

# Overview of Low Voltage equipment

Moulded-case and air circuit-breakers

1SDC001001B0205



**ABB**

# ABB SACE.

## At the forefront in Low Voltage.



ABB SACE is a synonym of quality and innovation in the Low Voltage sector, offering products which, by integrating perfectly, adapt to the various service and installation requirements thus satisfying all plant needs, from the small user up to large industrial electric power distributors.

ABB SACE's offer of low voltage circuit-breakers makes high quality, reliable and precise products available, which guarantee high performances under any conditions, products safe during use and, when necessary, with easy replacement of faulty parts.

The SACE Emax series of air circuit-breakers, now enriched with the new X1 size, cover all user needs from 630 up to 6300 A. X1 of Emax is proposed as the best solution for all those applications where dimensions are an important and determining

factor in selecting the circuit-breaker, without however necessarily having to give up high rated current values: rated current up to 1600 A, high  $I_{cw}$  for selective circuit-breakers and, for the current-limiting version, an  $I_{cu}$  of 150 kA at 415 V AC.

The SACE Tmax family of moulded-case circuit-breakers is divided into seven sizes (T1-T7) with rated uninterrupted currents from 160 to 1600 A. Perfect integration between the sizes, higher performances with circuit-breakers of even smaller dimensions,



a standardized range of accessories which considerably simplify selection of the apparatus ... all this is now possible thanks to the seven sizes of the new Tmax moulded-case circuit-breaker.

The Tmax family is completed by the new Tmax T7, available in two versions with manual and motorizable operating mechanism, to fulfil all installation and protection requirements – even the most specific ones.

In conformity with the commitment and attention the group pays to the environment, ABB SACE has always been careful to target the sustainable development and environmental protection objectives.

All the company production sites have obtained ISO 9001 quality certification, and most of them also have ISO 14001 certification of their environmental management system. The ABB SACE factories have also obtained certification for integrated management of their Quality, Environment and Safety systems in conformity with ISO 9001-2000, ISO 14001-96 and OHSAS 18001 Standards. From the safety viewpoint, ABB SACE is, once again, a

## Ethics and Social Accountability

The **SA8000** International Standard (Social Accountability 8000) or **System of Social Accountability** is the most widespread and recognized standard at international level, by means of which it is guaranteed that a company is socially accountable and is particularly committed to **respecting work ethics and working conditions**.

Based on the so-called “requirements of social accountability”, the SA8000 Standard confirms the **ethics of the whole production cycle** of a company regarding child labour, no forced labour, safeguarding personnel health and safety, freedom of association and right to collective bargaining, no discrimination, disciplinary procedures, compensation and working hours, relationships with suppliers and integration in the communities where the company carries on its activities.

In 2004, ABB SACE S.p.A. decided to implement the management system for Social Accountability according to the SA8000 Standard at its sites in Frosinone and Patrica, which had already had their QAS (Quality, Environment, Safety) integrated management system certified in accordance with ISO 9001:2000, ISO 14001:2004, and OHSAS 18001:99 Standards, also on the basis of the previous certification obtained by the ABB Group Services Center in 2003.

The initiative falls within the more general framework of the activities of the Sustainability Affairs Group Function of ABB, committed to implementing and striving to achieve the ABB sustainability objectives throughout the world.

During the process for implementing the SA8000 Standard, all the personnel at Frosinone and Patrica took part in a cycle of meetings for comparing ideas and for training. **The suppliers and sub-suppliers were also involved**, called on to acknowledge and adhere to the principles confirmed by the SA8000 Standard and by the policy of ABB SACE S.p.A. for Social Accountability.

**Until now, ABB is the only company to have obtained SA8000 certification among the multinational companies in the electrical sector.**

Once again ABB is to the fore in offering you better service.



guarantee of conformity with the electrical safety standards, in respect of the international Standards. Our products

undergo the most severe tests for conformity with standards as well as the necessary type tests in the ABB laboratories,

accredited by the most important national and international Organizations (SINAL, ACAE and LOVAG).

