



Technical catalog – Edition 2014.12

SACE Emax 2

New low voltage power circuit breakers
to ANSI C37 / UL 1066 standards

Power and productivity
for a better world™

ABB

SACE Emax 2 power circuit breakers UL 1066

2

Common data		
Rated maximum voltage	[V]	635
Rated voltage	[V]	600
Test voltage (1min. 50/60 Hz)	[kV]	2.2
Frequency	[Hz]	50 - 60
Number of poles		3 - 4
Version		Fixed (F) - Drawout (W)



SACE Emax 2 for UL1066			E1.2		
Performance levels			B-A	N-A	S-A
Current		[A]	800	800	250
		[A]	1200	1200	400
		[A]			800
		[A]			1200
		[A]			
		[A]			
Neutral pole current-carrying capacity for 4 pole CBs		[%Iu]	100	100	100
Interrupting rating at rated maximum voltage	254 V	[kA]	42	50	65
	508 V	[kA]	42	50	65
	635 V	[kA]	42	42	42
Rated short time current		[kA]	42	50	50
Trip times	Break time with fault current < rated short time current	[ms]	40	40	40
	Break time with fault current > rated short time current	[ms]	25	25	25
Overall dimensions	H - Fixed	[in/mm]	11.65 / 296		
	D - Fixed	[in/mm]	7.20 / 183		
	W - Fixed 3p	[in/mm]	8.27 / 210		
	W - Fixed 4p/4p full size	[in/mm]	11.02 / 280		
	H - Draw out	[in/mm]	14.33 / 363.5		
	D - Draw out	[in/mm]	11.06 / 281		
	W - Draw out 3p	[in/mm]	10.94 / 278		
Weights	Fixed 3p / 4p / 4p full size	[lbs/Kg]	30.9/35.3 lbs - 14/16 kg		
	Draw out 3p / 4p / 4p full size	[lbs/Kg]	90.4/102.5 lbs - 41/46.5 kg		

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

1) Version not yet available. Contact ABB.

Protection trip units for power distribution

Ekip Dip

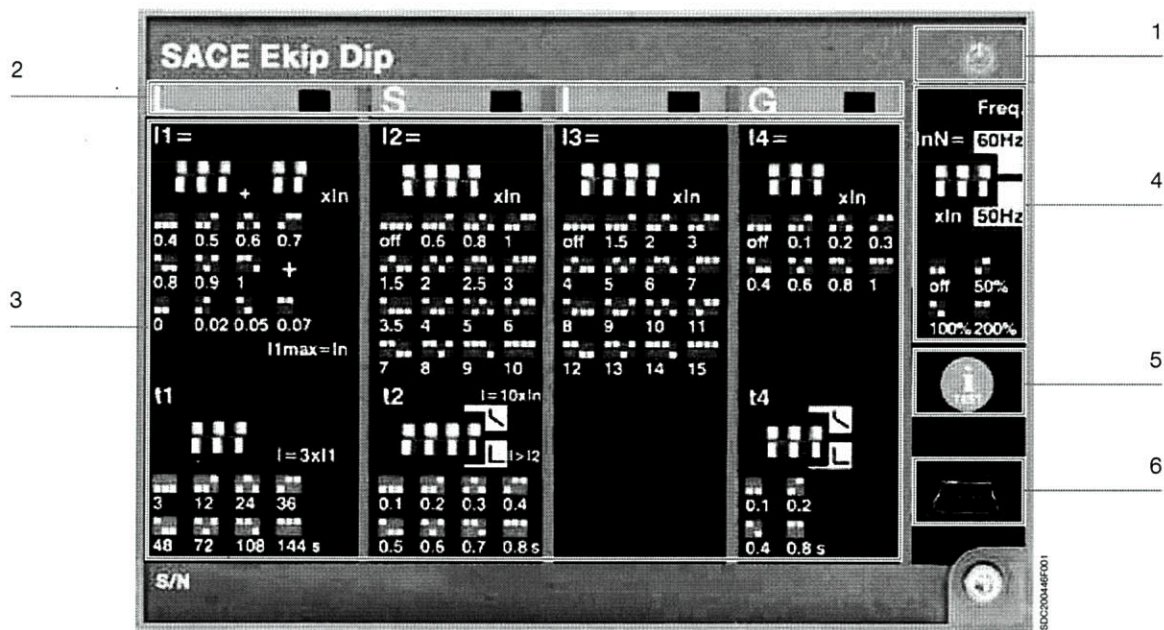
Characteristics

Ekip Dip is the new protection trip unit of the SACE Emax 2 family for all applications in which high accuracy and reliable protection against overcurrent are required. Ekip Dip offers a complete set of standard protection functions. Dedicated LEDs allow the fault that caused tripping to be determined.

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The unit is available in the following versions:

- Ekip Dip LI
- Ekip Dip LSI
- Ekip Dip LSIG

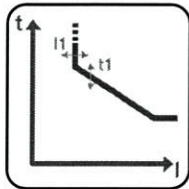


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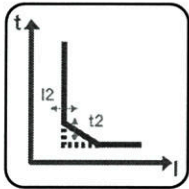
- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Power-on LED for signalling correct operation (watchdog) 2. LEDs for alarm signalling of L, S, I and G protection functions and diagnostics 3. Dip switches for setting the protection functions | <ol style="list-style-type: none"> 4. Dip switches for setting the network frequency and neutral protection device 5. Pushbutton for test and for indicating the cause of tripping 6. Test and programming connector |
|---|---|

Protection functions

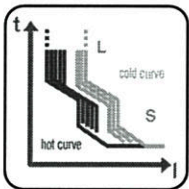
Ekip Dip offers overcurrent protection functions and, in the event of tripping, controls the opening of the circuit-breaker, preventing it from closing again unless it has been reset by the operator (lockout device – code ANSI 86).



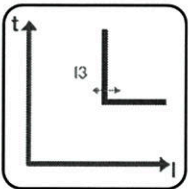
Overload (L - ANSI 49): with inverse long-time delay trip of the type $t = k/I^2$ available with 25 current thresholds and 8 curves, it provides effective protection of all systems. A pre-alarm warning is also available on reaching 90% of the threshold set.



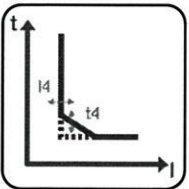
Time-delayed overcurrent (S - ANSI 51 & 50TD): with constant tripping time ($t = k$), or with constant specific let-through energy ($t = k/I^2$), it provides 15 current thresholds and 8 curves, for fine adjustment. The function can be excluded by setting the dip switch combination to "OFF".



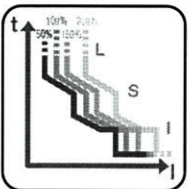
Thermal memory: for L and S protection functions, this is used to protect components, such as transformers, from overheating following an overload. The function, which can be enabled by the Ekip Connect software, adjusts the protection tripping time according to the length of time that has elapsed since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



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



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



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

Protection trip units for power distribution

Ekip Dip

Measurements

The Ekip Dip unit measures phase and neutral current with great accuracy: 1% including the current transformers in the 0.2 ... 1.2 In range (class 1 in accordance with IEC 61557-12). Using the current sensors in the circuit-breaker and without the need to install an external measuring system, it is possible to view the measurements by the display on the front of the Ekip Multimeter and Ekip Control Panel.

Ekip Dip also records the characteristics of the circuit-breaker, to enable a rapid analysis in the event of maintenance:

- 3 – Maximum and average current values per phase;
- Date, time, fault current per phase and type of protection tripped over the last 30 trips;
- Date, time and type of operation of the last 200 events (for example: opening/closing of circuit-breaker, pre-alarms, editing settings);
- Number of mechanical and electric operations of the circuit-breaker;
- Total operating time;
- Contact wear;
- Date and time of the last maintenance carried out, in addition to the estimate of the next maintenance required;
- Circuit-breaker identifying data: type, serial number, firmware version, name of the device as assigned by the user.

The values can be displayed on the front of the Ekip Multimeter or Ekip Control Panel or by Ekip Connect software on a Smartphone, Tablet or PC by using the communication units Ekip T&P or Ekip Bluetooth.

Watchdog

All the protection trip units of the SACE Emax 2 family ensure high reliability owing to an electronic circuit that periodically controls the continuity of the internal connections, such as trip coil, rating plug and each current sensor (Ansi 74). In the event of a malfunction, the LEDs indicate the corresponding alarm to enable the fault to be identified rapidly. Furthermore, Ekip Dip detects and indicates that the circuit-breaker has been opened because one of the protection functions has been tripped (Ansi BF code). In order to preserve the correct operation of the unit, Ekip Dip is also provided with self-protection against abnormal temperature (OT) inside the protection trip unit. The user can set it to open the circuit-breaker or to merely indicate an alarm.

