/171 kg			486/554/620 lbs 220/251/281 kg

E4.2			E6.2	
< 2500	2500	3200	4000	5000
20	20	20	12	12
60	60	60	60	60
10	8	7	4	3
10	8	7	4	2
20	20	20	10	10

SACE Emax 2 air switch disconnectors at 1500 V DC

The SACE Emax 2 MS/DC-E range of switch-disconnectors covers 1500V DC installations in compliance with UL489B (for use with Photovoltaic systems) and UL489F (for use with Battery Power Supplies), with rated short-time current up to 100kA.

Sharing the same dimension as the standard Emax 2, these compact switch-disconnectors allow UL switchgear and inverters manufacturers to optimize their footprint.

Thanks to the factory-fitted shorting busbar (jumper) kits, all four poles can be connected in series to isolate a single polarity source, or alternatively for a dual polarity source 2 poles can be configured in series for the positive supply and the other 2 poles in series for the negative supply.

All products can be equipped with the most common UL listed mechanical and electrical accessories already available for the SACE Emax 2 air circuit-breaker range.

Common data		
Rated maximum voltage	[V]	1500
Rated voltage	[V]	1500
Number of poles		4
Version		Fixed - Withdrawable
UL file		E348799, E501222



SACE Emax2 MS/DC-E for UL			**E4.2**		
Performance levels			S-A	H-A	V-A
Rated current	UL489B, UL489F	[A]	1600	1600	1600
	UL489B, UL489F	[A]	2000	2000	2000
	UL489B, UL489F	[A]	2500	2500	2500
	UL489B	[A]	3200	3200	3200
Rated short-time withstand current Icw	(1s)	[kA]	65	85	100
Dimensions	H - Fixed	[in / mm]	14.61/371		
	D - Fixed	[in / mm]	10.63/270		
	W - Fixed (4p)	[in / mm]	20.08/510		
	H - Draw out	[in / mm]	16.73/425		
	D - Draw out	[in / mm]	15.47/393		
	W - Draw out (4p)	[in / mm]	21.69/551		

The SACE Emax 2 DC range includes a global multi-standard version compliant with IEC 60947-3, UL 489B, UL 489F and with CCC approval.

For further detail, please consult the SACE Emax 2 MS/DC-E technical catalogue

Discover more by visiting the SACE Emax 2 MS/DC-E dedicated webpage

Protection trip units

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3/18 Protection functions

3/28 Measurement functions

3/34 **Description of protection functions**

Introduction

SACE Emax 2 Ekip protection trip units are the new benchmark for the protection, measurement and control of low-voltage electrical systems.

The SACE Emax 2 trip units are designed to be used in a wide range of applications. This complete, flexible protection trip unit can be adapted to the actual level of protection required, independently of the complexity of the system.
The range is available for three levels of performances, to accommodate a wide variety of applications from basic to advanced.

- Ekip Dip, standard applications
- Ekip Touch and Ekip Hi-Touch, the smart trip units
- Ekip G Touch and Ekip G Hi-Touch, generator protection

The protection units for power distribution are available in the LI, LSI and LSIG versions, are suited to almost all distribution systems. These trip units are designed for a vast range of applications, to be used with transformers, motors and drives. Depending on the complexity of the system, voltage and energy measurements can be also included.
The Ekip G range enables the protection of generators without the use of external devices that require dedicated relays and wiring. These trip units help increase efficiency from the design phase to installation, minimizing the time needed for the realization and commissioning of the system. They also help ensure high levels of accuracy and reliability of all protection devices required for running generators in applications such as naval, GenSet or cogeneration.



Ekip Dip trip units

The first level of electronic trip units for the standard protection of AC systems, delivering high reliability and tripping precision. They provide protection against overloads, selective short-circuits, short-circuits and ground faults. The power required for their operation is provided directly from the current sensors.

Ekip Touch and Ekip Hi-Touch trip units

These represent the state of the art in terms of technology for AC network protection with advanced protection and system management functions. Several communication protocols allow remote supervision of electrical systems and control the circuit breaker. Class 1 active energy measurement in compliance with IEC 61557-12 satisfies a high demanding requirements for energy efficiency. The integrated display offers an easy and intuitive experience to the user, while the new embedded Bluetooth technology allows fast interaction through EPiC mobile app.

New digital experience
The new Ekip Touch and Ekip Hi-Touch trip units help to provide maximum flexibility by offering a wide range of software solutions to always upgrade the circuit breaker. These functions can be selected when ordering the circuit-breaker or downloaded directly from the ABB Ability Marketplace™, even from a smart phone or tablet, thus reducing installation time to virtually zero.



Introduction

Ekip Touch/Hi-Touch trip units can be now customized.

Ekip Touch/Hi-Touch always allow the user to enjoy a new product experience thanks to the ability to build up a tailor-made trip unit by selecting the set of protections, measurements and logics.

Circuit-breakers' customization has never been so easy.
With the new Ekip Touch and Hi-Touch trip units, the most advanced functionalities can be enabled following two different purchasing processes:

- **ABB Ability Marketplace™**
  Users can download digital upgrades via web and enable them directly on the trip unit, without removing the circuit-breaker from the installation point, with zero shipping time and no installation costs. This process allows additional functions to be selected after the trip unit has been already received on site and installed. Moreover, stock can be optimized by keeping in the warehouse few types of trip units and customizing them according to the customer's specific needs. Once purchased, each function can be easily activated by using a smartphone or tablet via EPiC app mobile and embedded Bluetooth connectivity, or a laptop through Ekip Connect 3.

- **Traditional ordering**
  This option represents the standard way to order ABB devices. The traditional process allows the users to select and have installed the desired functions when ordering the circuit-breaker. Once received and installed, SACE Emax 2 always offers the possibility to add new functionalities via ABB Ability Marketplace™.

The new Ekip digital offering includes:

- **Packages**
  The software packages offer the possibility to customize the circuit-breaker by selecting additional protection functions and measurements. The device can be customized to create tailor-made solutions according to the specific application. Maximum flexibility is provided by offering specific technical features that can be combined in the Ekip Touch/Hi-Touch during the product life cycle.
- **Solutions**
  The SACE Emax 2 circuit-breaker is no longer intended as a simply stand-alone protection device; it has become an active player in the electrical system, able to exchange data and trigger actions managing the behavior of other connected devices. Thanks to the new electronic trip units, it is possible to implement transfer logics, load shedding and peak shaving strategies. Such solutions require additional plug and play hardware modules and other smart devices.

SACE Emax 2 allows to easily upgrade and customize the Ekip Touch and Hi-Touch trip units, providing maximum flexibility for any application, delivering value throughout the entire customer journey.

1. Design
Build the circuit-breaker according to specific project requirements.



Key drivers
- Ease of doing business
- Technical specifications
- Application and function

Benefits
- Flexibility of choice
- Customization by application

2. Commissioning
Customize the device thanks to the digital offering. Manage last minute changes through digital upgrades.



Key drivers
- Ease of doing business
- Management of components
- Time to market

Benefits
- Stock optimization
- Zero lead time and installation effort

3. Service
Unlock the full potential of your circuit-breaker at any time, minimizing downtime and installation changes.



Key drivers
- Manage installed base
- Simplify diagnostics
- Simplify the hardware re-design

Benefits
- Zero lead time and installation effort
- Avoid downtime

New digital experience
Packages

Each package includes a set of protection functions or measurements that can be enabled in the trip unit.
Six packages relate to protection functions:
- Voltage Protections
- Frequency Protections
- Power Protections,
- Advanced Voltage Protections,
- ROCOF Protections
- Adaptive Protections



Voltage Protections
Set of protections included:
- UV - Undervoltage, OV - Overvoltage
- UV2 - 2nd Undervoltage
- OV2 - 2nd Overvoltage
- PS - Phase Sequence, VU - Voltage unbalance.



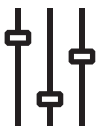
Frequency Protections
Set of protections included:
- UF - Underfrequency
- OF - Overfrequency
- UF2 - 2nd Underfrequency
- OF2 - 2nd Overfrequency.



Power Protections
Set of protections included:
- RP - Reverse active power
- CosΦ - Power factor
- D - Directional over-current
- RQ - Loss of field or reverse reactive power
- OQ - Reactive overpower
- OP - Active over power
- UP - Active underpower
- RQ - 2nd Loss of field or Reverse reactive power.



Advanced Voltage Protections
Set of protections included:
- S(V) - Voltage controlled overcurrent,
- S(V)2 - 2nd Voltage controlled overcurrent,
- RV-Residual overvoltage.



ROCOF Protections
Set of protections included:
- ROCOF - Rate of change of frequency.



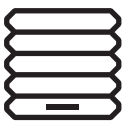
Adaptive Protections
Set of protections included:
- Dual Setting - Set A-B.

How to order: via ABB Ability Marketplace™ or traditional ordering channels.

Three packages relate to measurements and diagnostics: Measuring Package, Data Logger and Network Analyzer.



Measuring Package
To monitor the plant through several measurements:
- Phase-to-phase voltage
- Phase-to-neutral voltage
- Phase sequence
- Frequency
- Active power
- eactive power
- Apparent power
- Power factor
- Peak factor
- Active energy
- Reactive energy
- Apparent energy.



Data Logger
To record data about events in the plant:
- Currents
- Voltages
- Sampling rate
- Maximum recording duration
- Recording stop delay
- Number of registers.



Network Analyzer
To monitor the power quality of the network through:
- Harmonic analysis
- Hourly average voltage value
- Short voltage interruption
- Short voltage spikes
- Slow-voltage sags and swells
- Voltage unbalance.

How to order: via ABB Ability Marketplace™ or traditional ordering channels.

When a package is purchased via ABB Ability Marketplace™, it must be activated through:
- Ekip Connect 3 installed on a PC using Ekip T&P to scan the trip unit
- EPiC app mobile installed on a mobile device, by directly using the embedded Bluetooth connection available in the new Ekip trip units.

New digital experience
Packages

Thanks to the maximum flexibility provided by these packages, the new Ekip trip units are now completely customizable. Depending on the specific trip unit version, different packages are available by default, but all of them can be added to the trip unit.

Default functionalities and upgradability of the trip units:

	Standard Protection	Standard Measures	Measuring Package	Voltage Protections	Frequency Protections	Power Protections	Adaptive Protections	Data Logger	Network Analyzer	Advanced Voltage Protections	ROCOF Protections
Ekip Touch	●	●	↑	↑	↑	↑	↑	↑	↑	↑	↑
Ekip G Touch	●	●	●	↑	↑	↑	↑	●	↑	↑	↑
Ekip Hi-Touch	●	●	●	●	●	↑	●	●	●	↑	↑
Ekip G Hi-Touch	●	●	●	●	●	●	●	●	●	●	●

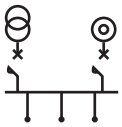
● Available by default

↑ Upgradable

↑ Some elements of the package are already provided by default. It is possible to upgrade the trip unit to achieve the complete package.

New digital experience
Solutions

Four solutions are available to fully exploit the potential of the Ekip architecture: Embedded ATS, Adaptive Load Shedding and Power Controller.



Embedded ATS
This function enables the activation of auxiliary generation sources (e.g. generators) and transfers the feed of the loads from the distribution network to such auxiliary sources, thus ensuring a secure transfer to maintain service continuity and reliability of the system.
How to order: via ABB Ability Marketplace™.
The hardware accessories must be ordered via traditional ordering channels.



Adaptive Load Shedding
Thanks to this solution, the circuit-breaker enables islanding transition to avoid blackouts.
It actively controls the power consumption based on the priorities set by the user.
How to order: via ABB Ability Marketplace™.
The hardware accessories must be ordered via traditional ordering channels.



Power Controller
This function is the ideal solution for load management and represents an optimum compromise between reliability, simplicity and cost-effectiveness. Based on a patented calculation algorithm, Ekip Power Controller allows a list of loads to be controlled from remote according to the priorities defined by the user.
How to order: via ABB Ability Marketplace™ or traditional ordering channels.The hardware accessories must be ordered via traditional ordering channels.

When a solution is purchased via ABB Ability Marketplace™, it must be activated through Ekip Connect 3 installed on a PC using Ekip T&P to scan the trip unit.

These solutions require the installation of hardware components that have to be ordered through the traditional ordering channels. For further information, please refer to the specific documentation available on ABB Library (www.abb.com/abblibrary/DownloadCenter/).

New digital experience
Solutions

	Functions included	**Hardware accessories**
PACKAGES		
Voltage Protections	UV - Undervoltage	-
	OV - Overvoltage	
	UV2 – 2nd Undervoltage	
	OV2 – 2nd Overvoltage	
	PS – Phase sequence	
	VU – Voltage unbalance	
Frequency Protections	UF - Underfrequency	-
	OF - Overfrequency	
	UF2 – 2nd Underfrequency	
	OF2 - 2nd Overfrequency	
Power Protections	RP – Reverse active power	-
	Cos Φ- Power factor	
	D – Directional current	
	RQ – Loss of field or Reverse reactive power	
	OQ – Reactive overpower	
	OP – Active overpower	
	UP – Active underpower	
Advanced Voltage Protections	S(V) – Voltage controlled overcurrent	-
	S(V)2 – 2nd Voltage controlled overcurrent	
	R – Residual voltage	
ROCOF Protections	ROCOF	-
Adaptive Protections	Dual setting	Ekip Signalling
Measuring Package	Phase-to-phase voltage	-
	Phase-to-neutral voltage	
	Phase sequence	
	Frequency	
	Active power	
	Reactive power	
	Apparent power	
	Power factor	
	Peak factor	
	Active energy	
	Reactive energy	
	Apparent energy	
Data Logger	Currents	-
	Voltages	
	Sampling rate	
	Maximum recording duration	
	Recording stop delay	
	Number of registers	
Network Analyzer	Hourly average voltage value	-
	Short voltage interruptions	
	Short voltage spikes	
	Slow voltage sags and swells	
	Voltage unbalance	
	Harmonic analysis	

	Functions included	Hardware accessories
SOLUTIONS		
Interface Protection System	-	Ekip Link, Ekip Signalling, motor operators and coils
Embedded ATS	-	Ekip Link, Ekip Signalling, motor operators and coils
Adaptive Load Shedding	-	Ekip Link, Ekip Signalling, motor operators and coils
Power Controller	-	Ekip Link, Ekip Signalling, motor operators and coils

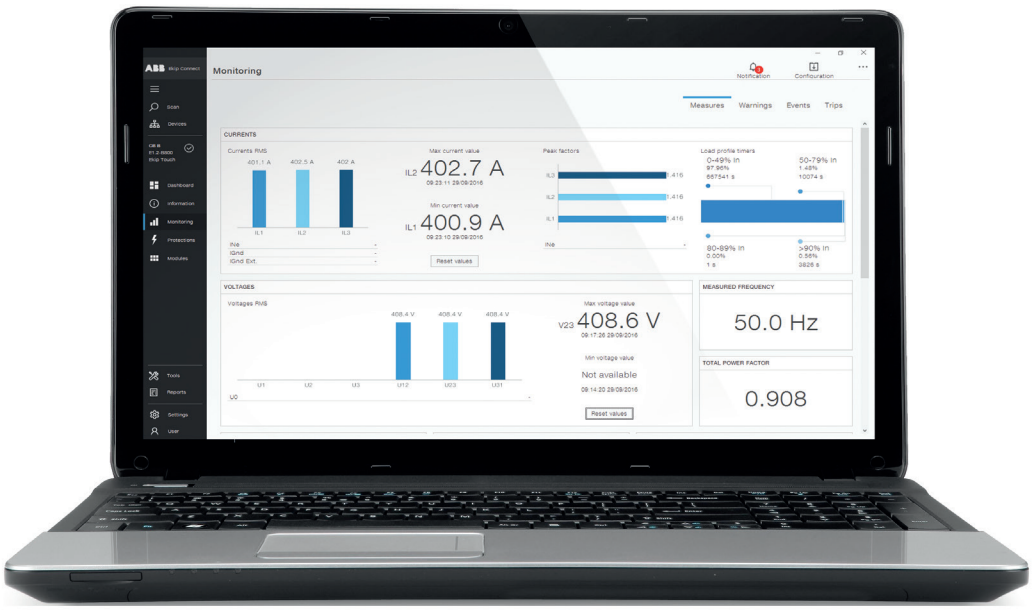
Architecture

All SACE Emax 2 circuit breakers are equipped with protection trip units that are able to evolve during the life cycle.

Ekip trip units are easily interchangeable from the front, with no need to dismantle the circuit breaker or access any internal or sensitive parts. In particular, they consist 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.
- **Measurement Enabler** module, hardware connected internally on all SACE Emax 2 circuit-breakers equipped with Touch and Hi-Touch trip units. The module enables high accuracy voltage, power and energy measurements and advanced protections without requiring any external connection or voltage transformers. The **Measurement Enabler with voltage sockets** module (standard with Ekip Hi-Touch and optional on Ekip Touch) additionally allows to supply the trip unit through direct connection to the busbar system. Depending on the functionality desired, a software package may need to be purchased separately.
- **Interchangeable rating plug** enables all protection thresholds to be adjusted according to the rated current, increasing flexibility for the customer especially in installations anticipating future development or where 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, provide high accuracy of both measurements and protection.





All protection trip units in the SACE Emax 2 family are self-powered by current that crosses the circuit breaker. They provide excellent reliability due to a system of self-control of internal connections.

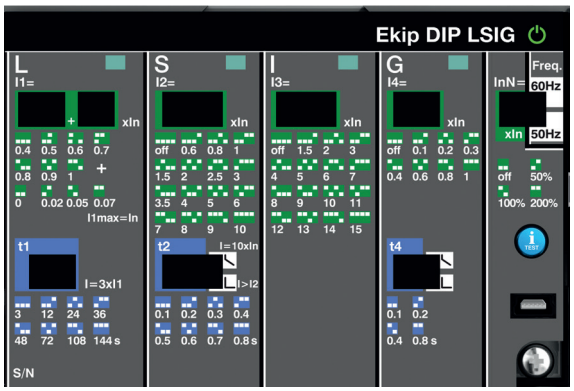
The setting, testing and downloading of reports can be carried out directly from a Smartphone, Tablet or PC. In addition, the commissioning stage can be further accelerated, minimizing the possibility of errors, by directly configuring the protection trip unit with the DOC design software settings. Cartridge-type modules that are easily installed onboard enable the units to be integrated into the most complex systems.
Additional functions can be created, such as:

- **Synchrocheck**, to check the synchronization of the two half-busbars before enabling circuit-breaker closing;
- Communication with all **supervision systems** available in the Modbus, Profibus and DeviceNet™ protocols as well as the modern Modbus TCP, Profinet, EtherNet/IP™ protocols;
- **Integration into Smart Grids** thanks to the possibility of communicating without the assistance of any external converter, according to standards (IEC 61850) already in use in the automation systems of high and medium voltage substations;
- Multi-voltage **supply module**, which enables the protection trip unit and modules to be supplied with any auxiliary voltage available in direct or alternating current;
- Programmable logic management with **Ekip Signalling** modules that provide a high number of electrical input and output contacts;
- Logical interlocks between circuit breakers, which can be achieved with the **Ekip Link** proprietary communication protocol, avoiding complex wiring due to the transmission of all signals via a bus.

Overview

SACE Emax 2 trip units offer a complete range of solutions for almost installation requirements, for both distribution and generator protection. Upgraded trip unit electronics provide additional features, updated HMI and updated black appearance for clear identification of trip unit version.

Ekip Dip: The standard trip unit



Ekip Dip LI
Ekip Dip LSI
Ekip Dip LSIG

- Overcurrent protection for distribution systems
- Phase and neutral current measurements
- LED Permanent trip cause signalization
- Ekip Multimeter to display data and measurements

Ekip Touch: The smart trip unit



Ekip Touch LI
Ekip Touch LSI
Ekip Touch LSIG

- Advanced set of protections and measurements, always upgradable and customizable
- Intuitive touchscreen interface
- High measurement accuracy of electrical parameters

Ekip Hi-Touch: The ultimate trip unit



Ekip Hi-Touch LSI
Ekip Hi-Touch LSIG

- Complete set of protections and measurements
- Dual settings of protection
- Network Analyzer function

Ekip G: The generator trip unit



Ekip G Touch LSIG
Ekip G Hi-Touch LSIG

- Designed for installations with generators such as Genset, cogeneration and marine applications
- Dedicated set of generator protections

Ekip LCD: The hardened trip unit



Ekip LCD LI
Ekip LCD LSI
Ekip LCD LSIG
Ekip Hi-LCD LSI
Ekip Hi-LCD LSIG
Ekip G LCD LSIG
Ekip G Hi-LCD LSIG

- Suitable for installation in aggressive environments and secure applications
- Available for both distribution and generator protection functions

Protection
SACE Emax 2 trip units offer a great variety of overcurrent protection functions, with thresholds and timing that can be easily set through dip switches or few simple steps directly from the touchscreen display. These units are available in different versions: LI, LSI, LSIG.
All the Ekip trip units also include a thermal memory function. The protection unit is able to record the trips which have occurred in the last few minutes. Since a trip causes overheating, to protect the cables and let them cool down, the trip unit imposes a shorter delay tripping time in case of a fault helping protect the system against damages due to cumulative overheating.

Watchdog
The Ekip trip units help ensure high reliability due to an electronic circuit that periodically checks the continuity of internal connections, such as trip coil, rating plug and each current sensor (ANSI 74).
In case of an alarm, a message is shown on the display (Ekip Touch) or through LEDs signalization (Ekip Dip). If a protection function intervenes, the unit always checks that the circuit breaker has been opened through auxiliary contacts that indicate the position of the main contacts. Otherwise, the unit creates an alarm (ANSI BF code - Breaker Failure) that can be used to command the opening of the upstream circuit breaker. Ekip trip units are also provided with self-protection against abnormal temperature (OT) to help ensure proper operations.

Overview

Test function
All SACE Emax 2 trip units are equipped with a test port on the front that can be used to carry out circuit breaker tests by connecting one of the following devices:
- Ekip TT to perform trip tests, LED tests and checks for the absence of alarms detected by the watchdog function
- Ekip T&P not only for the trip and LED tests, but also for testing the individual protection functions and the saving of the relative report

In addition, the iTest key can run a battery test when the circuit breaker is disconnected.

User interface
Ekip trip units can clearly identify the status of the circuit breaker through LEDs activation or an intuitive graphical interface. A password system is used to manage “Read” or “Edit” modes. The default password (00001) can be directly input by the user. The protection parameters are settable in “Edit” mode, while the information can always be accessed in “Read” mode.

Data & Measurements
SACE Emax 2 trip units are no longer simply protection devices. The Ekip Dip trip unit measures phase and neutral current with greater accuracy, while the other advanced units integrate multimeter and network analyzer functionalities. Compliant with IEC 61557-12 (Class 1 in energy accuracy).
A complete information on the circuit breaker and its operation is available for effective fault analysis and preventive scheduling of maintenance.

Communication & Connectivity
Ekip Touch and Hi-Touch trip units can be easily integrated into the most modern supervision systems through several communication protocols:
- IEC 61850
- Modbus TCP
- Modbus RS-485
- Profibus
- Profinet
- DeviceNet™
- EtherNet/IP™

Measurements, statuses and alarms can be easily programmed and viewed by remote function, with no need of external interface devices. Moreover, the Ekip Com Actuator module can be installed in the front of the device to remotely control the circuit breaker. Several communication modules with different protocols can be used simultaneously. In addition, up to two modules using the same protocol can be installed to help ensure a higher reliability of the installation. The Ekip Com Hub module allows cloud connectivity to ABB Ability™ Energy and Asset Manager platform. The new embedded Bluetooth Low Energy technology makes the circuit breaker easier to access, reducing time to commissioning and set parameter. Ekip Dip and Ekip LCD trip units are not provided with this feature.

Supply
SACE Emax 2 protection trip units are self-supplied through the three phase current sensors installed on the circuit breaker and do not require any external supply devices for basic protection and alarm indication functions. A three-phase 100A current is sufficient for the activation. All protection settings are stored in non-volatile memory that maintains the information without power supply.
The Ekip Supply module can be easily connected to both direct and alternating current to activate additional functions such as:

- Using the unit when the circuit breaker is opened
- Using additional modules such as Ekip Signalling and Ekip Com
- Connection to external devices such as Ekip Multimeter
- Recording the number of operations
- G protection with values below 100A or 0.2 In
- Zone selectivity
- Gext and MCR protection functions

SACE Emax 2 trip units are supplied with an internal battery that enables the cause of a fault to be indicated after a trip, with no time limit. The battery also updates time and date, thus providing the chronology of any events. When the unit is switched off, the battery can be tested by pressing the iTest key on the front.

Grey platform
The previous Ekip trip units and their accessories are now available as spare parts only.

Technical characteristics for protection trip units

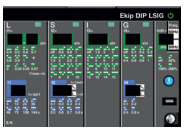
Protection functions

ABB Code	ANSI/IEEE C37.2 Code	Function	Threshold
L	49	Overload protection	I1 = 0.4 - 0.42 - 0.45 - 0.47 - 0.5 - 0.52 - 0.55 - 0.57 - 0.6 - 0.62 - 0.65 - 0.67 - 0.7 - 0.72 - 0.75 - 0.77 - 0.8 - 0.82 - 0.85 - 0.87 - 0.9 - 0.92 - 0.95 - 0.97 - 1 x In
		Thermal memory	
		Tolerance	trip between 1.05 and 1.2 x I1
S	50TD	Time-delayed overcurrent protection	I2 = 0.6 - 0.8 - 1 - 1.5 - 2 - 2.5 - 3 - 3.5 - 4 - 5 - 6 - 7 - 8 - 9 - 10 x In
		Tolerance	± 7% If ≤ 6 x In ± 10% If > 6 x In
	51	Time-delayed overcurrent protection	I2 = 0.6 - 0.8 - 1 - 1.5 - 2 - 2.5 - 3 - 3.5 - 4 - 5 - 6 - 7 - 8 - 9 - 10 x In
		Thermal memory	
		Tolerance	± 7% If ≤ 6 x In ± 10% If > 6 x In
I	50	Instantaneous overcurrent protection	I3= 1.5 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 x In
		Tolerance	± 10%
G	50N TD	Ground fault protection	I4(1) = 0.1 - 0.2 - 0.3 - 0.4 - 0.6 - 0.8 - 1 x In
		Tolerance	± 7%
	51N	Ground fault protection	I4(1) = 0.1 - 0.2 - 0.3 - 0.4 - 0.6 - 0.8 - 1 x In
		Tolerance	± 7%

(1) With Vaux all thresholds are available. Without Vaux minimum threshold is limited to: 0.3In (with In = 100A), 0.25In (with In = 400A) or 0.2In (for all other ratings)
(2) The minimum trip time is 1s, regardless of the type of curve set (self-protection)
(3) Total clearing time is the sum of breaking time and trip time

The tollerances above apply to trip units already powered by the main circuit with current flowing in at least two phases or an auxiliary power supply. In all other cases the following tollerance values apply

ABB Code	Trip threshold	Trip time
L	Trip between 1.05 and 1.2 x I1	± 20%
S	± 10%	± 20%
I	± 15%	≤ 60ms
G	± 15%	± 20%



Trip time [3]	Enable/Disable function	Pre Alarm	Trip curve	Ekip Dip
with If = 3 I1, t1 = 3 - 12 - 24 - 36 - 48 - 72 - 108 - 144s [2]	Not allowed for UL	50 ... 90% I1 Step 1%	t = k / I²	●
	Not allowed for UL			●
± 10% If ≤ 6 x In ± 20% If > 6 x In				
with If > I2, t2 = 0.1 - 0.2 - 0.3 - 0.4 - 0.5 - 0.6 - 0.7 - 0.8s	yes	-	t = k	●
The better of the two data: ± 10% t2 or ± 40 ms				
with If = 10 In, t2 = 0.1 - 0.2 - 0.3 - 0.4 - 0.5 - 0.6 - 0.7 - 0.8s	yes	-	t = k / I²	●
	yes	-		
± 15% If ≤ 6 x In ± 20% If > 6 x In				
Instantaneous	yes	-	t = k	●
≤ 30 ms				
with If > I4, t4 = 0.1 - 0.2 - 0.4 - 0.8s	yes	50 ... 90% I4 Step 1%	t = k	●
The better of the two data: ± 10% t4 or ± 40 ms				
with If = 3In, t4 = 0.1 - 0.2 - 0.4 - 0.8s	yes	50 ... 90% I4 Step 1%	t = k / I²	●
± 15%				

Technical characteristics for protection trip units

Protection functions

ABB Code	ANSI Code	Function	Threshold	Threshold step	Trip time	Time Step
L	49	Overload Protection	I1 = 0.4…1 x In	0.001 x In	with I = 3 I1, t1 = 3…144 s	1s
		Thermal Memory				
		Tolerance	trip between 1.05 and 1.2 x I1		± 10% I ≤ 6 x In / ± 20% I > 6 x In	
S	50TD	Time-delayed overcurrent protection	I2 = 0.6…10 x In	0.1 x In	With I > I2, t2 = 0.05…0.8s	0.01s
	68	Zone selectivity			t2sel = 0.04…0.2s	0.01s
		Start up	Activation: 0.6…10 x In	0.1 x In	Range: 0.1…30s	0.01s
		Tolerance	± 7% I ≤ 6 x In ± 10% I > 6 x In		The better of the two data: +-10% or +-40ms	
	51	Time-delayed overcurrent protection	I2 = 0.6…10 x In	0.1 x In	with I = 10 In, t2 = 0.05…0.8s	0.01s
		Thermal Memory				
		Tolerance	± 7% I ≤ 6 x In ± 10% I > 6 x In		± 15% I ≤ 6 x In ± 20% I > 6 x In	
I	50	Istantaneous overcurrent protection	I3= 1.5…15 x In	0.1 x In	With I > I3, instantaneous	-
		Start up	Activation: 1.5…15 x In	0.1 x In	Range: 0.1…30s	0.01s
		Tolerance	± 10%		≤ 30 ms	
	68	Zone selectivity			≤ 30 ms	
G	50N TD	Ground fault protection	I4(1) = 0.1…1 x In	0.001 x In	with I > I4, t4 = Instantaneous (with Vaux) + 0,1…1 s	0.05s
	68	Zone selectivity			t4sel = 0.04…0,2s	0.01s
		Start up	Activation: 0.2…1 x In	0.02 x In	range: 0.1…30s	0.01s
		Tolerance	± 7%		The better of the two data: ± 10% or ± 40 ms or 50ms with t4 = instantaneous	
	51N	Ground fault protection	I4(1) = 0.1…1 x In	0.001 x In	with I = 4 In, t4 = 0.1…1s	0.05s
		Tolerance	± 7%		± 15%	
IU	46	Current unbalance protection	I6 = 2…90% In unbalance	1%In	with unbalance > I6, t6 = 0.5…60s	0.5s
		Tolerance	± 10%		The better of the two data: ± 10% or ± 40 ms (for t<5s) / +-100ms (for t≥5s)	
2I	50	Programmable instantaneous overcurrent protection	I31 = 1.5…15 x In (max setting 15kA)	0.1xIn	with I>I31, instantaneous	
		Tolerance	± 10%		≤ 7 ms (2)	
MCR		Closing on short-circuit protection	I3= 1.5…15 x In	0.1 x In	With I > I3, instantaneous Monitor time range: 40…500ms	0.01s
		Tolerance	± 10%		≤ 30 ms	
Gext	50G TD	Ground fault protection	I41(1) = 0.1…1 x In Toroid	0.001 x In Toroid	with I > I41, t41 = 0.1…1s	0.05s
	68	Zone selectivity			t41sel = 0.04…0.2s	0.01s
		Start up	Activation: 0.1…1 x In	0.02 x In	range: 0.1…30s	0.01s
		Tolerance	± 7%		The better of the two data: ± 10% or ± 40 ms	
	51G	Ground fault protection	I41(1) = 0.1…1 x In	0.001 x In	with I = 4 In, t41 = 0.1…1s	0.05s
		Tolerance	± 7%		± 15%	
Rc	64 50N TD 87N	Residual current protection Differential ground fault protection	IΔn = 3 - 5 - 7 - 10 - 20 - 30A		with I > IΔn, tΔn = 0.06 - 0.1 - 0.2 - 0.3 - 0.4 - 0.5 - 0.8s	
		Tolerance	- 20% ÷ 0%		140ms @ 0.06s (max trip time) 950ms @ 0.80s (max trip time)	
UV	27	Undervoltage Protection	U8 = 0.5….0.98 x Un	0.001 x Un	with U < U8, t8 = 0.05…120s	0.01s
		Tolerance	± 2%		The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	
MDGF		Modified Differential Ground Fault protection	I41= 0.1…1 x In* Max setting 1200A		with I>I41, t41=0.05…0.4s (t=k) with I>I41, t41=0.1…0.4s (t=k)	0.05s
		Tolerance	± 7%		The highest of 15% or 15ms	

*In equal to max rating of the current sensor used in the application.






Enable/Disable Function	Enable/ Disable trip	Pre-alarm	Trip curve	Ekip Touch	Ekip Hi-Touch	Ekip G Touch	Ekip G Hi-Touch
yes, with rating plug L=off	Not allowed for UL	50...90% I1 step 1%	t = k / I^2	●	●	●	●
yes				●	●	●	●
yes	yes	no	t = k	●	●	●	●
yes				●	●	●	●
yes				●	●	●	●
yes	yes	no	t = k / I^2	●	●	●	●
yes				●	●	●	●
yes [3]	no	no	t = k	●	●	●	●
yes				●	●	●	●
yes							
yes	yes	50...90% I4 step 1%	t = k	●	●	●	●
yes				●	●	●	●
yes				●	●	●	●
yes	yes	50...90% I4 step 1%	t = k / I^2	●	●	●	●
yes	yes	no	t = k	●	●	●	●
yes	no	no	t = k	●	●	●	●
yes	no	no	t = k	●	●	●	●
yes	yes	50...90% I41 step 1%	t = k	●	●	●	●
yes				●	●	●	●
yes				●	●	●	●
yes	yes	50...90% I41 step 1%	t = k / I^2	●	●	●	●
Available with rating plug Rc	no	no	t = k	○	●	●	●
yes	yes	no	t = k	○	●	●	●
yes	yes	50...90% I41 step 1%	t = k t = k / I^2	●	●	●	●

Technical characteristics for protection trip units

Protection functions

ABB Code	ANSI Code	Function	Threshold	Threshold step	Trip time	Time Step
OV	59	Overvoltage protection	U9 = 1.02….1.5 x Un	0.001 x Un	with U > U9, t9 = 0.05…120s	0.01s
		Tolerance	± 2%		The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	
VU	47	Voltage unbalance protection	U14 = 2…90% Un unbalance	1%Un	with unbalance > U14, t14 = 0.5...60s	0.5s
		Tolerance	± 5%		The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	
UF	81L	Underfrequency protection	f12 = 0.9….0.999 x fn	0.001 x fn	with f < f12, t12 = 0.06…300s	0.01s
		Tolerance	± 1% (with fn ±2%)		The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	
OF	81H	Overfrequency protection	f13 = 1.001….1.1 x fn	0.001 x fn	with f > f13, t13 = 0.06…300s	0.01s
		Tolerance	± 1% (with fn ±2%)		The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	
RP	32R	Reverse active power protection	P11 = -1…-0.05 Sn	0.001 Sn	with P > P11, t11 = 0.5…100s	0.1s
		Tolerance	± 10%		The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	
ABB: Cyclical direction	47	Cyclical direction of the phases	1-2-3 or 3-2-1			
ABB: Power factor	78	3phase Power factor	PF3 = 0.5…0,95	0.01		
LC1/2 Iw1/2		Current threshold	LC1 =50%...100% I1 LC2 =50%...100% I1 Iw1 = 0.1…10 In Iw2 = 0.1…10 In Activation: up/down	1% 1% 0.01 x In		
		Tolerance	± 10%			
S2	50TD	Time-delayed overcurrent protection	I5 = 0.6...10 x In	0.1 x In	With I > I5, t5 = 0.05...0.8s	0.01s
	68	Zone selectivity			t5sel = 0.04…0.2s	0.01s
		Start up	Activation: 0.6…10 x In	0.1 x In	Range: 0.1…30s	0.01s
		Tolerance	± 7% I ≤ 6 x In ± 10% I > 6 x In		The better of the two data: ± 10% or ± 40 ms	
D	67	Directional overcurrent protection (forward &/or backward)	I7 = 0.6...10 x In	0.1 x In	with I > I7, t7 = 0.1...0.8s	0.01s
	68	Zone selectivity			t7sel = 0.1…0.8s	0.01s
		Start up (forward &/or backward)	Activation: 0.6…10 x In	0.1 x In	Range: 0.1…30s	0.01s
		Trip direction	forward &/or backward			
		Minimum angle direction (°)	3.6, 7.2, 10.8, 14.5, 18.2, 22, 25.9, 30, 34.2, 38.7, 43.4, 48.6, 54.3, 61, 69.6			
		Tolerance	± 7% I ≤ 6 x In ± 10% I > 6 x In		The better of the two data: ± 10% or ± 40 ms	
UV2	27	Undervoltage Protection	U15 = 0.5….0.98 x Un	0.001 x Un	with U < U15, t15 = 0.05…120s	0.01s
		Tolerance	± 2%		The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	
OV2	59	Overvoltage protection	U16 = 1.02….1.5 x Un	0.001 x Un	with U > U16, t16 = 0.05…120s	0.01s
		Tolerance	± 2%		The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	
UF2	81L	Underfrequency protection	f17 = 0.9….0.999 x fn	0.001 x fn	with f < f17, t17 = 0.15…300s	0.01s
		Tolerance	± 1% (with fn ±2%)		The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	






Enable/Disable Function	Enable/ Disable trip	Pre-allarm	Trip curve	Ekip Touch	Ekip Hi-Touch	Ekip G Touch	Ekip G Hi-Touch
yes	yes	no	t = k	○	●	●	●
yes	yes	no	t = k	○	●	●	●
yes	yes	no	t = k	○	●	●	●
yes	yes	no	t = k	○	●	●	●
yes	yes	no	t = k	○	●	●	●
yes	only signalling	no	-	○	●	●	●
yes	only signalling	no	-	○	●	●	●
yes	only signalling	no	-	●	●	●	●
yes	yes	no	t = k	●	●	●	●
yes	yes			●	●	●	●
yes				●	●	●	●
yes	yes	no	t = k	○	●	○	●
yes				○	●	○	●
yes				○	●	○	●
yes	yes	no	t = k	○	●	○	●
yes	yes	no	t = k	○	●	○	●
yes	yes	no	t = k	○	●	○	●

Technical characteristics for protection trip units

Protection functions

ABB Code	ANSI Code	Function	Threshold	Threshold step	Tripping time	Time Step
OF2	81H	Overfrequency protection	f18 = 1.001….1.1 x fn	0.001 x fn	with f > f18, t18 = 0.15...300s	0.01s
		Tolerance	± 1% (with fn ±2%)		The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	
S(V)	51V	Voltage controlled overcurrent protection	I20 = 0.6...10 x In	0.1 x In	With I > I20, t20 = 0.05…30s	0.01s
		Step mode	Ul= 0.2…1 x Un	0.01 x Un		
			Ks= 0.1…1	0.01		
		Linear mode	Ul= 0.2…1 x Un	0.01 x Un		
			Uh= 0.2…1 x Un	0.01 x Un		
			Ks= 0.1…1	0.01		
		Tolerance	± 10%		The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	
RV	59N	Residual overvoltage protection	U22 = 0.05….0.5 x Un	0.001 x Un	with U > U22, t22 = 0.5…120s	0.01s
		Tolerance	± 5%		The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	
OP	32OF	Active overpower protection	P26 = 0.4…2 Sn	0.001 Sn	with P > P26, t26 = 0.5…100s	0.5s
		Tolerance	± 10%		The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	
OQ	32OF	Reactive overpower protection	Q27 = 0.4…2 Sn	0.001 Sn	with Q > Q27, t27 = 0.5…100s	0.5s
		Tolerance	± 10%		The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	
UP	32LF	Active underpower protection	P23 = 0.1...1 x Sn	0.001 x Sn	with P < P23, t23 = 0.5…100s	0.5s
		Start up			range: 0.1…30s	0.01s
		Tolerance	± 10%		The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	
RQ	40/32R	Loss of field or reverse reactive power protection	Q24 = -1…-0.1 Sn	0.001 Sn	with Q > Q24, t24 = 0.5…100s	0.1s
			Kq = -2…2	0.01		
		Loss of field or reverse reactive power protection	Q25 = -1…-0.1 Sn	0.001 Sn	with Q > Q25, t25 = 0.5…100s	0.5s
			Kq2 = -2…2	0.01		
		Voltage minimum threshold	Vmin. = 0.5...1.2	0.01		
		Tolerance	± 10%		The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	
S2(V)	51V	Voltage controlled overcurrent protection	I21 = 0.6...10 x In	0.1 x In	With I > I21, t21 = 0.05…30s	0.01s
		Step mode	Ul2= 0.2…1 x Un	0.01 x Un		
			Ks2= 0.1…1	0.01		
		Linear mode	Ul2= 0.2…1 x Un	0.01 x Un		
			Uh2= 0.2…1 x Un	0.01 x Un		
			Ks2= 0.1…1	0.01		
		Tolerance	± 10%		The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	
ROCOF	81R	Rate of change of frequency protection	f28 = 0.4….10 Hz/s	0.2 Hz/s	with f > f28, t28 = 0.5...10s	0.01s
		Trip direction	up &/or down			
		Tolerance	± 10%		The better of the two data: ± 20% or ± 200 ms	






Enable/Disable Function	Enable/ Disable trip	Pre-allarm	Trip curve	Ekip Touch	Ekip Hi-Touch	Ekip G Touch	Ekip G Hi-Touch
yes	yes	no	t = k	○	●	○	●
yes	yes	no	t = k	○	○	○	●
				○	○	○	●
				○	○	○	●
yes	yes	no	t = k	○	○	●	●
yes	yes	no	t = k	○	○	●	●
yes	yes	no	t = k	○	○	●	●
yes	yes	no	t = k	○	○	●	●
yes							
yes	yes	no	t = k	○	○	●	●
yes	yes	no	t = k	○	○	○	●
yes							
yes	yes	no	t = k	○	○	○	●
				○	○	○	●
				○	○	○	●
yes	yes	no	t = k	○	○	○	●

Technical characteristics for protection trip units

Protection functions

ABB Code	ANSI Code	Function	Threshold	Threshold step	Tripping time	Time Step
Synchro-check SC	25	Synchrocheck (Live busbars)	Ulive = 0.5…1.1 Un ΔU = 0.02…0.12 Un Δf = 0.1…1Hz ΔΦ = 5…50° elt	0.001 Un 0.001 Un 0.1Hz 5° elt	Stability voltage time for live state = 100...30000ms Minimum matching Time = 100...3000ms	0.001s 0.01 s
		Tolerance	± 10%			
		Synchrocheck (Live,Dead busbars)	Ulive = 0.5…1.1 Un Udead = 0.02…0.2 Un	0.001 Un 0.001 Un	tref = 0.1…30s	0.1s
		Frequency check off				
		Phase check off				
		Dead bar configuration	Reverse/standard			
		Primary voltage	100...1150	100, 115, 120, 190, 208, 220, 230, 240, 277, 347, 380, 400, 415, 440, 480, 500, 550, 600, 660, 690, 910, 950, 1000, 1150		
		Secondary voltage	100...120	100, 110, 115, 120		
		Tolerance	± 10%			

(1) With Vaux all thresholds are available. Without Vaux minimum threshold is limited to: 0.3In (with In = 100A), 0.25In (with In = 400A) or 0.2In (for all other ratings)
The tolerances above apply to trip units already powered by the main circuit with current flowing in at least two-phases or an auxiliary power supply.
In all other cases the following tollerance values apply:

ABB Code	Trip threshold	Trip time
L	Trip between 1.05 and 1.2 x I1	± 20%
S	± 10%	± 20%
I	± 15%	≤ 60ms
G	± 15%	± 20%
Other protection	± 15%	± 20%

(2) 2I Trip time:
- < 3ms when the fault current is above 18kA
- 7ms (three-phase) or 9ms (single-phase) when the fault current is greater than three times the 2I setting (I31)
- ≤ 15ms when the fault current is lower than three times the 2I setting (I31)

(3) Instantaneous protection can be permanently non-defeatable through the dedicated extracode.

Key:
- not available
● available
○ available with the dedicated software package. The Measuring Package has to be activated first, if not provided by default. For RC protection, Measurement Enabler with voltage sockets and Ekip Supply are needed.
○○ available with Ekip Synchrocheck






Enable/Disable Function	Enable/ Disable trip	Pre-allarm	Trip curve	Ekip Touch	Ekip Hi-Touch	Ekip G Touch	Ekip G Hi-Touch
yes	only signalling	no	-	○ ○○	○○	○○	○○
yes	only signalling	no	-				
yes							
yes							
yes							

Technical characteristics for protection trip units

Measurement functions

Instantaneous measurements		**Displayed with Ekip Multimeter**	**Parameters**
Currents (RMS)	[A]	•	L1, L2, L3, Ne
Ground fault current (RMS)	[A]	•	Ig

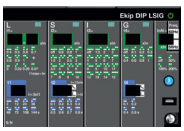
Record of values: of the parameter for each interval with time-stamping			**Parameters**
Current: minimum and maximum	[A]	•	I Min, I Max

Information on trip and opening data: after a fault with or without auxiliary supply			**Parameters**
Type of protection tripped		•	eg. L, S, I, G
Fault values per phase	[A]	•	eg. I1, I2, I3, neutral for S protection
Time-stamping		•	Date, time and progressive number

Maintenance indicators			**Parameters**
Information on last 30 trips		•	Type of protection, fault values and time-stamping
Information on last 200 events		•	Type of event, time-stamping
Number of mechanical operations (1)	[no]	•	Can be associated to alarm
Total number of trips	[no]	•	
Total operating time	[h]	•	
Wear of contacts	[%]	•	Prealarm >80%, Alarm = 100%
Date of maintenance operations performed		•	Last
Indication of maintenance operation needed		•	
Circuit-breaker I.D.		•	Type of circuit breaker, assigned device name, serial number

Self-diagnosis			**Parameters**
Check of continuity of internal connections		•	Alarm due to disconnection: rating plug, sensors, trip coil
Failure of circuit breaker to open (ANSI 50BF)		•	Alarm following non-tripping of protection functions
Temperature (T)		•	Pre-alarm and alarm for abnormal temperature

(1) with auxiliary supply present
Note: In case of Black trip units, 0.4% In is the lowest current value detected by Emax 2



Precision	Standard	Ekip Dip
1%	IEC 61557-12	●
2%		●

Window	Intervals	
Fixed, synchronizable by remote	Duration: 5...120min Number of intervals: 24	●

		●
		●
		●

		●
		●
		●
		●
		●
		●
		●
		●
		●

		●
Note: Opening of circuit breaker can be set in the event of alarm		●
		●

Technical characteristics for protection trip units

Measurement functions

Instantaneous measurements		**Parameters**
Currents (RMS)	[A]	L1, L2, L3, Ne
Ground fault current (RMS)	[A]	Ig
Phase-phase voltage (RMS)	[V]	U12, U23, U31
Phase-neutral voltage (RMS)	[V]	U1, U2, U3
Phase sequence		
Frequency	[Hz]	f
Active power	[kW]	P1, P2, P3, Ptot
Reactive power	[kVAR]	Q1, Q2, Q3, Qtot
Apparent power	[KVA]	S1, S2, S3, Stot
Power factor		total
Peak factor		L1, L2, L3, Ne

Counters recorded from installation or from the last reset		**Parameters**
Active energy	[kWh]	Ep total, Ep positive, Ep negative
Reactive energy	[kVARh]	Eq total, Ep positive, Ep negative
Apparent energy	[KVAh]	Es total

Network Analyzer		**Parameters**
Hourly average voltage value	[V] [no]	- Umin= 0.75…0.95 x Un - Umax= 1.05…1.25 x Un - Events counter (nr. of events day by day in the last year plus the total events in the breaker's lifetime)
Short voltage interruptions	[no]	- Umin= 0.75…0.95 x Un - Events counter (nr. of events day by day in the last year plus the total events in the breaker's lifetime)
Short voltage spikes	[no]	- Umax= 1,05…1,25 x Un - Events counter (nr. of events day by day in the last year plus the total events in the breaker's lifetime)
Slow-voltage sags and swells	[no]	- Umin1= 0.75…0.95 x Un - Umin2= 0.75…0.95 x Un - Umin3= 0.75…0.95 x Un - Umax1= 1.05…1.25 x Un - Umax2= 1.05…1.25 x Un - Events counter (nr. of events day by day in the last year plus the total events in the breaker's lifetime)
Voltage unbalance	[V] [no]	- U neg. seq.= 0.02…0.10 x Un - Events counter (nr. of events day by day in the last year plus the total events in the breaker's lifetime)
Harmonic analysis		Current and Voltage - up to 50° - Alarm THD: 5…20% - Single harmonic alarm: 3…10% plus a count of minutes the harmonic has been exceeded






Precision (Class 1)	Ekip Touch (*)	Ekip Hi-Touch	Ekip G Touch (*)	Ekip G Hi-Touch
0.5%	●	●	●	●
2%	●	●	●	●
0.5%	○	●	●	●
0.5%	○	●	●	●
	○	●	●	●
0.1%	○	●	●	●
1%	○	●	●	●
2%	○	●	●	●
1%	○	●	●	●
2%	○	●	●	●
	○	●	●	●

Precision (Class 1)				
1%	○	●	●	●
2%	○	●	●	●
1%	○	●	●	●

Intervals				
t = 5...120min	○	●	○	●
t <40ms	○	●	○	●
t <40ms	○	●	○	●
t = 0.02s...60s	○	●	○	●
t = 5...120min	○	●	○	●
	○	●	○	●

(*) Precision (Class 1) available with dedicated extracode
With no Class 1, please refer to the following precision values:

Current (RMS)	1%
Ground fault current (RMS)	2%
Phase-phase voltage (RMS)	0.5%
Phase-neutral voltage (RMS)	0.5%

Frequency	0.2%
Active power	2%
Reactive power	2%
Apparent power	2%

Power factor	2%
Active energy	2%
Reactive energy	2%
Apparent energy	2%

Technical characteristics for protection trip units

Measurement functions

Record of values: of the parameter for each interval with time-stamping		**Parameters**
Current: minimum and maximum	[A]	I Min, I Max
Phase-phase voltage: minimum and maximum	[V]	U Min, U max
Active power: average and maximum	[kW]	P Avg, P Max
Reactive power: average and maximum	[kVAR]	Q Avg, Q Max
Apparent power: average and maximum	[KVA]	S Avg, S Max

Data logger: record of high sampling rate parameters		**Parameters**
Currents	[A]	L1, L2, L3, Ne, Ig
Voltages	[V]	U12, U23, U31
Sampling rate	[Hz]	1200-2400-4800-9600
Maximum recording duration	[s]	13.6
Recording stop delay	[s]	0-10s
Number of registers	[no]	2 independent

Information on trip and opening data: after a fault without auxiliary supply		**Parameters**
Type of protection tripped		eg. L, S, I, G, UV, OV
Fault values per phase	[A/V/Hz W/var]	eg. I1, I2, I3, neutral for S protection V12, V23, V32 for UV protection
Time-stamping		Date, time and progressive number

Maintenance indicators		**Parameters**
Information on last 30 trips		Type of protection, fault values and time-stamping
Information on last 200 events		Type of event, time-stamping
Number of mechanical operations (1)	[no]	Can be associated to alarm
Total number of trips	[no]	
Total operating time	[h]	
Wear of contacts	[%]	Prealarm >80% Alarm = 100%
Date of maintenance operations performed		Last
Indication of maintenance operation needed		
Circuit-breaker I.D.		Type of circuit breaker, assigned device name, serial number

Self-diagnosis	**Parameters**
Check of continuity of internal connections	Alarm due to disconnection: rating plug, sensors, trip coil
Failure of circuit breaker to open (ANSI 50BF)	Alarm following non-tripping of protection functions
Temperature (OT)	Prealarm and alarm for abnormal temperature

(1) with auxiliary supply present

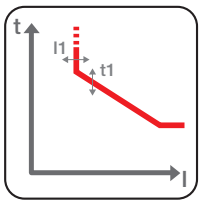




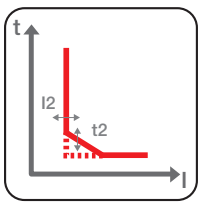

	Window	Intervals	Ekip Touch	Ekip Hi-Touch	Ekip G Touch	Ekip G Hi-Touch
	Fixed synchronizable by remote	Duration: 5...120min Number of intervals: 24	●	●	●	●
			●	●	●	●
			○	●	●	●
			○	●	●	●
			○	●	●	●
			○	●	●	●
			○	●	●	●
			○	●	●	●
			○	●	●	●
			○	●	●	●
			○	●	●	●
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			●	●	●	●
			●	●	●	●
			●	●	●	●
			●	●	●	●
			●	●	●	●
			●	●	●	●
			●	●	●	●
			●	●	●	●
			●	●	●	●
			●	●	●	●
	Note: Opening of circuit breaker can be set in the event of alarm		●	●	●	●
			●	●	●	●
			●	●	●	●

Key:
- - not available
- ● available
- ○ available with the dedicated software package

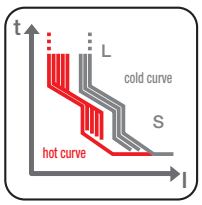
Description of protection functions



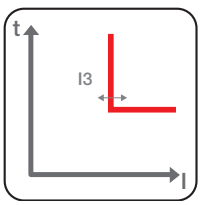
Overload (L - ANSI 49): available with three different types of trip curve:
1. $t = k/I^2$ with inverse long time;
Thresholds can be fine tuned (for example 1A for circuit-breaker E1.2 1000A) and timings can be set to the second directly from the display. The settable pre-alarm indicates the set threshold is reached before the protection is tripped.



Time-delayed overcurrent (S - ANSI 51 & 50TD): with constant tripping time (t = k), or with constant specific let-through energy ($t = k/I^2$), this provides 15 current thresholds and 8 curves, for fine adjustment. The function can be excluded by setting the dip switch combination to “OFF”.

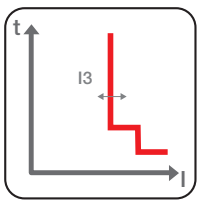


Thermal memory: for L and S protection functions, this is used to protect components, such as transformers, from overheating following an overload. The function, which can be enabled by the Ekip Connect software, adjusts the protection tripping time according to the length of time that has elapsed since the first overload, taking into account the amount of heat generated.

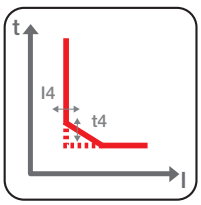


Instantaneous overcurrent (I - ANSI 50): with tripping curve without intentional delay, it offers 15 tripping thresholds and can be excluded by setting the dip switch combination to “OFF”.

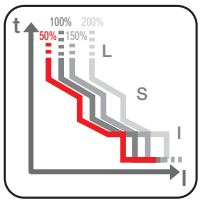
Closing on short-circuit (MCR): the protection uses the same algorithm of the protection I, limiting operation to a settable time window from the closing of the circuit-breaker. The protection also can be disabled to protection I. The function is active with an auxiliary supply.



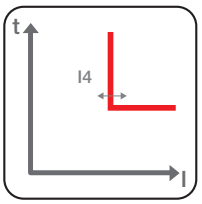
Programmable instantaneous overcurrent (2I - ANSI 50): Second instantaneous tripping curve designed to mitigate against arc flashes (also referred to as RELT - Reduced Energy Let-Through). This protection can be adjusted from 1.5 to 15 x In, with a maximum setting of 18kA. The clearing time of the 2I protection is between 25 and 42ms at 60Hz (+5ms for 50Hz). Easy activation and I/O assignment, including positive feedback, can be implemented using the RELT Ekip Signalling 2K-3 module.



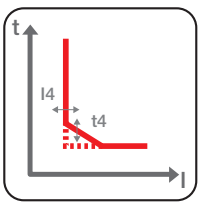
Ground fault (G - ANSI 51N & 50NTD): with tripping time independent of current (t = k) or constant specific let-through energy ($t = k/I^2$). The function can be excluded by setting the dip switch combination to “OFF”.



Neutral protection: available at 50%, 100% or 200% of the phase currents, or disabled, it is applied to the overcurrent protections L, S and I.

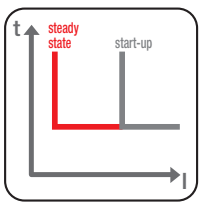


Instantaneous Ground Fault (G-ANSI 50N): with trip curve without instantaneous delay.



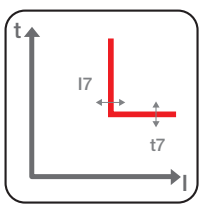
Ground fault on toroid (G ext - ANSI 51G & 50GTD): with trip time independent of the current (t = k) or with constant specific let-through energy ($t = k/I^2$). Pre-alarm that 90% threshold has been reached permits the fault to be reported to supervision systems without interruption of continuity. The protection uses the external toroid installed, for example, on the star center of the transformer, and is an alternative to the G and Rc functions. The function is active with an auxiliary supply.

Modified Differential Ground Fault (MDGF): Available with the trip time independent of the current (t = k) or constant specific let-through energy ($t = k/I^2$). This protection function is designed for systems with solidly grounded multi-source ground fault schemes (refer to instruction manual 1SDH001330R005). The complete equipment level solution includes third-party phase current transformers, summing current transformers, and a dedicated terminal (please refer to 1SDA114800R1 or 1SDA114798R1).



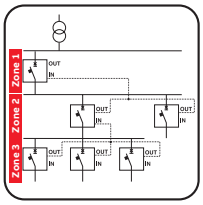
Start-up function: enables protections S, I and G to operate with higher trip thresholds during the starting phase, avoiding untimely trips due to high inrush currents of certain loads (motors, transformers, lamps). The starting phase lasts 100 ms to 30 s and is recognized automatically by the trip unit:

- at the closing of the circuit breaker with a self-supplied trip unit;
- when the peak value of the maximum current exceeds the set threshold (0.1…10 x In) with an externally supplied trip unit; a new start-up is possible after the current falls below the threshold.



Current unbalance (IU – ANSI 46): with constant trip time (t = k), protects from an unbalance between the currents of the single phases protected by the circuit breaker.

Description of protection functions

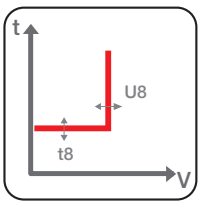


Zone selectivity for S, I and G protections (ANSI 68): can be used to minimize circuit- breaker trip times closer to the fault. The protection is provided by connecting all the zone selectivity outputs of the trip units belonging to the same zone and taking this signal to the trip unit input that is immediately upstream. Each circuit breaker that detects a fault reports it to the circuit breaker upstream; the circuit- breaker thus detects the fault but does not receive any communication from those downstream and opens without waiting for the set delay to elapse. It is possible to enable zone selectivity if the fixed-time curve has been selected and the auxiliary supply is present.

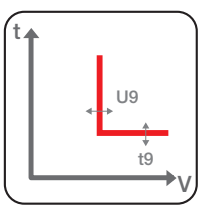
Current thresholds: this function enables indicators for four independent thresholds to enable corrective action implementation before the overload L protection trips the circuit breaker. For example, by disconnecting loads located downstream from the circuit breaker that are controlled by Ekip Signalling.

Advanced protection functions
A different operating mode can be chosen for the following protection function:
1. Active: protection enabled by opening of the circuit- breaker when the threshold is reached;
2. Only alarm: protection active, with only alarm indication when the threshold is reached;
3. Deactivated: protection disabled.

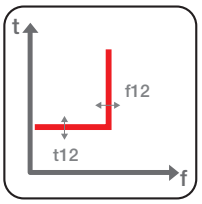
Furthermore, when the voltage and frequency protections are activated, they indicate an alarm status even when the circuit breaker is open so that a fault can be identified before the circuit breaker closes.



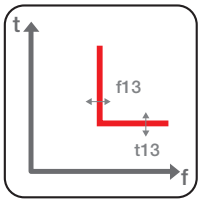
Undervoltage (UV - ANSI 27): with constant trip time (t = k), function is tripped when phase voltage falls below set threshold.



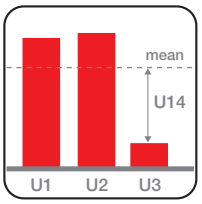
Overvoltage (OV - ANSI 59): with constant trip time (t = k), function is tripped when phase voltage exceeds the set threshold.



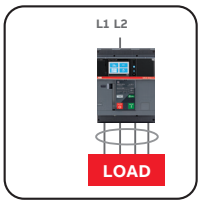
Underfrequency (UF - ANSI 81L): with constant trip time (t = k), function is tripped when network frequency falls below set threshold.



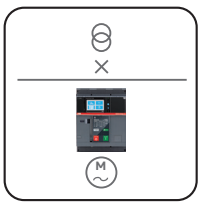
Overfrequency (OF - ANSI 81H): with constant trip time (t = k), function is tripped when network frequency exceeds the set threshold.



Voltage unbalance (VU – ANSI 47): with constant trip time (t = k), help protect against an unbalance between the voltages of the individual phases that are protected by the circuit- breaker.



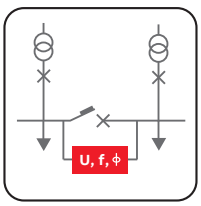
Residual current (Rc – ANSI 64 & 50NDT): with constant temperature (t=k) helps protect against indirect contacts and is integrated into Ekip Touch LSIG with Measurement Enabler with voltage sockets by a dedicated residual current rating plug and external toroid. The protection is an alternative to the functions G and Gext.



Reverse active power (RP - ANSI 32R): with constant trip time (t = k), function is tripped when total active power – in the opposite direction of the current - exceeds the set threshold.

Description of protection functions

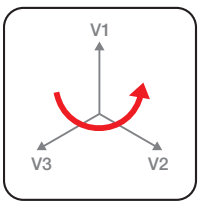
In addition to the protection functions, the following indication and control functions are available to warn the user that a given condition has been reached. The active indications are always shown on the display and are also available by communication on the system bus (with Ekip Com modules) or electrical indication (with Ekip Signalling modules).



Synchrocheck (SC - ANSI 25): the synchronism control function compares the voltages in the modules as well as the frequencies and phases of two circuit breakers to which the circuit breaker is connected. Ekip Touch indicates that conditions have been reached that enable the two lines to be made parallel.
The function is available with two work modes:

- In systems with both busbars supplied, where synchronism is determined by:
  1. voltage of the two half-busbars above the Ulive threshold for the set time
  2. difference of the module of the two voltages below the threshold ΔU
  3. difference in the frequency of the two voltages below the threshold Δf
  4. difference in the phase of the two voltages below the threshold Δ
  5. desirable time for synchronism condition tsyn
  6. circuit breaker open
- In systems with an out-of-service line (dead busbar), where the synchronism condition is determined by the concurrence of the following conditions for the tref set time:
  1. voltage of the active half-busbar above threshold Ulive
  2. voltage of the dead half-busbar below threshold Udead
  3. circuit breaker open

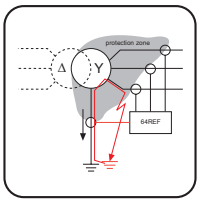
In both cases, synchronism consent is withdrawn when one of the above conditions is missing and it has not been less than 200ms from the change of the circuit- breaker condition (when the relationship has been set).
The indication of reached synchronism is available directly as an electrical indication via a contact that is always supplied with the module. The function can be activated simply by connecting the Ekip Synchrocheck module.



Cyclical direction of the phases (ANSI 47): indicates an alarm through inversion of the phases sequence.

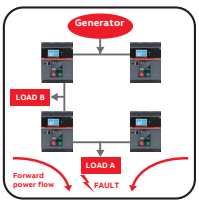
Power factor (ANSI 78): available with a three-phase threshold, warns when the system operates with a power factor that is less than the set power factor.

The following protections are also available:
Second time-delayed overcurrent protection (S2 – ANSI 50TD): in addition to the standard protection S, a second (excludable) time-constant protection is available that enables two independent thresholds to be set in order to help ensure precise selectivity, especially in highly critical conditions.



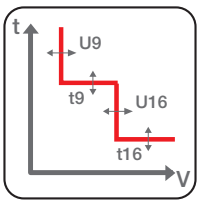
Second protection against ground fault (ANSI 50GTD/51G & 64REF): whereas with Ekip Touch the user has to choose between implementation of the protection G by internal current sensors (calculating the vector sum of the currents) or G ext external toroids (direct measurement of the ground fault current), Ekip Hi- Touch offers the exclusive feature of simultaneous management of both configurations by two independent ground fault protection curves. Through this characteristic, the trip unit is able to distinguish a non-restricted ground fault which activates the opening of Emax 2, from a restricted ground fault which activates the opening of the medium voltage circuit breaker.
Another possible configuration is with the residual current protection replacing the Gext protection, while the G protection remains active. The residual current protection is activated in the presence of the residual current rating-plug and of the toroid.

Directional overcurrent (D – ANSI 67): the protection is able to recognize the direction of the current during the fault period and detect whether the fault is upstream or downstream of the circuit-breaker. The protection, with fixed time trip curve (t=k), intervenes with two different time delays (t7bw and t7fw), according to the current direction. In ring distribution systems, this enables the distribution portion to be identified in which the fault occurred and to disconnect it while continuing to operate the rest of the installation.

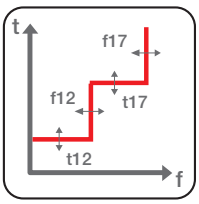


Zone selectivity for protection D (ANSI 68): provides the ability to interconnect circuit breakers so that allows rapid isolation of the fault area in the event of a fault. Disconnection only occurs at the level closest to the fault while the remainder of the operation continues uninterrupted. The function is particularly useful in ring and grid installations where, in addition to the zone, it is also essential to define the flow direction of the power that supplies the fault. It is possible to enable directional zone selectivity alternatively to the zone selectivity of the protections S and G, and in the presence of an auxiliary supply.

Start-up function for protection D: enables higher trip thresholds to be set at the outgoing point, as available for protections S, I and G.



Second protection against undervoltage and overvoltage (UV2 and OV2 – ANSI 27 and 59): enables two minimum and maximum voltage thresholds to be set with different delays to enable differentiation, for example, between voltage dip transients due to the start-up of a motor and an actual fault.

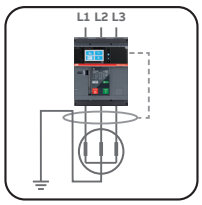


Second protection against underfrequency and overfrequency (UF2 and OF2 – ANSI 81L and 87H): enables two minimum and maximum frequency thresholds to be set simultaneously. For example, only an alarm can be set to be tripped when the first threshold is reached, and the circuit breaker can be set to be opened when the second threshold is reached.

Description of protection functions

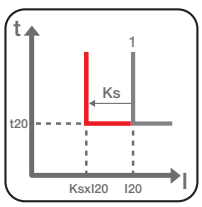
Dual setting of protections: Ekip Hi-Touch can store a set of alternative parameters for all protections. This second series (set B) can replace, if necessary, the default series (set A) by an external command. The command can be given when the network configuration is edited, for example when an emergency source is activated in the system, changing the load capacity and the short-circuit levels. Another typical application is helping protect the operator opposite the switchgear against the electric arc. In this case, protection delays are minimized to safeguard the operator (Set A), whereas in the absence of an operator the protections are set to help ensure selectivity with the circuit breakers downstream (Set B). It is possible to activate series B by:

- Digital input available with an Ekip Signalling module;
- Communication network, by means of one of the Ekip Com communication modules;
- Directly from the Ekip Hi-Touch display;
- By a settable internal time, after the circuit-breaker has closed.

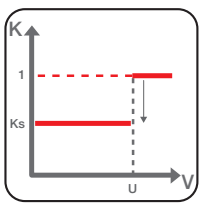


Differential ground fault (Rc - ANSI 87N): helps protect against internal ground fault on generator winding. The toroid is required to hug the active conductors and the ground conductor. Rc protection is integrated by a dedicated residual current rating plug and the external toroid.

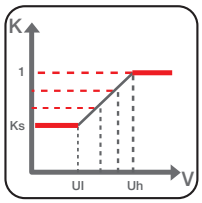
The specific functions for generator protections are described below. For each it is possible to choose the operating mode: active, only alarm or deactivated. All the voltage and frequency protections also operate when the circuit- breaker is open, enabling the fault to be identified before the closing of the circuit breaker.



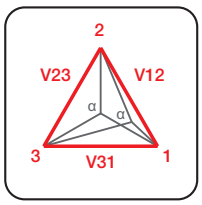
Voltage controlled overcurrent protection (S(V) - ANSI 51V): protection from maximum current with a constant trip time (t = k) that is sensitive to the voltage value. The set current threshold, following a voltage drop, decreases by steps or linearly.



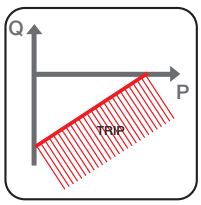
In step mode (controlled mode) the protection is tripped at the set threshold (I20) if the voltage is above U, whereas it is tripped at the lower threshold of the factor Ks (I20 * Ks) if the voltage is below U.



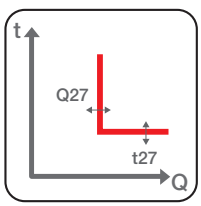
n linear mode (restrained mode, two voltage limits are selected within which the protection is tripped at the set threshold (I20) reduced by the factor K corresponding to the measured voltage. The variation of the factor K is proportional to the voltage, and for voltages greater than the upper threshold (Uh), the threshold I20 applies, and for voltages below the lower threshold (Ul), the minimum threshold (I20 * Ks) applies.



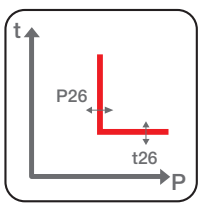
Residual overvoltage (RV – ANSI 59N): with constant trip time (t = k), helps protect against insulation loss in systems with insulated neutral or with grounded neutral with impedance.



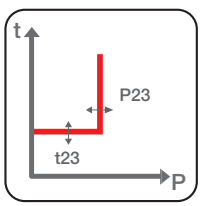
Loss of field or reverse reactive power (RQ – ANSI 40 or 32RQ): with constant trip time (t = k), the circuit breaker tripped when the total reactive power absorbed by the generator exceeds the set threshold. The constant threshold (k=0) or a function of the delivered active power of the generator (k≠0) can be selected.



Reactive overpower (OQ – ANSI 32OF): with constant trip time (t = k), the function is tripped when reactive power exceeds the set threshold in the generator to network direction.

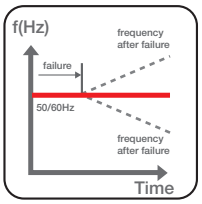


Active overpower (OP – ANSI 32OF): with constant trip time (t = k), the function is tripped when the active power exceeds the threshold set in the delivering direction of the generator.

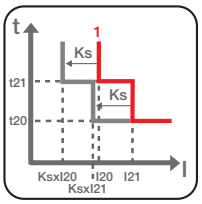


Active underpower (UP – ANSI 32LF): with constant trip time (t = k), the function is tripped when the active power delivered by the generator is lower than the set threshold. The protection can be temporarily disabled in order to manage the start-up phase, by setting a time window from the closing of the circuit breaker, by using an electrical signal or via incoming communication to a relay.

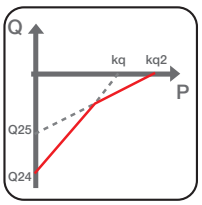
Description of protection functions



Rate of change of frequency (ROCOF – ANSI 81R): enables both positive and negative frequency variations to be rapidly detected . The protection is constant and is tripped when the frequency variation in Hz/s is greater than the set threshold.



Second protection against voltage controlled overcurrent protection (S2(V) - ANSI 51V): available in addition to the protection S(V), enables total selectivity to be achieved in all installations.



Second protection against loss of field or reverse reactive power (RQ – ANSI 40 or 32R): enables the generator's de-energization curve to be followed very accurately, thereby avoiding any unnecessary disconnection.

Software functions

4/2 **Introduction**

4/4 **Adaptive Protections**

4/6 **Load Shedding**

4/8 **Automatic Transfer Switch**

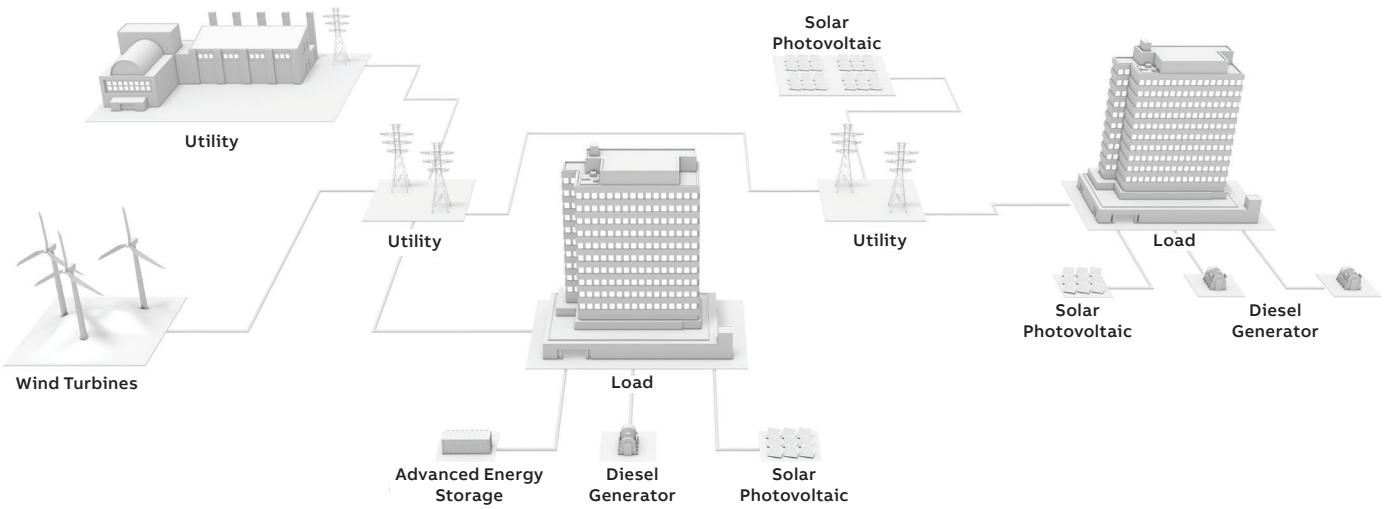
4/10 **Synchrocheck logics**

4/12 **Power Controller**

Introduction

Over the last 10 years, utilization of renewables has grown providing a reductions in pollution causing emissions to help achieve a greener world. Environmental changes have driven an awareness of ecology, sustainability, and energy efficiency.

Emax 2 is the first smart circuit breaker delivering all-in-one solutions that combine advanced protection, programmable logic, full connectivity, easy integration and comprehensive energy management in a single revolutionary device or at the local generation side.
Emax 2 and its Adaptive Protections recognize the network change and automatically set new thresholds to provide protection and coordination in on-grid and off-grid conditions.



In order to maximize service continuity, local generation starts to supply the islanded User's plant. Emax 2 is the first circuit breaker able to integrate in one device protection features and **Automatic Transfer Switching (ATS)** programmable logics. This unique integrated solution avoids the need for other external control units, providing a smaller switchgear footprint and commissioning time saving.
Strong reduction of wiring connection simplifies the installation and commissioning phase.
The **Load Shedding** embedded algorithm is able to manage the power system for the comprehensive microgrid energy management.
Before the transfer from the main grid to local line, selected loads are shed to provide power balance.
Emax 2 using slope of frequency disconnects loads only in case of emergency imbalance condition.

When the main grid stability is restored **Synchrocheck** logics manages the plant voltage and frequency to enable reconnection. In grid-connected operation, Emax 2 manages the **Power Controller** algorithm to shave peaks and shift loads in order to optimize system performance and productivity.
Emax 2 advanced features are easily customized due to commissioning software tools which do not require high level engineering competencies. Ready to use templates enable the download of all the logics directly into the trip unit. The solutions become plug & play, increasing modularization and standardization for design and installation.
Examples of several Adanced functionalities wich have been developed and integrated in Emax 2 follow the compatibility table.

	Load Shedding	Automatic Transfer Switch	Power Controller
Load Shedding	●		●
Automatic Transfer Switch		●	●
Power Controller	●	●	●

Adaptive Protections

Emax 2 adds dual setting capability to switching device to help continuous coordination.

Purpose

Plants can now work as a LV Microgrid due to the energy produced by renewable and local power sources, in particular as a consequence of the asence of the Utility power supply, e.g. due to a fault on the MV voltage side. In order to continue to provide a high level of selectivity and continuity of service, it is important to take into account the variation of the short circuit power when moving from. During grid connected condition the fault current on a microgrid feeder is supplied by the Utility, which is higher than the current supplied only by the local generation during islanded condition.
As a result, it is desirable to be able to automatically change the several protection thresholds of the units during the transition to the islanding condition.

Application example

A plant is connected to the MV Utility by means of a MV/LV transformer. If the Utility shuts down, the plant will become a Microgrid supplied by the local generator G, which will continue to feed the priority loads by enabling the loads shedding feature of Emax 2.
In Utility/grid-connected condition, the generator G is disconnected. Figure 1 illustrates the operation:

- Circuit breaker A is closed
- Circuit breaker B is open
- Circuit breakers C are closed. The protections of the load supplier to D are upgraded using "Set A" of Emax 2 unit.
- Circuit breakers D are closed
- Circuit breaker E is closed
- Circuit breaker QS1 is closed
- All loads supplied.

The circuit breakers C are selectively coordinated with the upstream main circuit breaker A, supplied by the Utility, and the downstream load circuit breakers D (fig. 2).

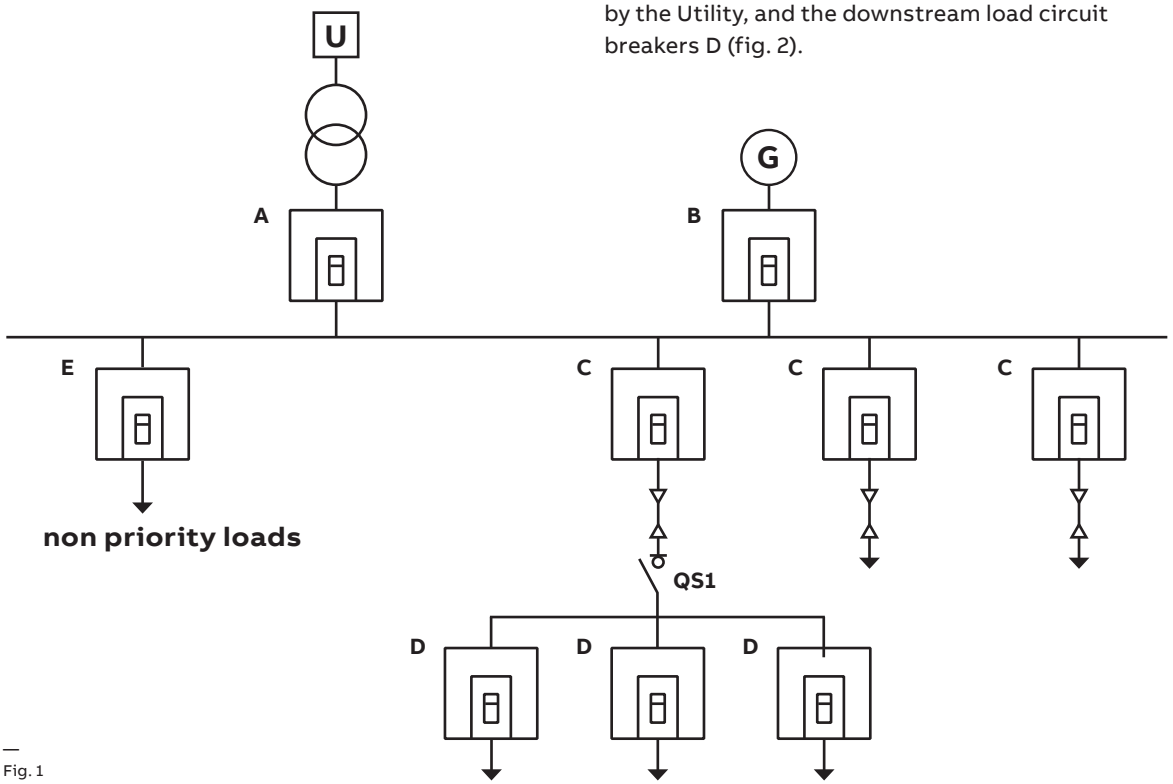


Fig. 1

With Adaptive protections when there is a Utility outage, circuit breaker A opens and B closes in order to have operation in islanded condition. In order to still provide selectivity, an alternate set of protection settings is required. Adding Emax 2 adaptive protections to circuit breaker C helps ensure this behavior. The second protection setting is optimized for the characteristics of the local generator helping to ensure the incoming supply and load side switching devices will remain selectively coordinated.
Figure 1 illustrates the operation:

- Circuit breaker A is open
- Circuit breaker B is closed
- Circuit breakers C are closed and the protection thresholds move automatically to “Set B”
- Circuit breakers D are closed
- Circuit breaker E is open
- Circuit breaker QS1 is closed
- No priority loads can be disconnected using another functionality of Emax 2 units (see Load Shedding).

The following figures shows switching to a set of parameters which provides selective coordination between circuit breakers C and B by means of the “Adaptive protections“ function embedded in the trip unit of the circuit- breaker C.

Benefits
Emax 2 makes it possible to have two sets of settings implemented in a single device. As a result, the following benefits are provided:

- Overcurrent protection and selectivity provided both in grid-connected and islanded condition
- Service continuity is provided by the addiction of a single unit in the switchboard in every plant condition
- Ease of use, due to Ekip Connect software which allows an immediate and intuitive commissioning phase.

For further information, please refer to the White Paper “Emax 2, all-in-one innovation – Adaptive protections” (1SDC007116G0201).

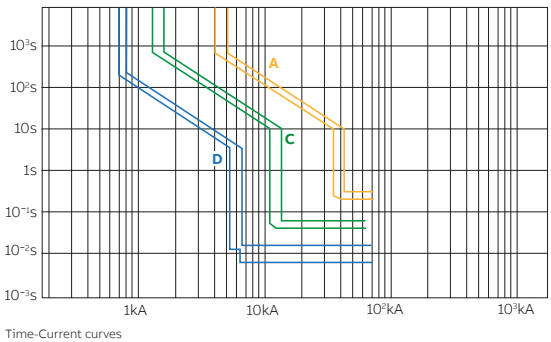


Fig. 2

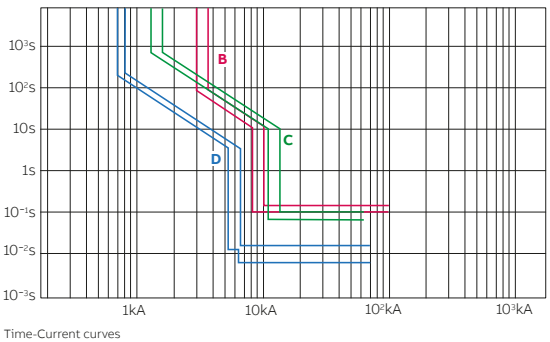


Fig. 3

Load Shedding

Emax 2 has built-in load shedding algorithms to avoid power imbalance in the low voltage plant and stress to components.

Purpose
ABB Emax 2 embeds patented functions based on load shedding which reduces the Microgrid stress in all situations. Typically, Emax 2 is the main protection relay of the low voltage Microgrid located at the interface point with the medium voltage grid and it able to help control the plant in all situations.

Microgrid in islanding operation
In a standalone, the Microgrid loads remains supplied by the local generation, like diesel GenSet or energy storage systems when power absorption from the main grid ceases. Depending on the plan configuration, the Microgrid generation can be continuously active or started up by an automatic transfer switching (ATS) logic after a disconnection from the main grid. In the islanding transition frequency drop must be avoided; otherwise, the generation protections could trip and jeopardize the Microgrid stability resulting with a long blackout. Emax 2, employing current and voltage measurements, integrates two different fast load shedding logics to reduce this blackout risk, protecting the Microgrid during the intentional or unintentional islanding operation:

- Basic Load Shedding, simple logic able to recognize the Microgrid disconnection event and shed a group of not priority loads thus ensuring a fast time response and power balance.
- Adaptive Load Shedding, the advanced algorithm available with Emax 2 as an enhancement of the basic version. The intelligent software embedded in the unit sheds very quickly the not priority loads according to the Microgrid power consumption and frequency measurements. Moreover, such software has a dedicated configuration for backup generation related to ATS and the software itself is even able to estimate the energy produced by a solar plant based on plant geography settings.

All the versions are available on Emax 2 platform for both the Microgrid situations, sharing some information about the loads under control in the plant.

Application examples
- **Grid-connected plants with running GenSets**, which in addition to supporting the load during emergency conditions subsidizes the grid power by contributing to the day-to-day self-consumption of their loads. These systems may also include renewable power sources. For example, PV-diesel remote communities connected to weak distribution-grids with many daily faults, or facilities located in areas which experience frequent environmental events, for example hurricanes or earthquakes.
- **Grid-connected plants with back-up GenSets** started up after main - gen transfer switching logics that require high reliability. For example, hospitals, banks or data centers.

Benefits
Emax 2 with embedded Load Shedding innovation, provides **Service continuity**
- When a plant is disconnected from the main grid, even if local production is present, there is a significant stress that turns off all the generators resulting in a blackout. Emax 2 Load Shedding logics helps reduce the frequency drop that usually triggers a local generation protection trip, enabling a plant to maintain its live status.

Space saving

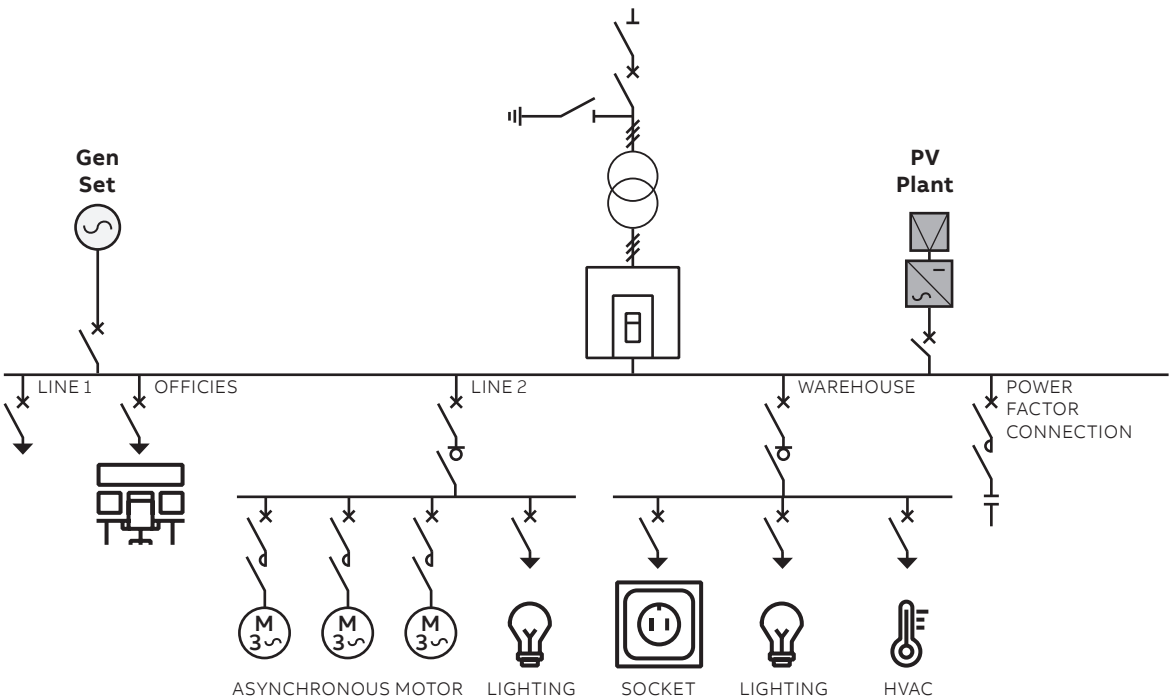
- No other Programmable Logic Controllers (PLC) are needed as Emax 2 has embedded the intelligence to realize the load shedding logics, taking advantage of the current and voltage sensors for electrical parameter measurements.
- Static converters for low voltage photo voltaic production typically include anti-islanding protections which adds the potential for another power deficit to be added to the main grid contribution during the Microgrid islanding. Emax 2 is the first circuit breaker that estimates solar production without additional sensors.
- Load Shedding is suitable with ATS architectures like Main-BusTie-Gen used to distinguish priority/ non-priority loads.
- Where feasible, BusTie switching device is no longer required resulting in:
  - Significant space and material saving up to 50% in the power distribution switchgear for panel builders.
  - Load Shedding is self-tuned with the specific power imbalance identification and dynamically choses the controllable loads to be shed, reducing constraints for consultants during plant design.
  - ATS unit manages only two sources, without interlock, logic programming and wiring connections for the third circuitbreaker with less time required for installation.

Ease of use

- Load shedding logics are generally set with high engineering skills and customization effort with devices as programmable logic controllers.
- Emax 2 provides easy installation due to predefined templates and the user-friendly graphic interface in the SW commissioning tool.

For further information, please refer to the White Paper “Emax 2, all-in-one innovation – Load Shedding” (1SDC007119G0201).

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Typical load shedding application



Automatic Transfer Switch

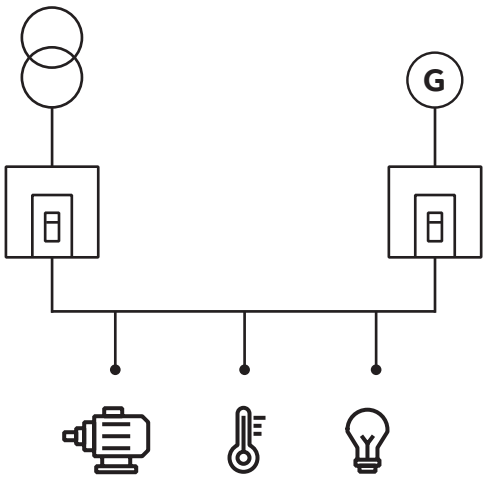
Emax 2 is designed for transfer switching applications reducing time needed for logics programming and commissioning.

The ATS solution
ABB's Automatic Switching (ATS) system takes advantage of the new capabilities provided by the new Ekip Connect 3 Software and the intelligent digital unit such as Emax 2 to deliver a versatile and reliable solution.

Application example
Automatic Transfer Switch systems are common in all application where service continuity is essential and where there are multi source supplies.

The main applications are:
- Power supplies of UPS groups in general
- Oil & Gas
- Operating rooms and primary hospital services
- Emergency power supplies for civil building, hotels and airports
- Data banks and telecommunication systems
- Power supply of industrial line for continuous processes.

ATS is also applicable where a portion of grid with local generation, called microgrid, can be disconnected from the main grid.



The ATS is a high-performance energy automation system, easy to install and program.

Benefits

Ready-to-go Programming
Estimated time and cost savings of ATS Engineering on a low voltage project is 95%.

Simplify the connections
Estimated time and cost savings of ATS cabling and commissioning on a power switchboard is 50%.

Emax 2 compactness
Estimated space saving on a power switchboard is up to 30%.

Top rate reliability
Watchdog functions and fewer installed components delivers enhanced reliability.

For more info check out the white paper "Emax 2, all in one innovation: Embedded ATS system" (1SDC007115G0201).

Synchrocheck logics

Emax 2 is able to analyze voltage waveforms from different power sources.

Purpose

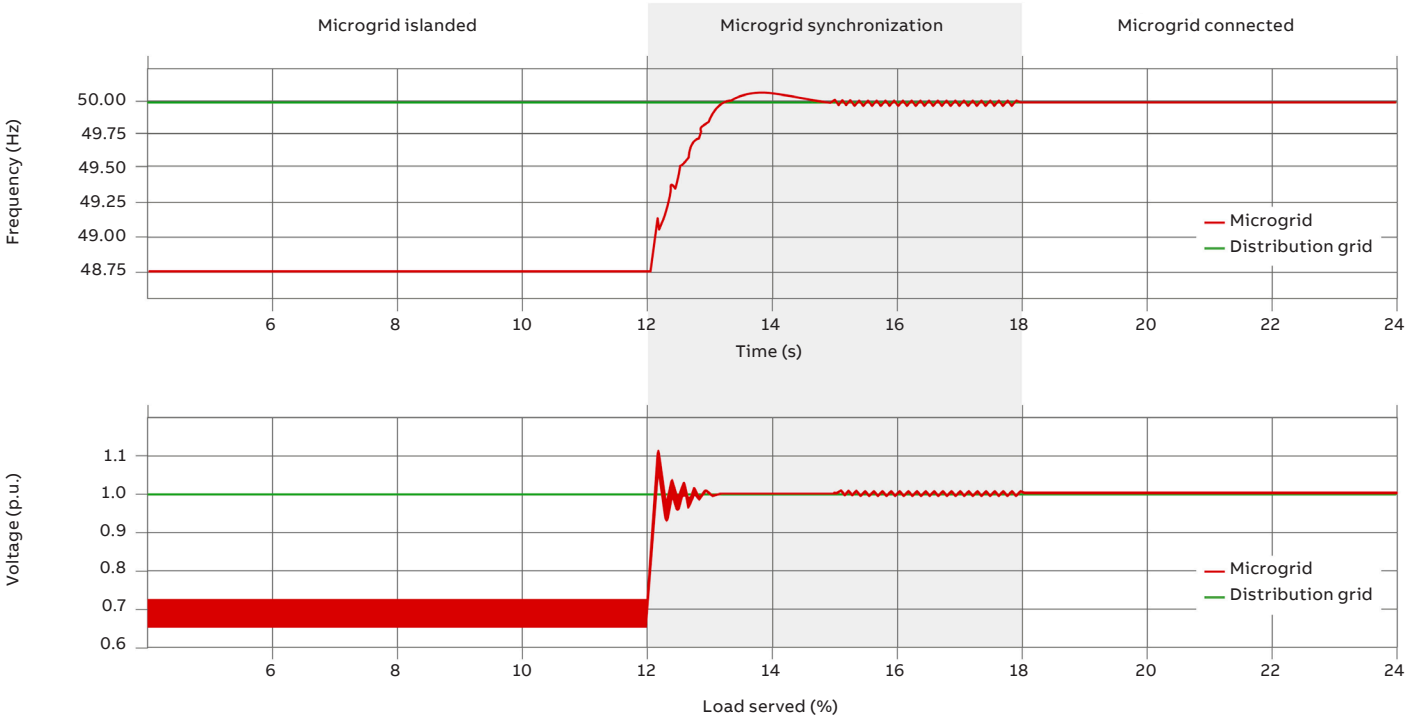
Emax 2's advanced electronics makes it the first smart unit able to island the Microgrid from disturbances such faults or other power quality events and reconnect it to the distribution network, when the disturbance is resolved.
Synchrocheck logics operate the ANSI 25A, with additional automatic re-closing capabilities based on the synchronism status detection.

Using the Ekip Synchrocheck cartridge module, Emax 2 monitors the voltage amplitude, the frequencies and the phase displacement and realizes simple logics to adapt the Microgrid voltage and frequency to the main grid. This regulation based on up and down signals sent to the local generator controllers can be realized by Ekip Signalling contacts in order to achieve synchronization. The circuit breaker automatically recloses when it understands that the synchronism is achieved using Ekip Synchrocheck and the integrated closing coil.
As an alternative, Ekip Synchrocheck can send an indication signal of synchronism achieved.
The cartridge module plugged-into Emax 2 works in dead or live busbsar mode, even with automatic check.

Application examples

Synchrocheck logics and protection are useful in the following plant-engineering situations:

- During the Microgrid reconnection to the main grid, speeding up the paralleling procedure between two systems with different steady states. This scenario comes after the islanding Microgrid operation.
- When there is the closed transition of an automatic transfer switch, the main grid should be connected to the same busbar with the backup Microgrid generation in order to provide continuos load operation, with or without a bus-tie switching device.
- This solution can also be adopted for single Gen-Set paralleling operation.



Benefits

Emax 2 with embedded Synchrocheck logics delivers the following benefits:

- Space Savings
  - Components reduction with no external synchronizer and fewer voltage transformers than traditional approaches.
  - Increased reliability & time saving during the installation due to less cabling and related installation complexity.

