CATALOG - APRIL 2026 EDITION

SACE EMAX 3

Low voltage power circuit-breakers
IEEE C37.13 / UL1066 / CSA standards



START

- Adaptive
- Reliable
- Secure

ENGINEERED
TO OUTRUN

Equipped with cutting-edge technology and intelligent data processing, SACE Emax 3 effectively optimizes control, adapts to emerging challenges, and mitigates risks, all while safeguarding personnel and protecting valuable assets.

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01

MAIN CHARACTERISTICS

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1/8 **Secure**

SACE EMAX 3 LOW-VOLTAGE POWER CIRCUIT-BREAKERS

Main characteristics

The ABB SACE Emax 3 represents the ultimate evolution of the circuit-breaker:
It transforms data into actionable insight, helping prevent potential issues and adapting to changing conditions.

Safeguard what matters most, Emax 3 is designed to help protect and secure personel, and assets with a high level of reliability. This commitment to protection empowers businesses to increase operational safety and efficiency, ensuring they can thrive in an ever-changing landscape.

Enhance the efficiency of electrical distribution systems, Emax 3 builds on the robust foundation of ABB's revolutionary Emax 2 circuit breaker. This innovative solution is designed for seamless integration and smooth collaboration with other devices, ensuring a cohesive and reliable power management experience.

Strengthen proactive decision-making and streamline system performance and maintenace. Emax 3 can continuously collect and intelligently processes information, helping anticipate critical situations and monitor electrical systems, it can sense and interpret environmental data to assess its own health status, optimizing protection and maximizing efficiency.

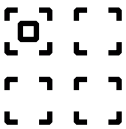
Emax 3 is cULus-listed in accordance with UL1066 and CSA C22.2 No.268 standards.



Distinctive Features

To address the challenges of modern electrical distribution systems, ABB SACE Emax 3 has advanced its innovations, becoming more adaptive, secure, and reliable than ever before.

01



Adaptive:

Easily integrate into systems and equipment, adapting to changing user needs by providing scalable solutions and upgrades for future requirements.

02



Reliable:

Optimize uptime for electrical distribution systems through comprehensive sensing capabilities and effective power and asset management strategies.

03



Secure:

Safeguard assets and prevent unwanted access with Emax 3's offering of expanded protections and extensive level of cybersecurity.

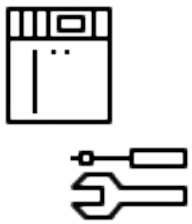
SACE EMAX 3 LOW-VOLTAGE POWER CIRCUIT-BREAKERS

Main characteristics

SACE EMAX 3: ADAPTIVE

The power of adaptability is key to drive success in an evolving electrical landscape. The Emax 3 is designed to be adaptive, helping to ensure seamless integration into both new systems and those previously built with Emax 2.

ABB's commitment to adaptability means not only facilitating integration but also evolving alongside customers' needs by providing scalable solutions and fostering continuous advancement to meet changing requirements.



Upgradeable and Customizable

Ekip Aware is the new trip unit platform that supports full customization on field, minimizing lead times and installation efforts, offering:

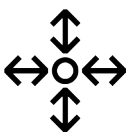
- Customizable set of preinstalled protection plus on-demand protection upgrades
- Digital rating plugs to choose the nominal current without additional hardware
- Digitally upgradable architecture to easily adapt to fast-growing needs



Intuitive interaction

Ekip Aware trip unit enables a comprehensive set of features to improve the overall user experience:

- Improved touchscreen with clear menu for easy navigation
- Standard USB-C interface for software connection by computer and by mobile
- Extended wireless connectivity for smartphones via NFC and Bluetooth



Optimized communication

Emax 3’s optimized communication architecture is adapting to exponentially growing number of connected devices. Ekip Aware matches applications requirements in terms of flexibility and reliability:

- Modbus TCP via daisy chain connection to simplify cabling
- Redundancy with IEC 61850, Profinet and Ethernet IP to increase reliability
- Empowered ethernet modules to manage more devices

Seamless Integration

Emax 3 offers backward compatibility with Emax 2: simplifies retesting for your system. Compared to Emax 2, the ABB SACE Emax 3 breaker offers:

- The same dimensions and mounting points
- The same minimum enclosure requirements
- The same power and auxiliary connection
- Compatibility between the Emax 2 fixed part and the Emax 3 moving part



SACE EMAX 3 LOW-VOLTAGE POWER CIRCUIT-BREAKERS

Main characteristics

SACE EMAX 3: RELIABLE

Achieve optimal power management and efficiency, Emax 3 transforms the landscape of electrical systems by providing exceptional measurement accuracy and performance. This innovative solution simplifies power quality, and asset management framework, and enables flexible power management of complex distribution systems, offering ready-to-go solutions and customizable options that can adapt to specific application needs.



Measurement and accuracy

Emax 3 provides top performance in measurement capabilities and accuracy. Providing consistent monitoring of power and energy consumption, it reduces the need for external devices and simplifies the measurement chain:

- Class 0.5 IEC 61557-12 certified for Active Power and Energy for best accuracy
- Total Harmonic Distortion THD and Total Demand Distortion TDD analysis
- Optional built-in Network Analyzer functionality for power quality analysis
- Improved data loggers for advanced waveform capture



Custom logics

Emax 3 introduces an innovative and flexible approach powered by distributed intelligence across various devices, eliminating the need for external controllers. This advancement enables users to streamline operations and enhance system performance through:

- Ready-to-Go Solutions like Integrated Automatic Throw Over (ATO), engineered and tested by ABB for immediate deployment
- Capability to adapt solutions that can be tailored to fit specific application needs
- A user-friendly tool to create new and customized logics from scratch, ensuring alignment with specific system requirements



Temperature monitoring

Emax 3 enhances system reliability by offering multiple temperature monitoring solutions at both device and system level. It enables data driven decisions based on collected measurement to keep plant under control:

- Ekip Temperature 4T to monitor up to 4 busbar temperatures
- Distributed wireless sensors to check temperature and humidity
- Internal temperature sensors to evaluate maintenance and protection strategies



Sense accessories

Emax 3 offers a new range of opening, closing and undervoltage coils, plus motor operators, to monitor and communicate health status of such key accessories. It makes possible to reduce unplanned downtime and to execute maintenance based on real condition and usage.

- Real time check of key parameters such as voltage, current, operations duration, etc.
- Standard and Sense coils can be combined for monitoring and redundancy
- Sense accessories are also field mountable for upgrades at any time



Diagnostic management

Emax 3 enables the continuous monitoring of relevant parameters to keep the overall health status of the circuit-breaker under control:

- Health index display to summarize main device and Sense accessories health
- Complete set of alarms and warnings for advanced diagnostic
- Integrated troubleshooting in Ekip Connect software and EPiC mobile app



Predictive maintenance

Emax 3 provides accurate predictions on when maintenance is needed, adapting estimations on real usage information and breaker health:

- Improved predictive algorithm based on real installation data
- Local and remote access to next maintenance date
- Efficient planning of service activities

SACE EMAX 3 LOW-VOLTAGE POWER CIRCUIT-BREAKERS

Main characteristics

SACE EMAX 3: SECURE

In response to the evolving demands of modern electrical systems, the scope of various types of protection for circuit breakers has significantly expanded beyond that of previous generations. This comprehensive offering addresses various levels and scenarios, to help ensure the protection of personnel, and assets.



Arc-flash protection

Emax 3 provides the option to integrate an active protection against arc-flash, to increase operators' safety and to reduce the risk of equipment damages, thanks to the fast detection time:

- Fast protection with a total clearing times of less than 40 ms for swift response
- Extensive monitoring with up to 12 sensors (arc light and pressure) per circuit-breaker



Adaptive microgrid protection

Under diverse plant conditions it is important to ensure high level of selectivity and continuity of service. Emax 3 can adapt its protection settings to different scenarios by changing relevant thresholds during transitions:

- Dual setting for most frequent applications
- Triple setting for an additional set of thresholds



MDGF protection

Emax 3 has enhanced its Modified Differential Ground Fault protection in a new, smart, and user-friendly manner, reducing installation time and minimizing the overall number of components required.

- Logic managed via Link internal communication
- No need for additional phase current transformers
- No need for external summing current transformers



RELT Protection for NEC 240.87

Emax 3 improves operator safety during maintenance by Reduced Energy Let-Through protection management in an easier way with Ekip Aware:

- The trip unit display changes to blue when protection is enabled, providing clear and immediate visual indication
- Activation/deactivation also via EPiC mobile app, keeping operator away from switchboard



Cybersecurity and IEC 62443-4-2

Emax 3 offers additional levels of security and the compliance with IEC 62443-4-2 Security level capability (SL-C 2), adding an additional layer of access protection to relevant parameters on trip unit and communication protocols:

- Dedicated module portfolio ensure that circuit breaker communicate only with original modules thanks to security artifacts. Anti spoofing and anti tampering features.
- Secure USB and BLE: Ensure that circuit breaker communicate only with original ABB tools thanks to security artifacts
- Role based access ABB account management will allow role-based access (Owner, Admin, Engineer, Operator, Viewer)



Remote racking device

Emax 3 expands its offering of Remote Racking Devices, increasing operator safety during breaker racking without being directly in front of the equipment:

- External RRD for all frames, to operate breaker up to a 10 meters (32.9 feet) in distance
- Embedded RRD-E for E4.3 and E6.3 frames, to operate also with EPiC mobile app



Key locks, padlocks and interlock offering

Emax 3 offers new solutions to prevent unwanted access to the circuit breaker and to enable interlock logics across different devices:

- Double keylock and padlock in open position for redundancy
- Simplified design for mechanical interlocks to reduce installation time

02

PERFORMANCES

2/2 **SACE Emax 3 E1.3 power circuit-breakers UL 1066**

2/3 **SACE Emax 3 E2.3 power circuit-breakers UL 1066**

2/4 **SACE Emax 3 E4.3 power circuit-breakers UL 1066**

2/5 **SACE Emax 3 E6.3 power circuit-breakers UL 1066**

2/6 **SACE Emax 3 switch disconnectors UL 1066**

2/7 **SACE Emax 3 multi-standard version IEC 60947, UL1066 and CCC**

SACE EMAX 3 E1.3 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 3 UL 1066				**E1.3**	
Performance levels			**B-A**	**N-A**	**S-A**
Rated uninterrupted current Iu @ 40°C		[A]	800	800	250
		[A]	1200	1200	400
		[A]			800
		[A]			1200
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 (30 cycle/0.5s)		[kA]	42	50	50
Breaking (1)	Breaking time for I<Icw	[ms]	40	40	40
	Breaking time for I>Icw	[ms]	25	25	25

1) Total clearing time is the sum of breaking time and trip time

Dimensions and weight			
Dimensions	H - Fixed/Drawout	[in/mm]	11.65 [in] - 296 [mm]/14.33 [in] - 363.5 [mm]
	D - Fixed/Drawout	[in/mm]	7.20 [in] - 183 [mm]/ 11.06 [in]- 281 [mm]
	W - Fixed 3p/4p	[in/mm]	8.27 [in] - 210 [mm]/ 11.02 [in] -280 [mm]
	W - Drawout 3p/4p	[in/mm]	10.94 [in] - 278 [mm]/13.70 [in] -348 [mm]
Weights (CB with trip unit/current sensors/standard accessories)	Fixed 3p/4p	[lbs/Kg]	30.9 [lbs] - 14 [kg]/35.3 [lbs] - 16 [kg]
	Drawout 3p/4p including fixed part	[lbs/Kg]	90.4 [lbs]- 41 [kg]/102.5 [lbs] - 46.5 [kg]

SACE Emax 3 UL 1066			**E1.3**		
Mechanical life with regular ordinary maintenance prescribed by the manufacturer	[Iu]	[A]	< 800	800	1200
		[No. cycles x 1000]	20	20	20
	Frequency	[Oper./Hour]	60	60	60
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	[Oper./Hour]	30	30	30

SACE EMAX 3 E2.3 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 3 UL 1066			**E2.3**				
Performance levels			**B-A**	**N-A**	**S-A**	**H-A**	**V-A**
Rated uninterrupted current Iu @ 40°C		[A]	1600	1600	800	800	250
		[A]		2000	1200	1200	400
		[A]			1600	1600	800
		[A]			2000	2000	1200
		[A]					1600
		[A]					2000
Neutral pole current-carrying capacity for 4-pole CBs		[%Iu]	100	100	100	100	100
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 (30 cycle/0.5s)		[kA]	42	50	65	85	85
Breaking (1)	Breaking time for I<Icw	[ms]	40	40	40	40	40
	Breaking time for I>Icw	[ms]	25	25	25	25	25

1) Total clearing time is the sum of breaking time and trip time

Dimensions and weight			
Dimensions	H - Fixed/Drawout	[in/mm]	14.61 [in] - 371 [mm]/16.73 [in] - 425 [mm]
	D - Fixed/Drawout	[in/mm]	10.63 [in] - 270 [mm]/15.47 [in]- 393 [mm]
	W - Fixed 3p/4p	[in/mm]	10.87 [in] -276 [mm]/ 14.41 [in] -366 [mm]
	W - Drawout 3p/4p	[in/mm]	12.48 [in] - 317 [mm]/16.02 [in] -407 [mm]
Weights (CB with trip unit/current sensors/standard accessories)	Fixed 3p/4p	[lbs/Kg]	115 [lbs] - 52 [kg]/148 [lbs] - 67 [kg]
	Drawout 3p/4p including fixed part	[lbs/Kg]	up to 1600A: 128 [lbs] -58 [kg]/150 [lbs] - 68 [Kg] ; 2000A: 135 [lbs] - 61 [kg]/239 [lbs] - 108 [kg]

SACE Emax 3 UL 1066			**E2.3**		
Mechanical life with regular ordinary maintenance prescribed by the manufacturer	[Iu]	[A]	<1600	1600	2000
		[No. cycles x 1000]	25	25	25
	Frequency	[Oper./Hour]	60	60	60
Electrical life with regular ordinary maintenance prescribed by the manufacturer	508 V	[No. cycles x 1000]	15	12	10
	635 V	[No. cycles x 1000]	15	10	8
	Frequency	[Oper./Hour]	30	30	30

SACE EMAX 3 E4.3 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 3 UL 1066			**E4.3**		
Performance levels			**S-A**	**H-A**	**V-A**
Rated uninterrupted current Iu @ 40°C		[A]	2500	2500	800
		[A]	3000	3000	1600
		[A]	3200	3200	2000
		[A]			2500
		[A]			3000
		[A]			3200
		[A]			
Neutral pole current-carrying capacity for 4-pole CBs		[%Iu]	100	100	100
Interrupting rating at rated maximum voltage	254 V	[kA]	65	85	100
	508 V	[kA]	65	85	100
	635 V	[kA]	65	85	100
Rated short time current (30 cycle/0.5s)		[kA]	65	85	100
Breaking (1)	Breaking time for I<Icw	[ms]	40	40	40
	Breaking time for I>Icw	[ms]	25	25	25

1) Total clearing time is the sum of breaking time and trip time

Dimensions and weight			
Dimensions	H - Fixed/Drawout	[in/mm]	14.61 [in] - 371 [mm]/16.73 [in]- 425 [mm]
	D - Fixed/Drawout	[in/mm]	10.63 [in]- 270 [mm]/ 15.47 [in]-393 [mm]
	W - Fixed 3p/4p	[in/mm]	15.12[in] - 384 [mm]/20.08 [in]-510 [mm]
	W - Drawout 3p/4p	[in/mm]	16.73 [in] - 425/[mm]/21.69 [in] -551 [mm]
Weights (CB with trip unit/current sensors/standard accessories)	Fixed 3p/4p	[lbs/Kg]	Up to 2500A: 161[lbs] - 73 [kg]/203 [lbs] - 92 [kg]; 3200A: 201[lbs]-91 [kg]/256 [lbs] -116 [kg] ; 3600A: 210 [lbs] - 95 [kg]
	Drawout 3p/4p including fixed part	[lbs/Kg]	Up to 2500A: 261 [lbs]-118 [kg]/325 [lbs] - 147 [kg]; 3200A: 300 [lbs]- 136 [kg]/377 [lbs] - 171 [kg]

SACE Emax 3 UL 1066			**E4.3**		
Mechanical life with regular ordinary maintenance prescribed by the manufacturer	[Iu]	[A]	< 800	800	1200
		[No. cycles x 1000]	20	20	20
	Frequency	[Oper./Hour]	60	60	60
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	[Oper./Hour]	30	30	30

SACE EMAX 3 E6.3 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 3 UL 1066			E6.3	
Performance levels			**H-A**	**V-A**
Rated uninterrupted current Iu @ 40°C		[A]	4000	4000
		[A]	5000	5000
		[A]	6000 (1)	6000 (1)
Neutral pole current-carrying capacity for 4-pole CBs		[%Iu]	50-100	50-100
Interrupting rating at rated maximum voltage	254 V	[kA]	85	100
	508 V	[kA]	85	100
	635 V	[kA]	85	100
Rated short time current (30 cycle/0.5s)		[kA]	85	100
Breaking (2)	Breaking time for I<Icw	[ms]	40	40
	Breaking time for I>Icw	[ms]	25	25

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

Dimensions and weight			
Dimensions	H - Fixed/Drawout	[in/mm]	14.61 [in] - 371 [mm]/16.73 [in]- 425 [mm]
	D - Fixed/Drawout	[in/mm]	10.63 [in]- 270 [mm]/ 15.47 [in]-393 [mm]
	W - Fixed 3p/4p/4p full size	[in/mm]	30 [in]-762[mm]/34.96 [in] - 888 [mm]/39.92 [in] - 1014 [mm]
	W - Drawout 3p/4p/4p full size	[in/mm]	31.61 [in] - 803[mm]/36.57 [in] - 929 [mm]/ 42.09 [in] - 1069 [mm]
Weights (CB with trip unit/current sensors/standard accessories)	Fixed 3p/4p/4p full size	[lbs/Kg]	314 [lbs]- 142 [kg]/360 [lbs]-163 [kg]/ 406 [lbs] - 184 [kg]
	Drawout 3p/4p/4p full size including fixed part	[lbs/Kg]	Up to 5000A: 486 [lbs]-220 [kg]/ 554 [lbs]-251 [kg]/620 [lbs] -281 [kg] 6000A: 818 [lbs] - 371 [kg]

SACE Emax 3 UL 1066			E6.3		
Mechanical life with regular ordinary maintenance prescribed by the manufacturer	[Iu]	[A]	4000	5000	6000
		[No. cycles x 1000]	12	12	12
	Frequency	[Oper./Hour]	60	60	60
Electrical life with regular ordinary maintenance prescribed by the manufacturer	508 V	[No. cycles x 1000]	4	3	2
	635 V	[No. cycles x 1000]	4	2	2
	Frequency	[Oper./Hour]	10	10	10

SACE EMAX 3 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 - 4/f
Version		Fixed (F) - Drawout (W)



Frame			**E1.3**		**E2.3**			**E4.3**			**E6.3**
Performance levels			**B-A**	**N-A**	**N-A**	**S-A**	**V-A**	**S-A**	**H-A**	**V-A**	**L-A**
Rated uninterrupted current Iu @ 40°C		[A]	800	800	1600	800	800	2500	2500	800	4000
		[A]	1200	1200	2000	1600	1600	3200	3200	1600	5000
		[A]				2000	2000			2000	6000 (1)
Neutral pole current-carrying capacity for 4-pole CBs		[%Iu]	100	100	100	100	100	100	100	100	50-100
Rated short time current (30 cycle/0.5s)		[kA]	42	50	50	65	65	65	85	100	100

1) 3 poles and draw out only - Overall dimension as 4 poles full size

Dimensions and weight			**E1.3**	**E2.3**	**E4.3**	**E6.3**
Dimensions	H - Fixed/Drawout	[in/mm]	11.65 [in] - 296 [mm]/ 14.33 [in] -363.5 [mm]	14.61 [in] - 371 [mm]/ 16.73 [in] - 425 [mm]	14.61 [in] - 371 [mm]/ 16.73 [in] - 425 [mm]	14.61 [in] - 371 [mm]/ 16.73 [in] - 425 [mm]
	D - Fixed/Drawout	[in/mm]	7.20 [in] - 183 [mm]/ 11.06 [in] - 281 [mm]	10.63 [in] - 270 [mm]/ 15.47 [in] - 393 [mm]	10.63 [in] - 270 [mm]/ 15.47 [in] - 393 [mm]	10.63 [in] - 270 [mm]/ 15.47 [in] - 393 [mm]
	W - Fixed 3p/4p	[in/mm]	8.27 [in] - 210 [mm]/ 11.02 [in] - 280 [mm]	10.87 [in] - 276 [mm]/ 14.41 [in] - 366 [mm]	15.12 [in] - 384 [mm]/ 20.08 [in] - 510 [mm]	30 [in] - 762 [mm]/ 34.96 [in] - 888 [mm]/ 39.92 [in] - 1014 [mm]
	W - Drawout 3p/4p	[in/mm]	10.94 [in] - 278 [mm]/ 13.70 [in] - 348 [mm]	12.48 [in] - 317 [mm]/ 16.02 [in] - 407 [mm]	16.73 [in] - 425 [mm]/ 21.69 [in] - 551 [mm]	31.61 [in] - 803 [mm]/ 36.57 [in] - 929 [mm]/ 42.09 [in] - 1069 [mm]
Weights (CB with trip unit/current sensors/standard accessories)	Fixed 3p/4p	[lbs/Kg]	30.9 [lbs] - 14 [kg]/ 35.3 [lbs] - 16 [kg]	115 [lbs] - 52 [kg]/ 148[lbs] - 67 [kg]	Up to 2500A: 161[lbs] - 73 [kg]/ 203[lbs] - 92 [kg]; 3200A: 201[lbs] - 91 [kg] / 256 [lbs] - 116 [kg]; 3600A: 210[lbs] - 95 [kg]	314 [lbs] - 142 [kg]/ 360 [lbs] - 163 [kg]/ 406 [lbs] - 184 [kg]
	Drawout 3p/4p including fixed part	[lbs/Kg]	90.4 [lbs] - 41 [kg]/ 102.5 [lbs] - 46.5 [kg]	up to 1600A: 128 [lbs] - 58 [kg]/ 150 [lbs] - 68 [kg]; 2000A: 135 [lbs] - 61 [kg]/ 239 [lbs] - 108 [kg]	Up to 2500A: 261 [lbs] - 118 [kg]/ 325 [lbs] - 147 [kg]; 3200A: 300 [lbs] - 136 [kg]/ 377 [lbs] - 171 [kg]	Up to 5000A: 486 [lbs] - 220 [kg]/ 554 [lbs] - 251 [kg]/ 620 [lbs] - 281 [kg] 6000A: 818 [lbs] - 371 [kg]

ELECTRICAL AND MECHANICAL LIFE

FRAME			**E1.3**			**E2.3**			**E4.3**				**E6.3**		
Mechanical life with regular ordinary maintenance prescribed by the manufacturer	[Iu]	[A]	< 800	800	1200	<1600	1600	2000	<2500	2500	3200	3600	4000	5000	6000
		[No. cycles x 1000]	20	20	20	25	25	25	20	20	20	20	12	12	12
	Frequency	[Oper./Hour]	60	60	60	60	60	60	60	60	60	60	60	60	60
Electrical life with regular ordinary maintenance prescribed by the manufacturer	508 V	[No. cycles x 1000]	8	8	7	15	12	10	10	8	7	7	4	3	2
	635 V	[No. cycles x 1000]	8	8	6,5	15	10	8	10	8	7	7	4	2	2
	Frequency	[Oper./Hour]	30	30	30	30	30	30	20	20	20	20	10	10	10

SACE EMAX 3 MULTI-STANDARD VERSION IEC 60947, UL1066 AND CCC

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)
Isolation behaviour		IEC 60947-2

Frame			E2.3			E4.3				E6.3
Performance levels			**N-A**	**S-A**	**H-A**	**V-A**	**S-A**	**H-A**	**V-A**	**V-A**
Rated uninterrupted current Iu @ 40°C		[A]	1600	800	800	250	2500	2500	800	4000
		[A]	2000	1200	1200	400	3000	3000	1600	5000
		[A]		1600	1600	800	3200	3200	2000	6000 (1)
		[A]		2000	2000	1200			2500	
		[A]				1600			3000	
		[A]				2000			3200	
		[A]								
Neutral pole current-carrying capacity for 4-pole CBs		[%Iu]	100	100	100	100	100	100	100	50-100
Interrupting rating at rated maximum voltage	254 V	[kA]	50	65	85	100	65	85	100	100
	508 V	[kA]	50	65	85	100	65	85	100	100
	635 V	[kA]	50	65	85	85	65	85	100	100
Rated short time current (30 cycle/0.5s)		[kA]	50	65	85	85	65	85	100	100

13 poles and draw out only - Overall dimension as 4 poles full size
Note: Drawout versions utilize standard UL cradles/fixed parts

Dimensions and weight			E2.3	E4.3	E6.3
Dimensions	H - Fixed/Drawout	[in/mm]	14.61 [in] - 371 [mm]/ 16.73 [in] - 425 [mm]	14.61 [in] - 371 [mm]/ 16.73 [in]- 425 [mm]	14.61 [in] - 371 [mm]/ 16.73 [in]- 425 [mm]
	D - Fixed/Drawout	[in/mm]	10.63 [in] - 270 [mm]/ 15.47 [in]- 393 [mm]	10.63 [in]- 270 [mm]/ 15.47 [in]-393 [mm]	10.63 [in]- 270 [mm]/ 15.47 [in]-393 [mm]
	W - Fixed 3p/4p	[in/mm]	10.87 [in] -276 [mm]/ 14.41 [in] -366 [mm]	15.12[in] - 384 [mm]/ 20.08 [in]-510 [mm]	30 [in]-762[mm]/ 34.96 [in] - 888 [mm]/ 39.92 [in] -1014 [mm]
	W - Drawout 3p/4p	[in/mm]	12.48 [in] - 317 [mm]/ 16.02 [in] -407 [mm]	16.73 [in] - 425/[mm]/ 21.69 [in] -551 [mm]	31.61 [in] - 803[mm]/ 36.57 [in] - 929 [mm]/ 42.09 [in] - 1069 [mm]
Weights (CB with trip unit/ current sensors/ standard accessories)	Fixed 3p/4p	[lbs/Kg]	115 [lbs] - 52 [kg]/ 148 [lbs] - 67 [kg]	Up to 2500A: 161[lbs] - 73 [kg]/ 203 [lbs] - 92 [kg]; 3200A: 201[lbs]-91 [kg]/256 [lbs] -116 [kg]; 3600A: 210 [lbs] - 95 [kg]	314 [lbs]- 142 [kg]/360 [lbs]- 163 [kg]/406 [lbs] - 184 [kg]
	Drawout 3p/4p including fixed part	[lbs/Kg]	up to 1600A: 128 [lbs] -58 [kg]/ 150 [lbs] - 68 [Kg]; 2000A: 135 [lbs] - 61 [kg]/ 239 [lbs] - 108 [kg]	Up to 2500A: 261 [lbs]-118 [kg]/ 325 [lbs] - 147 [kg]; 3200A: 300 [lbs]- 136 [kg]/ 377 [lbs] - 171 [kg]	Up to 5000A: 486 [lbs]- 220 [kg]/554 [lbs]- 251 [kg]/ 620 [lbs] -281 [kg]

ELECTRICAL AND MECHANICAL LIFE

FRAME			E1.3				E4.3				
Mechanical life with regular ordinary maintenance prescribed by the manufacturer	[Iu]	[A]	< 800	800	1200	1600	2000	<2500	2500	3200	5000
		[No. cycles x 1000]	20	20	20	25	25	20	20	20	12
	Frequency	[Oper./Hour]	60	60	60	60	60	60	60	60	60
Electrical life with regular ordinary maintenance prescribed by the manufacturer	508 V	[No. cycles x 1000]	8	8	7	12	10	10	8	7	3
	635 V	[No. cycles x 1000]	8	8	6,5	10	8	10	8	7	2
	Frequency	[Oper./Hour]	30	30	30	30	30	20	20	20	10

03

DIGITAL EXPERIENCE

3/2 **Ekip Aware Architecture**

3/7 **Features**

3/8 **System Protection**

3/33 **Power Quality**

3/39 **Connectivity**

3/46 **Power Management**

3/52 **Asset Management**

3/57 **Cybersecurity**

EKIP AWARE ARCHITECTURE

The SACE Emax 3 Digital Experience offers a sophisticated ecosystem that combines customization, advanced functionality, and intuitive logic for a refined user experience. At its core is Ekip Aware, the new electronic trip unit of Emax 3.

This ecosystem of customization and flexibility empowers users to select tailored functionality, protections, measurements, and cybersecurity to meet their specific requirements. The reimagined Digital Experience opens new horizons, integrating comprehensive sensing capabilities for effective asset management strategies. Additionally, Ekip Aware provides enhanced communication architecture options to build a flexible and reliable communication network infrastructure. Create and control distribution systems with a new layer of programmable logics that make power management more effective and customizable than ever before. Finally, Emax 3 offers a refined user experience with an improved HMI display, wired and wireless connection with commissioning and monitoring software Ekip Connect, EPiC mobile app and ABB Ability Marketplace.

Offering

Ekip Aware stands out as the industry's cutting-edge electronic trip unit. Powering the Emax 3 circuit breaker and revolutionizing the digital user experience. Ekip Aware provides a reliable and flexible solution, even under the most challenging conditions, starting from (3) levels of protection:

- Ekip Aware LI
- Ekip Aware LSI
- Ekip Aware LSIG



The Emax 3 Digital Experience goes far beyond basic protection. By providing on demand customizations and upgrades this circuit breaker can be tailormade for its specific application. Upgrades can be configured directly in the circuit breaker at time of order or can be digitally activated in the field. This enables the product to evolve throughout its lifecycle and adapt easily to evolving electrical landscapes. Emax 3 has been expertly engineered to not only be a simple protection device, but to be an active player in the electrical system including solutions for multiple application areas:

- System Protection
- Power Quality
- Power management
- Asset Management
- Connectivity
- Cybersecurity

Digital Rating Plug

Expanding upon the Digital Experience, the SACE Emax 3 offers a flexible method for adjustment of the nominal current of the circuit breaker. The Digital Rating Plug upgrade, eliminates the need for a hardware replacement of the rating plug in order to adjust the nominal current of the circuit breaker.

EKIP AWARE ARCHITECTURE

Refined user experience

Emax 3 users can interact with the circuit breaker in a variety of intuitive ways in order to take full advantage of the potential of the device throughout different stages of it's lifecycle.

Epic
Mobile app support device user experience. Configuring, monitoring, and digitally upgrade the circuit-breaker improving safety, speed, and control.

HMI
Ekip Aware touch screen for easy navigation and programming of key settings and parameters.



Ekip connect
Software tool designed specifically for upgrading, commissioning, programming, monitoring and testing low voltage circuit breakers.

Lite Panel & Lite Panel Pro
Remote HMI Touchscreen Display, enabling users to monitoring and control power distribution systems.

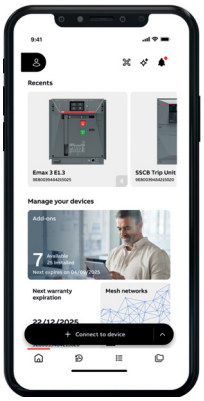
ABB Ability™ Marketplace
Online portal for accessing to the digital upgrades portfolio solutions that can be enabled on Ekip Aware.

Ekip Com modules
Easy integrate the circuit-breakers into automation and energy management systems. A wide range of communication protocols for an efficient and reliable connectivity.



HMI

Ekip Aware trip unit features a high resolution touch-screen display, providing an intuitive interface with Emax 3 circuit breakers. This refined user interface facilitates easier navigation of programming and key settings and parameters. Ekip Aware ensures clear visualization of the circuit breaker status and data.



EPiC Mobile App

EPiC allows users to connect safely to the Ekip Aware trip unit via Bluetooth, NFC or USB-C cable. It provides a convenient and user-friendly means of monitoring and managing the circuit-breaker while ensuring maximum flexibility for the end user. EPiC enables users to configure the device, setting thresholds, monitor the device status and electrical measurements available for the single device.

All of this is achieved simply by pairing the trip unit with the mobile device. EPiC allows remote access to the device information while staying safely away from the main system.

The app also allows:

- Enable circuit-breaker digital upgrades after purchasing them via the ABB Ability™ Market Place. Most of the digital upgrades after purchasing are available in the digital portfolio for the specific user account, ready to be activated on the device.
- Control remotely the circuit-breaker with a dedicated digital updrade Remote Control. It allows remote opening and closing of the circuit-breaker. In this way, interaction with the electrical system becomes safer, especially during maintenance operations.
- QR Code scanning in front of the circuit-breaker to allow the user to access details about the specific circuit-breaker, such as product information, technical specifications and test reports.



Ekip Connect

Dedicated software for upgrading, commissioning, programming, monitoring and testing low voltage circuit breakers. The USB-C front connector of Ekip Aware allows the trip unit to easily connect to PC. Ethernet and serial connection to the circuit breaker are also possible. Ekip Connect allows for adjustment of settings and parameters, secondary injection testing, circuit breaker report generation, and measurement analysis among other functionality.

EKIP AWARE ARCHITECTURE



ABB Ability™ Marketplace

The Marketplace acts as a shop for ABB's digital upgrades offerings, allowing customers to discover, subscribe to, manage and scale their usage of various ABB Ability™ services. It provides access to a growing catalog of on-demand digital upgrades, including both cloud-based and on-premises solutions offered by ABB. Customers can purchase new subscriptions, extend existing ones or even cancel services through the marketplace. Most important, it is possible to upgrade products in brownfield installation without the need to replace a device, saving cost and time.



Lite Panel Pro

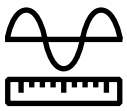
Emax 3 circuit breakers can also be connected to the state of the art in monitoring and control HMI, Lite Panel Pro, offering a versatile large touchscreen display and an intuitive interface. Lite Panel Pro HMI is a modular display solution that can connect to ABB and 3rd party devices using Ethernet communication bus, providing a customizable control options for various devices, combined with remote activation and monitoring of device status.

FEATURES

Emax 3 with Ekip Aware trip unit offers a wide range of features for different types of solutions and applications. These can be configured with the circuit breaker, and many of them can be digitally activated in the field after receipt of the product.



System Protection
- S - Time-Delayed Overcurrent Protection
- G - Ground Protections
- Current Protections
- Voltage Protections
- Advanced Voltage Protections
- Power Protections
- Directional Current Protections
- Frequency Protections
- Dual Setting Protections
- Triple Setting Protections
- Non Defeatable I Protection
- L Protection OFF
- Advanced MDGF



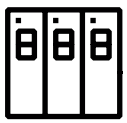
Metering
- Measuring
- Data Logger Pro
- Network Analyzer
- Class 1 Power and Energy metering
- Class 0.5 Power and Energy metering



Power Management
- Custom Logics
- Power Controller
- Adaptive Load Shedding



Cybersecurity
- Cybersecure IEC 62443-4-2



Asset management
- Predictive Maintenance on-premise
- Internal Temperature Control



Connectivity
- Com Link
- Modbus TCP Secure

SYSTEM PROTECTION

Emax 3 with Ekip Aware trip unit offers a range of protections to safeguard both the equipment and the overall system. These protection functions are essential for adapting to a variety of operational scenarios, ensuring that the circuit-breaker can respond effectively to different fault types and abnormal conditions.

L (ANSI 49), S (ANSI 50TD/51), I (ANSI 50), G (ANSI 50NTD/51N) protection functions are available depending on the type of Ekip Aware selected.
MCR (Making Current Release) protection is available by default on all trip units.

	Protection function			
Ekip Aware type	**L**	**S**	**I**	**G**
LI	●	○	●	○
LSI	●	●	●	○
LSIG	●	●	●	●

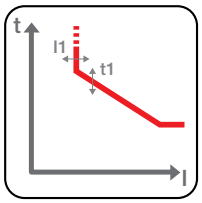
● = supplied with the circuit breaker
○ = optional loose after sales through dedicated digital upgrade

Additional protections can be added to Ekip Aware trip unit with some prerequisite as shown in the table. For example, Advanced voltage protections needs Measuring and Voltage Protections digital upgrades to be ordered separately.

L, S, I, G, Gext, RC, MDGF, MCR, S2, and RELT protection settings can be modified either via the HMI, Ekip Connect 3, or EPiC. All other protection settings can only be modified through Ekip Connect 3 or EPiC. On the HMI, they are visible only if they are enabled.

Upgrade	Protections and alarms included	Prerequisite
S protection	S - Short time delayed overcurrent (ANSI 50TD/51)	/
G protection	G - Earth fault (ANSI 50N TD/51N)	/
	Gext - External Earth Fault (ANSI 50G TD/51G)	Homopolar toroid, Ekip Supply
	MDGF - Conventional Modified Differential Ground Fault	MDGF terminal, phase and summing CT's
RC protection	RC - Residual current protection/differential current (ANSI 64, 50N/51N, 87N)	G protection, RC toroid, Ekip Supply (≥30V DC or ≥110V AC) or Ekip Busbars Supply
Advanced current protections	IU - Current Unbalance (ANSI 46)	S protection
	S2 - 2nd short-time overcurrent (ANSI 50TD/51)	
	LC1 / LC2 - Load Control Alarm	
	Iw1 / Iw2 - Current Warning	
Voltage protections	OV - Overvoltage (ANSI 59)	Measuring
	UV - Undervoltage (ANSI 27)	
	VU - Voltage unbalance (ANSI 47)	
	PS - Cyclical direction of the phases alarm (ANSI 47)	
	S(V) - Voltage controlled overcurrent (ANSI 51V)	
Advanced voltage protections	RV - Residual overvoltage (ANSI 59N)	Measuring, Voltage protections
	OV2 - 2nd Overvoltage (ANSI 59)	
	UV2 - 2nd Undervoltage (ANSI 27)	
	S(V)2 - 2nd Voltage controlled overcurrent (ANSI 51V)	
Power protections	Cos Φ- Power factor alarm (ANSI 78)	Measuring
	OP - Active overpower (ANSI 32OF)	
	OQ - Reactive overpower (ANSI 32RF)	
	RP - Reverse active power (ANSI 32R)	
	RQ - Loss of field or Reverse reactive power (ANSI 40 or 32RQ)	
	UP - Active underpower (ANSI 32LF)	
Directional overcurrent protection	D - Directional overcurrent current (ANSI 67)	Measuring
Frequency protections	OF - Overfrequency (ANSI 81H)	Measuring
	OF2 - 2nd Overfrequency (ANSI 81L)	
	UF - Underfrequency (ANSI 81L)	
	UF2 - 2nd Underfrequency (ANSI 81L)	
	ROCOF - Rate of change of frequency (ANSI 81R)	
Advanced MDGF protection	MDGF - Modified Differential Ground Fault (advanced solution with Com Link comunication)	G protection, Ekip Supply Evo Modbus TCP, neutral current sensors
Dual Setting	Set A, Set B	/
Triple Setting	Set A, Set B, Set C	/
Internal Temperature Control	CB T - Circuit breaker temperature	Ekip Supply
/	AF1, AF2 - Arc Flash 1, Arc Flash 2 (ANSI 50ARC)	Ekip Supply, Ekip Arc-Flash 6F module
/	SC - Synchrocheck (ANSI 25)	Measuring, Ekip Supply, Ekip Synchrocheck module
/	RELT - Reduced Energy Let-Through (ANSI 50)	Depends on the activation mode

SYSTEM PROTECTION



Long Time/Overload protection (L - ANSI 49)

Application: it protects cables, and electrical equipment against thermal damage caused by prolonged overcurrent conditions. Unlike short circuit events, which require rapid reaction and disconnection, overcurrents are not typically catastrophic in the short term but can significantly reduce the operational life of cables and equipment over time. It is mandatory for UL applications and it is especially valuable in applications that can be subjected to small amount of overcurrent for long durations, ensuring timely intervention before thermal stress reaches critical levels.

How it works: if the RMS current of one or more phases exceeds the set threshold/pickup value I1, the L protection function starts a time delay, that is adjustable by the user. If the conditions are maintained for the amount of time defined by the trip curve, adjusted using the parameter time delay t1, the protection sends a trip command to open the circuit breaker.
Three types of trip curves are available:

1. $t = k/I^2$ with inverse long time;
2. Inverse Definite Minimum Time (IDMT) in accordance with IEC 60255-151 for coordination with medium-voltage protections that are available according to the standard inverse (SI), very inverse (VI) and extremely inverse (EI) curves
3. With $t = k/I^4$ curve for better coordination with upstream circuit-breakers or with fuses.

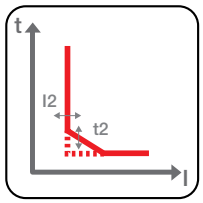
An optional pre-alarm threshold can be set to provide an early warning before the protection function sends a trip command.

Optional functions - (see page 3/16 for more details**)**

- Thermal memory only for $t=k/I^2$.

										Optional functions		
ABB Code	**ANSI Code**	**Trip curve**	**Threshold/ Pickup**	**Threshold tolerance**	**Trip time/Delay**	**Trip time tolerance (1)**	**Disable Function**	**Disable Trip (Alarm only)**	**Pre-alarm**	**Thermal memory**	**Zone selectivity**	**Start up**
L	49	$t = k / I^2$	I1 = 0.4...1 x In step 0.001 x In	trip between 1.05 and 1.2 x I1	with I = 3 I1, t1 = 3...144 s step 1s	± 10% I ≤ 6 x In ± 20% I > 6 x In	yes, only with digital upgrade L=off	Not allowed for UL	50...90% I1 step 1%	●		

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32



Short-time delayed overcurrent protection (S – ANSI 50TD/51)

Application: it provides selective short circuit protections by adding an adjustable short-time delay before tripping the circuit breaker. This time delay allows for coordination between upstream and downstream protection devices, ensuring that faults are cleared based on the systems required coordination.

How it works: if the RMS current of one or more phases exceeds the set threshold/pickup I2, the protection function starts a time delay t2, that is adjustable by the user. If the conditions are maintained for the amount of time defined by the trip curve, adjusted using the parameter time delay t2, the protection sends a trip command to open the circuit breaker. Two types of trip curves are available:

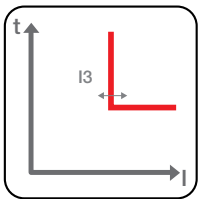
- $t = k / I^2$ where the trip time decreases with higher current magnitudes. It is necessary when time-current discrimination is required so that the tripping is delayed more and more by approaching the supply sources
- t=k providing a fixed delay regardless of current magnitude

Optional functions - (see page 3/16 for more details**)**

- Thermal memory only for $t=k/I^2$
- Zone selectivity (ANSI 68) only for t=k
- Start up: activation 0.6…10 x In with step 0.1 In and range 0.1…30s with step 0.01s

ABB Code	ANSI Code	Trip curve	Threshold/ Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance (1)	Disable Function	Disable Trip (Alarm only)	Pre-alarm	Optional functions: Thermal memory	Optional functions: Zone selectivity	Optional functions: Start up
S	50TD	t = k	I2 = 0.6...10 x In step 0.1 x In	± 7% I ≤ 6 x In ± 10% I > 6 x In	With I > I2, t2 = 0.05...0.4s step 0.01s	The better of the two data: ±10% or ±40ms	yes	yes	no		●	●
	51	t = k / I²	I2 = 0.6...10 x In step 0.1 x In	± 7% I ≤ 6 x In ± 10% I > 6 x In	with I = 10 In, t2 = 0.05...0.4s step 0.01s	± 15% I ≤ 6 x In ± 20% I > 6 x In	yes	yes	no	●		●

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32



Overcurrent instantaneous protection (I – ANSI 50)

Application: it provides protection against short circuit, where rapid fault clearance is necessary to prevent damage, safety risks, and fire hazards

How it works: if the RMS current in one or more phases exceeds the threshold I3, the protection function sends a trip command to open the circuit breaker. The trip time/delay (instantaneous) is fixed and cannot be set.

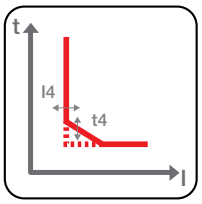
Optional functions - (see page 3/16 for more details**)**

- Zone selectivity (ANSI 68)
- Start-up: activation 1.5…15 x In with step 0.1 x In and range 0.1…30s with step 0.1s.

ABB Code	ANSI Code	Trip curve	Threshold/ Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance (1)	Disable Function	Disable Trip (Alarm only)	Pre-alarm	Optional functions: Thermal memory	Optional functions: Zone selectivity	Optional functions: Start up
I	50	t = k	I3 = 1.5...15 x In step 0.1 x In	± 10%	With I > I3, instantaneous	≤30ms	yes (no, when non defeatable digital upgrade is enabled)	no	no		●	●

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32

SYSTEM PROTECTION



Ground fault protection (G - ANSI 50N TD/51N)

Application: it provides protection against unintended current flow to ground, using the internal current sensors (rogowski coils) of the circuit breaker. In 3 pole circuit breakers where neutral current sensing is required, an external neutral current sensor must be used.

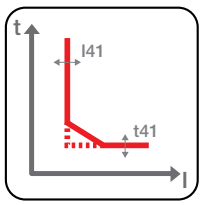
How it works: Ekip Aware continuously monitors the vector sum of currents for all three phases and neutral (if applicable). Under optimal conditions, this sum is equal to zero, since there is no alternative path for the current between source and load. In the event of a groundfault, part of the current returns to the source via the protective conductor or earth, causing an imbalance. This imbalance generates a residual current Ig, which the protection detects and compares to the set threshold/pickup I4. If Ig exceeds I4, the protection function starts a time delay t4, that is adjustable by the user. If the conditions are maintained for the amount of time defined by the trip curve, adjusted using the parameter time delay t4, the protection sends a trip command to open the circuit breaker. An optional pre-alarm threshold can be set to provide an early warning before the protection function sends a trip command.

Optional functions - (see page 3/16 for more details**)**

- Zone selectivity (ANSI 68) only for t=k
- Start-up: activation 0.2…1 x In with 0.02 x In and range 0.1…30s with step 0.01s.

										Optional functions		
ABB Code	**ANSI Code**	**Trip curve**	**Threshold/ Pickup**	**Threshold tolerance**	**Trip time/Delay**	**Trip time tolerance (1)**	**Disable Function**	**Disable Trip (Alarm only)**	**Pre-alarm**	**Thermal memory**	**Zone selectivity**	**Start up**
G	50N TD	t = k	I4 = 0.1...1 (2) x In step 0.001 x In	± 7%	with I > I4, t4 = Instantaneous (with Vaux) + 0,1...0.4s step 0.05s	The better of the two data: ± 10% or ± 40 ms or 50ms with t4 =istantaneous	yes	yes	50...90% I4 step 1%		●	●
	51N	t = k / I²	I4 = 0.1...1 (2) x In step 0.001 x In	± 7%	with I = 4 In, t4 = 0.1…0.4 s step 0.05	± 15%	yes	yes	50...90% I4 step 1%			●

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32
2)The maximum threshold allowed is 1200 A



External Ground Fault protection (Gext - ANSI 50G TD/51G)

Application: it protects against groundfaults using an external homopolar toroid that is typically applied where monitoring the return path of fault current is critical to avoid equipment damage or service interruptions. It is referred to as Source Ground Return (SGR). By installing the toroid on the groundconductor at the source, it allows detection of groundfaults occurring on both the line and load sides of the circuit breaker.

How it works: if the current measured by the homopolar toroid exceeds the set threshold I41, the protection function starts a time delay t41, that is adjustable by the user. If the conditions are maintained for the amount of time defined by the trip curve, adjusted using the parameter time delay t41, the protection sends a trip command to open the circuit breaker. This protection function is as an alternative to Residual Current (RC) (IEC only) and modified differential ground fault (MDGF) functions

Optional functions - (see page 3/16v for more details**)**

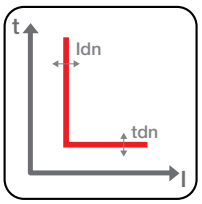
- Zone Selectivity (ANSI 68) only for t=k
- Start-Up: activation 0.1…1 x In with step 0.02 x In and range 0.1…30s with step 0.01s only for t=k.

Prerequisite: G protections, homopolar toroid and auxiliary supply (Ekip Supply Lite or Ekip Supply Evo Modbus TCP).

ABB Code	ANSI Code	Trip curve	Threshold/ Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance (1)	Disable Function	Disable Trip (Alarm only)	Pre-alarm	Optional functions		
										Thermal memory	Zone selectivity	Start up
Gext	50G TD	t = k	I41 = 0.1...1 x In of Toroid step 0.001 x In of Toroid	± 7%	with I > I41, t41 = 0.1…1s step 0.05s	± 15%	yes	yes	50...90% I41 step 1%		●	●
	51G	t = k / I^2	I41 = 0.1...1 x In	± 7%	with I = 4 In, t41 = 0.1…1s step 0.05s	± 15%	yes	yes	50...90% I41 step 1%			

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32

SYSTEM PROTECTION



Residual current protection/differential current protection (RC – ANSI 64, 50N/51N, 87N) - Not UL Listed

Application: it is used for protecting people against indirect contact and additional protection against direct contact with equipment.
The use of the RC function is necessary in certain cases where conventional overcurrent or groundfault protection (G) may not ensure adequate safety. Such cases include:

- TT distribution systems: the fault current returns to the power supply through the earth, resulting in a relatively low magnitude that may not reach the tripping threshold of conventional G protection.
- TN-S systems with a single earthing point, particularly when:
  - standard protections are not sufficient to meet the disconnection times required by safety standards;
  - the environment presents additional hazards (e.g., high humidity or wet conditions), increasing the risk of groundleakage currents;
  - faults involve significant impedance, which limits the magnitude of the fault current and prevents proper operation of overcurrent protections.

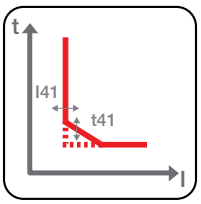
It cannot be used in TN-C systems since the neutral is used also as protective conductor and therefore the detection of the residual current would not be possible if the neutral passes through the toroid, since the vectorial sum of the currents would always be equal to zero.
It is implemented using a dedicated external RC toroid, a rectangular ferromagnetic sensor that surrounds the three phase conductors or the three phases and the neutral.

How it works: it detects the vectorial sum of the currents flowing through the external RC toroid. Under normal operating conditions, the sum of the phase currents and the neutral (if applicable) is equal to zero. However, in the event of an groundfault, a resulting residual current (denoted as IΔ) appears due to current leakage to earth. When IΔ exceeds the set threshold/pickup IΔn, the protection function starts a time delay tΔn that is adjustable by the user. If the conditions are maintained for the amount of time set in the time delay tΔn, the protection sends a trip command to open the circuit breaker.
This protection function is as an alternative to External Ground Fault (Gext) and modified differential ground fault (MDGF) functions.

Prerequisite: RC digital upgrade, RC toroid and system voltage supply (Ekip Busbar Supply).

										Optional functions		
ABB Code	**ANSI Code**	**Trip curve**	**Threshold/ Pickup**	**Threshold tolerance**	**Trip time/Delay**	**Trip time tolerance [1]**	**Disable Function**	**Disable Trip (Alarm only)**	**Pre-alarm**	**Thermal memory**	**Zone selectivity**	**Start up**
RC	64 50N TD 87N	t = k	IΔn = 3 - 5 - 7 - 10 - 20 - 30A	- 20% / 0%	with I > IΔn, tΔn = 0.06 - 0.1 - 0.2 - 0.3 - 0.4 - 0.5 - 0.8s	140ms @ 0.06s (max trip time) 950ms @ 0.80s (max trip time)	yes, putting External Toroid Type on None	no	no			

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32



Modified Differential Ground Fault protection (MDGF)

Application: it protects against ground faults in multi-sourced distribution systems where a common solidly grounded neutral conductor is shared between sources and loads. This configuration is commonly found in double-ended substations and generator paralleling switchgear/switchboard applications.
In these types of applications, the conventional G protection becomes ineffective in ensuring selectivity, as the fault current may return through multiple paths, making it difficult to isolate the faulted section accurately.

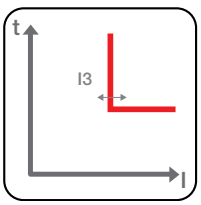
How it works: if the summation of the currents exceeds the set threshold/pickup I41, the protection starts a time delay I41, that is adjustable by the user. If the conditions are maintained for the amount of time defined by the trip curve, adjusted using the parameter time delay t41, the protection sends a trip command to open the circuit breaker. This protection function is as an alternative to External GroundFault (Gext) and Residual Current (RC) (IEC only) functions.

Optional functions - (see page 3/16 for more details**)**
- Zone Selectivity (ANSI 68) only for t=k
- Start-Up: activation 0.1…1 x In with step 0.02 x In and range 0.1…30s with step 0.01s.

Two solutions are available:
- Conventional solution that needs a dedicated ABB terminal and third-party phase current transformers and summing current transformers.
- Advanced MDGF utilizes the internal Rogowski coils of each circuit breaker involved and requires the Ekip Supply Evo Modbus TCP module, along with the Advanced MDGF digital upgrade, to enable communication between breakers via Com Link. An external neutral sensor is required for each breaker to measure the neutral current, as 3-pole circuit breakers are typically used. Com Link is automatically included with the purchase of the Advanced MDGF upgrade. This solution eliminates the need for external phase CTs and summing CTs used in traditional solutions, thereby simplifying wiring and reducing installation complexity.

										Optional functions		
ABB Code	ANSI Code	Trip curve	Threshold/ Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance (1)	Disable Function	Disable Trip (Alarm only)	Pre-alarm	Thermal memory	Zone selectivity	Start up
MDGF		t = k	I41= 0.1…1 x In	± 15%	with I >I41, t41 = 0.05…1s (t=k) with I > I41, t41=0.1…1s (t=k/I²) step 0.05s	The highest of 15% or 15ms	yes	yes	50…90% I41 step 1%		●	●

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32



Making Current Release (MCR)

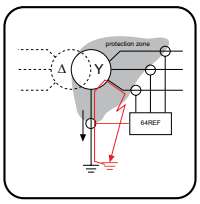
Application: it provides fast tripping when the circuit breaker closes onto a fault. In such scenarios, high fault currents are present immediately upon closing, selectivity is not required and immediate interruption is required. The function overrides any intentional delay and ensures the fault is cleared as quickly as possible, preventing damage caused by closing under short-circuit conditions.

How it works: the protection remains active for a time interval starting from the circuit-breaker's transition from open to closed after which it deactivates. If, during this time interval, the current of one or more phases exceeds threshold I3, the protection transmits the TRIP command after a non-programmable fixed time.
The MCR protection needs auxiliary supply Vaux (Ekip Supply Lite or Ekip Supply Evo Modbus TCP) or system voltage supply (Ekip Busbars Supply). It is always available by default for all trip units.
It is always available by default for all trip units

										Optional functions		
ABB Code	ANSI Code	Trip curve	Threshold/ Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance (1)	Disable Function	Disable Trip (Alarm only)	Pre-alarm	Thermal memory	Zone selectivity	Start up
MCR		t = k	I3= 1.5…15 x In step 0.1 x In	± 10%	With I > I3, instantaneous Monitor time range: 40…500ms step 0.01s	≤ 30 ms	yes	no	no		●	

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32

SYSTEM PROTECTION

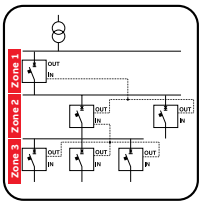


Second protection against groundfault (ANSI 50GTD/51G & 64REF)

Application: Ekip Aware offers the unique capability of simultaneously managing both protection G (via internal current sensors) and Gext (via external homopolar toroid) through two independent groundfault protection curves. Thanks to this feature, the trip unit can effectively differentiate between a unrestricted groundfault (UEF), which triggers the opening of an Emax 3, and a restricted groundfault (REF), which commands the opening of the medium-voltage circuit-breaker.
Another possible configuration involves replacing the Gext protection with RC protection, while maintaining the operation of G protection.

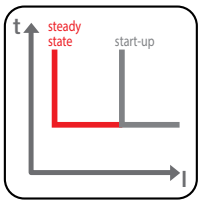
How it works: to determine which circuit-breaker should trip (whether the MV or LV circuit-breaker), a coordinated approach to the trip times is required.

Optional functions



Zone selectivity (ANSI 68)

It can be used for minimizing 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 (Ekip Supply Lite or Ekip Supply Evo Modbus TCP).
Refer the individual protection tables for availability of this function.
For W circuit breaker, FP connector for 3-pin/5-pin terminal block must be ordered.

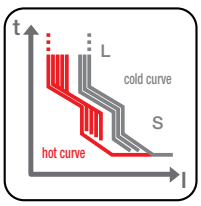


Start-UP

Start-up function enables protections 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 can be set from 100 ms to 30 s with 0.01s step and is recognized automatically by the trip unit:

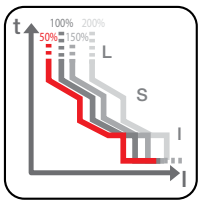
- at the closing of the circuit-breaker with a self-supplied trip unit
- when the peak value of the maximum current exceeds the set threshold (0.1…10 x In, step 0.1 x In) with an externally supplied trip unit; a new start-up is possible after the current falls below the threshold.

Refer the individual protection tables for availability of this function.



Thermal memory

Thermal memory helps prevent overheating of components and cables connected to the circuit-breaker by adjusting the protection tripping time based on recent overload history. In the event of successive trips occurring within short intervals, the function shortens the tripping time depending on the elapsed time since the first overload and the severity of the faults.
Refer the individual protection tables for availability of this function.



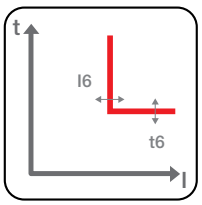
Neutral protection

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

Advanced current protection digital upgrade

It includes a set of protections and alarms:
- current unbalance protection (IU – ANSI 46)
- 2nd short-time delay protection (S2 - ANSI 50TD)
- Load current thresholds alarms (LC1/LC2)
- Current thresholds alarms (Iw1/Iw2)

Prerequisite: S protection.



Current unbalance protection (IU – ANSI 46)

Application: it protects generators against current unbalance. These conditions may arise in non-symmetrical systems, unbalanced loads, or single-phase faults. These conditions generate negative sequence currents in the stator, which induce rotor currents at twice the system frequency. If left unmitigated, this can result in rapid rotor heating and potential mechanical damage.

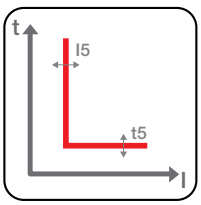
How it works: if the detected unbalance IU exceeds the set threshold/pickup I6, the protection function starts a time delay t6, that is adjustable by the user. If the conditions are maintained for the amount of time set in the time delay t6, the protection sends a trip command to open the circuit breaker. IU is computed by measuring the difference of RMS values of the current between the phases (phase angle differences not considered) or considering the maximum deviation among the measured currents max IAvg, calculated by comparing each current with the mean value.

$$IU = \frac{100 \times (\max I\ Avg)}{I\ Avg} \qquad IU = \frac{(Imax) - (Imin)}{(Imax)} \times 100$$

Prerequisite: S protection.

ABB Code	ANSI Code	Trip curve	Threshold/ Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance [1]	Disable Function	Disable Trip (Alarm only)	Pre-alarm
IU	46	t = k	I6 = 2...90% In step 1% In	± 10%	with unbalance > I6, t6 = 0.5...60s step 0.5s	The better of the two data: ± 10% or ± 40 ms (for t<5s) / ±100ms (for t≥5s)	yes	yes	no

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32



Second overcurrent delayed short-circuit protection (S2 – ANSI 50TD/51)

Application: it is useful for systems requiring precise selectivity and coordination, such as those with multiple power sources (e.g., grid and generator), where fault currents can vary depending on the fault source. The protection enables two independent thresholds for S, ensuring selective fault clearing and preventing unnecessary system trips.

How it works: if the RMS current of one or more phases exceeds the set threshold/pickup I5, the protection function starts a time delay t5, that is adjustable by the user. If the conditions are maintained for the amount of time set in the time delay t5, the protection sends a trip command to open the circuit breaker.

Optional functions

- Zone Selectivity (ANSI 68): t5sel = 0.04...0.2s 0.01s
- Start-Up: activation 0.1...1 x In with step 0.02 x In and range 0.1...30s with step 0.01s.

Prerequisite: S protection.

ABB Code	ANSI Code	Trip curve	Threshold/ Pickup	Threshold tolerance	Trip time/Delay [2]	Trip time tolerance [1]	Disable Function	Disable Trip (Alarm only)	Pre-alarm	Optional function		
										Thermal memory	Zone selectivity	Start up
S2	50TD	t = k	I5 = 0.6...10 x In step 0.1 x In	± 7% I ≤ 6 x In ± 10% I > 6 x In	With I > I5, t5 = 0.05...0.8s step 0.01s	The better of the two data: ± 10% or ± 40 ms	yes	yes	no		●	●

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32
2) For E1.3N, t5 must not be set above 0.6 seconds

SYSTEM PROTECTION

Current thresholds alarms (LC1/LC2 and Iw1/Iw2)

Application: four independent alarms are useful for implementing pre-trip logics before the overload protection (L) trips the circuit breaker. For example, they can be used to disconnect loads downstream of the circuit breaker, which are controlled by Ekip Signaling.

How LC1/LC2 work: if the highest of the three or four RMS current exceeds user-defined threshold (50%...100% I1 with step 1%), an alarm is generated.

How Iw1/Iw2 work: if the highest of the three or four RMS currents exceeds a user-defined threshold (settable between 0.1 and 1 In, with a step of 0.01 In), either above or below the set point, an alarm is generated.

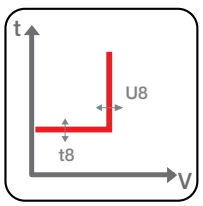
Digital upgrade needed: S protection.

Voltage protection digital upgrade

It includes a set of protections and alarms:

- Undervoltage protection (UV - ANSI 27)
- Overvoltage protection (OV - ANSI 59)
- Voltage unbalance protection (VU - ANSI 47)
- Voltage-controlled overcurrent protection (S(V) - ANSI 51V)
- Cyclical direction of the phases alarm (PS - ANSI 47)

Prerequisite: Measuring.



Undervoltage protections (UV – ANSI 27)

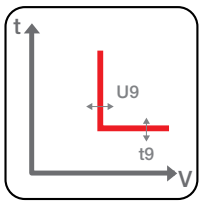
Application: it is particularly useful for generators, as it helps control undervoltage levels at the terminals. For generators, continuous operation with rated power and frequency and with minimum voltage of 95% is normally permitted. Low voltage can cause loss of synchronism between generators, increased reactive power drawn from the grid, and malfunctioning of connected loads. UV protection also serves as a backup in the event of a generator short-circuit combined with the failure of primary protection systems. Additionally, it acts as a back-up in case of automatic voltage regulator failure.

How it works: if one or more RMS line-to-line voltages drops below the set threshold/pickup I8, the protection function starts a time delay t8, that is adjustable by the user. If the conditions are maintained for the amount of time set in the time delay t8, the protection sends a trip command to open the circuit breaker. The function can be configured for alarm only or for both alarm and trip. The alarm status is indicated even when the circuit-breaker is open so that a fault can be identified before the circuit-breaker closes. In this case, voltage measurement cables needs to be put on the generator side.

Prerequisite: measuring.

ABB Code	ANSI Code	Trip curve	Threshold/Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance [1]	Disable Function	Disable Trip (Alarm only)	Pre-alarm
UV	27	t = k	U8 = 0.05....0.98 x Un step 0.001 Un	± 2%	with U < U8, t8 = 0.05...120s step 0.01s	The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	yes	yes	no

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32



Overvoltage protections (OV – ANSI 59)

Application: it protects a system when voltage exceeds a safe or defined threshold. In applications utilizing generators (in particular gas turbine or hydrogenerators), it can be used to prevent excessive voltage at the terminals which can lead to over excitation and impose damaging stress on the generator's insulation system. Overvoltage conditions may arise due to faults in the voltage regulator or sudden changes in the speed of the prime mover, such as those cause by sudden loss of load.

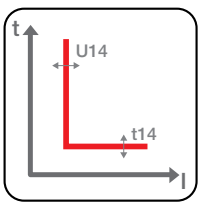
How it works: if one or more RMS line-to-line voltages exceeds the set threshold/pickup U9, the protection starts a time delay t9, that is adjustable by the user. If the conditions are maintained for the amount of time set in the time delay t9, the protection sends a trip command to open the circuit breaker.

The function can be configured for alarm only or for both alarm and trip. The alarm status is indicated even when the circuit-breaker is open so that a fault can be identified before the circuit-breaker closes. In this case, voltage measurement cables needs to be put on the generator side.

Prerequisite: measuring.

ABB Code	ANSI Code	Trip curve	Threshold/Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance [1]	Disable Function	Disable Trip (Alarm only)	Pre-alarm
OV	59	t = k	U9 = 1.02....1.5 x Un step 0.001 Un	± 2%	with U > U9, t9 = 0.05...120s step 0.01s	The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	yes	yes	no

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32



Voltage unbalance protection (VU – ANSI 47)

Application: it protects generators against current unbalance.

How it works: if the detected unbalance VU exceeds the set threshold/pickup U14, the protection starts a time delay t14, that is adjustable by the user. If the conditions are maintained for the amount of time set in the time delay t14, the protection sends a trip command to open the circuit breaker.

$$\text{mean} = \frac{U12rms + U23rms + U31rms}{3}$$

$$VU = \max(max_rms - mean, mean - min_rms)$$

$$VU\% = \frac{VU}{mean} \times 100$$

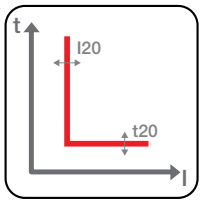
The function can be configured for alarm only or for both alarm and trip. The alarm status is indicated even when the circuit-breaker is open so that a fault can be identified before the circuit-breaker closes. In this case, voltage measurement cables needs to be put on the generator side.

Prerequisite: measuring.

ABB Code	ANSI Code	Trip curve	Threshold/Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance [1]	Disable Function	Disable Trip (Alarm only)	Pre-alarm
VU	47	t = k	U14 = 2...90% Un step 1% Un	± 5%	with unbalance > U14, t14 = 0.5...60s step 0.5s	The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	yes	yes	no

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32

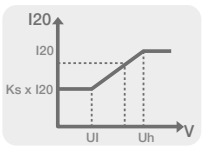
SYSTEM PROTECTION



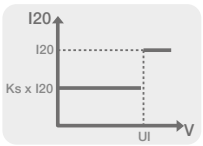
Voltage-controlled overcurrent protection (S(V) - ANSI 51V)

Application: it is useful for safeguarding generators against faults at their terminals, where a sudden voltage drop and a transient overcurrent (6–10 times nominal) may occur, followed by a steady-state current that can fall below the generator's full-load rated level. By dynamically lowering the current trip threshold during voltage drops, S(V) enables faster and more sensitive fault detection, even in situations where conventional overcurrent protections would not operate. Since it activates only during undervoltage conditions, S(V) also acts as a reliable backup to both instantaneous (I) and time-delayed (S) overcurrent protections, while maintaining coordination with the generator's normal operating conditions.

How it works: if the RMS current in one or more phases exceeds the set threshold/pickup I20, the protection starts a time delay t20, that is adjustable by the user. If the conditions are maintained for the amount of time set in the time delay t20, the protection sends a trip command to open the circuit breaker.
The current threshold I20 is voltage-dependent and can be adjusted in two modes:



- linear mode (restrained mode): the threshold I20 varies linearly from Ks x I20 at the lower voltage threshold UI to I20 at the upper voltage threshold Uh. If the minimum RMS value of the three line-to-line voltages exceeds Uh, the threshold remains at I20; if it falls below UI, the threshold is reduced to I20 x Ks. UI, Uh and Ks must be configured.



- step mode (controlled mode): the threshold I20 is equal to I20 if the minimum RMS value of the three line-to-line voltages is above UI and drops immediately to Ks*I20 when below UI. Ui must be configured.

The function can be configured for alarm only or for both alarm and trip. The alarm status is indicated even when the circuit-breaker is open so that a fault can be identified before the circuit-breaker closes. In this case, voltage measurement cables needs to be put on the generator side.

Prerequisite: measuring.

ABB Code	ANSI Code	Trip curve	Threshold/Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance [1]	Disable Function	Disable Trip (Alarm only)	Pre-alarm
S(V)	51V	t = k	I20 = 0.6...10 x In step 0.1 In	± 10%	With I > I20, t20 = 0.05...30s step 0.01s	The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	yes	yes	no
			STEP MODE UI= 0.2...1 x Un Ks= 0.1...1						
			LINEAR MODE Uh= 0.2...1 x Un Ks= 0.1...1						

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32

Cyclical direction of the phases alarm (PS - ANSI 47)

How it works: when the sequence of line-to-line voltages is not aligned with the sequence set by the user an alarm is generated.

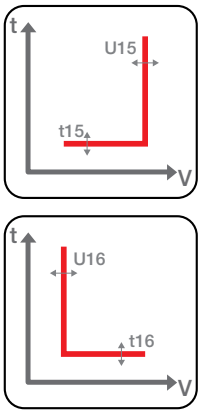
Prerequisite: measuring.

Advanced voltage digital upgrade

It includes a set of protections:

- 2nd overvoltage protection (OV2 - ANSI 59)
- 2nd undervoltage protection (UV2 – ANSI 27)
- 2nd Voltage-controlled overcurrent protection (S(V) - ANSI 51V)
- Residual overvoltage protection (RV – ANSI 59N)

Prerequisite: Measuring and Voltage protections.



Second protection against undervoltage and overvoltage (UV2 – ANSI 27 and OV2 – ANSI 59)

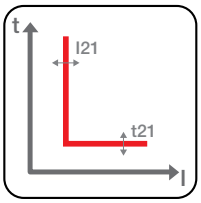
Application: UV2 provides additional undervoltage protection, independent from the primary UV function. This dual configuration allows for flexible programming with separate thresholds and delays to suit different system requirements. For instance, the protection can be set to generate an alarm for minor voltage drops with a long delay, and to trip the circuit-breaker for more severe drops with a shorter delay. Similarly, OV2 offers the same flexibility for overvoltage conditions, operating independently from the primary OV protection.

Prerequisite: measuring and voltage protections.

ABB Code	ANSI Code	Trip curve	Threshold/Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance (1)	Disable Function	Disable Trip (Alarm only)	Pre-alarm
UV2	27	t = k	U15 = 0.5….1 x Un step 0.001 In	± 2%	with U < U15, t15 = 0.05…120s step 0.01s	The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	yes	yes	no
OV2	59	t = k	U16 = 1….1.5 x Un step 0.001 In	± 2%	with U > U16, t16 = 0.05…120s step 0.01 s	The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	yes	yes	no

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32

SYSTEM PROTECTION



Second protection against voltage-controlled overcurrent protection (S(V)2 - ANSI 51V)

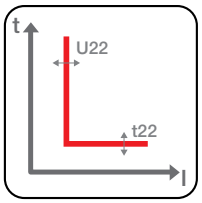
Application: it is useful for enabling full selectivity across all types of installations. The thresholds and operating modes of S(V) and S(V)2 can be independently configured to suit various system needs, for example, using S(V) for alarm signaling and S(V)2 for tripping, or vice versa, or configuring both protections for either signaling or tripping functions.

How it works: it works as S(V) but with different independent parameters.

Prerequisite: measuring and voltage protections.

ABB Code	ANSI Code	Trip curve	Threshold/Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance [1]	Disable Function	Disable Trip (Alarm only)	Pre-alarm
S(V)2	51V	t = k	I21 = 0.6...10 x In step 0.1 In **STEP MODE** UI2= 0.2...1 x Un Ks2= 0.1...1 **LINEAR MODE** Uh2= 0.2...1 x Un Ks2= 0.1...1	± 10%	With I > I21, t21 = 0.05...30s step 0.01s	The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	yes	yes	no

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32



Residual overvoltage protection (RV – ANSI 59N)

Application: it is useful for:

- protecting generators against groundfaults, particularly in stator windings, and potential phase-to-phase short circuits that may occur when a generator operates under abnormal conditions. These faults are often caused by insulation degradation in the windings, typically due to humidity, oil, or dirt accumulating on the coil surfaces outside the stator slots.
- To limit the impact of such faults, the generator's neutral is often connected to groundthrough a high impedance or left isolated. While this approach reduces fault current, it also makes fault detection more challenging with classical protections.
- in general distribution to protects against ground

How it works: Ekip Aware continuously monitors the vector sum of all phase voltages , referred to as U0. Under normal conditions, U0 is zero or very small. An groundfault in one phase or generator winding causes a voltage rise in the other two phases and at the neutral point. The magnitude of this rise depends on the fault's location, fault resistance, and the generator's earthing impedance. This imbalance generates a residual voltage U0, which the protection detects and compares to a threshold I22. If U0 exceeds the set threshold/pickup I22, the protection starts a time delay t22, that is adjustable by the user. If the conditions are maintained for the amount of time set in the time delay t20, the protection sends a trip command to open the circuit breaker.
The protection is available for:

- 4 poles
- 3 poles with also Neutral Voltage enabled via Ekip Connect, with Vn measured and wired to the dedicated I/O terminal.

The function can be configured for alarm only or for both alarm and trip. The alarm status is indicated even when the circuit-breaker is open so that a fault can be identified before the circuit-breaker closes. In this case, voltage measurement cables needs to be put on the generator side.

Prerequisite: measuring and voltage protections.

ABB Code	ANSI Code	Trip curve	Threshold/Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance [1]	Disable Function	Disable Trip (Alarm only)	Pre-alarm
RV	59N	t = k	U22 = 0.05....0.5 x Un step 0.001 Un	± 5%	with U > U22, t22 = 0.5...120s step 0.01s	The better of the two data: ±10% or ± 15 ms (for t22<150ms) / ± 40 ms (for 150 ms≤t22<5s) / ± 100 ms (for t22≥5s)	yes	yes	no

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32

Power protections digital upgrade

It includes a set of protections and alarm:

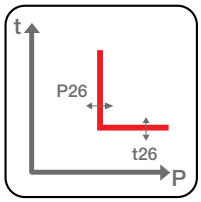
- Power factor alarm (Cos ϕ - ANSI 78)
- Active overpower protection (OP – ANSI 32OF)
- Reactive overpower protection (OQ – ANSI 32RF)
- Reverse active power protection (RP - ANSI 32R)
- Active underpower protection (UP – ANSI 32LF)
- Loss of field or reverse reactive power protection (RQ – ANSI 40 or 32RQ)

Prerequisite: Measuring.
The adopted convention is that the generator's active and reactive power output is considered positive.
In the standard configuration, the voltage measurement cables of the Ekip Aware trip unit are located on the lower terminals and must be connected on the generator side to ensure a positive power output value.
If the generator is connected to the upper terminals, the default power direction setting must be reversed.
The setting of all the power protection functions refers to the rated power Sn calculated based on the rated line-to-line voltage Un set on the trip unit and the rated current In of the circuit breaker (digital rating plug) according to the relation 3 x Un x In.

Power factor alarm (Cos ϕ - ANSI 78)

How it works: when the total Cos ϕ value drops below the set threshold (0.5 to 0.95 in 0.01 steps) an alarm is generated.
Total cos ϕ is calculated as ratio between total active power and total apparent power.

Prerequisite: measuring.



Active overpower protection (OP – ANSI 32OF)

Application: it is useful for preventing the generator from supplying excessive active power. For examples, in plants operating in island-mode, the power required from the generator may exceed the maximum power that the machine is able to supply. Such a condition can lead to a step-out (loss of synchronism), where the rotor loses synchronism with the system frequency, resulting in oscillations in the voltage of the electrical system.

How it works: if the total active power calculated as a sum of the power in the three phases exceeds the set threshold/pickup P26, the protection starts a time delay t26, that is adjustable by the user. If the conditions are maintained for the amount of time set in the time delay t26, the protection sends a trip command to open the circuit breaker.

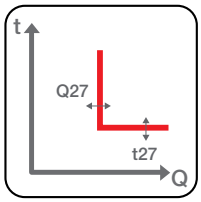
The function can be configured for alarm only or for both alarm and trip. The alarm status is indicated even when the circuit-breaker is open so that a fault can be identified before the circuit-breaker closes. In this case,voltage measurement cables needs to be put on the generator side.

Prerequisite: measuring.

ABB Code	ANSI Code	Trip curve	Threshold/Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance [1]	Disable Function	Disable Trip (Alarm only)	Pre-alarm
OP	32OF	t = k	P26 = 0.4...2 Sn step 0.001 Sn	± 10%	with P > P26, t26 = 0.5...100s step 0.5s	The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	yes	yes	no

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32

SYSTEM PROTECTION



Reactive overpower protection (OQ – ANSI 32OF)

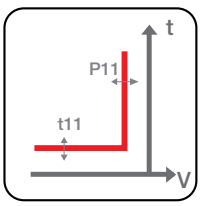
Application: it is useful for preventing the generator from supplying excessive reactive power to the network. This condition may occur during overexcitation, such as when a large load is disconnected but the excitation system fails to reduce the field current accordingly due to a control system fault.

How it works: if the total reactive power calculated as a sum of the power in the three phases exceeds the set threshold/pickup P27, the protection starts a time delay t27, that is adjustable by the user. If the conditions are maintained for the amount of time set in the time delay t27, the protection sends a trip command to open the circuit breaker. The function can be configured for alarm only or for both alarm and trip. The alarm status is indicated even when the circuit-breaker is open so that a fault can be identified before the circuit-breaker closes. In this case, voltage measurement cables needs to be put on the generator side.

Prerequisite: measuring.

ABB Code	ANSI Code	Trip curve	Threshold/Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance [1]	Disable Function	Disable Trip (Alarm only)	Pre-alarm
OQ	32OF	t = k	Q27 = 0.4…2 Sn step 0.001 Sn	± 10%	with Q > Q27, t27 = 0.5…100s step 0.5s	The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	yes	yes	no

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32



Reverse Active Power protection (RP - ANSI 32R)

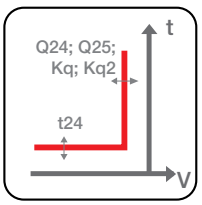
Application: it is useful for safeguarding generators from absorbing active power from the grid, a condition that can occur if the prime mover fails or if there is a malfunction in the speed control system. In such scenarios, instead of delivering active power to the system, the generator begins to draw power from the grid, effectively operating as a motor.

How it works: if the total active power exceeds threshold/pickup P11 and is in opposite direction of the current, the protection starts a time delay t11, that is adjustable by the user. If the conditions are maintained for the amount of time set in the time delay t11, the protection sends a trip command to open the circuit breaker. If the condition persists after the delay, the protection sends a trip command to open the circuit breaker.

Prerequisite: measuring.

ABB Code	ANSI Code	Trip curve	Threshold/Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance [1]	Disable Function	Disable Trip (Alarm only)	Pre-alarm
RP	32R	t = k	P11 = -1…-0.05 Sn step 0.001 Sn	± 10%	with P > P11, t11 = 0.5…100s step 0.1s	The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	yes	yes	no

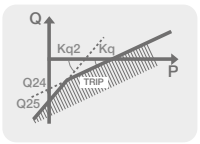
1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32



Loss of field or reverse reactive power protection (RQ – ANSI 40 or 32RQ)

Application: it is useful for protecting synchronous generators against reactive power absorption from the grid, which can be caused by faults in the excitation or field circuits leading to a loss of excitation. This condition results in temperature rises in the rotor, field, and damper circuits. This phenomenon is particularly evident in smooth rotor generators, whereas it is much less marked in salient pole generators. Additionally, if the grid cannot supply the required reactive power, this fault condition can lead to system instability.

How it works: it works by measuring the total active and reactive power of the generator. A tripping area is defined using one or two curves. When two curves are used, the trip area is determined by the intersection of the areas defined by both. The trip threshold can be adjusted by modifying the curve slopes (angles Kq and Kq2) and the intercepts (Q24 and Q25).
If the operating point is below the set protection curve, the protection starts a time delay t24, that is adjustable by the user. If the conditions are maintained for the amount of time set in the time delay t24, the protection sends a trip command to open the circuit breaker.

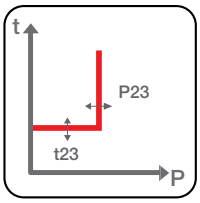


The function can be configured for alarm only or for both alarm and trip. The alarm status is indicated even when the circuit-breaker is open so that a fault can be identified before the circuit-breaker closes. In this case, voltage measurement cables needs to be put on the generator side. This protection is enabled if the voltage measured in the plant is higher than the set voltage parameter.Vmin. = 0.5...1.2.

Prerequisite: measuring.

ABB Code	ANSI Code	Trip curve	Threshold/Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance [1]	Disable Function	Disable Trip (Alarm only)	Pre-alarm
RQ	40/ 32RQ	t = k	Q24 [1]=0.1...1 Sn step 0.001 Sn Kq = -2...2 step 0.01 Q25 [1]=0.1...1 Sn step 0.001 Sn Kq2 = -2...2 step 0.01	± 10%	with Q > Q24, t24 = 0.5...100s step 0.1s	The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	yes	yes	no

1) The threshold, expressed in Sn, is not preceded by a "–" sign, but it should still be interpreted as reactive power absorbed from the grid (i.e., inverse reactive power)
2) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32



Active underpower protection (UP – ANSI 32LF)

Application: it is useful for safeguarding generators, especially in island mode, against excessive drops in active power output. A sudden reduction in load from the grid can cause an imbalance between mechanical input (e.g., from a turbine) and electrical output, leading to generator overspeed.

How it works: if one or more of the active power values detected by the unit drop below threshold/pickup P23, the protection starts a time delay t23, that is adjustable by the user. If the conditions are maintained for the amount of time set in the time delay t23, the protection sends a trip command to open the circuit breaker.
The protection is active also for negative (reverse) active power but is independent from the RP protection.
The protection excludes itself if the maximum value of the line-to-line voltage is less than 30 V.
The protection can be disabled temporarily, 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. The function can be configured for alarm only or for both alarm and trip. The alarm status is indicated even when the circuit-breaker is open so that a fault can be identified before the circuit-breaker closes. In this case, voltage measurement cables needs to be put on the generator side.

Prerequisite: measuring.

ABB Code	ANSI Code	Trip curve	Threshold/Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance [1]	Disable Function	Disable Trip (Alarm only)	Pre-alarm
UP	32LF	t = k	P23 = 0.1...1 x Sn step 0.001 x Sn	± 10%	with P < P23, t23 = 0.5...100s step 0.5s	The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	yes	yes	no

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32

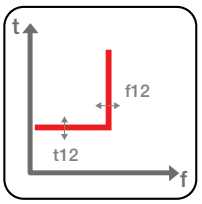
SYSTEM PROTECTION

Frequency protections digital upgrade

It includes a set of protections:

- Underfrequency protection (UF - ANSI 81L)
- Overfrequency protection (OF - ANSI 81H)
- Second protection against underfrequency and overfrequency protection (UF2 and OF2 – ANSI 81L and 87H)
- Rate of change of frequency protection (ROCOF – ANSI 81R)

Prerequisite: Measuring.



Underfrequency protection (UF - ANSI 81L)

Application: it is useful:

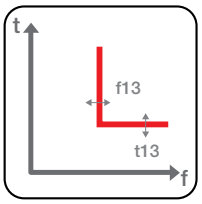
- for safeguarding generators when frequency falls below the rated value, typically due to insufficient power generation relative to load demand, a condition that often occurs during island-mode operation following a network disconnection. UF protection can initiate load shedding to restore power balance and stabilize frequency, or disconnect the generator if necessary. This function is especially important for protecting the mechanical prime mover, such as a steam turbine, from damage caused by prolonged low-frequency operation.
- in general, for ensuring that electrical systems operate within acceptable frequency limits, avoiding performance degradation, equipment damage or malfunction of critical loads.

How it works: if the grid frequency read by the unit drops below threshold/pickup f12, the protection starts a time delay t12, that is adjustable by the user. If the conditions are maintained for the amount of time set in the time delay t12, the protection sends a trip command to open the circuit breaker.
The function can be configured for alarm only or for both alarm and trip. The alarm status is indicated even when the circuit-breaker is open so that a fault can be identified before the circuit-breaker closes. In this case, voltage measurement cables needs to be put on the generator side.

Prerequisite: measuring.