# Tmax moulded-case circuit-breakers for distribution

Common data	
<b>Voltages</b>	
Rated service voltage, U <sub>e</sub>	[V] 690*
Rated impulse withstand voltage, U <sub>imp</sub>	[kV] 8
Rated insulation voltage, U <sub>i</sub>	[V] 800...1000**
Test voltages at power frequency for 1 min.	[V] 3000...3500
<b>Number of poles</b>	
	3-4

\* 240 V for T1 1p      \*\* 500 V for T1 1p

[V]	690*
[kV]	8
[V]	800...1000**
[V]	3000...3500
	3-4



Rated uninterrupted current, I <sub>u</sub> (A)	[I <sub>u</sub> ]	160	160	160	250
Rated ultimate short-circuit breaking capacity, I <sub>cu</sub> (AC) 50-60 Hz 220/230 V	[kA]	B	B C N	N S H L	N S
(AC) 50-60 Hz 380/415 V	[kA]	25 <sup>(1)</sup>	25 40 50	65 85 100 120	50 85
(AC) 50-60 Hz 440 V	[kA]		16 25 36	36 50 70 85	36 50
(AC) 50-60 Hz 500 V	[kA]		10 15 22	30 45 55 75	25 40
(AC) 50-60 Hz 690 V	[kA]		8 10 15	25 30 36 50	20 30
(DC) 250 V - 2 poles in series	[kA]		3 4 6	6 7 8 10	5 8
(DC) 250 V - 3 poles in series	[kA]	25 (at 125 V)	16 25 36	36 50 70 85	36 50
(DC) 500 V - 2 poles in series	[kA]		20 30 40	40 55 85 100	40 55
(DC) 500 V - 3 poles in series	[kA]		16 25 36	36 50 70 85	36 50
(DC) 750 V - 3 poles in series	[kA]				
Rated service short-circuit breaking capacity, I <sub>cs</sub> (at 415 V)	[%I <sub>cu</sub> ]	75%	100% 100% 75%	100% 100% 100% 75% <sup>(2)</sup>	75% 50% <sup>(3)</sup>
Rated short-circuit making capacity, I <sub>cm</sub> (415 V)	[kA]	52.5 (at 220/230 V)	32 52.5 75.6	75.6 105 154 187	75.6 105
Opening time (415 V)	[ms]	7	7 6 5	3 3 3 3	7 6
Rated short-time withstand current for 1 s, I <sub>cw</sub>	[kA]				
Category of utilization (IEC 60947-2, EN 60947-2)		A	A	A	A
Isolation behaviour		■	■	■	■
Reference standards IEC 60947-2, EN 60947-2		■	■	■	■
Trip unit:					
thermomagnetic					
T fixed, M fixed (10xIn) TMF		■			
T adjust., M fixed (10xIn) TMD			■		■
T adjust., M adjust. (5...10xIn) TMA				■	
T adjust., M fixed (3xIn) TMG					■
T adjust., M adjust. (2.5...5xIn) TMG					
magnetic only					
M adjustable (6...12xIn) MA				■ (MF up to I <sub>n</sub> 12.5 A)	■
electronic					
PR221DS (I-LS/I)				■	
PR222DS/P (LSI-LSIG)					
PR222 MP					
PR223DS/P					
PR223EF					
PR231/P (I-LS/I)					
PR232/P (LSI)					
PR331/P (LSIG)					
PR332/P (LI-LSI-LSIG-LSIRc)					
Interchangeability					
Versions		F	F	F - P	F - P
Terminals	Fixed (F)	FC Cu	FC Cu - EF - FC CuAl - HR	F - FC Cu - FC CuAl - EF - ES - R	F - FC Cu - FC CuAl - EF - ES - R
	Plug-in (P)			F - FC Cu - FC CuAl - EF - ES - R	F - FC Cu - FC CuAl - EF - ES - R
	Withdrawable (W)				
Fixing onto DIN rail			DIN EN 50022	DIN EN 50022	DIN EN 50022
Mechanical life	[No. operations / hourly ops.]	25000 / 240	25000 / 240	25000 / 240	25000 / 240
Electrical life (at 415 V)	[No. operations / hourly ops.]	8000 / 120	8000 / 120	8000 / 120	8000 / 120
Fixed basic dimensions	3/4 poles W	[mm] 25.4 (1 pole)	76 / 102	90 / 120	105 / 140
	D	[mm] 70	70	70	70
	H	[mm] 130	130	130	150
Weights	fixed 3/4 poles	[kg] 0.4 (1 pole)	0.9 / 1.2	1.1 / 1.5	1.5 / 2
	plug-in 3/4 poles	[kg]		1.5 / 1.9	2.7 / 3.7
	withdrawable 3/4 poles	[kg]			