Ease of use

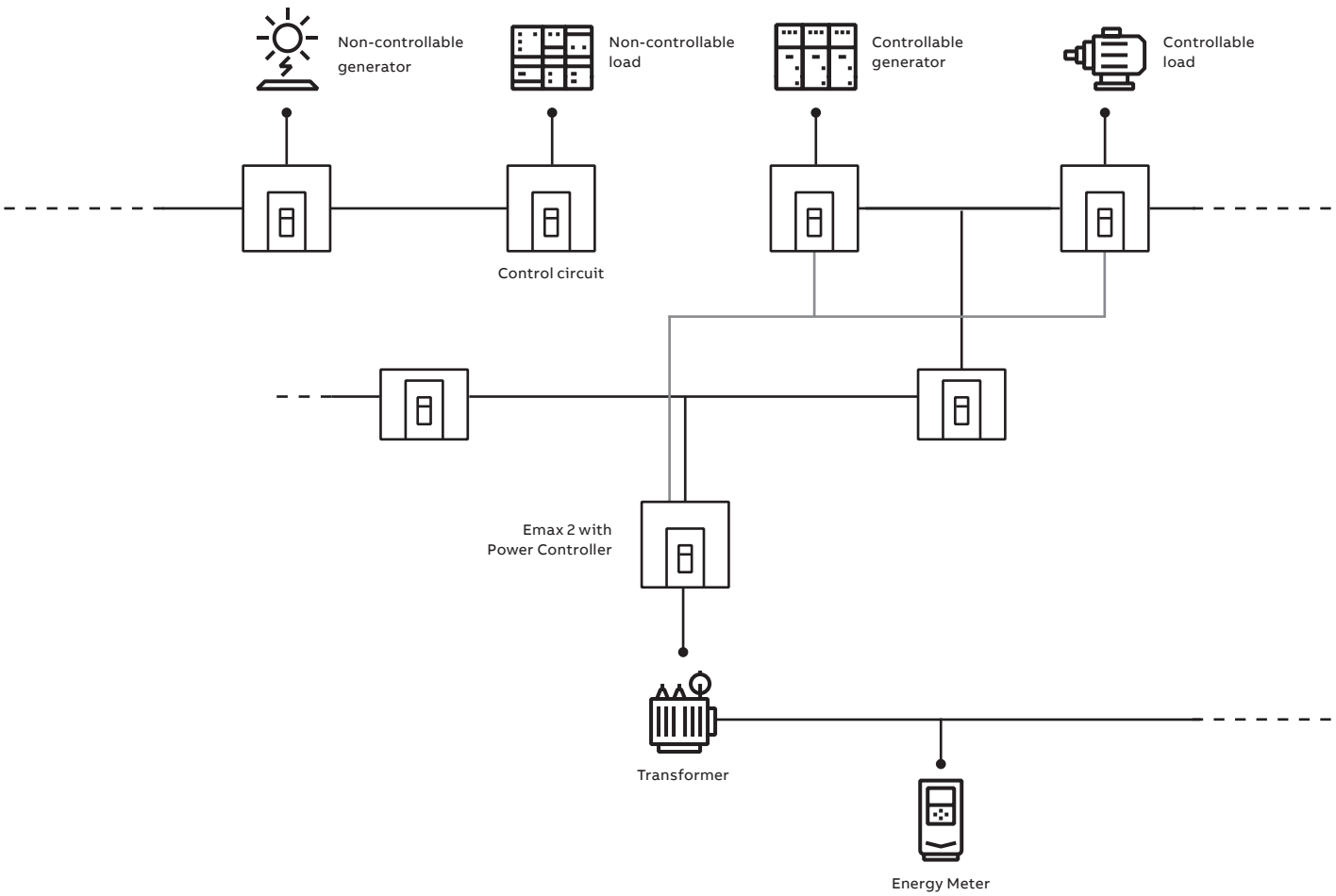
Embedded protections and logics simplified configuration eliminate the need for programming and engineering efforts.

Power Controller

Emax 2 is able to control both loads and generators to optimize energy costs for end users.

Purpose
Power Controller software enable Emax 2 to manage power to shaving the peaks and shifting loads making. It possible to reduce electricity bills, increase energy efficiency up to 20% and be ready for demand response programs. The Power Controller function is based on a patented calculation algorithm that allows a load list to be controlled through the remote command of the relevant switching device (such as switching device, contactor, drive) or control circuit according to a priority defined locally by the user or remotely by a load aggregator or utility, based on user requirements and types of load.

The algorithm is designed on average power absorption which can be set by the user over a determined time interval. Whenever this value exceeds the fixed power, the Power Controller function intervenes to bring it back within the limits.
This management can be accomplished with a single Emax 2 Control or Emax 2 Control+ standard equipped with this function and installed as the low voltage plant controller.
Furthermore, the control unit, not only commands the passive loads, it can also manage a reserve generator.



Ekip Power Controller, which can be used with all Ekip Touch trip units in the Emax 2 series, effectively helps to improve energy efficiency by managing the entire low-voltage electrical system. In fact, it is able to adapt the demand for power according to the availability of the energy source, the time of day and the costs indicated in the current pricing plan.
Therefore, the Ekip Power Controller is able to maintain power consumption within the limits defined, thereby optimizing the costs of managing the installation and reducing emissions.

The command sent to the downstream devices can be performed in two different ways:
- through the wired solution, by commanding the shunt opening/closing releases or acting on the motor operators of the loads to be managed;
- through a dedicated communication system.

The ability to control the loads according to a list of predefined priorities provides significant advantages, both economic as well as technical:
- economic: energy consumption optimization is focused on the control of the costs linked in particular to the penalties that are levied when the contractual power is exceeded or when the contractual power is increased by the Distribution System Operator (DSO) as a consequence of exceeding the limit repeatedly.
- technical: the possibility of power absorption over the contractual limits for shorter periods and, as well as, the management and the control of the power consumption over long periods of time. Thus it is possible to reduce the likelihood of malfunctioning due to overloads, or worse, complete inefficiency of the entire plant due to tripping ofthe LV main switching device.

The exclusive Power Controller function available on the new Emax 2 units monitors the power, keeping it below the limit set by the user. As a result of this more effective use, the peak of power consumed can be limited allowing savings on power bills.

The Power Controller, patented by ABB, disconnects non-priority utilities, such as electric car charging stations, lighting or refrigeration units, during the times when consumption limits need to be controlled, and reconnects them once limits are in check. When required, it automatically activates auxiliary power supplies such as generator sets. No other supervision and control system is required: the required load limit can be set on Emax 2, which can control any switching device located downstream, even if it is not equipped with a measurement function.

Application examples
Power bill savings, demand response, power overload avoidance are the typical reasons for adopting Ekip Power Controller.
The Ekip Power Controller is a common solution for office buildings, shopping malls, hotels, college campuses, waste and water industries and any plant that works like a low voltage microgrid.

Power Controller

Benefits
TheEmax 2 with embedded Power Controller delivers, the following benefits:

- **Reduction of energy costs with minimum impact.** The loads are disconnected from the power supply for short periods, in the minimum number necessary and in a fixed order of priority, enabling power consumption peaks to be limited. This allows the contract drawn up with the energy provider to be renegotiated, reducing the power allocated, with a consequent reduction in total energy costs.
- **Power limited only when necessary.** The Power Controller function manages up to four different time bands, it is possible to manage a particular power limit during the day (peak) or night (off peak). Consumption during the day when rates are at their highest can be limited.
- **Easy of use** The Power Controller function allows the installation to be managed efficiently with a simple architecture. Its patented design allows it to measure the total power of the installation without the need to measure the power consumed by each load. Installation costs and times are thereby kept to a minimum.
- The Power Controller function does not require writing, implementation and testing of complicated programs for PLC or computer because the logic has already been implemented in the protection unit and is ready to use; the installation parameters can be set from a smartphone or directly from the switching device display.
  The Power Controller significantly helps to flatten the load curve, limiting the use of peaking power plants in favor of base load power plants with greater efficiency.
- ThePower Controller's integrated communication modules can receive the maximum absorbable power directly from the medium voltage control system, determining consumption for the next 15 minutes. Ekip Power Controller, according to the information received, manages the switching off of non-priority loads or the switching on of reserve generators. The software gives maximum priority to non-programmable preferred energy sources, such as wind and solar, and they are therefore considered uninterruptable. In the event the production of internal power to the controlled network is reduced, due, for example, to decreased production of solar power, Power Controller will disconnect the necessary loads to manage the consumption limit set.
- This benefit is used, for example, in installations with a system of cogeneration. The Power Controller controls the total consumption drawn from the electrical network, interrupting non-indispensable loads when production is reduced and reconnecting them when generator power is sufficient to not exceed limits. The Power Contoller has multiple advantages: reduction in energy costs, maximum use of local production and greater overall energy efficiency.

For further information, please refer to the White Paper "Load management with Ekip Power Controller for SACE Emax 2" (1SDC007410G0202).

Supervision and connectivity

5/2 **Introduction**

5/4 **Supervision and control**
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Introduction

SACE Emax 2 circuit breakers provide a complete and flexible offering that can be adapted to the actual level of supervision and control required.

According to their complexity, the supervision of low-voltage systems may involve different levels:

- **switchgear compartment:** Ekip Touch trip units with their high resolution and multimeter display can control the main electrical values of the circuit breaker.
- **electrical switchgear:** Ekip touch trip units with their high resolution and multimeter display enable the display the data of all circuit breakers installed in the switchgear from a single point: in local mode via control panel on the front of the switchgear, or remotely via several communication protocol.
- **electrical system:** the integration of low-voltage devices in communicationnetworks is required in particular for: automatedindustrial processes, industrial and petrochemicalsites, modern data centres and intelligentelectricity networks, better known as smart grids.
  The system can be supervised via Internet with the ABB Ability™ Energy and Asset Manager webapp.





Supervision and control
Supervision of the switchgear compartment

For the list of information available for each trip unit, consult chapter 3.

The SACE Emax 2 circuit breakers equipped with Ekip electronic trip units enable electrical measurements and diagnostic data to be displayed on the front of the switchgear.

Solution with Ekip Touch trip units
The Ekip Touch electronic trip units are the ideal solution for supervision and control of switchgear. In particular:

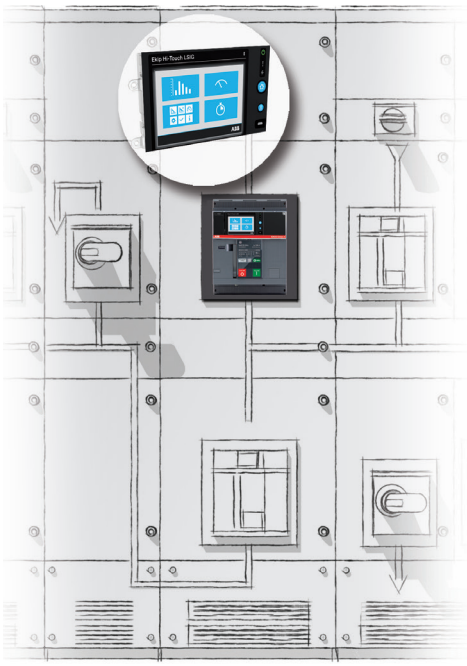
- simple and intuitive due to a large, high resolution, colour touch screen;
- no auxiliary power; the Ekip Touch trip units are directly supplied by the current sensors integrated in the circuit breaker, thereby avoiding the need for external power supplies.

The Ekip Multimeter is a display unit to be installed on the front of the switchgear for SACE Emax 2 air circuit breakers equipped with Ekip electronic trip units.

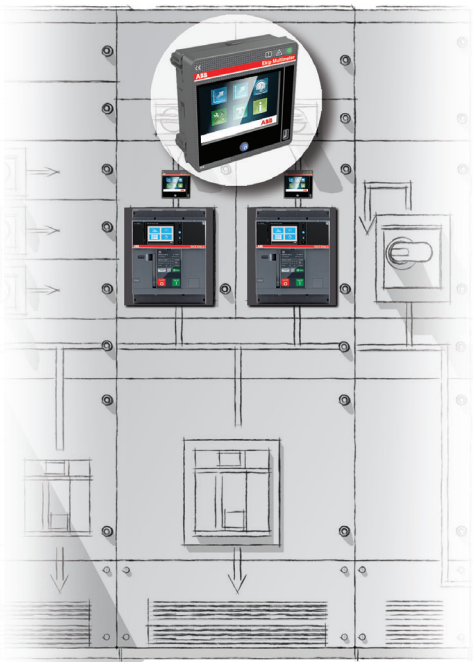
Solution with Ekip Multimeter Display on the front of the switchgear
This device remotely displays the information about the system that is available in the trip unit to which it is connected.
The main characteristics of the Ekip Multimeter unit are:

- **Graphical and functional uniformity with the Ekip Touch trip units**; Ekip Multimeter uses the same display as the trip unit to which it is connected, helping ensure perfect continuity between the graphic display and the menu items.
- **Reduced dimensions**; the Ekip Multimeter provides the precision of the trip unit to which it is connected and performs the function of a measuring instrument without requiring the installation of external current and voltage transformers.
- **Flexible installation**; the Ekip Multimeter can be installed at a distance from the trip unit, enabling access to information from the most convenient point.
- **Simultaneous reading of the various electrical values**; the advanced connection system used allows several Ekip Multimeter devices to be connected to the same protection trip unit.

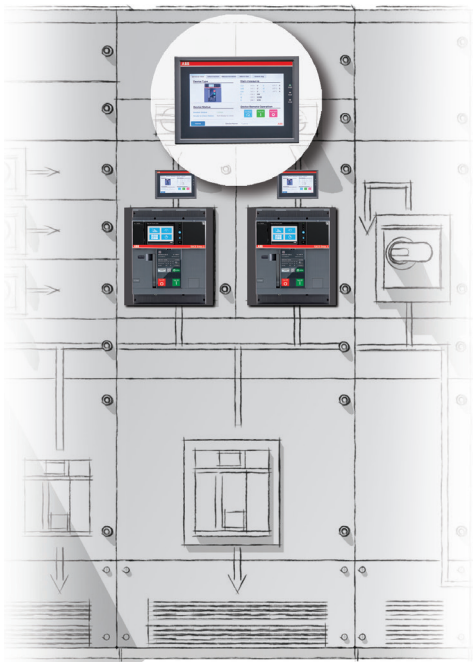
If connected to trip units equipped with display, the Ekip Multimeter enables adjustment of the parameters and protection thresholds.



—
01 Ekip Touch



—
02 Ekip Multimeter



—
03 Lite Panel

Electronic trip unit	Ekip Dip	Ekip Touch	Ekip G Touch	Ekip Hi Touch Ekip Hi-G Touch
Solution	Ekip trip units + Ekip Multimeter			
Type of trip units connectable to Ekip Multimeter	Ekip trip units			
Number of trip units connectable to Ekip Multimeter	1			
Measurement functions				
Currents	●	●	●	●
Voltages	-	○	●	●
Powers	-	○	●	●
Energies	-	○	●	●
Harmonics	-	○	○	●
Network analyzer	-	○	○	●
Adjustment functions				
Setting of thresholds	-	●	●	●
Setting of thresholds second set	-	○	○	●
Resetting of alarms	●	●	●	●
Diagnostics				
Protection function alarms	●	●	●	●
Device alarms	●	●	●	●
Protection unit tripping details	●	●	●	●
Events log	●	●	●	●
Protection unit tripping log	●	●	●	●
Maintenance				
Number of operations	●	●	●	●
Number of trips	●	●	●	●
Wear of contacts	●	●	●	●
Other data				
Status of circuit breaker	●	●	●	●
Circuit-breaker position [1)]	●	●	●	●
Local/remote mode	●	●	●	●

1) Circuit-breakers equipped with auxiliary contacts to indicate position
- not available
● available
○ available with the dedicated software package

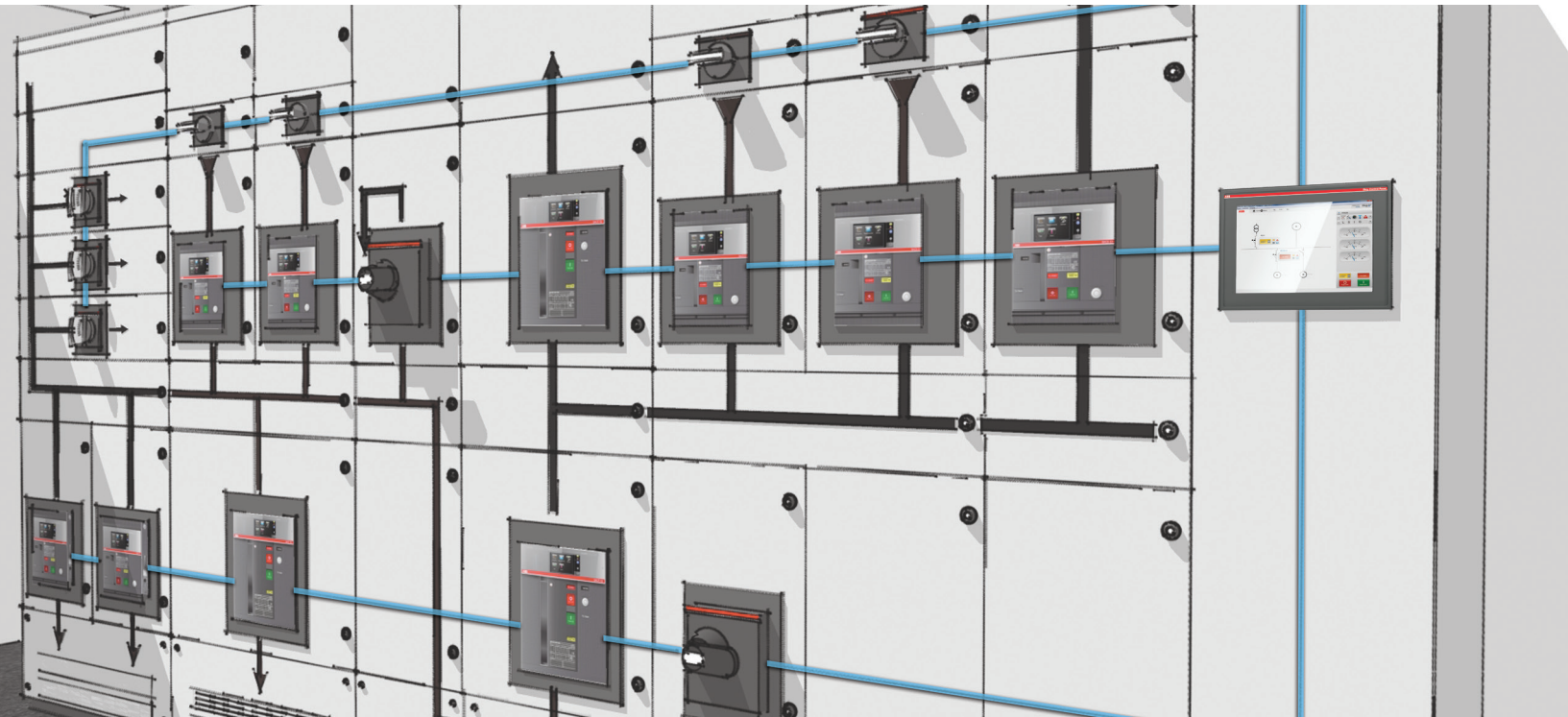
Supervision and control
Electrical switchgear

Ekip Link is a flexible and efficient solution for controlling and supervising low-voltage electrical switchgear.

SACE Emax 2 circuitbreakers can be connected to the Ekip Control Panel operator panel by means of Ekip Link interface modules.

Ekip Link system
The main characteristics of the Ekip Link System are:
- **centralized control;** from the Ekip Control Panel operator panel, all the main values of the installation (electrical measurements, system diagnostics, trends…) can be monitored and controlled.
- **adaptation to real requirements**; when the electrical values to be monitored are limited to currents only, the Ekip Dip trip unit can be connected to the Ekip Link without having to use circuit breakers equipped with communication modules.
- **access via the Internet** with any Internet browser using the web server function performed by the Ekip Control Panel.
- **rapid installation**, through the use of standardized EtherNet™ components such as STP cables and RJ45 type connectors.
- **ease of use**; due to the Ekip Control Panel operator panel in front of the switchgear with colour touch screen, the system mimic panel can be displayed so that the entire installation can be controlled rapidly and intuitively.
- **ready to use**; Ekip Control Panel is supplied with pre-configured software that requires no programming. It is only necessary to start scanning the Ekip Link system from the operator panel and in a few seconds communication with the connected devices is active.

Ekip Link enables supervision of electrical switchgear on which up to 30 ABB SACE circuit breakers have been installed. Tmax T and Tmax XT series circuit breakers equipped with Modbus RTU communication can also be easily integrated into the Ekip Link system using the multi-serial port fitted on the Ekip Control Panel.



Electronic trip unit	Ekip Dip	Ekip Touch	Ekip G Touch	Ekip Hi Touch Ekip Hi-G Touch
Solution	Ekip protection trip units equipped with Ekip link module + Ekip Control Panel operator panel + standard EtherNet™ components			
Type of trip units connectable	Ekip protection trip units			
Number of trip units connectable to the Ekip link system	up to 30 [1]			
Data exchange rate of Ekip link system	100 Mbit/sec			
Supervision and control functions				
Opening and Closing of circuit breakers [2]	●	●	●	●
Electrical value trends	I	I	I,V,P	I,V,P
Log of electrical value trends	I	I	I,V,P	I,V,P
Dynamic installation mimic panel	•	•	●	●
Automatic scanning of the Ekip link system	•	•	●	●
Centralized synchronizing of time	•	•	●	●
Web server function	● [3]	● [3]	● [3]	● [3]
Measurement functions				
Currents	●	●	●	●
Voltages	-	○	●	●
Powers	-	○	●	●
Energies	-	○	●	●
Harmonics	-	○	○	●
Network analyzer	-	○	○	●
Data logger	-	○	●	●
Adjustment functions				
Setting of thresholds	-	●	●	●
Resetting of alarms	●	●	●	●
Diagnostics				
Protection function alarms	●	●	●	●
Device alarms	●	●	●	●
Protection unit tripping details	●	●	●	●
Events log	●	●	●	●
Protection unit tripping log	●	●	●	●
Transmission of alarms via text message	optional	optional	optional	optional
Transmission of alarms via e-mail	optional	optional	optional	optional
Maintenance				
Number of operations	●	●	●	●
Number of trips	●	●	●	●
Wear of contacts	●	●	●	●
Other data				
Status of circuit breaker	●	●	●	●
Circuit-breaker position [4]	●	●	●	●
Local/remote mode	●	●	●	●

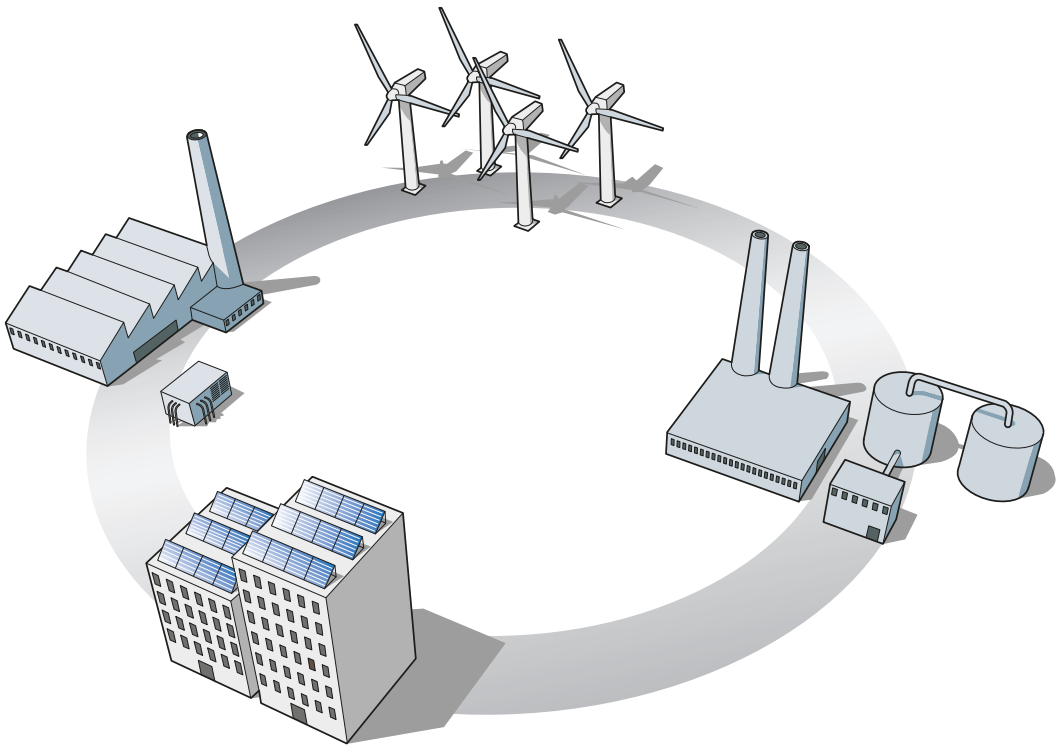
1) Ekip Control Panel is available in two versions that can manage a maximum of 10 or 30 circuit breakers. The number of circuit breakers may vary depending on their type. For details, ask ABB SACE
2) Circuit-breakers equipped with actuation module, electric accessories, opening and closing releases and spring charging motor
3) Two client web accesses included in the licence
4) Circuit-breakers equipped with auxiliary contacts to indicate position
- not available
● available
○ available with the dedicated software package

Supervision and control
Electrical system

The integration of low-voltage devices in communication networks is required in particular for: automated industrial processes, industrial and petrochemical sites, modern data centres and intelligent electricity networks, better known as smart grids.

Ekip Com Modules
SACE Emax 2 circuit breakers equipped with Ekip Touch electronic trip units can be integrated into communication networks without the need for external interface devices.
The distinctive characteristics of the SACE Emax 2 circuit breakers offering for industrial communication are:

- **Wide range of protocols supported;** the Ekip Com communication modules enable integration with the most common communication protocols based on RS485 serial lines and the most modern communication systems based on EtherNet™ infrastructures, which provides an exchange of data in the order of 100 Mbit/s.
- **Installation times reduced to a minimum** due to the plug & play technology of the communication modules, which are connected directly to the circuit breaker terminal box without having to remove the electronic trip unit.
- **Repetition of communication for greater reliability of the system**; the circuit breaker can be equipped with two communication modules, allowing the information on two buses to be exchanged simultaneously.
- **Smart grid ready**; the Ekip Com 61850 module is the solution for integrating SACE Emax 2 circuit breakers into the automated systems of electrical substations to meet the IEC 61850 standard without the need for complex external devices.



Electronic trip unit	Ekip Touch	Ekip G Touch	Ekip Hi Touch Ekip Hi-G Touch
Solution	Ekip Touch trip units + Ekip com modules		
Protocols supported:			
Modbus RTU	Ekip com Modbus RTU		
Profibus-DP	Ekip com Profibus		
DeviceNet™	Ekip com DeviceNet™		
Modbus TCP/IP	Ekip com Modbus TCP		
Profinet	Ekip com Profinet		
EtherNet/IP™	Ekip com EtherNet™		
IEC61850	Ekip com IEC61850		
Hub	Ekip com Hub		
Control functions			
Circuit-breakers opening and closing [1]	●	●	●
Measurement functions			
Currents	●	●	●
Voltages	○	●	●
Powers	○	●	●
Energies	○	●	●
Harmonics	○	○	●
Network analyzer	○	○	●
Data logger	○	●	●
Adjustment functions			
Setting of thresholds	●	●	●
Resetting of alarms	●	●	●
Diagnostic			
Protection function alarms	●	●	●
Device alarms	●	●	●
Protection unit tripping details	●	●	●
Events log	●	●	●
Protection unit tripping log	●	●	●
Maintenance			
Number of operations	●	●	●
Number of trips	●	●	●
Wear of contacts	●	●	●
Other data			
Status of circuit breaker	●	●	●
Circuit-breaker position [2]	●	●	●
Local/remote mode	●	●	●

1) Circuit-breakers equipped with Ekip Com Actuator module, electrical accessories, opening and closing releases and spring charging motor
2) Circuit-breakers equipped with auxiliary contacts to indicate position
- not available, ● available, ○ available with the dedicated software package

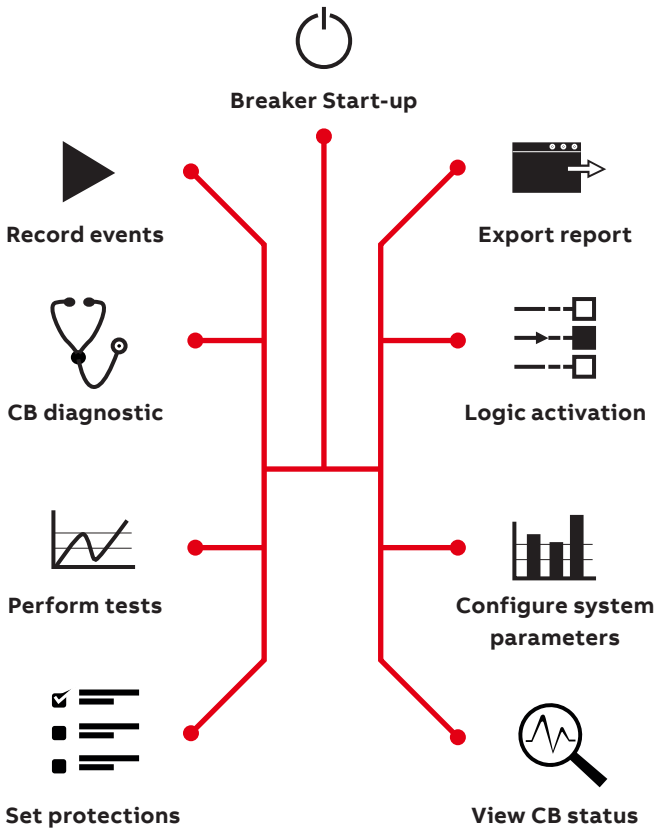
ABB Ability™ Edge Industrial gateway
This is a DIN-rail mounted communication module for cloud-connectivity. ABB Ability™ Edge Industrial gateway can collect data throughout the system from ACBs to MCCBs, multimeter, miniature CBs. Moreover, it is possible to connect sensors for environmental parameters (temperature, water, gas) via both analog and digital I/O. Modules for Wi-Fi or GPRS connection are provided as optional features.

Software and web applications
Ekip Connect

ABB SACE offers software applications that allow to utilization of the full potential of Ekip trip units' power management, acquisition and analysis of electrical data, protection testing, maintenance and diagnostic functions.

Ekip Connect is the ABB commissioning and programming software tool that allows the user to unlock the full potential of circuit breakers, improving the efficiency of the electrical plant.

A circuit breaker is an essential part of any electrical system to help ensure that the day-by-day processes can be performed safely and continuously. For this reason, it is vital that the installation and use of the circuit breaker is as simple as possible. From commissioning to implementation, through monitoring, testing and analysis, Ekip Connect software tool guides the user in the management of ABB circuit breakers throughout the whole product life cycle.
Using Ekip Connect, the user can commission and program Ekip to manage power, acquire and analyze electrical values, and test protection, maintenance and diagnostic functions.
Just as Emax 2 has evolved into a true power manager that has simplified the electrical plant, so too has Ekip Connect software become the user's key to access the full capability of the breaker.



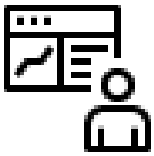
—
Panel builders
- 50% commissioning time



Ease of use

Imagine the panel builder who has to commission a circuit breaker and needs to save time. Using Ekip Connect – instead of managing it manually – commissioning time can be reduced by up to 50%. Providing a stress-free relationship with the device complexity, Ekip Connect is an easy-to-use software that has all the answers. Ekip Connect's simple and intuitive interface provides, from the very start, easy navigation throughout the tool and quick access to every circuit breaker operation. At a glance, the user can see all the information needed, thus being able to quickly and effectively asess any situation.

—
Facility manager
100% full exploitation
of your device



Full exploitation

Imagine the facility manager who needs to perform fast and precise diagnostics to have the system under control and to avoid failures. Ekip Connect provides to tools to unlock the full capabilities of Ekip and, thanks to the customizable dashboard, organize thewindows to manage any function of the device just the way the user wants. It is possible to manage all the circuit breaker settings and specifications directly with Ekip Connect, the perfect instrument for exploring and using the breaker. Diagnostics are easy too: it is possible to consult and download the event log, alarms and trips, thereby facilitating identification and understanding of any anomalies. One single software to manage all ABB low-voltage circuit breakers equipped with an electronic trip unit, granting full integration between air and molded case circuit breakers.

—
Consultant/system
integrator
Complex logic at your
fingertips



Product enhancement

Imagine the consultant or a system integrator whowantsto implement advanced features while avoiding risk of mistakes. Ekip Connect enables the implementation complex logics with justa few clicks. Add, setting and managing advanced functions has never been so easy. Cloud platform, automatic transfer switch logic, load shedding, advanced protection and demand management can be managed and easily set through the Ekip Connect software. Software features can even be expanded by purchasing and downloading software packages for advanced functions directly using Ekip Connect.

Software and web applications
Ekip Connect

Accessing the full potential of the circuit breaker is finally possible. Thanks to Ekip Connect software,complete utilization of the breaker and more can be achieved with a few clicks.



Configuration
- Set protections
- Configure system and communication parameters
- Breaker start-up



Monitoring & analysis
- View CB status and measure
- Read events list
- CB diagnostic

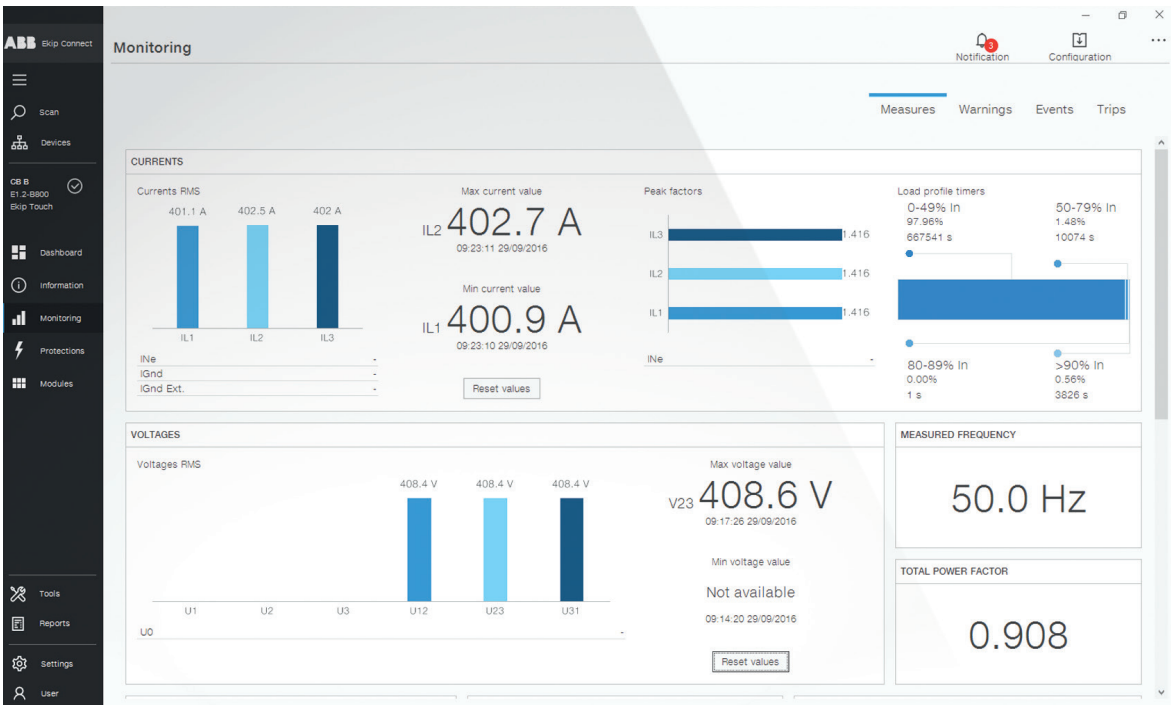


Product implementation
- Set advanced protections
- Logic activation
- Enable advanced functions



Testing & reporting
Check correct functionality
Perform tests
Export report

—
Ekip Connect is available for free download at https://library.abb.com



EPiC mobile app
With Bluetooth embedded into the trip units it possible to connect rapidly to the EPiC mobile app. Buy additional protection functions or measures, register the product and configure the device.

EPiC helps the customer during the commissioning of the system; all system parameters and protection thresholds can be set rapidly in the Ekip Touch trip units thanks to the easy and intuitive navigation pages of the app.

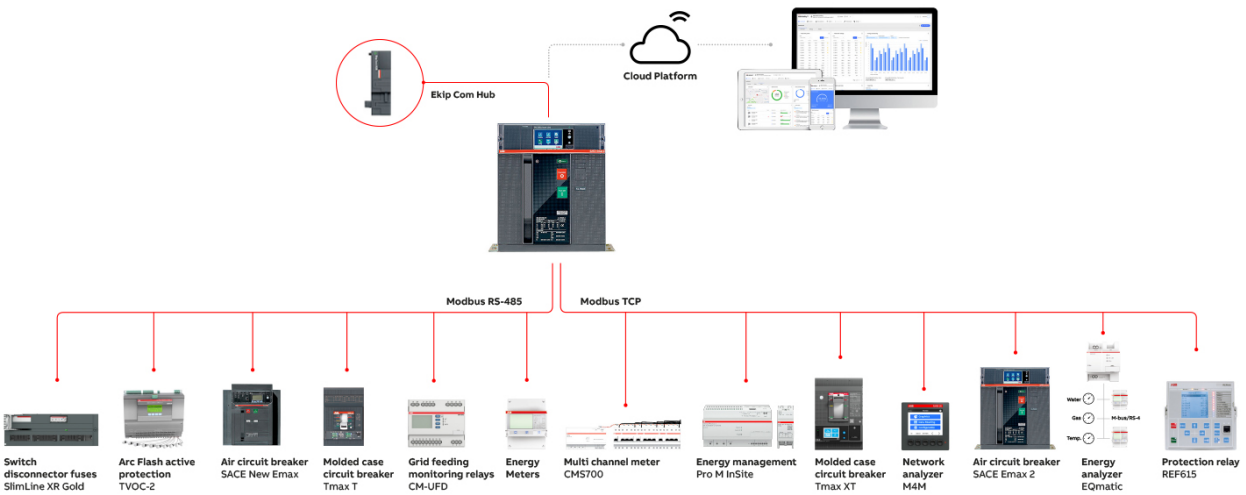
Software and web applications
ABB Ability™ Energy and Asset Manager

ABB Ability™ Energy and Asset Manager is the state-of-the-art cloud-solution for monitoring, supervising and analyzing a site's electrical distributions system and equipment resulting in improved overall performance, efficiency and safety.

Through its scalable and flexible approach, ABB Ability™ Energy and Asset Manager ensures full-range integration of main electrical LV and MV equipment installed in the distribution and sub-distribution switchboards. It also enables upgrades at any time via the ABB Ability Marketplace™ in just a click. With a single easy-to-use interface, ABB Ability™ Energy and Asset Manager assists the user by means of a cloud computing or hybrid platform, enabling analysis of relevant data and optimization of installation anytime, anywhere.

Value proposition

- **Flexible and scalable platform**
  - Ease of use: the power of understanding at your fingertips
  - Remote visibility: Discovery of facility performance anytime, anywhere
  - Faster payback
  - Scalable, from monitoring of a production line to the supervision of multiple sites.
- **Improved site efficiency**
  - Reduce cabling, connectivity components and commissioning time with embedded WiFi and 3G/4G
  - Save up to 20% on energy bills
  - Improve energy inefficiency by up to 10%
  - Identify unexpected consumptions and eliminate unwanted energy usage
  - 100% avoidance of penalties for low power factor.
- **Maximized performance**
  - 100% elimination of costly unplanned labor
  - Up to 40% maintenance-cost reduction: avoid unnecessary inspection and maintenance
  - Up to 15% extended asset lifetime
  - Up to 30% reduction in operational costs
  - Minimized risk of unplanned downtime
  - Monitoring up to 70% of potential asset-failure causes.
- **Enhanced personnel safety**
  - Improve safety: Healthy assets mean healthy people mean healthy business
  - Keep operators safe with remote monitoring
  - Supervise and schedule maintenance remotely.



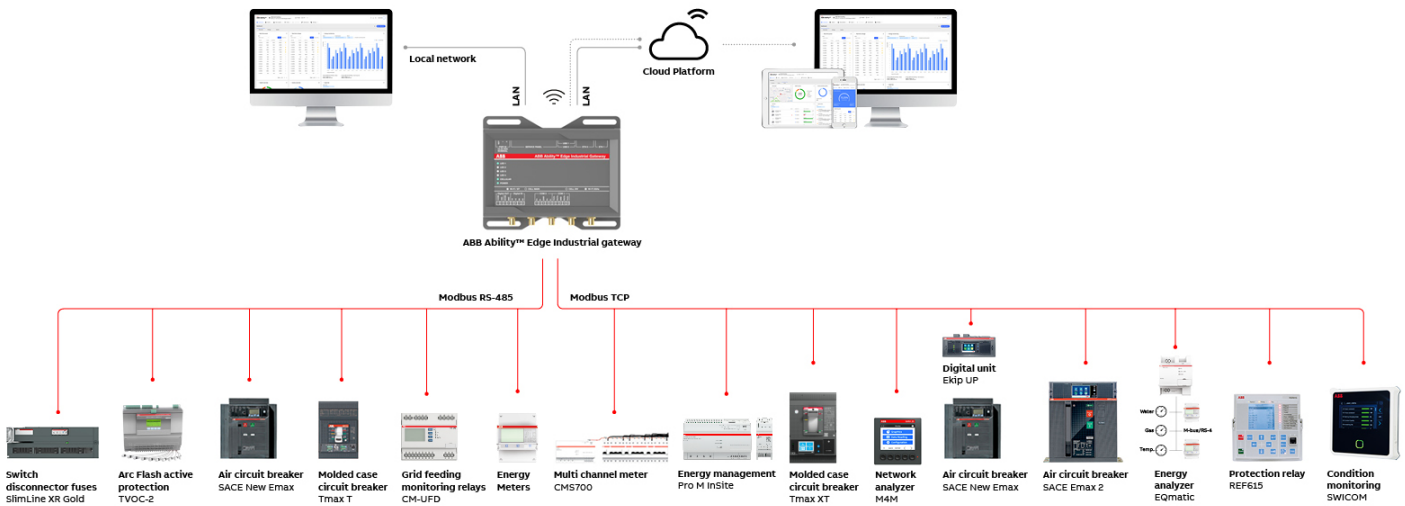


External solution with ABB Ability™ Edge Industrial gateway

The ABB Ability™ Edge Industrial gateway module can be mounted on DIN rail to collect data throughout the system. Moreover, it is possible to connect sensors for environmental parameters (temperature, water, gas) via both analog and digital I/O.

Modules for Wi-Fi or GPRS connection are provided as optional features.

For any further information please visit our website : https://new.abb.com/about/our-businesses/electrification/abb-ability/energy-and-asset-manager.



Energy Measurements
Introduction

The Emax 2 circuit-breakers have been designed to manage all low voltage electrical installations with maximum efficiency: from industrial plants, naval applications, traditional and renewable power generation installations to buildings, shopping centers, data centers and communication networks.

Achieving maximum efficiency of an electrical installation in order to reduce consumption and waste requires intelligent management of power supplies and energy. For this reason, the new technologies used in the Emax 2 circuit-breakers with Ekip Touch trip units allow the productivity and reliability of any installation to be optimized, and at the same time, reducing power consumption while fully respecting the environment.





Class 1 in power and energy measurements
Before starting to take any action on electrical systems and to analyze the available data, data accuracy is required.
With Ekip Touch trip units, the SACE Emax 2 range of circuit-breakers provides extremely accurate measurements, in compliance with the relevant IEC 61557-12 Standard.

Network Analyzer
The quality of the power supply is an important factor to consider in order to preserve the loads, to avoid equipment malfunctions, and to optimize energy consumption. The power quality of a power system is never a perfect sinusoidal waveform, distortions and harmonics are always present. Factors that cause reductions in power quality can be monitored and controlled with the Network Analyzer embedded function thereby avoiding the need for expensive external monitoring devices.

Energy Measurements
Class 1 accuracy

With the Ekip Touch trip units the embedded measurement functionalities allow the measurement of power and energy to a Class 1 degree of accuracy, as specified by the IEC 61557-12 Standard, avoiding the need of additional device saving costs, space and installation time.

With the Ekip Touch trip units, measurements of power and energy to an IEC 61557-12 Standard compliant, Class 1 level of accuracy, are provided by the embedded measurement functionalities. Thus, there is no need for additional devices resulting in advantages in terms of cost savings, space reduction and installation time optimization.
When energy needs monitoring, even small inaccuracies can result in a wasted money. Accuracy is everything and depends on the design and manufacturing quality of solution used. The SACE Emax 2 with Ekip Touch trip units are designed to provide 1% accuracy for power and energy monitoring.



Thanks to the extremely accurate Rogowsky coil, ABB Ekip Touch trip units are able to provide Class 0.5 for voltage and current measurements and Class 1 for active power and energy measurements, complying with and certified by the IEC 61557-12 Standard.
IEC 61557-12 can be applied to both AC and DC electrical networks up to 1000 V AC or 1500V DC.
Moreover, an upgrade of the device is quick and easy: the measurement functions not included in an installed trip unit can be downloaded directly from the MarketPlace via EPiC mobile app, thus allowing new system requirements to be met with ease. Measurement data can be displayed in several ways:

- On the embedded display on the trip unit
- On a smartphone via Bluetooth (EPiC mobile app)
- Using the Ekip Connect software on a PC
- On an Ekip Multimeter external display
- On a cloud-platform thanks to ABB Ability™ Energy and Asset Manager
- In the supervision system (ex SCADA) via several communication protocols
- On the control panel display

Energy Measurements
Network Analyzer

The Network Analyzer function available in all Ekip Touch trip units, enables monitoring of the quality of energy based on harmonics, micro-interruptions or voltage dips without the need for dedicated instrumentation.

Effective preventive and corrective action can be implemented through accurate analysis of faults, thereby improving the efficiency of the system.

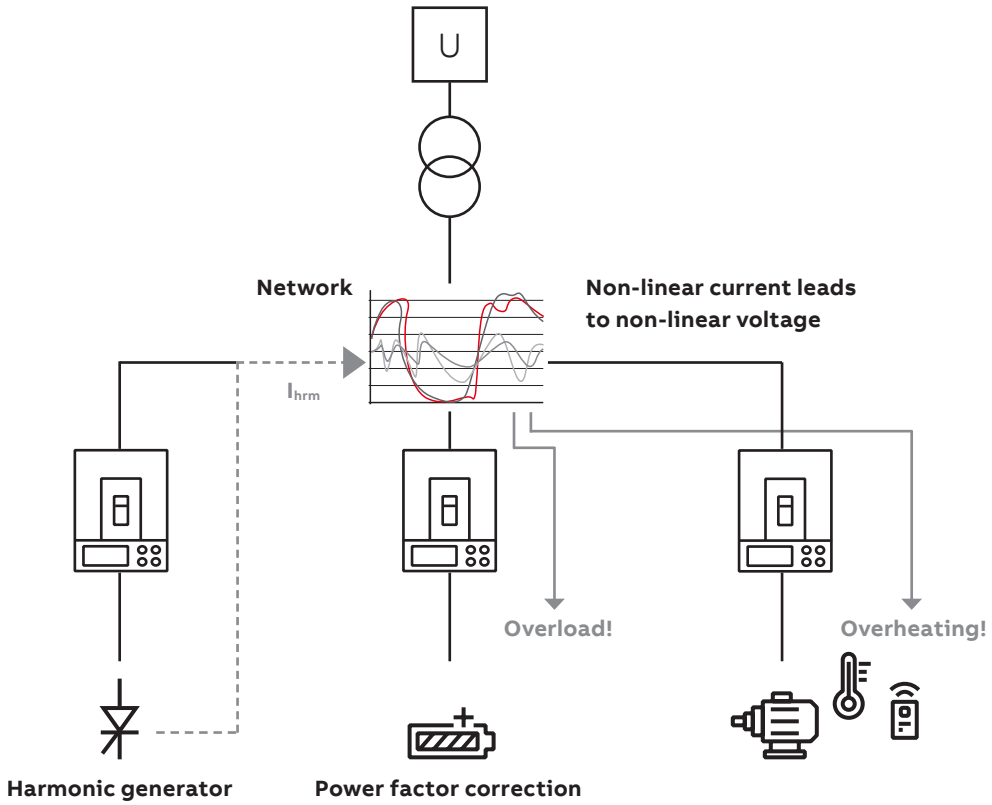
Applications

Electrical equipment is designed for optimum operation under constant and uniform voltage level, as close as possible to the rated value. In addition, industrial equipment, working on a three phase supply, requires the three phase voltage levels to be balanced. Power quality is a description of how well a power system complies with the above ideal conditions. Power quality issues can have negative consequences on the components and on the energy efficiency of the network. Thus, power quality monitoring is becoming more important in modern power systems, and will be a key part of the smart grid of the future.
In particular, power quality evaluation includes the following aspects:

- Deviations of voltage average value from the rated value
- Short decreases (sags) or increases (swells) of voltage value
- Voltage imbalance, i.e., difference in voltage values between different phases
- The presence of current and voltage harmonics.

Distortions of the voltage value (sags, swells) and/or frequency can have harmful consequences, especially for process industries, leading to possible production stoppages with consequently expensive downtime, damage to motor drives and damage to PLCs. Examples of process industries that can be badly hit by voltage instabilities include the plastics, petrochemicals, textiles, paper, semiconductor, and glass industries.
Voltage sag occurs when the value of the voltage is reduced below the rated one for a certain amount of time. Similarly, voltage swell occurs when the voltage is increased above the rated value for a certain amount of time.
RMS voltage values and frequency are two fundamental features of a voltage signal, but the “pureness” of the voltage waveform is also an important point. An ideal voltage waveform should be a perfect sinusoid, but this is not something that is normally seen in the real world. Frequencies other than the fundamental are always present.
These frequencies are called harmonics: a harmonic of a signal is a component frequency of the wave spectrum that is a multiple of the fundamental frequency. Harmonic content is an issue that is becoming increasingly debated: technological developments in the industrial and household field have led to the development of electronic equipment which, due to their operating principles, absorb a non-sinusoidal current (non-linear load). Such current causes a non-sinusoidal voltage drop on the supply side of the network with the consequence that the linear loads are also supplied with a distorted voltage.

Energy Measurements
Network Analyzer



Power electronics produce harmonic content that can affect other loads in the plant: the result can be an overheating of the asynchronous motor and an overload on the power factor correction capacitors. To get information about the harmonic content of voltage and current waveforms and to take measures if such values are high, a dedicated index has been defined. The total harmonic distortion (THD) of a signal is a measurement of the harmonic distortion present.

The first step towards better Power Quality: measurement

A Power Quality monitor is the most commonly used tool for detecting voltage sags and power quality issues. Measurement is the first step for checking the status of the installation and initiating the root cause analysis. Power Quality measurements and related instrumentation are described in specific industrial Standards such as IEC61000-4-30 and IEEE 1250. Now Ekip Touch trip units for the Emax 2 embeds the power quality monitor in a low voltage molded case circuit-breaker. The Network Analyzer function complies with the prescriptions of IEC 61000-4-30 and IEEE 1250.
The Network Analyzer function allows the user to set controls on the voltage in order to analyze the operation of the system: any time a control parameter exceeds a preset threshold, an alarm is generated. The accuracy of voltage measurements by the Emax 2 is excellent at 0.5%. The Emax 2 Network Analyzer complies with IEEE 1250-2011, Section 3 for the monitoring of the voltage value, imbalance and harmonic content, which is the equivalent of IEC61000-4-30 Class S for voltage values and imbalance and Class B for the harmonic content.

Network Analyzer
Hourly average voltage value
Short voltage interruption
Short voltage spikes
Slow voltage sags and swells
Voltage imbalance
Harmonic analysis

Referring to the voltage sag ambit, as an example, the Network Analyzer function has the ability to control three kinds of sag classes, defined by the user:

Parameter	Description
Sag Threshold (First Class)	This defines the first alarm threshold. It is expressed as % Un.
Sag Times (First Class)	In the event of dropping under the first alarm threshold, this defines the time beyond which the alarm counter is increased.
Sag Threshold (Second Class)	This defines the second alarm threshold. It is expressed as % Un.
Sag Times (Second Class)	In the event of dropping under the second alarm threshold, this defines the time beyond which the alarm counter is increased.
Sag Threshold (Third Class)	This defines the third alarm threshold. It is expressed as % Un.
Sag Times (Third Class)	In the event of dropping under the third alarm threshold, this defines the time beyond which the alarm counter is increased.

Two different types of counters for each power quality monitoring function are made available directly on the trip unit touch screen: one is a cumulative counter, which stores all the alarms (for example, all the voltage sags) from the beginning, and one is a 24h counter, that shows the alarms in the last 24 hours.
With the optional communication module (Modbus, Profibus, Profinet, etc.) eight counters for each power quality monitoring function are available: one is the cumulative and the other seven are the daily counters of the last seven days of activity.

Energy Measurements
Network Analyzer

Operating Principle

The Network Analyzer function performs continuous monitoring of the quality of energy, and shows all results through a display or communication module. In particular:

- **Hourly average voltage value:** in accordance with international Standards, this must remain within 10% of the rated value, but different limits can be defined according to the needs of the installation. The positive sequence voltage is compared with the limits. If the limits are exceeded, the Ekip Touch trip units generates a signaling event. The number of these events is stored in a counter. The counter values are available for each of last 7 days, as well as the total. The measures available are the positive and negative sequence voltages and positive and negative sequence currents of the last interval monitored. The time of the calculation of the average values can be set between 5 minutes and 2 hours.
- **Interruptions / short dips in voltage:** if the voltage remains below a threshold for more than 40ms, the Ekip Touch trip units generates an event that is counted in a dedicated log. The voltage is monitored on all lines.
- **Short voltage spikes** (voltage transients, spikes): if the voltage exceeds a threshold for 40ms, set for a pre-determined time, the Ekip Hi-Touch generates an event that is counted.
- **Slow voltage sags and swells:** when the voltage strays outside a range of acceptable limit values for a time greater than the one set, the Ekip Hi-Touch generates an event that is counted. Three values can be configured for voltage sags and two for voltage swells, each associated with a time limit: this enables verification of whether the voltage remains within a curve of values that are acceptable by equipment such as computers. The voltage is monitored on all lines.
- **Voltage imbalances:** if the voltage values are not equal or the phase displacements between them are not exactly 120°, an imbalance occurs, which is manifested with a negative sequence voltage value. If this limit exceeds the threshold value set, an event is stored which is counted.
- **Harmonic analysis:** the harmonic content of voltages and currents, measured to the 50th harmonic, as well as the value of the total harmonic distortion (THD), are available in real time on the display or through the communication modules. The Ekip Touch trip units also generates an alarm if the THD value or a magnitude of at least one of the harmonics exceeds the values set. The voltage and current values are monitored on all phases.

All information can be displayed directly on the screen or on a smartphone, a PC or in a network system with any of the communication modules. This is an embedded function of Ekip Touch trip units and analyzes important parameters of the distribution network including:

- The average Voltage value
- Short Voltage interruptions and spikes
- Slow Voltage sags and swells
- Voltage imbalance
- Harmonic analysis

Accessories

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Functional areas

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.



Standard supply

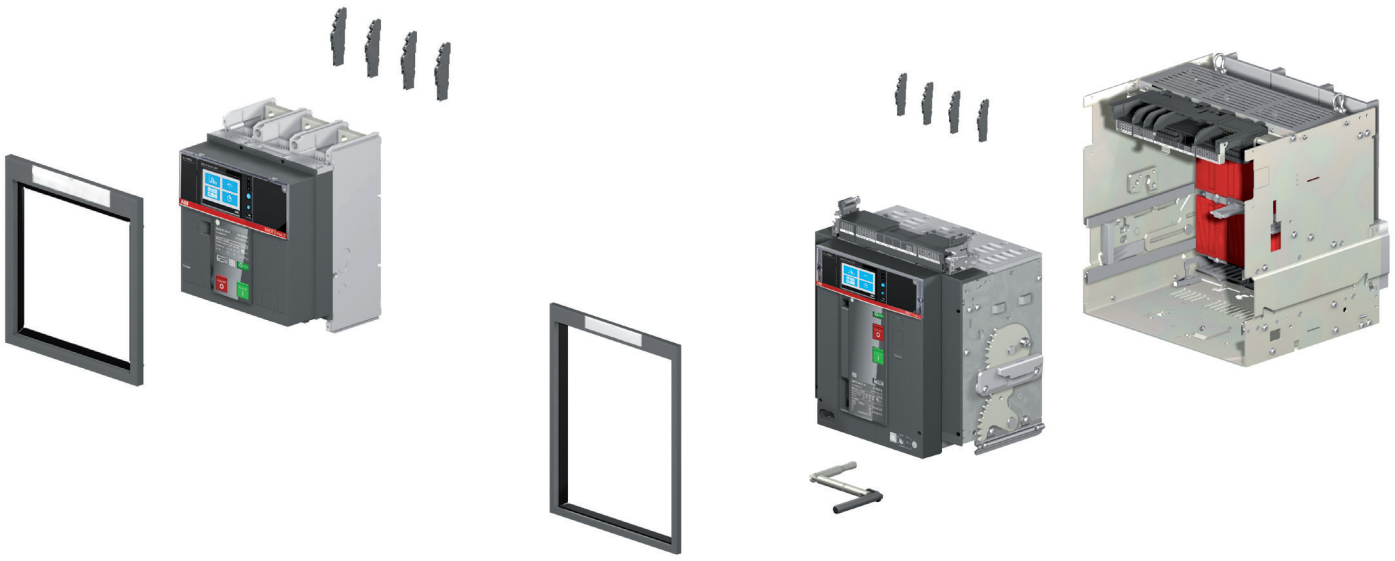
The fixed versions of SACE Emax 2 automatic circuit-breakers and switch-disconnectors are always supplied as standard with the following accessories:
- IP30 protection for switchgear door
- front terminals for E1.2 circuit-breaker
- adjustable rear terminals for E2.2 ... E6.2 circuit-breaker, mounted in HR – HR configuration.

In addition, for **fixed automatic circuit-breakers** only:
- four standard open/closed auxiliary contacts - AUX 4Q 400V
- four terminals for auxiliary connections
- mechanical signalling of the tripping of the protection trip unit - TU Reset
- contact signalling tripping of Ekip protection trip unit S51 250V.

The withdrawable versions of automatic circuit-breakers and switch-disconnectors are always supplied as standard with the following accessories:
- closed circuit-breaker racked-out mechanism lock
- lever for racking in and racking out
- anti-insertion lock.

In addition, for **withdrawable automatic circuit-breakers** only:
- four standard open/closed auxiliary contacts - AUX 4Q 400V
- four terminals for auxiliary connections
- mechanical signalling of the tripping of the protection trip unit - TU Reset
- contact signalling tripping of Ekip protection trip unit S51 250V.

The fixed parts feature:
- IP30 protection for switchgear door
- anti-insertion lock
- standard shutter lock – SL
- adjustable rear terminals, mounted in HR – HR configuration.



Accessories for circuit breakers

SACE Emax 2 circuit-breakers offer a wide range of accessories developed to meet the application and installation requirements of every customer.

	Automatic circuit-breaker		Switch-disconnector	
	E1.2	E2.2 - E4.2 - E6.2	E1.2	E2.2 - E4.2 - E6.2
Signalling				
Standard open/closed auxiliary contacts - AUX 4Q	● / ●●	● / ●●	○ / ○○	○ / ○○
Open/closed auxiliary contacts - AUX 6Q	-	○ / ○○	-	○ / ○○
Open/closed auxiliary contacts- AUX 15Q	○ / △	○ / △	○ / △	○ / △
Auxiliary position contacts - AUP	△	△	△	△
Ready to close signalling contact - RTC	○ / ○○	○ / ○○	○ / ○○	○ / ○○
TU Reset mechanical signalling of the tripping of protection trip unit - TU Reset	● / ●●	● / ●●	-	-
Contact signalling tripping of Ekip protection trip unit - S51	● / ●●	● / ●●	-	-
Second contact signalling tripping of Ekip protection trip unit - S51/2	-	○ / ○○	-	-
Contact signalling loaded springs – S33 M/2 (supplied with Motor)	○ / ○○	○ / ○○	○ / ○○	○ / ○○
Control				
Opening and closing release - YO/YC	○ / ○○	○ / ○○	○ / ○○	○ / ○○
Second opening and closing release - YO2/YC2	○ / ○○	○ / ○○	○ / ○○	○ / ○○
Undervoltage release - YU	○ / ○○	○ / ○○	○ / ○○	○ / ○○
Electronic time-delay device for undervoltage release - UVD	○ / ○○	○ / ○○	○ / ○○	○ / ○○
Motor - M	○ / ○○	○ / ○○	○ / ○○	○ / ○○
Remote reset - YR	○ / ○○	○ / ○○	-	-
Opening and closing release test unit - YO/YC Test Unit	○ / △	○ / △	○ / △	○ / △
Safety				
Key lock and padlock in open position - KLC and PLC	○ / ○○	○ / ○○	○ / ○○	○ / ○○
Key lock and padlock in racked-in / test / racked-out position - KLP and PLP	△	○○	△	○○
Shutter lock - SL	▲	▲	▲	▲
Fail Safe	●	●	●	●
Lock for racking-out mechanism with circuit-breaker in closed position	▲	●●	▲	●●
Lock for racking in / racking out the mobile part when the door is open - DLR	-	△	-	△
Lock to prevent door opening when circuit-breaker is in racked-in / test position - DLP	-	△	-	△
Lock to prevent door opening when circuit-breaker is in closed position - DLC	○ / ○○	○ / ○○	○ / ○○	○ / ○○
Anti-insertion lock	● / ●●	● / ●●	● / ●●	● / ●●
Mechanical operation counter - MOC	○ / ○○	○ / ○○	○ / ○○	○ / ○○
Protection devices				
Protection device for opening and closing pushbuttons - PBC	○ / ○○	○ / ○○	○ / ○○	○ / ○○
IP30 Protection	● / ▲	● / ▲	● / ▲	● / ▲
IP54 Protection	○ / △	○ / △	○ / △	○ / △
Terminal covers - HTC / LTC	○ / ○○	-	-	-
Separators - PB	○ / △	○ / △	○ / △	○ / △
Connections				
Orientable rear terminal - HR/VR	○ / ▲	● / ▲	○ / ▲	● / ▲
Front terminal - F	●	○ / △	●	○ / △
Other configurations	○ / △	○ / △	○ / △	○ / △
Interlocks and switching devices				
Mechanical interlock - MI	○ / ○○ / △	○ / ○○ / △	○ / ○○ / △	○ / ○○ / △
Automatic transfer switches - ATS **	○ / ○○	○ / ○○	○ / ○○	○ / ○○

● Standard accessory for fixed circuit-breaker
○ Accessory on request for fixed circuit-breaker
●● Standard accessory for mobile part
○○ Accessory on request for mobile part
▲ Standard accessory for fixed part
△ Accessory on request for fixed part
* Only closing release YC
** IEC only

Signalling

Open / closed auxiliary contacts - AUX (Fig. 01A/B/C)

SACE Emax 2 circuit-breakers can be equipped with auxiliary contacts that signal the open or closed status of the circuit-breaker. The first block of four standard contacts is always provided with the automatic circuit-breakers. The switching contacts are available in the following configurations:

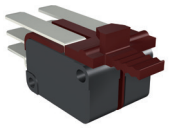


Fig. 01-A

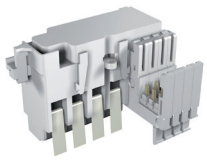


Fig. 01-B



Fig. 01-C

Open / closed auxiliary contacts (AUX 4Q)		E1.2	E2.2 ... E6.2
4 auxiliary contacts	standard	●	●
	digital signals	●	●
	mixed	●	●
Open / closed supplementary auxiliary contacts (AUX 6Q)			
6 auxiliary contacts	standard	-	●
	digital signals	-	●
	mixed	-	●
Open / closed external supplementary auxiliary contacts (AUX 15Q)			
15 auxiliary contacts	standard	●	●
	digital signals	●	●
Maximum number of open / closed auxiliary contacts that can be installed		19	25

		Standard contact	Contact for digital signals
Type		changeover contacts	changeover contacts
Minimum load		100mA @ 24V	1mA @ 5V
Breaking capacity			
DC	24V	~0	0.1A
	125V	0.3A @ 10ms	-
	250V	0.15A @ 10ms	-
AC	250V	5A @ cosφ 1	-
		5A @ cosφ 0.7	-
		5A @ cosφ 0.3	-
	400V	3A @ cosφ 1	-
		2A @ cosφ 0.7	-
		1A @ cosφ 0.3	-

Electrical diagram reference: figures 1, 81, 91

Aux 6Q is an alternative to the Ekip Signalling 4K module. AUX 15Q is an alternative to the mechanical interlock (MI), the DLC for E1.2 lock or the DLP lock if mounted on the right side.

Accessories for circuit breakers



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Fig. 02-A



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Fig. 02-B

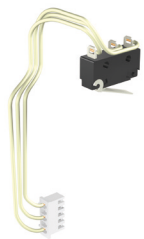
Auxiliary position contacts - AUP (Fig. 02A/B)

When the circuit breaker is a withdrawable version, the position of the mobile part can be signalled electrically by accessorizing the fixed part with one of the following signalling contact units:

Auxiliary position contacts (AUP)		**E1.2**	**E2.2 ... E6.2**
6 auxiliary contacts	standard	●	-
	digital signals	●	-
5 auxiliary contacts	standard	-	●
	digital signals	-	●
5 supplementary auxiliary contacts	standard	-	●
	digital signals	-	
Maximum number of auxiliary position contacts that can be installed		6	10

		Standard contact	**Contact for digital signals**
Type		changeover contacts	changeover contacts
Minimum load		100mA @ 24V	1mA @ 5V
Breaking capacity			
DC	24V	-	0.1A
	125V	0.3A @ 0ms	-
	250V	0.15A @ 0ms	-
AC	250V	5A @ cosφ 1	-
		5A @ cosφ 0.7	-
		5A @ cosφ 0.3	-
	400V	3A @ cosφ 1	-
		2A @ cosφ 0.7	-
		1A @ cosφ 0.3	-

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Electrical diagram reference: figures 95, 96, 97



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Fig. 03

Ready to close signalling contact - RTC (Fig. 03)

The ready to close signalling contact – RTC – indicates that the circuit-breaker is ready to receive the closing command. The circuit-breaker is ready to close when the following conditions have been met:

- circuit-breaker open
- springs loaded
- no opening command or locks on the opening command
- circuit-breaker reset following tripping of Ekip protection trip unit
- YU energized.

		Standard contact	**Contact for digital signals**
Type		Switching	
Minimum load		100mA @ 24V	1mA @ 5V
Breaking capacity			
DC	24V	-	0.1
	250V	0.5A @ 0ms / 0.2A 10ms	-
AC	250V	3A @ cosφ 0.7	-

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Electrical diagram reference: figure 71

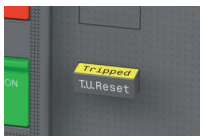


Fig. 04

Mechanical signalling of the tripping of protection trip unit - TU Reset (Fig. 04)
The automatic circuit-breakers are always equipped with a mechanical device that signals the tripping status of the protection trip units. After the Ekip trip unit has tripped due to an electrical fault, the signalling device indicates the tripping status on the front of the circuit- breaker. The circuit-breaker can be reset only after the signalling pushbutton has been restored to its normal operating position. The device conforms to the Ansi 86T standard.
Emax 2 is fitted with the anti-pumping function. With the anti-pumping function the opening order always takes priority over a closing order. Moreover, when the Circuit Breaker is in open position due to a trip, the anti-pumping function allows the reclosing of the operating mechanism only after a reset of the trip, avoiding improper or accidental closing.



Fig. 05

Contact signalling tripping of protection trip unit Ekip – S51 (Fig. 05)
The contact signals the opening of the circuit- breaker after the Ekip protection trip unit has tripped. The circuit-breaker can only be closed after the “TU Reset” tripped trip unit mechanical signalling pushbutton has been restored to its normal operating position.
The switching contact, which is always supplied with the standard version of the automatic circuit-breakers, is also available on request in a version for digital signals (for electrical characteristics, please refer to the RTC contact). It can also be associated with an optional accessory for resetting by remote control - YR. For electromechanical characteristics, please refer to the RTC contact.
For E2.2, E4.2 and E6.2 it is possible to double the signal for the tripping of the Ekip Trip Unit specifying the dedicated code for the S51/2. The S51/2 is an alternative of the YR contact.

Electrical diagram reference: figure 11

Contact signalling loaded springs – S33 M/2
This contact is always supplied with a geared motor; it remotely signals the spring status of the circuit-breaker operating mechanism. It is available in both standard version and version for digital signals.

		Standard contact	Contact for digital signals
Type		changeover contacts	changeover contacts
Minimum load		100mA @ 24V	1mA @ 5V
Breaking capacity			
DC	24V	-	0.1A
	125V	0.3A @ 0ms	-
	250V	0.15A @ 0ms	-
AC	250V	5A @ cosφ 1	-
		5A @ cosφ 0.7	-
		5A @ cosφ 0.3	-
	400V	3A @ cosφ 1	-
		2A @ cosφ 0.7	-
		1A @ cosφ 0.3	-

Electrical diagram reference: figure 12

Accessories for circuit breakers

Control

Opening and closing release- YO/YC (Fig. 06)

The opening and closing releases enable the circuit-breaker to be controlled remotely. Opening is always possible, while closing is available only when the closing springs of the operating mechanism are loaded and the circuit-breakers is ready to close. The releases operate by means of minimum impulse current duration time of 100 ms.

They can also operate in permanent service. If opening command is given by means of the opening release, the circuit-breaker can be closed by de-energizing the opening release and, after a time of at least 30 ms, by controlling the closing.

The circuit breaker operating mechanism has an anti-pumping function that helps ensure safety and reliability.

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Electrical diagram reference: figures 75, 77



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Fig. 06

Second opening and closing release - YO2/YC2

For certain installations the redundancy of mechanisms and circuit-breaker operating circuits is often requested. To address these needs, the SACE Emax 2 circuit-breakers can be equipped with double opening release and double closing release. The technical characteristics of the second opening release remain the same as those of the first opening and closing release. A double closing release can be used for E2.2, E4.2 and E6.2 circuit-breakers; a second open release in an alternative to undervoltage release.

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Electrical diagram reference: figures 72, 79

General characteristics			
Power supply (Un)		**AC**	**DC**
	24V	●	●
	30V	●	●
	48V	●	●
	60V	●	●
	110V...120V	●	●
	120V...127V	●	●
	220V...240V	●	●
	240V...250V	●	●
	380V...400V	●	-
	415V...440V	●	-
	480V...500V	●	-
Operating limits (IEC60947-2 standards)		YO/YO2: 70%...110% Un YC/YC2: 85%...110% Un	
Inrush power (Ps)		300VA	300W
Continuous power (Pc)		3.5VA	3.5W
Opening time (YO/YO2)			
	E1.2	35 ms	
	E2.2 ... E6.2	55 ms	
Closing time (YC/YC2)			
	E1.2	50 ms	
	E2.2 ... E6.2	70 ms	

Opening and closing release test unit - YO/YC Test Unit

The opening and closing releases test unit helps ensure that the various version of releases are running smoothly, to provide a high level of reliability in controlling circuit-breaker opening.
The test unit helps ensure the continuity of the opening and closing releases with a rated operating voltage between 24V and 250V (AC and DC), as well as verifies the functions of the opening and closing coil electronic circuit. Continuity is checked cyclically with an interval of 30s between tests. The unit has optic signals via LEDs on the front, which provide the following information:
POWER ON: correct power supply of the YO/YC Test Unit
OPEN ON: coil switch absent, power supply absent or insufficient, interrupted cables
SHORT ON: coil switch failure, short-circuited cables
OPEN and SHORT FLASHING: faulty coil switch or incorrect supply
OPEN and SHORT OFF: correct operation of the coil switch.
Two relays with one change-over area also available on board the unit, to allow remote signalling of the following events:
Failure of a test - resetting takes place automatically when the alarm stops
Failure of three tests - resetting occurs only by pressing the manual RESET on the unit.

Characteristics of device		
Auxiliary power supply		24V...250V AC/DC
Specification of the signalling relays		
	Maximum interruped current	6A
	Maximum interrupted voltage	250V AC

Undervoltage release – YU (Fig. 07)

The undervoltage release opens the circuit- breaker when there is a significant voltage drop or power failure. It can be used for safe remote tripping, for blocking closing or to control the voltage in the primary and secondary circuits. The power supply for the release is therefore obtained on the supply side of the circuit-breaker or from an independent source. Circuit-breaker closing is permitted only when the release is powered. The undervoltage release is an alternative to as second shunt trip or the anti-racking out device. The circuit-breaker is opened with trip unit power supply voltages of 35-70% Un. The circuit-breaker can be closed with a trip unit power supply voltage of 85-110% Un.



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Fig. 07

General characteristics			
Power supply (Un)		AC	DC
	24V	●	●
	30V	●	●
	48V	●	●
	60V	●	●
	110V...120V	●	●
	120V...127V	●	●
	220V...240V	●	●
	240V...250V	●	-
	380V...400V	●	-
	415V...440V	●	-
	480V...500V	●	-
Inrush power (Ps)		300VA	300W
Continuous power (Pc)		3.5VA	3.5W
Opening time (YU)			
	E1.2	30 ms	
	E2.2 ... E6.2	50 ms	

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Electrical diagram reference: figure 73

Accessories for circuit breakers

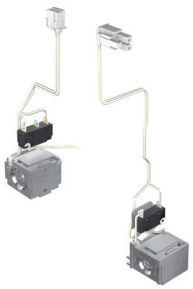


Fig. 08

Time-delay device for undervoltage release (UVD) (Fig. 08)

The undervoltage release can be combined with an electronic time-delay device for the circuitbreaker, allowing for delayed external tripping with adjustable preset times. Use of the delayed undervoltage trip unit is recommended to prevent tripping when the power supply network for the trip unit is subject to brief voltage drops or power supply failures. Circuit-breaker closing is inhibited when it is not powered. The time-delay device must be used with an undervoltage release with the same voltage.

General characteristics			
Power supply (UVD)		AC	DC
	24-30V	-	●
	48V	●	●
	60V	●	●
	110-127V	●	●
	220-250V	●	●
Adjustable opening time (YU + D):		0.5-1-1.5-2-3 s	

Resetting remotely- YR

The reset coil YR permits remote resetting of the circuit-breaker after a release has tripped due to an overcurrent condition. It is available for all automatic circuit-breakers, in different voltage supply:

General characteristics			
Power supply (Un)		AC	DC
	24V	●	●
	110V	●	●
	220V	●	●
Operating limits		90%...110% Un	

Electrical diagram reference: figure 4

Motor – M (Fig. 09A/B)

The motor automatically loads the closing springs of the circuit-breaker. The device, which can be installed from the front, automatically reloads the springs of the operating device when they are unloaded and power is present. In the event no power is present, the springs can be manually loaded by a dedicated lever on the operating device. The motor is always supplied with the limit switch contact S33 M/2 which signals the status of the springs.

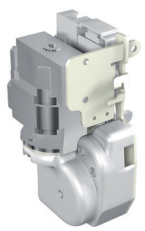


Fig. 09A



Fig. 09B

General characteristics			
Power supply (Un)		AC	DC
	24V-30V	●	●
	48V-60V	●	●
	100V...130V	●	●
	220V...250V	●	●
Operating limits (IEC60947-2 standards)		85%...110% Un	
Inrush power (Ps)		300VA E1.2 500VA E2.2 ... E6.2	300W E1.2 500W E2.2 ... E6.2
Inrush time		200ms	
Continuous power (Pc)		100VA E1.2 150VA E2.2 ... E6.2	100W E1.2 150W E2.2 ... E6.2
Charging time			
	E1.2	8 sec	
	E2.2 ... E6.2	7 sec	

Electrical diagram reference: figure 13



Fig. 10



Fig. 11



Fig. 12



Fig. 13

Safety

Key lock in open position - KLC (Fig. 10)

Due to these safety devices, the SACE Emax 2 circuit-breaker can be locked in the open position. The lock can also be used during maintenance activities when the accessory cover is removed. The device is available with lock with different keys – KLC-D (for only one circuit- breaker) or with the same keys – KLC-S (for several circuit-breakers). Four different key numbers are available for the KLC-S. SACE Emax 2 also allows an alternative key lock to be installed. The following key lock set-ups are also available:

- Ronis
- STI
- Kirk
- Castell

For the special ones the key lock must be supplied by the customer.
A lever can be installed on the withdrawable circuit-breaker, along with a lock on the fixed part, that serves the same purpose. This method is considered safer since it prevents the insertion of any another circuit-breaker.

Padlocks - PLC (Fig. 11) *

These padlock options allow the circuit-breaker to be kept open by acting directly on the mechanical operating device (opening pushbutton). Three different padlock versions, which are an alternative to the PBC, are available:

- Locking device with plastic structure for up to a maximum of three padlocks of 4 mm
- Locking device with metal structure for up to a maximum of two padlocks of 8 mm
- Locking device with metal structure for one padlock of 7 mm or for padlock holders

The padlocks must be supplied by the customer.

Key lock in racked-in / test / racked-out position - KLP (Fig. 12)

The KLP enables the mobile part to be locked in one of the three positions: racked-in, test and racked-out. It can be supplied with locks with different keys – KLP-D or with the same keys – KLP-S. A second key lock option can be added for a maximum of two key locks per breaker. Locking in the racked-in, test and racked-out positions can be achieved by using other key locks – KLP-A.
Adapters are offered for acceptance of Ronis, STI, Kirk and Castell locks, which are to be provided by the customer. With the exception of the Castell version, every circuit-breaker can accept up to two key locks. Locking can be limited to the racked-out position with a supplementary accessory.

Padlock in racked-in / test / racked-out position - PLP (Fig. 13) *

The PLP can hold up to three padlocks of 8 mm in diameter. The structure housing the padlocks can also be used in combination with the 2 lock KLP keylock option. It also enables the lock of the moving part only in the racked-out position by means of the supplementary lock in racked-out position.

Shutter lock – SL

When the mobile part is in the test position, the shutters of the fixed part close, maintaining the insulation distance and physically segregating the live parts of the of the cradle from the internal breaker compartment of the cradle. Using two dedicated mechanisms, the upper and lower shutters can be locked independently of one another. The shutter lock is always supplied with the fixed part of the SACE Emax 2 circuit-breakers and locks the shutters, using a maximum of three padlocks of 4 mm, 6 mm or 8 mm.

Anti-racking out device / Fail safe - FS

The anti-racking out, or fail safe device prevents the moving part of withdrawable circuit-breakers from being racked out of the cradle when the springs are charged. It is always supplied with the moving part of UL circuit-breakers and switch disconnectors. It is an alternative to the undervoltage coil or second shunt coil.

***** Compliant with OSHA 3120 up to 50 pounds

Accessories for circuit breakers



Fig. 14

Protection devices

Lock for racking-out mechanism with circuit- breaker in closed position (Fig. 14)
All SACE Emax 2 withdrawable circuit-breakers are always supplied with a lock that prevents the mobile part from being racked in and racked out when the circuit- breaker is in the closed position. To rack in the mobile part, the circuit-breaker must be in the open position.

Lock for racking in / racking out the mobile part when the door is open - DLR
The DLR accessory, which is mounted on the fixed part, prevents the mobile part from being racked in or out when the switchgear door is open.



Fig. 15

Lock to prevent door opening when the circuit- breaker is in racked-in / test position - DLP (Fig. 15)
The DLP safety device prevents the switchgear door from being opened when the mobile part of the withdrawable version of the circuit-breaker is in the racked-in or test position. This accessory can be installed on either the right-hand or left-hand side of the fixed part. It is available for circuit- breakers E2.2, E4.2 and E6.2. If mounted on the right side, it is an alternative to the mechanical interlock, the AUX 15Q or the DLC.



Fig. 16

Lock to prevent door opening when the circuit- breaker is in the closed position - DLC (Fig. 16)
The DLC prevents the compartment door from being opened when the circuit-breaker is in the closed position (and with the circuit-breaker racked in for withdrawable circuit-breakers).
It also blocks the circuit breaker from closing when the compartment door is open. DLC for E1.2 is an alternative to the mechanical interlock and the AUX 15Q. DLC direct door for E2.2...E6.2 is compatible with mechanical interlocks type A-B-D and the AUX 15Q. DLC cable door for E2.2...E6.2 is not compatible with mechanical interlock. DLC cable door for E2.2... E6.2 is compatible with the AUX 15Q.

Anti-insertion lock
The withdrawable circuit-breakers are equipped with special locks that allow the mobile part to be inserted only into the corresponding fixed part.

Mechanical operation counter - MOC (Fig. 17)
The number of mechanical operations is often one of the elements that determines the frequency of ordinary maintenance operations on circuit-breakers. With this mechanical operation counter, which is always visible on the front of the circuit-breaker, the user knows how many mechanical operations the device has performed.



Fig. 17





—
Fig. 18

Protection device for opening and closing pushbuttons - PBC (Fig. 18)
The PBC accessory is applied to the safety cover of the circuit-breaker and is available in two versions:
- Pushbutton protection device, which blocks operations on both the opening and closing pushbuttons unless the special key is used.
- Padlockable pushbutton protection device, which makes it possible to block either or both pushbuttons and lock the covers in place. It does not trip the breaker as a standard "Padlock device" would.
- PBC is an alternative to PLC padlocks.

IP30 Protection (Fig. 19)
Supplied with every circuit-breaker, the cover frame is installed on the door of the switchgear to achieve IP30 degree of protection on the front part of the circuit-breaker.

IP54 Protection
This transparent cover completely protects the front of the circuit-breaker, enabling an IP54 degree of protection to be achieved. This accessory is provided with double key lock (same or different keys).



—
Fig. 19

Terminal covers – HTC / LTC (Fig. 20)
The HTC and LTC accessories are installed over in the terminal area, thereby reducing the risk of direct contact with the live parts of the circuit-breaker. Two versions are available for E1.2: HTC high terminal covers and LTC low terminal covers.

Separators - PB (Fig. 21)
These protection devices increase the insulation distance between adjacent phases. They are available for all the frames.



—
Fig. 20

Remote Racking Device - RRD
The Remote Racking Device (RRD) operates Emax 2 circuit breakers without being in front of the gear. The remote control is connected to the main device through 10mt cable that allows the Racking-in/out command from a remote location. The cable length provides enough distance from the arc flash boundary of traditional low voltage switchgears. The RRD can only operate with the circuit breaker in open position and discharged springs. The RRD for switchgear and controlgear has been investigated by UL in accordance with the Standards UL 2876 and CSA-C22.2 (n.14).



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Fig. 21

General charateristics

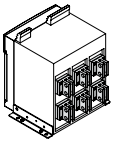
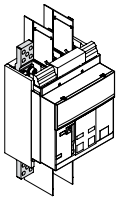
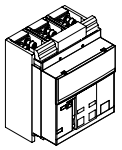
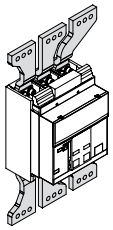
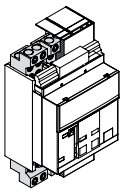
Rated service voltage	100...127V AC
	200...240V AC/DC
Frequency	50-60Hz
Rated power	150 W, 120VA
Working and storage temperature range	-5°C...+70°C / 23°F...158°F
Minimum time interval between operation	3 minutes
Maximum operating distance	100m / 33ft
Weight	11Kg / 24.3lb

Accessories for circuit breakers

Connections

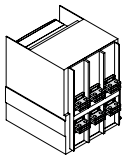
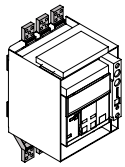
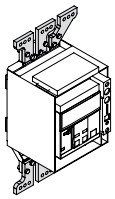
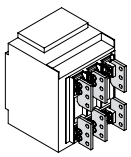
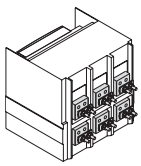
The SACE Emax 2 circuit breakers offer a wide variety of terminals, thereby providing an optimal solution for connection to the power circuit.

Solution for fixed circuit breakers

Type	Abbreviation		E1.2	E2.2	E4.2	E6.2
Rear adjustable terminal *	HR VR		Single stab design ○ Multiple stab design	● Iu = 2000A	● Iu = 3600A *	● Iu = 6000A
Extended front terminal **	EF		○			
Front terminal **	F		●	○	○	○
Front spread terminal **	ES		○			
Terminal for cable FcCuAl 4x500kcmil / 240mm2 **	FcCuAl		○			

● Standard configuration
○ Configuration on request
(*) The adjustable terminals are supplied as standard in the HR – HR configuration, with exception for E4.2 L version, E4.2 3200A/3600A and E6.2 6000A in which they are supplied in VR - VR configuration.
(**) Not UL listed

Solutions for fixed parts, withdrawable circuit breakers

Type	Abbreviation		E1.2	E2.2	E4.2	E6.2
Rear adjustable terminal *	HR VR		Single stab design ●			
			Multiple stab design	● Iu = 2000A	● Iu = 3200A *	● Iu = 6000A
Extended front terminal **	EF		○			
Front spread terminal **	ES		○			
Terminal for cable FcCuAl 4x240mm² **	Fc CuAl		○			
Flat terminal **	FL			○	○	○

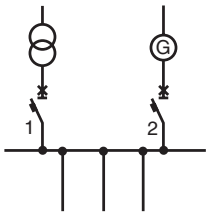
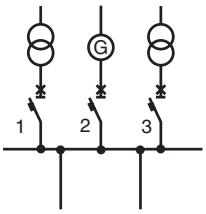
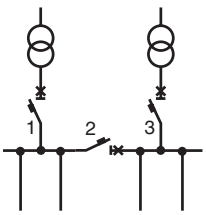
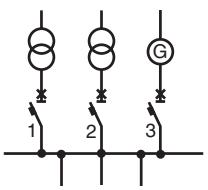
● Standard configuration
○ Configuration on request
(*) The adjustable terminals are supplied as standard in the HR – HR configuration, with exception for E4.2 L version, E4.2 3200A and E6.2 6000A in which they are supplied in VR - VR configuration.
(**) Not UL listed

Accessories for circuit breakers

Interlocks and switching devices

Mechanical interlocks

These interlock systems enable various opening and closing configurations to be obtained between two or three circuit-breakers. Four types of interlock configuration are available:

Types of interlock	Possible application	Logic	Circuit-breakers
Type A			
Excludes the possibility of having two circuit-breakers in the closed position at the same time.	Main line power supply and emergency power supply. 	1 2 O O I O O I	Available between circuit-breakers of different sizes and with any fixed / withdrawable version
Type B			
Permits a pair of circuit-breakers to be closed if the third is open. The latter can only be closed when the pair is open.	Two power supplies from transformers and one emergency power supply. 	1 2 3 O O O I O O O O I I O I O I O	Available between E2.2, E4.2 and E6.2 circuit-breakers and with any fixed / withdrawable version
Type C			
Permits two out of three circuit-breakers to be closed at the same time.	Two half-busbars can be powered by a single transformer (bus-tie closed) or by both at the same time (bus-tie open). 	1 2 3 O O O I O O O I O O O I O I I I I O I O I	Available between E2.2, E4.2 and E6.2 circuit-breakers and with any fixed / withdrawable version
Type D			
Permits one out of three interlocked circuit-breakers to be closed.	Three power supplies on the same busbar that must not operate in parallel. 	1 2 3 O O O I O O O I O O O I	Available between E2.2, E4.2 and E6.2 circuit-breakers and with any fixed / withdrawable version

The mechanical interlocks offer multiple solutions for installation that simplify their integration into the switchgear. The interlocks can be mounted:
- vertically VR
- horizontally HR
- mixed L

Different types of interlocks can be supplied according to the maximum distance between two interlocked breakers:

Configuration		Type A	Type B, C, D
Horizontal		2750mm	1600mm
Vertical		1000mm	1000mm
Breakers	E1.2	●	-
	E2.2	●	●
	E4.2	●	●
	E6.2	●	●

For B, C and D types, the maximum distance between the two furthest breakers is 3200mm for horizontal configurations and 2000mm for vertical configurations. It is possible to make the mechanical interlock among three circuit-breakers disposed in 'L position' by using the cables of three horizontal circuit-breakers interlock. The distance between the horizontal and vertical circuit- breakers must mantain the minimum and maximum distance. All cables can be cut to provide easy installation in switchboards.
Mechanical interlocks are not compatible with AUX 15Q, the lock for preventing door opening when the circuit breaker is in the closed position (DLC) or when the circuit breaker is in the racked in or test position (DLP). if mounted on the right side.

External Automatic Transfer Switches ATS
The ATS (Automatic Transfer Switch) is a network-unit transfer device used in installations where switching from the main power line to an emergency line is required in order to ensure that power is supplied to the loads in the case of power loss or abnormalities from the main line. These devices are able to control the entire transfer procedure automatically, but also offer commands for performing the procedure manually.
The new generation of ATSs (ATS021 and ATS022) offers the most advanced and complete solution for ensuring service continuity.

The ATS021 and ATS022 devices can also be used with all automatic circuit-breakers and switch-disconnectors of the Tmax XT family. The ATS021 and ATS022 devices have been designed to be self-powered. ATS022 is also designed for the connection of an auxiliary supply, which enables the use of further functions.
The ATS021 and ATS022 devices carry out control of both power supply lines and also analyze:
- phase imbalance;
- frequency imbalance;
- phase loss.

In addition to the standard control functions, the ATS022 unit also permits:
- the priority line to be selected;
- a third circuit-breaker to be controlled;
- the device to be integrated into a supervision system with Modbus communication (auxiliary supply needed);
- parameters to be read and set, and measurements and alarms to be displayed by means of a graphical display.

Typical applications are: supply of UPS (Uninterrupted Power Supply) units, operating rooms and primary hospital services, emergency power for civil buildings, airports, hotels, databases and telecommunication systems and power supply of industrial lines in continuous processes.
For correct configuration, each circuit-breaker connected to the ATS021 or ATS022 device must be fitted with the following accessories:
- mechanical interlock;
- motorized control of opening and closing;
- contact for signalling status (open / closed) and contact for signalling tripping;
- contact for signalling circuit-breaker racked in (for withdrawable circuit-breaker).

Accessories for circuit-breakers





Technical characteristics

			ATS021	ATS022
General	Auxiliary supply voltage		Not required	Not required (24-110V DC is required only for Modbus communication and systems of 16 2/3 Hz)
	Supply voltage, Un		Max 480V AC	Max 480V AC
	Frequency, fn		50, 60 Hz	16 2/3, 50, 60, 400 Hz
	Dimensions 	H mm	96	96
		W mm	144	144
		D mm	170	170
	Type of installation		Installation on front of switchgear Installation on DIN rail	Installation on front of switchgear Installation on DIN rail
	Operating mode		Automatic/Manual	Automatic/Manual
Characteristics	Monitoring of normal and emergency line		●	●
	Control of circuit-breakers on normal and emergency line		●	●
	Setting start-up of generator		●	●
	Setting switch-off of generator with settable time delay		●	●
	Third circuit-breaker		-	●
	Selection priority line		-	●
	Modbus Rs485 communication		-	●
	Display		-	●
Environmental conditions	Protection degree		IP20*	IP20*
	Operating temperature		-20 ... +60 °C	-20 ... +60 °C
	Humidity		5% - 90% without condensation	5% - 90% without condensation
Operating thresholds	Undervoltage		-30% ... -5% Un	-30% ... -5% Un
	Overvoltage		+5% ...+30% Un	+5% ...+30% Un
	Frequency thresholds		-10% / +10% fn	-10% ... +10% fn
Tests	Test Mode		●	●
	Mode Test Gen set		●	●
Standards	Electronic devices for use in electrical installations		EN-IEC 50178	EN-IEC 50178
	Electromagnetic compatibility		EN 50081-2	EN 50081-2
			EN 50082-2	EN 50082-2
	Environmental conditions		IEC 68-2-1	IEC 68-2-1
			IEC 68-2-2	IEC 68-2-2
			IEC 68-2-3	IEC 68-2-3

Electrical diagram reference: figures 100,101 and 102.
* IP54 available with 1SCA101001R1001 accessory

Accessories for Ekip trip units

The electronic trip unit accessories enable utilization of all the potential of Ekip protection trip units in terms of signalling, connectivity, protection functions and testing.

	Electronic trip unit				
	Ekip DIP	**Ekip Touch**	**Ekip Hi-Touch**	**Ekip G Touch**	**Ekip G Hi-Touch**
Power supply					
Ekip Supply	○	○	○	○	○
Battery for Ekip trip units	○	○	○	○	○
Connectivity					
Ekip Com		○	○	○	○
Ekip Com Redundant		○	○	○	○
Ekip Com Actuator	○	○	○	○	○
Ekip Link	○	○	○	○	○
Signalling					
Ekip Signalling 2K		○	○	○	○
Ekip Signalling 3T		○	○	○	○
Ekip Signalling 4K (1)		○	○	○	○
Ekip Signalling 10K	○	○	○	○	○
Ekip Signalling Modbus TCP	○	○	○	○	○
Ekip AUP	○	○	○	○	○
Ekip RTC	○	○	○	○	○
Measurement and Protection					
Measurement Enabler with voltage sockets		○	●	●	●
Measurement Enabler		● (2)			
Ekip Synchrocheck		○	○	○	○
Ekip LCD		○	○	○	○
Rating Plug	○	○	○	○	○
Homopolar toroid		○	○	○	○
Toroid for differential protection		○	○	○	○
Current sensor for neutral conductor outside the circuit-breaker	○	○	○	○	○
Displaying and Supervision					
Ekip Multimeter	○	○	○	○	○
Ekip Control Panel (3)	○	○	○	○	○
Testing and Programming					
Ekip TT	○	○	○	○	○
Ekip T&P	○	○	○	○	○
Ekip T&P: Ekip Programming	○	○	○	○	○

● Standard accessory
○ Accessory on request
(1) Not available for E1.2
(2) Measurements to be activated with the dedicated software package
(3) Available for Ekip trip units, Grey Platform only

Accessories for Ekip trip units

All accessories are automatically recognized by the Ekip units without the need for any specific configuration. Based on the installation method and connection of the trip units, the electronic accessories can be divided into:

Installation	Modules	Highlights
Terminal box	Cartridge modules: - Ekip Com - Ekip Link - Ekip Signalling 2K - Ekip Signalling 3T - Ekip Supply - Ekip Synchrocheck	- The Ekip Supply module enables the trip units to be supplied with a wide range of control voltages
		- The Ekip supply module must be present for the other modules to be used
		- The Ekip Supply module has a dedicated position in the installation area in the terminal box; the other modules can be installed as desired in the positions available
		- When fitted with the Ekip Supply module, up to 2 additional modules can be installed on E1.2, and up to 3 on E2.2, E4.2 and E6.2
Accessorizing area	Ekip LCD Ekip Com Actuator Ekip RTC Ekip AUP Ekip Signalling 4K Rating Plug Battery for Ekip	- These are installed in specific housings from the front of the circuit-breaker
		- For all the trip units with a touch screen interface, an LCD version is available with any adjustment in the protection and measurements functions
		- Thanks to the optional modules Ekip RTC and Ekip AUP, all the Ekip trip units can acquire and monitor the ready to close state and the racked-in/test isolated/racked-out position of the circuit-breaker. The module to acquire the open/closed position is supplied as standard for all Ekip trip units.
		- The Ekip Signalling 4k module increases the remote signalling possibilities for E2.2, E4.2 and E6.2 and can be installed if the Ekip Supply module or another 24V auxiliary power supply is present
Ekip trip unit test port	Ekip T&P Ekip TT	- These can be connected to the front test port of the trip units even with the device in operation
		- Compatible also with the SACE Tmax XT range
External	Ekip Multimeter Ekip Control Panel Ekip Signalling 10K Ekip Signalling Modbus TCP	- Ekip Multimeter can supply a 24V DC output to the trip unit it is connected to
		- Several Ekip units and / or Ekip Signalling 10K can be connected at the same time to the same Ekip trip unit
	External neutral sensor Homopolar toroid Differential toroid	- These are connected to the trip unit by the terminal box of the circuit-breaker

Power supply

Ekip Supply module (Fig. 23)

The Ekip Supply module supplies all Ekip trip units and modules present on the terminal box and of the circuit-breaker with several auxiliary power (in AC or DC) available in the switchgear. The module is mounted in the terminal box and permits the installation of the other advanced modules. It can be field installed at any time.