User interface

Ekip offers a great variety of thresholds and trip times, the protections can be set by dip-switches. Up to 5 LEDs are also available (depending on the version) to indicate correct operation or alarms. The interface always enables the status of the installation to be identified clearly and quickly:

- correct operation (green LED)
- overcurrent pre-alarms or alarms
- presence of self-control functions alarms
- maintenance interval expired
- indication of tripped protection after a fault

The protection tripped indication is activated by pressing the iTest key, and operates without the need of an external power supply because a battery is installed inside the unit.

Communication

The Ekip Bluetooth wireless communication unit enables the operator to interact with the protection trip unit by computer, Smartphone or Tablet. In fact, the free Ekip Connect software for Smartphones, Tablets and PC, enables measurements and fault data to be read and alarm status and information on the circuit-breaker or maintenance to be displayed. It is also possible to set parameters such as date, time and thermal memory and for the records to be reset.

Test function

The test port on the front of the protection trip unit can be used to run the circuit-breaker tests by connecting one of the following devices:

- Ekip TT to run the trip test, the LEDs test and check absence of alarms detected by the watchdog function;
- Ekip T&P to permit not only the trip test and LEDs test but also to run the test of the individual protection functions and save the relative report;
- ITest key that is pressed to run the battery test when the circuit-breaker is disconnected.

Supply

The Ekip Dip protection trip unit does not require an external supply for the protection functions or for the alarm indication functions because it is self-supplied by the current sensors installed on the circuit-breaker. A three-phase 100A current suffices to activate the LED indications.

The Ekip Supply module enables an auxiliary supply to be easily connected and is able to receive both a direct current supply (24-48V DC or 110-240V DC) and an alternating current (110-240V AC) to activate additional functions such as:

- G protection at values below 100A or below 0.2 In;
- connecting to external devices such as Ekip Multimeter and Ekip Control Panel;
- recording the number of operations.

The Ekip Dip protection trip unit also has a battery that enables the indication of the cause of the fault to be viewed for an unlimited time after tripping. In addition to that, the battery enables date and time to be maintained and updated, thus ensuring the chronology of the events. On the other hand, when the unit is switched off, the battery test can be run by simply pressing the iTest key.

Supply	Ekip Supply	
Nominal voltage	24-48V DC	110-240V AC/DC
Voltage range	21.5 - 53V DC	105-265V AC/DC
Rated power (including modules)	10W max.	10W max.
Inrush current	~10 A for 5 ms	~10 A for 5 ms

Whenever cartridge modules are not used in the terminal box area, the trip unit can be supplied by means of a galvanically isolated 24V DC auxiliary voltage.

Technical characteristics for protection trip units

Protection functions

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

(1) G protection below 100A or below 0.2 In available with auxiliary supply

(2) The minimum trip time is 1s, regardless of the type of curve set (self-protection)

(3) The maximum value for G protection is 1200A

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

Accessories

Electrical accessories



First and second shunt trip - YO

Size	Type	Code
E1.2..E6.2	YO E1.2..E6.2 24 VAC/DC	ZEASA
E1.2..E6.2	YO E1.2..E6.2 30 VAC/DC	ZEASB
E1.2..E6.2	YO E1.2..E6.2 48 VAC/DC	ZEASC
E1.2..E6.2	YO E1.2..E6.2 60 VAC/DC	ZEASD
E1.2..E6.2	YO E1.2..E6.2 110-120 VAC/DC	ZEASE
E1.2..E6.2	YO E1.2..E6.2 120-127 VAC/DC	ZEASF
E1.2..E6.2	YO E1.2..E6.2 220-240 VAC/DC	ZEASG
E1.2..E6.2	YO E1.2..E6.2 240-250 VAC/DC	ZEASH
E1.2..E6.2	YO E1.2..E6.2 277 VAC	ZEASJ
E1.2..E6.2	YO E1.2..E6.2 380-400 VAC	ZEASK
E1.2..E6.2	YO E1.2..E6.2 415-440 VAC	ZEASL
E1.2..E6.2	YO E1.2..E6.2 480-500 VAC	ZEASM

* Second shunt trips are an alternative to a UVR or anti-racking out device (fail safe)

First and second closing coil - YC

Size	Type	Code
E1.2..E6.2	YC E1.2..E6.2 24 VAC/DC	ZEACA
E1.2..E6.2	YC E1.2..E6.2 30 VAC/DC	ZEACB
E1.2..E6.2	YC E1.2..E6.2 48 VAC/DC	ZEACC
E1.2..E6.2	YC E1.2..E6.2 60 VAC/DC	ZEACD
E1.2..E6.2	YC E1.2..E6.2 110-120 VAC/DC	ZEACE
E1.2..E6.2	YC E1.2..E6.2 120-127 VAC/DC	ZEACF
E1.2..E6.2	YC E1.2..E6.2 220-240 VAC/DC	ZEACG
E1.2..E6.2	YC E1.2..E6.2 240-250 VAC/DC	ZEACH
E1.2..E6.2	YC E1.2..E6.2 277 VAC	ZEACJ
E1.2..E6.2	YC E1.2..E6.2 380-400 VAC	ZEACK
E1.2..E6.2	YC E1.2..E6.2 415-440 VAC	ZEACL
E1.2..E6.2	YC E1.2..E6.2 480-500 VAC	ZEACM

Shunt trip and closing coil test unit - YO/YC Test Unit (IEC only)

Size	Type	Code
E1.2..E6.2	YO/YC test unit E1.2..E6.2	ZEAYOYCT

Undervoltage release - YU

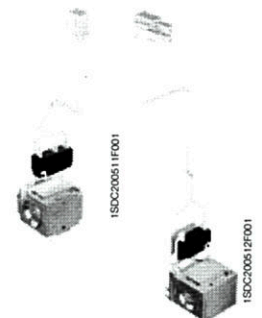
Size	Type	Code
E1.2..E6.2	YU E1.2..E6.2 24 VAC/DC	ZEAUA
E1.2..E6.2	YU E1.2..E6.2 30 VAC/DC	ZEAUB
E1.2..E6.2	YU E1.2..E6.2 48 VAC/DC	ZEAUC
E1.2..E6.2	YU E1.2..E6.2 60 VAC/DC	ZEAUD
E1.2..E6.2	YU E1.2..E6.2 110-120 VAC/DC	ZEAUE
E1.2..E6.2	YU E1.2..E6.2 120-127 VAC/DC	ZEAUF
E1.2..E6.2	YU E1.2..E6.2 220-240 VAC/DC	ZEAUG
E1.2..E6.2	YU E1.2..E6.2 240-250 VAC/DC	ZEAUH
E1.2..E6.2	YU E1.2..E6.2 277 VAC	ZEAUJ
E1.2..E6.2	YU E1.2..E6.2 380-400 VAC	ZEAUK
E1.2..E6.2	YU E1.2..E6.2 415-440 VAC	ZEAUL
E1.2..E6.2	YU E1.2..E6.2 440-500 VAC	ZEAUM

* The undervoltage release is an alternative to a second shunt trip or anti-racking out device (fail safe)

Electronic time-delay device for undervoltage release - UVD (IEC only)

Size	Type	Code
E1.2..E6.2	24-30 VDC	ZEATL9
E1.2..E6.2	48 VAC/DC	ZEATL8
E1.2..E6.2	60 VAC/DC	ZEATL7
E1.2..E6.2	110...127 VAC/DC	ZEATL5
E1.2..E6.2	220...250 VAC/DC	ZEATL3

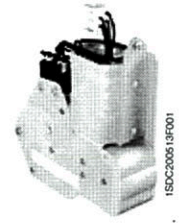
* The electronic time-delay device must be used with an undervoltage release with the same voltage



Remote reset - YR

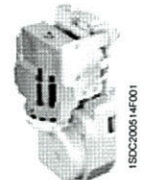
Size	Type	Code
E1.2	YR 24 VDC E1.2	ZE1YRA
E1.2	YR 110 VAC/DC E1.2	ZE1YRB
E1.2	YR 220 VAC/DC E1.2	ZE1YRC
E2.2..E6.2	YR 24 VDC E2.2...E6.2	ZEBYRA
E2.2..E6.2	YR 110 VAC/DC E2.2...E6.2	ZEBYRB
E2.2..E6.2	YR 220 VAC/DC E2.2...E6.2	ZEBYRC

* When the remote reset is used in DC, its activation must be done with a maximum impulse time of 50ms. It cannot be powered permanently.