<sup>(1)</sup> Settings I<sub>n</sub> = 16 and I<sub>n</sub> = 20 with I<sub>cu</sub> = 16 kA @ 220/230 V  
<sup>(2)</sup> 70 kA  
<sup>(3)</sup> 27 kA

<sup>(4)</sup> Only 630 and 800 A  
<sup>(5)</sup> Only for T7 800/1000/1250 A

Note: In the plug-in version of T2-T3 and T5 630 and in the withdrawable version of T5 630, the maximum rated current available is derated by 10% at 40 °C.



# Tmax moulded-case circuit-breakers for specific applications

		Tmax T1	Tmax T2	Tmax T3
<b>Current-limiting</b>				
			<b>T2L</b>	
Poles			3 - 4	
I <sub>u</sub>	[A]		160	
U <sub>e</sub>	[V]		690	
I <sub>cu</sub> @ 380/415 V	[kA]		85	
I <sub>cu</sub> @ 440 V	[kA]		75	
I <sub>cu</sub> @ 690 V	[kA]		10	
I <sub>cs</sub> /I <sub>cu</sub> %			75% (70 kA)	
Dimensions	W	[mm]	90 / 120	
	D	[mm]	70	
	H	[mm]	130	

<b>Advanced zone selectivity</b>				
Poles		[No.]		
I <sub>u</sub>		[A]		
U <sub>e</sub>	(AC) 50-60 Hz	[V]		
EFDP zone selectivity				
ZS zone selectivity				

			T2	T3
<b>Motor protection</b>				
Poles			3	3
I <sub>u</sub>		[A]	160	250
U <sub>e</sub>		[V]	690	690
Magnetic only M fixed release			■ (up to I <sub>n</sub> 12.5)	-
Magnetic only M adjustable release			■ (from I <sub>n</sub> 20)	■
Electronic PR221DS-I release, IEC 60947-2			■	-
Electronic PR222MP release, IEC 60947-4-1			-	-
Electronic PR231/P-I release, IEC 60947-2			-	-

<b>Circuit-breakers for use up to 1150 V AC and 1000 V DC</b>				
Poles				
I <sub>u</sub>		[A]		
I <sub>cu</sub> @ 1000 V AC		[kA]		
I <sub>cu</sub> @ 1150 V AC		[kA]		
I <sub>cu</sub> @ 1000 V DC	4 poles in series	[kA]		

			T1D	T3D
<b>Switch-disconnector according to IEC 60947-3 Standard</b>				
Poles			3 - 4	3 - 4
I <sub>th</sub>		[A]	160	250
I <sub>e</sub> AC23		[A]	125	200
U <sub>e</sub>	(AC) 50-60 Hz	[V]	690	690
	(DC)		500	500
U <sub>imp</sub>		[kV]	8	8
U <sub>i</sub>		[V]	800	800
I <sub>cm</sub>		[kA]	2.8	5.3
I <sub>cw</sub>		[kA]	2	3.6

			T1	T2	T3
<b>UL/CSA (UL 489 and CSA C22.2)</b>					
Poles			1 <sup>(1)</sup> - 3 - 4	3 - 4	3 - 4
Maximum continuous current @ 40 °C		[A]	100	100	225
Min-max Ampere Interrupting ratings @ 347 V		[kA]	14 <sup>(2)</sup>	-	-
Min-max Ampere Interrupting ratings @ 480 V		[kA]	22	35 - 65	25 - 35
Min-max Ampere Interrupting ratings @ 600Y/347 V AC		[kA]	10	-	10
Min-max Ampere Interrupting ratings @ 600 V		[kA]	-	-	-
Thermal-magnetic trip unit			■	■	■
Magnetic only			-	■	■
Microprocessor based trip unit			-	■	-
MCCB			■	■	■
MCP			-	■	■
MCS			■	-	■