Two versions are available according to the control voltage available:

- Ekip Supply 110-240V AC/DC
- Ekip Supply 24-48V DC



Fig. 23

	Supply	Ekip Supply	
Ekip Dip	**Nominal voltage**	24-48V DC	110-240V AC/DC
	Voltage range	21,5-53V DC	105-265V AC/DC
	Rated power (including modules)	10W max.	10W max.
	Inrush current	~2A for 20ms	~2A for 20ms
Ekip Touch/ Hi-Touch	**Nominal voltage**	24-48V DC	110-240V AC/DC
	Voltage range	21,5-53V DC	105-265V AC/DC
	Rated power (including modules)	10W max.	10W max.
	Inrush current	~2A for 20ms	~2A for 20ms

Connectivity

Ekip Com modules (Fig. 24)

The Ekip communication modules enable SACE Emax 2 circuit-breakers to be integrated in an industrial communication network for remote supervision and control of the circuit-breaker. They are suitable for all distribution and generator protection versions of the Ekip Touch and Hi-Touch trip units. Since they are mounted in the terminal box, communication can be maintained with withdrawable circuit-breakers, even while in the racked-out position. Several Ekip Com modules can be installed at the same time, thereby enabling connection to communication systems that use different protocols.

The Ekip Com modules for Modbus RTU, Profibus-DP and DeviceNet™ contain a terminating resistor and dip switch for optional activation to terminate the serial network or bus.

The Profibus-DP module also contains a polarization resistor and dip switch for its activation.

The Ekip Com modules are supplied with auxiliary position contacts Ekip AUP and ready to close circuit-breaker contacts Ekip RTC.

For industrial applications in which a higher reliability of the communication network is required, the Ekip Com Redundant modules can be installed together with the corresponding Ekip Com modules in order to provide a back-up connection to the network.



Fig. 24

The following communication protocols are available for Ekip trip units:

Protocol	Ekip Com Module	Ekip Com Redundant Module
Modbus RTU	Ekip Com Modbus RS-485	Ekip Com R Modbus RS-485
Modbus TCP	Ekip Com Modbus TCP	Ekip com R Modbus TCP
Profibus-DP	Ekip Com Profibus	Ekip Com R Profibus
Profinet	Ekip Com Profinet	Ekip Com R Profinet
EtherNet/IP™	Ekip Com EtherNet/IP™	Ekip Com R EtherNet/IP™
DeviceNet™	Ekip Com DeviceNet™	Ekip Com R DeviceNet™
IEC61850	Ekip Com IEC61850	Ekip Com R IEC61850
Cloud connectivity	Ekip Com Hub	–

Electrical diagram reference: figures from 51 to 57. Redundant version from 61 to 66.

Accessories for Ekip trip units



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Fig. 25



—
Fig. 26



—
Fig. 27

Ekip Link Module (Fig. 25)
The Ekip Link module enables the SACE Emax 2 circuit-breaker to be connected to ABB communication system for locally supervision of switchgear by means of the Ekip Control Panel and to act as Power Controller. It is suitable for all Ekip trip units and can be factory or field installed in time to the circuit-breaker terminal box, even when Ekip Com communication modules are present. In this way, it is possible to have both local supervision of the control panel by means of the Ekip Control Panel and supervision of the system by means of the Ekip Com modules connected to the communication network.
The Ekip Link modules are supplied complete with auxiliary position contacts Ekip AUP and ready to close circuit-breaker contacts Ekip RTC.

—
Electrical diagram reference: figure 58

Ekip Com Hub (Fig. 26)
Ekip Com Hub is the new communication module for Emax 2 cloud-connectivity.
Emax 2 equipped with Ekip Com Hub can establish the connection to ABB Ability™ Energy and Asset Manager for the whole low-voltage power distribution panel. This dedicated cartridge-type communication module just needs to be inserted into the terminal box and connected to the internet.
For further information related to ABB Ability™ Energy and Asset Manager, please visit the dedicated website https://new.abb.com/about/our-businesses/electrification/abb-ability/energy-and-asset-manager.

—
Ekip Com Hub has to be connected to the external network in order to refresh the Cybersercurity Certificate and keep it up to date. In case of long-term disconnections from the network for more than 6 months (e.g. module in stock or physically disconnected), the correct functioning of Ekip Com Hub can be inhibited from the cybersecurity measures in place.
It is recommended to keep the module connected or periodically connect it (e.g. in stock or physically disconnected) to the external network.

Ekip Com Actuator module (Fig. 27)
The Ekip Com Actuator module enables the SACE Emax 2 circuit-breakers to be opened and closed remotely. The Ekip com Actuator is optional and can be ordered for all Ekip trip units equipped with Ekip Com or Ekip Link modules; it is installed on the front of the circuit-breaker in the right-hand accessories area.

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Electrical diagram reference: figures 76, 78

Signalling



Fig. 29

Ekip 2K Signalling modules (Fig. 29)
The Ekip 2K Signalling modules supply two input and two output contacts for control and remote signalling of alarms and circuit-breaker trips. They can be programmed from the trip unit's display or through the Ekip Connect software. When using Ekip Connect, combinations of events can be freely configured. They are suitable for all distribution and generator protection versions of the Ekip Touch and Hi-Touch trip units. Three versions of the Ekip 2K Signalling modules are available: Ekip 2K-1, Ekip 2K-2, RELT Ekip 2K-3. A maximum of three modules for E2.2, E4.2, E6.2, and two for E1.2 can be installed at the same time. The RELT Ekip Signalling 2K-3 module enables the wizard for easy configuration of the arc flash mitigating 2I protection. This automatically assigns the I/O for remote activation and positive feedback.

Electrical diagram reference: figures 41, 42, 43



Fig. 29 A

Ekip 3T Signalling modules (Fig. 29A)
The Ekip 3T Signalling modules provide three analog inputs for PT100/PT1000 thermo-resistances and one analog input 4-20mA for external sensors. Through the Ekip Connect commissioning tool, it is possible to set different control thresholds and associate them to digital signals. The Ekip 3T Signalling modules are suitable for all the versions of Ekip Touch and Hi-Touch trip units. However, PT100 sensors are compatible with the Ekip black platform only. Up to two modules can be installed simultaneously on SACE Emax 2: one Ekip Signalling 3T-1 and one Ekip Signalling 3T-2. ABB external probes PT1000 are available for busbar applications.



Fig. 30

Ekip 4K Signalling module (Fig.30)
The Ekip 4K Signalling module is available for E2.2, E4.2, E6.2. This module provides four input contacts and four output contacts for control and remote signalling. It can be programmed from the trip unit's display or through the Ekip Connect software. When using Ekip Connect, combinations of events can be freely configured.
It is installed in the housing provided in the front left of distribution and generator protection versions of the Ekip Touch and Hi-Touch trip units, without having to remove the trip unit itself and is an alternative to the AUX 6Q auxiliary contacts unit.

Electrical diagram reference: figure 2



Fig. 31

Ekip 10K Signalling modules (Fig. 31)
Ekip 10K Signalling is an external signalling unit designed for DIN rail installation for SACE Emax 2 automatic circuit-breakers. The unit provides ten contacts for electrical signalling of timing and tripping of protection devices.
If connected via the Ekip Connect software, the contacts can be freely configured in association with any event and alarm or combination of both.
Several Ekip 10K Signalling modules (up to 3) can be installed at the same time on the same Ekip trip unit.
The Ekip 10K Signalling module can be powered either by direct or alternating current and can be connected to all the trip units via internal bus or Ekip Link modules.

Electrical diagram reference: figure 103

Accessories for Ekip trip units



Fig. 32

Ekip Signalling Modbus TCP (Fig. 32)

Modbus is an external signalling unit designed for DIN rail installation. The function of the signalling module is to share, via an Ethernet network with Modbus TCP communication protocol, information about the state of circuit-breakers that might not have the ability to provide such information via Ethernet, and also to allow these circuit-breakers to be operated via remote control.

Characteristics of output contacts			**Number of contacts**		
Type		**Monostable**	**Ekip 2K**	**Ekip 4K**	**Ekip 10K**
Maximum switching voltage		150V DC / 250V AC	2 output + 2 input	4 output + 4 input	10 output + 11 input
Maximum switching current					
	30V DC	2A			
	50V DC	0.8A			
	150V DC	0.2A			
	250V AC	4A			
Contact/coil insulation		1000 Vrms (1min @50Hz)			



Fig. 33

Ekip 10K/Ekip Signalling Modbus TCP power supply	
Auxiliary supply	24-48V DC, 110-240V AC/DC
Voltage range	21.5-53V DC, 105-265V AC/DC
Rated power	10VA/W
Inrush current	1A for 10ms

Ekip RTC and Ekip AUP Signalling contacts (Fig. 33)

The signalling contacts allow the Ekip trip units to acquire the ready-to-close status of the circuit-breaker, as well as its racked-in, test or racked-out position. These contacts can be optionally installed in the accessories area of SACE Emax 2 equipped with Ekip Dip, Ekip Touch and Ekip Hi-Touch trip units. Ekip Link and Ekip Com modules are always supplied with Ekip RTC and Ekip AUP.

Measurement and protection



Fig. 34

Measurement Enabler module (Fig. 34)

The Measurement Enabler module is supplied standard with Ekip Touch trip unit and is installed to the right of the trip unit. This module enables the trip unit to internally measure phase and neutral voltages, as well as power and energy. In particular, the Measurement Enabler module makes the platform always customizable through the activation of dedicated software packages available in the ABB Ability MarketplaceTM. Depending on the functionality desired, a software package may need to be purchased separately. The voltage outlets are installed standard on the lower terminals and can be moved to the upper terminals upon request. No external connection is required, except for rated voltages higher than 690V. In this case, the voltage connection is moved outside the circuit-breaker by using voltage transformers connected to the terminal box. The installation of external outlets does not guarantee Class 1 accuracy.



Measurement Enabler with voltage sockets (Fig. 35)
This module has the same features as the Measurement Enabler module, but additionally includes voltage sockets that allow direct connection of line voltages higher than 85V. This module is mandatory for Rc protection and is always supplied with Ekip Hi-Touch and Ekip G trip units. On request, it can be also installed with the Ekip Touch version.

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Fig. 35

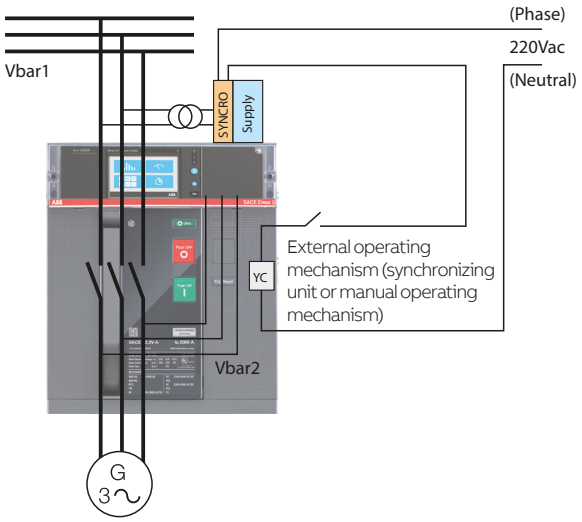
Ekip Synchrocheck (Fig. 36)
This module enables the control of the synchronism condition when placing two lines in parallel. The module can be used with distribution and generator protection versions of the Ekip Touch and Hi-Touch trip units with the measurement function enabled.
Ekip Synchrochek measures the voltages from two phases of one line through an external transformer and compares them to the measured voltages at the breaker. An output contact is available, which is activated upon reaching synchronism, and enables the circuit-breaker to be closed by means of wiring with the closing coil.



—
Fig. 36

Characteristics of output contacts			Number of contacts
Type		Monostable	Ekip Synchrocheck
Maximum switching voltage		150V DC / 250V AC	1 output
Maximum switching current			
	30V DC	2A	
	50V DC	0.8A	
	150V DC	0.2A	
	250V AC	4A	
Contact/coil insulation		1000 Vrms (1min @50Hz)	

—
Electrical diagram reference: figure 48



Accessories for Ekip trip units



Fig. 37

Ekip LCD interface (Fig. 37)
The Ekip trip units can be supplied with LCD black and white display, equipped with dedicated pushbuttons to easily interact with the circuit-breaker. This option is well suited for aggressive environments characterized by low temperatures, high humidity or the presence of dust and chemical agents. The Ekip LCD trip units share the same advanced features with the touchscreen trip units in terms of protections, measurements and accuracy levels. However, the LCD version is not equipped with the embedded Bluetooth antenna.

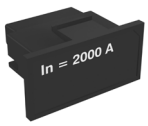


Fig. 38

Rating Plug (Fig. 38)
The rating plugs are field interchangeable from the front on all trip units and enable the protection thresholds to be adjusted according to the actual rated current of the system.
This function is particularly advantageous in installations that may require future expansion or in cases in which the power supplied needs to be limited temporarily (e.g. mobile Gen Set). The Overload (L) protection function can be disabled at any time by using an L OFF version of the rating plug. There is a matching L OFF version for each standard version of rating plug.

Circuit-breaker	Rating plugs available (both in standard and L OFF versions)
E1.2	400-600-800-1000-1200
E1.2 250	100-200-250
E2.2	400-600-800-1000-1200-1600-2000
E2.2 250	100-200-250
E4.2	400-600-800-1000-1200-1600-2000-2500-3200-3600
E6.2	400-600-800-1000-1200-1600-2000-2500-3200-3600-4000-5000-6000

Special rating plugs are also available for differential protection against ground faults in combination with a suitable toroid to be installed externally.

Circuit-breaker	Rating plug available for Rc protection
E1.2	400-630-800-1250
E1.2 250	100-200-250
E2.2	400-630-800-1250-2000
E2.2 250	100-200-250
E4.2 / E6.2	400-630-800-1250-2000-3200-4000



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Fig. 39

Current sensor for neutral conductor outside the circuit-breaker (Fig. 39)
Only suitable for three-pole circuit-breakers; the current sensor enables protection of the neutral conductor to be achieved through connection to the Ekip trip unit. Supplied on request.

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Electrical diagram reference: figure 27



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Fig. 40

Homopolar toroid for the earthing conductor of main power supply (Fig.40)
The distribution and generator protection versions of the Ekip Touch and Hi-Touch trip units can be used with an external toroid positioned, for example, on the conductor that connects the star centre of the MV/LV transformer to ground (homopolar transformer): in this case, the ground protection is called Source Ground Return. There are four sizes of the toroid: 100A, 250A, 400A, 800A. The homopolar toroid is an alternative to the toroid for differential protection.

—
Electrical diagram reference: figure 25



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Fig. 41

Toroid for differential protection (Fig. 41)
Connected to the Ekip Touch and Hi-Touch LSIG trip units equipped with a rating plug for differential protection, this toroid enables ground fault currents of 3...30A to be monitored. To be installed on the busbar system, it is an alternative to the homopolar toroid.

—
Electrical diagram reference: figure 24



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Fig. 42

Dedicated terminal for Modified Differential Ground Fault (MDGF) protection (Fig. 42)
This terminal is needed to realize the MDGF scheme with SACE Emax 2 circuit-breakers. Two types of terminal are available: one for the fixed circuit-breakers and one for the withdrawable ones. The application needs the mounting of external phase current transformers and summing current transformers. SACE Emax 2 MDGF scheme is compatible only with current transformer from Amram that must be purchased separately. External current transformers must have the same rating of the circuit-breaker rating plug.

For the complete application wiring diagram, please refer to 1SDM000019A1001. Listed below the commercial codes of Phase CTs and Summing CTs compatible with SACE Emax 2 MDGF scheme.

Current rating (A)	Phase current transformer	Summing current transformer
800	CT409-801-01, or CT420-801-01	CT550-5X4-01000
1200	CT409-122-01, or CT420-122-01	CT550-5X4-01515
1600	CT409-162-01	CT550-5X4-02000
2000	CT409-202-01, or CT421-202-01	CT550-5X4-02500
2500	CT409-252-01, or CT421-252-01	CT550-5X4-03125
3200	CT409-322-01, or CT421-322-01	CT550-5X4-04167
4000	CT421-402-01	CT550-5X4-05000
5000	CT421-502-01	CT550-5X4-06250

Accessories for Ekip trip units



Fig. 43

Displaying and supervision

Ekip Multimeter (Fig. 43)

Ekip Multimeter is a display unit to be installed on the front of the switchgear for SACE Emax 2 circuit-breakers equipped with Ekip electronic trip units. The device is equipped with a large touch screen display and enables measurements to be displayed with the same levels of precision. If connected to trip units with a display, Ekip Multimeter enables the adjustment of parameters and protection thresholds. Up to 4 Ekip Multimeter devices can be connected at the same time to the same Ekip protection trip unit to display currents, voltage, powers and energy.

Ekip Multimeter can be powered either in direct current or in alternating current. It is equipped with a 24V DC output that supplies the trip unit to which it is connected.

Power supply	24-48V DC, 110-240V AC/DC
Tolerance	21.5-53V DC, 105-265V AC/DC
Rated Power	10VA/W
Inrush current	2A for 20ms



Fig. 45

Testing and programming

Ekip TT testing and power supply unit (Fig. 45)

Ekip TT eliminates the need for the Ekip trip unit to have anauxiliary power supply. In this way, the last protection device tripped can be displayed directly on the screen or by the illumination of corresponding LEDs. Moreover, the unit permits verification that the circuit-breaker trip mechanism is operating correctly (trip test). Ekip TT can be directly connected through the front test connector of any Ekip trip units of SACE Emax 2 and allows to set all protection functions.



Fig. 46

Ekip Programming module testing kit (Fig. 46)

Ekip Programming module is a kit that includes different components for programming and testing the electronic protection trip units.

The kit includes:

- Ekip T&P (Test and Programming);
- Ekip TT unit;
- adaptors for Emax and Tmax trip units;
- USB cable to connect the Ekip Programming module unit to the Ekip trip units;
- installation CD for Ekip Connect and Ekip Ekip Programming module interface software.

The Ekip Programming module unit easily connects from your PC (via USB) to the trip unit (via mini USB) via the cable provided.

The Ekip Programming module unit can perform simple manual or automatic tests on the trip unit functions. The Ekip Programming module will also provide the ability to conduct more advanced function testing that allows the addition of harmonics and the shifting of phases to more accurately represent the real conditions of an application. Thus, leading to more concise protection function parameters that may be required for critical applications. It can also generate a test report as well as monitor maintenance schedules.



Fig. 47

Ekip Programming Module (Fig. 47)

The Ekip Programming module is used for programming Ekip trip units via USB to a PC using the Ekip Connect software that can be downloaded on-line. This can be useful for uploading/downloading entire sets of parameters for multiple breakers both for set-up as well as for maintenance (for periodic cataloging breaker parameters in case of a catastrophic situation).

Ekip T&P for EMAX2 and Tmax XT

The kit includes:

- Ekip T&P unit;
- USB cable to connect the T&P unit to the Ekip trip units ;

The Ekip T&P unit easily connects your PC (via USB) to the trip unit (via mini USB) with the cable provided.

The Ekip T&P unit can perform simple manual or automatic tests on the trip unit functions. The Ekip T&P will also provide the ability to conduct more advanced function testing that allows the addition of harmonics and the shifting of phases to more accurately represent the real conditions of an application.

Thus, leading to more concise protection function parameters that may be required for critical applications. It can also generate a test report as well as help you to monitor maintenance schedules.

Service

Extended warranty

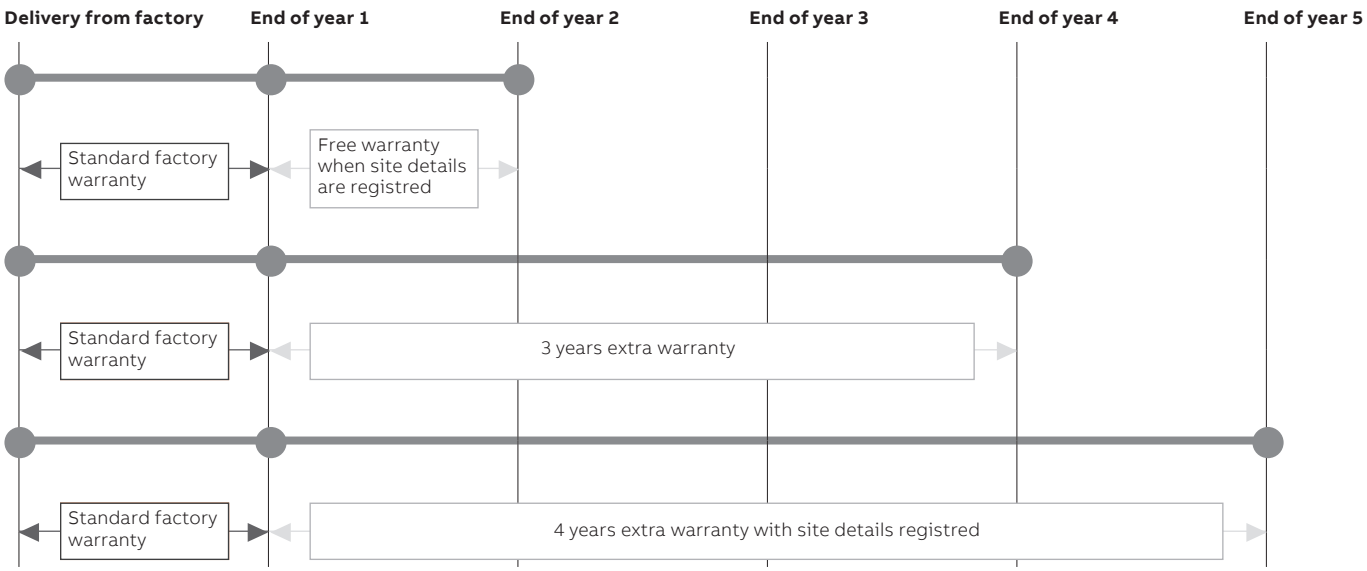
For ABB Low Voltage circuit breakers, the 1-year standard factory warranty can be extended for 5 years.
Extended warranty activation can be requested after the online registration in the Extended Warranty tool. This web-tool verifies that the application of the circuit breaker is within the recommended guidelines, and grant the registration of the circuit breaker.
When end users details are registered, one year of extra warranty is offered free-of-charge.
Extended Warranty can be ordered by following the steps:

1) Registration in the online tool (Extended Warranty Tool) to verify the application.
2) Extended Warranty part number(s) and registration code received by email
3) Place the order of the circuit breaker(s) together with:
   - Extended warranty part number(s)
   - Unique registration code

Warranty coverage:

- Any possible issues related to circuit breaker quality for the complete extra warranty time
- Accessories mounted by the factory only.





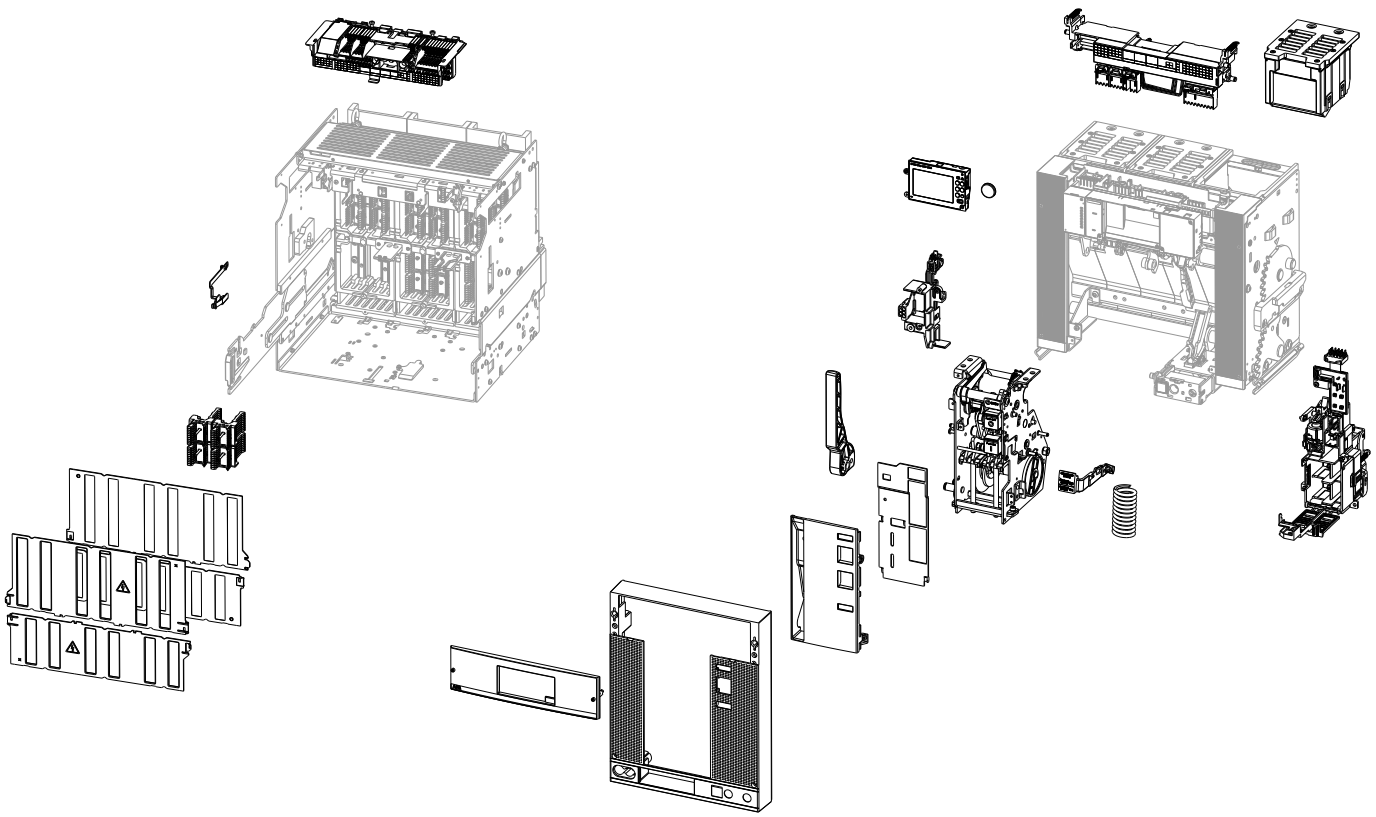
Service

Spare parts

The following original and spare parts are available:

- Accessories and Safety Covers
- Closed Door lock lever
- Closing Spring
- Conversion kit from Fixed to Moving part
- Conversion kit from Moving Part into Fixed version
- Conversion kit into Switch Disconnector MS
- Ground sliding contacts
- Fixing screws kit
- Arching chambers
- Jaw contacts
- Moving part Terminals
- Poles
- Kit front cover plugs
- Lateral guides for Fixed and Moving part
- Left and Right plates for accessories (Left MID, Right MID)
- Main board
- Main board + Sensors + cables
- Operating mechanism
- Racked in and out device
- Racking in and out lever
- Safety shutters for fixed part
- Side walls
- Sliding contacts/ Terminal Box
- Transparent cover
- Trip coil
- Trip Unit Battery
- Tripping mechanism
- Spring charging device
- Spring Charging lever
- Gray platform spare parts (trip units, Ekip Measuring modules, rating plugs).

For further details, please refer pag 296-301 or to ABB SACE Spare Parts Catalogue (1SDC001007D0203).



Installation

7/2 **Circuit-breaker**
7/3 Sizes
7/4 Versions
7/5 Poles
7/6 Terminals
7/7 Degree of protection
7/7 Power losses
7/8 Temperature derating

7/9 **Installation environment**
7/9 Temperature
7/10 Environmental conditions
7/10 Vibration
7/10 Electromagnetic compatibility

7/13 **Installation in switchgear**
7/13 Position
7/13 Power supply
7/13 Insulation distances and connection
7/15 Earthing connection
7/16 Busbar types
7/16 Bars connection
7/16 Auxiliary connection

Circuit breaker

The new SACE Emax 2 family incorporates the same characteristics of strength and reliability that have always distinguished the tradition of ABB SACE air circuit breakers.

The new SACE Emax 2 circuit breakers, available in four sizes, are extremely compact due to their new dimensions: with reduced depths and heights, combined with standarized widths, they provide a solution for the most stringent installation requirements.

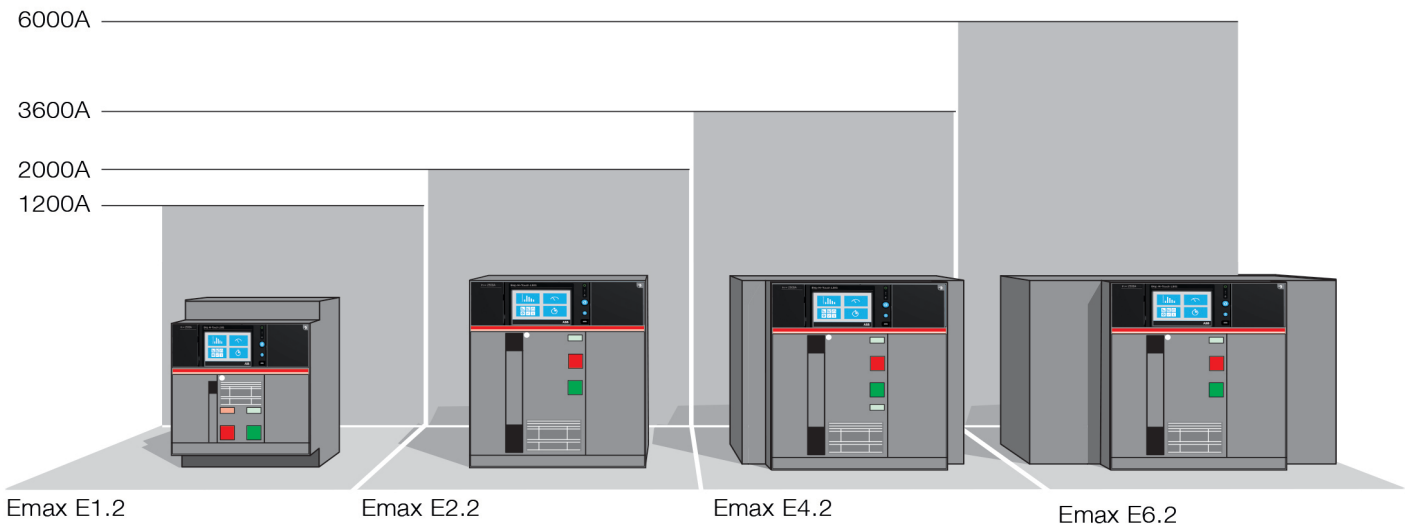
Safety is expected thanks to the double insulation of the live parts and total segregation of the phases. Furthermore, the new functional design of the SACE Emax 2 circuit breakers has been developed with the purpose of improving installation operations and use of the devices and accessories; making them simpler, more intuitive and safer.

Distinctive characteristics		**Benefits**
Simplicity of use and safety	- Ekip protection trip units are interchangeable from front of circuit breaker	Reduced times during the stages of: - installation - wiring - configuration - commissioning - maintenance
	- Rapid configuration of the Ekip trip units	
	- Electronic modules can be installed on terminal box without removing the electronic trip units and protection shield	
	- Electrical plug-in accessories can be installed from the front of circuit breaker	
	- New push-in terminal box allows rapid auxiliary connections	
	- Horizontal or vertical rear connections can be modified on-site by turning 90°	Increased level of safety
	- Accessorizing logic common to the entire family of circuit breakers	
	- Accessory cabinet and terminal box are stamped with accessory codes for easy identification	
	- Accessories area is separated functionally from the safety area	
	- Mechanical safety locks in open position are active when the front cover is removed	
	- Guided racking in and out of the mobile part	

Sizes

The SACE Emax 2 circuit breakers, available in 4 sizes up to 6000A, provide:

- **Versatility**, where installation space is a critical and influential factor, such as naval applications, wind turbine towers or switchgear
- **Opportunities**, optimization of the dimensions of the electrical switchgear results in a potential reduction in the consumption of the materials used.



Circuit breaker

Versions

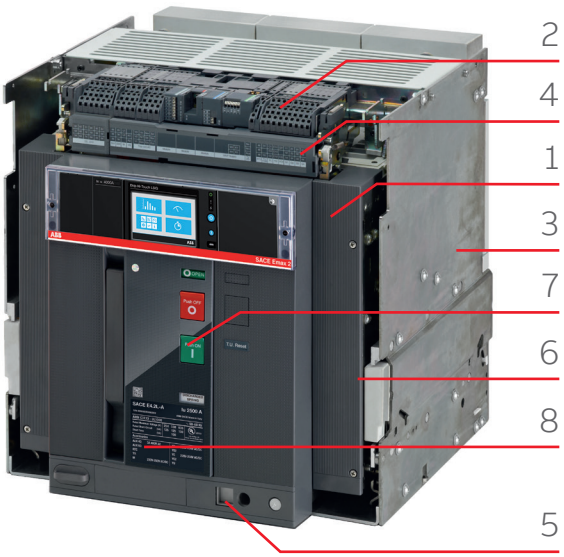
The SACE Emax 2 circuit breakers are available in both fixed and withdrawable versions. The withdrawable version is recommended in applications in which service continuity is a fundamental requirement.
Replacement of the moving part with a new device does not require any intervention on power connections or on auxiliary connections, thus permitting reset in the shortest time possible.

The fixed version, which is connected directly to power system through the circuit breaker terminals, is recommended in applications in which the need for space means that compact products are required without compromising product performance and accessory fit.

Fixed



Withdrawable



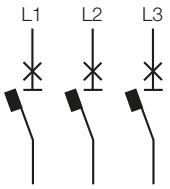
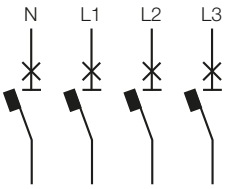
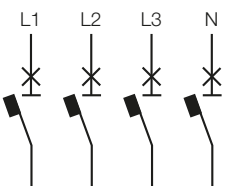
1. Moving part
2. Sliding contacts
3. Fixed part
4. Terminal box
5. Racking-out mechanism
6. Racking-out guide rails
7. Pushbuttons
8. Data label and accessories

Poles

SACE Emax 2 circuit breakers are available in three-pole and four-pole versions and can be used in all types of distribution systems. With the possibility of connecting the external current sensor, three-pole circuit breakers can be used efficiently even in systems in which the neutral conductor cannot be isolated.

The four-pole circuit breakers E1.2, E2.2 and E4.2 are always provided with full-size neutral pole with rated uninterrupted current-carrying capacity identical to the phase poles. The E6.2 circuit- breakers, due to their construction modularity, are available with neutral set at 50 percent of normal supply and with full-sized neutral, so that the customer does not need to oversize the neutral unless strictly necessary.

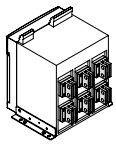
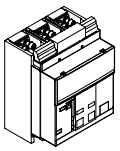
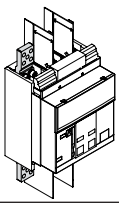
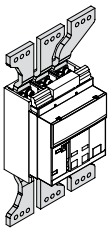
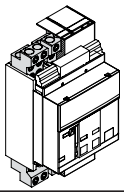
The standard supplied circuit breakers are suitable for connection of phases in the sequence L1, L2, L3 for three-pole circuitbreakers, or N, L1, L2 and L3 for four-pole circuit breakers with neutral on the left; a special optional kit enables the position of the circuit breaker neutral to be changed to the right, making the sequence L1, L2, L3, N available (refer to page 265 for the commercial codes).

Circuit breaker	Standard version		Optional version with neutral on the right
	Three-pole	Four-pole	Four-pole
Emax E1.2 Emax E2.2 Emax E4.2 Emax E6.2			

Circuit breaker

Terminals

The integration of the circuit breaker into an electrical system is simpler due to the connection terminals of the circuit breakers. The silver-plated copper terminals are designed to assist installation of connecting bars according to the change in the rated capacity of the circuit breaker. Each terminal has been created to the standard width of busbar for that amperage and is equipped with one, two or three terminal stabs for easy connection to multiple bus runs that may be required for the application. For particular installation requirements, the circuit breakers can be equipped with different combinations of terminals for the upper and lower part.

Type	Abbreviation		E1.2	E2.2	E4.2	E6.2
Rear adjustable terminal (1)	HR VR		F, W	F, W	F, W	F, W
Front terminal	F		F	F, W **	F, W **	F, W **
Extended front terminal	EF **		F, W			
Front spread terminal	ES **		F, W			
Terminal for cable FcCuAl 4x500kcmil / 240mm2	Fc CuAl **		F			

(1) The rear adjustable terminals are supplied as sandard in the HR-HR configuration, with exception for E4.2 L version, E4.2 3200A and E6.2 6000A in which they are supplied in VR - VR configuration.
(**) Not UL listed

Degree of protection

SACE Emax 2 circuit breakers provide the following degrees of protection:

- IP20 for circuit breakers in fixed or drawout versions, excluding the terminals.
- IP30 for the front parts of the circuit breaker when installed in switchgear with the IP30 flange mounted on the door.
- IP54 for circuit breakers equipped with optional IP54 transparent flange fixed on the door on the front of the switchgear.

Power losses

To provide the performance of the electrical switchgear in terms of rated uninterrupted current-carrying capacity, the design of the electrical switchgear must take into consideration the power losses by installed live parts.

The values in the table below refer to total power for three and four pole circuit breakers with balanced loads with a current flow equal to rated uninterrupted current "Iu" at 60Hz.

Circuit breaker type		[W]/[A]	250	400	800	1200	1600	2000	2500	3200	3600	4000	5000	6000
Fixed	**E1.2 B-A, N-A, S-A**	W	7	17	59	125								
	E2.2 B-A, N-A, S-A	W		15	48	100	170							
	E2.2 H-A, V-A / E2.2 2000A B-A, N-A, S-A	W		15	48	99	167	250						
	E4.2 S-A, H-A, V-A	W			44	86	143	211	310					
	E4.2 3200A/3600A S-A, H-A, V-A	W			42	81	132	193	280	445	578			
	E6.2 H-A, V-A	W								323	395	476	700	
Drawout	**E1.2 B-A, N-A, S-A**	W	14	35	118	250								
	E2.2 B-A, N-A, S-A	W		22	73	152	260							
	E2.2 H-A, V-A / E2.2 2000A B-A, N-A, S-A	W		22	68	138	233	350						
	E4.2 S-A, H-A, V-A	W			58	114	189	279	410					
	E4.2 3200A S-A, H-A, V-A	W			49	111	181	264	384	610				
	E6.2 H-A, V-A	W								438	536	646	950	1484

Circuit breaker

Temperature derating

Under specific installation conditions, the circuit-breakers can operate at higher temperatures than the reference temperature of 40 °C. In this case the current-carrying capacity of the circuit- breaker may be lower than the rated current-carrying capacity at the reference temperature requiring the application of the derating coefficients as shown. Percentage values refer to withdrawable and fixed circuit breaker.
If not specified, all data refer to a copper according to IEC60947.

Emax 2 E1.2		Temperature [°C/°F]						
		<40/104	45/113	50/122	55/131	60/140	65/149	70/158
E1.2	250	100%	100%	100%	100%	100%	100%	100%
E1.2	400	100%	100%	100%	100%	100%	100%	100%
E1.2	800	100%	100%	100%	100%	100%	100%	100%
E1.2	1000	100%	100%	100%	100%	100%	100%	100%
E1.2	1200	100%	98%	96%	94%	91%	88%	84%

Emax 2 E2.2		Temperature [°C/°F]						
		<40/104	45/113	50/122	55/131	60/140	65/149	70/158
E2.2	250	100%	100%	100%	100%	100%	100%	100%
E2.2	400	100%	100%	100%	100%	100%	100%	100%
E2.2	800	100%	100%	100%	100%	100%	100%	100%
E2.2	1200	100%	100%	100%	100%	100%	100%	100%
E2.2	1600	100%	100%	98%	94%	90%	84%	78%
E2.2	2000	100%	100%	97%	93%	88%	82%	76%

Emax 2 E4.2		Temperature [°C/°F]						
		<40/104	45/113	50/122	55/131	60/140	65/149	70/158
E4.2	800	100%	100%	100%	100%	100%	100%	100%
E4.2	1600	100%	100%	100%	100%	100%	100%	100%
E4.2	2000	100%	100%	100%	100%	100%	100%	100%
E4.2	3200	100%	98%	96%	92%	87%	81%	75%
E4.2	3600	100%	98%	95%	92%	88%	85%	81%

Emax 2 E6.2		Temperature [°C/°F]						
		<40/104	45/113	50/122	55/131	60/140	65/149	70/158
E6.2	4000	100%	100%	100%	100%	100%	100%	100%
E6.2	5000	100%	98%	96%	91%	86%	80%	74%
E6.2	6000	100%	97%	94%	91%	88%	84%	81%

Installation environment

SACE Emax 2 circuit breakers are designed and tested in accordance with major international Standards to manage the electrical plant.

The installation requirements prescribed by the international Standards are listed below.

In addition, ABB provides instructions for the use of circuit breakers in nonstandard environments, as for example personalized maintenance program or installation solutions aimed at increasing performances and extending the lifecycle of the circuit breaker.

Temperature

SACE Emax 2 circuit breakers can operate in the following environmental conditions:

	Temperature		
	Operating	**Active Display**	**Storage**
Emax 2 with Ekip DIP	-25°C ... +70°C -13°F...+158°F	-	-40°C ... +70°C -40°F...+158°F
Emax 2 with Ekip Touch, Hi-Touch	-25°C ... +70°C -13°F...+158°F	-20°C ... +70°C -4°F...+158°F	-30°C ... +70°C -22°F...+158°F
Emax 2 with LCD	-25°C ... +70°C -13°F...+158°F	-25°C ... +70°C -13°F...+158°F	-40°C ... +70°C -40°F...+158°F
Emax 2 swith-disconnectors	-25°C ... +70°C -13°F...+158°F	-	-40°C ... +70°C -40°F...+158°F

Installation environment

Environmental conditions

The devices can be installed in industrial environments with pollution level 3, IEC60947. SACE Emax 2 circuit breakers also comply with:

- IEC60721-3-6 class 6C3
- IEC60721-3-3 class 3C2

Altitude

SACE Emax 2 air circuit breakers do not change in rated performance up to 6600 feet. However, above 6600 feet, the properties of the atmosphere in terms of composition, dielectric capacitance, cooling power and pressure can vary and, therefore, the performance of the circuit breakers is subject to derating, which is capable of measurement by means of the variation in maximum rated service voltage and rated uninterrupted current.

Altitude	**[ft]**	**6600**	**9900**	**13200**	**16500**
	[m]	**2000**	**3000**	**4000**	**5000**
Rated service voltage - Ue	[V]	600	600	544	477
Rated current	[% In]	100	98	93	90

Vibration

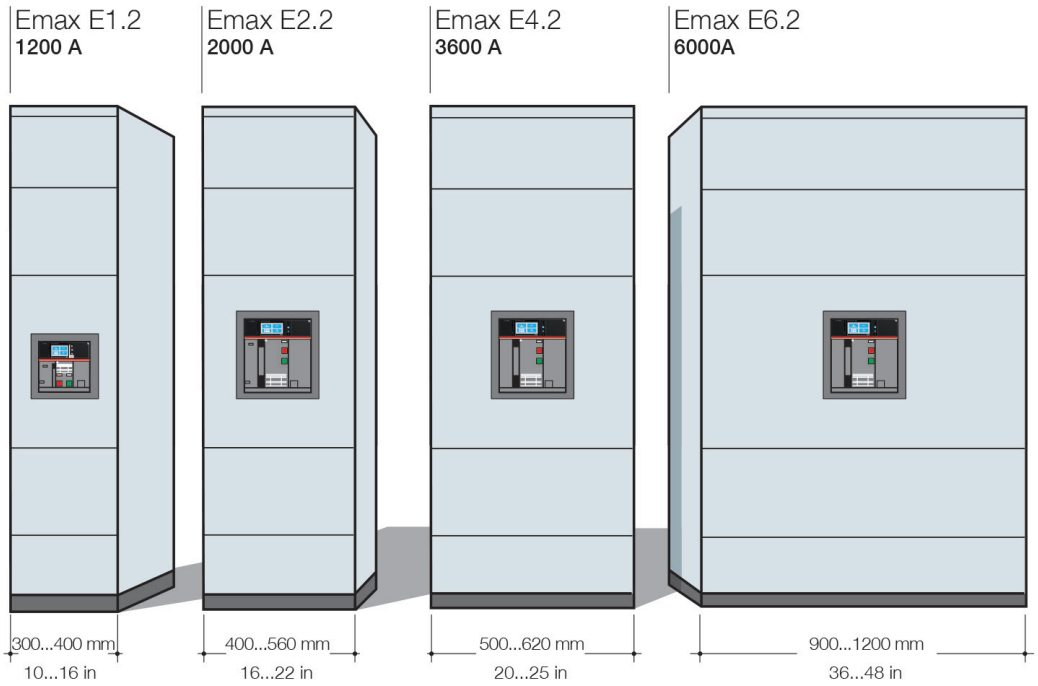
The circuit breakers have been tested according to:

- IEC60068-2-6
- From 1 to 13 Hz with amplitude 1mm
- From 13 to 100 Hz with constant acceleration 0.7g
- IEC60721-3-1
- Storage: 1M3
- IEC60721-3-2
- Transport: 2M2
- IEC60721-3-3
- Operational conditions: 3M2
- Shipping registers or certifications

Electromagnetic compatibility

The use of certain devices in industrial installations may cause electromagnetic interference in the electrical system. SACE Emax 2 circuit breakers have been developed and tested for electromagnetic compatibility in accordance with IEC 60947-2; Appendices J and F, ANSI C37.90.1 and C37.90.2.

The four construction sizes and the reduced insulation distances required, allow SACE Emax 2 circuit breakers to optimize the installation spaces of the compartments of electrical switchgear, thereby providing a rational solution to the customers' application needs.

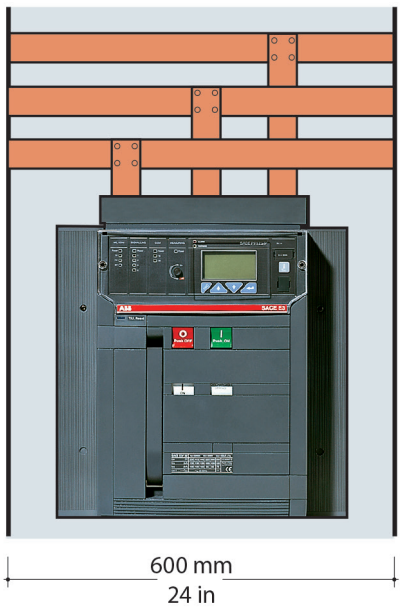


Installation environment

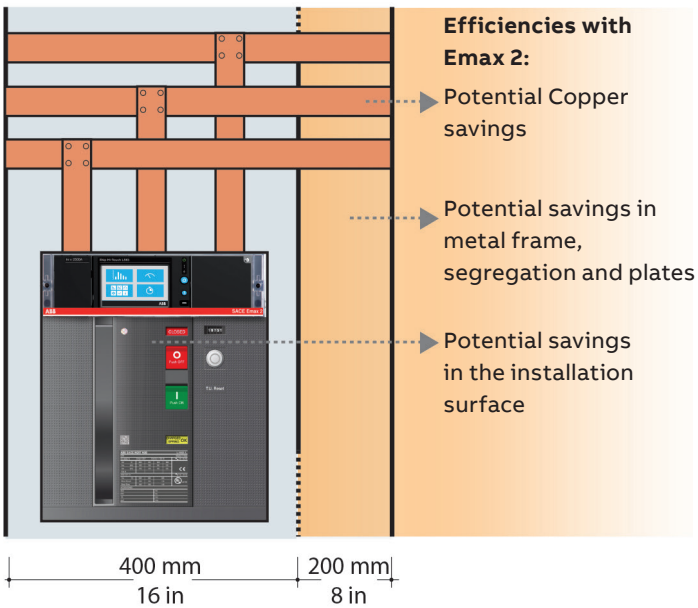
SACE Emax 2 circuit breakers enable the improvement of electrical switchgear design, optimized performance and in the use of the main materials as follows:

- **Copper**: allows minimization of busbar length.
- **Metal frame and structure**: reduced volumes mean less surface space is used for panels and internal structures.
- **Space**: the optimization of the individual units benefits the entire switchgear by making the entire unit more compact and can therefore be installed taking up less surface space.

Traditional circuit breaker 3p Iu 2000A



Emax E2.2 3p Iu 2000A



Installation in switchgear

Position

All SACE Emax 2 circuit breakers can be floor mounted in a vertical position inside the switchgear compartment.
The E1.2 circuit breaker can also be installed in a horizontal position and wall mounted. Conveniently, the screens of the Ekip Touch and Hi-Touch versions rotate to a horizontal view for key data when the E1.2 is installed horizontally.

Power supply

The Emax 2 circuit breakers can be supplied, from either the upper or lower terminals. In the event a measurement module is present, in order to make use of all information when the circuit breaker is in the open position, the voltage sockets must be installed on the power supply side.

Insulation distances and connection

The circuit breakers can be connected to the main power system using the most common configurations and dimensions of copper bars.

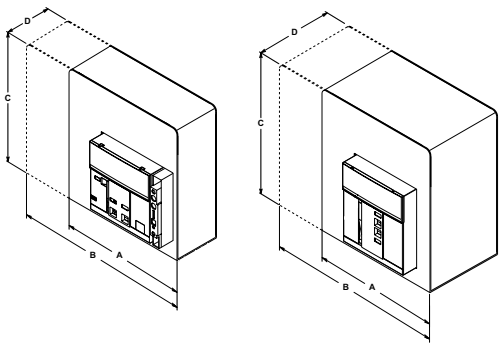
Installation of live parts must ensure:

- **Minimum insulation distances between the phases**

Rated insulation voltage Ui	Minimum distance [mm]
1000V	The use of phase barriers is recommended for fixed version circuit breakers used in voltages over 480V.

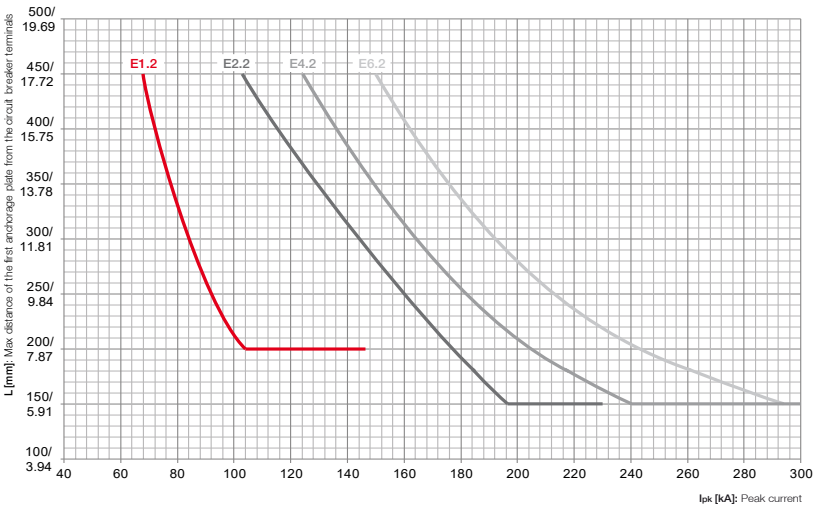
- **Insulation distance of installation cubicle**

Fixed circuit breakers						Drawout circuit breakers			
		Width		C - Height	D - Depth	Width		C - Height	D - Depth
		3p	4P			3p	4P		
E1.2	[mm]	250	322	382.5	130	280	350	440	252
	[inch]	9.84	12.67	15.05	5.11	11.02	13.77	17.32	9.92
E2.2	[mm]	400	490	500	221	400	490	440	355
	[inch]	15.74	19.29	19.68	8.7	15.74	19.29	17.32	13.97
E4.2	[mm]	500	620	500	221	500	620	440	355
	[inch]	19.68	24.41	19.68	8.7	19.68	24.41	17.32	13.97
E6.2	[mm]	900	1020	500	221	900	1020	440	355
	[inch]	35.43	40.16	19.68	8.7	35.43	40.16	17.32	13.97
E6.2/f	[mm]	-	1200	500	221	-	1200	440	355
	[inch]	-	47.24	19.68	8.7	-	47.24	17.32	13.97



Installation in switchgear

- **Anchorage plates**
  The electrodynamic force released during a short-circuit can cause high levels of mechanical stress on the devices and structures of the switch-gear. To minimize this, fastening plates must be positioned near the circuit breaker terminals.



- **Tightening torques**
  The following table indicates the values required for connecting the circuit breaker terminal and the connecting bars.

Terminals	E1.2	E2.2 / E4.2 / E6.2
Adjustable HR/VR rear	40 Nm / 354.03 lb-in	70 Nm / 619.55 lb-in
Spread rear	40 Nm / 354.03 lb-in	–
Front	40 Nm / 354.03 lb-in	70 Nm / 619.55 lb-in
Extended front	40 Nm / 354.03 lb-in	–
Spread front	70 Nm / 619.55 lb-in	–
Front for cables	43 Nm / 380.58 lb-in	–

- **Segregation plates and separator plates**
  The rear part of the circuit breaker has been designed with specific slots in which insulating walls can be housed to facilitate segregation of live parts. In addition, phase barriers are available as an optional accessory for E1.2.

Earthing connection

To achieve continuity and equal potential of earthing between the Emax 2 circuit breaker and the protection circuit of the switchgear, customers can use either option below:

- Connect the Emax 2 fixed circuit breaker or the cradle of the drawout circuit breaker to the protective circuit by means of a cable with suitable cross-sectional area to fulfil the switchgear requirements.
- If the continuity of the circuit breaker frame with the switchboard earthing is provided by the metal contact (support) between the circuit breaker and the metal structure of the switchboard (which is a part of the protective circuit) no connection is necessary (provided that no panels of insulating material are interposed between the circuit breaker and the metal frame of the switchboard).

Emax E1.2, fixed version, does not require any earthing connection.

Installation in switchgear

Busbar types

The circuit breakers, via the terminals, can be connected to the main distribution system by busbars of different types: copper, silver-plated copper and tinned aluminium when the main distribution system is made of aluminium.

The circuit breakers can be connected directly with copper or aluminium cables in the case of E1.2 circuit breakers, or indirectly by cable-carrying bars in the case of E2.2, E4.2 and E6.2.

Bars recommendation

		Vertical			Horizontal		
Frame	**Iu**	**Qty**	**Size (in)**	**Size (mm)**	**Qty**	**Size (in)**	**Size (mm)**
E1.2	800	1	1/4 x 3	6.35 x 76.2	2	1/4 x 2	6.35 x 50.8
E1.2	1200	2	1/4 x 3	6.35 x 76.2	4	1/4 x 2	6.35 x 50.8
E2.2	1600	2	1/4 x 3	6.35 x 76.2	3	1/4 x 2.5	6.35 x 63.5
E2.2	1600	3	1/4 x 2	6.35 x 50.8	4	1/4 x 2	6.35 x 50.8
E2.2	2000	4	1/4 x 2	6.35 x 50.8	4	1/4 x 2.5	6.35 x 63.5
E4.2	2000	4	1/4 x 2	6.35 x 50.8	4	1/4 x 2.5	6.35 x 63.5
E4.2	2500	3	1/4 x 4	6.35 x 101.6	4	1/4 x 4	6.35 x 101.6
E4.2	3200	4	1/4 x 4	6.35 x 101.6	-	-	-
E4.2	3600	4	1/4 x 5	6.35 x 127	-	-	-
E6.2	4000	4	1/4 x 5	6.35 x 127	6	1/4 x 4	6.35 x 101.6
E6.2	5000	6	1/4 x 5	6.35 x 127	10	1/4 x 4	6.35 x 101.6
E6.2	6000	6	1/4 x 6	6.35 x 152.4	-	-	-

The tables should be used solely as a general guideline for selecting products. Due to the extensive variety of switchgear construction shapes and conditions that can affect the behavior of the apparatus, the solution used must always be verified.

Bars connection

The Emax 2 terminal design maximizes the thermal performance into the switchgear. Due to the busbar friendly, single to multiple stab design, can be easily and smartly:

- a wide contact surface between terminals and bars improves the current carrying capacity;
- a spacing between stabs and multi bars increase the ventilation efficiency on E2.2, E4.2 and E6.2;
- a ¼” spacing eliminates the need to bend bars and allows for an easier connection to the main busbars.

Auxiliary connection

The new terminal box uses spring clamp technology. All cables can be connected to each terminal without tools, providing time saving during the wiring activities.

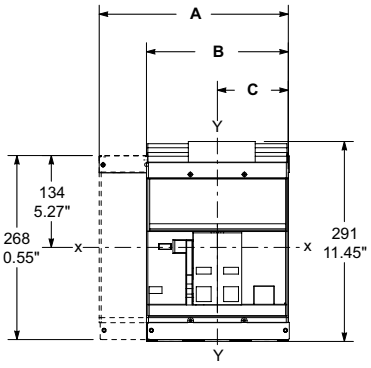
Dimensions

8/2 **Fixed circuit-breaker**
8/4 E1.2
8/8 E2.2
8/10 E4.2
8/14 E6.2

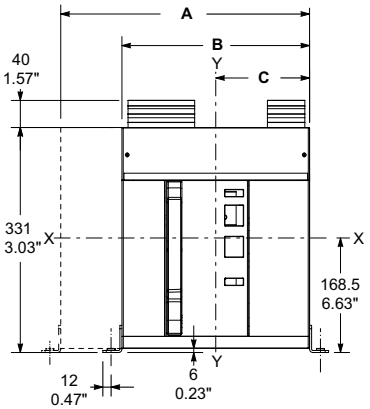
8/16 **Withdrawable circuit breaker**
8/18 E1.2
8/21 E2.2
8/23 E4.2
8/26 E6.2

Fixed circuit breaker

E1.2



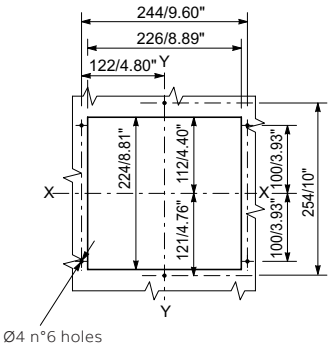
E2.2 - E4.2 - E6.2



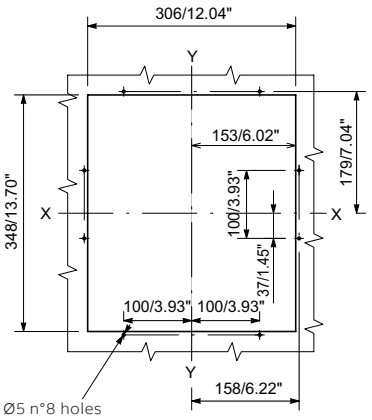
[mm/in]	A	B	C	
	4p	3p	3p	4p
E1.2	284/ 11.18	214/ 8.42	107/ 4.21	107/ 4.21
E2.2	366/ 14.40	276/ 10.86	138/ 5.43	138/ 5.43
E4.2	510/ 20.07	384/ 15.11	192/ 7.55	192/ 7.55
E6.2	888/ 34.96	762/ 30	318/ 12.42	444/ 17.48
E6.2/f	1014/ 39.92	-	-	444/ 17.48

Compartment door drilling

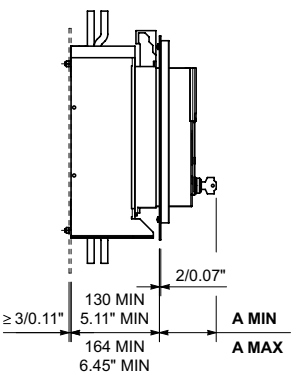
E1.2



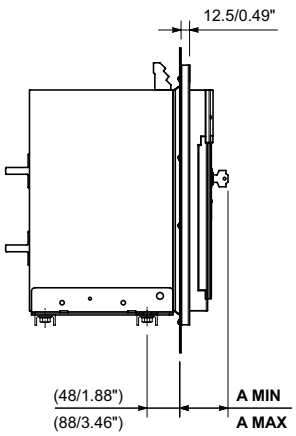
E2.2 - E4.2 - E6.2



E1.2



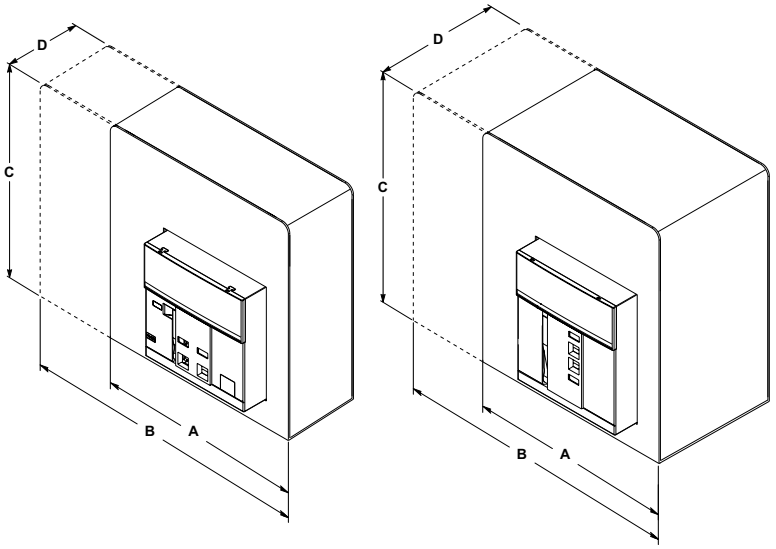
E2.2 - E4.2 - E6.2



E1.2		Standard	Ronis/ Profalux	Kirk	Castell
A MIN	[mm/ in]	49.5/ 1.94"	63.5/ 2.5"	63.5/ 2.5"	83.5/ 3.28"
A MAX	[mm/ in]	83.5/ 3.28"	97.5/ 3.83"	97.5/ 3.83"	117.5/ 4.62"

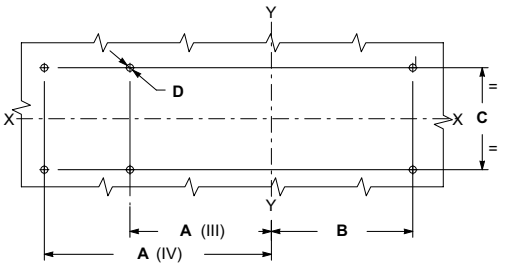
E2.2-E4.2-E6.2		Standard	Ronis/ Profalux	Kirk	Castell
A MIN	[mm/ in]	29.5/ 1.16"	41.5/ 1.63"	46.5/ 1.83"	65/ 2.55"
A MAX	[mm/ in]	69.5/ 2.73"	81.5/ 3.20"	86.5/ 3.40"	105/ 4.13"

Dimensions of the compartment



[mm/in]	A	B	C	D
	3p	4p		
E1.2	250/ 9.84	322/ 12.67	382.5/ 15.05	130/ 5.11
E2.2	400/ 15.74	490/ 19.29	500/ 19.68	221/ 8.70
E4.2	500/ 19.68	620/ 24.41	500/ 19.68	221/ 8.70
E6.2	900/ 35.43	1020/ 40.16	500/ 19.68	221/ 8.70
E6.2/f	-	1200/ 47.24	500/ 19.68	221/ 8.70

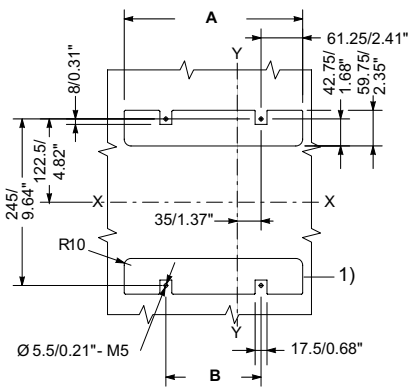
Floor fixing



Floor fixing plate required for E1.2 in order to floor mount.
Ordering code ZE1FFPF missing 1SDA code now 1SDA076020R1

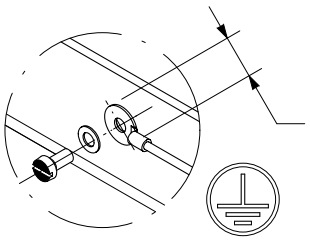
[mm/in]	A		B		C	D
	3p	4p	3p	4p		
E1.2	117/ 4.60	187/ 7.36	117/ 4.60	117/ 4.60	80/ 3.14	5.5/ 0.21
E2.2	154/ 6.06	244/ 9.60	154/ 6.06	154/ 6.06	150/ 5.90	10.5/ 0.41
E4.2	208/ 8.18	334/ 13.14	208/ 8.18	208/ 8.18	150/ 5.90	10.5/ 0.41
E6.2	460/ 18.11	460/ 18.11	334/ 13.14	460/ 18.11	150/ 5.90	10.5/ 0.41
E6.2/f	-	586/ 23.07	-	460/ 18.11	150/ 5.90	10.5/ 0.41

Wall fixing (only for E1.2)



[mm]	3 p	4 p
A	192.5/7.57"	262.5/10.33"
B	70/2.75"	140/5.51"

Earthing device E2.2 - E4.2 - E6.2

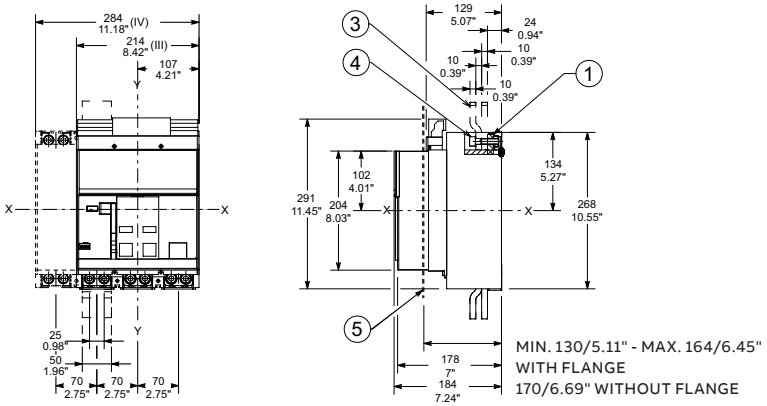


M5x8 screws supplied
Tightening torque 3Nm

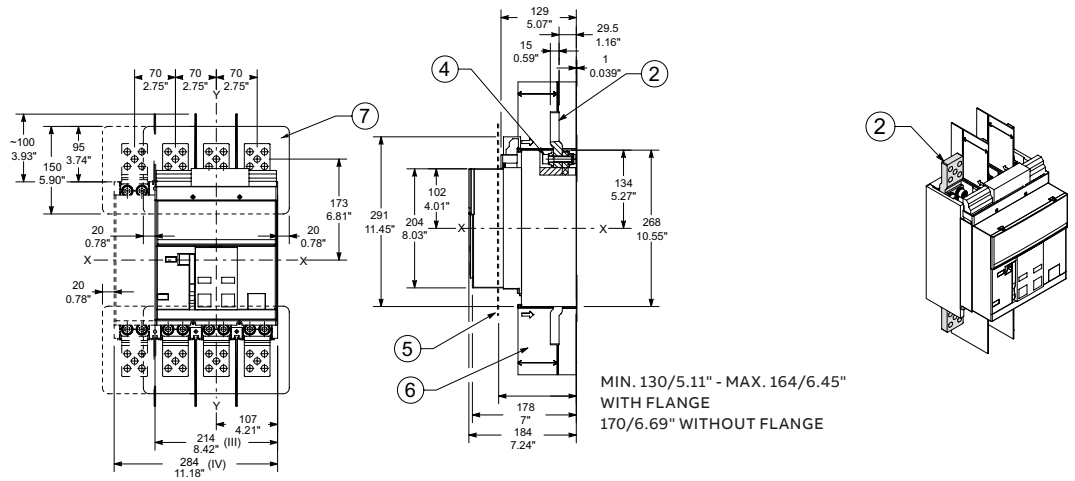
—
1) for fixing with rear terminals

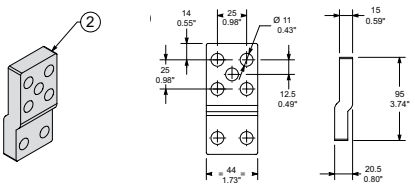
Fixed circuit breaker - E1.2

Front terminals – F



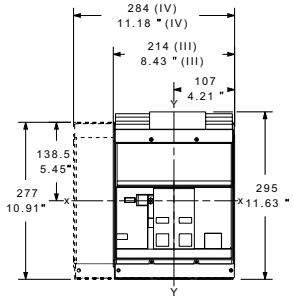
Extended front terminals – EF (not UL listed)

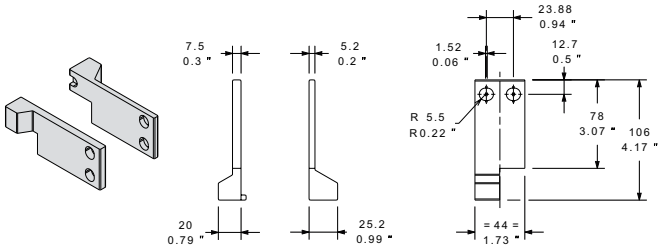




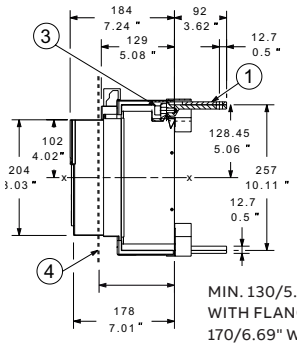
Key
1 Front terminals for flat connection
2 Extended front terminals
3 To be supplied by the customer
4 Tightening torque 18Nm - 159lb in
5 Door position - Ref. page 7/2
6 Obligatory phase separators 100mm/3.93in
7 Obligatory insulating plate to be supplied by the customer

Orientable rear terminals - HR/VR

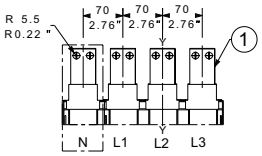


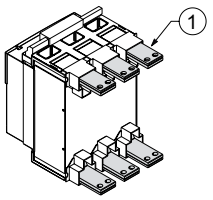


Terminals HR

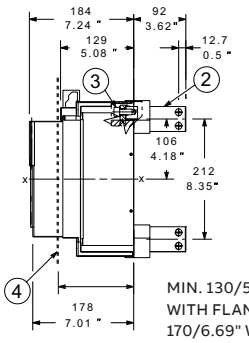


MIN. 130/5.11" - MAX. 164/6.45"
WITH FLANGE
170/6.69" WITHOUT FLANGE

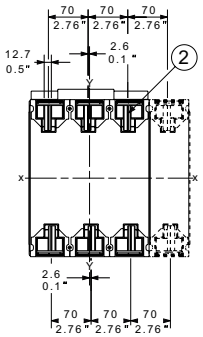


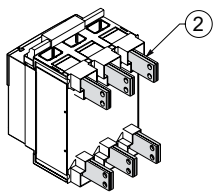


Terminals VR



MIN. 130/5.11" - MAX. 164/6.45"
WITH FLANGE
170/6.69" WITHOUT FLANGE



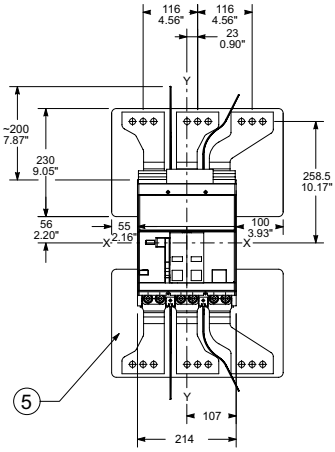


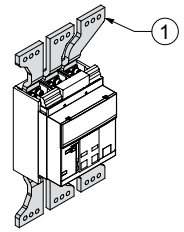
—
Key
1 Horizontal orientable terminals HR
2 Vertical orientable terminals VR
3 Tightening torque 20Nm - 177lb in
4 Door position - Ref. page 7/2

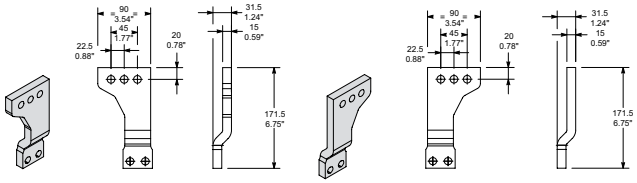
Fixed circuit breaker - E1.2

Extended spread front terminals - ES

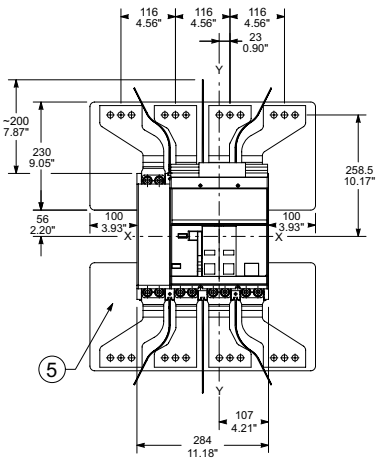
3-pole version (not UL listed)

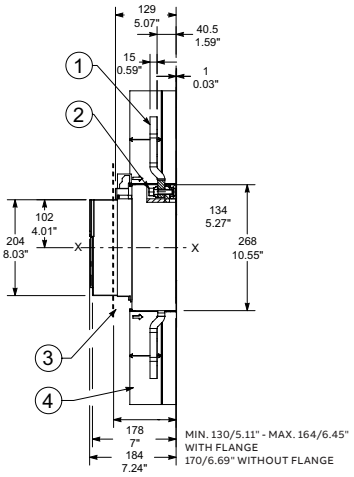


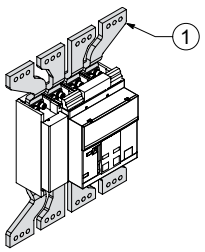


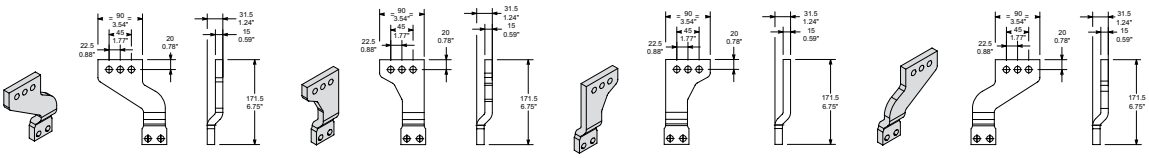


4-pole version









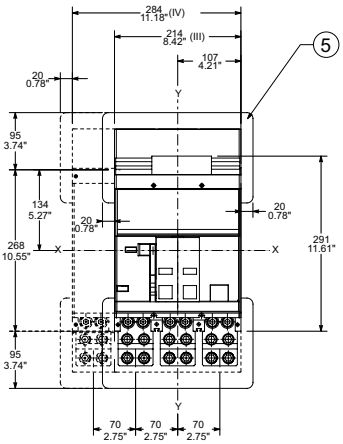
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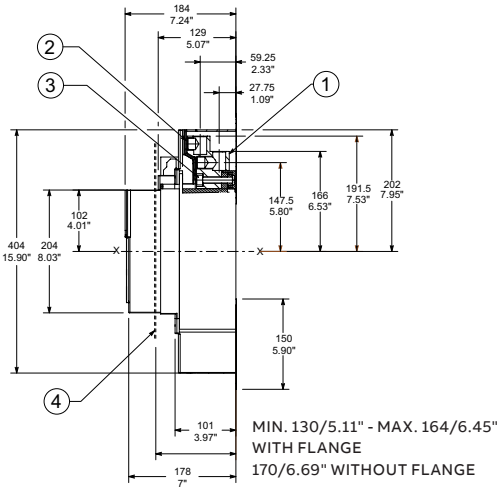
Key

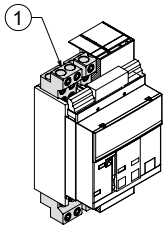
1 Splayed extended front terminals
2 Tightening torque 18Nm - 159lb in
3 Door position - Ref. page 7/2
4 Obligatory phase separators 200mm/7.87in
5 Obligatory insulating plate to be supplied by the customer

—
Not UL Listed

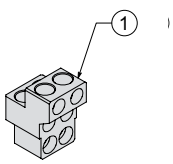
Front terminals for cables – FcCuAl

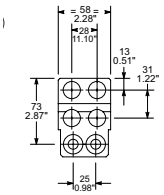


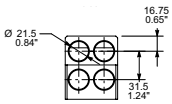


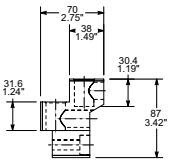


MIN. 130/5.11" - MAX. 164/6.45"
WITH FLANGE
170/6.69" WITHOUT FLANGE







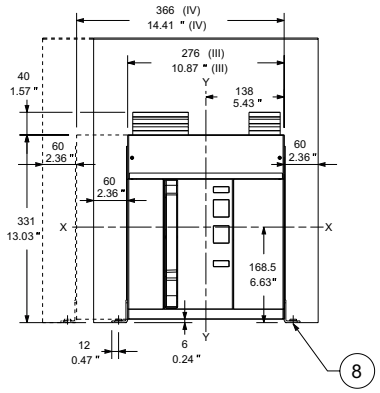


—
Key
1 Front terminals for cables FC CU AL
2 Tightening torque 43Nm - 379lb in
3 Tightening torque 18Nm - 159lb in
4 Door position - Ref. page 7/2
5 Obligatory insulating plate to be supplied by the customer

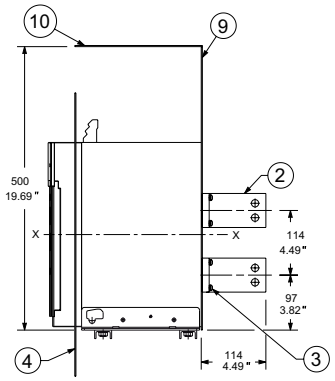
Fixed circuit breaker - E2.2

Orientable rear terminals - HR/VR

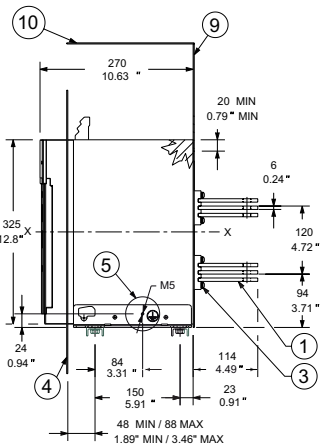
E2.2 B-A, N-A, S-A, H-A, V-A 250A - 2000A

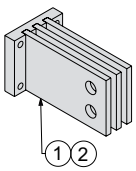


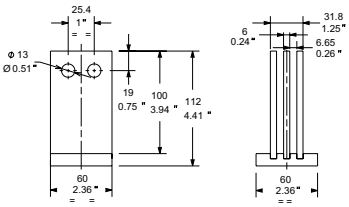
VR adjustment

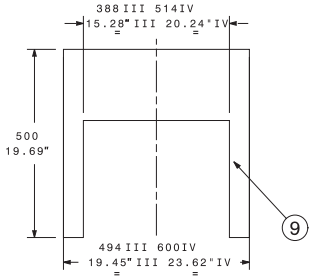


HR adjustment

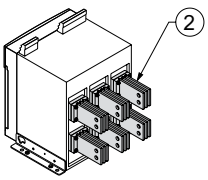


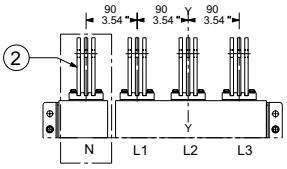




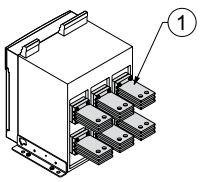


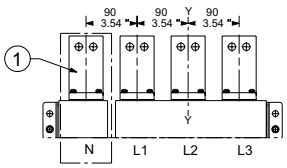
VR adjustment





HR adjustment





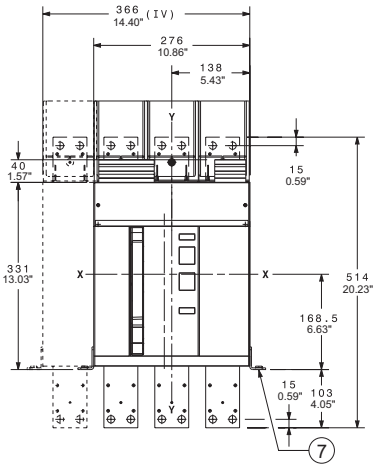
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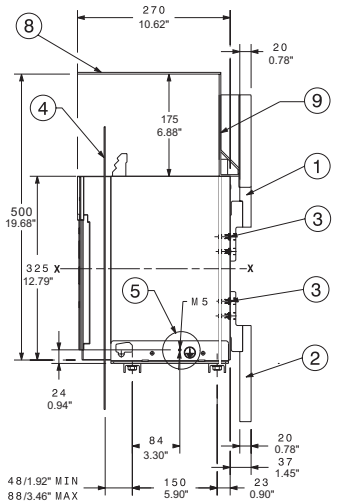
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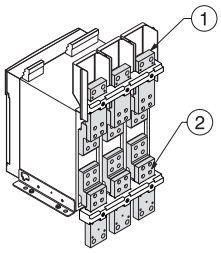
1 Horizontal terminals 1600A-2000A
2 Vertical terminals 1600A-2000A
3 Tightening torque 8.6Nm - 76lb in
4 Door position - Ref. page 7/2
5 Grounding
8 Mounting outside feet
9 Insulating sheet or insulated metallic sheet
10 Metallic sheet

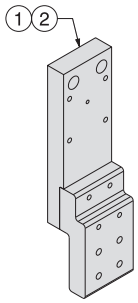
Front terminals – F (not UL listed)

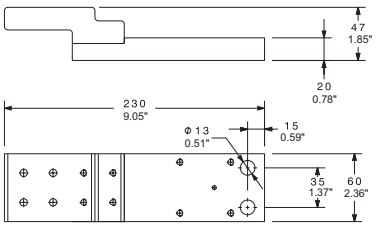
E2.2 B-A, N-A, S-A, H-A, V-A 250A - 2000A

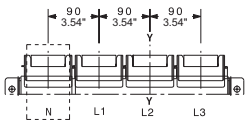












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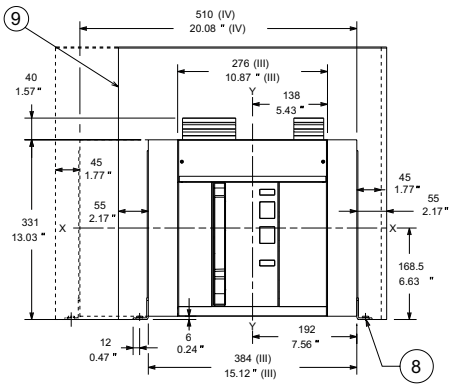
Key

1 Upper front terminals
2 Lower front terminals
3 Tightening torque 8.6Nm - 76lb in
4 Door position - Ref. page 7/2
8 External fixing point. Reccomended screws M10x25 high class

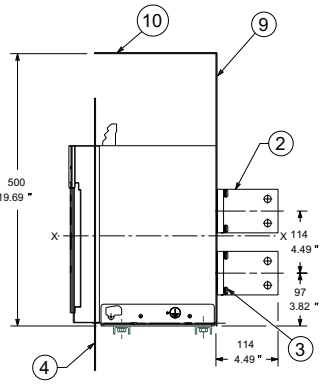
Fixed circuit breaker - E4.2

Orientable rear terminals - HR/VR

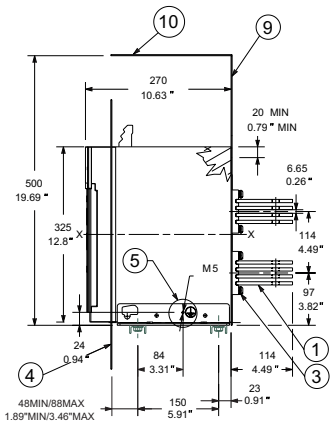
E4.2 S-A, H-A, V-A 800A - 2500A

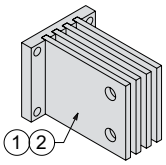


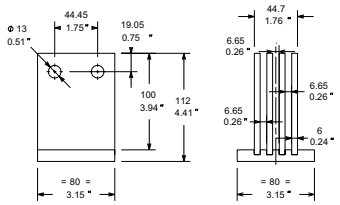
VR adjustment

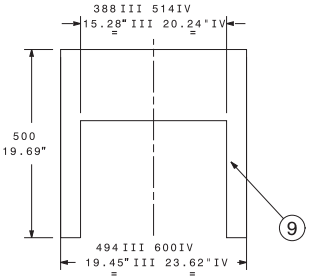


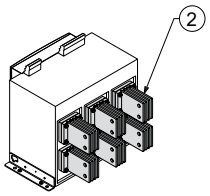
HR adjustment



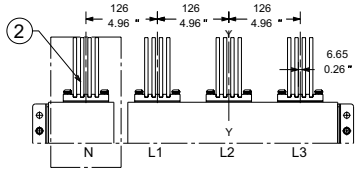


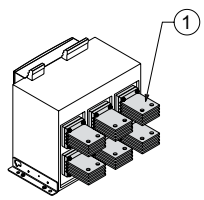




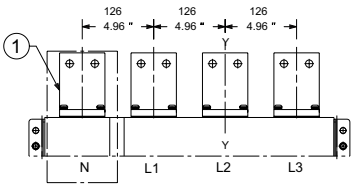


VR adjustment





HR adjustment



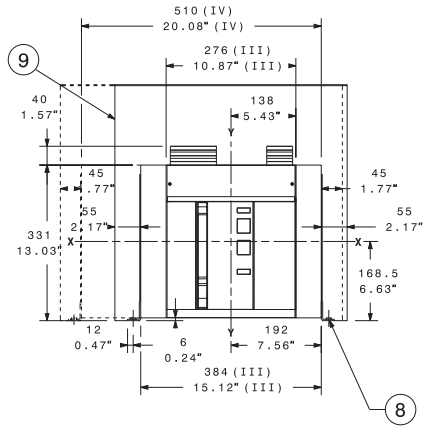
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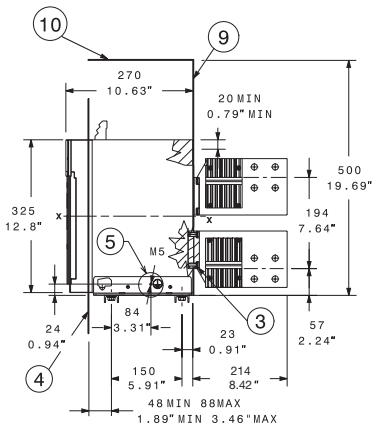
Key

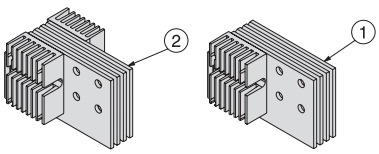
1 Horizontal terminals 2500A
2 Vertical terminals 2500A
3 Tightening torque 20Nm - 177lb in
4 Door position - Ref. page 7/2
5 Grounding
8 Mounting outside feet
9 Insulating sheet or insulated metallic sheet
10 Metallic sheet

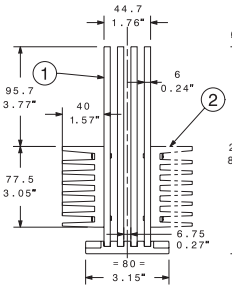
Vertical rear terminals - VR

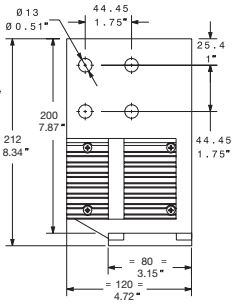
E4.2 S-A, H-A, V-A 3200A

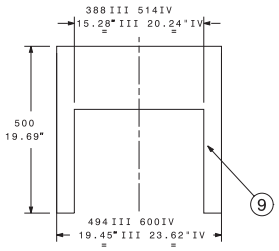


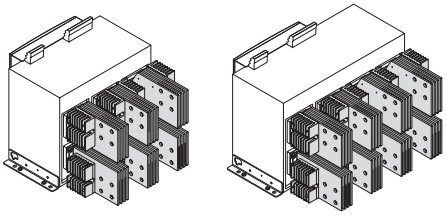


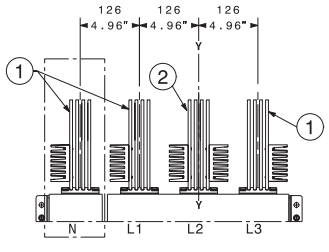












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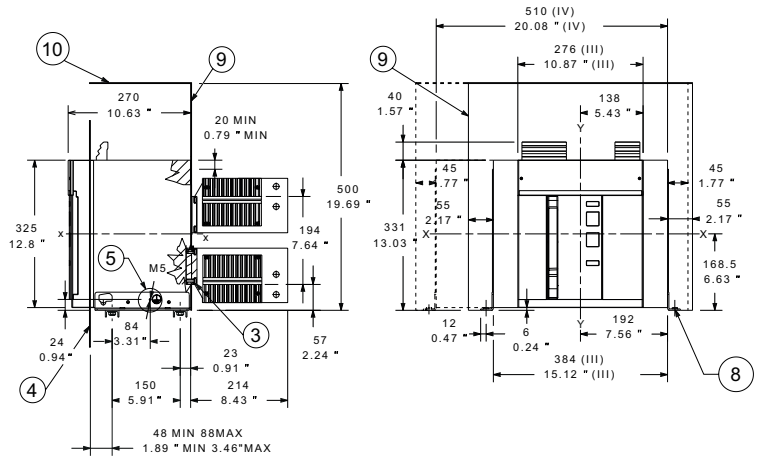
Key

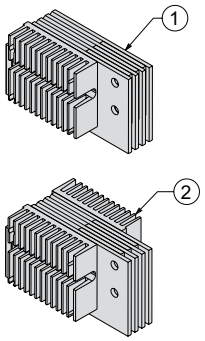
1 Lateral vertical terminals 3200A
2 Central vertical terminals 3200A
3 Tightening torque 20Nm - 177lb in
4 Door position - Ref. page 7/2
8 Mounting outside feet. Reccomended screws M10x25 high class
9 Insulating sheet or insulated metallic sheet
10 Metallic sheet

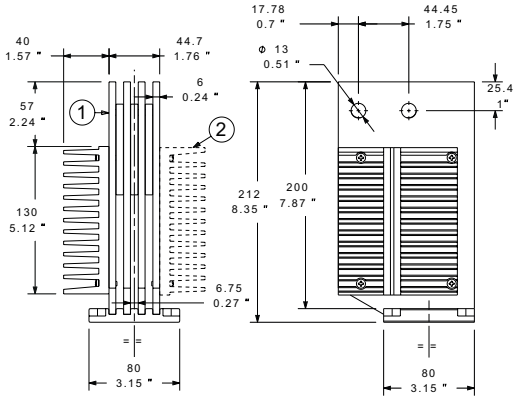
Fixed circuit breaker - E4.2

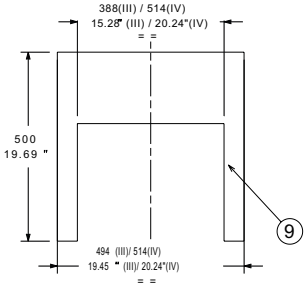
Vertical rear terminals - VR

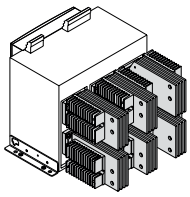
E4.2 S-A, H-A, V-A 3600A

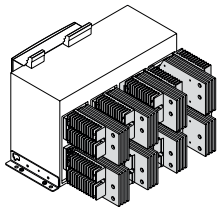


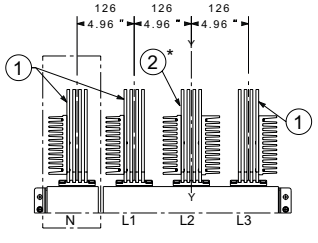












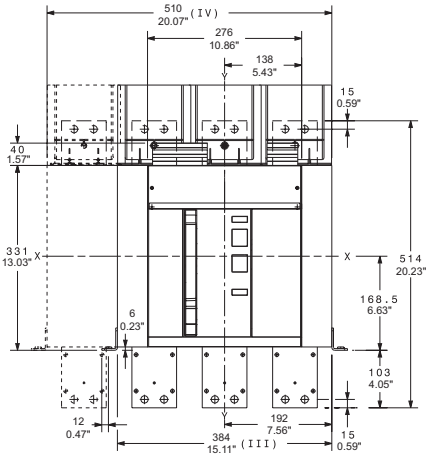
Key

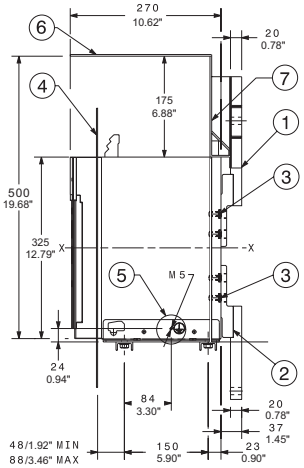
1 Lateral vertical terminal 3600A (*)
2 Central vertical terminal 3600A (*)
3 Tightening torque 20 Nm - 177 lb in
4 Door position- Ref. page 7/2
5 Grounding
8 Mounting outside feet screws reccomend m10x25 high class 8.8 or couple superior tightening torque 40 nm - 354 lb in compulsory fixing screws from top
9 Insulating sheet or insulated metallic sheet
10 Metallic sheet

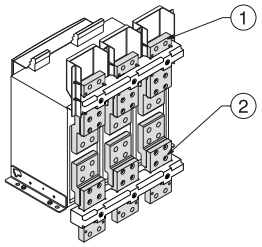
(*) for applications with neutral pole on the right, terminals with double radiator must be installed at the left of y-y axis

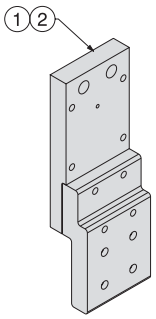
Front terminals – F (not UL listed)

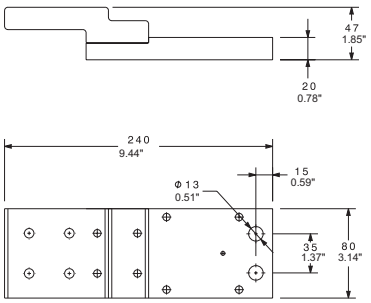
E4.2 S-A, H-A, V-A 800A - 3200A

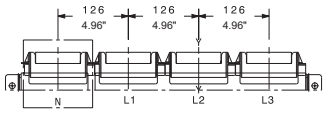












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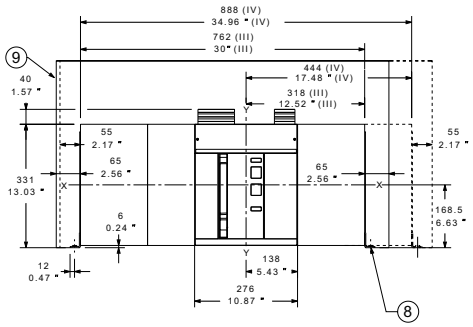
Key

1 Upper front terminals
2 Lower front terminals
3 Tightening torque 8.6Nm - 76lb in
4 Door position - Ref. page 7/2
5 Earthing device - Ref. page 7/3
6 Metallic sheet
7 Insulating sheet or insulated metallic sheet