Motor - M

Size	Type	Code
E1.2	M E1.2 24-30 VAC/DC + MC 250V	ZE1M2
E1.2	M E1.2 48-60 VAC/DC + MC 250V	ZE1M3
E1.2	M E1.2 100-130 VAC/DC + MC 250V	ZE1M4
E1.2	M E1.2 220-250 VAC/DC + MC 250V	ZE1M5
E1.2	M E1.2 220-250 VAC/DC + MC 250V	ZE1M6
E1.2	M E1.2 277 VAC + MC 250V	ZE1M7
E2.2..E6.2	M E2.2...E6.2 24-30 VAC/DC + MC 400V	ZEBM2
E2.2..E6.2	M E2.2...E6.2 48-60 VAC/DC + MC 400V	ZEBM3
E2.2..E6.2	M E2.2...E6.2 100-130 VAC/DC + MC 400V	ZEBM4
E2.2..E6.2	M E2.2...E6.2 220-250 VAC/DC + MC 400V	ZEBM5
E2.2..E6.2	M E2.2...E6.2 277 VAC + MC 400V	ZEBM6
E2.2..E6.2	M E2.2...E6.2 380-415 VAC + MC 400V	ZEBM7
E2.2..E6.2	M E2.2...E6.2 440-480 VAC + MC 400V	ZEBM8
E1.2	M E1.2 24-30 VAC/DC + MC 24V	ZE1MA
E1.2	M E1.2 48-60 VAC/DC + MC 24V	ZE1MB
E1.2	M E1.2 100-130 VAC/DC + MC 24V	ZE1MC
E1.2	M E1.2 220-250 VAC/DC + MC 24V	ZE1MD
E1.2	M E1.2 277 VAC + MC 24V	ZEBME
E1.2	M E1.2 380-415 VAC + MC 24V	ZE1MF
E2.2..E6.2	M E2.2...E6.2 24-30 VAC/DC + MC 24V	ZEBMA
E2.2..E6.2	M E2.2...E6.2 48-60 VAC/DC + MC 24V	ZEBMB
E2.2..E6.2	M E2.2...E6.2 100-130 VAC/DC + MC 24V	ZEBMC
E2.2..E6.2	M E2.2...E6.2 220-250 VAC/DC + MC 24V	ZEBMD
E2.2..E6.2	M E2.2...E6.2 380-415 VAC + MC 24V	ZEBMF
E2.2..E6.2	M E2.2...E6.2 440-480 VAC + MC 24V	ZEBMG



Current sensor for external neutral

Size	Type	Code
E1.2, E2.2	Ext CS N E1.2, E2.2 2000A	ZE1NCT
E2.2	Ext CS N E2.2	ZE2NCT
E4.2	Ext CS N E4.2	ZE4NCT
E4.2, E6.2	Ext CS N E4.2 3200A, E6.2 50%	ZE6NCT
E6.2	Ext CS N E6.2	ZE6NCTF



Homopolar toroid for the grounding conductor of the main power supply (Transformer star center sensor input)

Size	Type	Code
E1.2..E6.2	Homopolar toroid E1.2...E6.2 100A	ZEAHT100
E1.2..E6.2	Homopolar toroid E1.2...E6.2 250A	ZEAHT250
E1.2..E6.2	Homopolar toroid E1.2...E6.2 400A	ZEAHT400
E1.2..E6.2	Homopolar toroid E1.2...E6.2 800A	ZEAHT800

* The homopolar toroid is an alternative to the toroid for differential protection



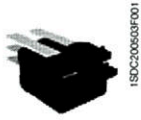
Toroid for differential protection (Rc residual current protection sensor input) (IEC only)

Size	Type	Code
E1.2 & E2.2 3p	Toroid RC E1.2, E2.2 3p	ZE12RCT1
E2.2 4p & E4.2	Toroid RC E2.2 4p, E4.2	ZE24RCT2

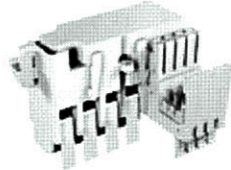
* The toroid for differential protection is an alternative to the homopolar toroid for the grounding conductor of the main power supply

Accessories

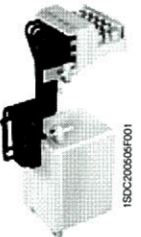
Electrical accessories



1SDC200603F001



1SDC200604F001



1SDC200606F001



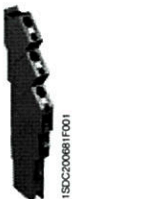
1SDC200608F001



1SDC200607F001



1SDC200605F001



1SDC200609F001

Open closed auxiliary contacts - AUX

Size	Type	Code
E1.2	AUX 4Q (4 Form C) 400V E1.2	ZE1AUX4
E1.2	AUX 4Q (4 Form C) 24V E1.2	ZE1AUX4D
E1.2	AUX 2Q (2 Form C) 400V + 2Q (2 Form C) 24V E1.2	ZE1AUX2-2D
E2.2..E6.2	AUX 4Q (4 Form C) 400V E2.2...E6.2	ZEB AUX4
E2.2..E6.2	AUX 4Q (4 Form C) 24V E2.2...E6.2	ZEB AUX4D
E2.2..E6.2	AUX 2Q (2 Form C) 400V + 2Q (2 Form C) 24V E2.2...E6.2	ZEB AUX2-2D
E2.2..E6.2	AUX 6Q 400V E2.2...E6.2 ¹⁾	ZEB AUX6
E2.2..E6.2	AUX 6Q 24V E2.2...E6.2 ¹⁾	ZEB AUX6D
E2.2..E6.2	AUX 3Q (3 Form C) 400V + 3Q (3 Form C) 24V E2.2...E6.2 ¹⁾	ZEB AUX3-3D
E1.2	AUX 15Q (15 Form C) 400V E1.2 ²⁾	ZE1AUX15
E1.2	AUX 15Q (15 Form C) 24V E1.2 ²⁾	ZE1AUX15D
E1.2	Mounting plate for fixed	ZE1AUXM
E1.2	Mounting plate for fixed - on bottom	ZE1AUXMB
E1.2	Mounting plate for drawout	ZE1AUXMD
E2.2..E6.2	AUX 15Q (15 Form C) 400V (for fixed/drawout with signalling in racked in) E2.2...E6.2 ²⁾	ZEB AUX15
E2.2..E6.2	AUX 15Q (15 Form C) 24V (for fixed/drawout with signalling in racked in) E2.2...E6.2 ²⁾	ZEB AUX15D
E2.2..E6.2	AUX 15Q (15 Form C) 400V (for fixed/drawout with signalling in racked in/test isolated) E2.2...E6.2 ²⁾	ZEB AUX15RT
E2.2..E6.2	AUX 15Q (15 Form C) 24V (for fixed/drawout with signalling in racked in/test isolated) E2.2...E6.2 ²⁾	ZEB AUX15DRT

¹⁾ AUX 6Q (6 Form C) is an alternative to the Ekip Signalling 4k module

²⁾ Aux 15 Q (15 Form C) is an alternative to the Mechanical interlock (MI), the lock to prevent door opening when the circuit breaker is in the closed position (DLC) or the lock to prevent door opening when the circuit breaker is in the racked in or test position (DCP) when mounted on the right side. For E1.2 one of the mounting plates is also needed.