<sup>(1)</sup> 1 pole breaker up to 347 V

<sup>(2)</sup> 18 kA @ 227 V; I<sub>n</sub> = 15 A → 10 kA

	Tmax T4	Tmax T5	Tmax T6	Tmax T7	
	<b>T4V</b>	<b>T5V</b>	<b>T6L</b>	<b>T7V</b>	
	3 - 4	3 - 4	3 - 4	3 - 4	
	250 / 320	400 / 630	630 / 800 / 1000	800 / 1000 / 1250	
	690	690	690	690	
	200	200	100	150	
	180	180	80	130	
	80	80	30	60	
	100%	100%	75%	100%	
	105 / 140	140 / 184	210 / 280	210 / 280	
	103.5	103.5	103.5	154 (manual) / 178 (motorizable)	
	205	205	268	268	

	T4	T5	T6	T7	
	3 - 4	3 - 4	3 - 4	3 - 4	
	250 / 320	400 / 630	630 / 800 / 1000	800 / 1000 / 1250 / 1600	
	690	690	690	690	
	■	■	■	-	
	-	-	-	■	

	T4	T5	T6	T7	
	3	3	3	3	
	250 / 320	400 / 630	630 / 800 / 1000	800 / 1000 / 1250 / 1600	
	690	690	690	690	
	-	-	-	-	
	■	-	-	-	
	■	■	■	-	
	■	■	■	-	
	-	-	-	■	

	T4	T5	T6		
	3 - 4	3 - 4	3 - 4		
	250	400 / 630	630 / 800		
	20	20	12		
	12	12	-		
	40	40	40		

	T4D	T5D	T6D	T7D	
	3 - 4	3 - 4	3 - 4	3 - 4	
	250 / 320	400 / 630	630 / 800 / 1000	1000 / 1250 / 1600	
	250	400	630 / 800 / 800	1000 / 1250 / 1250	
	690	690	690	690	
	750	750	750	750	
	8	8	8	8	
	800	800	1000	1000	
	5.3	11	30	52.5	
	3.6	6	15	20	

	T4	T5	T6	S7	S8
	2 - 3 - 4	2 - 3 - 4	2 - 3 - 4	2 - 3 - 4	3
	250	400 / 600	800	1200	1600 / 2000 / 2500
	-	-	-	-	-
	25 - 150	25 - 150	50 - 100	65	100
	-	-	-	-	-
	18 - 100	18 - 100	25 - 42	50	85
	■	■	■	-	-
	-	-	-	-	-
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■

# Accessories for Tmax moulded-case circuit-breakers



	Tmax T1	Tmax T2	
<b>Service releases</b>			
Shunt trips	■	■	
Closing coils			
Undervoltage releases	■	■	
Time-delay device for undervoltage release	■	■	
<b>Electrical signals</b>			
Contacts:			
2 in Open/Closed changeover			
1 in Open/Closed changeover + 1 in changeover to signal release tripped	■	■	
3 in Open/Closed changeover + 1 in changeover to signal release tripped	■	■	
1 Open/Closed + 1 release tripped + 1 open to signal release intervention		■ <sup>(1)</sup>	
Early auxiliary for undervoltage release	■ (no. 2)	■ (no. 2)	
For signalling circuit-breaker Racked-in/Racked-out		■	
<b>Remote control</b>			
Solenoid operator	■	■	
Motor operator with stored energy			
Spring-charging motor for T7 in motorizable version			
<b>Operating mechanisms and locks</b>			
Direct or transmitted rotary handle operating mechanism	■	■	
IP54 protection for rotary handle	■	■	
Front for lever operating mechanism			
Key lock in open position	■	■	
Padlock for operating lever	■	■	
Anti-tampering lock on thermomagnetic release	■	■	
Compartment door lock	■	■	
Mechanical interlock between two circuit-breakers	■	■	
<b>Electronic residual current releases</b>			
Associated with the circuit-breaker	RC221/1 - RC222/1	RC221/2 - RC222/2	
For RCQ switchgear	■	■	
<b>Accessories for electronic releases</b>			
Front display unit - FDU			
SACE TT1 test unit		■	
PR021/K signalling unit		■	
SACE PR010/T Test and Configuration unit			
SACE PR212/CI contactor control unit			
<b>Automatic network-generator transfer unit</b>			
ATS010			