ABB Code	ANSI Code	Trip curve	Threshold/Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance [1]	Disable Function	Disable Trip (Alarm only)	Pre-alarm
UF	81L	t = k	f12 = 0.9….0.999 x fn step 0.001 x fn	± 1% (with fn ±2%)	with f < f12, t12 = 0.06…300s step 0.01s	The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	yes	yes	no

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32



Overfrequency protection (OF - ANSI 81H)

Application: it is useful:

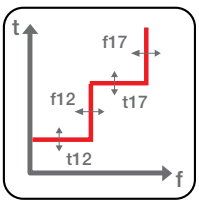
- for protecting generators from excessive frequency increases, which occur when the mechanical driving power exceeds the active power demanded by the load, typically following a load disconnection due to a fault. While the generator's speed regulator attempts to restore frequency to its rated value, if it fails, OF protection intervenes to prevent mechanical damage to the turbine/alternator unit and to avoid supplying loads at unsafe frequency levels.
- in general, to ensure that electrical systems operate within acceptable frequency limits, avoiding performance degradation, equipment damage or malfunction of critical loads.

How it works: if the frequency read by the unit exceeds threshold/pickup f13, the protection starts a time delay t13, that is adjustable by the user. If the conditions are maintained for the amount of time set in the time delay t13, the protection sends a trip command to open the circuit breaker.
The function can be configured for alarm only or for both alarm and trip. The alarm status is indicated even when the circuit-breaker is open so that a fault can be identified before the circuit-breaker closes. In this case, voltage measurement cables needs to be put on the generator side.

Prerequisite: measuring.

ABB Code	ANSI Code	Trip curve	Threshold/Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance [1]	Disable Function	Disable Trip (Alarm only)	Pre-alarm
OF	81H	t = k	f13 = 1.001....1.1 x fn step 0.001 x fn	± 1% (with fn ±2%)	with f > f13, t13 = 0.06...300s step 0.01s	The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	yes	yes	no

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32



Second protection against underfrequency and overfrequency protection (UF2 and OF2 – ANSI 81L and 87H)

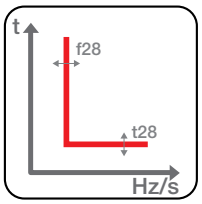
Application: UF2 provides additional underfrequency protection, independent from the primary UF function. This dual configuration allows for flexible programming with separate thresholds and delays to suit different system requirements. For instance, the protection can be set to generate an alarm for minor voltage drops with a long delay, and to trip the circuit-breaker for more severe drops with a shorter delay. Similarly, OF2 offers the same flexibility for overfrequency conditions, operating independently from the primary OF protection.

Prerequisite: measuring.

ABB Code	ANSI Code	Trip curve	Threshold/Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance [1]	Disable Function	Disable Trip (Alarm only)	Pre-alarm
UF2	81L	t = k	f17 = 0.9....0.999 x fn step 0.001 x fn	± 1% (with fn ±2%)	with f < f17, t17 = 0.15...300s step 0.01s	The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	yes	yes	no
OF2	81H	t = k	f18 = 1.001....1.1 x fn step 0.001 x fn	± 1% (with fn ±2%)	with f > f18, t18 = 0.15...300s step 0.01s	The better of the two data: ± 10% or ± 40 ms (for t<5s) / ± 100 ms (for t≥5s)	yes	yes	no

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32

SYSTEM PROTECTION



Rate of change of frequency protection (ROCOF – ANSI 81R)

Application: it is useful:

- in plants where generators operate in parallel with the main grid, a fault in the distribution network may lead the grid to disconnection from the plant. As a result, the generator must operate in island mode, where its electrical parameters may no longer match those of the grid. To prevent the risk of an unsynchronized reconnection, which could cause severe damage to both the generator and the grid, ROCOF protection detects the event and triggers immediate disconnection of the circuit-breaker.
- to prevent islanding operation when the generator cannot sustain the connected loads (i.e., when load demand exceeds generator capacity). In such cases, system instability may occur, potentially resulting in equipment failure.

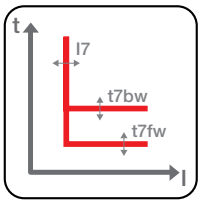
This protection enables both positive and negative frequency variations to be detected rapidly and with greater sensitivity, thus ensuring a protection faster than what is possible to obtain with traditional under and overfrequency functions.

How it works: if the frequency variation read by the trip unit exceeds threshold/pickup f28, the protection starts a time delay t28, that is adjustable by the user. If the conditions are maintained for the amount of time set in the time delay t28, the protection sends a trip command to open the circuit breaker.

Prerequisite: measuring.

ABB Code	ANSI Code	Trip curve	Threshold/Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance [1]	Disable Function	Disable Trip (Alarm only)	Pre-alarm
ROCOF	81R	t = k	f28 = 0.4....10 Hz/s up &/or down step 0.2 Hz/s	± 10%	with f > f28, t28 = 0.5...10s step 0.01s	The better of the two data: ± 20% or ± 200 ms	yes	yes	no

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32



Directional overcurrent protection (D – ANSI 67)

Application: it is useful to recognize the direction of the current during the fault period and thus detect if the fault is upstream or downstream of the circuit-breaker. In ring distribution systems, this enables the distribution portion in which the fault occurred to be identified and to disconnect it while maintaining the operation of the rest of the installation.

How it works: depending on the direction of the fault, if the current of one or more phases exceeds threshold I7 (I7fw or I7bw) for longer than time t7 (t7fw or t7bw), the protection activates and sends a TRIP command.

Optional functions:

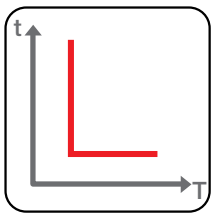
- Start-up: it enables higher trip thresholds to be set at the outgoing point, as available for protections S, I and G. Activation: 0.6…10 x In, Range: 0.1…30s with 0.01s step
- Zone selectivity: This protection enables circuit-breakers to be interconnected so that, in the event of a fault, the fault area can be rapidly isolated. Disconnection only occurs at the level close to the fault and the rest 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. t7sel = 0.1…0.8s, with 0.01s step).

Prerequisite: measuring.

ABB Code	ANSI Code	Trip curve	Threshold/Pickup	Threshold tolerance	Trip time/Delay	Trip time tolerance[2]	Disable Function	Disable Trip (Alarm only)	Pre-alarm	Optional function: Thermal memory	Optional function: Zone selectivity	Optional function: Start up
D	67	t = k	I7 = 0.6...10 x In step 0.1 x In 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	± 7% I ≤ 6 x In ± 10% I > 6 x In	with I > I7, t7 = 0.1...0.8s step 0.01s	The better of the two data: ± 10% or ± 40 ms	yes	yes	no		●	●

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32

SYSTEM PROTECTION



Internal Temperature Control (CB T)

Application: it prevent against overheating caused by various factors, including:
- Mechanical issues: such as broken moving contacts, arc chamber wear, contact surface degradation, or foreign objects between moving and fixed contacts
- Electrical issues: like loose busbar-terminal connections
- Environmental conditions: for example, excessively high ambient temperatures

This protection is particularly important in facilities with high load factors, such as data centers, refrigerated warehouses, laboratories, and hospitals, where continuous power supply is critical and equipment is at greater risk of thermal stress or failure.
When ordered, dedicated temperature sensors are installed

How it works: If the temperatures measured by the internal sensors exceed the preset thresholds, the protection CB T is activated and, after after 5 minutes from the moment the temperature threshold is exceeded, it sends a TRIP command. The function can be configured either for alarm only or for both alarm and trip. A pre-alarm is also available and can be used for signaling or triggering actions (e.g., activating fans).

Prerequisite: Ekip Supply

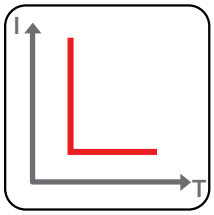
it is not available with the Neutral on the right-side configuration.

Dual and Triple setting of protection

Ekip Aware can store up to two (dual setting) or up to three (triple setting) sets of alternative parameters for all protections. Set B and Set C can replace the default set A, if necessary, 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. They can be activated by:
- Digital input available with an Ekip Signaling module
- Communication network, by means of one of the Ekip Com communication modules
- Directly from the Aware display
- By a settable internal time, after the circuit-breaker has closed.

Additional protections

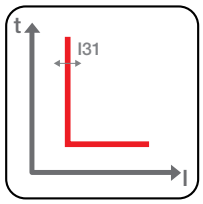
In addition, following protections can be used if dedicated module is installed:
- Arc Flash protection (ANSI 50ARC)
- Reduced Energy Let-Through (RELT - ANSI 50)
- Synchrocheck (SC - ANSI 25).



Arc Flash protections (AF1, AF2 - ANSI 50ARC)

Application: it provides active arc flash mitigation, reducing the risks to personnel (such as burns and pressure related injuries) and help mitigate damage to switchgear equipment. Thanks to an integrated solution, arc flash events can be detected and cleared in less than 40 ms for E2.3, E4.3 and E6.3 and less than 30 ms for E1.3, when only light detection method is used. It enables rapid tripping that can lower incident energy produced during an arc flash event and reduces the need for traditional external relay based systems.

How it works: it utilizes dedicated Ekip Arc Flash 6F module along with arc flash detectors. When Light-Sense Detector (if light >8000lux) or Light&Pressure-Sense Detector (if light >8000 lux and pressure >0.2 bar above ambient pressure) are triggered, each detector sends a signal to the corresponding channel of the module. To trigger the Emax 3 to trip, a protection function must be enabled and assigned to each channel.
Two independent protection functions are available (AF1 and AF2) allowing adaptation to different operating conditions. These functions are automatically visible in Ekip Connect 3 or EPiC mobile app when at least one Ekip Arc Flash 6F module is installed.
An optional current check can be enabled for each protection function, enabling both light (arc flash) and current threshold verification before issuing a trip command.
Prerequisite: Ekip Arc-Flash 6F, Ekip Supply module and Light-Sense Detectors (red) and/or Light&Pressure-Sense Detectors (yellow).



Reduced Energy Let-Through protection (RELT - ANSI 50)

Application: it increases operator safety during maintenance by reducing the energy let-through in the event of a short circuit and compliance with NEC 240.87 code regarding the use of an energy-reducing maintenance switching with local indicator for Arc Energy Reduction. The dedicated RELT protection ensures faster tripping times than the standard Instantaneous protection when activated.
RELT protection can be activated in three ways:
- via Ekip RELT module with an external input signal (e.g., a switch): the switch can be located outside the arc flash boundary, allowing RELT to be activated before the operator approaches. A local status indicator is typically installed near the switch to provide visual confirmation locally on Ekip Aware
- HMI: activation does not require additional hardware.
- Via EPiC Mobile App (only if the Ekip RELT module is installed): enables remote activation.

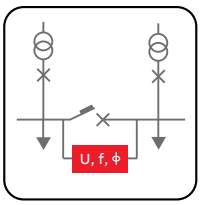
When RELT is active, a local status indicator (e.g., LED) or the Ekip Aware HMI blue indicator confirms state of the protection. Once maintenance is completed, and RELT protection is deactivated, the indicator returns to its normal color, confirming the system has reverted to standard protection mode.

Prerequisite: depends on the activation way.

ABB Code	ANSI Code	Trip curve	Threshold/Pickup	Threshold tolerance (1)	Trip time/Delay	Trip time tolerance (1)	Disable Function	Disable Trip (Alarm only)	Pre-alarm	Optional function: Thermal memory	Optional function: Zone selectivity	Optional function: Start up
RELT	50	t = k	I3 = 1.5...15 x In (max setting 15kA) step 0.1 x In	± 10%	with I > I31 = instantaneous	≤7ms (2)	yes	yes	no		●	●

1) with Vaux or Ekip Aware already powered by the main circuit with current flowing in at least two-phases. In other case see table in page 3/32
2) RELT Trip time: ≤3ms when If≥18kA/ ≤7ms (If three-phase) or ≤9ms (If single-phase) when I31 ≤If<18kA/ 15ms when 3*I31 <If<18kA
Where If is the fault current

SYSTEM PROTECTION



Synchrocheck (SC - ANSI 25)

Application: for distribution systems with two power sources that are to be connected in parallel, electrical synchronism (phase angle, frequency, and voltage) must be verified before closing the Emax 3 in the tie position.

How it works: when equipped with the dedicated Ekip Synchrocheck module the synchrocheck function supports two operating modes (Live Bus and Dead Bus) and two input configurations (single-phase or three phase).
1. Live Bus Mode: used when both sources are energized.

- Single-phase mode: synchronism is achieved when all the following conditions are met:
  - one line-to-line voltage of first source and the correspondent one of the second source above the Ulive threshold for the tref set time
  - Difference of the two line-to-line voltages of the two sources below the threshold ΔU
  - Difference of the two frequencies between the two sources below the threshold Δf
  - Difference of the two phase angle of the two line-to-line voltages below the threshold ΔΦ
  - All required synchronism conditions maintained for the programmed amount of time tsyn
  - The circuit breaker is open
- In three phase mode three line-to-line voltages are considered and all must satisfy the conditions at the same time

2. Dead Bus Mode: used when one source is de-energized (dead bus) and the other is energized (live bus).

- In single phase mode, synchronism is achieved when:
  - Line-to-line voltage of the energized source (live bus) above the specified threshold Ulive
  - Line-to-line voltage of the de-energized source (dead bus) below the threshold Udead
  - Circuit breaker open
- In three phase mode three line-to-line voltages are considered and all must satisfy the conditions at the same time

Dead Bus mode has both Standard and Reversed configurations
In both live and dead modes, 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).
Voltages of one source are measured using two inputs (single-phase) or three inputs (three-phase) via the Ekip Synchrocheck module. Voltages of the second source are measured using the internal voltage measurement cables of the Emax 3, provided they are correctly configured.

Prerequisite: Measuring, Ekip Synchrocheck module.

If Ekip Aware trip unit is not already powered by the main circuit with current flowing in at least two-phases or there is no auxiliary power supply, 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%

POWER QUALITY

Measurement

When it comes to energy monitoring, even a small percentage of measurement errors can lead to significant financial losses. Therefore, measurement accuracy is paramount.

Measuring digital upgrade

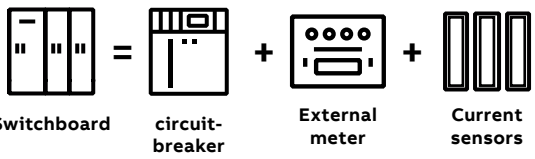
The "measuring" digital upgrade enhances the Ekip Aware trip unit by providing the integration of additional measurements such as voltage, frequency, power and energy. Users can display instantaneous measurements and counter in various ways:

- Ekip Aware HMI display
- EPiC mobile app, connected via Bluetooth Low Energy (BLE) or USB-C cable.
- Ekip Connect software
- Supervisory system (i.e. SCADA) using multiple communication protocols.
- Lite Panel Pro display

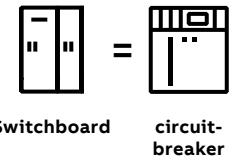
Accuracy class

The SACE Emax 3 family of circuit breakers are equipped with internal Rogowski coils, ensuring Class 2 accuracy by default for active power and energy measurements according to the IEC 61557-12 standard. For those requiring higher accuracy measurements, Emax 3 can be configured from with factory with Class 1 or 0.5 accuracy in compliance with IEC 61557-12 standard. When used as a EPMF-DD power meter device as defined in IEC61557-12, the Emax 3 eliminates the need for additional devices, sensors/CT's, resulting in cost savings, reduced space requirements, and optimized installation. The declared accuracy is the accuracy of Emax 3 is that of the complete measuring system as shown below.

From



To



POWER QUALITY

The following table summarizes:

- Which measurement function are included by default and which are included with measuring digital upgrade
- Precision for each measurements depending on class accuracy chosen, following IEC 61557-12.

Instantaneous measurements	Unit	Parameters	Digital upgrade needed	Class 2 - default	Class 1 - optional (1)	Class 0.5 - optional (1)
Currents (RMS)	[A]	L1, L2, L3, Ne	/	2%	0.5%	0.5%
Ground fault current (RMS)	[A]	Ig	/	2%	2%	2%
Phase-to-phase voltage (RMS)	[V]	U12, U23, U31	Measuring	1%	0.5%	0.2%
Phase-neutral voltage (RMS)	[V]	U1, U2, U3	Measuring	1%	0.5%	0.5%
Phase sequence			Measuring			
Frequency	[Hz]	f	Measuring	0.2%	0.1%	0.1%
Active power	[kW]	P1, P2, P3, Ptot	Measuring	2%	1%	0.5%
Reactive power	[kVAR]	Q1, Q2, Q3, Qtot	Measuring	3%	2%	1%
Apparent power	[KVA]	S1, S2, S3, Stot	Measuring	2%	1%	0.5%
Power factor		total	Measuring	2%	1%	0.5%
Peak factor		L1, L2, L3, Ne	Measuring			
Current THD		THD for (V12, V23, V31, V1N, V2N, V3N) VTHDavg, VTHDavgmax	Measuring	3%	2%	1%
Voltage THD		THD (I1, I2, I3, IN) ITHDavg, ITHDavgMAX	Measuring	3%	2%	1%

1) The accuracy values refer to the normal operating ranges and conditions established by IEC 61557-12 for each declared quantity and class. Class 0,5 and Class 1 Power&Energy Metering are available only if supplied with the circuit breaker; the Measuring Digital upgrade is mandatory. The performance values in the table apply to circuit breakers supplied with an auxiliary power supply (Ekip Supply or Ekip Supply Evo Modbus TCP), with a frame size (Iu) ≥ 630 A, Un ≥ 400 V, internal voltage cables only, and with phase sequence 1-2-3 only. They are also valid for 3-pole circuit breakers (without external neutral sensor) or 4-pole circuit breakers (only if the neutral is on the left).

Counters recorded from installation or from the last reset	Unit	Parameters	Digital upgrade needed	Class 2 - default	Precision (Class 1) (1)	Precision (Class 0.5) (1)
Active energy	[kWh]	Ep total, Ep positive, Ep negative	Measuring	2%	1%	0.5%
Reactive energy	[kVARh]	Eq total, Ep positive, Ep negative	Measuring	3%	2%	2%
Apparent energy	[KVAh]	Es total	Measuring	2%	1%	0.5%

1) The accuracy values refer to the normal operating ranges and conditions established by IEC 61557-12 for each declared quantity and class. Class 0,5 and Class 1 Power&Energy Metering are available only if supplied with the circuit breaker; the Measuring Digital upgrade is mandatory. The performance values in the table apply to circuit breakers supplied with an auxiliary power supply (Ekip Supply or Ekip Supply Evo Modbus TCP), with a frame size (Iu) ≥ 630 A, Un ≥ 400 V, internal voltage cables only, and with phase sequence 1-2-3 only. They are also valid for 3-pole circuit breakers (without external neutral sensor) or 4-pole circuit breakers (only if the neutral is on the left).

Record of values: of the parameter for each interval with time-stamping	Unit	Parameters	Digital upgrade needed	Window	Intervals	Where
Current: minimum and maximum	[A]	I Min, I Max	Measuring	Fixed synchronizable by remote	Duration: 5...120min Number of intervals: 24	EPiC, Ekip Connect, SCADA through communication protocols
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				

POWER QUALITY

Network Analyzer

The Network Analyzer provides a means of diagnostics by analyzing the electrical characteristics of the system, based on harmonics and voltage and frequency fluctuations and imbalance without the need of external instrumentation. Effective preventative and corrective action can be implemented through accurate analysis, thereby improving the efficiency of the system.

Applications

Electrical equipment is designed for use under optimum operation and uniform or balanced voltage levels. Power Quality is the description of how well a power system complies with ideal conditions. Power quality issues can have negative consequences on the efficiency of systems and components. Monitoring the power quality of a system is more important than ever in order to achieve optimal system efficiency.

In particular, power quality analysis includes the following aspects:

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

POWER QUALITY

Network Analyzer

The first step toward 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 in checking the status of the installation and starting the root cause analysis. Power quality measurements and related instrumentation are described in specific industrial standards such as IEC61000-4-30. With the Ekip Aware trip unit for Emax 3, the power quality monitor is embedded in a low-voltage air circuit-breaker. The Network Analyzer function of Emax 3 complies with the IEC61000-4-30 Class S standard for the calculation of voltage imbalances, overvoltages, and sags. The measuring digital upgrade is needed in order to install the network analyzer.

The Network Analyzer has the ability to monitor and signal three kinds of sag classes which can be 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.

In addition, for the last 50 voltage events, a table with voltage, duration and time stamp is available and can be downloaded from Ekip Connect 3.
Two different types of counters for each power quality monitoring function are 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 24-hour 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.
The harmonic content of voltages and currents, measured to the 50th harmonic and voltage unbalance data are available with the Network Analyzer digital upgrade. The following table summarize the parameters monitored by the Network Analyzer.

Network Analyzer		Parameters	Intervals
Hourly average voltage value	[V] [no]	- Umin= 0.75…0.95 x Un	t = 5…120min
		- 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	t <20ms
		- 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	t <20ms
		- 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	t = 0.02s…60s
		- 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	t = 5…120min
		- 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	

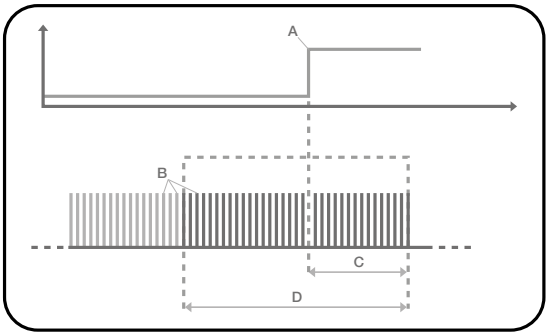
POWER QUALITY

Data Logger and Data Logger Pro

The Data Logger function allows for data associated with a trigger event (i.e. trip event) to be recorded and stored within the trip unit of the circuit breaker. A user can then analyze the even in detail and investigate the root cause of the event to determine any potential issues with the system.

When the Data Logger is enabled and activated, Ekip Aware will continuously acquire data by filling and emptying an internal buffer (B). If a trigger event (A) occurs, Ekip Aware will then collect the data up until the event occurs or by a user defined time delay (C) and stores all the data of the window (D), which can then be download to a PC for analysis. The recording duration (D) depends on the sample frequency.

Two Data Loggers are available and can work independently. One event trigger can be selected on the Data Logger Pro and a different trigger on the standard Data Logger. The Data Logger is included as standard with Ekip Aware while the optional Data Logger Pro is available configured or by digital upgrade. For Data Logger Pro an SD card must be purchased separately from a 3rd party.



Data can be displayed in two methods:
- EPiC mobile app via Bluetooth or USB-C on mobile device
- Ekip Connect 3 software on PC.

	Data Logger	**Data Logger Pro**
Digital upgrade needed	No	Data Logger Pro
Hardware needed	No	• Ekip supply Lite or Ekip Supply Evo Modbus TCP • SD card
Number of registers recorded	• 8 • 16 • 32	• 8 • 16 • 32 (default) • 64
Recording Duration (D)/ Sampling frequency	With 32 registers: • 3,4 s/1200 Hz • 1,7 s/2400 Hz • 850 ms/4800 Hz • 424 ms/9600 Hz With 16 registers: duration is the double	D limited by memory up to 512 GB (SD card) • 1200 Hz • 2400 Hz • 4800 Hz • 9600 Hz
Recorded Electrical parameters	• V (line) (1) • I (phase) • Digital Events (protection events or alarms, circuit-breaker status signals, protection trips)	• V (line- to-line) (1) • I (phase) • Digital Events (protection events or alarms, circuit-breaker status signals, protection trips) • temperature (2)
Trigger	• Trip • Alarm (limited) • Status (limited)	• Trip • Alarm • Status • Warning • Programmable Status • Manual • Multitrigger function
N° of buffers	1	2 (1 Data Logger + 1 Data Logger Pro)
Supply mode	Self/auxiliary	Auxiliary
File extension	.abb/.COMTRADE (Ekip Connect 3 conversion)	.abb/comtrade (Ekip Connect 3 conversion)

1) Measuring digital upgrade needed
2) Temperature sensors needed

CONNECTIVITY

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Recognizing the need for adaptability in an era of rapidly increasing connected devices, Emax 3 and Ekip Aware features an optimized communication architecture that meets modern application requirements for flexibility and reliability.



CONNECTIVITY

Architecture

Emax 3 circuit breakers are designed to seamlessly integrate into various automation, building, and energy management systems. By supporting a wide range of communication protocols such as Modbus RTU, Profibus, Modbus TCP, Profinet, EtherNet/IP(TM) and IEC 61850, Emax 3 can help ensure efficient and reliable connectivity.

Emax 3's communication architecture integrates both hardware and software components to ensure robust performance. A version of Ekip Supply is required when a communication or signaling module is present. Two version of Ekip Supply are available:

- Ekip Supply Lite
- Ekip Supply Evo Modbus TCP

Note: Ekip Supply Evo Modbus TCP is required when protocols IEC 61850, Profinet, EtherNet/IP(TM) are used.

Refer to module compatibility table below for more details.



Compatible with

Ekip Supply EVO Modbus TCP												
10K	6F-1-2	Modbus RTU	Profibus	2K 1-2	RELT	4T-1-2	Synchro-check	Profinet	External Cartridge	IEC 61850	External Cartridge	Com Link	Modbus TCP Security Protocol

Compatible with

Ekip Supply Lite						
Modbus RTU	6F-1-2	Profibus	2K 1-2	RELT	4T-1-2	Synchro-check

Ekip Supply Evo Modbus TCP enables the circuit breaker to communicate using Modbus TCP protocol and facilitates daisy chain connections for streamlined networking. Com Link is an upgrade of the circuit-breaker, enabling an exclusive ABB proprietary bus that serves as the communication backbone between circuit-breakers.
As the communication layer, Com Link enables the execution of custom logic within the system. Furthermore, it provides the capability to program digital logic selectivity and interlock, leveraging the robust Link network. This feature-rich communication solution is designed to enhance the functionality and performance of power systems. Modbus TCP Security Protocol is an upgrade that must be specified at the time of ordering the circuit-breaker. When configured with Ekip Supply Evo Modbus TCP, it enhances security in communications, following the Modbus Security Protocol Specification. Com Link and Modbus TCP Secure are circuit breakers features that require Ekip Supply Evo Modbus TCP in order to run.

The Ekip Signaling system enables the ability to program custom functions through inputs from the Ekip Signaling modules. Employing digital input/output and temperature sensors, the circuit-breaker is aware of what is happening in the environment. This adaptability allows for seamless adjustment to varying grid conditions, establishing Ekip Signaling as a flexible and reliable choice for low-voltage distribution system management.
Ordering codes are conveniently located in a dedicated section of the catalog for easy reference (Chapter 8).
The external cartridge is designed for exclusive connection to the embedded cartridge in the circuit-breaker through the Ekip Supply Evo Modbus TCP. For the external cartridge, the Ekip Supply Lite is the only permitted supply unit.

CONNECTIVITY

Communication protocols

Ethernet communication

Modbus TCP

The Ekip Supply Evo Modbus TCP facilitates communication over the Modbus network for the circuit-breaker. The Modbus connection enables monitoring of the breaker's status, collection of operational data and parameter setting via the Ekip Connect configuration software.

The Ekip Supply Evo Modbus TCP module is essential hardware for Modbus communication. It can be easily integrated into the circuit-breaker's terminal box and Ekip Cartridge. This module is equipped with an RJ45 port and a 2-wire Ethernet port (100 base T1).



The module's architecture allows for the creation of a Modbus daisy chain connection among various devices.

IEC 61850

IEC 61850 defines a common communication protocol for intelligent electronic devices (IEDs) in substations. In adhering to this standard, Emax 3 can seamlessly communicate with other IEDs, such as protection relays, meters and SCADA systems.

This simplifies system integration, reduces custom development effort, and ensures consistent data exchange across various vendors' equipment. With Ekip COM IEC 61850 GOOSE, Process Bus and .COMTRADE file transmission are available on Emax 3.

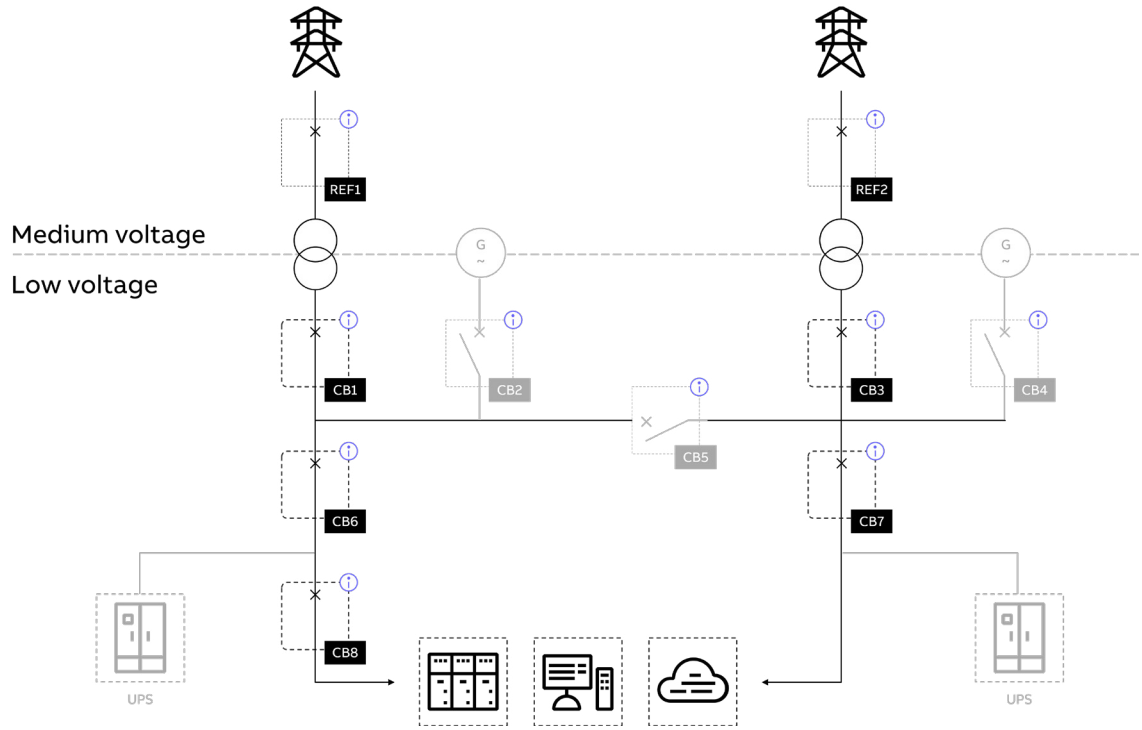
PRP and HSR redundancy are also supported by the Ekip COM IEC 61850.



Emax 3 supports Generic Object-Oriented Substation Event (GOOSE) messaging, enabling fast tripping and isolation of faulty sections, thus minimizing damage and improving personnel safety. With GOOSE messages, it is possible to implement interlock and selectivity logic without the need for a SCADA system. Here are the key applications:

- **LV Selectivity (CB1...CB7):** Low-voltage selectivity among circuit-breakers (from CB1 to CB7) ensures that only the breaker closest to the fault trips, minimizing service disruption.
- **LV-MV Interlock (REF1-CB1; REF2-CB3):** The interlock between low voltage (LV) and medium voltage (MV) devices prevents hazardous operations and ensures coordination between the devices.
- **Communication between LV and MV:** IEC 61850, widely used in MV systems, facilitates communication between LV and MV equipment.
- **Control LV and MV equipment with a single SCADA:** Both LV and MV equipment can be managed with a single SCADA system, eliminating the need for additional hardware.
- **Remote control of the CBs:** Circuit-breakers can be remotely controlled, enhancing the flexibility and responsiveness of the system.
- **Selectivity integration with MV:** Selectivity is integrated with the MV system for optimal protection.
- **Integration with external PLCs:** Integration with an external programmable logic controller (PLC) allows for greater customization and control of the system.

These points highlight the versatility and efficiency of advanced communication systems in managing and protecting electrical infrastructures.



CONNECTIVITY

Communication protocols

In the context of substations and distribution systems, the use of sampled values (SV IEC 61850-9-2) messages proves to be an efficient method for exchanging sampled data between intelligent electronic devices. Regarding network resilience, the Parallel Redundancy Protocol (PRP) and High-availability Seamless Redundancy (HSR) play pivotal roles in ensuring communication reliability, especially in critical infrastructures like substations.
Redundancy can be implemented using the RJ45 ports of the Ekip COM IEC 61850 and Ekip Supply Evo Modbus TCP, providing a redundant communication path to prevent single points of failure.

Profinet
The Emax 3 Ekip Com Profinet Module is a Profinet-compatible communication module for the Emax 3 circuit-breaker series. It enables real-time data exchange for energy distribution management in industrial settings, enhancing operational efficiency and productivity.
The Emax 3 Ekip Com Profinet Module supports both cyclical and acyclical communication, catering to diverse industrial automation needs. Cyclical communication allows for regular data exchange at fixed intervals, ensuring consistent monitoring and control. Acyclical communication, on the other hand, is event-driven and allows for data transfer as needed, providing flexibility in managing critical events or specific tasks.

In addition, the module supports S2 redundancy, a Profinet feature that ensures uninterrupted operation, even in the event of a network failure. This redundancy feature enhances the reliability and robustness of the system, making the Emax 3 Ekip Com Profinet Module an ideal choice for demanding industrial environments.



Ethernet IP
The Ekip Com Ethernet/IP Module is an Ethernet/IP-compatible communication module designed for the Emax 3 circuit-breaker series. It facilitates real-time data exchange for energy distribution management in industrial automation systems, thereby enhancing operational efficiency and productivity.



Fieldbus communication

Modbus RTU

The Modbus RTU communication module in Emax 3 circuit-breakers offers several advantages. Modbus RTU is a well-established, widely accepted protocol for industrial communication, known for its simplicity and reliability. By integrating Modbus RTU, Emax 3 circuit-breakers can seamlessly communicate with other industrial electronic devices, making them an integral part of any building management system (BMS) or industrial automation system (IAS). This allows for real-time monitoring and control of the circuit-breakers, enhancing operational efficiency and safety. The Ekip Com Modbus RTU and Profibus-DP contain a terminating resistor and dip switch for optional activation to terminate the serial network or bus.



Profibus

The Profibus communication module in Emax 3 provides a robust and versatile solution for fieldbus communication in various industrial environments. Profibus is a widely accepted protocol for fieldbus communication in automation technology, used to operate sensors and actuators via a centralized controller. With Profibus integration, Emax 3 circuit-breakers can be easily monitored and controlled via a process control system, improving the overall efficiency and safety of industrial processes. This makes Emax 3 a reliable choice for various industrial applications. The Ekip Com Profibus-DP module contain a terminating resistor and dip switch for optional activation to terminate the serial network or bus. It also contains a polarization resistor and dip switch for its activation.



POWER MANAGEMENT

The importance of power management in electrical installation

Power management is an essential aspect that involves not only the protection of the electrical system but also the optimization of power usage, the prevention of power interruptions and longevity of your electrical system. It's a key component of modern electrical systems and plays a crucial role in the efficient operation of any facility.

Effective power management ensures that electricity is distributed evenly and safely, preventing potential issues such as overloads or power surges. These can cause significant damage to both the electrical installation and the devices connected to it. Moreover, efficient power management contributes to energy conservation, leading to cost savings and a reduced environmental impact.



Therefore, power management is not just crucial, but indispensable in electrical installations, ensuring their optimal performance and durability.
Emax 3 contributes to improving power management in the system, capitalizing on the smart capabilities of the Ekip Aware trip unit:

- **Custom logic** software, a brand-new functionality available on Emax 3, ensures the creation of embedded logics inside the circuit-breaker that becomes able to control loads and power sources. Integrated automatic transfer switch solutions are available.
- **Power Controller** software optimizes power management by reducing peak loads and shifting loads. It operates based on a patented algorithm that allows control of a list of loads where users can set the priority for load management. The algorithm is configured based on an average power consumption over a specified time interval. If the power consumption exceeds the set limit, the Power Controller intervenes to bring it back within the boundaries.
- **Load shedding** features prioritize certain loads over others, prioritizing power to essential machinery over less critical systems. This level of control can help to prevent interruptions in the event of a power surge or drop in the power supply.

POWER MANAGEMENT

Custom Logic

Purpose

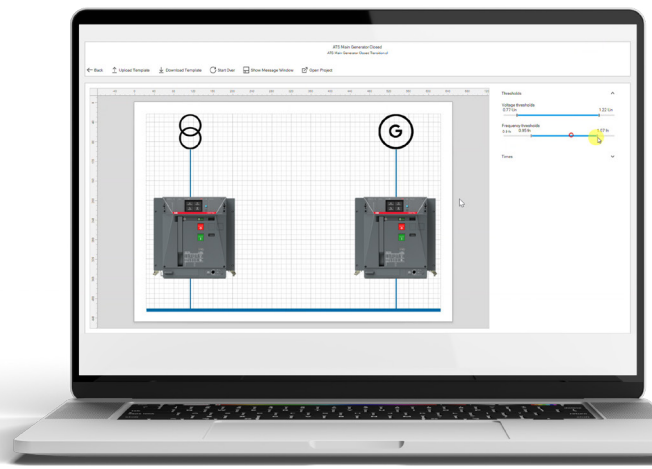
It is an innovative tool within the Ekip Connect 3 software, designed to enable users to create custom logics for a wide range of applications. This tool simplifies the process of creating connections and logics with devices, significantly reducing the time spent on complex programming and extra wiring and eliminating the need for external controllers.

The Custom Logic tool features an intuitive graphical interface, making programming much simpler compared to traditional programmable logic controllers (PLCs). The tool is always accessible within the Ekip Connect 3 software. To transfer a logic to a device, a Digital upgrade must be purchased for each device, either from the factory or through the ABB Ability™ Marketplace (1SDA126527R1).

Features

Key features of the Custom Logic functionality include:

- **Convenient programming:** The tool does not require a physical connection to circuit-breakers during the programming of the logic in Ekip Connect. This ensures the comfort and safety of the operator by allowing logic configuration without needing a direct connection to the device. A connection tool-device is required when transferring logic from Ekip Connect to Emax 3 to enable the execution of the logic.
- **Graphical User Interface:** The intuitive interface through the Ekip Connect 3 software tool makes it user-friendly. Unlike traditional programmable logic controllers that require high engineering skills, a block-based approach, guides users in employing the available inputs on the device and combining them with the available operators.
- **Ready-to-go solutions available:** ABB provides ready-to-go solutions with pre-tested templates inside Custom logic Library. These plug-and-play templates are programmed and tested by ABB, allowing users to deploy applications quickly without extensive customization, saving time in programming.
- **Bill of materials generation:** The tool provides the necessary product configuration for each device to implement the programmed logic.
- **Validation and testing:** The tool checks the accuracy of the connections within the logic and allows users to monitor the behavior of inputs and outputs at the tool level.



POWER MANAGEMENT

Custom Logic

Usage

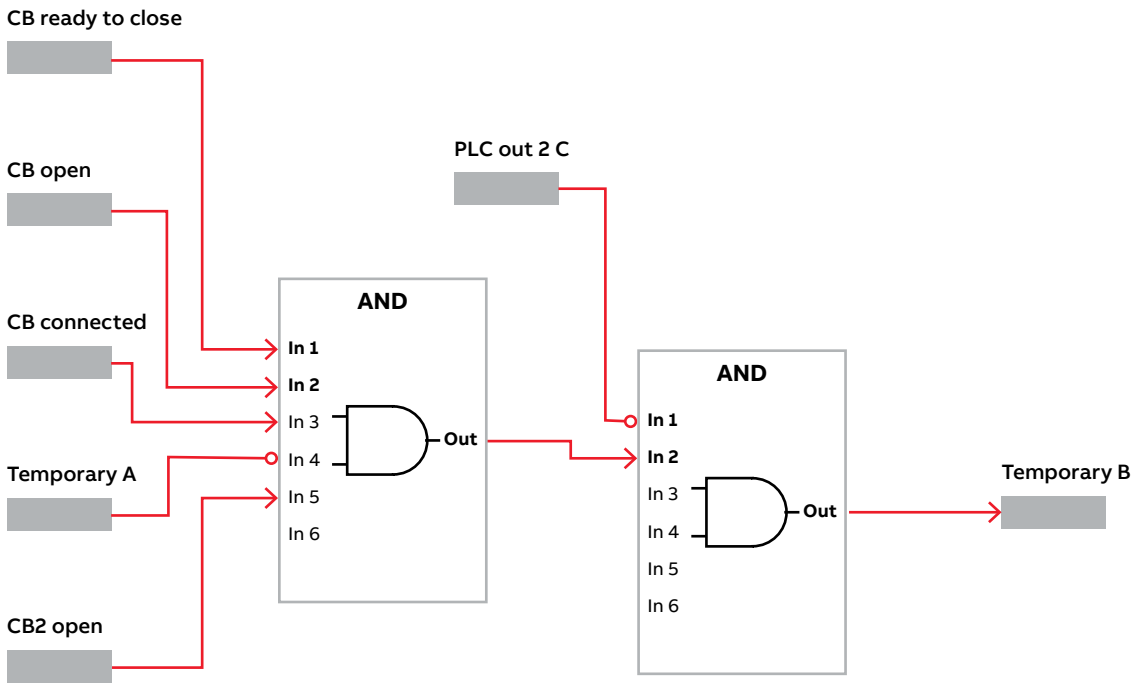
ABB custom logic software offers three different approaches:

- **Ready-to-go solutions:** These templates come with ABB preset configurations that significantly reduce the time and effort required. They are available inside the tool in Ekip Connect, in the Custom Logic Library section.
- **Customization of Ready to go solutions:** These solutions offer a degree of customizability, despite being pre-programmed, allowing users to modify the logic template to fit specific needs.
- **Design from scratch:** Custom logics offer the ability to design a full solution from scratch, leveraging the powerful electronics of Emax 3. This option enables the highest flexibility of logic design, giving users complete control over the configuration.

The Custom Logic Library, accessible to all users, provides a variety of solutions tailored to meet specific requirements:

- **Main Gen -Open Transition:** Perfect for scenarios requiring an open transition between the main power source and the generator (or Main).
- **Main Gen -Close Transition:** Designed for situations that need a close transition between the main power source and the generator (or Main).

For more information about ABB's innovative solution, please refer to the Custom Logic user guide.



POWER MANAGEMENT

Power Controller

Benefits

Emax 3 equipped with a Power Controller offers several key advantages:

- **Energy Savings:** By disconnecting loads from the power supply for brief periods and in a prioritized order, the Power Controller helps limit peak power consumption. This allows for renegotiation of the contract with the energy provider, leading to a decrease in allocated power and a consequent reduction in overall energy costs.
- **Controlled Power Consumption:** The Power Controller can manage up to four different time bands, enabling it to adhere to a specific power limit during peak (day) and off-peak (night) hours. This helps to control consumption during the day when rates are typically higher.
- **Integrated Logic:** The Power Controller enables efficient management of the installation with a straightforward architecture. It measures the total power of the installation without the need to measure the power consumed by each individual load, thereby minimizing installation costs and time. The logic is already implemented in the protection unit and is ready for use.
- **Load Curve Optimization:** The Power Controller aids in flattening the load curve, promoting the use of base- load power plants with higher efficiency than peaking power plants.
- **Integrated Communication Modules:** The Power Controller can receive the maximum absorbable power directly from the medium voltage control system, determining consumption for the next 15 minutes. Based on the information received, it manages the disconnection of non-priority loads or the activation of reserve generators. Non-programmable preferred energy sources, such as wind and solar, are given maximum priority and are considered uninterruptable.
- **Cogeneration System Advantage:** The Power Controller controls the total consumption drawn from the electrical network, interrupting non-essential loads when production is reduced and reconnecting them when generator power is sufficient to not exceed limits. This leads to multiple advantages: reduction in energy costs, maximum use of local production and greater overall energy efficiency.

POWER MANAGEMENT

Load Shedding

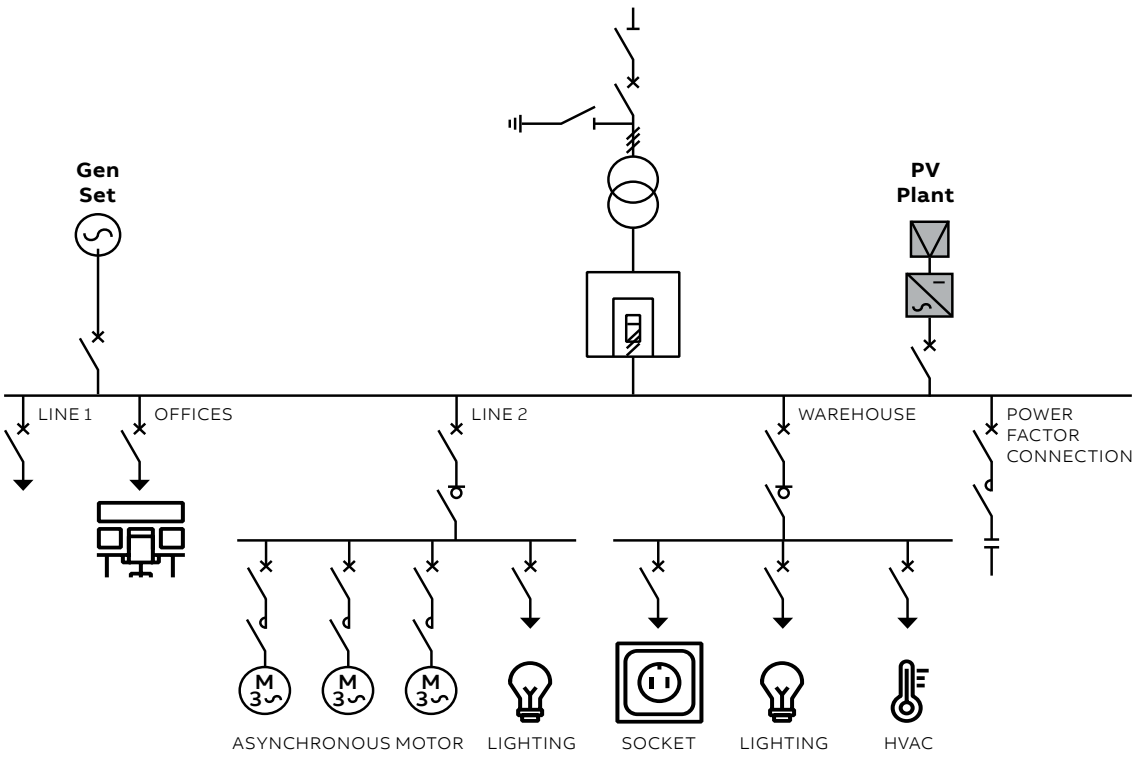
Purpose

The Emax 3 circuit-breaker, integrates algorithms to safeguard microgrids and manage their resources, maximizing the efficiency. It embeds patented functions based on load shedding, which reduces microgrid stress in all situations.
A typical application scenario is one in which Emax 3 is the main circuit-breaker for the low voltage microgrid located at the interface point with the medium voltage grid, able to control the plant in every circumstance. After the Emax 3 circuit-breaker opens, because of interface protection systems intervention or external command, the microgrid should transit from on-grid to off-grid state. When it is standalone, the power absorption from the main grid ceases so that the microgrid load continue to be supplied by the local generation, like diesel genset or energy storage systems. During the islanding transition, it is very important to avoid the frequency drop; otherwise, the generation protections could trip, jeopardizing the microgrid's stability with consequently a long downtime.

Emax 3, employing embedded voltage 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 microgrid disconnection events and shed a group of low-priority loads, ensuring a fast response and power balance.
- **Adaptive Load Shedding:** The advanced algorithm available with Emax 3 as an enhancement of the basic version. The intelligent software embedded in the circuit-breaker very quickly sheds low-priority loads according to the microgrid power consumption and frequency measurements.

While Basic Load Shedding is available by default, Adaptive Load Shedding requires an additional digital upgrade.



Benefits

- **Service Continuity:**
  When a plant remains disconnected from the utility grid, even with active local production, there is a significant stress that turns off all the generators with consequent blackout. Thanks to its load shedding function, Emax 3 not only improves the service continuity but also enhances the lifetime of the spinning generators.
- **Space Optimization:**
  Neither PLC nor external relays are needed as Emax 3 has embedded the intelligence to realize the load shedding logic, taking advantage of the internal current and voltage sensors for electrical parameter measurements.
- **Ease of Use:**
  Load-shedding logics are generally set with high engineering skills and customization effort with such devices as programmable logic controllers. Emax 3 ensures ease of use, with predefined templates and the user-friendly graphic interface in Ekip Connect.

ASSET MANAGEMENT

Enabling Asset Management Through Embedded Intelligence

True asset management becomes possible only when the Emax 3 circuit breaker is equipped with intelligent accessories, such as embedded sensors and temperature monitoring systems. These integrated components are essential for capturing real-time operational data, enabling the breaker to continuously assess its own condition and monitor the overall health of the switchgear. As a result, the Emax 3 can detect anomalies and highlight areas where performance may be compromised. With built-in diagnostic capabilities, the breaker evolves from a passive component into an active contributor to system reliability, enabling predictive maintenance and reducing the risk of unexpected failures.



Advanced Monitoring with Sense Accessories

Sense accessories retain all the core functionalities of standard accessories, but they go a step further by integrating advanced monitoring and communication capabilities. Specifically:

- They can track a range of operational parameters—such as the number of operations, power consumption—providing continuous feedback on their status directly to Ekip Aware.
- They can be remotely controlled through a variety of communication protocols without the need for any other additional device

Monitoring the parameters of sense coils is especially critical. These coils are responsible for key actuation functions—such as opening, closing, and undervoltage release—and their performance directly impacts the reliability and responsiveness of the circuit breaker.

In addition to real-time monitoring, two key indicators provide deeper insights into the condition of these components:

- **Health Index:** This metric reflects the current health status of the accessory, offering a clear and immediate understanding of its operational integrity in percentage.
- **Estimated End of Life:** This predictive indicator estimates the remaining useful life of components such as coils and motors. It is calculated based on the number of operations and operating temperature—two factors that significantly influence the aging and degradation of electrical components.

Together, these indicators empower users with actionable intelligence, enabling a shift from reactive to predictive maintenance strategies and ensuring long-term system reliability.



Thermal monitoring

Thermal issues are among the most prevalent and underestimated threats to low-voltage switchgear. Excessive heat often serves as an early indicator of underlying problems, which can range from loose or faulty connections and deteriorating insulation to equipment wear. If left unaddressed, these issues can lead to unplanned downtime and, in extreme cases, severe failures that jeopardize operational continuity.

While thermographic inspections have long been employed to identify such anomalies, they come with inherent drawbacks, providing only limited, periodic snapshots of equipment conditions. As electrical systems become increasingly complex and operational uptime grows more critical, continuous monitoring offers real-time, proactive detection of overheating, enabling early intervention before failures occur.

The Emax 3 circuit breaker supports continuous thermal monitoring at two levels of the asset:

- **Switchgear-Level Monitoring:**
  - T-Sense Ambient
  - T-Sense Busbars
  - Ekip Temperature 4T
- **Device-Level Monitoring:**
  - Internal Temperature Sensors

In particular:

- **T-Sense Ambient** is a wireless sensor typically installed in the upper and lower sections of the switchgear to monitor heat dissipation over time. It can also be placed inside auxiliary cubicles (e.g., aux cubicle) to monitor internal ambient temperature conditions.
- **T-Sense Busbars** is a wireless sensor typically mounted at critical junctions, such as HR–VR busbar joints, breaker terminal–busbar joints etc Both T-Sense Ambient and T-Sense Busbars communicate directly with Emax 3 via a **Bluetooth Low Energy (BLE) mesh network.** This setup creates a scalable, robust wireless communication infrastructure without the need for external concentrators.
- **Ekip Temperature 4T with PT100/PT1000 Probes** are typically installed at high-risk junctions (e.g., HR–VR busbar joints, breaker terminal–busbar joints) and provide cabled temperature measurements, offering an effective alternative where wireless solutions are not ideal.
- With the **Internal Temperature Control** solution, **internal temperature sensors** continuously monitor the Emax 3's internal heat levels. When abnormal conditions are detected, the system can automatically trigger self-protection actions, such as opening the breaker to prevent damage. Additionally, a pre-alarm function enables early detection of rising temperatures, allowing preventive measures, like activating cooling fans, to be taken before critical thresholds are reached. Internal Temperature Control is not available with the Neutral on the right-side configuration.

Asset management strategies

The breaker asset comprises several key components that are critical for its functionality:

- Internal Circuit Breaker Temperature
- Internal Trip Unit Temperature
- Current Sensors
- Opening, Closing, and Undervoltage Coils
- Ekip Modules

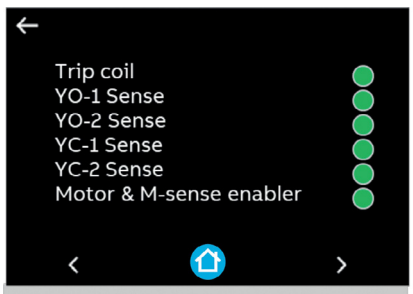
These components play a vital role in enhancing the functionality of the circuit breaker, providing users with the necessary information for optimal operation and maintenance.

ASSET MANAGEMENT

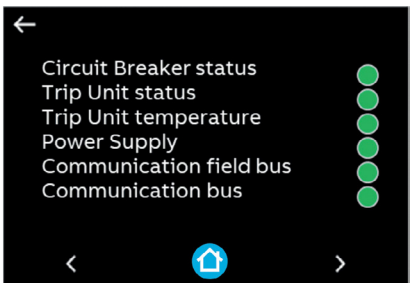
Condition based monitoring

Thanks to embedded sensors and intelligence, Emax 3 incorporates a comprehensive condition-based monitoring system that continuously oversees critical areas to ensure optimal performance and safety. This monitoring is seamlessly integrated into the HMI, Ekip Connect, and Epic interfaces, providing real-time insights into the following areas:

- **Poles and Power Terminals:** the temperature monitoring ensures secure and efficient electrical connections.
- **Mechanism:** Evaluating the functionality of the circuit breaker's mechanism, including the switching time.
- **Coils:** Inspecting the winding and performance of the coils every 30 s.
- **Current Sensors:** Verifying that the current sensors are consistently and correctly connected.
- **Ekip Modules:** Monitoring the status of various Ekip modules to ensure proper communication with the trip unit.
- **Trip Unit:** Assessing the functionality and temperature of the trip unit.
- **Circuit Breaker Status:** Providing a comprehensive overview of the circuit breaker to ensure that its status is accurately recorded by the trip unit.



Sense accessories & trip coil



Trip Unit, Communication Modules, Supply, Breaker status

Each of these areas contains multiple indicators displayed through the HMI. A green dot signifies that everything is functioning well, while an orange or red dot indicates an alarm or warning, prompting users to check their system. In such cases, a "System check" will appear on the HMI, alerting operators to potential issues.

The purpose of these monitoring pages is to provide early detection of potential failures, allowing for timely intervention before a functional failure occurs, thereby enhancing system reliability and safety.

Additionally, Ekip Connect will integrate troubleshooting features within these monitoring pages, enabling customers to understand how to correctly address specific situations effectively. The purpose of these monitoring pages is to provide early detection of potential failures, allowing for timely intervention before a functional failure occurs, thereby enhancing system reliability and safety.

Advanced Predictive Maintenance on premise

Emax 3 is equipped with a cutting-edge predictive maintenance algorithm that transforms traditional maintenance strategies into a proactive, data-driven process. This innovation is powered by an embedded algorithm located directly within the trip unit—no cloud connection is required.

The embedded algorithm uses all the real-time data and data inputted by the user to calculate the optimal next maintenance date, which is clearly displayed on the HMI, Ekip Connect, Epic or accessible via local communication protocols.

In addition to displaying the next scheduled maintenance date, the system also provides a Health Index, expressed as a percentage. This index is calculated by the same embedded algorithm and reflects the current health status of the circuit breaker. A higher percentage indicates better operational condition.

The operational and environmental parameters that directly impact the health and longevity of the circuit breaker include:

Utilization condition

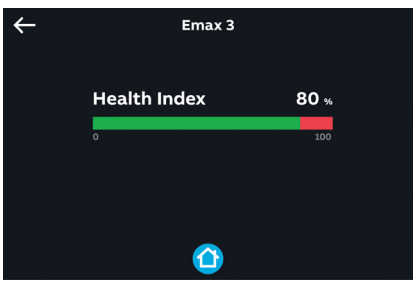
- **Internal Temperature:** Measured via internal temperature sensors, this is a critical indicator of thermal stress and aging. While ordering predictive maintenance on premise functionality, internal temperature sensors are automatically installed.
- **Contact Wear:** Tracks the degradation of contact surfaces due to arcing and mechanical operations.
- **Actual Load Current:** Monitors real-time current flow to assess thermal loading and stress.
- Number of Operations: counts mechanical open/close cycles

Environmental Conditions

- **Ambient Temperature:** High or fluctuating temperatures can accelerate material aging. The temperature can be dynamically inputted in the algorithm if the Ekip Temperature 4T-1 is installed
- **Humidity Levels:** Excess moisture can lead to corrosion and insulation breakdown. Humidity can be dynamically inputted in the algorithm if the Ekip Temperature 4T-1 is installed
- **Vibration Exposure:** Mechanical vibrations may loosen connections or damage internal components. Vibration can be dynamically inputted in the algorithm if the Ekip Temperature 4T-1 is installed
- **Corrosive Atmosphere:** Presence of chemicals or gases that can degrade metallic and insulating parts.
- **Dust Concentration:** Accumulated dust can impair insulation and cooling, increasing the risk of faults.

The next maintenance date and the health index of the device ensures the equipment operates efficiently and safely, preventing unexpected breakdowns that could lead to costly downtime and repairs. Additionally, it helps in planning and allocating resources effectively, minimizing disruptions to operations.





ASSET MANAGEMENT

Whenever maintenance is conducted on the circuit breaker, the user must document that the maintenance has been completed in Ekip Connect. The algorithm will then update the date for the next maintenance. This next maintenance date encompasses both the first and second levels of maintenance in a single schedule. Detailed operations for these maintenance levels are outlined in the manual.

Please note that these values are the result of an algorithmic estimation based on a mathematical model. While it is designed to provide a reliable indication of the circuit breaker's condition, it may not always reflect the exact real-world status. Therefore, the Predictive maintenance feature should be used as a supporting tool and not as the sole basis for critical maintenance decisions.

Advanced Predictive Maintenance on premise is not available with the Neutral on the right-side configuration.

CYBERSECURITY

Safeguard your assets

In an age where cyber threats are a growing concern, the Emax 3 air circuit breakers have been meticulously designed to offer robust cybersecurity features, ensuring the safety and integrity of electrical distribution systems.

Emax 3 with Ekip Aware provides two distinct offerings: a standard configuration that includes essential cybersecurity features, and an advanced IEC 62443-4-2 SL-C 2 configuration that incorporates enhanced security measures for organizations with stringent cybersecurity requirements. This version can be selected during the purchase, by ordering the corresponding upgrade.

The standard offer of the Emax 3 includes a suite of cybersecurity functionalities that provide a solid foundation for protecting against potential threats. Key features include:

- **PIN Access:** A secure PIN is required to access and modify settings from the Human-Machine Interface (HMI), laptop, or mobile devices, ensuring that only authorized personnel can make changes.
- **Secure Firmware Update:** The firmware is digitally signed and includes anti-roll-back mechanisms, ensuring that only authorized updates can be applied.In case of a firmware upgrade, any device verifies the new firmware's digital signature before installing it, thus ensuring that original ABB firmware has been received and that no tampering has been carried out by an external attacker. Unverified firmware is discarded, preventing any insecure upgrade and keeping the system protected from potential vulnerabilities.
- **Secure Storage:** Device parameters are protected against tampering, enhancing the overall security of the circuit breaker.
- **Secure Communication:** The Emax 3 offer a dedicated communication protocol for Modbus TCP: Modbus TCP Security Protocol, that follows the Modbus Security Protocol Specification.
- **Bluetooth Low Energy (BLE)** communication is protected through PIN pairing, with any change in the HMI PIN resulting in the removal of all bonded devices.
- **Remote/Local Setting Optimization:** Each communication module can operate in local or remote mode independently, allowing for flexible configuration while maintaining security.

CYBERSECURITY

Safeguard your assets

The IEC 62443-4-2 SL-C 2 upgrade, on the other hand, builds upon the standard features by incorporating additional security measures designed to mitigate more sophisticated cyber threats. This enhanced configuration includes:

- **Dedicated Communication and Signallling Modules Portfolio:** Ensures that the circuit breaker communicates only with original modules, supported by security artifacts that prevent unauthorized access. Note: These are the only modules that work with an IEC 62443-42 SL2 Emax 3. It is possible to find ordering codes in the accessories chapter.
- **Secure USB and BLE:** Communication via USB and BLE is restricted to original ABB tools, ensuring that only certified devices can interact with the Emax 3.
- **Role-Based Access Control:** ABB's account management system allows for role-based access, categorizing users into Owner, Admin, Engineer, Operator, and Viewer roles, thus controlling the level of access each user has. Each role has different permission in terms of viewing and modify parameters on the circuit breaker.

Both configurations of the Emax 3 air circuit breakers are designed to provide a high level of cybersecurity, catering to different organizational needs. The following table summarizes the features available in the standard offer and the IEC 62443-4-2 SL-C 2 offer, highlighting the key cybersecurity capabilities of each configuration.

With Ekip Aware, users can have confidence in their power system's protection, knowing that they are equipped with top-of-the-line technology that prioritizes safety and security. This system not only offers robust protection against cyber threats but also ensures that daily operations are conducted efficiently and without interruptions, contributing to a safe and reliable operational environment.
This upgrade is available to be purchased with circuit-breaker and it cannot be added aftersales.

Feature	Description	Emax 3 standard	Emax 3 IEC 62443
PIN	Pin to access and modify settings from HMI, Laptop and mobile	●	●
Secure Firmware Update	Digitally signed FW. Anti roll-back.	●	●
Secure Storage	Anti tampering of device parameters	●	●
Modbus TCP Security Protocol	Dedicated communication protocol (digital upgrade). This protocol follows the Modbus Security Protocol Specification.	●	●
Secure Communications - BLE	Pairing (HMI PIN-protected). A charge of HMI PIN will force the removal of all bonded devices. BLE Encryption.	●	●
Remote/Local setting optimized	Each communication module can be in local/remote mode independently from the other	●	●
Dedicated module portfolio	Ensure that circuit breaker communicate only with original modules thanks to security artifacts. Anti spoofing and tampering features.		●
Secure USB	Ensure that circuit breaker communicate only with original ABB tools thanks to security artifacts		●
Secure BLE	Ensure that circuit breaker communicate only with original ABB tools thanks to security artifacts		●
Role based access	ABB account management will allow role-based access (Owner, Admin, Engineer, Operator, Viewer)		●

04

ACCESSORIES

4/3 **Functional areas**

4/4 **Available accessories**

4/6 **Signalling & Input/Output**

4/10 **Control**

4/15 **Safety & Protection**

4/26 **Power Connections**

4/28 **Interlocks**

4/30 **Connectivity**

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4/40 **Displaying**

4/41 **Miscellaneous**

4/42 **Service**


Signalling 4K
In =3200A
Ekip Aware
Protections
Measurements
Diagnostic
Settings
Test
Info
ABB
SACE Emax 3
CLOSED
Push OFF
Push ON
T.U.Reset
DISCHARGED SPRING
SACE E4.3V-A
3200 A
Made in Italy
PUSH
CONNECT
TEST
DISCONNECT

FUNCTIONAL AREAS

SACE Emax 3 circuit-breakers have been expertly engineered to optimize accessory installation and commissioning.

The following features make it possible:

- Two functional areas at the front of the breaker, protected by a cover:
  - **Accessorizing Area** provides easy access to the areas dedicated to electrical accessories. Upon removing the accessory cover, the operating mechanism area remains separated and isolated, ensuring operator safety.
  - **Safety area** effectively confines the stored energy mechanism to ensure safe maintenance. To perform maintenance on the operating mechanism, removing a metallic cover is necessary.
- Terminal Box, with two areas:
  - a housing for wiring terminals, and blocks
  - a cartridge module area for the installation of Ekip modules.

These modules can be installed directly into the circuit-breaker or the fixed parts/cradles above.

This design significantly reduces the time and the effort needed for accessory installation and commissioning, optimizing the overall operation of the circuit-breaker.

AVAILABLE ACCESSORIES

SACE Emax 3 circuit-breakers are the solution for all circuit protection needs. A wide range of accessories is offered specifically designed to meet the unique application and installation requirements of every customer.

Our circuit-breakers have been engineered with the latest technology and are guaranteed to perform optimally throughout their lifespan.

STANDARD SUPPLY

	Automatic circuit-breaker		Switch-disconnector	
	E1.3	E2.3 E4.3 E6.3	E1.3	E2.3 E4.3 E6.3
Signalling & Input/Output				
Open/closed auxiliary contacts - AUX 4Q (400V)	F/MP	F/MP	-	-
TU Reset mechanical signalling of the tripping of protection trip unit - TU Reset	F/MP	F/MP	-	-
Contact signalling tripping of Ekip protection trip unit - S51 (250V)	F/MP	F/MP	-	-
3-pin terminal blocks	F/FP	F/FP	F/FP	F/FP
Safety & IP Protection				
Shutter lock – SL and Rail Lock - RL	FP	FP	FP	FP
Fail safe	FP	FP	FP	FP
Lock for racking-out mechanism with circuit-breaker in closed position	FP	MP	FP	MP
Anti-insertion lock	FP/MP	FP/MP	FP/MP	FP/MP
Lifting plates	-	F/MP	-	F/MP
IP30 Protection	F/FP	F/FP	F/FP	F/FP
Power Connections				
Orientable rear terminal - HR/VR	FP	F/FP	FP	F/FP
Front terminal - F	F	-	F	-
Connectivity				
Power Supply				
Battery for Ekip Aware	F/MP	F/MP	-	-

ON REQUEST

	Automatic circuit-breaker		Switch-disconnector	
	E1.3	E2.3 E4.3 E6.3	E1.3	E2.3 E4.3 E6.3
Signalling & Input/Output				
Open/closed auxiliary contacts - AUX 4Q (400V)	-	-	F/MP	F/MP
Open/closed auxiliary contacts - AUX 6Q	-	F/MP	-	F/MP
Open/closed auxiliary contacts- AUX 15Q	F/FP	F/FP	F/FP	F/FP
Standard/fast auxiliary position contacts - AUP	FP	FP	FP	FP
Ready to close signalling contact - RTC	F/MP	F/MP	F/MP	F/MP
Second contact signalling tripping of Ekip protection trip unit - S51/2	-	F/MP	-	-
Contact signalling loaded springs – S33 M/2 (supplied with Motor)	F/MP	F/MP	F/MP	F/MP
5-pin terminal blocks	F/FP	F/FP	F/FP	F/FP
Control				
Opening and closing release - YO/YC	F/MP	F/MP	F/MP	F/MP
Second opening release - YO2	F/MP	F/MP	F/MP	F/MP
Second closing release - YC2	-	F/MP	F/MP	F/MP
Undervoltage release - YU	F/MP	F/MP	F/MP	F/MP
Second undervoltage release - YU2	F/MP	F/MP	F/MP	F/MP
YO-Sense / YC-Sense / YU-Sense	F/MP	F/MP	-	-
Electronic time-delay device for undervoltage release - UVD	F/MP	F/MP	F/MP	F/MP
Motor - M	F/MP	F/MP	F/MP	F/MP
M-Sense Enabler	F/MP	F/MP	-	-
Remote reset - YR	F/MP	F/MP	-	-

F: Fixed circuit-breaker
MP: Mobile part
FP: Fixed part

* Only closing release YC
** external installation but connected to the breaker

1) only for E4.3 and E6.3

CONTINUE →

ON REQUEST

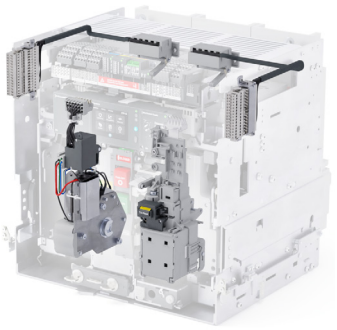
	Automatic circuit-breaker		Switch-disconnector	
	E1.3	E2.3 E4.3 E6.3	E1.3	E2.3 E4.3 E6.3
Safety & IP Protection				
Key lock and padlock in open position - KLC and PLC	F/MP	F/MP	F/MP	F/MP
Key lock and padlock in racked-in / test / racked-out position - KLP and PLP	FP	MP	FP	MP
Lock for racking-in / racking-out the mobile part when the door is open - DLR	-	FP	-	FP
Lock to prevent door opening when CB is in racked-in / test position - DLP	FP	FP	-	FP
Lock to prevent door opening when circuit-breaker is in closed position - DLC	F/MP	F/MP	F/MP	F/MP
Lifting plates	F/MP	-	F/MP	-
Mechanical operation counter - MOC	F/MP	F/MP	F/MP	F/MP
Protection device for opening and closing pushbuttons - PBC	F/MP	F/MP	F/MP	F/MP
IP54 Protection	F/FP	F/FP	F/FP	F/FP
Terminal covers - HTC / LTC	F	-	F	-
Separators - PB	F/FP	F/FP	F/FP	F/FP
Back flange - BF	F/FP	F/FP	F/FP	F/FP
External Remote Racking Device - RRD**	MP	MP	MP	MP
Embedded Remote Racking Device RRD-E	-	MP (1)	-	MP (1)
Power Connections				
Orientable rear terminal - HR/VR	F	-	F	-
Front terminal - F	-	F/FP	-	F/FP
Other configurations	F/FP	F/FP	F/FP	F/FP
Interlocks				
Mechanical interlock - MI	F/MP/FP	F/MP/FP	F/MP/FP	F/MP/FP
Connectivity				
Power Supply				
Ekip Supply Lite	F/FP	F/FP	-	-
Ekip Supply Evo Modbus TCP	F/FP	F/FP	-	-
Ekip Busbars Supply	F/MP	F/MP	-	-
Communication				
Ekip Com Modbus RTU	F/FP	F/FP	-	-
Ekip Com Profibus	F/FP	F/FP	-	-
Ekip Com Profinet	F/FP	F/FP	-	-
Ekip Com EtherNet/IP™	F/FP	F/FP	-	-
Ekip Com IEC61850	F/FP	F/FP	-	-
Ekip Cartridge**	F/MP	F/MP	-	-
Signalling				
Ekip Signalling 2K-1 and 2K-2	F/FP	F/FP	-	-
Ekip Signalling 4K	-	F/MP	-	-
Ekip Signalling 10K Link / Ekip Signalling Modbus TCP			-	-
Ekip AUP	F/FP	F/FP	-	-
Ekip RTC	F/FP	F/FP	-	-
Temperature				
Ekip Temperature 4T-1 and 4T-2	F/FP	F/FP	-	-
T-Sense Ambient / Busbars**	F/MP	F/MP	-	-
Protection				
Ekip RELT	F/FP	F/FP	-	-
Ekip Arc-Flash 6F-1 and Ekip Arc-Flash 6F-2	F/FP	F/FP	-	-
Measurement & Protection				
Ekip Synchrocheck	F/FP	F/FP	-	-
Homopolar toroid**	F/MP	F/MP	-	-
Toroid for differential protection**	F/MP	F/MP	-	-
Current sensor for neutral conductor outside the CB (standard and openable)**	F/MP	F/MP	-	-
Dedicated terminal for MDGF	F/FP	F/FP	-	-
Displaying				
Lite Panel Pro	F/MP	F/MP	-	-

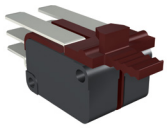
F: Fixed circuit-breaker
MP: Mobile part
FP: Fixed part

* Only closing release YC
** external installation but connected to the breaker

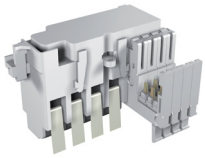
1) only for E4.3 and E6.3

SIGNALLING & INPUT/OUTPUT





Open / closed auxiliary contacts - AUX



Open / closed auxiliary contacts - AUX



Open / closed auxiliary contacts - AUX

Open / closed auxiliary contacts - AUX

SACE Emax 3 circuit-breakers can be equipped with auxiliary contacts that signal the open or closed status of the circuit-breaker. The first block (AUX 4Q) of four standard contacts is always provided by default with the automatic circuit-breakers. Alternate voltages and combinations, as well as additional number of contacts can also be added per the table below:

Open / closed auxiliary contacts (AUX 4Q)		**E1.3**	**E2.3 - E4.3 - E6.3**
4 auxiliary contacts	standard	●	●
	digital signals	●	●
	mixed	●	●
Open / closed additional auxiliary contacts (AUX 6Q)			
6 auxiliary contacts	additional	-	●
	digital signals	-	●
	mixed	-	●
Open / closed external additional auxiliary contacts (AUX 15Q)			
15 auxiliary contacts	additional	●	●
	digital signals	●	●
Maximum number of open / closed auxiliary contacts that can be installed		19	25

In the table below all the electrical characteristics related to the contacts for all the frames are reported:

		Standard contact	**Contact for digital signals**
Type		changeover contacts	changeover contacts
Minimum load [1]		100mA @ 24V	1mA @ 5V
Breaking capacity [2]			
DC	24V	-	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	-

1) minimum load (or minimum switching capacity) refers to the smallest amount of electrical power that a relay contact can reliably switch (i.e., open or close) without failure or degradation over time.
2) Breaking capacity is the maximum current that a relay contact can safely interrupt without being damaged

—

Electrical diagram reference: figures 1, 81, 91.

Order code

Aux 6Q is an alternative to the Ekip Signalling 4K module and M-Sense Enabler. AUX 15Q is an alternative to the mechanical interlock and fast right AUP, the DLC for E1.3 lock or the DLP lock if mounted on the right side.



E1.3 Auxiliary position contacts - AUP



E2.3 - E4.3 - E6.3 Auxiliary position contacts - AUP

Standard/Fast auxiliary position contacts - AUP

Available for withdrawable version, the position of the mobile part can be electrically signalled by accessorizing the fixed part with one of the following signalling contact units:

Auxiliary position contacts (AUP)		**E1.3**	**E2.3 ... E6.3**
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

SACE Emax 3 offers two types of auxiliary position contacts (AUPs); standard contacts and fast contacts. Fast AUPs are available for frames E2.3 - E4.3 - E6.2 and have the same functions as the standard version, but are easier to install as they are pre-wired.
The table below reports all the features related to the contacts for all the frames:

		Standard contact	**Contact for digital signals**
Type		changeover contacts	changeover contacts
Minimum load (1)		100mA @ 24V	1mA @ 5V
Breaking capacity (2)			
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	-

1) minimum load (or minimum switching capacity) refers to the smallest amount of electrical power that a relay contact can reliably switch (i.e., open or close) without failure or degradation over time.
2) Breaking capacity is the maximum current that a relay contact can safely interrupt without being damaged

—
Electrical diagram reference: figures 95, 95A, 96, 96A, 97, 97A

Order code

SIGNALLING & INPUT/OUTPUT



Ready to close signalling contact - RTC

Ready to close signalling contact - RTC

The ready to close signalling contact (RTC) electrically signals that the circuit breaker is ready to receive a closing command. A circuit breaker is ready to close when the following conditions have been met:

- Circuit breaker is in the open position
- Springs are fully charged
- No opening command is present
- TU Reset is in normal position.
- UVR (YU) is energized
- Device is not locked in the open position via Keylock/Padlock

		Standard contact	Contact for digital signals
Type		Switching	
Minimum load (1)		100mA @ 24V	1mA @ 5V
Breaking capacity (2)			
DC	24V	-	0.1
	250V	0.5A @ 0ms / 0.2A 10ms	-
AC	250V	3A @ cosφ 0.7	-

1) minimum load (or minimum switching capacity) refers to the smallest amount of electrical power that a relay contact can reliably switch (i.e., open or close) without failure or degradation over time.
2) Breaking capacity is the maximum current that a relay contact can safely interrupt without being damaged

—

Electrical diagram reference: figure 71



Mechanical signalling of the tripping of protection trip unit - TU Reset

Mechanical signalling of the tripping of protection trip unit - TU Reset

Circuit-breakers are provided as standard with a mechanical trip indicator flag that signals status of a trip event from the trip unit. After the Ekip Aware has tripped due to a protection function, the mechanical flag clearly indicates the tripped status on the front of the circuit breaker. The circuit breaker can be reset only after the mechanical flag pushbutton has been restored to its normal position. Conforming to ANSI 86T standards. In addition, Emax 3 is equipped with an anti-pumping function, so that an opening command always takes priority and precedence over a closing command. Additionally, when the circuit breaker is in the open position due to a trip, the anti-pumping function prevents the reclosing of the operating mechanism until the mechanical flag has been reset to its normal position, avoiding improper or accidental closing.



Contact signalling tripping of protection trip unit Ekip – S51

Bell Alarm contact for signalling tripped status - S51

A bell alarm S51 contact is provided as standard with all SACE Emax 3 circuit breakers. This contact electrically signals the opening of the circuit breaker due to a protection function of Ekip Aware. Optional versions for digital signals and second S51/2 bell alarm are available. S51/2 are available for E2.3 - E4.3 - E6.3 and are an alternative to the Remote Reset contact (YR).

—

Electrical diagram reference: figure 11

Contact signalling loaded springs – S33 M/2

This contact is provided as standard with a Spring Charging Motor - M. This contact electrically signals the status of the closing springs. It is available in both a standard version and version for digital signals.

		Standard contact	Contact for digital signals
Type		changeover contacts	changeover contacts
Minimum load (1)		100mA @ 24V	1mA @ 5V
Breaking capacity (2)			
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	-

1) minimum load (or minimum switching capacity) refers to the smallest amount of electrical power that a relay contact can reliably switch (i.e., open or close) without failure or degradation over time.
2) Breaking capacity is the maximum current that a relay contact can safely interrupt without being damaged

—

Electrical diagram reference: figure 12

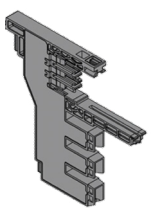


5 Pin terminal

Standard 3 pin terminal block and 5 pin terminal block

Two types of terminal blocks are available:

- 3-pin terminal blocks: Supplied as standard with electrical accessories that require wiring to the terminal box. It is also possible to order sets of 8 or 18 pieces supplied with the circuit breaker. Additionally, 10 pieces can be purchased as loose items.
- 5-pin terminal blocks: Available as an optional accessory. They allow for multiple connections to simplify wiring and reduce the need for extensive cabling such as interconnecting cabling for coils and spring charging motors sequentially. It is also possible to order sets of 8 or 18 pieces supplied with the circuit breaker. Additionally, 10 pieces can be purchased as loose items.



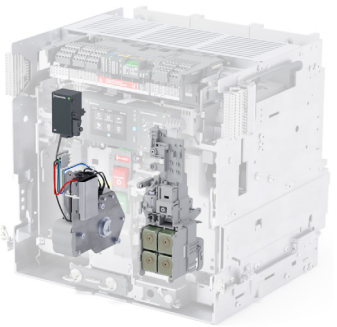
FP connector for 3-pin/5-pin terminal block

FP connector for 3-pin/5-pin terminal block

It must be installed on the fixed part and in particular in the 'Trip Unit I/O' section of the terminal box. It is necessary for the installation of the 3-pin and 5-pin terminal blocks. Thanks to it, a terminal block is electrically connected to FP sliding contact.
It must be ordered if zone selectivity is required or if terminal for MDGF is bought aftersales.

Order code

CONTROL





Opening and closing release- YO/YC

Opening and closing release - YO/YC

The opening and closing coils enables the circuit breaker to be electrically or remotely operated. In order to remotely close the circuit breaker the springs must be fully charged or be equipped with a Spring Charging Motor M. YO/YC coils operate by means of an impulse current lasting a minimum of 100ms.
Additionally, they can also operate in permanent service/supply. In this case, if an opening command is given by the opening coil, the circuit breaker can then be closed by de-energizing the opening coil with a duration of at least 30ms. The circuit breaker operating mechanism has an anti-pumping function that ensures a opening command takes priority/precedence over a closing command to help ensure safety and reliability.

—
Electrical diagram reference: figures 75, 77

Second opening and closing release - YO2/YC2

For critical power installations, the redundancy of electrical operation/control are key to ensure reliability and efficiency of the system. SACE Emax 3 circuit breakers can be equipped with redundant opening and closing coils. Second closing coil YC2 can only be equipped on frames E2.3 - E4.3 - E6.3, and the second opening release is an alternate to a Undervoltage Release YU.

—
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
Operations	10.000	
Breaker opening time (YO/YO2)		
E1.3	35 ms	
E2.3 - E4.3 - E6.3	55 ms	
Breaker closing time (YC/YC2)		
E1.3	50 ms	
E2.3 - E4.3 - E6.3	70 ms	

Order code



Undervoltage release – YU

Undervoltage release (UVR) - YU

The UVR - YU opening the circuit-breaker when there is a significant drop in voltage in the supply to the UVR - YU. It can be used to prevent closing of the circuit breaker when voltage is not present or to protect primary and secondary circuits. The power supply of the UVR can be obtained from the supply side of the circuit breaker or from an independent source. Closing of the circuit breaker can only be performed when the YU is energized within the range of 85 - 110% of the nominal voltage (Un). The undervoltage release is an alternative of the second opening coil YO2 and anti-pumping device. Refer to the electrical characteristics below for more details.

—

Electrical diagram reference: figure 73

Second undervoltage release (UVR) - YU, YU2

SACE Emax 3 circuit breakers can be equipped with a second UVR - YU2 to provide redundancy for certain applications.

—

Electrical diagram reference: figure 73A

General characteristics		
Power supply (Un)	AC	DC
24V	●	●
30V	●	●
48V - 60 V	●	●
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
Breaker opening time (YU/YU2)		
E1.3	30 ms	
E2.3 - E4.3 - E6.3	50 ms	

Order code

CONTROL

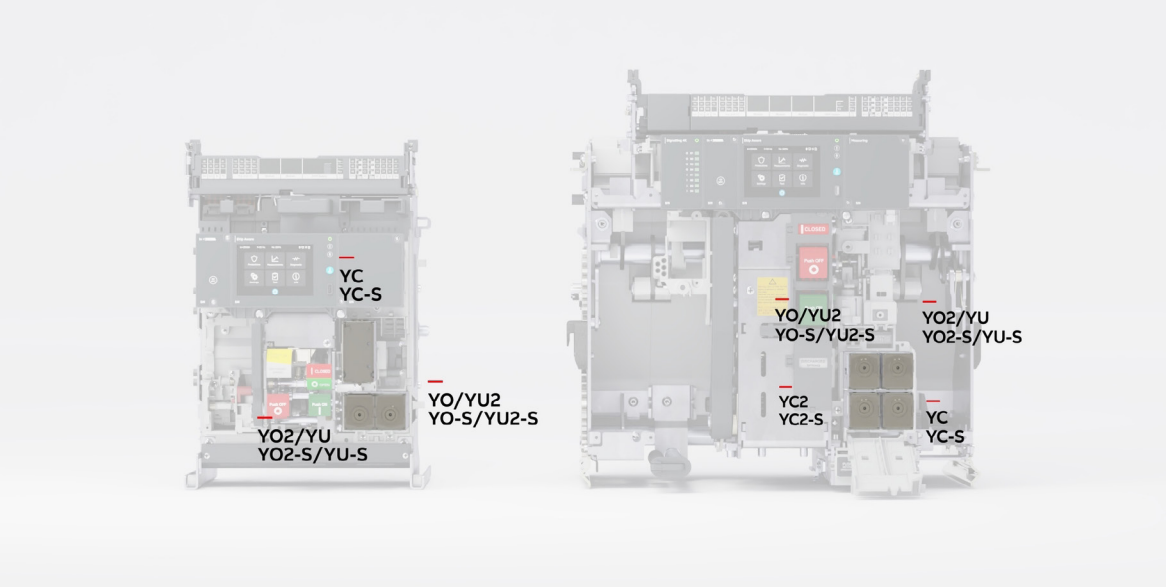


FIG. 01



YO-Sense/YC-Sense/
YU-Sense

Sense coils - YO-Sense/YC-Sense/YU-Sense

Sense coils offer the same base functionality as the standard coils - YO/YC/YU but provide additional functionality that can monitor and sense health status, as well as enable remote control via communications. By verifying wiring and power continuity, as well as monitoring inrush and continuous current, voltage and the number of operations, Sense coils can accurately predict the maintenance needs and evaluate remaining service life. For Remote Operation via communications the circuit breaker can be equipped with the following accessories:

- Sense Opening Coil - YO-S
- Sense Closing Coil - YC-S
- Spring Charging Motor - M
- Ekip Com module
- Remote Reset - YR

Ekip Supply Lite or Ekip Supply Evo Modbus TCP are mandatory, however coil protection is still available in absence of auxiliary supply.