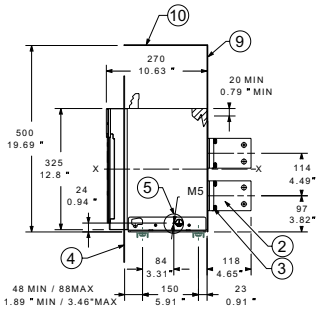
Fixed circuit breaker - E6.2

Orientable rear terminals - HR/VR

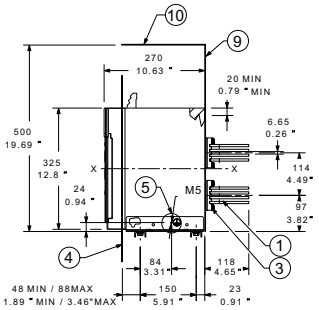
E6.2 H-A, V-A 4000A - 5000A

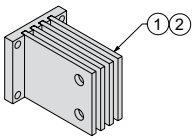


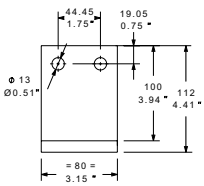
VR adjustment

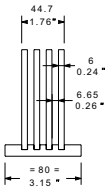


HR adjustment

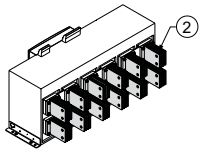


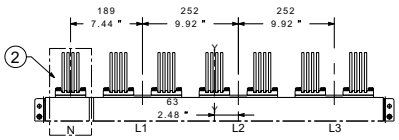


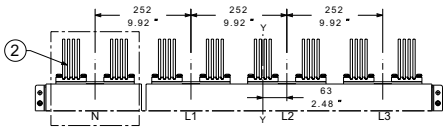




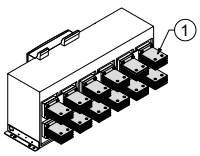
VR adjustment

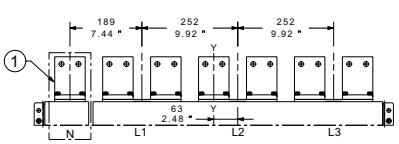


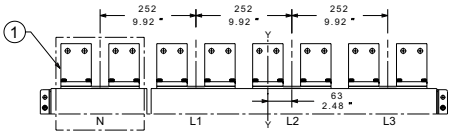




HR adjustment







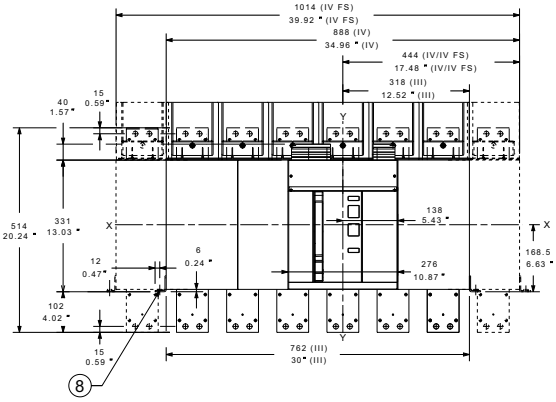
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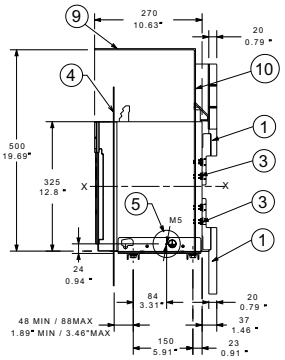
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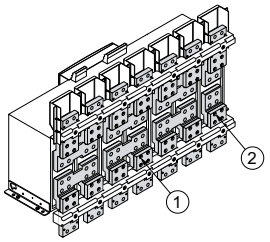
1 Horizontal terminals 5000A
2 Vertical terminals 5000A
3 Tightening torque 20Nm - 177lb in
4 Door position
5 Grounding
6 Ferrule for grounding
7 Screws M5x8 provided Tightening torque 3Nm - 26lb in
8 Mounting outside feet
9 Insulating sheet or insulated metallic sheet
10 Metallic sheet

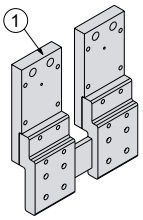
Front terminals – F (not UL listed)

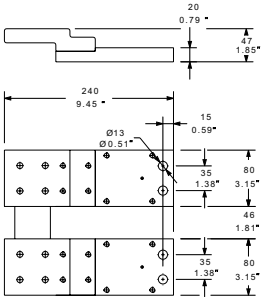
E6.2 H-A, V-A 4000A - 5000A

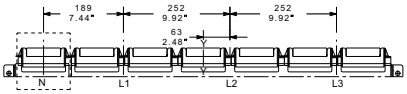


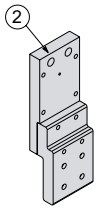


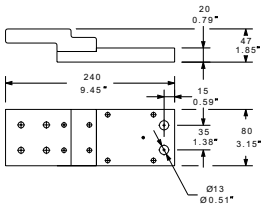












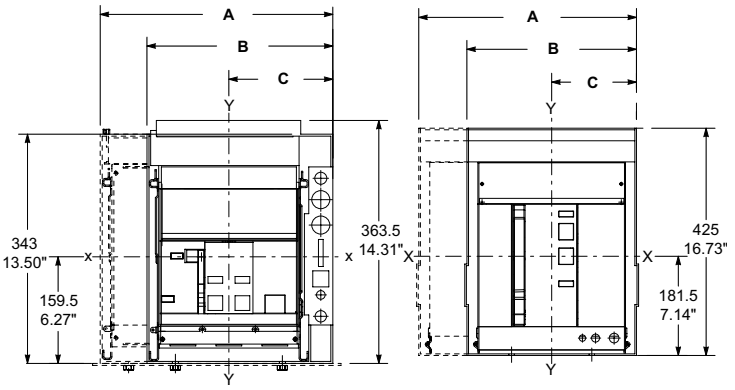
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Key

1 Upper and lower front terminals
2 Single front terminals
3 Tightening torque 20Nm - 177lb in
4 Door position - Ref. page 7/2
5 Grounding
8 Mounting outside feet
9 Metallic sheet
10 Insulating sheet or insulated metallic sheet

Withdrawable circuit breaker

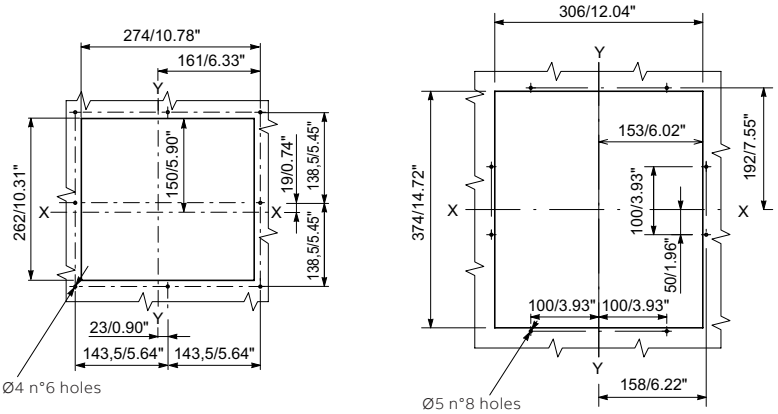
E1.2 **E2.2 - E4.2 - E6.2**



[mm/in]	A	B	C	
	4p	3p	3p	4p
E1.2	348/ 13.70	278/ 10.94	155.5/ 6.12	155.5/ 6.12
E2.2	407/ 16.02	317/ 12.48	158.5/ 6.24	158.5/ 6.24
E4.2	551/ 21.69	425/1 6.73	212.5/ 8.36	212.5/ 8.36
E6.2	929/ 36.57	803/ 31.61	338.5/ 13.32	464.5/ 18.28
E6.2/f	1055/ 41.53	-	-	464.5/ 18.28

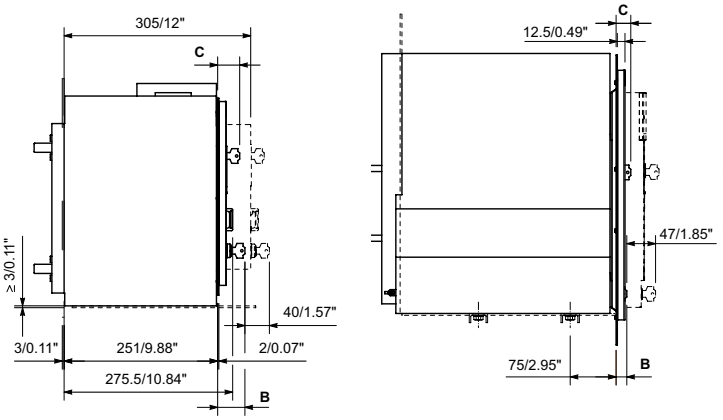
Compartment door drilling

E1.2 **E2.2 - E4.2 - E6.2**



Distance from connected to isolated position

E1.2 **E2.2 - E4.2 - E6.2**

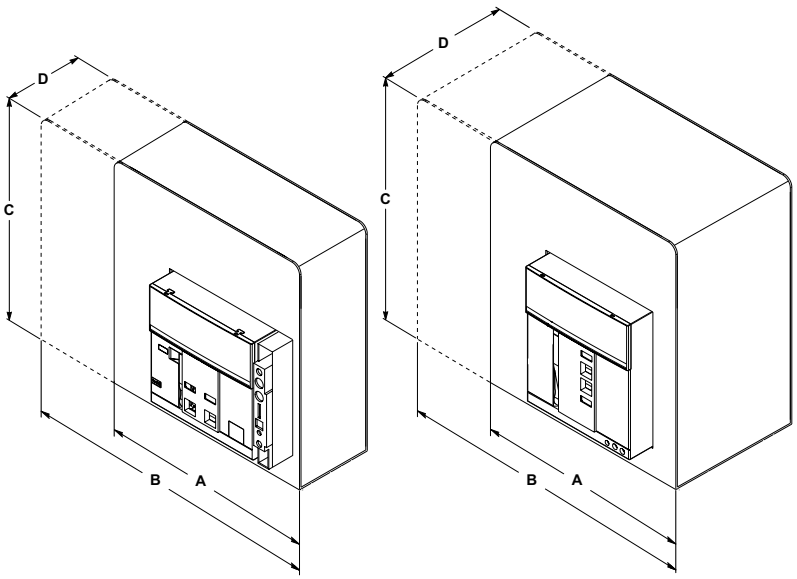


E1.2		Standard	Ronis/ Profalux	Kirk	Castell
A min	[mm/ in]	44.5/ 1.75	55/ 2.16	55/ 2.16	85
A max	[mm/ in]	36/ 1.41	46.5/ 1.83	46.5/ 1.83	76.5

E2.2-E4.2-E6.2		Standard	Ronis/ Profalux	Kirk	Castell
A min	[mm/ in]	22/ 0.86"	34/ 1.33"	39/ 1.53"	57.5/ 2.26"
A max	[mm/ in]	23/ 0.90"	35/ 1.37"	40/ 1.57"	58.5/ 2.30"

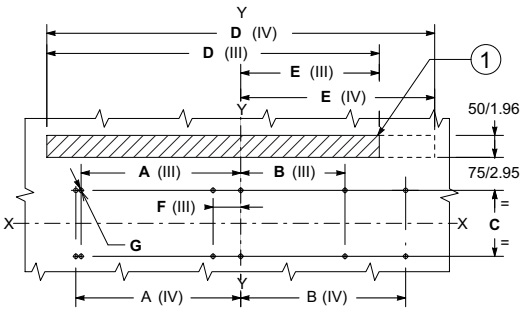
B refers to KLC; C refers to KLP

Dimensions of the compartment



[mm/in]	A	B	C	D
	3p	4p		
E1.2	280/ 11.02	350/ 13.77	440/ 17,32	252/ 9.92
E2.2	400/ 15.74	490/ 19.29	440/ 17,32	355/ 13.97
E4.2	500/ 19.68	620/ 24.41	440/ 17,32	355/ 13.97
E6.2	900/ 35.43	1020/ 40.16	440/ 17,32	355/ 13.97
E6.2/f	-	1200/ 47.24	440/ 17,32	355/ 13.97

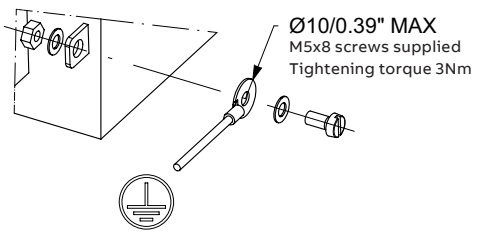
Floor fixing



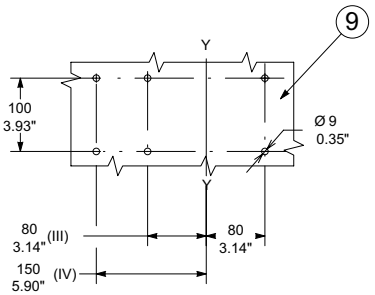
—
Key
1 Ventilation drilling on the switchgear

[mm/in]	A 3p	A 4p	B 3p	B 4p	C	D 3p	D 4p	E 3p	E 4p	F	G
E1.2	80/3.14	150/5.90	80/3.14	80/3.14	100/3.93	-	-	-	-	-	9/0.35
E2.2	75/2.95	175/6.88	75/2.95	75/2.95	150/5.90	270/10.62	360/14.17	135/5.31	135/5.31	-	10/0.39
E4.2	100/3.93	225/8.85	100/3.93	100/3.93	150/5.90	378/14.88	504/19.84	189/7.44	189/7.44	-	10/0.39
E6.2	363/14.29	375/14.76	237/9.33	375/14.76	150/5.90	756/29.76	882/34.72	315/12.40	441/17.36	63/2.48	10/0.39
E6.2/f	-	425/16.73	-	425/16.73	150/5.90	-	1008/39.68	-	441/17.36	-	10/0.39

Earthing device E2.2 - E4.2 - E6.2

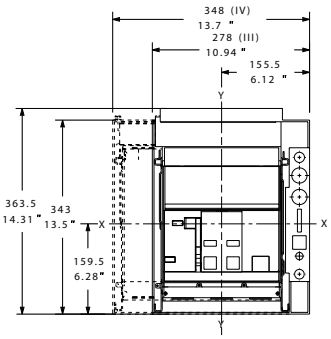


Fixing on support sheet (only for E1.2)

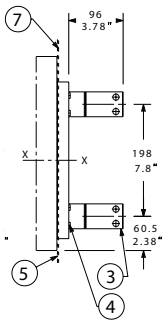


Withdrawable circuit breaker - E1.2

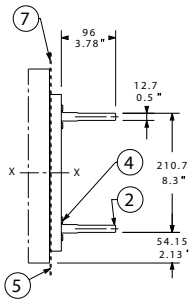
Orientable rear terminals - HR/VR

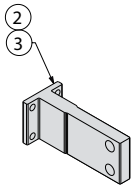


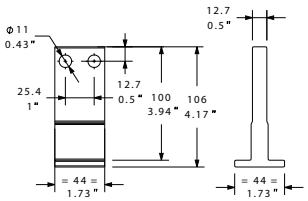
VR adjustment

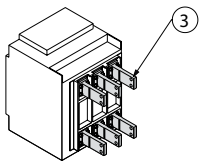


HR adjustment

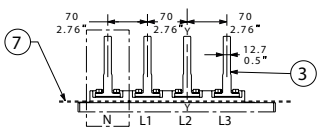


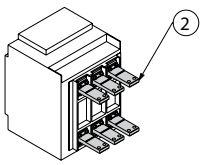




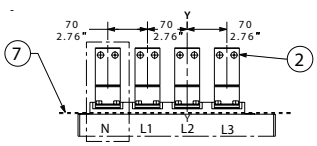


VR adjustment





HR adjustment

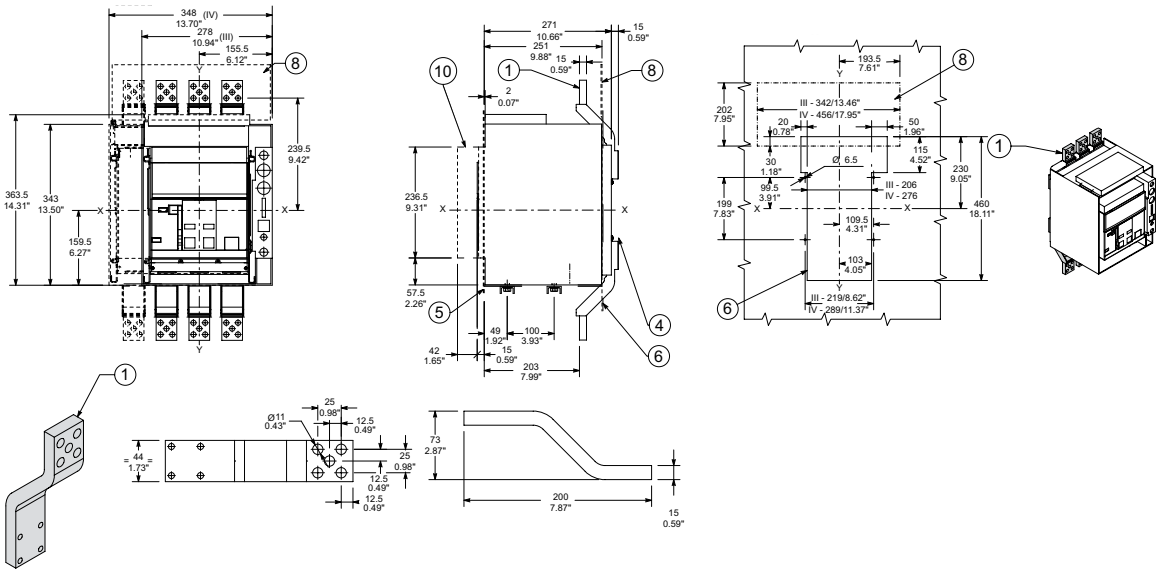


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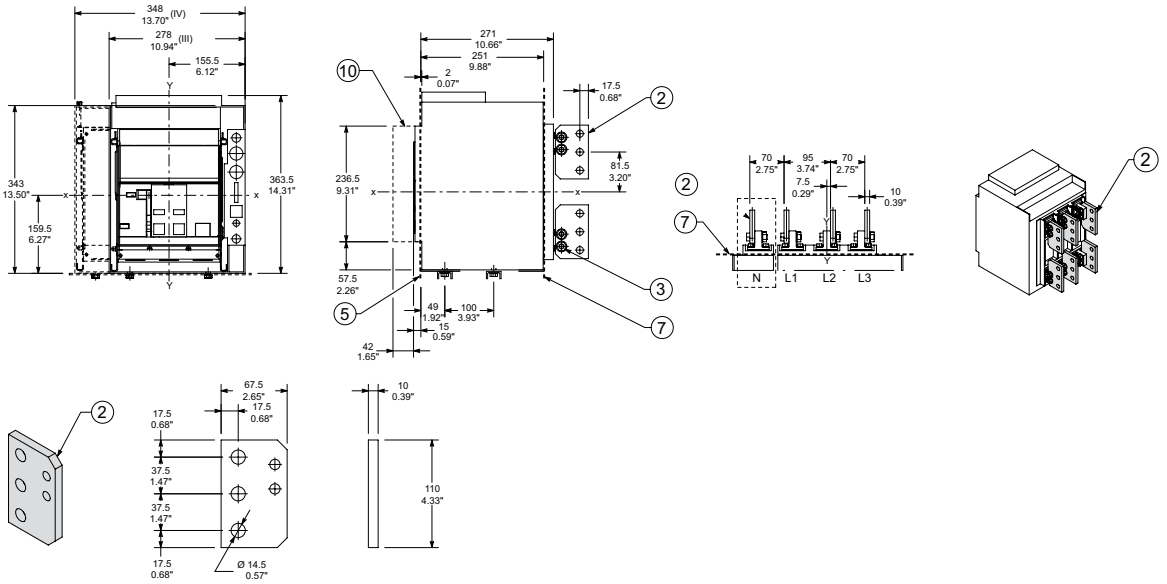
Key

2 Horizontal rear terminals
3 Vertical rear terminals
3 Tightening torque 12 Nm - 106lb in
5 Door position - Ref. page 7/12
7 Rear segregation for rear terminals
8 Insulating Protection

Extended front terminals – EF (not UL listed)



Rear terminals for cables – FcCuAl (not UL listed)



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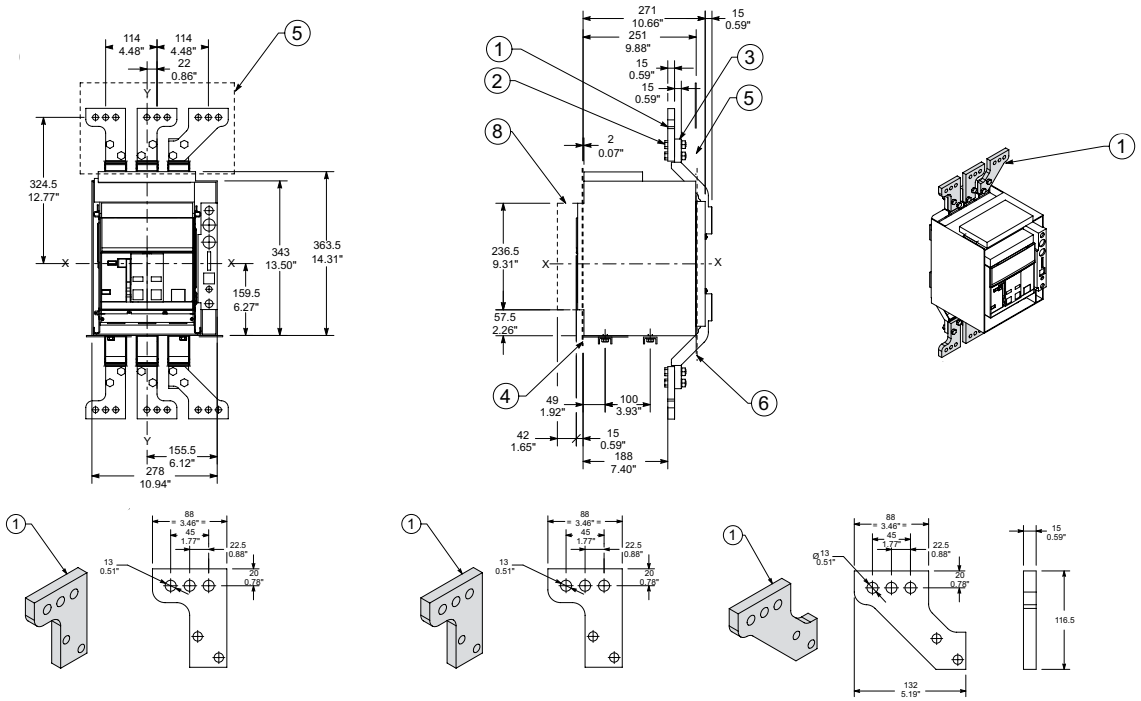
Key

1 Front terminals
2 Rear terminals for cables
3 Tightening torque 48 Nm - 424lb in
4 Tightening torque 12 Nm - 106lb in
5 Door position - Ref. page 7/12
6 Rear segregation for front terminals
7 Rear segregation for rear terminals - Ref. page 7/15
8 Insulating protection
10 Sectioning run

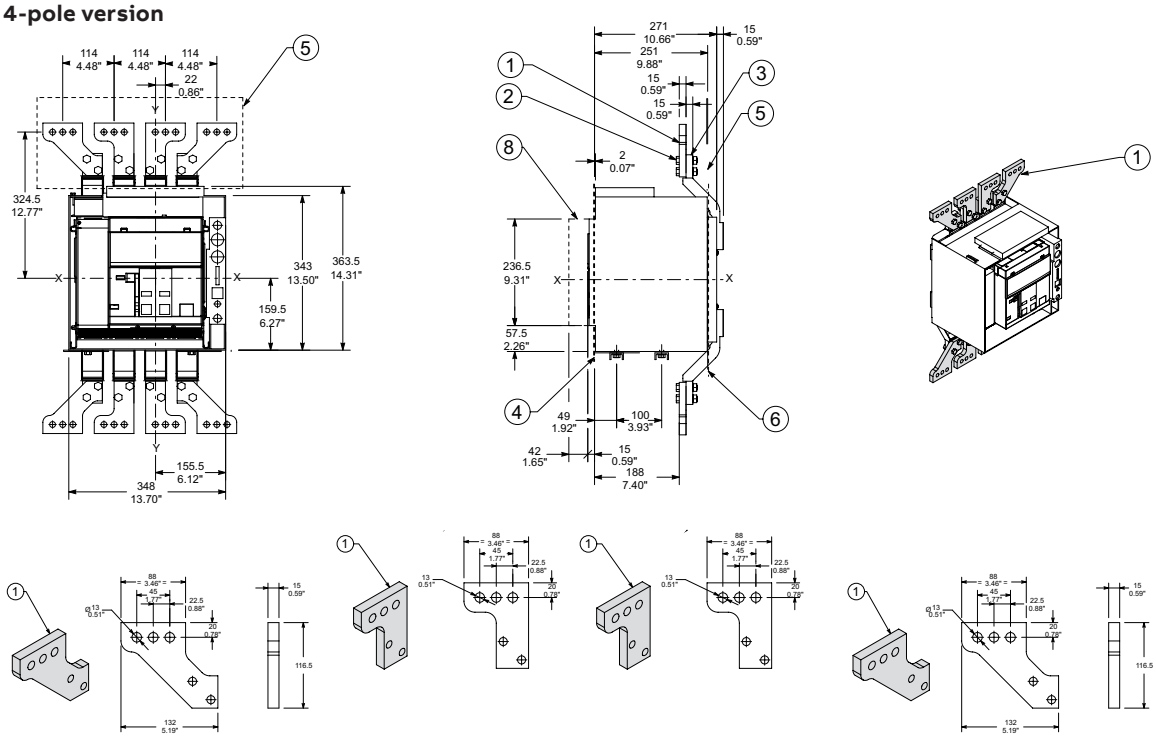
Withdrawable circuit breaker - E1.2

Front spread terminals - ES (not UL listed)

3-pole version



4-pole version

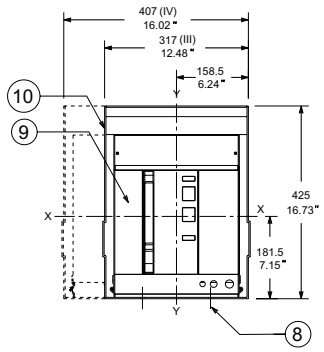


Key
1 Spread terminal
2 Tightening torque 40 Nm - 353lb in
3 Front terminal
4 Door position - Ref. page 7/12
5 Insulating protection (refer to front terminals page 7/15)
6 Rear segregation for front terminals - Ref. page 7/15
8 Sectioning run

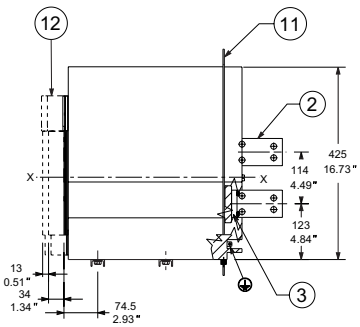
Withdrawable circuit breaker - E2.2

Orientable rear terminals - HR/VR

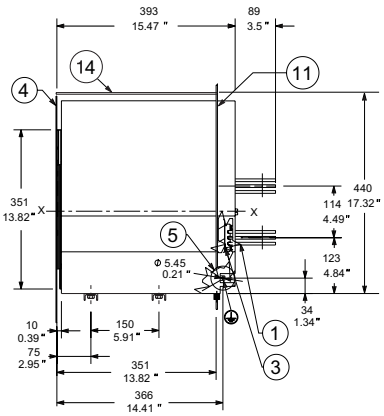
E2.2 B-A, N-A, S-A, H-A, V-A 250A - 2000A

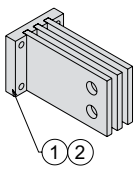


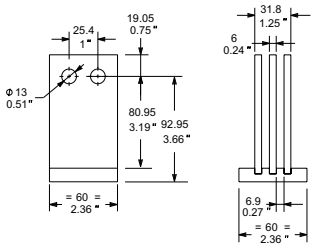
VR adjustment

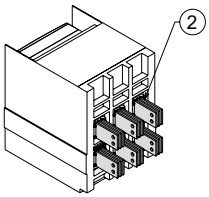


HR adjustment

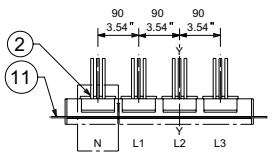


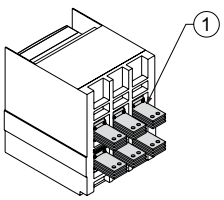




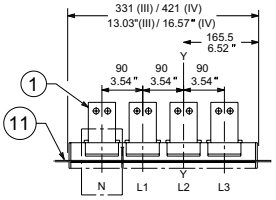


VR adjustment





HR adjustment



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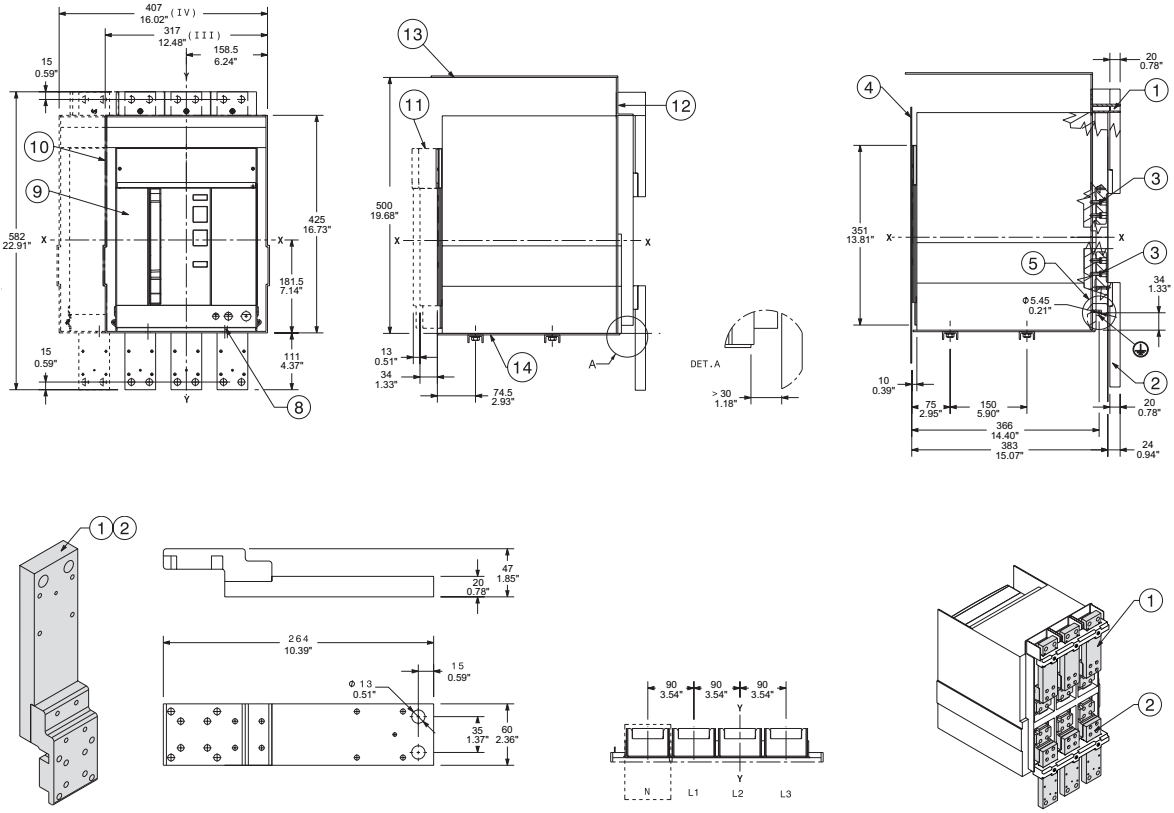
Key

1 Horizontal terminals 1600A-2000A
2 Vertical terminals 1600A-2000A
3 Tightening torque 8.6Nm - 76lb in
4 Door position - Ref. page 7/13
5 Grounding
8 Mounting fixed part screws
9 Moving part
10 Fixed part
11 Segregation
12 Connected, test, disconnected distances
14 Metallic sheet

Withdrawable circuit breaker - E2.2

Front terminals – F (not UL listed)

E2.2 B-A, N-A, S-A, H-A, V-A 250A - 2000A

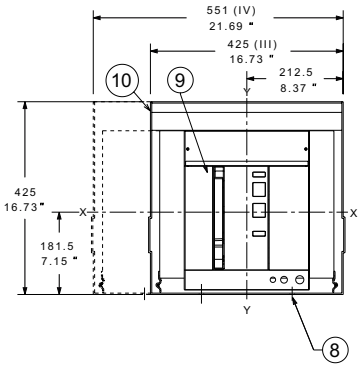


Key
1 Upper front terminals
2 Lower front terminals
3 Tightening torque 8.6Nm - 76lb in
4 Door position - Ref. page 7/13
5 Earthing device
8 External fixing point. Reccomended screws M10x25 high class
9 Moving part
10 Fixed part
11 Connected, test, disconnected distances
12 Insulating sheet or insulated metallic sheet
13 Roof insulation or insulated metal
14 Fixing plate

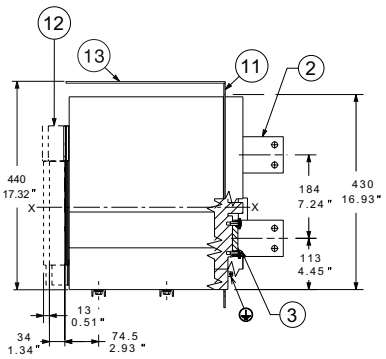
Withdrawable circuit breaker - E4.2

Orientable rear terminals - HR/VR

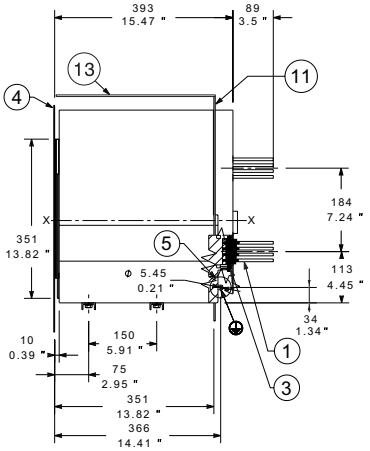
E4.2 S-A, H-A, V-A 800A - 2500A

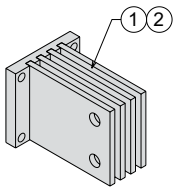


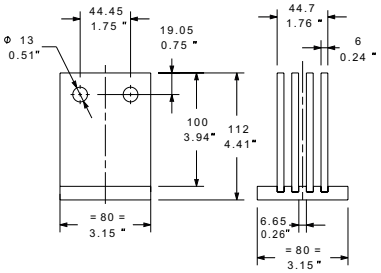
VR adjustment

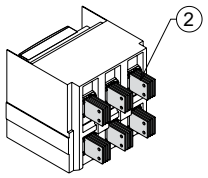


HR adjustment

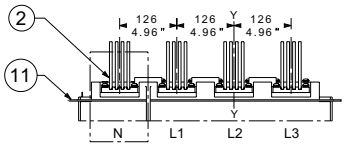


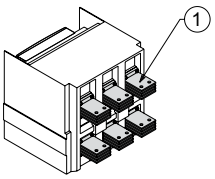




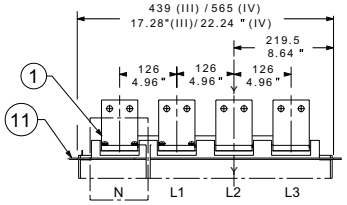


VR adjustment





HR adjustment



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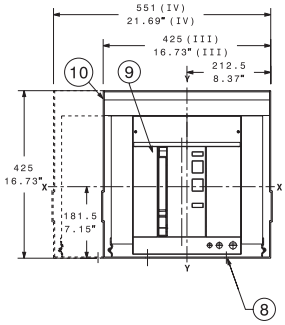
Key

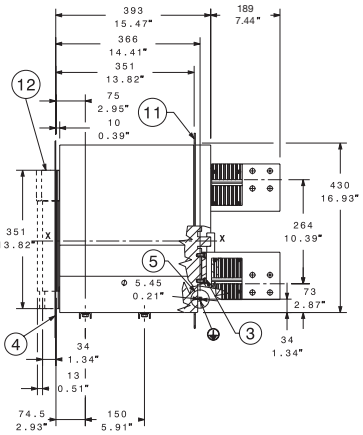
1 Horizontal terminals 2500A
2 Vertical terminals 2500A
3 Tightening torque 20Nm - 177lb in
4 Door position - Ref. page 7/13
5 Grounding
8 Mounting fixed part screws
9 Moving part
10 Fixed part
11 Segregation
12 Connected, test, disconnected distances
13 Roof insulation or insulated metal

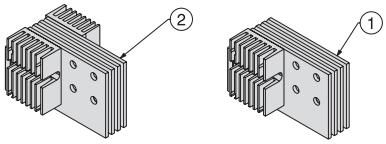
Withdrawable circuit breaker - E4.2

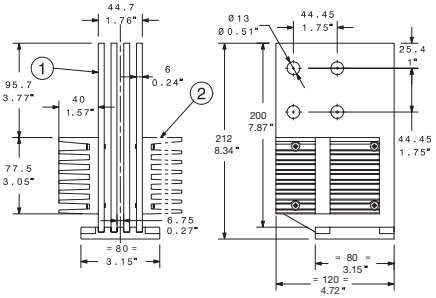
Rear terminals VR

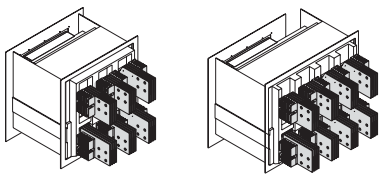
E4.2 S-A, H-A, V-A 3200A

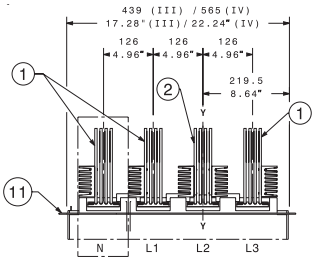






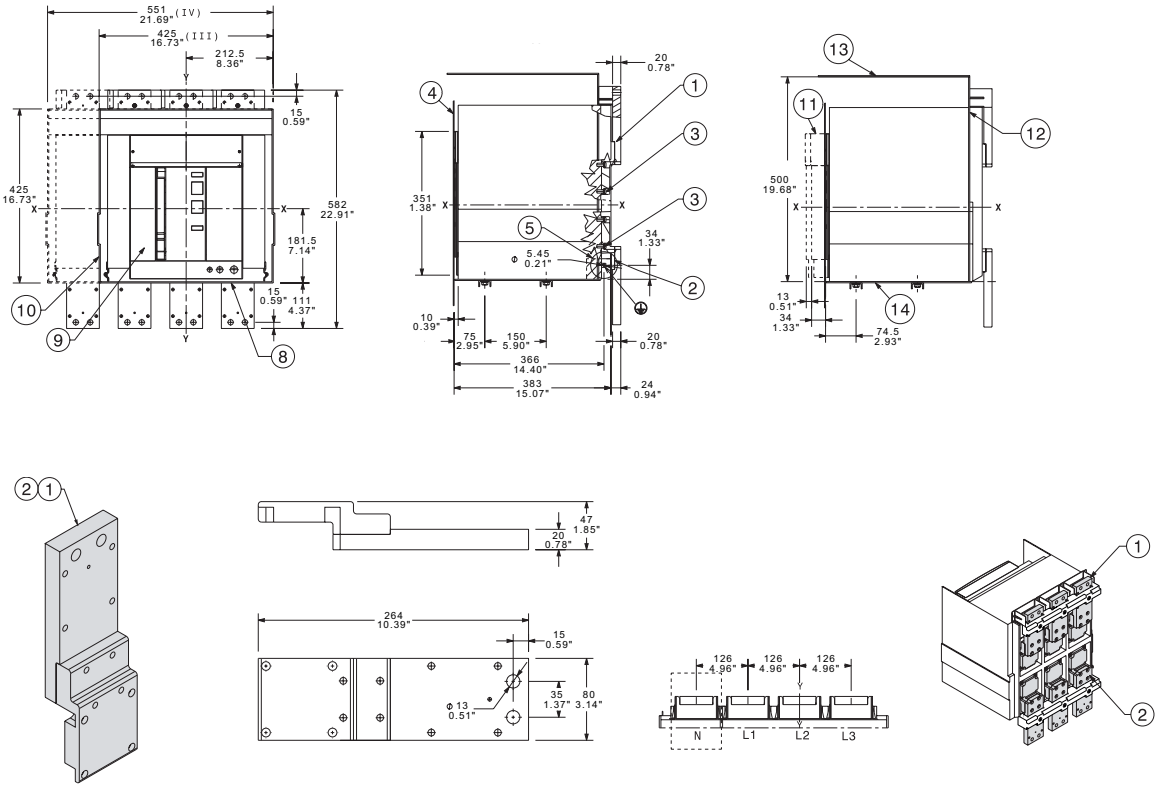






Front terminals – F (not UL listed)

E4.2 S-A, H-A, V-A 800 - 3200A



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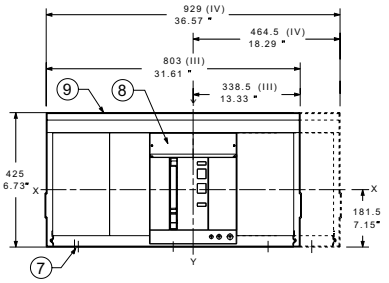
Key

1 Upper front terminals
2 Lower front terminals
3 Tightening torque 20Nm - 176lb in
4 Door position - Ref. page 7/13
5 Earthing device
8 External fixing point. Reccomended screws M10x25 high class
9 Moving part
10 Fixed part
11 Connected, test, disconnected distances
12 Insulating sheet or insulated metallic sheet
13 Roof insulation or insulated metal
14 Fixing plate

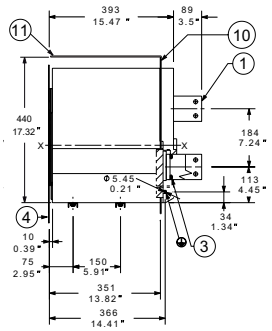
Withdrawable circuit breaker - E6.2

Orientable rear terminals - HR/VR

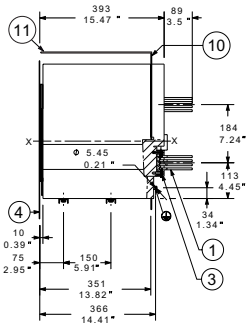
E6.2 H-A, V-A 4000A - 5000A

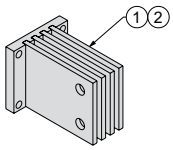


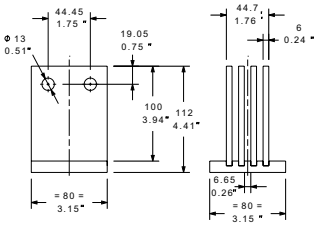
VR adjustment



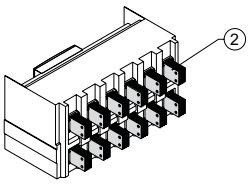
HR adjustment

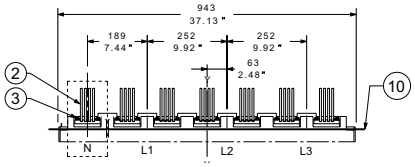


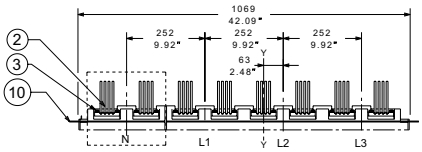




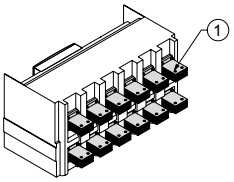
VR adjustment

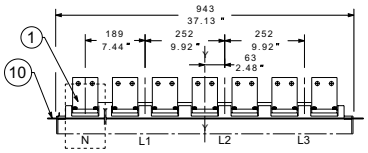


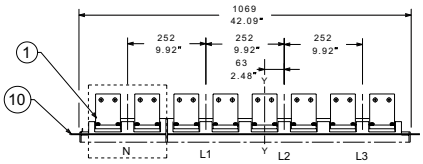




HR adjustment







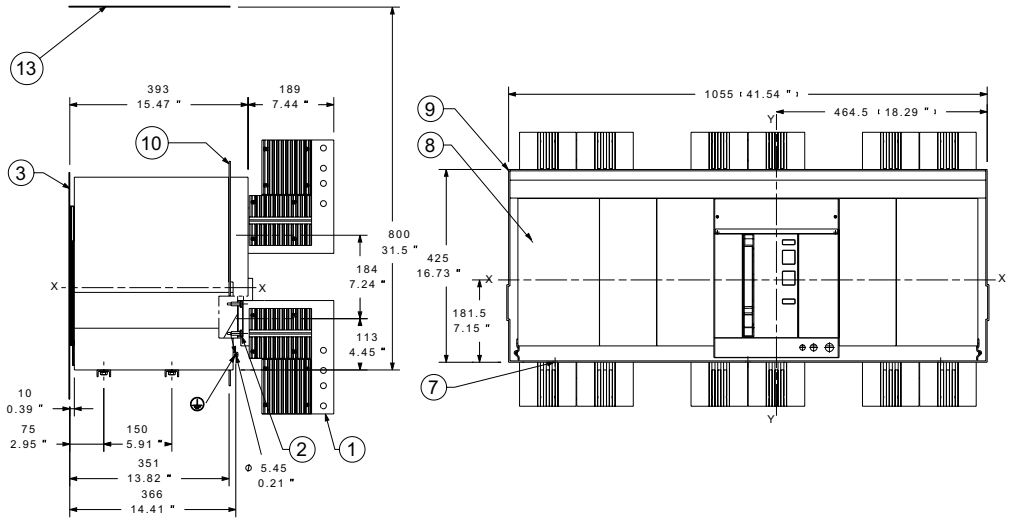
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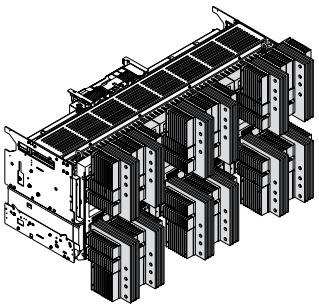
Key

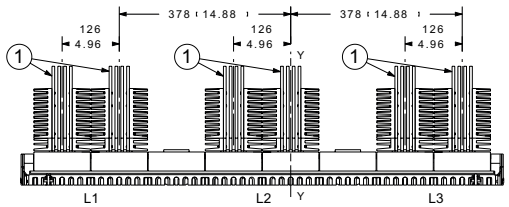
1 Horizontal terminals 5000A
2 Vertical terminals 5000A
3 Tightening torque 20Nm - 177lb in
4 Door position
7 Mounting fixed part screws M8x25 provided Tightening torque 20Nm - 177lb in
8 Moving part
9 Fixed part
10 Segregation
11 Roof insulation or insulated metal

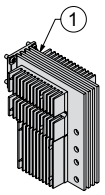
Vertical terminals – VR

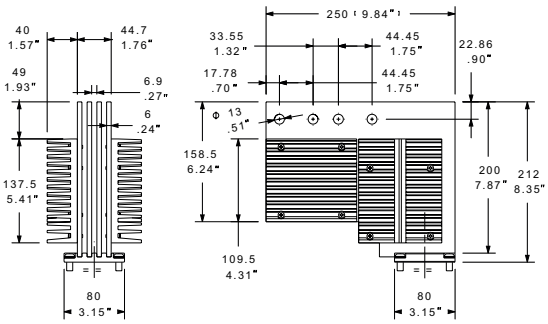
E6.2 H-A, V-A 6000A











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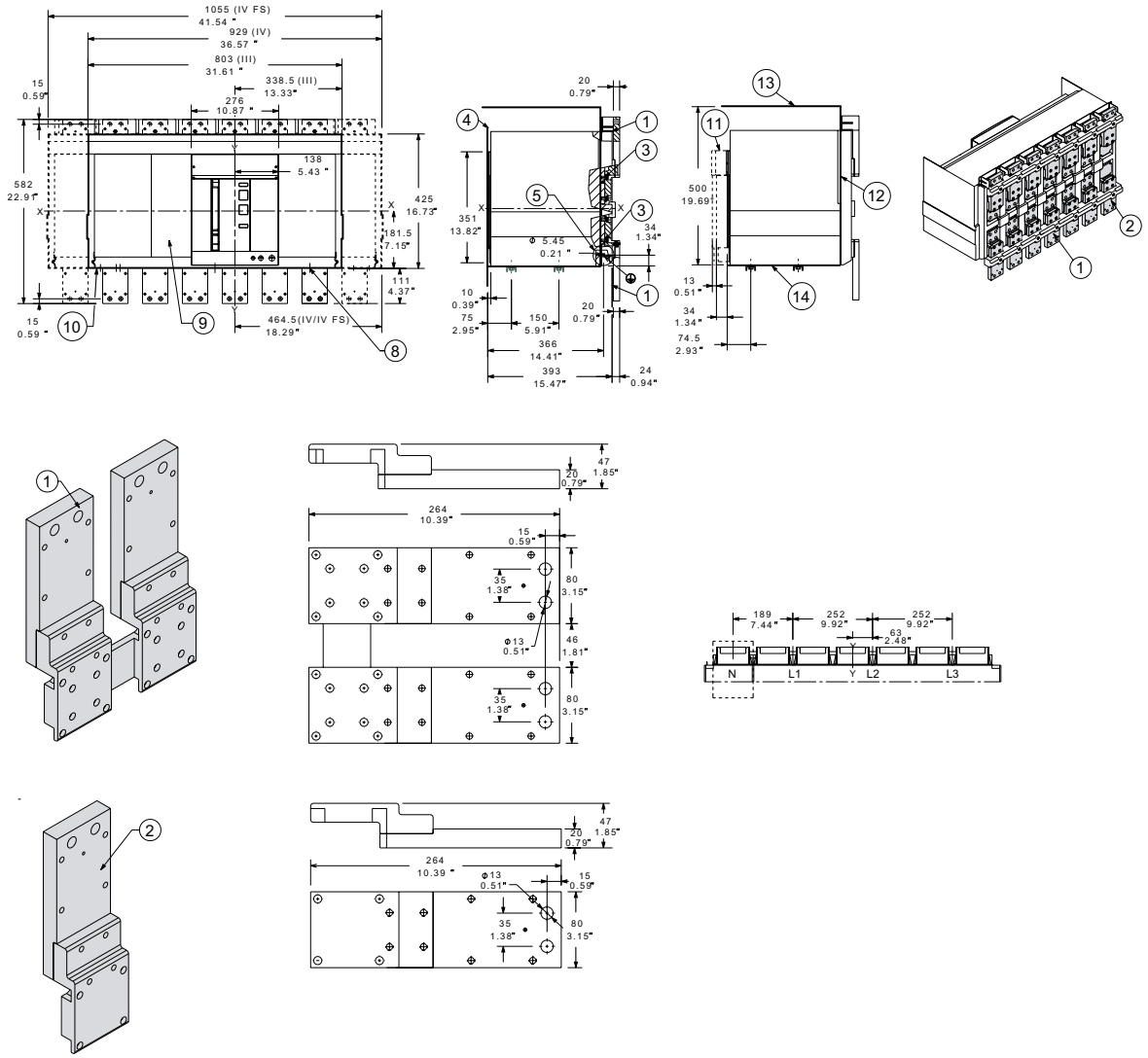
Key

1 Terminal 6000A
2 Tightening Torque 20 Nm - 177 Lb In
3 Door position
7 Mounting fixed part screws M8x25 provided Tightening torque 20Nm - 177lb in
8 Moving part
9 Fixed part
10 Segregation (When Provided)
13 Metallic Sheet

Withdrawable circuit breaker - E6.2

Front terminals – F (not UL listed)

E6.2 H-A, V-A 4000A - 5000A



Key

1 Upper and lower front terminals
2 Single front terminals
3 Tightening torque 20Nm - 177lb in
4 Door position - Ref. page 7/2
5 Grounding
8 Mounting fixed part
9 Moving part
10 Fixed part
11 Connected, test, disconnected distance
12 Insulating sheet or insulated metallic sheet
13 Roof insulation or insulated metal
14 Fixing plate

Electrical diagrams

9/2 **Reading information**

9/7 **Circuit-breakers**

9/9 **Terminal box E2.2 - E4.2 - E6.2**

9/10 **Electrical accessories**

Reading information
Circuit breakers

Operating state shown
The diagram is shown in the following conditions:
- withdrawable version circuit-breaker, open and racked-in
- with de-energized circuits
- trip units not tripped
- motor operator with unloaded springs.

Versions
The diagram shows a withdrawable version circuit-breaker, but it is also valid for fixed version circuit-breakers.

Fixed version
The control circuits are included between the XV terminals (the X connector is not supplied).

Withdrawable version
The control circuits are included between the poles of the X connector (the XV terminal box is not supplied).

Description of figures
1) Supplementary open/closed auxiliary contacts of the circuit-breaker - AUX 6Q (6 Form C)
2) Ekip Signalling 4K
11) Trip signalling contact
12) Contact for signalling position of loaded springs - S33 M/2
13) Motor for loading closing springs- M
14) Remote reset - YR
20) Measurement Enabler/Measurement Enabler with voltage sockets inside the four-pole circuit breaker
21) Measurement Enabler/Measurement Enabler with voltage sockets inside the three-pole circuit breaker and connection to the external neutral
22) Measurement Enabler/Measurement Enabler with voltage sockets for residual voltage protection (for Ekip G only)
23) Measurement Enabler/Measurement Enabler with voltage sockets with external voltage transformer
24) Rc residual current protection sensor input
25) Transformer star center sensor input
26) Zone selectivity
27) Current sensor input on external neutral (only for 3-pole circuit-breakers)
31) Direct auxiliary supply 24V DC and local bus - Ekip Supply
32) Auxiliary supply through module 110-240V AC/DC or 24-48V DC and local bus - Ekip Supply
41) Ekip signalling 2K-1
42) Ekip signalling 2K-2
43) RELT Ekip signalling 2K-3
48) Ekip sinchrocheck
51) Ekip COM Modbus RS-485
52) Ekip COM Modbus TCP
53) Ekip COM Profibus
54) Ekip COM Profinet
55) Ekip COM EtherNet/IP™
56) Ekip COM EtherNet/IP™
57) Ekip COM IEC61850
58) Ekip LINK
59) Ekip Com Hub
61) Ekip COM R Modbus RS-485 Redundant
62) Ekip COM R Modbus TCP Redundant
63) Ekip COM R Profibus Redundant
64) Ekip COM R Profinet Redundant
65) Ekip COM R DeviceNet™ Redundant
66) Ekip COM R EtherNet/IP™ Redundant
71) Ready to close contact - RTC
72) Second opening coil - YO2
73) Undervoltage coil - YU
74) Undervoltage coil with external time-lag device - YU, D

75) First opening coil - YO
76) First opening coil with control from protection trip unit - YO, Ekip Com Actuator
77) First closing coil - YC
78) First closing coil with control from protection trip unit - YC, Ekip Com Actuator
79) Second closing coil - YC2
81) Open/closed auxiliary contacts of circuit-breaker - AUX 4Q (4 Form C)
91) External supplementary open/closed auxiliary contacts of circuit-breaker - AUX 15Q (15 Form C)
95) Contacts for signalling of circuit-breaker in racked-in, test, racked-out position
96) Contacts for signalling of circuit-breaker in racked-in, test, racked-out position (first set)
97) Contacts for signalling of circuit-breaker in racked-in, test, racked-out position (second set)
97A) Contacts for signalling of circuit-breaker in racked-in, test, racked-out position (second set)

Reading information
Circuit breakers

Key

*	= See the note indicated by the letter
A1	= Applications located on the mobile part of the circuit-breaker
A3	= Applications located on the fixed part of the circuit-breaker
A4	= Indicative devices and connections for control and signalling, outside the circuit-breaker
BUS1	= Serial interface with external bus
D	= Electronic time-lag device of YU undervoltage coil, outside the circuit-breaker
F1	= Time-delayed trip fuse
GZi(DBi)	= Zone selectivity input for G protection or input in “reverse” direction for D protection
GZo(DBo)	= Zone selectivity output for G protection or output in “reverse” direction for D protection
I O1…32	= Programmable digital inputs of the EKIP protection trip unit
K51	= Electronic overcurrent protection trip unit of the types: EKIP DIP, EKIP TOUCH, EKIP LCD, EKIP HI-TOUCH , EKIP HI-LCD, EKIP G TOUCH, EKIP G LCD, EKIP G HI-TOUCH , EKIP G HI-LCD
K51/COM	= Communication module
K51/MEAS	= Measurement module
K51/SIGN	= Signalling module
K51/SUPPLY	= Optional auxiliary supply module (110-220VAC/DC and 24-48VDC)
K51/SYNC	= Synchronization module
K51/YC	= Closing control from the EKIP protection trip unit
K51/YO	= Opening control from the EKIP protection trip unit
M	= Motor for loading closing springs
O 01...32	= Programmable signalling contacts of the EKIP protection trip unit
O SC	= EKIP protection trip unit contact for synchronism control
Q	= Circuit-breaker
Q/1...Q/25	= Auxiliary contacts of circuit- breaker
Q/26...Q/27	= Auxiliary open/close contacts used internally by the trip unit
RC	= RC (residual current) protection sensor
RT1…RT3	= Temperature sensors
RTC EKIP	= Auxiliary ready to close contact of circuit-breaker, used internally by the trip unit
RTC	= Contact for signalling circuit-breaker is ready to close
S33M/1…2	= Limit contacts of spring loading motor
S43	= Switch for presetting remote/local control
S51	= Trip signalling contact
S75E/1…4	= Contacts for signalling circuit-breaker in racked-out position (provided only with withdrawable version)
S75I/1…5	= Contacts for signalling circuit-breaker in racked-in position (provided only with withdrawable version)
S75T/1…2	= Contact for signalling circuit-breaker in test position (provided only with withdrawable version)
SC	= Pushbutton or contact for closing the circuit-breaker
SO	= Pushbutton or contact for immediate opening of the circuit-breaker
SO1	= Pushbutton or contact for opening the circuit-breaker with time-delayed trip

SR	= Pushbutton or contact for electrical resetting of S51trip contact
SZi(DFi)	= Input for zone selectivity for S and I protection or input in “direct” direction for D protection
SZo(DFo)	= Output for zone selectivity for S and I protection or output in “direct” direction for D protection
TI/L1	= Current transformer phase L1
TI/L2	= Current transformer phase L2
TI/L3	= Current transformer phase L3
TI/N	= Current transformer on neutral
TU1…TU2	= Insulation voltage transformer (outside circuit-breaker)
Uaux	= Auxiliary supply voltage
UI/L1	= Current sensor phase L1
UI/L2	= Current sensor phase L2
UI/L3	= Current sensor on phase L3
UI/N	= Current sensor on neutral
UI/O	= Single-pole current sensor
W2	= Serial interface with internal bus (local bus)
W9…W13	= RJ45 connector for communication modules
W9R.W11R	= RJ45 connector for redundant communication modules
X	= Delivery connector for auxiliary circuits for withdrawable version of circuit-breaker
XB1...XB7	= Connectors for circuit-breaker applications
XF	= Delivery terminal board for position contacts of withdrawable version of circuit-breaker
XK1…XK3	= Connectors for auxiliary circuits of the EKIP protection trip unit
XK7	= Connector for auxiliary circuits of communication module
XV	= Delivery terminal box for auxiliary circuits of fixed version circuit-breaker
YC	= Closing coil
YC2	= Second closing coil
YO	= Opening coil
YO1	= Opening coil for overcurrent
YO2	= Second opening coil
YR	= Coil for electrical resetting of trip contact S51
YU	= Undervoltage coil

Reading information
Circuit breakers

Notes

A) Auxiliary supply for Ekip trip unit is mandatory (refer to diagram 1SDM00009R0001 figures 31 - 32- 33 - 34).

B) When there are mixed auxiliary contacts Q1 and Q2 are 400V, while Q3 and Q4 are 24V. Then Q5, Q6, Q7 are 400V, while Q8, Q9, Q10 are 24V.

C) Always supplied with Ekip Com module.

D) Always supplied with motor for loading closing springs in Fig. 13.

E) Obligatory voltage transformer in the case of external sockets. Obligatory external sockets for systems with rated voltage greater than 690V.

F) The connections between the RC residual current protection sensor and the poles of the X connector (or XV) of the circuitbreaker must be made with 4-pole shielded cable with conductors interwoven in pairs (type BELDEN 9696 paired or equivalent), of a length no greater than 10 m. The shield should be grounded on circuit-breaker side.

G) With all electronic protection trip units equipped with display interface with LSIG protections, protection against a ground fault is available (Gext) by means of current sensor positioned on the star center of the MV/LV transformer. The connection between terminals 1 and 2 of the UI/O current transformer and Ge+ and Ge- poles of the X connector (or XV) must be made with shielded and stranded 2-pole cable (type BELDEN 9841 or equivalent) of length no greater than 15 m.

H) The connection between the terminal box and external neutral sensor must be made with the 2m cable provided. For three pole circuit- breakers, the Ne+ and Ne- poles of the X connector (or XV) must be short-circuited if no sensor is present on the external neutral conductor.

I) Obligatory in the case of the presence of any Ekip module.

J) Only for E2.2, E4.2 and E6.2 withdrawable version circuit-breakers as an alternative to Fig. 31-32-34.

K) Only for E2.2, E4.2 and E6.2 withdrawable version circuit-breakers as an alternative to Fig. 31-32-33.

K) Only for E2.2, E4.2 and E6.2 withdrawable version circuit-breakers as an alternative to Fig. 31-32-33.

L) In the presence of Fig. 32, for E2.2, E4.2 and E6.2 circuit-breakers up to three applications between Fig. 41…58 taken only once can be supplied, instead for E1.2 circuit-breakers, up to two applications between Fig. 41…58 taken only once can be supplied. The Ekip Com module selected can be duplicated if required, by choosing between Fig. 61…66.

M) In the presence of Fig. 33, for E2.2, E4.2 and E6.2 circuit-breakers, up to two applications between Fig. 41…58 taken only once can be supplied. The Ekip Com module selected can be duplicated if required, by choosing between Fig. 61…66.

N) In the presence of Fig. 34, for E2.2, E4.2 and E6.2 circuit-breakers, a single application between Fig. 41…58 can be supplied.

O) In the presence of several Ekip Com modules with withdrawable version circuit-breakers, the contact S75I/5 should be connected only once to a single module.

P) The auxiliary voltage Uaux. enables activation of all the functions of the EKIP electronic protection trip units. Since an earth insulated Uaux was requested, it is necessary to use “galvanically separated convertors” which comply with the standards IEC 60950 (UL 1950) or equivalent, which provide a common mode current or leakage current (refer to IEC 478/1, CEI 22/3) no greater than 3.5mA, IEC 60364-41 and CEI 64-8.

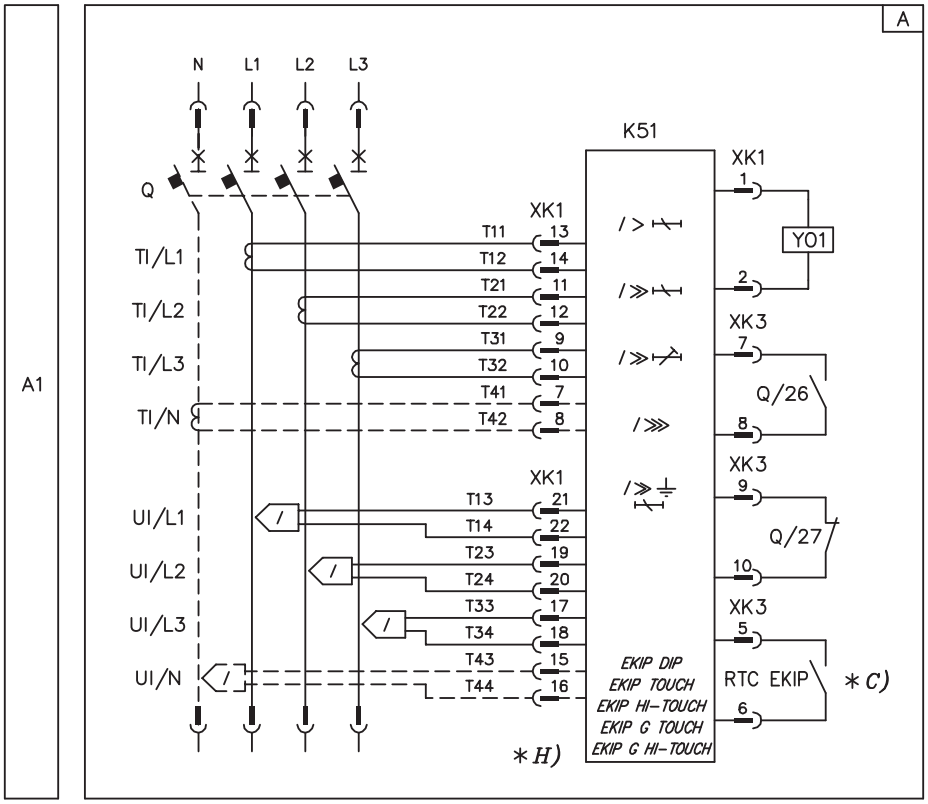
Q) Regarding local bus the maximum cable lenght is 15m.

R) Suggested RJ45 cable: CAT6 STP.

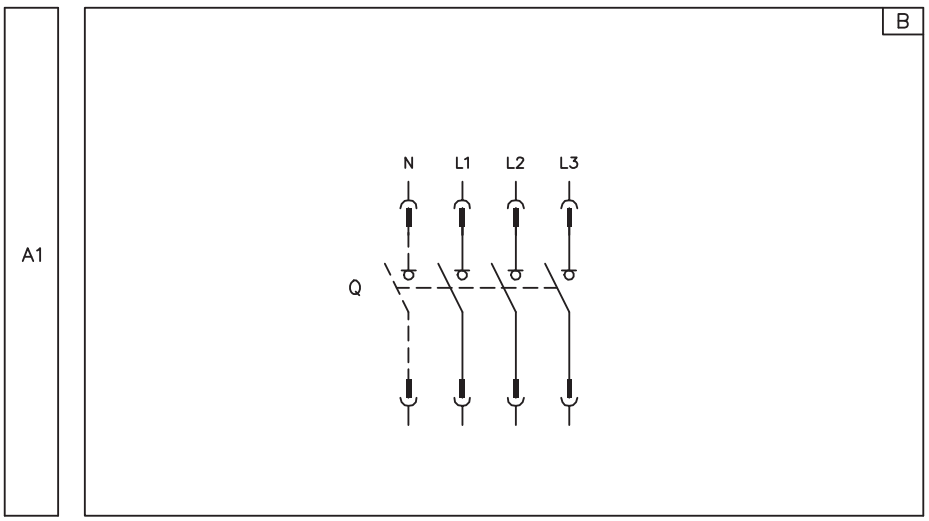
T) Connect terminals 120 Ω on to insert a termination resistance on the Local Bus.

Circuit-breakers (IEC60617 standards)

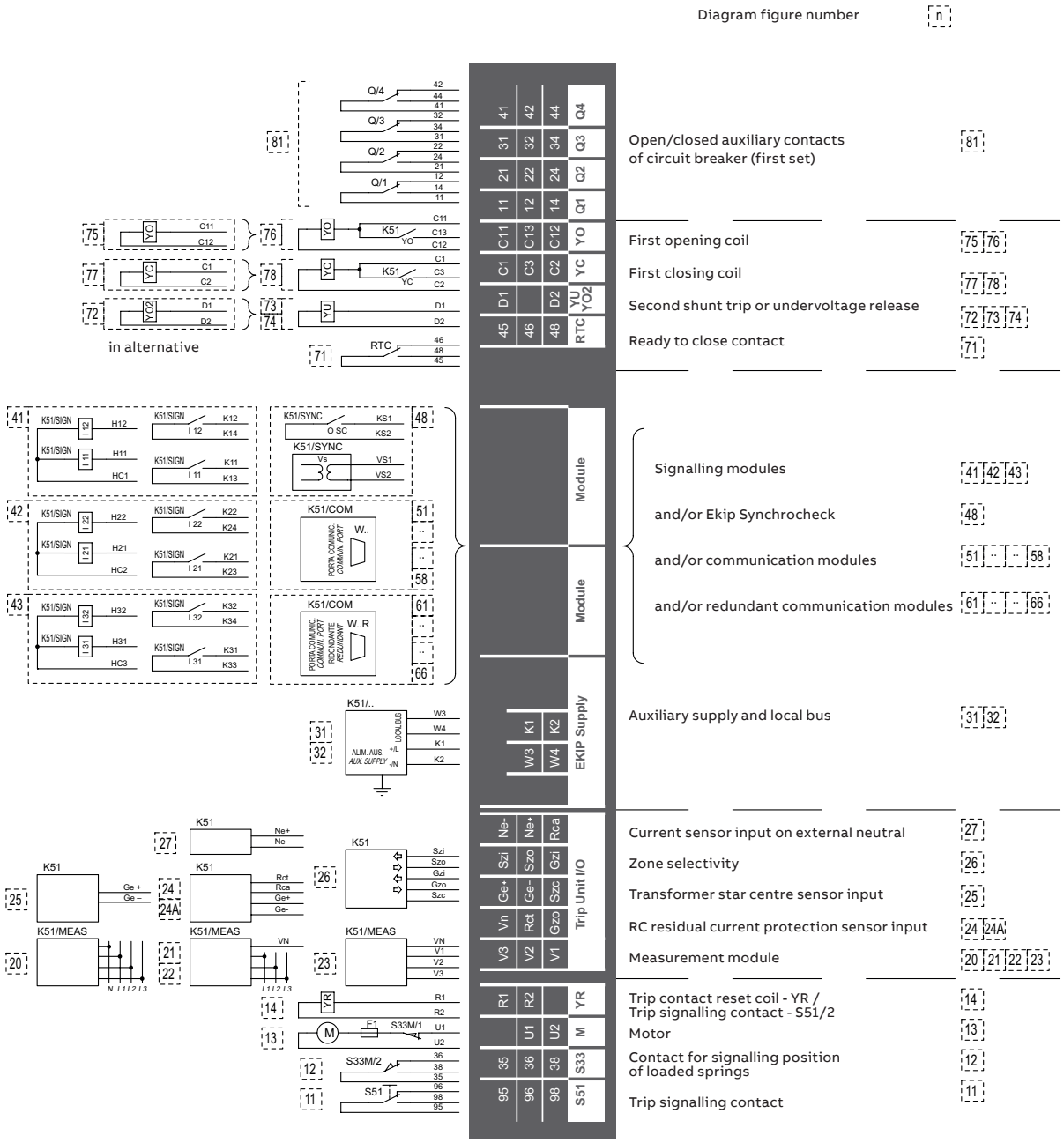
3-pole or 4-pole circuit breaker



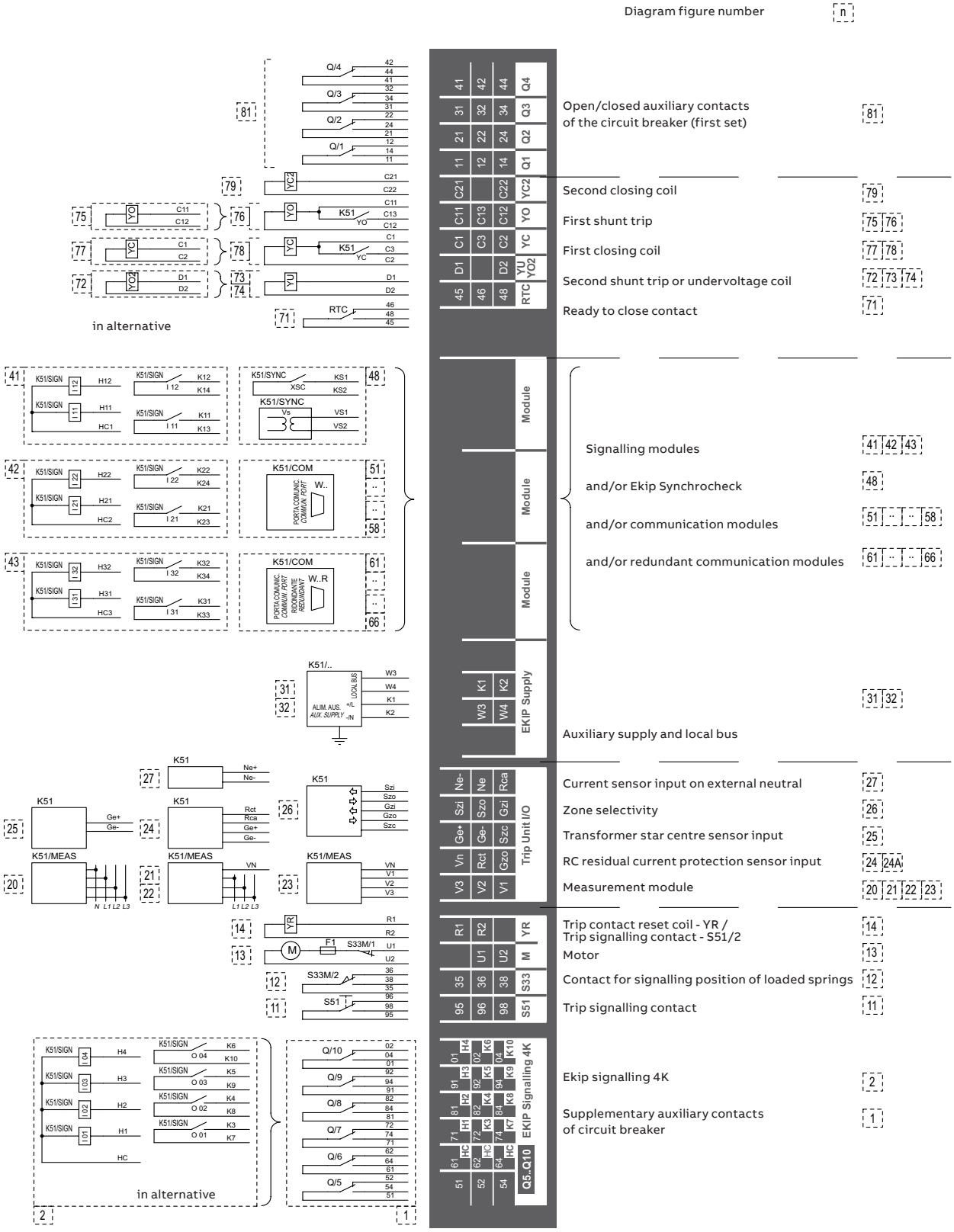
3-pole or 4-pole switch-disconnector



Terminal box E1.2



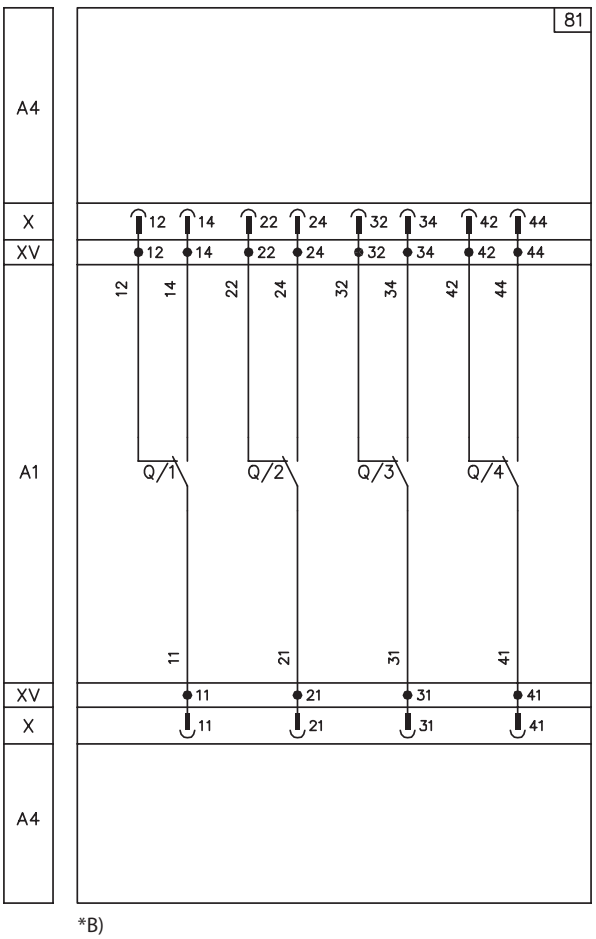
Terminal box E2.2 - E4.2 - E6.2



Electrical accessories



81) Open/closed auxiliary contacts of circuit-breaker - AUX 4Q (4 Form C)





77) First closing coil - YC

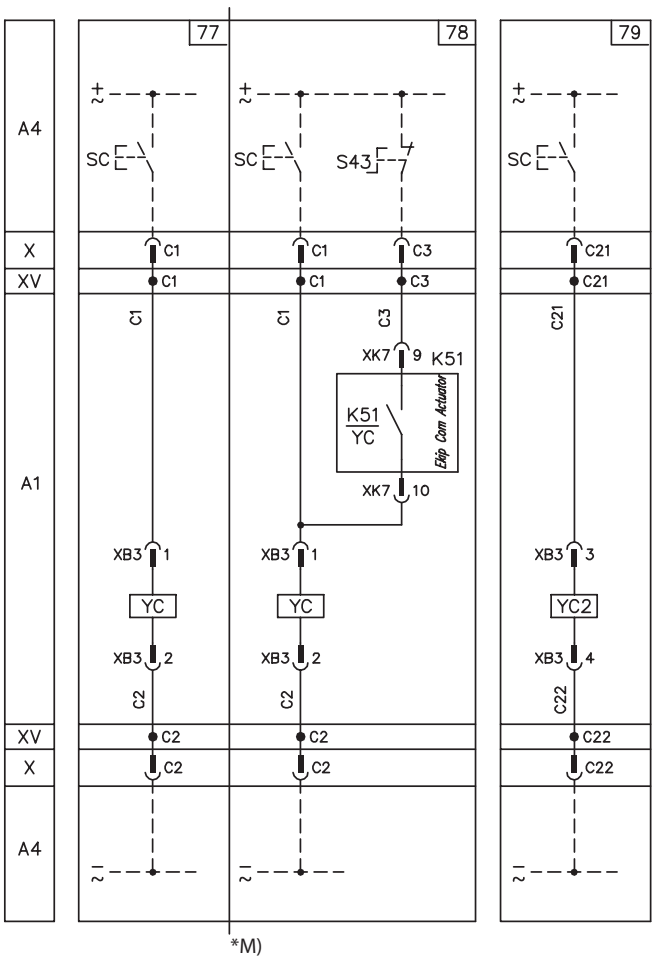
78) First closing coil with control from protection trip unit - YC, Ekip Com Actuator

79) Second closing coil - YC2

—

77- 78 as an alternative to each other

79 valid only for E2.2 - E4.2 - E6.2



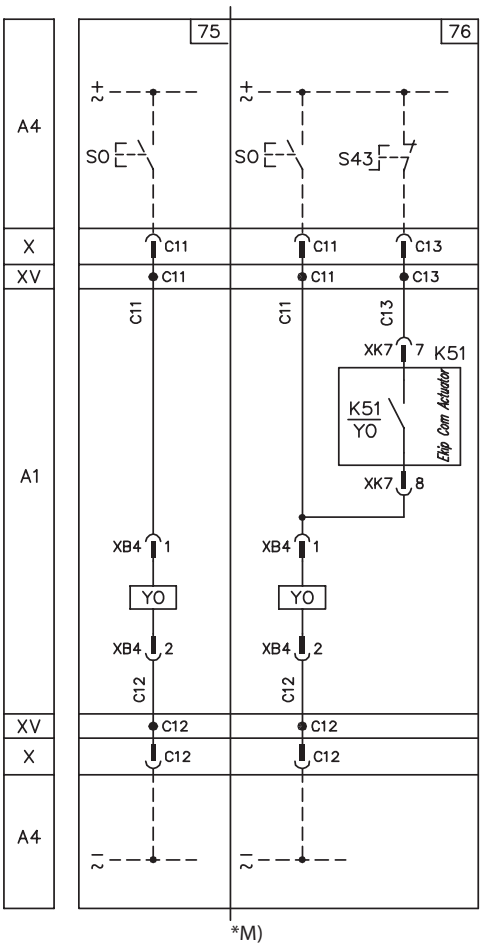
Electrical accessories

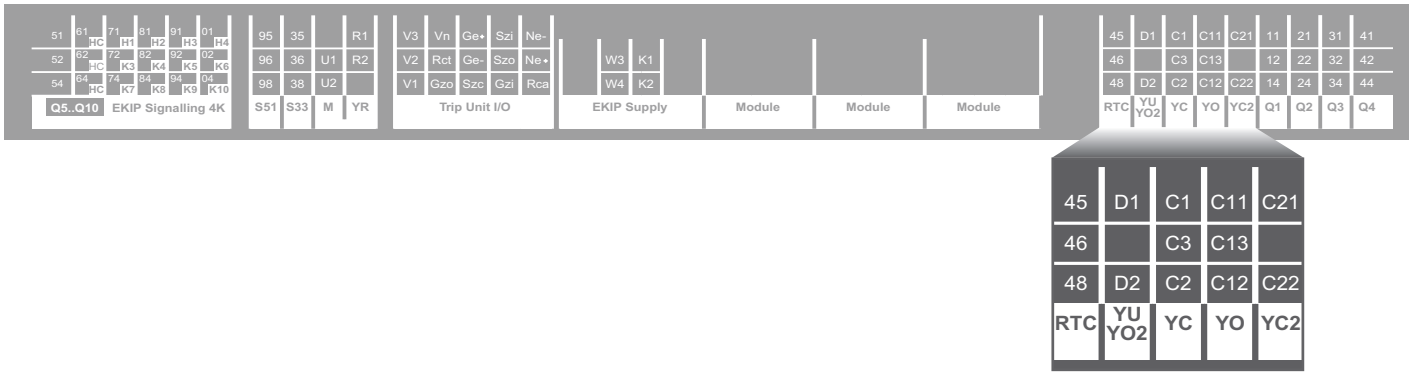


75) First opening coil - YO

76) First opening coil with control from protection trip unit - YO, Ekip Com Actuator

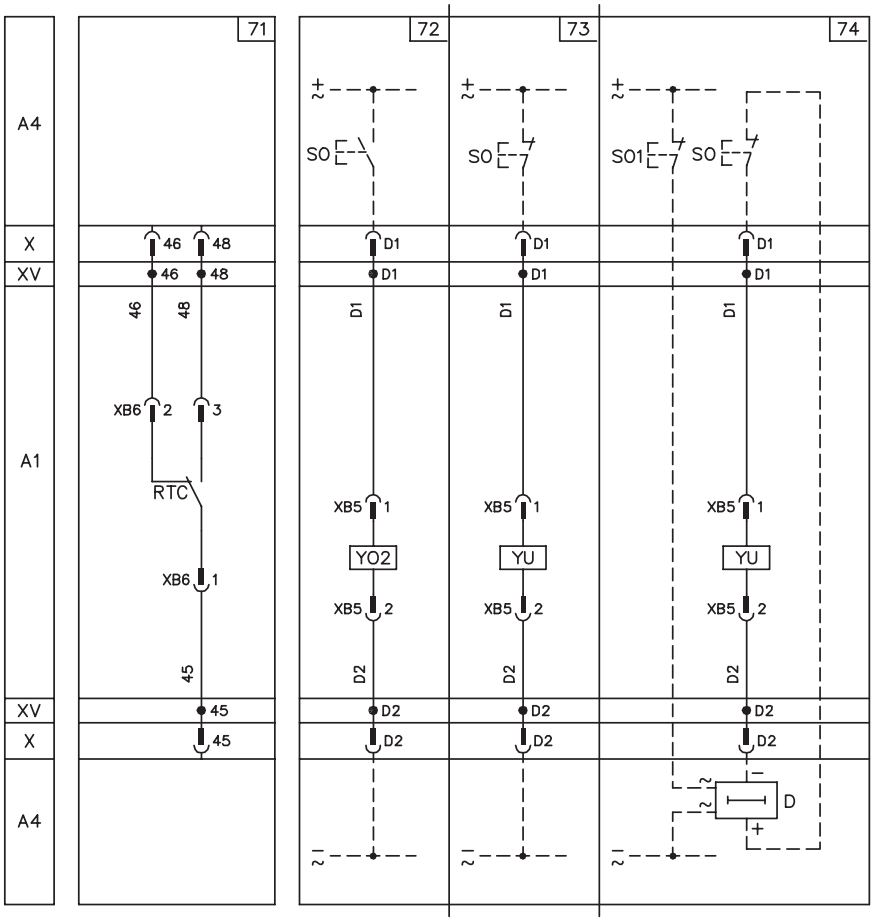
—
75-76 as an alternative to each other



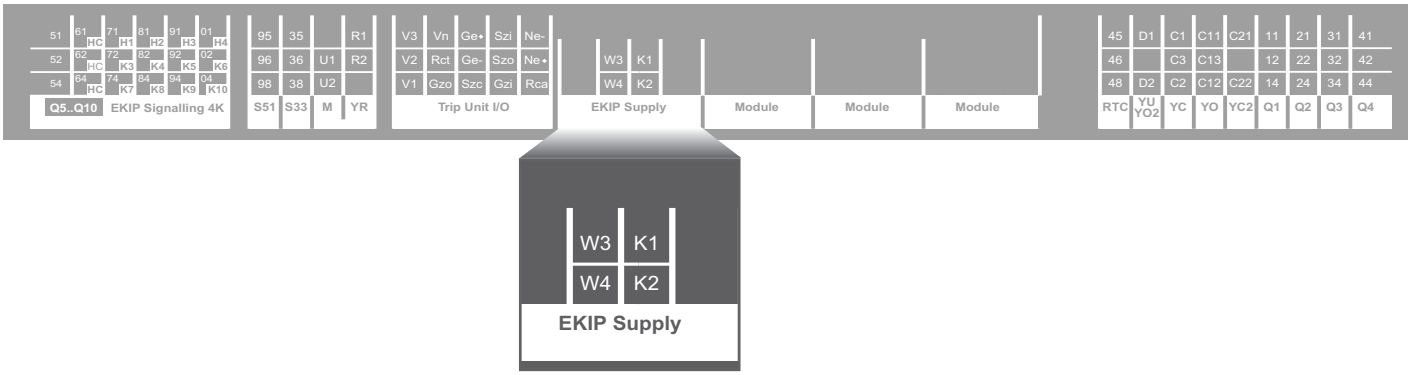


71) Ready to close signalling contact - RTC
72) Second opening coil - YO2
73) Undervoltage coil - YU
74) Undervoltage coil with external time-lag device - YU, D

—
72-73 or 74 as an alternative to each other

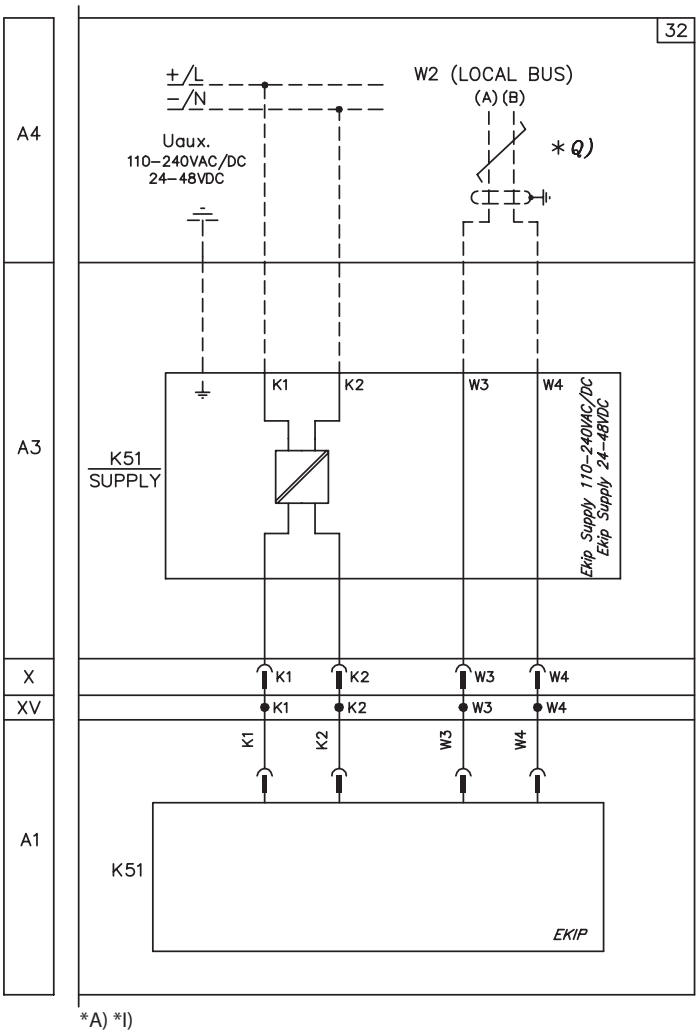


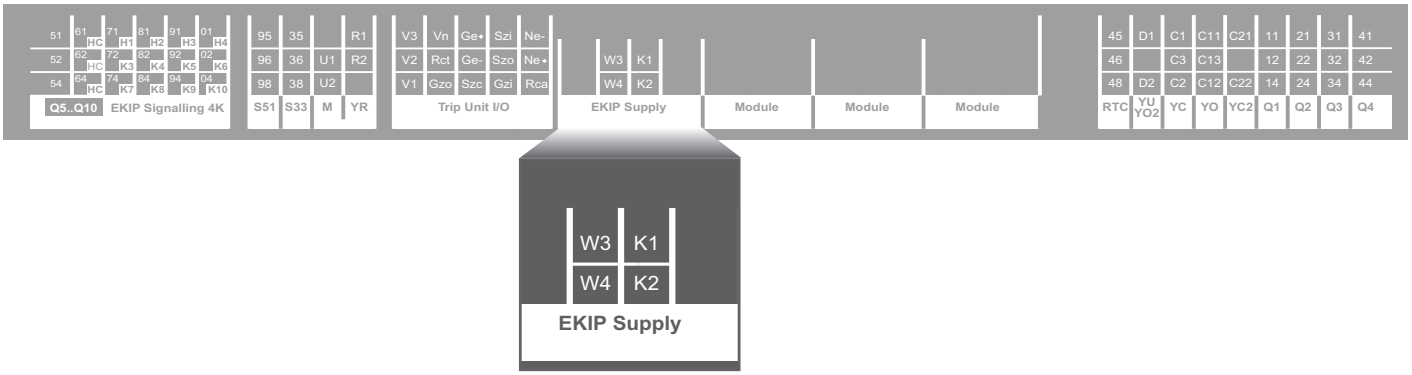
Electrical accessories



32) Auxiliary supply through module 110-240V AC/DC or 24-48V DC and local bus - Ekip Supply

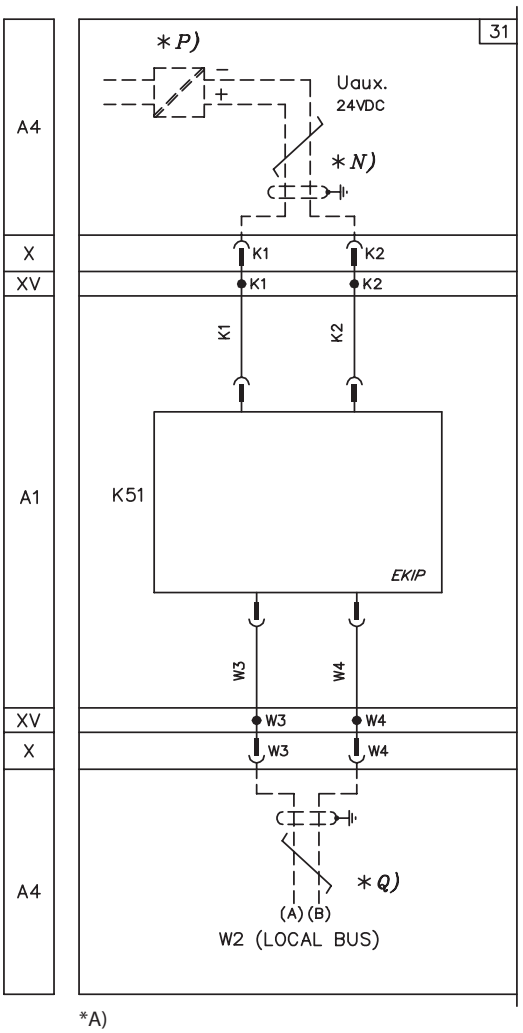
—
As an alternative to figures 31





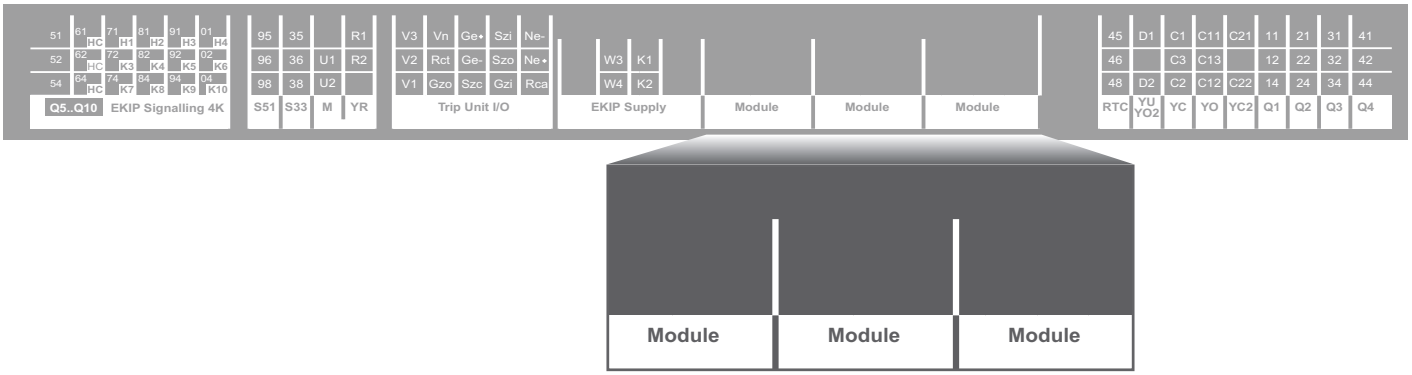
31) Direct auxiliary supply 24V DC and local bus - Ekip Supply

—
As an alternative to figures 32

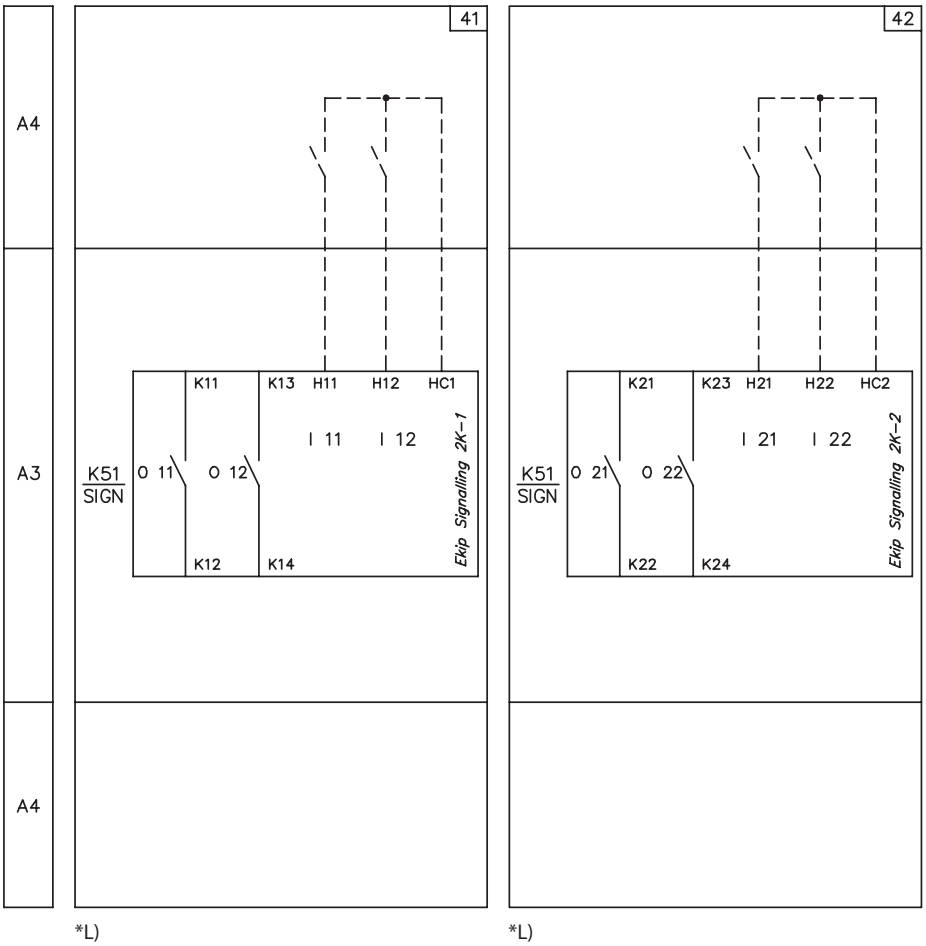


*A)