<sup>(1)</sup> Pre-cabled version only for PR221DS release

<sup>(2)</sup> Trip unit with integrated residual current protection available



	Tmax T3	Tmax T4	Tmax T5	Tmax T6	Tmax T7
	■	■	■	■	■
	■	■	■	■	■ T7M
	■	■	■	■	■
		■	■	■	■
	■	■	■	■	■
	■	■	■	■	
	■ (no. 2)	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■ T7 M
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	RC221/3 - RC222/3 - RC223/3	RC222/4 - RC223/4	RC222/5		■ (2)
	■	■	■	■	■
		■	■	■	■
		■	■	■	■
		■	■	■	■
		■	■	■	■
		■	■	■	■
		■	■	■	■
		■	■	■	■

# Emax air circuit-breakers for distribution

Common data			
<b>Voltages</b>			
Rated service voltage	Ue	[V]	690 ~
Rated insulation voltage	Ui	[V]	1000
Rated impulse withstand voltage	Uimp	[kV]	12
<b>Operating temperature</b>			
[°C]			
Storage temperature		[°C]	-25...+70
Frequency	f	[Hz]	50 - 60
Number of poles			3-4
Version			Fixed - Withdrawable



Levels of performance			X1			E1	
			B	N	L	B	N
<b>Currents:</b> rated uninterrupted current (at 40 °C)	lu	[A]	630	630	630	800	800
		[A]	800	800	800	1000	1000
		[A]	1000	1000	1000	1250	1250
		[A]	1250	1250	1250	1600	1600
		[A]	1600	1600			
		[A]					
Capacity of the neutral pole for four-pole cb		[%Iu]	100	100	100	100	100
Ultimate short-circuit breaking capacity	lcu	220/230/380/400/415 V ~	42	65	150	42	50
		440 V ~	42	65	130	42	50
		500/525 V ~	42	50	100	42	50
		660/690 V ~	42	50	60	42	50
		220/230/380/400/415 V ~	42	50	150	42	50
Rated short-circuit service breaking capacity	lcs	440 V ~	42	50	130	42	50
		500/525 V ~	42	42	100	42	50
		660/690 V ~	42	42	45	42	50
		(1s)	42	42	15	42	50
Short-time withstand current	lcw	(3s)				36	36
Rated short-circuit making capacity (peak value)	lcm	220/230/380/400/415 V ~	88.2	143	330	88.2	105
		440 V ~	88.2	143	286	88.2	105
		500/525 V ~	88.2	105	220	88.2	105
		660/690 V ~	88.2	105	132	88.2	105
<b>Category of utilization</b>	CEI EN 60947-2		B	B	A	B	B
<b>Isolation behaviour</b>	CEI EN 60947-2		■	■	■	■	■
<b>Overcurrent release</b>			■	■	■	■	■
Electronic trip units for AC applications			■	■	■	■	■
<b>Operation times</b>							
Closing time (max)		[ms]	80	80	80	80	80
Breaking time for I<lcw (max) <sup>(1)</sup>		[ms]	70	70	70	70	70
Breaking time for I>lcw (max)		[ms]	30	30	12	30	30
<b>Overall dimensions</b>							
Fixed: H = 418 mm - D = 302 mm	W	(3/4 poles)	H=268 mm - D=181 mm - W(3/4)=210/280			296/386	
Withdrawable: H = 461 mm - D = 396.5 mm	W	(3/4 poles)	H=343 mm - D=254 mm - W(3/4)=284/354			324/414	
<b>Weights (circuit-breaker complete with releases and CT, excluding accessories)</b>							
Fixed 3/4 poles		[kg]	11/14	11/14	11/14	45/54	45/54
Withdrawable 3/4 poles (including the fixed part)		[kg]	32/42.6	32/42.6	32/42.6	70/82	70/82