General characteristics

Power supply (Un)		AC	DC
YO-S/YC-S	24V...60V	●	●
	110V...250V	●	●
YU-S	24V	●	●
	30V	●	●
	48-60V	●	●
	110-120V	●	●
	120-127V	●	●
	220-240V	●	●
	240-250V	●	●

As for standard coils, redundancy can be guaranteed using first and second Sense coils of the same type. Moreover, standard coils can be used in conjunction with Sense coils.

Order code

Time-delay device for undervoltage release (UVD)

Standard and Sense Undervoltage Releases can be combined with an electronic time-delay device (UVD) for the circuit breaker, providing a delayed external opening with adjustable preset times. The use of the UVD is recommended to prevent opening of the circuit breaker when the power supply network is subject to brief drops or power supply interruptions. Circuit breaker closing is inhibited when the device is not powered. The time-delay device (UVD) must be used with a 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):		0.2 s – 0.25 s - 0,5 s – 0.75 s – 1 s – 1.5 s – 2 s – 2.5 s – 3 s	

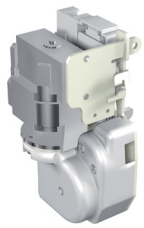
Resetting remotely- YR

The Remote Reset (YR) allows for remote resetting of the circuit breaker after a trip event. It is available for circuit breaker versions only with the following voltage ranges:

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

—

Electrical diagram reference: figure 14



Motor – M for E1.3



Motor – M for E2.3...E6.3

Motor – M

This device automatically charges the closing springs of the circuit breaker when discharged after a closing command and power is present. In the event where no power is present, the springs can be manually charged via the lever on the front of the device. The Motor is always supplied with auxiliary contact S33 M/2 for signalling status of the closing springs.

General characteristics			
Power supply (Un)		AC	DC
	24V-30V	●	●
	48V-60V	●	●
	100V...130V	●	●
	220V...250V	●	●
	380V...415V	●	●
Operating limits (IEC60947-2 standards)		85%...110% Un	
Inrush power (Ps)		300VA E1.3 500VA E2.3 - E4.3 - E6.3	300W E1.3 500W E2.3 - E4.3 - E6.3
Inrush time		200ms	
Continuous power (Pc)		100VA E1.3 150VA E2.3 - E4.3 - E6.3	100W E1.3 150W E2.3 - E4.3 - E6.3
Charging time			
	E1.3	8 sec	
	E2.3 ... E6.3	7 sec	
Frequency of operation		60 [Oper./Hour] Tamb<= 50°C and V>=95%Un (1) 30 [Oper./Hour] Tamb>50°C or V<95%Un (2)	

1) 30 [Oper./Hour] only for E4.3V, E6.3V, and E6.3X
2) 20 [Oper./Hour] only for E4.3V, E6.3V, and E6.3X

Order code

—

Electrical diagram reference: figure 13

CONTROL



M-Sense Enabler E1.3



M-Sense Enabler
E2.3-E4.3-E6.3

M-Sense Enabler

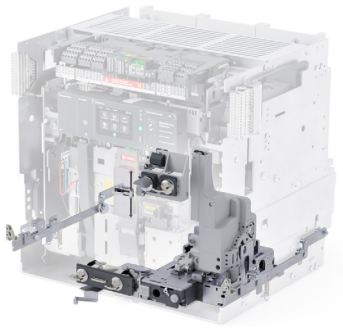
The M-Sense Enabler monitors and assesses the health status of the Spring Charging Motor. By monitoring both inrush current and voltage supplied to the Motor as well as the number of operations, it can accurate assess and predict maintenance needs and help diagnose potential issues. M-Sense Enabler can only be used when a Motor (M) is present and is an alternate to Ekip Signalling 4K, and AUX 6Q.

Two versions of the M-Sense Enabler are available depending on the voltage range of the Spring Charging Motor (M) and must match each other. Ekip Supply Lite or Ekip Supply Modbus Evo TCP is a mandatory accessory to supply the module.

General characteristics			**Motor Size**
Power supply (Un)	AC	DC	
24V...60V	●	●	24V...30V, 48V...60V
100V...415V	●	●	100...130V, 220...250V, 380...415V
Operating limits (IEC60947-2 standards)	85%...110% Un		

Order code

SAFETY & PROTECTION





Key lock in open position - KLC

Key lock in open position - KLC

SACE Emax3 circuit-breaker (either fixed or drawout versions) can be locked in the open position (OFF) using one or two keylocks (KLC).

KLCs are available in the following configurations:

- KLC-D with a provided key (classical key or Ronis 1351-10A);
- KLC-S with specific numbered key, particularly useful when the same key is used for different circuit-breakers. Five different key typology number are available (from n°20001 to n°20005)
- KLC-A includes support for Castell, STI or Kirk. Keys must be supplied separately by the customer.

In E1.3, the only available second key is the 2nd KLC-D (classical key), which can be used with either the 1st KLC-D (classical key) or the 1st KLC-S (from n°20001 to n°20005).

In E2.3, E4.3, and E6.3, the 2nd KLC requires the 1st KLC to function and must be of the same type as the 1st KLC. When using a 1st KLC-S (from n°20001 to n°20005), only a 2nd KLC-D (classical key) can be used.



Padlocks - PLC

Padlocks - PLC

SACE Emax3 circuit-breaker (available in both fixed and drawout versions) can be locked in the open position (OFF) using one or two padlock devices (PLC). Please note that the padlocks required for the padlock device must be purchased separately. It is essential to adhere to the specified padlock diameters for safe operation:

- Ø 4 mm: up to 3 padlocks
- Ø 6 mm: maximum 1 padlock
- Ø 7 mm: maximum 1 padlock
- Ø 8 mm: maximum 1 padlock

The Emax 3 also offers the option to install both KLC and PLC on the device for all frame types.

E1.3



FIG. 02

E2.3-E4.3-E6-3



FIG. 03

Order code

SAFETY & PROTECTION



Key lock in racked-in / test / racked-out position - KLP E1.3



Key lock in racked-in / test / racked-out position - KLP E2.3 - E4.3 - E6.3



Padlock in racked-in / test / racked-out position - PLP

Key lock in racked-in / test / racked-out position - KLP

The SACE Emax3 drawout circuit-breaker can be locked in the connected (racked-in), test, and disconnected (racked-out) positions using one or two keylocks (KLP). The second keylock (KLP) must match the type of the first. The KLP is available in the following configurations:

- KLP-D: Comes with a provided key (either a classical key or Ronis 1351-10A).
- KLP-S: Comes with a specific numbered key, particularly useful when the same key is used for different circuit-breakers. Five different key number typologies are available (from n°20001 to n°20005).
- KLP-A: Provides support for Castell, STI, or Kirk locks. Keys must be supplied separately by the customer.

To lock the moving part in the racked-out position, a supplementary lock accessory is required.

Padlock in racked-in / test / racked-out position - PLP (1)

The SACE Emax3 drawout circuit-breaker can be locked in the connected (racked-in), test, or disconnected (racked-out) positions using one or two padlock devices (PLPs). The padlocks are sold separately.
The Emax3 also offers the option to install both KLPs and PLP on the device for all frame sizes. Furthermore, it enables the lock of the moving part in the racked-out position only by means of the supplementary lock in racked-out position.

1) Compliant with OSHA 3120 up to 50 pounds

E2.3-E4.3-E6-3 on drawout part



E1.3 on fixed part

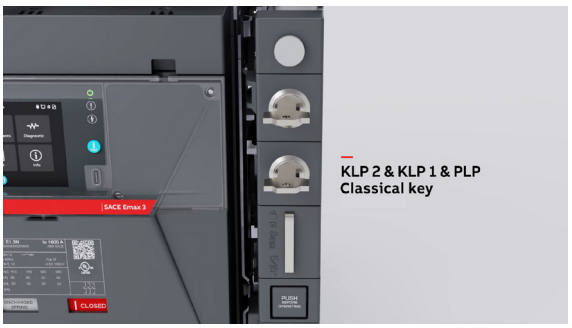


FIG. 04

Order code



Lock for racking in / racking out the mobile part when the door is open - DLR

Lock to prevent racking-out when circuit breaker is in closed position
All SACE Emax 3 drawout versions are always supplied with a lock that prevents the mobile part/circuit breaker from be racked-in and racked-out when the circuit breaker is in the closed position. In order to start the rack in/out procedure, the circuit breaker must be in the open position.

Lock for racking in / racking out the mobile part when the door is open - DLR
This accessory, which is mounted on the fixed part/cradle, prevents the mobile part from being racked in/out when the equipment door is open. It is available only for E2.3 - E4.3 - E6.3 frames.



Lock to prevent door opening when the circuit- breaker is in racked-in / test position - DLP

Lock to prevent door opening when the circuit- breaker is in racked-in / test position - DLP
The DLP prevents the equipment door from being opened while the mobile part is in the connected (racked-in) or test position. It is available only for drawout versions.
- For E1.3 only one option is available and can be mounted only on the left hand side.
- For E2.3 - E4.3 - E6.3 frames, options to be installed on the right-hand or left-hand side of the fixed part/cradles are available. If mounted on the right-hand side, it is an alternative to the mechanical interlock, DLC or the AUX 15Q.



Lock to prevent door opening when the circuit- breaker is in the closed position - DLC

Lock to prevent door opening when the circuit- breaker is in the closed position - DLC
This prevents the equipment door from being opened when the circuit breaker is in the closed position (and when the circuit breaker is racked-in for drawout circuit-breakers). Additionally, it blocks the circuit breaker from closing when the equipment door is open.
Two versions (fixed and drawout) are available depending on the version, they can be mounted only on the right-hand side. For all the frames, the DLC is not compatible with the mechanical interlock and the AUX 15Q.

Anti-racking out device / Fail safe - FS
The fail safe (anti-racking-out device) prevents the complete withdrawal of the moving part when the closing springs are charged. Depending on the circuit-breaker configuration, specific actions are required to complete the racking-out operation. The procedures is described in the manual for each configuration (with YU and/or M).

* Compliant with OSHA 3120 up to 50 pounds

Order code

SAFETY & PROTECTION

Compatibility chart

E1.3 FIXED

		Signalling							Safety					Protection Devices									RRD
		4Q	15Q	RTC	Ekip RTC	TU reset	S51	S33	KLC	PLC	DLP	DLC	MOC	PBC	IP30 (F)	IP54	PB - Phase barrier (F)	Back flange (F)	0-Arc distance top cover for fixed parts	HTC	LTC	Mechanical interlock	RRD external
Signalling	4Q	-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	15Q		-	•	•	•	•	•	•	•	•	-	•	•	•	•	•	•	•	•	•	-	•
	RTC			-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Ekip RTC				-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	TU reset					-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	S51						-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	S33							-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Safety	KLC								see Fig. 2		•	•	•	•	•	•	•	•	•	•	•	•	•
	PLC								see Fig. 2		•	•	•	•	•	•	•	•	•	•	•	•	•
	DLC										•	-	•	•	•	•	•	•	•	•	•	-	•
	MOC												-	•	•	•	•	•	•	•	•	•	•
Protection device	PBC													-	•	•	•	•	•	•	•	•	•
	IP30 (W)														-	-	•	•	•	•	•	•	•
	IP54														-	-	•	•	•	•	•	•	•
	PB - Phase barrier (F)																-	•	•	-	-	•	•
	Back flange (F)																	-	•	•	•	•	•
	0-Arc distance top cover for fixed parts																		-	•	•	•	•
	LTC																			-	-	•	•
	RTC																			-	-	•	•
	Mechanical interlock																					-	•
RRD	RRD external																						-

Order code

E1.3 DRAWOUT

		Signalling								Safety							Protection Devices							RRD
		4Q	15Q	AUP	RTC	Ekip RTC	TU reset	S51	S33	KLC	PLC	KLP	PLP	DLP	DLC	MOC	PBC	IP30 (W)	IP54	PB - Phase barrier (W)	Back flange (W)	0-Arc distance top cover for fixed parts	Mechanical interlock	RRD external
Signalling	4Q	-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	15Q		-	•	•	•	•	•	•	•	•	•	•	•	-	•	•	•	•	•	•	•	-	•
	AUP			-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	RTC				-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Ekip RTC					-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	TU reset						-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	S51							-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	S33								-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Safety	KLC									see Fig. 2		•	•	•	•	•	•	•	•	•	•	•	•	•
	PLC									see Fig. 2		•	•	•	•	•	•	•	•	•	•	•	•	•
	KLP											see Fig. 4	•	•	•	•	•	•	•	•	•	•	•	•
	PLP												-	•	•	•	•	•	•	•	•	•	•	•
	DLP													-	•	•	•	•	•	•	•	•	-	•
	DLC														-	•	•	•	•	•	•	•	-	•
	MOC															-	•	•	•	•	•	•	•	•
Protection device	PBC																-	•	•	•	•	•	•	•
	IP30 (W)																	-	-	•	•	•	•	•
	IP54																	-	-	•	•	•	•	•
	PB - Phase barrier (W)																			-	•	•	•	•
	Back flange (W)																				-	•	•	•
	0-Arc distance top cover for fixed parts																					-	•	•
	Mechanical interlock																						-	•
RRD	RRD external																							-

Order code

SAFETY & PROTECTION

Compatibility chart

E2.3-E4.3-E6.3 FIXED

		Signalling									Safety				Protection Devices							RRD	
		4Q	6Q	15Q	RTC	Ekip RTC	TU reset	S51	S51/2	S33	KLC	PLC	DLC	MOC	PBC	IP30 (F)	IP54	PB - Phase barrier (F)	Back flange (F)	0-Arc distance top cover for fixed parts	Mechanical interlock	RRD external	RRD-E
Signalling	4Q	-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	6Q		-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	15Q			-	•	•	•	•	•	•	•	•	-	•	•	•	•	•	•	•	-	•	•
	RTC				-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Ekip RTC					-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	TU reset						-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	S51							-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	S51/2									•	•	•	•	•	•	•	•	•	•	•	•	•	•
	S33									-	•	•	•	•	•	•	•	•	•	•	•	•	•
Safety	KLC										see Fig. 3		•	•	•	•	•	•	•	•	•	•	•
	PLC										see Fig. 3		•	•	•	•	•	•	•	•	•	•	•
	DLC												-	•	•	•	•	•	•	•	-	•	•
	MOC													-	•	•	•	•	•	•	•	•	•
Protection device	PBC														-	•	•	•	•	•	•	•	•
	IP30 (F)															-	-	•	•	•	•	•	•
	IP54															-	-	•	•	•	•	•	•
	PB - Phase barrier (F)																	-	•	•	•	•	•
	Back flange (F)																		-	•	•	•	•
	0-Arc distance top cover for fixed parts																			-	•	•	•
	Mechanical interlock																				-	•	•
RRD	RRD external																					-	•
	RRD-E																						-

• compatible accessory

Order code

E2.3-E4.3-E6.3 DRAWOUT

		Signalling										Safety								Protection Devices							RRD	
		4Q	6Q	15Q	AUP	RTC	Ekip RTC	TU reset	S51	S51/2	S33	KLC	PLC	KLP	PLP	DLR	DLP (2)	DLC	MOC	PBC	IP30 (W)	IP54	PB - Phase barrier (W)	Back flange (W)	0-Arc distance top cover for fixed parts	Mechanical interlock	RRD external	RRD internal
Signalling	4Q	-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	6Q		-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	15Q			-	•	•	•	•	•	•	•	•	•	•	•	•	•	-	•	•	•	•	•	•	•	•	•	•
	AUP (1)				-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	RTC					-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Ekip RTC						-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	TU reset							-	-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	S51							-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	S51/2								-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	S33										-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Safety	KLC											see Fig. 3		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	PLC											see Fig. 3		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	KLP													see Fig. 4	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	PLP														-	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	DLR															-	•	•	•	•	•	•	•	•	•	•	•	•	•
	DLP (2)																-	•	•	•	•	•	•	•	•	•	•	•	•
	DLC																	-	•	•	•	•	•	•	•	-	•	•	•
	MOC																		-	•	•	•	•	•	•	•	•	•	•
Protection device	PBC																			-	•	•	•	•	•	•	•	•	•
	IP30 (W)																				-	-	•	•	•	•	•	•	•
	IP54																				-	-	•	•	•	•	•	•	•
	PB - Phase barrier (W)																						-	•	•	•	•	•	•
	Back flange (W)																							-	•	•	•	•	•
	0-Arc distance top cover for fixed parts																								-	•	•	•	•
	Mechanical interlock																									-	•	•	•
RRD	RRD external																										-	•	•
	RRD internal																											-	•

• compatible accessory
1) Fast right AUP is not compatible with interlock, 15Q and DLC
2) If mounted on the right-hand side, it is an alternative to the mechanical interlock, DLC or the AUX 15Q.

Order code

SAFETY & PROTECTION

Compatibility chart

ELECTRICAL ACCESSORIES

		Accessory for Ground protection				Control							
		MDGF terminal	Toroid RC	Homopolar toroid	Ext CS for N (standard)	Motor	Motor+MC	M-Sense Enabler	YC	YO	YU (UVR)	UVD	YR
Accessory for Ground protection	MDGF terminal				•	•	•	•	•	•	•	•	•
	Toroid RC				•	•	•	•	•	•	•	•	•
	Homopolar Toroid				•	•	•	•	•	•	•	•	•
	Ext CS for N	•	•	•	•	•	•	•	•	•	•	•	•
Control	Motor	•	•	•	•			•	•	•	•	•	•
	Motor+MC	•	•	•	•			•	•	•	•	•	•
	M-Sense Enabler	•	•	•	•	•	•	•	•	•	•	•	•
	YC	•	•	•	•	•	•	•	see Fig. 1			•	•
	YO	•	•	•	•	•	•	•				•	•
	YU (UVR)	•	•	•	•	•	•	•				•	•
	UVD	•	•	•	•	•	•	•	•	•	•	•	•
	YR	•	•	•	•	•	•	•	•	•	•	•	•

• compatible accessory

Order code



Mechanical operation counter - MOC

Mechanical operation counter - MOC
The number of mechanical operations is a key element that determines the frequency of ordinary maintenance. The optional MOC is visible from the front of the circuit breaker and indicates the total number of mechanical operations the device has performed.

Lifting plates
The lifting plates are integrated in all E2.3 - E4.3 - E6.3 moving parts to lift them in a safe way. For E1.3 they are available as loose accessories.



Back flange
The optional back flange helps isolate and segregate the circuit breaker from gas and smoke during a fault/event. It is available for E2.3 - E4.3 - E6.3 fixed and drawout versions and available only for the drawout version of E1.3.



Protection device for opening and closing pushbuttons - PBC

Pushbutton Protection (Open/Close) - PBC
This accessory is applied to the safety cover of the circuit-breaker and is available in three 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 cover in place.
- Padlockable pushbutton protection device, which makes it possible to block only closing pushbutton.

IP30 Protection
Provided as standard with each fixed circuit breaker or fixed part/cradle, the IP30 door flange is installed in the door of the equipment to provide IP30 degree of protection.



IP30 Protection

IP54 Protection
This transparent cover completely protects the front of the circuit-breaker, enabling an IP54 degree of protection. The IP54 cover is provided with double key lock KLC (same or different keys).
This is not compatible with second key lock (KLC) Kirk, STI, Ronis and first Castell, or with a padlock in open position PLC 4mm.

Trasparent trip unit cover
Ekip Aware is supplied by default with an open transparent cover that allows access to the touchscreen.
For E2.3, E4.3, and E6.3, a closed cover is optionally available in two versions: a standard closed cover, which prevents access to the touchscreen, and a sealable closed cover, which also prevents access to the touchscreen but additionally allows tamper indication if someone attempts to remove the cover to access the trip unit.
For E1.3, only the closed cover is optionally available. The same closed cover can be used as a sealable version by applying a wire seal.



IP54 Protection

Order code

SAFETY & PROTECTION



Terminal covers – HTC / LTC

Terminal covers – HTC / LTC
Available only for fixed E1.3 circuit breaker or swith disconnector, terminal covers can be installed on the top and bottom terminals to help reduce the risk of direct contact with live parts. They are available in two versions: high terminal covers (HTC) and low terminal covers (LTC).



Separators - PB

Separators / Phase Barriers - PB
Phase barriers can be used to help insulate the terminal connections between phases. They are available for all the frames.

0-ARC Distance top cover
This accessory allows the circuit-breakers to reach the 0-arc distance performance. Installable on the fixed part of E2.3, E4.3 and E6.3 gives the possibility to dimension the cubicle at the same height of the fixed part.



RRD

Remote Racking Device - RRD
The RRD allows for the racking-in/out of a withdrawable circuit breaker from a remote distance of up to 10m (33 ft) in order to stay outside of the arc flash boundary. The RRD can only operate with the circuit breaker in the open position and with springs discharged. UL2876 and CSA C22.2 (n.14) certified. The RRD kit includes Motor, power supply, adapter and pendant controller.

GENERAL FEATURES

Rated service voltage	100...240V AC, 142...340V DC
Frequency	50-60Hz
Rated power	300 VA, 300 W
Inrush power	450 VA, 450 W
Working temperature range	-5°C ... + 40°C
Storage temperature range	-40°C ... +80°C
Minimum time interval between operation	3 minutes
Maximum operating distance	10m
Weight	3Kg

Order code



RRD-E

Remote Racking Device Embedded - RRD-E

Available for frame E4.3 and E6.3 an embedded version of Remote Racking is fitted directly inside the mobile part and linked to the Ekip Aware trip unit. Racking procedures can be performed in two methods:

- Wireless: Remote operation via EPiC mobile app
- Wired: Utilize the pendant controller utilizing the USB-C port on the front of the circuit breaker. The controller is the same of external motor solution.

To ensure safety, the device was primarily designed to operated via RRD-E remotely, with manual operation to be used as back up or emergency measure. 24VDC must be supplied and is not compatible with switch disconnector versions.

GENERAL CHARATERISTICS

Supply voltage	24V DC ± 10%
Rated power	190W (peak)
Working and storage temperature range	-20°C...+70°C
Minimum time interval between operation	3 minutes T=25°C, 25 minutes -20°C<T<70°C
Maximum operating distance	100m

As a power supply, it is suggested to use ABB CP-S.1 24/40.0 (ordering code 1SVR320861R1000) or a similar one with these characteristics:

Description	Rated output voltage	Rated output current	Output power	Order code
CP-S.1 24/40.0	24V DC	40.0 A	960 W	1SVR320861R1000

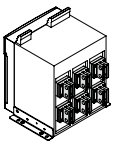
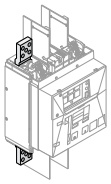
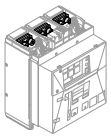
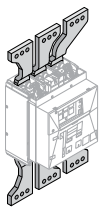
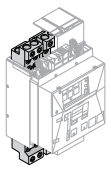
Order code

POWER CONNECTIONS



The SACE Emax 3 offers a wide variety of terminal connections, providing an optimal solution for connection to the power circuit.
Emax 3 product family is tested according to IEC standard 60947-2 and 60947-3.

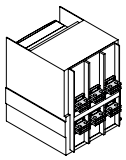
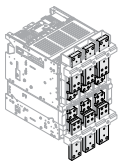
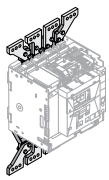
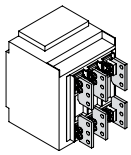
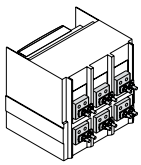
SOLUTION FOR FIXED CIRCUIT-BREAKERS

Type	Abbreviation		E1.3	E2.3	E4.3	E6.3
Rear adjustable terminal (1)	HR VR		Single stab design ○ Multiple stab design			
				● frame size= 2000A	● frame size= 3600A *	● frame size= 6000A
Extended front terminal (2)	EF		○			
Front terminal (2)	F		●	○	○	○
Front spread terminal (2)	ES		○			
Terminal for cable FcCuAl 4x500kcmil / 240mm² (2)	FcCuAl		○			

● Standard configuration
○ Configuration on request
1) 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.
2) Not UL listed

Order code

SOLUTIONS FOR FIXED PARTS/CRADLES, DRAWOUT CIRCUIT-BREAKERS

Type	Abbreviation		E1.3	E2.3	E4.3	E6.3
Rear adjustable terminal (1)	HR VR		Single stab design ●	Multiple stab design ● frame size= 2000A	● frame size= 3200A	● frame size= 6000A
Extended front terminal (2)	EF		○			
Front spread terminal (2)	ES		○			
Terminal for cable FcCuAl 4x240mm² (2)	Fc CuAl		○			
Flat terminal (2)	FL			○	○	○

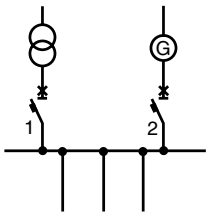
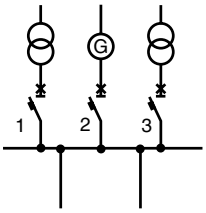
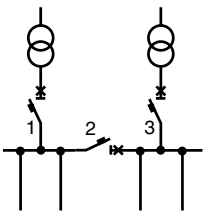
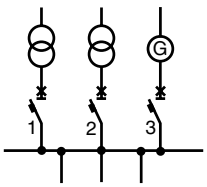
● Standard configuration
○ Configuration on request
1) The adjustable terminals are supplied as standard in the HR – HR configuration, with exception for E4.2 L version, E4.2 3200A and E6.2 6000A in which they are supplied in VR - VR configuration.
2) Not UL listed

Order code

INTERLOCKS

Mechanical interlocks

The following interlock schemes are available to enable various mechanical opening/closing configurations between circuit breakers.

Types of interlock	Example application	Logic	Circuit-breakers
Type A			
Prevents two circuit breakers from being closed 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 / drawout version
Type B			
Allows a pair of circuit breakers to be closed only if the third is open or vice versa.	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 E2.3, E4.3 and E6.3 circuit-breakers and with any fixed / drawout 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 E2.3, E4.3 and E6.3 circuit-breakers and with any fixed / drawout 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 E2.3, E4.3 and E6.3 circuit-breakers and with any fixed / drawout version

Order code

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		3000mm	2000mm
Vertical		1000mm	1000mm
Breakers	E1.2	●	-
	E2.2	●	●
	E4.2	●	●
	E6.2	●	●

For types B, C, and D the maximum distance between the two furthest circuit breakers is 4000m for horizontal, and 2000m for vertical configurations. It is also possible to make the connections with three circuit breakers in an "L" position by using the cable of three horizontal circuit breakers. Please note to make sure the distance between the horizontal and vertical circuit breakers respects the minimum and maximum distances. All cables can be cut to length for easy installation.
DLCs, DLPs and AUX15Q are not compatible when mechanical interlocks are installed.

CONNECTIVITY



The following accessories are automatically recognized by Ekip Aware and based on the installation method and connection to the trip unit, the accessories can be divided into:

Installation	Modules	Highlights
Terminal box	Cartridge modules: - Ekip Com Modbus RTU - Ekip Com Profibus - Ekip Com Profinet - Ekip Com EtherNet/IP™ - Ekip Com IEC61850 - Ekip Signalling 2K - Ekip RELT - Ekip Temperature 4T - Ekip Supply Lite - Ekip Supply Evo Modbus TCP - Ekip Synchrocheck - Ekip Arc-Flash 6F	- Ekip Supply Lite/Ekip Supply Evo Modbus TCP enables the trip units to be supplied with a wide range of control voltages - Ekip Supply Lite/Ekip Supply Evo Modbus TCP must be present for the other modules to be used - Ekip Supply Lite/Ekip Supply Evo Modbus TCP 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 Lite module, up to 2 additional modules can be installed on E1.3, and up to 3 on E2.3, E4.3 and E6.3 - Ekip Supply Evo Modbus TCP can be used as an alternative to Ekip Supply Lite. In this case up to 1 additional modules can be installed on E1.3, and up to 2 on E2.3, E4.3 and E6.3. It enables Modbus TCP, redundancy and daisy chain.
Accessorizing area	- Ekip RTC - Ekip AUP - Ekip Signalling 4K - Battery for Ekip	- These are installed in specific housings from the front of the circuit-breaker - Thanks to the optional modules Ekip RTC and Ekip AUP, the Ekip trip unit can acquire and monitor the ready to close state and the racked-in/test isolated/racked-out position of the circuit-breaker. - The Ekip Signalling 4K module increases the remote signalling possibilities for E2.3, E4.3 and E6.3 and must be supplied with the Ekip Supply Lite (or Ekip Supply Evo Modbus TCP)
External	- Ekip Signalling 10K Link / Ekip Signalling Modbus TCP	- Up to three Ekip Signalling 10K Link / Ekip Signalling Modbus TCP can be connected at the same time to the same Ekip trip unit
	- External neutral sensor - Homopolar toroid - RC toroid	- These are connected to the trip unit by the terminal box of the circuit-breaker
	- T-Sense Ambient - T-Sense Busbar	- These are wireless sensors connected to the trip unit via BLE mesh network
	- Ekip Cartridge	- The external cartridge expands connectivity possibilities. It can contain one Ekip Supply Lite and up to three cartridge modules. Ethernet modules (Ekip Com IEC 61850, Ekip Com EtherNet/IP, and Ekip Com PROFINET) must be installed adjacent to the Ekip Supply Evo Modbus TCP module. Therefore, they cannot be installed in the Ekip cartridge.

Order code



Ekip Supply Lite

Power Supply

Ekip Supply Lite

The Ekip Supply Lite module supplies the Ekip Aware and all the modules present on the terminal box of the circuit-breaker. It can be field installed in the dedicated position.
Ekip Supply Lite covers an extended range of control voltage:

	Supply	Ekip Supply Lite
Ekip Aware	Nominal voltage	24-240V DC / 110-240V AC
	Tolerance	±10%
	Rated power (including modules)	10W max.
	Inrush current	~2A for 20ms
	AWG cable	Max 14 AWG

—
Electrical diagram reference: figures 32, 99 (in the Ekip Cartridge)



Ekip Supply Evo Modbus TCP

Ekip Supply Evo Modbus TCP

The Ekip Supply Evo Modbus TCP supplies the Ekip Aware and all the modules present in the terminal box as the Ekip Supply Lite. In addition to this, it supports:

- Modbus TCP and Modbus TCP Secure, which are alternatives to each other;
- Com Link, an internal ABB protocol;
- Daisy-chain (for more information, see the chapter “Digital Experience”);
- Ethernet modules.

Modbus TCP protocol is provided by default with the module, while the others communication protocol must be purchased separately.
The Ekip Supply Evo module is provided with Ekip RTC and Ekip AUP.

	Supply	Ekip Supply Evo Modbus TCP
Ekip Aware	Nominal voltage	24-240V DC / 110-240V AC
	Tolerance	±10%
	Rated power (including modules)	10W max.
	Inrush current	~2A for 20ms
	AWG cable	Max 14 AWG

Communication Protocol	Availability
Modbus TCP	Standard supply
Com Link	Digital upgrade
Modbus TCP Secure	Upgrade (only supplied with the breaker)

—
Electrical diagram reference: figure 33



Ekip Busbars Supply

Ekip Busbars Supply

The module supplies the trip unit through the main system busbars and is installed to the right of the trip unit. All the circuit-breakers include already the internal bottom voltage measurement cables that allow the trip unit to be supplied with a voltage higher than 80V if the module is present. See page 3/14 for RC protection prerequisite.

Order code

CONNECTIVITY

Communication



Ekip Com Modbus RTU



Ekip Com Profinet

Ekip Com modules

The Ekip communication modules enable SACE Emax 3 circuit-breakers to be integrated in an industrial communication network for remote supervision and control of the circuit-breaker. Since they are mounted in the terminal box, communication can be maintained with drawout circuit-breakers, even while in the racked-out position. Several Ekip Com modules, which belong to two main groups—fieldbus and Ethernet—can be installed simultaneously, enabling connections to communication systems that use different protocols.
The Ekip Com modules are supplied with auxiliary position contacts Ekip AUP and ready to close circuit-breaker contacts Ekip RTC.
When higher reliability of the communication network is required, redundancy ensures a backup connection to the network. For further information, please refer to the paragraph in the Digital Experience chapter.
The user can select local or remote to allow one single module as remote and the others as local.
The following communication protocols are available for Ekip Aware:

Protocol	Ekip Com Module	Other modules needed
Fieldbus		
Modbus RTU	Ekip Com Modbus RTU	
Profibus-DP	Ekip Com Profibus	
Ethernet		
Profinet	Ekip Com Profinet	Ekip Supply Evo Modbus TCP
EtherNet/IP™	Ekip Com EtherNet/IP™	Ekip Supply Evo Modbus TCP
IEC61850	Ekip Com IEC61850	Ekip Supply Evo Modbus TCP
EtherNet/IP™ Redundancy	Ekip Com EtherNet/IP™	Ekip Supply Evo Modbus TCP
IEC61850 Redundancy (PRP and HSR)	Ekip Com IEC61850	Ekip Supply Evo Modbus TCP

Electrical diagram reference: figures from 51, 52, 53, 56, 57, 59.

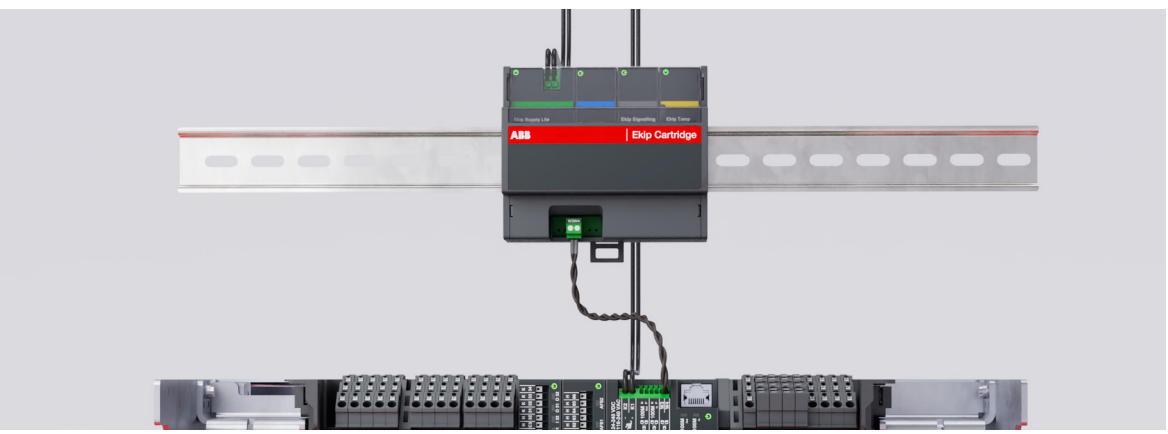


Ekip Cartridge

Ekip Cartridge

The Ekip Cartridge is used to expand the connectivity of the circuit breaker. The external mounted device connects directly with Ekip Supply Evo Modbus TCP and Ekip Aware, allowing the use of connectivity modules, including Ekip Com, Ekip Signalling 2K, Ekip Synchrocheck. It is mandatory to have an Ekip Supply Lite module installed in the Ekip Cartridge.

Electrical diagram reference: figure 98



Order code

Signalling



Ekip Signalling 2K

Ekip Signalling 2K

The Ekip Signalling 2K modules supply two input and two output contacts for control and remote signalling of alarms, warnings, status, trips and circuit-breaker events. They can be programmed through the Ekip Connect software. Furthermore, when using Ekip Connect, combinations of events can be freely configured. Two versions of the Ekip 2K Signalling modules are available: Ekip 2K-1 and Ekip 2K-2. In this way, a maximum of two modules for all the frames can be installed at the same time.

—

Electrical diagram reference: figures 41, 42



Ekip 4K Signalling module

Ekip Signalling 4K

The Ekip Signalling 4K is available for E2.3, E4.3, E6.3. This module provides four input contacts and four output contacts for control and remote signalling. It can be programmed through the Ekip Connect software. Furthermore, when using Ekip Connect, combinations of events can be freely configured.
It is installed in the housing provided in the front left of the Ekip Aware, without having to remove the trip unit itself and is an alternative to the AUX 6Q auxiliary contacts unit and to Motor-Sense Enabler.

—

Electrical diagram reference: figure 2



Ekip 10K Link Signalling module

Ekip Signalling 10K Link

Ekip Signalling 10K Link is an external signalling unit designed for DIN rail installation for SACE Emax 3 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.
Up to 3 Ekip 10K Link Signalling modules can be connected at the same time to the same circuit-breaker. The Ekip Signalling 10K Link can be powered either by AC or DC prower supply and can be connected using Ekip Supply Evo Modbus TCP with Link digital upgrade

Order code

CONNECTIVITY



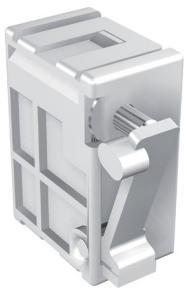
Ekip Signalling
Modbus TCP

Ekip Signalling Modbus TCP

It is an external signalling unit designed for DIN rail installation. 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.
Up to 3 Ekip Signalling Modbus TCP modules can be installed at the same time on the same circuit-breaker.
Function of the signalling module is to share, via an Ethernet network with Modbus TCP or 100baseT1 communication protocol, information about the status of circuit-breakers that might not have the ability to provide such information via Ethernet, and 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 Link / Ekip Signalling Modbus TCP**
Maximum switching voltage		150V DC / 250V AC			
Maximum switching current					
	30V DC	2A	2 output + 2 input	4 output + 4 input	10 output + 11 input
	50V DC	0.8A			
	150V DC	0.2A			
	250V AC	4A			
Contact/coil insulation		1000 Vrms (1min @50Hz)			

Ekip Signalling 10K Link/ Ekip Signalling Modbus TCP		
Auxiliary supply	24-240V AC/DC	
Tolerance	±10%	
Rated power	7W	
Inrush current	1A for 10ms	
5 inputs + 5 outputs	4-20mA	1 DIN-rail type
5 inputs + 5 outputs	0-5V	1 DIN-rail type



Ekip RTC and Ekip AUP
Signalling contacts

Ekip RTC and Ekip AUP Signalling contacts

Ekip RTC enables Ekip Aware to acquire the circuit breaker ready-to-close status.
Ekip AUP enables Ekip Aware to detect whether the circuit breaker is in the racked-in, test, or racked-out position.
Ekip RTC and Ekip AUP are always supplied together with the Ekip Supply Evo Modbus TCP module and with fieldbus modules (Ekip Com Modbus RTU and Ekip Com Profibus). If those modules are bought from factory Ekip RTC and Ekip AUP are installed in the circuit breaker. If they are purchased loose, Ekip RTC and Ekip AUP are included in the module kit.
Ethernet modules (Ekip Com IEC 61850, Ekip Com EtherNet/IP, and Ekip Com PROFINET) and Ekip Supply Lite do not include Ekip RTC and Ekip AUP in their kit; therefore, if required, they must be ordered separately.

Order code



Ekip RELT

Protection

Ekip RELT

In accordance with NEC 240.87 code, an energy reducing maintenance switch must be used for circuit breakers above 1000A.The Ekip RELT module reduces the impact of a possible arc flash event by means of the RELT protection. This module automatically assigns the Input/Outputs for remote activation and positive feedback that the protection is active. Activation and deactivation are possible via communication as well and via EPiC mobile app. For additional information about RELT see "Digital experience - Protections".

Electrical diagram reference: figure 43



Ekip Arc-Flash 6F and Arc-Flash Sense

Ekip Arc-Flash 6F and Light-Sense Detector/Light&Pressure-Sense Detector

Ekip Arc-Flash 6F uses dedicated Light-Sense Detectors (red) and/or Light&Pressure-Sense Detectors (yellow) that can quickly detect a potential arc flash event and trip the circuit breaker in less than 40ms without the need for an external arc flash monitoring relay. It can be installed within the module cartridge area of the terminal box or externally via Ekip Cartridge. In addition, 2 Ekip Arc-Flash 6F modules with up to 12 total sensors can be installed for each circuit breaker. For additional information about Ekip Arc-Flash see "Digital experience - Protections".

Electrical diagram reference: figure 49,50



Light-Sense Detectors



Light&Pressure-Sense Detector

Order code

CONNECTIVITY



4T

Temperature

Ekip Temperature 4T

The Ekip Temperature 4T modules provide four analog inputs for PT100/PT1000 thermo-resistances. Through the Ekip Connect commissioning tool, it is possible to set different control thresholds and associate them to digital signals. ABB external probes PT1000 are available for busbar applications as loose parts.
Two versions are available, 4T-1 and 4T-2.



T-Sense Ambient and
T-Sense Busbars

T-Sense Ambient and T-Sense Busbar

Monitor real-time temperature and humidity directly from the Ekip Aware trip unit HMI. These devices are capable of providing environmental information to the trip unit, which is connected via a Bluetooth mesh network allowing the sensors to be installed strategically within the equipment.
Two versions are available:

- T-Sense Ambient is a non-contact sensor, powered by an internal battery used to monitor ambient temperature conditions and humidity.
- T-Sense Busbar is a self-supplied device from the current flowing through the busbars (minimum of 40A) used for continuous humidity monitoring and thermal hotspot detection.

They both need auxiliary supply (Ekip Supply Lite or Ekip Supply Evo Mosbus TCP).

Order code

MEASUREMENT & PROTECTION



Ekip Synchrocheck

Ekip Synchrocheck

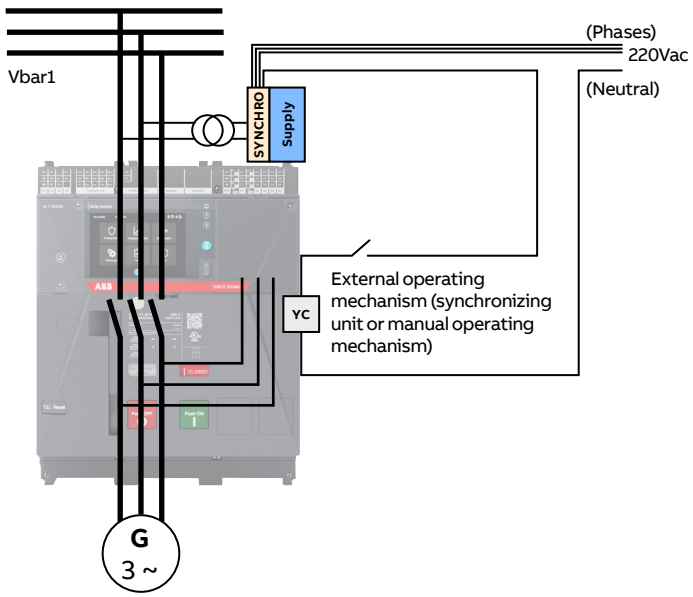
This module enables the control of the synchronism condition when placing two lines in parallel. The module can be used with the Ekip Aware with the measurement function enabled.

Ekip Synchrocheck measures the voltages from three phases of one line through an external transformer and compares the concatenated voltages to the measured voltages at the breaker. The maximum concatenated voltage value is 120V AC.

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 release .Please note the Ekip Synchrocheck also works in single phase applications

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

Electrical diagram reference: figure 48



Order code

MEASUREMENT & PROTECTION



Current sensor for neutral conductor outside the circuit-breaker

Current sensor for neutral conductor outside the circuit-breaker

Accessory used for 3 pole circuit breakers to measure current located on the neutral bus for 3P4W Ground Fault protection, in addition to enabling neutral protection. Hardbus connection to neutral bus required. it enables protection of the neutral conductor to be achieved through connection (3m) to the trip unit. It is supplied on request. 10m cable available for connecting to the trip unit.

—

Electrical diagram reference: figure 27

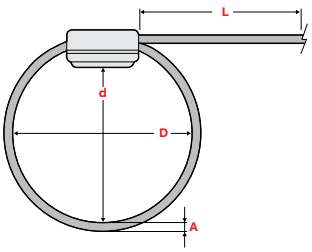


Openable current sensor for neutral conductor outside the circuit-breaker

With similar functionality to the standard current sensor for neutral conductor outside the circuit-breaker, this allows for easy installation by means of plug-in sensor that can be installed around the busbar or cables without the need for a hardbus connection, offering 80% less installation time than external neutral sensor. Thanks to a positioning device, positioning of busbars and cables with openable current sensors becomes easier, as no other ties or equipments are needed. It is compatible with busbar connection up to 2x80x10 [mm].

—

Electrical diagram reference: figure 27



Frame	d [mm]	D [mm]	A [mm]	L [m]	Nominal Current [A]	Example of connection
CT100	65	85	12	3	Up to 6300	cable 2x60x10 mm
CT120	105	90	12	3	Up to 6300	busbar 2x100x10 mm
CT200	165	180	12	3	Up to 6300	busbar 4x100x10 mm
CT290	225	245	12	3	Up to 6300	busbar 6x100x10 mm



Homopolar toroid for the earthing conductor of main power supply

Homopolar toroid for the earthing conductor of main power supply

Used for applications where Source Ground Return (SGR) Protection is needed. Utilizes Gext Protection Function. 5 Sizes of toroids are available: 100A, 250A, 400A, 800A, 1200A. The homopolar toroid is an alternative to the toroid for differential protection.

—

Electrical diagram reference: figure 25

Order code



Dedicated terminal for Modified Differential Ground Fault (MDGF) protection

Dedicated terminal for Modified Differential Ground Fault (MDGF) protection

There are two methods to have MDGF protection on Emax 3 :
1) standard, with the dedicated terminal
2) advanced with the MDGF digital upgrade

For the first one, a dedicated terminal is needed. Two types of terminal are available: one for the fixed circuit-breakers and one for the drawout ones. The application needs the mounting of external phase current transformers and summing current transformers. SACE Emax 3 MDGF scheme is compatible only with current transformers from Amram that must be purchased separately.

For the complete application wiring diagram, please refer to 1SDM000019A1001. Listed below the com- mercial codes of Phase CTs and Summing CTs compatible with SACE Emax 3 MDGF scheme.

Current rating (A)	Phase current transformer	Summing current transformer
800	CT409-801-01 or CT420-801-01 or CT430-801-01	CT550-5X4-01000
1200	CT409-122-01 or CT420-122-01	CT550-5X4-01515
1600	CT409-162-01 or CT430-162-01	CT550-5X4-02000
2000	CT409-202-01 or CT421-202-01 or CT430-202-01	CT550-5X4-02500
2500	CT409-252-01 or CT421-252-01 or CT430-252-01	CT550-5X4-03125
3000	CT421-302	CT550-5X4-04167
4000	CT421-402-01 or CT430-402-01	CT550-5X4-05000
5000	CT421-502-01 or CT430-502-01	CT550-5X4-06250
6000	CT422-602-01 or CT430-602-01	CT550-5C4-07692

The second method is that Emax 3 can now perform MDGF protection without the need of external phase and summing CT's thanks to Ekip Aware and it's breaker-to-breaker communication via Link along with Ekip Supply Evo Modbus TCP, which can enable MDGF protection via a digital updgrade.

If the terminal for MDGF is bought after sales, FP connector for 3-pin/5-pin terminal block must be ordered.

Order code

DISPLAYING



Lite Panel Pro

Lite Panel Pro

Lite Panel Pro is a 12.1 inches local control panel that can monitor and control up to 90 devices connected via Modbus TCP/IP or Modbus RTU. It must be supplied with 24V. This is a very customizable device according to customer's needs, and it can also be used to integrate and monitor third party devices.The most important functionalities of this device:

- User administration: 5 types of local user accounts available inside the Lite Panel Pro
- Automatic Scan of various devices already mapped inside the Lite Panel Pro: Emax 2, Tmax XT, ITS2, M4M, CMS700 etc... (see detailed list in the user installation manual)
- Local monitoring directly on the front of the panel for all the devices since real-time data are always visible
- Local control of devices such as breakers and ATOs: open, closing, reset
- Alarm list and event log directly visible from one access point, taking in consideration also the single-line diagram
- Data historization and trend visualization
- Report download
- Web server available via LAN or Wi-Fi (EPiC)
- Possibility to enable cloud connection to ABB Ability Energy Manager, without any additional hardware
- Third party device support enabled via pre-defined templates.

Order code

MISCELLANEOUS

Reports

Various types of reports are available:

- **Test Report Lite:**
  This report confirms that routine tests have been performed on the specific serial number of the circuit breaker or switch disconnector. It provides detailed information for an individual device. Specifically, it includes:
  - Accessories inspection checklist (confirming the presence of all accessories specific to that breaker)
  - Mechanical operation tests on the breaker (e.g., manual close–open operations)
  - Mechanical operation tests on coils and the motor, if applicable
  - Primary injection test (including the actual injected current)
  - Dielectric withstand voltage test with the applied voltage values
- **Test Report:**
  This is a more comprehensive report that includes all the information provided in the Test Report Lite, plus pole resistance measurements. It also applies only to the specific serial number of the circuit breaker or switch disconnector..

Test Reports for each individual circuit breaker can be easily downloaded via:

- the EPiC mobile app by scanning the QR code located on the front of the circuit breaker,
- or through Ekip Connect (using the S/N and commercial code), even without being connected to the circuit breaker.

SERVICE

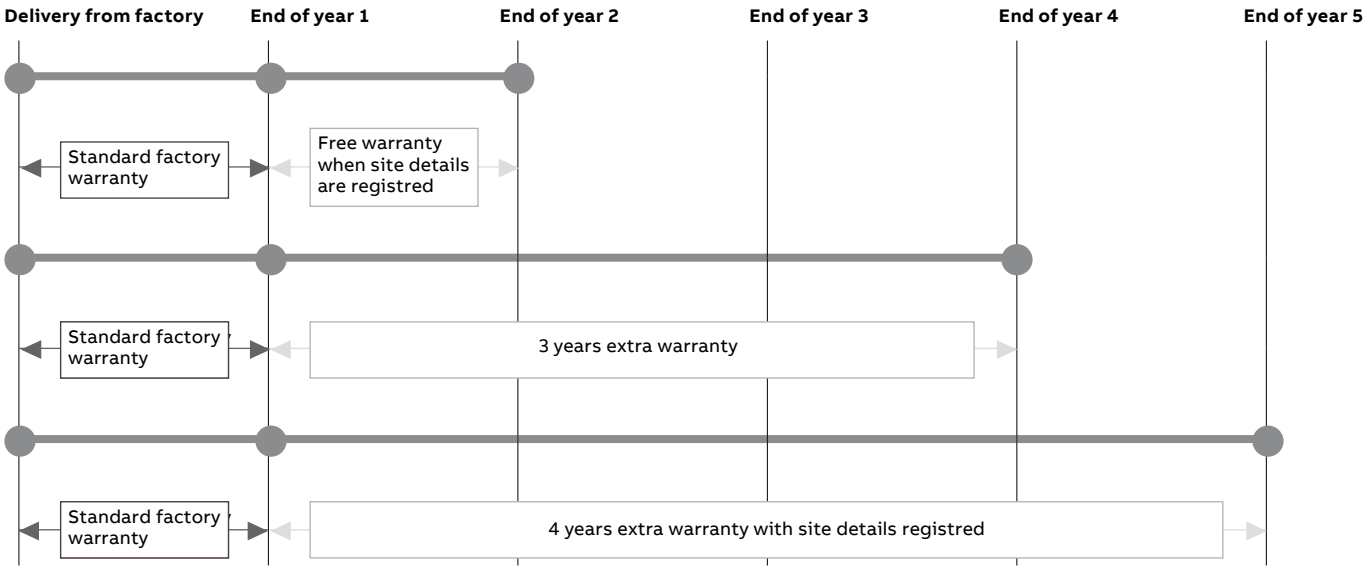
Extended warranty

For ABB Low Voltage circuit-breakers, extending the 1-year standard factory warranty to up to 5 years is possible.
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.





Order code

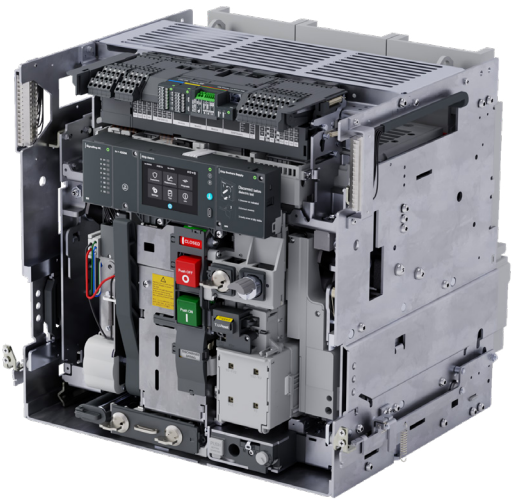
Spare parts

The following original and guaranteed spare parts are available:

- Front Cover
- 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.

For further details, please refer to “Ordering Codes” or to ABB SACE Spare Parts Catalogue (1SDC001007D0206).





05

INSTALLATION

5/2 **Circuit-breaker**
5/2 Sizes
5/3 Versions
5/4 Poles
5/5 Terminals
5/6 Degree of protection

5/7 **Operating conditions**
5/7 Temperature
5/7 Altitude
5/8 Electromagnetic compatibility

5/10 **Installation in equipment**
5/10 Position
5/10 Power supply
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5/12 Earthing connection
5/13 Busbar types
5/13 Bars connection

5/14 **Performance in equipment**
5/14 Power losses

CIRCUIT-BREAKER

The new SACE Emax 3 family incorporates the same characteristics of strength and reliability that have always distinguished the tradition of ABB SACE air circuit-breakers.

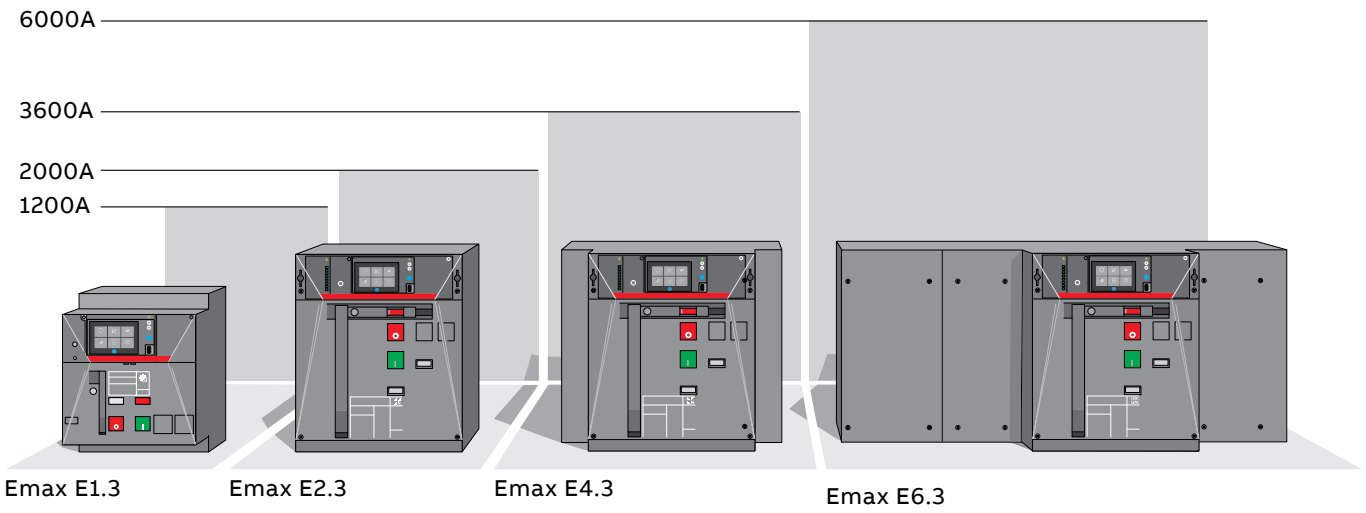
The new SACE Emax 3 circuit-breakers, available in four sizes, are extremely compact: with low depths and heights, combined with standardized widths, they provide a solution for the most stringent installation requirements.

Safety is expected thanks to double insulation between the live power parts and the front parts of the apparatus and thanks to total segregation of the phases. Furthermore, the design of the SACE Emax 3 circuit-breakers has been developed with the purpose of improving installation operations and use of the devices and accessories making them simple, more intuitive and safe.

Sizes

The SACE Emax 3 circuit-breakers, available in 4 sizes up to 6000A, provide:

- **Versatility:** this is particularly important since the design of Emax 3 can fit comfortably within the confined space of the switchgear, ensuring it operates efficiently in various demanding environments.
- **Saving:** optimizing the dimensions of electrical switchgear can lead to a potential reduction in material consumption.



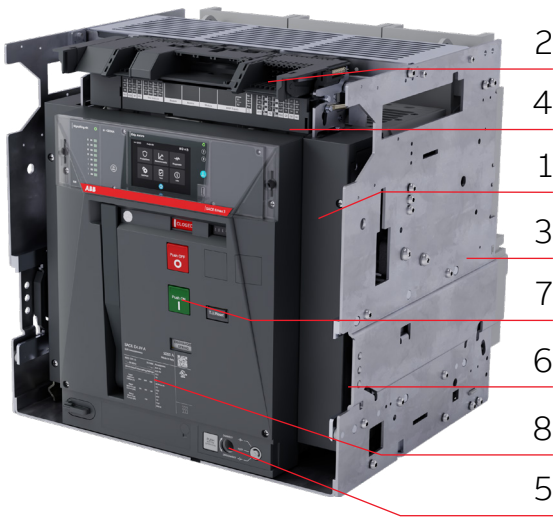
Versions

The SACE Emax 3 circuit-breakers are available in both fixed and drawout versions.

The drawout version is recommended for applications where service continuity is essential. This version allows for the replacement of the moving part using a remote racking device (either external or embedded) without requiring any intervention on power or auxiliary connections, thus permitting reset in the shortest time possible.
The fixed version is connected directly to the power system through the circuit-breaker terminals. It is ideal for applications where space is limited, providing a compact solution without compromising performance or the ability to fit accessories.

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

Drawout



Fixed



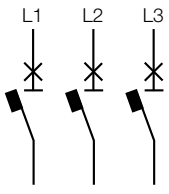
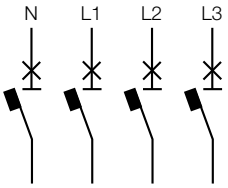
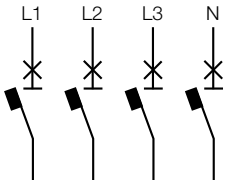
CIRCUIT-BREAKER

Poles

SACE Emax 3 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.

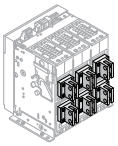
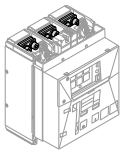
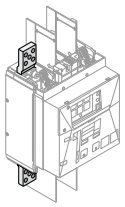
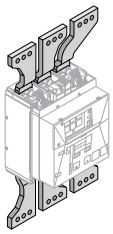
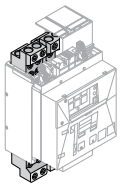
The four-pole circuit-breakers E1.3, E2.3 and E4.3 are always provided with full-size neutral pole with rated uninterrupted current-carrying capacity identical to the phase poles. The E6.3 circuit- breakers, due to their construction modularity, are available with neutral set at 50 percent of nor- mal 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 circuit-breakers, 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 chapter 08 for the commercial codes).

	Standard version		**Optional version with neutral on the right**
Circuit-breaker	**Three-pole**	**Four-pole**	**Four-pole**
Emax E1.3			
Emax E2.3			
Emax E4.3			
Emax E6.3			

Terminals

Silver-plated copper terminals make installation of circuit-breaker easier since they are designed to connect the breaker to busbars based on circuit-breaker's rated capacity. Each terminal matches the standard busbar width based on its amperage and has one, two or three stabs to connect to multiple bus runs if needed. For specific installation needs, the circuit-breaker can be fitted with different terminal combinations for the upper and lower parts.

Type	Abbreviation		E1.3	E2.3	E4.3	E6.3
Rear adjustable terminal (1)	HR VR		F, W	F, W	F, W	F, W
Front terminal	F		F	F, W (2)	F, W (2)	F, W (2)
Extended front terminal	EF (2)		F, W			
Front spread terminal	ES (2)		F, W			
Terminal for cable FcCuAl 4x500kcmil / 240mm2	Fc CuAl (2)		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.
2) Not UL listed

CIRCUIT-BREAKER

Degree of protection

The SACE Emax 3 circuit-breakers guarantee the following degrees of protection:

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

OPERATING CONDITIONS

SACE Emax 3 circuit-breakers have been 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 with the aim to increase performances and extending the lifecycle of the circuit-breaker.

Temperature

SACE Emax 3 circuit-breakers can operate in the following environmental conditions:

	Temperature (°C)		
	Operating	**Active Display**	**Storage**
Emax 3 with Ekip Aware	-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 3 switch-disconnectors	-25°C ... +70°C -13°F...+158°F	-	-40°C ... +70°C -40°F...+158°F

Altitude

SACE Emax 3 air circuit-breakers maintain their rated performance up to an altitude of 6600 feet. Beyond this altitude, atmospheric properties such as composition, dielectric strength, cooling capacity and pressure can vary, leading to a derating of the circuit-breakers' performance. This derating can be assessed through changes in the maximum rated service voltage and the rated uninterrupted current.

		[ft]	**6600**	**9900**	**13200**	**16500**
Altitude		**[m]**	**2000**	**3000**	**4000**	**5000**
Rated service voltage - Ue	Versions 690V	[V]	600	600	544	477
Rated current		[% In]	100	98	93	90

OPERATING CONDITIONS

The SACE Emax 3 circuit-breakers have been tested in accordance with key international standards to ensure their reliability and performance under demanding environmental and mechanical conditions.

Mechanical tests

- Shock tests according to IEC 60068-2-27
  - Acceleration: 5 g
  - Pulse duration: 11 ms
- Vibration tests according to IEC 60068-2-6
  - Displacement: 1 mm for the frequency range 2–13.2 Hz
  - Acceleration: 0.7 g for the frequency range 13.2–100 Hz

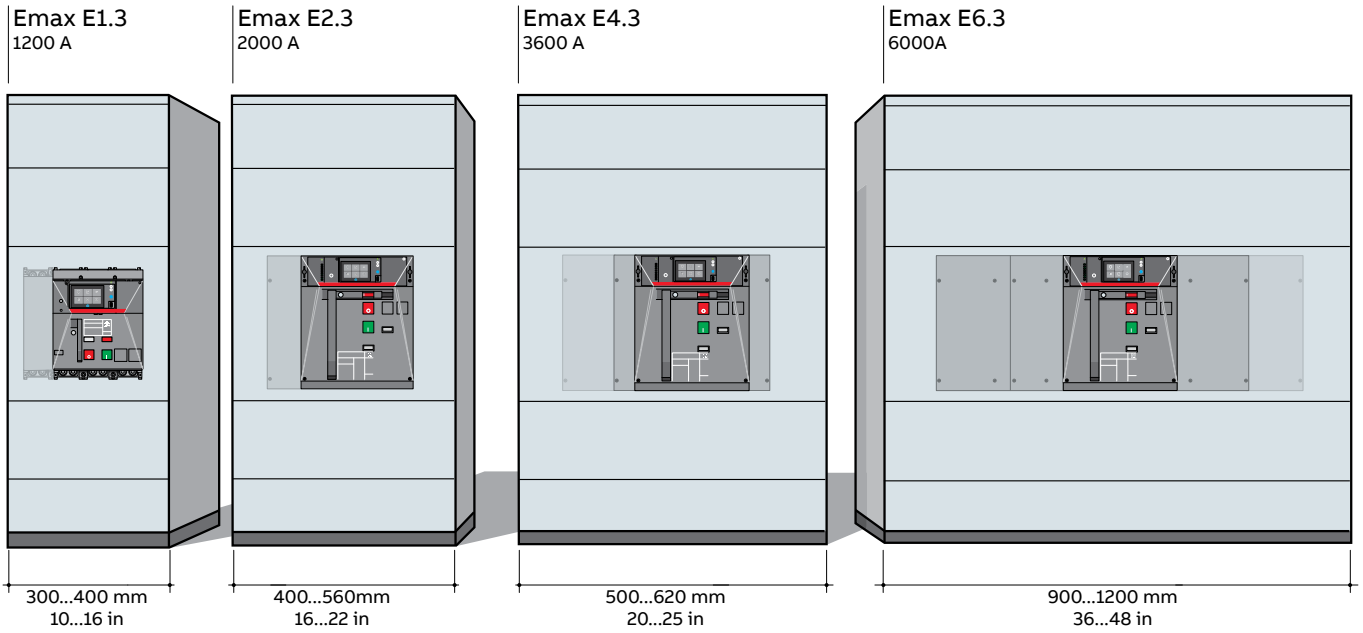
Climatic and environmental tests

- Climatic tropicalization according to IEC 60947-2, Annex F
  Including the damp heat test performed in accordance with IEC 60068 2 30 (variant 1), ensuring product resilience in high humidity and high temperature environments.
- Corrosive atmosphere exposure
  The circuit-breakers can operate in environments containing SO_2 and H_2S, achieving the following corrosion resistance classifications:
  - classes C1 to C3 according to IEC 60721-3-3 (Classification of groups of environmental parameters and their severities – Stationary use at weatherprotected locations - which refers to ISO 9223)
  - Classes 6C4 to 6C5, according to IEC 60721-3-6: Part 3-6: Classification of groups of environmental parameters and their severities - Ship environments

Electromagnetic compatibility

The use of specific devices in industrial installa- tions may cause electromagnetic interference in the electrical system. SACE Emax 3 circuit-breakers have been developed and tested for electro-magnetic compatibility in accordance with IEC 60947-2, Appendices J and F, ANSI C37.90.1 and C37.90.2.

Due to the four construction sizes and the reduced insulation distances required, SACE Emax 3 circuit-breakers optimize the installation spaces of the compartments of electrical switchgear, thereby providing a rational solution to the customers' application needs.



INSTALLATION IN EQUIPMENT

Position

All SACE Emax 3 circuit-breakers can be floor mounted in a vertical position inside the switch-gear compartment.
The E1.3 circuit-breaker can also be installed in a horizontal position and wall mounted.

Power supply

The Emax 3 circuit-breakers can be supplied from either the upper or lower terminals. If Measuring digital upgrade is present, the voltage measure-ment cables (installed by default on the bottom part) must be installed on the power supply side to ensure that all information is accessible when the circuit-breaker is in the open position.

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.

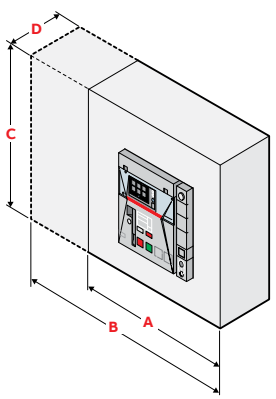
Installation of live parts must ensure:

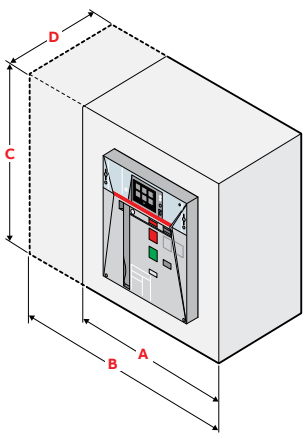
1. **Minimum insulation distances between the phases**

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.

2. Insulation distance of installation cubicle

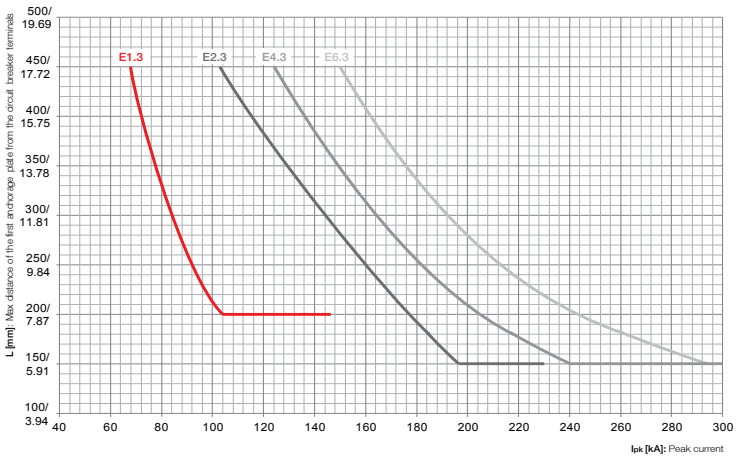
		FIXED CIRCUIT BREAKERS				DRAWOUT CIRCUIT BREAKERS			
		A - Width				A - Width			
		3p	4P	C - Height	D - Depth	3p	4P	C - Height	D - Depth
E1.3	[mm]	250	322	382.5	130	280	350	440	252
	[inch]	9.84	12.67	15.05	5.11	11.02	13.77	17.32	9.92
E2.3	[mm]	400	490	500	221	400	490	440	355
	[inch]	15.74	19.29	19.68	8.7	15.74	19.29	17.32	13.97
E4.3	[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
E6.3	[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
E6.3/f	[mm]	-	1200	500	221	-	1200	440	355
	[inch]	-	47.24	19.68	8.7	-	47.24	17.32	13.97



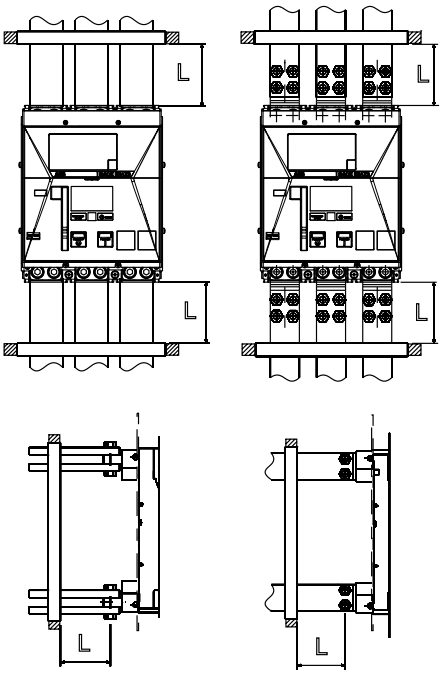


3. **Anchorage plates**

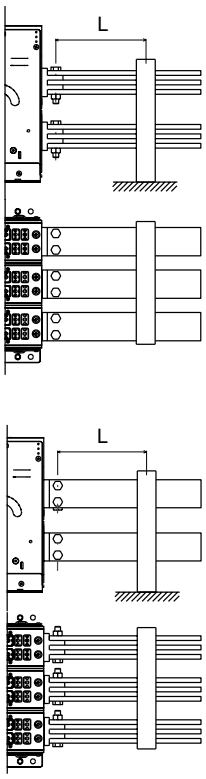
During a short-circuit event, electrodynamic forces are generated, which can exert significant mechanical stress on both the circuit-breakers and the surrounding switchgear structures. To mitigate the impact of these forces, it is essential to position fastening anchor plates near the terminals of the circuit-breaker. These plates help absorb and distribute the mechanical stress, preventing damage to the components. The diagram below illustrates the recommended distance for positioning the first anchor plate for the Emax 3 circuit-breakers, which is determined based on the peak current expected during a short-circuit. Proper placement of these anchor plates is critical for ensuring the structural integrity and reliable operation of the switchgear under fault conditions.



E1.3



E2.3, E4.3, E6.3



INSTALLATION IN EQUIPMENT

4. **Tightening torques**
   For connecting CB and burbars.

Terminals	E1.3	E2.3 / E4.3 / E6.3
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	

5. **Segregation plates and phase separator plates**
   The rear part of the circuit-breaker has been designed with specific slots in which insulating plates can be housed to facilitate segregation of live parts. In addition, phase separators are available as optional accessories for E1.3.

Earthing connection

To achieve continuity and equal potential of earthing between the Emax 3 circuit-breaker and the protection circuit of the switchboard, customers can choose one of the following options:

- Connect the Emax 3 fixed circuit-breaker or the fixed part 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 guaranteed by the metal contact (support) between the circuit-breaker and the metal structure of the switch- board (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 E1.3, fixed version, does not require any earthing connection.

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 aluminum when the main distribution system is made of aluminum.
The circuit-breakers can be connected directly with copper or aluminum cables in the case of E1.3 circuit-breakers, or indirectly by cable-carrying bars in the case of E2.3, E4.3 and E6.3.

		Vertical			Horizontal		
Frame	**Iu**	**Qty**	**Size (in)**	**Size (mm)**	**Qty**	**Size (in)**	**Size (mm)**
E1.3	800	1	1/4 x 3	6.35 x 76.2	2	1/4 x 2	6.35 x 50.8
E1.3	1200	2	1/4 x 3	6.35 x 76.2	4	1/4 x 2	6.35 x 50.8
E2.3	1600	2	1/4 x 3	6.35 x 76.2	3	1/4 x 2.5	6.35 x 63.5
E2.3	1600	3	1/4 x 2	6.35 x 50.8	4	1/4 x 2	6.35 x 50.8
E2.3	2000	4	1/4 x 2	6.35 x 50.8	4	1/4 x 2.5	6.35 x 63.5
E4.3	2000	4	1/4 x 2	6.35 x 50.8	4	1/4 x 2.5	6.35 x 63.5
E4.3	2500	3	1/4 x 4	6.35 x 101.6	4	1/4 x 4	6.35 x 101.6
E4.3	3200	4	1/4 x 4	6.35 x 101.6	-	-	-
E4.3	3600	4	1/4 x 5	6.35 x 127	-	-	-
E6.3	4000	4	1/4 x 5	6.35 x 127	6	1/4 x 4	6.35 x 101.6
E6.3	5000	6	1/4 x 5	6.35 x 127	10	1/4 x 4	6.35 x 101.6
E6.3	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 3 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 E2.3, E4.3 and E6.3;
- a ¼" spacing eliminates the need to bend bars and allows for an easier connection to the main busbars.

PERFORMANCE IN EQUIPMENT

Power losses

To guarantee 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 of the apparatus and by live parts installed.