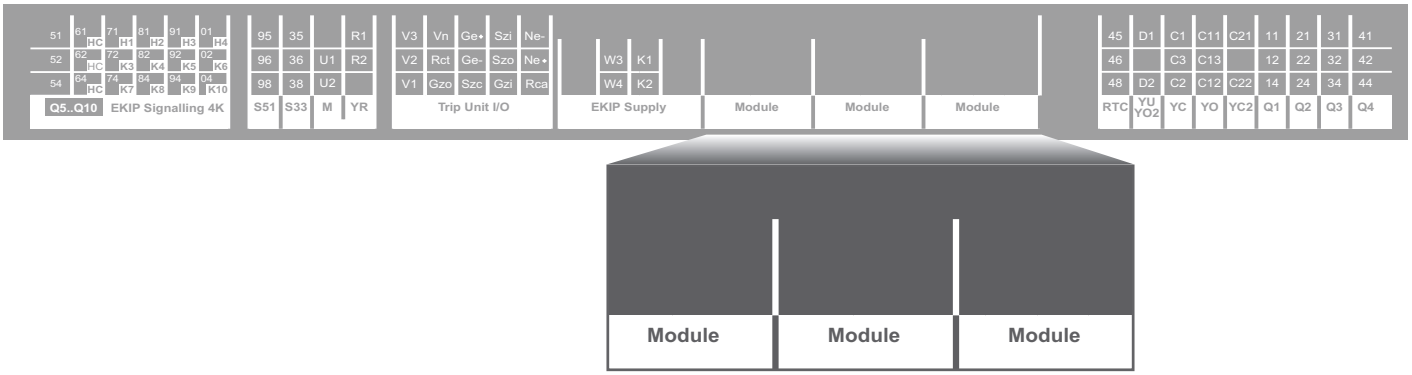
Electrical accessories



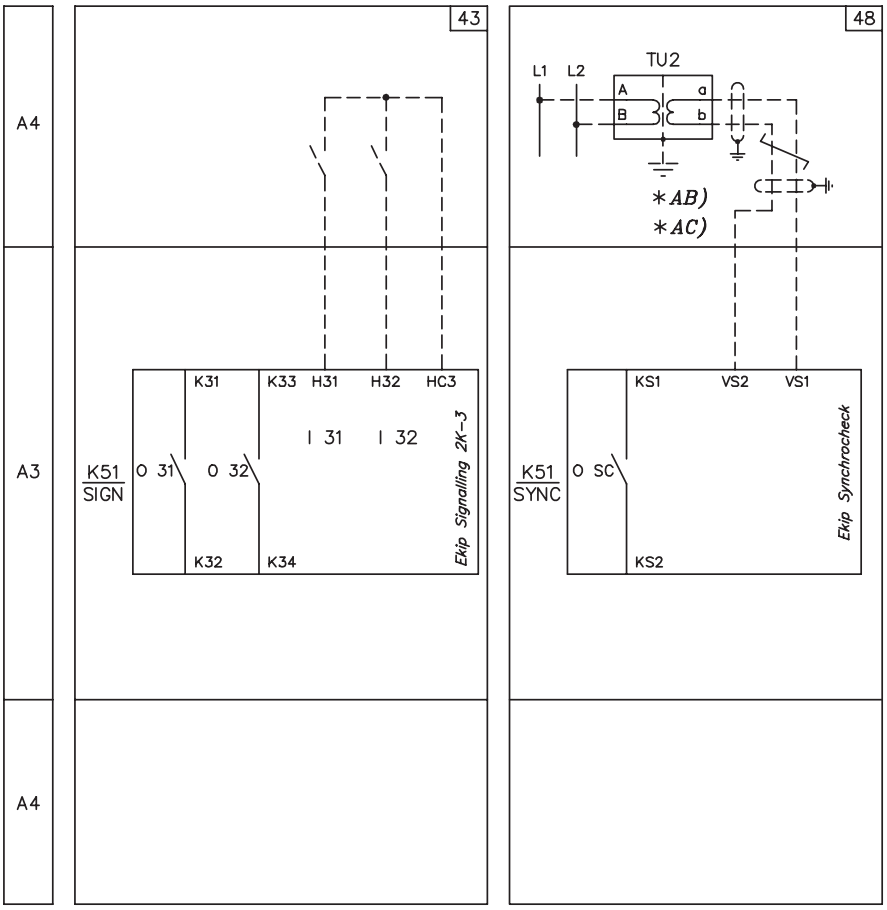
41) Ekip signalling 2K-1
42) Ekip signalling 2K-2



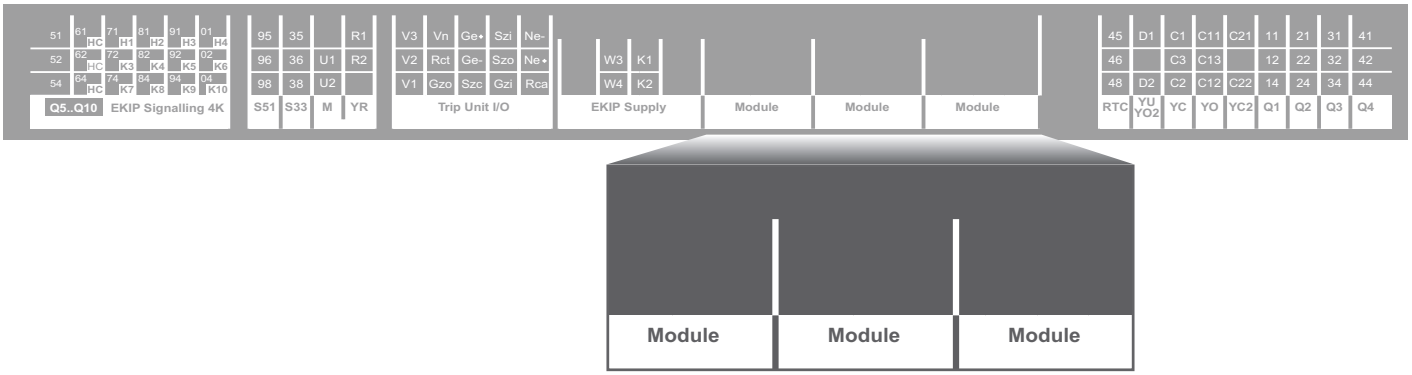
*L) *L)



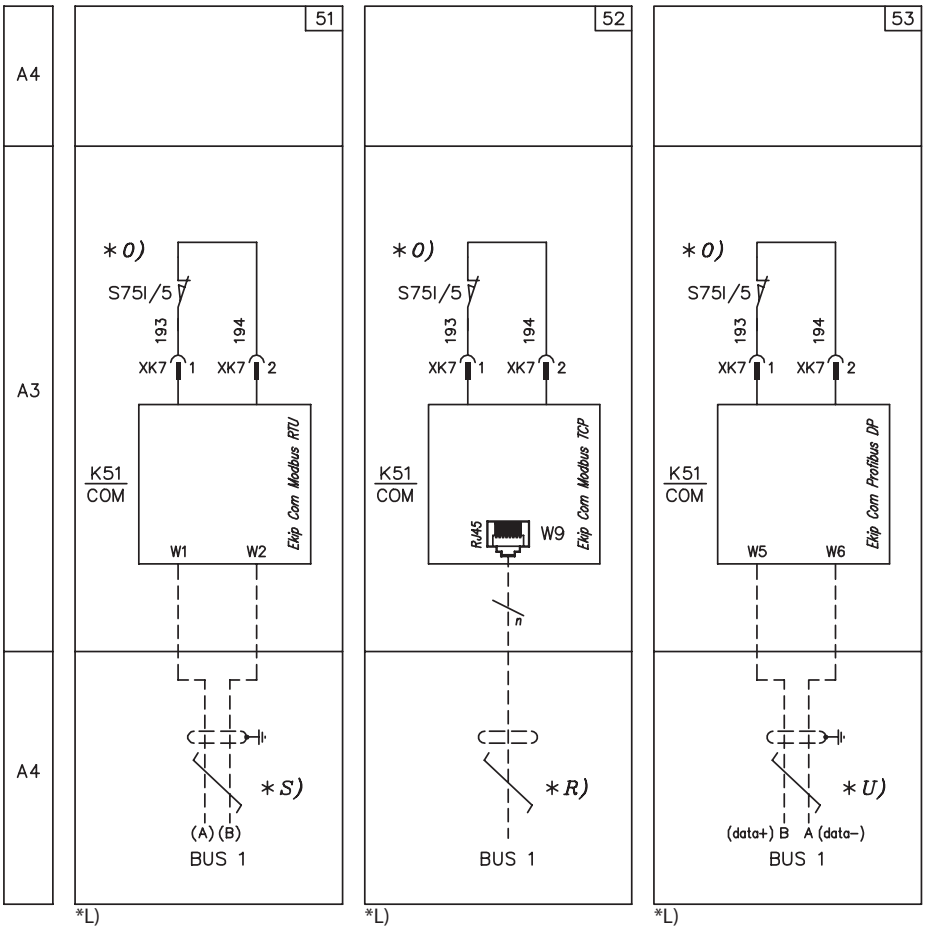
43) RELT Ekip Signalling 2K-3
48) Ekip Synchrocheck

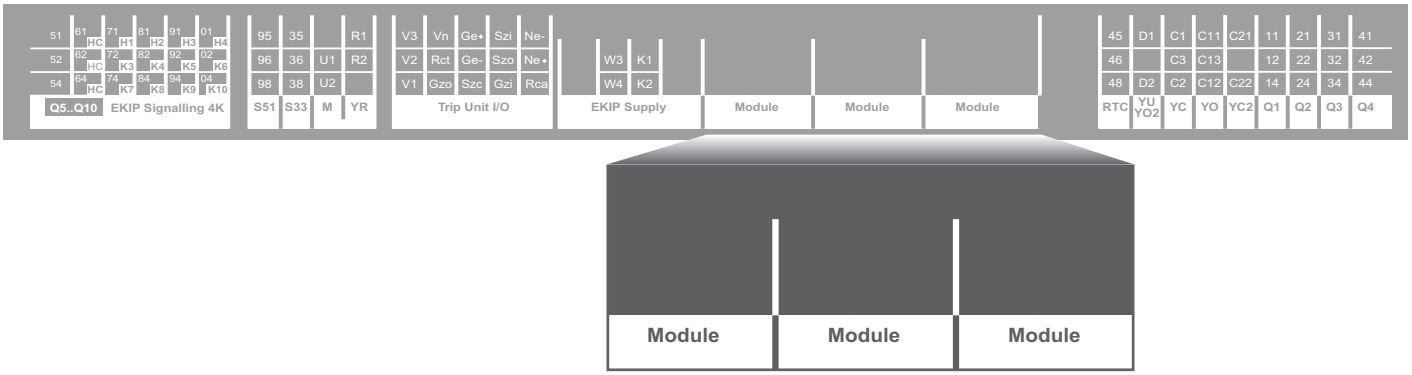


Electrical accessories

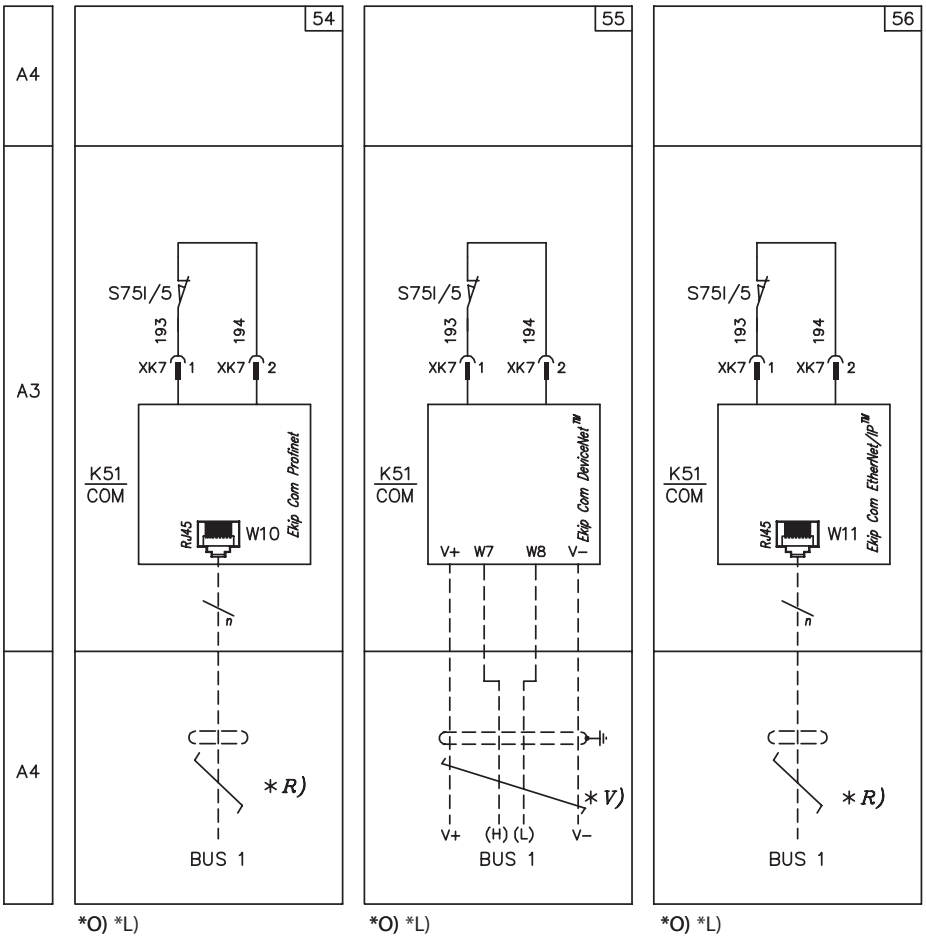


51) Ekip COM Modbus RS-485
52) Ekip COM Modbus TCP
53) Ekip COM Profibus

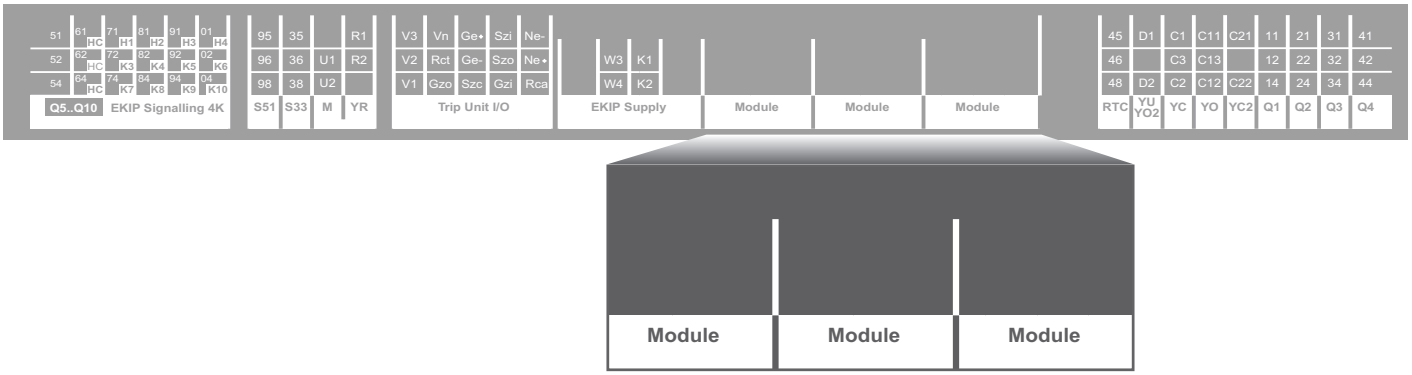




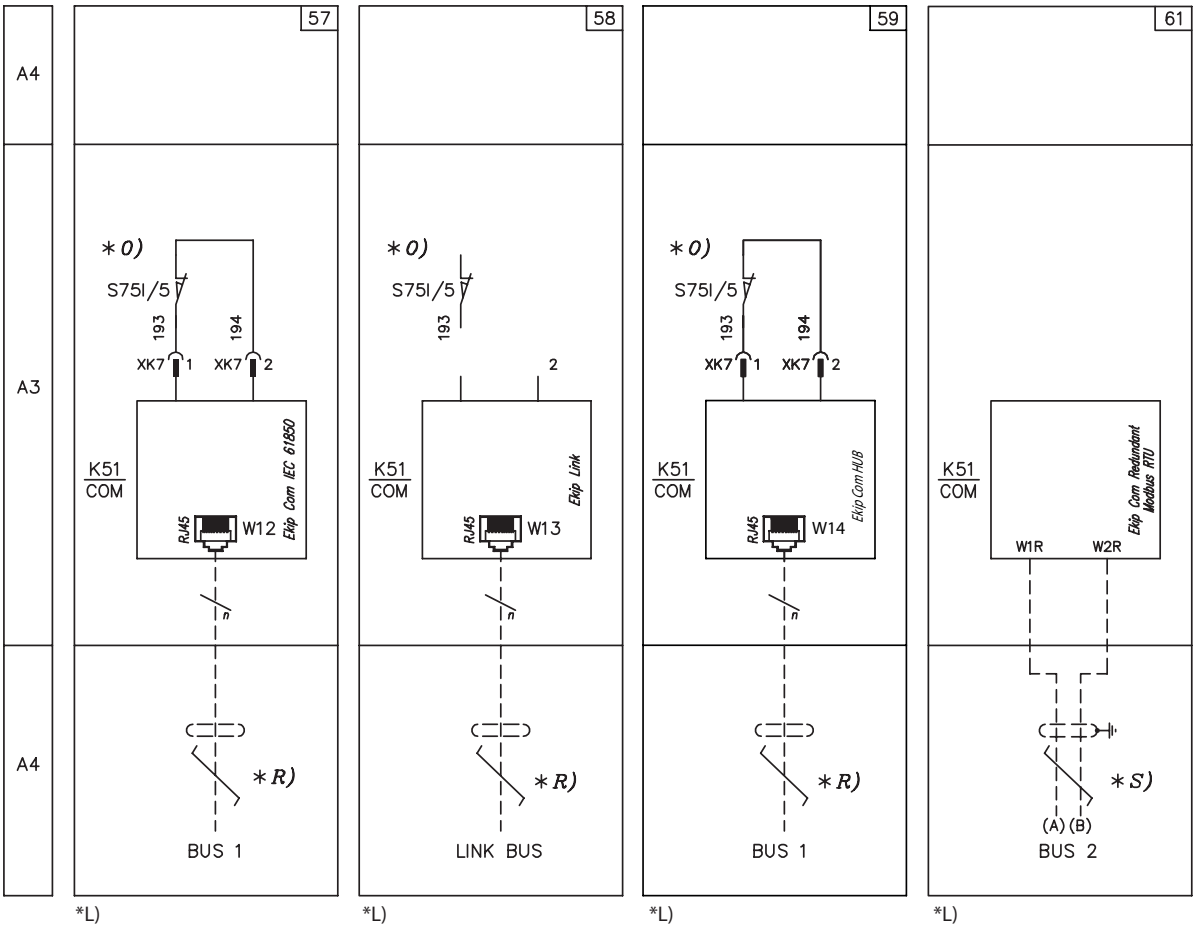
54) Ekip COM Profinet
55) Ekip COM DeviceNet™
56) Ekip COM EtherNet/IP™

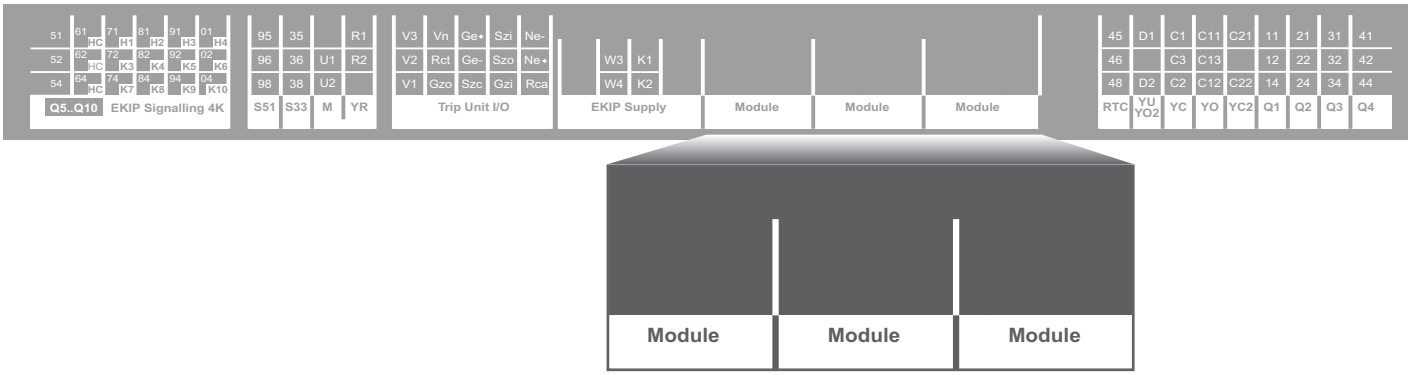


Electrical accessories

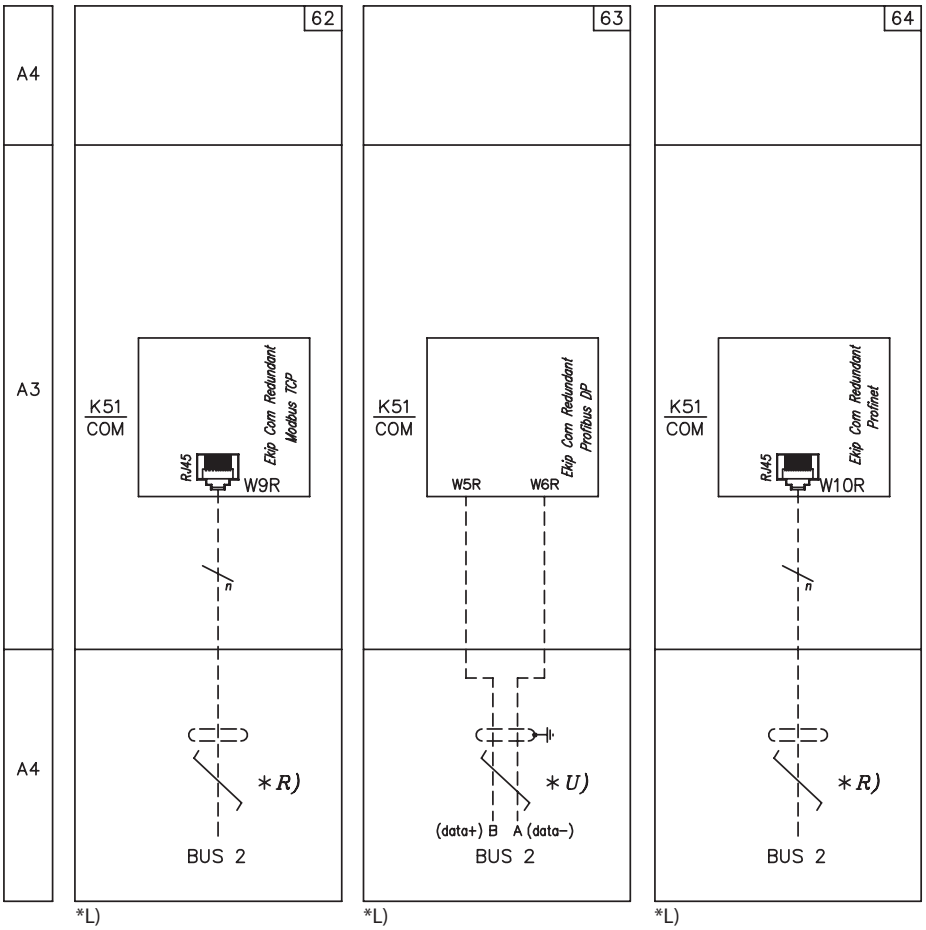


57) Ekip COM IEC61850
58) Ekip LINK
59) Ekip Com Hub
61) Ekip COM R Modbus RS-485 Redundant

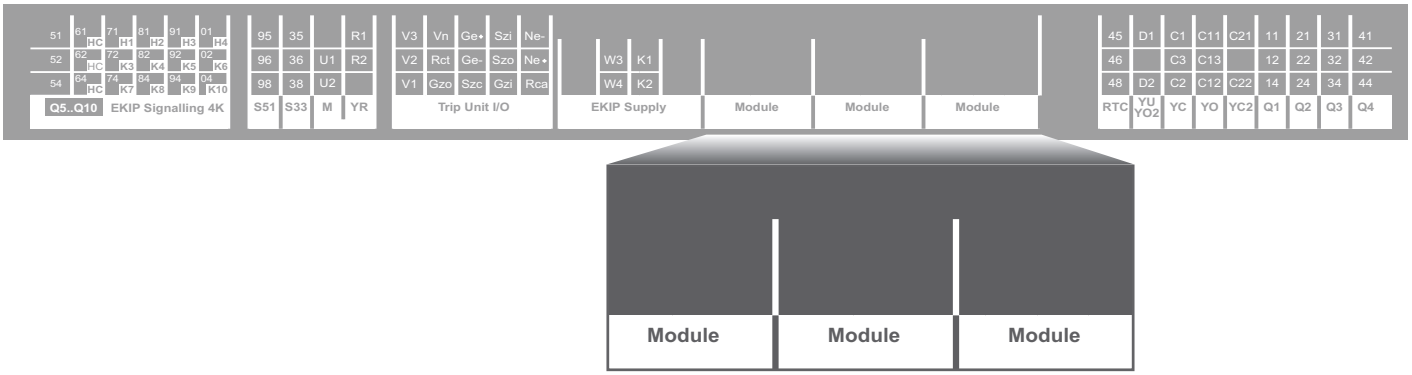




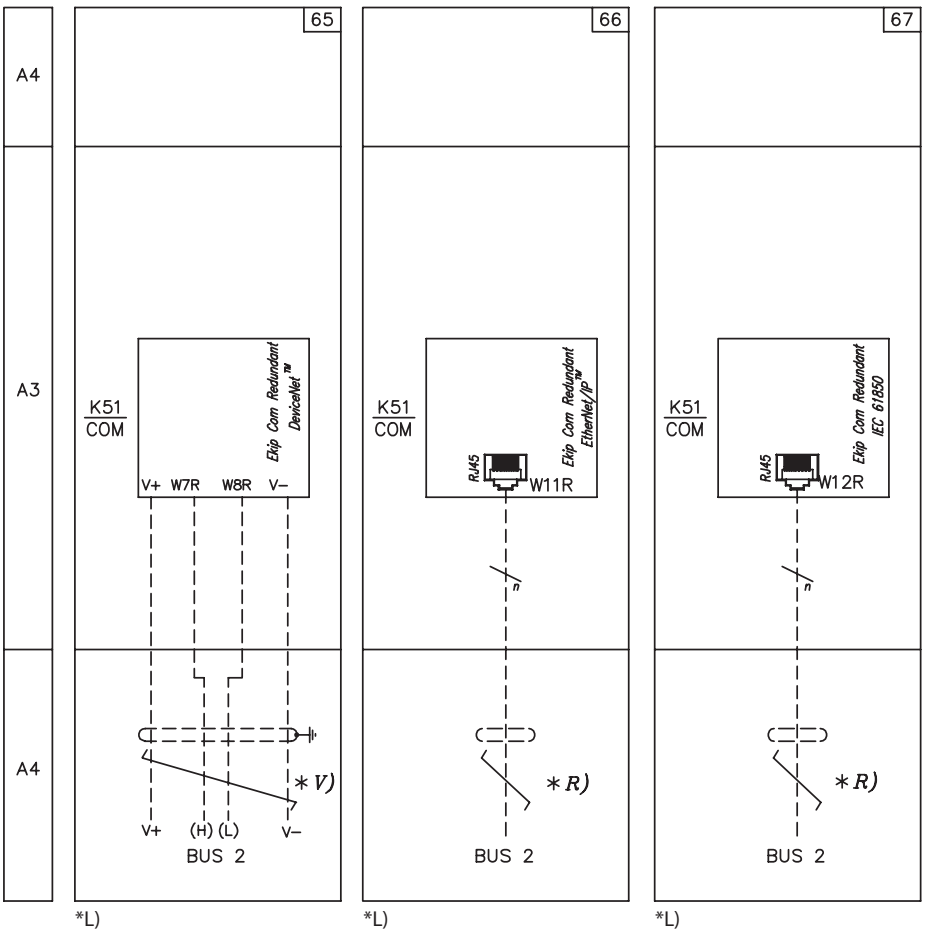
62) Ekip COM R Modbus TCP Redundant
63) Ekip COM R Profibus Redundant
64) Ekip COM R ProfiNet Redundant

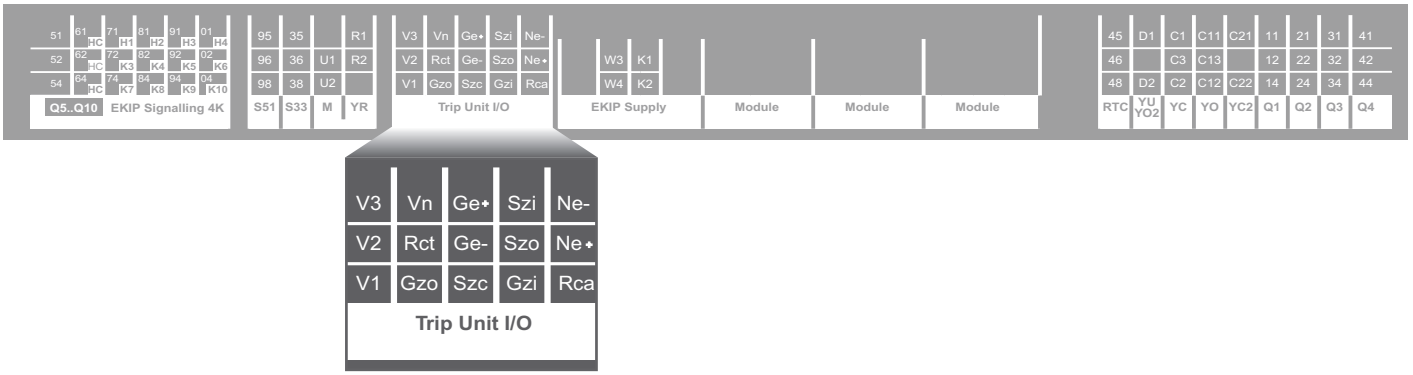


Electrical accessories



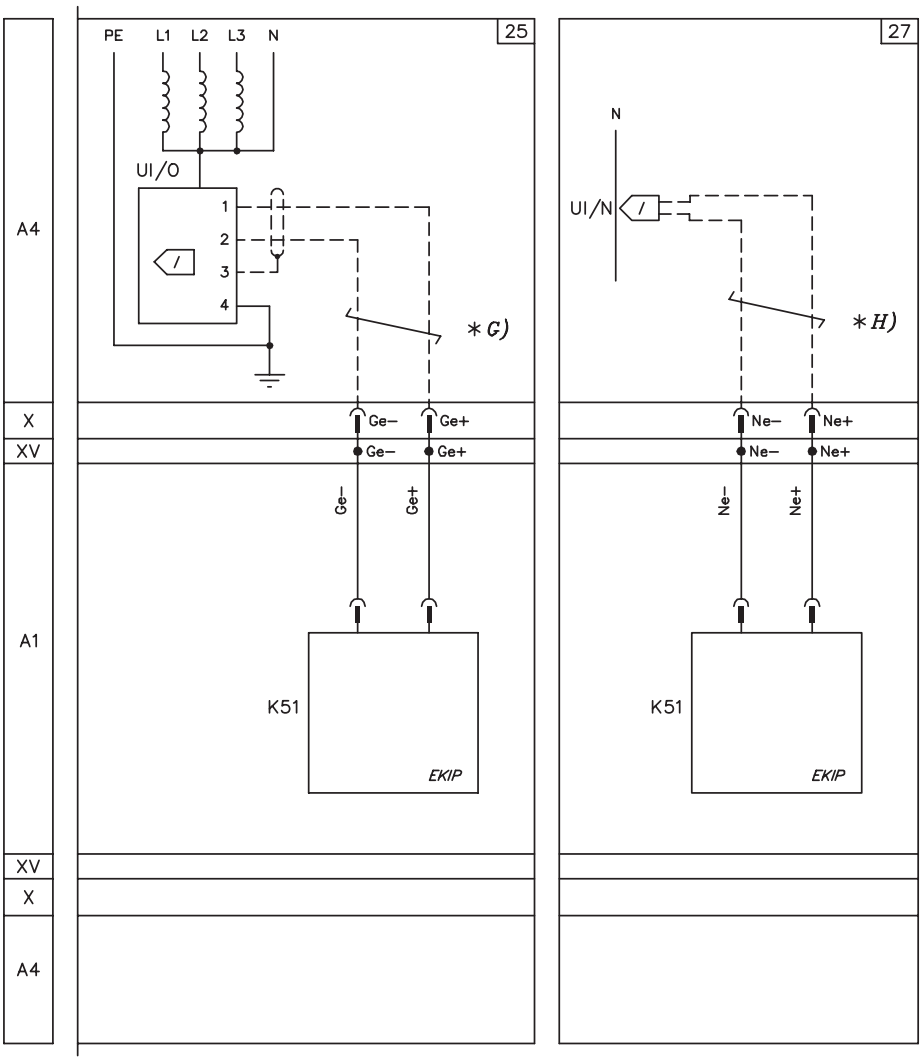
65) Ekip COM R DeviceNet™ Redundant
66) Ekip COM R EtherNet/IP™ Redundant
66) Ekip COM R IEC 61850 Redundant



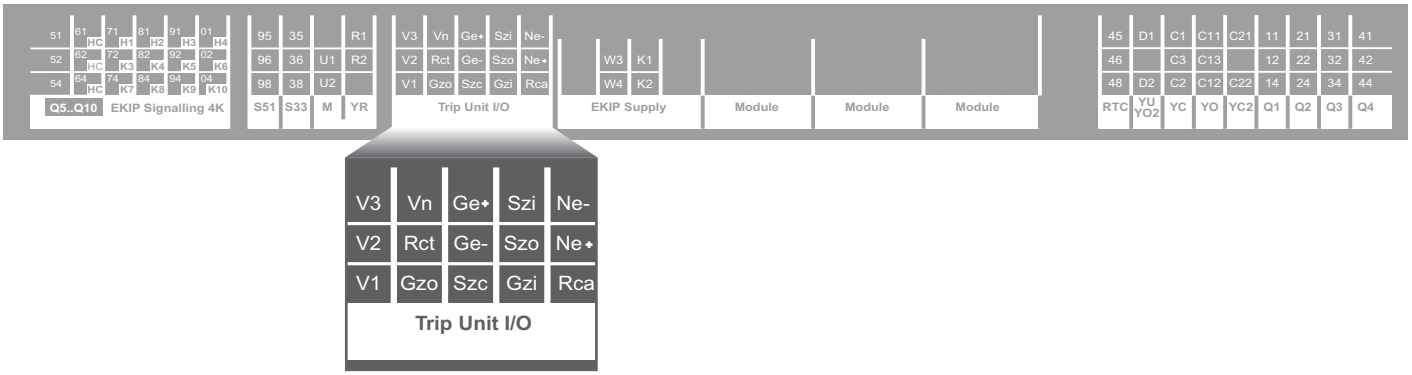


25) Transformer star center sensor input (homopolar toroid for the earthing conductor of main power suppy)
27) Current sensor input on external neutral (only for 3-pole circuit-breakers)

—
As an alternative to figures 24 - 24A

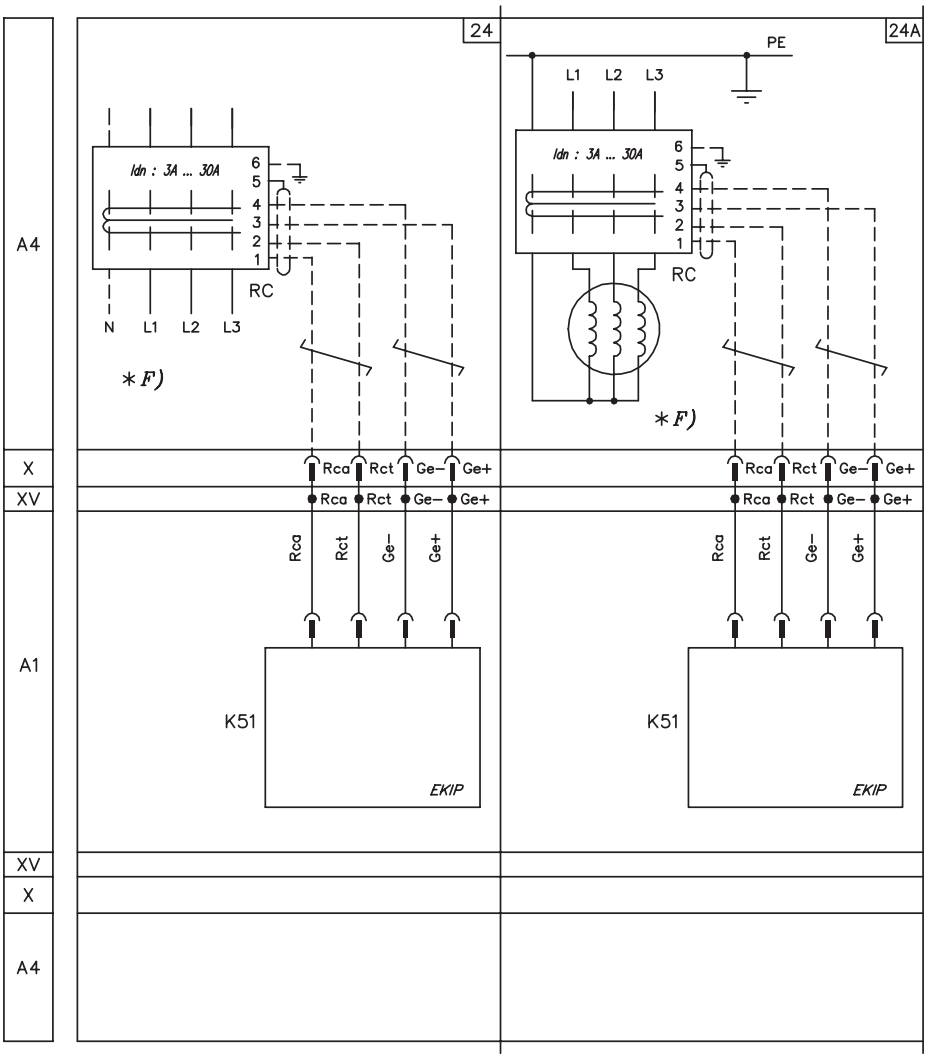


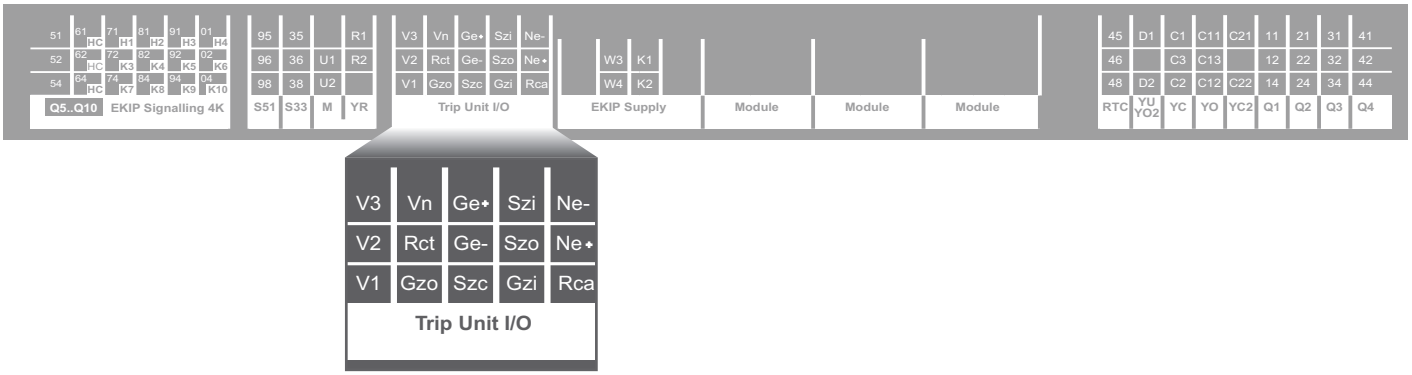
Electrical accessories



24) Rc residual current protection sensor input (ANSI 64 & 50NTD)
24a) Rc differential ground fault protection (ANSI 87N)

—
As an alternative to figures 25

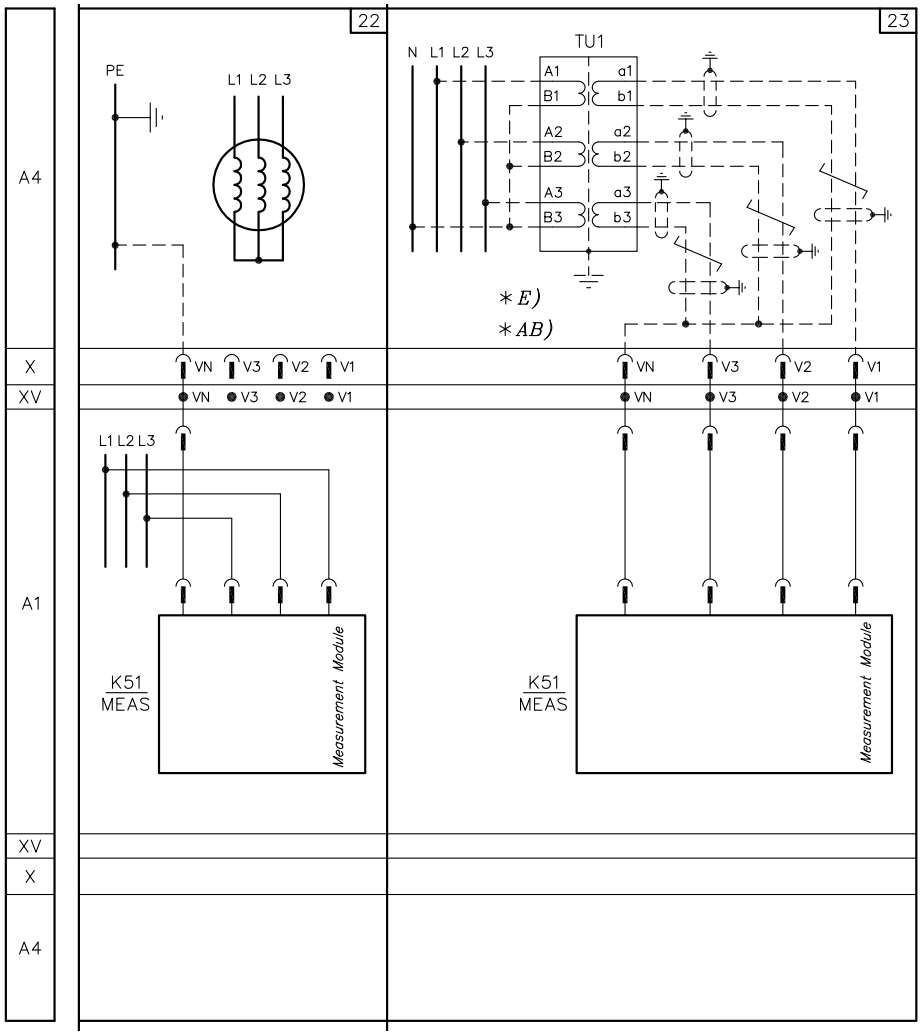




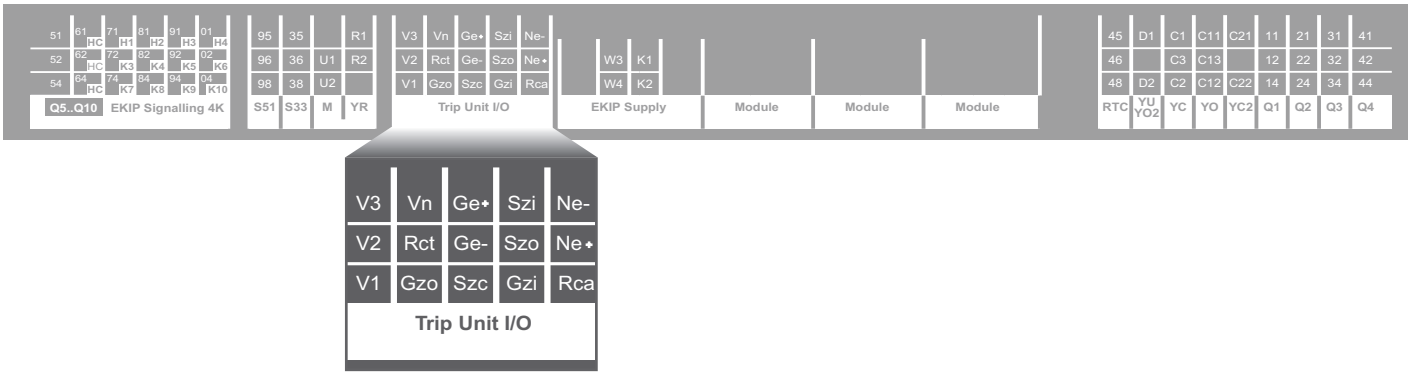
22) Measurement Enabler/Measurement Enabler with voltage sockets for residual voltage protection (for Ekip G only)

23) Measurement Enabler/Measurement Enabler with voltage sockets with external voltage transformer

—
As an alternative to each other or to 20-21 diagram

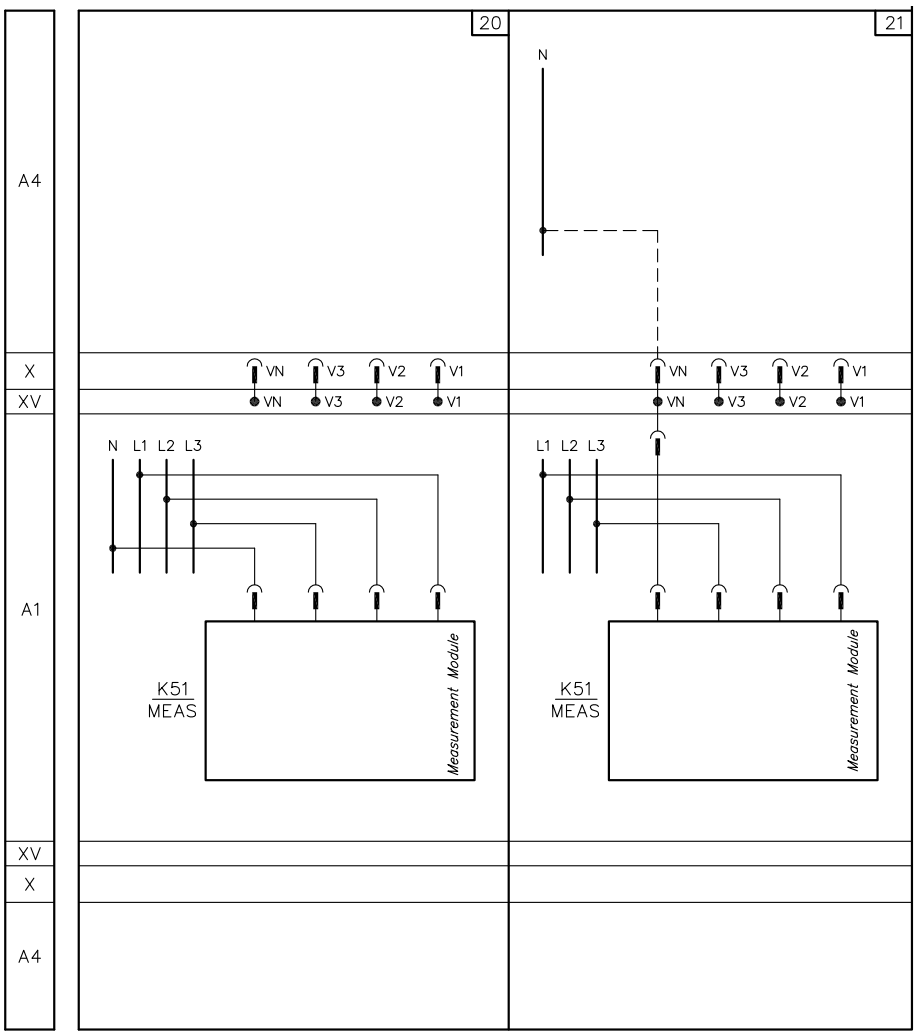


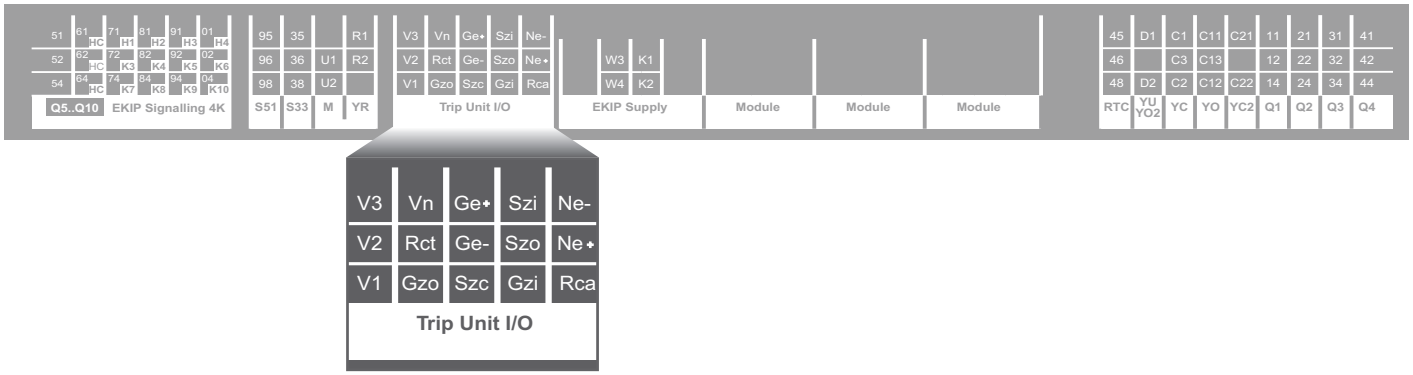
Electrical accessories



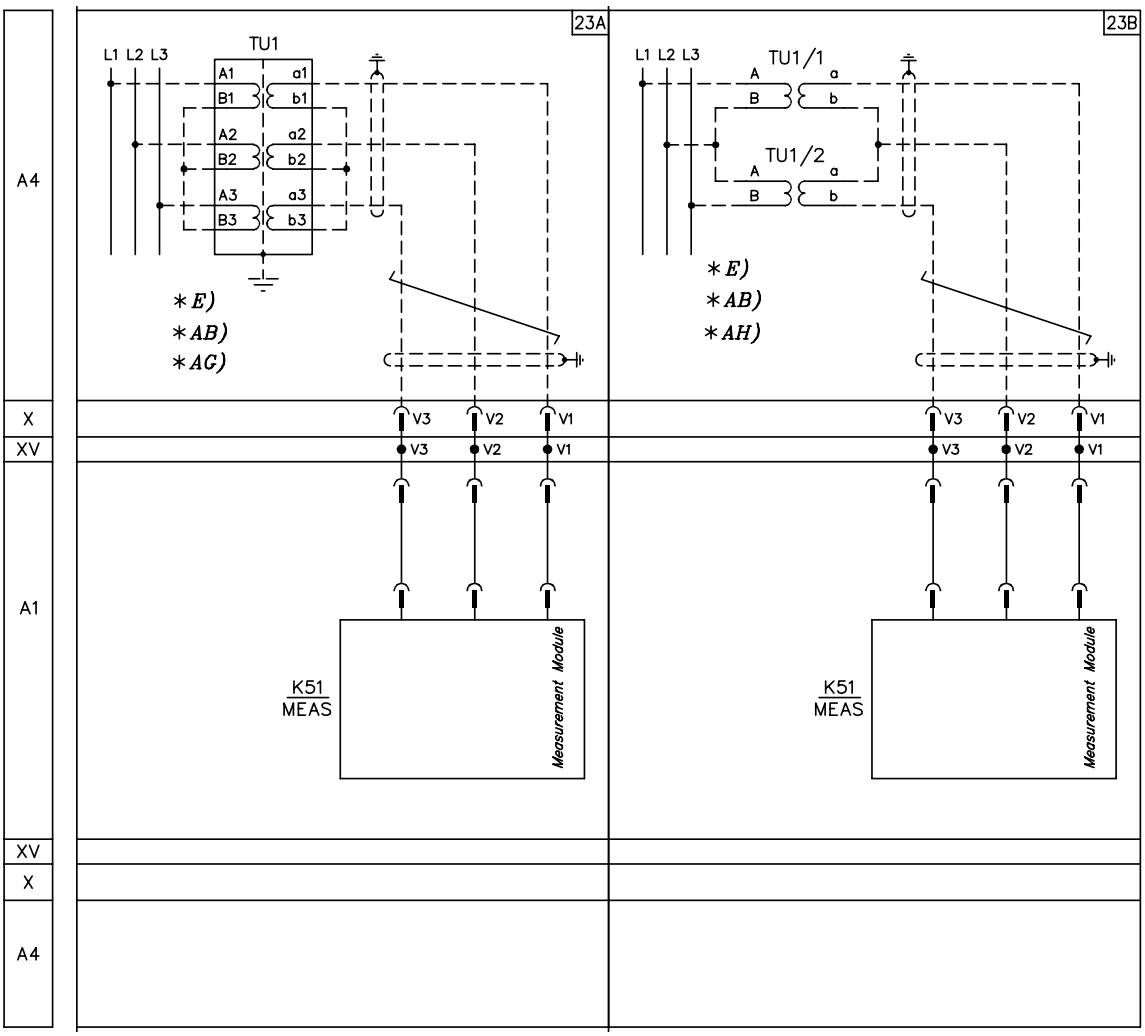
20) Measurement Enabler/Measurement Enabler with voltage sockets inside the four-pole circuit breaker
21) Measurement Enabler/Measurement Enabler with voltage sockets inside the three-pole circuit breaker and connection to the external neutral

—
As an alternative to each other or to 22-23 diagram

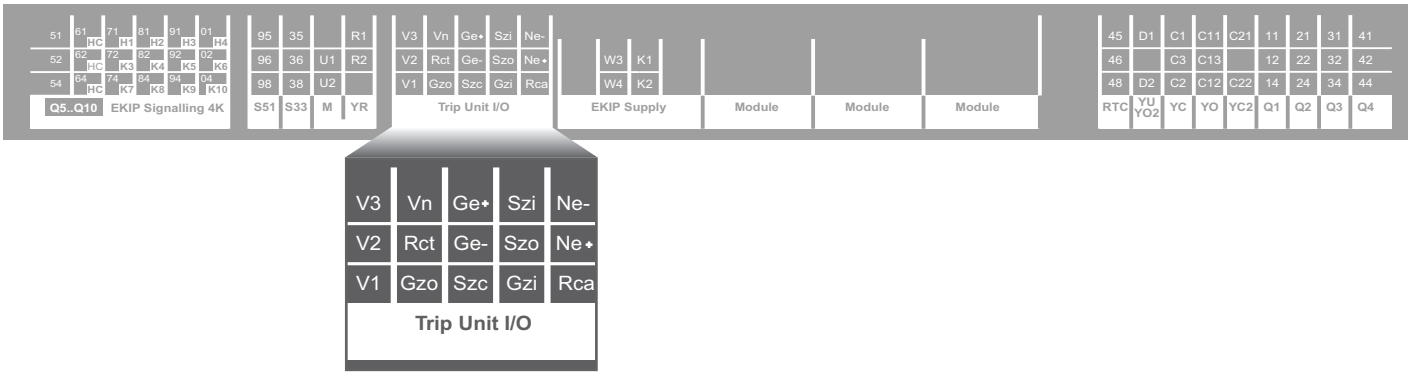




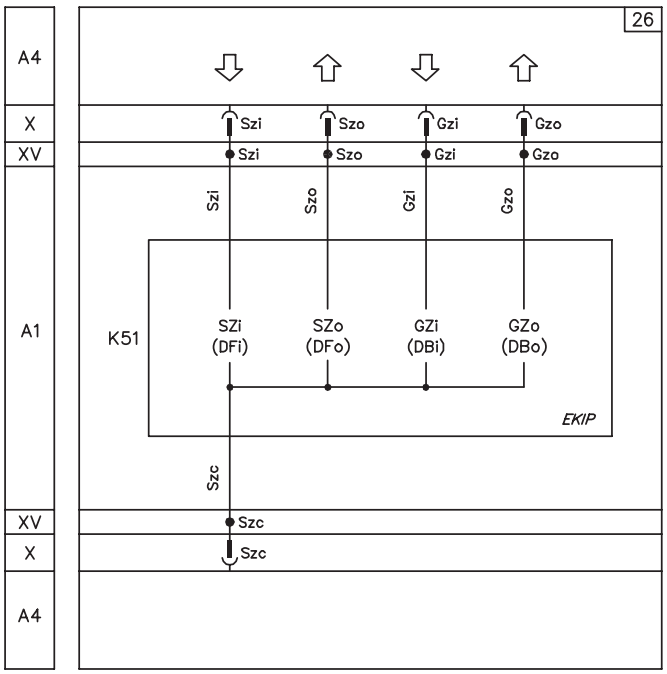
23A/B) Measurement Enabler/Measurement Enabler with voltage sockets with external voltage transformer



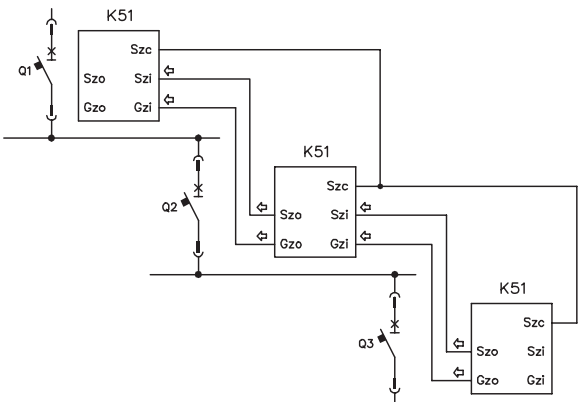
Electrical accessories



26) Zone selectivity

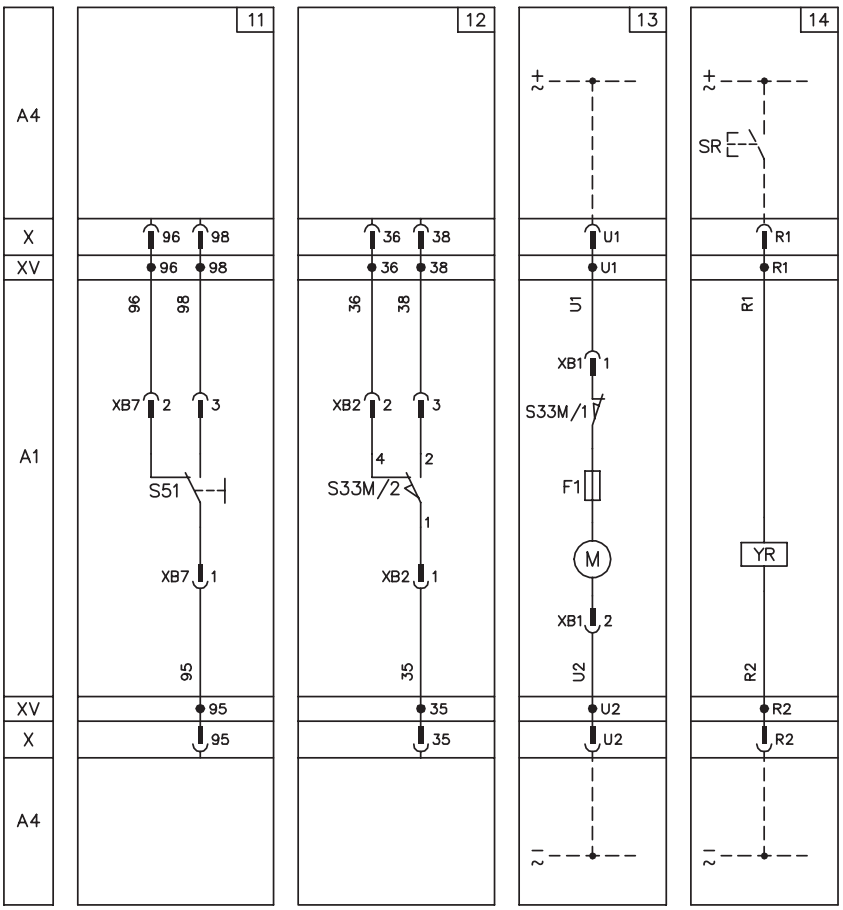


Example for application diagram (among 3 circuit-breakers)



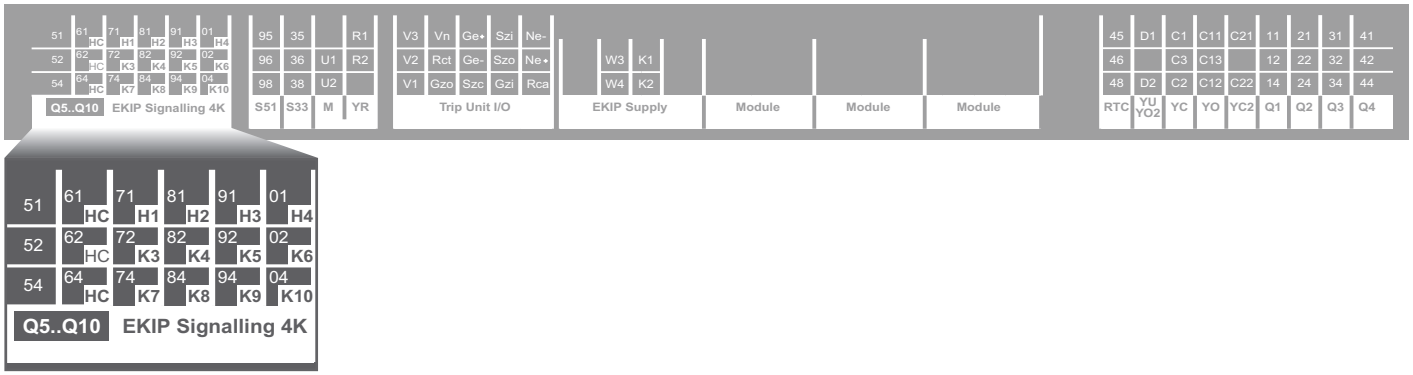


11) Trip signalling contact - S51
12) Contact for signalling position of loaded springs - S33 M/2
13) Motor for loading closing springs - M
14) Trip contact reset coil - YR / Trip signalling contact - S51/2

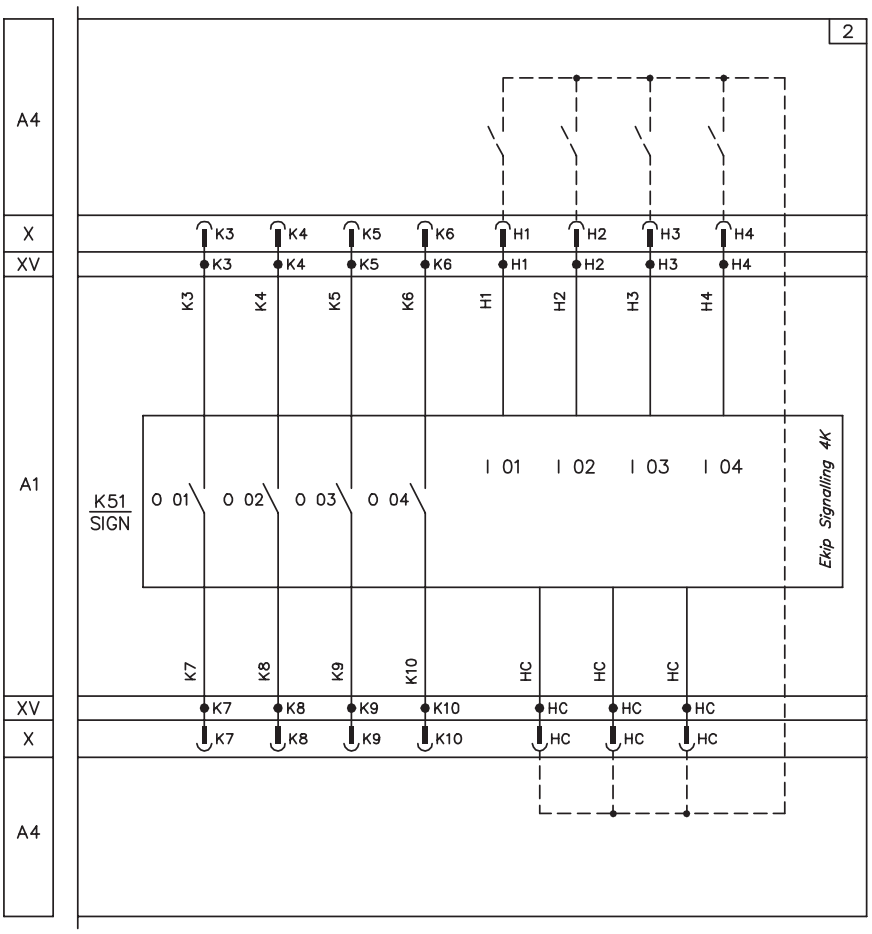


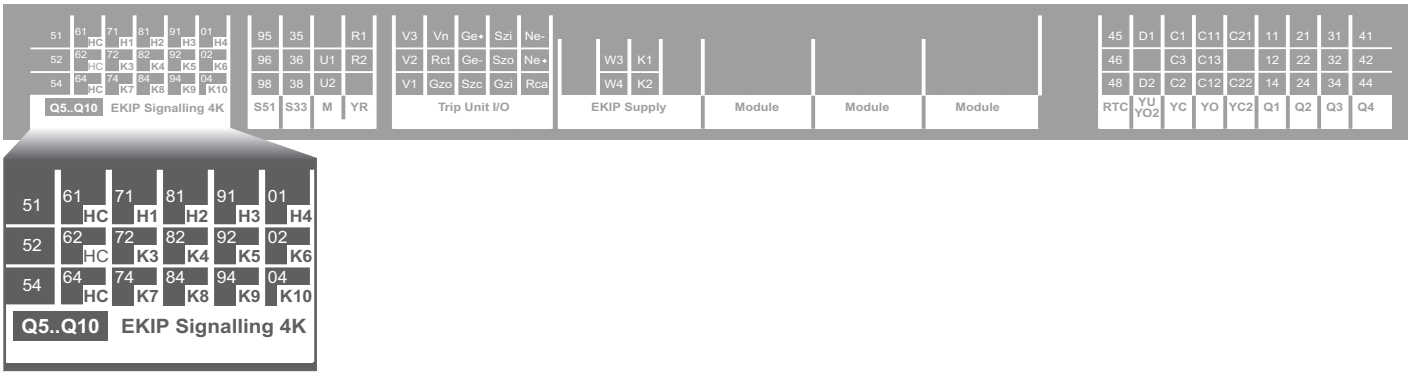
*D)

Electrical accessories



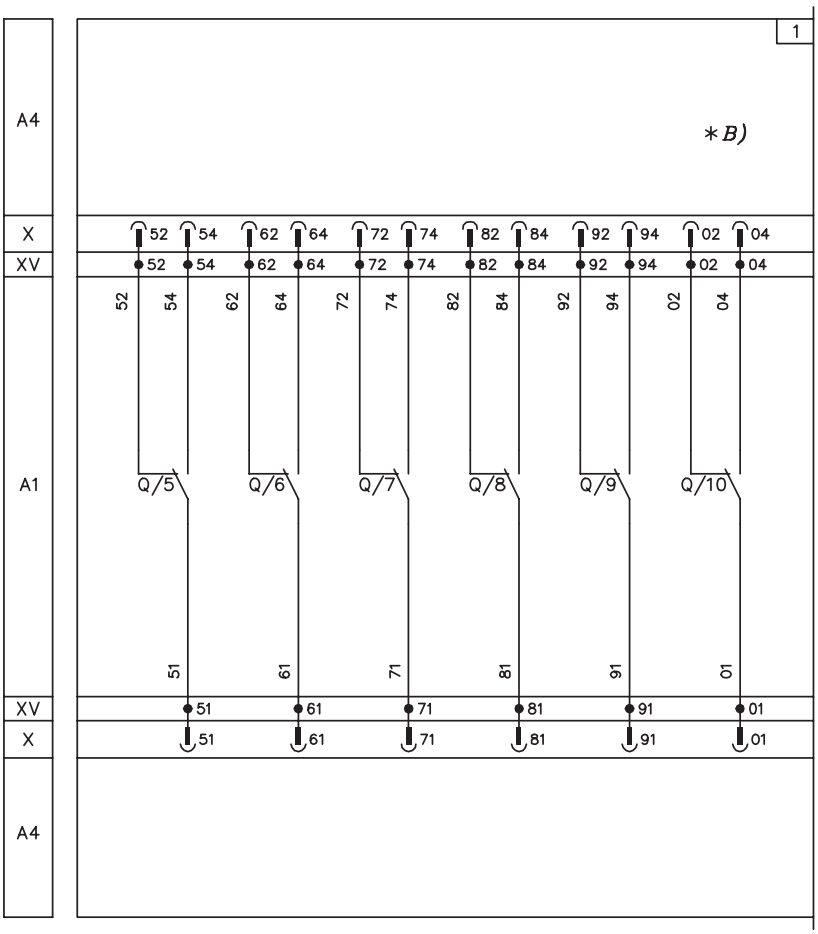
2) Ekip Signalling 4K





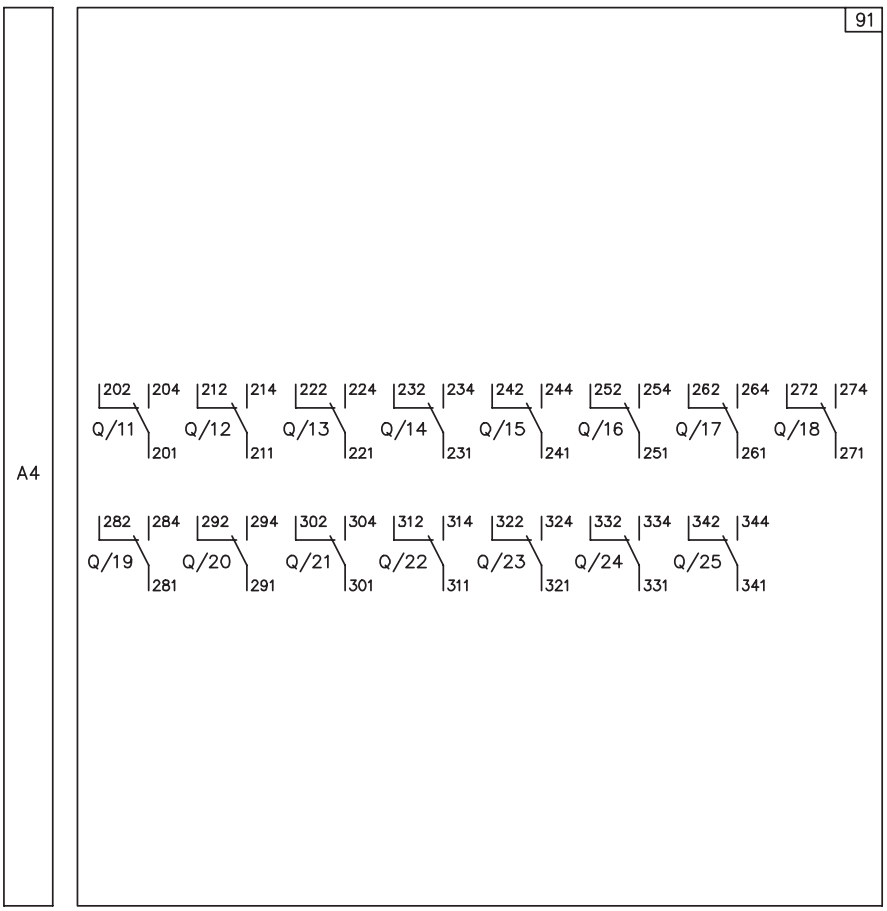
51 61 HC 71 H1 81 H2 91 H3 01 H4
52 62 HC 72 K3 82 K4 92 K5 02 K6
54 64 HC 74 K7 84 K8 94 K9 04 K10
Q5..Q10 EKIP Signalling 4K

1) Supplementary open/closed auxiliary contacts of the circuit-breaker - AUX 6Q (6 Form C)

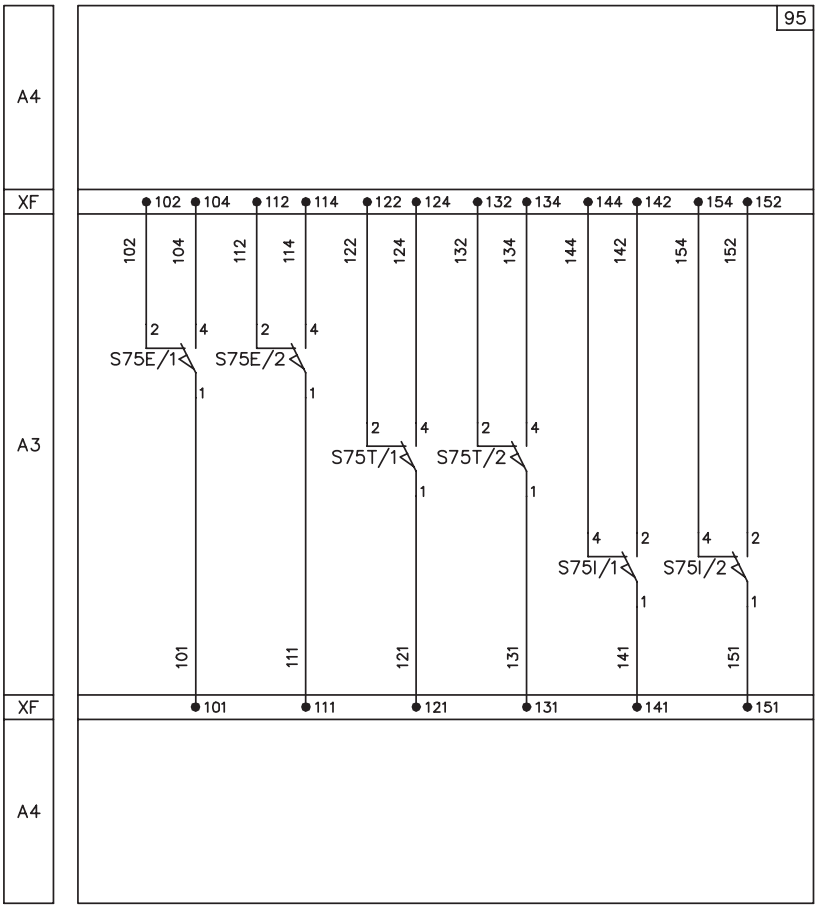


Electrical accessories

91) Supplementary open/closed auxiliary contacts outside the circuit-breaker - AUX 15Q (15 Form C)

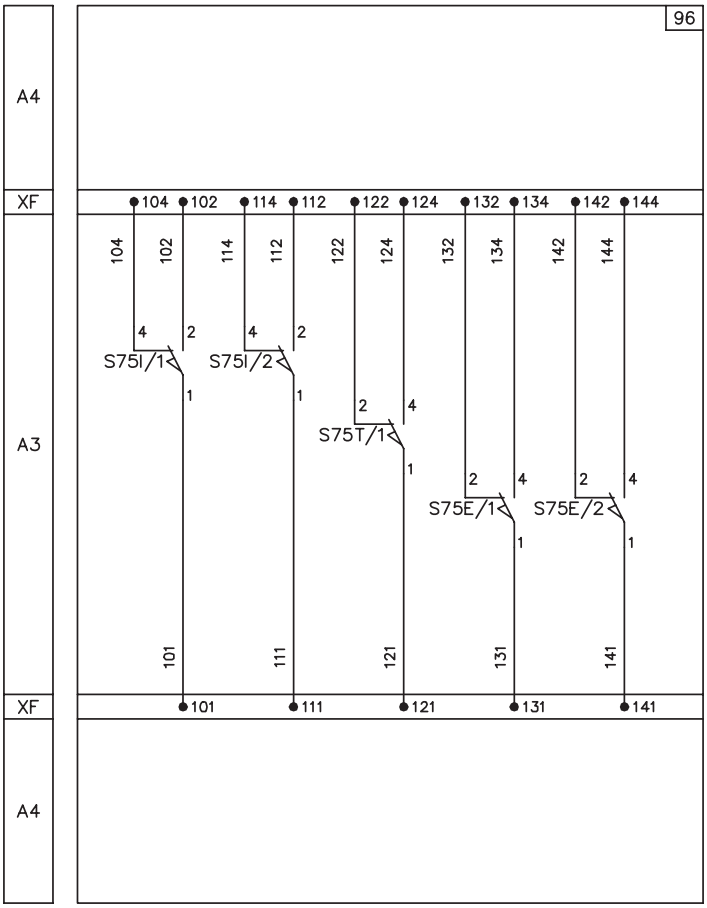


95) Contacts for signalling of circuit-breaker in racked-in, test, racked-out position



Electrical accessories

96) Contacts for signalling of circuit-breaker in racked-in, test, racked-out position (left set)



Ordering codes

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10/2 SACE Emax 2 configured circuit breaker/switch disconnector order code breakdown
10/10 SACE Emax 2 cradle (fixed part) order code breakdown
10/12 SACE Emax 2 switch disconnector (MS/DC-E 1500VDC) order code breakdown
10/16 SACE Emax 2 cradle MS/DC-E 1500VDC (fixed part) order code breakdown
10/18 Ordering examples

10/20 **General information**

10/21 **Automatic circuit-breakers**
10/21 Fixed version for power distribution
10/32 Drawout version for power distribution
10/42 Fixed version for generators
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10/52 **Switch-disconnectors**
10/52 Fixed version
10/54 Drawout version

10/56 **Circuit breakers**

10/57 **Cradles**

10/58 **Accessories**
10/58 Electrical accessories
10/63 Mechanical accessories
10/67 Mechanical interlock
10/68 Ekip modules
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10/78 Service
10/79 Spare Parts

10/86 **Contact informations**

Instructions for ordering

SACE Emax 2 configured circuit breaker/ switch disconnector order code breakdown

Z	2	H	F	UJ	A	E	4	8	N	B	E	A	A	O	Q	C	E	A
1	2	3	4	5&6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

1 - Emax 2 Prefix

	OEM Versions
Z	Standard AC version
L	Triple Certification (UL/IEC/CCC)
M	ML Naval version (IEC)
9	800 - 900VAC version (IEC)
S	Marine (UL1066 SA)
	ReliaGear Family
A	Emax 2 for ReliaGear LV SWG (UL1558)
Y	Emax 2 for ReliaGear LV SB (UL891)

2 - Frame

	E1.2	E2.2	E4.2	E6.2	E6.2/f
3p	1	2	4	6	-
4p - N Left (1)	A	B	C	D	E
4p - N Right	F	G	H	J	K

1) Standard

3 - Short Circuit Rating / Version

	B	C	N	S	H	V	L	X
kA @ 508V AC	42	-	50	65	85	100	-	-
UL kA @ 635V AC	42	-	50 (1)	65 (1)	85	85/100 (4)	-	-
IEC kA @ 440V AC	42	50	66	85	100	150	-	150
IEC kA @ 690V AC	42	42	66 (2)	66	85/100 (3)	100	-	100

1) E1.2N = 42kA
2) E1.2N = 50kA
3) E2.2H and E4.2H = 85kA / E6.2H = 100kA
4) E2.V and E4.2V = 85kA / E6.2V = 100kA

4 - Frame Rating [A]

UL	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**Z**	**J**	**K**	**L**
	250	400	800	1200	1600	2000	2500	3200	3600	4000	5000	6000
IEC	**M**	**N**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	**Y**
	250	630	800	1000	1250	1600	2000	2500	3200	4000	5000	6300

5 & 6 - Rating Plug [A]

Switch	00	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-
UL	**UA**	**UB**	**UC**	**UD**	**UE**	**UF**	**UG**	**UH**	**UJ**	**UK**	**UL**	**UM**	**UN**	**UQ**	**UR**	**US**	**UT**
	100	200	250	400	600	800	1000	1200	1600	2000	2500	3000	3200	3600	4000	5000	6000
UL (I-ON) [1]	**NA**	**NB**	**NC**	**ND**	**NE**	**NF**	**NG**	**NH**	**NJ**	**NK**	**NL**	**NM**	**NN**	**NQ**	**NR**	**NS**	**NT**
	100	200	250	400	600	800	1000	1200	1600	2000	2500	3000	3200	3600	4000	5000	6000
IEC	**EA**	**EB**	**EC**	**ED**	**EE**	**EF**	**EG**	**EH**	**EJ**	**EK**	**EL**	**EM**	**EN**	**ER**	**ES**	**ET**	**-**
	100	200	250	400	630	800	1000	1250	1600	2000	2500	3000	3200	4000	5000	6300	-
IEC L-Off	**LA**	**LB**	**LC**	**LD**	**LE**	**LF**	**LG**	**LH**	**LJ**	**LK**	**LL**	**-**	**LN**	**LR**	**LS**	**LT**	**-**
	100	200	250	400	630	800	1000	1250	1600	2000	2500	-	3200	4000	5000	6300	-
IEC RC	**RA**	**RB**	**RC**	**RD**	**RE**	**RF**	**RH**	**RK**	**RN**	**RR**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	100	200	250	400	630	800	1250	2000	3200	4000							-

1) Instantaneous protection always on (non-defeatable) - available for Ekip Touch or greater

7 - Fixed/Drawout and Terminal connections

	No lever	**With Kirk Lever**
Drawout (less cradle)	A	Y
Fixed (std. terminals)	B [1]	
Fixed (alt. terminals)	**Upper Terminals**	

Lower Terminals		**Horiz. Rear(HR)** [2]	**Vert. Rear (VR)**	**Front (F)** [7]	**Ext. Front (EF)** [7]	**FCCUAL Lugs** [7]	**Horiz. Rear Spread (SHR)** [6] [7]	**Vert. Rear Spread (SVR)** [6] [7]
	Horiz. Rear (HR) [2]	C [3]	D	E	F	G	-	-
	Vert. Rear (VR)	H	J [4]	K	L	M	-	-
	Front (F) [7]	N	P	Q [5]	R	S	-	-
	Ext. Front (EF) [7]	T	U	V	W	X	-	-
	FCCUAL Lugs [3] [7]	2	3	4	5	6	-	-
	Horiz. Rear Spread (SHR) [6] [7]	-	-	-	-	-	7	
	Vert. Rear Spread (SVR) [6] [7]	-	-	-	-	-	-	8

1) Standard terminals: E1=F / E2.2 - E6.2 = HR with exception of E4.2 3200 & 3600, and E6.2 6000A which are VR
2) Not available for E4.2 3200, 3600A and E6.2 6000A
3) Available for E1.2 only (IEC version)
4) Not available for E4.2 3200, 3600A and E6.2 6000A
5) Available for E2.2 - E6.2 (IEC versions)
6) Available for E2.2 and E4.2 (IEC version)
7) Not UL Listed

Instructions for ordering

SACE Emax 2 configured circuit breaker/ switch disconnector order code breakdown

Z	2	H	F	UJ	A	E	4	8	N	B	E	A	A	O	Q	C	E	A
1	2	3	4	5&6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

8 - Ekip Trip Unit

Switch Disconnector	0			
	Protection Functions	LI	LSI	LSIG
Ekip Trip Unit + Standard 250V Bell Alarm	DIP	A	B	C
	Touch	D	E	F
	Touch + Power Controller (1)	G	H	I
	Hi-Touch	-	J	K
	Hi-Touch + Power Controller (1)	-	L	M
	G Touch	-	-	N
	G Touch + Power Controller (1)	-	-	P
	G Hi-Touch	-	-	Q
	G Hi-Touch + Power Contoller (1)	-	-	R
Ekip Trip Unit + optional 24VDC Bell Alarm	DIP	S	T	U
	Touch	V	W	X
	Touch + Power Controller (1)	Y	Z	1
	Hi-Touch	-	2	3
	Hi-Touch + Power Controller (1)	-	4	5
	G Touch	-	-	6
	G Touch + Power Controller (1)	-	-	7
	G Hi-Touch	-	-	8
	G Hi-Touch + Power Contoller (1)	-	-	9

1) Ekip Power Controller requires the use of Ekip Measuring or Measuring Pro modules

9 - Auxiliary Power Supply (Ekip Supply) and Measuring Package

	None	0	-
	-	Measuring Package (1)	1% Accuracy (2)
	-	1	2
24V - 48V DC Supply	3	4	5
110 -240V AC/DC Supply	6	7	8
Top Supply	-	A	B
External Mtg Cables	-	C	D
Top Supply + 24V DC Supply	-	E	F
Top Supply + 110-240V AC/DC Supply	-	G	H
Ext. Mtg cables + 24V DC Supply	-	J	K
Ext. Mtg cables + 110-240V AC/DC Supply	-	L	M

1) For Ekip Touch only. Refer to 1% Accuracy Measuring column for Hi-Touch or greater
2) Standard with Hi-Touch and G Hi-Touch

10 - Communication Modules

None	**0**	**-**	**-**	**-**	**-**	**-**	**-**
RTC Ekip (24VDC)				**Y**			
Single	**2**	**3**	**4**	**5**	**6**	**7**	**8**
	Modbus RS-485	Modbus TCP/IP	Profibus	Profinet	DeviceNet	EtherNet/IP	IEC 61850
Combos	**A**	**B**	**C**	**D**	**E**	**F**	**-**
	RS-485 + TCP/IP	TCP/IP + Profibus	Profibus + Profinet	Profinet + DeviceNet	DeviceNet + EtherNet/IP	EtherNet/IP + IEC 61850	-
	G	**H**	**J**	**K**	**L**	**-**	**-**
	RS-485 + Profibus	TCP/IP + Profinet	Profibus + DeviceNet	Profinet + EtherNet/IP	DeviceNet + IEC 61850	-	-
	M	**N**	**P**	**Q**	**-**	**-**	**-**
	RS-485 + Profinet	TCP/IP + DeviceNet	Profibus + EtherNet/IP	Profinet + IEC 61850	-	-	-
	R	**S**	**T**	**-**	**-**	**-**	**-**
	RS-485 + DeviceNet	TCP/IP + EtherNet/IP	Profibus + IEC 61850	-	-	-	-
	U	**V**	**-**	**-**	**-**	**-**	**-**
	RS-485 + EtherNet/IP	TCP/IP + IEC 61850	-	-	-	-	-
	W	**-**	**-**	**-**	**-**	**-**	**-**
	RS-485 + IEC 61850	-	-	-	-	-	-

Note: not valid with Ekip Dip or Switch Disconnectors

Instructions for ordering

SACE Emax 2 configured circuit breaker/ switch disconnector order code breakdown

Z	2	H	F	UJ	A	E	4	8	N	B	E	A	A	O	Q	C	E	A
1	2	3	4	5&6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

11 - Redundant Communications and Additional Ekip Modules

None	**0**	-	-	-	-	-	-
Redundant Com.	**2**	**3**	**4**	**5**	**6**	**7**	**8**
	Modbus RS-485	Modbus TCP/IP	Profibus	Profinet	DeviceNet	EtherNet/IP	IEC 61850
Other Modules	**A**	**B**	**C**	**Q**	**W**	**L**	-
	Ekip Link	Synchrocheck	Signalling 2K-1	Ekip Com Hub	Signalling 3T-1	RELT Signalling 2K-3	-
Combos	**D**	**E**	**F**	**R**	**X**	-	-
	Redundant Com + Ekip Link	Redundant Com + Synchrocheck	Redundant Com + Signalling 2K	Redundant Com + Ekip Com Hub	Redundant Com + Signalling 3T-1	-	-
	G	**H**	**J**	**S**	**Y**	-	-
	Ekip Link + Synchrocheck	Synchrocheck + Signalling 2K	Signalling 2K-1 + Signalling 2K-2	Ekip Link + Ekip Com Hub	Ekip Link + Signalling 3T-1	-	-
	K	**V**	**Z**	**1**	**M**	-	-
	Ekip Link + Synchrocheck + Signalling 2K	Ekip Com Hub + Signalling 3T-1	Synchrocheck + Signalling 3T-1	Signalling 2K-1 + Signalling 3T-1	RELT-Ekip Signalling 2K3 + Ekip Link	-	-
	N	**T**	**U**	**9**	**P**		
	Ekip Link + Signalling 2K-1	Synchrocheck + Ekip Com Hub	Signalling 2K-1 + Ekip Com Hub	Ekip Com Hub + Signalling 2K + Signalling 3T-1	RELT-Ekip Signalling 2K3 + Redundant Com		

Note 1: Communication, Synchrocheck, Ekip 2K, Ekip 3T, and Ekip Link are not compatible with Switch Disconnectors
Note 2: Ekip Touch or greater trip unit is required for Communication, Ekip 2K, Ekip 3T, and Synchrocheck modules
Note 3: Redundant Com will match communication module selected in digit 10

12 - Auxilary Contacts (AUX) and Additional Signaling (4K)

None	0			
	-	4 AUX (4Q) 400V (3)	4 AUX (4Q) 24V	4 AUX (2Q+2Q) 24 & 400V
	-	A	B	C
6 AUX (6Q) 400V (1)	D	E	F	G
6 AUX (6Q) 24V (1)	H	J	K	L
6 AUX (3Q+3Q) 400 & 24V (1)	M	N	B	Q
4K Signaling (1) (2)	-	R	S	T

1) Not compatible with E1.2
2) Not compatible with Ekip Dip or Switch disconnectors
3) Provided as standard for all circuit breakers
Note: Options O, D, H and M are for use with switch disconnectors only

13 - Remote Reset (YR), 2nd Bell Alarm (S51/2) and Ready to Close Contacts (RTC)

None	0					
	-	YR 24V AC/DC	YR 110V AC/DC	YR 220V AC/DC	S51/2 250V [1]	S51/2 24V DC [1]
	-	A	B	C	P	Q
RTC 24VDC	D	E	F	G	R	S
RTC 250V AC/DC	H	J	K	L	T	U
Disable Bluetooth + Sealable Cover [2]	M	N	V	W	X	Y
Disable Bluetooth + Sealable Cover [2] + RTC 24VDC	Z	1	2	3	4	5
Disable Bluetooth + Sealable Cover [2] + RTC 250V	6	7	8	9	I	O

1) Not compatible with E1.2
2) Disable Bluetooth for Ekip Touch or greater trip unit

14 - Closing Coil (YC) and Redundant Closing Coil (YC2)

None	0										
	24V AC/DC	30V AC/DC	48V AC/DC	60V AC/DC	110-120V AC/DC	120-127V AC/DC	220-240V AC/DC	240-250V AC/DC	380-400V AC	415-440V AC	480-500V AC
YC	A	B	C	D	E	F	G	H	K	L	M
YC + YC2	N	P	Q	R	S	T	U	V	X	Y	Z

Note: YC2 will have the same control voltage as YC1

15 - Opening Coil (YO)

None	0										
	24V AC/DC	30V AC/DC	48V AC/DC	60V AC/DC	110-120V AC/DC	120-127V AC/DC	220-240V AC/DC	240-250V AC/DC	380-400V AC	415-440V AC	480-500V AC
YO	A	B	C	D	E	F	G	H	K	L	M

16 - Undervoltage Release (UVR) or Redundant Opening Coil (YO2)

None	0										
	24V AC/DC	30V AC/DC	48V AC/DC	60V AC/DC	110-120V AC/DC	120-127V AC/DC	220-240V AC/DC	240-250V AC/DC	380-400V AC	415-440V AC	480-500V AC
UVR	A	B	C	D	E	F	G	H	K	L	M
YO2 only	N	P	Q	R	S	T	U	V	X	Y	Z

Instructions for ordering

SACE Emax 2 configured circuit breaker/ switch disconnector order code breakdown

Z	2	H	F	UJ	A	E	4	8	N	B	E	A	A	O	Q	C	E	A
1	2	3	4	5&6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

17 - Spring Charging Motor (M) and Ekip Com Actuator

None	0				
Ekip Com Actuator	1				
	24-30V AC/DC	48-60V AC/DC	100-130V AC/DC	220-250V AC/DC	380-415V AC
M with standard aux. for status indication of springs	2	3	4	5	7
M with 24V DC aux. contacts for status indication of springs	A	B	C	D	F
M with standard aux. for status indication of springs + Ekip Com Actuator	H	J	K	L	N
M with 24V DC aux. contacts for status indication of springs + Ekip Com Actuator	Q	R	S	T	U

Note: Standard aux = E1.2 = 250V / E2.2 - E6.2 = 400V
1) not compatible with E1.2

18 - Push Button Locking Options

None	0							
		Push Button Covers (PBC)				**Padlock in Open Position (PLC)**		
		PBC Special Key	**PBC Padlock (4mm)**	**PBC Padlock (7mm)**	**PBC Padlock (8mm)**	**PLC (4mm)**	**PLC (7mm)**	**PLC (8mm)**
		2	3	4	5	6	7	8
Key Lock in Open Position - Different Keys (KLC-D)	A	D	E	F	G	H	J	K
Key Lock in Open Position - Same Keys (KLC-S) (1)	B	L	M	N	P	Q	R	S
Key Lock in Open Position - Kirk Key provisions (KLA)	C	T	U	V	W	X	Y	Z

1) Standard key for Same Key option is #20005. Locks for #20006 - 20009 are available for order as loose accessories.
Note: Key lock options for Castell and Ronis/Profalux are available for order as loose accessories.

19 - Racking Lock Options (1st lock) and Factory Test Report

None	X	Keylock in racked in/ out - Same Keys (KLP-S) [1]	Keylock in racked in/ out - Different Keys (KLP-D) [1]	Keylock in racked in/ out - Kirk/Ronis/ Profulaux provisions (KLP-A) [1]	Keylock in racked in/ out - Castell provisions (KLP-A) [2]
	-	A	B	C	D
Padlock in racked in/out position (PLP)	E	F	G	H	J
Factory Test Report	K	M	N	P	Q
PLP + Factory Test Report	R	S	T	U	V

1) Standard key for Same Key option is #20005. Locks for #20006 - 20009 are available for order as loose accessories.
2) Two Castell adapters cannot be used at once, but can be used in either position with another type of lock.