Auxiliary position contacts - AUP

Size	Type	Code
E1.2	AUP 6 contacts 400V E1.2	ZE1AUP
E1.2	AUP 6 contacts 24V E1.2	ZE1AUPD
E2.2..E6.2	AUP 5 contacts 400V E2.2...E6.2 - Left set	ZEB AUP-L
E2.2..E6.2	AUP 5 contacts 24V E2.2...E6.2 - left set	ZEB AUPD-L
E2.2..E6.2	AUP 5 suppl. contacts 400V E2.2...E6.2 - right set	ZEB AUP-R
E2.2..E6.2	AUP 5 suppl. contacts 24V E2.2...E6.2 - right set	ZEB AUPD-R
E1.2...E6.2	AUP Ekip auxiliary position contact E1.2...E6.2	ZEA AUPE

Ready to close signaling contact - RTC

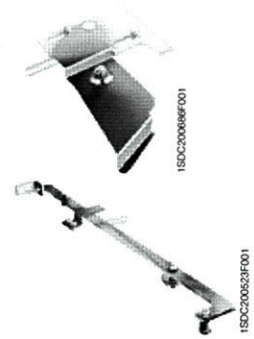
Size	Type	Code
E1.2	RTC 250V E1.2	ZE1RTC
E1.2	RTC 24V E1.2	ZE1RTCD
E1.2	RTC Ekip 24V E1.2	ZE1RTCDE
E2.2..E6.2	RTC 250V E2.2...E6.2	ZEB RTC
E2.2..E6.2	RTC 24V E2.2...E6.2	ZEB RTCD
E2.2..E6.2	RTC Ekip 24V E2.2...E6.2	ZEB RTCDE

Trip signaling contact - S51 / bell alarm

Size	Type	Code
E1.2	S51 / bell alarm 250V E1.2	ZE1BA
E1.2	S51 / bell alarm 24V E1.2	ZE1BAD
E2.2..E6.2	S51 / bell alarm 250V E2.2...E6.2	ZEB BA
E2.2..E6.2	S51 / bell alarm 24V E2.2...E6.2	ZEB BAD

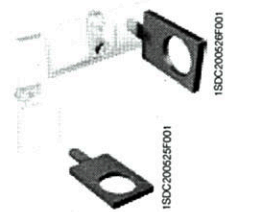
Terminal blocks for auxiliary connection

Size	Type	Code
E1.2...E6.2	Terminal blocks 10 pcs	ZEATB10



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

Size	Type	Global Code
E1.2...E6.2	DLR E2.2...E6.2	ZEBDLR



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

Size	Type	Code
E2.2...E6.2	DLP E2.2...E6.2	ZEBDLP

* If mounted on the right side, the DLP is an alternative to the mechanical interlock, AUX 15Q (15 Form C) or Lock to prevent door opening when the circuit breaker is in a closed position (DLC)



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

Size	Type	Global Code
E1.2	DLC Interlock cable door E1.2	ZE1DLCDD
E1.2	DLC Interlock direct door E1.2	ZE1DLCDD
E2.2...E6.2	DLC Interlock cable door E2.2...E6.2 ¹⁾	ZEBDLCCD
E2.2...E6.2	DLC Interlock direct door E2.2...E6.2 ¹⁾	ZEBDLCCD

* 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 racked in / test position (DLP)

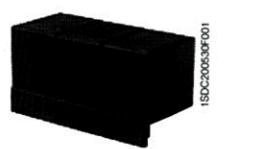
¹⁾ To be ordered with lever for interlock (group 2) and support for interlock Type A, B, D (group 3)



Protection device for opening and closing pushbuttons - PBC

Size	Type	Code
E1.2	PBC Op/Cl BP protection sp. key E1.2	ZE1PBC
E1.2	PBC Op/Cl BP protection PL D=4mm/0.15" E1.2	ZE1PBC4
E1.2	PBC Op/Cl BP protection PL D=7mm/0.27" E1.2	ZE1PBC7
E1.2	PBC Op/Cl BP protection PL D=8mm/0.31" E1.2	ZE1PBC8
E2.2...E6.2	PBC Op/Cl BP protection sp. key E2.2...E6.2	ZEBPBC
E2.2...E6.2	PBC Op/Cl BP protection PL D=4mm/0.15" E2.2...E6.2	ZEBPBC4
E2.2...E6.2	PBC Op/Cl BP protection PL D=7mm/0.27" E2.2...E6.2	ZEBPBC7
E2.2...E6.2	PBC Op/Cl BP protection PL D=8mm/0.31" E2.2...E6.2	ZEBPBC8

* The PBC is an alternative to the Padlock in open position (PLC)



Circuit breaker flange / door escutcheon

Size	Type	Code
E1.2	IP30 flange E1.2 Fixed	ZE1FLG30F
E1.2	IP30 flange E1.2 Drawout	ZE1FLG30D
E2.2...E6.2	IP30 flange E2.2...E6.2 Fixed	ZEBFLG30F
E2.2...E6.2	IP30 flange E2.2...E6.2 Drawout	ZEBFLG30D
E1.2	IP54 flange, different keys E1.2	ZE1FLG54DK
E2.2...E6.2	IP54 flange, different keys E2.2...E6.2	ZEBFLG54DK
E1.2	IP54 flange, key N.20005 E1.2	ZE1FLG54SK
E2.2...E6.2	IP54 flange, key N.20005 E2.2...E6.2	ZEBFLG54SK
E2.2...E6.2	Sealable trip unit cover E2.2...E6.2	ZEBSTUC



High or low terminal covers - HTC/LTC

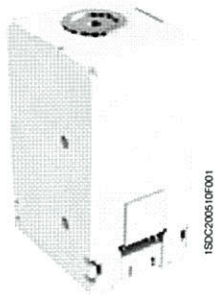
Size	Type	3 Pole Code	4 Pole Code
E1.2	HTC high terminal covers E1.2 2pcs	ZE1HTC	ZE1HTC-4
E1.2	LTC low terminal covers E1.2 2pcs	ZE1LTC	ZE1LTC-4

Phase barriers - PB

Size	Type	Code
E1.2	PB H=100mm/3.94" 4pcs E1.2 Fixed 3P	ZE1PBF100
E1.2	PB H=100mm/3.94" 6pcs E1.2 Fixed 4P	ZE1PBF100-4
E1.2	PB H=200mm/7.87" 4pcs E1.2 Fixed 3P	ZE1PBF200
E1.2	PB H=200mm/7.87" 6pcs E1.2 Fixed 4P	ZE1PBF200-4
E1.2	PB 2pcs E1.2 Drawout 3P	ZE1PBW
E1.2	PB 3pcs E1.2 Drawout 4P	ZE1PBW-4
E2.2...E6.2	PB 2pcs E2.2...E6.2 Fixed 3P	ZEBPBF
E2.2...E6.2	PB 3pcs E2.2...E6.2 Fixed 4P	ZEBPBF-4
E2.2...E6.2	PB 2pcs E2.2...E6.2 Drawout 3P	ZEBPBW
E2.2...E6.2	PB 3pcs E2.2...E6.2 Drawout 4P	ZEBPBW-4

Accessories

Circuit breaker accessories



Control

Shunt trip / closing coil - YO/YC

The shunt trip and closing coil allow the circuit breaker to be controlled remotely. Opening is always possible, while closing is available only when the closing springs of the operating mechanism are loaded and the circuit breaker is ready to close.

The releases operate by means of a minimum impulse current duration time of 100 ms. They can also operate in permanent service. In such case, if an opening command is given by means of the shunt trip, the circuit breaker can be closed by de-energizing the shunt trip and (after a time of at least 30ms) by supplying a closing command.

Electrical diagram reference: figure 75, 77

Second shunt trip / closing coil - YO2/YC2

Certain applications require redundant mechanisms and circuit breaker operating circuits. To address this need, SACE Emax 2 circuit breakers can be equipped with double shunt trips and double closing coils. The technical characteristics of the second accessories remain the same as those of the first.

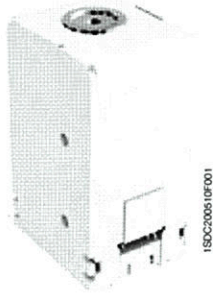
A second closing coil can be used for E2.2, E4.2 and E6.2 circuit breakers. A second shunt trip can be used as an alternative to the undervoltage release or anti-racking out device on any breaker.