<sup>(1)</sup> Without intentional delays

<sup>(2)</sup> The performance at 600 V is 100 kA

Rated uninterrupted current (at 40 °C)	lu	[A]	X1 B-N-L			E1 B-N		
			800	1250	1600	800	1000-1250	1600
<b>Mechanical life with regular ordinary maintenance</b>		[No. Operations x 1000]	12.5	12.5	12.5	25	25	25
Operation frequency		[Operations/hour]	60	60	60	60	60	60
Electrical life	(440 V ~)	[No. Operations x 1000]	6	4	3	10	10	10
	(690 V ~)	[No. Operations x 1000]	3	2	1	10	8	8
Operation frequency		[Operations/hour]	30	30	30	30	30	30



	E2				E3					E4			E6	
	B	N	S	L	N	S	H	V	L	S	H	V	H	V
	1600	1000	800	1250	2500	1000	800	800	2000	4000	3200	3200	4000	3200
	2000	1250	1000	1600	3200	1250	1000	1250	2500		4000	4000	5000	4000
		1600	1250			1600	1250	1600					6300	5000
		2000	1600			2000	1600	2000						6300
			2000			2500	2000	2500						
						3200	2500	3200						
						3200								
	100	100	100	100	100	100	100	100	100	50	50	50	50	50
	42	65	85	130	65	75	100	130	130	75	100	150	100	150
	42	65	85	110	65	75	100	130	110	75	100	150	100	150
	42	55	65	85	65	75	100	100	85	75	100	130	100	130
	42	55	65	85	65	75	85 <sup>(2)</sup>	100	85	75	85 <sup>(2)</sup>	100	100	100
	42	65	85	130	65	75	85	100	130	75	100	150	100	125
	42	65	85	110	65	75	85	100	110	75	100	150	100	125
	42	55	65	65	65	75	85	85	65	75	100	130	100	100
	42	55	65	65	65	75	85	85	65	75	85	100	100	100
	42	55	65	10	65	75	75	85	15	75	100	100	100	100
	42	42	50	-	65	65	65	65	-	75	75	75	85	85
	88.2	143	187	286	143	165	220	286	286	165	220	330	220	330
	88.2	143	187	242	143	165	220	286	242	165	220	330	220	330
	88.2	121	143	187	143	165	187	220	187	165	220	286	220	286
	88.2	121	143	187	143	165	187	220	187	165	187	220	220	220
	B	B	B	A	B	B	B	B	A	B	B	B	B	B
	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	80	80	80	80	80	80	80	80	80	80	80	80	80	80
	70	70	70	70	70	70	70	70	70	70	70	70	70	70
	30	30	30	12	30	30	30	30	12	30	30	30	30	30
		296/386				404/530					566/656		782/908	
		324/414				432/558					594/684		810/936	
	50/61	50/61	50/61	52/63	66/80	66/80	66/80	66/80	72/83	97/117	97/117	97/117	140/160	140/160
	78/93	78/93	78/93	80/95	104/125	104/125	104/125	104/125	110/127	147/165	147/165	147/165	210/240	210/240

	E2 B-N-S				E2 L		E3 N-S-H-V						E3 L		E4 S-H-V		E6 H-V			
	800	1000-1250	1600	2000	1250	1600	800	1000-1250	1600	2000	2500	3200	2000	2500	3200	4000	3200	4000	5000	6300
	25	25	25	25	20	20	20	20	20	20	20	20	15	15	15	15	12	12	12	12
	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	15	15	12	10	4	3	12	12	10	9	8	6	2	1.8	7	5	5	4	3	2
	15	15	10	8	3	2	12	12	10	9	7	5	1.5	1.3	7	4	5	4	2	1.5
	30	30	30	30	20	20	20	20	20	20	20	20	20	20	10	10	10	10	10	10

# Emax air circuit-breakers for specific applications

		X1	E1	E2	
<b>Automatic circuit-breakers with full-size neutral conductor</b>					
Poles	[no.]	Standard version	Standard version	Standard version	
Capacity of the neutral of 4p cb I <sub>n</sub> (40 °C)	[% I <sub>n</sub> ]				
U <sub>e</sub>	[V~]				
I <sub>cu</sub> (220...415 V)	[kA]				
I <sub>cs</sub> (220...415 V)	[kA]				
I <sub>cw</sub> (1s)	[kA]				
	(3s)	[kA]			