The values given 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	**E1.3 B-A, N-A, S-A**	W	7	17	59	125								
	E2.3 B-A, N-A, S-A	W		15	48	100	170							
	E2.3 H-A, V-A / E2.3 2000A B-A, N-A, S-A	W		15	48	99	167	250						
	E4.3 S-A, H-A, V-A	W			44	86	143	211	310					
	E4.3 3200A/3600A S-A, H-A, V-A	W			42	81	132	193	280	445	578			
	E6.3 H-A, V-A	W								323	395	476	700	
Drawout	**E1.3 B-A, N-A, S-A**	W	14	35	118	250								
	E2.3 B-A, N-A, S-A	W		22	73	152	260							
	E2.3 H-A, V-A / E2.3 2000A B-A, N-A, S-A	W		22	68	138	233	350						
	E4.3 S-A, H-A, V-A	W			58	114	189	279	410					
	E4.3 3200A S-A, H-A, V-A	W			49	111	181	264	384	610				
	E6.3 H-A, V-A	W								438	536	646	950	1484

06

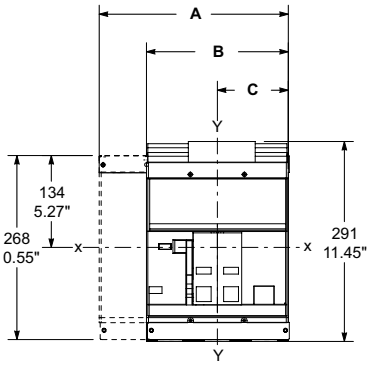
OVERALL DIMENSIONS

6/2 **Fixed circuit-breaker**
6/4 E1.3
6/8 E2.3
6/10 E4.3
6/14 E6.3

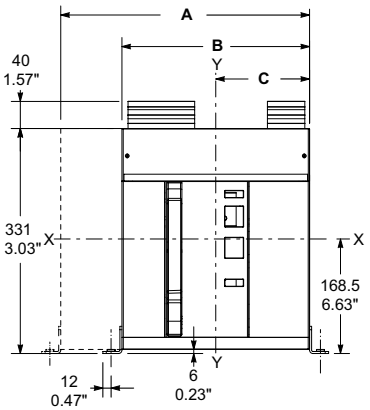
6/18 **Drawout circuit-breaker**
6/20 E1.3
6/24 E2.3
6/26 E4.3
6/29 E6.3

FIXED CIRCUIT-BREAKER

E1.3



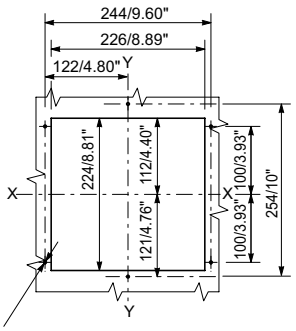
E2.3 - E4.3 - E6.3



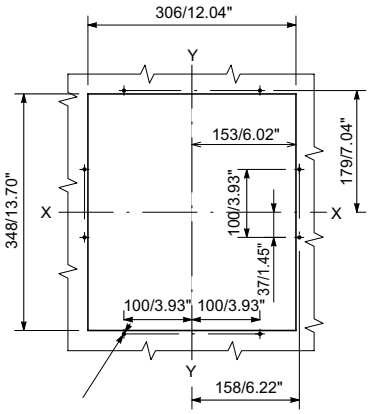
[mm/in]	A	B	C	
	4p	3p	3p	4p
E1.3	284/ 11.18	214/ 8.42	107/ 4.21	107/ 4.21
E2.3	366/ 14.40	276/ 10.86	138/ 5.43	138/ 5.43
E4.3	510/ 20.07	384/ 15.11	192/ 7.55	192/ 7.55
E6.3	888/ 34.96	762/ 30	318/ 12.42	444/ 17.48
E6.3/f	1014/ 39.92	-	-	444/ 17.48

Compartment door drilling

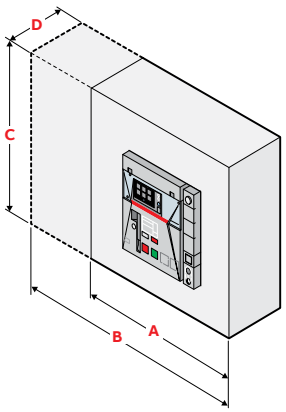
E1.3



E2.3 - E4.3 - E6.3

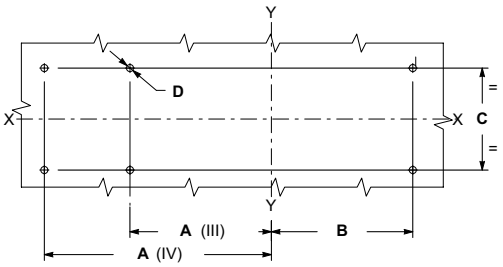


Dimensions of the compartment



		A - Width			
		3p	4P	C - Height	D - Depth
E1.3	[mm]	250	322	382.5	130
	[inch]	9.84	12.67	15.05	5.11
E2.3	[mm]	400	490	500	221
	[inch]	15.74	19.29	19.68	8.7
E4.3	[mm]	500	620	500	221
	[inch]	19.68	24.41	19.68	8.7
E6.3	[mm]	900	1020	500	221
	[inch]	35.43	40.16	19.68	8.7
E6.3/f	[mm]	-	1200	500	221
	[inch]	-	47.24	19.68	8.7

Floor fixing

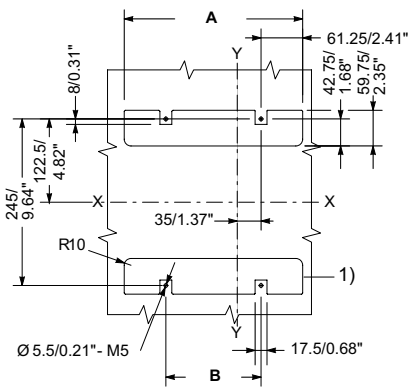


Floor fixing plate required for E1.3 in order to floor mount.
Ordering code ZE1FFPF missing 1SDA code now 1SDA076020R1

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

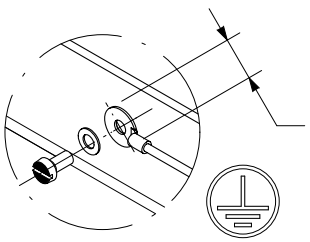
Wall fixing (only for E1.3)

1 for fixing with rear terminals



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

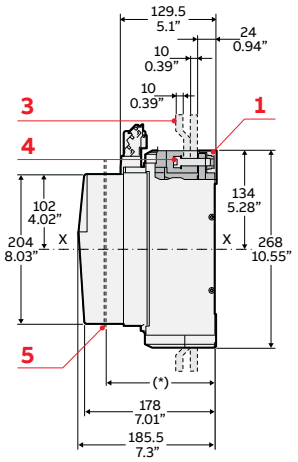
Earthing device E2.3 - E4.3 - E6.3

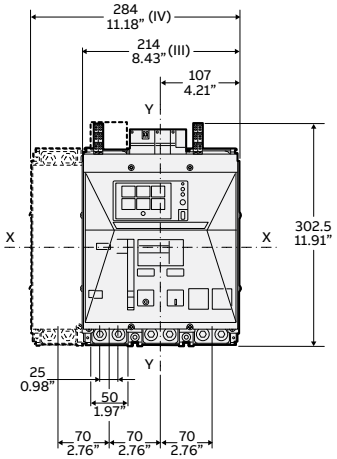


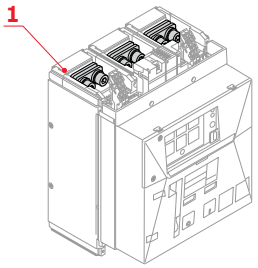
M5x8 screws supplied
Tightening torque 3Nm

FIXED CIRCUIT-BREAKER - E1.3

Front terminals – F

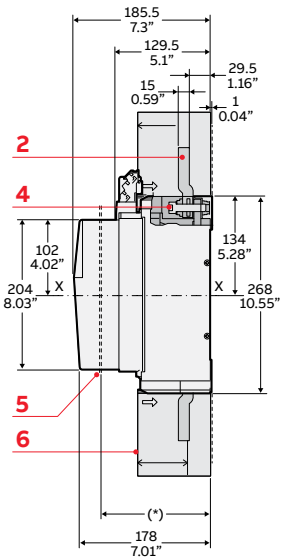


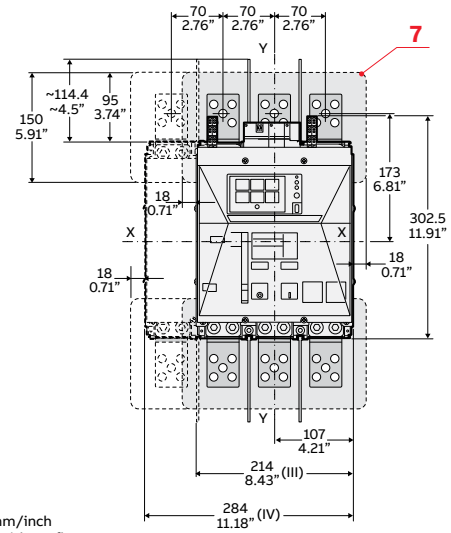


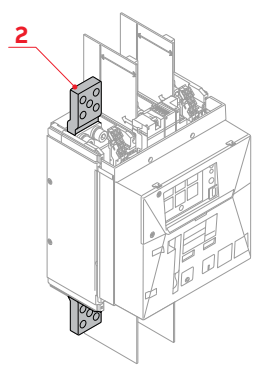


(*) Min. 130/5.12” - Max.164/6.46”mm/inch with flange, 170/6.69”mm/inch without flange

Extended Front terminals – EF







(*) Min. 130/5.12” - Max.164/6.46”mm/inch with flange, 170/6.69”mm/inch without flange

1 Front terminal for flat connection

2 Extended front terminal

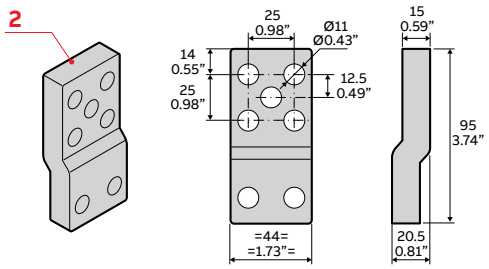
3 In charge of the customer

4 Tightening torque 18Nm

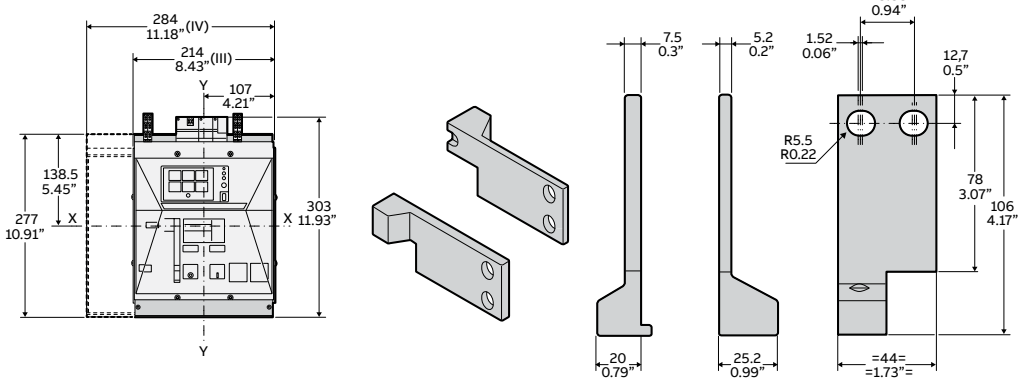
5 Door position for dimensions flange: see TN 1SDH002309A1120

6 Phase separators 100mm compulsory

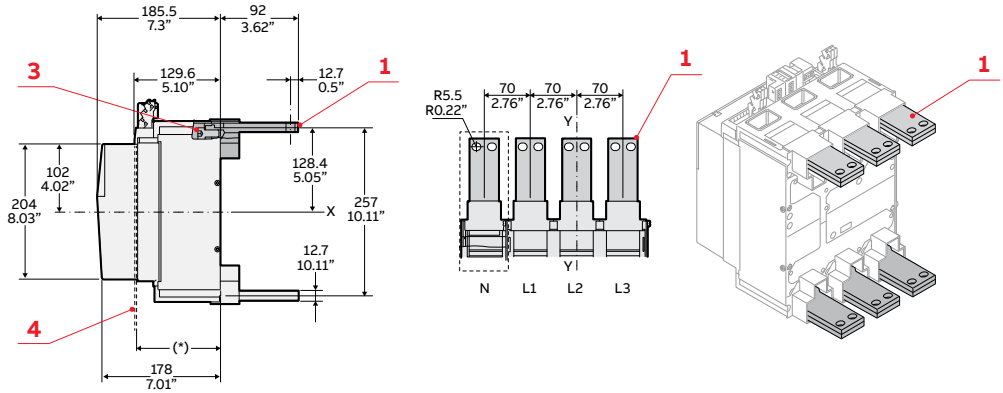
7 Compulsory insulating plate in charge of the customer



Orientable rear terminals HR - VR

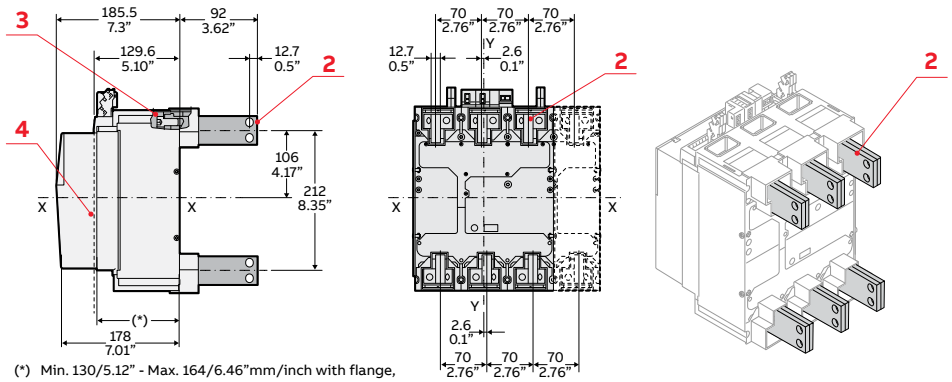


HR Terminals



(*) Min. 130/5.12" - Max. 164/6.46"mm/inch with flange, 170/6.69"mm/inch without flange

VR Terminals



(*) Min. 130/5.12" - Max. 164/6.46"mm/inch with flange, 170/6.69"mm/inch without flange

1 Horizontal rotary terminals HR

2 Vertical rotary terminals VR

3 Tightening torque 20Nm - 177 lb in

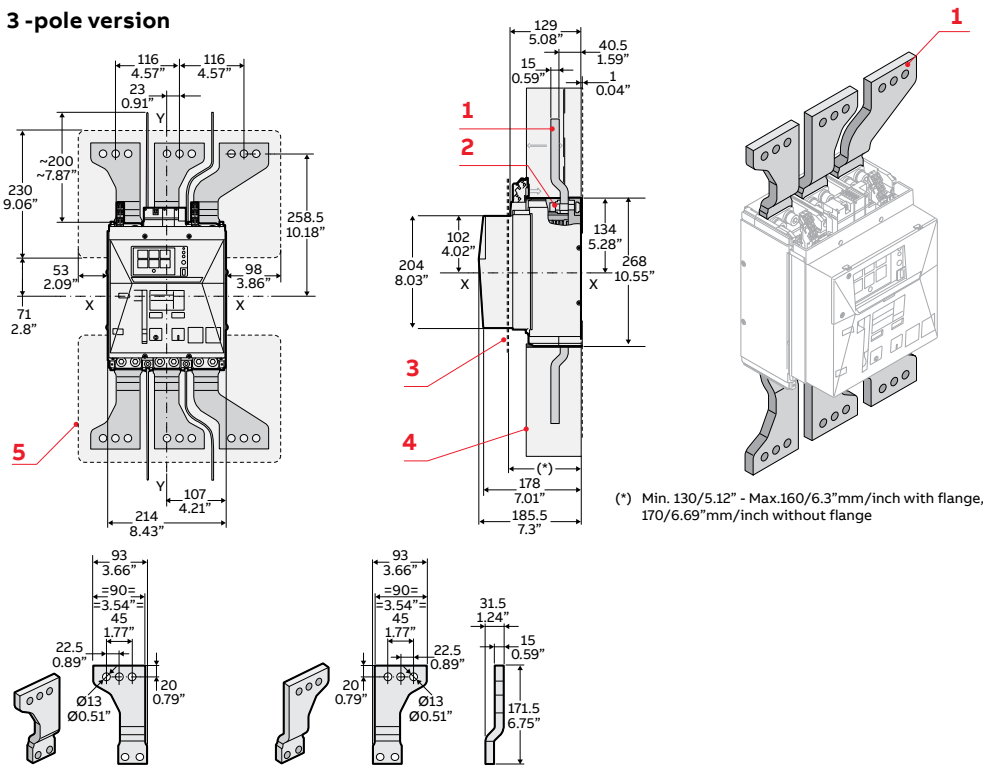
4 Door position for dimensions flange: see TN 1SDH002309A1120

5 Template of piercing for fixing on support plate

FIXED CIRCUIT-BREAKER - E1.3

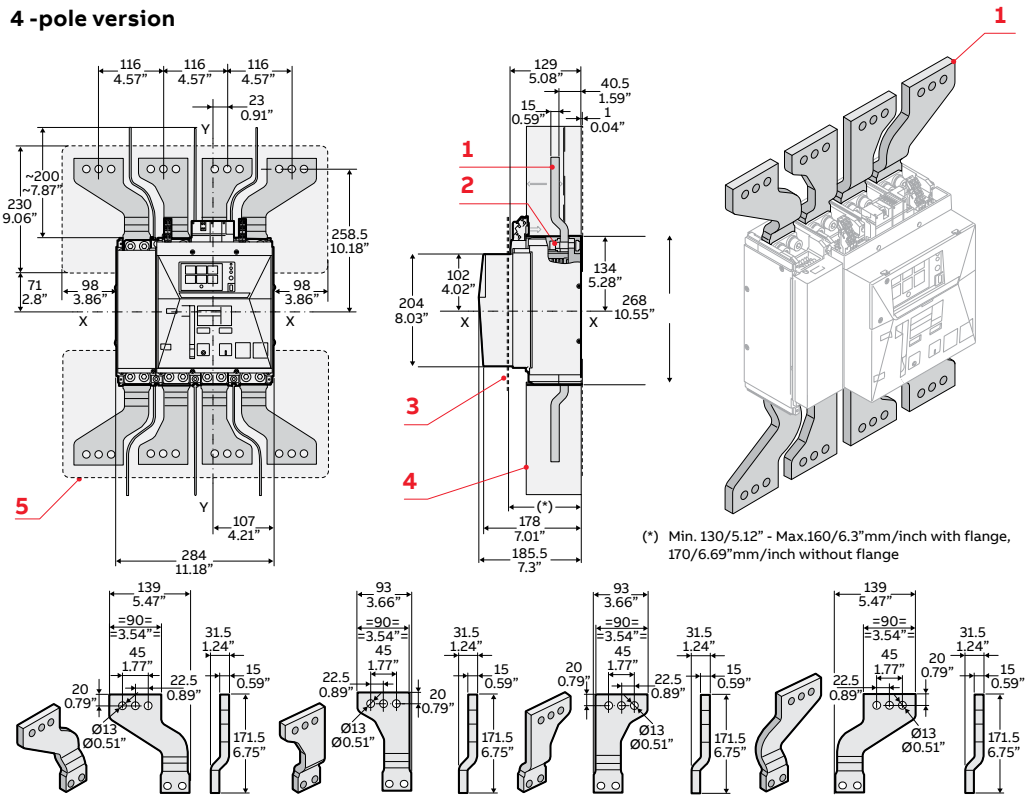
Spread extended front terminals - ES

3 -pole version



(*) Min. 130/5.12" - Max.160/6.3"mm/inch with flange, 170/6.69"mm/inch without flange

4 -pole version



(*) Min. 130/5.12" - Max.160/6.3"mm/inch with flange, 170/6.69"mm/inch without flange

1 Sreaded extended front terminals

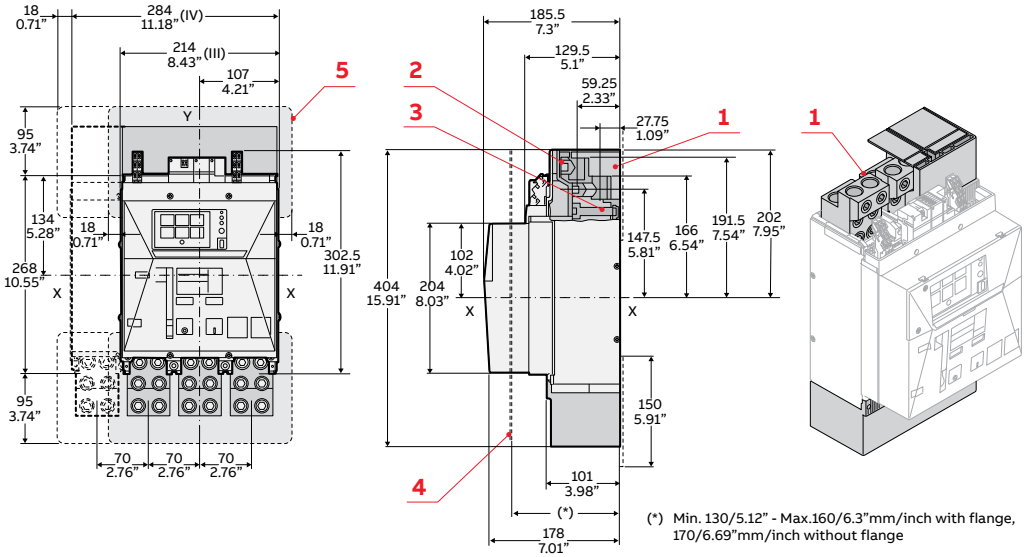
2 Tightening torque 18Nml

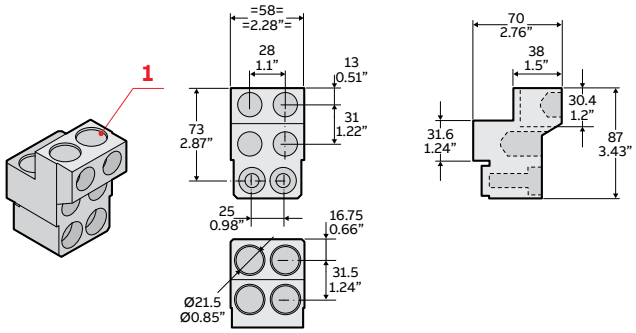
3 Door position for dimensions flange: see TN 1SDH002309A1120

4 Compulsory phase separators 200mm

5 Compulsory insulating plate in charge of the customer

Front terminals for cables – FcCuAl





1 FC Cu Al Front cable terminal

2 Tightening torque 43Nm

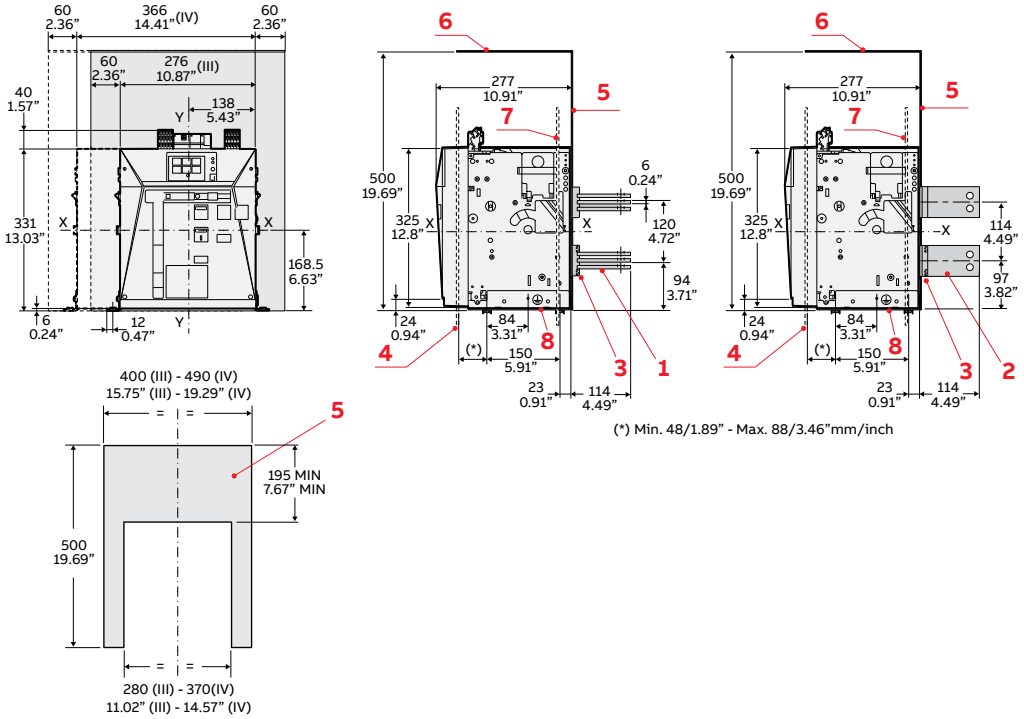
3 Tightening torque 18Nm

4 Door position for dimensions flange: see TN 1SDH002309A1120

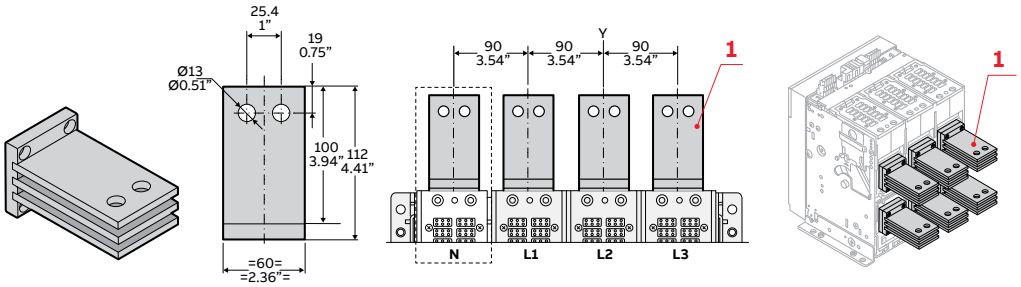
5 Compulsory insulating plate in charge of the customer

FIXED CIRCUIT-BREAKER - E2.3

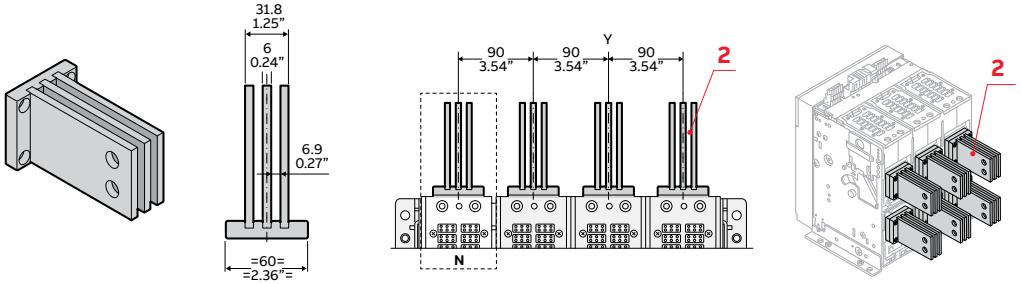
Orientable rear terminals HR - VR



HR Terminals



VR Terminals



1 Horizontal terminal 1600-2000A

2 Vertical terminal 1600-2000A

3 Tightening torque 20Nm - 177 lb in

4 Door position for dimensions flange: see TN1SDH002310A1120

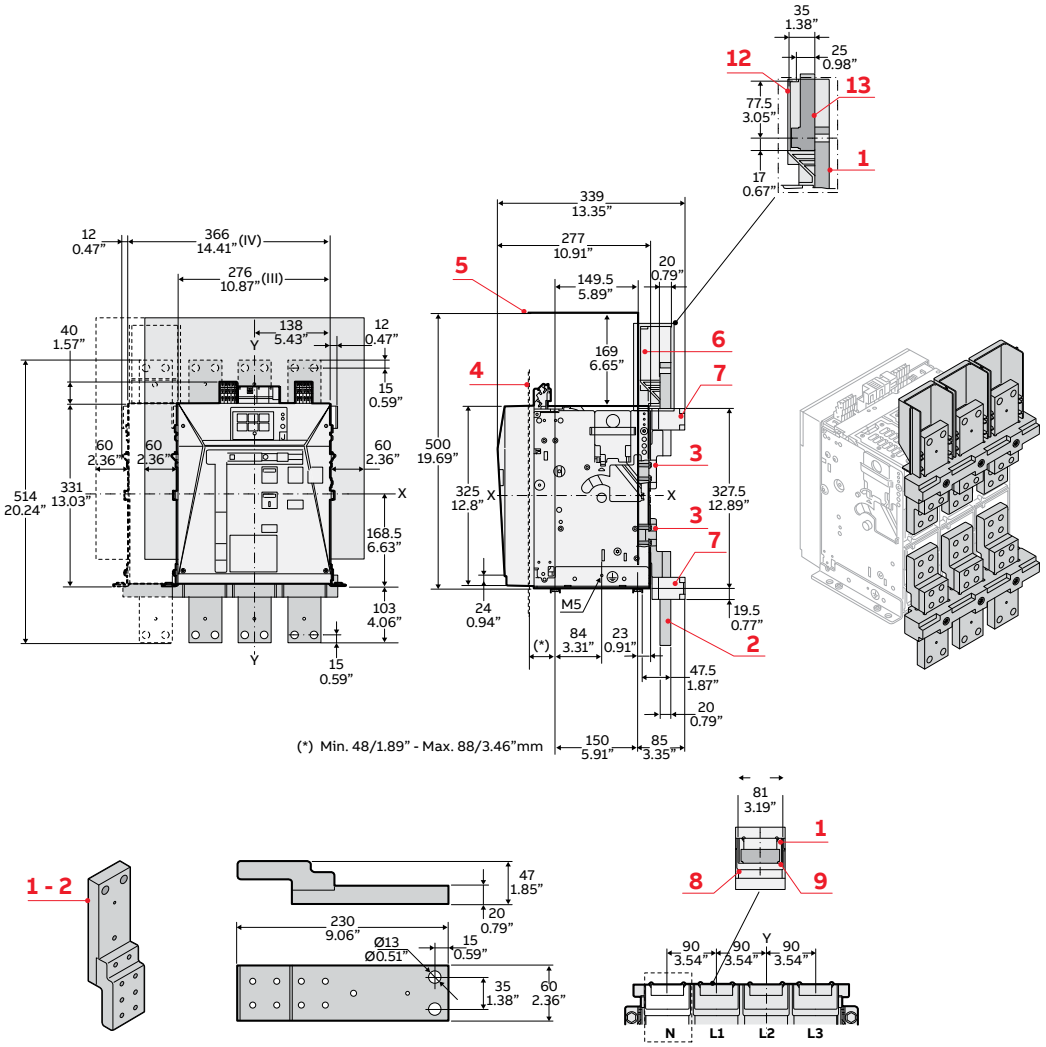
5 Insulating sheet or insulated metallic sheet

6 Metallic sheet

7 Optional insulating protections with blackflange: see 1SDH002310A1238

8 Grounding

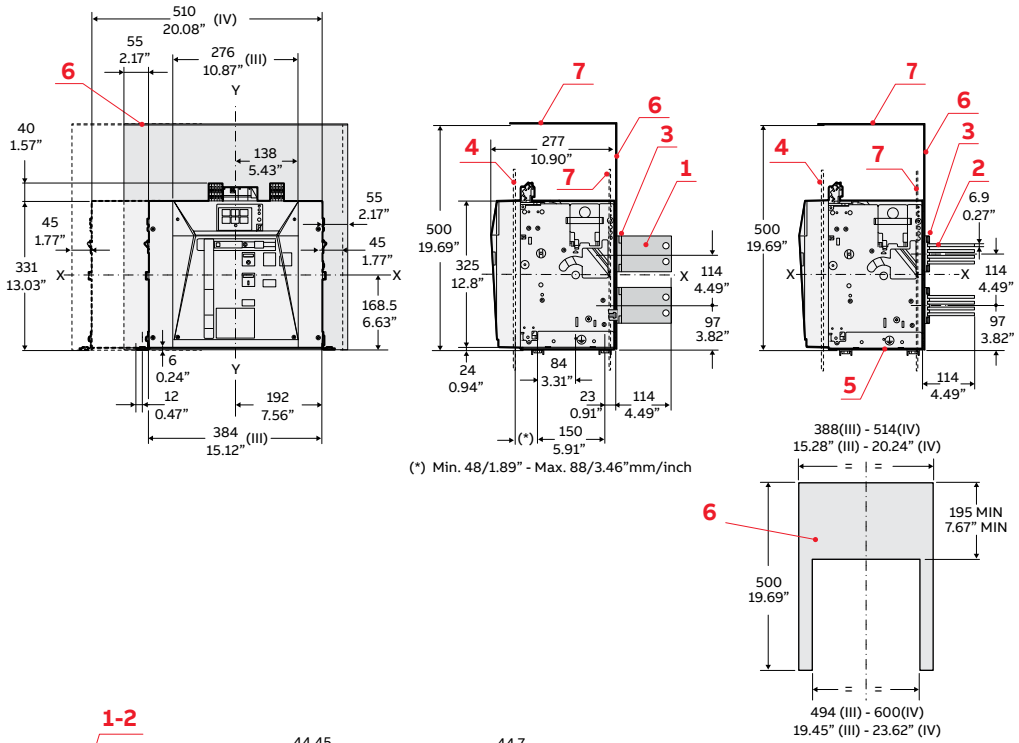
Front terminals – F



1 Front terminal upper
2 Front terminal lower
3 Tightening torque 8.6Nm
4 Door position for dimensions flange: see TN 1SDH002310A1120
5 Metallic sheet
6 Insulating sheet or insulated metallic sheet
7 Crossbeam front terminals
8 Plastic protection
9 Customer busbar and screws (not provided)

FIXED CIRCUIT-BREAKER - E4.3

Orientable rear terminals HR-VR 2500 A



1 Vertical terminal 2500A

2 Horizontal terminal 2500A

3 Tightening torque 20Nm - 177 lb in

4 Door position for dimensions flange: see TN1SDH002310A1120

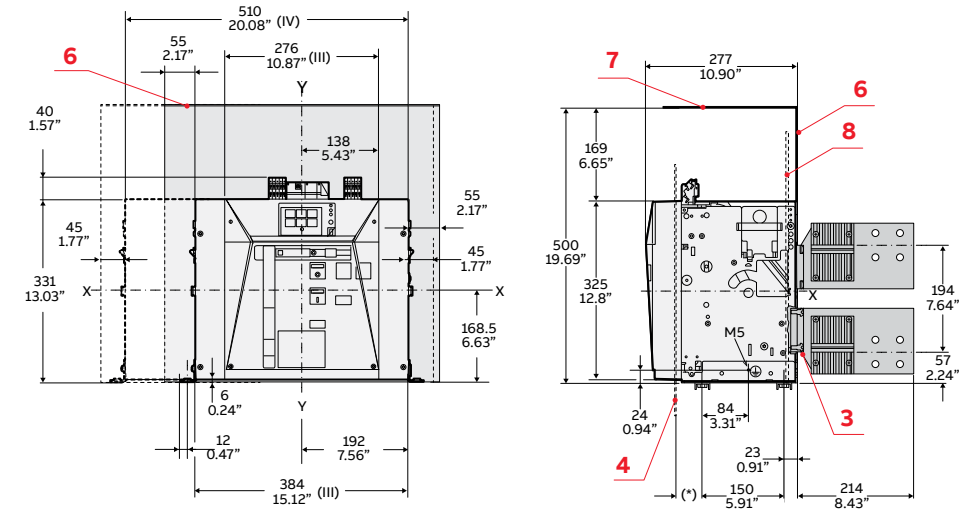
5 Grounding

6 Insulating sheet or insulated metallic sheet

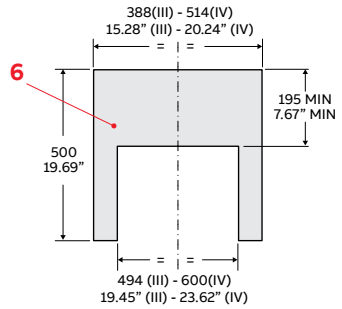
7 Metallic sheet

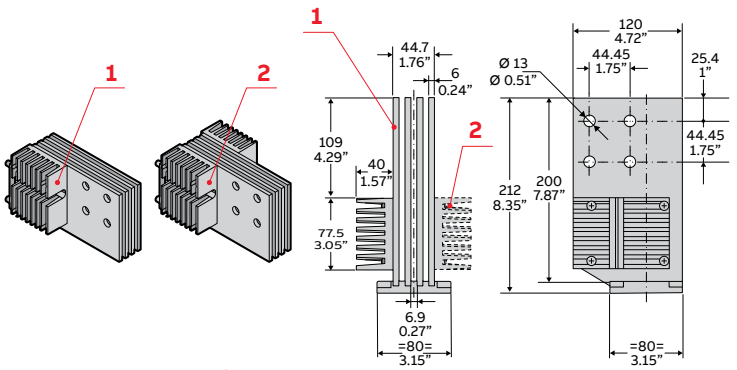
8 Optional insulating protections with blackflange: see 1SDH002310A1238

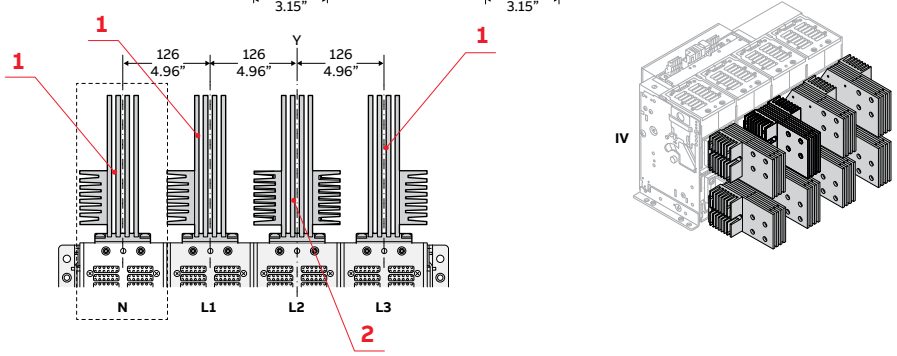
Vertical rear terminals VR 3200 A



(*) Min. 48/1.89" - Max. 88/3.46"mm/inch







1 Lateral vertical terminal 3200A

2 Central vertical terminal 3200A

3 Tightening torque 20Nm - 177 lb in

4 Door position for dimensions flange: see TN1SDH002310A1120

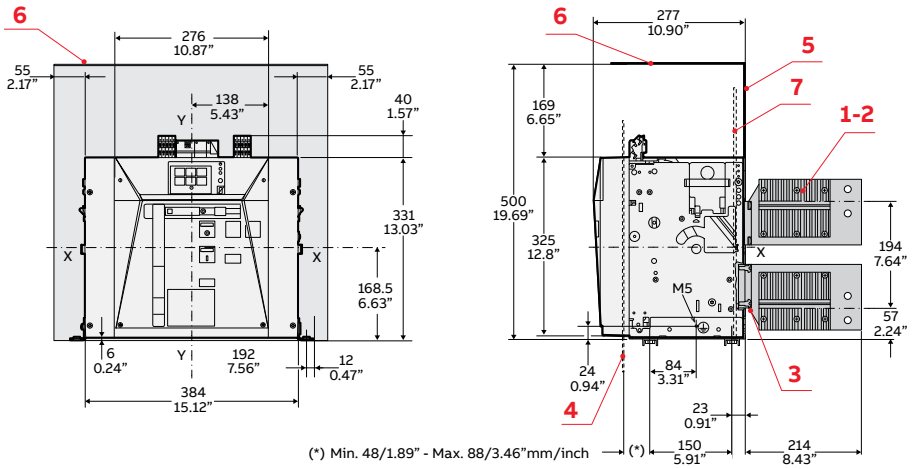
6 Insulating sheet or insulated metallic sheet

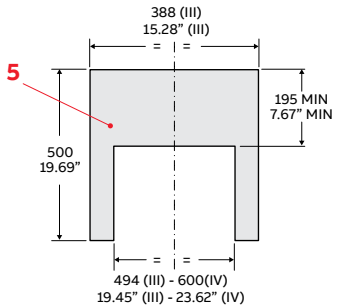
7 Metallic sheet

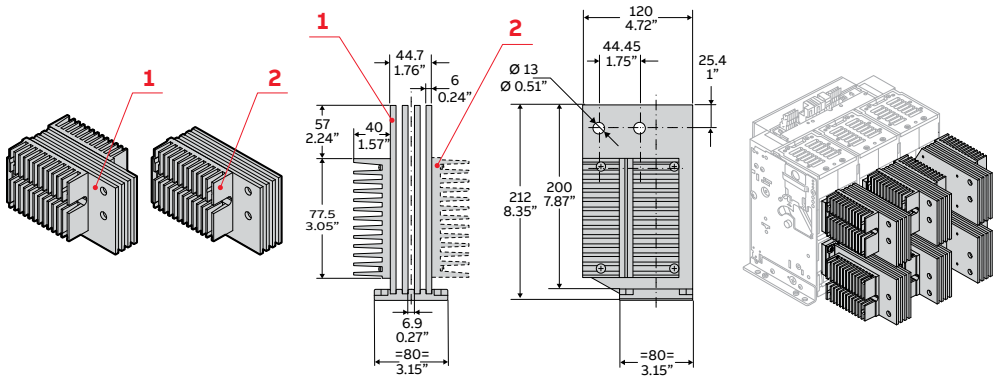
8 Optional insulating protections with blackflange: see 1SDH002310A1238

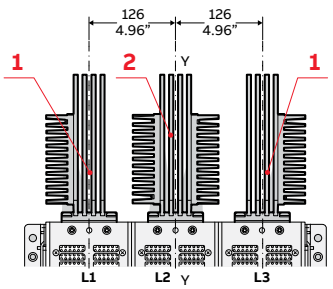
FIXED CIRCUIT-BREAKER - E4.3

Vertical rear terminals VR 3600 A









1 Lateral vertical terminal 3200A

2 Central vertical terminal 3200A

3 Tightening torque 20Nm - 177 lb in

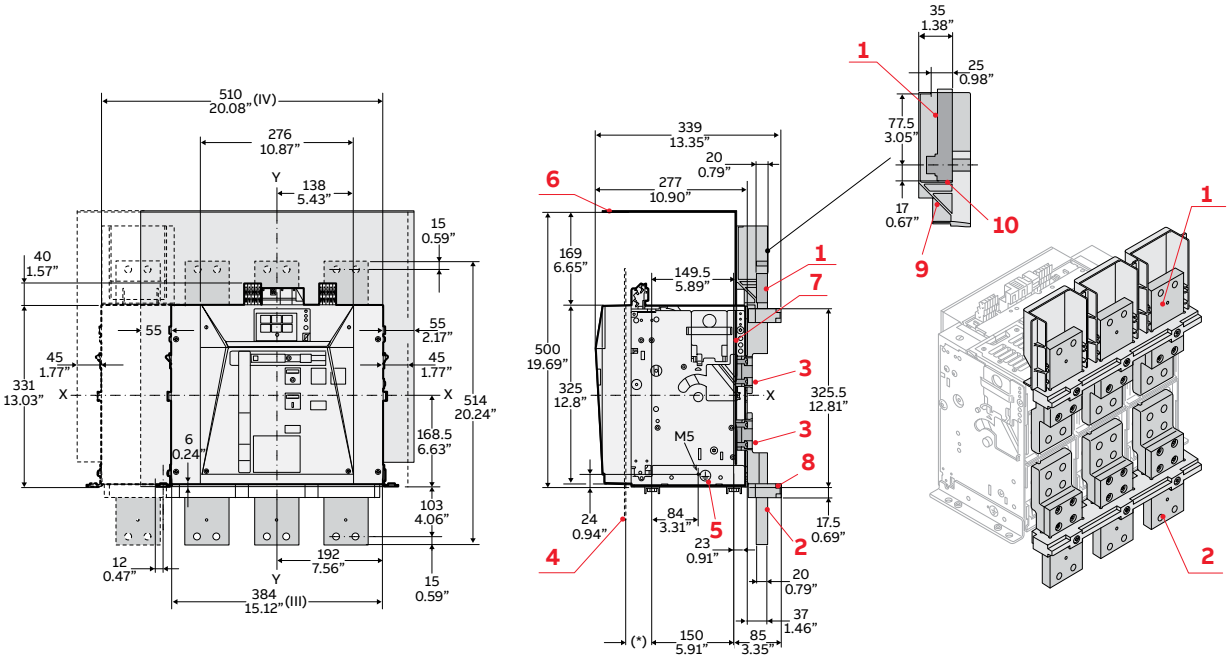
4 Door position for dimensions flange: see TN1SDH002310A1120

5 Insulating sheet or insulated metallic sheet

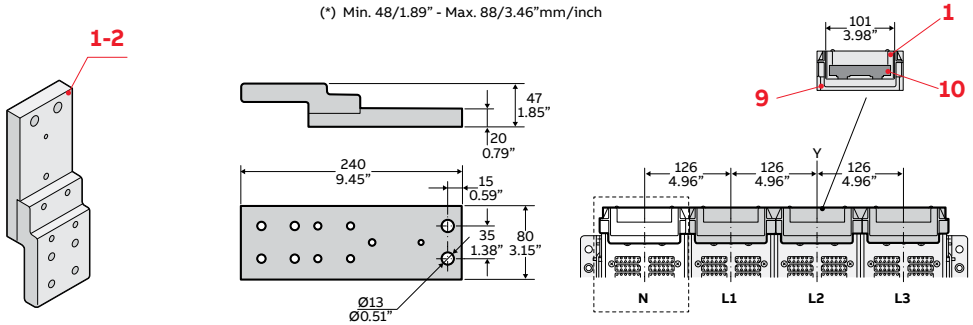
6 Metallic sheet

7 Optional insulating protections with blackflange: see 1SDH002310A1238

Front terminals – F



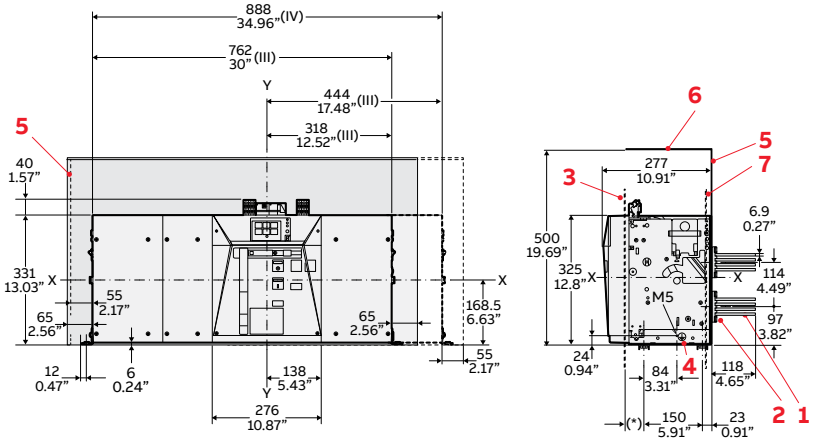
(*) Min. 48/1.89" - Max. 88/3.46"mm/inch



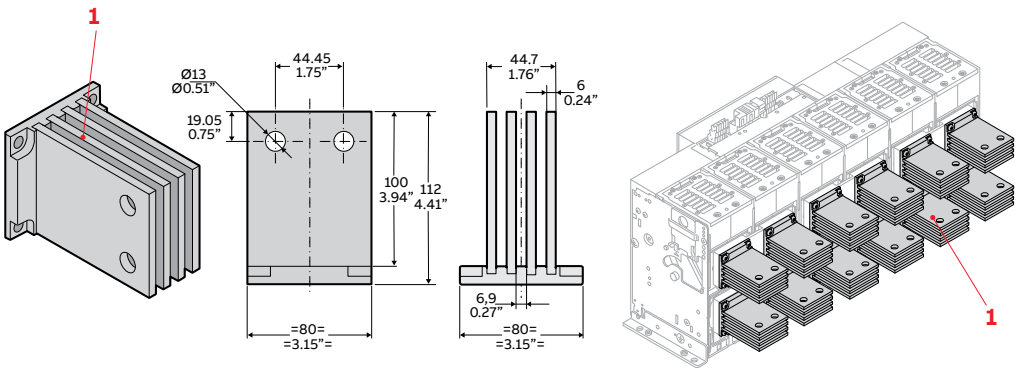
1 Front terminal upper
2 Front terminal lower
3 Tightening torque 20Nm
4 Door position for dimensions flange: see TN 1SDH002310A1120
5 Grounding
6 Insulating sheet or insulated metallic sheet
7 Crossbeam front terminal
8 Plastic protection
9 Customer busbar and screws (not provided)

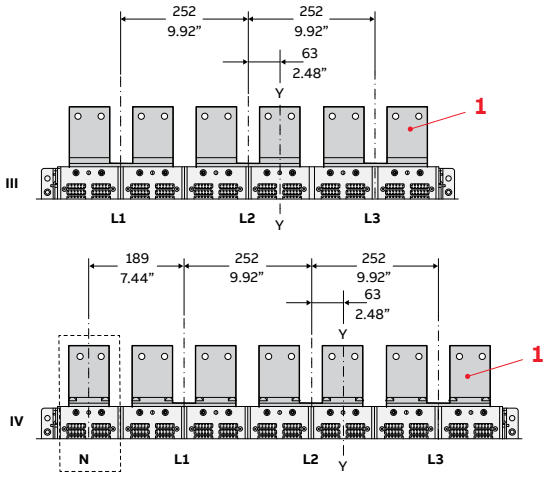
FIXED CIRCUIT-BREAKER - E6.3

Horizontal rear terminals – HR 5000 A



(*) Min. 48/1.89" - Max. 88/3.46"mm/inch





1 Horizontal terminal 5000A

2 Tightening torque 20Nm - 177 lb in

3 Door position for dimensions flange: see TN 1SDH002310A1120

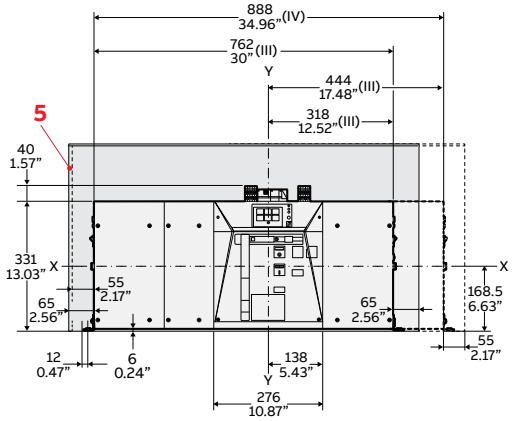
4 Grounding

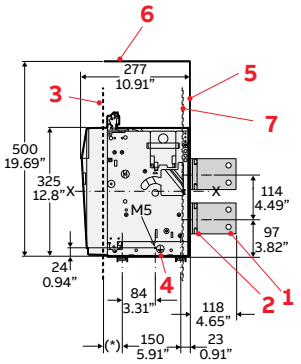
5 Insulating sheet or insulated metallic sheet

6 Metallic sheet

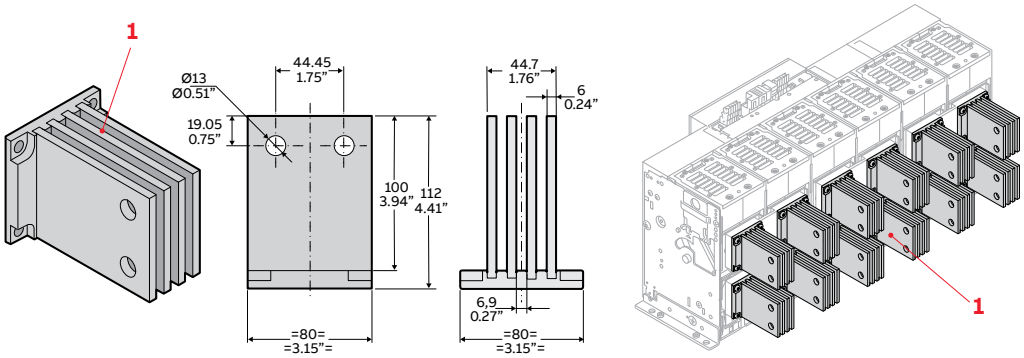
7 Optional insulating protections with blackflange: see 1SDH002310A1238

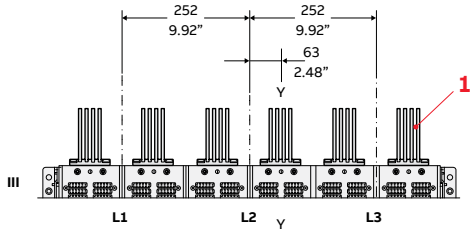
Horizontal rear terminals – VR 5000 A

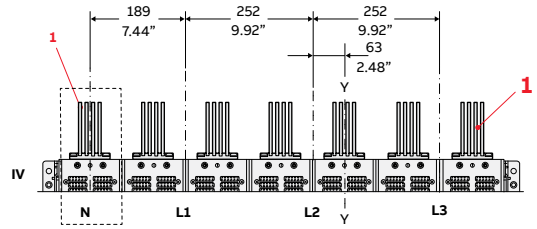




(*) Min. 48/1.89" - Max. 88/3.46"mm/inch







1 Vertical terminal 5000A

2 Tightening torque 20Nm - 177 lb in

3 Door position for dimensions flange: see TN1SDH002310A1120

4 Grounding

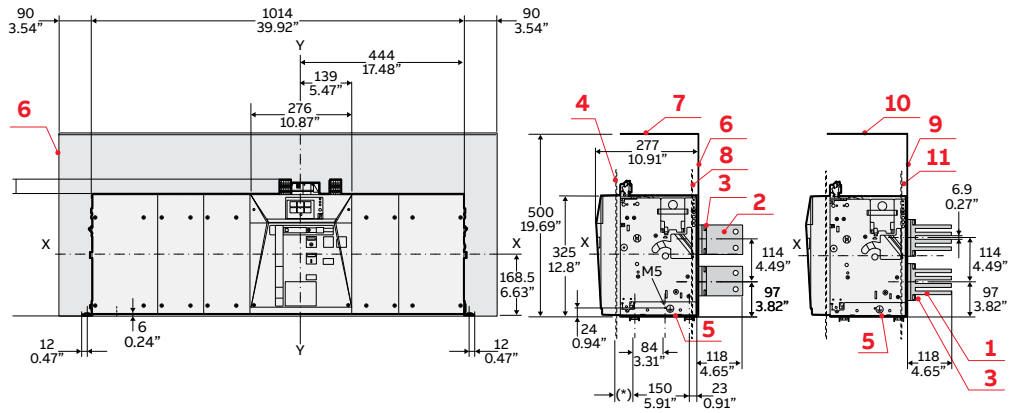
5 Insulating sheet or insulated metallic sheet

6 Metallic sheet

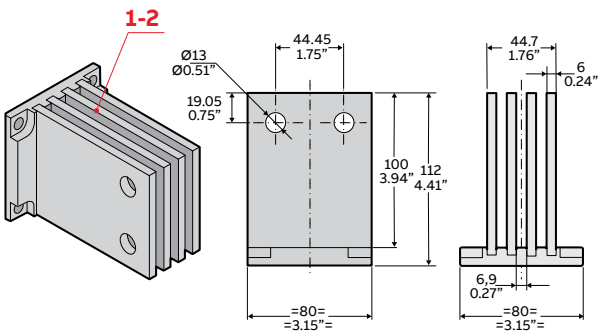
7 Optional insulating protections with blackflange: see 1SDH002310A123

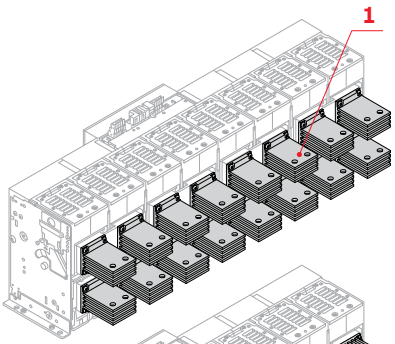
FIXED CIRCUIT-BREAKER - E6.3

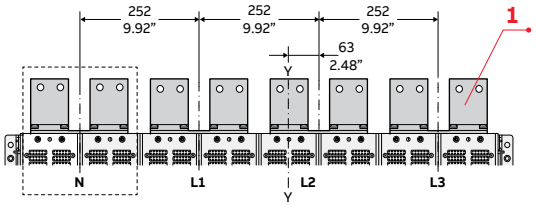
Orientable rear terminals - HR/VR full size 5000 A

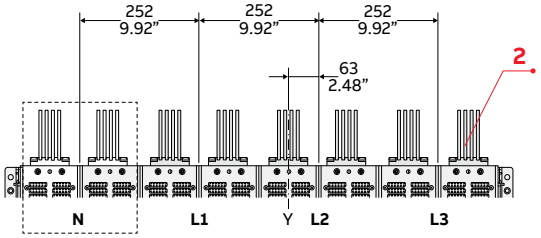


(*) Min. 48/1.89” - Max. 88/3.46”mm/inch









1 Horizontal terminal 5000A

2 Vertical terminal 5000A

3 Tightening torque 20Nm - 177 lb in

4 Door position for dimensions flange: see TN1SDH002310A1120

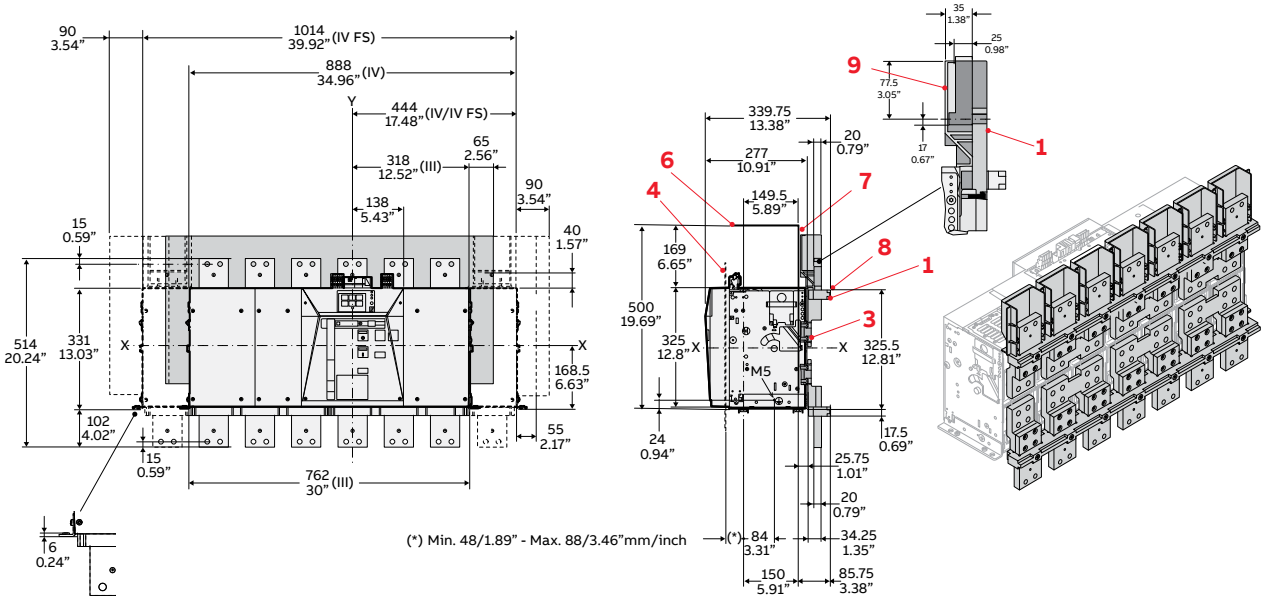
5 Grounding

6 Insulating sheet or insulated metallic sheet

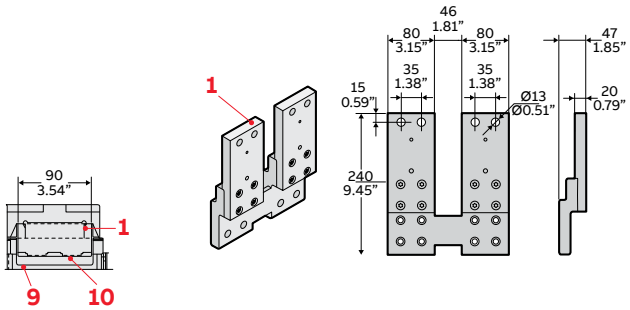
7 Metallic sheet

8 Optional insulating protections with blackflange: see 1SDH002310A1238

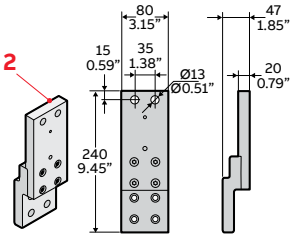
Front terminals – F

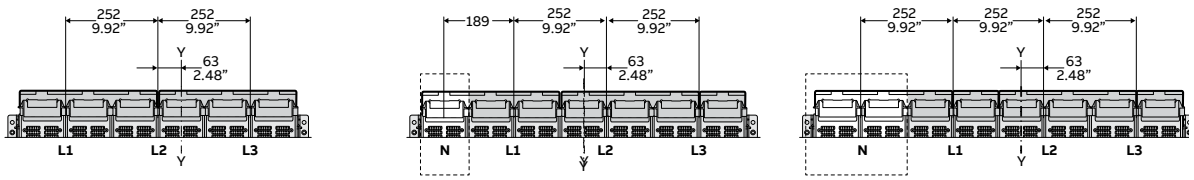


Upper front terminals



Lower front terminals



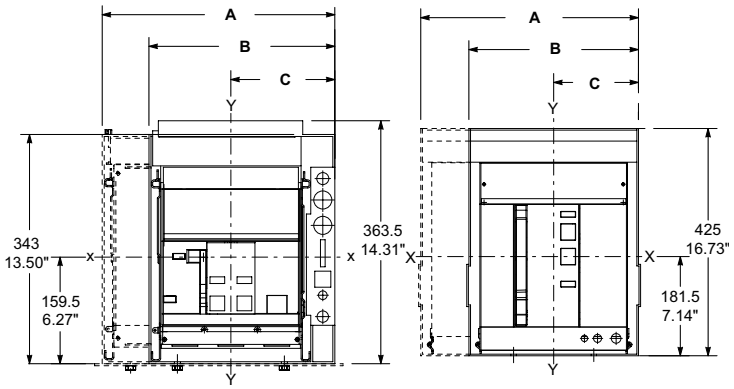


3-pole **4-pole** **4-pole full size**

1 Front terminal upper and lower
2 Single front terminal
3 Tightening torque 20Nm
4 Door position for dimensions flange: see TN 1SDH002310A1120
5 Grounding
6 Metallic sheet
7 Insulating sheet or insulated metallic sheet
8 Crossbeam front terminals
9 Plastic protection
10 Customer busbar and screws (not provided)

DRAWOUT CIRCUIT-BREAKER

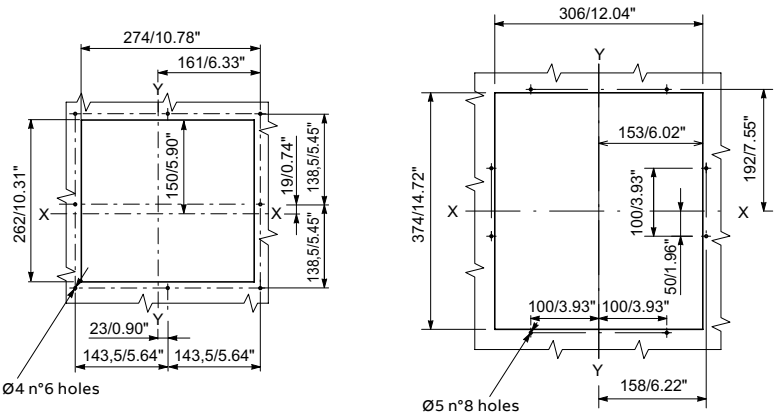
E1.3 **E2.3 - E4.3 - E6.3**



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

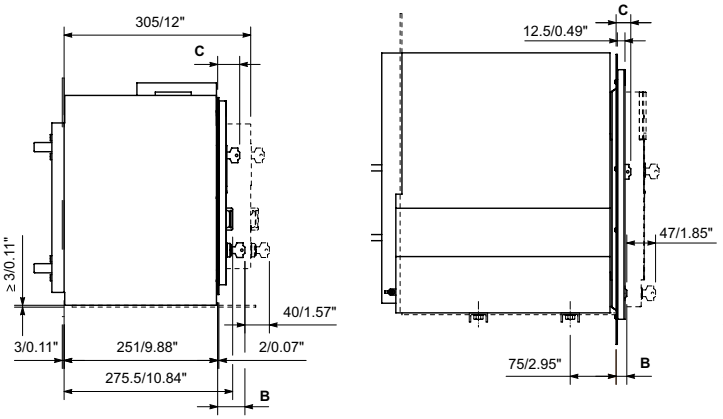
Compartment door drilling

E1.3 **E2.3 - E4.3 - E6.3**



Distance from connected to isolated position

E1.3 **E2.3 - E4.3 - E6.3**

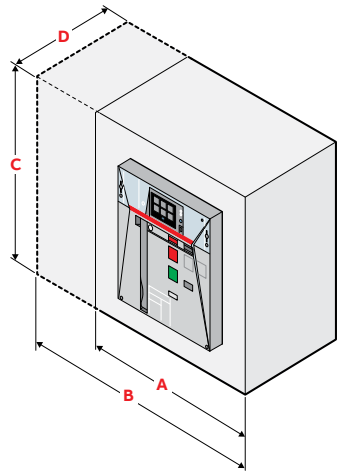


E1.3		Standard	Ronis/ Profalux	Kirk	Castell
A min	[mm/ in]	44.5/ 1.75	55/ 2.16	55/ 2.16	85
A max	[mm/ in]	36/ 1.41	46.5/ 1.83	46.5/ 1.83	76.5

E2.3-E4.3-E6.3		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

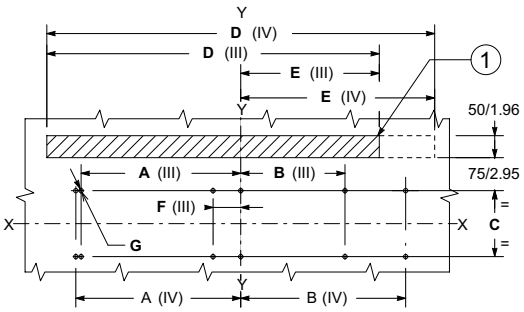
Dimensions of the compartment



	A - Width		C - Height	D - Depth
	3p	4P		
E1.3	280	350	440	252
	11.02	13.77	17.32	9.92
E2.3	400	490	440	355
	15.74	19.29	17.32	13.97
E4.3	500	620	440	355
	19.68	24.41	17.32	13.97
E6.3	900	1020	440	355
	35.43	40.16	17.32	13.97
E6.3/f	-	1200	440	355
	-	47.24	17.32	13.97

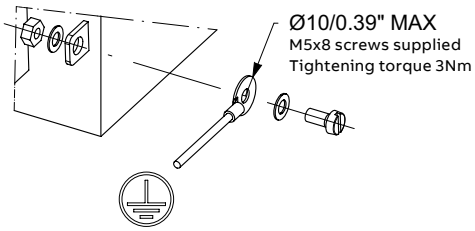
Floor fixing

1 Ventilation drilling on the switchgear

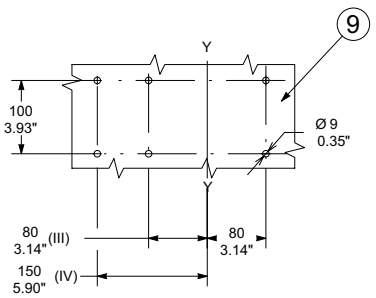


	A		B		C	D		E		F	G
[mm/in]	3p	4p	3p	4p		3p	4p	3p	4p		
E1.3	80/3.14	150/5.90	80/3.14	80/3.14	100/3.93	-	-	-	-	-	9/0.35
E2.3	75/2.95	175/6.88	75/2.95	75/2.95	150/5.90	270/10.62	360/14.17	135/5.31	135/5.31	-	10/0.39
E4.3	100/3.93	225/8.85	100/3.93	100/3.93	150/5.90	378/14.88	504/19.84	189/7.44	189/7.44	-	10/0.39
E6.3	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
E6.3/f	-	425/16.73	-	425/16.73	150/5.90	-	1008/39.68	-	441/17.36	-	10/0.39

Earthing device E2.3 - E4.3 - E6.3

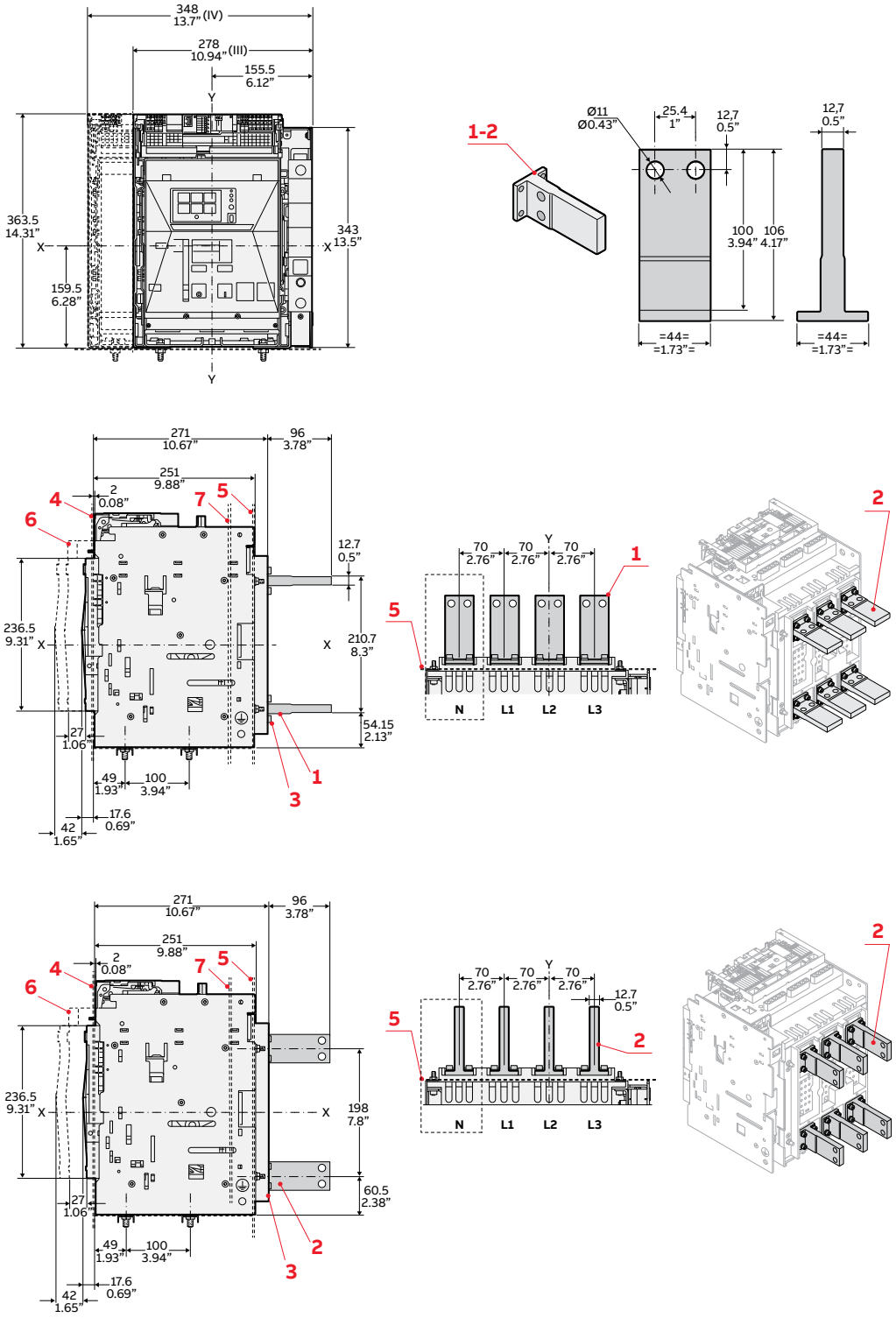


Fixing on support sheet (only for E1.3)



DRAWOUT CIRCUIT-BREAKER - E1.3

Rear orientable terminals - HR/VR



1 Horizontal rear terminal

2 Vertical rear terminal

3 Tightening torque 12Nm - 106 lb in

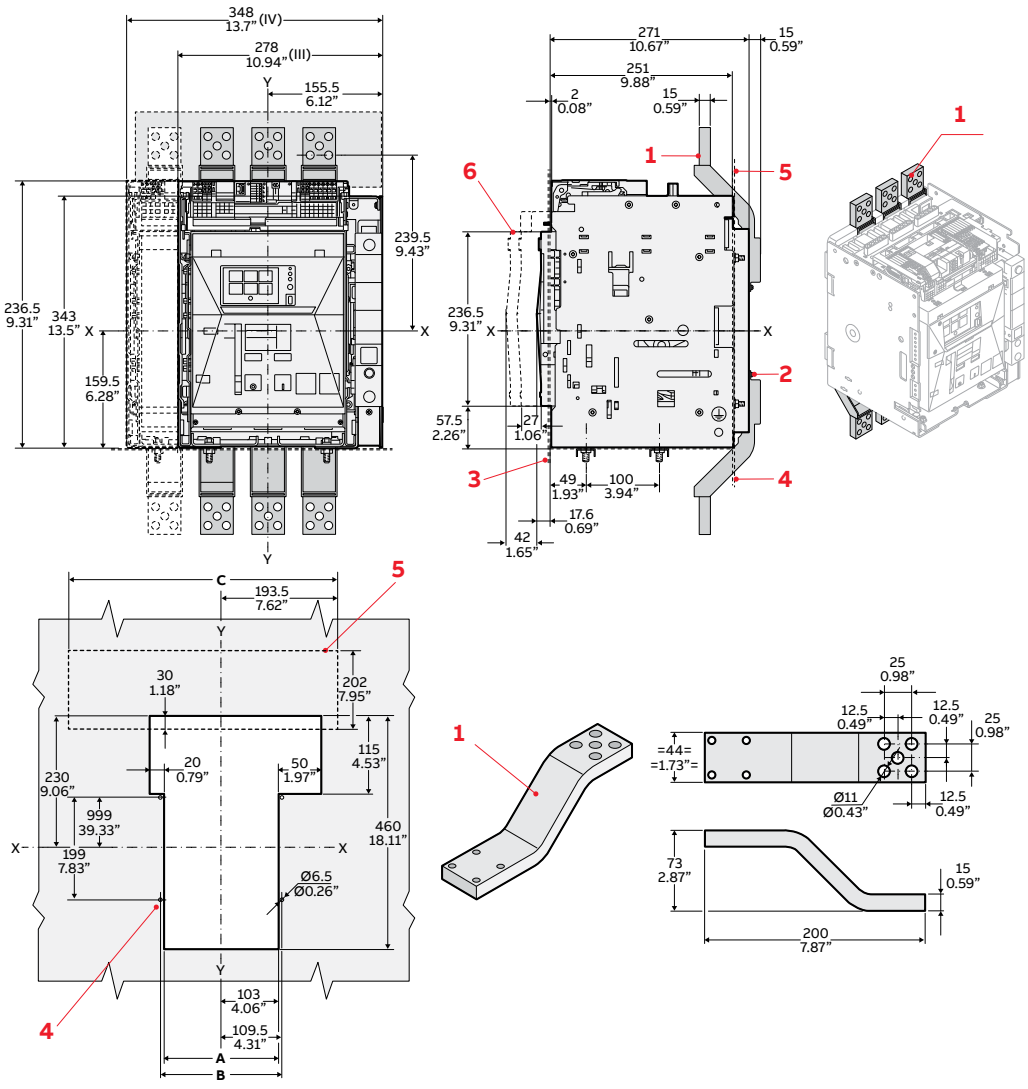
4 Door position for dimensions flange: see TN1SDH002310A1120

5 Rear metallic segregation for rear terminals

6 Connect test disconnected distance

7 Optional insulating protections with blackflange: see 1SDH002310A1238

Extended front terminals – EF



1 Extended front terminal

2 Tightening torque 12Nm

3 Door position for dimensions flange: see TN 1SDH002310A1120

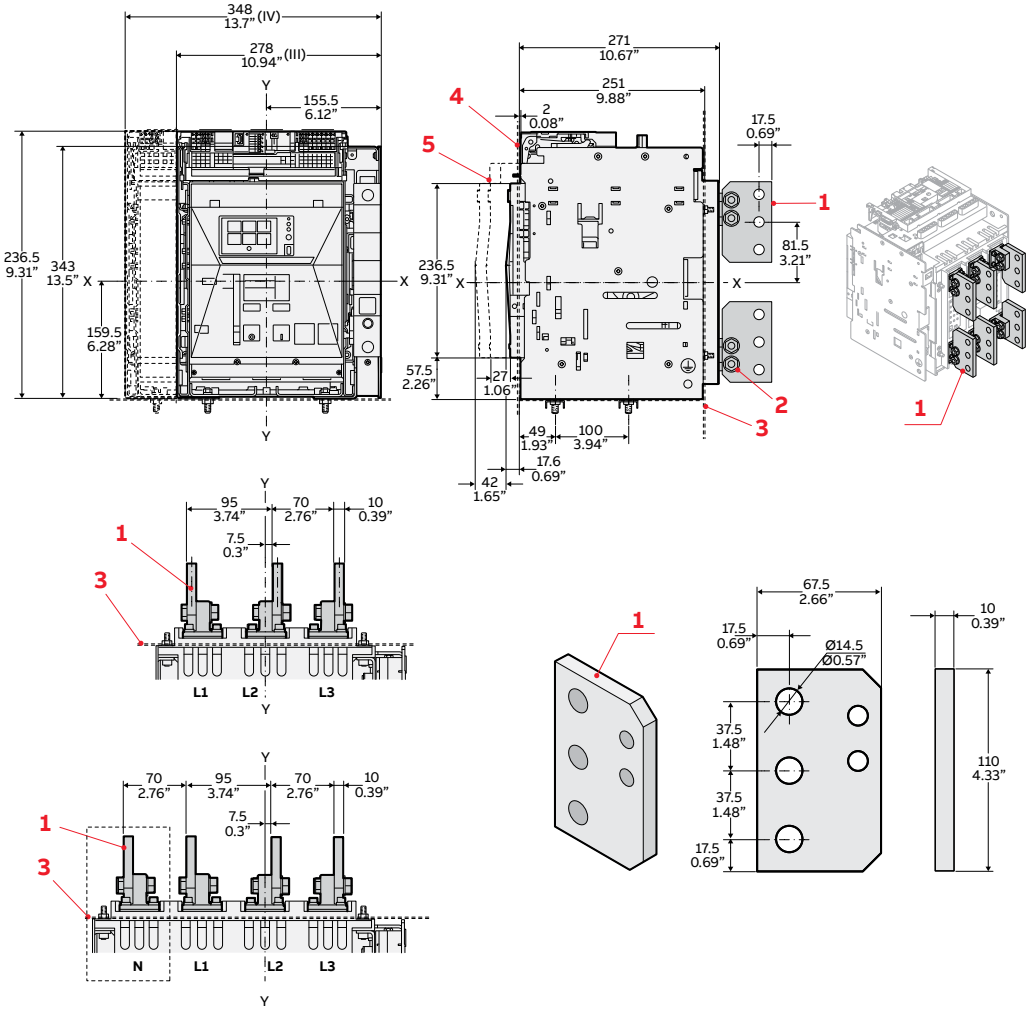
4 Rear segregation for rear terminals

5 Insulating protection

6 Connented, test, disconnected distances

DRAWOUT CIRCUIT-BREAKER - E1.3

Rear terminals for cables – FcCuAl



1 Rear terminal cable

2 Tightening torque 48Nm

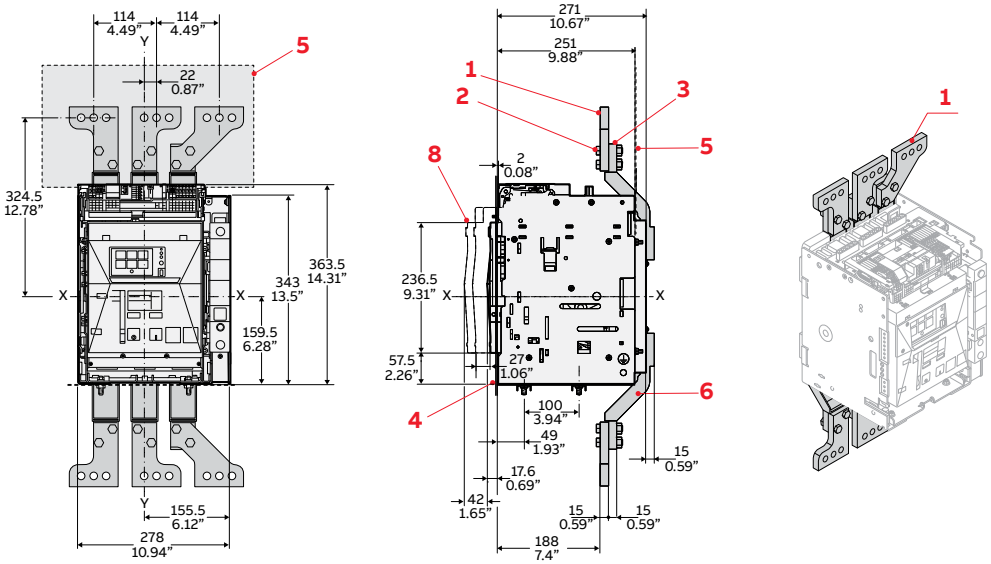
3 Rear segregation for rear terminals

4 Door position for dimensions flange: see TN 1SDH002310A1120

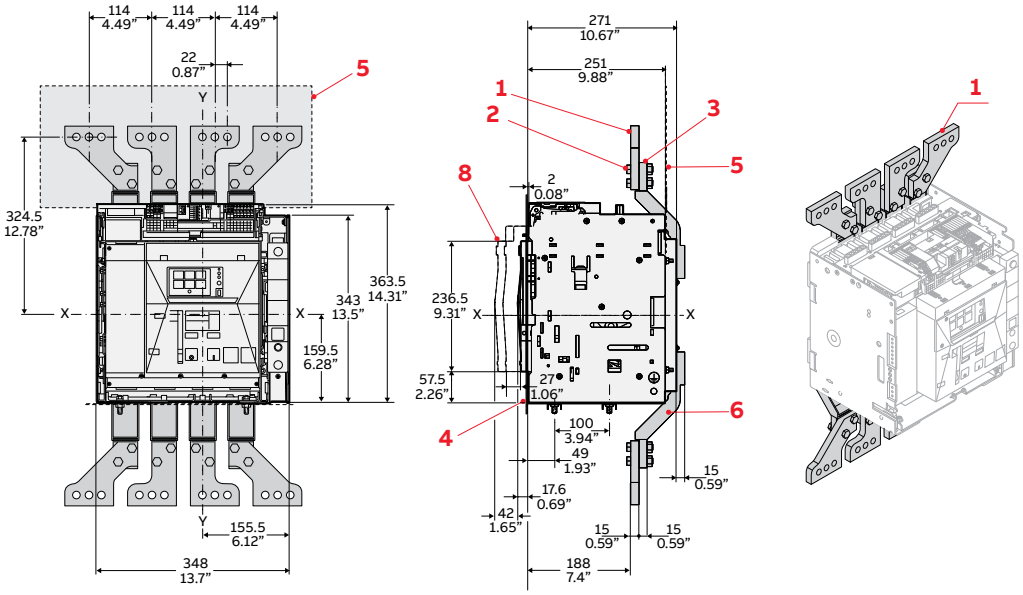
5 Connented, test, disconnected distances

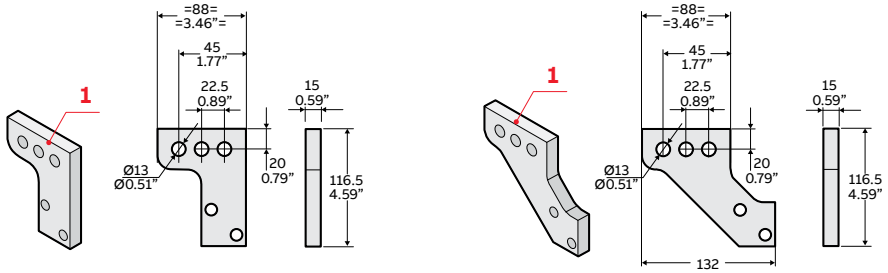
Front spread terminals - ES

3-pole version



4-pole version

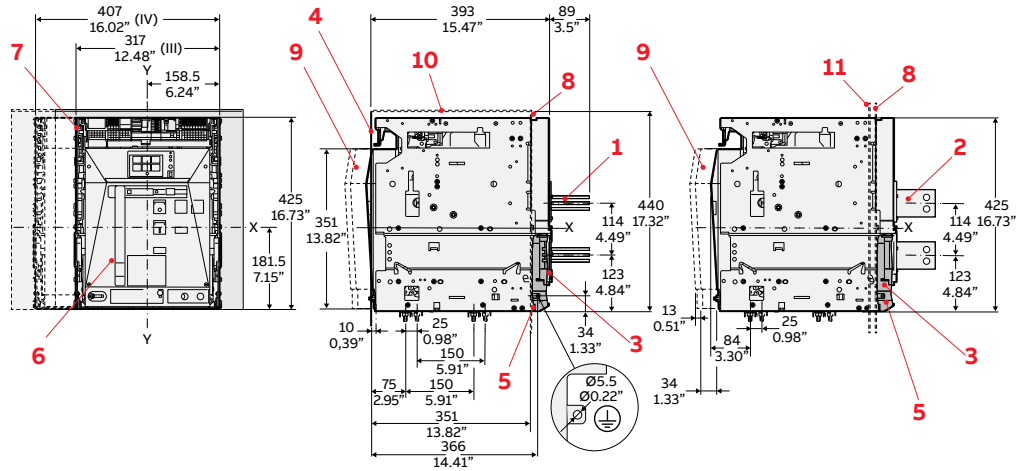


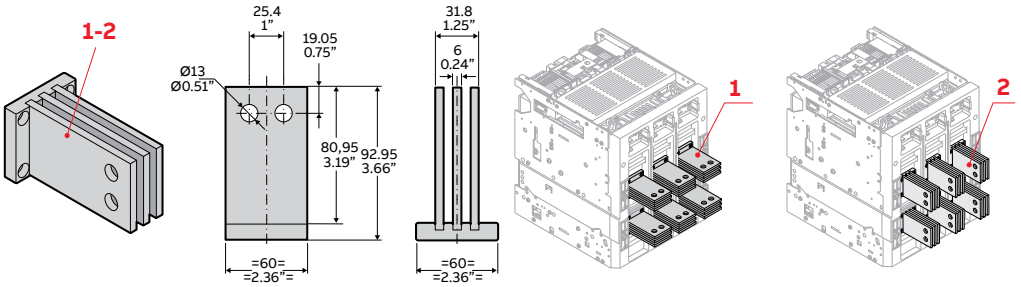


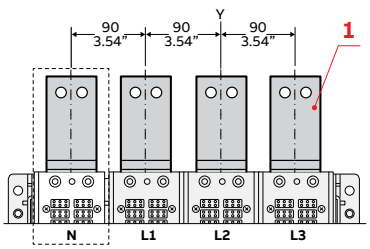
1 Spread terminal
2 Tightening torque 40Nm - 354 lb in
3 Front terminal
4 Door position for dimensions flange: see TN1SDH002310A1120
5 Insulating protection
6 Rear metallic segregation for rear terminals
7 Connect test disconnected distance

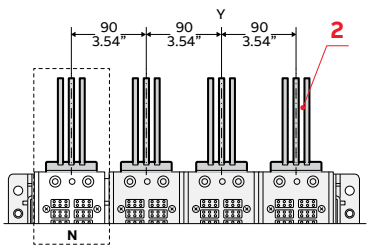
DRAWOUT CIRCUIT-BREAKER - E2.3

Rear orientable terminals HR-VR









1 Horizontal terminal 1600-2000A

2 Vertical terminal 1600-2000A

3 Tightening torque 8.6Nm - 76 lb in

4 Door position for dimensions flange: see TN1SDH002310A1120

5 Grounding

6 Moving part

7 Fixed part

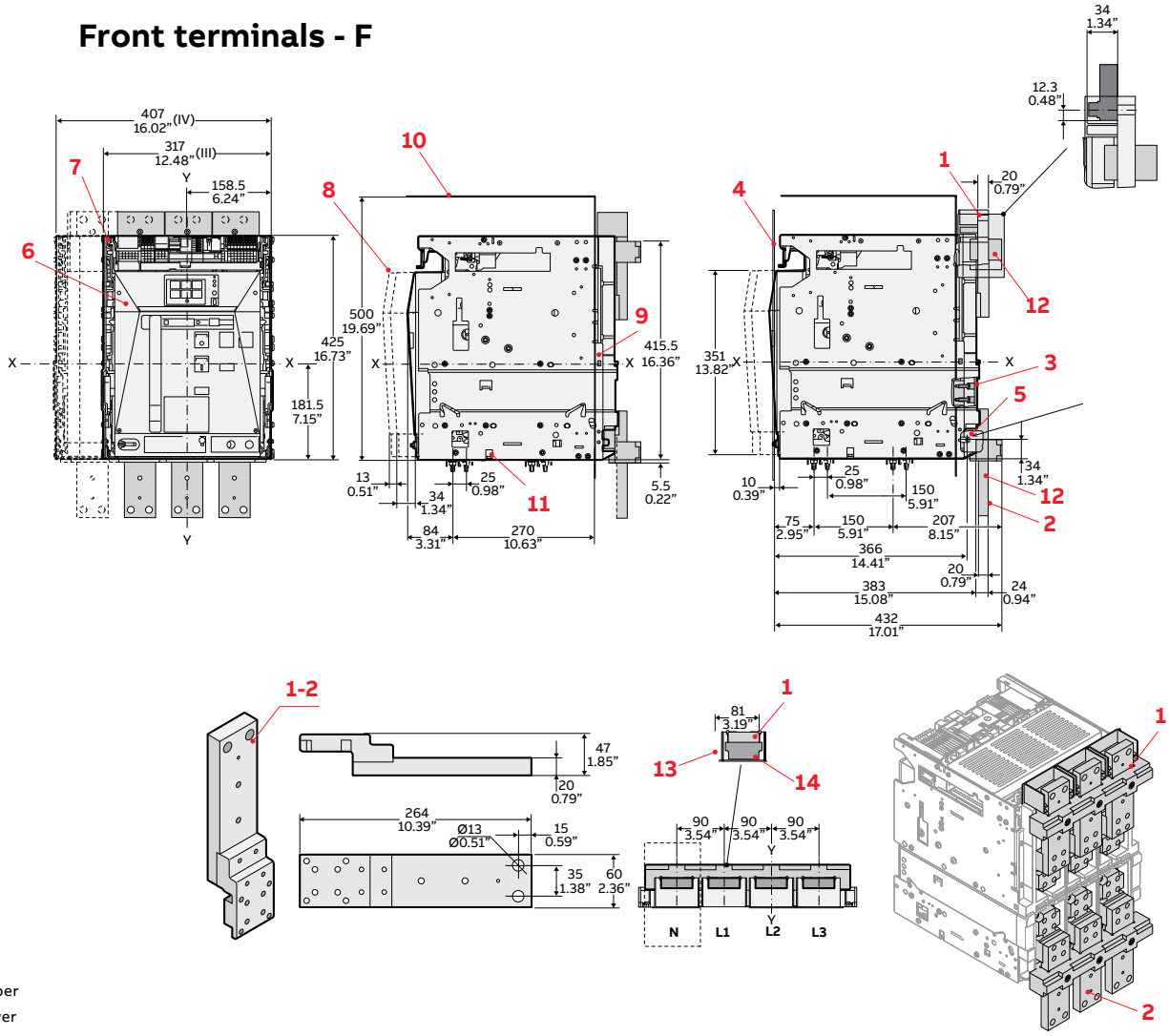
8 Metallic segregation - segr. shape (where envisaged). See ABB accessories catalog (back flange)

9 Connect test disconnected distance

10 Metallic sheet

11 Optional insulating protections with blackflange: see 1SDH002310A1238

Front terminals - F



1 Front terminal upper

2 Front terminal lower

3 Tightening torque 8.6Nm

4 Door position for dimension flange: see TN1SDH002310A1120

5 Grounding

6 Fixed part

7 Moving part

8 Connected, test, disconnected distances

9 Insulating sheet or insulated metallic sheet

10 Roof insulation or insulated metal

11 Ventilation drilling on the switchgear and throught terminals

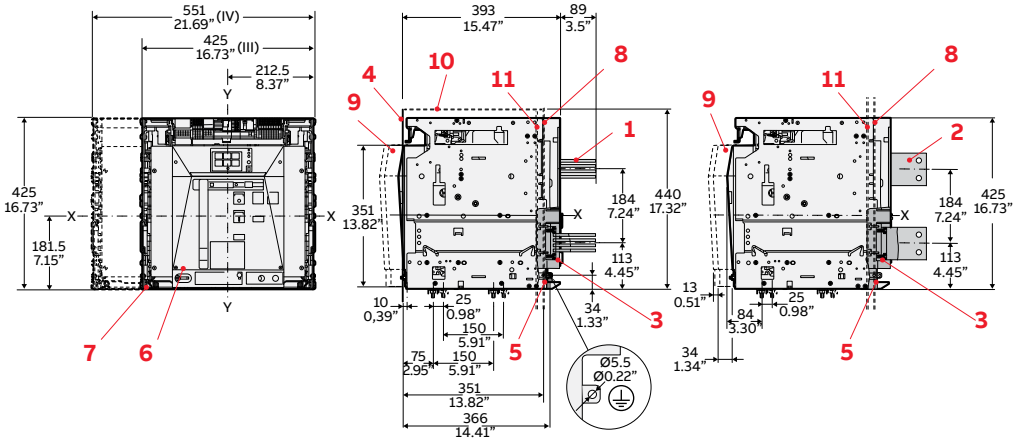
12 Crossbeam front terminal

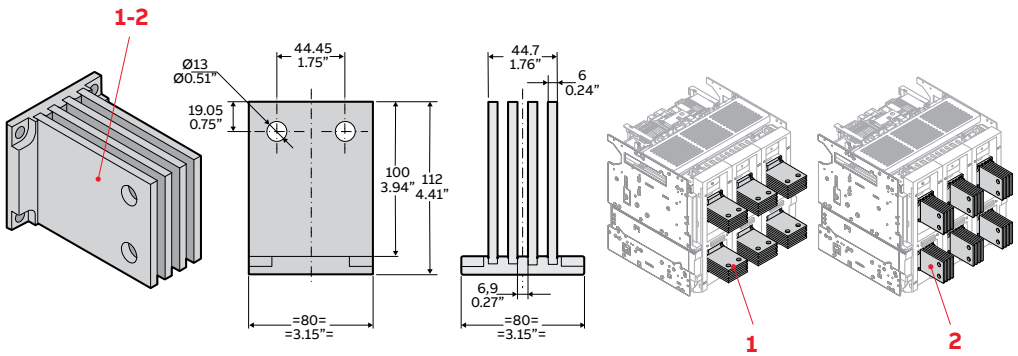
13 Plastic protection

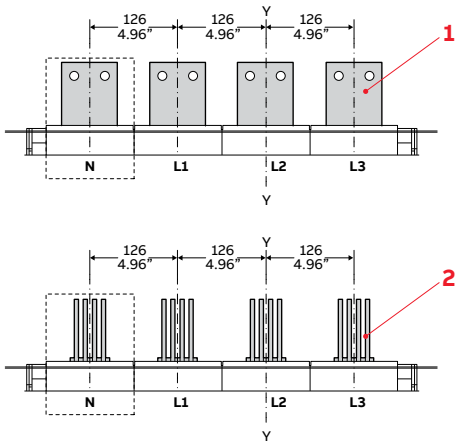
14 Customer busbar and screws (not provided)