General characteristics

Power supply (Un)	AC	DC
24V	•	•
30V	•	•
48V	•	•
60V	•	•
110V...120V	•	•
120V...127V	•	•
220V...240V	•	•
240V...250V	•	•
277V	•	-
380V...400V	•	-
415V...440V	•	-
480V...500V	•	-
Operating limits	YO/YO2: 70%...110% Un YC/YC2: 85%...110% Un	
Inrush power (Ps)	300VA	300W
Continuous power (Pc)	3.5VA	3.5W
Opening time (YO/YO2)		
E1.2	35 ms	
E2.2 ... E6.2	35 ms	
Closing time (YC/YC2)		
E1.2	50 ms	
E2.2 ... E6.2	50 ms	

Accessories

Circuit breaker accessories



1SXC200510F001

Undervoltage release – YU

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

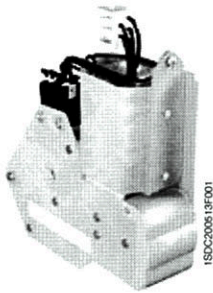
General characteristics

Power supply (Un)	AC	DC
24V	•	•
30V	•	•
48V	•	•
60V	•	•
110V...120V	•	•
120V...127V	•	•
220V...240V	•	•
240V...250V	•	-
277V	•	-
380V...400V	•	-
415V...440V	•	-
480V...500V	•	-
Operating limits	70%...110% Un	
Inrush power (Ps)	300VA	300W
Continuous power (Pc)	3.5VA	3.5W
Opening time (YU)		
E1.2	30 ms	
E2.2 ... E6.2	50 ms	

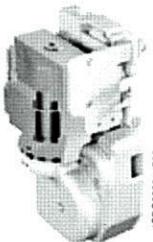
Electrical diagram reference: figure 73

Accessories

Circuit breaker accessories



1SXC2000 13F001



1SXC2000 14F001

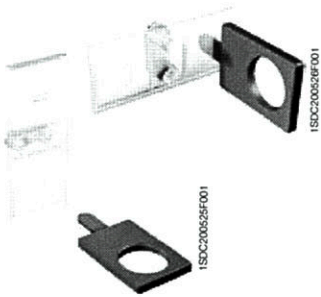
Motor – M

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

General characteristics

Power supply (Un)	AC	DC
24V-30V	•	•
48V-60V	•	•
100V...130V	•	•
220V...250V	•	•
277V ¹⁾	•	-
380V...415V	•	-
440V...480V (E2.2 ... E6.2)	•	-
Operating limits	85%...110% Un	
Inrush power (Ps)	300VA E1.2 500VA E2.2 ... E6.2	300W E1.2 500W E2.2 ... E6.2
Inrush time	200ms	
Continuous power (Pc)	100VA E1.2 150VA E2.2 ... E6.2	100W E1.2 150W E2.2 ... E6.2
Charging time		
E1.2	8 sec	
E2.2 ... E6.2	8 sec	

1) A 277V motor is available for E2.2 through E6.2
Electrical diagram reference: figure 13



Protection device for opening and closing pushbuttons - PBC

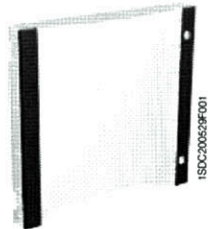
This accessory is applied to the safety cover of the circuit breaker and is available in two versions:

- Pushbutton protection device, which blocks operations on both the opening and closing pushbuttons unless the special key is used.
- Padlockable pushbutton protection device, which makes it possible to block either or both pushbuttons and lock the covers in place. It does not trip the breaker as a standard "Padlock device" would.
- This device is an alternative to PLC padlocks.



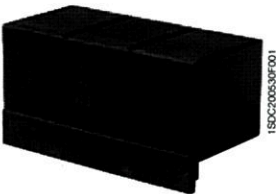
IP30 Protection (door escutcheon)

Supplied with every circuit breaker, the cover frame is installed on the door of the switchgear to achieve an IP30 degree of protection on the front part of the circuit breaker.



IP54 Protection (door escutcheon)

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



Terminal covers - HTC / LTC

These accessories are installed over the terminal area, reducing the risk of direct contact with the live parts of the circuit breaker. Two versions are available for E1.2: HTC high terminal covers and LTC low terminal covers.



Phase barriers - PB

These protection devices increase the insulation distance between adjacent phases. They are available for all the frames.


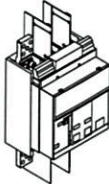
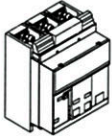
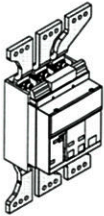
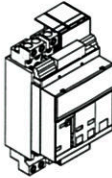
Accessories

Circuit breaker accessories

Connections

The SACE Emax 2 circuit breakers conforming to ANSI C37 / UL 1066 offer a wide variety of terminals, always ensuring an optimal solution for connection to the power circuit.

Solution for fixed circuit breakers

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

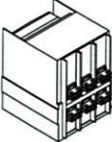
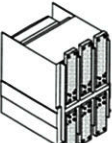
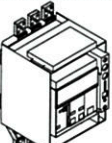
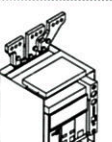
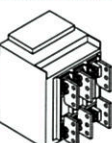
● Standard configuration

○ Optional configuration

(*) Adjustable terminals are supplied as standard in the HR - HR configuration, except for E4.2 L version, E4.2 3200A and E6.2 6000A, supplied in VR - VR configuration.

5

Solutions for cradles, drawout circuit breakers

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

● Standard configuration

○ Optional configuration

(*) Adjustable terminals are supplied as standard in the HR - HR configuration, except for E4.2 L version, E4.2 3200A and E6.2 6000A, supplied in VR - VR configuration.

Installation

Circuit breaker

Temperature derating

Under certain installation conditions, the circuit breakers can operate at higher temperatures than the reference temperature of 40°C (104°F). In such case, the current-carrying capacity of the circuit breaker may be lower than the rated current-carrying capacity at the reference temperature; therefore, the derating coefficients shown in the table must be applied. Percentage values refer to drawout and fixed circuit breakers.

Emax 2 E1.2		Temperature [°C/°F]						
		<40/104	45/113	50/122	55/131	60/140	65/149	70/158
E1.2	250	100%	100%	100%	100%	100%	100%	100%
E1.2	400	100%	100%	100%	100%	100%	100%	100%
E1.2	800	100%	100%	100%	100%	100%	100%	100%
E1.2	1200	100%	98%	96%	95%	92%	90%	89%

Emax 2 E2.2		Temperature [°C/°F]						
		<40/104	45/113	50/122	55/131	60/140	65/149	70/158
E2.2	250	100%	100%	100%	100%	100%	100%	100%
E2.2	400	100%	100%	100%	100%	100%	100%	100%
E2.2	800	100%	100%	100%	100%	100%	100%	100%
E2.2	1200	100%	100%	100%	100%	100%	100%	100%
E2.2	1600	100%	100%	98%	95%	93%	91%	89%
E2.2	2000	100%	100%	97%	94%	92%	90%	88%

Emax 2 E4.2		Temperature [°C/°F]						
		<40/104	45/113	50/122	55/131	60/140	65/149	70/158
E4.2	800	100%	100%	100%	100%	100%	100%	100%
E4.2	1600	100%	100%	100%	100%	100%	100%	100%
E4.2	2000	100%	100%	100%	100%	100%	100%	100%
E4.2	2500	100%	98%	96%	94%	92%	90%	88%
E4.2	3200	Consult factory						

Emax 2 E6.2		Temperature [°C/°F]						
		<40/104	45/113	50/122	55/131	60/140	65/149	70/158
E6.2	4000	100%	100%	100%	100%	100%	100%	100%
E6.2	5000	100%	98%	96%	93%	91%	89%	87%
E6.2	6000	Consult factory						


Installation

Installation environment

SACE Emax 2 circuit breakers have been designed and tested in accordance with major international standards to manage the electrical plant with maximum reliability. The installation requirements prescribed by the international standards are listed below. ABB also provides instructions for using circuit breakers in non-standard environments; for example, personalized maintenance programs or installation solutions aimed at enhancing the circuit breaker's performance and prolonging its life cycle.

Temperature

SACE Emax2 circuit breakers can operate in the following environmental conditions:

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

Environmental conditions

The devices can be installed in industrial environments with pollution level 3, IEC 60947. SACE Emax 2 circuit breakers also comply with:

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

Altitude

SACE Emax 2 air circuit breakers do not undergo changes in rated performance up to 6600 feet. Beyond this altitude, the properties of the atmosphere in terms of composition, dielectric capacitance, cooling power and pressure can vary and, therefore, the performance of the circuit breakers is subject to derating, which can be measured by means of the variation in maximum rated service voltage and rated uninterrupted current.