## Switch-disconnectors

		X1B/MS	E1B/MS	E1N/MS	E2B/MS	E2N/MS	E2S/MS	
Poles	[no.]	3-4	3 - 4	3 - 4	3 - 4	3 - 4	3 - 4	
I <sub>n</sub> (40 °C)	[A]	1000-1250-1600	800-1000-1250-1600	800-1000-1250-1600	1600-2000	1000-1250-1600-2000	1000-1250-1600-2000	
U <sub>e</sub>	[V~]	690	690	690	690	690	690	
I <sub>cw</sub> (1s)	[kA]	42	42	50	42	55	65	
	(3s)	[kA]	36	36	42	42	42	
I <sub>cm</sub> (220...440 V)	[kA]	88.2	88.2	105	88.2	121	143	

## Circuit-breakers for applications up to 1150 V AC

		X1B/E		E2B/E	E2N/E	
Poles	[no.]	3-4		3 - 4	3 - 4	
I <sub>n</sub> (40 °C)	[A]	630-800-1000-1250-1600		1600-2000	1250-1600-2000	
U <sub>e</sub>	[V~]	1000		1150	1150	
I <sub>cu</sub> (1000 V)	[kA]	20		20	30	
I <sub>cu</sub> (1150 V)	[kA]	-		20	30	
I <sub>cs</sub> (% I <sub>cu</sub> )	[kA]	100%		100%	100%	
I <sub>cw</sub> (1s)	[kA]	20		20	30	

## Switch-disconnector for applications up to 1150 V AC

		X1B/E MS		E2B/E MS	E2N/E MS	
Poles	[no.]	3-4		3 - 4	3 - 4	
I <sub>n</sub> (40 °C)	[A]	1000-1250-1600		1600-2000	1250-1600-2000	
U <sub>e</sub>	[V~]	1000		1150	1150	
I <sub>cw</sub> (1s)	[kA]	20		20	30	
I <sub>cm</sub> (1150 V)	[kA]	40 <sup>(*)</sup>		40	63	

## Switch-disconnector for applications up to 1000 V DC

			E1B/E MS		E2N/E MS	
Poles	[no.]		3 - 4		3 - 4	
I <sub>n</sub> (40 °C)	[A]		800-1250		1250-1600-2000	
U <sub>e</sub>	[V-]		750 (3p) - 1000 (4P)		750 (3p) - 1000 (4p)	
I <sub>cw</sub> (1s)	[kA]		20		25	
I <sub>cm</sub> (750 V)	[kA]		42		52.5	
	(1000 V)	[kA]	42		52.5	

## Isolating truck

			E1 CS		E2 CS	
I <sub>n</sub> (40 °C)	[A]		1250		2000	

## Earthing switch with making capacity

			E1 MTP		E2 MTP	
I <sub>n</sub> (40 °C)	[A]		1250		2000	

## Earthing truck

			E1 MT		E2 MT	
I <sub>n</sub> (40 °C)	[A]		1250		2000	

<sup>(\*)</sup> The performance at 1150 V is 30 kA  
<sup>(\*\*)</sup> At 1000 V AC

<sup>(1)</sup> 50 kA @ 1000 V  
<sup>(2)</sup> 105 kA @ 1000 V

	E3	E4	E6	
	Standard version	E4S/f 4 100 4000 690 80 80 80 75	E4H/f 4 100 3200-4000 690 100 100 85 75	E6H/f 4 100 4000-5000-6300 690 100 100 100 85

	E3N/MS	E3S/MS	E3V/MS	E4S/MS	E4S/f MS	E4H/MS	E4H/f MS	E6H/MS	E6H/f MS
	3 - 4	3 - 4	3 - 4	3 - 4	4	3 - 4	4	3 - 4	4
	2500-3200	1000-1250-1600- 2000-2500-3200	800-1250-1600- 2000-2500-3200	4000	4000	3200-4000	3200-4000	4000-5000-6300	4000-5000-6300
	690	690	690	690	690	690	690	690	690
	65	75	85	75	75	100	85	100	100
	65	65	65	75	75	75	75	85	85
	143	165	187	165	165	220	187	220	220