20 - 2nd Racking Lock Options, Mechanical Operations Counter (MOC) and Extended Warranty's

None	X	Keylock in racked in/ out - Same Keys (KLP-S) [1]	Keylock in racked in/ out - Different Keys (KLP-D) [1]	Keylock in racked in/ out - Kirk/Ronis/ Profulaux provisions (KLP-A) [1]	Keylock in racked in/ out - Castell provisions (KLP-A) [2]
		B	C	D	E
Mechanical Operations Counter (MOC)	A	F	G	H	J
2 Year Extended Warranty	2	N	R	U	Y
4 Year Extended Warranty	4	P	S	V	Z
5 Year Extended Warranty	5	Q	T	W	6
Additional Combinations					
MOC + 2 Year Extended Warranty	K	7	-	-	-
MOC + 4 Year Extended Warranty	L	8	-	-	-
MOC + 5 Year Extended Warranty	M	9	-	-	-

Note: for additional combinations please contact your local ABB sales person

Instructions for ordering

SACE Emax 2 cradle (fixed part) order code breakdown

Z	2	A	20	O	O	X	X
1	2	3	4&5	6	7	8	9

1 - Emax 2 Prefix

Z	Standard AC version
M	ML Naval version (IEC)

2 - Frame

	E1.2	E2.2	E4.2	E6.2	E6.2/f
3p	1	2	4	6	-
4p	A	B	C	D	E

3 - Standard

UL	A
IEC	C

4 & 5 - Amp Ratings by Frame

UL	**E1.2 1200A**	**E2.2 2000A**	**E4.2 2500A**	**E4.2 3200A**	**E6.2 5000A**	**E6.2 6000A**	
	12	20	25	32	50	60	
IEC	**E1.2 1600A**	**E2.2 2000A**	**E4.2 2500A**	**E4.2 3200A**	**E4.2 4000A**	**E6.2 5000A**	**E6.2 6300A**
	16	20	25	32	40	50	63

Note: E4.2 3200A (IEC) is compatible with N, S, and H versions for V version use E4.2 4000A

6 - Terminal Connections

Standard Terminals	A [1]							
Alternate Terminals	**Upper Terminals**							
Lower Terminals		**Horiz. Rear(HR) [1]**	**Vert. Rear (VR)**	**Front (F) [2]**	**Ext. Front (EF) [3] [5]**	**FCCUAL Lugs [3]**	**Horiz. Rear Spread (SHR) [5] [6]**	**Vert. Rear Spread (SVR) [5] [6]**
	Horiz. Rear (HR) [1]-		D	E	F	G	-	-
	Vert. Rear (VR)	H	J [4]	K	L	M	-	-
	Front (F) [2][5]	N	P	Q	-	-	-	-
	Ext. Front (EF) [3] [5]	T	U	-	W	X	-	-
	FCCUAL Lugs [3] [5]	2	3	-	5	6	-	-
	Horiz. Rear Spread (SHR) [5] [6]	-	-	-	-	-	7	-
	Vert. Rear Spread (SVR) [5] [6]	-	-	-	-	-	-	8

1) Standard terminals for cradles are horizontal rear (HR) with exception of: E4.2 3200A = VR, E6.2 6000A = VR
2) Not compatible with E1.2
3) Available only for E1.2
4) Not available for E4.2 3200A, E6.2 6000A as this is the standard terminals
5) IEC only
6) Available for E2.2 only

7 - Auxilary Cradle Position Contacts (AUP)

None	0				
	6 AUP (400V AC)	6 AUP (24V DC)	5 AUP (400V AC)	5 AUP (24V DC)	-
E1.2	A	B	-	-	-
E2.2 - E6.2 Left position	-	-	C	D	-
E2.2 - E6.2 Right position	-	-	E	F	-
E2.2 - E6.2 Left & Right positions	-	-	G	H	J [1]

1) Includes one 400V set (left) and one 24VDC set (right)

8 - Racking Lock Options (1st lock)

None	**X**	**Keylock in racked in/ out - Same Keys (KLP-S)** [1]	**Keylock in racked in/ out - Different Keys (KLP-D)** [1]	**Keylock in racked in/ out - Kirk/Ronis/ Profulaux provisions (KLP-A)** [1]	**Keylock in racked in/ out - Castell provisions (KLP-A)** [2]
	-	A	B	C	D
Padlock in racked in/out position (PLP)	E	F	G	H	J
Racked out Position Lock (Supplementary)	K [3]	L	M	N	P
PLP + Racked out Position Lock	Q	R	S	T	U

1) Standard key for Same Key option is #20005. Locks for #20006 - 20009 are available for order as loose accessories.
2) Two Castell adapter cannot be used at once, but can be used in either position with another style of lock
3) Available for E2.2-E6.2 and only if a racking lock option has been selected on the circuit breaker side
Note: Racking locks are for E1.2 For E2.2 - E6.2 they are configured within the circuit breaker

9 - 2nd Racking Lock Options

None	**X**	**Keylock in racked in/ out - Same Keys (KLP-S)** [1]	**Keylock in racked in/ out - Different Keys (KLP-D)** [1]	**Keylock in racked in/ out - Kirk/Ronis/ Profulaux provisions (KLP-A)** [1]	**Keylock in racked in/ out - Castell provisions (KLP-A)** [2]
	-	B	C	D	E

1) Standard key for Same Key option is #20005. Locks for #20006 - 20009 are available for order as loose accessories.
2) Two Castell adapter cannot be used at once, but can be used in either position with another style of lock.
Note: Racking locks are for E1.2 For E2.2 - E6.2 they are configured within the circuit breaker

Instructions for ordering

SACE Emax 2 switch disconnector (MS/DC-E 1500VDC) order code breakdown

P	C	H	F	O	I	O	4	8	N	B	E	A	A	O	Q	C	E	A
1	2	3	4	5&6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

1 - Emax 2 Prefix

P	DC (1500VDC)

2 - Frame

	E4.2
4p	C

3 - Short-time withstand (1s)/ Version

	S	**V**	**H**
UL kA @ 1500V AC	65	85	100
IEC kA @ 1500V AC	65	85	100

4 - Frame Rating [A]

UL	**E**	**F**	**G**	**H**	
	1600	2000	2500	3200	
IEC	**R**	**S**	**T**	**U**	**V**
	1600	2000	2500	3200	4000

5 & 6 - Rating Plug [A]

Switch	00

7 - Fixed/Drawout and Terminal connections

		DC Insulated Network (2+2ps) Upper	**DC Insulated Network (2+2ps) Lower**	**DC Grounded Polarity (4ps) Upper**	**DC Grounded Polarity (4ps) Lower**
Drawout (less cradle)	A				
Fixed (std. terminals)		I	Z	9	1

8 - Ekip Trip Unit

Switch Disconnector	0

9 - Auxiliary Power Supply (Ekip Supply) and Measuring Package

None	0

10 - Communication Modules

None	0

11 - Redundant Communications and Additional Ekip Modules

None	0

12 - Auxilary Contacts (AUX) and Additional Signaling (4K)

None	0			
	-	4 AUX (4Q) 400V	4 AUX (4Q) 24V	4 AUX (2Q+2Q) 24 & 400V
	-	A	B	C
6 AUX (6Q) 400V (1)	D	E	F	G
6 AUX (6Q) 24V (1)	H	J	K	L
6 AUX (3Q+3Q) 400 & 24V (1)	M	N	B	Q

1) Not compatible with E1.2

13 - Remote Reset (YR), 2nd Bell Alarm (S51/2), Ready to Close Contacts (RTC), and Disabling Bluetooth + Sealable Cover

None	0
RTC 24VDC	D
RTC 250V AC/DC	H

14 - Closing Coil (YC) and Redundant Closing Coil (YC2)

None	0										
	24V AC/DC	30V AC/DC	48V AC/DC	60V AC/DC	110-120V AC/DC	120-127V AC/DC	220-240V AC/DC	240-250V AC/DC	380-400V AC	415-440V AC	480-500V AC
YC	A	B	C	D	E	F	G	H	K	L	M
YC + YC2	N	P	Q	R	S	T	U	V	X	Y	Z

Note: YC2 will have the same control voltage as YC1

15 - Opening Coil (YO)

None	0										
	24V AC/DC	30V AC/DC	48V AC/DC	60V AC/DC	110-120V AC/DC	120-127V AC/DC	220-240V AC/DC	240-250V AC/DC	380-400V AC	415-440V AC	480-500V AC
YO	A	B	C	D	E	F	G	H	K	L	M

16 - Undervoltage Release (UVR) or Redundant Opening Coil (YO2)

None	0										
	24V AC/DC	30V AC/DC	48V AC/DC	60V AC/DC	110-120V AC/DC	120-127V AC/DC	220-240V AC/DC	240-250V AC/DC	380-400V AC	415-440V AC	480-500V AC
UVR	A	B	C	D	E	F	G	H	K	L	M
YO2 only	N	P	Q	R	S	T	U	V	X	Y	Z

Instructions for ordering

SACE Emax 2 configured circuit breaker/ switch disconnector order code breakdown

P	C	H	F	O	I	O	4	8	N	B	E	A	A	O	Q	C	E	A
1	2	3	4	5&6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

17 - Spring Charging Motor (M) and Ekip Com Actuator

None	0					
	24-30V AC/DC	48-60V AC/DC	100-130V AC/DC	220-250V AC/DC	380-415V AC	440-480V AC (1)
M with standard aux. for status indication of springs	2	3	4	5	7	8
M with 24V DC aux. contacts for status indication of springs	A	B	C	D	F	G

Note: Standard aux = E1.2 = 250V / E2.2 - E6.2 = 400V
1) not compatible with E1.2

18 - Push Button Locking Options

None	0							
		Push Button Covers (PBC)				**Padlock in Open Position (PLC)**		
		PBC Special Key	**PBC Padlock (4mm)**	**PBC Padlock (7mm)**	**PBC Padlock (8mm)**	**PLC (4mm)**	**PLC (7mm)**	**PLC (8mm)**
		2	3	4	5	6	7	8
Key Lock in Open Position - Different Keys (KLC-D)	A	D	E	F	G	H	J	K
Key Lock in Open Position - Same Keys (KLC-S) (1)	B	L	M	N	P	Q	R	S
Key Lock in Open Position - Kirk Key provisions (KLA)	C	T	U	V	W	X	Y	Z

1) Standard key for Same Key option is #20005. Locks for #20006 - 20009 are available for order as loose accessories.
Note: Key lock options for Castell and Ronis/Profalux are available for order as loose accessories.

19 - Racking Lock Options (1st lock) and Factory Test Report

None	X	Keylock in racked in/ out - Same Keys (KLP-S) (1)	Keylock in racked in/ out - Different Keys (KLP-D) (1)	Keylock in racked in/ out - Kirk/Ronis/ Profulaux provisions (KLP-A) (1)	Keylock in racked in/ out - Castell provisions (KLP-A) (2)
	-	A	B	C	D
Padlock in racked in/out position (PLP)	E	F	G	H	J

1) Standard key for Same Key option is #20005. Locks for #20006 - 20009 are available for order as loose accessories.
2) Two Castell adapters cannot be used at once, but can be used in either position with another type of lock.
Note: Racking locks are for E2.2 - E6.2. For E1.2 they are configured within the cradle.

20 - 2nd Racking Lock Options, Mechanical Operations Counter (MOC) and Extended Warranty's

None	X	Keylock in racked in/ out - Same Keys (KLP-S) (1)	Keylock in racked in/ out - Different Keys (KLP-D) (1)	Keylock in racked in/ out - Kirk/Ronis/ Profulaux provisions (KLP-A) (1)	Keylock in racked in/ out - Castell provisions (KLP-A) (2)
		B	C	D	E
Mechanical Operations Counter (MOC)	A	F	G	H	J
2 Year Extended Warranty	2	N	R	U	Y
4 Year Extended Warranty	4	P	S	V	Z
5 Year Extended Warranty	5	Q	T	W	6
Additional Combinations					
MOC + 2 Year Extended Warranty	K	7	-	-	-
MOC + 4 Year Extended Warranty	L	8	-	-	-
MOC + 5 Year Extended Warranty	M	9	-	-	-

1) Standard key for Same Key option is #20005. Locks for #20006 - 20009 are available for order as loose accessories.
2) Two Castell adapters cannot be used at once, but can be used in either position with another type of lock.
Note: for additional combinations please contact your local ABB sales person

Instructions for ordering

SACE Emax 2 cradle MS/DC-E 1500VDC (fixed part) order code breakdown

P	C	A	20	I	O	X	X
1	2	3	4&5	6	7	8	9

1 - Emax 2 Prefix

P	1500VDC

2 - Frame

	E4.2
4p	C

3 - Standard

UL	A
IEC	C

4 & 5 - Amp Ratings by Frame

UL	**1600-2000A**	**2500A**	**3200A**
	20	25	32
IEC	**1600 -2500A**		**3200-4000A**
	25		40

Note: E4.2 3200A (IEC) is compatible with N, S, and H versions for V version use E4.2 4000A

6 - Terminal Connections

DC Insulated Network (2+2ps) Upper	I
DC Insulated Network (2+2ps) Lower	Z
DC Grounded Polarity (4ps) Upper	9
DC Grounded Polarity (4ps) Lower	1

7 - Auxilary Cradle Position Contacts (AUP)

None	0				
	6 AUP (400V AC)	6 AUP (24V DC)	5 AUP (400V AC)	5 AUP (24V DC)	-
E2.2 - E6.2 Left position	-	-	C	D	-
E2.2 - E6.2 Right position	-	-	E	F	-
E2.2 - E6.2 Left & Right positions	-	-	G	H	J [1]

1) Includes one 400V set (left) and one 24VDC set (right)

8 - Racking Lock Options (1st lock)

None	X	Keylock in racked in/ out - Same Keys (KLP-S) [1]	Keylock in racked in/ out - Different Keys (KLP-D) [1]	Keylock in racked in/ out - Kirk/Ronis/ Profulaux provisions (KLP-A) [1]	Keylock in racked in/ out - Castell provisions (KLP-A) [2]
	-	A	B	C	D
Padlock in racked in/out position (PLP)	E	F	G	H	J
Racked out Position Lock (Supplementary)	K [3]	L	M	N	P
PLP + Racked out Position Lock	Q	R	S	T	U

1) Standard key for Same Key option is #20005. Locks for #20006 - 20009 are available for order as loose accessories.
2) Two Castell adapter cannot be used at once, but can be used in either position with another style of lock
3) Available for E2.2-E6.2 and only if a racking lock option has been selected on the circuit breaker side
Note: Racking locks are for E1.2 For E2.2 - E6.2 they are configured within the circuit breaker

9 - 2nd Racking Lock Options

None	X	Keylock in racked in/ out - Same Keys (KLP-S) [1]	Keylock in racked in/ out - Different Keys (KLP-D) [1]	Keylock in racked in/ out - Kirk/Ronis/ Profulaux provisions (KLP-A) [1]	Keylock in racked in/ out - Castell provisions (KLP-A) [2]
	-	B	C	D	E

1) Standard key for Same Key option is #20005. Locks for #20006 - 20009 are available for order as loose accessories.
2) Two Castell adapter cannot be used at once, but can be used in either position with another style of lock.
Note: Racking locks are for E1.2 For E2.2 - E6.2 they are configured within the circuit breaker

Instructions for ordering
Ordering examples

Standard version Emax 2 series circuit breakers are identified by codes that can be accessorized.

Ordering examples

- **Terminal kit codes** (other than standard supply) for fixed circuit breakers or cradles.
  The codes refer to 3 or 4 pieces for mounting on either the top or bottom terminals.

To convert a complete circuit breaker, 1 kit for upper terminals and 1 kit for lower terminals must be specified on the order.

Example no. 1

Emax E2.2N 3 poles fixed with vertical rear terminals (VR)	
1SDA077293R1	E2.2N-A 2000 Ekip Touch LSIG 3p F HR
1SDA079852R1	Kit VR Upper E2.2 Iu=2000 3pcs INST
1SDA079854R1	Kit VR Lower E2.2 Iu=2000 3pcs INST

Example no. 2

Emax E1.2N 4 poles fixed with upper vertical rear (VR) and lower front (F) terminals (standard supply)	
1SDA077020R1	E1.2N-A 1200 Ekip Dip LSIG 4p F F
1SDA079837R1	Kit VR Upper E1.2 Iu=1200 4pcs INST

- **Rating plug for lower rated current values.**
  Rating plugs installed on the circuit breaker allow for rated current values that are lower than the rated current of the circuit breaker.

Example no. 3

Emax E2.2S 2000 3 poles fixed In=1000A	
1SDA077333R1	E2.2S-A 2000 Ekip Touch LSIG 3p F HR
1SDA074264R1	Rating Plug 1000A E1.2...E6.2 INST

- **Ordering Ekip modules.**
  The Ekip Supply module enables Ekip Com, Ekip Link, Ekip 2K and Ekip Synchrocheck modules to be installed.

In addition to the Ekip Supply module, up to 3 additional modules can be installed on E2.2, E4.2 and E6.2 and up to 2 additional modules on E1.2.

Example no. 4

Emax E4.2H 3 poles fixed with modules: Ekip Supply, Ekip Com Modbus TCP, Ekip Signalling 2K, Ekip Com Modbus RCP Redundant and Ekip Signalling 4K	
1SDA077926R1	E4.2H-A 3200 Ekip Hi-Touch LSIG 3p F HR
1SDA074173R1	Ekip Supply 24-48V DC E1.2..E6.2
1SDA074151R1	Ekip Com Modbus TCP E1.2..E6.2
1SDA074158R1	Ekip Com R Modbus TCP E1.2..E6.2
1SDA074167R1	Ekip Sign. 2K-1 E1.2..E6.2
1SDA074170R1	Ekip Sign. 4K E2.2..E6.2

Example no. 5

Emax E4.2H 3 poles fixed with modules: Ekip Supply, Ekip Com EtherNet/IP, Ekip Com Modbus RS-485 and Ekip Measuring Pro	
1SDA077923R1	E4.2H-A 3200 Ekip Touch LSIG 3p F HR
1SDA074173R1	Ekip Supply 24-48V DC E1.2..E6.2
1SDA074155R1	Ekip Com EtherNet/IP E1.2..E6.2
1SDA074150R1	Ekip Com Modbus RS-485 E1.2..E6.2
1SDA074189R1	Ekip Measuring Pro E4.2

Example no. 6

Emax E1.2N 4 poles fixed with modules: Ekip Supply and Ekip Link	
1SDA077020R1	E1.2N-A 1200 Ekip Dip LSIG 4p F F
1SDA074172R1	Ekip Supply 110-240V AC/DC E1.2..E6.2
1SDA074163R1	Ekip Link E1.2..E6.2

- Ordering for electrical accessories.

Example no. 7

Emax E2.2S 3 poles drawout with acessories: shunt coil, closing coil, motor and second shunt coil	
1SDA077662R1	E2.2S-A 1600 Ekip Touch LSI 3p WMP
1SDA073674R1	YO E1.1..E6.2 220-240V AC/DC
1SDA073687R1	YC E1.2..E6.2 220-240V AC/DC
1SDA073725R1	M E2.2..E6.2 220-250V AC/DC
1SDA073674R1	YO E1.2..E6.2 220-240V AC/DC

- Ordering for locks.

Example no. 8

Emax E2.2N 3 poles with double key lock in racked in / test / racked out position, using different keys	
1SDA077293R1	E2.2N-A 2000 Ekip Touch LSIG 3p F HR
1SDA073806R1	KLP-D Bl. Racked in/out E2.2..E6.2 1st key
1SDA073812R1	KLP-D Bl. Racked in/out E2.2..E6.2 2nd key

General informations

Abbreviations used for the description of the product

Versions and terminals	
F	Fixed circuit breaker
W	Drawout circuit breaker
MP	Mobile part of drawout circuit breaker
FP	Fixed part (Cradle) of drawout circuit breaker

Iu	Rated uninterrupted current
In	Rated current of the rating plug
Icu	Rated ultimate short-circuit breaking capacity
Icw	Rated short-time withstand current

/MS	Switch disconnector
/E	Circuit breakers for 1150V applications
/f	Four-pole circuit breakers with neutral pole at 100%
CS	Sectionalizing truck
MT	Earthing truck
MTP	Earthing switch with making capacity

HR VR	Rear orientable terminals
SHR	Horizontal rear spread terminals
SVR	Vertical rear spread terminals
F	Front terminals
FL	Flat terminals
EF	Extended front terminals
ES	Front spread terminals
Fc CuAl	Terminals for cables

Protection trip units and functions	
Ekip Dip	Protection trip unit for power distribution
Ekip Touch	Measurement and protection trip unit for power distribution
Ekip Hi Touch	Measurement and protection trip unit and network analyzer for power distribution
Ekip G Touch	Measurement and protection trip unit for generators
Ekip G Hi-Touch	Measurement and protection trip unit and protection network analyzer for generators

L	Overload protection
S	Protection against selective short circuit
I	Protection against instantaneous short circuit
G	Earth fault protection
Rc	Residual current protection
Power Controller	Load management function

Automatic circuit breakers
Fixed version for power distribution



SACE Emax E1.2B-A/N-A • Front terminals (F)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E1.2B-A	800	42	42	E1.2B-A 800 Ekip Dip LI	1SDA076908R1	Z1BCUFBA000A000000XX	1SDA076988R1	ZABCUFBA000A000000XX
				E1.2B-A 800 Ekip Dip LSI	1SDA076909R1	Z1BCUFBB000A000000XX	1SDA076989R1	ZABCUFBB000A000000XX
				E1.2B-A 800 Ekip Dip LSIG	1SDA076910R1	Z1BCUFBC000A000000XX	1SDA076990R1	ZABCUFBC000A000000XX
				E1.2B-A 800 Ekip Touch LI	1SDA076911R1	Z1BCUFBD000A000000XX	1SDA076991R1	ZABCUFBD000A000000XX
				E1.2B-A 800 Ekip Touch LSI	1SDA076912R1	Z1BCUFBE000A000000XX	1SDA076992R1	ZABCUFBE000A000000XX
				E1.2B-A 800 Ekip Touch LSIG	1SDA076913R1	Z1BCUFBF000A000000XX	1SDA076993R1	ZABCUFBF000A000000XX
				E1.2B-A 800 Ekip Hi-Touch LSI	1SDA076915R1	Z1BCUFBJ200A000000XX	1SDA076995R1	ZABCUFBJ200A000000XX
				E1.2B-A 800 Ekip Hi-Touch LSIG	1SDA076916R1	Z1BCUFBK200A000000XX	1SDA076996R1	ZABCUFBK200A000000XX
	1200	42	42	E1.2B-A 1200 Ekip Dip LI	1SDA076918R1	Z1BDUHBA000A000000XX	1SDA076998R1	ZABDUHBA000A000000XX
				E1.2B-A 1200 Ekip Dip LSI	1SDA076919R1	Z1BDUHBB000A000000XX	1SDA076999R1	ZABDUHBB000A000000XX
				E1.2B-A 1200 Ekip Dip LSIG	1SDA076920R1	Z1BDUHBC000A000000XX	1SDA077000R1	ZABDUHBC000A000000XX
				E1.2B-A 1200 Ekip Touch LI	1SDA076921R1	Z1BDUHBD000A000000XX	1SDA077001R1	ZABDUHBD000A000000XX
				E1.2B-A 1200 Ekip Touch LSI	1SDA076922R1	Z1BDUHBE000A000000XX	1SDA077002R1	ZABDUHBE000A000000XX
				E1.2B-A 1200 Ekip Touch LSIG	1SDA076923R1	Z1BDUHBF000A000000XX	1SDA077003R1	ZABDUHBF000A000000XX
				E1.2B-A 1200 Ekip Hi-Touch LSI	1SDA076925R1	Z1BDUHBJ200A000000XX	1SDA077005R1	ZABDUHBJ200A000000XX
				E1.2B-A 1200 Ekip Hi-Touch LSIG	1SDA076926R1	Z1BDUHBK200A000000XX	1SDA077006R1	ZABDUHBK200A000000XX
E1.2N-A	800	50	50	E1.2N-A 800 Ekip Dip LI	1SDA076928R1	Z1NCUFBA000A000000XX	1SDA077008R1	ZANCUFBA000A000000XX
				E1.2N-A 800 Ekip Dip LSI	1SDA076929R1	Z1NCUFBB000A000000XX	1SDA077009R1	ZANCUFBB000A000000XX
				E1.2N-A 800 Ekip Dip LSIG	1SDA076930R1	Z1NCUFBC000A000000XX	1SDA077010R1	ZANCUFBC000A000000XX
				E1.2N-A 800 Ekip Touch LI	1SDA076931R1	Z1NCUFBD000A000000XX	1SDA077011R1	ZANCUFBD000A000000XX
				E1.2N-A 800 Ekip Touch LSI	1SDA076932R1	Z1NCUFBE000A000000XX	1SDA077012R1	ZANCUFBE000A000000XX
				E1.2N-A 800 Ekip Touch LSIG	1SDA076933R1	Z1NCUFBF000A000000XX	1SDA077013R1	ZANCUFBF000A000000XX
				E1.2N-A 800 Ekip Hi-Touch LSI	1SDA076935R1	Z1NCUFBJ200A000000XX	1SDA077015R1	ZANCUFBJ200A000000XX
				E1.2N-A 800 Ekip Hi-Touch LSIG	1SDA076936R1	Z1NCUFBK200A000000XX	1SDA077016R1	ZANCUFBK200A000000XX
	1200	50	50	E1.2N-A 1200 Ekip Dip LI	1SDA076938R1	Z1NDUHBA000A000000XX	1SDA077018R1	ZANDUHBA000A000000XX
				E1.2N-A 1200 Ekip Dip LSI	1SDA076939R1	Z1NDUHBB000A000000XX	1SDA077019R1	ZANDUHBB000A000000XX
				E1.2N-A 1200 Ekip Dip LSIG	1SDA076940R1	Z1NDUHBC000A000000XX	1SDA077020R1	ZANDUHBC000A000000XX
				E1.2N-A 1200 Ekip Touch LI	1SDA076941R1	Z1NDUHBD000A000000XX	1SDA077021R1	ZANDUHBD000A000000XX
				E1.2N-A 1200 Ekip Touch LSI	1SDA076942R1	Z1NDUHBE000A000000XX	1SDA077022R1	ZANDUHBE000A000000XX
				E1.2N-A 1200 Ekip Touch LSIG	1SDA076943R1	Z1NDUHBF000A000000XX	1SDA077023R1	ZANDUHBF000A000000XX
				E1.2N-A 1200 Ekip Hi-Touch LSI	1SDA076945R1	Z1NDUHBJ200A000000XX	1SDA077025R1	ZANDUHBJ200A000000XX
				E1.2N-A 1200 Ekip Hi-Touch LSIG	1SDA076946R1	Z1NDUHBK200A000000XX	1SDA077026R1	ZANDUHBK200A000000XX

About wall mount is standard; for floor fixing must order: 1SDA076020R1 ZE1FFPF

Automatic circuit breakers
Fixed version for power distribution



SACE Emax E1.2S-A • Front terminals (F)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E1.2S-A	250	65	50	E1.2S-A 250 Ekip Dip LI	1SDA076948R1	Z1SAUCBA000A000000XX	1SDA077028R1	ZASAUCBA000A000000XX
				E1.2S-A 250 Ekip Dip LSI	1SDA076949R1	Z1SAUCBB000A000000XX	1SDA077029R1	ZASAUCBB000A000000XX
				E1.2S-A 250 Ekip Dip LSIG	1SDA076950R1	Z1SAUCBC000A000000XX	1SDA077030R1	ZASAUCBC000A000000XX
				E1.2S-A 250 Ekip Touch LI	1SDA076951R1	Z1SAUCBD000A000000XX	1SDA077031R1	ZASAUCBD000A000000XX
				E1.2S-A 250 Ekip Touch LSI	1SDA076952R1	Z1SAUCBE000A000000XX	1SDA077032R1	ZASAUCBE000A000000XX
				E1.2S-A 250 Ekip Touch LSIG	1SDA076953R1	Z1SAUCBF000A000000XX	1SDA077033R1	ZASAUCBF000A000000XX
				E1.2S-A 250 Ekip Hi-Touch LSI	1SDA076955R1	Z1SAUCBJ200A000000XX	1SDA077035R1	ZASAUCBJ200A000000XX
				E1.2S-A 250 Ekip Hi-Touch LSIG	1SDA076956R1	Z1SAUCBK200A000000XX	1SDA077036R1	ZASAUCBK200A000000XX
	400	65	50	E1.2S-A 400 Ekip Dip LI	1SDA076958R1	Z1SBUDBA000A000000XX	1SDA077038R1	ZASBUDBA000A000000XX
				E1.2S-A 400 Ekip Dip LSI	1SDA076959R1	Z1SBUDBB000A000000XX	1SDA077039R1	ZASBUDBB000A000000XX
				E1.2S-A 400 Ekip Dip LSIG	1SDA076960R1	Z1SBUDBC000A000000XX	1SDA077040R1	ZASBUDBC000A000000XX
				E1.2S-A 400 Ekip Touch LI	1SDA076961R1	Z1SBUDBD000A000000XX	1SDA077041R1	ZASBUDBD000A000000XX
				E1.2S-A 400 Ekip Touch LSI	1SDA076962R1	Z1SBUDBE000A000000XX	1SDA077042R1	ZASBUDBE000A000000XX
				E1.2S-A 400 Ekip Touch LSIG	1SDA076963R1	Z1SBUDBF000A000000XX	1SDA077043R1	ZASBUDBF000A000000XX
				E1.2S-A 400 Ekip Hi-Touch LSI	1SDA076965R1	Z1SBUDBJ200A000000XX	1SDA077045R1	ZASBUDBJ200A000000XX
				E1.2S-A 400 Ekip Hi-Touch LSIG	1SDA076966R1	Z1SBUDBK200A000000XX	1SDA077046R1	ZASBUDBK200A000000XX
	800	65	50	E1.2S-A 800 Ekip Dip LI	1SDA076968R1	Z1SCUFBA000A000000XX	1SDA077048R1	ZASCUFBA000A000000XX
				E1.2S-A 800 Ekip Dip LSI	1SDA076969R1	Z1SCUFBB000A000000XX	1SDA077049R1	ZASCUFBB000A000000XX
				E1.2S-A 800 Ekip Dip LSIG	1SDA076970R1	Z1SCUFBC000A000000XX	1SDA077050R1	ZASCUFBC000A000000XX
				E1.2S-A 800 Ekip Touch LI	1SDA076971R1	Z1SCUFBD000A000000XX	1SDA077051R1	ZASCUFBD000A000000XX
				E1.2S-A 800 Ekip Touch LSI	1SDA076972R1	Z1SCUFBE000A000000XX	1SDA077052R1	ZASCUFBE000A000000XX
				E1.2S-A 800 Ekip Touch LSIG	1SDA076973R1	Z1SCUFBF000A000000XX	1SDA077053R1	ZASCUFBF000A000000XX
				E1.2S-A 800 Ekip Hi-Touch LSI	1SDA076975R1	Z1SCUFBJ200A000000XX	1SDA077055R1	ZASCUFBJ200A000000XX
				E1.2S-A 800 Ekip Hi-Touch LSIG	1SDA076976R1	Z1SCUFBK200A000000XX	1SDA077056R1	ZASCUFBK200A000000XX
	1200	65	50	E1.2S-A 1200 Ekip Dip LI	1SDA076978R1	Z1SDUHBA000A000000XX	1SDA077058R1	ZASDUHBA000A000000XX
				E1.2S-A 1200 Ekip Dip LSI	1SDA076979R1	Z1SDUHBB000A000000XX	1SDA077059R1	ZASDUHBB000A000000XX
				E1.2S-A 1200 Ekip Dip LSIG	1SDA076980R1	Z1SDUHBC000A000000XX	1SDA077060R1	ZASDUHBC000A000000XX
				E1.2S-A 1200 Ekip Touch LI	1SDA076981R1	Z1SDUHBD000A000000XX	1SDA077061R1	ZASDUHBD000A000000XX
				E1.2S-A 1200 Ekip Touch LSI	1SDA076982R1	Z1SDUHBE000A000000XX	1SDA077062R1	ZASDUHBE000A000000XX
				E1.2S-A 1200 Ekip Touch LSIG	1SDA076983R1	Z1SDUHBF000A000000XX	1SDA077063R1	ZASDUHBF000A000000XX
				E1.2S-A 1200 Ekip Hi-Touch LSI	1SDA076985R1	Z1SDUHBJ200A000000XX	1SDA077065R1	ZASDUHBJ200A000000XX
				E1.2S-A 1200 Ekip Hi-Touch LSIG	1SDA076986R1	Z1SDUHBK200A000000XX	1SDA077066R1	ZASDUHBK200A000000XX

About wall mount is standard; for floor fixing must order: 1SDA076020R1 ZE1FFPF



SACE Emax 2 E2.2B-A/N-A • Orientable rear terminals (HR)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E2.2B-A	1600	42	42	E2.2B-A 1600 Ekip Dip LI	1SDA077228R1	Z2BEUJBA000A000000XX	1SDA077398R1	ZBBEUJBA000A000000XX
				E2.2B-A 1600 Ekip Dip LSI	1SDA077229R1	Z2BEUJBB000A000000XX	1SDA077399R1	ZBBEUJBB000A000000XX
				E2.2B-A 1600 Ekip Dip LSIG	1SDA077230R1	Z2BEUJBC000A000000XX	1SDA077400R1	ZBBEUJBC000A000000XX
				E2.2B-A 1600 Ekip Touch LI	1SDA077231R1	Z2BEUJBD000A000000XX	1SDA077401R1	ZBBEUJBD000A000000XX
				E2.2B-A 1600 Ekip Touch LSI	1SDA077232R1	Z2BEUJBE000A000000XX	1SDA077402R1	ZBBEUJBE000A000000XX
				E2.2B-A 1600 Ekip Touch LSIG	1SDA077233R1	Z2BEUJBF000A000000XX	1SDA077403R1	ZBBEUJBF000A000000XX
				E2.2B-A 1600 Ekip Hi-Touch LSI	1SDA077235R1	Z2BEUJBJ200A000000XX	1SDA077405R1	ZBBEUJBJ200A000000XX
				E2.2B-A 1600 Ekip Hi-Touch LSIG	1SDA077236R1	Z2BEUJBK200A000000XX	1SDA077406R1	ZBBEUJBK200A000000XX
E2.2N-A	1600	50	50	E2.2N-A 1600 Ekip Dip LI	1SDA077278R1	Z2NEUJBA000A000000XX	1SDA077448R1	ZBNEUJBA000A000000XX
				E2.2N-A 1600 Ekip Dip LSI	1SDA077279R1	Z2NEUJBB000A000000XX	1SDA077449R1	ZBNEUJBB000A000000XX
				E2.2N-A 1600 Ekip Dip LSIG	1SDA077280R1	Z2NEUJBC000A000000XX	1SDA077450R1	ZBNEUJBC000A000000XX
				E2.2N-A 1600 Ekip Touch LI	1SDA077281R1	Z2NEUJBD000A000000XX	1SDA077451R1	ZBNEUJBD000A000000XX
				E2.2N-A 1600 Ekip Touch LSI	1SDA077282R1	Z2NEUJBE000A000000XX	1SDA077452R1	ZBNEUJBE000A000000XX
				E2.2N-A 1600 Ekip Touch LSIG	1SDA077283R1	Z2NEUJBF000A000000XX	1SDA077453R1	ZBNEUJBF000A000000XX
				E2.2N-A 1600 Ekip Hi-Touch LSI	1SDA077285R1	Z2NEUJBJ200A000000XX	1SDA077455R1	ZBNEUJBJ200A000000XX
				E2.2N-A 1600 Ekip Hi-Touch LSIG	1SDA077286R1	Z2NEUJBK200A000000XX	1SDA077456R1	ZBNEUJBK200A000000XX
	2000	50	50	E2.2N-A 2000 Ekip Dip LI	1SDA077288R1	Z2NFUKBA000A000000XX	1SDA077458R1	ZBNFUKBA000A000000XX
				E2.2N-A 2000 Ekip Dip LSI	1SDA077289R1	Z2NFUKBB000A000000XX	1SDA077459R1	ZBNFUKBB000A000000XX
				E2.2N-A 2000 Ekip Dip LSIG	1SDA077290R1	Z2NFUKBC000A000000XX	1SDA077460R1	ZBNFUKBC000A000000XX
				E2.2N-A 2000 Ekip Touch LI	1SDA077291R1	Z2NFUKBD000A000000XX	1SDA077461R1	ZBNFUKBD000A000000XX
				E2.2N-A 2000 Ekip Touch LSI	1SDA077292R1	Z2NFUKBE000A000000XX	1SDA077462R1	ZBNFUKBE000A000000XX
				E2.2N-A 2000 Ekip Touch LSIG	1SDA077293R1	Z2NFUKBF000A000000XX	1SDA077463R1	ZBNFUKBF000A000000XX
				E2.2N-A 2000 Ekip Hi-Touch LSI	1SDA077295R1	Z2NFUKBJ200A000000XX	1SDA077465R1	ZBNFUKBJ200A000000XX
				E2.2N-A 2000 Ekip Hi-Touch LSIG	1SDA077296R1	Z2NFUKBK200A000000XX	1SDA077466R1	ZBNFUKBK200A000000XX

Automatic circuit breakers
Fixed version for power distribution



SACE Emax 2 E2.2S-A • Orientable rear terminals (HR)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E2.2S-A	800	65	65	E2.2S-A 800 Ekip Dip LI	1SDA077298R1	Z2SCUFBA000A000000XX	1SDA077468R1	ZBSCUFBA000A000000XX
				E2.2S-A 800 Ekip Dip LSI	1SDA077299R1	Z2SCUFBB000A000000XX	1SDA077469R1	ZBSCUFBB000A000000XX
				E2.2S-A 800 Ekip Dip LSIG	1SDA077300R1	Z2SCUFBC000A000000XX	1SDA077470R1	ZBSCUFBC000A000000XX
				E2.2S-A 800 Ekip Touch LI	1SDA077301R1	Z2SCUFBD000A000000XX	1SDA077471R1	ZBSCUFBD000A000000XX
				E2.2S-A 800 Ekip Touch LSI	1SDA077302R1	Z2SCUFBE000A000000XX	1SDA077472R1	ZBSCUFBE000A000000XX
				E2.2S-A 800 Ekip Touch LSIG	1SDA077303R1	Z2SCUFBF000A000000XX	1SDA077473R1	ZBSCUFBF000A000000XX
				E2.2S-A 800 Ekip Hi-Touch LSI	1SDA077305R1	Z2SCUFBJ200A000000XX	1SDA077475R1	ZBSCUFBJ200A000000XX
				E2.2S-A 800 Ekip Hi-Touch LSIG	1SDA077306R1	Z2SCUFBK200A000000XX	1SDA077476R1	ZBSCUFBK200A000000XX
	1200	65	65	E2.2S-A 1200 Ekip Dip LI	1SDA077308R1	Z2SDUHBA000A000000XX	1SDA077478R1	ZBSDUHBA000A000000XX
				E2.2S-A 1200 Ekip Dip LSI	1SDA077309R1	Z2SDUHBB000A000000XX	1SDA077479R1	ZBSDUHBB000A000000XX
				E2.2S-A 1200 Ekip Dip LSIG	1SDA077310R1	Z2SDUHBC000A000000XX	1SDA077480R1	ZBSDUHBC000A000000XX
				E2.2S-A 1200 Ekip Touch LI	1SDA077311R1	Z2SDUHBD000A000000XX	1SDA077481R1	ZBSDUHBD000A000000XX
				E2.2S-A 1200 Ekip Touch LSI	1SDA077312R1	Z2SDUHBE000A000000XX	1SDA077482R1	ZBSDUHBE000A000000XX
				E2.2S-A 1200 Ekip Touch LSIG	1SDA077313R1	Z2SDUHBF000A000000XX	1SDA077483R1	ZBSDUHBF000A000000XX
				E2.2S-A 1200 Ekip Hi-Touch LSI	1SDA077315R1	Z2SDUHBJ200A000000XX	1SDA077485R1	ZBSDUHBJ200A000000XX
				E2.2S-A 1200 Ekip Hi-Touch LSIG	1SDA077316R1	Z2SDUHBK200A000000XX	1SDA077486R1	ZBSDUHBK200A000000XX
	1600	65	65	E2.2S-A 1600 Ekip Dip LI	1SDA077318R1	Z2SEUJBA000A000000XX	1SDA077488R1	ZBSEUJBA000A000000XX
				E2.2S-A 1600 Ekip Dip LSI	1SDA077319R1	Z2SEUJBB000A000000XX	1SDA077489R1	ZBSEUJBB000A000000XX
				E2.2S-A 1600 Ekip Dip LSIG	1SDA077320R1	Z2SEUJBC000A000000XX	1SDA077490R1	ZBSEUJBC000A000000XX
				E2.2S-A 1600 Ekip Touch LI	1SDA077321R1	Z2SEUJBD000A000000XX	1SDA077491R1	ZBSEUJBD000A000000XX
				E2.2S-A 1600 Ekip Touch LSI	1SDA077322R1	Z2SEUJBE000A000000XX	1SDA077492R1	ZBSEUJBE000A000000XX
				E2.2S-A 1600 Ekip Touch LSIG	1SDA077323R1	Z2SEUJBF000A000000XX	1SDA077493R1	ZBSEUJBF000A000000XX
				E2.2S-A 1600 Ekip Hi-Touch LSI	1SDA077325R1	Z2SEUJBJ200A000000XX	1SDA077495R1	ZBSEUJBJ200A000000XX
				E2.2S-A 1600 Ekip Hi-Touch LSIG	1SDA077326R1	Z2SEUJBK200A000000XX	1SDA077496R1	ZBSEUJBK200A000000XX
	2000	65	65	E2.2S-A 2000 Ekip Dip LI	1SDA077328R1	Z2SFUKBA000A000000XX	1SDA077498R1	ZBSFUKBA000A000000XX
				E2.2S-A 2000 Ekip Dip LSI	1SDA077329R1	Z2SFUKBB000A000000XX	1SDA077499R1	ZBSFUKBB000A000000XX
				E2.2S-A 2000 Ekip Dip LSIG	1SDA077330R1	Z2SFUKBC000A000000XX	1SDA077500R1	ZBSFUKBC000A000000XX
				E2.2S-A 2000 Ekip Touch LI	1SDA077331R1	Z2SFUKBD000A000000XX	1SDA077501R1	ZBSFUKBD000A000000XX
				E2.2S-A 2000 Ekip Touch LSI	1SDA077332R1	Z2SFUKBE000A000000XX	1SDA077502R1	ZBSFUKBE000A000000XX
				E2.2S-A 2000 Ekip Touch LSIG	1SDA077333R1	Z2SFUKBF000A000000XX	1SDA077503R1	ZBSFUKBF000A000000XX
				E2.2S-A 2000 Ekip Hi-Touch LSI	1SDA077335R1	Z2SFUKBJ200A000000XX	1SDA077505R1	ZBSFUKBJ200A000000XX
				E2.2S-A 2000 Ekip Hi-Touch LSIG	1SDA077336R1	Z2SFUKBK200A000000XX	1SDA077506R1	ZBSFUKBK200A000000XX



SACE Emax 2 E2.2H-A • Orientable rear terminals (HR)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E2.2H-A	800	85	85	E2.2H-A 800 Ekip Dip LI	1SDA077238R1	Z2HCUFBA000A000000XX	1SDA077408R1	ZBHCUFBA000A000000XX
				E2.2H-A 800 Ekip Dip LSI	1SDA077239R1	Z2HCUFBB000A000000XX	1SDA077409R1	ZBHCUFBB000A000000XX
				E2.2H-A 800 Ekip Dip LSIG	1SDA077240R1	Z2HCUFBC000A000000XX	1SDA077410R1	ZBHCUFBC000A000000XX
				E2.2H-A 800 Ekip Touch LI	1SDA077241R1	Z2HCUFBD000A000000XX	1SDA077411R1	ZBHCUFBD000A000000XX
				E2.2H-A 800 Ekip Touch LSI	1SDA077242R1	Z2HCUFBE000A000000XX	1SDA077412R1	ZBHCUFBE000A000000XX
				E2.2H-A 800 Ekip Touch LSIG	1SDA077243R1	Z2HCUFBF000A000000XX	1SDA077413R1	ZBHCUFBF000A000000XX
				E2.2H-A 800 Ekip Hi-Touch LSI	1SDA077245R1	Z2HCUFBJ200A000000XX	1SDA077415R1	ZBHCUFBJ200A000000XX
				E2.2H-A 800 Ekip Hi-Touch LSIG	1SDA077246R1	Z2HCUFBK200A000000XX	1SDA077416R1	ZBHCUFBK200A000000XX
	1200	85	85	E2.2H-A 1200 Ekip Dip LI	1SDA077248R1	Z2HDUHBA000A000000XX	1SDA077418R1	ZBHDUHBA000A000000XX
				E2.2H-A 1200 Ekip Dip LSI	1SDA077249R1	Z2HDUHBB000A000000XX	1SDA077419R1	ZBHDUHBB000A000000XX
				E2.2H-A 1200 Ekip Dip LSIG	1SDA077250R1	Z2HDUHBC000A000000XX	1SDA077420R1	ZBHDUHBC000A000000XX
				E2.2H-A 1200 Ekip Touch LI	1SDA077251R1	Z2HDUHBD000A000000XX	1SDA077421R1	ZBHDUHBD000A000000XX
				E2.2H-A 1200 Ekip Touch LSI	1SDA077252R1	Z2HDUHBE000A000000XX	1SDA077422R1	ZBHDUHBE000A000000XX
				E2.2H-A 1200 Ekip Touch LSIG	1SDA077253R1	Z2HDUHBF000A000000XX	1SDA077423R1	ZBHDUHBF000A000000XX
				E2.2H-A 1200 Ekip Hi-Touch LSI	1SDA077255R1	Z2HDUHBJ200A000000XX	1SDA077425R1	ZBHDUHBJ200A000000XX
				E2.2H-A 1200 Ekip Hi-Touch LSIG	1SDA077256R1	Z2HDUHBK200A000000XX	1SDA077426R1	ZBHDUHBK200A000000XX
	1600	85	85	E2.2H-A 1600 Ekip Dip LI	1SDA077258R1	Z2HEUJBA000A000000XX	1SDA077428R1	ZBHEUJBA000A000000XX
				E2.2H-A 1600 Ekip Dip LSI	1SDA077259R1	Z2HEUJBB000A000000XX	1SDA077429R1	ZBHEUJBB000A000000XX
				E2.2H-A 1600 Ekip Dip LSIG	1SDA077260R1	Z2HEUJBC000A000000XX	1SDA077430R1	ZBHEUJBC000A000000XX
				E2.2H-A 1600 Ekip Touch LI	1SDA077261R1	Z2HEUJBD000A000000XX	1SDA077431R1	ZBHEUJBD000A000000XX
				E2.2H-A 1600 Ekip Touch LSI	1SDA077262R1	Z2HEUJBE000A000000XX	1SDA077432R1	ZBHEUJBE000A000000XX
				E2.2H-A 1600 Ekip Touch LSIG	1SDA077263R1	Z2HEUJBF000A000000XX	1SDA077433R1	ZBHEUJBF000A000000XX
				E2.2H-A 1600 Ekip Hi-Touch LSI	1SDA077265R1	Z2HEUJBJ200A000000XX	1SDA077435R1	ZBHEUJBJ200A000000XX
				E2.2H-A 1600 Ekip Hi-Touch LSIG	1SDA077266R1	Z2HEUJBK200A000000XX	1SDA077436R1	ZBHEUJBK200A000000XX
	2000	85	85	E2.2H-A 2000 Ekip Dip LI	1SDA077268R1	Z2HFUKBA000A000000XX	1SDA077438R1	ZBHFUKBA000A000000XX
				E2.2H-A 2000 Ekip Dip LSI	1SDA077269R1	Z2HFUKBB000A000000XX	1SDA077439R1	ZBHFUKBB000A000000XX
				E2.2H-A 2000 Ekip Dip LSIG	1SDA077270R1	Z2HFUKBC000A000000XX	1SDA077440R1	ZBHFUKBC000A000000XX
				E2.2H-A 2000 Ekip Touch LI	1SDA077271R1	Z2HFUKBD000A000000XX	1SDA077441R1	ZBHFUKBD000A000000XX
				E2.2H-A 2000 Ekip Touch LSI	1SDA077272R1	Z2HFUKBE000A000000XX	1SDA077442R1	ZBHFUKBE000A000000XX
				E2.2H-A 2000 Ekip Touch LSIG	1SDA077273R1	Z2HFUKBF000A000000XX	1SDA077443R1	ZBHFUKBF000A000000XX
				E2.2H-A 2000 Ekip Hi-Touch LSI	1SDA077275R1	Z2HFUKBJ200A000000XX	1SDA077445R1	ZBHFUKBJ200A000000XX
				E2.2H-A 2000 Ekip Hi-Touch LSIG	1SDA077276R1	Z2HFUKBK200A000000XX	1SDA077446R1	ZBHFUKBK200A000000XX

Automatic circuit breakers

Fixed version for power distribution



SACE Emax 2 E2.2V-A • Orientable rear terminals (HR)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E2.2V-A	250	100	85	E2.2V-A 250 Ekip Dip LI	1SDA077338R1	Z2VAUCBA000A000000XX	1SDA077508R1	ZBVAUCBA000A000000XX
				E2.2V-A 250 Ekip Dip LSI	1SDA077339R1	Z2VAUCBB000A000000XX	1SDA077509R1	ZBVAUCBB000A000000XX
				E2.2V-A 250 Ekip Dip LSIG	1SDA077340R1	Z2VAUCBC000A000000XX	1SDA077510R1	ZBVAUCBC000A000000XX
				E2.2V-A 250 Ekip Touch LI	1SDA077341R1	Z2VAUCBD000A000000XX	1SDA077511R1	ZBVAUCBD000A000000XX
				E2.2V-A 250 Ekip Touch LSI	1SDA077342R1	Z2VAUCBE000A000000XX	1SDA077512R1	ZBVAUCBE000A000000XX
				E2.2V-A 250 Ekip Touch LSIG	1SDA077343R1	Z2VAUCBF000A000000XX	1SDA077513R1	ZBVAUCBF000A000000XX
				E2.2V-A 250 Ekip Hi-Touch LSI	1SDA077345R1	Z2VAUCBJ200A000000XX	1SDA077515R1	ZBVAUCBJ200A000000XX
				E2.2V-A 250 Ekip Hi-Touch LSIG	1SDA077346R1	Z2VAUCBK200A000000XX	1SDA077516R1	ZBVAUCBK200A000000XX
	400	100	85	E2.2V-A 400 Ekip Dip LI	1SDA077348R1	Z2VBUDBA000A000000XX	1SDA077518R1	ZBVBUDBA000A000000XX
				E2.2V-A 400 Ekip Dip LSI	1SDA077349R1	Z2VBUDBB000A000000XX	1SDA077519R1	ZBVBUDBB000A000000XX
				E2.2V-A 400 Ekip Dip LSIG	1SDA077350R1	Z2VBUDBC000A000000XX	1SDA077520R1	ZBVBUDBC000A000000XX
				E2.2V-A 400 Ekip Touch LI	1SDA077351R1	Z2VBUDBD000A000000XX	1SDA077521R1	ZBVBUDBD000A000000XX
				E2.2V-A 400 Ekip Touch LSI	1SDA077352R1	Z2VBUDBE000A000000XX	1SDA077522R1	ZBVBUDBE000A000000XX
				E2.2V-A 400 Ekip Touch LSIG	1SDA077353R1	Z2VBUDBF000A000000XX	1SDA077523R1	ZBVBUDBF000A000000XX
				E2.2V-A 400 Ekip Hi-Touch LSI	1SDA077355R1	Z2VBUDBJ200A000000XX	1SDA077525R1	ZBVBUDBJ200A000000XX
				E2.2V-A 400 Ekip Hi-Touch LSIG	1SDA077356R1	Z2VBUDBK200A000000XX	1SDA077526R1	ZBVBUDBK200A000000XX
	800	100	85	E2.2V-A 800 Ekip Dip LI	1SDA077358R1	Z2VCUFBA000A000000XX	1SDA077528R1	ZBVCUFBA000A000000XX
				E2.2V-A 800 Ekip Dip LSI	1SDA077359R1	Z2VCUFBB000A000000XX	1SDA077529R1	ZBVCUFBB000A000000XX
				E2.2V-A 800 Ekip Dip LSIG	1SDA077360R1	Z2VCUFBC000A000000XX	1SDA077530R1	ZBVCUFBC000A000000XX
				E2.2V-A 800 Ekip Touch LI	1SDA077361R1	Z2VCUFBD000A000000XX	1SDA077531R1	ZBVCUFBD000A000000XX
				E2.2V-A 800 Ekip Touch LSI	1SDA077362R1	Z2VCUFBE000A000000XX	1SDA077532R1	ZBVCUFBE000A000000XX
				E2.2V-A 800 Ekip Touch LSIG	1SDA077363R1	Z2VCUFBF000A000000XX	1SDA077533R1	ZBVCUFBF000A000000XX
				E2.2V-A 800 Ekip Hi-Touch LSI	1SDA077365R1	Z2VCUFBJ200A000000XX	1SDA077535R1	ZBVCUFBJ200A000000XX
				E2.2V-A 800 Ekip Hi-Touch LSIG	1SDA077366R1	Z2VCUFBK200A000000XX	1SDA077536R1	ZBVCUFBK200A000000XX
	1200	100	85	E2.2V-A 1200 Ekip Dip LI	1SDA077368R1	Z2VDUHBA000A000000XX	1SDA077538R1	ZBVDUHBA000A000000XX
				E2.2V-A 1200 Ekip Dip LSI	1SDA077369R1	Z2VDUHBB000A000000XX	1SDA077539R1	ZBVDUHBB000A000000XX
				E2.2V-A 1200 Ekip Dip LSIG	1SDA077370R1	Z2VDUHBC000A000000XX	1SDA077540R1	ZBVDUHBC000A000000XX
				E2.2V-A 1200 Ekip Touch LI	1SDA077371R1	Z2VDUHBD000A000000XX	1SDA077541R1	ZBVDUHBD000A000000XX
				E2.2V-A 1200 Ekip Touch LSI	1SDA077372R1	Z2VDUHBE000A000000XX	1SDA077542R1	ZBVDUHBE000A000000XX
				E2.2V-A 1200 Ekip Touch LSIG	1SDA077373R1	Z2VDUHBF000A000000XX	1SDA077543R1	ZBVDUHBF000A000000XX
				E2.2V-A 1200 Ekip Hi-Touch LSI	1SDA077375R1	Z2VDUHBJ200A000000XX	1SDA077545R1	ZBVDUHBJ200A000000XX
				E2.2V-A 1200 Ekip Hi-Touch LSIG	1SDA077376R1	Z2VDUHBK200A000000XX	1SDA077546R1	ZBVDUHBK200A000000XX
	1600	100	85	E2.2V-A 1600 Ekip Dip LI	1SDA077378R1	Z2VEUJBA000A000000XX	1SDA077548R1	ZBVEUJBA000A000000XX
				E2.2V-A 1600 Ekip Dip LSI	1SDA077379R1	Z2VEUJBB000A000000XX	1SDA077549R1	ZBVEUJBB000A000000XX
				E2.2V-A 1600 Ekip Dip LSIG	1SDA077380R1	Z2VEUJBC000A000000XX	1SDA077550R1	ZBVEUJBC000A000000XX
				E2.2V-A 1600 Ekip Touch LI	1SDA077381R1	Z2VEUJBD000A000000XX	1SDA077551R1	ZBVEUJBD000A000000XX
				E2.2V-A 1600 Ekip Touch LSI	1SDA077382R1	Z2VEUJBE000A000000XX	1SDA077552R1	ZBVEUJBE000A000000XX
				E2.2V-A 1600 Ekip Touch LSIG	1SDA077383R1	Z2VEUJBF000A000000XX	1SDA077553R1	ZBVEUJBF000A000000XX
				E2.2V-A 1600 Ekip Hi-Touch LSI	1SDA077385R1	Z2VEUJBJ200A000000XX	1SDA077555R1	ZBVEUJBJ200A000000XX
				E2.2V-A 1600 Ekip Hi-Touch LSIG	1SDA077386R1	Z2VEUJBK200A000000XX	1SDA077556R1	ZBVEUJBK200A000000XX
	2000	100	85	E2.2V-A 2000 Ekip Dip LI	1SDA077388R1	Z2VFUKBA000A000000XX	1SDA077558R1	ZBVFUKBA000A000000XX
				E2.2V-A 2000 Ekip Dip LSI	1SDA077389R1	Z2VFUKBB000A000000XX	1SDA077559R1	ZBVFUKBB000A000000XX
				E2.2V-A 2000 Ekip Dip LSIG	1SDA077390R1	Z2VFUKBC000A000000XX	1SDA077560R1	ZBVFUKBC000A000000XX
				E2.2V-A 2000 Ekip Touch LI	1SDA077391R1	Z2VFUKBD000A000000XX	1SDA077561R1	ZBVFUKBD000A000000XX
				E2.2V-A 2000 Ekip Touch LSI	1SDA077392R1	Z2VFUKBE000A000000XX	1SDA077562R1	ZBVFUKBE000A000000XX
				E2.2V-A 2000 Ekip Touch LSIG	1SDA077393R1	Z2VFUKBF000A000000XX	1SDA077563R1	ZBVFUKBF000A000000XX
				E2.2V-A 2000 Ekip Hi-Touch LSI	1SDA077395R1	Z2VFUKBJ200A000000XX	1SDA077565R1	ZBVFUKBJ200A000000XX
				E2.2V-A 2000 Ekip Hi-Touch LSIG	1SDA077396R1	Z2VFUKBK200A000000XX	1SDA077566R1	ZBVFUKBK200A000000XX



SACE Emax 2 E4.2S-A/H-A • Orientable rear terminals up to 2500 A (HR)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E4.2S-A	2500	65	65	E4.2S-A 2500 Ekip Dip LI	1SDA077998R1	Z4SGULBA000A000000XX	1SDA078228R1	ZCSGULBA000A000000XX
				E4.2S-A 2500 Ekip Dip LSI	1SDA077999R1	Z4SGULBB000A000000XX	1SDA078229R1	ZCSGULBB000A000000XX
				E4.2S-A 2500 Ekip Dip LSIG	1SDA078000R1	Z4SGULBC000A000000XX	1SDA078230R1	ZCSGULBC000A000000XX
				E4.2S-A 2500 Ekip Touch LI	1SDA078001R1	Z4SGULBD000A000000XX	1SDA078231R1	ZCSGULBD000A000000XX
				E4.2S-A 2500 Ekip Touch LSI	1SDA078002R1	Z4SGULBE000A000000XX	1SDA078232R1	ZCSGULBE000A000000XX
				E4.2S-A 2500 Ekip Touch LSIG	1SDA078003R1	Z4SGULBF000A000000XX	1SDA078233R1	ZCSGULBF000A000000XX
				E4.2S-A 2500 Ekip Hi-Touch LSI	1SDA078005R1	Z4SGULBJ200A000000XX	1SDA078235R1	ZCSGULBJ200A000000XX
				E4.2S-A 2500 Ekip Hi-Touch LSIG	1SDA078006R1	Z4SGULBK200A000000XX	1SDA078236R1	ZCSGULBK200A000000XX
	3200 (1)	65	65	E4.2S-A 3200 Ekip Dip LI	1SDA078008R1	Z4SHUNBA000A000000XX	1SDA078238R1	ZCSHUNBA000A000000XX
				E4.2S-A 3200 Ekip Dip LSI	1SDA078009R1	Z4SHUNBB000A000000XX	1SDA078239R1	ZCSHUNBB000A000000XX
				E4.2S-A 3200 Ekip Dip LSIG	1SDA078010R1	Z4SHUNBC000A000000XX	1SDA078240R1	ZCSHUNBC000A000000XX
				E4.2S-A 3200 Ekip Touch LI	1SDA078011R1	Z4SHUNBD000A000000XX	1SDA078241R1	ZCSHUNBD000A000000XX
				E4.2S-A 3200 Ekip Touch LSI	1SDA078012R1	Z4SHUNBE000A000000XX	1SDA078242R1	ZCSHUNBE000A000000XX
				E4.2S-A 3200 Ekip Touch LSIG	1SDA078013R1	Z4SHUNBF000A000000XX	1SDA078243R1	ZCSHUNBF000A000000XX
				E4.2S-A 3200 Ekip Hi-Touch LSI	1SDA078015R1	Z4SHUNBJ200A000000XX	1SDA078245R1	ZCSHUNBJ200A000000XX
				E4.2S-A 3200 Ekip Hi-Touch LSIG	1SDA078016R1	Z4SHUNBK200A000000XX	1SDA078246R1	ZCSHUNBK200A000000XX
	3600 (1)	65	65	E4.2S-A 3600 Ekip Dip LI	1SDA078018R1	Z4SZUSBA000A000000XX	-	-
				E4.2S-A 3600 Ekip Dip LSI	1SDA078019R1	Z4SZUSBB000A000000XX	-	-
				E4.2S-A 3600 Ekip Dip LSIG	1SDA078020R1	Z4SZUSBC000A000000XX	-	-
				E4.2S-A 3600 Ekip Touch LI	1SDA078021R1	Z4SZUSBD000A000000XX	-	-
				E4.2S-A 3600 Ekip Touch LSI	1SDA078022R1	Z4SZUSBE000A000000XX	-	-
				E4.2S-A 3600 Ekip Touch LSIG	1SDA078023R1	Z4SZUSBF000A000000XX	-	-
				E4.2S-A 3600 Ekip Hi-Touch LSI	1SDA078025R1	Z4SZUSBJ200A000000XX	-	-
				E4.2S-A 3600 Ekip Hi-Touch LSIG	1SDA078026R1	Z4SZUSBK200A000000XX	-	-
E4.2H-A	2500	85	85	E4.2H-A 2500 Ekip Dip LI	1SDA077908R1	Z4HGULBA000A000000XX	1SDA078138R1	ZCHGULBA000A000000XX
				E4.2H-A 2500 Ekip Dip LSI	1SDA077909R1	Z4HGULBB000A000000XX	1SDA078139R1	ZCHGULBB000A000000XX
				E4.2H-A 2500 Ekip Dip LSIG	1SDA077910R1	Z4HGULBC000A000000XX	1SDA078140R1	ZCHGULBC000A000000XX
				E4.2H-A 2500 Ekip Touch LI	1SDA077911R1	Z4HGULBD000A000000XX	1SDA078141R1	ZCHGULBD000A000000XX
				E4.2H-A 2500 Ekip Touch LSI	1SDA077912R1	Z4HGULBE000A000000XX	1SDA078142R1	ZCHGULBE000A000000XX
				E4.2H-A 2500 Ekip Touch LSIG	1SDA077913R1	Z4HGULBF000A000000XX	1SDA078143R1	ZCHGULBF000A000000XX
				E4.2H-A 2500 Ekip Hi-Touch LSI	1SDA077915R1	Z4HGULBJ200A000000XX	1SDA078145R1	ZCHGULBJ200A000000XX
				E4.2H-A 2500 Ekip Hi-Touch LSIG	1SDA077916R1	Z4HGULBK200A000000XX	1SDA078146R1	ZCHGULBK200A000000XX
	3200 (1)	85	85	E4.2H-A 3200 Ekip Dip LI	1SDA077918R1	Z4HHUNBA000A000000XX	1SDA078148R1	ZCHHUNBA000A000000XX
				E4.2H-A 3200 Ekip Dip LSI	1SDA077919R1	Z4HHUNBB000A000000XX	1SDA078149R1	ZCHHUNBB000A000000XX
				E4.2H-A 3200 Ekip Dip LSIG	1SDA077920R1	Z4HHUNBC000A000000XX	1SDA078150R1	ZCHHUNBC000A000000XX
				E4.2H-A 3200 Ekip Touch LI	1SDA077921R1	Z4HHUNBD000A000000XX	1SDA078151R1	ZCHHUNBD000A000000XX
				E4.2H-A 3200 Ekip Touch LSI	1SDA077922R1	Z4HHUNBE000A000000XX	1SDA078152R1	ZCHHUNBE000A000000XX
				E4.2H-A 3200 Ekip Touch LSIG	1SDA077923R1	Z4HHUNBF000A000000XX	1SDA078153R1	ZCHHUNBF000A000000XX
				E4.2H-A 3200 Ekip Hi-Touch LSI	1SDA077925R1	Z4HHUNBJ200A000000XX	1SDA078155R1	ZCHHUNBJ200A000000XX
				E4.2H-A 3200 Ekip Hi-Touch LSIG	1SDA077926R1	Z4HHUNBK200A000000XX	1SDA078156R1	ZCHHUNBK200A000000XX
	3600 (1)	65	65	E4.2H-A 3600 Ekip Dip LI	1SDA077928R1	Z4HZUSBA000A000000XX	-	-
				E4.2H-A 3600 Ekip Dip LSI	1SDA077929R1	Z4HZUSBB000A000000XX	-	-
				E4.2H-A 3600 Ekip Dip LSIG	1SDA077930R1	Z4HZUSBC000A000000XX	-	-
				E4.2H-A 3600 Ekip Touch LI	1SDA077931R1	Z4HZUSBD000A000000XX	-	-
				E4.2H-A 3600 Ekip Touch LSI	1SDA077932R1	Z4HZUSBE000A000000XX	-	-
				E4.2H-A 3600 Ekip Touch LSIG	1SDA077933R1	Z4HZUSBF000A000000XX	-	-
				E4.2H-A 3600 Ekip Hi-Touch LSI	1SDA077935R1	Z4HZUSBJ200A000000XX	-	-
				E4.2H-A 3600 Ekip Hi-Touch LSIG	1SDA077936R1	Z4HZUSBK200A000000XX	-	-

1) 3200A/3600A ratings only with rear vertical terminals

Automatic circuit breakers

Fixed version for power distribution



SACE Emax 2 E4.2V-A • Orientable rear terminals up to 2500 A (HR)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E4.2V-A	800	100	85	E4.2V-A 800 Ekip Dip LI	1SDA078028R1	Z4VCUFBA000A000000XX	1SDA078258R1	ZCVCUFBA000A000000XX
				E4.2V-A 800 Ekip Dip LSI	1SDA078029R1	Z4VCUFBB000A000000XX	1SDA078259R1	ZCVCUFBB000A000000XX
				E4.2V-A 800 Ekip Dip LSIG	1SDA078030R1	Z4VCUFBC000A000000XX	1SDA078260R1	ZCVCUFBC000A000000XX
				E4.2V-A 800 Ekip Touch LI	1SDA078031R1	Z4VCUFBD000A000000XX	1SDA078261R1	ZCVCUFBD000A000000XX
				E4.2V-A 800 Ekip Touch LSI	1SDA078032R1	Z4VCUFBE000A000000XX	1SDA078262R1	ZCVCUFBE000A000000XX
				E4.2V-A 800 Ekip Touch LSIG	1SDA078033R1	Z4VCUFBF000A000000XX	1SDA078263R1	ZCVCUFBF000A000000XX
				E4.2V-A 800 Ekip Hi-Touch LSI	1SDA078035R1	Z4VCUFBJ200A000000XX	1SDA078265R1	ZCVCUFBJ200A000000XX
				E4.2V-A 800 Ekip Hi-Touch LSIG	1SDA078036R1	Z4VCUFBK200A000000XX	1SDA078266R1	ZCVCUFBK200A000000XX
	1600	100	85	E4.2V-A 1600 Ekip Dip LI	1SDA078038R1	Z4VEUJBA000A000000XX	1SDA078268R1	ZCVEUJBA000A000000XX
				E4.2V-A 1600 Ekip Dip LSI	1SDA078039R1	Z4VEUJBB000A000000XX	1SDA078269R1	ZCVEUJBB000A000000XX
				E4.2V-A 1600 Ekip Dip LSIG	1SDA078040R1	Z4VEUJBC000A000000XX	1SDA078270R1	ZCVEUJBC000A000000XX
				E4.2V-A 1600 Ekip Touch LI	1SDA078041R1	Z4VEUJBD000A000000XX	1SDA078271R1	ZCVEUJBD000A000000XX
				E4.2V-A 1600 Ekip Touch LSI	1SDA078042R1	Z4VEUJBE000A000000XX	1SDA078272R1	ZCVEUJBE000A000000XX
				E4.2V-A 1600 Ekip Touch LSIG	1SDA078043R1	Z4VEUJBF000A000000XX	1SDA078273R1	ZCVEUJBF000A000000XX
				E4.2V-A 1600 Ekip Hi-Touch LSI	1SDA078045R1	Z4VEUJBJ200A000000XX	1SDA078275R1	ZCVEUJBJ200A000000XX
				E4.2V-A 1600 Ekip Hi-Touch LSIG	1SDA078046R1	Z4VEUJBK200A000000XX	1SDA078276R1	ZCVEUJBK200A000000XX
	2000	100	85	E4.2V-A 2000 Ekip Dip LI	1SDA078048R1	Z4VFUKBA000A000000XX	1SDA078278R1	ZCVFUKBA000A000000XX
				E4.2V-A 2000 Ekip Dip LSI	1SDA078049R1	Z4VFUKBB000A000000XX	1SDA078279R1	ZCVFUKBB000A000000XX
				E4.2V-A 2000 Ekip Dip LSIG	1SDA078050R1	Z4VFUKBC000A000000XX	1SDA078280R1	ZCVFUKBC000A000000XX
				E4.2V-A 2000 Ekip Touch LI	1SDA078051R1	Z4VFUKBD000A000000XX	1SDA078281R1	ZCVFUKBD000A000000XX
				E4.2V-A 2000 Ekip Touch LSI	1SDA078052R1	Z4VFUKBE000A000000XX	1SDA078282R1	ZCVFUKBE000A000000XX
				E4.2V-A 2000 Ekip Touch LSIG	1SDA078053R1	Z4VFUKBF000A000000XX	1SDA078283R1	ZCVFUKBF000A000000XX
				E4.2V-A 2000 Ekip Hi-Touch LSI	1SDA078055R1	Z4VFUKBJ200A000000XX	1SDA078285R1	ZCVFUKBJ200A000000XX
				E4.2V-A 2000 Ekip Hi-Touch LSIG	1SDA078056R1	Z4VFUKBK200A000000XX	1SDA078286R1	ZCVFUKBK200A000000XX
	2500	100	85	E4.2V-A 2500 Ekip Dip LI	1SDA078058R1	Z4VGULBA000A000000XX	1SDA078288R1	ZCVGULBA000A000000XX
				E4.2V-A 2500 Ekip Dip LSI	1SDA078059R1	Z4VGULBB000A000000XX	1SDA078289R1	ZCVGULBB000A000000XX
				E4.2V-A 2500 Ekip Dip LSIG	1SDA078060R1	Z4VGULBC000A000000XX	1SDA078290R1	ZCVGULBC000A000000XX
				E4.2V-A 2500 Ekip Touch LI	1SDA078061R1	Z4VGULBD000A000000XX	1SDA078291R1	ZCVGULBD000A000000XX
				E4.2V-A 2500 Ekip Touch LSI	1SDA078062R1	Z4VGULBE000A000000XX	1SDA078292R1	ZCVGULBE000A000000XX
				E4.2V-A 2500 Ekip Touch LSIG	1SDA078063R1	Z4VGULBF000A000000XX	1SDA078293R1	ZCVGULBF000A000000XX
				E4.2V-A 2500 Ekip Hi-Touch LSI	1SDA078065R1	Z4VGULBJ200A000000XX	1SDA078295R1	ZCVGULBJ200A000000XX
				E4.2V-A 2500 Ekip Hi-Touch LSIG	1SDA078066R1	Z4VGULBK200A000000XX	1SDA078296R1	ZCVGULBK200A000000XX



SACE Emax 2 E4.2V-A • Orientable rear terminals up to 2500 A (HR)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E4.2V-A	3200 [1]	100	85	E4.2V-A 3200 Ekip Dip LI	1SDA078068R1	Z4VHUNBA000A000000XX	1SDA078298R1	ZCVHUNBA000A000000XX
				E4.2V-A 3200 Ekip Dip LSI	1SDA078069R1	Z4VHUNBB000A000000XX	1SDA078299R1	ZCVHUNBB000A000000XX
				E4.2V-A 3200 Ekip Dip LSIG	1SDA078070R1	Z4VHUNBC000A000000XX	1SDA078300R1	ZCVHUNBC000A000000XX
				E4.2V-A 3200 Ekip Touch LI	1SDA078071R1	Z4VHUNBD000A000000XX	1SDA078301R1	ZCVHUNBD000A000000XX
				E4.2V-A 3200 Ekip Touch LSI	1SDA078072R1	Z4VHUNBE000A000000XX	1SDA078302R1	ZCVHUNBE000A000000XX
				E4.2V-A 3200 Ekip Touch LSIG	1SDA078073R1	Z4VHUNBF000A000000XX	1SDA078303R1	ZCVHUNBF000A000000XX
				E4.2V-A 3200 Ekip Hi-Touch LSI	1SDA078075R1	Z4VHUNBJ200A000000XX	1SDA078305R1	ZCVHUNBJ200A000000XX
				E4.2V-A 3200 Ekip Hi-Touch LSIG	1SDA078076R1	Z4VHUNBK200A000000XX	1SDA078306R1	ZCVHUNBK200A000000XX
	3600 [1]	100	85	E4.2V-A 3600 Ekip Dip LI	1SDA078078R1	Z4VZUSBA000A000000XX	-	-
				E4.2V-A 3600 Ekip Dip LSI	1SDA078079R1	Z4VZUSBB000A000000XX	-	-
				E4.2V-A 3600 Ekip Dip LSIG	1SDA078080R1	Z4VZUSBC000A000000XX	-	-
				E4.2V-A 3600 Ekip Touch LI	1SDA078081R1	Z4VZUSBD000A000000XX	-	-
				E4.2V-A 3600 Ekip Touch LSI	1SDA078082R1	Z4VZUSBE000A000000XX	-	-
				E4.2V-A 3600 Ekip Touch LSIG	1SDA078083R1	Z4VZUSBF000A000000XX	-	-
				E4.2V-A 3600 Ekip Hi-Touch LSI	1SDA078085R1	Z4VZUSBJ200A000000XX	-	-
				E4.2V-A 3600 Ekip Hi-Touch LSIG	1SDA078086R1	Z4VZUSBK200A000000XX	-	-

1) 3200A/3600A ratings only with rear vertical terminals

Automatic circuit breakers
Fixed version for power distribution



SACE Emax 2 E6.2H-A/V-A • Orientable rear terminals up to 5000A (HR)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E6.2H-A	4000	85	85	E6.2H-A 4000 Ekip Dip LI	1SDA078828R1	Z6HJURBA000A000000XX	1SDA078948R1	ZDHJURBA000A000000XX
				E6.2H-A 4000 Ekip Dip LSI	1SDA078829R1	Z6HJURBB000A000000XX	1SDA078949R1	ZDHJURBB000A000000XX
				E6.2H-A 4000 Ekip Dip LSIG	1SDA078830R1	Z6HJURBC000A000000XX	1SDA078950R1	ZDHJURBC000A000000XX
				E6.2H-A 4000 Ekip Touch LI	1SDA078831R1	Z6HJURBD000A000000XX	1SDA078951R1	ZDHJURBD000A000000XX
				E6.2H-A 4000 Ekip Touch LSI	1SDA078832R1	Z6HJURBE000A000000XX	1SDA078952R1	ZDHJURBE000A000000XX
				E6.2H-A 4000 Ekip Touch LSIG	1SDA078833R1	Z6HJURBF000A000000XX	1SDA078953R1	ZDHJURBF000A000000XX
				E6.2H-A 4000 Ekip Hi-Touch LSI	1SDA078835R1	Z6HJURBJ200A000000XX	1SDA078955R1	ZDHJURBJ200A000000XX
				E6.2H-A 4000 Ekip Hi-Touch LSIG	1SDA078836R1	Z6HJURBK200A000000XX	1SDA078956R1	ZDHJURBK200A000000XX
	5000	85	85	E6.2H-A 5000 Ekip Dip LI	1SDA078838R1	Z6HKUSBA000A000000XX	1SDA078958R1	ZDHKUSBA000A000000XX
				E6.2H-A 5000 Ekip Dip LSI	1SDA078839R1	Z6HKUSBB000A000000XX	1SDA078959R1	ZDHKUSBB000A000000XX
				E6.2H-A 5000 Ekip Dip LSIG	1SDA078840R1	Z6HKUSBC000A000000XX	1SDA078960R1	ZDHKUSBC000A000000XX
				E6.2H-A 5000 Ekip Touch LI	1SDA078841R1	Z6HKUSBD000A000000XX	1SDA078961R1	ZDHKUSBD000A000000XX
				E6.2H-A 5000 Ekip Touch LSI	1SDA078842R1	Z6HKUSBE000A000000XX	1SDA078962R1	ZDHKUSBE000A000000XX
				E6.2H-A 5000 Ekip Touch LSIG	1SDA078843R1	Z6HKUSBF000A000000XX	1SDA078963R1	ZDHKUSBF000A000000XX
				E6.2H-A 5000 Ekip Hi-Touch LSI	1SDA078845R1	Z6HKUSBJ200A000000XX	1SDA078965R1	ZDHKUSBJ200A000000XX
				E6.2H-A 5000 Ekip Hi-Touch LSIG	1SDA078846R1	Z6HKUSBK200A000000XX	1SDA078966R1	ZDHKUSBK200A000000XX
E6.2V-A	4000	100	100	E6.2V-A 4000 Ekip Dip LI	1SDA078888R1	Z6VJURBA000A000000XX	1SDA079008R1	ZDVJURBA000A000000XX
				E6.2V-A 4000 Ekip Dip LSI	1SDA078889R1	Z6VJURBB000A000000XX	1SDA079009R1	ZDVJURBB000A000000XX
				E6.2V-A 4000 Ekip Dip LSIG	1SDA078890R1	Z6VJURBC000A000000XX	1SDA079010R1	ZDVJURBC000A000000XX
				E6.2V-A 4000 Ekip Touch LI	1SDA078891R1	Z6VJURBD000A000000XX	1SDA079011R1	ZDVJURBD000A000000XX
				E6.2V-A 4000 Ekip Touch LSI	1SDA078892R1	Z6VJURBE000A000000XX	1SDA079012R1	ZDVJURBE000A000000XX
				E6.2V-A 4000 Ekip Touch LSIG	1SDA078893R1	Z6VJURBF000A000000XX	1SDA079013R1	ZDVJURBF000A000000XX
				E6.2V-A 4000 Ekip Hi-Touch LSI	1SDA078895R1	Z6VJURBJ200A000000XX	1SDA079015R1	ZDVJURBJ200A000000XX
				E6.2V-A 4000 Ekip Hi-Touch LSIG	1SDA078896R1	Z6VJURBK200A000000XX	1SDA079016R1	ZDVJURBK200A000000XX
	5000	100	100	E6.2V-A 5000 Ekip Dip LI	1SDA078898R1	Z6VKUSBA000A000000XX	1SDA079018R1	ZDVKUSBA000A000000XX
				E6.2V-A 5000 Ekip Dip LSI	1SDA078899R1	Z6VKUSBB000A000000XX	1SDA079019R1	ZDVKUSBB000A000000XX
				E6.2V-A 5000 Ekip Dip LSIG	1SDA078900R1	Z6VKUSBC000A000000XX	1SDA079020R1	ZDVKUSBC000A000000XX
				E6.2V-A 5000 Ekip Touch LI	1SDA078901R1	Z6VKUSBD000A000000XX	1SDA079021R1	ZDVKUSBD000A000000XX
				E6.2V-A 5000 Ekip Touch LSI	1SDA078902R1	Z6VKUSBE000A000000XX	1SDA079022R1	ZDVKUSBE000A000000XX
				E6.2V-A 5000 Ekip Touch LSIG	1SDA078903R1	Z6VKUSBF000A000000XX	1SDA079023R1	ZDVKUSBF000A000000XX
				E6.2V-A 5000 Ekip Hi-Touch LSI	1SDA078905R1	Z6VKUSBJ200A000000XX	1SDA079025R1	ZDVKUSBJ200A000000XX
				E6.2V-A 5000 Ekip Hi-Touch LSIG	1SDA078906R1	Z6VKUSBK200A000000XX	1SDA079026R1	ZDVKUSBK200A000000XX



SACE Emax 2 E6.2H-A/f/V-A/f full size • Orientable rear terminals up to 5000A (HR)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	4 Poles	
					Global PN	US / CA PN
E6.2H-A/f	4000	85	85	E6.2H-A/f 4000 Ekip Dip LI	1SDA079308R1	ZEHJURBA000A000000XX
				E6.2H-A/f 4000 Ekip Dip LSI	1SDA079309R1	ZEHJURBB000A000000XX
				E6.2H-A/f 4000 Ekip Dip LSIG	1SDA079310R1	ZEHJURBC000A000000XX
				E6.2H-A/f 4000 Ekip Touch LI	1SDA079311R1	ZEHJURBD000A000000XX
				E6.2H-A/f 4000 Ekip Touch LSI	1SDA079312R1	ZEHJURBE000A000000XX
				E6.2H-A/f 4000 Ekip Touch LSIG	1SDA079313R1	ZEHJURBF000A000000XX
				E6.2H-A/f 4000 Ekip Hi-Touch LSI	1SDA079315R1	ZEHJURBJ200A000000XX
				E6.2H-A/f 4000 Ekip Hi-Touch LSIG	1SDA079316R1	ZEHJURBK200A000000XX
	5000	85	85	E6.2H-A/f 5000 Ekip Dip LI	1SDA079318R1	ZEHKUSBA000A000000XX
				E6.2H-A/f 5000 Ekip Dip LSI	1SDA079319R1	ZEHKUSBB000A000000XX
				E6.2H-A/f 5000 Ekip Dip LSIG	1SDA079320R1	ZEHKUSBC000A000000XX
				E6.2H-A/f 5000 Ekip Touch LI	1SDA079321R1	ZEHKUSBD000A000000XX
				E6.2H-A/f 5000 Ekip Touch LSI	1SDA079322R1	ZEHKUSBE000A000000XX
				E6.2H-A/f 5000 Ekip Touch LSIG	1SDA079323R1	ZEHKUSBF000A000000XX
				E6.2H-A/f 5000 Ekip Hi-Touch LSI	1SDA079325R1	ZEHKUSBJ200A000000XX
				E6.2H-A/f 5000 Ekip Hi-Touch LSIG	1SDA079326R1	ZEHKUSBK200A000000XX
E6.2V-A/f	4000	100	100	E6.2V-A/f 4000 Ekip Dip LI	1SDA079368R1	ZEVJURBA000A000000XX
				E6.2V-A/f 4000 Ekip Dip LSI	1SDA079369R1	ZEVJURBB000A000000XX
				E6.2V-A/f 4000 Ekip Dip LSIG	1SDA079370R1	ZEVJURBC000A000000XX
				E6.2V-A/f 4000 Ekip Touch LI	1SDA079371R1	ZEVJURBD000A000000XX
				E6.2V-A/f 4000 Ekip Touch LSI	1SDA079372R1	ZEVJURBE000A000000XX
				E6.2V-A/f 4000 Ekip Touch LSIG	1SDA079373R1	ZEVJURBF000A000000XX
				E6.2V-A/f 4000 Ekip Hi-Touch LSI	1SDA079375R1	ZEVJURBJ200A000000XX
				E6.2V-A/f 4000 Ekip Hi-Touch LSIG	1SDA079376R1	ZEVJURBK200A000000XX
	5000	100	100	E6.2V-A/f 5000 Ekip Dip LI	1SDA079378R1	ZEVKUSBA000A000000XX
				E6.2V-A/f 5000 Ekip Dip LSI	1SDA079379R1	ZEVKUSBB000A000000XX
				E6.2V-A/f 5000 Ekip Dip LSIG	1SDA079380R1	ZEVKUSBC000A000000XX
				E6.2V-A/f 5000 Ekip Touch LI	1SDA079381R1	ZEVKUSBD000A000000XX
				E6.2V-A/f 5000 Ekip Touch LSI	1SDA079382R1	ZEVKUSBE000A000000XX
				E6.2V-A/f 5000 Ekip Touch LSIG	1SDA079383R1	ZEVKUSBF000A000000XX
				E6.2V-A/f 5000 Ekip Hi-Touch LSI	1SDA079385R1	ZEVKUSBJ200A000000XX
				E6.2V-A/f 5000 Ekip Hi-Touch LSIG	1SDA079386R1	ZEVKUSBK200A000000XX

Automatic circuit breakers

Drawout version for power distribution



SACE Emax 2 E1.2B-A/N-A • Mobile part of drawout circuit breaker (MP)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E1.2B-A	800	42	42	E1.2B-A 800 Ekip Dip LI	1SDA077068R1	Z1BCUFAA000A000000XX	1SDA077148R1	ZABCUFAA000A000000XX
				E1.2B-A 800 Ekip Dip LSI	1SDA077069R1	Z1BCUFAB000A000000XX	1SDA077149R1	ZABCUFAB000A000000XX
				E1.2B-A 800 Ekip Dip LSIG	1SDA077070R1	Z1BCUFAC000A000000XX	1SDA077150R1	ZABCUFAC000A000000XX
				E1.2B-A 800 Ekip Touch LI	1SDA077071R1	Z1BCUFAD000A000000XX	1SDA077151R1	ZABCUFAD000A000000XX
				E1.2B-A 800 Ekip Touch LSI	1SDA077072R1	Z1BCUFAE000A000000XX	1SDA077152R1	ZABCUFAE000A000000XX
				E1.2B-A 800 Ekip Touch LSIG	1SDA077073R1	Z1BCUFAF000A000000XX	1SDA077153R1	ZABCUFAF000A000000XX
				E1.2B-A 800 Ekip Hi-Touch LSI	1SDA077075R1	Z1BCUFAJ200A000000XX	1SDA077155R1	ZABCUFAJ200A000000XX
				E1.2B-A 800 Ekip Hi-Touch LSIG	1SDA077076R1	Z1BCUFAK200A000000XX	1SDA077156R1	ZABCUFAK200A000000XX
	1200	42	42	E1.2B-A 1200 Ekip Dip LI	1SDA077078R1	Z1BDUHAA000A000000XX	1SDA077158R1	ZABDUHAA000A000000XX
				E1.2B-A 1200 Ekip Dip LSI	1SDA077079R1	Z1BDUHAB000A000000XX	1SDA077159R1	ZABDUHAB000A000000XX
				E1.2B-A 1200 Ekip Dip LSIG	1SDA077080R1	Z1BDUHAC000A000000XX	1SDA077160R1	ZABDUHAC000A000000XX
				E1.2B-A 1200 Ekip Touch LI	1SDA077081R1	Z1BDUHAD000A000000XX	1SDA077161R1	ZABDUHAD000A000000XX
				E1.2B-A 1200 Ekip Touch LSI	1SDA077082R1	Z1BDUHAE000A000000XX	1SDA077162R1	ZABDUHAE000A000000XX
				E1.2B-A 1200 Ekip Touch LSIG	1SDA077083R1	Z1BDUHAF000A000000XX	1SDA077163R1	ZABDUHAF000A000000XX
				E1.2B-A 1200 Ekip Hi-Touch LSI	1SDA077085R1	Z1BDUHAJ200A000000XX	1SDA077165R1	ZABDUHAJ200A000000XX
				E1.2B-A 1200 Ekip Hi-Touch LSIG	1SDA077086R1	Z1BDUHAK200A000000XX	1SDA077166R1	ZABDUHAK200A000000XX
E1.2N-A	800	50	50	E1.2N-A 800 Ekip Dip LI	1SDA077088R1	Z1NCUFAA000A000000XX	1SDA077168R1	ZANCUFAA000A000000XX
				E1.2N-A 800 Ekip Dip LSI	1SDA077089R1	Z1NCUFAB000A000000XX	1SDA077169R1	ZANCUFAB000A000000XX
				E1.2N-A 800 Ekip Dip LSIG	1SDA077090R1	Z1NCUFAC000A000000XX	1SDA077170R1	ZANCUFAC000A000000XX
				E1.2N-A 800 Ekip Touch LI	1SDA077091R1	Z1NCUFAD000A000000XX	1SDA077171R1	ZANCUFAD000A000000XX
				E1.2N-A 800 Ekip Touch LSI	1SDA077092R1	Z1NCUFAE000A000000XX	1SDA077172R1	ZANCUFAE000A000000XX
				E1.2N-A 800 Ekip Touch LSIG	1SDA077093R1	Z1NCUFAF000A000000XX	1SDA077173R1	ZANCUFAF000A000000XX
				E1.2N-A 800 Ekip Hi-Touch LSI	1SDA077095R1	Z1NCUFAJ200A000000XX	1SDA077175R1	ZANCUFAJ200A000000XX
				E1.2N-A 800 Ekip Hi-Touch LSIG	1SDA077096R1	Z1NCUFAK200A000000XX	1SDA077176R1	ZANCUFAK200A000000XX
	1200	50	50	E1.2N-A 1200 Ekip Dip LI	1SDA077098R1	Z1NDUHAA000A000000XX	1SDA077178R1	ZANDUHAA000A000000XX
				E1.2N-A 1200 Ekip Dip LSI	1SDA077099R1	Z1NDUHAB000A000000XX	1SDA077179R1	ZANDUHAB000A000000XX
				E1.2N-A 1200 Ekip Dip LSIG	1SDA077100R1	Z1NDUHAC000A000000XX	1SDA077180R1	ZANDUHAC000A000000XX
				E1.2N-A 1200 Ekip Touch LI	1SDA077101R1	Z1NDUHAD000A000000XX	1SDA077181R1	ZANDUHAD000A000000XX
				E1.2N-A 1200 Ekip Touch LSI	1SDA077102R1	Z1NDUHAE000A000000XX	1SDA077183R1	ZANDUHAF000A000000XX
				E1.2N-A 1200 Ekip Touch LSIG	1SDA077103R1	Z1NDUHAF000A000000XX	1SDA077182R1	ZANDUHAE000A000000XX
				E1.2N-A 1200 Ekip Hi-Touch LSI	1SDA077105R1	Z1NDUHAJ200A000000XX	1SDA077185R1	ZANDUHAJ200A000000XX
				E1.2N-A 1200 Ekip Hi-Touch LSIG	1SDA077106R1	Z1NDUHAK200A000000XX	1SDA077186R1	ZANDUHAK200A000000XX



SACE Emax 2 E1.2S-A • Mobile part of drawout circuit breaker (MP)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E1.2S-A	250	65	50	E1.2S-A 250 Ekip Dip LI	1SDA077108R1	Z1SAUCAA000A000000XX	1SDA077188R1	ZASAUCAA000A000000XX
				E1.2S-A 250 Ekip Dip LSI	1SDA077109R1	Z1SAUCAB000A000000XX	1SDA077189R1	ZASAUCAB000A000000XX
				E1.2S-A 250 Ekip Dip LSIG	1SDA077110R1	Z1SAUCAC000A000000XX	1SDA077190R1	ZASAUCAC000A000000XX
				E1.2S-A 250 Ekip Touch LI	1SDA077111R1	Z1SAUCAD000A000000XX	1SDA077191R1	ZASAUCAD000A000000XX
				E1.2S-A 250 Ekip Touch LSI	1SDA077112R1	Z1SAUCAE000A000000XX	1SDA077192R1	ZASAUCAE000A000000XX
				E1.2S-A 250 Ekip Touch LSIG	1SDA077113R1	Z1SAUCAF000A000000XX	1SDA077193R1	ZASAUCAF000A000000XX
				E1.2S-A 250 Ekip Hi-Touch LSI	1SDA077115R1	Z1SAUCAJ200A000000XX	1SDA077195R1	ZASAUCAJ200A000000XX
				E1.2S-A 250 Ekip Hi-Touch LSIG	1SDA077116R1	Z1SAUCAK200A000000XX	1SDA077196R1	ZASAUCAK200A000000XX
	400	65	50	E1.2S-A 400 Ekip Dip LI	1SDA077118R1	Z1SBUDAA000A000000XX	1SDA077198R1	ZASBUDAA000A000000XX
				E1.2S-A 400 Ekip Dip LSI	1SDA077119R1	Z1SBUDAB000A000000XX	1SDA077199R1	ZASBUDAB000A000000XX
				E1.2S-A 400 Ekip Dip LSIG	1SDA077120R1	Z1SBUDAC000A000000XX	1SDA077200R1	ZASBUDAC000A000000XX
				E1.2S-A 400 Ekip Touch LI	1SDA077121R1	Z1SBUDAD000A000000XX	1SDA077201R1	ZASBUDAD000A000000XX
				E1.2S-A 400 Ekip Touch LSI	1SDA077122R1	Z1SBUDAE000A000000XX	1SDA077202R1	ZASBUDAE000A000000XX
				E1.2S-A 400 Ekip Touch LSIG	1SDA077123R1	Z1SBUDAF000A000000XX	1SDA077203R1	ZASBUDAF000A000000XX
				E1.2S-A 400 Ekip Hi-Touch LSI	1SDA077125R1	Z1SBUDAJ200A000000XX	1SDA077205R1	ZASBUDAJ200A000000XX
				E1.2S-A 400 Ekip Hi-Touch LSIG	1SDA077126R1	Z1SBUDAK200A000000XX	1SDA077206R1	ZASBUDAK200A000000XX
	800	65	50	E1.2S-A 800 Ekip Dip LI	1SDA077128R1	Z1SCUFAA000A000000XX	1SDA077208R1	ZASCUFAA000A000000XX
				E1.2S-A 800 Ekip Dip LSI	1SDA077129R1	Z1SCUFAB000A000000XX	1SDA077209R1	ZASCUFAB000A000000XX
				E1.2S-A 800 Ekip Dip LSIG	1SDA077130R1	Z1SCUFAC000A000000XX	1SDA077210R1	ZASCUFAC000A000000XX
				E1.2S-A 800 Ekip Touch LI	1SDA077131R1	Z1SCUFAD000A000000XX	1SDA077211R1	ZASCUFAD000A000000XX
				E1.2S-A 800 Ekip Touch LSI	1SDA077132R1	Z1SCUFAE000A000000XX	1SDA077212R1	ZASCUFAE000A000000XX
				E1.2S-A 800 Ekip Touch LSIG	1SDA077133R1	Z1SCUFAF000A000000XX	1SDA077213R1	ZASCUFAF000A000000XX
				E1.2S-A 800 Ekip Hi-Touch LSI	1SDA077135R1	Z1SCUFAJ200A000000XX	1SDA077215R1	ZASCUFAJ200A000000XX
				E1.2S-A 800 Ekip Hi-Touch LSIG	1SDA077136R1	Z1SCUFAK200A000000XX	1SDA077216R1	ZASCUFAK200A000000XX
	1200	65	50	E1.2S-A 1200 Ekip Dip LI	1SDA077138R1	Z1SDUHAA000A000000XX	1SDA077218R1	ZASDUHAA000A000000XX
				E1.2S-A 1200 Ekip Dip LSI	1SDA077139R1	Z1SDUHAB000A000000XX	1SDA077219R1	ZASDUHAB000A000000XX
				E1.2S-A 1200 Ekip Dip LSIG	1SDA077140R1	Z1SDUHAC000A000000XX	1SDA077220R1	ZASDUHAC000A000000XX
				E1.2S-A 1200 Ekip Touch LI	1SDA077141R1	Z1SDUHAD000A000000XX	1SDA077221R1	ZASDUHAD000A000000XX
				E1.2S-A 1200 Ekip Touch LSI	1SDA077142R1	Z1SDUHAE000A000000XX	1SDA077222R1	ZASDUHAE000A000000XX
				E1.2S-A 1200 Ekip Touch LSIG	1SDA077143R1	Z1SDUHAF000A000000XX	1SDA077223R1	ZASDUHAF000A000000XX
				E1.2S-A 1200 Ekip Hi-Touch LSI	1SDA077145R1	Z1SDUHAJ200A000000XX	1SDA077225R1	ZASDUHAJ200A000000XX
				E1.2S-A 1200 Ekip Hi-Touch LSIG	1SDA077146R1	Z1SDUHAK200A000000XX	1SDA077226R1	ZASDUHAK200A000000XX

Automatic circuit breakers

Drawout version for power distribution



SACE Emax 2 E2.2B-A/N-A • Mobile part of drawout circuit breaker (MP)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E2.2B-A	1600	42	42	E2.2B-A 1600 Ekip Dip LI	1SDA077568R1	Z2BEUJAA000A000000XX	1SDA077738R1	ZBBEUJAA000A000000XX
				E2.2B-A 1600 Ekip Dip LSI	1SDA077569R1	Z2BEUJAB000A000000XX	1SDA077739R1	ZBBEUJAB000A000000XX
				E2.2B-A 1600 Ekip Dip LSIG	1SDA077570R1	Z2BEUJAC000A000000XX	1SDA077740R1	ZBBEUJAC000A000000XX
				E2.2B-A 1600 Ekip Touch LI	1SDA077571R1	Z2BEUJAD000A000000XX	1SDA077741R1	ZBBEUJAD000A000000XX
				E2.2B-A 1600 Ekip Touch LSI	1SDA077572R1	Z2BEUJAE000A000000XX	1SDA077742R1	ZBBEUJAE000A000000XX
				E2.2B-A 1600 Ekip Touch LSIG	1SDA077573R1	Z2BEUJAF000A000000XX	1SDA077743R1	ZBBEUJAF000A000000XX
				E2.2B-A 1600 Ekip Hi-Touch LSI	1SDA077575R1	Z2BEUJAJ200A000000XX	1SDA077745R1	ZBBEUJAJ200A000000XX
				E2.2B-A 1600 Ekip Hi-Touch LSIG	1SDA077576R1	Z2BEUJAK200A000000XX	1SDA077746R1	ZBBEUJAK200A000000XX
E2.2N-A	1600	50	50	E2.2N-A 1600 Ekip Dip LI	1SDA077618R1	Z2NEUJAA000A000000XX	1SDA077788R1	ZBNEUJAA000A000000XX
				E2.2N-A 1600 Ekip Dip LSI	1SDA077619R1	Z2NEUJAB000A000000XX	1SDA077789R1	ZBNEUJAB000A000000XX
				E2.2N-A 1600 Ekip Dip LSIG	1SDA077620R1	Z2NEUJAC000A000000XX	1SDA077790R1	ZBNEUJAC000A000000XX
				E2.2N-A 1600 Ekip Touch LI	1SDA077621R1	Z2NEUJAD000A000000XX	1SDA077791R1	ZBNEUJAD000A000000XX
				E2.2N-A 1600 Ekip Touch LSI	1SDA077622R1	Z2NEUJAE000A000000XX	1SDA077792R1	ZBNEUJAE000A000000XX
				E2.2N-A 1600 Ekip Touch LSIG	1SDA077623R1	Z2NEUJAF000A000000XX	1SDA077793R1	ZBNEUJAF000A000000XX
				E2.2N-A 1600 Ekip Hi-Touch LSI	1SDA077625R1	Z2NEUJAJ200A000000XX	1SDA077795R1	ZBNEUJAJ200A000000XX
				E2.2N-A 1600 Ekip Hi-Touch LSIG	1SDA077626R1	Z2NEUJAK200A000000XX	1SDA077796R1	ZBNEUJAK200A000000XX
	2000	50	50	E2.2N-A 2000 Ekip Dip LI	1SDA077628R1	Z2NFUKAA000A000000XX	1SDA077798R1	ZBNFUKAA000A000000XX
				E2.2N-A 2000 Ekip Dip LSI	1SDA077629R1	Z2NFUKAB000A000000XX	1SDA077799R1	ZBNFUKAB000A000000XX
				E2.2N-A 2000 Ekip Dip LSIG	1SDA077630R1	Z2NFUKAC000A000000XX	1SDA077800R1	ZBNFUKAC000A000000XX
				E2.2N-A 2000 Ekip Touch LI	1SDA077631R1	Z2NFUKAD000A000000XX	1SDA077801R1	ZBNFUKAD000A000000XX
				E2.2N-A 2000 Ekip Touch LSI	1SDA077632R1	Z2NFUKAE000A000000XX	1SDA077802R1	ZBNFUKAE000A000000XX
				E2.2N-A 2000 Ekip Touch LSIG	1SDA077633R1	Z2NFUKAF000A000000XX	1SDA077803R1	ZBNFUKAF000A000000XX
				E2.2N-A 2000 Ekip Hi-Touch LSI	1SDA077635R1	Z2NFUKAJ200A000000XX	1SDA077805R1	ZBNFUKAJ200A000000XX
				E2.2N-A 2000 Ekip Hi-Touch LSIG	1SDA077636R1	Z2NFUKAK200A000000XX	1SDA077806R1	ZBNFUKAK200A000000XX