Altitude	[ft]	6600	9900	13200	16500
	[m]	2000	3000	4000	5000
Rated service voltage - Ue	[V]	600	600	500	440
Rated current	[% In]	100	98	93	90

Vibration

The circuit breakers have been tested according to:

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

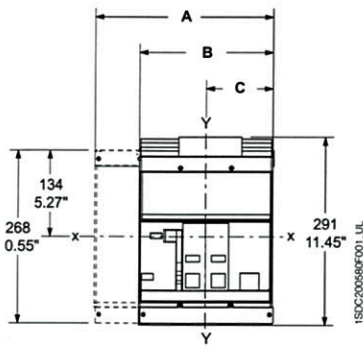
Electromagnetic compatibility

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

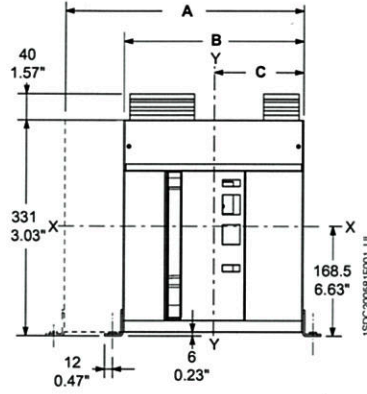
Dimensions

Fixed circuit breaker

E1.2



E2.2 - E4.2 - E6.2

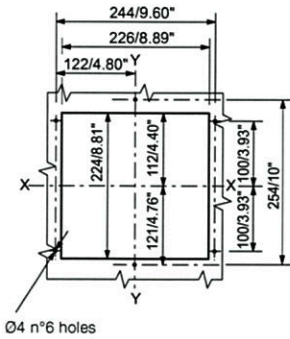


	A		B		C	
	4p	3p	3p	4p	3p	4p
E1.2	284/11.18	214/8.42	107/4.21	107/4.21		
E2.2	366/14.40	276/10.86	138/5.43	138/5.43		
E4.2	510/20.07	384/15.11	192/7.55	192/7.55		
E6.2	888/34.96	762/30	318/12.42	444/17.48		
E6.2/f	1014/39.92	-	-	444/17.48		

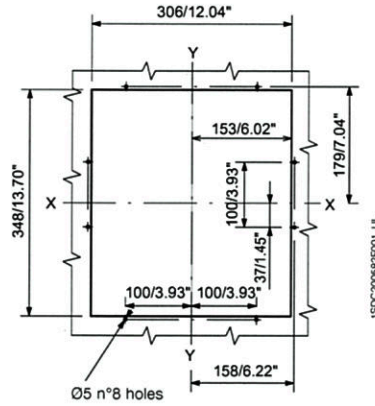
7

Compartment door drilling

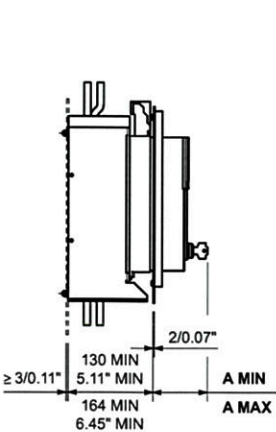
E1.2



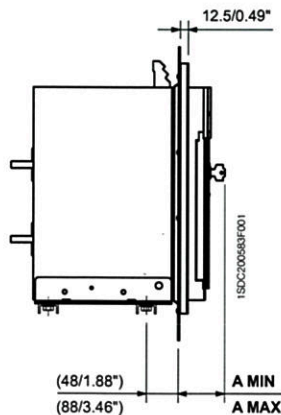
E2.2 - E4.2 - E6.2



E1.2



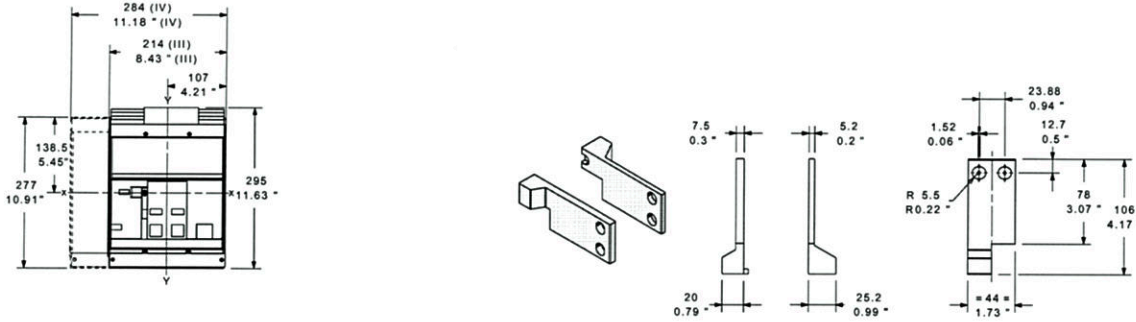
E2.2 - E4.2 - E6.2



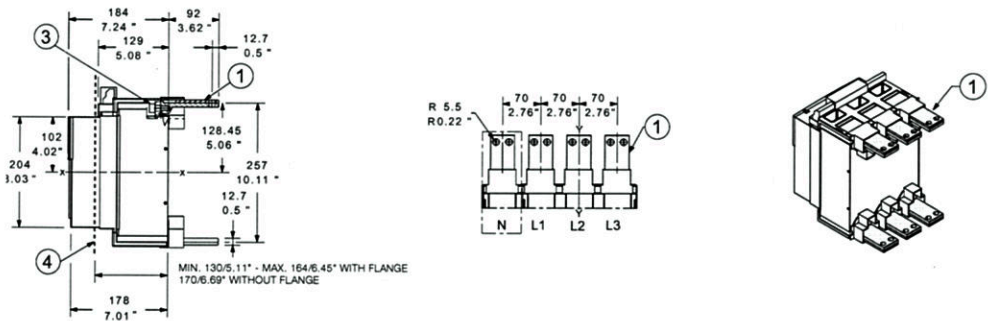
E1.2	Standard	Ronis/Profalux	Kirk	Castell
A MIN	[mm/in] 49.5/ 1.94"	63.5/ 2.5"	63.5/ 2.5"	83.5/ 3.28"
A MAX	[mm/in] 83.5/ 3.28"	97.5/ 3.83"	97.5/ 3.83"	117.5/ 4.62"

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

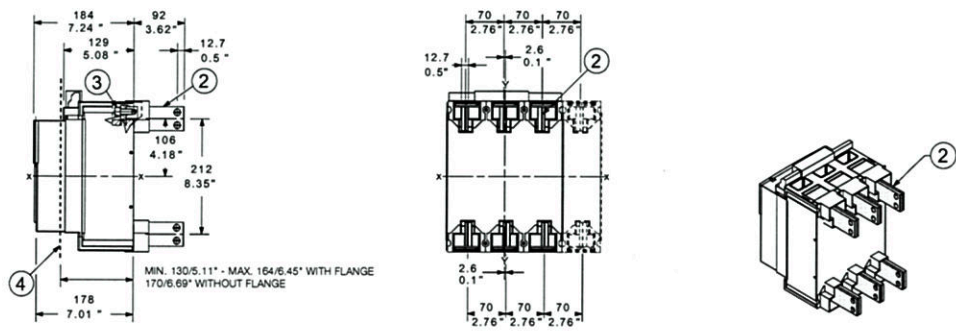
Orientable rear terminals - HR/VR



Terminals HR



Terminals VR



Key

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

Instructions for ordering

Emax 2 order code explanation

Emax 2 circuit breaker order code explanation

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

1 — Emax 2 Prefix

Z

2 — Frame

	E1.2	E2.2	E4.2	E6.2	E6.2 100%N
3p	1	2	4	6	—
4p — N Left	A	B	C	D	E
4p — N Right	F	G	H	J	K

3 — Breaking Capacity

	B	C	N	S	H	V	L	X	Q
UL kA @ 508VAC	42	—	50	65	85	100	125/150 ⁹⁾	200	—
UL kA @ 635VAC	42	—	50 ¹⁾	65 ¹⁾	85	85/100 ⁴⁾	100	200	—
IEC kA @ 440VAC	42	50	66	85	100	150	130	200	1150VAC ⁶⁾
IEC kA @ 690VAC	42	42	66 ²⁾	66	85/100 ³⁾	100	60	120	1150VAC ⁶⁾

¹⁾ E1.2 has 42kA

²⁾ E1.2 has 50kA

³⁾ 85kA for E2.2 and E4.2, 100kA for E6.2

⁴⁾ 85kA for E2.2 and E4.2, 100kA for E6.2

⁵⁾ 125kA for E4.2, 150kA for E6.2

⁶⁾ E1.2 available in N, E2.2 and E4.2 in H and E6.2 in X versions.