	E3H/E	E4H/E	E6H/E
	3 - 4	3 - 4	3 - 4
	1250-1600-2000-2500-3200	3200-4000	4000-5000-6300
	1150	1150	1150
	50	65	65
	30	65	65
	100%	100%	100%
	50 <sup>(*)</sup>	65	65

	E3H/E MS	E4H/E MS	E6H/E MS
	3 - 4	3 - 4	3 - 4
	1250-1600-2000-2500-3200	3200-4000	4000-5000-6300
	1150	1150	1150
	30 <sup>(1)</sup>	65	65
	63 <sup>(2)</sup>	143	143

	E3H/E MS	E4H/E MS	E6H/E MS
	3 - 4	3 - 4	3 - 4
	1250-1600-2000-2500-3200	3200-4000	4000-5000-6300
	750 (3p) - 1000 (4p)	750 (3p) - 1000 (4p)	750 (3p) - 1000 (4p)
	40	65	65
	105	143	143
	105	143	143

	E3 CS	E4 CS	E6 CS
	3200	4000	6300

	E3 MTP	E4 MTP	E6 MTP
	3200	4000	6300

	E3 MT	E4 MT	E6 MT
	3200	4000	6300

# Accessories for Emax air circuit-breakers

Circuit-breaker version	Circuit-breakers			
	Circuit-breakers with neutral with full section			
	Circuit-breakers for applications up to 1150 V AC			
	X1		E1-E6	
	Fixed	Withdrawable	Fixed	Withdrawable
<b>Service trip units</b>				
Shunt trip/closing coil and second shunt trip	■	■	■	■
SOR test unit	■	■	■	■
Undervoltage release	■	■	■	■
Time-delay device for undervoltage release	■	■	■	■
<b>Remote control</b>				
Geared motor for automatic closing spring charging (M)	■	■	■	■
<b>Electrical signals</b>				
Electrical signalling of overcurrent trip unit tripped	■	■	■	■
Electrical signalling of overcurrent trip unit trip with remote operating mechanism	■	■	■	■
Electrical signalling for circuit-breaker open/closed <sup>(1)</sup>	■	■	■	■
Electrical signalling for circuit-breaker open/closed, supplementary external			■	■
Electrical signalling for circuit-breaker racked-in/racked-out/racked-out for test		■		■
Contact signalling closing springs charged	■	■	■	■
Contact signalling undervoltage release de-energized (Aux C. YU)			■	■
Contact signalling "ready to close"	■	■		
<b>Accessories for electronic trip units</b>				
Current transformer for the neutral conductor outside the circuit-breaker	■	■	■	■
Homopolar toroid for the earthing conductor of the main power supply (star centre of the transformer)	■	■	■	■
Homopolar toroid for residual current protection	■	■	■	■
<b>Controls and locks</b>				
Mechanical operation counter	■	■	■	■
Lock in open position: key	■	■	■	■
Lock in open position: padlocks	■	■	■	■
Circuit-breaker lock in racked-in/racked-out/racked-out for test position		■		■
Accessories for lock in racked-out/racked-out for test position		■		■
Accessory for shutter padlocks				■
Mechanical lock on compartment door	■	■	■	■
Opening and closing pushbutton protection	■	■	■	■
IP54 door protection	■	■	■	■
Lock on sliding contacts	■	■		
Interlock between circuit-breakers <sup>(2)</sup>	■	■	■	■
<b>Automatic network-generator transfer unit</b>				
Automatic network-generator transfer unit ATS010 <sup>(3)</sup>	■	■	■	■

## KEY

- Accessory on request on fixed circuit-breaker or on moving part
- Accessory on request on fixed part
- Accessory on request on moving part

<sup>(1)</sup> For circuit-breaker, the 4 auxiliary contacts for electrical signalling of circuit-breaker open/closed are included in the standard supply

<sup>(2)</sup> Incompatible with the versions with full-section neutral E6/f

<sup>(3)</sup> For E1-E6, incompatible with the range of circuit-breakers for applications up to 1150 V AC. For X1, incompatible with the range of circuit-breaker for applications up to 1000 V AC





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Due to possible developments of standards as well as of materials, the characteristics and dimensions specified in the present catalogue may only be considered binding after confirmation by ABB SACE.

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