DRAWOUT CIRCUIT-BREAKER - E4.3

Rear orientable terminals - HR/VR 2500 A







1 Horizontal terminal 2500A

2 Vertical terminal 2500A

3 Tightening torque 20Nm - 177 lb in

4 Door position for dimensions flange: see TN1SDH002310A1120

5 Grounding

6 Moving part

7 Fixed part

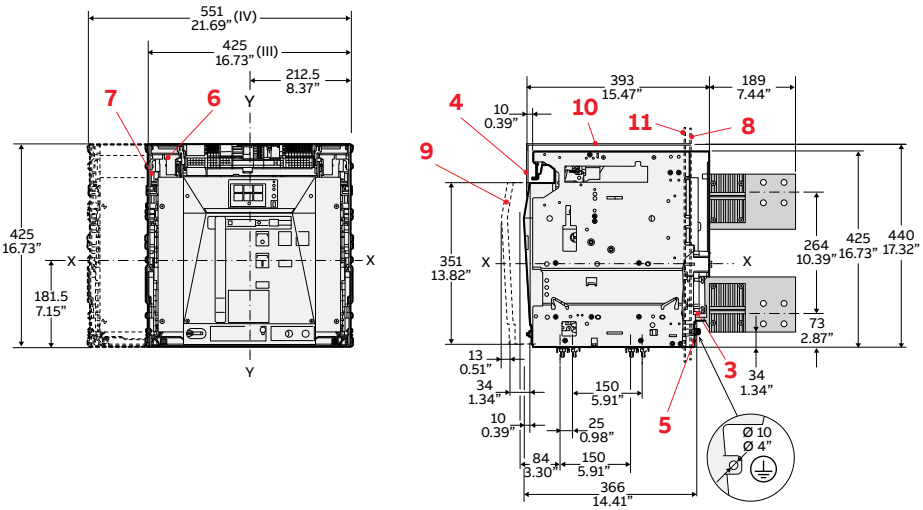
8 Metallic segregation (when applicable)

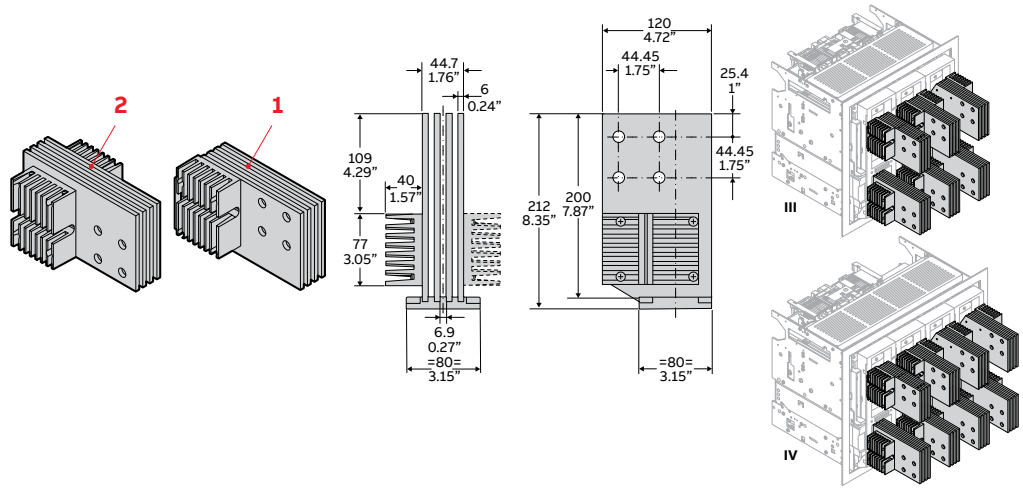
9 Connect test disconnected distance

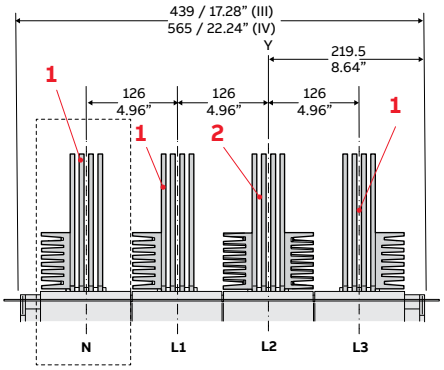
10 Metallic sheet

11 Optional insulating protections with blackflange: see 1SDH002310A1238

Rear terminals - VR 3200 A







1 Lateral vertical terminal 3200A

2 Central vertical terminal 3200A

3 Tightening torque 20Nm - 177 lb in

4 Door position for dimensions flange: see TN1SDH002310A1120

5 Grounding

6 Moving part

7 Fixed part

8 Metallic segregation (when applicable)

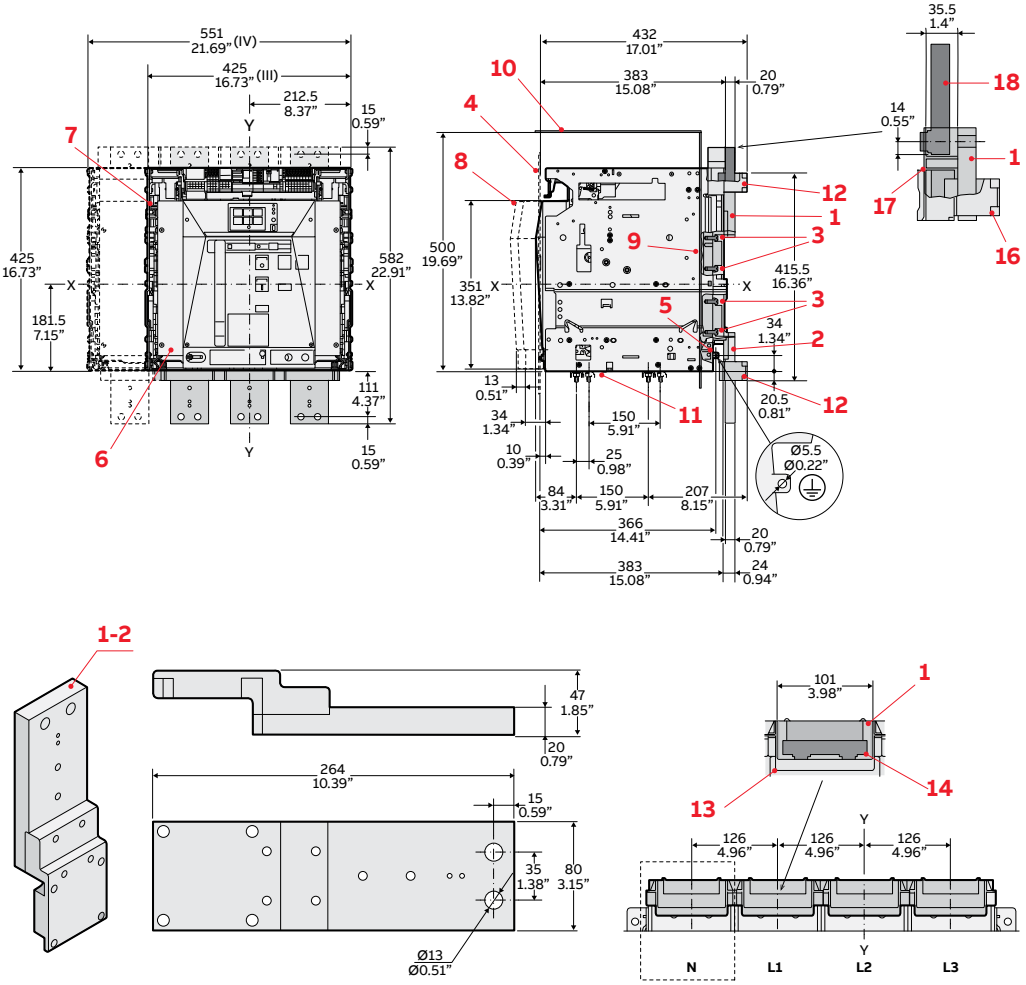
9 Connect test disconnected distance

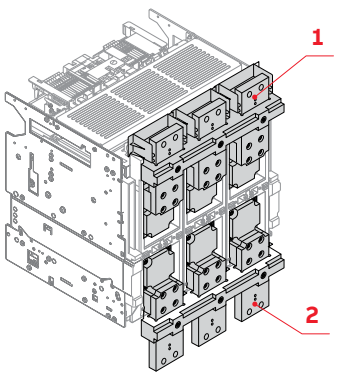
10 Metallic sheet

11 Optional insulating protections with blackflange: see 1SDH002310A1238

DRAWOUT CIRCUIT-BREAKER - E4.3

Front terminals – F

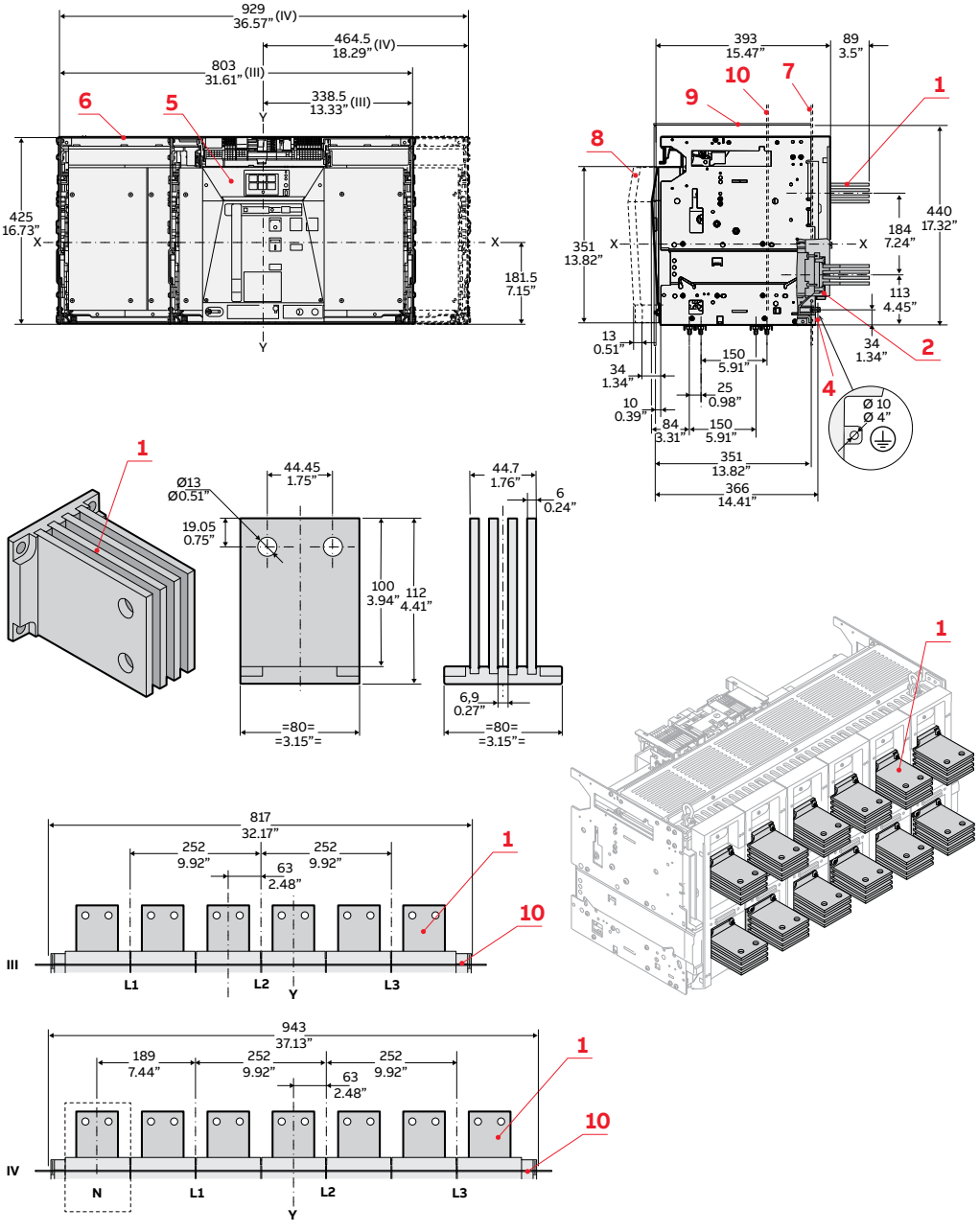




1 Front terminal upper
2 Front terminal lower
3 Tightening torque 20Nm
4 For dimension flange: see TN 1SDH002310A1120
5 Grounding
6 Moving part
7 Fixed part
8 Connected test discommected distances
9 Insulating sheet or insulated metallic sheet
10 Roof insulation or insulated metal
11 Fixing plate
12 Crossbeam front terminal
13 Plastic protection
14 Customer busbar and screws (not provided)

DRAWOUT CIRCUIT-BREAKER - E6.3

Rear terminals – HR



1 Horizontal terminal 5000A

2 Tightening torque 20Nm - 177 lb in

3 Door position for dimensions flange: see TN1SDH002310A1120

4 Grounding

5 Moving part

6 Fixed part

7 Metallic segregation - segr. shape (where envisaged). See ABB accessories catalog (back flange)

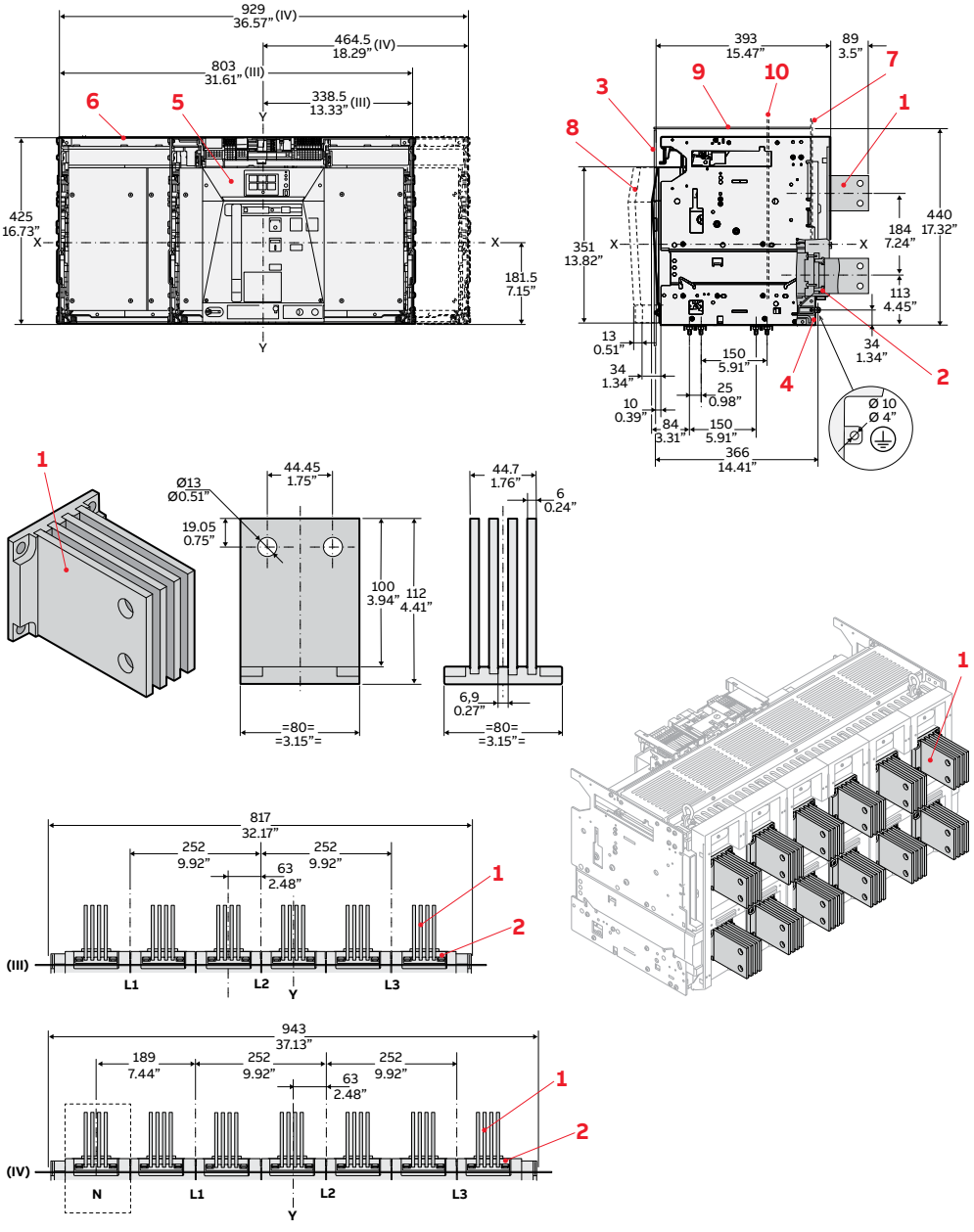
8 Connect test disconnected distance

9 Metallic sheet

10 Optional insulating protections with blackflange: see 1SDH002310A1238

DRAWOUT CIRCUIT-BREAKER - E6.3

Vertical rear terminals – VR



1 Vertical terminal 5000A

2 Tightening torque 20Nm - 177 lb in

3 Door position for dimensions flange: see TN1SDH002310A1120

4 Grounding

5 Moving part

6 Fixed part

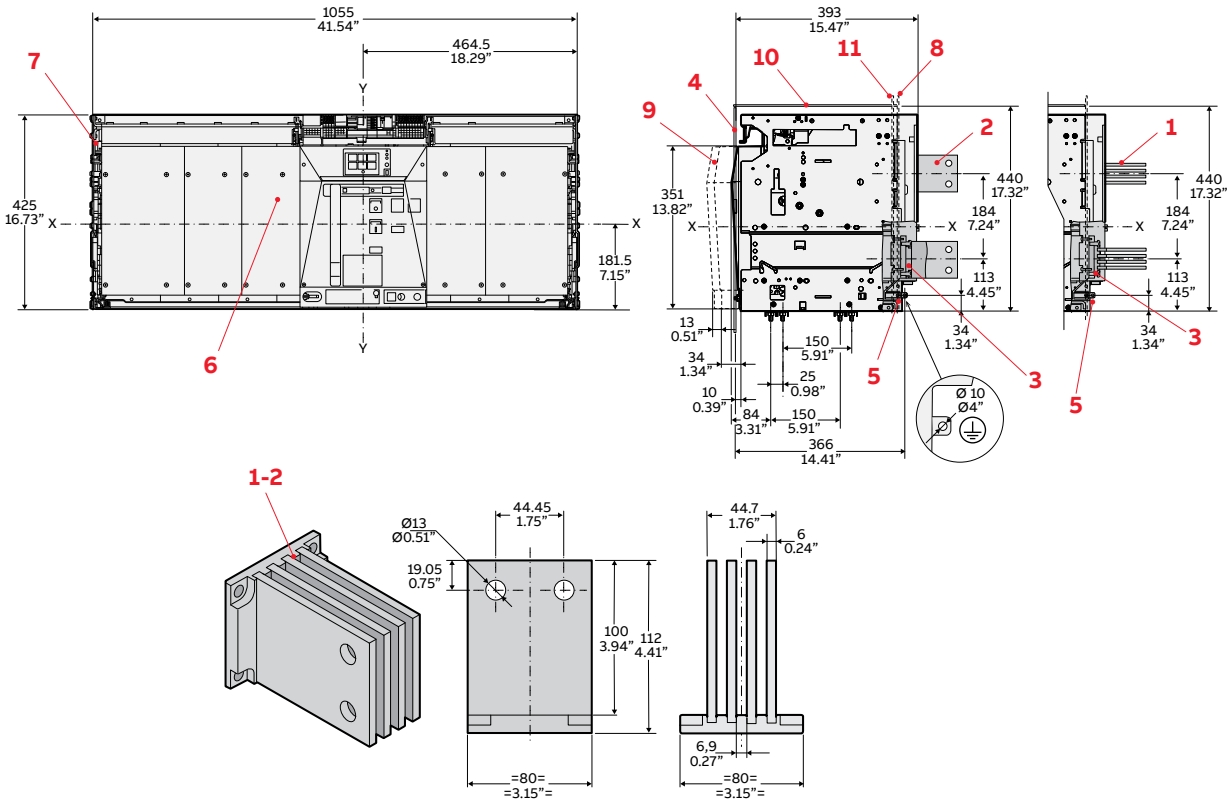
7 Metallic segregation - segr. shape (where envisaged). See ABB accessiories catalog (back flange)

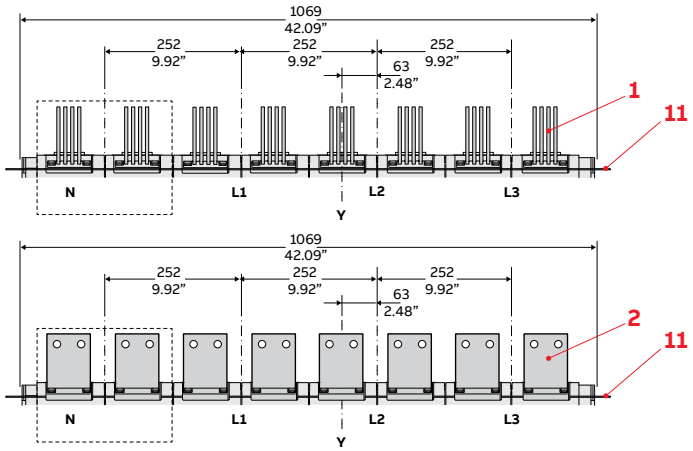
8 Connect test disconnected distance

9 Metallic sheet

10 Optional insulating protections with blackflange: see 1SDH002310A1238

Rear orientable terminals - HR/VR full size





1 Horizontal terminal 5000A

2 Vertical terminal 5000A

3 Tightening torque 20Nm - 177 lb in

4 Door position for dimensions flange: see TN1SDH002310A1120

5 Grounding

6 Moving part

7 Fixed part

8 Metallic segregation - segr. shape (where envisaged). See ABB accessories catalog (back flange)

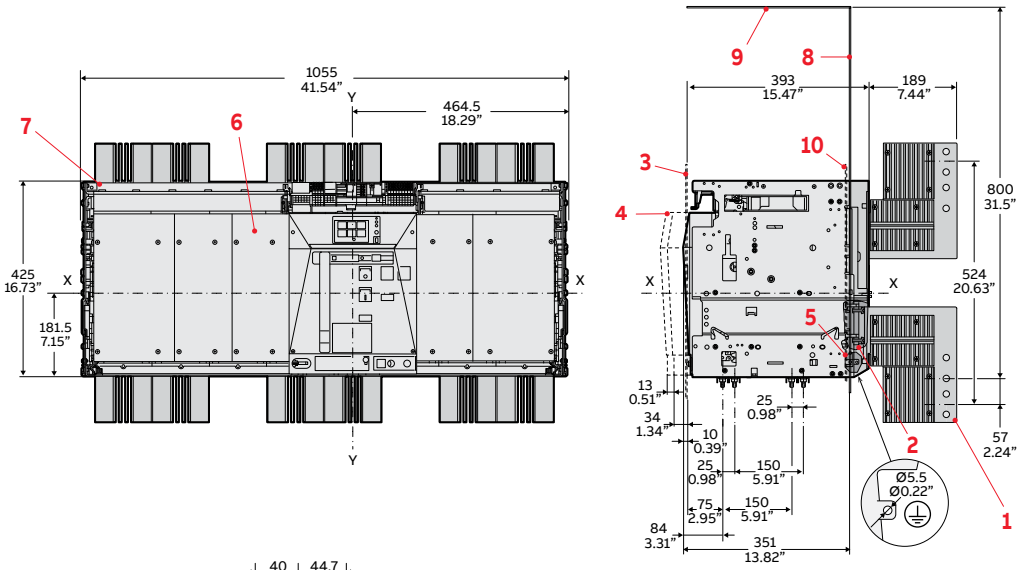
9 Connect test disconnected distance

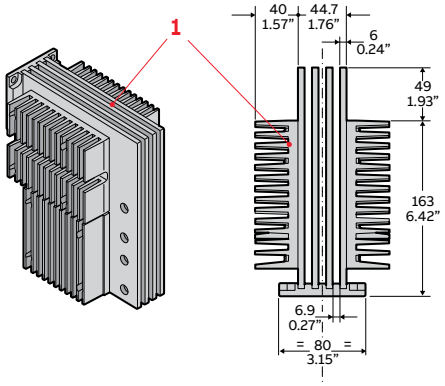
10 Metallic sheet

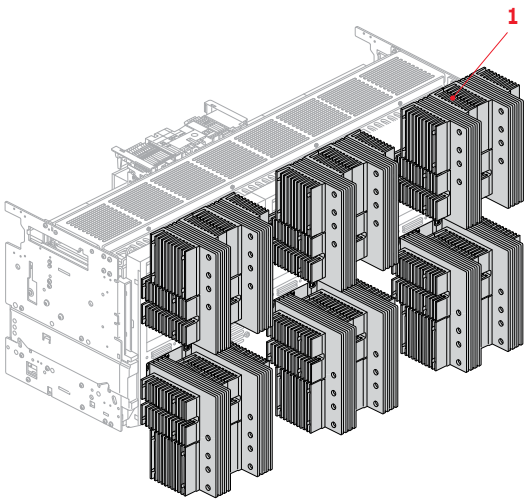
11 Optional insulating protections with blackflange: see 1SDH002310A1238

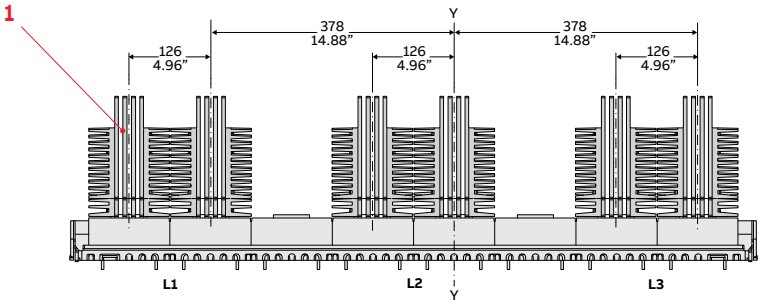
DRAWOUT CIRCUIT-BREAKER - E6.3

Vertical rear terminals – VR 6000 A









1 Vertical terminal 6000A

2 Tightening torque 20Nm - 177 lb in

3 Door position for dimensions flange: see TN1SDH002310A1120

4 Connected, test, disconnected distances

5 Grounding

6 Moving part

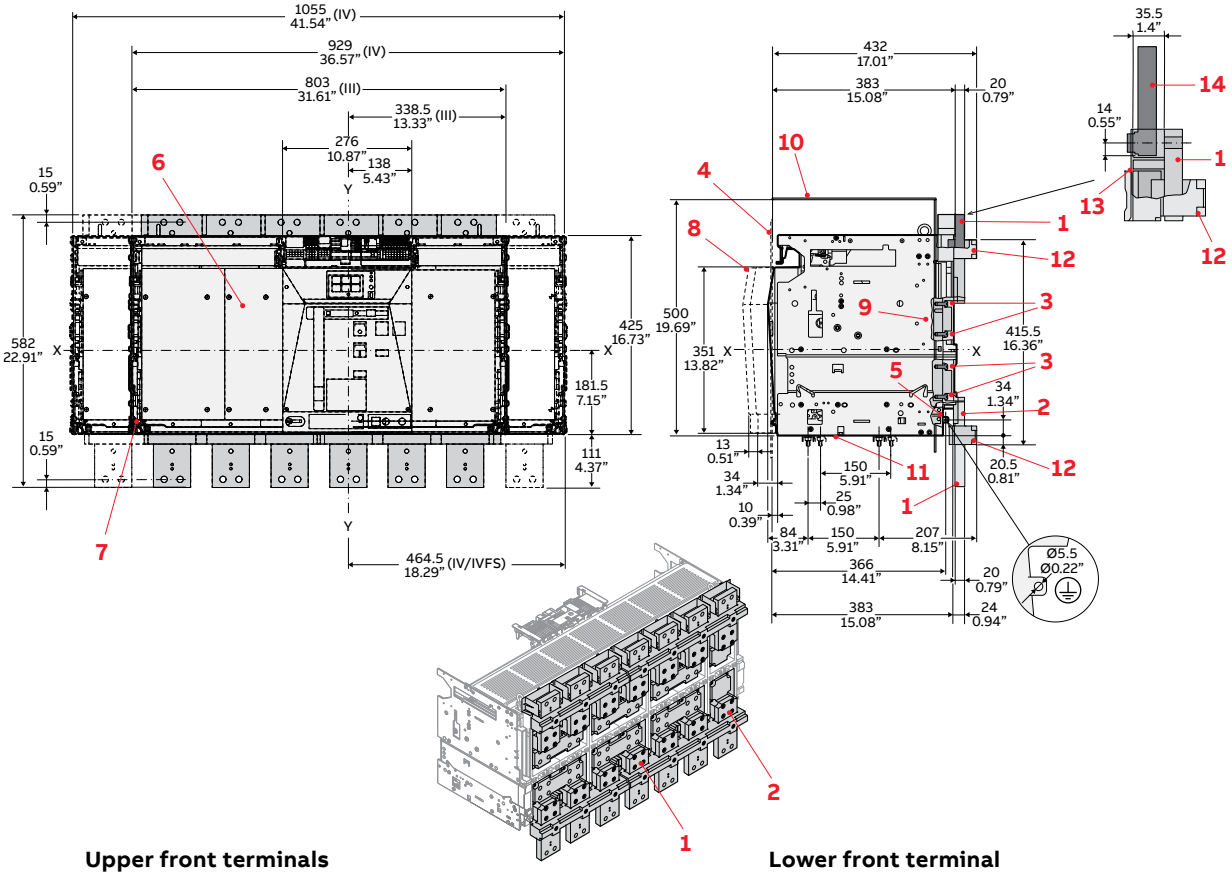
7 Fixed part

8 Insulating sheet or insulated metallic sheet

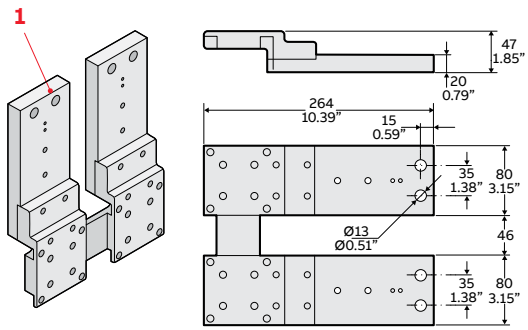
9 Metallic sheet

10 Optional insulating protections with blackflange: see 1SDH002310A1238

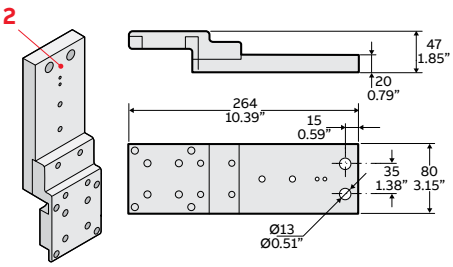
Front terminals – F

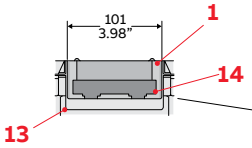


Upper front terminals

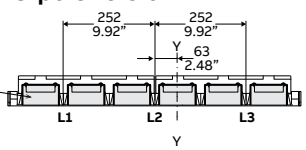


Lower front terminal

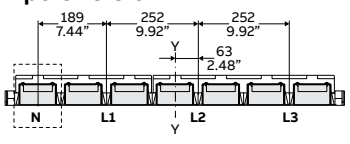




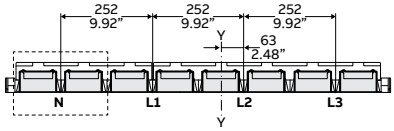
3-pole version



4-pole version



4-pole full size



1 Front terminal upper and lower
2 Single front terminal
3 Tightening torque 20Nm
4 For dimension flange: see TN 1SDH002310A1120
5 Grounding
6 Moving part
7 Fixed part
8 Connected, test, disconnected distances
9 Insulating sheet or insulated metallic sheet
10 Fixed part
11 Fixing plate
12 Crossbeam front terminal
13 Plastic protection
14 Customer busbar and screws (not provided)

07

WIRING DIAGRAMS

7/2 **Reading information**

7/5 **Circuit-breakers**

7/6 **Wirings rotation on terminal boards**

7/7 **Terminal box E1.3**

7/8 **Terminal box E2.3 - E4.3 - E6.3**

7/9 **Electrical accessories**

READING INFORMATION

Circuit-breakers

Operating state shown

The circuit diagram is for the following conditions:

- drawout version circuit-breaker, open and racked-in
- circuits de-energised
- releases not tripped
- motor operating mechanism with springs discharged.

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
A5	= Modules applications
A6	= Ekip DIN Rail cartridge applications
A13	= Ekip Signalling 10K type signalling unit, outside the circuit-breaker
A19	= Ekip DIN Rail cartridge
AF1÷3	= Inputs for ARC-FLASH protection system
BUS1	= Serial interface with external bus
D	= Electronic time-delay device for undervoltage release coil, outside the circuit-breaker
GZI(DBI)	= Zone selectivity input for G protection or for input in “reverse” direction for D protection
GZo(DBo)	= Zone selectivity output for G protection or for output in “reverse” direction for D protection
I 01÷32	= Programmable digital inputs
I 41÷54	= Programmable analogue inputs for temperature sensors
K51	= Electronic overcurrent protection trip unit type Ekip Aware
K51/COM	= Communication module
K51/AF1-2	= Modules for ARC-FLASH protection system
K51/MEAS	= Measurement module
K51/SIGN	= Signalling module
K51/SUPPLY	= Auxiliary supply module (110÷240VAC 24÷240VDC)
K51/SYNC	= Synchronization module
K51/TEMP	= Temperature monitoring module
M	= Motor for closing springs loading
O 01÷32	= Programmable signalling contacts
O SC	= Contact for synchronism control
Q	= Circuit-breaker
Q/1÷Q/25	= Auxiliary open/closed contacts of circuit-breaker
Q/26-27	= Auxiliary open/closed contacts used internally by the trip unit
RC	= RC (residual current) protection sensor
RTC	= Contact for signalling circuit- breaker is ready to close
RTC EKIP	= Contact for signalling circuit-breaker is ready to close, used internally by the trip unit
S33M/1÷2	= Limit contacts of springs loading motor
S43	= Switch for presetting remote/local control
S51-S51/2	= Trip signalling contacts
S75E/1÷4*	= Contacts for signalling circuit- breaker in racked-out position (provided only with drawout circuit-breaker version)
S75I/1÷6*	= Contacts for signalling circuit-breaker in racked-in position (provided only with drawout circuit-breaker version)
S75T/1÷4*	= Contact for signalling circuit- breaker in test position (provided only with drawout circuit-breaker version)

(*) = Maximum number of 575 contacts is 10 for circuit-breakers E2.3-E4.3-E6.3, for circuit-breakers E1.3 maximum number of contacts is 6.

SC	= Pushbutton or contact for circuit-breaker closing
SO	= Pushbutton or contact for circuit-reaker immediate opening
SO1	= Pushbutton or contact for circuit-breaker opening with time-delayed trip
SR	= Pushbutton or contact for electrical resetting of 551 trip contact
SZI(DFI)	= Zone selectivity input for S protection or for input in 'direct" direction for D protection

SZo(DFo)	= Zone selectivity output for S protection or for output in 'direct" direction for D protection
TI/L1-L2-L3	= Current transformers located on phases Ll ·L2-L3
TI/N	= Current transformer located on neutral conductor
TU1-TU2	= Insulation voltage transformers (outside the circuit-breaker)
UAF/...	= ARC-FLASH protection system sensors for internal arc detection
Uaux	= Auxiliary supply voltage
UI/L1-L2-L3	= Current sensors (Rogowski coils) located on phases Ll-L2-L3
UI/N	= Current sensor (Rogowski coil) located on neutral conductor
UI/O	= Homopolar current sensor (Rogowski coil)
W2	= Serial interface with internal bus (local bus)
W9	= RJ45 connector for external bus (BUS 1 or LINK Bus)
W10÷W14	= RJ45 connectors for communication modules
X	= Connector for delivery auxiliary circuits for drawout version circuit-breaker
XB1÷XB7	= Connectors for circuit-breaker applications
XCT1	= Ekip DIN Rail Cartridge terminal board
XF	= Terminal board for delivery position contacts of drawout version circuit-breaker
XK1÷XK3	= Connectors for Ekip Aware protection trip unit circuits
XK7	= Connector for modules auxiliary circuits
XV	= Terminal board for delivery auxiliary circuits for fixed version circuit-breaker
YC	= First closing coil
YC2	= Second closing coil
YO	= First opening coil
YO1	= Opening coil for overcurrent protection trip
YO2	= Second opening coil
YR	= Coil for electrical resetting of 551 trip contact
YU	= First undervoltage coil
YU2	= Second undervoltage coil

READING INFORMATION

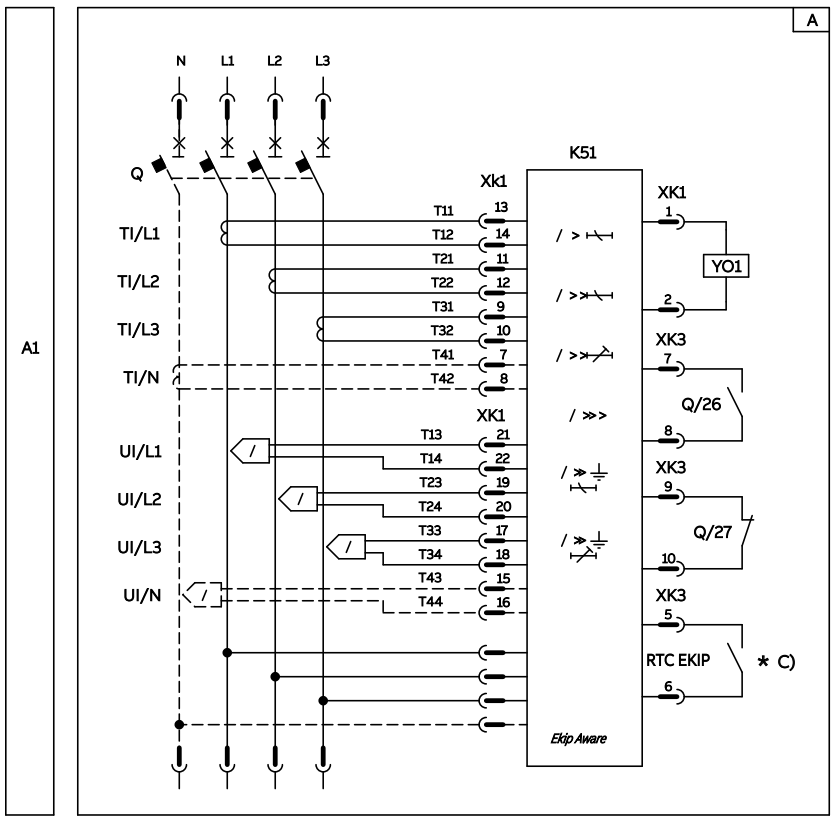
Circuit-breakers

Notes

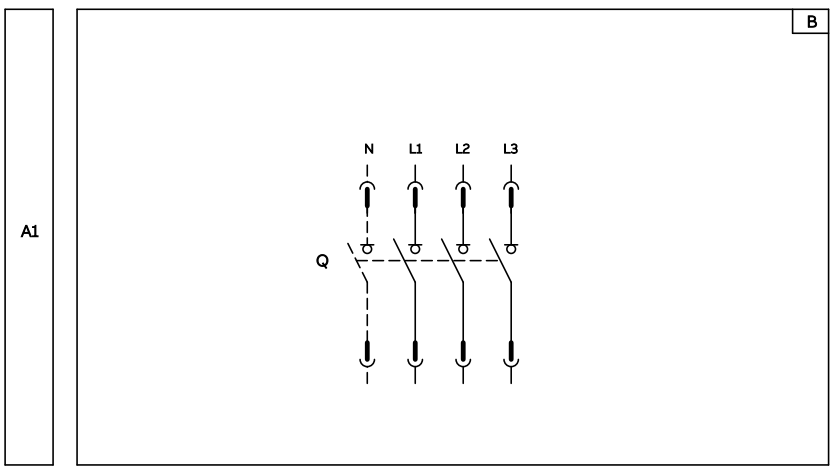
A. For the zone selectivity and local bus functions, the presence of auxiliary power supply is required (see Figs. 32-33).
B. Always supplied with motor for closing springs loading in Fig. 13.
C. Voltage transformer mandatory in the case of external sockets. External sockets mandatory for systems with rated voltage lower or equal than 100V.
D. The connections between the RC residual current protection sensor and the poles of X connector (or XV) of the circuit-breaker must be made with 4-pole shielded cable with conductors interwoven in pairs (type BELDEN 9696 paired or equivalent), of length no greater than 15m.
E. With Ekip Aware electronic protection trip unit, protection against an ground fault is available (Gext) by means of current sensor located on the star center of the MV/LV transformer. The connection between terminals 1 and 2 of the current sensor and Ge+ and Ge- poles of the X connector (or XV) of the circuit-breaker must be made with shielded and stranded 2-pole cable (type BELDEN 9841 or equivalent) of length no greater than 15m.
F. Make the connection using the ABB cable supplied. There must be no break in the cable. Use of other cables or extensions using intermediate terminals is not allowed. If external neutral conductor is not present, the poles Ne+ and Ne- of the X connector (or XV) of the circuit-breaker must be short-circuit.
G. Mandatory in the case of the presence of Ekip Cartridge.
H. Circuit-breakers E2.3, E4.3 and E6.3, equipped with Ekip Supply Lite, can use up to three of the applications between Figures 41 and 59, in the quantity of one for each application. Equipped with Ekip Supply Evo Modbus TCP, these same circuit-breakers can use up to two of the applications between Figures 41 and 59, in the quantity of one for each application. Circuit-breakers E1.3, equipped with Ekip Supply Lite, can use up to two of the applications between Figures 41 and 59, in the quantity of one for each application. Equipped with Ekip Supply Evo Modbus TCP, these same circuit-breakers can use one of the applications between Figures 41 and 59.
I. In the Ekip Cartridge device it is possible to mount up to three separate modules, chosen from figures 41 to 59. Check that the same modules are not already present in the circuit-breaker terminal box.
J. In the presence of several Ekip Com modules with drawout version circuit-breaker, the contact S75I/5 should be connected only once to a single module.
K. The auxiliary voltage supply Uaux. enables activation of all the functions of the Ekip Aware electronic protection trip unit. Since an ground insulated Uaux. was requested, it is necessary to use “galvanically separated convertors” which comply with the standars IEC 60950 (UL 1950) or equivalent.
L. Use the twisted pair cable supplied with Ekip Cartridge. If a longer cable is required, use BELDEN 3105A shielded cable or equivalent, not more than 15 m in length. The shield must be grounded from both sides.
M. Suggested RJ45 cable type: CAT6 STP.
N. Consult “Technical Application Papers - vol. 9: Communication with ABB circuit-breakers via BUS” when connecting the EIA RS485 serial link wiring. Use BELDEN 3105A cable or equivalent.
O. Use cable type BELDEN 3079A or equivalent. For further details see White Paper 1SDC007412G0201 “Communication with SACE Emax Circuit-Breakers”.
P. The Ekip Signalling 10K Link module in Fig. 103 can be connected to the Ekip Supply Evo Modbus TCP of Fig. 33 via the W13 LINK Bus interface or via the 100M 2-wire Ethernet connection.
Q. Use a multi-conductor shielded and stranded cable type BELDEN 8762/8772 or equivalent. The shield must be grounded on the selectivity input side (for zone selectivity) or on both sides (for other applications).
R. Use PENTRONIC TEXTSITW type insulated cables for PT100/PT1000, no more than 10 m in length.
S. The digital inputs terminals of Ekip Signalling 10K Link unit (HS02÷HS22) are internally short-circuited.
T. Use a suitable 2-wire cable for the Ethernet connection, e.g. a T1 SPE cable with double shielding type HARTING T1 SPE SF/TP 1x2xAWG26/7, up to 15 m in length.
U. Use 3-wire shielded cables type BELDEN 8772 or 9533 or equivalent. The total length of the connections must not exceed 100 m. The shield must be grounded from both sides.

CIRCUIT-BREAKERS (IEC60617 STANDARDS)

3-pole or 4-pole circuit-breaker

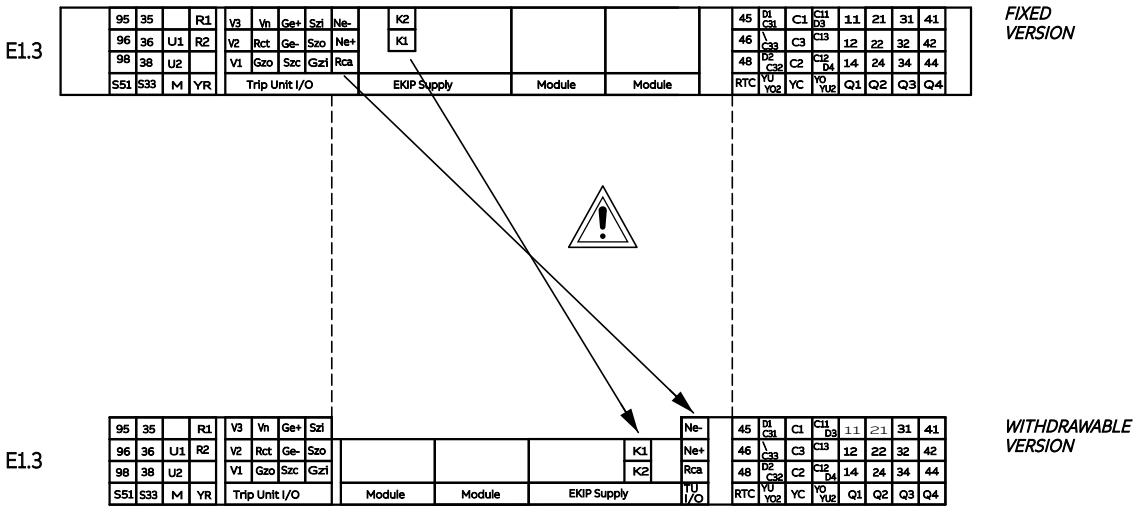


3-pole or 4-pole switch-disconnector

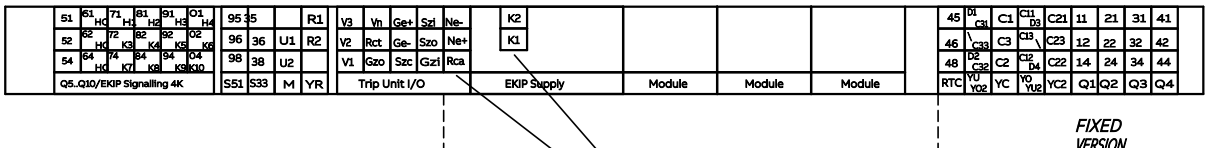


WIRINGS ROTATION ON TERMINAL BOARDS

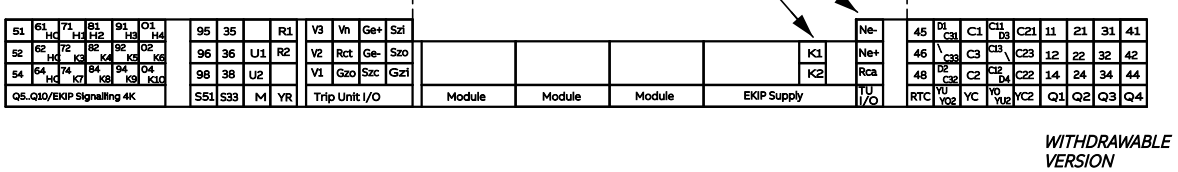
Fixed and drawout version



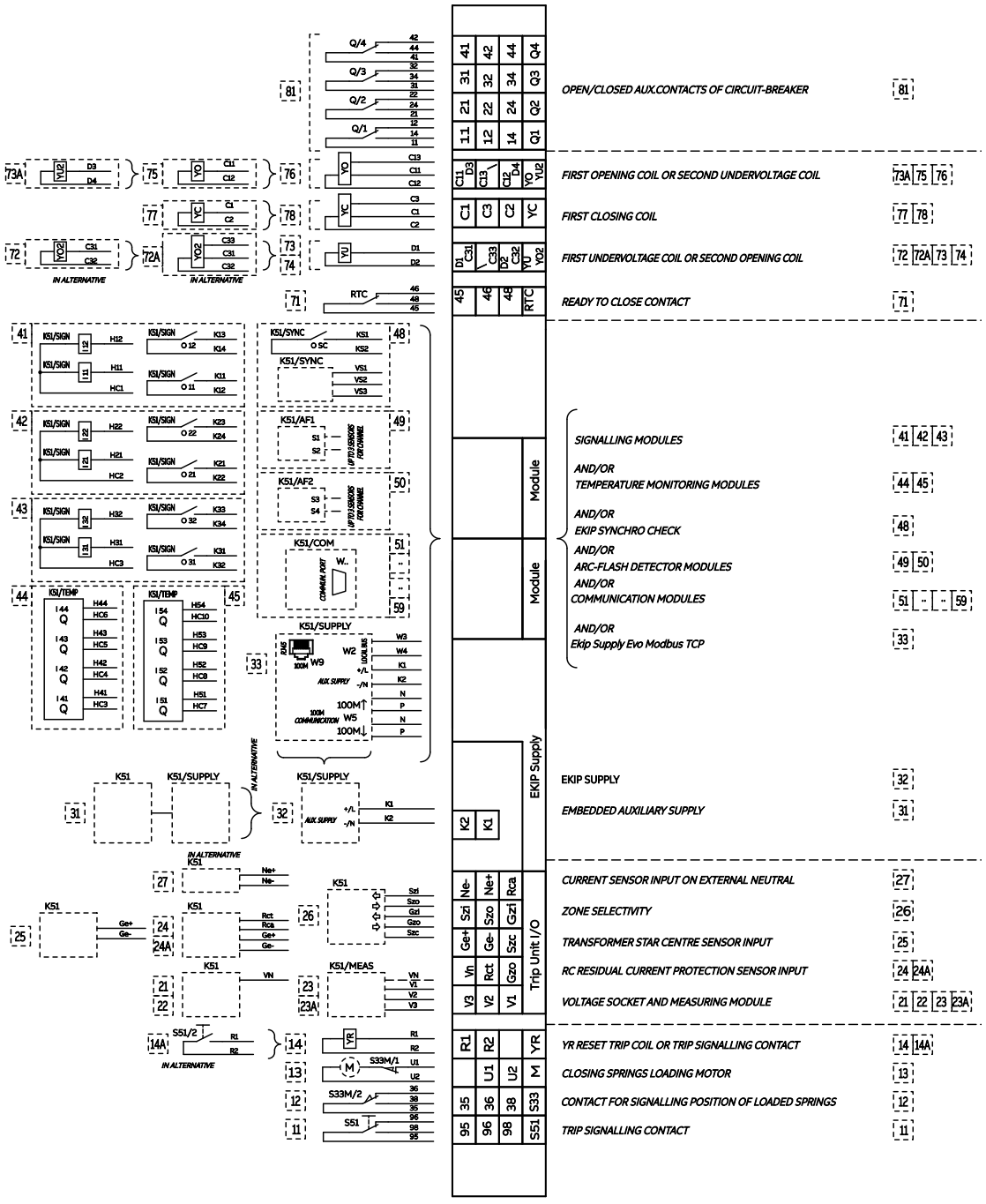
E2.3
E4.3
E6.3



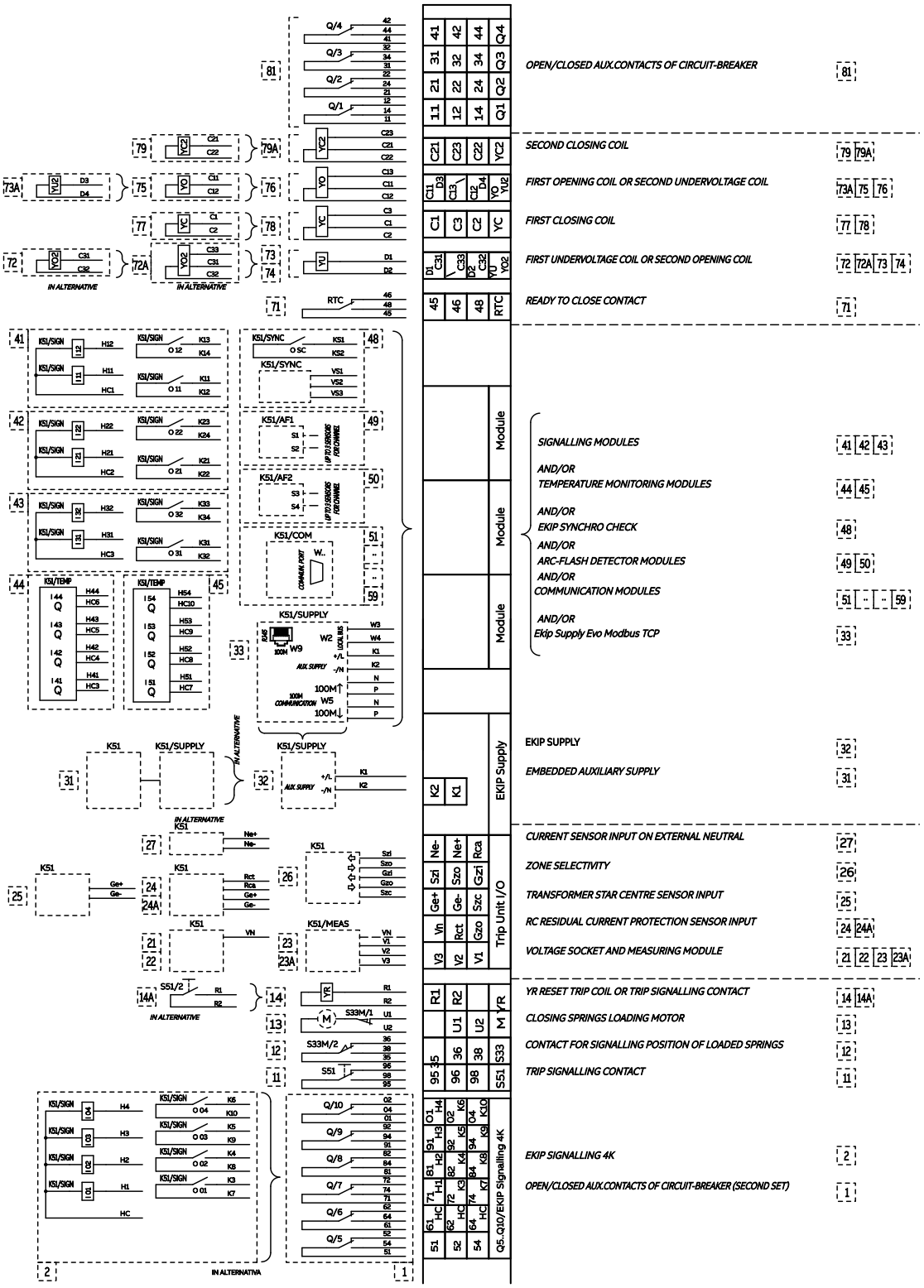
E2.3
E4.3
E6.3



TERMINAL BOX E1.3



TERMINAL BOX
E2.3 - E4.3 - E6.3



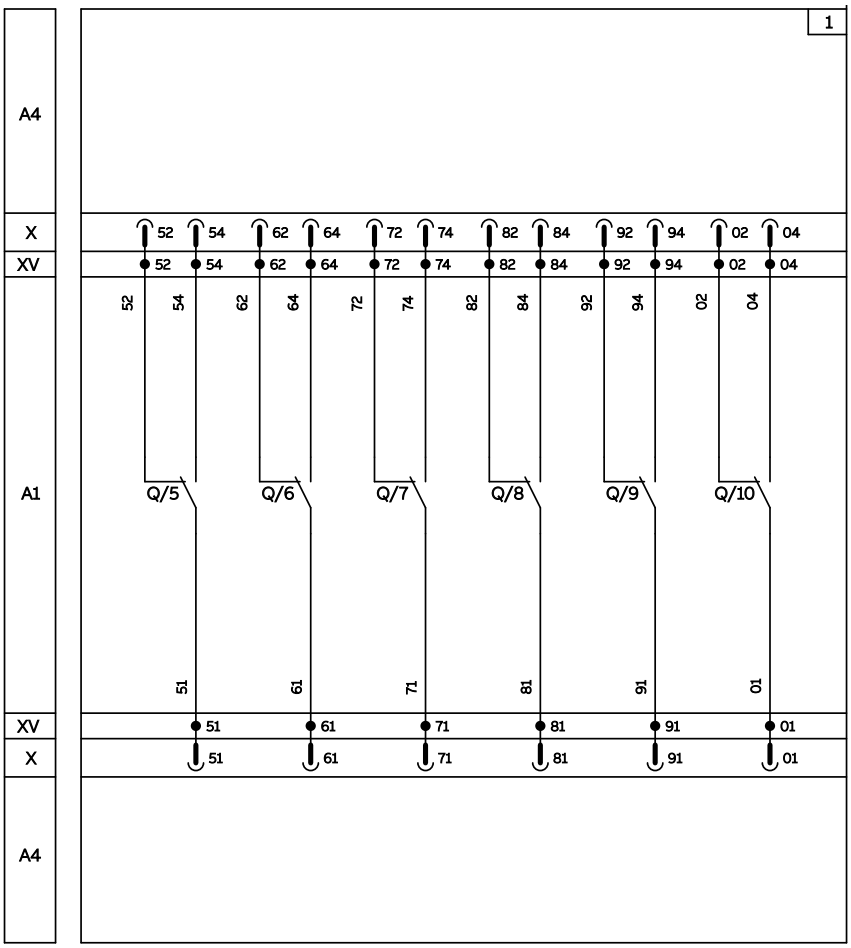
ELECTRICAL ACCESSORIES



1) Supplementary open/closed auxiliary contacts of the circuit-breaker - AUX 4Q

1 Only for circuit-breakers E2.3-E4.3-E6.3

As an alternative to figure 2 (Ekip signalling 4K) and to smart motor



ELECTRICAL ACCESSORIES

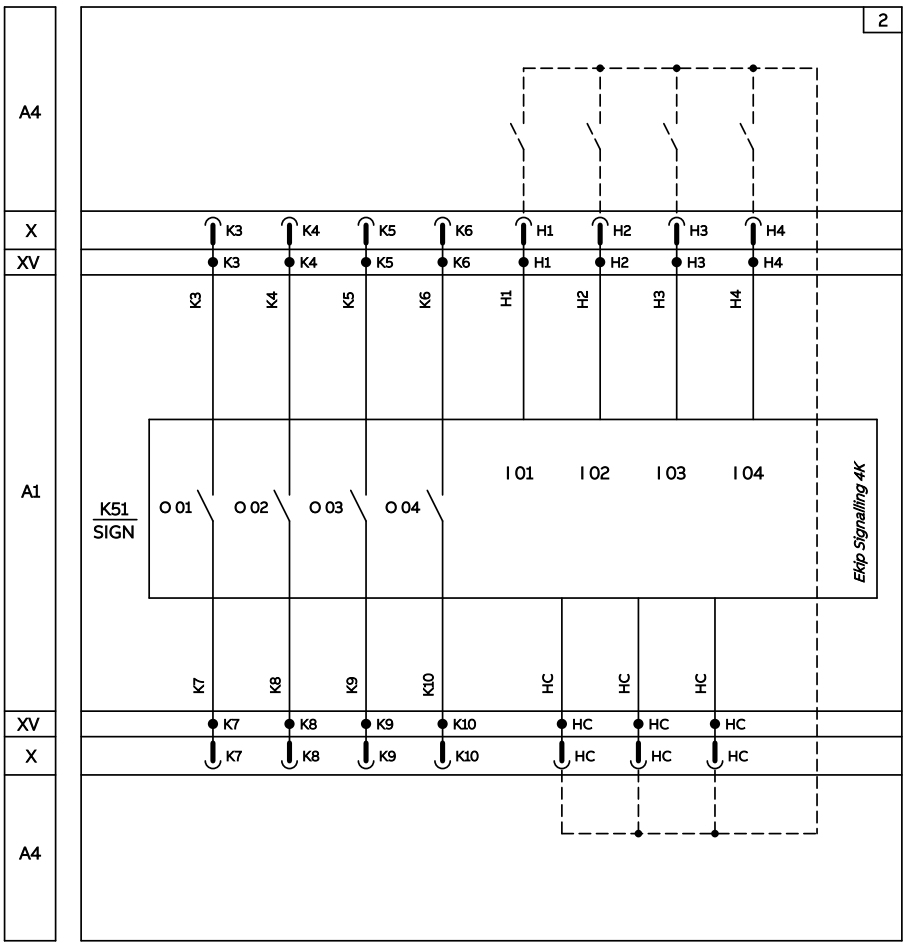


51 61 HC 71 H1 81 H2 91 H3 01 H4
52 62 HC 72 K3 82 K4 92 K5 02 K6
54 64 HC 74 K7 84 K8 94 K9 04 K10
Q5..Q10 EKIP Signalling 4K

2) Ekip Signalling 4K

2 Only for circuit-breakers E2.3-E4.3-E6.3

As an alternative to figure 1 (Q/5 ... Q/10) and to smart motor

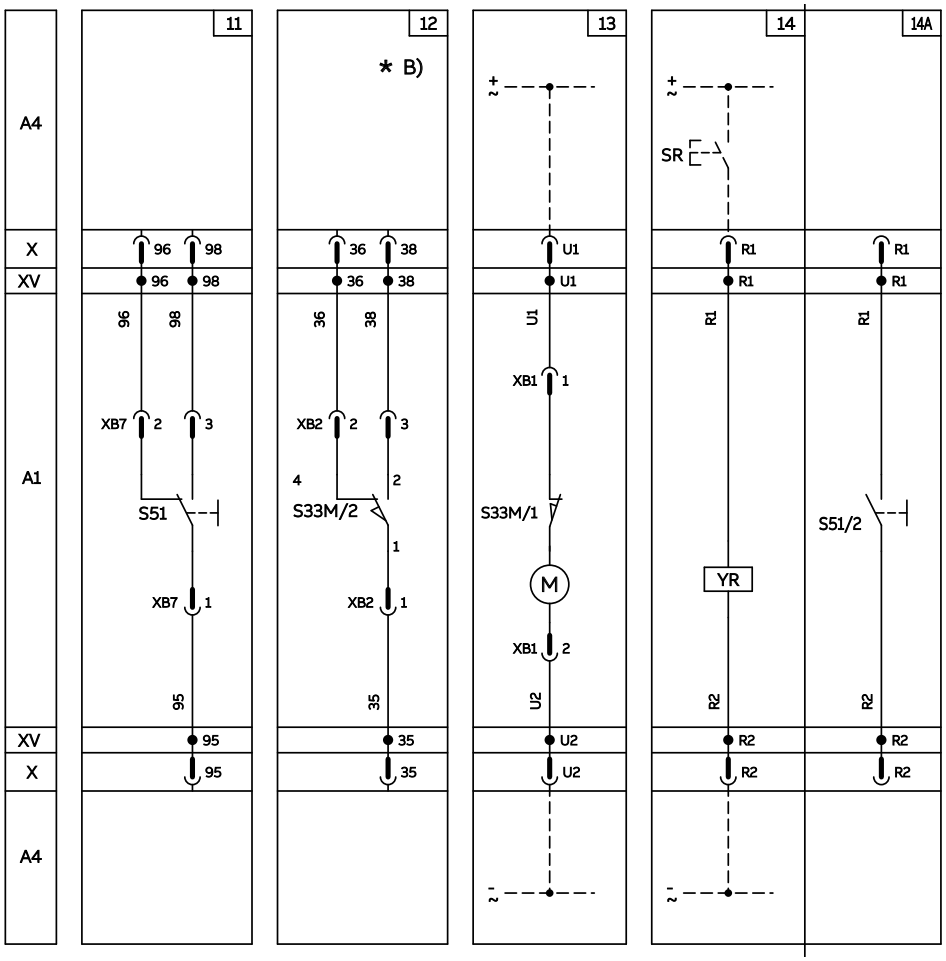




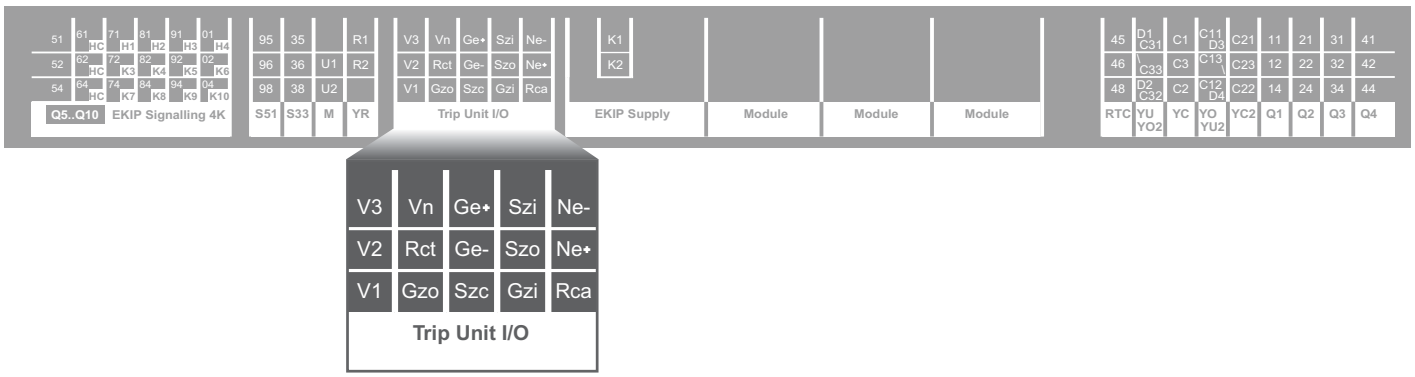
11) Trip signalling contact - S51
12) Contact for signalling position of loaded springs - S33 M/2
13) Motor for loading closing springs - M
14) Trip contact reset coil – YR
14A) Trip signalling contact - S51/2

12 Not available with M-Sense Enabler

14 (YR)-14A(S51/2) as an alternative to each other



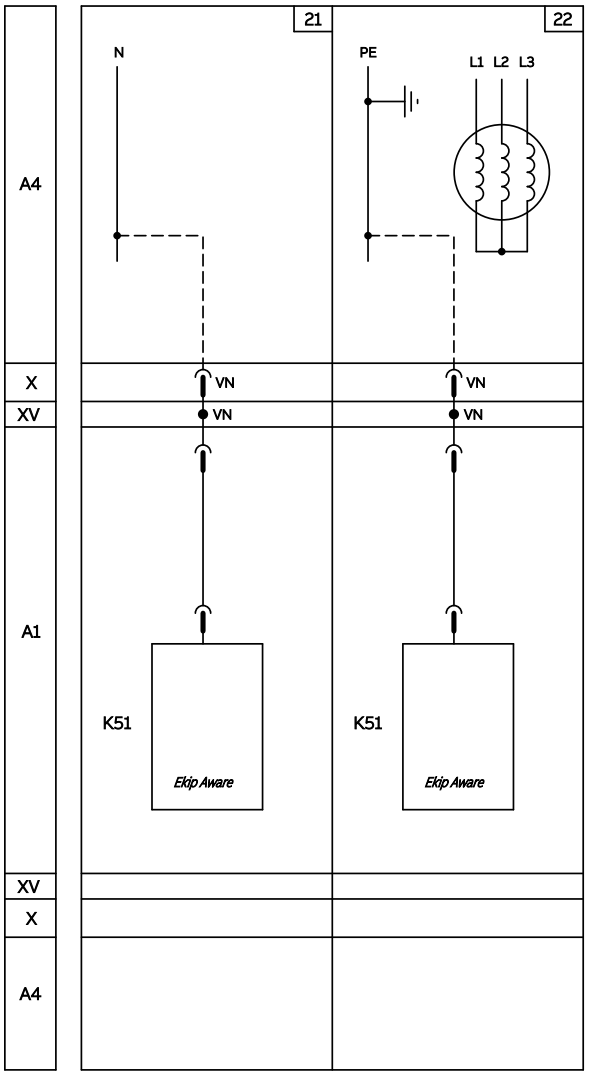
ELECTRICAL ACCESSORIES

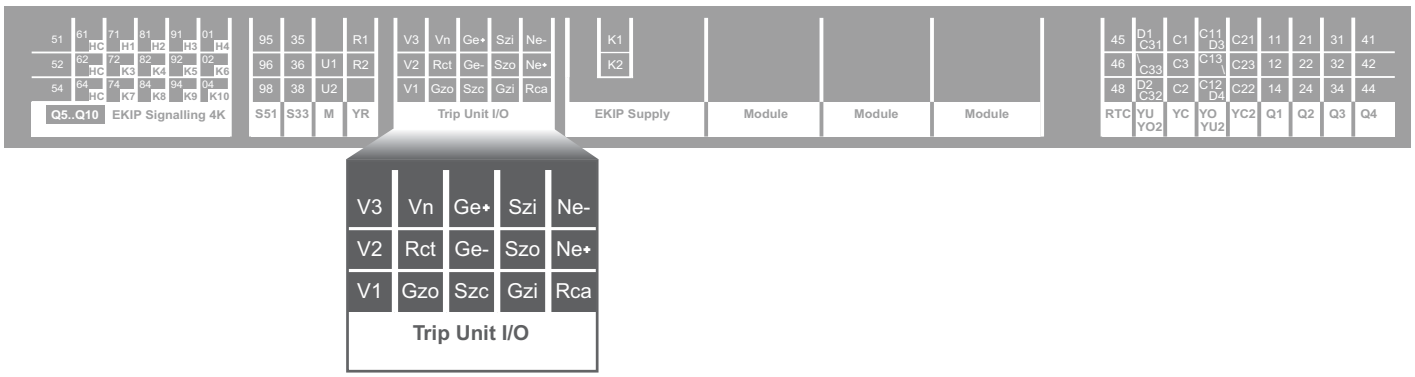


21) Sockets for connection to external neutral conductor on 3- pole c. breaker

22) Sockets for generator residual voltage protection)

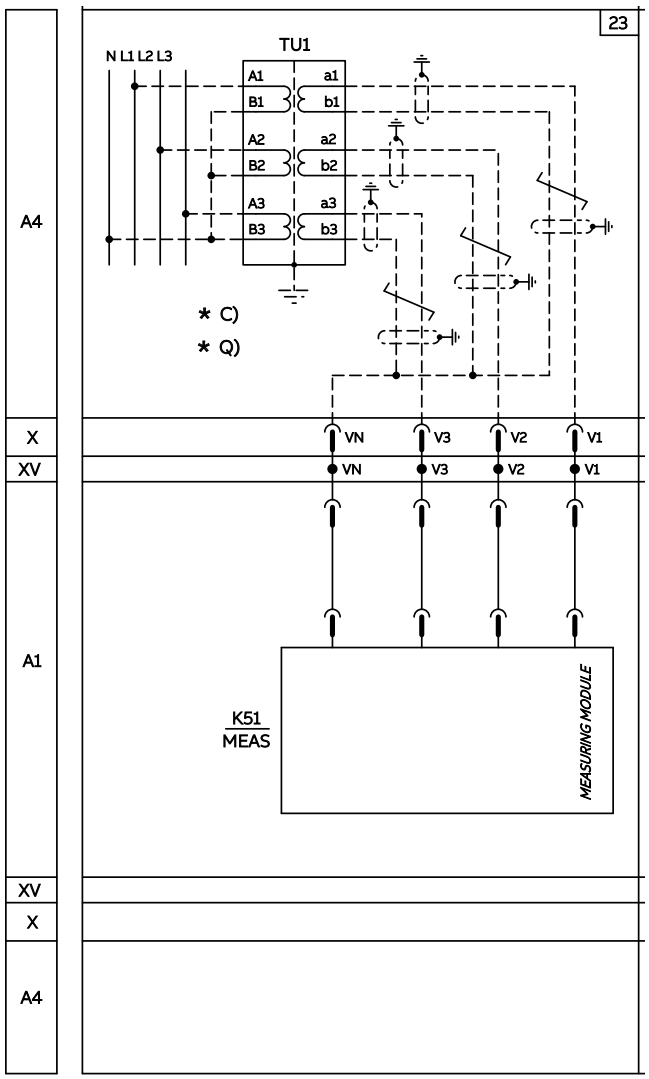
21 22 As an alternative to each other or to figures 23 (Measuring module)



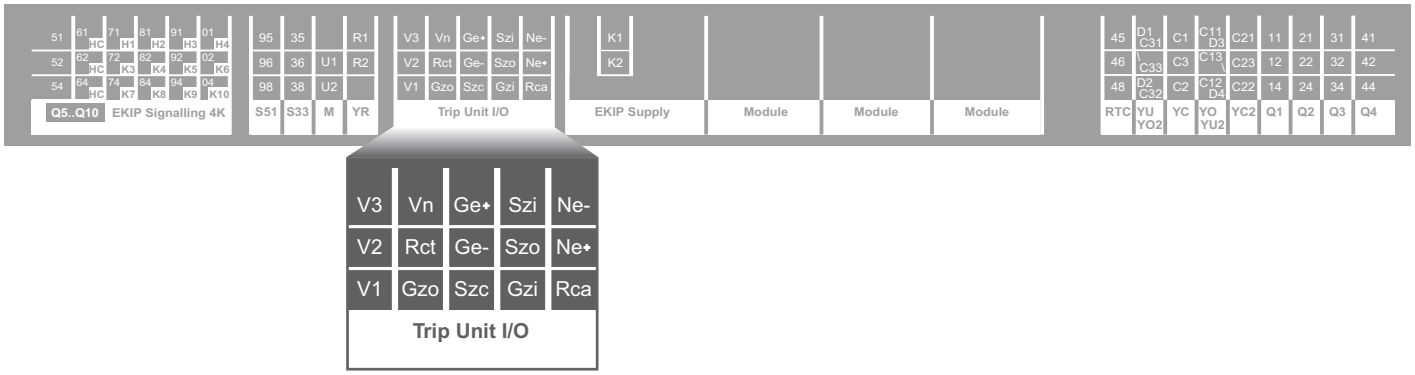


23) Measuring module for 4-pole or 3-pole with external neautral conductor c.breaker

23 As an alternative to figures 21-22 (Voltage socket)

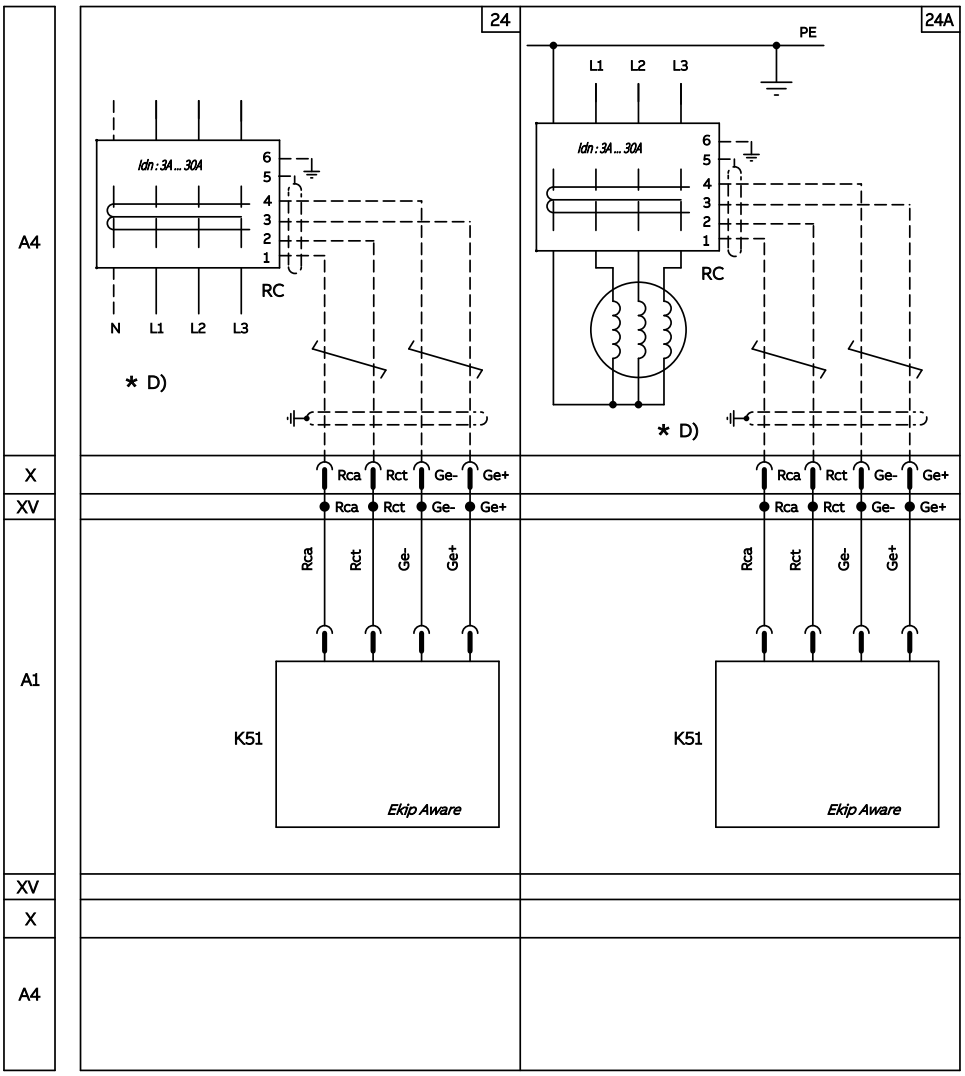


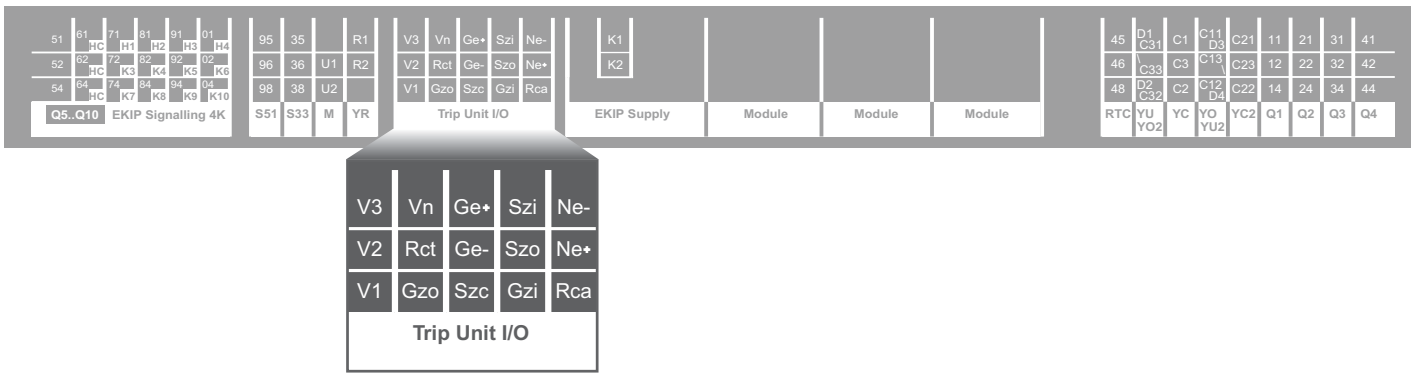
ELECTRICAL ACCESSORIES



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

24 24A As an alternative to each other or to figure 25

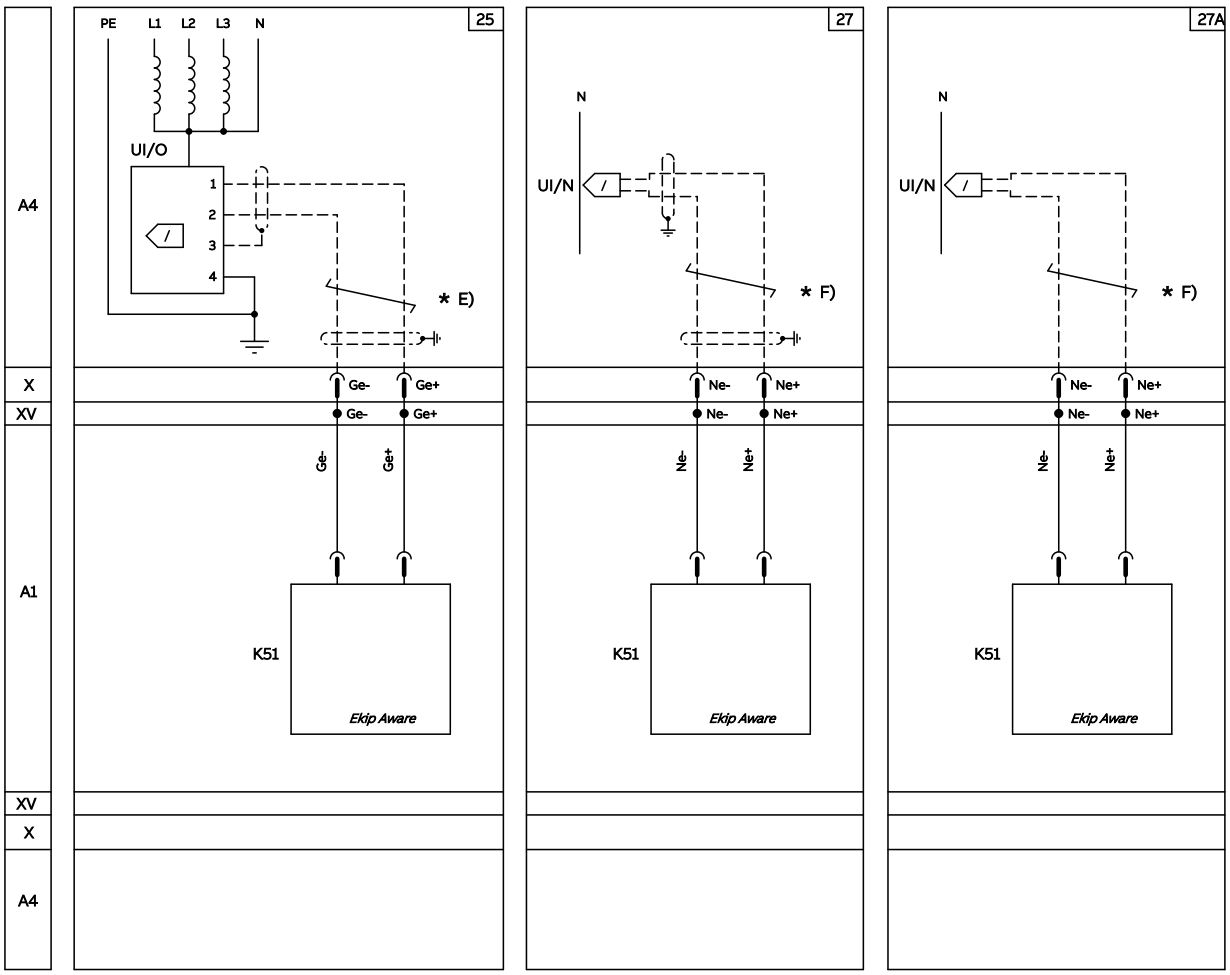




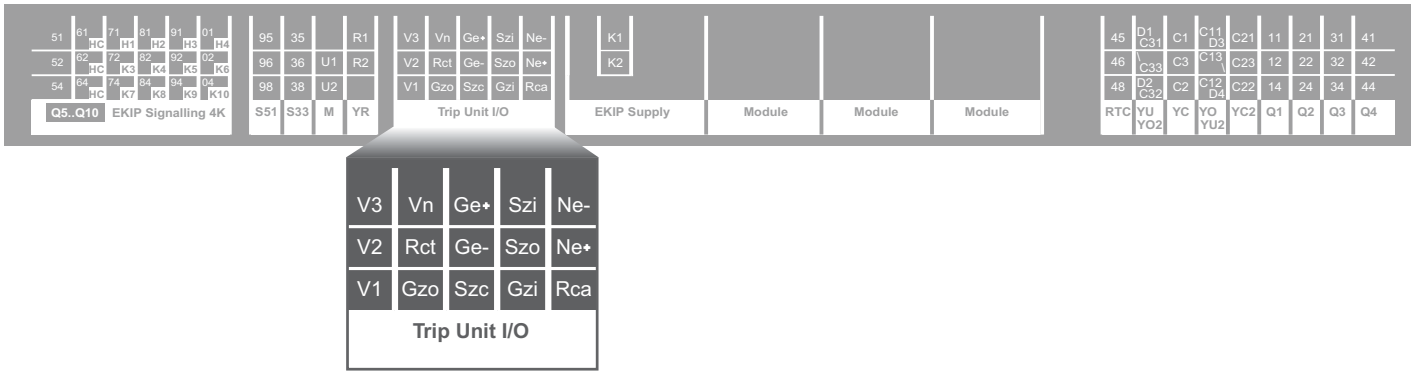
25) Transformer star center sensor input
27) Current sensor input on external neutral (only for 3-pole circuit-breakers)
27A) Current sensor input on external neutral (only for 3-pole Ne- circuit-breaker)