4 — Frame Rating (A)

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

5&6 — Rating Plug

Switch Disconnector	00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
UL Rating Plug (A)	100	200	250	400	600	800	1000	1200	1600	2000	2500	3000	3200	3600	4000	5000	6000
	UA	UB	UC	UD	UE	UF	UG	UH	UI	UK	UL	UM	UN	UQ	UR	US	UT
IEC Rating Plug (A)	100	200	250	400	630	800	1000	1250	1600	2000	2500	3200	4000	5000	6300	—	—
	EA	EB	EC	ED	EE	EF	EG	EH	EJ	EK	EL	EN	ER	ES	ET	—	—
IEC "L-Off" Rating Plug (A)	100	200	250	400	630	800	1000	1250	1600	2000	2500	3200	4000	5000	6300	—	—
	LA	LB	LC	LD	LE	LF	LG	LH	LJ	LK	LL	LN	LR	LS	LT	—	—
IEC RC Rating Plug (A)	100	200	250	400	630	800	1250	2000	3200	4000	—	—	—	—	—	—	—
	RA	RB	RC	RD	RE	RF	RH	RK	RN	RR	—	—	—	—	—	—	—

7 — Version

Drawout (Less Cradle)	A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Fixed W/Std Term	B ¹⁾	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Fixed W/Alternative	—	Upper Terminals															
	—	Rear Horiz ²⁾	Rear Vert	Front	Ext Front ³⁾	FcCuAl Cable ⁴⁾	Spread Rear Horiz ⁵⁾	Spread Rear Vert ⁶⁾									
Lower Terminals	Rear Horiz ²⁾	C ³⁾	D	E	F	G	—	—									
	Rear Vert	H	J ⁴⁾	K	L	M	—	—									
	Front	N	P	Q ⁵⁾	R	S	—	—									
	Ext Front ³⁾	T	U	V	W	X	—	—									
	FcCuAl Cable ⁴⁾	2	3	4	5	6	—	—									
	Spread Rear Horiz ⁵⁾	—	—	—	—	—	7	—									
	Spread Rear Vert ⁶⁾	—	—	—	—	—	—	—	8								

¹⁾ Standard terminals for E1.2 fixed are Front. Standard terminals for E2.2 - E6.2 are Rear Horizontal except for UL E4.2 3200A and E6.2 6000A, which are Rear Vertical

²⁾ Not available for UL E4.2 3200A or UL E6.2 6000A

³⁾ Available for E1.2 only

⁴⁾ Not available for UL E4.2 3200A or E6.2 6000A, it is their standard termination

⁵⁾ Available for E2.2 - E6.2 only

⁶⁾ Available for E2.2 IEC only; not available as factory installed with other terminal combinations

Note: Additional, non-factory installed options are available: Front extended spread for all E1.2 and Horizontal or Vertical Rear Spread individual terminal kits for IEC E2.2

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

8 — Trip Unit

Switch Disconnector	0	—	—	—
W/Std 250V Bell Alarm	—	LI	LSI	LSIG
DIP		A	B	C
Touch		D	E	F
Touch + Power Controller ¹⁾		G	H	I
Hi-Touch		—	J	K
Hi-Touch + Power Controller ¹⁾		—	L	M
G Touch		—	—	N
G Touch + Power Controller ¹⁾		—	—	P
G Hi-Touch		—	—	Q
G Hi-Touch + Power Controller ¹⁾		—	—	R
W/24V Digital Bell Alarm	—	LI	LSI	LSIG
Dip		S	T	U
Touch		V	W	X
Touch + Power Controller ¹⁾		Y	Z	1
Hi-Touch		—	2	3
Hi-Touch + Power Controller ¹⁾		—	4	5
G Touch		—	—	6
G Touch + Power Controller ¹⁾		—	—	7
G Hi-Touch		—	—	8
G Hi-Touch + Power Controller ¹⁾		—	—	9

Note: An LCD screen version trip unit is available as a separate item for Ekip Touch, Ekip Hi-touch and Ekip G versions

¹⁾ The Ekip Power Controller requires the use of either the Ekip Measuring or the Ekip Measuring Pro module

10 — Communication Modules

	None	0	—	—	—	—	
Single	MOD-RS-485	MOD-TCP	Profibus	Profinet	DeviceNet	Ethernet/IP	IEC 61850
	2	3	4	5	6	7	8
Combos	MOD-RS-485 + MOD-TCP	MOD-TCP + Profibus	Profibus + Profinet	Profinet + DeviceNet	DeviceNet + Ethernet/IP	Ethernet/IP + IEC 61850	—
	A	B	C	D	E	F	—
	MOD-RS-485 + Profibus	MOD-TCP + Profinet	Profibus + DeviceNet	Profinet + Ethernet/IP	DeviceNet + IEC 61850	—	—
	G	H	J	K	L	—	—
	MOD-RS-485 + Profinet	MOD-TCP + DeviceNet	Profibus + Ethernet/IP	Profinet + IEC 61850	—	—	—
	M	N	P	Q	—	—	—
	MOD-RS-485 + DeviceNet	MOD-TCP + Ethernet/IP	Profibus + IEC 61850	—	—	—	—
	R	S	T	—	—	—	—
	MOD-RS-485 + Ethernet/IP	MOD-TCP + IEC 61850	—	—	—	—	—
	U	V	—	—	—	—	—
	MOD-RS-485 + IEC 61850	—	—	—	—	—	—
	W	—	—	—	—	—	—

Note: Communication modules are not usable with Ekip Dip trip units or for Switch Disconnectors.

9 — Measuring and Power Supply

	None	0	—	—
	—	Measuring	Measuring Pro	Future Arrangement
	—	1	2	N
Pwr Sply 24-48VDC	3	4	5	P
Pwr Sply 110-240VAC/DC	6	7	8	Q
UTMO	—	A	B	R
EMO	—	C	D	S
UTMO + Pwr Sply 24-48VDC	—	E	F	T
UTMO + Pwr Sply 110-240VAC/DC	—	G	H	U
EMO + Pwr Sply 24-48VDC	—	J	K	V
EMO + Pwr Sply 110-240VAC/DC	—	L	M	W

Note: Ekip Hi-Touch and all Ekip G trip units are supplied with Measuring Pro as standard.

Note: Voltage outlets are installed on the bottom terminals as standard.

UTMO = Upper terminal mounting option of voltage outlets

EMO = External mounting option of voltage outlets

Future Arrangement is the pre-wiring for the ability to easily add a measuring module at a future date

continued

Instructions for ordering

Emax 2 order code explanation (cont.)

Emax 2 circuit breaker order code explanation

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

11 – Redundant Communication & Other Modules

	None	0	—	—	—	
Redundant Com.	MOD-RS-485	MOD-TCP	Profibus	Profinet	DeviceNet	Ethernet/IP
	2	3	4	5	6	7
Other Modules	Ekip Link	Synchrocheck ¹⁾	Signalling 2K	—	—	—
	A	B	C	—	—	—
Combos	Rdt Com + Link	Redun Com + Sync ¹⁾	Redun Com + 2K	—	—	—
	D	E	F	—	—	—
	Link + Sync ¹⁾	Sync ¹⁾ + 2K	2K+2K	—	—	—
	G	H	J	—	—	—
	Link + Sync ¹⁾ + 2K	Sync ¹⁾ + 2K + 2K	2K+2K+2K	—	—	—
	K	L	M	—	—	—
	Link + 2K	—	—	—	—	—
	N	—	—	—	—	—
	Link + 2K + 2K	—	—	—	—	—
	P	—	—	—	—	—

¹⁾ Ekip Synchrocheck requires the use of the Ekip Measuring Pro module.

Note: Communication, Ekip 2K and Ekip Synchrocheck modules are not usable with Ekip Dip trip units or for Switch Disconnectors. Ekip Link is compatible with all trip units, but not with switch disconnectors.

If the redundant communication plus another module is selected (D-F), the redundant module will automatically match the selected communication type of digit 10.

If two communication options are selected in digit 10, then the specific redundant module required is needed (2-7).

The maximum number of modules allowed for the combination of digit 10 and 11 is 3 for E2.2-E6.2 and 2 for E1.2.

12 – Auxiliary Contacts & Signaling

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

Note: Circuit breakers include the standard 400V 4 AUX as a standard item, but the 24V or mix options can be selected in its place.

Note: Options 0, D, H and M are available for use with switch disconnectors only.

¹⁾ Not available for the E1.2.

²⁾ Not compatible with Ekip Dip trip units or switch disconnectors.