SACE Emax 2 E2.2S-A • Mobile part of drawout circuit breaker (MP)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E2.2S-A	800	65	65	E2.2S-A 800 Ekip Dip LI	1SDA077638R1	Z2SCUFAA000A000000XX	1SDA077808R1	ZBSCUFAA000A000000XX
				E2.2S-A 800 Ekip Dip LSI	1SDA077639R1	Z2SCUFAB000A000000XX	1SDA077809R1	ZBSCUFAB000A000000XX
				E2.2S-A 800 Ekip Dip LSIG	1SDA077640R1	Z2SCUFAC000A000000XX	1SDA077810R1	ZBSCUFAC000A000000XX
				E2.2S-A 800 Ekip Touch LI	1SDA077641R1	Z2SCUFAD000A000000XX	1SDA077811R1	ZBSCUFAD000A000000XX
				E2.2S-A 800 Ekip Touch LSI	1SDA077642R1	Z2SCUFAE000A000000XX	1SDA077812R1	ZBSCUFAE000A000000XX
				E2.2S-A 800 Ekip Touch LSIG	1SDA077643R1	Z2SCUFAF000A000000XX	1SDA077813R1	ZBSCUFAF000A000000XX
				E2.2S-A 800 Ekip Hi-Touch LSI	1SDA077645R1	Z2SCUFAJ200A000000XX	1SDA077815R1	ZBSCUFAJ200A000000XX
				E2.2S-A 800 Ekip Hi-Touch LSIG	1SDA077646R1	Z2SCUFAK200A000000XX	1SDA077816R1	ZBSCUFAK200A000000XX
	1200	65	65	E2.2S-A 1200 Ekip Dip LI	1SDA077648R1	Z2SDUHAA000A000000XX	1SDA077818R1	ZBSDUHAA000A000000XX
				E2.2S-A 1200 Ekip Dip LSI	1SDA077649R1	Z2SDUHAB000A000000XX	1SDA077819R1	ZBSDUHAB000A000000XX
				E2.2S-A 1200 Ekip Dip LSIG	1SDA077650R1	Z2SDUHAC000A000000XX	1SDA077820R1	ZBSDUHAC000A000000XX
				E2.2S-A 1200 Ekip Touch LI	1SDA077651R1	Z2SDUHAD000A000000XX	1SDA077821R1	ZBSDUHAD000A000000XX
				E2.2S-A 1200 Ekip Touch LSI	1SDA077652R1	Z2SDUHAE000A000000XX	1SDA077822R1	ZBSDUHAE000A000000XX
				E2.2S-A 1200 Ekip Touch LSIG	1SDA077653R1	Z2SDUHAF000A000000XX	1SDA077823R1	ZBSDUHAF000A000000XX
				E2.2S-A 1200 Ekip Hi-Touch LSI	1SDA077655R1	Z2SDUHAJ200A000000XX	1SDA077825R1	ZBSDUHAJ200A000000XX
				E2.2S-A 1200 Ekip Hi-Touch LSIG	1SDA077656R1	Z2SDUHAK200A000000XX	1SDA077826R1	ZBSDUHAK200A000000XX
	1600	65	65	E2.2S-A 1600 Ekip Dip LI	1SDA077658R1	Z2SEUJAA000A000000XX	1SDA077828R1	ZBSEUJAA000A000000XX
				E2.2S-A 1600 Ekip Dip LSI	1SDA077659R1	Z2SEUJAB000A000000XX	1SDA077829R1	ZBSEUJAB000A000000XX
				E2.2S-A 1600 Ekip Dip LSIG	1SDA077660R1	Z2SEUJAC000A000000XX	1SDA077830R1	ZBSEUJAC000A000000XX
				E2.2S-A 1600 Ekip Touch LI	1SDA077661R1	Z2SEUJAD000A000000XX	1SDA077831R1	ZBSEUJAD000A000000XX
				E2.2S-A 1600 Ekip Touch LSI	1SDA077662R1	Z2SEUJAE000A000000XX	1SDA077832R1	ZBSEUJAE000A000000XX
				E2.2S-A 1600 Ekip Touch LSIG	1SDA077663R1	Z2SEUJAF000A000000XX	1SDA077833R1	ZBSEUJAF000A000000XX
				E2.2S-A 1600 Ekip Hi-Touch LSI	1SDA077665R1	Z2SEUJAJ200A000000XX	1SDA077835R1	ZBSEUJAJ200A000000XX
				E2.2S-A 1600 Ekip Hi-Touch LSIG	1SDA077666R1	Z2SEUJAK200A000000XX	1SDA077836R1	ZBSEUJAK200A000000XX
	2000	65	65	E2.2S-A 2000 Ekip Dip LI	1SDA077668R1	Z2SFUKAA000A000000XX	1SDA077838R1	ZBSFUKAA000A000000XX
				E2.2S-A 2000 Ekip Dip LSI	1SDA077669R1	Z2SFUKAB000A000000XX	1SDA077839R1	ZBSFUKAB000A000000XX
				E2.2S-A 2000 Ekip Dip LSIG	1SDA077670R1	Z2SFUKAC000A000000XX	1SDA077840R1	ZBSFUKAC000A000000XX
				E2.2S-A 2000 Ekip Touch LI	1SDA077671R1	Z2SFUKAD000A000000XX	1SDA077841R1	ZBSFUKAD000A000000XX
				E2.2S-A 2000 Ekip Touch LSI	1SDA077672R1	Z2SFUKAE000A000000XX	1SDA077842R1	ZBSFUKAE000A000000XX
				E2.2S-A 2000 Ekip Touch LSIG	1SDA077673R1	Z2SFUKAF000A000000XX	1SDA077843R1	ZBSFUKAF000A000000XX
				E2.2S-A 2000 Ekip Hi-Touch LSI	1SDA077675R1	Z2SFUKAJ200A000000XX	1SDA077845R1	ZBSFUKAJ200A000000XX
				E2.2S-A 2000 Ekip Hi-Touch LSIG	1SDA077676R1	Z2SFUKAK200A000000XX	1SDA077846R1	ZBSFUKAK200A000000XX

Automatic circuit breakers

Drawout version for power distribution



SACE Emax 2 E2.2H-A • Mobile part of drawout circuit breaker (MP)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E2.2H-A	800	85	85	E2.2H-A 800 Ekip Dip LI	1SDA077578R1	Z2HCUFAA000A000000XX	1SDA077748R1	ZBHCUFAA000A000000XX
				E2.2H-A 800 Ekip Dip LSI	1SDA077579R1	Z2HCUFAB000A000000XX	1SDA077749R1	ZBHCUFAB000A000000XX
				E2.2H-A 800 Ekip Dip LSIG	1SDA077580R1	Z2HCUFAC000A000000XX	1SDA077750R1	ZBHCUFAC000A000000XX
				E2.2H-A 800 Ekip Touch LI	1SDA077581R1	Z2HCUFAD000A000000XX	1SDA077751R1	ZBHCUFAD000A000000XX
				E2.2H-A 800 Ekip Touch LSI	1SDA077582R1	Z2HCUFAE000A000000XX	1SDA077752R1	ZBHCUFAE000A000000XX
				E2.2H-A 800 Ekip Touch LSIG	1SDA077583R1	Z2HCUFAF000A000000XX	1SDA077753R1	ZBHCUFAF000A000000XX
				E2.2H-A 800 Ekip Hi-Touch LSI	1SDA077585R1	Z2HCUFAJ200A000000XX	1SDA077755R1	ZBHCUFAJ200A000000XX
				E2.2H-A 800 Ekip Hi-Touch LSIG	1SDA077586R1	Z2HCUFAK200A000000XX	1SDA077756R1	ZBHCUFAK200A000000XX
	1200	85	85	E2.2H-A 1200 Ekip Dip LI	1SDA077588R1	Z2HDUHAA000A000000XX	1SDA077758R1	ZBHDUHAA000A000000XX
				E2.2H-A 1200 Ekip Dip LSI	1SDA077589R1	Z2HDUHAB000A000000XX	1SDA077759R1	ZBHDUHAB000A000000XX
				E2.2H-A 1200 Ekip Dip LSIG	1SDA077590R1	Z2HDUHAC000A000000XX	1SDA077760R1	ZBHDUHAC000A000000XX
				E2.2H-A 1200 Ekip Touch LI	1SDA077591R1	Z2HDUHAD000A000000XX	1SDA077761R1	ZBHDUHAD000A000000XX
				E2.2H-A 1200 Ekip Touch LSI	1SDA077592R1	Z2HDUHAE000A000000XX	1SDA077762R1	ZBHDUHAE000A000000XX
				E2.2H-A 1200 Ekip Touch LSIG	1SDA077593R1	Z2HDUHAF000A000000XX	1SDA077763R1	ZBHDUHAF000A000000XX
				E2.2H-A 1200 Ekip Hi-Touch LSI	1SDA077595R1	Z2HDUHAJ200A000000XX	1SDA077765R1	ZBHDUHAJ200A000000XX
				E2.2H-A 1200 Ekip Hi-Touch LSIG	1SDA077596R1	Z2HDUHAK200A000000XX	1SDA077766R1	ZBHDUHAK200A000000XX
	1600	85	85	E2.2H-A 1600 Ekip Dip LI	1SDA077598R1	Z2HEUJAA000A000000XX	1SDA077768R1	ZBHEUJAA000A000000XX
				E2.2H-A 1600 Ekip Dip LSI	1SDA077599R1	Z2HEUJAB000A000000XX	1SDA077769R1	ZBHEUJAB000A000000XX
				E2.2H-A 1600 Ekip Dip LSIG	1SDA077600R1	Z2HEUJAC000A000000XX	1SDA077770R1	ZBHEUJAC000A000000XX
				E2.2H-A 1600 Ekip Touch LI	1SDA077601R1	Z2HEUJAD000A000000XX	1SDA077771R1	ZBHEUJAD000A000000XX
				E2.2H-A 1600 Ekip Touch LSI	1SDA077602R1	Z2HEUJAE000A000000XX	1SDA077772R1	ZBHEUJAE000A000000XX
				E2.2H-A 1600 Ekip Touch LSIG	1SDA077603R1	Z2HEUJAF000A000000XX	1SDA077773R1	ZBHEUJAF000A000000XX
				E2.2H-A 1600 Ekip Hi-Touch LSI	1SDA077605R1	Z2HEUJAJ200A000000XX	1SDA077775R1	ZBHEUJAJ200A000000XX
				E2.2H-A 1600 Ekip Hi-Touch LSIG	1SDA077606R1	Z2HEUJAK200A000000XX	1SDA077776R1	ZBHEUJAK200A000000XX
	2000	85	85	E2.2H-A 2000 Ekip Dip LI	1SDA077608R1	Z2HFUKAA000A000000XX	1SDA077778R1	ZBHFUKAA000A000000XX
				E2.2H-A 2000 Ekip Dip LSI	1SDA077609R1	Z2HFUKAB000A000000XX	1SDA077779R1	ZBHFUKAB000A000000XX
				E2.2H-A 2000 Ekip Dip LSIG	1SDA077610R1	Z2HFUKAC000A000000XX	1SDA077780R1	ZBHFUKAC000A000000XX
				E2.2H-A 2000 Ekip Touch LI	1SDA077611R1	Z2HFUKAD000A000000XX	1SDA077781R1	ZBHFUKAD000A000000XX
				E2.2H-A 2000 Ekip Touch LSI	1SDA077612R1	Z2HFUKAE000A000000XX	1SDA077782R1	ZBHFUKAE000A000000XX
				E2.2H-A 2000 Ekip Touch LSIG	1SDA077613R1	Z2HFUKAF000A000000XX	1SDA077783R1	ZBHFUKAF000A000000XX
				E2.2H-A 2000 Ekip Hi-Touch LSI	1SDA077615R1	Z2HFUKAJ200A000000XX	1SDA077785R1	ZBHFUKAJ200A000000XX
				E2.2H-A 2000 Ekip Hi-Touch LSIG	1SDA077616R1	Z2HFUKAK200A000000XX	1SDA077786R1	ZBHFUKAK200A000000XX



SACE Emax 2 E2.2V-A • Mobile part of drawout circuit breaker (MP)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E2.2V-A	250	100	85	E2.2V-A 250 Ekip Dip LI	1SDA077678R1	Z2VAUCAA000A000000XX	1SDA077848R1	ZBVAUCAA000A000000XX
				E2.2V-A 250 Ekip Dip LSI	1SDA077679R1	Z2VAUCAB000A000000XX	1SDA077849R1	ZBVAUCAB000A000000XX
				E2.2V-A 250 Ekip Dip LSIG	1SDA077680R1	Z2VAUCAC000A000000XX	1SDA077850R1	ZBVAUCAC000A000000XX
				E2.2V-A 250 Ekip Touch LI	1SDA077681R1	Z2VAUCAD000A000000XX	1SDA077851R1	ZBVAUCAD000A000000XX
				E2.2V-A 250 Ekip Touch LSI	1SDA077682R1	Z2VAUCAE000A000000XX	1SDA077852R1	ZBVAUCAE000A000000XX
				E2.2V-A 250 Ekip Touch LSIG	1SDA077683R1	Z2VAUCAF000A000000XX	1SDA077853R1	ZBVAUCAF000A000000XX
				E2.2V-A 250 Ekip Hi-Touch LSI	1SDA077685R1	Z2VAUCAJ200A000000XX	1SDA077855R1	ZBVAUCAJ200A000000XX
				E2.2V-A 250 Ekip Hi-Touch LSIG	1SDA077686R1	Z2VAUCAK200A000000XX	1SDA077856R1	ZBVAUCAK200A000000XX
	400	100	85	E2.2V-A 400 Ekip Dip LI	1SDA077688R1	Z2VBUDAA000A000000XX	1SDA077858R1	ZBVBUDAA000A000000XX
				E2.2V-A 400 Ekip Dip LSI	1SDA077689R1	Z2VBUDAB000A000000XX	1SDA077859R1	ZBVBUDAB000A000000XX
				E2.2V-A 400 Ekip Dip LSIG	1SDA077690R1	Z2VBUDAC000A000000XX	1SDA077860R1	ZBVBUDAC000A000000XX
				E2.2V-A 400 Ekip Touch LI	1SDA077691R1	Z2VBUDAD000A000000XX	1SDA077861R1	ZBVBUDAD000A000000XX
				E2.2V-A 400 Ekip Touch LSI	1SDA077692R1	Z2VBUDAE000A000000XX	1SDA077862R1	ZBVBUDAE000A000000XX
				E2.2V-A 400 Ekip Touch LSIG	1SDA077693R1	Z2VBUDAF000A000000XX	1SDA077863R1	ZBVBUDAF000A000000XX
				E2.2V-A 400 Ekip Hi-Touch LSI	1SDA077695R1	Z2VBUDAJ200A000000XX	1SDA077865R1	ZBVBUDAJ200A000000XX
				E2.2V-A 400 Ekip Hi-Touch LSIG	1SDA077696R1	Z2VBUDAK200A000000XX	1SDA077866R1	ZBVBUDAK200A000000XX
	800	100	85	E2.2V-A 800 Ekip Dip LI	1SDA077698R1	Z2VCUFAA000A000000XX	1SDA077868R1	ZBVCUFAA000A000000XX
				E2.2V-A 800 Ekip Dip LSI	1SDA077699R1	Z2VCUFAB000A000000XX	1SDA077869R1	ZBVCUFAB000A000000XX
				E2.2V-A 800 Ekip Dip LSIG	1SDA077700R1	Z2VCUFAC000A000000XX	1SDA077870R1	ZBVCUFAC000A000000XX
				E2.2V-A 800 Ekip Touch LI	1SDA077701R1	Z2VCUFAD000A000000XX	1SDA077871R1	ZBVCUFAD000A000000XX
				E2.2V-A 800 Ekip Touch LSI	1SDA077702R1	Z2VCUFAE000A000000XX	1SDA077872R1	ZBVCUFAE000A000000XX
				E2.2V-A 800 Ekip Touch LSIG	1SDA077703R1	Z2VCUFAF000A000000XX	1SDA077873R1	ZBVCUFAF000A000000XX
				E2.2V-A 800 Ekip Hi-Touch LSI	1SDA077705R1	Z2VCUFAJ200A000000XX	1SDA077875R1	ZBVCUFAJ200A000000XX
				E2.2V-A 800 Ekip Hi-Touch LSIG	1SDA077706R1	Z2VCUFAK200A000000XX	1SDA077876R1	ZBVCUFAK200A000000XX
	1200	100	85	E2.2V-A 1200 Ekip Dip LI	1SDA077708R1	Z2VDUHAA000A000000XX	1SDA077878R1	ZBVDUHAA000A000000XX
				E2.2V-A 1200 Ekip Dip LSI	1SDA077709R1	Z2VDUHAB000A000000XX	1SDA077879R1	ZBVDUHAB000A000000XX
				E2.2V-A 1200 Ekip Dip LSIG	1SDA077710R1	Z2VDUHAC000A000000XX	1SDA077880R1	ZBVDUHAC000A000000XX
				E2.2V-A 1200 Ekip Touch LI	1SDA077711R1	Z2VDUHAD000A000000XX	1SDA077881R1	ZBVDUHAD000A000000XX
				E2.2V-A 1200 Ekip Touch LSI	1SDA077712R1	Z2VDUHAE000A000000XX	1SDA077882R1	ZBVDUHAE000A000000XX
				E2.2V-A 1200 Ekip Touch LSIG	1SDA077713R1	Z2VDUHAF000A000000XX	1SDA077883R1	ZBVDUHAF000A000000XX
				E2.2V-A 1200 Ekip Hi-Touch LSI	1SDA077715R1	Z2VDUHAJ200A000000XX	1SDA077885R1	ZBVDUHAJ200A000000XX
				E2.2V-A 1200 Ekip Hi-Touch LSIG	1SDA077716R1	Z2VDUHAK200A000000XX	1SDA077886R1	ZBVDUHAK200A000000XX
	1600	100	85	E2.2V-A 1600 Ekip Dip LI	1SDA077718R1	Z2VEUJAA000A000000XX	1SDA077888R1	ZBVEUJAA000A000000XX
				E2.2V-A 1600 Ekip Dip LSI	1SDA077719R1	Z2VEUJAB000A000000XX	1SDA077889R1	ZBVEUJAB000A000000XX
				E2.2V-A 1600 Ekip Dip LSIG	1SDA077720R1	Z2VEUJAC000A000000XX	1SDA077890R1	ZBVEUJAC000A000000XX
				E2.2V-A 1600 Ekip Touch LI	1SDA077721R1	Z2VEUJAD000A000000XX	1SDA077891R1	ZBVEUJAD000A000000XX
				E2.2V-A 1600 Ekip Touch LSI	1SDA077722R1	Z2VEUJAE000A000000XX	1SDA077892R1	ZBVEUJAE000A000000XX
				E2.2V-A 1600 Ekip Touch LSIG	1SDA077723R1	Z2VEUJAF000A000000XX	1SDA077893R1	ZBVEUJAF000A000000XX
				E2.2V-A 1600 Ekip Hi-Touch LSI	1SDA077725R1	Z2VEUJAJ200A000000XX	1SDA077895R1	ZBVEUJAJ200A000000XX
				E2.2V-A 1600 Ekip Hi-Touch LSIG	1SDA077726R1	Z2VEUJAK200A000000XX	1SDA077896R1	ZBVEUJAK200A000000XX
	2000	100	85	E2.2V-A 2000 Ekip Dip LI	1SDA077728R1	Z2VFUKAA000A000000XX	1SDA077898R1	ZBVFUKAA000A000000XX
				E2.2V-A 2000 Ekip Dip LSI	1SDA077729R1	Z2VFUKAB000A000000XX	1SDA077899R1	ZBVFUKAB000A000000XX
				E2.2V-A 2000 Ekip Dip LSIG	1SDA077730R1	Z2VFUKAC000A000000XX	1SDA077900R1	ZBVFUKAC000A000000XX
				E2.2V-A 2000 Ekip Touch LI	1SDA077731R1	Z2VFUKAD000A000000XX	1SDA077901R1	ZBVFUKAD000A000000XX
				E2.2V-A 2000 Ekip Touch LSI	1SDA077732R1	Z2VFUKAE000A000000XX	1SDA077902R1	ZBVFUKAE000A000000XX
				E2.2V-A 2000 Ekip Touch LSIG	1SDA077733R1	Z2VFUKAF000A000000XX	1SDA077903R1	ZBVFUKAF000A000000XX
				E2.2V-A 2000 Ekip Hi-Touch LSI	1SDA077735R1	Z2VFUKAJ200A000000XX	1SDA077905R1	ZBVFUKAJ200A000000XX
				E2.2V-A 2000 Ekip Hi-Touch LSIG	1SDA077736R1	Z2VFUKAK200A000000XX	1SDA077906R1	ZBVFUKAK200A000000XX

Automatic circuit breakers

Drawout version for power distribution



SACE Emax 2 E4.2S-A/H-A • Mobile part of drawout circuit breaker (MP)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E4.2S-A	2500	65	65	E4.2S-A 2500 Ekip Dip LI	1SDA078458R1	Z4SGULAA000A000000XX	1SDA078688R1	ZCSGULAA000A000000XX
				E4.2S-A 2500 Ekip Dip LSI	1SDA078459R1	Z4SGULAB000A000000XX	1SDA078689R1	ZCSGULAB000A000000XX
				E4.2S-A 2500 Ekip Dip LSIG	1SDA078460R1	Z4SGULAC000A000000XX	1SDA078690R1	ZCSGULAC000A000000XX
				E4.2S-A 2500 Ekip Touch LI	1SDA078461R1	Z4SGULAD000A000000XX	1SDA078691R1	ZCSGULAD000A000000XX
				E4.2S-A 2500 Ekip Touch LSI	1SDA078462R1	Z4SGULAE000A000000XX	1SDA078692R1	ZCSGULAE000A000000XX
				E4.2S-A 2500 Ekip Touch LSIG	1SDA078463R1	Z4SGULAF000A000000XX	1SDA078693R1	ZCSGULAF000A000000XX
				E4.2S-A 2500 Ekip Hi-Touch LSI	1SDA078465R1	Z4SGULAJ200A000000XX	1SDA078695R1	ZCSGULAJ200A000000XX
				E4.2S-A 2500 Ekip Hi-Touch LSIG	1SDA078466R1	Z4SGULAK200A000000XX	1SDA078696R1	ZCSGULAK200A000000XX
	3200	65	65	E4.2S-A 3200 Ekip Dip LI	1SDA078468R1	Z4SHUNAA000A000000XX	1SDA078698R1	ZCSHUNAA000A000000XX
				E4.2S-A 3200 Ekip Dip LSI	1SDA078469R1	Z4SHUNAB000A000000XX	1SDA078699R1	ZCSHUNAB000A000000XX
				E4.2S-A 3200 Ekip Dip LSIG	1SDA078470R1	Z4SHUNAC000A000000XX	1SDA078700R1	ZCSHUNAC000A000000XX
				E4.2S-A 3200 Ekip Touch LI	1SDA078471R1	Z4SHUNAD000A000000XX	1SDA078701R1	ZCSHUNAD000A000000XX
				E4.2S-A 3200 Ekip Touch LSI	1SDA078472R1	Z4SHUNAE000A000000XX	1SDA078702R1	ZCSHUNAE000A000000XX
				E4.2S-A 3200 Ekip Touch LSIG	1SDA078473R1	Z4SHUNAF000A000000XX	1SDA078703R1	ZCSHUNAF000A000000XX
				E4.2S-A 3200 Ekip Hi-Touch LSI	1SDA078475R1	Z4SHUNAJ200A000000XX	1SDA078705R1	ZCSHUNAJ200A000000XX
				E4.2S-A 3200 Ekip Hi-Touch LSIG	1SDA078476R1	Z4SHUNAK200A000000XX	1SDA078706R1	ZCSHUNAK200A000000XX
E4.2H-A	2500	85	85	E4.2H-A 2500 Ekip Dip LI	1SDA078368R1	Z4HGULAA000A000000XX	1SDA078598R1	ZCHGULAA000A000000XX
				E4.2H-A 2500 Ekip Dip LSI	1SDA078369R1	Z4HGULAB000A000000XX	1SDA078599R1	ZCHGULAB000A000000XX
				E4.2H-A 2500 Ekip Dip LSIG	1SDA078370R1	Z4HGULAC000A000000XX	1SDA078600R1	ZCHGULAC000A000000XX
				E4.2H-A 2500 Ekip Touch LI	1SDA078371R1	Z4HGULAD000A000000XX	1SDA078601R1	ZCHGULAD000A000000XX
				E4.2H-A 2500 Ekip Touch LSI	1SDA078372R1	Z4HGULAE000A000000XX	1SDA078602R1	ZCHGULAE000A000000XX
				E4.2H-A 2500 Ekip Touch LSIG	1SDA078373R1	Z4HGULAF000A000000XX	1SDA078603R1	ZCHGULAF000A000000XX
				E4.2H-A 2500 Ekip Hi-Touch LSI	1SDA078375R1	Z4HGULAJ200A000000XX	1SDA078605R1	ZCHGULAJ200A000000XX
				E4.2H-A 2500 Ekip Hi-Touch LSIG	1SDA078376R1	Z4HGULAK200A000000XX	1SDA078606R1	ZCHGULAK200A000000XX
	3200	85	85	E4.2H-A 3200 Ekip Dip LI	1SDA078378R1	Z4HHUNAA000A000000XX	1SDA078608R1	ZCHHUNAA000A000000XX
				E4.2H-A 3200 Ekip Dip LSI	1SDA078379R1	Z4HHUNAB000A000000XX	1SDA078609R1	ZCHHUNAB000A000000XX
				E4.2H-A 3200 Ekip Dip LSIG	1SDA078380R1	Z4HHUNAC000A000000XX	1SDA078610R1	ZCHHUNAC000A000000XX
				E4.2H-A 3200 Ekip Touch LI	1SDA078381R1	Z4HHUNAD000A000000XX	1SDA078611R1	ZCHHUNAD000A000000XX
				E4.2H-A 3200 Ekip Touch LSI	1SDA078382R1	Z4HHUNAE000A000000XX	1SDA078612R1	ZCHHUNAE000A000000XX
				E4.2H-A 3200 Ekip Touch LSIG	1SDA078383R1	Z4HHUNAF000A000000XX	1SDA078613R1	ZCHHUNAF000A000000XX
				E4.2H-A 3200 Ekip Hi-Touch LSI	1SDA078385R1	Z4HHUNAJ200A000000XX	1SDA078615R1	ZCHHUNAJ200A000000XX
				E4.2H-A 3200 Ekip Hi-Touch LSIG	1SDA078386R1	Z4HHUNAK200A000000XX	1SDA078616R1	ZCHHUNAK200A000000XX



SACE Emax 2 E4.2V-A • Mobile part of drawout circuit breaker (MP)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E4.2V-A	800	100	85	E4.2V-A 800 Ekip Dip LI	1SDA078488R1	Z4VCUFAA000A000000XX	1SDA078718R1	ZCVCUFAA000A000000XX
				E4.2V-A 800 Ekip Dip LSI	1SDA078489R1	Z4VCUFAB000A000000XX	1SDA078719R1	ZCVCUFAB000A000000XX
				E4.2V-A 800 Ekip Dip LSIG	1SDA078490R1	Z4VCUFAC000A000000XX	1SDA078720R1	ZCVCUFAC000A000000XX
				E4.2V-A 800 Ekip Touch LI	1SDA078491R1	Z4VCUFAD000A000000XX	1SDA078721R1	ZCVCUFAD000A000000XX
				E4.2V-A 800 Ekip Touch LSI	1SDA078492R1	Z4VCUFAE000A000000XX	1SDA078722R1	ZCVCUFAE000A000000XX
				E4.2V-A 800 Ekip Touch LSIG	1SDA078493R1	Z4VCUFAF000A000000XX	1SDA078723R1	ZCVCUFAF000A000000XX
				E4.2V-A 800 Ekip Hi-Touch LSI	1SDA078495R1	Z4VCUFAJ200A000000XX	1SDA078725R1	ZCVCUFAJ200A000000XX
				E4.2V-A 800 Ekip Hi-Touch LSIG	1SDA078496R1	Z4VCUFAK200A000000XX	1SDA078726R1	ZCVCUFAK200A000000XX
	1600	100	85	E4.2V-A 1600 Ekip Dip LI	1SDA078498R1	Z4VEUJAA000A000000XX	1SDA078728R1	ZCVEUJAA000A000000XX
				E4.2V-A 1600 Ekip Dip LSI	1SDA078499R1	Z4VEUJAB000A000000XX	1SDA078729R1	ZCVEUJAB000A000000XX
				E4.2V-A 1600 Ekip Dip LSIG	1SDA078500R1	Z4VEUJAC000A000000XX	1SDA078730R1	ZCVEUJAC000A000000XX
				E4.2V-A 1600 Ekip Touch LI	1SDA078501R1	Z4VEUJAD000A000000XX	1SDA078731R1	ZCVEUJAD000A000000XX
				E4.2V-A 1600 Ekip Touch LSI	1SDA078502R1	Z4VEUJAE000A000000XX	1SDA078732R1	ZCVEUJAE000A000000XX
				E4.2V-A 1600 Ekip Touch LSIG	1SDA078503R1	Z4VEUJAF000A000000XX	1SDA078733R1	ZCVEUJAF000A000000XX
				E4.2V-A 1600 Ekip Hi-Touch LSI	1SDA078505R1	Z4VEUJAJ200A000000XX	1SDA078735R1	ZCVEUJAJ200A000000XX
				E4.2V-A 1600 Ekip Hi-Touch LSIG	1SDA078506R1	Z4VEUJAK200A000000XX	1SDA078736R1	ZCVEUJAK200A000000XX
	2000	100	85	E4.2V-A 2000 Ekip Dip LI	1SDA078508R1	Z4VFUKAA000A000000XX	1SDA078738R1	ZCVFUKAA000A000000XX
				E4.2V-A 2000 Ekip Dip LSI	1SDA078509R1	Z4VFUKAB000A000000XX	1SDA078739R1	ZCVFUKAB000A000000XX
				E4.2V-A 2000 Ekip Dip LSIG	1SDA078510R1	Z4VFUKAC000A000000XX	1SDA078740R1	ZCVFUKAC000A000000XX
				E4.2V-A 2000 Ekip Touch LI	1SDA078511R1	Z4VFUKAD000A000000XX	1SDA078741R1	ZCVFUKAD000A000000XX
				E4.2V-A 2000 Ekip Touch LSI	1SDA078512R1	Z4VFUKAE000A000000XX	1SDA078742R1	ZCVFUKAE000A000000XX
				E4.2V-A 2000 Ekip Touch LSIG	1SDA078513R1	Z4VFUKAF000A000000XX	1SDA078743R1	ZCVFUKAF000A000000XX
				E4.2V-A 2000 Ekip Hi-Touch LSI	1SDA078515R1	Z4VFUKAJ200A000000XX	1SDA078745R1	ZCVFUKAJ200A000000XX
				E4.2V-A 2000 Ekip Hi-Touch LSIG	1SDA078516R1	Z4VFUKAK200A000000XX	1SDA078746R1	ZCVFUKAK200A000000XX
	2500	100	85	E4.2V-A 2500 Ekip Dip LI	1SDA078518R1	Z4VGULAA000A000000XX	1SDA078748R1	ZCVGULAA000A000000XX
				E4.2V-A 2500 Ekip Dip LSI	1SDA078519R1	Z4VGULAB000A000000XX	1SDA078749R1	ZCVGULAB000A000000XX
				E4.2V-A 2500 Ekip Dip LSIG	1SDA078520R1	Z4VGULAC000A000000XX	1SDA078750R1	ZCVGULAC000A000000XX
				E4.2V-A 2500 Ekip Touch LI	1SDA078521R1	Z4VGULAD000A000000XX	1SDA078751R1	ZCVGULAD000A000000XX
				E4.2V-A 2500 Ekip Touch LSI	1SDA078522R1	Z4VGULAE000A000000XX	1SDA078752R1	ZCVGULAE000A000000XX
				E4.2V-A 2500 Ekip Touch LSIG	1SDA078523R1	Z4VGULAF000A000000XX	1SDA078753R1	ZCVGULAF000A000000XX
				E4.2V-A 2500 Ekip Hi-Touch LSI	1SDA078525R1	Z4VGULAJ200A000000XX	1SDA078755R1	ZCVGULAJ200A000000XX
				E4.2V-A 2500 Ekip Hi-Touch LSIG	1SDA078526R1	Z4VGULAK200A000000XX	1SDA078756R1	ZCVGULAK200A000000XX
	3200	100	85	E4.2V-A 3200 Ekip Dip LI	1SDA078528R1	Z4VHUNAA000A000000XX	1SDA078758R1	ZCVHUNAA000A000000XX
				E4.2V-A 3200 Ekip Dip LSI	1SDA078529R1	Z4VHUNAB000A000000XX	1SDA078759R1	ZCVHUNAB000A000000XX
				E4.2V-A 3200 Ekip Dip LSIG	1SDA078530R1	Z4VHUNAC000A000000XX	1SDA078760R1	ZCVHUNAC000A000000XX
				E4.2V-A 3200 Ekip Touch LI	1SDA078531R1	Z4VHUNAD000A000000XX	1SDA078761R1	ZCVHUNAD000A000000XX
				E4.2V-A 3200 Ekip Touch LSI	1SDA078532R1	Z4VHUNAE000A000000XX	1SDA078762R1	ZCVHUNAE000A000000XX
				E4.2V-A 3200 Ekip Touch LSIG	1SDA078533R1	Z4VHUNAF000A000000XX	1SDA078763R1	ZCVHUNAF000A000000XX
				E4.2V-A 3200 Ekip Hi-Touch LSI	1SDA078535R1	Z4VHUNAJ200A000000XX	1SDA078765R1	ZCVHUNAJ200A000000XX
				E4.2V-A 3200 Ekip Hi-Touch LSIG	1SDA078536R1	Z4VHUNAK200A000000XX	1SDA078766R1	ZCVHUNAK200A000000XX

Automatic circuit breakers

Drawout version for power distribution



SACE Emax 2 E6.2H-A/V-A • Mobile part of drawout circuit breaker (MP)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E6.2H-A	4000	85	85	E6.2H-A 4000 Ekip Dip LI	1SDA079068R1	Z6HJURAA000A000000XX	1SDA079188R1	ZDHJURAA000A000000XX
				E6.2H-A 4000 Ekip Dip LSI	1SDA079069R1	Z6HJURAB000A000000XX	1SDA079189R1	ZDHJURAB000A000000XX
				E6.2H-A 4000 Ekip Dip LSIG	1SDA079070R1	Z6HJURAC000A000000XX	1SDA079190R1	ZDHJURAC000A000000XX
				E6.2H-A 4000 Ekip Touch LI	1SDA079071R1	Z6HJURAD000A000000XX	1SDA079191R1	ZDHJURAD000A000000XX
				E6.2H-A 4000 Ekip Touch LSI	1SDA079072R1	Z6HJURAE000A000000XX	1SDA079192R1	ZDHJURAE000A000000XX
				E6.2H-A 4000 Ekip Touch LSIG	1SDA079073R1	Z6HJURAF000A000000XX	1SDA079193R1	ZDHJURAF000A000000XX
				E6.2H-A 4000 Ekip Hi-Touch LSI	1SDA079075R1	Z6HJURAJ200A000000XX	1SDA079195R1	ZDHJURAJ200A000000XX
				E6.2H-A 4000 Ekip Hi-Touch LSIG	1SDA079076R1	Z6HJURAK200A000000XX	1SDA079196R1	ZDHJURAK200A000000XX
	5000	85	85	E6.2H-A 5000 Ekip Dip LI	1SDA079078R1	Z6HKUSAA000A000000XX	1SDA079198R1	ZDHKUSAA000A000000XX
				E6.2H-A 5000 Ekip Dip LSI	1SDA079079R1	Z6HKUSAB000A000000XX	1SDA079199R1	ZDHKUSAB000A000000XX
				E6.2H-A 5000 Ekip Dip LSIG	1SDA079080R1	Z6HKUSAC000A000000XX	1SDA079200R1	ZDHKUSAC000A000000XX
				E6.2H-A 5000 Ekip Touch LI	1SDA079081R1	Z6HKUSAD000A000000XX	1SDA079201R1	ZDHKUSAD000A000000XX
				E6.2H-A 5000 Ekip Touch LSI	1SDA079082R1	Z6HKUSAE000A000000XX	1SDA079202R1	ZDHKUSAE000A000000XX
				E6.2H-A 5000 Ekip Touch LSIG	1SDA079083R1	Z6HKUSAF000A000000XX	1SDA079203R1	ZDHKUSAF000A000000XX
				E6.2H-A 5000 Ekip Hi-Touch LSI	1SDA079085R1	Z6HKUSAJ200A000000XX	1SDA079205R1	ZDHKUSAJ200A000000XX
				E6.2H-A 5000 Ekip Hi-Touch LSIG	1SDA079086R1	Z6HKUSAK200A000000XX	1SDA079206R1	ZDHKUSAK200A000000XX
	6000 (*)	85	85	E6.2H-A 6000 Ekip Dip LI	1SDA079088R1	Z6HLUTAA000A000000XX	-	-
				E6.2H-A 6000 Ekip Dip LSI	1SDA079089R1	Z6HLUTAB000A000000XX	-	-
				E6.2H-A 6000 Ekip Dip LSIG	1SDA079090R1	Z6HLUTAC000A000000XX	-	-
				E6.2H-A 6000 Ekip Touch LI	1SDA079091R1	Z6HLUTAD000A000000XX	-	-
				E6.2H-A 6000 Ekip Touch LSI	1SDA079092R1	Z6HLUTAE000A000000XX	-	-
				E6.2H-A 6000 Ekip Touch LSIG	1SDA079093R1	Z6HLUTAF000A000000XX	-	-
				E6.2H-A 6000 Ekip Hi-Touch LSI	1SDA079095R1	Z6HLUTAJ200A000000XX	-	-
				E6.2H-A 6000 Ekip Hi-Touch LSIG	1SDA079096R1	Z6HLUTAK200A000000XX	-	-
E6.2V-A	4000	100	100	E6.2V-A 4000 Ekip Dip LI	1SDA079128R1	Z6VJURAA000A000000XX	1SDA079248R1	ZDVJURAA000A000000XX
				E6.2V-A 4000 Ekip Dip LSI	1SDA079129R1	Z6VJURAB000A000000XX	1SDA079249R1	ZDVJURAB000A000000XX
				E6.2V-A 4000 Ekip Dip LSIG	1SDA079130R1	Z6VJURAC000A000000XX	1SDA079250R1	ZDVJURAC000A000000XX
				E6.2V-A 4000 Ekip Touch LI	1SDA079131R1	Z6VJURAD000A000000XX	1SDA079251R1	ZDVJURAD000A000000XX
				E6.2V-A 4000 Ekip Touch LSI	1SDA079132R1	Z6VJURAE000A000000XX	1SDA079252R1	ZDVJURAE000A000000XX
				E6.2V-A 4000 Ekip Touch LSIG	1SDA079133R1	Z6VJURAF000A000000XX	1SDA079253R1	ZDVJURAF000A000000XX
				E6.2V-A 4000 Ekip Hi-Touch LSI	1SDA079135R1	Z6VJURAJ200A000000XX	1SDA079255R1	ZDVJURAJ200A000000XX
				E6.2V-A 4000 Ekip Hi-Touch LSIG	1SDA079136R1	Z6VJURAK200A000000XX	1SDA079256R1	ZDVJURAK200A000000XX
	5000	100	100	E6.2V-A 5000 Ekip Dip LI	1SDA079138R1	Z6VKUSAA000A000000XX	1SDA079258R1	ZDVKUSAA000A000000XX
				E6.2V-A 5000 Ekip Dip LSI	1SDA079139R1	Z6VKUSAB000A000000XX	1SDA079259R1	ZDVKUSAB000A000000XX
				E6.2V-A 5000 Ekip Dip LSIG	1SDA079140R1	Z6VKUSAC000A000000XX	1SDA079260R1	ZDVKUSAC000A000000XX
				E6.2V-A 5000 Ekip Touch LI	1SDA079141R1	Z6VKUSAD000A000000XX	1SDA079261R1	ZDVKUSAD000A000000XX
				E6.2V-A 5000 Ekip Touch LSI	1SDA079142R1	Z6VKUSAE000A000000XX	1SDA079262R1	ZDVKUSAE000A000000XX
				E6.2V-A 5000 Ekip Touch LSIG	1SDA079143R1	Z6VKUSAF000A000000XX	1SDA079263R1	ZDVKUSAF000A000000XX
				E6.2V-A 5000 Ekip Hi-Touch LSI	1SDA079145R1	Z6VKUSAJ200A000000XX	1SDA079265R1	ZDVKUSAJ200A000000XX
				E6.2V-A 5000 Ekip Hi-Touch LSIG	1SDA079146R1	Z6VKUSAK200A000000XX	1SDA079266R1	ZDVKUSAK200A000000XX
	6000	100	100	E6.2V-A 6000 Ekip Dip LI	1SDA079148R1	Z6VLUTAA000A000000XX	1SDA079268R1	-
				E6.2V-A 6000 Ekip Dip LSI	1SDA079149R1	Z6VLUTAB000A000000XX	1SDA079269R1	-
				E6.2V-A 6000 Ekip Dip LSIG	1SDA079150R1	Z6VLUTAC000A000000XX	1SDA079270R1	-
				E6.2V-A 6000 Ekip Touch LI	1SDA079151R1	Z6VLUTAD000A000000XX	1SDA079271R1	-
				E6.2V-A 6000 Ekip Touch LSI	1SDA079152R1	Z6VLUTAE000A000000XX	1SDA079272R1	-
				E6.2V-A 6000 Ekip Touch LSIG	1SDA079153R1	Z6VLUTAF000A000000XX	1SDA079273R1	-
				E6.2V-A 6000 Ekip Hi-Touch LSI	1SDA079155R1	Z6VLUTAJ200A000000XX	1SDA079275R1	-
				E6.2V-A 6000 Ekip Hi-Touch LSIG	1SDA079156R1	Z6VLUTAK200A000000XX	1SDA079276R1	-



SACE Emax 2 E6.2H-A/f/V-A/f • Mobile part of drawout circuit breaker (MP)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	4 Poles	
					Global PN	US / CA PN
E6.2H-A/f	4000	85	85	E6.2H-A/f 4000 Ekip Dip LI	1SDA079428R1	ZEHJURAA000A000000XX
				E6.2H-A/f 4000 Ekip Dip LSI	1SDA079429R1	ZEHJURAB000A000000XX
				E6.2H-A/f 4000 Ekip Dip LSIG	1SDA079430R1	ZEHJURAC000A000000XX
				E6.2H-A/f 4000 Ekip Touch LI	1SDA079431R1	ZEHJURAD000A000000XX
				E6.2H-A/f 4000 Ekip Touch LSI	1SDA079432R1	ZEHJURAE000A000000XX
				E6.2H-A/f 4000 Ekip Touch LSIG	1SDA079433R1	ZEHJURAF000A000000XX
				E6.2H-A/f 4000 Ekip Hi-Touch LSI	1SDA079435R1	ZEHJURAJ200A000000XX
				E6.2H-A/f 4000 Ekip Hi-Touch LSIG	1SDA079436R1	ZEHJURAK200A000000XX
	5000	85	85	E6.2H-A/f 5000 Ekip Dip LI	1SDA079438R1	ZEHKUSAA000A000000XX
				E6.2H-A/f 5000 Ekip Dip LSI	1SDA079439R1	ZEHKUSAB000A000000XX
				E6.2H-A/f 5000 Ekip Dip LSIG	1SDA079440R1	ZEHKUSAC000A000000XX
				E6.2H-A/f 5000 Ekip Touch LI	1SDA079441R1	ZEHKUSAD000A000000XX
				E6.2H-A/f 5000 Ekip Touch LSI	1SDA079442R1	ZEHKUSAE000A000000XX
				E6.2H-A/f 5000 Ekip Touch LSIG	1SDA079443R1	ZEHKUSAF000A000000XX
				E6.2H-A/f 5000 Ekip Hi-Touch LSI	1SDA079445R1	ZEHKUSAJ200A000000XX
				E6.2H-A/f 5000 Ekip Hi-Touch LSIG	1SDA079446R1	ZEHKUSAK200A000000XX
	6000 (*)	85	85	E6.2H-A/f 6000 Ekip Dip LI	1SDA079448R1	ZEHLUTAA000A000000XX
				E6.2H-A/f 6000 Ekip Dip LSI	1SDA079449R1	ZEHLUTAB000A000000XX
				E6.2H-A/f 6000 Ekip Dip LSIG	1SDA079450R1	ZEHLUTAC000A000000XX
				E6.2H-A/f 6000 Ekip Touch LI	1SDA079451R1	ZEHLUTAD000A000000XX
				E6.2H-A/f 6000 Ekip Touch LSI	1SDA079452R1	ZEHLUTAE000A000000XX
				E6.2H-A/f 6000 Ekip Touch LSIG	1SDA079453R1	ZEHLUTAF000A000000XX
				E6.2H-A/f 6000 Ekip Hi-Touch LSI	1SDA079455R1	ZEHLUTAJ200A000000XX
				E6.2H-A/f 6000 Ekip Hi-Touch LSIG	1SDA079456R1	ZEHLUTAK200A000000XX
E6.2V-A/f	4000	100	100	E6.2V-A/f 4000 Ekip Dip LI	1SDA079488R1	ZEVJURAA000A000000XX
				E6.2V-A/f 4000 Ekip Dip LSI	1SDA079489R1	ZEVJURAB000A000000XX
				E6.2V-A/f 4000 Ekip Dip LSIG	1SDA079490R1	ZEVJURAC000A000000XX
				E6.2V-A/f 4000 Ekip Touch LI	1SDA079491R1	ZEVJURAD000A000000XX
				E6.2V-A/f 4000 Ekip Touch LSI	1SDA079492R1	ZEVJURAE000A000000XX
				E6.2V-A/f 4000 Ekip Touch LSIG	1SDA079493R1	ZEVJURAF000A000000XX
				E6.2V-A/f 4000 Ekip Hi-Touch LSI	1SDA079495R1	ZEVJURAJ200A000000XX
				E6.2V-A/f 4000 Ekip Hi-Touch LSIG	1SDA079496R1	ZEVJURAK200A000000XX
	5000	100	100	E6.2V-A/f 5000 Ekip Dip LI	1SDA079498R1	ZEVKUSAA000A000000XX
				E6.2V-A/f 5000 Ekip Dip LSI	1SDA079499R1	ZEVKUSAB000A000000XX
				E6.2V-A/f 5000 Ekip Dip LSIG	1SDA079500R1	ZEVKUSAC000A000000XX
				E6.2V-A/f 5000 Ekip Touch LI	1SDA079501R1	ZEVKUSAD000A000000XX
				E6.2V-A/f 5000 Ekip Touch LSI	1SDA079502R1	ZEVKUSAE000A000000XX
				E6.2V-A/f 5000 Ekip Touch LSIG	1SDA079503R1	ZEVKUSAF000A000000XX
				E6.2V-A/f 5000 Ekip Hi-Touch LSI	1SDA079505R1	ZEVKUSAJ200A000000XX
				E6.2V-A/f 5000 Ekip Hi-Touch LSIG	1SDA079506R1	ZEVKUSAK200A000000XX
	6000	100	100	E6.2V-A/f 6000 Ekip Dip LI	1SDA079508R1	-
				E6.2V-A/f 6000 Ekip Dip LSI	1SDA079509R1	-
				E6.2V-A/f 6000 Ekip Dip LSIG	1SDA079510R1	-
				E6.2V-A/f 6000 Ekip Touch LI	1SDA079511R1	-
				E6.2V-A/f 6000 Ekip Touch LSI	1SDA079512R1	-
				E6.2V-A/f 6000 Ekip Touch LSIG	1SDA079513R1	-
				E6.2V-A/f 6000 Ekip Hi-Touch LSI	1SDA079515R1	-
				E6.2V-A/f 6000 Ekip Hi-Touch LSIG	1SDA079516R1	-

Automatic circuit breakers
Fixed version for generators



SACE Emax E1.2B-N-S • Front terminals (F)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E1.2B-A	800	42	42	E1.2B-A 800 Ekip G Touch LSIG	1SDA076914R1	Z1BCUFBN200A000000XX	1SDA076994R1	ZABCUFBN200A000000XX
				E1.2B-A 800 Ekip G Hi-Touch LSIG	1SDA076917R1	Z1BCUFBQ200A000000XX	1SDA076997R1	ZABCUFBQ200A000000XX
	1200	42	42	E1.2B-A 1200 Ekip G Touch LSIG	1SDA076924R1	Z1BDUHBN200A000000XX	1SDA077004R1	ZABDUHBN200A000000XX
				E1.2B-A 1200 Ekip G Hi-Touch LSIG	1SDA076927R1	Z1BDUHBQ200A000000XX	1SDA077007R1	ZABDUHBQ200A000000XX
E1.2N-A	800	50	50	E1.2N-A 800 Ekip G Touch LSIG	1SDA076934R1	Z1NCUFBN200A000000XX	1SDA077014R1	ZANCUFBN200A000000XX
				E1.2N-A 800 Ekip G Hi-Touch LSIG	1SDA076937R1	Z1NCUFBQ200A000000XX	1SDA077017R1	ZANCUFBQ200A000000XX
	1200	50	50	E1.2N-A 1200 Ekip G Touch LSIG	1SDA076944R1	Z1NDUHBN200A000000XX	1SDA077024R1	ZANDUHBN200A000000XX
				E1.2N-A 1200 Ekip G Hi-Touch LSIG	1SDA076947R1	Z1NDUHBQ200A000000XX	1SDA077027R1	ZANDUHBQ200A000000XX
E1.2S-A	250	65	50	E1.2S-A 250 Ekip G Touch LSIG	1SDA076954R1	Z1SAUCBN200A000000XX	1SDA077034R1	ZASAUCBN200A000000XX
				E1.2S-A 250 Ekip G Hi-Touch LSIG	1SDA076957R1	Z1SAUCBQ200A000000XX	1SDA077037R1	ZASAUCBQ200A000000XX
	400	65	50	E1.2S-A 400 Ekip G Touch LSIG	1SDA076964R1	Z1SBUDBN200A000000XX	1SDA077044R1	ZASBUDBN200A000000XX
				E1.2S-A 400 Ekip G Hi-Touch LSIG	1SDA076967R1	Z1SBUDBQ200A000000XX	1SDA077047R1	ZASBUDBQ200A000000XX
	800	65	50	E1.2S-A 800 Ekip G Touch LSIG	1SDA076974R1	Z1SCUFBN200A000000XX	1SDA077054R1	ZASCUFBN200A000000XX
				E1.2S-A 800 Ekip G Hi-Touch LSIG	1SDA076977R1	Z1SCUFBQ200A000000XX	1SDA077057R1	ZASCUFBQ200A000000XX
	1200	65	50	E1.2S-A 1200 Ekip G Touch LSIG	1SDA076984R1	Z1SDUHBN200A000000XX	1SDA077064R1	ZASDUHBN200A000000XX
				E1.2S-A 1200 Ekip G Hi-Touch LSIG	1SDA076987R1	Z1SDUHBQ200A000000XX	1SDA077067R1	ZASDUHBQ200A000000XX

About wall mount is standard; for floor fixing must order: 1SDA076020R1 ZE1FFPF



SACE Emax 2 E2.2 B-A, N-A, S-A, H-A, V-A • Orientable rear terminals (HR)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E2.2B-A	1600	42	42	E2.2B-A 1600 Ekip G Touch LSIG	1SDA077234R1	Z2BEUJBN200A000000XX	1SDA077404R1	ZBBEUJBN200A000000XX
				E2.2B-A 1600 Ekip G Hi-Touch LSIG	1SDA077237R1	Z2BEUJBQ200A000000XX	1SDA077407R1	ZBBEUJBQ200A000000XX
E2.2N-A	1600	50	50	E2.2N-A 1600 Ekip G Touch LSIG	1SDA077284R1	Z2NEUJBN200A000000XX	1SDA077454R1	ZBNEUJBN200A000000XX
				E2.2N-A 1600 Ekip G Hi-Touch LSIG	1SDA077287R1	Z2NEUJBQ200A000000XX	1SDA077457R1	ZBNEUJBQ200A000000XX
	2000	50	50	E2.2N-A 2000 Ekip G Touch LSIG	1SDA077294R1	Z2NFUKBN200A000000XX	1SDA077464R1	ZBNFUKBN200A000000XX
				E2.2N-A 2000 Ekip G Hi-Touch LSIG	1SDA077297R1	Z2NFUKBQ200A000000XX	1SDA077467R1	ZBNFUKBQ200A000000XX
E2.2S-A	800	65	65	E2.2S-A 800 Ekip G Touch LSIG	1SDA077304R1	Z2SCUFBN200A000000XX	1SDA077474R1	ZBSCUFBN200A000000XX
				E2.2S-A 800 Ekip G Hi-Touch LSIG	1SDA077307R1	Z2SCUFBQ200A000000XX	1SDA077477R1	ZBSCUFBQ200A000000XX
	1200	65	65	E2.2S-A 1200 Ekip G Touch LSIG	1SDA077314R1	Z2SDUHBN200A000000XX	1SDA077484R1	ZBSDUHBN200A000000XX
				E2.2S-A 1200 Ekip G Hi-Touch LSIG	1SDA077317R1	Z2SDUHBQ200A000000XX	1SDA077487R1	ZBSDUHBQ200A000000XX
	1600	65	65	E2.2S-A 1600 Ekip G Touch LSIG	1SDA077324R1	Z2SEUJBN200A000000XX	1SDA077494R1	ZBSEUJBN200A000000XX
				E2.2S-A 1600 Ekip G Hi-Touch LSIG	1SDA077327R1	Z2SEUJBQ200A000000XX	1SDA077497R1	ZBSEUJBQ200A000000XX
	2000	65	65	E2.2S-A 2000 Ekip G Touch LSIG	1SDA077334R1	Z2SFUKBN200A000000XX	1SDA077504R1	ZBSFUKBN200A000000XX
				E2.2S-A 2000 Ekip G Hi-Touch LSIG	1SDA077337R1	Z2SFUKBQ200A000000XX	1SDA077507R1	ZBSFUKBQ200A000000XX
E2.2H-A	800	85	85	E2.2H-A 800 Ekip G Touch LSIG	1SDA077244R1	Z2HCUFBN200A000000XX	1SDA077414R1	ZBHCUFBN200A000000XX
				E2.2H-A 800 Ekip G Hi-Touch LSIG	1SDA077247R1	Z2HCUFBQ200A000000XX	1SDA077417R1	ZBHCUFBQ200A000000XX
	1200	85	85	E2.2H-A 1200 Ekip G Touch LSIG	1SDA077254R1	Z2HDUHBN200A000000XX	1SDA077424R1	ZBHDUHBN200A000000XX
				E2.2H-A 1200 Ekip G Hi-Touch LSIG	1SDA077257R1	Z2HDUHBQ200A000000XX	1SDA077427R1	ZBHDUHBQ200A000000XX
	1600	85	85	E2.2H-A 1600 Ekip G Touch LSIG	1SDA077264R1	Z2HEUJBN200A000000XX	1SDA077434R1	ZBHEUJBN200A000000XX
				E2.2H-A 1600 Ekip G Hi-Touch LSIG	1SDA077267R1	Z2HEUJBQ200A000000XX	1SDA077437R1	ZBHEUJBQ200A000000XX
	2000	85	85	E2.2H-A 2000 Ekip G Touch LSIG	1SDA077274R1	Z2HFUKBN200A000000XX	1SDA077444R1	ZBHFUKBN200A000000XX
				E2.2H-A 2000 Ekip G Hi-Touch LSIG	1SDA077277R1	Z2HFUKBQ200A000000XX	1SDA077447R1	ZBHFUKBQ200A000000XX
E2.2V-A	250	100	85	E2.2V-A 250 Ekip G Touch LSIG	1SDA077344R1	Z2VAUCBN200A000000XX	1SDA077514R1	ZBVAUCBN200A000000XX
				E2.2V-A 250 Ekip G Hi-Touch LSIG	1SDA077347R1	Z2VAUCBQ200A000000XX	1SDA077517R1	ZBVAUCBQ200A000000XX
	400	100	85	E2.2V-A 400 Ekip G Touch LSIG	1SDA077354R1	Z2VBUDBN200A000000XX	1SDA077524R1	ZBVBUDBN200A000000XX
				E2.2V-A 400 Ekip G Hi-Touch LSIG	1SDA077357R1	Z2VBUDBQ200A000000XX	1SDA077527R1	ZBVBUDBQ200A000000XX
	800	100	85	E2.2V-A 800 Ekip G Touch LSIG	1SDA077364R1	Z2VCUFBN200A000000XX	1SDA077534R1	ZBVCUFBN200A000000XX
				E2.2V-A 800 Ekip G Hi-Touch LSIG	1SDA077367R1	Z2VCUFBQ200A000000XX	1SDA077537R1	ZBVCUFBQ200A000000XX
	1200	100	85	E2.2V-A 1200 Ekip G Touch LSIG	1SDA077374R1	Z2VDUHBN200A000000XX	1SDA077544R1	ZBVDUHBN200A000000XX
				E2.2V-A 1200 Ekip G Hi-Touch LSIG	1SDA077377R1	Z2VDUHBQ200A000000XX	1SDA077547R1	ZBVDUHBQ200A000000XX
	1600	100	85	E2.2V-A 1600 Ekip G Touch LSIG	1SDA077384R1	Z2VEUJBN200A000000XX	1SDA077554R1	ZBVEUJBN200A000000XX
				E2.2V-A 1600 Ekip G Hi-Touch LSIG	1SDA077387R1	Z2VEUJBQ200A000000XX	1SDA077557R1	ZBVEUJBQ200A000000XX
	2000	100	85	E2.2V-A 2000 Ekip G Touch LSIG	1SDA077394R1	Z2VFUKBN200A000000XX	1SDA077564R1	ZBVFUKBN200A000000XX
				E2.2V-A 2000 Ekip G Hi-Touch LSIG	1SDA077397R1		1SDA077567R1	

Automatic circuit breakers
Fixed version for generators



SACE Emax 2 E4.2 S-A, H-A, V-A • Orientable rear terminals up to 2500A (HR)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E4.2S-A	2500	65	65	E4.2S-A 2500 Ekip G Touch LSIG	1SDA078004R1	Z4SGULBN200A000000XX	1SDA078234R1	ZCSGULBN200A000000XX
				E4.2S-A 2500 Ekip G Hi-Touch LSIG	1SDA078007R1	Z4SGULBQ200A000000XX	1SDA078237R1	ZCSGULBQ200A000000XX
	3200 (1)	65	65	E4.2S-A 3200 Ekip G Touch LSIG	1SDA078014R1	Z4SHUNBN200A000000XX	1SDA078244R1	ZCSHUNBN200A000000XX
				E4.2S-A 3200 Ekip G Hi-Touch LSIG	1SDA078017R1	Z4SHUNBQ200A000000XX	1SDA078247R1	ZCSHUNBQ200A000000XX
	3600 (1)	65	65	E4.2S-A 3600 Ekip G Touch LSIG	1SDA078024R1	Z4SZUSBQ200A000000XX	-	-
				E4.2S-A 3600 Ekip G Hi-Touch LSIG	1SDA078027R1	Z4SZUSBQ200A000000XX	-	-
E4.2H-A	2500	85	85	E4.2H-A 2500 Ekip G Touch LSIG	1SDA077914R1	Z4HGULBN200A000000XX	1SDA078144R1	ZCHGULBN200A000000XX
				E4.2H-A 2500 Ekip G Hi-Touch LSIG	1SDA077917R1	Z4HGULBQ200A000000XX	1SDA078147R1	ZCHGULBQ200A000000XX
	3200 (1)	85	85	E4.2H-A 3200 Ekip G Touch LSIG	1SDA077924R1	Z4HHUNBN200A000000XX	1SDA078154R1	ZCHHUNBN200A000000XX
				E4.2H-A 3200 Ekip G Hi-Touch LSIG	1SDA077927R1	Z4HHUNBQ200A000000XX	1SDA078157R1	ZCHHUNBQ200A000000XX
	3600 (1)	85	85	E4.2H-A 3600 Ekip G Touch LSIG	1SDA077934R1	Z4HZUSBQ200A000000XX	-	-
				E4.2H-A 3600 Ekip G Hi-Touch LSIG	1SDA077937R1	Z4HZUSBQ200A000000XX	-	-
E4.2V-A	800	100	85	E4.2V-A 800 Ekip G Touch LSIG	1SDA078034R1	Z4VCUFBN200A000000XX	1SDA078264R1	ZCVCUFBN200A000000XX
				E4.2V-A 800 Ekip G Hi-Touch LSIG	1SDA078037R1	Z4VCUFBQ200A000000XX	1SDA078267R1	ZCVCUFBQ200A000000XX
	1600	100	85	E4.2V-A 1600 Ekip G Touch LSIG	1SDA078044R1	Z4VEUJBN200A000000XX	1SDA078274R1	ZCVEUJBN200A000000XX
				E4.2V-A 1600 Ekip G Hi-Touch LSIG	1SDA078047R1	Z4VEUJBQ200A000000XX	1SDA078277R1	ZCVEUJBQ200A000000XX
	2000	100	85	E4.2V-A 2000 Ekip G Touch LSIG	1SDA078054R1	Z4VFUKBN200A000000XX	1SDA078284R1	ZCVFUKBN200A000000XX
				E4.2V-A 2000 Ekip G Hi-Touch LSIG	1SDA078057R1	Z4VFUKBQ200A000000XX	1SDA078287R1	ZCVFUKBQ200A000000XX
	2500	100	85	E4.2V-A 2500 Ekip G Touch LSIG	1SDA078064R1	Z4VGULBN200A000000XX	1SDA078294R1	ZCVGULBN200A000000XX
				E4.2V-A 2500 Ekip G Hi-Touch LSIG	1SDA078067R1	Z4VGULBQ200A000000XX	1SDA078297R1	ZCVGULBQ200A000000XX
	3200 (1)	100	85	E4.2V-A 3200 Ekip G Touch LSIG	1SDA078074R1	Z4VHUNBN200A000000XX	1SDA078304R1	ZCVHUNBN200A000000XX
				E4.2V-A 3200 Ekip G Hi-Touch LSIG	1SDA078077R1	Z4VHUNBQ200A000000XX	1SDA078307R1	ZCVHUNBQ200A000000XX
	3600 (1)	100	85	E4.2V-A 3600 Ekip G Touch LSIG	1SDA078084R1	Z4VZUSBQ200A000000XX	-	-
				E4.2V-A 3600 Ekip G Hi-Touch LSIG	1SDA078087R1	Z4VZUSBQ200A000000XX	-	-

1) 3200/3600A ratings only with rear vertical terminals



SACE Emax 2 E6.2 H-A, V-A • Orientable rear terminals up to 5000A (HR)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E6.2H-A	4000	85	85	E6.2H-A 4000 Ekip G Touch LSIG	1SDA078834R1	Z6HJURBN200A000000XX	1SDA078954R1	ZDHJURBN200A000000XX
				E6.2H-A 4000 Ekip G Hi-Touch LSIG	1SDA078837R1	Z6HJURBQ200A000000XX	1SDA078957R1	ZDHJURBQ200A000000XX
	5000	85	85	E6.2H-A 5000 Ekip G Touch LSIG	1SDA078844R1	Z6HKUSBN200A000000XX	1SDA078964R1	ZDHKUSBN200A000000XX
				E6.2H-A 5000 Ekip G Hi-Touch LSIG	1SDA078847R1	Z6HKUSBQ200A000000XX	1SDA078967R1	ZDHKUSBQ200A000000XX
E6.2V-A	4000	100	100	E6.2V-A 4000 Ekip G Touch LSIG	1SDA078894R1	Z6VJURBN200A000000XX	1SDA079014R1	ZDVJURBN200A000000XX
				E6.2V-A 4000 Ekip G Hi-Touch LSIG	1SDA078897R1	Z6VJURBQ200A000000XX	1SDA079017R1	ZDVJURBQ200A000000XX
	5000	100	100	E6.2V-A 5000 Ekip G Touch LSIG	1SDA078904R1	Z6VKUSBN200A000000XX	1SDA079024R1	ZDVKUSBN200A000000XX
				E6.2V-A 5000 Ekip G Hi-Touch LSIG	1SDA078907R1	Z6VKUSBQ200A000000XX	1SDA079027R1	ZDVKUSBQ200A000000XX

Automatic circuit breakers
Fixed version for generators



SACE Emax 2 E6.2 H-A/f, V-A/f • Orientable rear terminals up to 5000A (HR)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	4 Poles	
					Global PN	US / CA PN
E6.2H-A/f	4000	85	85	E6.2H-A/f 4000 Ekip G Touch LSIG	1SDA079314R1	ZEHJURBN200A000000XX
				E6.2H-A/f 4000 Ekip G Hi-Touch LSIG	1SDA079317R1	ZEHJURBQ200A000000XX
	5000	85	85	E6.2H-A/f 5000 Ekip G Touch LSIG	1SDA079324R1	ZEHKUSBN200A000000XX
				E6.2H-A/f 5000 Ekip G Hi-Touch LSIG	1SDA079327R1	ZEHKUSBQ200A000000XX
E6.2V-A/f	4000	100	100	E6.2V-A/f 4000 Ekip G Touch LSIG	1SDA079374R1	ZEVJURBN200A000000XX
				E6.2V-A/f 4000 Ekip G Hi-Touch LSIG	1SDA079377R1	ZEVJURBQ200A000000XX
	5000	100	100	E6.2V-A/f 5000 Ekip G Touch LSIG	1SDA079384R1	ZEVKUSBN200A000000XX
				E6.2V-A/f 5000 Ekip G Hi-Touch LSIG	1SDA079387R1	ZEVKUSBQ200A000000XX

Automatic circuit breakers
Drawout version for generators



SACE Emax 2 E1.2 B-A, N-A, S-A • Mobile part of drawout circuit breaker (MP)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E1.2B-A	800	42	42	E1.2B-A 800 Ekip G Touch LSIG	1SDA077074R1	Z1BCUFAN200A000000XX	1SDA077154R1	ZABCUFAN200A000000XX
				E1.2B-A 800 Ekip G Hi-Touch LSIG	1SDA077077R1	Z1BCUFAQ200A000000XX	1SDA077157R1	ZABCUFAQ200A000000XX
	1200	42	42	E1.2B-A 1200 Ekip G Touch LSIG	1SDA077084R1	Z1BDUHAN200A000000XX	1SDA077164R1	ZABDUHAN200A000000XX
				E1.2B-A 1200 Ekip G Hi-Touch LSIG	1SDA077087R1	Z1BDUHAQ200A000000XX	1SDA077167R1	ZABDUHAQ200A000000XX
E1.2N-A	800	50	50	E1.2N-A 800 Ekip G Touch LSIG	1SDA077094R1	Z1NCUFAN200A000000XX	1SDA077174R1	ZANCUFAN200A000000XX
				E1.2N-A 800 Ekip G Hi-Touch LSIG	1SDA077097R1	Z1NCUFAQ200A000000XX	1SDA077177R1	ZANCUFAQ200A000000XX
	1200	50	50	E1.2N-A 1200 Ekip G Touch LSIG	1SDA077104R1	Z1NDUHAN200A000000XX	1SDA077184R1	ZANDUHAN200A000000XX
				E1.2N-A 1200 Ekip G Hi-Touch LSIG	1SDA077107R1	Z1NDUHAQ200A000000XX	1SDA077187R1	ZANDUHAQ200A000000XX
E1.2S-A	250	65	50	E1.2S-A 250 Ekip G Touch LSIG	1SDA077114R1	Z1SAUCAN200A000000XX	1SDA077194R1	ZASAUCAN200A000000XX
				E1.2S-A 250 Ekip G Hi-Touch LSIG	1SDA077117R1	Z1SAUCAQ200A000000XX	1SDA077197R1	ZASAUCAQ200A000000XX
	400	65	50	E1.2S-A 400 Ekip G Touch LSIG	1SDA077124R1	Z1SBUDAN200A000000XX	1SDA077204R1	ZASBUDAN200A000000XX
				E1.2S-A 400 Ekip G Hi-Touch LSIG	1SDA077127R1	Z1SBUDAQ200A000000XX	1SDA077207R1	ZASBUDAQ200A000000XX
	800	65	50	E1.2S-A 800 Ekip G Touch LSIG	1SDA077134R1	Z1SCUFAN200A000000XX	1SDA077214R1	ZASCUFAN200A000000XX
				E1.2S-A 800 Ekip G Hi-Touch LSIG	1SDA077137R1	Z1SCUFAQ200A000000XX	1SDA077217R1	ZASCUFAQ200A000000XX
	1200	65	50	E1.2S-A 1200 Ekip G Touch LSIG	1SDA077144R1	Z1SDUHAN200A000000XX	1SDA077224R1	ZASDUHAN200A000000XX
				E1.2S-A 1200 Ekip G Hi-Touch LSIG	1SDA077147R1	Z1SDUHAQ200A000000XX	1SDA077227R1	ZASDUHAQ200A000000XX

Automatic circuit breakers
Drawout version for generators



SACE Emax 2 E2.2 B-A, N-A, S-A, H-A, V-A • Mobile part of drawout circuit breaker (MP)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E2.2B-A	1600	42	42	E2.2B-A 1600 Ekip G Touch LSIG	1SDA077574R1	Z2BEUJAN200A000000XX	1SDA077744R1	ZBBEUJAN200A000000XX
				E2.2B-A 1600 Ekip G Hi-Touch LSIG	1SDA077577R1	Z2BEUJAQ200A000000XX	1SDA077747R1	ZBBEUJAQ200A000000XX
E2.2N-A	1600	50	50	E2.2N-A 1600 Ekip G Touch LSIG	1SDA077624R1	Z2NEUJAN200A000000XX	1SDA077794R1	ZBNEUJAN200A000000XX
				E2.2N-A 1600 Ekip G Hi-Touch LSIG	1SDA077627R1	Z2NEUJAQ200A000000XX	1SDA077797R1	ZBNEUJAQ200A000000XX
	2000	50	50	E2.2N-A 2000 Ekip G Touch LSIG	1SDA077634R1	Z2NFUKAN200A000000XX	1SDA077804R1	ZBNFUKAN200A000000XX
				E2.2N-A 2000 Ekip G Hi-Touch LSIG	1SDA077637R1	Z2NFUKAQ200A000000XX	1SDA077807R1	ZBNFUKAQ200A000000XX
E2.2S-A	800	65	65	E2.2S-A 800 Ekip G Touch LSIG	1SDA077644R1	Z2SCUFAN200A000000XX	1SDA077814R1	ZBSCUFAN200A000000XX
				E2.2S-A 800 Ekip G Hi-Touch LSIG	1SDA077647R1	Z2SCUFAQ200A000000XX	1SDA077817R1	ZBSCUFAQ200A000000XX
	1200	65	65	E2.2S-A 1200 Ekip G Touch LSIG	1SDA077654R1	Z2SDUHAN200A000000XX	1SDA077824R1	ZBSDUHAN200A000000XX
				E2.2S-A 1200 Ekip G Hi-Touch LSIG	1SDA077657R1	Z2SDUHAQ200A000000XX	1SDA077827R1	ZBSDUHAQ200A000000XX
	1600	65	65	E2.2S-A 1600 Ekip G Touch LSIG	1SDA077664R1	Z2SEUJAN200A000000XX	1SDA077834R1	ZBSEUJAN200A000000XX
				E2.2S-A 1600 Ekip G Hi-Touch LSIG	1SDA077667R1	Z2SEUJAQ200A000000XX	1SDA077837R1	ZBSEUJAQ200A000000XX
	2000	65	65	E2.2S-A 2000 Ekip G Touch LSIG	1SDA077674R1	Z2SFUKAN200A000000XX	1SDA077844R1	ZBSFUKAN200A000000XX
				E2.2S-A 2000 Ekip G Hi-Touch LSIG	1SDA077677R1	Z2SFUKAQ200A000000XX	1SDA077847R1	ZBSFUKAQ200A000000XX
E2.2H-A	800	85	85	E2.2H-A 800 Ekip G Touch LSIG	1SDA077584R1	Z2HCUFAN200A000000XX	1SDA077754R1	ZBHCUFAN200A000000XX
				E2.2H-A 800 Ekip G Hi-Touch LSIG	1SDA077587R1	Z2HCUFAQ200A000000XX	1SDA077757R1	ZBHCUFAQ200A000000XX
	1200	85	85	E2.2H-A 1200 Ekip G Touch LSIG	1SDA077594R1	Z2HDUHAN200A000000XX	1SDA077764R1	ZBHDUHAN200A000000XX
				E2.2H-A 1200 Ekip G Hi-Touch LSIG	1SDA077597R1	Z2HDUHAQ200A000000XX	1SDA077767R1	ZBHDUHAQ200A000000XX
	1600	85	85	E2.2H-A 1600 Ekip G Touch LSIG	1SDA077604R1	Z2HEUJAN200A000000XX	1SDA077774R1	ZBHEUJAN200A000000XX
				E2.2H-A 1600 Ekip G Hi-Touch LSIG	1SDA077607R1	Z2HEUJAQ200A000000XX	1SDA077777R1	ZBHEUJAQ200A000000XX
	2000	85	85	E2.2H-A 2000 Ekip G Touch LSIG	1SDA077614R1	Z2HFUKAN200A000000XX	1SDA077784R1	ZBHFUKAN200A000000XX
				E2.2H-A 2000 Ekip G Hi-Touch LSIG	1SDA077617R1	Z2HFUKAQ200A000000XX	1SDA077787R1	ZBHFUKAQ200A000000XX
E2.2V-A	250	100	85	E2.2V-A 250 Ekip G Touch LSIG	1SDA077684R1	Z2VAUCAN200A000000XX	1SDA077854R1	ZBVAUCAN200A000000XX
				E2.2V-A 250 Ekip G Hi-Touch LSIG	1SDA077687R1	Z2VAUCAQ200A000000XX	1SDA077857R1	ZBVAUCAQ200A000000XX
	400	100	85	E2.2V-A 400 Ekip G Touch LSIG	1SDA077694R1	Z2VBUDAN200A000000XX	1SDA077864R1	ZBVBUDAN200A000000XX
				E2.2V-A 400 Ekip G Hi-Touch LSIG	1SDA077697R1	Z2VBUDAQ200A000000XX	1SDA077867R1	ZBVBUDAQ200A000000XX
	800	100	85	E2.2V-A 800 Ekip G Touch LSIG	1SDA077704R1	Z2VCUFAN200A000000XX	1SDA077874R1	ZBVCUFAN200A000000XX
				E2.2V-A 800 Ekip G Hi-Touch LSIG	1SDA077707R1	Z2VCUFAQ200A000000XX	1SDA077877R1	ZBVCUFAQ200A000000XX
	1200	100	85	E2.2V-A 1200 Ekip G Touch LSIG	1SDA077714R1	Z2VDUHAN200A000000XX	1SDA077884R1	ZBVDUHAN200A000000XX
				E2.2V-A 1200 Ekip G Hi-Touch LSIG	1SDA077717R1	Z2VDUHAQ200A000000XX	1SDA077887R1	ZBVDUHAQ200A000000XX
	1600	100	85	E2.2V-A 1600 Ekip G Touch LSIG	1SDA077724R1	Z2VEUJAN200A000000XX	1SDA077894R1	ZBVEUJAN200A000000XX
				E2.2V-A 1600 Ekip G Hi-Touch LSIG	1SDA077727R1	Z2VEUJAQ200A000000XX	1SDA077897R1	ZBVEUJAQ200A000000XX
	2000	100	85	E2.2V-A 2000 Ekip G Touch LSIG	1SDA077734R1	Z2VFUKAN200A000000XX	1SDA077904R1	ZBVFUKAN200A000000XX
				E2.2V-A 2000 Ekip G Hi-Touch LSIG	1SDA077737R1	Z2VFUKAQ200A000000XX	1SDA077907R1	ZBVFUKAQ200A000000XX



SACE Emax 2 E4.2 S-A, H-A, V-A • Mobile part of drawout circuit breaker (MP)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E4.2S-A	2500	65	65	E4.2S-A 2500 Ekip G Touch LSIG	1SDA078464R1	Z4SGULAN200A000000XX	1SDA078694R1	ZCSGULAN200A000000XX
				E4.2S-A 2500 Ekip G Hi-Touch LSIG	1SDA078467R1	Z4SGULAQ200A000000XX	1SDA078697R1	ZCSGULAQ200A000000XX
	3200	65	65	E4.2S-A 3200 Ekip G Touch LSIG	1SDA078474R1	Z4SHUNAN200A000000XX	1SDA078704R1	ZCSHUNAN200A000000XX
				E4.2S-A 3200 Ekip G Hi-Touch LSIG	1SDA078477R1	Z4SHUNAQ200A000000XX	1SDA078707R1	ZCSHUNAQ200A000000XX
E4.2H-A	2500	85	85	E4.2H-A 2500 Ekip G Touch LSIG	1SDA078374R1	Z4HGULAN200A000000XX	1SDA078604R1	ZCHGULAN200A000000XX
				E4.2H-A 2500 Ekip G Hi-Touch LSIG	1SDA078377R1	Z4HGULAQ200A000000XX	1SDA078607R1	ZCHGULAQ200A000000XX
	3200 (1)	85	85	E4.2H-A 3200 Ekip G Touch LSIG	1SDA078384R1	Z4HHUNAN200A000000XX	1SDA078614R1	ZCHHUNAN200A000000XX
				E4.2H-A 3200 Ekip G Hi-Touch LSIG	1SDA078387R1	Z4HHUNAQ200A000000XX	1SDA078617R1	ZCHHUNAQ200A000000XX
E4.2V-A	800	100	85	E4.2V-A 800 Ekip G Touch LSIG	1SDA078494R1	Z4VCUFAN200A000000XX	1SDA078724R1	ZCVCUFAN200A000000XX
				E4.2V-A 800 Ekip G Hi-Touch LSIG	1SDA078497R1	Z4VCUFAQ200A000000XX	1SDA078727R1	ZCVCUFAQ200A000000XX
	1600	100	85	E4.2V-A 1600 Ekip G Touch LSIG	1SDA078504R1	Z4VEUJAN200A000000XX	1SDA078734R1	ZCVEUJAN200A000000XX
				E4.2V-A 1600 Ekip G Hi-Touch LSIG	1SDA078507R1	Z4VEUJAQ200A000000XX	1SDA078737R1	ZCVEUJAQ200A000000XX
	2000	100	85	E4.2V-A 2000 Ekip G Touch LSIG	1SDA078514R1	Z4VFUKAN200A000000XX	1SDA078744R1	ZCVFUKAN200A000000XX
				E4.2V-A 2000 Ekip G Hi-Touch LSIG	1SDA078517R1	Z4VFUKAQ200A000000XX	1SDA078747R1	ZCVFUKAQ200A000000XX
	2500	100	85	E4.2V-A 2500 Ekip G Touch LSIG	1SDA078524R1	Z4VGULAN200A000000XX	1SDA078754R1	ZCVGULAN200A000000XX
				E4.2V-A 2500 Ekip G Hi-Touch LSIG	1SDA078527R1	Z4VGULAQ200A000000XX	1SDA078757R1	ZCVGULAQ200A000000XX
	3200 (1)	100	85	E4.2V-A 3200 Ekip G Touch LSIG	1SDA078534R1	Z4VHUNAN200A000000XX	1SDA078764R1	ZCVHUNAN200A000000XX
				E4.2V-A 3200 Ekip G Hi-Touch LSIG	1SDA078537R1	Z4VHUNAQ200A000000XX	1SDA078767R1	ZCVHUNAQ200A000000XX

1) 3200A ratings only with rear vertical terminals
Contact local sales for availability for L version

Automatic circuit breakers
Drawout version for generators



SACE Emax 2 E6.2 H-A, V-A - Mobile part of drawout circuit breaker (MP)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E6.2H-A	4000	85	85	E6.2H-A 4000 Ekip G Touch LSIG	1SDA079074R1	Z6HJURAN200A000000XX	1SDA079194R1	ZDHJURAN200A000000XX
				E6.2H-A 4000 Ekip G Hi-Touch LSIG	1SDA079077R1	Z6HJURAQ200A000000XX	1SDA079197R1	ZDHJURAQ200A000000XX
	5000	85	85	E6.2H-A 5000 Ekip G Touch LSIG	1SDA079084R1	Z6HKUSAN200A000000XX	1SDA079204R1	ZDHKUSAN200A000000XX
				E6.2H-A 5000 Ekip G Hi-Touch LSIG	1SDA079087R1	Z6HKUSAQ200A000000XX	1SDA079207R1	ZDHKUSAQ200A000000XX
	6000 (1)	85	85	E6.2H-A 6000 Ekip G Touch LSIG	1SDA079094R1	Z6HLUTAN200A000000XX	1SDA079214R1	ZDHLUTAN200A000000XX
				E6.2H-A 6000 Ekip G Hi-Touch LSIG	1SDA079097R1	Z6HLUTAQ200A000000XX	1SDA079217R1	ZDHLUTAQ200A000000XX
E6.2V-A	4000	100	100	E6.2V-A 4000 Ekip G Touch LSIG	1SDA079134R1	Z6VJURAN200A000000XX	1SDA079254R1	ZDVJURAN200A000000XX
				E6.2V-A 4000 Ekip G Hi-Touch LSIG	1SDA079137R1	Z6VJURAQ200A000000XX	1SDA079257R1	ZDVJURAQ200A000000XX
	5000	100	100	E6.2V-A 5000 Ekip G Touch LSIG	1SDA079144R1	Z6VKUSAN200A000000XX	1SDA079264R1	ZDVKUSAN200A000000XX
				E6.2V-A 5000 Ekip G Hi-Touch LSIG	1SDA079147R1	Z6VKUSAQ200A000000XX	1SDA079265R1	ZDVKUSAJ200A000000XX
	6000 (1)	100	100	E6.2V-A 6000 Ekip G Touch LSIG	1SDA079154R1	Z6VLUTAN200A000000XX	-	-
				E6.2V-A 6000 Ekip G Hi-Touch LSIG	1SDA079157R1	Z6VLUTAQ200A000000XX	-	-

1) 6000A ratings only with rear vertical terminals.



SACE Emax 2 E6.2 H-A/f, V-A/f - Mobile part of drawout circuit breaker (MP)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	4 Poles	
					Global PN	US / CA PN
E6.2H-A/f	4000	85	85	E6.2H-A/f 4000 Ekip G Touch LSIG	1SDA079434R1	ZEHJURAN200A000000XX
				E6.2H-A/f 4000 Ekip G Hi-Touch LSIG	1SDA079437R1	ZEHJURAQ200A000000XX
	5000	85	85	E6.2H-A/f 5000 Ekip G Touch LSIG	1SDA079444R1	ZEHKUSAN200A000000XX
				E6.2H-A/f 5000 Ekip G Hi-Touch LSIG	1SDA079447R1	ZEHKUSAQ200A000000XX
	6000 (1)	85	85	E6.2H-A/f 6000 Ekip G Touch LSIG	1SDA079454R1	ZEHLUTAN200A000000XX
				E6.2H-A/f 6000 Ekip G Hi-Touch LSIG	1SDA079457R1	ZEHLUTAQ200A000000XX
E6.2V-A/f	4000	100	100	E6.2V-A/f 4000 Ekip G Touch LSIG	1SDA079494R1	ZEVJURAN200A000000XX
				E6.2V-A/f 4000 Ekip G Hi-Touch LSIG	1SDA079497R1	ZEVJURAQ200A000000XX
	5000	100	100	E6.2V-A/f 5000 Ekip G Touch LSIG	1SDA079504R1	ZEVKUSAN200A000000XX
				E6.2V-A/f 5000 Ekip G Hi-Touch LSIG	1SDA079507R1	ZEVKUSAQ200A000000XX
	6000 (1)	100	100	E6.2V-A/f 6000 Ekip G Touch LSIG	1SDA079514R1	ZEVLUTAN200A000000XX
				E6.2V-A/f 6000 Ekip G Hi-Touch LSIG	1SDA079517R1	ZEVLUTAQ200A000000XX

1) 6000A ratings only with rear vertical terminals.

Switch disconnectors
Fixed version



SACE Emax 2 E1.2 B-A/MS, N-A/MS • Front terminals (F)

Size	Frame Amps	Withstand (kA)	Type	3 Poles		4 Poles	
				Global PN	US / CA PN	Global PN	US / CA PN
E1.2B-A/MS	800	42	E1.2B-A/MS 800	1SDA079548R1	Z1BC00B000000000000XX	1SDA079552R1	ZABC00B000000000000XX
	1200	42	E1.2B-A/MS 1200	1SDA079549R1	Z1BD00B000000000000XX	1SDA079553R1	ZABD00B000000000000XX
E1.2N-A/MS	800	50	E1.2N-A/MS 800	1SDA079550R1	Z1NC00B000000000000XX	1SDA079554R1	ZANC00B000000000000XX
	1200	50	E1.2N-A/MS 1200	1SDA079551R1	Z1ND00B000000000000XX	1SDA079555R1	ZAND00B000000000000XX

About wall mount is standard; for floor fixing must order: 1SDA076020R1 ZE1FFPF



SACE Emax 2 E2.2 N-A/MS, S-A/MS, V-A/MS • Orientable rear terminals (HR)

Size	Frame Amps	Withstand (kA)	Type	3 Poles		4 Poles	
				Global PN	US / CA PN	Global PN	US / CA PN
E2.2N-A/MS	1600	50	E2.2N-A/MS 1600	1SDA079570R1	Z2NE00B000000000000XX	1SDA079578R1	ZBNE00B000000000000XX
	2000	50	E2.2N-A/MS 2000	1SDA079571R1	Z2NF00B000000000000XX	1SDA079579R1	ZBNF00B000000000000XX
E2.2S-A/MS	800	65	E2.2S-A/MS 800	1SDA079564R1	Z2SC00B000000000000XX	1SDA079572R1	ZBSC00B000000000000XX
	1600	65	E2.2S-A/MS 1600	1SDA079565R1	Z2SE00B000000000000XX	1SDA079573R1	ZBSE00B000000000000XX
	2000	65	E2.2S-A/MS 2000	1SDA079566R1	Z2SF00B000000000000XX	1SDA079574R1	ZBSF00B000000000000XX
E2.2V-A/MS	800	85	E2.2V-A/MS 800	1SDA079567R1	Z2VC00B000000000000XX	1SDA079575R1	ZBVC00B000000000000XX
	1600	85	E2.2V-A/MS 1600	1SDA079568R1	Z2VE00B000000000000XX	1SDA079576R1	ZBVE00B000000000000XX
	2000	85	E2.2V-A/MS 2000	1SDA079569R1	Z2VF00B000000000000XX	1SDA079577R1	ZBVF00B000000000000XX



SACE Emax 2 E4.2 S-A/MS, H-A/MS, V-A/MS • Orientable rear terminals up to 2500A (HR)

Size	Frame Amps	Withstand (kA)	Type	3 Poles		4 Poles	
				Global PN	US / CA PN	Global PN	US / CA PN
E4.2S-A/MS	2500	65	E4.2S-A/MS 2500	1SDA079596R1	Z4SG00B000000000000XX	1SDA079612R1	ZCSG00B000000000000XX
	3200 (1)	65	E4.2S-A/MS 3200	1SDA079597R1	Z4SH00B000000000000XX	1SDA079613R1	ZCSH00B000000000000XX
	3600 (1)	65	E4.2S-A/MS 3600	1SDA079598R1	Z4SZ00B000000000000XX	-	-
E4.2H-A/MS	2500	85	E4.2H-A/MS 2500	1SDA081867R1	Z4HG00B000000000000XX	1SDA081872R1	ZCHG00B000000000000XX
	3200 (1)	85	E4.2H-A/MS 3200	1SDA081868R1	Z4HH00B000000000000XX	1SDA081873R1	ZCHG00B000000000000XX
	3600 (1)	85	E4.2H-A/MS 3600	1SDA079611R1	Z4HZ00B000000000000XX	-	-
E4.2V-A/MS	800	100	E4.2V-A/MS 800	1SDA081864R1	Z4VC00B000000000000XX	1SDA081869R1	ZCVC00B000000000000XX
	1600	100	E4.2V-A/MS 1600	1SDA081865R1	Z4VE00B000000000000XX	1SDA081870R1	ZCVE00B000000000000XX
	2000	100	E4.2V-A/MS 2000	1SDA081866R1	Z4VF00B000000000000XX	1SDA081871R1	ZCVF00B000000000000XX
	2500	100	E4.2V-A/MS 2500	1SDA079602R1	Z4VG00B000000000000XX	1SDA079618R1	ZCVG00B000000000000XX
	3200 (1)	100	E4.2V-A/MS 3200	1SDA079603R1	Z4VH00B000000000000XX	1SDA079619R1	ZCVH00B000000000000XX
	3600 (1)	100	E4.2V-A/MS 3600	1SDA079604R1	Z4VZ00B000000000000XX	-	-

1) 3200/3600A ratings only with rear vertical terminals



SACE Emax 2 E6.2 L-A/MS • Orientable rear terminals up to 5000A (HR)

Size	Frame Amps	Withstand (kA)	Type	3 Poles		4 Poles	
				Global PN	US / CA PN	Global PN	US / CA PN
E6.2L-A/MS	4000	100	E6.2L-A/MS 4000	1SDA079660R1	Z6LJ00B000000000000XX	1SDA079666R1	ZDLJ00B000000000000XX
	5000	100	E6.2L-A/MS 5000	1SDA079661R1	Z6LK00B000000000000XX	1SDA079667R1	ZDLK00B000000000000XX

SACE Emax 2 E6.2 L-A/f/MS • Orientable rear terminals up to 5000A (HR)

Size	Frame Amps	Withstand (kA)	Type	4 Poles	
				Global PN	US / CA PN
E6.2L-A/f/MS	4000	100	E6.2L-A/f/MS 4000	1SDA079684R1	ZDLJ00B000000000000XX
	5000	100	E6.2L-A/f/MS 5000	1SDA079685R1	ZDLK00B000000000000XX

Switch disconnectors
Drawout version



SACE Emax 2 E1.2 B-A/MS, N-A/MS • Mobile part of switch disconnector (MP)

Size	Frame Amps	Withstand (kA)	Type	3 Poles		4 Poles	
				Global PN	US / CA PN	Global PN	US / CA PN
E1.2B-A/MS	800	42	E1.2B-A/MS 800	1SDA079556R1	Z1BC00A000000000000XX	1SDA079560R1	ZABC00A000000000000XX
	1200	42	E1.2B-A/MS 1200	1SDA079557R1	Z1BD00A000000000000XX	1SDA079561R1	ZABD00A000000000000XX
E1.2N-A/MS	800	50	E1.2N-A/MS 800	1SDA079558R1	Z1NC00A000000000000XX	1SDA079562R1	ZANC00A000000000000XX
	1200	50	E1.2N-A/MS 1200	1SDA079559R1	Z1ND00A000000000000XX	1SDA079563R1	ZAND00A000000000000XX



SACE Emax 2 E2.2 N-A/MS, S-A/MS, V-A/MS • Mobile part of switch disconnector (MP)

Size	Frame Amps	Withstand (kA)	Type	3 Poles		4 Poles	
				Global PN	US / CA PN	Global PN	US / CA PN
E2.2N-A/MS	1600	50	E2.2N-A/MS 1600	1SDA079586R1	Z2NE00A000000000000XX	1SDA079594R1	ZBNE00A000000000000XX
	2000	50	E2.2N-A/MS 2000	1SDA079587R1	Z2NF00A000000000000XX	1SDA079595R1	ZBNF00A000000000000XX
E2.2S-A/MS	800	65	E2.2S-A/MS 800	1SDA079580R1	Z2SC00A000000000000XX	1SDA079588R1	ZBSC00A000000000000XX
	1600	65	E2.2S-A/MS 1600	1SDA079581R1	Z2SE00A000000000000XX	1SDA079589R1	ZBSE00A000000000000XX
	2000	65	E2.2S-A/MS 2000	1SDA079582R1	Z2SF00A000000000000XX	1SDA079590R1	ZBSF00A000000000000XX
E2.2V-A/MS	800	85	E2.2V-A/MS 800	1SDA079583R1	Z2VC00A000000000000XX	1SDA079591R1	ZBVC00A000000000000XX
	1600	85	E2.2V-A/MS 1600	1SDA079584R1	Z2VE00A000000000000XX	1SDA079592R1	ZBVE00A000000000000XX
	2000	85	E2.2V-A/MS 2000	1SDA079585R1	Z2VF00A000000000000XX	1SDA079593R1	ZBVF00A000000000000XX



SACE Emax 2 E4.2 S-A/MS, H-A/MS, V-A/MS • Mobile part of switch disconnector (MP)

Size	Frame Amps	Withstand (kA)	Type	3 Poles		4 Poles	
				Global PN	US / CA PN	Global PN	US / CA PN
E4.2S-A/MS	2500	65	E4.2S-A/MS 2500	1SDA079628R1	Z4SG00A000000000000XX	1SDA079644R1	ZCSG00A000000000000XX
	3200	65	E4.2S-A/MS 3200	1SDA079629R1	Z4SH00A000000000000XX	1SDA079645R1	ZCSH00A000000000000XX
E4.2H-A/MS	2500	85	E4.2H-A/MS 2500	1SDA081877R1	Z4HG00A000000000000XX	1SDA081882R1	ZCHG00A000000000000XX
	3200	85	E4.2H-A/MS 3200	1SDA081878R1	Z4HH00A000000000000XX	1SDA081883R1	ZCHH00A000000000000XX
E4.2V-A/MS	800	100	E4.2V-A/MS 800	1SDA081874R1	Z4VC00A000000000000XX	1SDA081879R1	ZCVC00A000000000000XX
	1600	100	E4.2V-A/MS 1600	1SDA081875R1	Z4VE00A000000000000XX	1SDA081880R1	ZCVE00A000000000000XX
	2000	100	E4.2V-A/MS 2000	1SDA081876R1	Z4VF00A000000000000XX	1SDA081881R1	ZCVF00A000000000000XX
	2500	100	E4.2V-A/MS 2500	1SDA079634R1	Z4VG00A000000000000XX	1SDA079650R1	ZCVG00A000000000000XX
	3200	100	E4.2V-A/MS 3200	1SDA079635R1	Z4VH00A000000000000XX	1SDA079651R1	ZCVH00A000000000000XX



SACE Emax 2 E6.2 L-A/MS • Mobile part of switch disconnector (MP)

Size	Frame Amps	Withstand (kA)	Type	3 Poles		4 Poles	
				Global PN	US / CA PN	Global PN	US / CA PN
E6.2L-A/MS	4000	100	E6.2L-A/MS 4000	1SDA079672R1	Z6LJ00A000000000000XX	1SDA079678R1	ZDLJ00A000000000000XX
	5000	100	E6.2L-A/MS 5000	1SDA079673R1	Z6LK00A000000000000XX	1SDA079679R1	ZDLK00A000000000000XX
	6000 (1)	100	E6.2L-A/MS 6000	1SDA079674R1	Z6LL00A000000000000XX	-	-

1) 6000A ratings only with rear vertical terminals.