25 As an alternative to figures 24-24A

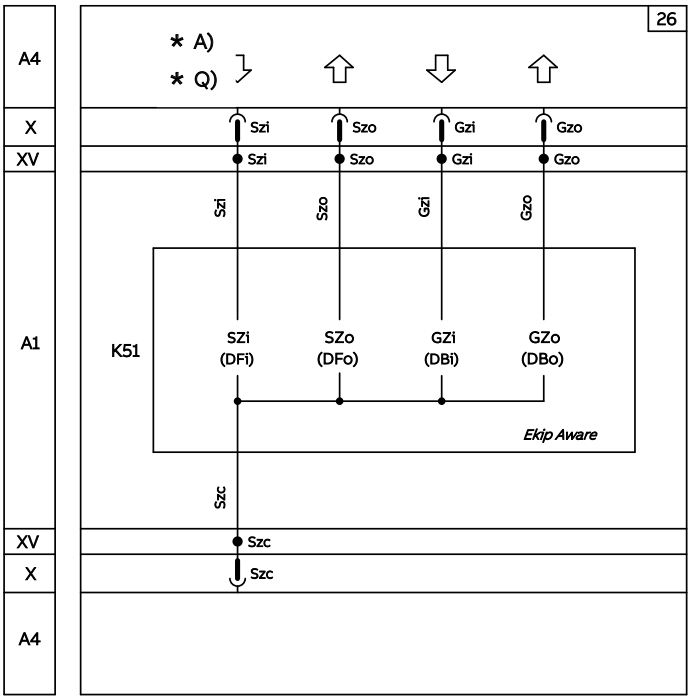
27A As an alternative to figure 27



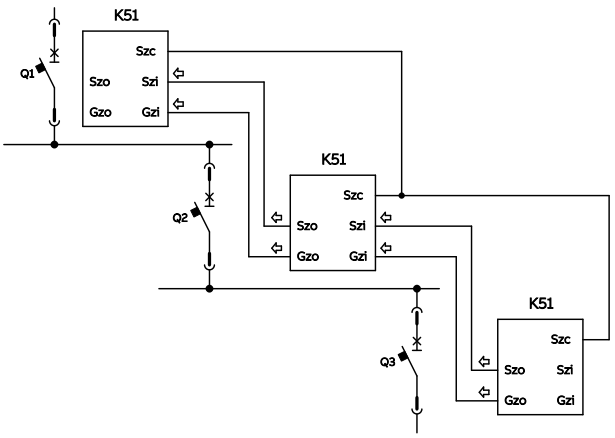
ELECTRICAL ACCESSORIES

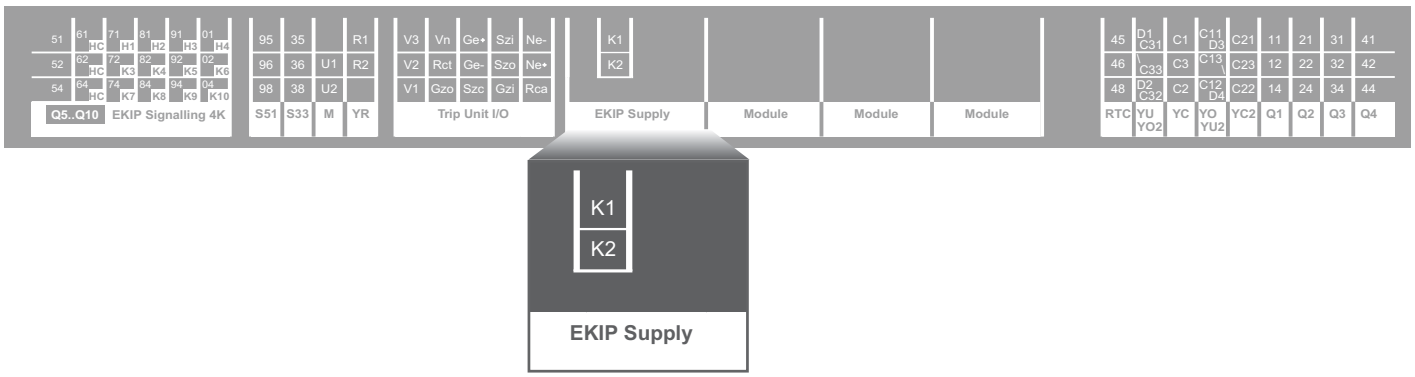


26) Zone selectivity



Example for application diagram (among 3 circuit-breakers)

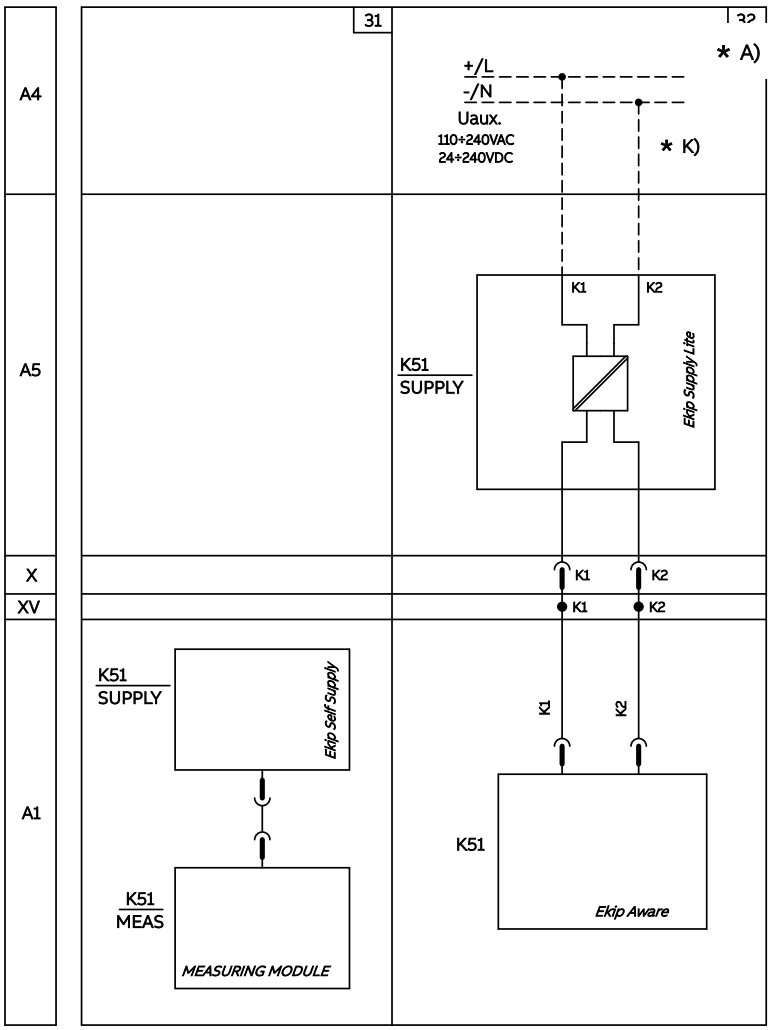




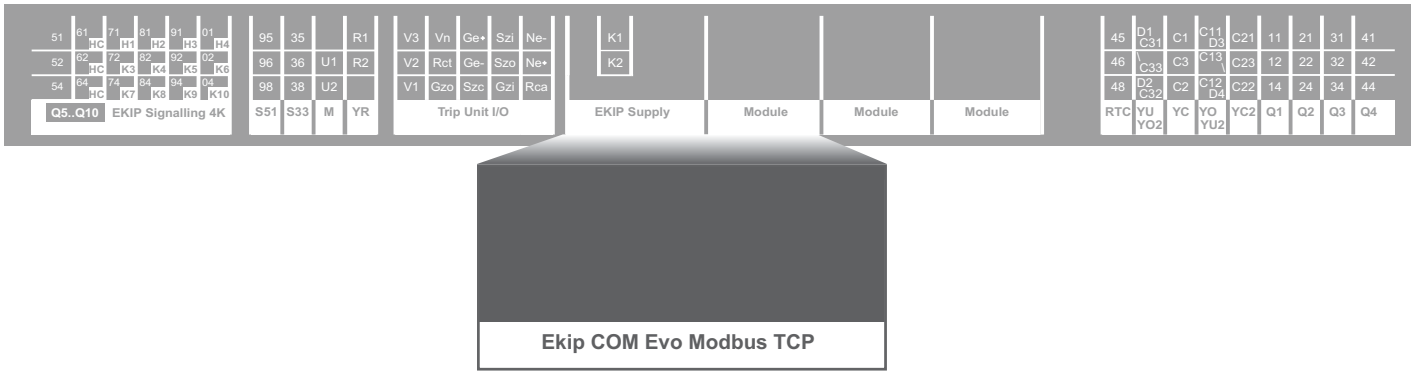
31) Embedded auxiliary supply

32) Auxiliary supply through module 110-240V AC or 24-240DC

31 32 As an alternative to each other or to figure 33

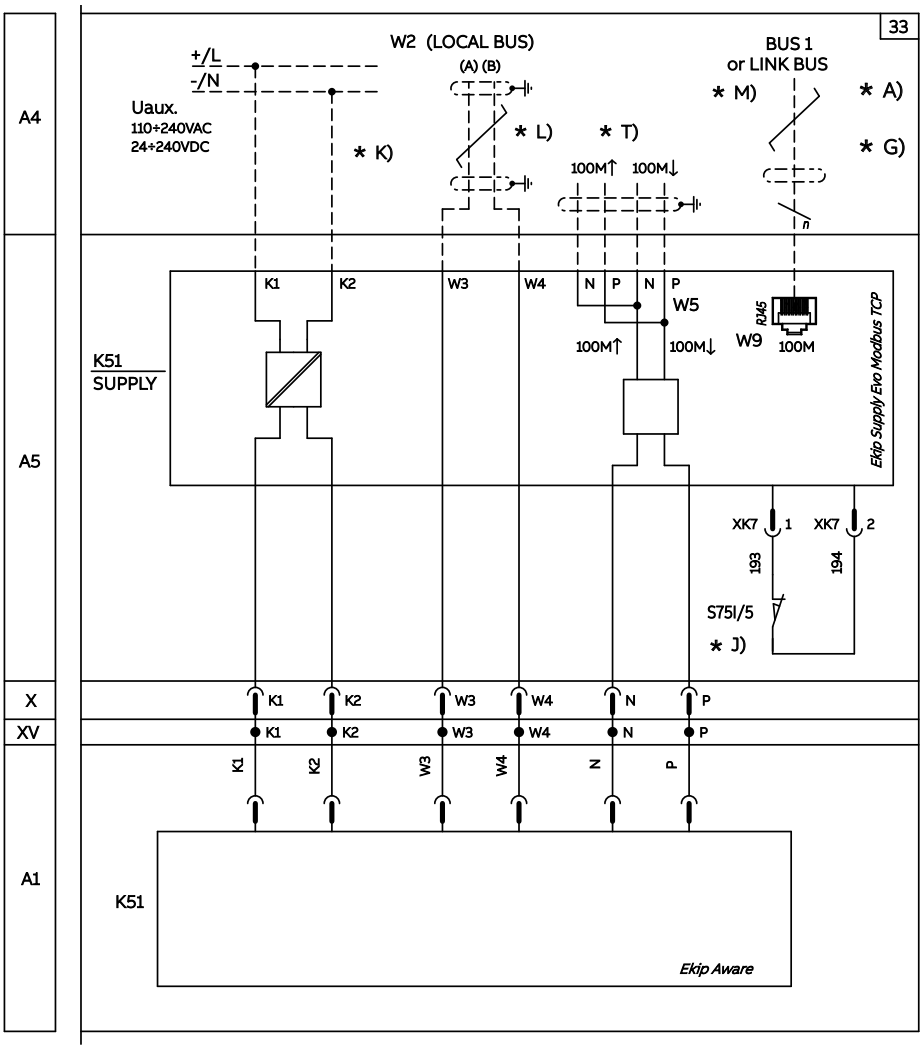


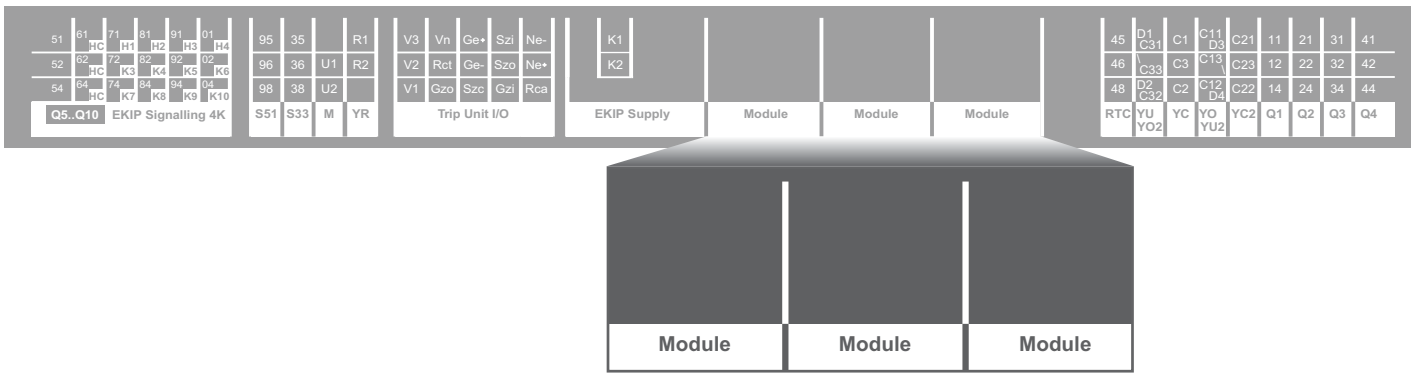
ELECTRICAL ACCESSORIES



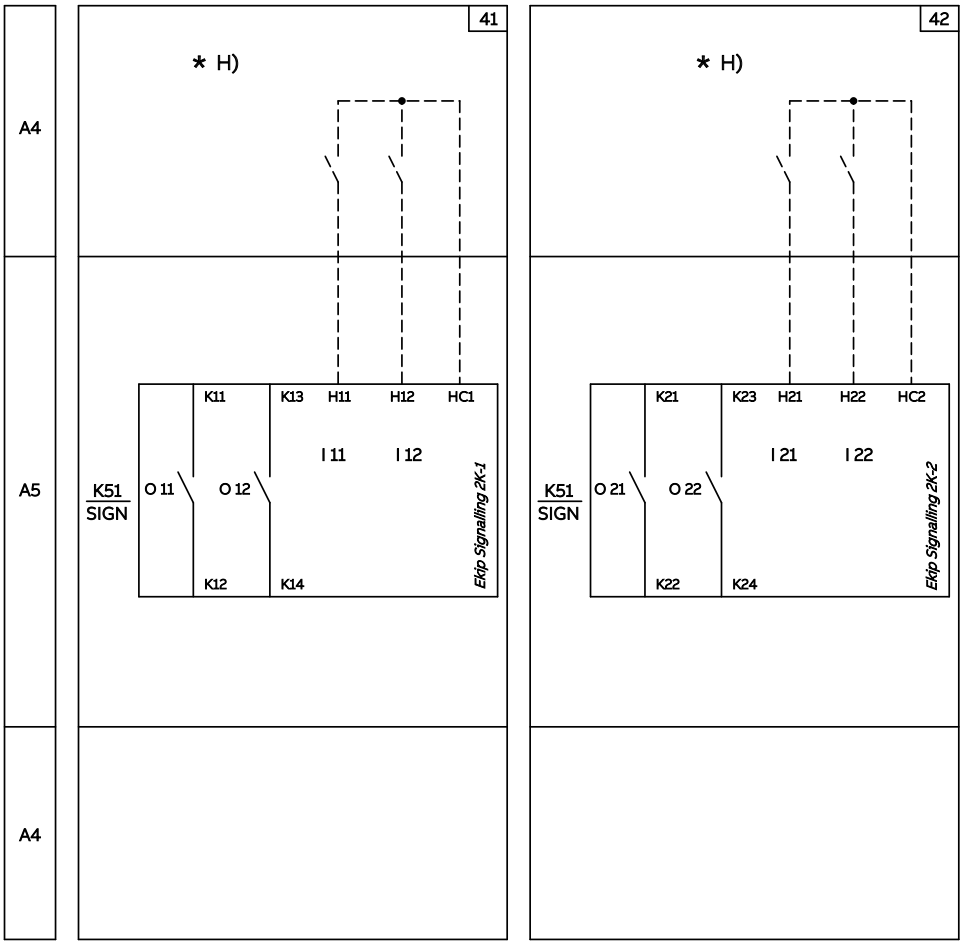
33) Auxiliary supply, local bus and modbus TCP/LINK comunication

33 As an alternative to figures 31-32

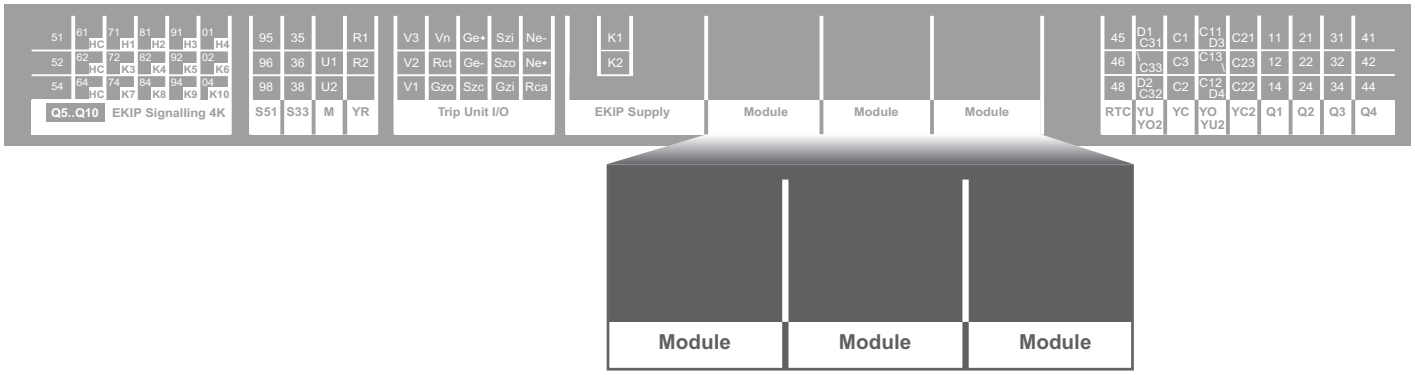




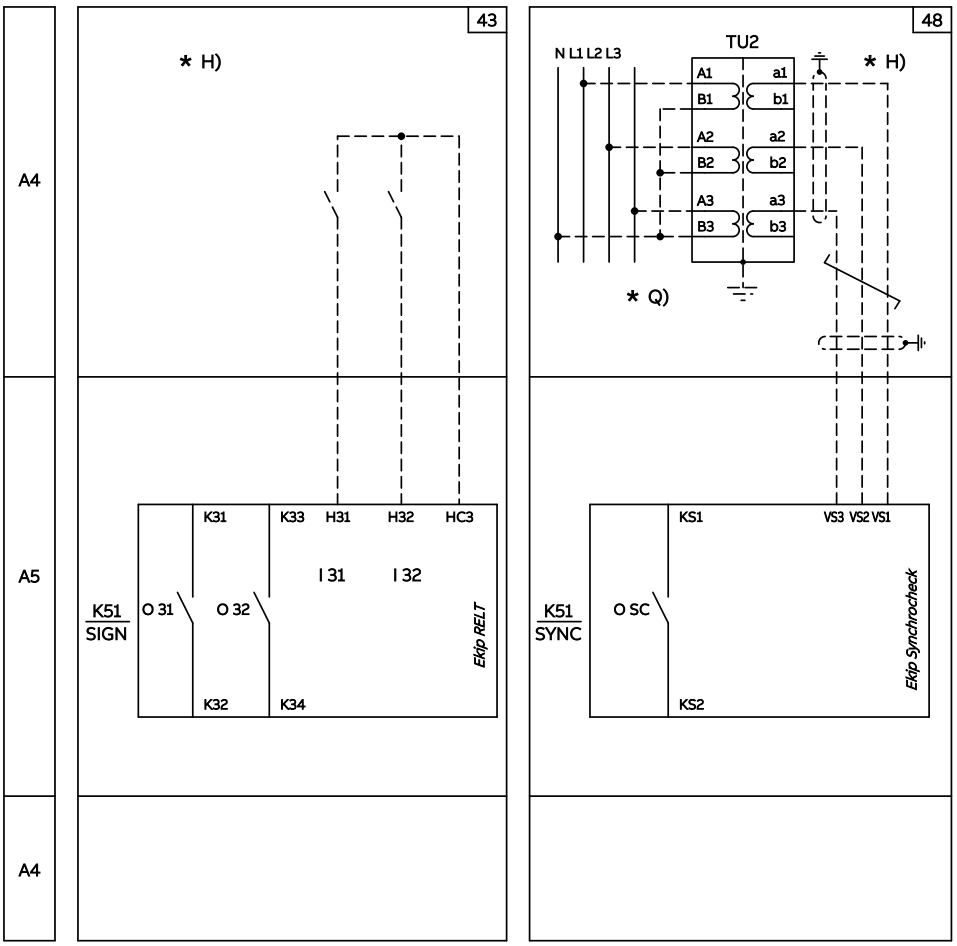
41) Ekip Signalling 2k-1
42) Ekip Signalling 2k-2

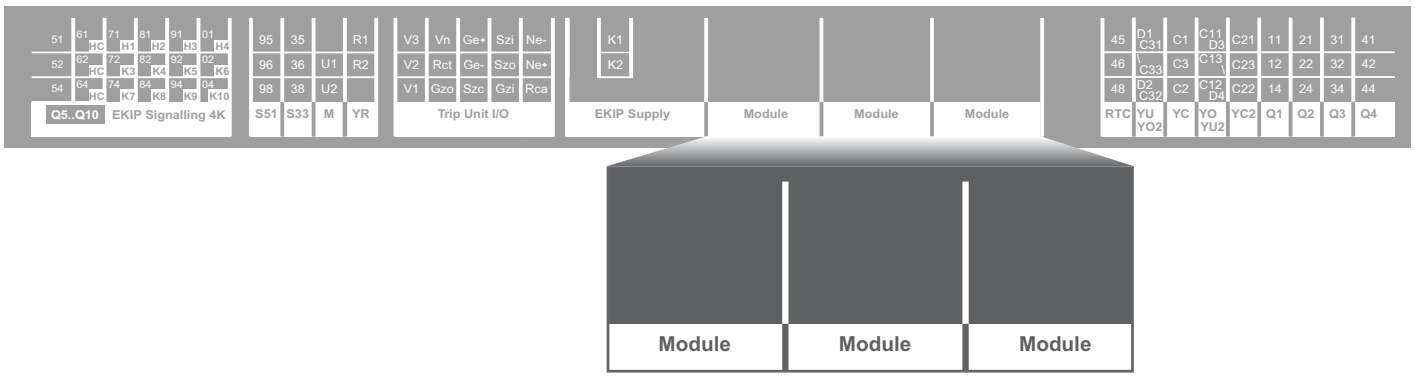


ELECTRICAL ACCESSORIES



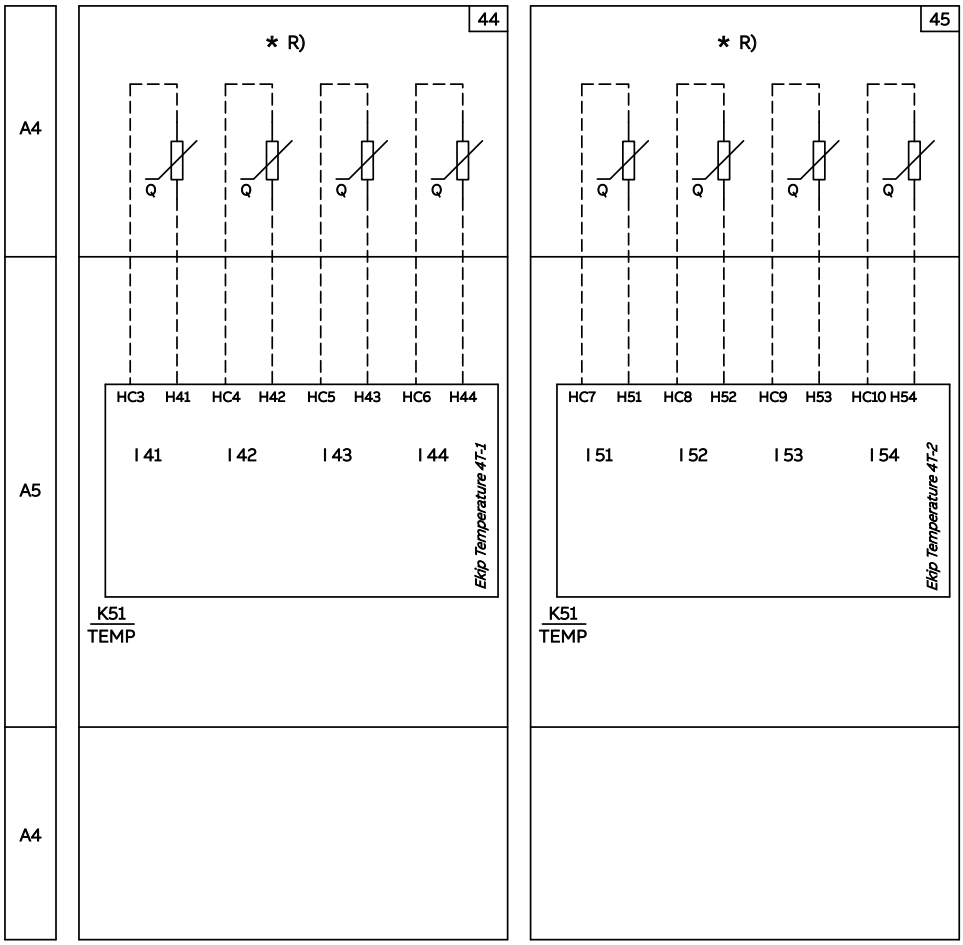
43) Ekip RELT
48) Ekip Sinchrocheck



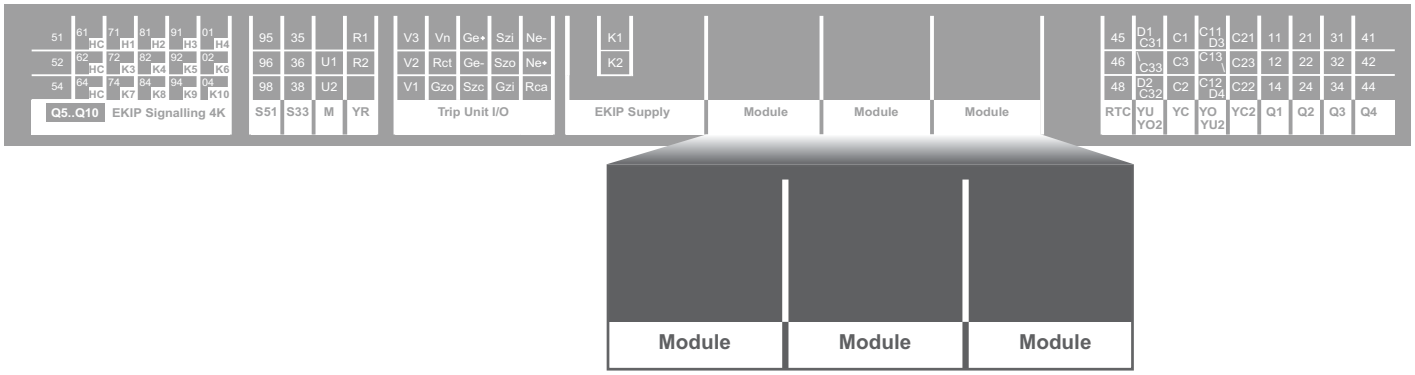


44) Ekip Temperature 4T-1

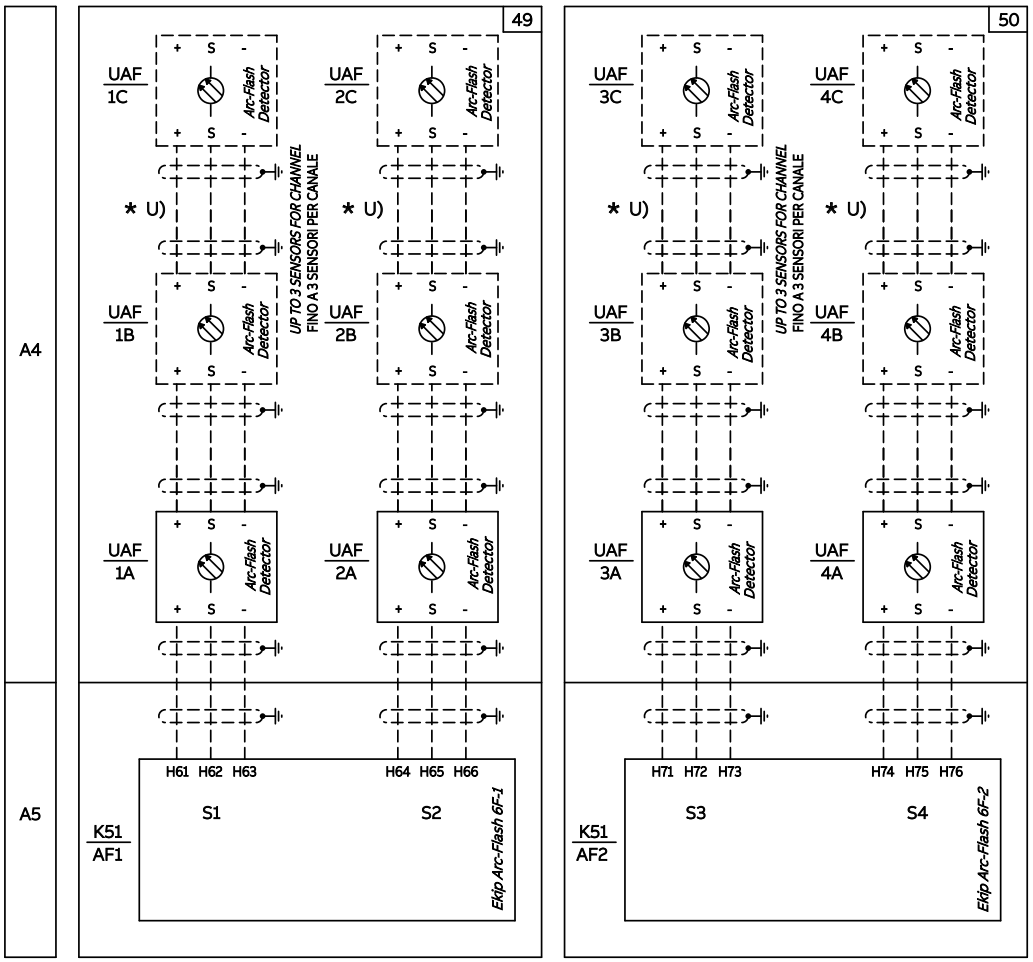
45) Ekip Temperature 4T-2

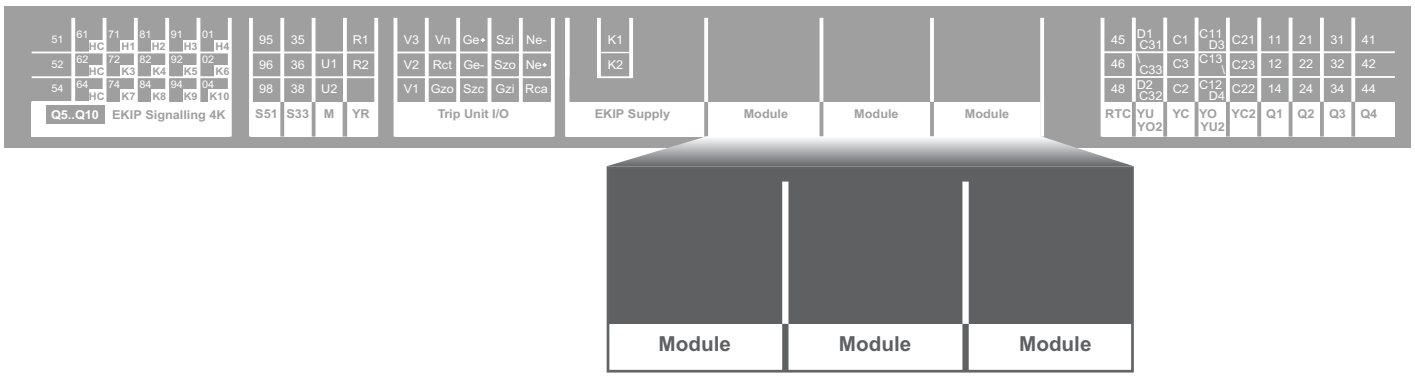


ELECTRICAL ACCESSORIES

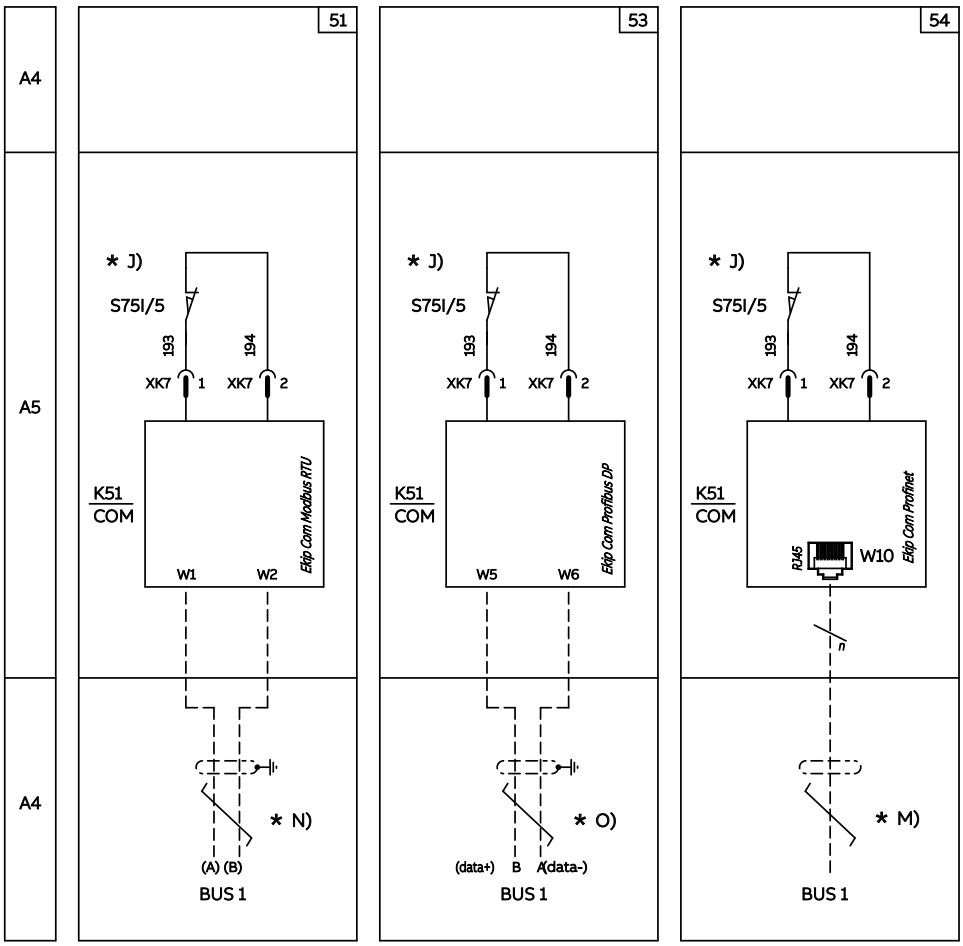


49) Ekip Arc-Flash 6F-1 module
50) Ekip Arc-Flash 6F-2 module

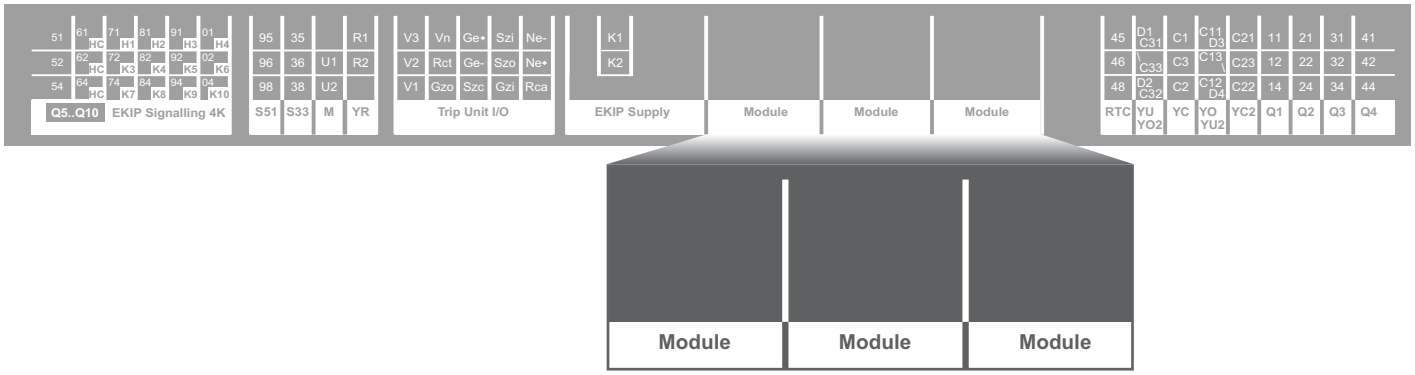




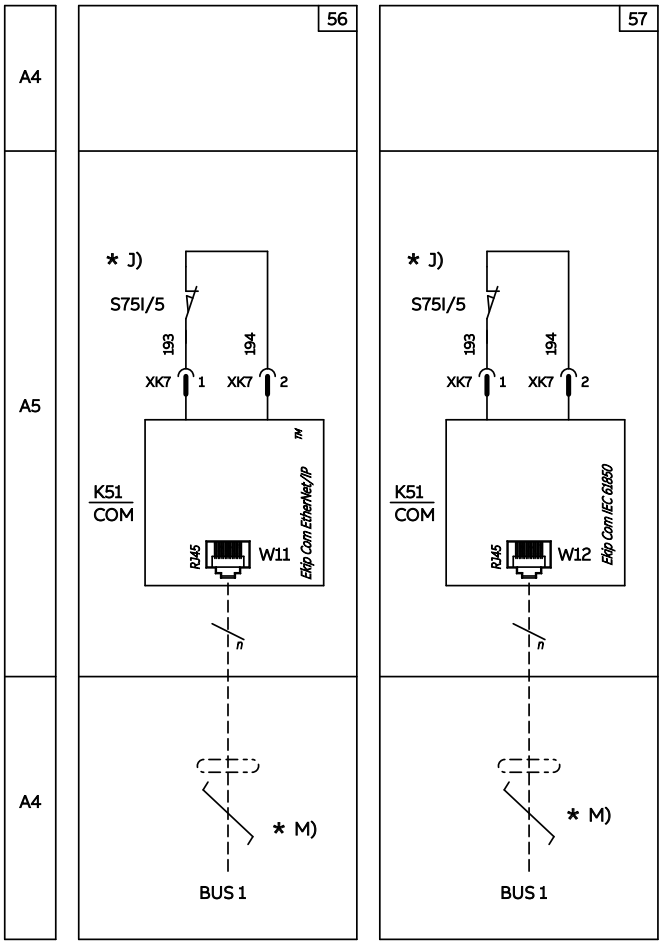
51) Ekip COM Modbus RTU
52) Ekip COM Profibus DP
53) Ekip COM Profinet



ELECTRICAL ACCESSORIES

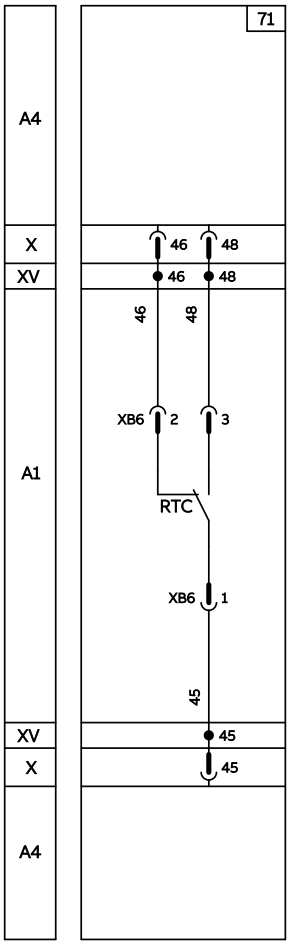


56) Ekip COM EtherNet/IP™
57) Ekip COM IEC61850





71) Ready to close signalling contact – RTC

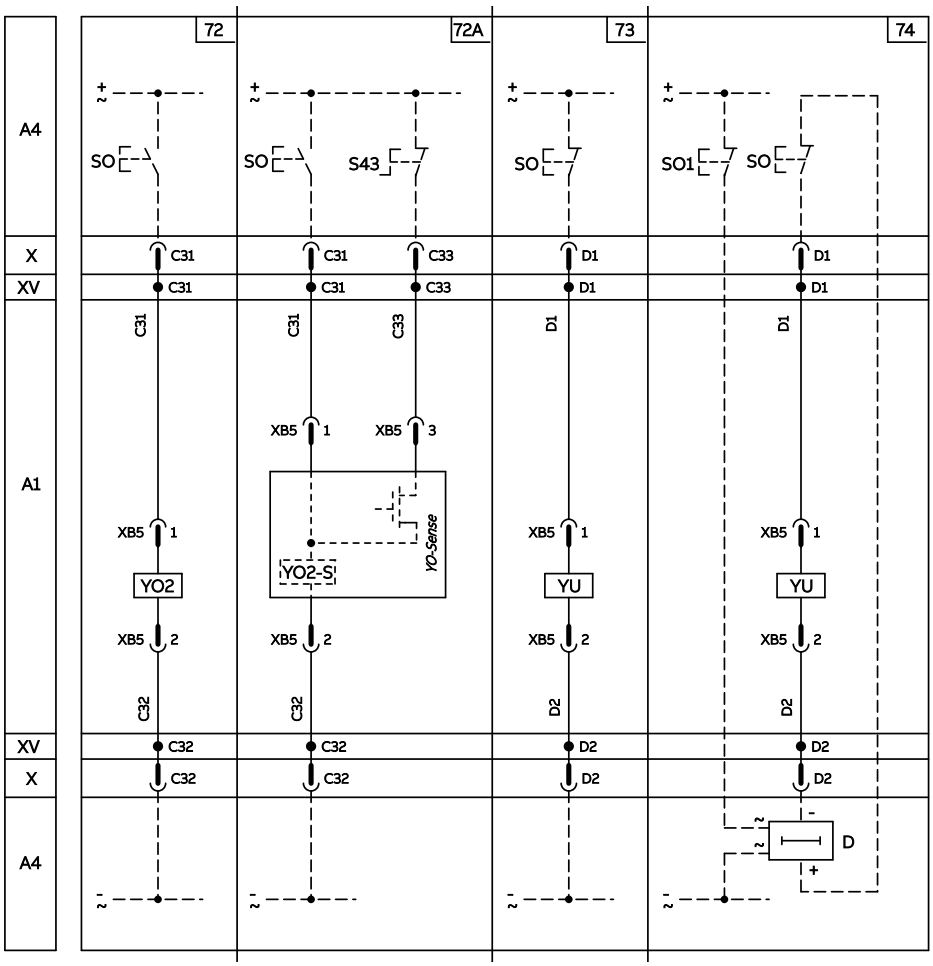


ELECTRICAL ACCESSORIES



72) Second opening coil - YO2
72A) Second opening coil - YO2 YO- Sense
73) First Undervoltage coil - YU
74) Undervoltage coil with external time-lag device - YU

72 (YO2) - 72A (YO Sense) - 73 (YU) - 74(YU,D) as an alternative to each other

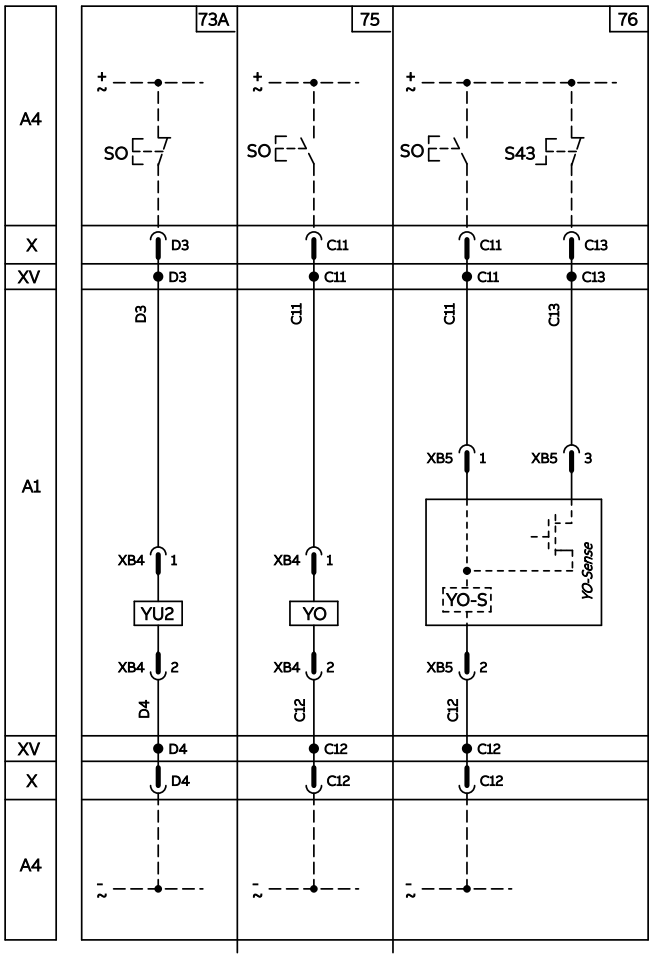




73A) Second undervoltage coil – YU2
75) First opening coil - YO
76) First opening coil YO-Sense

73A (YU2) - 75 (YO) - 76 (YO Sense) as an alternative to each other

73A Only for circuit-breakers E2.3-E4.3-E6.3

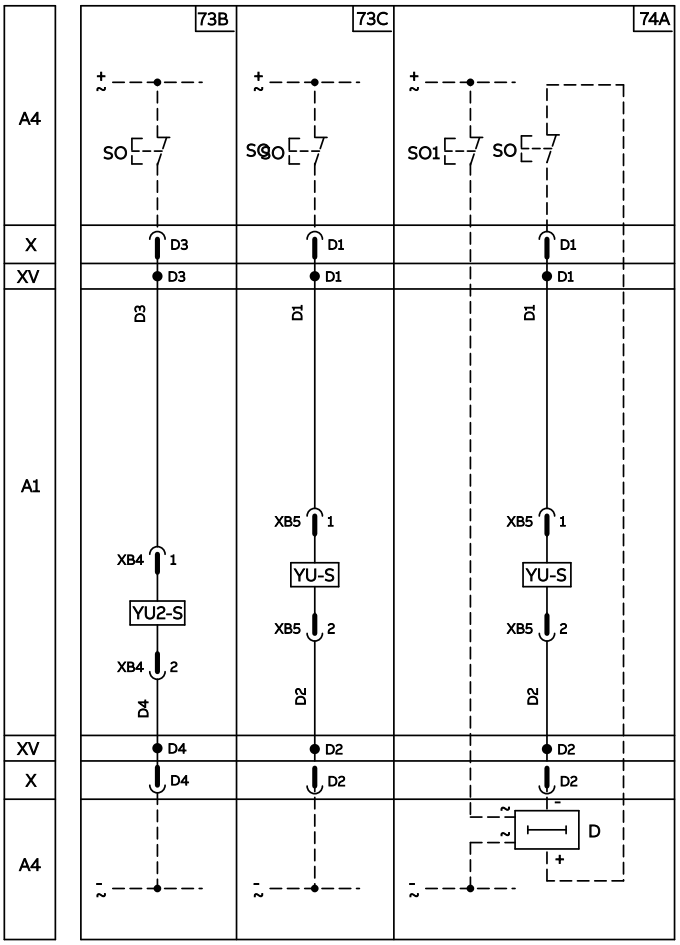


ELECTRICAL ACCESSORIES



73B) Second undervoltage coil - YU2 - YU2-Sense
73C) First undervoltage coil - YU - YU-Sense
74A) Undervoltage coil with external time-lag device - YU, D YU-Sense, D

73B(YU2-Sense)-
c(YU-Sense)-
74A(YU-Sense, D)
as an alternative
to each other



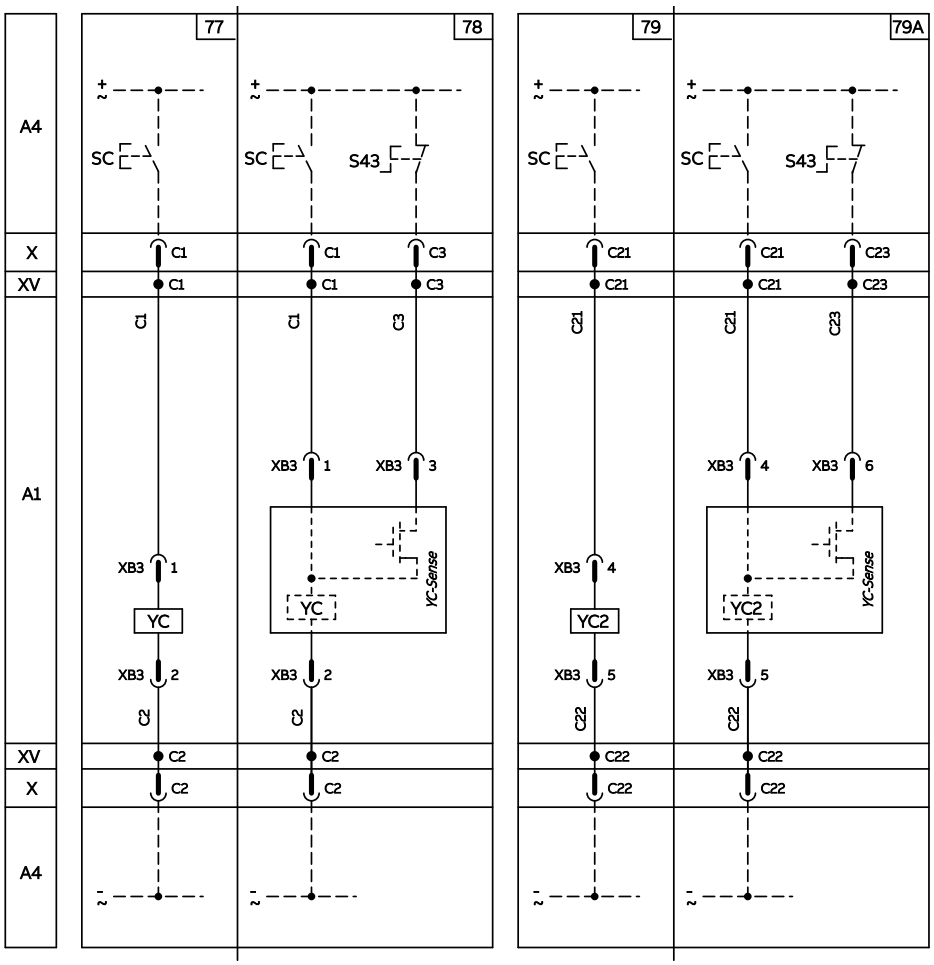


77) First closing coil - YC
78) First closing coil - YC - YC Sense
79) Second closing coil - YC2
79A) Second closing coil - YC2 - YC-Sense

77(YC)
78(YC-Sense)
as an alternative
to each other

79(YC2)
79A(YC2-Sense)
as an alternative
to each other

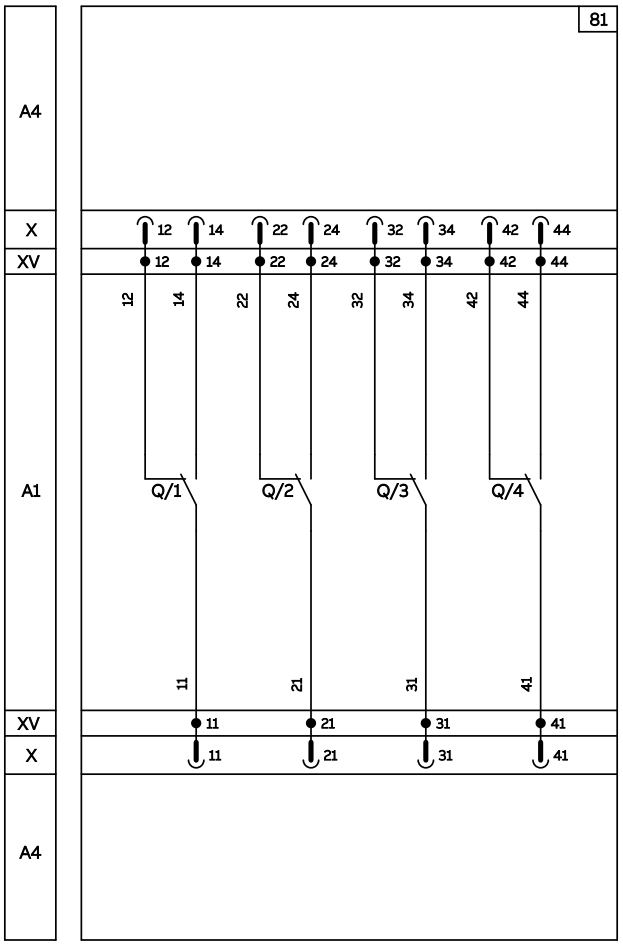
Only for circuit-breakers
E2.3-E4.3-E6.3



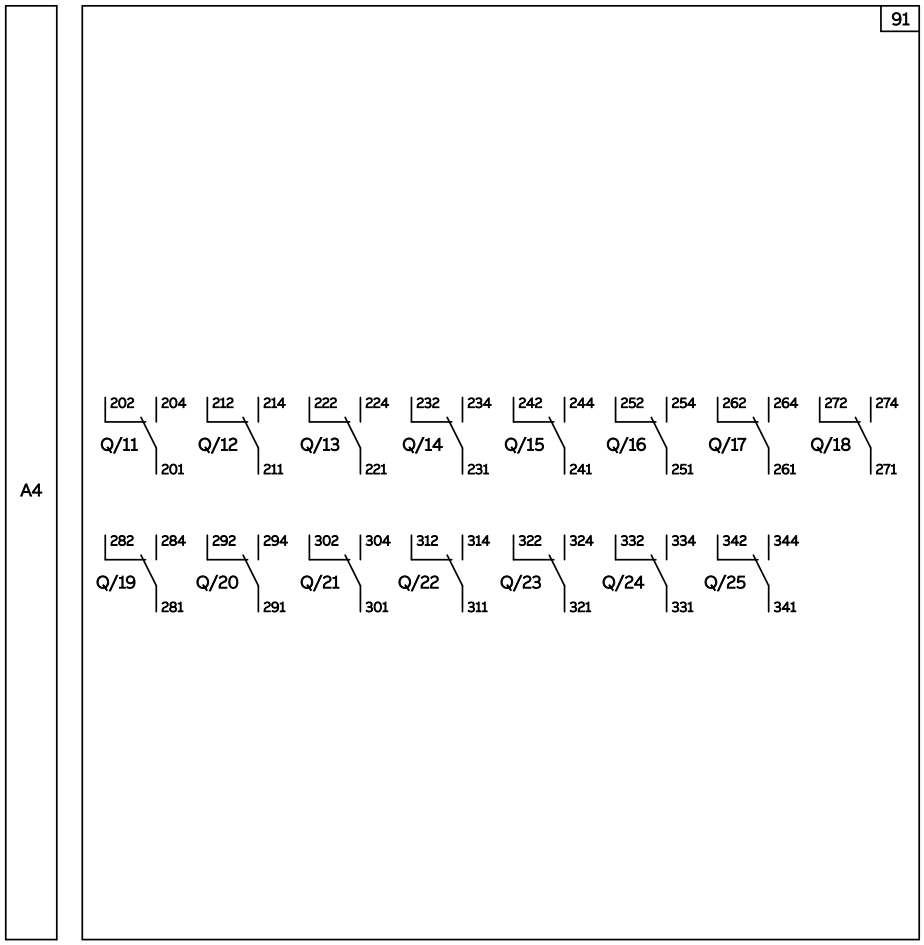
ELECTRICAL ACCESSORIES



81) Open/closed auxiliary contacts of circuit-breaker



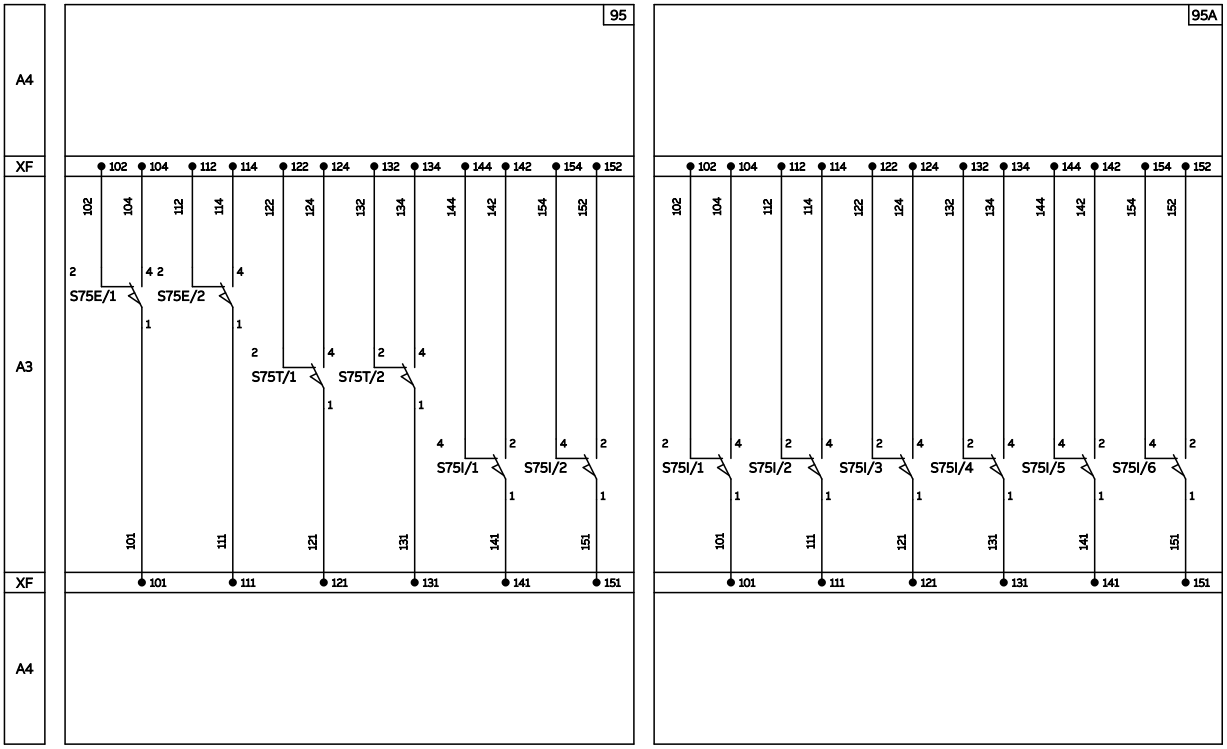
91) Supplementary Open/closed auxiliary contacts outside the circuit-breaker



ELECTRICAL ACCESSORIES

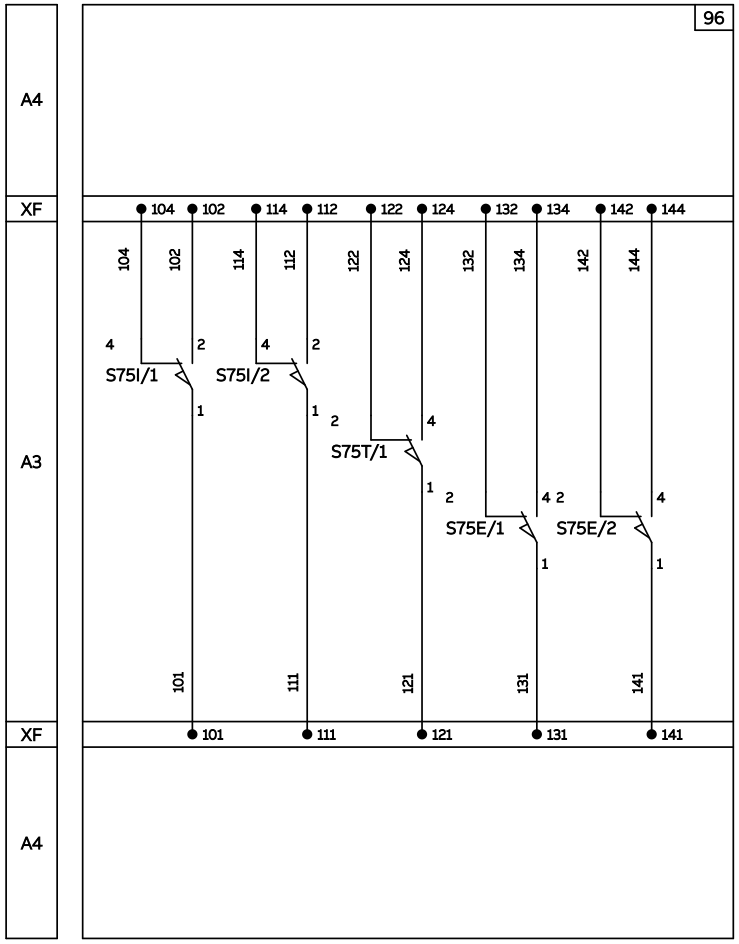
95) Contacts for signalling of circuit-breaker in racked-in, test, racked-out position
95A) Contacts for signalling of circuit-breaker in racked position

95 95A Only for circuit-breakers E1.3 in drawout version



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

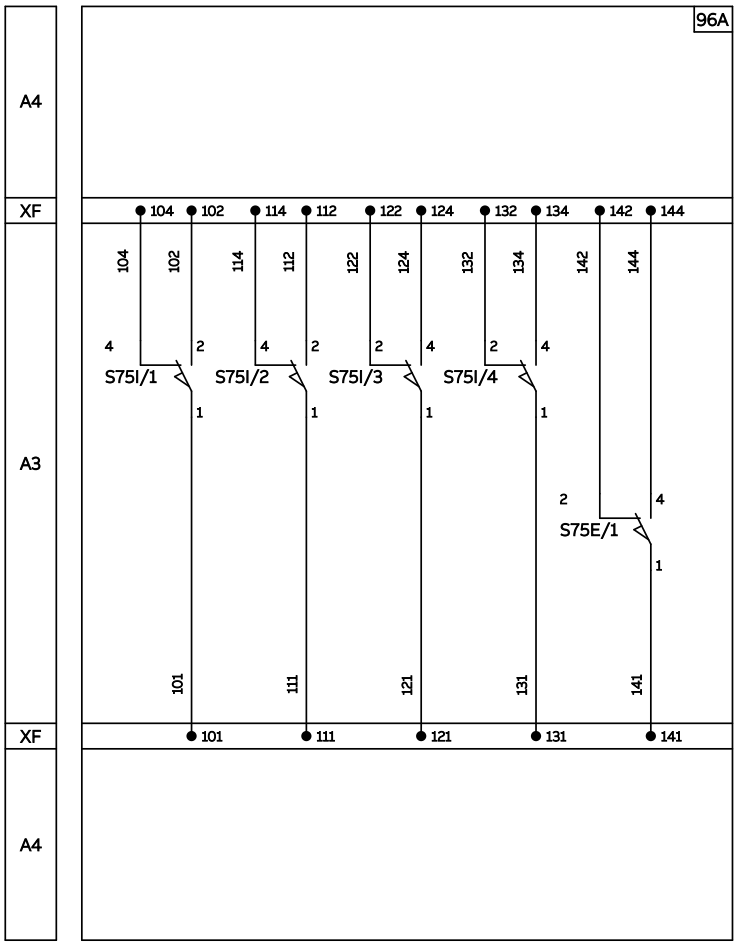
96 Only for circuit-breakers E2.3-E4.3-E6.3 in drawout version



ELECTRICAL ACCESSORIES

96A) Contacts for signalling of circuit-breaker in racked-in, test, racked-out position (FIRST SET)

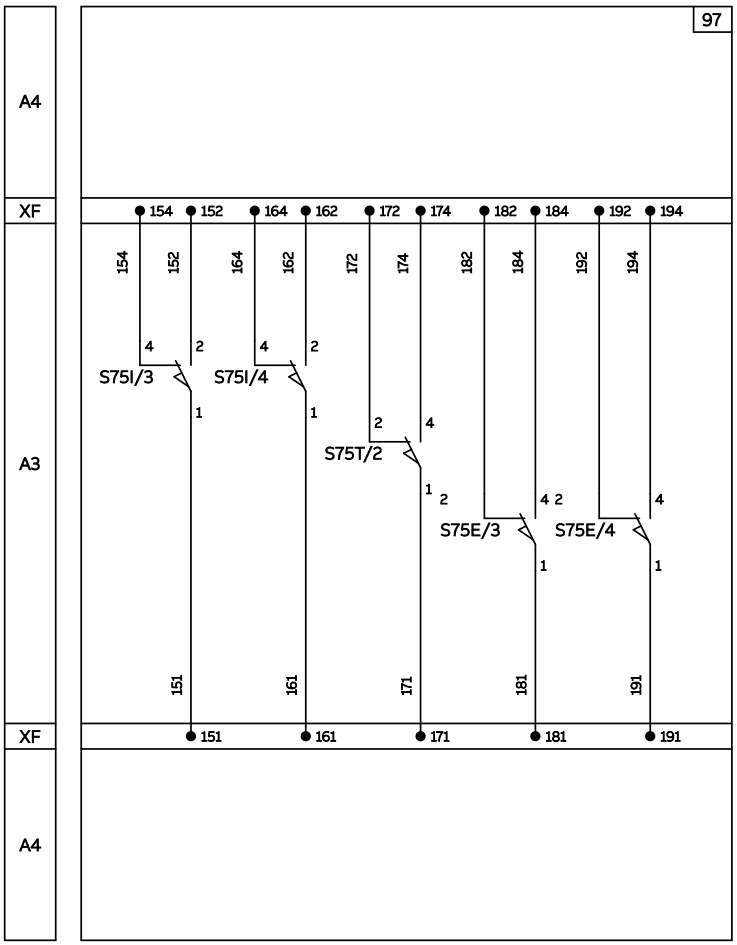
96A Only for circuit-breakers E2.3-E4.3-E6.3 in drawout version



97) Contacts for signalling of circuit-breaker in racked-in, test, racked-out position (SECOND SET)

97 Only for circuit-breakers E2.3-E4.3-E6.3 in drawout version

As an alternative to figure 97A

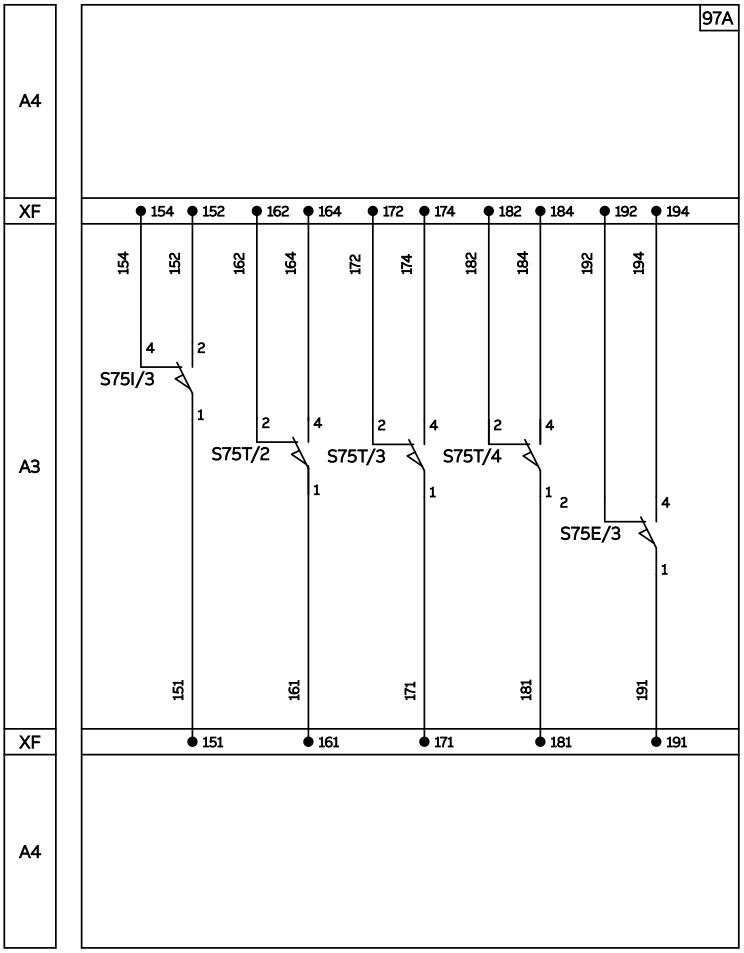


ELECTRICAL ACCESSORIES

97A) Contacts for signalling of circuit-breaker in racked-in, test, racked-out position (SECOND SET)

97A Only for circuit-breakers E2.3-E4.3-E6.3 in drawout version

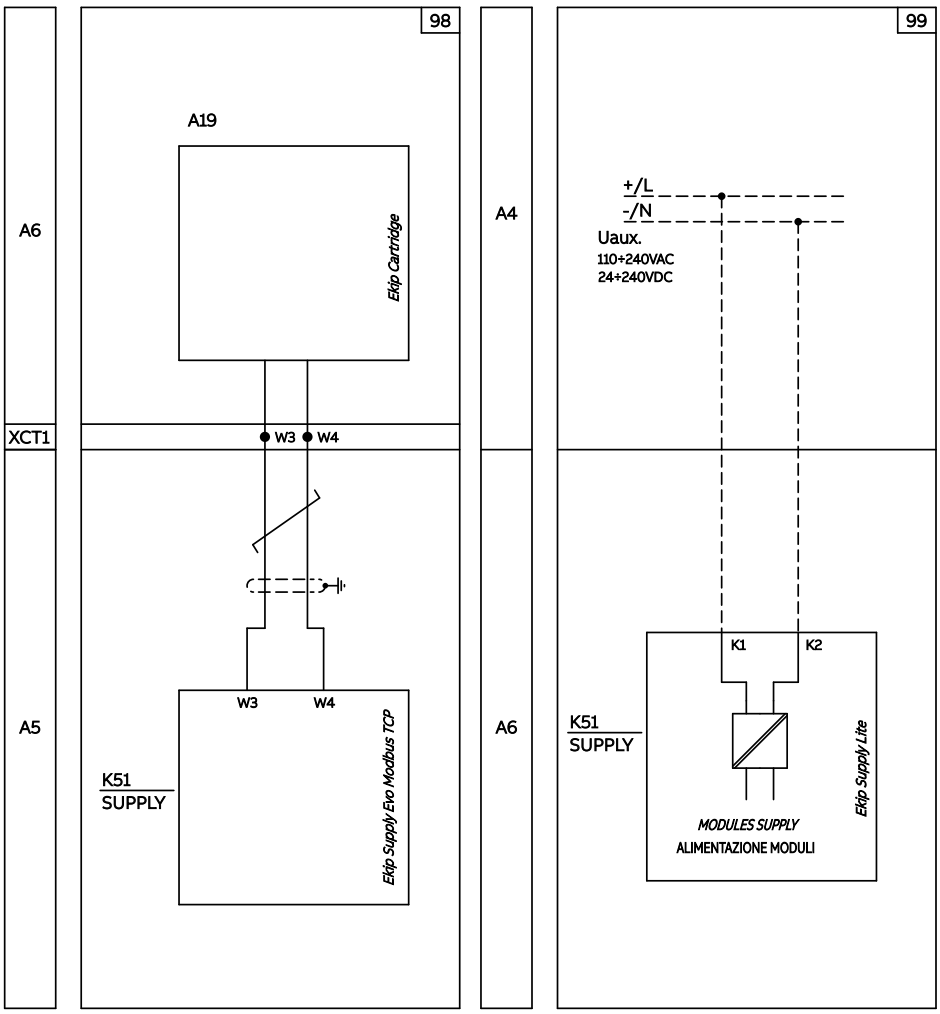
As an alternative to figure 97



98) Bus connection to EKIP Cartridge
99) Auxiliary Supply of moduled of EKIP DIN Cartridge

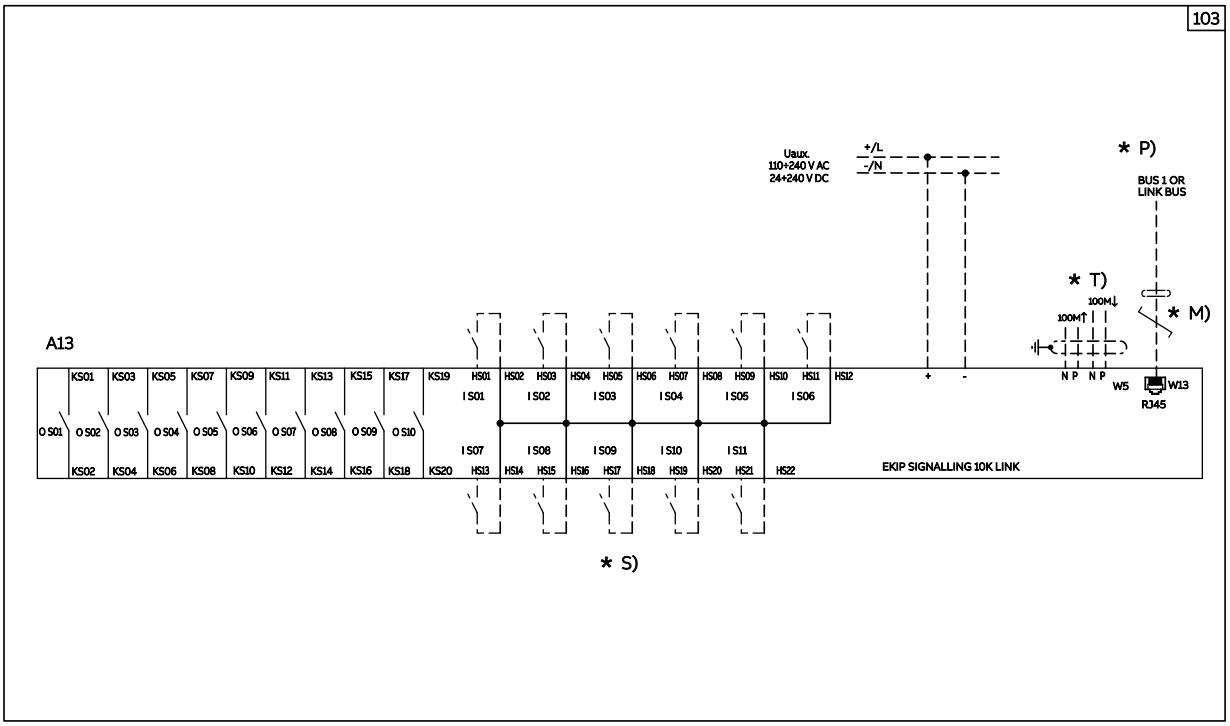
98 99 Up to three applications between Fig. 41 ... 59

Taken only once can be Mounted in Ekip DIN Rail Cartridge.