13 – Remote Reset (YR) & Ready to Close (RTC)

	None	0	—	—
	—	YR 24VAC/DC	YR 110VAC/DC	YR 220V AC/DC
	A	B	C	
RTC 24VDC	D	E	F	G
RTC 250VAC/DC	H	J	K	L

14 – Closing Coil (YC) & Redundant Closing Coil (YC2)

	—	None	0	—	—	—	—	—	—	—	—	—
	24VAC/DC	30VAC/DC	48VAC/DC	60VAC/DC	110-120VAC/DC	120-127V AC/DC	220-240VAC/DC	240-250VAC/DC	277VAC	380-400VAC	415-440VAC	480-500VAC
YC Only	A	B	C	D	E	F	G	H	J	K	L	M
YC + YC2 (equal V) ¹⁾	N	P	Q	R	S	T	U	V	W	X	Y	Z

¹⁾ Not available for E1.2

15 – Shunt Trip – YO

	None	0	—	—	—	—	—	—	—	—	—	—
	24VAC/DC	30VAC/DC	48VAC/DC	60VAC/DC	110-120VAC/DC	120-127V AC/DC	220-240VAC/DC	240-250VAC/DC	277VAC	380-400VAC	415-440VAC	480-500VAC
	A	B	C	D	E	F	G	H	J	K	L	M

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

16 — Undervoltage (YU) & Redundant Shunt Trip (YO2)

	—	None	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	24VAC/DC	30VAC/DC	48VAC/DC	60VAC/DC	110-120VAC/DC	120-127V AC/DC	220-240VAC/DC	240-250VAC/DC	277VAC	380-400VAC	415-440VAC	480-500VAC						
YU Only	A	B	C	D	E	F	G	H	J	K	L	M						
YO2 Only	N	P	Q	R	S	T	U	V	W	X	Y	Z						

17 — Spring Charge Motor (M) and Ekip Communication Actuator

	—	None	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Actuator Only	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	24-30VAC/DC	48-60VAC/DC	100-130VAC/DC	220-250VAC/DC	277VAC	380-415VAC	440-480VAC ¹⁾											
M W/ Std Aux	2	3	4	5	6	7	8											
M W/ 24VDC Aux	A	B	C	D	E	F	G											
M W/ Std Aux + Actuator	H	J	K	L	M	N	P											
M W/ 24VDC Aux + Actuator	Q	R	S	T	U	V	W											

Note: Standard AUX contact for motors are 250V for E1.2 and 400V for E2.2-E6.2
¹⁾ Not available for E1.2

18 — Push Button Lock Options

	None	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	—	Push Button Covers						Padlocks in Open Positions						—	—	—	—	—	—
	—	PBC Sp Key	PBC PL - 4mm	PBC PL - 7mm	PBC PL - 8mm	PLC - 4mm	PLC - 7mm	PLC - 8mm											
	—	2	3	4	5	6	7	8											
Key Lock in Open Pos. — Diff Keys	A	D	E	F	G	H	J	K											
Key Lock in Open Pos — Same Keys ¹⁾	B	L	M	N	P	Q	R	S											
Key Lock in Open Pos. — Kirk Key	C	T	U	V	W	X	Y	Z											

¹⁾ Standard key for Same Key option is #20005. Locks with keys #20006, #20007, #20008 and #20009 are available as separate items.
 Note: Key lock options for Castell and Ronis/Profalux are available for order as separate items.

19 — 1st Racking Lock Options

	None	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	—	1st KLP-Same Keys ¹⁾	1st KLP-Diff Keys	1st KLP-Kirk/Ron/Prof	1st KLP - Castell ²⁾													
	—	A	B	C	D													
PLP Padlock	E	F	G	H	J													

¹⁾ Standard key for Same Key option is #20005. Locks with keys #20006, #20007, #20008 and #20009 are available as separate items.
²⁾ Two Castell adapters cannot be used together, but a Castell adapter can be used in either position with another style lock.
 Note: The racking locks above are for E2.2-E6.2 only; for E1.2 they are located on the cradle. The supplement for locking in racked out only is located on the cradle for all breaker sizes.

20 — 2nd Racking Lock Options & Mechanical Operation Counter

	None	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	—	2nd KLP-Same Keys ¹⁾	2nd KLP-Diff Keys	2nd KLP-Kirk/Ron/Prof	2nd KLP - Castell ²⁾													
	—	B	C	D	E													
MEC OP CTR	A	F	G	H	J													

¹⁾ Standard key for Same Key option is #20005. Locks with keys #20006, #20007, #20008 and #20009 are available as separate items.
²⁾ Two Castell adapters cannot be used together, but a Castell adapter can be used in either position with another style lock.
 Note: The racking locks above are for E2.2-E6.2 only; for E1.2 they are located on the cradle.

Automatic circuit breakers

Fixed version for power distribution



SACE Emax 2 E1.2S-A - Front terminals (F)

Size	Frame Amps	Int. Rating (kA@508V)	Withstand (kA)	Type	3 Pole Code	4 Pole Code
E1.2S-A	250	65	50	E1.2S-A 250 Ekip Dip LI	Z1SAUCBA000A000000XX	ZASAUCA000A000000XX
				E1.2S-A 250 Ekip Dip LSI	Z1SAUCBB000A000000XX	ZASAUCCB000A000000XX
				E1.2S-A 250 Ekip Dip LSIG	Z1SAUCBC000A000000XX	ZASAUCCB000A000000XX
				E1.2S-A 250 Ekip Touch LI	Z1SAUCBD000A000000XX	ZASAUCCD000A000000XX
				E1.2S-A 250 Ekip Touch LSI	Z1SAUCBE000A000000XX	ZASAUCCD000A000000XX
				E1.2S-A 250 Ekip Touch LSIG	Z1SAUCBF000A000000XX	ZASAUCCD000A000000XX
				E1.2S-A 250 Ekip Hi-Touch LSI	Z1SAUCBJ200A000000XX	ZASAUCCJ200A000000XX
				E1.2S-A 250 Ekip Hi-Touch LSIG	Z1SAUCBK200A000000XX	ZASAUCCJ200A000000XX
	400	65	50	E1.2S-A 400 Ekip Dip LI	Z1SBUDBA000A000000XX	ZASBUDBA000A000000XX
				E1.2S-A 400 Ekip Dip LSI	Z1SBUDBB000A000000XX	ZASBUDBB000A000000XX
				E1.2S-A 400 Ekip Dip LSIG	Z1SBUDBC000A000000XX	ZASBUDBB000A000000XX
				E1.2S-A 400 Ekip Touch LI	Z1SBUDBD000A000000XX	ZASBUDBD000A000000XX
				E1.2S-A 400 Ekip Touch LSI	Z1SBUDEB000A000000XX	ZASBUDBD000A000000XX
				E1.2S-A 400 Ekip Touch LSIG	Z1SBUDBF000A000000XX	ZASBUDBD000A000000XX
				E1.2S-A 400 Ekip Hi-Touch LSI	Z1SBUDBJ200A000000XX	ZASBUDBJ200A000000XX
				E1.2S-A 400 Ekip Hi-Touch LSIG	Z1SBUDBK200A000000XX	ZASBUDBJ200A000000XX
	800	65	50	E1.2S-A 800 Ekip Dip LI	Z1SCUFBA000A000000XX	ZASCUFBA000A000000XX
				E1.2S-A 800 Ekip Dip LSI	Z1SCUFB000A000000XX	ZASCUFBB000A000000XX
				E1.2S-A 800 Ekip Dip LSIG	Z1SCUFC000A000000XX	ZASCUFBB000A000000XX
				E1.2S-A 800 Ekip Touch LI	Z1SCUFD000A000000XX	ZASCUFBD000A000000XX
				E1.2S-A 800 Ekip Touch LSI	Z1SCUFE000A000000XX	ZASCUFBD000A000000XX
				E1.2S-A 800 Ekip Touch LSIG	Z1SCUFBF000A000000XX	ZASCUFBD000A000000XX
				E1.2S-A 800 Ekip Hi-Touch LSI	Z1SCUFBJ200A000000XX	ZASCUFBJ200A000000XX
				E1.2S-A 800 Ekip Hi-Touch LSIG	Z1SCUFBK200A000000XX	ZASCUFBJ200A000000XX
	1200	65	50	E1.2S-A 1200 Ekip Dip LI	Z1SDUHBA000A000000XX	ZASDUHBA000A000000XX
				E1.2S-A 1200 Ekip Dip LSI	Z1SDUHB000A000000XX	ZASDUHBB000A000000XX
				E1.2S-A 1200 Ekip Dip LSIG	Z1SDUHBC000A000000XX	ZASDUHBB000A000000XX
				E1.2S-A 1200 Ekip Touch LI	Z1SDUHBD000A000000XX	ZASDUHBD000A000000XX
E1.2S-A 1200 Ekip Touch LSI				Z1SDUHBE000A000000XX	ZASDUHBD000A000000XX	
E1.2S-A 1200 Ekip Touch LSIG				Z1SDUHBF000A000000XX	ZASDUHBD000A000000XX	
E1.2S-A 1200 Ekip Hi-Touch LSI				Z1SDUHBJ200A000000XX	ZASDUHBJ200A000000XX	
E1.2S-A 1200 Ekip Hi-Touch LSIG				Z1SDUHBK200A000000XX	ZASDUHBJ200A000000XX	