SACE Emax 2 E6.2 L-A/f/MS • Mobile part of switch disconnector (MP)

Size	Frame Amps	Withstand (kA)	Type	4 Poles	
				Global PN	US / CA PN
E6.2L-A/f/MS	4000	100	E6.2L-A/f/MS 4000	1SDA079690R1	ZELJ00A000000000000XX
	5000	100	E6.2L-A/f/MS 5000	1SDA079691R1	ZELK00A000000000000XX

Circuit breakers

Multi-Standard: IEC 60947 / UL1066 / CSA / CCC

Size	Performance	Description	3 Poles		4 Poles	
			Global PN	US / CA PN	Global PN	US / CA PN
E2.2	B	Triple certific: UL/IEC/CCC E2.2B-A EXT	1SDA083020R1	Factory installed only	1SDA083020R1	Factory installed only
E2.2	N	Triple certific: UL/IEC/CCC E2.2N-A EXT	1SDA083021R1	Factory installed only	1SDA083021R1	Factory installed only
E2.2	S	Triple certific: UL/IEC/CCC E2.2S-A EXT	1SDA083022R1	Factory installed only	1SDA083022R1	Factory installed only
E2.2	H	Triple certific: UL/IEC/CCC E2.2H-A EXT	1SDA083023R1	Factory installed only	1SDA083023R1	Factory installed only
E2.2	V	Triple certific: UL/IEC/CCC E2.2V-A EXT	1SDA083024R1	Factory installed only	1SDA083024R1	Factory installed only
E4.2	S	Triple certific: UL/IEC/CCC E4.2S-A EXT	1SDA083025R1	Factory installed only	1SDA083025R1	Factory installed only
E4.2	H	Triple certific: UL/IEC/CCC E4.2H-A EXT	1SDA083026R1	Factory installed only	1SDA083026R1	Factory installed only
E4.2	V	Triple certific: UL/IEC/CCC E4.2V-A EXT	1SDA083027R1	Factory installed only	1SDA083027R1	Factory installed only
E6.2	V	Triple certific: UL/IEC/CCC E6.2V-A EXT	1SDA083028R1	Factory installed only	1SDA083028R1	Factory installed only

The multiple-standard Emax2 can be ordered Iin the same way you accessories are ordered:
1. Select the right UL circuit breaker you need;
2. Like an accessory configuration, upgrade the circuit breaker with multi-standard performance by adding the code shown above.

Cradles

With terminals






Size	Performance	Amperage range	Terminal type	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E1.2	B-A, N-A, S-A	250 - 1200	HR - HR	E1.2-A W FP Iu=1200 HR HR UL	1SDA079696R1	Z1A12A0XX	1SDA079697R1	ZAA12A0XX
E2.2	B-A, N-A, S-A, H-A, V-A	250 - 2000	HR - HR	E2.2-A W FP Iu=2000 HR HR UL	1SDA079698R1	Z2A20A0XX	1SDA079699R1	ZBA20A0XX
E4.2	S-A, H-A, V-A, L-A	800 - 2500	HR - HR	E4.2-A W FP Iu=2500 HR HR UL	1SDA079700R1	Z4A25A0XX	1SDA079701R1	ZCA25A0XX
	S-A, H-A, V-A, L-A	3200	VR-VR	E4.2-A W FP Iu=3200 VR VR UL	1SDA079702R1	Z4A32A0XX	1SDA079703R1	ZCA32A0XX
E6.2	H-A, V-A, L-A	4000 - 5000	HR - HR	E6.2-A W FP Iu=5000 HR HR UL	1SDA079706R1	Z6A50A0XX	1SDA079707R1	ZDA50A0XX
				E6.2-A/f W FP Iu=5000 HR HR UL	-	-	1SDA079708R1	ZEA50A0XX
	H-A, V-A, L-A	6000	VR - VR	E6.2-A W FP Iu=6000 VR VR UL	1SDA079709R1	Z6A60A0XX	-	-

Without terminals






Size	Performance	Amperage range	Terminal type	Type	3 Poles		4 Poles	
					Global PN	US / CA PN	Global PN	US / CA PN
E1.2	B-A, N-A, S-A	250-1200	None	E1.2-A W FP Iu=1200	1SDA118019R1	Z1A1200XX	1SDA118020R1	ZAA1200XX
E2.2	B-A, N-A, S-A, H-A, V-A	250-2000	None	E2.2-A W FP Iu=2000	1SDA118021R1	Z2A2000XX	1SDA118022R1	ZBA2000XX
E4.2	S-A, H-A, V-A	800-2500	None	E4.2-A W FP Iu=2500	1SDA118023R1	Z4A2500XX	1SDA118024R1	ZCA2500XX
	S-A, H-A, V-A	3200 (only)	None	E4.2-A W FP Iu=3200	1SDA118025R1	Z4A3200XX	1SDA118026R1	ZCA3200XX
E6.2	H-A, V-A	4000-5000	None	E6.2-A W FP Iu=5000	1SDA118029R1	Z6A5000XX	1SDA118028R1	ZDA5000XX
				E6.2-A/f W FP Iu=5000	-	-	1SDA118030R1	ZEA5000XX
	H-A, V-A	6000 (only)	None	E6.2-A W FP Iu=6000	1SDA118027R1	Z6A6000XX	-	-

Accessories

Electrical accessories



First and second shunt coil - YO

Size	Type	Global PN	US / CA PN
E1.2..E6.2	YO E1.2..E6.2 24 Vac/dc	1SDA073668R1	ZEASA
E1.2..E6.2	YO E1.2..E6.2 30 Vac/dc	1SDA073669R1	ZEASB
E1.2..E6.2	YO E1.2..E6.2 48 Vac/dc	1SDA073670R1	ZEASC
E1.2..E6.2	YO E1.2..E6.2 60 Vac/dc	1SDA073671R1	ZEASD
E1.2..E6.2	YO E1.2..E6.2 110-120 Vac/dc	1SDA073672R1	ZEASE
E1.2..E6.2	YO E1.2..E6.2 120-127 Vac/dc	1SDA073673R1	ZEASF
E1.2..E6.2	YO E1.2..E6.2 220-240 Vac/dc	1SDA073674R1	ZEASG
E1.2..E6.2	YO E1.2..E6.2 240-250 Vac/dc	1SDA073675R1	ZEASH
E1.2..E6.2	YO E1.2..E6.2 380-400 Vac	1SDA073677R1	ZEASK
E1.2..E6.2	YO E1.2..E6.2 415-440 Vac	1SDA073678R1	ZEASL
E1.2..E6.2	YO E1.2..E6.2 480-500 Vac	1SDA073679R1	ZEASM

Second shunt coils are an alternative to a UVR or anti-racking out device (fail safe)

First and second closing coil - YC

Size	Type	Global PN	US / CA PN
E1.2..E6.2	YC E1.2..E6.2 24 Vac/dc	1SDA073681R1	ZEACA
E1.2..E6.2	YC E1.2..E6.2 30 Vac/dc	1SDA073682R1	ZEACB
E1.2..E6.2	YC E1.2..E6.2 48 Vac/dc	1SDA073683R1	ZEACC
E1.2..E6.2	YC E1.2..E6.2 60 Vac/dc	1SDA073684R1	ZEACD
E1.2..E6.2	YC E1.2..E6.2 110-120 Vac/dc	1SDA073685R1	ZEACE
E1.2..E6.2	YC E1.2..E6.2 120-127 Vac/dc	1SDA073686R1	ZEACF
E1.2..E6.2	YC E1.2..E6.2 220-240 Vac/dc	1SDA073687R1	ZEACG
E1.2..E6.2	YC E1.2..E6.2 240-250 Vac/dc	1SDA073688R1	ZEACH
E1.2..E6.2	YC E1.2..E6.2 380-400 Vac	1SDA073690R1	ZEACK
E1.2..E6.2	YC E1.2..E6.2 415-440 Vac	1SDA073691R1	ZEACL
E1.2..E6.2	YC E1.2..E6.2 480-500 Vac	1SDA073692R1	ZEACM

Shunt coil and closing coil test unit - YO/YC Test Unit (IEC only)

Size	Type	Global PN	US / CA PN
E1.2..E6.2	YO/YC test unit E1.2...E6.2	1SDA082751R1	ZEAYOYCT

Undervoltage coil - YU

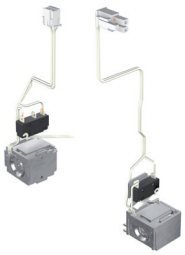
Size	Type	Global PN	US / CA PN
E1.2..E6.2	YU E1.2..E6.2 24 Vac/dc	1SDA073694R1	ZEAUA
E1.2..E6.2	YU E1.2..E6.2 30 Vac/dc	1SDA073695R1	ZEAUB
E1.2..E6.2	YU E1.2..E6.2 48 Vac/dc	1SDA073696R1	ZEAUC
E1.2..E6.2	YU E1.2..E6.2 60 Vac/dc	1SDA073697R1	ZEAUD
E1.2..E6.2	YU E1.2..E6.2 110-120 Vac/dc	1SDA073698R1	ZEAUE
E1.2..E6.2	YU E1.2..E6.2 120-127 Vac/dc	1SDA073699R1	ZEAUF
E1.2..E6.2	YU E1.2..E6.2 220-240 Vac/dc	1SDA073700R1	ZEAUG
E1.2..E6.2	YU E1.2..E6.2 240-250 Vac/dc	1SDA073701R1	ZEAUH
E1.2..E6.2	YU E1.2..E6.2 380-400 Vac	1SDA073703R1	ZEAUK
E1.2..E6.2	YU E1.2..E6.2 415-440 Vac	1SDA073704R1	ZEAUL
E1.2..E6.2	YU E1.2..E6.2 440-500 Vac	1SDA073705R1	ZEAUM

The undervoltage coil is an alternative to a second shunt coil or anti-racking out device (fail safe)

Electronic time-delay device for undervoltage coil - UVD

Size	Type	Global PN	US / CA PN
E1.2..E6.2	24-30 Vdc	1SDA038316R1	ZEATL9
E1.2..E6.2	48 Vac/dc	1SDA038317R1	ZEATL8
E1.2..E6.2	60 Vac/dc	1SDA038318R1	ZEATL7
E1.2..E6.2	110...127 Vac/dc	1SDA038319R1	ZEATL5
E1.2..E6.2	220...250 Vac/dc	1SDA038320R1	ZEATL3

The electronic time-delay device must be used with an undervoltage coil with the same voltage



Remote reset - YR

Size	Type	Global PN	US / CA PN
E1.2	YR 24 Vdc E1.2	1SDA073744R1	ZE1YRA
E1.2	YR 110 Vac/dc E1.2	1SDA073745R1	ZE1YRB
E1.2	YR 220 Vac/dc E1.2	1SDA073746R1	ZE1YRC
E2.2..E6.2	YR 24 Vdc E2.2...E6.2	1SDA073747R1	ZEBYRA
E2.2..E6.2	YR 110 Vac/dc E2.2...E6.2	1SDA073748R1	ZEBYRB
E2.2..E6.2	YR 220 Vac/Dc E2.2...E6.2	1SDA073749R1	ZEBYRC

When the remote reset is used in DC, its activation must be done with a maximum impluse time of 50ms. It can not be powered permanently.

Accessories

Electrical accessories





Motor - M

Size	Type	Global PN	US / CA PN
E1.2	M E1.2 24-30 Vac/dc + MC 250V	1SDA073708R1	ZE1M2
E1.2	M E1.2 48-60 Vac/dc + MC 250V	1SDA073709R1	ZE1M3
E1.2	M E1.2 100-130 Vac/dc + MC 250V	1SDA073710R1	ZE1M4
E1.2	M E1.2 220-250 Vac/dc + MC 250V	1SDA073711R1	ZE1M5
E1.2	M E1.2 380-415 Vac + MC 250V	1SDA073713R1	ZE1M7
E2.2..E6.2	M E2.2...E6.2 24-30 Vac/dc + MC 400V	1SDA073722R1	ZEBM2
E2.2..E6.2	M E2.2...E6.2 48-60 Vac/dc + MC 400V	1SDA073723R1	ZEBM3
E2.2..E6.2	M E2.2...E6.2 100-130 Vac/dc + MC 400V	1SDA073724R1	ZEBM4
E2.2..E6.2	M E2.2...E6.2 220-250 Vac/dc + MC 400V	1SDA073725R1	ZEBM5
E2.2..E6.2	M E2.2...E6.2 380-415 Vac + MC 400V	1SDA073727R1	ZEBM7
E1.2	M E1.2 24-30 Vac/dc + MC 24V	1SDA073715R1	ZE1MA
E1.2	M E1.2 48-60 Vac/dc + MC 24V	1SDA073716R1	ZE1MB
E1.2	M E1.2 100-130 Vac/dc + MC 24V	1SDA073717R1	ZE1MC
E1.2	M E1.2 220-250 Vac/dc + MC 24V	1SDA073718R1	ZE1MD
E1.2	M E1.2 380-415 Vac + MC 24V	1SDA073720R1	ZE1MF
E2.2..E6.2	M E2.2...E6.2 24-30 Vac/dc + MC 24V	1SDA073729R1	ZEBMA
E2.2..E6.2	M E2.2...E6.2 48-60 Vac/dc + MC 24V	1SDA073730R1	ZEBMB
E2.2..E6.2	M E2.2...E6.2 100-130 Vac/dc + MC 24V	1SDA073731R1	ZEBMC
E2.2..E6.2	M E2.2...E6.2 220-250 Vac/dc + MC 24V	1SDA073732R1	ZEBMD



Current sensor for external neutral

Size	Type	Global PN	US / CA PN
E1.2-E2.2	Ext CS N E1.2 - E2.2	1SDA082134R1	ZE1NCT
E4.2-E6.2	Ext CS N E4.2-E6.2 50%	1SDA082135R1	ZE6NCT
E6.2 FS	Ext CS N E6.2 100%	1SDA082136R1	ZE6NCTF
E1.2-E2.2	Ext CS N E1.2 - E2.2 2000A for 1% CB (1) (2)	1SDA107553R1	ZE1NCTE1PCT
E2.2	Ext CS N E2.2 2500A for 1% CB (1) (2)	1SDA107554R1	ZE2NCT1PCT
E4.2	Ext CS N E4.2 3200A for 1% CB (1) (2)	1SDA107555R1	ZE4NCT1PCT
E4.2-E6.2	Ext CS N E4.2 4000A - E6.2 N 50% for 1% CB (1) (2)	1SDA107556R1	ZE6NCTE1PCT
E6.2	Ext CS N E6.2 for 1% CB (1) (2)	1SDA107557R1	ZE6NCTFE1PCT
E1.2-E2.2	Ext CS N E1.2 - E2.2 UL for 1% CB (2)	1SDA107558R1	ZE1NCT1PCT
E4.2-E6.2	Ext CS N E4.2 - E6.2 50% UL for 1% CB (2)	1SDA107559R1	ZE6NCT1PCT
E6.2 FS	Ext CS N E6.2 100% UL for 1% CB (2)	1SDA107560R1	ZE6NCTF1PCT

1) IEC only 2) To be used with circuit-breakers equipped with 1% accuracy feature. The external neutral is not certified for 1% accuracy.



Homopolar toroid for the earthing conductor of the main power supply (Transformer star center sensor input)

Size	Type	Global PN	US / CA PN
E1.2..E6.2	Homopolar toroid E1.2...E6.2 100A (1)	1SDA073743R1	ZEAHT100
E1.2..E6.2	Homopolar toroid E1.2...E6.2 250A (1)	1SDA076248R1	ZEAHT250
E1.2..E6.2	Homopolar toroid E1.2...E6.2 400A (1)	1SDA076249R1	ZEAHT400
E1.2..E6.2	Homopolar toroid E1.2...E6.2 800A (1)	1SDA076250R1	ZEAHT800

The homopolar toroid is an alternative to the toroid for differential protection; 1) Only as loose part



Toroid for differential protection (Rc residual current protection sensor input) (IEC only)

Size	Type	Global PN	US / CA PN
E1.2 & E2.2 3p	Toroid RC E1.2, E2.2 3p (1)	1SDA073741R1	ZE12RCT1
E2.2 4p & E4.2	Toroide RC E2 4p, E4.2 (1)	1SDA073742R1	ZE24RCT2

The toroid for differential protection is an alternative to the homopolar toroid for the earthing conductor of the main power supply;
1) Only as loose part

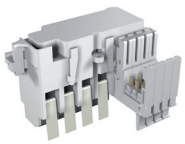


Dedicated terminal for Modified Differential Ground Fault (MDGF) protection

Size	Type	Global PN	US / CA PN
E1.2..E6.2	MDGF Terminal for fixed circuit breaker (1)	1SDA114800R1	ZEAMDGFF
E1.2..E6.2	MDGF Terminal for withdrawable circuit breaker (1)	1SDA114798R1	ZEAMDGFW

1) The commercial code includes one piece.
External phase current transformers and summing current transformers must be purchased separately.









Open closed auxiliary contacts - AUX

Size	Type	Global PN	US / CA PN
E1.2	AUX 4Q (4 Form C) 400V E1.2 (4)	1SDA073750R1	ZE1AUX4
E1.2	AUX 4Q (4 Form C) 24V E1.2	1SDA073751R1	ZE1AUX4D
E1.2	AUX 2Q (2 Form C) 400V + 2Q (2 Form C) 24V E1.2	1SDA073752R1	ZE1AUX2-2D
E2.2..E6.2	AUX 4Q (4 Form C) 400V E2.2...E6.2 (4)	1SDA073753R1	ZEBAUX4
E2.2..E6.2	AUX 4Q (4 Form C) 24V E2.2...E6.2	1SDA073754R1	ZEBAUX4D
E2.2..E6.2	AUX 2Q (2 Form C) 400V + 2Q (2 Form C) 24V E2.2...E6.2	1SDA073755R1	ZEBAUX2-2D
E2.2..E6.2	AUX 6Q 400V E2.2...E6.2 (1) (5)	1SDA073756R1	ZEBAUX6
E2.2..E6.2	AUX 6Q 24V E2.2...E6.2 (1) (5)	1SDA073757R1	ZEBAUX6D
E2.2..E6.2	AUX 3Q (3 Form C) 400V + 3Q (3 Form C) 24V E2.2...E6.2 (1) (5)	1SDA075973R1	ZEBAUX3-3D
E2.2..E6.2	AUX 6Q 400Vac E2.2...E6.2 F (6)	1SDA123475R1	ZEBAUX6F
E2.2..E6.2	AUX 6Q 24V E2.2...E6.2 F (6)	1SDA123476R1	ZEBAUX6DF
E2.2..E6.2	AUX 3Q 400Vac + 3Q 24Vdc E2.2...E6.2 F (6)	1SDA123477R1	ZEBAUX3-3DF
E2.2..E6.2	AUX 6Q 400Vac E2.2...E6.2 W (6)	1SDA123748R1	ZEBAUX6W
E2.2..E6.2	AUX 6Q 24V E2.2...E6.2 W (6)	1SDA123749R1	ZEBAUX6DW
E2.2..E6.2	AUX 3Q 400Vac + 3Q 24Vdc E2.2...E6.2 W (6)	1SDA123750R1	ZEBAUX3-3DW
E1.2	AUX 15Q (15 Form C) 400V E1.2 (2) (3)	1SDA073758R1	ZE1AUX15
E1.2	AUX 15Q (15 Form C) 24V E1.2 (2) (3)	1SDA073759R1	ZE1AUX15D
E2.2..E6.2	AUX 15Q (15 Form C) 400V (for fixed/drawout with signalling in racked in) E2.2...E6.2 (2) (3)	1SDA073760R1	ZEBAUX15
E2.2..E6.2	AUX 15Q (15 Form C) 24V (for fixed/drawout with signalling in racked in) E2.2...E6.2 (2) (3)	1SDA073761R1	ZEBAUX15D
E2.2..E6.2	AUX 15Q (15 Form C) 400V (for fixed/drawout with signalling in racked in/test isolated) E2.2...E6.2 (2) (3)	1SDA073846R1	ZEBAUX15RT
E2.2..E6.2	AUX 15Q (15 Form C) 24V (for fixed/drawout with signalling in racked in/test isolated) E2.2...E6.2 (2) (3)	1SDA073847R1	ZEBAUX15DRT

1) AUX 6Q (6 Form C) is an alternative to the Ekip Signalling 4k module
2) Aux 15 Q (15 Form C) is an alternative to the Mechanical interlock (MI), the lock to prevent door opening when the circuit breaker is in the closed position (DLC) or the lock to prevent door opening when the circuit breaker is in the racked in or test position (DCP) when mounted on the right side. For E1.2 one of the mounting plates is also needed. For E1.2 you need to order also one of the following items:
Plate for fixed - floor mounted 1SDA079783R1 ZE1AUX15PLF; Plate for fixed - wall mounted 1SDA079782R1 ZE1AUX15PLW
Plate for withdrawable 1SDA079784R1 ZE1AUX15PLMP
3) Not compatible with mechanical locks on compartment doors or mechanical interlocks
4) Standard supply with automatic circuit-breakers
5) Factory fitted only
6) Only as loose part

Accessories

Electrical accessories



Auxiliary position contacts - AUP

Size	Type	Global PN	US / CA PN
E1.2	AUP 6 contacts 400V E1.2	1SDA073762R1	ZE1AUP
E1.2	AUP 6 contacts 24V E1.2	1SDA073763R1	ZE1AUPD
E2.2...E6.2	AUP 5 contacts 400V E2.2...E6.2 - left set	1SDA080373R1	ZEBAUP-L
E2.2...E6.2	AUP 5 contacts 24V E2.2...E6.2 - left set	1SDA080374R1	ZEBAUPD-L
E2.2...E6.2	AUP 5 suppl. contacts 400V E2.2...E6.2 - right set	1SDA080375R1	ZEBAUP-R
E2.2...E6.2	AUP 5 suppl. contacts 24V E2.2...E6.2 - right set	1SDA080376R1	ZEBAUPD-R
E1.2...E6.2	AUP Ekip auxiliary position contact E1.2...E6.2	1SDA073768R1	ZEAAUPE



Ready to close signalling contact - RTC

Size	Type	Global PN	US / CA PN
E1.2	RTC 250V E1.2	1SDA073770R1	ZE1RTC
E1.2	RTC 24V E1.2	1SDA073771R1	ZE1RTCD
E1.2	RTC Ekip 24V E1.2	1SDA073772R1	ZE1RTCDE
E2.2...E6.2	RTC 250V E2.2...E6.2	1SDA073773R1	ZEBRTC
E2.2...E6.2	RTC 24V E2.2...E6.2	1SDA073774R1	ZEBRTCD
E2.2...E6.2	RTC Ekip 24V E2.2...E6.2	1SDA073775R1	ZEBRTCDE



Trip signalling contact - S51 / bell alarm

Size	Type	Global PN	US / CA PN
E1.2	S51 / bell alarm 250V E1.2 (1)	1SDA073776R1	ZE1BA
E1.2	S51 / bell alarm 24V E1.2	1SDA073777R1	ZE1BAD
E2.2...E6.2	S51 / bell alarm 250V E2.2...E6.2 (1)	1SDA073778R1	ZEBBA
E2.2...E6.2	S51 / bell alarm 24V E2.2...E6.2	1SDA073779R1	ZEBBAD
E2.2...E6.2	250V E2.2...E6.2	1SDA085699R1	ZEBBA2
E2.2...E6.2	24V E2.2...E6.2	1SDA085700R1	ZEBBAD2

1) Standard supply with automatic circuit-breakers

Terminal blocks for auxiliary connection

Size	Type	Global PN	US / CA PN
E1.2..E6.2	Terminal blocks 10 pcs	1SDA073906R1	ZEATB10
E1.2..E6.2	Terminal blocks 8 pcs INST	1SDA114779R1	
E1.2..E6.2	Terminal blocks 18 pcs INST	1SDA114780R1	

Accessories

Mechanical accessories



Mechanical operation counter - MOC

Size	Type	Global PN	US / CA PN
E1.2	MOC mechanical operation counter (1)	1SDA073780R1	ZE1MOC
E2.2...E6.2	MOC mechanical operation counter	1SDA073781R1	ZEBMOC

1) Only available with motor



Key lock in open position - KLC

Size	Type	Global PN	US / CA PN
E1.2	KLC-D Key lock open E1.2	1SDA073782R1	ZE1KLCD
E1.2	KLC-S Key lock open N.20005 E1.2	1SDA073783R1	ZE1KLCS5
E1.2	KLC-S Key lock open N.20006 E1.2	1SDA073784R1	ZE1KLCS6
E1.2	KLC-S Key lock open N.20007 E1.2	1SDA073785R1	ZE1KLCS7
E1.2	KLC-S Key lock open N.20008 E1.2	1SDA073786R1	ZE1KLCS8
E1.2	KLC-S Key lock open N.20009 E1.2	1SDA073787R1	ZE1KLCS9
E1.2	KLC-A Key lock open Castell E1.2 (1) (2)	1SDA073788R1	ZE1KLAC
E1.2	KLC-A Key lock open Kirk E1.2 (1)	1SDA073789R1	ZE1KLAK
E1.2	KLC-A Key lock open Ronis Profalux E1.2 (1)	1SDA073790R1	ZE1KLAR
E2.2	Kirk lever Drawout Part 3p	1SDA114350R1	ZE2KLEV
E4.2	Kirk lever Drawout Part 3p	1SDA114351R1	ZE4KLEV
E6.2	Kirk lever Drawout Part 3p up to 5000A	1SDA114352R1	ZEBKLAKW
E2.2...E6.2	Support KLC Kirk Fixed Part	1SDA114349R1	ZEBKSPW
E2.2...E6.2	KLC-A open Kirk Fixed Part	1SDA114353R1	ZEBKLAKW
E2.2...E6.2	KLC-D Key lock open E2.2...E6.2	1SDA073791R1	ZEBKLCD
E2.2...E6.2	KLC-S Key lock open N.20005 E2.2..E6.2	1SDA073792R1	ZEBKLCS5
E2.2...E6.2	KLC-S Key lock open N.20006 E2.2..E6.2	1SDA073793R1	ZEBKLCS6
E2.2...E6.2	KLC-S Key lock open N.20007 E2.2..E6.2	1SDA073794R1	ZEBKLCS7
E2.2...E6.2	KLC-S Key lock open N.20008 E2.2..E6.2	1SDA073795R1	ZEBKLCS8
E2.2...E6.2	KLC-S Key lock open N.20009 E2.2..E6.2	1SDA073796R1	ZEBKLCS9
E2.2...E6.2	KLC-A Key lock open Castell E2.2...E6.2 (1) (2)	1SDA073797R1	ZEBKLAC
E2.2...E6.2	KLC-A Key lock open Kirk E2.2..E6.2 (1)	1SDA073798R1	ZEBKLAK
E2.2...E6.2	KLC-A Key lock open Ronis Profalux E2.2..E6.2 (1)	1SDA073799R1	ZEBKLAR

1) If you need as loose supply, please order also the dedicated cover on page 294 under Accessories Cover;
2) arrangement only.



Padlocks in open position - PLC

Size	Type	Global PN	US / CA PN
E1.2	PLC E1.2 Padlock open D=4mm/0.15"	1SDA073800R1	ZE1PLC4
E1.2	PLC E1.2 Padlock open D=7mm/0.27"	1SDA073801R1	ZE1PLC7
E1.2	PLC E1.2 Padlock open D=8mm/0.31"	1SDA073802R1	ZE1PLC8
E2.2...E6.2	PLC E2.2..E6.2 Padlock open D=4mm/0.15"	1SDA073803R1	ZEBPLC4
E2.2...E6.2	PLC E2.2..E6.2 Padlock open D=7mm/0.27"	1SDA073804R1	ZEBPLC7
E2.2...E6.2	PLC E2.2..E6.2 Padlock open D=8mm/0.31"	1SDA073805R1	ZEBPLC8

The lock shackle/shank diameter must match for proper operation.
The PLC is an alternative to the protection device for opening and closing pushbuttons (PBC)

Accessories
Mechanical accessories

Fixed or Mobile Part with neutral on right side

Size	Type	Global PN	US / CA PN
E1.2...E6.2	Installation with neutral on right side sequence L1, L2, L3, N (1)	1SDA076153R1	Factory installed only

(1) When this configuration is selected, the circuit-breaker is certified for IEC61557-12 (Class 1 accuracy)

Floor fixing plate - F

Size	Type	Global PN	US / CA PN
E1.2	Floor fixing plate for fixed unit	1SDA076020R1	ZE1FFPF



Key lock in racked in / test / racked out position - KLP

Size	Type	Global PN	US / CA PN
E1.2	KLP-D Key lock racked in/out E1.2 1st key	1SDA073822R1	ZE1KLPD
E1.2	KLP-S Key lock racked in/out N.20005 E1.2 1st key	1SDA073823R1	ZE1KLPS5
E1.2	KLP-S Key lock racked in/out N.20006 E1.2 1st key	1SDA073824R1	ZE1KLPS6
E1.2	KLP-S Key lock racked in/out N.20007 E1.2 1st key	1SDA073825R1	ZE1KLPS7
E1.2	KLP-S Key lock racked in/out N.20008 E1.2 1st key	1SDA073826R1	ZE1KLPS8
E1.2	KLP-S Key lock racked in/out N.20009 E1.2 1st key	1SDA073827R1	ZE1KLPS9
E1.2	KLP-D Key lock racked in/out E1.2 2nd key	1SDA073828R1	ZE1KLPD-2
E1.2	KLP-S Key lock racked in/out N.20005 E1.2 2nd key	1SDA073829R1	ZE1KLPS5-2
E1.2	KLP-S Key lock racked in/out N.20006 E1.2 2nd key	1SDA073830R1	ZE1KLPS6-2
E1.2	KLP-S Key lock racked in/out N.20007 E1.2 2nd key	1SDA073831R1	ZE1KLPS7-2
E1.2	KLP-S Key lock racked in/out N.20008 E1.2 2nd key	1SDA073832R1	ZE1KLPS8-2
E1.2	KLP-S Key lock racked in/out N.20009 E1.2 2nd key	1SDA073833R1	ZE1KLPS9-2
E1.2	KLP-A Key lock racked in/out RonProfKirk E1.2 1st key (2)	1SDA073834R1	ZE1KLPR
E1.2	KLP-A Key lock racked in/out RonProfKirk E1.2 2nd key (2)	1SDA073835R1	ZE1KLPR-2
E2.2...E6.2	KLP-D Key lock racked in/out E2.2...E6.2 1st key	1SDA073806R1	ZEBKLPD
E2.2...E6.2	KLP-S Key lock racked in/out N.20005 E2.2...E6.2 1st key	1SDA073807R1	ZEBKLPS5
E2.2...E6.2	KLP-S Key lock racked in/out N.20006 E2.2...E6.2 1st key	1SDA073808R1	ZEBKLPS6
E2.2...E6.2	KLP-S Key lock racked in/out N.20007 E2.2...E6.2 1st key	1SDA073809R1	ZEBKLPS7
E2.2...E6.2	KLP-S Key lock racked in/out N.20008 E2.2...E6.2 1st key	1SDA073810R1	ZEBKLPS8
E2.2...E6.2	KLP-S Key lock racked in/out N.20009 E2.2...E6.2 1st key	1SDA073811R1	ZEBKLPS9
E2.2...E6.2	KLP-D Key lock racked in/out E2.2...E6.2 2nd key	1SDA073812R1	ZEBKLPD-2
E2.2...E6.2	KLP-S Key lock racked in/out N.20005 E2.2...E6.2 2nd key	1SDA073813R1	ZEBKLPS5-2
E2.2...E6.2	KLP-S Key lock racked in/out N.20006 E2.2...E6.2 2nd key	1SDA073814R1	ZEBKLPS6-2
E2.2...E6.2	KLP-S Key lock racked in/out N.20007 E2.2...E6.2 2nd key	1SDA073815R1	ZEBKLPS7-2
E2.2...E6.2	KLP-S Key lock racked in/out N.20008 E2.2...E6.2 2nd key	1SDA073816R1	ZEBKLPS8-2
E2.2...E6.2	KLP-S Key lock racked in/out N.20009 E2.2...E6.2 2nd key	1SDA073817R1	ZEBKLPS9-2
E2.2...E6.2	KLP-A Key lock racked in/out RonProfKirk E2.2...E6.2 1st key (2)	1SDA073818R1	ZEBKLPR
E2.2...E6.2	KLP-A Key lock racked in/out RonProfKirk E2.2...E6.2 2nd key (2)	1SDA073819R1	ZEBKLPR-2
E2.2...E6.2	KLP-A Key lock racked in/out Castell E2.2...E6.2 1st key (1) (2)	1SDA073820R1	ZEBKLPC
E2.2...E6.2	KLP-A Key lock racked in/out Castell E2.2...E6.2 2nd key (1) (2)	1SDA073821R1	ZEBKLPC-2

To have 2 keys, one each of a 1st key and 2nd key option must be ordered. When the Padlock in racked in/test/racked out (PLP) is also present, the 2nd key option must be ordered.
1) Two Castell key options can not be used together; 2) Arrangement only



Supplementary lock in racked out position accessory

Size	Type	Global PN	US / CA PN
E1.2	Suppl. lock in racked out E1.2	1SDA073838R1	ZE1SUP
E2.2...E6.2	Suppl. lock in racked out E2.2...E6.2	1SDA073839R1	ZEBSUP



Padlock in racked in / test / racked out position - PLP

Size	Type	Global PN	US / CA PN
E1.2	PLP Padlock racked in/out E1.2	1SDA073840R1	ZE1PLP
E2.2...E6.2	PLP Padlock racked in/out E2.2...E6.2	1SDA073841R1	ZEBPLP

Can also be used with the key lock in racked in/test/racked out device when the 2nd key option is ordered.

Anti-racking out device (fail safe) - FS

Size	Type	Global PN	US / CA PN
E1.2	Fail Safe E1.2	1SDA079898R1	ZE1FS
E2.2...E6.2	Fail Safe E2.2...E6.2	1SDA079899R1	ZEBFS

Standard for CBs UL, not compatible with YU



Lock for racking in / racking out the mobile part when the door is open - DLR

Size	Type	Global PN	US / CA PN
E1.2...E6.2	DLR E2.2...E6.2 (1)	1SDA073845R1	ZEBDLR

1) Only as loose part



Lock to prevent door opening when the circuit breaker is in racked in / test position - DLP

Size	Type	Global PN	US / CA PN
E2.2...E6.2	DLP E2.2...E6.2 (1)	1SDA073849R1	ZEBDLP

If mounted on the right side, the DLP is an alternative to the mechanical interlock, AUX 15Q (15 Form C) or Lock to prevent door opening when the circuit breaker is in a closed position (DLC); 1) Only as loose part

Lock to prevent door opening when the circuit breaker is in a closed position - DLC

Size	Type	Global PN	US / CA PN
E1.2	DLC Interlock cable door for fixed part withdrawable E1.2	1SDA081034R1	ZE1DLCCDFP
E1.2	DLC Interlock direct door for fixed to wall E1.2	1SDA079779R1	ZE1DLCDDFW
E1.2	DLC Interlock direct door for fixed part withdrawable E1.2	1SDA079781R1	ZE1DLCDDFP
E2.2...E6.2	DLC Interlock direct door E2.2...E6.2 (1)	1SDA073853R1	ZEBDLCDD

If mounted on the right side, the DLP is an alternative to the mechanical interlock, AUX 15Q (15 Form C) or Lock to prevent door opening when the circuit breaker is in a closed position (DLC); 1) To be ordered with lever for interlock [group 2] and support for interlock [1SDA073895R1]



Protection device for opening and closing pushbuttons - PBC

Size	Type	Global PN	US / CA PN
E1.2	PBC Op/Cl BP protection sp. key E1.2	1SDA073854R1	ZE1PBC
E1.2	PBC Op/Cl BP protection PL D=4mm/0.15" E1.2	1SDA073855R1	ZE1PBC4
E1.2	PBC Op/Cl BP protection PL D=7mm/0.27" E1.2	1SDA073856R1	ZE1PBC7
E1.2	PBC Op/Cl BP protection PL D=8mm/0.31" E1.2	1SDA073857R1	ZE1PBC8
E2.2...E6.2	PBC Op/Cl BP protection sp. key E2.2...E6.2	1SDA073858R1	ZEBPBC
E2.2...E6.2	PBC Op/Cl BP protection PL D=4mm/0.15" E2.2...E6.2	1SDA073859R1	ZEBPBC4
E2.2...E6.2	PBC Op/Cl BP protection PL D=7mm/0.27" E2.2...E6.2	1SDA073860R1	ZEBPBC7
E2.2...E6.2	PBC Op/Cl BP protection PL D=8mm/0.31" E2.2...E6.2	1SDA073861R1	ZEBPBC8

The lock shackle/shank diameter must match for proper operation

Accessories

Mechanical accessories



Circuit breaker flange / door escutcheon

Size	Type	Global PN	US / CA PN
E1.2	IP30 flange E1.2 Fixed	1SDA073862R1	ZE1FLG30F
E1.2	IP30 flange E1.2 Drawout	1SDA073863R1	ZE1FLG30D
E2.2...E6.2	IP30 flange E2.2...E6.2 Fixed	1SDA073864R1	ZEBFLG30F
E2.2...E6.2	IP30 flange E2.2...E6.2 Drawout	1SDA073865R1	ZEBFLG30D
E1.2	IP54 flange, different keys E1.2 (1)	1SDA073866R1	ZE1FLG54DK
E2.2...E6.2	IP54 flange, different keys E2.2...E6.2 (1)	1SDA073867R1	ZEBFLG54DK
E1.2	IP54 flange, key N.20005 E1.2 (1)	1SDA073868R1	ZE1FLG54SK
E2.2...E6.2	IP54 flange, key N.20005 E2.2...E6.2 (1)	1SDA073869R1	ZEBFLG54SK
E2.2...E6.2	Sealable trip unit cover E2.2...E6.2	1SDA073870R1	ZEBSTUC

1) Only as loose part





High or low terminal covers - HTC/LTC

Size	Type	3 poles		4 poles	
		Global PN	US / CA PN	Global PN	US / CA PN
E1.2	HTC high terminal covers E1.2 2pcs	1SDA073871R1	ZE1HTC	1SDA073872R1	ZE1HTC-4
E1.2	LTC low terminal covers E1.2 2pcs	1SDA073873R1	ZE1LTC	1SDA073874R1	ZE1LTC-4



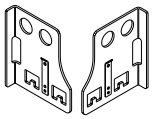
Phase Barriers - PB

Size	Type	Global PN	US / CA PN
E1.2	PB H=100mm/3.94" 4pcs E1.2 Fixed 3P	1SDA073877R1	ZE1PBF100
E1.2	PB H=100mm/3.94" 6pcs E1.2 Fixed 4P	1SDA073878R1	ZE1PBF100-4
E1.2	PB H=200mm/7.87" 4pcs E1.2 Fixed 3P	1SDA073879R1	ZE1PBF200
E1.2	PB H=200mm/7.87" 6pcs E1.2 Fixed 4P	1SDA073880R1	ZE1PBF200-4
E1.2	PB 2pcs E1.2 Drawout 3P	1SDA076164R1	ZE1PBW
E1.2	PB 3pcs E1.2 Drawout 4P	1SDA076165R1	ZE1PBW-4
E2.2...E6.2	PB 2pcs E2.2...E6.2 Fixed 3P	1SDA076166R1	ZEBPBF
E2.2...E6.2	PB 3pcs E2.2...E6.2 Fixed 4P	1SDA076167R1	ZEBPBF-4
E2.2...E6.2	PB 2pcs E2.2...E6.2 Drawout 3P	1SDA076168R1	ZEBPBW
E2.2...E6.2	PB 3pcs E2.2...E6.2 Drawout 4P	1SDA076169R1	ZEBPBW-4
E4.2	PB Separators E4.2 3200A/3600A UL Fixed 3P	1SDA107410R1	ZEBPBF36
E4.2	PB Separators E4.2 3200A UL Fixed 4P	1SDA107411R1	ZEBPBF32-4
E4.2	PB Separators E4.2 3200A UL Drawout 3P	1SDA107412R1	ZEBPBW32
E4.2	PB Separators E4.2 3200A UL Drawout 4P	1SDA107413R1	ZEBPBW32-4

Remote Racking Device - RRD

Size	Type	Global PN	US / CA PN
E2.2...E6.2	RRD Emax 2 E2.2...E6.2 110Vac/dc	1SDA085528R1	ZEBRRD
E2.2...E6.2	RRD Emax 2 E2.2...E6.2 220Vac/dc	1SDA085529R1	ZEBRRD2
E2.2...E6.2	Kit for fixing RRD on E2.2...E6.2 (1)	1SDA085530R1	ZEARRDCB

1) One kit per breaker needed



Lifting plates

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E2.2; E4.2; E6.2	3p; 4p	IEC/UL	F; W (MP)	1SDA081454R1		1

Lifting plate are no more available on standard supply. Please to purchase it separately under product code: 1SDA081454R1.

Accessories
Mechanical interlock

Cables for mechanical interlock [Group 1]

Size	Type	Global PN	US / CA PN
E1.2..E6.2	Type A horizontal	1SDA073881R1	ZEACBLAHR
E2.2..E6.2	Type B,C,D horizontal	1SDA073882R1	ZEACBLBHR
E1.2..E6.2	Type A vertical	1SDA073885R1	ZEACBLAVR
E2.2..E6.2	Type B,C,D vertical	1SDA073886R1	ZEA6CBLBVR

On type of cable must be ordered for each interlock. The cable must be ordered with the fixed circuit breaker or the cradle of a drawout circuit breaker.

Lever for mechanical interlock of fixed circuit breaker or cradle [Group 2]

Size	Type	3 Poles		4 Poles	
		Global PN	US / CA PN	Global PN	US / CA PN
E2.2	Lever for mechanical interlock	1SDA073889R1	ZE2LEV	1SDA073889R1	ZE2LEV
E4.2	Lever for mechanical interlock	1SDA073890R1	ZE4LEV	1SDA073890R1	ZE4LEV
E6.2	Lever for mechanical interlock	1SDA073891R1	ZE6LEV	1SDA073892R1	ZE6LEV-4

The lever for the mechanical interlock is not required for E1.2

Support for mechanical interlock of fixed circuit breaker [Group 3]

Size	Type	Global PN	US / CA PN
E1.2	Type A - floor mounted	1SDA073893R1	ZE1SPA
E1.2	Type A - wall mounted	1SDA073894R1	ZE1SPAFM
E2.2...E6.2	Type A / B / D	1SDA073895R1	ZEBSPB
E2.2...E6.2	Type C	1SDA073897R1	ZEBSPC

Support for mechanical interlock of fixed part [Group 4]

Size	Type	Global PN	US / CA PN
E1.2	Type A	1SDA073896R1	ZE1SPCRDA
E2.2...E6.2	Type A / B / D	1SDA073895R1	ZEBSPB
E2.2...E6.2	Type C	1SDA073897R1	ZEBSPC




Automatic transfer switch

Size	Type	Global PN	US / CA PN
E1.2..E6.2	ATS021	1SDA065523R1	ATS021
E1.2..E6.2	ATS022	1SDA065524R1	ATS022

Accessories
Ekip modules



Ekip trip units, Black Platform - loose supply

Size	Type	Global PN	US / CA PN
E1.2..E6.2	Ekip Dip LI (Black)	1SDA107526R1	ZEDEDLI
E1.2..E6.2	Ekip Dip LSI (Black)	1SDA107527R1	ZEDEDLSI
E1.2..E6.2	Ekip Dip LSIG (Black)	1SDA107528R1	ZEDEDLSIG
E1.2..E6.2	Ekip Touch LI (Black)	1SDA107529R1	ZEDETLI
E1.2..E6.2	Ekip Touch LSI (Black)	1SDA107530R1	ZEDETLSI
E1.2..E6.2	Ekip Touch LSIG (Black)	1SDA107531R1	ZEDETLSIG
E1.2..E6.2	Ekip Hi-Touch LSI (Black) (1)	1SDA107532R1	ZEDEHTLSI
E1.2..E6.2	Ekip Hi-Touch LSIG (Black) (1)	1SDA107533R1	ZEDEHTLSIG
E1.2..E6.2	Ekip G Touch LSIG (Black) (1)	1SDA107534R1	ZEDEGTLSIG
E1.2..E6.2	Ekip G Hi-Touch LSIG (Black) (1)	1SDA107535R1	ZEDEGHTLSIG
E1.2..E6.2	Ekip LCD LI (Black) (1)	1SDA107536R1	ZEDELCDLI
E1.2..E6.2	Ekip LCD LSI (Black) (1)	1SDA107537R1	ZEDELCDLSI
E1.2..E6.2	Ekip LCD LSIG (Black) (1)	1SDA107538R1	ZEDELCDLSIG
E1.2..E6.2	Ekip Hi-LCD LSI (Black) (1)	1SDA107539R1	ZEDEHLCDLSI
E1.2..E6.2	Ekip Hi-LCD LSIG (Black) (1)	1SDA107540R1	ZEDEGHLCDLSIG
E1.2..E6.2	Ekip G LCD LSIG (Black) (1)	1SDA107541R1	ZEDEGLCDLSIG
E1.2..E6.2	Ekip G Hi-LCD LSIG (Black) (1)	1SDA107542R1	ZEDEHLCDLSIG

1) provided without Measurement Enabler/Measurement Enabler with voltage sockets
Note: In case of Ekip Touch trip unit or higher, only SW packages provided by default will be present

Options for Ekip trip units

Size	Type	Global PN	US / CA PN
E1.2..E6.2	Ekip LCD installed	1SDA074211R1	Factory installed code only
E1.2..E6.2	No Bluetooth connectivity (3)	1SDA114808R1	Factory installed code only
E1.2..E6.2	Non defeatable I protection	1SDA114799R1	Factory installed code only
E1.2..E6.2	Upper internal installed voltage outlets	1SDA074216R1	Factory installed code only
E1.2..E6.2	External installed voltage outlets	1SDA074217R1	Factory installed code only
E1.2..E6.2	Arrangement for cables with lower internal voltage outlets (2)	1SDA074213R1	Factory installed code only
E1.2..E6.2	Arrangement for cables with upper internal voltage outlets (2)	1SDA074214R1	Factory installed code only
E1.2..E6.2	Arrangement for cables with externalvoltage outlets (2)	1SDA074215R1	Factory installed code only

2) For Ekip trip units, Grey Platform only
3) Extracode suitable for Ekip Touch and Hi-Touch trip units



Power Supply modules

Size	Type	Global PN	US / CA PN
E1.2..E6.2	Ekip Supply 110-240VAC/DC	1SDA074172R1	ZEAPWRS
E1.2..E6.2	Ekip Supply 24-48VDC	1SDA074173R1	ZEAPWRSD





Connectivity modules

Size	Type	Global PN	US / CA PN
E1.2..E6.2	Ekip Com Hub	1SDA082894R1	ZEAEKIPHUB
E1.2..E6.2	Ekip Com Modbus RS-485	1SDA074150R1	ZEAMOD485
E1.2..E6.2	Ekip Com Modbus TCP	1SDA074151R1	ZEAMODTCP
E1.2..E6.2	Ekip Com Profibus	1SDA074152R1	ZEAPRFIBUS
E1.2..E6.2	Ekip Com Profinet	1SDA074153R1	ZEAPRFINET
E1.2..E6.2	Ekip Com DeviceNet	1SDA074154R1	ZEADEVICNET
E1.2..E6.2	Ekip Com EtherNet/IP	1SDA074155R1	ZEAETHRNT
E1.2..E6.2	Ekip Com IEC61850	1SDA074156R1	ZEAIEC61850
E1.2..E6.2	Ekip Com R Modbus RS-485	1SDA074157R1	ZEAMOD485R
E1.2..E6.2	Ekip Com R Modbus TCP	1SDA074158R1	ZEAMODTCPR
E1.2..E6.2	Ekip Com R Profibus	1SDA074159R1	ZEAPROFIBUSR
E1.2..E6.2	Ekip Com R Profinet	1SDA074160R1	ZEAPROFINETR
E1.2..E6.2	Ekip Com R DeviceNet	1SDA074161R1	ZEADEVICENETR
E1.2..E6.2	Ekip Com R EtherNet/IP	1SDA074162R1	ZEAIPR
E1.2..E6.2	Ekip Com R IEC61850	1SDA076170R1	
E1.2..E6.2	Ekip Link	1SDA074163R1	ZEALINK
E1.2..E6.2	Ekip Com GPRS-M	1SDA074165R1	ZEAGPRSM
E1.2..E6.2	Ekip Com Actuator	1SDA074166R1	ZEACACT



Signalling modules

Size	Type	Global PN	US / CA PN
E1.2..E6.2	Ekip 2K-1	1SDA074167R1	ZEA2K1
E1.2..E6.2	Ekip 2K-2	1SDA074168R1	ZEA2K2
E1.2..E6.2	RELT Ekip 2K-3	1SDA074169R1	ZEB2K3
E2.2..E6.2	Ekip 4K (Black) (1)	1SDA074170R1	ZED4K
E1.2..E6.2	Ekip 10K (2)	1SDA074171R1	ZEA10K
E1.2..E6.2	Ekip Signalling 3T-1 (3)	1SDA085693R1	ZEA3T1
E1.2..E6.2	Ekip Signalling 3T-2 (3)	1SDA085694R1	ZEA3T2
E1.2..E6.2	Ekip Signalling Modbus TCP	1SDA082485R1	ZEASIGMBTCP

1) Ekip 4k is not available for the E1.2. It is an alternative to the AUX 6Q (6 Form C) auxiliary contacts unit on other frames; 2) only as loose part;
3) External probe PT100/PT1000 not supplied

External Probe for Ekip 3T Signalling modules

Size	Type	Global PN	US / CA PN
E1.2..E6.2	External Probe PT1000 3mt (1)	1SDA085695R1	ZEA3TPR

1) For busbar applications only. The code includes one single probe.



Measurement Enabler and Measurement Enabler with voltage sockets (2)

Size	Type	Global PN	US / CA PN
E1.2	Measurement Enabler E1.2	1SDA107543R1	ZE1MEAMOD
E1.2	Measurement Enabler with voltage sockets E1.2	1SDA107544R1	ZE1MEASOC
E2.2	Measurement Enabler E2.2	1SDA107545R1	ZE2MEAMOD
E2.2	Measurement Enabler with voltage sockets E2.2	1SDA107546R1	ZE2MEASOC
E4.2	Measurement Enabler E4.2	1SDA107547R1	ZE4MEAMOD
E4.2	Measurement Enabler with voltage sockets E4.2	1SDA107548R1	ZE4MEASOC
E6.2	Measurement Enabler E6.2	1SDA107549R1	ZE6MEAMOD
E6.2	Measurement Enabler with voltage sockets E6.2	1SDA107550R1	ZE6MEASOC
E1.2	Voltage socket for neutral on right side L1 L2 L3 N - E1.2 (1)	1SDA076244R1	ZE1MEASOCNRT
E2.2	Voltage socket for neutral on right side L1 L2 L3 N - E2.2 (1)	1SDA076245R1	ZE2MEASOCNRT
E4.2	Voltage socket for neutral on right side L1 L2 L3 N - E4.2 (1)	1SDA076246R1	ZE4MEASOCNRT
E6.2	Voltage socket for neutral on right side L1 L2 L3 N - E6.2 (1)	1SDA076247R1	ZE6MEASOCNRT

1) Suitable for circuit-breakers with neutral on the right side (L1 L2 L3 N)
2) The Measurement Enabler module is provided as standard with Ekip Touch trip units. Select the Measuring Package to activate measurements (V, f, P, E, ..). The Measurement Enabler with voltage sockets module is provided as standard with Ekip Hi-Touch, G Touch and G Hi-Touch trip units. Measurements are also provided as standard, with no need to activate the dedicated software package. Both these modules are available as spare parts.

Accessories
Ekip modules

Synchrocheck module

Size	Type	Global PN	US / CA PN
E1.2..E6.2	Ekip Synchrocheck	1SDA074183R1	ZEASYNCHK



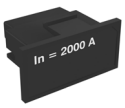
Displaying and supervision systems

Size	Type	Global PN	US / CA PN
E1.2..E6.2	Ekip T&P - Progamming and Test unit	1SDA066989R1	ZEAEKPTP
E1.2..E6.2	Ekip TT - Trip Test	1SDA066988R1	ZEAEKPTT
E1.2..E6.2	Ekip T&P for Emax2 and Tmax XT	1SDA127535R1	ZEAEKPTPSA
E1.2..E6.2	Ekip Programming	1SDA076154R1	ZEAEKPPGM
E1.2..E6.2	Ekip Multimeter (1)	1SDA074192R1	ZEAMM

1) only as loose part



Rating plugs for Ekip trip units



Size	Type	Global PN (loose supply)	US / CA PN (loose supply)	Global PN (installed)	US / CA PN (installed)
E1.2...E2.2	Rating Plug 100A (Black) (1)	1SDA112840R1	ZED0100RP	1SDA074258R1	Factory installed only
E1.2...E2.2	Rating Plug 200A (Black) (1)	1SDA112841R1	ZED0200RP	1SDA074259R1	Factory installed only
E1.2...E2.2	Rating Plug 250A (Black) (1)	1SDA112842R1	ZED0250RP	1SDA074260R1	Factory installed only
E1.2..E6.2	Rating Plug 400A (Black)	1SDA112843R1	ZED0400RP	1SDA074261R1	Factory installed only
E1.2..E6.2	Rating Plug 600A (Black) (2)	1SDA112844R1	ZED0600RP	1SDA079826R1	Factory installed only
E1.2..E6.2	Rating Plug 800A (Black)	1SDA112846R1	ZED0800RP	1SDA074263R1	Factory installed only
E1.2..E6.2	Rating Plug 1000A (Black)	1SDA112847R1	ZED1000RP	1SDA074264R1	Factory installed only
E1.2..E6.2	Rating Plug 1200A (Black) (4)	1SDA112848R1	ZED1200RP	1SDA079828R1	Factory installed only
E2.2..E6.2	Rating Plug 1600A (Black) (3)	1SDA112850R1	ZED1600RP	1SDA074266R1	Factory installed only
E2.2..E6.2	Rating Plug 2000A (Black)	1SDA112851R1	ZED2000RP	1SDA074267R1	Factory installed only
E2.2..E6.2	Rating Plug 2500A (Black) (4)	1SDA112852R1	ZED2500RP	1SDA074268R1	Factory installed only
E4.2..E6.2	Rating Plug 3200A (Black)	1SDA112854R1	ZED3200RP	1SDA074269R1	Factory installed only
E4.2..E6.2	Rating Plug 3600A (Black) (2)	1SDA112855R1	ZED3600RP	1SDA112855R1	Factory installed only
E4.2..E6.2	Rating Plug 4000A (Black) (5)	1SDA112856R1	ZED4000RP	1SDA074270R1	Factory installed only
E6.2	Rating Plug 5000A (Black)	1SDA112857R1	ZED5000RP	1SDA074271R1	Factory installed only
E6.2	Rating Plug 6000A (Black) (2)	1SDA112858R1	ZED6000RP	-	-

1) Available only with 250 V CB versions
2) UL only
3) IEC only for E1.2, both UL and IEC for all other frames
4) IEC only for E2.2, both UL and IEC for E4.2 and E6.2
5) IEC only for E4.2, both UL and IEC for E6.2

Advanced functionalities

Software functions

Size	Type	Global PN	US / CA PN
E1.2..E6.2	Adaptive Load Shedding (1)	1SDA082921R1	Factory installed/ ABB Ability Marketplace™
E1.2..E6.2	ATS Main-Tie-Main Closed Transition (2)	1SDA082886R1	ABB Ability Marketplace™
E1.2..E6.2	ATS Main-Gen Open Transition (2)	1SDA082889R1	ABB Ability Marketplace™
E1.2..E6.2	Power Controller	1SDA074212R1	Factory installed only

1) Available both factory fitted and via ABB Ability Marketplace™.
2) Available via ABB Ability Marketplace™ only.

Software packages

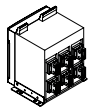
Size	Type	Global PN	US / CA PN
E1.2..E6.2	Measuring Package	1SDA107525R1	Factory installed / ABB Ability Marketplace™
E1.2..E6.2	Voltage Protection	1SDA105227R1	ABB Ability Marketplace™
E1.2..E6.2	Advanced Voltage Protection	1SDA105228R1	ABB Ability Marketplace™
E1.2..E6.2	Frequency Protection	1SDA105229R1	ABB Ability Marketplace™
E1.2..E6.2	Power Protection	1SDA105230R1	ABB Ability Marketplace™
E1.2..E6.2	ROCOF Protection	1SDA105231R1	ABB Ability Marketplace™
E1.2..E6.2	Adaptive Protection	1SDA105232R1	ABB Ability Marketplace™
E1.2..E6.2	Data Logger	1SDA105233R1	ABB Ability Marketplace™
E1.2..E6.2	Network Analyzer	1SDA105234R1	ABB Ability Marketplace™

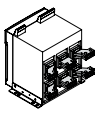
Metering functions - Class 1 accuracy (1)

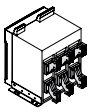
Size	Type	Global PN	US / CA PN
E1.2	Class 1 Power&Energy Metering E1.2	1SDA107551R1	Factory installed only
E2.2	Class 1 Power&Energy Metering E2.2	1SDA107675R1	Factory installed only
E4.2	Class 1 Power&Energy Metering E4.2	1SDA107676R1	Factory installed only
E6.2	Class 1 Power&Energy Metering E6.2	1SDA107677R1	Factory installed only

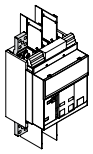
1) Extracodes available for Ekip Touch and Ekip G Touch trip units.

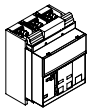
Accessories
Terminals

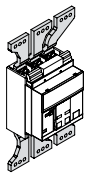

Rear orientable terminal - HR VR

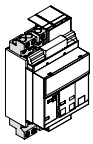

Horizontal rear spread terminal - SHR


Vertical rear spread terminal - SVR


Extended front terminal - EF


Front terminal - F

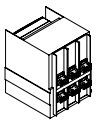

Front spread terminal - ES

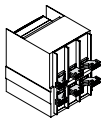

Terminal for cable FcCuAl 4x240mm² - Fc CuAl

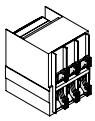
Kit for terminals - installed on fixed circuit breaker

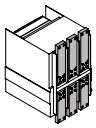
Size	Version	Max amperage	Type	3 Poles		4 Poles	
				Global PN	US / CA PN	Global PN	US / CA PN
E1.2	F	1200	Kit EF Upper (1)	1SDA073963R1	Factory installed only	1SDA073964R1	Factory installed only
E1.2	F	1200	Kit EF Lower (1)	1SDA073965R1	Factory installed only	1SDA073966R1	Factory installed only
E1.2	F	1200	Kit ES Upper (1)	1SDA073975R1	Factory installed only	1SDA073976R1	Factory installed only
E1.2	F	1200	Kit ES Lower (1)	1SDA073977R1	Factory installed only	1SDA073978R1	Factory installed only
E1.2	F	1200	Kit HR Upper	1SDA079840R1	Factory installed only	1SDA079841R1	Factory installed only
E1.2	F	1200	Kit HR Lower	1SDA079842R1	Factory installed only	1SDA079843R1	Factory installed only
E1.2	F	1200	Kit VR Upper	1SDA079836R1	Factory installed only	1SDA079837R1	Factory installed only
E1.2	F	1200	Kit VR Lower	1SDA079838R1	Factory installed only	1SDA079839R1	Factory installed only
E1.2	F	1200	Kit FcCuAl 4x500kcmil/240mm² Upper (1)	1SDA073997R1	Factory installed only	1SDA073998R1	Factory installed only
E1.2	F	1200	Kit FcCuAl 4x500kcmil/240mm² Lower (1)	1SDA073999R1	Factory installed only	1SDA074000R1	Factory installed only
E2.2	F	2000	Kit F Upper (1)	1SDA074118R1	Factory installed only	1SDA074119R1	Factory installed only
E2.2	F	2000	Kit F Lower (1)	1SDA074120R1	Factory installed only	1SDA074121R1	Factory installed only
E2.2	F	2000	Kit VR Upper	1SDA079852R1	Factory installed only	1SDA079853R1	Factory installed only
E2.2	F	2000	Kit VR Lower	1SDA079854R1	Factory installed only	1SDA079855R1	Factory installed only
E4.2	F	3200	Kit F Upper (1)	1SDA074126R1	Factory installed only	1SDA074127R1	Factory installed only
E4.2	F	3200	Kit F Lower (1)	1SDA074128R1	Factory installed only	1SDA074129R1	Factory installed only
E4.2	F	2500	Kit VR Upper	1SDA079862R1	Factory installed only	1SDA079863R1	Factory installed only
E4.2	F	2500	Kit VR Lower	1SDA079864R1	Factory installed only	1SDA079865R1	Factory installed only
E6.2	F	6000	Kit F Upper (1)	1SDA074134R1	Factory installed only	1SDA074135R1	Factory installed only
E6.2	F	6000	Kit F Lower (1)	1SDA074137R1	Factory installed only	1SDA074138R1	Factory installed only
E6.2	F	5000	Kit VR Upper	1SDA079891R1	Factory installed only	1SDA079892R1	Factory installed only
E6.2	F	5000	Kit VR Lower	1SDA079893R1	Factory installed only	1SDA079894R1	Factory installed only
E6.2/f	F	6000	Kit F Upper (1)	-	-	1SDA074136R1	Factory installed only
E6.2/f	F	6000	Kit F Lower (1)	-	-	1SDA074138R1	Factory installed only

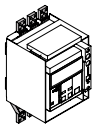
1) Not UL listed

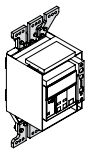

Rear orientable terminal - HR VR

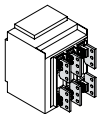

Horizontal rear terminal - SHR


Vertical rear spread terminal - SVR


Front terminal - F


Extended front terminal - EF


Front spread terminal - ES

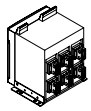

Terminal for cable FcCuAl 4x240mm² - Fc CuAl

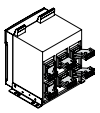
Kit for terminals - installed on cradle

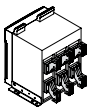
Size	Version	Max amperage	Type	3 Poles		4 Poles	
				Global PN	US / CA PN	Global PN	US / CA PN
E1.2	W	1200	Kit EF Upper (2)	1SDA073939R1	Factory installed only	1SDA073940R1	Factory installed only
E1.2	W	1200	Kit EF Lower (2)	1SDA073941R1	Factory installed only	1SDA073942R1	Factory installed only
E1.2	W	1200	Kit ES Upper (1) (2)	1SDA073951R1	Factory installed only	1SDA073952R1	Factory installed only
E1.2	W	1200	Kit ES Lower (1) (2)	1SDA073953R1	Factory installed only	1SDA073954R1	Factory installed only
E1.2	W	1200	Kit VR Upper	1SDA079830R1	Factory installed only	1SDA079831R1	Factory installed only
E1.2	W	1200	Kit VR Lower	1SDA079832R1	Factory installed only	1SDA079833R1	Factory installed only
E1.2	W	1200	Kit FcCuAl 4x 500kcmil/240mm² Upper (2)	1SDA073991R1	Factory installed only	1SDA073993R1	Factory installed only
E1.2	W	1200	Kit FcCuAl 4x 500kcmil/240mm² Lower (2)	1SDA073992R1	Factory installed only	1SDA073994R1	Factory installed only
E2.2	W	2000	Kit F Upper (2)	1SDA074090R1	Factory installed only	1SDA074091R1	Factory installed only
E2.2	W	2000	Kit F Lower (2)	1SDA074092R1	Factory installed only	1SDA074093R1	Factory installed only
E2.2	W	2000	Kit VR Upper	1SDA079846R1	Factory installed only	1SDA079847R1	Factory installed only
E2.2	W	2000	Kit VR Lower	1SDA079848R1	Factory installed only	1SDA079849R1	Factory installed only
E4.2	W	3200	Kit F Upper (2)	1SDA074098R1	Factory installed only	1SDA074099R1	Factory installed only
E4.2	W	3200	Kit F Lower (2)	1SDA074100R1	Factory installed only	1SDA074101R1	Factory installed only
E4.2	W	2500	Kit VR Upper	1SDA079856R1	Factory installed only	1SDA079857R1	Factory installed only
E4.2	W	2500	Kit VR Lower	1SDA079858R1	Factory installed only	1SDA079859R1	Factory installed only
E6.2	W	6000	Kit F Upper (2)	1SDA074106R1	Factory installed only	1SDA074107R1	Factory installed only
E6.2	W	6000	Kit F Lower (2)	1SDA074109R1	Factory installed only	1SDA074110R1	Factory installed only
E6.2	W	5000	Kit VR Upper	1SDA079882R1	Factory installed only	1SDA079883R1	Factory installed only
E6.2	W	5000	Kit VR Lower	1SDA079885R1	Factory installed only	1SDA079886R1	Factory installed only
E6.2/f	W	6000	Kit F Upper (2)	-	-	1SDA074108R1	-
E6.2/f	W	6000	Kit F Lower (2)	-	-	1SDA074111R1	-
E6.2/f	W	5000	Kit VR Upper	-	Factory installed only	1SDA079884R1	Factory installed only
E6.2/f	W	5000	Kit VR Lower	-	Factory installed only	1SDA079887R1	Factory installed only

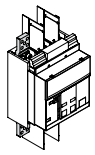
1) ES terminals can be ordered only if the cradle also has EF terminals.
2) Not UL listed

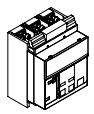
Accessories
Terminals

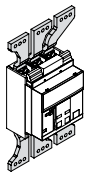

Rear orientable terminal - HR VR

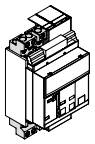

Horizontal rear spread terminal - SHR


Vertical rear spread terminal - SVR


Extended front terminal - EF


Front terminal - F

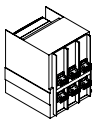

Front spread terminal - ES

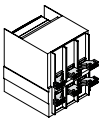

Terminal for cable FcCuAl 4x240mm² - Fc CuAl

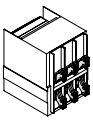
Kit for terminals - loose supply for one side of fixed circuit breaker

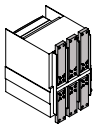
Size	Version	Max amperage	Type	3 pieces		4 pieces	
				Global PN	US / CA PN	Global PN	US / CA PN
E1.2	F	1200	Kit EF (1)	1SDA073967R1	ZE1EFF	1SDA073968R1	ZE1EFF-4
E1.2	F	1200	Kit F (1)	1SDA073973R1	ZE1FF	1SDA073974R1	ZE1FF-4
E1.2	F	1200	Kit ES (1)	1SDA073979R1	ZE1ESF	1SDA073980R1	ZE1ESF-4
E1.2	F	1200	Kit Adjustable HR/VR	1SDA079844R1	ZE1HRVRF	1SDA079845R1	ZE2HRVRF-4
E1.2	F	1200	Kit FcCuAl 4x500kcmil/240mm² (1)	1SDA074001R1	ZE1LUGF	1SDA074002R1	ZE1LUGF-4
E2.2	F	2000	Kit F Upper (1)	1SDA074122R1	ZE2FUF	1SDA074123R1	ZE2FUF-4
E2.2	F	2000	Kit F Lower (1)	1SDA074124R1	ZE2FLF	1SDA074125R1	ZE2FLF-4
E2.2	F	2000	Adjustable HR/VR	1SDA079850R1	ZE2HRVRFW	1SDA079851R1	ZE2HRVRFW-4
E4.2	F	3200	Kit F Upper (1)	1SDA074130R1	ZE4FUF	1SDA074131R1	ZE4FUF-4
E4.2	F	3200	Kit F Lower (1)	1SDA074132R1	ZE4FLF	1SDA074133R1	ZE4FLF-4
E4.2	F	2500	Kit Adjustable HR/VR	1SDA079860R1	ZE4HRVRFW25	1SDA079861R1	ZE4HRVRFW25-4
E4.2	F	3200	Kit VR	1SDA079866R1	ZE4VRFW32	1SDA079867R1	ZE4VRFW32
E6.2	F	6000	Kit F Upper (1)	1SDA074140R1	ZE6FUF	1SDA074141R1	ZE6FU-4
E6.2	F	6000	Kit F Lower (1)	1SDA074143R1	ZE6FLF	1SDA074144R1	ZE6FLF-4
E6.2	F	5000	Kit Adjustable HR/VR	1SDA079888R1	ZE6HRVRFW50	1SDA079889R1	ZE6HRVRFW50-4
E6.2	F	6000	Kit VR	1SDA079895R1	ZE6VRFW60	-	-
E6.2/f	F	6000	Kit F Upper (1)	-		1SDA074142R1	ZE6FUF-4F
E6.2/f	F	6000	Kit F Lower (1)	-		1SDA074145R1	ZE6FLF-4F
E6.2/f	F	5000	Kit Adjustable HR/VR	-		1SDA079890R1	ZE6HRVRFW50-4F

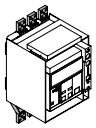
1) Not UL listed

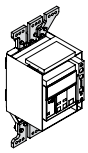

Rear orientable terminal - HR VR

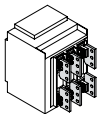

Horizontal rear terminal - SHR


Vertical rear spread terminal - SVR


Front terminal - F


Extended front terminal - EF


Front spread terminal - ES


Terminal for cable FcCuAl 4x240mm2 - Fc CuAl

Kit for terminals - loose supply for one side of cradle

Size	Version	Max amperage	Type	3 pieces		4 pieces	
				Global PN	US / CA PN	Global PN	US / CA PN
E1.2	W	1200	Kit EF [2]	1SDA073943R1	ZE1EFW	1SDA073944R1	ZE1EFW-4
E1.2	W	1200	Kit ES [1] [2]	1SDA073955R1	ZE1ESW	1SDA073956R1	ZE1ESW-4
E1.2	W	1200	Kit Adjustable HR/VR	1SDA079834R1	ZE1HRVRW	1SDA079835R1	ZE1HRVRW-4
E1.2	W	1200	Kit FcCuAl 4x 500kcmil/240mm^2 [2]	1SDA073995R1	ZE1LUGW	1SDA073996R1	ZE1LUGW-4
E2.2	W	2000	Kit F Upper [2]	1SDA074094R1	ZE2FUW	1SDA074095R1	ZE2FUW-4
E2.2	W	2000	Kit F Lower [2]	1SDA074096R1	ZE2FLW	1SDA074097R1	ZE2FLW-4
E2.2	W	2000	Kit Adjustable HR/VR	1SDA079850R1	ZE2HRVRFW	1SDA079851R1	ZE2HRVRFW-4
E4.2	W	3200	Kit F Upper [2]	1SDA074102R1	ZE4FUW	1SDA074103R1	ZE4FUW-4
E4.2	W	3200	Kit F Lower [2]	1SDA074104R1	ZE4FLW	1SDA074105R1	ZE4FLW-4
E4.2	W	2500	Kit Adjustable HR/VR	1SDA079860R1	ZE4HRVRFW25	1SDA079861R1	ZE4HRVRFW25-4
E4.2	W	3200	Kit VR	1SDA079866R1	ZE4VRFW32	1SDA079867R1	ZE4VRFW32-4
E6.2	W	6000	Kit F Upper [2]	1SDA074112R1	ZE6FUW	1SDA074113R1	ZE6FUW-4
E6.2	W	6000	Kit F Lower [2]	1SDA074115R1	ZE6FLW	1SDA074116R1	ZE6FLW-4
E6.2	W	5000	Kit Adjustable HR/VR	1SDA079888R1	ZE6HRVRFW50	1SDA079889R1	ZE6HRVRFW50-4
E6.2	W	6000	Kit VR	1SDA079895R1	ZE6VRFW60	1SDA079896R1	-
E6.2/f	W	6000	Kit F Upper [2]	-		1SDA074114R1	-
E6.2/f	W	6000	Kit F Lower [2]	-		1SDA074117R1	-
E6.2/f	W	5000	Kit Adjustable HR/VR	-		1SDA079890R1	ZE6HRVRFW50-4F

1) ES terminals can be ordered only if the cradle also has EF terminals.
2) Not UL listed

Accessories

Spare parts Grey Platform







Ekip trip units, Grey Platform – loose supply

Size	Type	Global PN	US / CA PN
E1.2..E6.2	Ekip Dip LI	1SDA074194R1	ZEAEDLI
E1.2..E6.2	Ekip Dip LSI	1SDA074195R1	ZEAEDLSI
E1.2..E6.2	Ekip Dip LSIG	1SDA074196R1	ZEAEDLSIG
E1.2..E6.2	Ekip Touch LI	1SDA074197R1	ZEAETLI
E1.2..E6.2	Ekip Touch LSI	1SDA074198R1	ZEAETLSI
E1.2..E6.2	Ekip Touch LSIG	1SDA074199R1	ZAETLSIG
E1.2..E6.2	Ekip G Touch LSIG (1)	1SDA074200R1	ZEAEGTLSIG
E1.2..E6.2	Ekip Hi-Touch LSI (1)	1SDA074201R1	ZEAEHTLSI
E1.2..E6.2	Ekip Hi-Touch LSIG (1)	1SDA074202R1	ZEAEHTLSIG
E1.2..E6.2	Ekip G Hi-Touch LSIG (1)	1SDA074203R1	ZEAEGHTLSIG
E1.2..E6.2	Ekip LCD LI (1)	1SDA074204R1	ZEAELCDLI
E1.2..E6.2	Ekip LCD LSI (1)	1SDA074205R1	ZEAELCDLSI
E1.2..E6.2	Ekip LCD LSIG (1)	1SDA074206R1	ZEAELCDLSIG
E1.2..E6.2	Ekip G LCD LSIG (1)	1SDA074207R1	ZEAEGLCDLSIG
E1.2..E6.2	Ekip Hi-LCD LSI (1)	1SDA074208R1	ZEAEHLCDLSI
E1.2..E6.2	Ekip Hi-LCD LSIG (1)	1SDA074209R1	ZEAEHLCDLSIG
E1.2..E6.2	Ekip G Hi-LCD LSIG (1)	1SDA074210R1	ZEAEGHLCDLSIG
E1.2..E6.2	Battery for Ekip trip units	1SDA074193R1	ZEAEKIPBAT

1) provided without Ekip Measuring/Ekip Measuring Pro.



Measuring and Measuring Pro modules

Size	Type	Global PN	US / CA PN
E1.2	Ekip Measuring	1SDA074184R1	ZE1MEEAS
E1.2	Ekip Measuring Pro	1SDA074185R1	ZE1MEEASPRO
E2.2	Ekip Measuring	1SDA074186R1	ZE2MEEAS
E2.2	Ekip Measuring Pro	1SDA074187R1	ZE2MEEASPRO
E4.2	Ekip Measuring	1SDA074188R1	ZE4MEEAS
E4.2	Ekip Measuring Pro	1SDA074189R1	ZE4MEEASPRO
E6.2	Ekip Measuring	1SDA074190R1	ZE6MEEAS
E6.2	Ekip Measuring Pro	1SDA074191R1	ZE6MEEASPRO
E1.2	Voltage socket for neutral on right side L1 L2 L3 N - E1.2 (1)	1SDA076244R1	ZE1VSNRT
E2.2	Voltage socket for neutral on right side L1 L2 L3 N - E2.2 (1)	1SDA076245R1	ZE2VSNRT
E4.2	Voltage socket for neutral on right side L1 L2 L3 N - E4.2 (1)	1SDA076246R1	ZE4VSNRT
E6.2	Voltage socket for neutral on right side L1 L2 L3 N - E6.2 (1)	1SDA076247R1	ZE6VSNRT

1) use only with circuit breakers with neutral on right side L1 L2 L3 N

Signalling modules

Size	Type	Global PN	US / CA PN
E2.2..E6.2	Ekip 4K	1SDA114475R1	ZEA4K



Rating plug for Ekip trip units

Size	Type	Global PN (loose supply)	US / CA PN (loose supply)
E1.2..E2.2	Rating Plug 100A	1SDA074218R1	ZEA0100RP
E1.2..E2.2	Rating Plug 200A	1SDA074219R1	ZEA0200RP
E1.2..E2.2	Rating Plug 250A	1SDA074220R1	ZEA0250RP
E1.2..E6.2	Rating Plug 400A	1SDA074221R1	ZEA0400RP
E1.2..E6.2	Rating Plug 600A (1)	1SDA082038R1	ZEA0600RP
E1.2..E6.2	Rating Plug 800A	1SDA074223R1	ZEA0800RP
E1.2..E6.2	Rating Plug 1000A	1SDA074224R1	ZEA1000RP
E1.2..E6.2	Rating Plug 1200A (1)	1SDA079730R1	ZEA1200RP
E1.2..E6.2	Rating Plug 1600A (2)	1SDA074226R1	ZEA1600RP
E2.2..E6.2	Rating Plug 2000A	1SDA074227R1	ZEA2000RP
E2.2..E6.2	Rating Plug 2500A (3)	1SDA074228R1	ZEA2500RP
E4.2..E6.2	Rating Plug 3200A	1SDA074229R1	ZEA3200RP
E4.2..E6.2	Rating Plug 3600A (1)	1SDA079827R1	ZEA3600RP
E4.2..E6.2	Rating Plug 4000A (4)	1SDA074230R1	ZEA4000RP
E6.2	Rating Plug 5000A	1SDA074231R1	ZEA5000RP
E6.2	Rating Plug 6000A (1)	1SDA079731R1	ZEA6000RP

1) UL only
2) IEC only for E1.2, both UL and IEC for all other frames
3) IEC only for E2.2, both UL and IEC for E4.2 and E6.2
4) IEC only for E4.2, both UL and IEC for E6.2

Accessories
Service



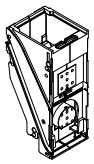
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Note:
Warranty periods are measured from the date the circuit breaker leaves the factory.

Extended warranty

Size	Type	Global PN[c)]	US / CA PN
E1.2...E6.2	Warranty 2 years E1.2...E6.2 (1)	1SDA082413R1	Factory installed
E1.2	Warranty 4 years E1.2 (2)	1SDA082414R1	Factory installed
E2.2	Warranty 4 years E2.2 (2)	1SDA082415R1	Factory installed
E4.2	Warranty 4 years E4.2 (2)	1SDA082416R1	Factory installed
E6.2	Warranty 4 years E6.2 (2)	1SDA082417R1	Factory installed
E1.2	Warranty 5 years E1.2 (2)	1SDA082418R1	Factory installed
E2.2	Warranty 5 years E2.2 (2)	1SDA082419R1	Factory installed
E4.2	Warranty 5 years E4.2 (2)	1SDA082420R1	Factory installed
E6.2	Warranty 5 years E6.2 (2)	1SDA082421R1	Factory installed

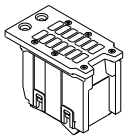
The registration in the Extended Warranty online tool is mandatory
1) Free-of-charge with site details entered
2) Warranty durations:
- 4 years when site details not entered into the Extended Warranty online tool
- 5 years when site details entered into the Extended Warranty online tool.

Accessories
Spare parts



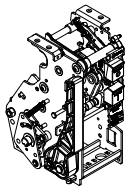
Single phase pole

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E2.2 - Iu≤2000A	3p; 4p	IEC	F; W (MP)	1SDA081187R1	A	3 or 4
E2.2 - Iu=2500A	3p; 4p	IEC	F; W (MP)	1SDA081188R1	A	3 or 4
E4.2	3p; 4p	IEC	F; W (MP)	1SDA081189R1	A	3 or 4
E6.2 - Half phase	3p; 4p; 4p/f	IEC	F; W (MP)	1SDA081190R1	A	6 or 7 or 8



Arching chamber

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E2.2	3p; 4p	IEC	F; W (MP)	1SDA081430R1		3 or 4
E4.2; E6.2	3p; 4p	IEC	F; W (MP)	1SDA081431R1		3 or 4 for E4.2, 6 or 7 or 8 for E6.2



Operating mechanism (1)

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E2.2	3p; 4p	IEC/UL	F; W (MP)	1SDA081191R1	A	1
E4.2	3p; 4p	IEC/UL	F; W (MP)	1SDA081192R1	A	1
E6.2	3p; 4p	IEC/UL	F; W (MP)	1SDA081193R1	A	1
E6.2	4p/f	IEC/UL	F; W (MP)	1SDA081194R1	A	1

1) Add closing spring

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Min quantity = min quantity to complete a circuit-breaker: The quantity is related to the number of phases (3 or 4 polese) of the cirucit-breaker (E6.2 has half phases so quantities are double). Type A Spare part = only for ABB L3 technicians

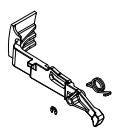
Closing Spring

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E2.2 - Iu≤2000A	3p	IEC/UL	F; W (MP)	1SDA081207R1	A	1
E2.2 - Iu≤2000A	4p	IEC/UL	F; W (MP)	1SDA081208R1	A	1
E2.2 - Iu=2500A; E4.2	3p	IEC/UL	F; W (MP)	1SDA081208R1	A	1
E2.2 - Iu=2500A; E4.2	4p	IEC/UL	F; W (MP)	1SDA081209R1	A	1
E6.2	3p	IEC/UL	F; W (MP)	1SDA081210R1	A	1
E6.2	4p; 4p/f	IEC/UL	F; W (MP)	1SDA081211R1	A	1



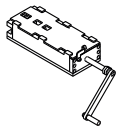
Spring Charging lever

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E2.2; E4.2; E6.2	3p; 4p	IEC/UL	F; W (MP)	1SDA081217R1	A	1



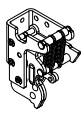
Signalling charged spring lever

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E2.2; E4.2; E6.2	3p; 4p	IEC/UL	F; W (MP)	1SDA081242R1	A	1



Spring charging device

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E2.2; E4.2; E6.2	3p; 4p	IEC	F; W(MP)	1SDA082230R1	A	1



Tripping mechanism

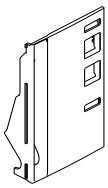
Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E2.2; E4.2; E6.2	3p; 4p	IEC	F; W (MP)	1SDA082187R1	A	1

Accessories
Spare parts



Fixing screws kit - 50 pcs

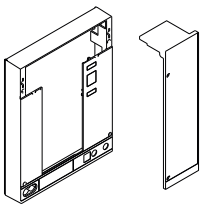
Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E1.2 - wall mounted	3p; 4p	IEC/UL	F	1SDA081179R1		1
E1.2 - floor mounted	3p; 4p	IEC/UL	F	1SDA081413R1		1
E1.2 - floor mounted	3p; 4p	IEC/UL	W (FP)	1SDA081414R1		1
E2.2; E4.2; E6.2	3p; 4p	IEC/UL	F; W (FP)	1SDA081467R1		1



Safety cover

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E1.2	3p; 4p	IEC/UL	F; W (MP)	1SDA081402R1		1
E2.2; E4.2; E6.2	3p; 4p	IEC/UL	F; W (MP)	1SDA081432R1		1

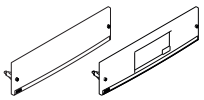
For each part ordered, specify the Serial number of the circuit-breaker it is intended for.



Accessories cover [2]

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E1.2	3p	IEC/UL	F; W (MP)	1SDA081403R1		1
E1.2	4p	IEC/UL	F; W (MP)	1SDA081404R1		1
E2.2	3p	IEC/UL	F	1SDA081433R1		1
E2.2	4p	IEC/UL	F	1SDA081434R1		1
E2.2	3p	IEC/UL	W (MP)	1SDA081435R1		1
E2.2	4p	IEC/UL	W (MP)	1SDA081436R1		1
E4.2	3p	IEC/UL	F	1SDA081437R1		1
E4.2	4p	IEC/UL	F	1SDA081438R1		1
E4.2	3p	IEC/UL	W (MP)	1SDA081439R1		1
E4.2	4p	IEC/UL	W (MP)	1SDA081440R1		1
E6.2	3p	IEC/UL	F	1SDA081441R1		1
E6.2	4p	IEC/UL	F	1SDA081442R1		1
E6.2	3p	IEC/UL	W (MP)	1SDA081443R1		1
E6.2	4p	IEC/UL	W (MP)	1SDA081444R1		1
E6.2	4p/f	IEC/UL	F	1SDA081445R1		1
E6.2	4p/f	IEC/UL	W (MP)	1SDA081446R1		1
E1.2 - Castell [1]	3p; 4p	IEC	F; W (MP)	1SDA082145R1		1
E2.2...E6.2 - Castell [1]	3p; 4p	IEC	F	1SDA082146R1		1
E2.2...E6.2 - Castell [1] **KLC**	3p; 4p	IEC	W (MP)	1SDA082149R1		1
E2.2...E6.2 - Castell [1] **KLC+ KLP**	3p; 4p	IEC	W (MP)	1SDA082150R1		1
E2.2...E6.2 - Castell [1] **KLP**	3p; 4p	IEC	W (MP)	1SDA082151R1		1

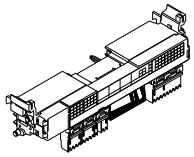
1) The lock is not included; 2) TU Reset not included. Use the existing one.



Transparent cover for trip unit

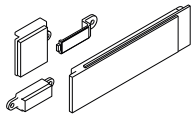
Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E1.2 DIP	3p; 4p	IEC/UL	F; W (MP)	1SDA081405R1		1
E1.2 Touch	3p; 4p	IEC/UL	F; W (MP)	1SDA081406R1		1
E2.2; E4.2; E6.2 DIP	3p; 4p	IEC/UL	F; W (MP)	1SDA081447R1		1
E2.2; E4.2; E6.2 Touch	3p; 4p	IEC/UL	F; W (MP)	1SDA081448R1		1

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Type A Spare part = only for ABB L3 technicians



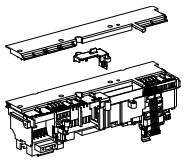
Sliding contact for Moving Part

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E1.2	3p	IEC/UL	W (MP)	1SDA081167R1		1
E1.2	4p	IEC/UL	W (MP)	1SDA081168R1		1
E2.2; E4.2; E6.2	3p; 4p	IEC/UL	W (MP)	1SDA081212R1		1
E2.2; E4.2; E6.2 - MS	3p; 4p	IEC/UL	W (MP)	1SDA081213R1		1



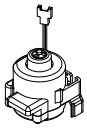
Kit front cover plugs

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E1.2	3p; 4p	IEC/UL	F; W (MP)	1SDA081415R1		1
E2.2; E4.2; E6.2	3p; 4p	IEC/UL	F; W (MP)	1SDA081471R1		1



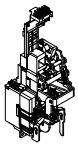
Terminal box connection interface

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E1.2	3p; 4p	IEC/UL	F	1SDA081409R1	A	1
E2.2; E4.2; E6.2	3p; 4p	IEC/UL	F; W (MP)	1SDA081451R1	A	1
E2.2; E4.2; E6.2 - MS	3p; 4p	IEC/UL	F; W (MP)	1SDA081452R1	A	1



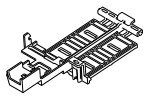
Trip coil

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E1.2	3p; 4p	IEC/UL	F; W (MP)	1SDA081407R1		1
E2.2; E4.2; E6.2	3p; 4p	IEC/UL	F; W (MP)	1SDA081449R1		1



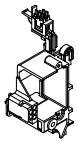
Right plate for accessories (Right MID)

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E2.2; E4.2; E6.2	3p; 4p	IEC/UL	F; W (MP)	1SDA081214R1	A	1
E2.2; E4.2; E6.2 - MS	3p; 4p	IEC/UL	F; W (MP)	1SDA081215R1	A	1



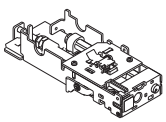
Cover for right plate for accessories (Right MID Cover)

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E2.2; E4.2; E6.2	3p; 4p	IEC/UL	F; W (MP)	1SDA081466R1		1



Left plate for accessories (Left MID)

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E1.2	3p; 4p	IEC/UL	F; W (MP)	1SDA081170R1		1
E2.2; E4.2; E6.2	3p; 4p	IEC/UL	F; W (MP)	1SDA081453R1		1



Racked in and out device (CD)

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E2.2; E4.2; E6.2	3p; 4p	IEC/UL	W (MP)	1SDA081216R1	A	1

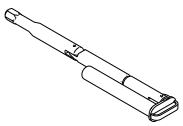


CD lock lever

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E2.2; E4.2; E6.2	3p; 4p	IEC/UL	W (MP)	1SDA081256R1	A	1

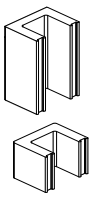
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Accessories
Spare parts



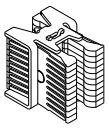
Racking in and out lever

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E1.2	3p; 4p	IEC/UL	W (MP)	1SDA081410R1		1
E2.2; E4.2; E6.2	3p; 4p	IEC/UL	W (MP)	1SDA081455R1		1



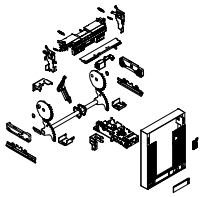
Moving part terminals

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E2.2 - Iu≤2000A	3p; 4p	IEC	W (MP)	1SDA081243R1	A	3 or 4
E2.2 - Iu=2500A	3p; 4p	IEC	W (MP)	1SDA081244R1	A	3 or 4
E4.2 - Iu≤3200A	3p; 4p	IEC	W (MP)	1SDA081245R1	A	3 or 4
E4.2 - Iu=4000A	3p; 4p	IEC	W (MP)	1SDA081246R1	A	3 or 4
E6.2	3p; 4p/f	IEC	W (MP)	1SDA081247R1	A	6 or 7 or 8



Jaw contacts

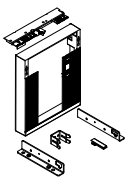
Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E1.2	3p; 4p	IEC	W (FP)	1SDA081164R1	A	3 or 4
E2.2 - Iu≤2000A	3p; 4p	IEC	W (FP)	1SDA081195R1	A	3 or 4
E2.2 - Iu=2500A	3p; 4p	IEC	W (FP)	1SDA081196R1	A	3 or 4
E4.2 - Iu≤3200A	3p; 4p	IEC	W (FP)	1SDA081197R1	A	3 or 4
E4.2 - Iu=4000A	3p; 4p	IEC	W (FP)	1SDA081198R1	A	3 or 4
E6.2	3p; 4p; 4p/f	IEC	W (FP)	1SDA081199R1	A	6 or 7 or 8



Conversion kit from Fixed to Moving part [(1)]

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E1.2	3p	IEC	F	1SDA081176R1	A	1
E1.2	4p	IEC	F	1SDA081177R1	A	1
E2.2	3p	IEC	F	1SDA081234R1	A	1
E2.2	4p	IEC	F	1SDA081235R1	A	1
E4.2	3p	IEC	F	1SDA081236R1	A	1
E4.2	4p	IEC	F	1SDA081237R1	A	1
E6.2	3p	IEC	F	1SDA081238R1	A	1
E6.2	4p	IEC	F	1SDA081239R1	A	1
E6.2	4p/f	IEC	F	1SDA081240R1	A	1

For each part ordered, specify the Serial number of the circuit-breaker it is intended for; * moving part terminals not included

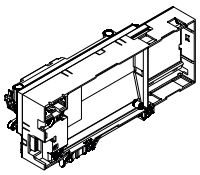


Conversion kit from Moving Part into Fixed version *

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E1.2 - wall mounted	3p; 4p	IEC/UL	W (MP)	1SDA081178R1	A	1
E1.2 - floor mounted	3p; 4p	IEC/UL	W (MP)	1SDA082303R1	A	1
E2.2; E4.2; E6.2	3p; 4p	IEC/UL	W (MP)	1SDA081241R1	A	1

For each part ordered, it is mandatory to specify the Serial number of the circuit-breaker it is intended for; 1) Standard terminals not included

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Type A Spare part = only for ABB L3 technicians



Main board

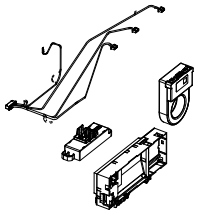
Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E1.2	3p; 4p	IEC/UL	F; W (MP)	1SDA081408R1		1
E2.2; E4.2; E6.2	3p; 4p	IEC/UL	F; W (MP)	1SDA081450R1		1

For each part ordered, it is mandatory to specify the Serial number of the circuit-breaker it is intended for.



Trip Unit Battery

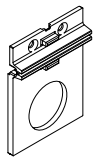
Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E1.2; E2.2; E4.2; E6.2	3p; 4p	IEC/UL	F; W (MP)	1SDA074193R1		1



Main board + Sensors + cables

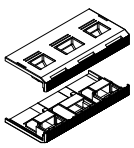
Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E2.2	3p	IEC/UL	F; W (MP)	1SDA081200R1	A	1
E2.2	4p	IEC/UL	F; W (MP)	1SDA081201R1	A	1
E4.2	3p	IEC/UL	F; W (MP)	1SDA081202R1	A	1
E4.2	4p	IEC/UL	F; W (MP)	1SDA081203R1	A	1
E6.2	3p	IEC/UL	F; W (MP)	1SDA081204R1	A	1
E6.2	4p	IEC/UL	F; W (MP)	1SDA081205R1	A	1
E6.2	4p/f	IEC/UL	F; W (MP)	1SDA081206R1	A	1

For each part ordered, it is mandatory to specify the Serial number of the circuit-breaker it is intended for.



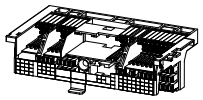
Sensors plastic covers

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E2.2	3p; 4p	IEC/UL	F; W (MP)	1SDA081468R1		1
E4.2	3p; 4p	IEC/UL	F; W (MP)	1SDA081469R1		1
E6.2	3p; 4p; 4p/f	IEC/UL	F; W (MP)	1SDA081470R1		1



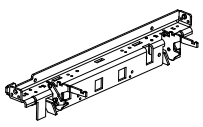
Terminal covers

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E1.2	3p	IEC/UL	W (MP)	1SDA081182R1		1
E1.2	4p	IEC/UL	W (MP)	1SDA081183R1		1



Terminal box fixed part

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E1.2	3p; 4p	IEC/UL	W (FP)	1SDA081180R1	A	1
E2.2; E4.2	3p; 4p	IEC	W (FP)	1SDA082152R1	A	1
E6.2	3p; 4p; 4p/f	IEC	W (FP)	1SDA082153R1	A	1

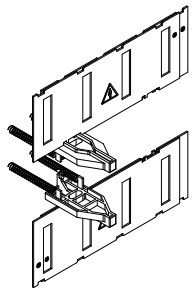


Support for terminal box of Fixed Part

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E1.2	3p	IEC/UL	W (FP)	1SDA082237R1	A	1
E1.2	4p	IEC/UL	W (FP)	1SDA082238R1	A	1
E2.2	3p	IEC/UL	W (FP)	1SDA081249R1	A	1
E2.2	4p	IEC/UL	W (FP)	1SDA081250R1	A	1
E4.2	3p	IEC/UL	W (FP)	1SDA081251R1	A	1
E4.2	4p	IEC/UL	W (FP)	1SDA081252R1	A	1
E6.2	3p	IEC/UL	W (FP)	1SDA081253R1	A	1
E6.2	4p	IEC/UL	W (FP)	1SDA081254R1	A	1
E6.2	4p/f	IEC/UL	W (FP)	1SDA081255R1	A	1

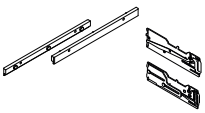
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Type A Spare part = only for ABB L3 technicians

Accessories
Spare parts



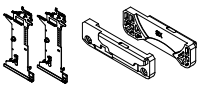
Safety shutters for fixed part

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E1.2	3p	IEC	W (FP)	1SDA081411R1		1
E1.2	4p	IEC	W (FP)	1SDA081412R1		1
E2.2	3p	IEC	W (FP)	1SDA081457R1		1
E2.2	4p	IEC	W (FP)	1SDA081458R1		1
E4.2	3p	IEC	W (FP)	1SDA081459R1		1
E4.2	4p	IEC	W (FP)	1SDA081460R1		1
E6.2	3p	IEC	W (FP)	1SDA081461R1		1
E6.2	4p	IEC	W (FP)	1SDA081462R1		1
E6.2	4p/f	IEC	W (FP)	1SDA081463R1		1



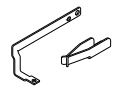
Lateral guides for fixed part

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E2.2; E4.2; E6.2	3p; 4p	IEC	W (FP)	1SDA082154R1	A	1



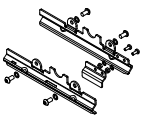
Lateral guides for Moving part

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E1.2	3p; 4p	IEC	W (MP)	1SDA082188R1		1
E2.2; E4.2; E6.2	3p; 4p	IEC	W (MP)	1SDA082302R1		1



Earth sliding contact for Fixed Part

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E2.2; E4.2; E6.2	3p; 4p	IEC/UL	W (FP)	1SDA081465R1		1



Safety cover

Size	Poles	IEC/UL	Version	Global PN	Type spare	Min quantity
E2.2; E4.2; E6.2	3p; 4p	IEC/UL	W (MP)	1SDA081464R1		1

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Type A Spare part = only for ABB L3 technicians

The complete ordering codes for original and guaranteed spare parts are available in the ABB SACE Spare Parts Catalog – 1SDC001007D0204.

Contact information

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