ELECTRICAL ACCESSORIES

103) Ekip signalling 10K LINK



08

ORDERING PART NUMBERS

8/2 **Ordering Code Breakdown**
8/2 Circuit Breaker & Switch Disconnector
8/11 Cradle/Fixed Part
8/13 Accessories

8/14 **General information**

8/15 **Automatic circuit-breakers**
8/15 Fixed version for power distribution
8/20 Drawout version for power distribution

8/25 **Switch-disconnectors**
8/25 Fixed version
8/27 Drawout version

8/29 **Circuit breakers**

8/30 **Cradles**

8/31 **Accessories**
8/31 Control
8/34 Measurement & Protection
8/36 Signalling & Input/Output
8/39 Safety & IP Protection
8/45 Interlocks
8/46 Connectivity
8/48 Displaying
8/49 Digital upgrades
8/51 Power Connections
8/55 Miscellaneous
8/56 Service

ORDERING CODE BREAKDOWN

Circuit Breaker & Switch Disconnector

1	2	3	4	5	6	7 & 8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

1 - EMAX 3 PREFIX

Emax 3	E

2 - FRAME

	E1.3	E2.3	E4.3	E5.3	E6.3	E6.3/f
3p	1	2	4	5	6	-
4p - N Left	A	B	C		D	E
4p - N Right	F	G	H		J	K

Default 4p configuration is on the left
E6.3/f = 100% rated neutral

3 - SHORT CIRCUIT RATING / PERFORMANCE

	B	C	N	S	H	V	L	X
508V AC	42	-	50	65	85	100	-	-
635V AC	42	-	50	65	85	85/100	-	-
440V AC	42	50	66	85	100	150	-	150
690V AC	42	42	66	66	85/100	100	-	100

4 - VERSION/CERTIFICATION

A	3	R	L	D	C
UL1066 (OEM)	UL1066 + Non-defeatable I Protection	ReliaGear SB Drawout (Replacement)	UL/IEC/ CCC (Triple Cert.)	UL/IEC (Dual Cert.)	IEC

5 - FRAME/SENSOR RATING

	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
UL [A]	250	400	-	800	1000	1200	1600	2000	2500	3000	3200	3600	4000	5000	6000
IEC [A]	250	400	630	800	1000	1250	1600	2000	2500	-	3200	-	4000	5000	6300

6 - DIGITAL RATING PLUG

	1	2	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
UL [A]	100	200	250	400	600	800	1000	1200	1600	2000	2500	3000	3200	3600	4000	5000	6000
IEC [A]	100	200	250	400	630	800	1000	1250	1600	2000	2500	3000	3200	3600	4000	5000	6300

7 & 8 - MOUNTING & TERMINALS

	7	8
Drawout	M	P
Drawout Embedded RRD	R	R
	Fixed Mount - Upper Terminals	**Fixed Mount - Lower Terminals**
HR	H	H
VR	V	V
LHR-Multi	A	A
LVR-Multi	B	B
SHR-Single	C	C
SVR-Single	D	D
SHR-Multi	G	G
SVR-Multi	J	J
F	F	F
EF	E	E
ES	S	S
FCCUAL	L	L

10 - MEASUREMENT HARDWARE & COMMUNICATION ACCESSORIES

NONE (Switch disconnector only)	X
Measurement Hardware Placement	
Measurement Hardware Lower Terminals (1)	A
Measurement Hardware Upper Terminals	B
Measurement Hardware External Cables	C
Add Trip Unit Supply from Busbars	
Measurement Hardware Lower Terminals (1) + Busbar Supply	D
Measurement Hardware Upper Terminals + Busbar Supply	E
Measurement Hardware External Cables + Busbar Supply	F
Add Ekip RTC to monitor Ready to Close Status via Communications	
Measurement Hardware Lower Terminals (1) + Ekip RTC	G
Measurement Hardware Upper Terminals + Ekip RTC	H
Measurement Hardware External Cables + Ekip RTC	J
Additional Combinations	
Measurement Hardware Lower Terminals (1) + Busbar Supply + Ekip RTC	K
Measurement Hardware Upper Terminals + Busbar Supply + Ekip RTC	L
Measurement Hardware External Cables + Busbar Supply + Ekip RTC	M

1) Provided as default with base circuit breaker

9 - BASIC PROTECTIONS & TRIP UNIT OPTIONS

Switch disconnector	X
Ekip Aware	
LI	A
LSI	B
LSIG	C
No Wireless Connectivity	
LI	D
LSI	E
LSIG	F
Sealable Trip Unit Cover	
LI	G
LSI	H
LSIG	J
No Wireless + Sealable TU Cover	
LI	K
LSI	L
LSIG	M
Ekip Aware Cybersecurity IEC 62443-4-2	
LI	N
LSI	P
LSIG	Q
No Wireless Connectivity	
LI	R
LSI	S
LSIG	T
Sealable Trip Unit Cover	
LI	U
LSI	V
LSIG	Q
No Wireless + Sealable TU Cover	
LI	W
LSI	Y
LSIG	Z

ORDERING CODE BREAKDOWN

Circuit Breaker & Switch Disconnector

1	2	3	4	5	6	7 & 8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

11 - AUXILARY CONTACTS - CIRCUIT BREAKER STATUS

None (Switch disconnector only)	X
Standard Supply	
AUX 4Q 400VAC* + Bell Alarm 250V (S51) (1) (2)	A
Optional Combinations	
AUX 4Q 400VAC* + Bell Alarm 24VDC (S51)	B
AUX 4Q 24VDC + Bell Alarm 250V (S51) (1) (2)	C
AUX 4Q 24VDC + Bell Alarm 24VDC (S51)	D
Mixed Voltages	
AUX 2Q 400V + 2Q 24VDC + Bell Alarm 250V (1) (2)	E
AUX 2Q 400V + 2Q 24VDC + Bell Alarm 24VDC	F
5 Pin Terminal Blocks For Electrical Accessories	
AUX 4Q 400VAC* + Bell Alarm 250V (S51) (1) (2)	G
Optional Combinations	
AUX 4Q 400VAC* + Bell Alarm 24VDC (S51)	H
AUX 4Q 24VDC + Bell Alarm 250V (S51) (1) (2)	J
AUX 4Q 24VDC + Bell Alarm 24VDC (S51)	K
Mixed Voltages	
AUX 2Q 400V + 2Q 24VDC + Bell Alarm 250V (1) (2)	L
AUX 2Q 400V + 2Q 24VDC + Bell Alarm 24VDC	M

1) Provided as default with base circuit breaker
2) Bell Alarm not available for Switch Disconnector versions

12 - ADDITIONAL AUXILARY CONTACTS & SIGNALLING I/O

None	X
Additional AUX 6Q Contacts	
AUX 6Q 400Vac	A
AUX 6Q 24Vdc	D
AUX 3Q 400Vac + 3Q 24Vdc	C
Additional Signalling I/O's	
Ekip Signalling 4K	4
M-Sense Enabler - Motor	
M-Sense Enabler 100V-415V	F
M-Sense Enabler 24V-60V	E

13 - MODULE 1

None	X
Ekip Supply Lite	S
Ekip supply Evo Modbus TCP	E
Ekip Supply Evo + Module 1	
Communications	
Ekip Com Modbus RS-485	A
Ekip Com Ethernet/Ip	B
Ekip Com IEC61850	C
Ekip Com Profibus	D
Ekip Com Profinet	F
Other Modules	
Ekip RELT	G
Ekip Signalling 2k	H
Ekip Synchrocheck	J
Ekip Signalling 4T	K
Ekip Arc-Flash 6F	L
Ekip Supply Lite + Module 1	
Communications	
Ekip Com Modbus RS-485	M
Ekip Com Profibus	N
Other Modules	
Ekip RELT	P
Ekip Signalling 2k	Q
Ekip Synchrocheck	R
Ekip Signalling 4T	T
Ekip Arc-Flash 6F	U

14 - MODULE 2

None	X
Communications	
Ekip Com Modbus RS-485	A
Ekip Com Ethernet/Ip	B
Ekip Com IEC61850	C
Ekip Com Profibus	D
Ekip Com Profinet	F
Other Modules	
Ekip RELT	G
Ekip Signalling 2k	H
Ekip Synchrocheck	J
Ekip Signalling 4T-1	K
Ekip Arc-Flash 6F	L

15 - MODULE 3

None	X
Communications	
Ekip Com Modbus RS-485	A
Ekip Com Profibus	D
Other Modules	
Ekip RELT	G
Ekip Synchrocheck	H
Ekip Signalling 4T-1	K
Ekip Arc-Flash 6F	L

16 - OPENING COIL & SECOND UVR

None	X
Opening coil (YO1)	
110-120 Vac/dc	A
120-127 Vac/dc	B
220-240 Vac/dc	C
24 Vac/dc	D
240-250 Vac/dc	E
30 Vac/dc	F
380-400 Vac	G
415-440 Vac	H
48 Vac/dc	J
480-500 Vac	K
60 Vac/dc	L
Opening coil - Sense - (YO1-S)	
YO-1 Sense 110-250 Vac/dc	M
YO-1 Sense 24-60 Vac/dc	N
Second Undervoltage Release (YU2)	
YU 110-120 Vac/dc	O
YU 120-127 Vac/dc	P
YU 220-240 Vac/dc	Q
YU 24 Vac/dc	R
YU 240-250 Vac/dc	S
YU 30 Vac/dc	T
YU 380-400 Vac	U
YU 415-440 Vac	V
YU 48 Vac/dc	W
YU 480-500 Vac	Y
YU 60 Vac/dc	Z
Second Undervoltage Release - Sense (YU2-S)	
YU-2 Sense 110-120 Vac/dc	2
YU-2 Sense 120-127 Vac/dc	3
YU-2 Sense 220-240 Vac/dc	4
YU-2 Sense 24 Vac/dc	5
YU-2 Sense 240-250 Vac/dc	6
YU-2 Sense 30 Vac/dc	7
YU-2 Sense 48 Vac/dc	8
YU-2 Sense 60 Vac/dc	9

ORDERING CODE BREAKDOWN

Circuit Breaker & Switch Disconnector

1	2	3	4	5	6	7 & 8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

17 - CLOSING COIL 1

None	X
Closing coil (YC1)	
YC 110-120 Vac/dc	A
YC 120-127 Vac/dc	B
YC 220-240 Vac/dc	C
YC 24 Vac/dc	D
YC 240-250 Vac/dc	E
YC 30 Vac/dc	F
YC 380-400 Vac	G
YC 415-440 Vac	H
YC 48 Vac/dc	J
YC 480-500 Vac	K
YC 60 Vac/dc	L
Closing coil - Sense (YC-S)	
YC Sense 110-250 Vac/dc	M
YC Sense 24-60 Vac/dc	N

18 - CLOSING COIL 2

None	X
Close coil (YC2) [1]	
YC2 110-120 Vac/dc	A
YC2 120-127 Vac/dc	B
YC2 220-240 Vac/dc	C
YC2 24 Vac/dc	D
YC2 240-250 Vac/dc	E
YC2 30 Vac/dc	F
YC2 380-400 Vac	G
YC2 415-440 Vac	H
YC2 48 Vac/dc	J
YC2 480-500 Vac	K
YC2 60 Vac/dc	L
Closing coil - Sense (YC2-S)	
YC2-Sense 110-250 Vac/dc	M
YC2-Sense 24-60 Vac/dc	N

1) E2.3 - E6.3 only

19 - UNDERVOLTAGE AND SECOND OPENING COILS

None	X
Undervoltage Release (YU)	
YU 110-120 Vac/dc	A
YU 120-127 Vac/dc	B
YU 220-240 Vac/dc	C
YU 24 Vac/dc	D
YU 240-250 Vac/dc	E
YU 30 Vac/dc	F
YU 380-400 Vac	G
YU 415-440 Vac	H
YU 48 Vac/dc	J
YU 480-500 Vac	K
YU 60 Vac/dc	L
Undervoltage Release - Sense (YU-S)	
YU-Sense 110-120 Vac/dc	M
YU-Sense 120-127 Vac/dc	N
YU-Sense 220-240 Vac/dc	O
YU-Sense 24 Vac/dc	P
YU-Sense 240-250 Vac/dc	Q
YU-Sense 30 Vac/dc	R
YU-Sense 48 Vac/dc	S
YU-Sense 60 Vac/dc	T
Second opening coil (YO2)	
YO2 110-120 Vac/dc	U
YO2 120-127 Vac/dc	V
YO2 220-240 Vac/dc	W
YO2 24 Vac/dc	Y
YO2 240-250 Vac/dc	Z
YO2 30 Vac/dc	2
YO2 380-400 Vac	3
YO2 415-440 Vac	4
YO2 48 Vac/dc	5
YO2 480-500 Vac	6
YO2 60 Vac/dc	7
Second opening coil - Sense (YO2-S)	
YO2-Sense 110-250 Vac/dc	8
YO2-Sense 24-60 Vac/dc	9

20 - SPRING CHARGING MOTOR & MECHANICAL OPERATIONS COUNTER

None	X
Spring Charging Motor (M)	
M 100-130 VAC/DC	A
M 220-250 VAC/DC	B
M 24-30 VAC/DC	C
M 24-30 VAC/DC + MC 24V	D
M 277 VAC	E
M 277 VAC + MC 24V	F
M 380-415 VAC	G
M 380-415 VAC + MC 24V	H
M 48-60 VAC/DC	J
M 48-60 VAC/DC + MC 24V	K
M 440-480 VAC	L
M 100-130 VAC/DC + MC 24V	M
M 220-250 VAC/DC + MC 24V	N
M 440-480 VAC + MC 24V	P
Mechnical Counter (MOC)	Q
Spring Charging Motor + MOC	
M 100-130 VAC/DC	R
M 220-250 VAC/DC	S
M 24-30 VAC/DC	T
M 24-30 VAC/DC + MC 24V	U
M 277 VAC	V
M 277 VAC + MC 24V	W
M 380-415 VAC	Y
M 380-415 VAC + MC 24V	Z
M 48-60 VAC/DC	2
M 48-60 VAC/DC + MC 24V	3
M 440-480 VAC	4
M 100-130 VAC/DC + MC 24V	5
M 220-250 VAC/DC + MC 24V	6
M 440-480 VAC + MC 24V	7

21 - READY TO CLOSE (RTC), REMOTE RESET OF TRIPPED FLAG (YR), 2ND BELL ALARM (S51/2)

None	X
Ready to Close (RTC)	
RTC 250Vac	A
RTC 24Vdc	B
Remote Reset of Tripped Flag (YR)	
YR 110 VAC/DC	C
YR 24 VDC	D
YR 250 VAC/DC	E
Second Bell Alarm (S51/2) [1]	
2nd Bell Alarm 250V (S51/2)	F
2nd Bell Alarm 24VDC (S51/2)	G
Optional Combinations	
RTC 250Vac + YR 110 VAC/DC	H
RTC 24Vdc + YR 110 VAC/DC	J
RTC 250Vac + YR 24 VDC	K
RTC 24Vdc + YR 24 VDC	L
RTC 250Vac + YR 250 VAC/DC	M
RTC 24Vdc + YR 250 VAC/DC	N
RTC 250Vac + 2nd Bell Alarm 250V (S51/2)	P
RTC 24Vdc + 2nd Bell Alarm 250V (S51/2)	Q
RTC 250Vac + 2nd Bell Alarm 24VDC (S51/2)	R
RTC 24Vdc + 2nd Bell Alarm 24VDC (S51/2)	S

1) S51/2 uses the same housing as YR

ORDERING CODE BREAKDOWN

Circuit Breaker & Switch Disconnector

1	2	3	4	5	6	7 & 8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

23 - 1ST & 2ND PADLOCK OR KEYLOCK DEVICES

None	X
Padlock in Open Position (PLC) 1st/Left	P
Keylock in Open Position (KLC) 1st/Right	
KLC-S 1st/Right No. 20005	S
KLC-D 1st/Right Random No. 20005-8	D
KLC-D Ronis 1st/Right	R
KLC-A Kirk-STI -1st/Right	K
KLC-A Castell-1st/Right	C
Padlock & Keylock Combinations	
PLC 1st/Left + PLC 2nd/Right	L
PLC 1st/Left + KLC-S 1st/Right No. 20005	**A**
PLC 1st/Left + KLC-D 1st/Right Random No. 20005-8	B
PLC 1st/Left + KLC-D Ronis 1st/Right	E
PLC 1st/Left + KLC-A Kirk-STI -1st/Right	F
PLC 1st/Left + KLC-A Castell-1st/Right	G
Dual Keylock Combinations	
KLC-S 1st/Right No. 20005 + KLC-D 2nd/Left Random No. 20005-8	H
KLC-D 1st/Right Random No. 20005-8 + KLC-D 2nd/Left Random No. 20005-8	J
KLC-D Ronis 1st/Right + KLC-D Ronis 2nd/Left (1)	M
KLC-A Kirk-STI -1st/Right + KLC-A Kirk-STI -2nd/Left (1)	2

(1) E2.3 - E6.3 only

24 - PADLOCK & KEYLOCK FOR RACKED-IN/ TEST/OUT POSITION FOR E2.3-E6.3 ONLY

None	X
Padlock in Racked-In/Test/Out Position (PLP)	P
Keylock in Racked-In/Test/Out Position (KLP-S) - Keyed the Same	
KLP-S Pos.lock N.20005 1key	S
Keylock in Racked-In/Test/Out Position (KLP-D) - Random keys (N200005-8)	
KLP-D Pos.lock 1Key	D
3rd Party Keylock Provisions (KLP-A)	
KLP-A Keylock in Open Position Kirk-STI	K
KLP-A Keylock in Open Position Castell	C
KLP-D Keylock Ronis	R
Additional Combinations	
Padlock in Racked-In/Test/Out Position (PLP) + KLP-S Pos.lock N.20005 1key	A
Padlock in Racked-In/Test/Out Position (PLP) + KLP-D Pos.lock 1Key	B
Padlock in Racked-In/Test/Out Position (PLP) + KLP-A Keylock in Open Position Kirk-STI	E
Padlock in Racked-In/Test/Out Position (PLP) + KLP-A Keylock in Open Position Castell	F
Padlock in Racked-In/Test/Out Position (PLP) + KLP-D Keylock Ronis	G
KLP-D Pos.lock 1Key + KLP-D Pos.lock 2Key	H
KLP-A Keylock in Open Position Kirk-STI + 2nd KLP-A Keylock in Open Position Kirk-STI	2
KLP-D Keylock Ronis + KLP-D Keylock Ronis	J

25 - FACTORY WARRANTY & TEST REPORTS

None	X
Warranty Extension (Total Years)	
2 Years	A
3 Years	B
4 Years	C
5 Years	D
Factory Test Reports	
Factory Test Report	E
Factory Test Report with Pole Resistence	F
Additional Combinations	
2 Years + Factory Test Report	G
3 Years + Factory Test Report	H
4 Years + Factory Test Report	J
5 Years + Factory Test Report	K
2 Years + Factory Test Report with Pole Resistence	L
3 Years + Factory Test Report with Pole Resistence	M
4 Years + Factory Test Report with Pole Resistence	N
5 Years + Factory Test Report with Pole Resistence	P

26 - TRIP UNIT FEATURES 1

None	X
Metering/Measurement Digital uprades	
2% Measuring Digital uprade	2
1% Accuracy Measuring Digital uprade (2)	1
0.5% Accuracy Measuring Digital uprade (2)	5
Power Quality	
Network Analyzer (1)	A
Datalogger PRO (1)	D
Additional Combinations	
Network Analyzer + Datalogger PRO (1)	B
1% Accuracy (2) + Network Analyzer	C
1% Accuracy (2) + Datalogger PRO	E
1% Accuracy (2) + Network Analyzer + Datalogger PRO	F
0.5% Accuracy (2) + Network Analyzer	G
0.5% Accuracy (2) + Datalogger PRO	H
0.5% Accuracy (2)+ Network Analyzer + Datalogger PRO	J

1) Requires minimum Measuring Digital uprade
2) Factory installed only

27 - TRIP UNIT FEATURES 2

None	X
Voltage Protections	A
Voltage Protections, Adv. Voltage Protections	B
Frequency Protections	C
Power Protections	D
Advance Current Protections	E
Additional Combinations	
Voltage Protections, Frequency Protections	F
Voltage Protections, Adv. Voltage Protections, Frequency Protections	G
Voltage Protections, Power Protections	H
Voltage Protections, Adv. Voltage Protections, Power Protections	J
Voltage Protections, Advance Current Protection	K
Voltage Protections, Adv. Voltage Protections, Advance Current Protection	L
Frequency Protections, Power Protections	M
Frequency Protections, Advance Current Protection	N
Power Protections, Advance Current Protection	P
Voltage Protections, Frequency Protections, Power Protections	Q
Voltage Protections, Adv. Voltage Protections, Frequency Protections, Power Protections	R
Voltage Protections, Frequency Protections, Advance Current Protection	S
Voltage Protections, Adv. Voltage Protections, Frequency Protections, Advance Current Protection	T
Voltage Protections, Power Protections, Advance Current Protection	U
Voltage Protections, Adv. Voltage Protections, Power Protections, Advance Current Protection	V
Frequency Protections, Power Protections, Advance Current Protection	W
Voltage Protections, Frequency Protections, Power Protections, Advance Current Protection	Y
Voltage Protections, Adv. Voltage Protections, Frequency Protections, Power Protections, Advance Current Protection	Z

ORDERING CODE BREAKDOWN

Circuit Breaker & Switch Disconnector

1	2	3	4	5	6	7 & 8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

28 - TRIP UNIT FEATURES 3

None	X
Advanced MDGF	A
Ekip Link	B
Custom Logic	C
Internal Temperature Control	D
Directional Protection	E
Additional Combinations	
Advanced MDGF, Custom Logic	F
Advanced MDGF, Internal Temperature Control	G
Advanced MDGF, Directional Protection	H
Ekip Link, Custom Logic	J
Ekip Link, Internal Temperature Control	K
Ekip Link, Directional Protection	L
Custom Logic, Internal Temperature Control	M
Custom Logic, Directional Protection	N
Internal Temperature Control, Directional Protection	P
Advanced MDGF, Custom Logic, Internal Temperature Control	Q
Advanced MDGF, Custom Logic, Directional Protection	R
Advanced MDGF, Internal Temperature Control, Directional Protection	S
Ekip Link, Custom Logic, Internal Temperature Control	T
Ekip Link, Custom Logic, Directional Protection	U
Ekip Link, Internal Temperature Control, Directional Protection	V
Custom Logic, Internal Temperature Control, Directional Protection	W
Advanced MDGF, Custom Logic, Internal Temperature Control, Directional Protection	Y
Ekip Link, Custom Logic, Internal Temperature Control, Directional Protection	Z

29 - TRIP UNIT FEATURES 4

None	X
Dual Settings	A
Triple Settings	B
Remote Control (EPiC)	C
Predictive Maintenance	D
Additional Combinations	
Dual Settings, Remote Control (EPiC)	E
Dual Settings,Predictive Maintenance	F
Remote Control (EPiC),Predictive Maintenance	G
Dual Settings, Remote Control (EPiC),Predictive Maintenance	H
Triple Settings, Remote Control (EPiC)	J
Triple Settings,Predictive Maintenance	K
Triple Settings, Remote Control (EPiC),Predictive Maintenance	L

30 - TRIP UNIT FEATURES 5

None	X
Adaptive load shedding	A
Power Controller	B
Additional Combinations	
Adaptive load shedding + Power Controller	Z

ORDERING CODE BREAKDOWN

Cradle/Fixed Part

1 **2** **3** **4** **5** **6** **7** **8** **9** **10** **11**

1 - EMAX 3 PREFIX

Emax 3	E

2 - FRAME

	E1.3	E2.3	E4.3	E5.3	E6.3	E6.3/f
3p	1	2	4	5	6	-
4p	A	B	C		D	E

3 - STANDARD/VERSION

UL	A
IEC	C

4 & 5 - VERSION/CERTIFICATION

UL		FRAME IEC [A] (PERFORMACE CLASS)	
E1.3 1200A	12	E1.3 1600A	16
E2.3 2000A	20	E2.3 2000A	20
E4.3 2500A	25	E4.3 2500A	25
E4.3 3200A	32	E4.3 (N, S, H) 3200A	32
-	-	E4.3 2000 (V), 2500 (V), 3200 (V), 4000 (N, S, H, V)	40
E6.3 5000A	50	E6.3H 4000, 5000A	5H
E6.3 6000A	60	E6.3V 4000, 5000A	5V
		E6.3 4000 (X), 5000 (X), 6300 (H, V, X)	6X

6, 7 -VERSION/CERTIFICATION

	H	V	A	B	C	D	G	J	F	E	S	L	X
Upper	HR	VR	LHR-Multi	LVR-Multi	SHR-Single	SVR-Single	SHR-Multi	SVR-Multi	F	EF	ES	FCCUAL	NONE
Lower	HR	VR	LHR-Multi	LVR-Multi	SHR-Single	SVR-Single	SHR-Multi	SVR-Multi	F	EF	ES	FCCUAL	NONE

8 - AUXILIARY POSITION CONTACTS (AUP) (LEFT)

None	X
E1.1: 400VAC 6 Contacts (2 Conn. / 2 Test / 2 Disconn.) **E2.3-E6.3**: 400VAC 5 Contacts (2 Conn. / 1 Test / 2 Disconn.)	A
E1.3: 24VDC 6 Contacts (2 Conn. / 2 Test / 2 Disconn.) **E2.3-E6.3**: 24VDC 5 Contacts (2 Conn. / 1 Test / 2 Disconn.)	D
E2.3-E6.3: 400VAC 5 Contacts (1 Conn. / 3 Test / 1 Disconn.)	E
E2.3-E6.3: 24VDC 5 Fast Connect Contacts (2 Conn. / 1 Test / 2 Disconn.)	F
E2.3-E6.3: 400VAC 5 Fast Connect Contacts (2 Conn. / 1 Test / 2 Disconn.)	G
E2.3-E6.3: 400VAC 5 Fast Connect Contacts (1 Conn. / 3 Test / 1 Disconn.)	H

9 - AUXILIARY POSITION CONTACTS (AUP) (RIGHT)

None	X
E2.3-E6.3: 400VAC 5 Contacts (2 Conn. / 1 Test / 2 Disconn.)	A
E2.3-E6.3: 24VDC 5 Contacts (2 Conn. / 1 Test / 2 Disconn.)	D
E2.3-E6.3: 24VDC 5 Fast Connect Contacts (2 Conn. / 1 Test / 2 Disconn.)	F
E2.3-E6.3: 400VAC 5 Fast Connect Contacts (2 Conn. / 1 Test / 2 Disconn.)	G
E2.3-E6.3: 400VAC 5 Fast Connect Contacts (4 Conn. / 1 Disconn.)	H
E2.3-E6.3: 24VDC 5 Fast Connect Contacts (4 Conn. / 1 Disconn.)	J

ORDERING CODE BREAKDOWN

Cradle/Fixed Part

1 2 3 4 5 6 7 8 9 10 11

10 - PRE-INSTALLED TERMINAL BLOCKS FOR ACCESSORIES

None	X
8 Terminal blocks	A
18 Terminal blocks	B
8 Terminal blocks - 5 Pin	C
18 Terminal blocks - 5 Pin	D

11 - PADLOCK (PLP) & KEYLOCK (KLP) FOR RACKED-IN / TEST / DISCONNECTED POSITION (E1.2 ONLY)

None	X
Padlock in Racked-In/Test/Out Position (PLP)	A
Keylock in Racked-In/Test/Out Position (KLP-S) - Keyed the Same	
KLP-S Pos.lock N.20005 1key	B
KLP-S Pos.lock N.20006 1Key	C
KLP-S Pos.lock N.20007 1Key	D
KLP-S Pos.lock N.20008 1Key	E
KLP-S Pos.lock N.20009 1Key	F
Keylock in Racked-In/Test/Out Position (KLP-D) - Random keys (N200005-8)	
KLP-D Pos.lock 1Key	G
3rd Party Keylock Provisions (KLP-A)	
KLP-A Keylock in Open Position Kirk-STI	H
KLP-A Keylock in Open Position Castell	J
Additional Combinations	
Padlock in Racked-In/Test/Out Position (PLP) + KLP-S Pos.lock N.20005 1key	K
Padlock in Racked-In/Test/Out Position (PLP) + KLP-S Pos.lock N.20006 1key	L
Padlock in Racked-In/Test/Out Position (PLP) + KLP-S Pos.lock N.20007 1key	M
Padlock in Racked-In/Test/Out Position (PLP) + KLP-S Pos.lock N.20008 1key	N
Padlock in Racked-In/Test/Out Position (PLP) + KLP-S Pos.lock N.20009 1key	P
Padlock in Racked-In/Test/Out Position (PLP) + KLP-D Pos.lock 1Key	Q
Padlock in Racked-In/Test/Out Position (PLP) + KLP-A Keylock in Open Position Kirk-STI	R
Padlock in Racked-In/Test/Out Position (PLP) + KLP-A Keylock in Open Position Castell	S
KLP-D Pos.lock 1Key + KLP-D Pos.lock 2Key	T
KLP-A Keylock in Open Position Kirk-STI + 2nd KLP-A Keylock in Open Position Kirk-STI	U

ORDERING CODE BREAKDOWN

Accessories

EMAX 3 ACCESSORY PREFIX

Kit Loose Supply	K3
Factory Installed Accessory Only	F3

FRAME COMPATIBILITY

All (E1.3 - E6.3)	A
E1.3 only	1
E2.3	2
E4.3	4
E6.3	6
E2.3 - E6.3	B

ACCESSORY CATEGORY

Electrical Accessories	ELEC
Aux Contacts	AUX
Drawout Position Contacts	AUP
Com Related Accessories	COM
Ekip Accessories	EK
Mechanical Accessories	MECH
Software	SW
Software - ABB Marketpace	SWMP

GENERAL INFORMATION

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 draw-out circuit breaker

Iu	Rated uninterrupted current
In	Rated current of the digital rating plug
Icu	Rated ultimate short-circuit breaking capacity
Icw	Rated short-time withstand current

/MS	Switch-disconnector
/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 unit and functions	
Ekip Aware	Measurement and protection trip unit for power distribution

L	Overload protection
S	Short-time overcurrent protection
I	Instantaneous overcurrent protection
G	Ground fault protection
Rc	Residual current protection

Automatic circuit-breakers

Fixed version for power distribution



SACE EMAX E1.3B-A/N-A • FRONT TERMINALS (F)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3P Global PN	3P US / CA PN	4P Global PN	4P US / CA PN
E1.3B-A	800	42	42	E1.3B-A 800 Ekip Aware LI	1SDA126653R1	E1BADDFFAAA	1SDA126669R1	EABADDFFAAA
				E1.3B-A 800 Ekip Aware LSI	1SDA126654R1	E1BADDFFBAA	1SDA126670R1	EABADDFFBAA
				E1.3B-A 800 Ekip Aware LSIG	1SDA129043R1	E1BADDFFCAA	1SDA129051R1	EABADDFFCAA
	1200	42	42	E1.3B-A 1200 Ekip Aware LI	1SDA126655R1	E1BAFFFFAAA	1SDA126671R1	EABAFFFFAAA
				E1.3B-A 1200 Ekip Aware LSI	1SDA126656R1	E1BAFFFFBAA	1SDA126672R1	EABAFFFFBAA
				E1.3B-A 1200 Ekip Aware LSIG	1SDA129044R1	E1BAFFFFCAA	1SDA129052R1	EABAFFFFCAA
E1.3N-A	800	50	50	E1.3N-A 800 Ekip Aware LI	1SDA126657R1	E1NADDFFAAA	1SDA126673R1	EANADDFFAAA
				E1.3N-A 800 Ekip Aware LSI	1SDA126658R1	E1NADDFFBAA	1SDA126674R1	EANADDFFBAA
				E1.3N-A 800 Ekip Aware LSIG	1SDA129045R1	E1NADDFFCAA	1SDA129053R1	EANADDFFCAA
	1200	50	50	E1.3N-A 1200 Ekip Aware LI	1SDA126659R1	E1NAFFFFAAA	1SDA126675R1	EANAFFFFAAA
				E1.3N-A 1200 Ekip Aware LSI	1SDA126660R1	E1NAFFFFBAA	1SDA126676R1	EANAFFFFBAA
				E1.3N-A 1200 Ekip Aware LSIG	1SDA129046R1	E1NAFFFFCAA	1SDA129054R1	EANAFFFFCAA

SACE EMAX E1.3S-A • FRONT TERMINALS (F)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3P Global PN	3P US / CA PN	4P Global PN	4P US / CA PN
E1.3S-A	250	65	50	E1.3S-A 250 Ekip Aware LI	1SDA126661R1	E1SAAAFFAAA	1SDA126677R1	EASAAAFFAAA
				E1.3S-A 250 Ekip Aware LSI	1SDA126662R1	E1SAAAFFBAA	1SDA126678R1	EASAAAFFBAA
				E1.3S-A 250 Ekip Aware LSIG	1SDA129047R1	E1SAAAFFCAA	1SDA129055R1	EASAAAFFCAA
	400	65	50	E1.3S-A 400 Ekip Aware LI	1SDA126663R1	E1SABBFFAAA	1SDA126679R1	EASABBFFAAA
				E1.3S-A 400 Ekip Aware LSI	1SDA126664R1	E1SABBFFBAA	1SDA126680R1	EASABBFFBAA
				E1.3S-A 400 Ekip Aware LSIG	1SDA129048R1	E1SABBFFCAA	1SDA129056R1	EASABBFFCAA
	800	65	50	E1.3S-A 800 Ekip Aware LI	1SDA126665R1	E1SADDFFAAA	1SDA126681R1	EASADDFFAAA
				E1.3S-A 800 Ekip Aware LSI	1SDA126666R1	E1SADDFFBAA	1SDA126682R1	EASADDFFBAA
				E1.3S-A 800 Ekip Aware LSIG	1SDA129049R1	E1SADDFFCAA	1SDA129057R1	EASADDFFCAA
	1200	65	50	E1.3S-A 1200 Ekip Aware LI	1SDA126667R1	E1SAFFFFAAA	1SDA126683R1	EASAFFFFAAA
				E1.3S-A 1200 Ekip Aware LSI	1SDA126668R1	E1SAFFFFBAA	1SDA126684R1	EASAFFFFBAA
				E1.3S-A 1200 Ekip Aware LSIG	1SDA129050R1	E1SAFFFFCAA	1SDA129058R1	EASAFFFFCAA

About wall mount is standard; for floor fixing must order: 1SDA076020R1 ZE1FFPF

Automatic circuit-breakers

Fixed version for power distribution



SACE EMAX 3 E2.3B-A/N-A • ORIENTABLE REAR TERMINALS (HR)

					3P		4P	
Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	Global PN	US / CA PN	Global PN	US / CA PN
E2.3B-A	1600	42	42	E2.3B-A 1600 Ekip Aware LI	1SDA126717R1	E2BAGGHHAAA	1SDA126751R1	EBBAGGHHAAA
				E2.3B-A 1600 Ekip Aware LSI	1SDA126718R1	E2BAGGHHBAA	1SDA126752R1	EBBAGGHHBAA
				E2.3B-A 1600 Ekip Aware LSIG	1SDA129075R1	E2BAGGHHCAA	1SDA129092R1	EBBAGGHHCAA
E2.3N-A	1600	50	50	E2.3N-A 1600 Ekip Aware LI	1SDA126727R1	E2NAGGHHAAA	1SDA126761R1	EBNAGGHHAAA
				E2.3N-A 1600 Ekip Aware LSI	1SDA126728R1	E2NAGGHHBAA	1SDA126762R1	EBNAGGHHBAA
				E2.3N-A 1600 Ekip Aware LSIG	1SDA129080R1	E2NAGGHHCAA	1SDA129097R1	EBNAGGHHCAA
	2000	50	50	E2.3N-A 2000 Ekip Aware LI	1SDA126729R1	E2NAHHHHAAA	1SDA126763R1	EBNAHHHHAAA
				E2.3N-A 2000 Ekip Aware LSI	1SDA126730R1	E2NAHHHHBAA	1SDA126764R1	EBNAHHHHBAA
				E2.3N-A 2000 Ekip Aware LSIG	1SDA129081R1	E2NAHHHHCAA	1SDA129098R1	EBNAHHHHCAA

SACE EMAX 3 E2.3S-A • ORIENTABLE REAR TERMINALS (HR)

					3P		4P	
Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	Global PN	US / CA PN	Global PN	US / CA PN
E2.3S-A	800	65	65	E2.3S-A 800 Ekip Aware LI	1SDA126731R1	E2SADDHHAAA	1SDA126765R1	EBSADDHHAAA
				E2.3S-A 800 Ekip Aware LSI	1SDA126732R1	E2SADDHHBAA	1SDA126766R1	EBSADDHHBAA
				E2.3S-A 800 Ekip Aware LSIG	1SDA129082R1	E2SADDHHCAA	1SDA129099R1	EBSADDHHCAA
	1200	65	65	E2.3S-A 1200 Ekip Aware LI	1SDA126733R1	E2SAFFHHAAA	1SDA126767R1	EBSAFFHHAAA
				E2.3S-A 1200 Ekip Aware LSI	1SDA126734R1	E2SAFFHHBAA	1SDA126768R1	EBSAFFHHBAA
				E2.3S-A 1200 Ekip Aware LSIG	1SDA129083R1	E2SAFFHHCAA	1SDA129100R1	EBSAFFHHCAA
	1600	65	65	E2.3S-A 1600 Ekip Aware LI	1SDA126735R1	E2SAGGHHAAA	1SDA126769R1	EBSAGGHHAAA
				E2.3S-A 1600 Ekip Aware LSI	1SDA126736R1	E2SAGGHHBAA	1SDA126770R1	EBSAGGHHBAA
				E2.3S-A 1600 Ekip Aware LSIG	1SDA129084R1	E2SAGGHHCAA	1SDA129101R1	EBSAGGHHCAA
	2000	65	65	E2.3S-A 2000 Ekip Aware LI	1SDA126737R1	E2SAHHHHAAA	1SDA126771R1	EBSAHHHHAAA
				E2.3S-A 2000 Ekip Aware LSI	1SDA126738R1	E2SAHHHHBAA	1SDA126772R1	EBSAHHHHBAA
				E2.3S-A 2000 Ekip Aware LSIG	1SDA129085R1	E2SAHHHHCAA	1SDA129102R1	EBSAHHHHCAA

SACE EMAX 3 E2.3H-A • ORIENTABLE REAR TERMINALS (HR)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3P		4P	
					Global PN	US / CA PN	Global PN	US / CA PN
E2.3H-A	800	85	85	E2.3H-A 800 Ekip Aware LI	1SDA126719R1	E2HADDHHAAA	1SDA126753R1	EBHADDHHAAA
				E2.3H-A 800 Ekip Aware LSI	1SDA126720R1	E2HADDHHBAA	1SDA126754R1	EBHADDHHBAA
				E2.3H-A 800 Ekip Aware LSIG	1SDA129076R1	E2HADDHHCAA	1SDA129093R1	EBHADDHHCAA
	1200	85	85	E2.3H-A 1200 Ekip Aware LI	1SDA126721R1	E2HAFFHHAAA	1SDA126755R1	EBHAFFHHAAA
				E2.3H-A 1200 Ekip Aware LSI	1SDA126722R1	E2HAFFHHBAA	1SDA126756R1	EBHAFFHHBAA
				E2.3H-A 1200 Ekip Aware LSIG	1SDA129077R1	E2HAFFHHCAA	1SDA129094R1	EBHAFFHHCAA
	1600	85	85	E2.3H-A 1600 Ekip Aware LI	1SDA126723R1	E2HAGGHHAAA	1SDA126757R1	EBHAGGHHAAA
				E2.3H-A 1600 Ekip Aware LSI	1SDA126724R1	E2HAGGHHBAA	1SDA126758R1	EBHAGGHHBAA
				E2.3H-A 1600 Ekip Aware LSIG	1SDA129078R1	E2HAGGHHCAA	1SDA129095R1	EBHAGGHHCAA
	2000	85	85	E2.3H-A 2000 Ekip Aware LI	1SDA126725R1	E2HAHHHHAAA	1SDA126759R1	EBHAHHHHAAA
				E2.3H-A 2000 Ekip Aware LSI	1SDA126726R1	E2HAHHHHBAA	1SDA126760R1	EBHAHHHHBAA
				E2.3H-A 2000 Ekip Aware LSIG	1SDA129079R1	E2HAHHHHCAA	1SDA129096R1	EBHAHHHHCAA

SACE EMAX 3 E2.3V-A • ORIENTABLE REAR TERMINALS (HR)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3P		4P	
					Global PN	US / CA PN	Global PN	US / CA PN
E2.3V-A	250	100	85	E2.3V-A 250 Ekip Aware LI	1SDA126739R1	E2VAAAHHAAA	1SDA126773R1	EBVAAAHHAAA
				E2.3V-A 250 Ekip Aware LSI	1SDA126740R1	E2VAAAHHBAA	1SDA126774R1	EBVAAAHHBAA
				E2.3V-A 250 Ekip Aware LSIG	1SDA129086R1	E2VAAAHHCAA	1SDA129103R1	EBVAAAHHCAA
	400	100	85	E2.3V-A 400 Ekip Aware LI	1SDA126741R1	E2VABBHHAAA	1SDA126775R1	EBVABBHHAAA
				E2.3V-A 400 Ekip Aware LSI	1SDA126742R1	E2VABBHHBAA	1SDA126776R1	EBVABBHHBAA
				E2.3V-A 400 Ekip Aware LSIG	1SDA129087R1	E2VABBHHCAA	1SDA129104R1	EBVABBHHCAA
	800	100	85	E2.3V-A 800 Ekip Aware LI	1SDA126743R1	E2VADDHHAAA	1SDA126777R1	EBVADDHHAAA
				E2.3V-A 800 Ekip Aware LSI	1SDA126744R1	E2VADDHHBAA	1SDA126778R1	EBVADDHHBAA
				E2.3V-A 800 Ekip Aware LSIG	1SDA129088R1	E2VADDHHCAA	1SDA129105R1	EBVADDHHCAA
	1200	100	85	E2.3V-A 1200 Ekip Aware LI	1SDA126745R1	E2VAFFHHAAA	1SDA126779R1	EBVAFFHHAAA
				E2.3V-A 1200 Ekip Aware LSI	1SDA126746R1	E2VAFFHHBAA	1SDA126780R1	EBVAFFHHBAA
				E2.3V-A 1200 Ekip Aware LSIG	1SDA129089R1	E2VAFFHHCAA	1SDA129106R1	EBVAFFHHCAA
	1600	100	85	E2.3V-A 1600 Ekip Aware LI	1SDA126747R1	E2VAGGHHAAA	1SDA126781R1	EBVAGGHHAAA
				E2.3V-A 1600 Ekip Aware LSI	1SDA126748R1	E2VAGGHHBAA	1SDA126782R1	EBVAGGHHBAA
				E2.3V-A 1600 Ekip Aware LSIG	1SDA129090R1	E2VAGGHHCAA	1SDA129107R1	EBVAGGHHCAA
	2000	100	85	E2.3V-A 2000 Ekip Aware LI	1SDA126749R1	E2VAHHHHAAA	1SDA126783R1	EBVAHHHHAAA
				E2.3V-A 2000 Ekip Aware LSI	1SDA126750R1	E2VAHHHHBAA	1SDA126784R1	EBVAHHHHBAA
				E2.3V-A 2000 Ekip Aware LSIG	1SDA129091R1	E2VAHHHHCAA	1SDA129108R1	EBVAHHHHCAA

Automatic circuit-breakers

Fixed version for power distribution



SACE EMAX 3 E4.3S-A/H-A • ORIENTABLE REAR TERMINALS UP TO 2500 A (HR)

					3P		4P	
Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	Global PN	US / CA PN	Global PN	US / CA PN
E4.3S-A	2500	65	65	E4.3S-A 2500 Ekip Aware LI	1SDA126861R1	E4SAJJHHAAA	1SDA126889R1	ECSAJJHHAAA
				E4.3S-A 2500 Ekip Aware LSI	1SDA126862R1	E4SAJJHHBAA	1SDA126890R1	ECSAJJHHBAA
				E4.3S-A 2500 Ekip Aware LSIG	1SDA129147R1	E4SAJJHHCAA	1SDA129161R1	ECSAJJHHCAA
	3200 (1)	65	65	E4.3S-A 3200 Ekip Aware LI	1SDA126865R1	E4SALLVVAAA	1SDA126893R1	ECSALLVVAAA
				E4.3S-A 3200 Ekip Aware LSI	1SDA126866R1	E4SALLVVBAA	1SDA126894R1	ECSALLVVBAA
				E4.3S-A 3200 Ekip Aware LSIG	1SDA129149R1	E4SALLVVCAA	1SDA129163R1	ECSALLVVCAA
	3600 (1)	65	65	E4.3S-A 3600 Ekip Aware LI	1SDA126867R1	E4SAMMVVAAA	-	-
				E4.3S-A 3600 Ekip Aware LSI	1SDA126868R1	E4SAMMVVBAA	-	-
				E4.3S-A 3600 Ekip Aware LSIG	1SDA129150R1	E4SAMMVVCAA	-	-
E4.3H-A	2500	85	85	E4.3H-A 2500 Ekip Aware LI	1SDA126853R1	E4HAJJHHAAA	1SDA126883R1	ECHAJJHHAAA
				E4.3H-A 2500 Ekip Aware LSI	1SDA126854R1	E4HAJJHHBAA	1SDA126884R1	ECHAJJHHBAA
				E4.3H-A 2500 Ekip Aware LSIG	1SDA129143R1	E4HAJJHHCAA	1SDA129158R1	ECHAJJHHCAA
	3200 (1)	85	85	E4.3H-A 3200 Ekip Aware LI	1SDA126857R1	E4HALLVVAAA	1SDA126887R1	ECHALLVVAAA
				E4.3H-A 3200 Ekip Aware LSI	1SDA126858R1	E4HALLVVBAA	1SDA126888R1	ECHALLVVBAA
				E4.3H-A 3200 Ekip Aware LSIG	1SDA129145R1	E4HALLVVCAA	1SDA129160R1	ECHALLVVCAA

1) 3200A ratings only with rear vertical terminals

SACE EMAX 3 E4.3V-A • ORIENTABLE REAR TERMINALS UP TO 2500 A (HR)

					3P		4P	
Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	Global PN	US / CA PN	Global PN	US / CA PN
E4.3V-A	800	100	85	E4.3V-A 800 Ekip Aware LI	1SDA126869R1	E4VADDHHAAA	1SDA126895R1	ECVADDHHAAA
				E4.3V-A 800 Ekip Aware LSI	1SDA126870R1	E4VADDHHBAA	1SDA126896R1	ECVADDHHBAA
				E4.3V-A 800 Ekip Aware LSIG	1SDA129151R1	E4VADDHHCAA	1SDA129164R1	ECVADDHHCAA
	1600	100	85	E4.3V-A 1600 Ekip Aware LI	1SDA126871R1	E4VAGGHHAAA	1SDA126897R1	ECVAGGHHAAA
				E4.3V-A 1600 Ekip Aware LSI	1SDA126872R1	E4VAGGHHBAA	1SDA126898R1	ECVAGGHHBAA
				E4.3V-A 1600 Ekip Aware LSIG	1SDA129152R1	E4VAGGHHCAA	1SDA129165R1	ECVAGGHHCAA
	2000	100	85	E4.3V-A 2000 Ekip Aware LI	1SDA126873R1	E4VAHHHHAAA	1SDA126899R1	ECVAHHHHAAA
				E4.3V-A 2000 Ekip Aware LSI	1SDA126874R1	E4VAHHHHBAA	1SDA126900R1	ECVAHHHHBAA
				E4.3V-A 2000 Ekip Aware LSIG	1SDA129153R1	E4VAHHHHCAA	1SDA129166R1	ECVAHHHHCAA
	2500	100	85	E4.3V-A 2500 Ekip Aware LI	1SDA126875R1	E4VAJJHHAAA	1SDA126901R1	ECVAJJHHAAA
				E4.3V-A 2500 Ekip Aware LSI	1SDA126876R1	E4VAJJHHBAA	1SDA126902R1	ECVAJJHHBAA
				E4.3V-A 2500 Ekip Aware LSIG	1SDA129154R1	E4VAJJHHCAA	1SDA129167R1	ECVAJJHHCAA
	3200 (1)	100	85	E4.3V-A 3200 Ekip Aware LI	1SDA126879R1	E4VALLVVAAA	1SDA126905R1	ECVALLVVAAA
				E4.3V-A 3200 Ekip Aware LSI	1SDA126880R1	E4VALLVVBAA	1SDA126906R1	ECVALLVVBAA
				E4.3V-A 3200 Ekip Aware LSIG	1SDA129156R1	E4VALLVVCAA	1SDA129169R1	ECVALLVVCAA

1) 3200A ratings only with rear vertical terminals



SACE EMAX 3 E6.3H-A/V-A • ORIENTABLE REAR TERMINALS UP TO 5000A (HR)

					3P		4P 50% Neutral	
Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	Global PN	US / CA PN	Global PN	US / CA PN
E6.3H-A	4000	85	85	E6.3H-A 4000 Ekip Aware LI	1SDA126955R1	E6HANNHHAAA	1SDA126963R1	EDHANNHHAAA
				E6.3H-A 4000 Ekip Aware LSI	1SDA126956R1	E6HANNHHBAA	1SDA126964R1	EDHANNHHBAA
				E6.3H-A 4000 Ekip Aware LSIG	1SDA129194R1	E6HANNHHCAA	1SDA129198R1	EDHANNHHCAA
	5000	85	85	E6.3H-A 5000 Ekip Aware LI	1SDA126957R1	E6HAPPHHAAA	1SDA126965R1	EDHAPPHHAAA
				E6.3H-A 5000 Ekip Aware LSI	1SDA126958R1	E6HAPPHHBAA	1SDA126966R1	EDHAPPHHBAA
				E6.3H-A 5000 Ekip Aware LSIG	1SDA129195R1	E6HAPPHHCAA	1SDA129199R1	EDHAPPHHCAA
E6.3V-A	4000	100	100	E6.3V-A 4000 Ekip Aware LI	1SDA126959R1	E6VANNHHAAA	1SDA126967R1	EDVANNHHAAA
				E6.3V-A 4000 Ekip Aware LSI	1SDA126960R1	E6VANNHHBAA	1SDA126968R1	EDVANNHHBAA
				E6.3V-A 4000 Ekip Aware LSIG	1SDA129196R1	E6VANNHHCAA	1SDA129200R1	EDVANNHHCAA
	5000	100	100	E6.3V-A 5000 Ekip Aware LI	1SDA126961R1	E6VAPPHHAAA	1SDA126969R1	EDVAPPHHAAA
				E6.3V-A 5000 Ekip Aware LSI	1SDA126962R1	E6VAPPHHBAA	1SDA126970R1	EDVAPPHHBAA
				E6.3V-A 5000 Ekip Aware LSIG	1SDA129197R1	E6VAPPHHCAA	1SDA129201R1	EDVAPPHHCAA

SACE EMAX 3 E6.3H-A/F/V-A/F FULL SIZE • ORIENTABLE REAR TERMINALS UP TO 5000A (HR)

					4P 100% Neutral	
Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	Global PN	US / CA PN
E6.3H-A/f	4000	85	85	E6.3H-A/f 4000 Ekip Aware LI	1SDA126991R1	EEHANNHHAAA
				E6.3H-A/f 4000 Ekip Aware LSI	1SDA126992R1	EEHANNHHBAA
				E6.3H-A/f 4000 Ekip Aware LSIG	1SDA129212R1	EEHANNHHCAA
	5000	85	85	E6.3H-A/f 5000 Ekip Aware LI	1SDA126993R1	EEHAPPHHAAA
				E6.3H-A/f 5000 Ekip Aware LSI	1SDA126994R1	EEHAPPHHBAA
				E6.3H-A/f 5000 Ekip Aware LSIG	1SDA129213R1	EEHAPPHHCAA
E6.3V-A/f	4000	100	100	E6.3V-A/f 4000 Ekip Aware LI	1SDA126995R1	EEVANNHHAAA
				E6.3V-A/f 4000 Ekip Aware LSI	1SDA126996R1	EEVANNHHBAA
				E6.3V-A/f 4000 Ekip Aware LSIG	1SDA129214R1	EEVANNHHCAA
	5000	100	100	E6.3V-A/f 5000 Ekip Aware LI	1SDA126997R1	EEVAPPHHAAA
				E6.3V-A/f 5000 Ekip Aware LSI	1SDA126998R1	EEVAPPHHBAA
				E6.3V-A/f 5000 Ekip Aware LSIG	1SDA129215R1	EEVAPPHHCAA

Automatic circuit-breakers

Drawout version for power distribution



SACE EMAX 3 E1.2B-A/N-A/S-A • MOBILE PART OF DRAWOUT CIRCUIT BREAKER (MP)

					3P		4P	
Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	Global PN	US / CA PN	Global PN	US / CA PN
E1.3B-A	800	42	42	E1.3B-A 800 Ekip Aware LI	1SDA126685R1	E1BADDMPAAA	1SDA126701R1	EABADDMPAAA
				E1.3B-A 800 Ekip Aware LSI	1SDA126686R1	E1BADDMPBAA	1SDA126702R1	EABADDMPBAA
				E1.3B-A 800 Ekip Aware LSIG	1SDA129059R1	E1BADDMPCAA	1SDA129067R1	EABADDMPCAA
	1200	42	42	E1.3B-A 1200 Ekip Aware LI	1SDA126687R1	E1BAFFMPAAA	1SDA126703R1	EABAFFMPAAA
				E1.3B-A 1200 Ekip Aware LSI	1SDA126688R1	E1BAFFMPBAA	1SDA126704R1	EABAFFMPBAA
				E1.3B-A 1200 Ekip Aware LSIG	1SDA129060R1	E1BAFFMPCAA	1SDA129068R1	EABAFFMPCAA
E1.3N-A	800	50	50	E1.3N-A 800 Ekip Aware LI	1SDA126689R1	E1NADDMPAAA	1SDA126705R1	EANADDMPAAA
				E1.3N-A 800 Ekip Aware LSI	1SDA126690R1	E1NADDMPBAA	1SDA126706R1	EANADDMPBAA
				E1.3N-A 800 Ekip Aware LSIG	1SDA129061R1	E1NADDMPCAA	1SDA129069R1	EANADDMPCAA
	1200	50	50	E1.3N-A 1200 Ekip Aware LI	1SDA126691R1	E1NAFFMPAAA	1SDA126707R1	EANAFFMPAAA
				E1.3N-A 1200 Ekip Aware LSI	1SDA126692R1	E1NAFFMPBAA	1SDA126708R1	EANAFFMPBAA
				E1.3N-A 1200 Ekip Aware LSIG	1SDA129062R1	E1NAFFMPCAA	1SDA129070R1	EANAFFMPCAA
E1.3S-A	250	65	50	E1.3S-A 250 Ekip Aware LI	1SDA126693R1	E1SAAAMPAAA	1SDA126709R1	EASAAAMPAAA
				E1.3S-A 250 Ekip Aware LSI	1SDA126694R1	E1SAAAMPBAA	1SDA126710R1	EASAAAMPBAA
				E1.3S-A 250 Ekip Aware LSIG	1SDA129063R1	E1SAAAMPCAA	1SDA129071R1	EASAAAMPCAA
	400	65	50	E1.3S-A 400 Ekip Aware LI	1SDA126695R1	E1SABBMPAAA	1SDA126711R1	EASABBMPAAA
				E1.3S-A 400 Ekip Aware LSI	1SDA126696R1	E1SABBMPBAA	1SDA126712R1	EASABBMPBAA
				E1.3S-A 400 Ekip Aware LSIG	1SDA129064R1	E1SABBMPCAA	1SDA129072R1	EASABBMPCAA
	800	65	50	E1.3S-A 800 Ekip Aware LI	1SDA126697R1	E1SADDMPAAA	1SDA126713R1	EASADDMPAAA
				E1.3S-A 800 Ekip Aware LSI	1SDA126698R1	E1SADDMPBAA	1SDA126714R1	EASADDMPBAA
				E1.3S-A 800 Ekip Aware LSIG	1SDA129065R1	E1SADDMPCAA	1SDA129073R1	EASADDMPCAA
	1200	65	50	E1.3S-A 1200 Ekip Aware LI	1SDA126699R1	E1SAFFMPAAA	1SDA126715R1	EASAFFMPAAA
				E1.3S-A 1200 Ekip Aware LSI	1SDA126700R1	E1SAFFMPBAA	1SDA126716R1	EASAFFMPBAA
				E1.3S-A 1200 Ekip Aware LSIG	1SDA129066R1	E1SAFFMPCAA	1SDA129074R1	EASAFFMPCAA

SACE EMAX 3 E2.3B-A/N-A/S-A/H-A• MOBILE PART OF DRAWOUT CIRCUIT BR. (MP)

					3P		4P	
Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	Global PN	US / CA PN	Global PN	US / CA PN
E2.3B-A	1600	42	42	E2.3B-A 1600 Ekip Aware LI	1SDA126785R1	E2BAGGMPAAA	1SDA126819R1	EBBAGGMPAAA
				E2.3B-A 1600 Ekip Aware LSI	1SDA126786R1	E2BAGGMPBAA	1SDA126820R1	EBBAGGMPBAA
				E2.3B-A 1600 Ekip Aware LSIG	1SDA129109R1	E2BAGGMPCAA	1SDA129126R1	EBBAGGMPCAA
E2.3N-A	1600	50	50	E2.3N-A 1600 Ekip Aware LI	1SDA126795R1	E2NAGGMPAAA	1SDA126829R1	EBNAGGMPAAA
				E2.3N-A 1600 Ekip Aware LSI	1SDA126796R1	E2NAGGMPBAA	1SDA126830R1	EBNAGGMPBAA
				E2.3N-A 1600 Ekip Aware LSIG	1SDA129114R1	E2NAGGMPCAA	1SDA129131R1	EBNAGGMPCAA
	2000	50	50	E2.3N-A 2000 Ekip Aware LI	1SDA126797R1	E2NAHHMPAAA	1SDA126831R1	EBNAHHMPAAA
				E2.3N-A 2000 Ekip Aware LSI	1SDA126798R1	E2NAHHMPBAA	1SDA126832R1	EBNAHHMPBAA
				E2.3N-A 2000 Ekip Aware LSIG	1SDA129115R1	E2NAHHMPCAA	1SDA129132R1	EBNAHHMPCAA
E2.3S-A	800	65	65	E2.3S-A 800 Ekip Aware LI	1SDA126799R1	E2SADDMPAAA	1SDA126833R1	EBSADDMPAAA
				E2.3S-A 800 Ekip Aware LSI	1SDA126800R1	E2SADDMPBAA	1SDA126834R1	EBSADDMPBAA
				E2.3S-A 800 Ekip Aware LSIG	1SDA129116R1	E2SADDMPCAA	1SDA129133R1	EBSADDMPCAA
	1200	65	65	E2.3S-A 1200 Ekip Aware LI	1SDA126801R1	E2SAFFMPAAA	1SDA126835R1	EBSAFFMPAAA
				E2.3S-A 1200 Ekip Aware LSI	1SDA126802R1	E2SAFFMPBAA	1SDA126836R1	EBSAFFMPBAA
				E2.3S-A 1200 Ekip Aware LSIG	1SDA129117R1	E2SAFFMPCAA	1SDA129134R1	EBSAFFMPCAA
	1600	65	65	E2.3S-A 1600 Ekip Aware LI	1SDA126803R1	E2SAGGMPAAA	1SDA126837R1	EBSAGGMPAAA
				E2.3S-A 1600 Ekip Aware LSI	1SDA126804R1	E2SAGGMPBAA	1SDA126838R1	EBSAGGMPBAA
				E2.3S-A 1600 Ekip Aware LSIG	1SDA129118R1	E2SAGGMPCAA	1SDA129135R1	EBSAGGMPCAA
	2000	65	65	E2.3S-A 2000 Ekip Aware LI	1SDA126805R1	E2SAHHMPAAA	1SDA126839R1	EBSAHHMPAAA
				E2.3S-A 2000 Ekip Aware LSI	1SDA126806R1	E2SAHHMPBAA	1SDA126840R1	EBSAHHMPBAA
				E2.3S-A 2000 Ekip Aware LSIG	1SDA129119R1	E2SAHHMPCAA	1SDA129136R1	EBSAHHMPCAA
E2.3H-A	800	85	85	E2.3H-A 800 Ekip Aware LI	1SDA126787R1	E2HADDMPAAA	1SDA126821R1	EBHADDMPAAA
				E2.3H-A 800 Ekip Aware LSI	1SDA126788R1	E2HADDMPBAA	1SDA126822R1	EBHADDMPBAA
				E2.3H-A 800 Ekip Aware LSIG	1SDA129110R1	E2HADDMPCAA	1SDA129127R1	EBHADDMPCAA
	1200	85	85	E2.3H-A 1200 Ekip Aware LI	1SDA126789R1	E2HAFFMPAAA	1SDA126823R1	EBHAFFMPAAA
				E2.3H-A 1200 Ekip Aware LSI	1SDA126790R1	E2HAFFMPBAA	1SDA126824R1	EBHAFFMPBAA
				E2.3H-A 1200 Ekip Aware LSIG	1SDA129111R1	E2HAFFMPCAA	1SDA129128R1	EBHAFFMPCAA
	1600	85	85	E2.3H-A 1600 Ekip Aware LI	1SDA126791R1	E2HAGGMPAAA	1SDA126825R1	EBHAGGMPAAA
				E2.3H-A 1600 Ekip Aware LSI	1SDA126792R1	E2HAGGMPBAA	1SDA126826R1	EBHAGGMPBAA
				E2.3H-A 1600 Ekip Aware LSIG	1SDA129112R1	E2HAGGMPCAA	1SDA129129R1	EBHAGGMPCAA
	2000	85	85	E2.3H-A 2000 Ekip Aware LI	1SDA126793R1	E2HAHHMPAAA	1SDA126827R1	EBHAHHMPAAA
				E2.3H-A 2000 Ekip Aware LSI	1SDA126794R1	E2HAHHMPBAA	1SDA126828R1	EBHAHHMPBAA
				E2.3H-A 2000 Ekip Aware LSIG	1SDA129113R1	E2HAHHMPCAA	1SDA129130R1	EBHAHHMPCAA

Automatic circuit-breakers

Drawout version for power distribution



SACE EMAX 3 E2.3V-A • MOBILE PART OF DRAWOUT CIRCUIT BREAKER (MP)

					3P		4P	
Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	Global PN	US / CA PN	Global PN	US / CA PN
E2.3V-A	250	100	85	E2.3V-A 250 Ekip Aware LI	1SDA126807R1	E2VAAAMPAAA	1SDA126841R1	EBVAAAMPAAA
				E2.3V-A 250 Ekip Aware LSI	1SDA126808R1	E2VAAAMPBAA	1SDA126842R1	EBVAAAMPBAA
				E2.3V-A 250 Ekip Aware LSIG	1SDA129120R1	E2VAAAMPCAA	1SDA129137R1	EBVAAAMPCAA
	400	100	85	E2.3V-A 400 Ekip Aware LI	1SDA126809R1	E2VABBMPAAA	1SDA126843R1	EBVABBMPAAA
				E2.3V-A 400 Ekip Aware LSI	1SDA126810R1	E2VABBMPBAA	1SDA126844R1	EBVABBMPBAA
				E2.3V-A 400 Ekip Aware LSIG	1SDA129121R1	E2VABBMPCAA	1SDA129138R1	EBVABBMPCAA
	800	100	85	E2.3V-A 800 Ekip Aware LI	1SDA126811R1	E2VADDMPAAA	1SDA126845R1	EBVADDMPAAA
				E2.3V-A 800 Ekip Aware LSI	1SDA126812R1	E2VADDMPBAA	1SDA126846R1	EBVADDMPBAA
				E2.3V-A 800 Ekip Aware LSIG	1SDA129122R1	E2VADDMPCAA	1SDA129139R1	EBVADDMPCAA
	1200	100	85	E2.3V-A 1200 Ekip Aware LI	1SDA126813R1	E2VAFFMPAAA	1SDA126847R1	EBVAFFMPAAA
				E2.3V-A 1200 Ekip Aware LSI	1SDA126814R1	E2VAFFMPBAA	1SDA126848R1	EBVAFFMPBAA
				E2.3V-A 1200 Ekip Aware LSIG	1SDA129123R1	E2VAFFMPCAA	1SDA129140R1	EBVAFFMPCAA
	1600	100	85	E2.3V-A 1600 Ekip Aware LI	1SDA126815R1	E2VAGGMPAAA	1SDA126849R1	EBVAGGMPAAA
				E2.3V-A 1600 Ekip Aware LSI	1SDA126816R1	E2VAGGMPBAA	1SDA126850R1	EBVAGGMPBAA
				E2.3V-A 1600 Ekip Aware LSIG	1SDA129124R1	E2VAGGMPCAA	1SDA129141R1	EBVAGGMPCAA
	2000	100	85	E2.3V-A 2000 Ekip Aware LI	1SDA126817R1	E2VAHHMPAAA	1SDA126851R1	EBVAHHMPAAA
				E2.3V-A 2000 Ekip Aware LSI	1SDA126818R1	E2VAHHMPBAA	1SDA126852R1	EBVAHHMPBAA
				E2.3V-A 2000 Ekip Aware LSIG	1SDA129125R1	E2VAHHMPCAA	1SDA129142R1	EBVAHHMPCAA



SACE EMAX 3 E4.3S-A/H-A/V-A • MOBILE PART OF DRAWOUT CIRCUIT BREAKER (MP)

					3P		4P	
Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	Global PN	US / CA PN	Global PN	US / CA PN
E4.3S-A	2500	65	65	E4.3S-A 2500 Ekip Aware LI	1SDA126913R1	E4SAJJMPAAA	1SDA126937R1	ECSAJJMPAAA
				E4.3S-A 2500 Ekip Aware LSI	1SDA126914R1	E4SAJJMPBAA	1SDA126938R1	ECSAJJMPBAA
				E4.3S-A 2500 Ekip Aware LSIG	1SDA129173R1	E4SAJJMPCAA	1SDA129185R1	ECSAJJMPCAA
	3200	65	65	E4.3S-A 3200 Ekip Aware LI	1SDA126917R1	E4SALLMPAAA	1SDA126941R1	ECSALLMPAAA
				E4.3S-A 3200 Ekip Aware LSI	1SDA126918R1	E4SALLMPBAA	1SDA126942R1	ECSALLMPBAA
				E4.3S-A 3200 Ekip Aware LSIG	1SDA129175R1	E4SALLMPCAA	1SDA129187R1	ECSALLMPCAA
E4.3H-A	2500	85	85	E4.3H-A 2500 Ekip Aware LI	1SDA126907R1	E4HAJJMPAAA	1SDA126931R1	ECHAJJMPAAA
				E4.3H-A 2500 Ekip Aware LSI	1SDA126908R1	E4HAJJMPBAA	1SDA126932R1	ECHAJJMPBAA
				E4.3H-A 2500 Ekip Aware LSIG	1SDA129170R1	E4HAJJMPCAA	1SDA129182R1	ECHAJJMPCAA
	3200	85	85	E4.3H-A 3200 Ekip Aware LI	1SDA126911R1	E4HALLMPAAA	1SDA126935R1	ECHALLMPAAA
				E4.3H-A 3200 Ekip Aware LSI	1SDA126912R1	E4HALLMPBAA	1SDA126936R1	ECHALLMPBAA
				E4.3H-A 3200 Ekip Aware LSIG	1SDA129172R1	E4HALLMPCAA	1SDA129184R1	ECHALLMPCAA
E4.3V-A	800	100	85	E4.3V-A 800 Ekip Aware LI	1SDA126919R1	E4VADDMPAAA	1SDA126943R1	ECVADDMPAAA
				E4.3V-A 800 Ekip Aware LSI	1SDA126920R1	E4VADDMPBAA	1SDA126944R1	ECVADDMPBAA
				E4.3V-A 800 Ekip Aware LSIG	1SDA129176R1	E4VADDMPCAA	1SDA129188R1	ECVADDMPCAA
	1600	100	85	E4.3V-A 1600 Ekip Aware LI	1SDA126921R1	E4VAGGMPAAA	1SDA126945R1	ECVAGGMPAAA
				E4.3V-A 1600 Ekip Aware LSI	1SDA126922R1	E4VAGGMPBAA	1SDA126946R1	ECVAGGMPBAA
				E4.3V-A 1600 Ekip Aware LSIG	1SDA129177R1	E4VAGGMPCAA	1SDA129189R1	ECVAGGMPCAA
	2000	100	85	E4.3V-A 2000 Ekip Aware LI	1SDA126923R1	E4VAHHMPAAA	1SDA126947R1	ECVAHHMPAAA
				E4.3V-A 2000 Ekip Aware LSI	1SDA126924R1	E4VAHHMPBAA	1SDA126948R1	ECVAHHMPBAA
				E4.3V-A 2000 Ekip Aware LSIG	1SDA129178R1	E4VAHHMPCAA	1SDA129190R1	ECVAHHMPCAA
	2500	100	85	E4.3V-A 2500 Ekip Aware LI	1SDA126925R1	E4VAJJMPAAA	1SDA126949R1	ECVAJJMPAAA
				E4.3V-A 2500 Ekip Aware LSI	1SDA126926R1	E4VAJJMPBAA	1SDA126950R1	ECVAJJMPBAA
				E4.3V-A 2500 Ekip Aware LSIG	1SDA129179R1	E4VAJJMPCAA	1SDA129191R1	ECVAJJMPCAA
	3200	100	85	E4.3V-A 3200 Ekip Aware LI	1SDA126929R1	E4VALLMPAAA	1SDA126953R1	ECVALLMPAAA
				E4.3V-A 3200 Ekip Aware LSI	1SDA126930R1	E4VALLMPBAA	1SDA126954R1	ECVALLMPBAA
				E4.3V-A 3200 Ekip Aware LSIG	1SDA129181R1	E4VALLMPCAA	1SDA129193R1	ECVALLMPCAA

Automatic circuit-breakers

Drawout version for power distribution



SACE EMAX 3 E6.3H-A/V-A • MOBILE PART OF DRAWOUT CIRCUIT BREAKER (MP)

					3P		4P 50% Neutral	
Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	Global PN	US / CA PN	Global PN	US / CA PN
E6.3H-A	4000	85	85	E6.3H-A 4000 Ekip Aware LI	1SDA126971R1	E6HANNMPAAA	1SDA126983R1	EDHANNMPAAA
				E6.3H-A 4000 Ekip Aware LSI	1SDA126972R1	E6HANNMPBAA	1SDA126984R1	EDHANNMPBAA
				E6.3H-A 4000 Ekip Aware LSIG	1SDA129202R1	E6HANNMPCAA	1SDA129208R1	EDHANNMPCAA
	5000	85	85	E6.3H-A 5000 Ekip Aware LI	1SDA126973R1	E6HAPPMPAAA	1SDA126985R1	EDHAPPMPAAA
				E6.3H-A 5000 Ekip Aware LSI	1SDA126974R1	E6HAPPMPBAA	1SDA126986R1	EDHAPPMPBAA
				E6.3H-A 5000 Ekip Aware LSIG	1SDA129203R1	E6HAPPMPCAA	1SDA129209R1	EDHAPPMPCAA
	6000 (1)	85	85	E6.3H-A 6000 Ekip Aware LI	1SDA126975R1	E6HAQQMPAAA	-	-
				E6.3H-A 6000 Ekip Aware LSI	1SDA126976R1	E6HAQQMPBAA	-	-
				E6.3H-A 6000 Ekip Aware LSIG	1SDA129204R1	E6HAQQMPCAA	-	-
E6.3V-A	4000	100	100	E6.3V-A 4000 Ekip Aware LI	1SDA126977R1	E6VANNMPAAA	1SDA126987R1	EDVANNMPAAA
				E6.3V-A 4000 Ekip Aware LSI	1SDA126978R1	E6VANNMPBAA	1SDA126988R1	EDVANNMPBAA
				E6.3V-A 4000 Ekip Aware LSIG	1SDA129205R1	E6VANNMPCAA	1SDA129210R1	EDVANNMPCAA
	5000	100	100	E6.3V-A 5000 Ekip Aware LI	1SDA126979R1	E6VAPPMPAAA	1SDA126989R1	EDVAPPMPAAA
				E6.3V-A 5000 Ekip Aware LSI	1SDA126980R1	E6VAPPMPBAA	1SDA126990R1	EDVAPPMPBAA
				E6.3V-A 5000 Ekip Aware LSIG	1SDA129206R1	E6VAPPMPCAA	1SDA129211R1	EDVAPPMPCAA
	6000	100	100	E6.3V-A 6000 Ekip Aware LI	1SDA126981R1	E6VAQQMPAAA	-	-
				E6.3V-A 6000 Ekip Aware LSI	1SDA126982R1	E6VAQQMPBAA	-	-
				E6.3V-A 6000 Ekip Aware LSIG	1SDA129207R1	E6VAQQMPCAA	-	-

1) 6000 A ratings available only with read vertical terminals

SACE EMAX 3 E6.3H-A/F/V-A/F • MOBILE PART OF DRAWOUT CIRCUIT BREAKER (MP)

					4P 100% Neutral	
Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	Global PN	US / CA PN
E6.3H-A/f	4000	85	85	E6.3H-A/f 4000 Ekip Aware LI	1SDA126999R1	EEHANNMPAAA
				E6.3H-A/f 4000 Ekip Aware LSI	1SDA127000R1	EEHANNMPBAA
				E6.3H-A/f 4000 Ekip Aware LSIG	1SDA129216R1	EEHANNMPCAA
	5000	85	85	E6.3H-A/f 5000 Ekip Aware LI	1SDA127001R1	EEHAPPMPAAA
				E6.3H-A/f 5000 Ekip Aware LSI	1SDA127002R1	EEHAPPMPBAA
				E6.3H-A/f 5000 Ekip Aware LSIG	1SDA129217R1	EEHAPPMPCAA
	6000 (1)	85	85	E6.3H-A/f 6000 Ekip Aware LI	-	-
				E6.3H-A/f 6000 Ekip Aware LSI	-	-
				E6.3H-A/f 6000 Ekip Aware LSIG	-	-
E6.3V-A/f	4000	100	100	E6.3V-A/f 4000 Ekip Aware LI	1SDA127003R1	EEVANNMPAAA
				E6.3V-A/f 4000 Ekip Aware LSI	1SDA127004R1	EEVANNMPBAA
				E6.3V-A/f 4000 Ekip Aware LSIG	1SDA129218R1	EEVANNMPCAA
	5000	100	100	E6.3V-A/f 5000 Ekip Aware LI	1SDA127005R1	EEVAPPMPAAA
				E6.3V-A/f 5000 Ekip Aware LSI	1SDA127006R1	EEVAPPMPBAA
				E6.3V-A/f 5000 Ekip Aware LSIG	1SDA129219R1	EEVAPPMPCAA
	6000	100	100	E6.3V-A/f 6000 Ekip Aware LI	-	-
				E6.3V-A/f 6000 Ekip Aware LSI	-	-
				E6.3V-A/f 6000 Ekip Aware LSIG	-	-

1) 6000 A ratings available only with read vertical term

Switch-disconnectors
Fixed version

SACE EMAX 3 E1.3 B-A/MS, N-A/MS • FRONT TERMINALS (F)

Size	Frame Amps	Withstand (kA)	Type	3P		4P	
				Global PN	US / CA PN	Global PN	US / CA PN
E1.3B-A/MS	800	42	E1.3B-A/MS 800	1SDA127537R1	E1BAD0FFXXX	1SDA127541R1	EABAD0FFXXX
	1200	42	E1.3B-A/MS 1200	1SDA127538R1	E1BAF0FFXXX	1SDA127542R1	EABAF0FFXXX
E1.3N-A/MS	800	50	E1.3N-A/MS 800	1SDA127539R1	E1NAD0FFXXX	1SDA127543R1	EANAD0FFXXX
	1200	50	E1.3N-A/MS 1200	1SDA127540R1	E1NAF0FFXXX	1SDA127544R1	EANAF0FFXXX

Note: Wall mount is standard; for floor fixing must order: 1SDA076020R1 ZE1FFPF

SACE EMAX 3 E2.3 N-A/MS, S-A/MS, V-A/MS • ORIENTABLE REAR TERMINALS (HR)

Size	Frame Amps	Withstand (kA)	Type	3P		4P	
				Global PN	US / CA PN	Global PN	US / CA PN
E2.3N-A/MS	1600	50	E2.3N-A/MS 1600	1SDA127559R1	E2NAG0HHXXX	1SDA127567R1	EBNAG0HHXXX
	2000	50	E2.3N-A/MS 2000	1SDA127560R1	E2NAH0HHXXX	1SDA127568R1	EBNAH0HHXXX
E2.3S-A/MS	800	65	E2.3S-A/MS 800	1SDA127553R1	E2SAD0HHXXX	1SDA127561R1	EBSAD0HHXXX
	1600	65	E2.3S-A/MS 1600	1SDA127554R1	E2SAG0HHXXX	1SDA127562R1	EBSAG0HHXXX
	2000	65	E2.3S-A/MS 2000	1SDA127555R1	E2SAH0HHXXX	1SDA127563R1	EBSAH0HHXXX
E2.3V-A/MS	800	85	E2.3V-A/MS 800	1SDA127556R1	E2VAD0HHXXX	1SDA127564R1	EBVAD0HHXXX
	1600	85	E2.3V-A/MS 1600	1SDA127557R1	E2VAG0HHXXX	1SDA127565R1	EBVAG0HHXXX
	2000	85	E2.3V-A/MS 2000	1SDA127558R1	E2VAH0HHXXX	1SDA127566R1	EBVAH0HHXXX

SACE EMAX 3 E4.3 S-A/MS, H-A/MS, V-A/MS • ORIENTABLE REAR TERMINALS UP TO 2500A (HR)

Size	Frame Amps	Withstand (kA)	Type	3P		4P	
				Global PN	US / CA PN	Global PN	US / CA PN
E4.3S-A/MS	2500	65	E4.3S-A/MS 2500	1SDA127585R1	E4SAA0HHXXX	1SDA127604R1	ECSAA0HHXXX
	3200 (1)	65	E4.3S-A/MS 3200	1SDA127587R1	E4SAA0VVXXX	1SDA127606R1	ECSAL0VVXXX
	3600 (1)	65	E4.3S-A/MS 3600	1SDA127588R1	E4SAM0VVXXX	-	-
	1600	65	E2.3S-A/MS 1600	1SDA127554R1	E2SAG0HHXXX	1SDA127562R1	EBSAG0HHXXX
E4.3H-A/MS	2500	85	E4.3H-A/MS 2500	1SDA127674R1	E4HAJ0HHXXX	1SDA127680R1	ECHAJ0HHXXX
	3200 (1)	85	E4.3H-A/MS 3200	1SDA127676R1	E4HAL0VVXXX	1SDA127682R1	ECHAL0VVXXX
	3600 (1)	85	E4.3H-A/MS 3600	1SDA127603R1	E4HAM0VVXXX	-	-
E4.3V-A/MS	800	100	E4.3V-A/MS 800	1SDA127671R1	E4VAD0HHXXX	1SDA127677R1	ECVAD0HHXXX
	1600	100	E4.3V-A/MS 1600	1SDA127672R1	E4VAG0HHXXX	1SDA127678R1	ECVAG0HHXXX
	2000	100	E4.3V-A/MS 2000	1SDA127673R1	E4VAH0HHXXX	1SDA127679R1	ECVAH0HHXXX
	2500	100	E4.3V-A/MS 2500	1SDA127592R1	E4VAJ0HHXXX	1SDA127610R1	ECVAJ0HHXXX
	3200 (1)	100	E4.3V-A/MS 3200	1SDA127594R1	E4VAL0VVXXX	1SDA127612R1	ECVAL0VVXXX

1) 3200 ratings only with rear vertical terminals

Switch-disconnectors

Fixed version

SACE EMAX 3 E6.3 L-A/MS • ORIENTABLE REAR TERMINALS UP TO 5000A (HR)

				3P		4P 50% Neutral	
Size	Frame Amps	Withstand (kA)	Type	Global PN	US / CA PN	Global PN	US / CA PN
E6.3L-A/MS	4000	100	E6.3L-A/MS 4000	1SDA127644R1	E6LAN0HHXXX	1SDA127650R1	EDLAN0HHXXX
	5000	100	E6.3L-A/MS 5000	1SDA127645R1	E6LAP0HHXXX	1SDA127651R1	EDLAP0HHXXX

SACE EMAX 3 E6.3 L-A/F/MS • ORIENTABLE REAR TERMINALS UP TO 5000A (HR)

				4P 100% Neutral	
Size	Frame Amps	Withstand (kA)	Type	Global PN	US / CA PN
E6.3L-A/f/MS	4000	100	E6.3L-A/f/MS 4000	1SDA127662R1	EELAN0HHXXX
	5000	100	E6.3L-A/f/MS 5000	1SDA127663R1	EELAP0HHXXX

Switch-disconnectors

Drawout version

SACE EMAX 3 E1.3 B-A/MS, N-A/MS • MOBILE PART OF SWITCH DISCONNECTOR (MP)

				3P		4P	
Size	Frame Amps	Withstand (kA)	Type	Global PN	US / CA PN	Global PN	US / CA PN
E1.3B-A/MS	800	42	E1.3B-A/MS 800	1SDA127545R1	E1BAD0MPXXX	1SDA127549R1	EABAD0MPXXX
	1200	42	E1.3B-A/MS 1200	1SDA127546R1	E1BAF0MPXXX	1SDA127550R1	EABAF0MPXXX
E1.3N-A/MS	800	50	E1.3N-A/MS 800	1SDA127547R1	E1NAD0MPXXX	1SDA127551R1	EANAD0MPXXX
	1200	50	E1.3N-A/MS 1200	1SDA127548R1	E1NAF0MPXXX	1SDA127552R1	EANAF0MPXXX

SACE EMAX 3 E2.3 N-A/MS, S-A/MS, V-A/MS • MOBILE PART OF SWITCH DISCONNECTOR (MP)

				3P		4P	
Size	Frame Amps	Withstand (kA)	Type	Global PN	US / CA PN	Global PN	US / CA PN
E2.3N-A/MS	1600	50	E2.3N-A/MS 1600	1SDA127575R1	E2NAG0MPXXX	1SDA127583R1	EBNAG0MPXXX
	2000	50	E2.3N-A/MS 2000	1SDA127576R1	E2NAH0MPXXX	1SDA127584R1	EBNAH0MPXXX
E2.3S-A/MS	800	65	E2.3S-A/MS 800	1SDA127569R1	E2SAD0MPXXX	1SDA127577R1	EBSAD0MPXXX
	1600	65	E2.3S-A/MS 1600	1SDA127570R1	E2SAG0MPXXX	1SDA127578R1	EBSAG0MPXXX
	2000	65	E2.3S-A/MS 2000	1SDA127571R1	E2SAH0MPXXX	1SDA127579R1	EBSAH0MPXXX
E2.3V-A/MS	800	85	E2.3V-A/MS 800	1SDA127572R1	E2VAD0MPXXX	1SDA127580R1	EBVAD0MPXXX
	1600	85	E2.3V-A/MS 1600	1SDA127573R1	E2VAG0MPXXX	1SDA127581R1	EBVAG0MPXXX
	2000	85	E2.3V-A/MS 2000	1SDA127574R1	E2VAH0MPXXX	1SDA127582R1	EBVAH0MPXXX

SACE EMAX 3 E4.3 S-A/MS, H-A/MS, V-A/MS • MOBILE PART OF SWITCH DISCONNECTOR (MP)

				3P		4P	
Size	Frame Amps	Withstand (kA)	Type	Global PN	US / CA PN	Global PN	US / CA PN
E4.3S-A/MS	2500	65	E4.3S-A/MS 2500	1SDA127620R1	E4SAJ0MPXXX	1SDA127632R1	ECSAJ0MPXXX
	3200	65	E4.3S-A/MS 3200	1SDA127622R1	E4SAL0MPXXX	1SDA127634R1	ECSAL0MPXXX
E4.3H-A/MS	2500	85	E4.3H-A/MS 2500	1SDA127686R1	E4HAJ0MPXXX	1SDA127692R1	ECHAJ0MPXXX
	3200	85	E4.3H-A/MS 3200	1SDA127688R1	E4HAL0MPXXX	1SDA127694R1	ECHAL0MPXXX
E4.3V-A/MS	800	100	E4.3V-A/MS 800	1SDA127683R1	E4VAD0MPXXX	1SDA127689R1	ECVAD0MPXXX
	1600	100	E4.3V-A/MS 1600	1SDA127684R1	E4VAG0MPXXX	1SDA127690R1	ECVAG0MPXXX
	2000	100	E4.3V-A/MS 2000	1SDA127685R1	E4VAH0MPXXX	1SDA127691R1	ECVAH0MPXXX
	2500	100	E4.3V-A/MS 2500	1SDA127626R1	E4VAJ0MPXXX	1SDA127638R1	ECVAJ0MPXXX
	3200	100	E4.3V-A/MS 3200	1SDA127628R1	E4VAL0MPXXX	1SDA127640R1	ECVAL0MPXXX

Switch-disconnectors

Drawout version

SACE EMAX 3 E6.3 L-A/MS • MOBILE PART OF SWITCH DISCONNECTOR (MP)

				3P		4P 50% Neutral	
Size	Frame Amps	Withstand (kA)	Type	Global PN	US / CA PN	Global PN	US / CA PN
E6.3L-A/MS	4000	100	E6.3L-A/MS 4000	1SDA127656R1	E6LAN0MPXXX	1SDA127659R1	EDLAN0MPXXX
	5000	100	E6.3L-A/MS 5000	1SDA127657R1	E6LAP0MPXXX	1SDA127660R1	EDLAP0MPXXX
	6000 (1)	100	E6.3L-A/MS 6000	1SDA127658R1	E6LAQ0MPXXX	-	-

1) 6000A ratings only with rear vertical terminals.

SACE EMAX 3 E6.3 L-A/MS • MOBILE PART OF SWITCH DISCONNECTOR (MP)

				4P 100% Neutral	
Size	Frame Amps	Withstand (kA)	Type	Global PN	US / CA PN
E6.3L-A/f/MS	4000	100	E6.3L-A/f/MS 4000	1SDA127668R1	EELAN0MPXXX
	5000	100	E6.3L-A/f/MS 5000	1SDA127669R1	EELAP0MPXXX

Circuit breakers

MULTI-STANDARD: IEC 60947-2/UL1066/CSA C22.2 NO. 268/GB/T 14048.2

			3P		
Size	**Performance**	**Description**	**Global PN**	**US / CA PN**	
E2.3	B	DOUBLE CERTIFICAT: UL/IEC E2.3B EXT	1SDA127774R1	F32B-CERTDOUBLE	Factory installed only
E2.3	N	DOUBLE CERTIFICAT: UL/IEC E2.3N EXT	1SDA127775R1	F32N-CERTDOUBLE	Factory installed only
E2.3	S	DOUBLE CERTIFICAT: UL/IEC E2.3S EXT	1SDA127776R1	F32S-CERTDOUBLE	Factory installed only
E2.3	H	DOUBLE CERTIFICAT: UL/IEC E2.3H EXT	1SDA127777R1	F32H-CERTDOUBLE	Factory installed only
E2.3	V	DOUBLE CERTIFICAT: UL/IEC E2.3V EXT	1SDA127778R1	F32V-CERTDOUBLE	Factory installed only
E4.3	S	DOUBLE CERTIFICAT: UL/IEC E4.3S EXT	1SDA127779R1	F34S-CERTDOUBLE	Factory installed only
E4.3	H	DOUBLE CERTIFICAT: UL/IEC E4.3H EXT	1SDA127780R1	F34H-CERTDOUBLE	Factory installed only
E4.3	V	DOUBLE CERTIFICAT: UL/IEC E4.3V EXT	1SDA127781R1	F34V-CERTDOUBLE	Factory installed only
E6.3	V	DOUBLE CERTIFICAT: UL/IEC E6.3V EXT	1SDA127782R1	F36V-CERTDOUBLE	Factory installed only

			Global PN	US / CA PN	
E2.3	B	Triple certific: UL/IEC/CCC E2.3B-A EXT	1SDA127765R1	F32B-CERTTRIPLE	Factory installed only
E2.3	N	Triple certific: UL/IEC/CCC E2.3N-A EXT	1SDA127766R1	F32N-CERTTRIPLE	Factory installed only
E2.3	S	Triple certific: UL/IEC/CCC E2.3S-A EXT	1SDA127767R1	F32S-CERTTRIPLE	Factory installed only
E2.3	H	Triple certific: UL/IEC/CCC E2.3H-A EXT	1SDA127768R1	F32H-CERTTRIPLE	Factory installed only
E2.3	V	Triple certific: UL/IEC/CCC E2.3V-A EXT	1SDA127769R1	F32V-CERTTRIPLE	Factory installed only
E4.3	S	Triple certific: UL/IEC/CCC E4.3S-A EXT	1SDA127770R1	F34S-CERTTRIPLE	Factory installed only
E4.3	H	Triple certific: UL/IEC/CCC E4.3H-A EXT	1SDA127771R1	F34H-CERTTRIPLE	Factory installed only
E4.3	V	Triple certific: UL/IEC/CCC E4.3V-A EXT	1SDA127772R1	F34V-CERTTRIPLE	Factory installed only
E6.3	V	Triple certific: UL/IEC/CCC E6.3V-A EXT	1SDA127773R1	F36V-CERTTRIPLE	Factory installed only

The multiple-standard Emax 3 can be ordered in 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

Size	Performance	Amperage range	Terminal type	Type	3P Global PN	3P US / CA PN	4P Global PN	4P US / CA PN
E1.3	B-A, N-A, S-A	250 - 1200	HR - HR	E1.3-A W FP Iu=1200 HR HR UL	1SDA126241R1	E1A12HHXXXX	1SDA126242R1	EAA12HHXXXX
E2.3	B-A, N-A, S-A, H-A, V-A	250 - 2000	HR - HR	E2.3-A W FP Iu=2000 HR HR UL	1SDA126243R1	E2A20HHXXXX	1SDA126244R1	EBA20HHXXXX
E4.3	S-A, H-A, V-A, L-A	800 - 2500	HR - HR	E4.3-A W FP Iu=2500 HR HR UL	1SDA126245R1	E4A25HHXXXX	1SDA126246R1	ECA25HHXXXX
	S-A, H-A, V-A, L-A	3200	VR-VR	E4.3-A W FP Iu=3200 VR VR UL	1SDA126247R1	E4A32VVXXXX	1SDA126248R1	ECA32VVXXXX
E6.3	H-A, V-A, L-A	4000 - 5000	HR - HR	E6.3-A W FP Iu=5000 HR HR UL	1SDA126249R1	E6A50HHXXXX	1SDA126250R1	EDA50HHXXXX
				E6.3-A/f W FP Iu=5000 HR HR UL (1)	-	-	1SDA126251R1	EEA50HHXXXX
	H-A, V-A, L-A	6000	VR - VR	E6.3-A W FP Iu=6000 VR VR UL	1SDA126252R1	E6A60VVXXXX	-	-

1) 100% Neutral

WITHOUT TERMINALS

Size	Performance	Amperage range	Terminal type	Type	3P Global PN	3P US / CA PN	4P Global PN	4P US / CA PN
E1.3	B-A, N-A, S-A	250-1200	None	E1.3-A W FP Iu=1200	1SDA130195R1	E1A12XXXXXX	1SDA130196R1	EAA12XXXXXX
E2.3	B-A, N-A, S-A, H-A, V-A	250-2000	None	E2.3-A W FP Iu=2000	1SDA130197R1	E2A20XXXXXX	1SDA130198R1	EBA20XXXXXX
E4.3	S-A, H-A, V-A	800-2500	None	E4.3-A W FP Iu=2500	1SDA130199R1	E4A25XXXXXX	1SDA130200R1	ECA25XXXXXX
	S-A, H-A, V-A	3200 (only)	None	E4.3-A W FP Iu=3200	1SDA130201R1	E4A32XXXXXX	1SDA130202R1	ECA32XXXXXX
E6.3	H-A, V-A	4000-5000	None	E6.3-A W FP Iu=5000	1SDA130205R1	E6A50XXXXXX	1SDA130204R1	EDA50XXXXXX
				E6.3-A/f W FP Iu=5000 (1)	-	-	1SDA130206R1	EEA50XXXXXX
	H-A, V-A	6000 (only)	None	E6.3-A W FP Iu=6000	1SDA130203R1	E6A60XXXXXX	-	-

1) 100% Neutral

Accessories
Control



FIRST AND SECOND OPENING RELEASE - YO

Size	Type	Part Number	US / CA PN
E1.3...E6.3	YO E1.3...E6.3 24 Vac/dc	1SDA126253R1	K3A-ELEC-YOD
E1.3...E6.3	YO E1.3...E6.3 30 Vac/dc	1SDA126254R1	K3A-ELEC-YOF
E1.3...E6.3	YO E1.3...E6.3 48 Vac/dc	1SDA126255R1	K3A-ELEC-YOJ
E1.3...E6.3	YO E1.3...E6.3 60 Vac/dc	1SDA126256R1	K3A-ELEC-YOL
E1.3...E6.3	YO E1.3...E6.3 110-120 Vac/dc	1SDA126257R1	K3A-ELEC-YOA
E1.3...E6.3	YO E1.3...E6.3 120-127 Vac/dc	1SDA126258R1	K3A-ELEC-YOB
E1.3...E6.3	YO E1.3...E6.3 220-240 Vac/dc	1SDA126259R1	K3A-ELEC-YOC
E1.3...E6.3	YO E1.3...E6.3 240-250 Vac/dc	1SDA126260R1	K3A-ELEC-YOE
E1.3...E6.3	YO E1.3...E6.3 380-400 Vac	1SDA126261R1	K3A-ELEC-YOG
E1.3...E6.3	YO E1.3...E6.3 415-440 Vac	1SDA126262R1	K3A-ELEC-YOH
E1.3...E6.3	YO E1.3...E6.3 480-500 Vac	1SDA126263R1	K3A-ELEC-YOK



YO-SENSE FIRST AND SECOND OPENING RELEASE-SENSE

Size	Type	Part Number	US / CA PN
E1.3...E6.3	YO-Sense 1st E1.3...E6.3 24-60 Vac/dc	1SDA126264R1	K3A-ELEC-YO-SN
E1.3...E6.3	YO-Sense 1st E1.3...E6.3 110-250 Vac/dc	1SDA126265R1	K3A-ELEC-YO-SM
E1.3...E6.3	YO-Sense 2nd E1.3...E6.3 24-60 Vac/dc	1SDA126266R1	K3A-ELEC-2YO-S9
E1.3...E6.3	YO-Sense 2nd E1.3...E6.3 110-250 Vac/dc	1SDA126267R1	K3A-ELEC-2YO-S8



FIRST AND SECOND CLOSING RELEASE - YC

Size	Type	Global PN	US / CA PN
E1.3...E6.3	YC E1.3...E6.3 24 Vac/dc	1SDA126268R1	K3A-ELEC-YCD
E1.3...E6.3	YC E1.3...E6.3 30 Vac/dc	1SDA126269R1	K3A-ELEC-YCF
E1.3...E6.3	YC E1.3...E6.3 48 Vac/dc	1SDA126270R1	K3A-ELEC-YCJ
E1.3...E6.3	YC E1.3...E6.3 60 Vac/dc	1SDA126271R1	K3A-ELEC-YCL
E1.3...E6.3	YC E1.3...E6.3 110-120 Vac/dc	1SDA126272R1	K3A-ELEC-YCA
E1.3...E6.3	YC E1.3...E6.3 120-127 Vac/dc	1SDA126273R1	K3A-ELEC-YCB
E1.3...E6.3	YC E1.3...E6.3 220-240 Vac/dc	1SDA126274R1	K3A-ELEC-YCC
E1.3...E6.3	YC E1.3...E6.3 240-250 Vac/dc	1SDA126275R1	K3A-ELEC-YCE
E1.3...E6.3	YC E1.3...E6.3 380-400 Vac	1SDA126276R1	K3A-ELEC-YCG
E1.3...E6.3	YC E1.3...E6.3 415-440 Vac	1SDA126277R1	K3A-ELEC-YCH
E1.3...E6.3	YC E1.3...E6.3 480-500 Vac	1SDA126278R1	K3A-ELEC-YCK

Accessories
Control



FIRST AND SECOND UNDERVOLTAGE RELEASE - YU

Size	Type	Part Number	US / CA PN
E1.3...E6.3	YU E1.3...E6.3 24 Vac/dc	1SDA126283R1	K3A-ELEC-YUD
E1.3...E6.3	YU E1.3...E6.3 30 Vac/dc	1SDA126284R1	K3A-ELEC-YUF
E1.3...E6.3	YU E1.3...E6.3 48 Vac/dc	1SDA126285R1	K3A-ELEC-YUJ
E1.3...E6.3	YU E1.3...E6.3 60 Vac/dc	1SDA126286R1	K3A-ELEC-YUL
E1.3...E6.3	YU E1.3...E6.3 110-120 Vac/dc	1SDA126287R1	K3A-ELEC-YUA
E1.3...E6.3	YU E1.3...E6.3 120-127 Vac/dc	1SDA126288R1	K3A-ELEC-YUB
E1.3...E6.3	YU E1.3...E6.3 220-240 Vac/dc	1SDA126289R1	K3A-ELEC-YUC
E1.3...E6.3	YU E1.3...E6.3 240-250 Vac/dc	1SDA126290R1	K3A-ELEC-YUE
E1.3...E6.3	YU E1.3...E6.3 380-400 Vac	1SDA126291R1	K3A-ELEC-YUG
E1.3...E6.3	YU E1.3...E6.3 415-440 Vac	1SDA126292R1	K3A-ELEC-YUH
E1.3...E6.3	YU E1.3...E6.3 440-500 Vac	1SDA126293R1	K3A-ELEC-YUK



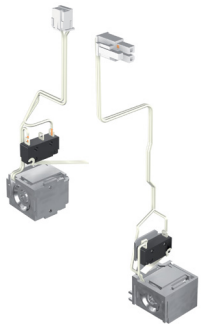
YU-SENSE FIRST AND SECOND UNDERVOLTAGE RELEASE-SENSE

Size	Type	Part Number	US / CA PN
E1.3...E6.3	YU-Sense 1st E1.3...E6.3 24 Vac/dc	1SDA126294R1	K3A-ELEC-YU-SP
E1.3...E6.3	YU-Sense 1st E1.3...E6.3 30 Vac/dc	1SDA126295R1	K3A-ELEC-YU-SR
E1.3...E6.3	YU-Sense 1st E1.3...E6.3 48 Vac/dc	1SDA126296R1	K3A-ELEC-YU-SS
E1.3...E6.3	YU-Sense 1st E1.3...E6.3 60 Vac/dc	1SDA126297R1	K3A-ELEC-YU-ST
E1.3...E6.3	YU-Sense 1st E1.3...E6.3 110-120 Vac/dc	1SDA126298R1	K3A-ELEC-YU-SM
E1.3...E6.3	YU-Sense 1st E1.3...E6.3 120-127 Vac/dc	1SDA126299R1	K3A-ELEC-YU-SN
E1.3...E6.3	YU-Sense 1st E1.3...E6.3 220-240 Vac/dc	1SDA126300R1	K3A-ELEC-YU-SO
E1.3...E6.3	YU-Sense 1st E1.3...E6.3 240-250 Vac/dc	1SDA126301R1	K3A-ELEC-YU-SQ
E1.3...E6.3	YU-Sense 2nd E1.3...E6.3 24 Vac/dc	1SDA126302R1	K3A-ELEC-2YU-S5
E1.3...E6.3	YU-Sense 2nd E1.3...E6.3 30 Vac/dc	1SDA126303R1	K3A-ELEC-2YU-S7
E1.3...E6.3	YU-Sense 2nd E1.3...E6.3 48 Vac/dc	1SDA126304R1	K3A-ELEC-2YU-S8
E1.3...E6.3	YU-Sense 2nd E1.3...E6.3 60 Vac/dc	1SDA126305R1	K3A-ELEC-2YU-S9
E1.3...E6.3	YU-Sense 2nd E1.3...E6.3 110-120 Vac/dc	1SDA126306R1	K3A-ELEC-2YU-S2
E1.3...E6.3	YU-Sense 2nd E1.3...E6.3 120-127 Vac/dc	1SDA126307R1	K3A-ELEC-2YU-S3
E1.3...E6.3	YU-Sense 2nd E1.3...E6.3 220-240 Vac/dc	1SDA126308R1	K3A-ELEC-2YU-S4
E1.3...E6.3	YU-Sense 2nd E1.3...E6.3 240-250 Vac/dc	1SDA126309R1	K3A-ELEC-2YU-S6

ELECTRONIC TIME-DELAY DEVICE FOR UNDERVOLTAGE RELEASE - UVD

Size	Type	Part Number	US / CA PN
E1.3...E6.3	UVD 24-30 Vdc	1SDA133771R1	K3A-ELEC-UVDD
E1.3...E6.3	UVD 48-60 Vac/dc	1SDA133772R1	K3A-ELEC-UVDE
E1.3...E6.3	UVD 110...125 Vac/dc	1SDA133769R1	K3A-ELEC-UVDA
E1.3...E6.3	UVD 220...250 Vac/dc	1SDA133770R1	K3A-ELEC-UVDC

Note: The electronic time-delay device must be used with an undervoltage coil with the same voltage



REMOTE RESET - YR

Size	Type	Part Number	US / CA PN
E1.3	YR 24 Vdc E1.3	1SDA073744R1	ZE1YRA
E1.3	YR 110 Vac/dc E1.3 (1)	1SDA073745R1	ZE1YRB
E1.3	YR 220 Vac/dc E1.3 (1)	1SDA073746R1	ZE1YRC
E2.3..E6.3	YR 24 Vdc E2.3...E6.3	1SDA073747R1	ZEBYRA
E2.3..E6.3	YR 110 Vac/dc E2.3...E6.3 (1)	1SDA073748R1	ZEBYRB
E2.3..E6.3	YR 220 Vac/Dc E2.3...E6.3 (1)	1SDA073749R1	ZEBYRC

1) when YR is used in DC, the activation of YR must be done with a maximum impulse time of 50ms.
The YR cannot be powered permanently.





MOTOR - M

Size	Type	Part Number	US / CA PN
E1.3	M E1.3 24-30 Vac/dc + MC 250V	1SDA073708R1	ZE1M2
E1.3	M E1.3 48-60 Vac/dc + MC 250V	1SDA073709R1	ZE1M3
E1.3	M E1.3 100-130 Vac/dc + MC 250V	1SDA073710R1	ZE1M4
E1.3	M E1.3 220-250 Vac/dc + MC 250V	1SDA073711R1	ZE1M5
E1.3	M E1.3 380-415 Vac + MC 250V	1SDA073713R1	ZE1M7
E2.3..E6.3	M E2.3...E6.3 24-30 Vac/dc + MC 400V	1SDA073722R1	ZEBM2
E2.3..E6.3	M E2.3...E6.3 48-60 Vac/dc + MC 400V	1SDA073723R1	ZEBM3
E2.3..E6.3	M E2.3...E6.3 100-130 Vac/dc + MC 400V	1SDA073724R1	ZEBM4
E2.3..E6.3	M E2.3...E6.3 220-250 Vac/dc + MC 400V	1SDA073725R1	ZEBM5
E2.3..E6.3	M E2.3...E6.3 380-415 Vac + MC 400V	1SDA073727R1	ZEBM7
E1.3	M E1.3 24-30 Vac/dc + MC 24V	1SDA073715R1	ZE1MA
E1.3	M E1.3 48-60 Vac/dc + MC 24V	1SDA073716R1	ZE1MB
E1.3	M E1.3 100-130 Vac/dc + MC 24V	1SDA073717R1	ZE1MC
E1.3	M E1.3 220-250 Vac/dc + MC 24V	1SDA073718R1	ZE1MD
E1.3	M E1.3 380-415 Vac + MC 24V	1SDA073720R1	ZE1MF
E2.3..E6.3	M E2.3...E6.3 24-30 Vac/dc + MC 24V	1SDA073729R1	ZEBMA
E2.3..E6.3	M E2.3...E6.3 48-60 Vac/dc + MC 24V	1SDA073730R1	ZEBMB
E2.3..E6.3	M E2.3...E6.3 100-130 Vac/dc + MC 24V	1SDA073731R1	ZEBMC
E2.3..E6.3	M E2.3...E6.3 220-250 Vac/dc + MC 24V	1SDA073732R1	ZEBMD



M-SENSE ENABLER (1)

Size	Type	Part Number	US / CA PN
E1.3	M-Sense Enabler E1.3 24V-60V	1SDA126310R1	K31-ELEC-M-SF
E1.3	M-Sense Enabler E1.3 100V-415V	1SDA126311R1	K31-ELEC-M-SE
E2.3..E6.3	M-Sense Enabler E2.3...E6.3 24V-60V	1SDA126312R1	K3B-ELEC-M-SF
E2.3..E6.3	M-Sense Enabler E2.3...E6.3 100V-415V	1SDA126313R1	K3B-ELEC-M-SE

1) Ekip Supply Lite is mandatory (in alternative Ekip Supply Evo Modbus TCP)

Accessories

Measurement & Protection

UPGRADES

Size	Type	Part Number	US / CA PN
E1.3...E6.3	Non defeatable I protection (1)	1SDA114799R1	Factory installed code only
E1.3...E6.3	Cybersecure breaker IEC 62443-4-2 (1)	1SDA126529R1	F3A-EK-CYBERSECURE
E1.3...E6.3	Predictive maintenance on-premise (2)	1SDA126531R1	F3A-SW-PREDMAINT
E1.3...E6.3	Internal temperature control (2)	1SDA126532R1	F3A-EK-INTEMP

1) Only supplied with the circuit-breaker.
2) Only supplied with the circuit-breaker. It is not available with the Neutral on the right-side configuration. Auxiliary supply (Ekip Supply Lite or Ekip Supply Evo Modbus TCP) is needed







CURRENT SENSOR FOR NEUTRAL CONDUCTOR OUTSIDE THE CIRCUIT-BREAKER (1)

Size	Type	Part Number	US / CA PN
E1.3-E2.3	Ext CS N E1.3 - E2.3 UL	1SDA126319R1	K32-ELEC-NCT2000
E4.3-E6.3	Ext CS N E4.3 - E6.3 50% UL	1SDA126320R1	K34-ELEC-NCT3200
E6.3	Ext CS N E6.3 100% UL	1SDA126321R1	K36-ELEC-NCT6000
E1.3-E2.3-E4.3	Ext CS N E1.3-E2.3-E4.3 10mt cable (2)	1SDA126322R1	K34-ELEC-ENCTCABLE
E6.3	Ext CS N E6.3 10mt cable (2)	1SDA128406R1	K36-ELEC-ENCTCABLE
E1.3...E6.3	External openable CS N CT100	1SDA126327R1	K3A-ELEC-NCT100
E1.3...E6.3	External openable CS N CT120	1SDA126328R1	K3A-ELEC-NCT120
E1.3...E6.3	External openable CS N CT200	1SDA126329R1	K3A-ELEC-NCT200
E1.3...E6.3	External openable CS N CT290	1SDA126330R1	K3A-ELEC-NCT290
E1.3...E6.3	Positioning device	1SDA085570R1	

1) Only loose
2) Only for Ext CS N version

FIXED OR MOBILE PART WITH NEUTRAL ON THE RIGHT SIDE

Size	Type	Part Number 4-poles
E1.3...E6.3	Installation with neutral on right side sequence L1,L2,L3,N (1)	1SDA076153R1

1) When this configuration is selected the circuit-breaker is not certified for IEC 61557-12 (Class 0.5 and class 1 accuracy)



HOMOPOLAR TOROID FOR GEXT PROTECTION (1) (2)

Size	Type	Part Number	US / CA PN
E1.3...E6.3	Homopolar toroid E1.3...E6.3 100A	1SDA127755R1	K3A-ELEC-SGR100
E1.3...E6.3	Homopolar toroid E1.3...E6.3 250A	1SDA127762R1	K3A-ELEC-SGR250
E1.3...E6.3	Homopolar toroid E1.3...E6.3 400A	1SDA127763R1	K3A-ELEC-SGR400
E1.3...E6.3	Homopolar toroid E1.3...E6.3 800A	1SDA127764R1	K3A-ELEC-SGR800
E1.3...E6.3	Homopolar toroid E1.3...E6.3 1200A	1SDA126331R1	K3A-ELEC-SGR1200

1) Only loose
2) The homopolar toroid is an alternative to the toroid for differential protection (RC)



TOROID FOR DIFFERENTIAL PROTECTION (RC RESIDUAL CURRENT PROTECTION) (1) (2)

Size	Type	Part Number	US / CA PN
E1.3 & E2.3 3p	Toroid RC E1.3, E2.3 3p	1SDA126332R1	K32-ELEC-RCTOROID
E2.3 4p & E4.3	Toroid RC E2.3 4p, E4.3 3p	1SDA126333R1	K34-ELEC-RCTOROID

1) Only loose
2) The toroid for differential protection is an alternative to the homopolar toroid



DEDICATED TERMINAL FOR MODIFIED DIFFERENTIAL GROUND FAULT (MDGF) PROTECTION

Size	Type	Part Number	US / CA PN
E1.3...E6.3	MDGF Terminal for fixed circuit-breaker (1)	1SDA114800R1	ZEAMDGFF
E1.3...E6.3	MDGF Terminal for withdrawable circuit-breaker (1)	1SDA114798R1	ZEAMDGFW

1) The commercial Part Number includes one piece.
Note: External phase current transformers and summing current transformers must be purchased separately. If the terminal for MDGF is bought after sales, FP connector for 3-pin/5-pin terminal block must be ordered

METERING (1)

Size	Type	Part Number	US / CA PN
E1.3	Class 0.5 Power&Energy Metering E1.3	1SDA126537R1	F31-EK-CLASS05
E2.3	Class 0.5 Power&Energy Metering E2.3	1SDA126538R1	F32-EK-CLASS05
E4.3	Class 0.5 Power&Energy Metering E4.3	1SDA126539R1	F34-EK-CLASS05
E6.3	Class 0.5 Power&Energy Metering E6.3	1SDA126540R1	F36-EK-CLASS05
E1.3	Class 1 Power&Energy Metering E1.3	1SDA132663R1	F31-EK-CLASS1
E2.3	Class 1 Power&Energy Metering E2.3	1SDA132664R1	F32-EK-CLASS1
E4.3	Class 1 Power&Energy Metering E4.3	1SDA132665R1	F34-EK-CLASS1
E6.3	Class 1 Power&Energy Metering E6.3	1SDA132666R1	F36-EK-CLASS1

1) Available only if supplied with the circuit breaker; the Measuring Digital upgrade is mandatory. The performance values in the table apply to circuit breakers supplied with an auxiliary power supply (Ekip Supply or Ekip Supply Evo Modbus TCP), with a frame size (Iu) ≥ 630 A, Un ≥ 400 V, internal voltage cables only, and with phase sequence 1-2-3 only. They are also valid for 3-pole circuit breakers (without external neutral sensor) or 4-pole circuit breakers (only if the neutral is on the left).

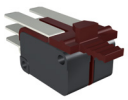
DIGITAL RATING PLUG (1)

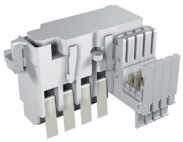
Size	Type	Part Number	US / CA PN
E1.3...E6.3	Digital Rating Plug 100A	1SDA126541R1	F32-EK-RP100
E1.3...E6.3	Digital Rating Plug 200A	1SDA126542R1	F32-EK-RP200
E1.3...E6.3	Digital Rating Plug 250A	1SDA126543R1	F32-EK-RP250
E1.3...E6.3	Digital Rating Plug 400A	1SDA126544R1	F3A-EK-RP400
E1.3...E6.3	Digital Rating Plug 630A	1SDA126546R1	F3A-EK-RP630
E1.3...E6.3	Digital Rating Plug 800A	1SDA126547R1	F3A-EK-RP800
E1.3...E6.3	Digital Rating Plug 1000A	1SDA126548R1	F3A-EK-RP1000
E1.3...E6.3	Digital Rating Plug 1250A	1SDA126550R1	F3A-EK-RP1250
E1.3...E6.3	Digital Rating Plug 1600A	1SDA126551R1	F3A-EK-RP1600
E2.3...E6.3	Digital Rating Plug 2000A	1SDA126552R1	F3B-EK-RP2000
E2.3...E6.3	Digital Rating Plug 2500A	1SDA126553R1	F3B-EK-RP2500
E4.3...E6.3	Digital Rating Plug 3000A	1SDA126554R1	F3B-EK-RP3000
E4.3...E6.3	Digital Rating Plug 3200A	1SDA126555R1	F3B-EK-RP3200
E4.3...E6.3	Digital Rating Plug 4000A	1SDA126557R1	F3B-EK-RP4000
E6.3	Digital Rating Plug 5000A	1SDA126558R1	F36-EK-RP5000

1) Only supplied with the circuit-breaker

Accessories

Signalling & Input/Output









OPEN CLOSED AUXILIARY CONTACTS - AUX

Size	Type	Part Number	US / CA PN
E1.3	AUX 4Q (4 Form C) 400V E1.3 (4) (6)	1SDA073750R1	ZE1AUX4
E1.3	AUX 4Q (4 Form C) 24V E1.3 (5)	1SDA073751R1	ZE1AUX4D
E1.3	AUX 2Q (2 Form C) 400V + 2Q (2 Form C) 24V E1.3 (6)	1SDA073752R1	ZE1AUX2-2D
E2.3..E6.3	AUX 4Q (4 Form C) 400V E2.3...E6.3 (4)	1SDA073753R1	ZEBAUX4
E2.3..E6.3	AUX 4Q (4 Form C) 24V E2.3...E6.3 (5)	1SDA073754R1	ZEBAUX4D
E2.3..E6.3	AUX 2Q (2 Form C) 400V + 2Q (2 Form C) 24V E2.3...E6.3 (6)	1SDA073755R1	ZEBAUX2-2D
E2.3..E6.3	AUX 6Q 400V E2.3...E6.3 F (1) (6)	1SDA126334R1	K3B-AUX6QAF
E2.3..E6.3	AUX 6Q 400V E2.3...E6.3 W (1) (6)	1SDA127790R1	K3B-AUX6QAW
E2.3..E6.3	AUX 6Q 24V E2.3...E6.3 F (1) (5)	1SDA126335R1	K3B-AUX6QDF
E2.3..E6.3	AUX 6Q 24V E2.3...E6.3 W (1) (5)	1SDA127791R1	K3B-AUX6QDW
E2.3..E6.3	AUX 3Q (3 Form C) 400V + 3Q (3 Form C) 24V E2.3...E6.3 F (1)	1SDA126340R1	K3B-AUX3-3QCF
E2.3..E6.3	AUX 3Q (3 Form C) 400V + 3Q (3 Form C) 24V E2.3...E6.3 W (1)	1SDA127792R1	K3B-AUX3-3QCW
E1.3	AUX 15Q (15 Form C) 400V E1.3 (2) (3) (6)	1SDA073758R1	ZE1AUX15
E1.3	AUX 15Q (15 Form C) 24V E1.3 (2) (3) (5)	1SDA073759R1	ZE1AUX15D
E2.3..E6.3	AUX 15Q (15 Form C) 400V (for fixed/drawout with signalling in racked in) E2.3...E6.3 (2) (3) (6)	1SDA126336R1	K3B-AUX15QCONAW
E2.3..E6.3	AUX 15Q (15 Form C) 24V (for fixed/drawout with signalling in racked in) E2.3...E6.3 (2) (3) (5)	1SDA126337R1	K3B-AUX15QCONDW
E2.3..E6.3	AUX 15Q (15 Form C) 400V (for fixed/drawout with signalling in racked in/test isolated) E2.3...E6.3 (2) (3) (6)	1SDA126338R1	K3B-AUX15QAW
E2.3..E6.3	AUX 15Q (15 Form C) 24V (for fixed/drawout with signalling in racked in/test isolated) E2.3...E6.3 (2) (3) (5)	1SDA126339R1	K3B-AUX15QDW

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 E1.3 one of the mounting plates is also needed. For E1.3 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) Max load 0.1 A
6) Max working voltage 400V



AUXILIARY POSITION CONTACTS - AUP

Size	Type	Part Number	US / CA PN
E1.3	AUP 6 contacts 400V E1.3 2I/2T/2E - right set	1SDA141030R1	ZE1AUP
E1.3	AUP 6 contacts 24V E1.3 2I/2T/2E - right set (1)	1SDA141029R1	ZE1AUPD
E1.3	AUP 6 contacts 400V E1.3 6I - right set	1SDA135119R1	
E1.3	AUP 6 contacts 24V E1.3 6I - right set	1SDA135120R1	
E1.3...E6.3	AUP Ekip auxiliary position contact E1.3...E6.3	1SDA073768R1	ZEAAUPE
E2.3...E6.3	AUP 5 contacts 400V E2.3...E6.3 2I1T2E - left set (2)	1SDA126341R1	K3B-AUP-5AL-2I1T2E
E2.3...E6.3	AUP 5 contacts 24V E2.3...E6.3 2I1T2E - left set (1)	1SDA126342R1	K3B-AUP-5DL-2I1T2E
E2.3...E6.3	AUP 5 contacts 24Vdc E2.3...6.3 4I1E - left set	1SDA135292R1	
E2.3...E6.3	AUP 5 contacts 400Vac E2.3...6.3 4I1E - left set	1SDA135293R1	
E2.3...E6.3	AUP 5 contacts 400V E2.3...E6.3 2I1T2E - right set (2)	1SDA126343R1	K3B-AUP-5AR-2I1T2E
E2.3...E6.3	AUP 5 contacts 24V E2.3...E6.3 2I1T2E - right set (1)	1SDA126344R1	K3B-AUP-5DR-2I1T2E
E2.3...E6.3	AUP 5 contacts 400V E2.3..E6.3 1I3T1E - right set (2)	1SDA126345R1	K3B-AUP-5AR-1I3T1E
E2.3...E6.3	AUP 5 contacts 400V E2.3..E6.3 2I1T2E - left set Fast Contact (2)	1SDA126346R1	K3B-AUP-5AL-2I1T2EFC
E2.3...E6.3	AUP 5 contacts 24V E2.3..E6.3 2I1T2E - left set Fast Contact (1)	1SDA126347R1	K3B-AUP-5DL-2I1T2EFC
E2.3...E6.3	AUP 5 contacts 400V E2.3..E6.3 4I/1E - left set Fast Contact (2)	1SDA126348R1	K3B-AUP-5DLFC
E2.3...E6.3	AUP 5 contacts 24V E2.3..E6.3 4I/1E - left set Fast Contact (1)	1SDA126349R1	K3B-AUP-5ALFC
E2.3...E6.3	AUP 5 contacts. 400V E2.3...E6.3 2I1T2E - right set Fast Contact (2) (3)	1SDA126350R1	K3B-AUP-5AR-2I1T2EFC
E2.3...E6.3	AUP 5 contacts 24V E2.3...E6.3 2I1T2E - right set Fast Contact (1) (3)	1SDA126351R1	K3B-AUP-5DR-2I1T2EFC
E2.3...E6.3	AUP 5 contacts 400Vac E2.3..E6.3 1I3T1E - right set Fast Contact (2) (3)	1SDA126352R1	K3B-AUP-5AR-1I3T1EFC

1) Max load 0.1 A
2) Max working voltage 400V
3) Right Fast AUP is not compatible with mechanical interlocks, 15Q, DLC and right DLP



READY TO CLOSE SIGNALLING CONTACT - RTC

Size	Type	Part Number	US / CA PN
E1.3	RTC 250V E1.3	1SDA126353R1	K31-AUXRTCA
E1.3	RTC 24V E1.3	1SDA126354R1	K31-AUXRTCB
E1.3	RTC Ekip 24V E1.3	1SDA126355R1	K31-COM-EKRTC
E2.3...E6.3	RTC 250V E2.3...E6.3	1SDA126356R1	K3B-AUXRTCA
E2.3...E6.3	RTC 24V E2.3...E6.3	1SDA126357R1	K3B-AUXRTCB
E2.3...E6.3	RTC Ekip 24V E2.3...E6.3	1SDA126358R1	K3B-COM-EKRTC

CONTACT SIGNALLING TRIPPING OF EKIP PROTECTION TRIP UNIT - S51

Size	Type	Part Number	US / CA PN
E1.3	S51 / bell alarm 250V E1.3 (1)	1SDA073776R1	ZE1BA
E1.3	S51 / bell alarm 24V E1.3	1SDA073777R1	ZE1BAD
E2.3...E6.3	S51 / bell alarm 250V E2.3...E6.3 (1)	1SDA073778R1	ZEBBA
E2.3...E6.3	S51 / bell alarm 24V E2.3...E6.3	1SDA073779R1	ZEBBAD
E2.3...E6.3	250V E2.3...E6.3	1SDA085699R1	ZEBBA2
E2.3...E6.3	24V E2.3...E6.3	1SDA085700R1	ZEBBAD2

1) Standard supply with automatic circuit-breakers

Accessories

Signalling & Input/Output



TERMINAL BLOCKS FOR AUXILIARY CONNECTION

Size	Type	Part Number	US / CA PN
E1.3...E6.3	3 pin terminal blocks 10 pcs (1)	1SDA073906R1	ZEATB10
E1.3...E6.3	3 pin terminal blocks 8 pcs INST (2)	1SDA114779R1	F3A-AUX8TB3PIN
E1.3...E6.3	3 pin terminal blocks 18 pcs INST (2)	1SDA114780R1	F3A-AUX18TB3PIN
E1.3...E6.3	Replacement 3-pin to 5-pin terminals INST (2) (3)	1SDA126359R1	F3A-AUXINSTB5PIN
E1.3...E6.3	5 pin terminal blocks 10pcs (1)	1SDA126360R1	K3A-AUX10TB5PIN
E1.3...E6.3	5 pin terminal blocks 8pcs INST (2)	1SDA126361R1	F3A-AUX8TB5PIN
E1.3...E6.3	5 pin terminal blocks 18pcs INST (2)	1SDA126362R1	F3A-AUX18TB5PIN

1) Only as Loose part
2) Only supplied with the circuit-breaker
3) All 3-pin terminal blocks are substituted with 5-pin terminal blocks

FIXED PART CONNECTOR

Size	Type	Part Number	US / CA PN
E1.3...E6.3	FP connector for 3-pin/5-pin terminal block (1)	1SDA134296R1	NA

1) the kit contains 4 connectors. Only for W circuit breaker

Accessories

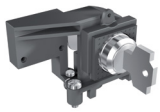
Safety & IP Protection



MECHANICAL OPERATION COUNTER - MOC

Size	Type	Part Number	US / CA PN
E1.3	MOC mechanical operation counter (1)	1SDA073780R1	ZE1MOC
E2.3...E6.3	MOC mechanical operation counter	1SDA143402R1	K3B-MECH-MOC

1) Available with motor, for installation without Motor the support 1SDA126565R1 is required





KEY LOCK IN OPEN POSITION - KLC

Size	Type	Part Number	US / CA PN
E1.3	1st KLC-D Key lock open E1.3	1SDA126363R1	K31-MECH-1KLCD
E1.3	2nd KLC-D Key lock open E1.3	1SDA126364R1	K31-MECH-2KLCD
E1.3	KLC-S Key lock open N.20005 E1.3	1SDA126365R1	K31-MECH-KLCS5
E1.3	KLC-S Key lock open N.20006 E1.3	1SDA126366R1	K31-MECH-KLCS6
E1.3	KLC-S Key lock open N.20007 E1.3	1SDA126367R1	K31-MECH-KLCS7
E1.3	KLC-S Key lock open N.20008 E1.3	1SDA126368R1	K31-MECH-KLCS8
E1.3	KLC-S Key lock open N.20009 E1.3	1SDA126369R1	K31-MECH-KLCS9
E1.3	1st KLC-A Key lock open Castell E1.3 (1) (2)	1SDA126371R1	K31-MECH-1KLCAC
E1.3	1st KLC-A Key lock open Kirk - STI E1.3 (1) (3)	1SDA126372R1	K31-MECH-1KLCAK
E1.3	1st KLC-D Key lock open Ronis E1.3	1SDA126370R1	K31-MECH-1KLCDR
E2.3...E6.3	1st KLC-D Key lock open E2.3...E6.3	1SDA126373R1	K3B-MECH-1KLCD
E2.3...E6.3	2nd KLC-D Key lock open E2.3...E6.3	1SDA126374R1	K3B-MECH-2KLCD
E2.3...E6.3	KLC-S Key lock open N.20005 E2.3..E6.3	1SDA126375R1	K3B-MECH-KLCS5
E2.3...E6.3	KLC-S Key lock open N.20006 E2.3..E6.3	1SDA126376R1	K3B-MECH-KLCS6
E2.3...E6.3	KLC-S Key lock open N.20007 E2.3..E6.3	1SDA126377R1	K3B-MECH-KLCS7
E2.3...E6.3	KLC-S Key lock open N.20008 E2.3..E6.3	1SDA126378R1	K3B-MECH-KLCS8
E2.3...E6.3	KLC-S Key lock open N.20009 E2.3..E6.3	1SDA126379R1	K3B-MECH-KLCS9
E2.3...E6.3	1st KLC-A Key lock open Castell E2.3...E6.3 (1) (2)	1SDA126382R1	K3B-MECH-1KLCAC
E2.3...E6.3	1st KLC-A Key lock open Kirk-STI E2.3..E6.3 (3)	1SDA126383R1	K3B-MECH-1KLCAK
E2.3...E6.3	2nd KLC-A Key lock open Kirk-STI E2.3..E6.3 (1) (3)	1SDA126384R1	K3B-MECH-2KLCAK
E2.3...E6.3	1st KLC-D Key lock open Ronis E2.3..E6.3	1SDA126380R1	K3B-MECH-1KLCDR
E2.3...E6.3	2nd KLC-D Key lock open Ronis E2.3..E6.3	1SDA126381R1	K3B-MECH-2KLCDR

1) Arrangement only
2) If purchased as a loose supply, the dedicated cover must also be ordered separately. Compatible models: Castell PDS05693-FSB, PDS05693-FSS, PDS05693-QB, PDS05693-QS
3) Compatible models: STI ABA90GEL5000 - STI HBA90GPS5000

Accessories

Safety & IP Protection



PADLOCKS IN OPEN POSITION - PLC

Size	Type	Part Number	US / CA PN
E1.3	1st PLC E1.3 Padlocks open pos. left	1SDA126385R1	K31-MECH-1PLC
E1.3	2nd PLC E1.3 Padlocks open pos. right	1SDA126386R1	K31-MECH-2PLC
E2.3...E6.3	1st PLC E2.3..E6.3 Padlocks open pos. left	1SDA126387R1	K3B-MECH-1PLC
E2.3...E6.3	2nd PLC E2.3..E6.3 Padlocks open pos. right	1SDA126388R1	K3B-MECH-2PLC

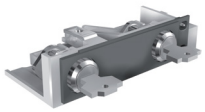
Note: The lock shackle/shank diameter must match for proper operation as indicated in the Instruction Manual.
The PLC is an alternative to the protection device for opening and closing pushbuttons (PBC)

FLOOR FIXING PLATE - F (1)

Size	Type	Part Number	US / CA PN
E1.3	Floor fixing plate for fixed unit	1SDA076020R1	ZE1FFPF

1) Only available with Motor, for installation without Motor the support 1SDA126565R1 is required





KEY LOCK IN RACKED IN / TEST / RACKED OUT POSITION - KLP

Size	Type	Part Number	US / CA PN
E1.3	KLP-D Key lock racked in/out E1.3 1st key	1SDA126389R1	K31-MECH-1KLPD
E1.3	KLP-S Key lock racked in/out N.20005 E1.3 1st key	1SDA126390R1	K31-MECH-1KLPS5
E1.3	KLP-S Key lock racked in/out N.20006 E1.3 1st key	1SDA126391R1	K31-MECH-1KLPS6
E1.3	KLP-S Key lock racked in/out N.20007 E1.3 1st key	1SDA126392R1	K31-MECH-1KLPS7
E1.3	KLP-S Key lock racked in/out N.20008 E1.3 1st key	1SDA126393R1	K31-MECH-1KLPS8
E1.3	KLP-S Key lock racked in/out N.20009 E1.3 1st key	1SDA126394R1	K31-MECH-1KLPS9
E1.3	KLP-D Key lock racked in/out E1.3 2nd key	1SDA126395R1	K31-MECH-2KLPD
E1.3	KLP-S Key lock racked in/out N.20005 E1.3 2nd key	1SDA126396R1	K31-MECH-2KLPS5
E1.3	KLP-S Key lock racked in/out N.20006 E1.3 2nd key	1SDA126397R1	K31-MECH-2KLPS6
E1.3	KLP-S Key lock racked in/out N.20007 E1.3 2nd key	1SDA126398R1	K31-MECH-2KLPS7
E1.3	KLP-S Key lock racked in/out N.20008 E1.3 2nd key	1SDA126399R1	K31-MECH-2KLPS8
E1.3	KLP-S Key lock racked in/out N.20009 E1.3 2nd key	1SDA126400R1	K31-MECH-2KLPS9
E1.3	KLP-A Key lock racked in/out Kirk-STI E1.3 1st key (4)	1SDA126401R1	K31-MECH-1KLPAK
E1.3	KLP-A Key lock racked in/out Kirk-STI E1.3 2nd key (4)	1SDA126402R1	K31-MECH-2KLPAC
E1.3	KLP-A Key lock racked in/out Castell E1.3 1st key (2) (3)	1SDA126403R1	K31-MECH-1KLPAC
E1.3	KLP-A Key lock racked in/out Castell E1.3 2nd key (2) (3)	1SDA126404R1	K31-MECH-2KLPAC
E1.3	KLP-A Key lock racked in/out Ronis E1.3 1st key	1SDA126405R1	K31-MECH-1KLPDR
E1.3	KLP-A Key lock racked in/out Ronis E1.3 2nd key	1SDA126406R1	K31-MECH-2KLPDR
E2.3...E6.3	KLP-D Key lock racked in/out E2.3...E6.3 1st key	1SDA126407R1	K3B-MECH-1KLPD
E2.3...E6.3	KLP-S Key lock racked in/out N.20005 E2.3...E6.3 1st key	1SDA126408R1	K3B-MECH-1KLPS5
E2.3...E6.3	KLP-S Key lock racked in/out N.20006 E2.3...E6.3 1st key	1SDA126409R1	K3B-MECH-1KLPS6
E2.3...E6.3	KLP-S Key lock racked in/out N.20007 E2.3...E6.3 1st key	1SDA126410R1	K3B-MECH-1KLPS7
E2.3...E6.3	KLP-S Key lock racked in/out N.20008 E2.3...E6.3 1st key	1SDA126411R1	K3B-MECH-1KLPS8
E2.3...E6.3	KLP-S Key lock racked in/out N.20009 E2.3...E6.3 1st key	1SDA126412R1	K3B-MECH-1KLPS9
E2.3...E6.3	KLP-D Key lock racked in/out E2.3...E6.3 2nd key	1SDA126413R1	K3B-MECH-2KLPD
E2.3...E6.3	KLP-S Key lock racked in/out N.20005 E2.3...E6.3 2nd key	1SDA126414R1	K3B-MECH-2KLPS5
E2.3...E6.3	KLP-S Key lock racked in/out N.20006 E2.3...E6.3 2nd key	1SDA126415R1	K3B-MECH-2KLPS6
E2.3...E6.3	KLP-S Key lock racked in/out N.20007 E2.3...E6.3 2nd key	1SDA126416R1	K3B-MECH-2KLPS7
E2.3...E6.3	KLP-S Key lock racked in/out N.20008 E2.3...E6.3 2nd key	1SDA126417R1	K3B-MECH-2KLPS8
E2.3...E6.3	KLP-S Key lock racked in/out N.20009 E2.3...E6.3 2nd key	1SDA126418R1	K3B-MECH-2KLPS9
E2.3...E6.3	KLP-A Key lock racked in/out Kirk-STI E2.3...E6.3 1st key (2) (4)	1SDA126419R1	K3B-MECH-1KLPAK
E2.3...E6.3	KLP-A Key lock racked in/out Kirk-STI E2.3...E6.3 2nd key (2) (4)	1SDA126420R1	K3B-MECH-2KLPAK
E2.3...E6.3	KLP-A Key lock racked in/out Castell E2.3...E6.3 1st key (1) (2) (3)	1SDA126421R1	K3B-MECH-1KLPAC
E2.3...E6.3	KLP-A Key lock racked in/out Castell E2.3...E6.3 2nd key (1) (2) (3)	1SDA126422R1	K3B-MECH-2KLPAC
E2.3...E6.3	KLP-D Key lock racked in/out Ronis E2.3/E6.3 1st key	1SDA126423R1	K3B-MECH-1KLPDR
E2.3...E6.3	KLP-D Key lock racked in/out Ronis E2.3/E6.3 2nd key	1SDA126424R1	K3B-MECH-2KLPDR

Note: 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
3) Compatible models: Castell PDS05693-FSB, PDS05693-FSS, PDS05693-QB, PDS05693-QS
4) Compatible models: STI ABA90GEL5000 - STI HBA90GPS5000 - KIRK KCAM00011

Accessories

Safety & IP Protection



ACCESSORY FOR SUPPLEMENTARY LOCK IN RACKED-OUT POSITION

Size	Type	Part Number	US / CA PN
E1.3	Suppl. lock in racked out E1.3 (1)	1SDA073838R1	ZE1SUP
E2.3...E6.3	Suppl. lock in racked out E2.3...E6.3	1SDA073839R1	ZEBSUP

1) Not compatible with Castell KLP

PADLOCK IN RACKED IN / TEST / RACKED OUT POSITION - PLP

Size	Type	Part Number	US / CA PN
E1.3	PLP Padlock racked in/out E1.3	1SDA073840R1	ZE1PLP
E2.3...E6.3	PLP Padlock racked in/out E2.3...E6.3	1SDA126425R1	K3B-MECH-PLP

Note: The lock shackle/shank diameter must match for proper operation.



LOCK FOR RACKING IN / RACKING OUT THE MOBILE PART WHEN THE DOOR IS OPEN - DLR (1)

Size	Type	Part Number
E1.3...E6.3	DLR E2.3...E6.3	1SDA073845R1

1) Only as loose part



LOCK TO PREVENT DOOR OPENING WHEN THE CIRCUIT-BREAKER IS IN RACKED IN / TEST POSITION - DLP (1)

Size	Type	Part Number	US / CA PN
E1.3	DLP E1.3 Left	1SDA114338R1	K31-MECH-DLP
E2.3...E6.3	DLP E2.3...E6.3 Left	1SDA126427R1	K3B-MECH-DLPL
E2.3...E6.3	DLP E2.3...E6.3 Right (2)	1SDA128407R1	K3B-MECH-DLPR

1) Only as loose part
2) Right DLP is not compatible with mechanical interlocks, 15Q, DLC and fast AUP right

LOCK TO PREVENT DOOR OPENING WHEN THE CIRCUIT-BREAKER IS IN A CLOSED POSITION - DLC

Size	Type	Part Number	US / CA PN
E1.3	DLC Interlock cable door for fixed part withdrawable E1.3	1SDA081034R1	ZE1DLCCDFP
E1.3	DLC Interlock direct door for fixed to wall E1.3	1SDA079779R1	ZE1DLCDDFW
E1.3	DLC Interlock direct door for fixed part withdrawable E1.3	1SDA079781R1	ZE1DLCDDFP
E2.3...E6.3	DLC Interlock direct door E2.3...E6.3 F (1)	1SDA126428R1	K3B-MECH-DLCCF
E2.3...E6.3	DLC Interlock direct door E2.3...E6.3 W (1)	1SDA129641R1	K3B-MECH-DLCDW

Note: 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 [1SDA126457R1]



PROTECTION DEVICE FOR OPENING AND CLOSING PUSHBUTTONS - PBC

Size	Type	Part Number	US / CA PN
E1.3	PBC Op/Cl Pushbutton Protection sp. key E1.3	1SDA126429R1	K31-MECH-PBC
E1.3	PBC Op/Cl Pushbutton Protection PL D=4mm/0.15" E1.3	1SDA126430R1	K31-MECH-PBC4
E1.3	PBC Op/Cl Pushbutton Protection PL D=7mm/0.27" E1.3	1SDA126431R1	K31-MECH-PBC7
E1.3	PBC Op/Cl Pushbutton Protection PL D=8mm/0.31" E1.3	1SDA126432R1	K31-MECH-PBC8
E2.3...E6.3	PBC Op/Cl Pushbutton Protection sp. key E2.3...E6.3	1SDA126433R1	K3B-MECH-PBC
E2.3...E6.3	PBC Op/Cl Pushbutton Protection PL D=4mm/0.15" E2.3...E6.3	1SDA126435R1	K3B-MECH-PBC4
E2.3...E6.3	PBC Op/Cl Pushbutton Protection PL D=7mm/0.27" E2.3...E6.3	1SDA126436R1	K3B-MECH-PBC7
E2.3...E6.3	PBC Op/Cl Pushbutton Protection PL D=8mm/0.31" E2.3...E6.3	1SDA126437R1	K3B-MECH-PBC8
E2.3...E6.3	PBC2 Closing Pushbutton Protection E2.3...E6.3	1SDA126434R1	K3B-MECH-PBCCL

Note: The lock shackle/shank diameter must match for proper operation



CIRCUIT-BREAKER FLANGE

Size	Type	Part Number	US / CA PN
E1.3	IP30 flange E1.3 Fixed	1SDA073862R1	ZE1FLG30F
E1.3	IP30 flange E1.3 Drawout	1SDA073863R1	ZE1FLG30D
E2.3...E6.3	IP30 flange E2.3...E6.3 Fixed	1SDA073864R1	ZEBFLG30F
E2.3...E6.3	IP30 flange E2.3...E6.3 Drawout	1SDA073865R1	ZEBFLG30D
E1.3	IP30 blind door E1.3	1SDA126438R1	K31-MECH-IP30
E2.3...E6.3	IP30 blind door E2.3...E6.3	1SDA126439R1	K3B-MECH-IP30
E1.3	IP54 flange, different keys E1.3 (1)	1SDA073866R1	ZE1FLG54DK
E2.3...E6.3	IP54 flange, different keys E2.3...E6.3 (1)	1SDA073867R1	ZEBFLG54DK
E1.3	IP54 flange, key N.20005 E1.3 (1)	1SDA073868R1	ZE1FLG54SK
E2.3...E6.3	IP54 flange, key N.20005 E2.3...E6.3 (1)	1SDA073869R1	ZEBFLG54SK

1) Only as loose part

TRASPARENT TRIP UNIT COVER

Size	Type	Part Number	US / CA PN
E1.3	Closed trip unit cover E1.3	1SDA126440R1	K31-MECH-STUCOVER
E2.3...E6.3	Sealable closed trip unit cover E2.3...E6.3	1SDA126441R1	K3B-MECH-STUCOVER
E2.3...E6.3	Closed trip unit cover E2.3...E6	1SDA128250R1	K3B-MECH-CLTUCOVER

Accessories

Safety & IP Protection



REMOTE RACKING DEVICE - RRD

Size	Type	Part Number	US / CA PN
E1.3	RRD Motor 110-220 Vac/dc (2)	1SDA126190R1	K31-ELEC-RRDM
E1.3	Kit for fixing RRD on E1.3 (1)	1SDA126191R1	K31-MECH-RRD
E2.3...E6.3	RRD Motor 110-220Vac/dc (2)	1SDA126192R1	K3B-ELEC-RRDM
E2.3...E6.3	Kit for fixing RRD on E2.3...E6.3 (1)	1SDA126193R1	K3B-MECH-RRD
E1.3...E6.3	RRD controller (3)	1SDA126194R1	K3A-ELEC-RRDC

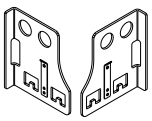
1) One kit per breaker needed
2) It includes Motor, power supply and controller
3) It includes a controller that can be used either for the external RRD solution or for the embedded RRD-E solution. Only in the latter case, an adapter (included in the kit) and four AA batteries (not included in the kit) are needed.



REMOTE RACKING DEVICE EMBEDDED - RRD-E (1)

Size	Type	Part Number	US / CA PN
E4.3	RRD Embedded 24 V	1SDA127015R1	F34-ELEC-RRDE
E6.3	RRD Embedded 24 V	1SDA127016R1	F36-ELEC-RRDE

1) Only supplied with the circuit-breaker or the switch disconnector



LIFTING PLATES (1)

Size	Poles	IEC/UL	Version	Part Number	US/CA PN	Type spare	Min quantity
E1.3	3p; 4p	IEC/UL	F; W (MP)	1SDA126442R1	K31-MECH-LIFTPLATES		1

1) Only supplied with the circuit-breaker



HIGH OR LOW TERMINAL COVERS - HTC/LTC

		3 Poles		4 Poles	
Size	Type	Part Number	US / CA PN	Part Number	US / CA PN
E1.3	HTC high terminal covers E1.3 2pcs	1SDA126443R1	K31-MECH-HTC	1SDA126444R1	K31-MECH-HTC-4
E1.3	LTC low terminal covers E1.3 2pcs	1SDA126445R1	K31-MECH-LTC	1SDA126446R1	K31-MECH-LTC-4



SEPARATORS / PHASE BARRIERS - PB (1)

Size	Type	Part Number	US / CA PN
E1.3	PB H=100mm/3.94" 4pcs E1.3 Fixed 3P	1SDA073877R1	ZE1PBF100
E1.3	PB H=100mm/3.94" 6pcs E1.3 Fixed 4P	1SDA073878R1	ZE1PBF100-4
E1.3	PB H=200mm/7.87" 4pcs E1.3 Fixed 3P	1SDA073879R1	ZE1PBF200
E1.3	PB H=200mm/7.87" 6pcs E1.3 Fixed 4P	1SDA073880R1	ZE1PBF200-4
E1.3	PB 2pcs E1.3 Drawout 3P	1SDA076164R1	ZE1PBW
E1.3	PB 3pcs E1.3 Drawout 4P	1SDA076165R1	ZE1PBW-4
E2.3...E6.3	PB 2pcs E2.3...E6.3 Fixed 3P	1SDA076166R1	ZEBPBF
E2.3...E6.3	PB 3pcs E2.3...E6.3 Fixed 4P	1SDA076167R1	ZEBPBF-4
E2.3...E6.3	PB 2pcs E2.3...E6.3 Drawout 3P	1SDA076168R1	ZEBPBW
E2.3...E6.3	PB 3pcs E2.3...E6.3 Drawout 4P	1SDA076169R1	ZEBPBW-4

Accessories
Interlocks

CABLES FOR MECHANICAL INTERLOCK [GROUP 1]

Size	Type	Part Number	US / CA PN
E1.3...E6.3	Type A horizontal	1SDA126447R1	K3A-MECH-CABLEHRA
E2.3..E6.3	Type B,C,D horizontal	1SDA126448R1	K3B-MECH-CABLEHRBCD
E1.3...E6.3	Type A vertical	1SDA126449R1	K3A-MECH-CABLEVRA
E2.3..E6.3	Type B,C,D vertical	1SDA126450R1	K3B-MECH-CABLEVRBCD

Note: One 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]

		3 Poles		4 Poles	
Size	Type	Part Number	US / CA PN	Part Number	US / CA PN
E2.3	Lever for mechanical interlock	1SDA126451R1	K32-MECH-LEVER	1SDA126451R1	K32-MECH-LEVER
E4.3	Lever for mechanical interlock	1SDA126452R1	K34-MECH-LEVER	1SDA126452R1	K34-MECH-LEVER
E6.3	Lever for mechanical interlock	1SDA126453R1	K36-MECH-LEVER	1SDA126454R1	K36-MECH-LEVER-4

Note: The lever for the mechanical interlock is not required for E1.3

SUPPORT FOR MECHANICAL INTERLOCK OF FIXED CIRCUIT-BREAKER [GROUP 3]

Size	Type	Part Number	US / CA PN
E1.3	Type A - floor mounted	1SDA126455R1	K31-MECH-SUP-FL-AF
E1.3	Type A - wall mounted	1SDA126456R1	K31-MECH-SUP-WALL-AF
E2.3...E6.3	Type A / B / D	1SDA126457R1	K3B-MECH-SUP-ABD
E2.3...E6.3	Type C	1SDA126458R1	K3B-MECH-SUP-C

SUPPORT FOR MECHANICAL INTERLOCK OF FIXED PART [GROUP 4]

Size	Type	Part Number	US / CA PN
E1.3	Type A	1SDA126459R1	K31-MECH-SUP-AW
E2.3...E6.3	Type A / B / D	1SDA126457R1	K3B-MECH-SUP-ABD
E2.3...E6.3	Type C	1SDA126458R1	K3B-MECH-SUP-C

Accessories
Connectivity

OPTIONS FOR EKIP AWARE

Size	Type	Part Number	US / CA PN
E1.3...E6.3	No Wireless Connectivity (2)	1SDA128405R1	F3A-EK-NOWIRELESS
E1.3...E6.3	Upper internal installed voltage cables (1)	1SDA127756R1	F3A-EK-UPPERMEAS
E1.3...E6.3	External installed voltage cables (1)	1SDA127757R1	F3A-EK-EXTMEAS

1) All Ekip Aware trip units have lower voltage cables installed by default
2) It means Bluetooth and NFC disabled. Only supplied with the circuit-breaker



EXTERNAL CARTRIDGE

Size	Type	Part Number	US / CA PN
E1.3...E6.3	Ekip Cartridge	1SDA127787R1	K3A-EK-CARTRIDGE4



POWER SUPPLY

Size	Type	Part Number	US / CA PN
E1.3...E6.3	Ekip Supply Lite 24-240VAC/DC (3)	1SDA126470R1	K3A-EK-SUPPLYLITE
E1.3...E6.3	Ekip Supply Evo Modbus TCP (4)	1SDA126472R1	K3A-COM-EVOMODTCP
E1.3...E6.3	Ekip Busbars Supply (1) (2)	1SDA126493R1	F3A-EK-BUSBARSUPPLY

1) Voltage measurement cables always present
2) Only supplied with the circuit-breaker
3) do not include Ekip RTC and Ekip AUP in the kit; therefore, if required, they must be ordered separately.
4) Provided with Ekip RTC and Ekip AUP.



COMMUNICATION MODULES

Size	Type	Part Number	US / CA PN
E1.3...E6.3	Ekip Com Modbus RTU (2)	1SDA126471R1	K3A-COM-MODRTU
E1.3...E6.3	Ekip Com Profibus (2)	1SDA126473R1	K3A-COM-PROFIBUS
E1.3...E6.3	Ekip Com Profinet (1) (3)	1SDA126474R1	K3A-COM-PROFINET
E1.3...E6.3	Ekip Com EtherNet/IP (1) (3)	1SDA126475R1	K3A-COM-ETHERNETIP
E1.3...E6.3	Ekip Com IEC61850 (1) (3)	1SDA126476R1	K3A-COM-61850

1) Ekip Supply Evo Modbus TCP mandatory
2) provided with Ekip RTC and Ekip AUP
4) do not include Ekip RTC and Ekip AUP in the kit; therefore, if required, they must be ordered separately



SIGNALLING MODULES

Size	Type	Part Number	US / CA PN
E1.3...E6.3	Ekip Signalling 2K-1	1SDA126481R1	K3A-EK-2K1
E1.3...E6.3	Ekip Signalling 2K-2	1SDA126482R1	K3A-EK-2K2
E2.3..E6.3	Ekip Signalling 4K (1)	1SDA126484R1	K3B-EK-4K
E1.3...E6.3	Ekip Signalling 10K Link (2)	1SDA126485R1	K3A-EK-10KLINK
E1.3...E6.3	Ekip Signalling Modbus TCP (2)	1SDA082485R1	ZEASIGMBTCP

1) Ekip 4K is not available for the E1.3. It is an alternative to the AUX 6Q (6 Form C) auxiliary contacts unit on other frames
2) Only loose



TEMPERATURE MODULES

Size	Type	Part Number	US / CA PN
E1.3...E6.3	Ekip Temperature 4T-1 (1)	1SDA126487R1	K3A-EK-TEMP4T1
E1.3...E6.3	Ekip Temperature 4T-2 (1)	1SDA126488R1	K3A-EK-TEMP4T2
E1.3...E6.3	External Probe PT1000 3mt (2)	1SDA085695R1	ZEA3TPR
E1.3...E6.3	T-sense Ambient (3)	1SDA126489R1	K3A-EK-TSENSEAMBIENT
E1.3...E6.3	T-sense Busbars (3)	1SDA126490R1	K3A-EK-TSENSEBUSBAR

1) External probe PT100/PT1000 not supplied
2) For busbar applications only. The Part Number includes one loose single probe.
3) Auxiliary supply is needed (Ekip Supply Lite or Ekip Supply Evo Modbus TCP)



PROTECTION MODULES

Size	Type	Part Number	US / CA PN
E1.3...E6.3	Ekip RELT	1SDA126483R1	K3A-EK-RELT
E1.3...E6.3	Ekip Arc-Flash 6F-1	1SDA126491R1	K3A-EK-ARCFLASH6F1
E1.3...E6.3	Ekip Arc-Flash 6F-2	1SDA128420R1	K3A-EK-ARCFLASH6F2
E1.3...E6.3	Light-Sense Detector (1)	1SDA126492R1	K3A-EK-ARCFLASHLIGHT
E1.3...E6.3	Light&Pressure-Sense Detector (1)	1SDA128423R1	K3A-EK-ARCFLASHLP

1) Only loose



SYNCHROCHECK MODULE

Size	Type	Part Number	US / CA PN
E1.3...E6.3	Ekip Synchrocheck	1SDA126494R1	K3A-EK-SYNC

CYBERSECURE MODULES COMPATIBLE WITH IEC 622443 EMAX 3 (1)

Size	Type	Part Number	US / CA PN
E1.3...E6.3	Ekip Supply Evo Modbus TCP Secure	1SDA128409R1	K3A-COM-EVOMODTCP-S
E1.3...E6.3	Ekip Com Modbus RTU Secure	1SDA128408R1	K3A-COM-MODRTU-S
E1.3...E6.3	Ekip Com Profibus Secure	1SDA128410R1	K3A-COM-PROFIBUS-S
E1.3...E6.3	Ekip Com Profinet Secure	1SDA128411R1	K3A-COM-PROFINET-S
E1.3...E6.3	Ekip Com EtherNet/IP™ Secure	1SDA128412R1	K3A-COM-ETHERNETIP-S
E1.3...E6.3	Ekip Com IEC61850 Secure	1SDA128413R1	K3A-COM-61850-S
E1.3...E6.3	Ekip Signalling 2K-1 Secure	1SDA128415R1	K3A-EK-2K1-S
E1.3...E6.3	Ekip Signalling 2K-2 Secure	1SDA128416R1	K3A-EK-2K2-S
E1.3...E6.3	Ekip RELT Secure	1SDA128417R1	K3A-EK-RELT-S
E1.3...E6.3	Ekip Synchrocheck Secure	1SDA128424R1	K3A-EK-SYNC-S
E1.3...E6.3	Ekip Temperature 4T-1 Secure	1SDA128418R1	K3A-EK-TEMP4T1-S
E1.3...E6.3	Ekip Temperature 4T-2 Secure	1SDA128419R1	K3A-EK-TEMP4T2-S
E1.3...E6.3	Ekip Arc-Flash 6F-1 Secure	1SDA128421R1	K3A-EK-ARCFLASH6F1-S
E1.3...E6.3	Ekip Arc-Flash 6F-2 Secure	1SDA128422R1	K3A-EK-ARCFLASH6F2-S
E1.3...E6.3	Ekip Signalling 10K Link Secure	1SDA133779R1	K3A-EK-10KLINK-S

1) To comply with IEC 62443-4-2, both cybersecure modules and cybersecure circuit-breaker (1SDA126529R1) must be purchased together. Cybersecure modules can be purchased with the circuit breaker or aftersales as standalone.

Accessories
Displaying





DISPLAYING SYSTEM

Size	Type	Part Number	US / CA PN
E1.3...E6.3	Lite Panel Pro	1SDA123321R1	ABBLITEPANELPRO

Accessories

Digital upgrades

PROTECTION UPGRADES

		Supplied with the breaker		ABB Marketplace order	
Size	**Type**	**Part Number**	**US / CA PN**	**Part Number**	**US / CA PN**
E1.3...E6.3	Protection S (1)	1SDA126499R1	K3A-SW-SHORTTIME	1SDA126588R1	K3A-SWMP-SHORTTIME
E1.3...E6.3	Protection G (1)	1SDA126507R1	K3A-SW-GROUND	1SDA126596R1	K3A-SWMP-GROUND
E1.3...E6.3	L protection OFF setting	1SDA126561R1	F3A-SW-LOFF	1SDA126643R1	K3A-SWMP-LOFF
E1.3...E4.3	RC protection	1SDA126562R1	F3A-SW-RC	1SDA126644R1	K3A-SWMP-RC
E1.3...E6.3	Advanced MDGF	1SDA126512R1	F3A-SW-MDGF	1SDA133352R1	K3A-SWMP-MDGF
E1.3...E6.3	Advanced Current Protections	1SDA126513R1	F3A-SW-ADCURR	1SDA126605R1	K3A-SWMP-ADCURR
E1.3...E6.3	Voltage Protection	1SDA126514R1	F3A-SW-VOLT	1SDA126606R1	K3A-SWMP-VOLT
E1.3...E6.3	Frequency Protection	1SDA126515R1	F3A-SW-FREQ	1SDA126607R1	K3A-SWMP-FREQ
E1.3...E6.3	Power Protection	1SDA126516R1	F3A-SW-POWER	1SDA126608R1	K3A-SWMP-POWER
E1.3...E6.3	Directional protection	1SDA126517R1	F3A-SW-DIR	1SDA126609R1	K3A-SWMP-DIR
E1.3...E6.3	Advanced Voltage Protection	1SDA126518R1	F3A-SW-ADVOLT	1SDA126610R1	K3A-SWMP-ADVOLT
E1.3...E6.3	Dual Setting	1SDA126524R1	F3A-SW-DUAL	1SDA126616R1	K3A-SWMP-DUAL
E1.3...E6.3	Triple Setting	1SDA126525R1	F3A-SW-TRIPLE	1SDA126617R1	K3A-SWMP-TRIPLE

1) Only loose from MarketPlace

POWER QUALITY UPGRADES

		Supplied with the breaker		ABB Marketplace order	
Size	**Type**	**Part Number**	**US / CA PN**	**Part Number**	**US / CA PN**
E1.3...E6.3	Measuring	1SDA126519R1	F3A-SW-MEASURING	1SDA126611R1	K3A-SWMP-MEASURING
E1.3...E6.3	Network Analyzer	1SDA126520R1	F3A-SW-NETWORK	1SDA126612R1	K3A-SWMP-NETWORK
E1.3...E6.3	Datalogger Pro (1)	1SDA126522R1	F3A-SW-DATALOGPRO	1SDA126614R1	K3A-SWMP-DATALOGPRO

1) SD card must be purchased separately

DIGITAL TOOLS UPGRADE

		Supplied with the breaker		ABB Marketplace order	
Size	**Type**	**Part Number**	**US / CA PN**	**Part Number**	**US / CA PN**
E1.3...E6.3	Remote Control (1)	1SDA126526R1	F3A-SW-REMOTEOP	1SDA126618R1	K3A-SWMP-REMOTEOP
E1.3...E6.3	Test Area PRO (2)	1SDA126528R1	F3A-SW-TESTAREA	1SDA126620R1	K3A-SWMP-TESTAREA

1) Only for EPiC mobile. It allows to open and close circuit breaker via BLE through EPiC mobile app.
2) Only for Ekip Connect

Accessories

Digital upgrades

POWER MANAGEMENT UPGRADES

		Supplied with the breaker		ABB Marketplace order	
Size	**Type**	**Part Number**	**US / CA PN**	**Part Number**	**US / CA PN**
E1.3...E6.3	Power Controller	1SDA126523R1	F3A-SW-PWRCONTROL	1SDA126615R1	K3A-SWMP-PWRCONTROL
E1.3...E6.3	Adaptive Load Shedding	1SDA126530R1	F3A-SW-ADPLOAD	1SDA126621R1	K3A-SWMP-ADPLOAD
E1.3...E6.3	Custom logic	1SDA126527R1	F3A-SW-CUSTLOGICS	1SDA126619R1	K3A-SWMP-CUSTLOGICS

COMMUNICATION UPGRADES

		Supplied with the breaker		ABB Marketplace order	
Size	**Type**	**Part Number**	**US / CA PN**	**Part Number**	**US / CA PN**
E1.3...E6.3	Com Link (1)	1SDA126479R1	F3A-SW-COMLINK	1SDA126646R1	K3A-SWMP-COMLINK
E1.3...E6.3	Modbus TCP Security Protocol (1) (2)	1SDA126478R1	K3A-COM-MODTCP-S		

1) Ekip Supply Evo Modbus TCP mandatory
2) Only supplied with the circuit breaker. It is according to Modbus Security Protocol Specification

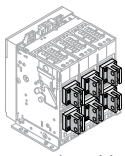
DIGITAL RATING PLUG UPGRADE

		Supplied with the breaker		ABB Marketplace order	
Size	**Type**	**Part Number**	**US / CA PN**	**Part Number**	**US / CA PN**
E1.3...E6.3	Flexible Digital Rating Plug (1)	1SDA126623R1	-	1SDA126624R1	K3A-SWMP-RPFLEX
E1.3...E6.3	Rating Plug Card (2)	1SDA128425R1	K3A-EK-RPCARD	-	-

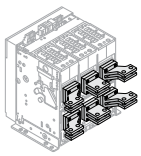
1) When the Digital Rating Plug is changed, Rating Plug card must be purchased
2) The Rating Plug card includes a set of stickers with different In values, which can be applied to the circuit breaker when replacing the Digital Rating Plug.

Accessories

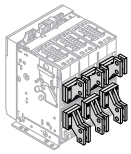
Power Connections



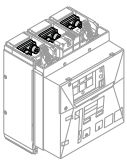
Rear orientable terminal - HR VR



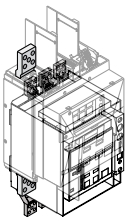
Horizontal rear terminal - SHR



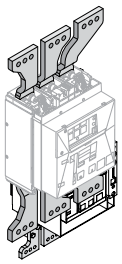
Vertical rear spread terminal - SVR



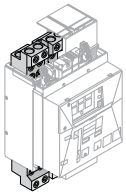
Front terminal - F



Extended front terminal - EF



Front spread terminal - ES



Terminal for cable FcCuAl 4x240mm² - Fc CuAl

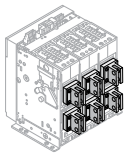
KIT FOR TERMINALS - INSTALLED ON FIXED CIRCUIT BREAKER

				3 Poles		4 Poles	
Size	Version	Max amperage	Type	Global PN	US / CA PN	Global PN	US / CA PN
E1.3	F	1200	Kit EF Upper (1)	1SDA073963R1	Fact. inst. only	1SDA073964R1	Fact. inst. only
E1.3	F	1200	Kit EF Lower (1)	1SDA073965R1	Fact. inst. only	1SDA073966R1	Fact. inst. only
E1.3	F	1200	Kit ES Upper (1)	1SDA073975R1	Fact. inst. only	1SDA073976R1	Fact. inst. only
E1.3	F	1200	Kit ES Lower (1)	1SDA073977R1	Fact. inst. only	1SDA073978R1	Fact. inst. only
E1.3	F	1200	Kit HR Upper	1SDA079840R1	Fact. inst. only	1SDA079841R1	Fact. inst. only
E1.3	F	1200	Kit HR Lower	1SDA079842R1	Fact. inst. only	1SDA079843R1	Fact. inst. only
E1.3	F	1200	Kit VR Upper	1SDA079836R1	Fact. inst. only	1SDA079837R1	Fact. inst. only
E1.3	F	1200	Kit VR Lower	1SDA079838R1	Fact. inst. only	1SDA079839R1	Fact. inst. only
E1.3	F	1200	Kit FcCuAl 4x500kcmil/240mm² Upper (1)	1SDA073997R1	Fact. inst. only	1SDA073998R1	Fact. inst. only
E1.3	F	1200	Kit FcCuAl 4x500kcmil/240mm² Lower (1)	1SDA073999R1	Fact. inst. only	1SDA074000R1	Fact. inst. only
E2.3	F	2000	Kit F Upper (1)	1SDA074118R1	Fact. inst. only	1SDA074119R1	Fact. inst. only
E2.3	F	2000	Kit F Lower (1)	1SDA074120R1	Fact. inst. only	1SDA074121R1	Fact. inst. only
E2.3	F	2000	Kit VR Upper	1SDA079852R1	Fact. inst. only	1SDA079853R1	Fact. inst. only
E2.3	F	2000	Kit VR Lower	1SDA079854R1	Fact. inst. only	1SDA079855R1	Fact. inst. only
E4.3	F	3200	Kit F Upper (1)	1SDA074126R1	Fact. inst. only	1SDA074127R1	Fact. inst. only
E4.3	F	3200	Kit F Lower (1)	1SDA074128R1	Fact. inst. only	1SDA074129R1	Fact. inst. only
E4.3	F	2500	Kit VR Upper	1SDA079862R1	Fact. inst. only	1SDA079863R1	Fact. inst. only
E4.3	F	2500	Kit VR Lower	1SDA079864R1	Fact. inst. only	1SDA079865R1	Fact. inst. only
E6.3	F	6000	Kit F Upper (1)	1SDA074134R1	Fact. inst. only	1SDA074135R1	Fact. inst. only
E6.3	F	6000	Kit F Lower (1)	1SDA074137R1	Fact. inst. only	1SDA074138R1	Fact. inst. only
E6.3	F	5000	Kit VR Upper	1SDA079891R1	Fact. inst. only	1SDA079892R1	Fact. inst. only
E6.3	F	5000	Kit VR Lower	1SDA079893R1	Fact. inst. only	1SDA079894R1	Fact. inst. only
E6.3/f	F	6000	Kit F Upper (1)	-	-	1SDA074136R1	Fact. inst. only
E6.3/f	F	6000	Kit F Lower (1)	-	-	1SDA074138R1	Fact. inst. only

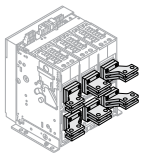
1) Not UL listed

Accessories

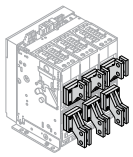
Power Connections



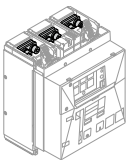
Rear orientable terminal - HR VR



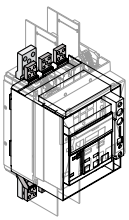
Horizontal rear terminal - SHR



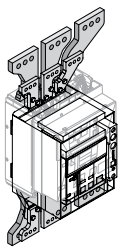
Vertical rear spread terminal - SVR



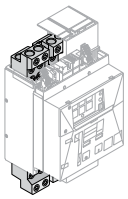
Front terminal - F



Extended front terminal - EF



Front spread terminal - ES

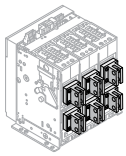


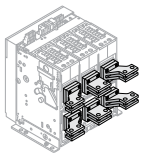
Terminal for cable FcCuAl 4x240mm² - Fc CuAl

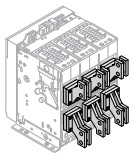
KIT FOR TERMINALS - INSTALLED ON CRADLE

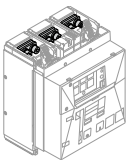
				3 Poles		4 Poles	
Size	**Version**	**Max amperage**	**Type**	**Global PN**	**US / CA PN**	**Global PN**	**US / CA PN**
E1.3	W	1200	Kit EF Upper (2)	1SDA073939R1	Fact. inst. only	1SDA073940R1	Fact. inst. only
E1.3	W	1200	Kit EF Lower (2)	1SDA073941R1	Fact. inst. only	1SDA073942R1	Fact. inst. only
E1.3	W	1200	Kit ES Upper (1) (2)	1SDA073951R1	Fact. inst. only	1SDA073952R1	Fact. inst. only
E1.3	W	1200	Kit ES Lower (1) (2)	1SDA073953R1	Fact. inst. only	1SDA073954R1	Fact. inst. only
E1.3	W	1200	Kit VR Upper	1SDA079830R1	Fact. inst. only	1SDA079831R1	Fact. inst. only
E1.3	W	1200	Kit VR Lower	1SDA079832R1	Fact. inst. only	1SDA079833R1	Fact. inst. only
E1.3	W	1200	Kit FcCuAl 4x 500kcmil/240mm² Lower (2)	1SDA073991R1	Fact. inst. only	1SDA073993R1	Fact. inst. only
E1.3	W	1200	Kit FcCuAl 4x 500kcmil/240mm² Lower (2)	1SDA073992R1	Fact. inst. only	1SDA073994R1	Fact. inst. only
E3.3	W	2000	Kit F Upper (2)	1SDA074090R1	Fact. inst. only	1SDA074091R1	Fact. inst. only
E3.3	W	2000	Kit F Lower (2)	1SDA074092R1	Fact. inst. only	1SDA074093R1	Fact. inst. only
E3.3	W	2000	Kit VR Upper	1SDA079846R1	Fact. inst. only	1SDA079847R1	Fact. inst. only
E3.3	W	2000	Kit VR Lower	1SDA079848R1	Fact. inst. only	1SDA079849R1	Fact. inst. only
E4.3	W	3200	Kit F Upper (2)	1SDA074098R1	Fact. inst. only	1SDA074099R1	Fact. inst. only
E4.3	W	3200	Kit F Lower (2)	1SDA074100R1	Fact. inst. only	1SDA074101R1	Fact. inst. only
E4.3	W	2500	Kit VR Upper	1SDA079856R1	Fact. inst. only	1SDA079857R1	Fact. inst. only
E4.3	W	2500	Kit VR Lower	1SDA079858R1	Fact. inst. only	1SDA079859R1	Fact. inst. only
E6.3	W	6000	Kit F Upper (2)	1SDA074106R1	Fact. inst. only	1SDA074107R1	Fact. inst. only
E6.3	W	6000	Kit F Lower (2)	1SDA074109R1	Fact. inst. only	1SDA074110R1	Fact. inst. only
E6.3	W	5000	Kit VR Upper	1SDA079882R1	Fact. inst. only	1SDA079883R1	Fact. inst. only
E6.3	W	5000	Kit VR Lower	1SDA079885R1	Fact. inst. only	1SDA079886R1	Fact. inst. only
E6.3/f	W	6000	Kit F Upper (2)	-	-	1SDA074108R1	-
E6.3/f	W	6000	Kit F Lower (2)	-	-	1SDA074111R1	-
E6.3/f	W	5000	Kit VR Upper	-	Fact. inst. only	1SDA079884R1	Fact. inst. only
E6.3/f	W	5000	Kit VR Lower	-	Fact. inst. only	1SDA079887R1	Fact. inst. only

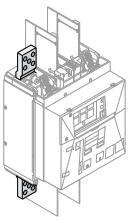
1) ES terminals can be ordered only if the cradle also has EF terminals.
2) Not UL listed

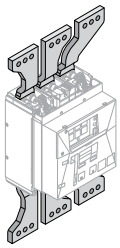

Rear orientable terminal - HR VR

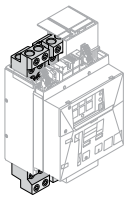

Horizontal rear terminal - SHR


Vertical rear spread terminal - SVR


Front terminal - F


Extended front terminal - EF


Front spread terminal - ES


Terminal for cable FcCuAl 4x240mm² - Fc CuAl

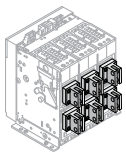
KIT FOR TERMINALS - LOOSE SUPPLY FOR ONE SIDE OF FIXED CIRCUIT BREAKER

				3 Poles		4 Poles	
Size	Version	Max amperage	Type	Global PN	US / CA PN	Global PN	US / CA PN
E1.3	F	1200	Kit EF (1)	1SDA073967R1	ZE1EFF	1SDA073968R1	ZE1EFF-4
E1.3	F	1200	Kit F (1)	1SDA073973R1	ZE1FF	1SDA073974R1	ZE1FF-4
E1.3	F	1200	Kit ES (1)	1SDA073979R1	ZE1ESF	1SDA073980R1	ZE1ESF-4
E1.3	F	1200	Kit Adjustable HR/VR	1SDA079844R1	ZE1HRVRF	1SDA079845R1	ZE2HRVRF-4
E1.3	F	1200	Kit FcCuAl 4x500kcmil/240mm² (1)	1SDA074001R1	ZE1LUGF	1SDA074002R1	ZE1LUGF-4
E3.3	F	2000	Kit F Upper (1)	1SDA074122R1	ZE2FUF	1SDA074123R1	ZE2FUF-4
E3.3	F	2000	Kit F Lower (1)	1SDA074124R1	ZE2FLF	1SDA074125R1	ZE2FLF-4
E3.3	F	2000	Adjustable HR/VR	1SDA079850R1	ZE2HRVRFW	1SDA079851R1	ZE2HRVRFW-4
E4.3	F	3200	Kit F Upper (1)	1SDA074130R1	ZE4FUF	1SDA074131R1	ZE4FUF-4
E4.3	F	3200	Kit F Lower (1)	1SDA074132R1	ZE4FLF	1SDA074133R1	ZE4FLF-4
E4.3	F	2500	Kit Adjustable HR/VR	1SDA079860R1	ZE4HRVRFW25	1SDA079861R1	ZE4HRVRFW25-4
E4.3	F	3200	Kit VR	1SDA079866R1	ZE4VRFW32	1SDA079867R1	ZE4VRFW32
E6.3	F	6000	Kit F Upper (1)	1SDA074140R1	ZE6FUF	1SDA074141R1	ZE6FU-4
E6.3	F	6000	Kit F Lower (1)	1SDA074143R1	ZE6FLF	1SDA074144R1	ZE6FLF-4
E6.3	F	5000	Kit Adjustable HR/VR	1SDA079888R1	ZE6HRVRFW50	1SDA079889R1	ZE6HRVRFW50-4
E6.3	F	6000	Kit VR	1SDA079895R1	ZE6VRFW60	-	-
E6.3/f	F	6000	Kit F Upper (1)	-		1SDA074142R1	ZE6FUF-4F
E6.3/f	F	6000	Kit F Lower (1)	-		1SDA074145R1	ZE6FLF-4F
E6.3/f	F	5000	Kit Adjustable HR/VR	-		1SDA079890R1	ZE6HRVRFW50-4F

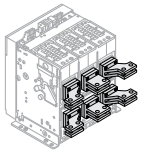
1) Not UL listed

Accessories

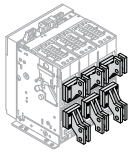
Power Connections



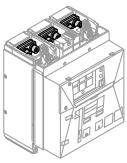
Rear orientable terminal - HR VR



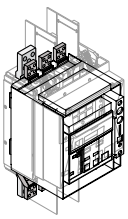
Horizontal rear terminal - SHR



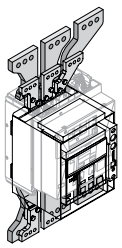
Vertical rear spread terminal - SVR



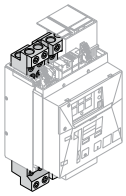
Front terminal - F



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

				3 Poles		4 Poles	
Size	**Version**	**Max amperage**	**Type**	**Global PN**	**US / CA PN**	**Global PN**	**US / CA PN**
E1.3	**W**	**1200**	Kit EF (2)	1SDA073943R1	ZE1EFW	1SDA073944R1	ZE1EFW-4
E1.3	**W**	**1200**	Kit ES (1) (2)	1SDA073955R1	ZE1ESW	1SDA073956R1	ZE1ESW-4
E1.3	**W**	**1200**	Kit Adjustable HR/VR	1SDA079834R1	ZE1HRVRW	1SDA079835R1	ZE1HRVRW-4
E1.3	**W**	**1200**	Kit FcCuAl 4x 500kcmil/240mm2 (2)	1SDA073995R1	ZE1LUGW	1SDA073996R1	ZE1LUGW-4
E3.3	**W**	**2000**	Kit F Upper (2)	1SDA074094R1	ZE2FUW	1SDA074095R1	ZE2FUW-4
E3.3	**W**	**2000**	Kit F Lower (2)	1SDA074096R1	ZE2FLW	1SDA074097R1	ZE2FLW-4
E3.3	**W**	**2000**	Kit Adjustable HR/VR	1SDA079850R1	ZE2HRVRFW	1SDA079851R1	ZE2HRVRFW-4
E4.3	**W**	**3200**	Kit F Upper (2)	1SDA074102R1	ZE4FUW	1SDA074103R1	ZE4FUW-4
E4.3	**W**	**3200**	Kit F Lower (2)	1SDA074104R1	ZE4FLW	1SDA074105R1	ZE4FLW-4
E4.3	**W**	**2500**	Kit Adjustable HR/VR	1SDA079860R1	ZE4HRVRFW25	1SDA079861R1	ZE4HRVRFW25-4
E4.3	**W**	**3200**	Kit VR	1SDA079866R1	ZE4VRFW32	1SDA079867R1	ZE4VRFW32-4
E6.3	**W**	**6000**	Kit F Upper (2)	1SDA074112R1	ZE6FUW	1SDA074113R1	ZE6FUW-4
E6.3	**W**	**6000**	Kit F Lower (2)	1SDA074115R1	ZE6FLW	1SDA074116R1	ZE6FLW-4
E6.3	**W**	**5000**	Kit Adjustable HR/VR	1SDA079888R1	ZE6HRVRFW50	1SDA079889R1	ZE6HRVRFW50-4
E6.3	**W**	**6000**	Kit VR	1SDA079895R1	ZE6VRFW60	1SDA079896R1	-
E6.3/f	**W**	**6000**	Kit F Upper (2)	-		1SDA074114R1	-
E6.3/f	**W**	**6000**	Kit F Lower (2)	-		1SDA074117R1	-
E6.3/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

Miscellaneous

INSTALLATION MANUAL

Size	Type	Part Number
E1.3...E6.3	Additional installation manual E1.3...E6.3 IT	1SDA126579R1
E1.3...E6.3	Additional installation manual E1.3...E6.3 EN	1SDA126580R1
E1.3...E6.3	Additional installation manual E1.3...E6.3 DE	1SDA126581R1
E1.3...E6.3	Additional installation manual E1.3...E6.3 FR	1SDA126582R1
E1.3...E6.3	Additional installation manual E1.3...E6.3 ES	1SDA126583R1
E1.3...E6.3	Additional installation manual E1.3...E6.3 CN	1SDA133734R1

LITE TEST REPORT

		Supplied with the breaker		ABB Marketplace order	
Size	Type	Part Number	US / CA PN	Part Number	US / CA PN
E1.3	Test Report Lite E1.3	1SDA127783R1	F31-EK-TESTREPLITE	1SDA130141R1	K31-SWMP-TESTREPLITE
E2.3	Test Report Lite E2.3	1SDA127784R1	F32-EK-TESTREPLITE	1SDA130142R1	K32-SWMP-TESTREPLITE
E4.3	Test Report Lite E4.3	1SDA127785R1	F34-EK-TESTREPLITE	1SDA130143R1	K34-SWMP-TESTREPLITE
E6.3	Test Report Lite E6.3	1SDA127786R1	F36-EK-TESTREPLITE	1SDA130144R1	K36-SWMP-TESTREPLITE

TEST REPORT

		Supplied with the breaker		ABB Marketplace order	
Size	Type	Part Number	US / CA PN	Part Number	US / CA PN
E1.3	Test Report E1.3	1SDA126584R1	F31-EK-TESTREP	1SDA133773R1	K31-SWMP-TESTREP
E2.3	Test Report E2.3	1SDA126585R1	F32-EK-TESTREP	1SDA133774R1	K32-SWMP-TESTREP
E4.3	Test Report E4.3	1SDA126586R1	F34-EK-TESTREP	1SDA133775R1	K34-SWMP-TESTREP
E6.3	Test Report E6.3	1SDA126587R1	F36-EK-TESTREP	1SDA133776R1	K36-SWMP-TESTREP

Accessories

Service



Note:
Warranty periods are measured from the date the circuit-breaker leaves the factory.

EXTENDED WARRANTY

Size	Type	Part Number (3)
E1.3...E6.3	Warranty 2 years E1.3...E6.3 (1)	1SDA129632R1
E1.3	Warranty 4 years E1.3 (2)	1SDA129633R1
E2.3	Warranty 4 years E2.3 (2)	1SDA129634R1
E4.3	Warranty 4 years E4.3 (2)	1SDA129635R1
E6.3	Warranty 4 years E6.3 (2)	1SDA129636R1
E1.3	Warranty 5 years E1.3 (2)	1SDA129637R1
E2.3	Warranty 5 years E2.3 (2)	1SDA129638R1
E4.3	Warranty 5 years E4.3 (2)	1SDA129639R1
E6.3	Warranty 5 years E6.3 (2)	1SDA129640R1

Note: 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.

3) Supplied only with the circuit-breaker. Specify Registration Part Number in the order to activate the warranty.

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